

# **D1 Series and FM100 Draper Header and Float Module for Combines**

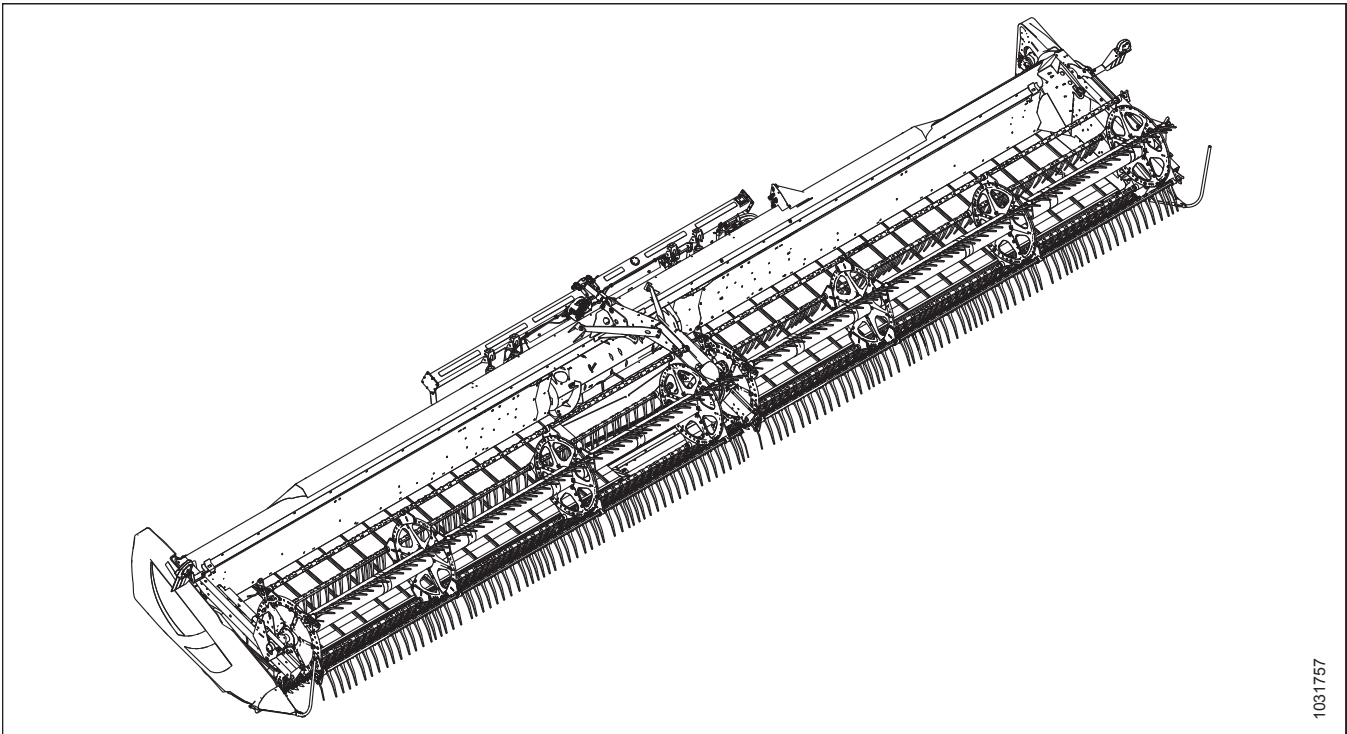
**IMPORTANT: PAGE 33 HAS BEEN  
UPDATED SINCE THIS MANUAL WAS  
PUBLISHED.**

Operator's Manual

215547 Revision A

Original Instruction

D1 Series Draper Header and FM100 Float Module for Combines



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# Declaration of Conformity



## EC Declaration of Conformity

[1] **MacDon** [4] As per Shipping Document

MacDon Industries Ltd.  
680 Moray Street,  
Winnipeg, Manitoba, Canada  
R3J 3S3

[5] September 3, 2020

[2] Combine Draper Header

[6] \_\_\_\_\_

[3] MacDon D1 Series

Christoph Martens  
Product Integrity

EN	BG	CZ	DA
We, [1]	Ние, [1]	My, [1]	Vi, [1]
Declare, that the product:	декларираме, че следният продукт:	Prohlášíjeme, že produkt:	erklærer, at prduktet:
Machine Type: [2]	Тип машина: [2]	Typ zařízení: [2]	Maskintype [2]
Name & Model: [3]	Наименование и модел: [3]	Název a model: [3]	Navn og model: [3]
Serial Number(s): [4]	Сериен номер(а) [4]	Sériové(á) číslo(a): [4]	Serienummer (-numre): [4]
fulfils all the relevant provisions of the Directive 2006/42/EC.	отговаря на всички приложими разпоредби на директива 2006/42/ЕО.	splňuje všechna relevantní ustanovení směrnice 2006/42/EC.	Opfylder alle bestemmelser i direktiv 2006/42/EF.
Harmonized standards used, as referred to in Article 7(2):	Използвани са следните хармонизирани стандарти според чл. 7(2):	Byly použity harmonizované standardy, jak je uvedeno v článku 7(2):	Anvendte harmoniserede standarder, som henviser til i paragraf 7(2):
EN ISO 4254-1:2013 EN ISO 4254-7:2009	EN ISO 4254-1:2013 EN ISO 4254-7:2009	EN ISO 4254-1:2013 EN ISO 4254-7:2009	EN ISO 4254-1:2013 EN ISO 4254-7:2009
Place and date of declaration: [5]	Място и дата на декларацията: [5]	Místo a datum prohlášení: [5]	Sted og dato for erklæringen: [5]
Identity and signature of the person empowered to draw up the declaration: [6]	Име и подпис на лицето, упълномощено да изготви декларацията: [6]	Identita a podpis osoby oprávněné k vydání prohlášení: [6]	Identitet på og underskrift fra den person, som er bemyndiget til at udarbejde erklæringen: [6]
Name and address of the person authorized to compile the technical file:	Име и адрес на лицето, упълномощено да състави техническия файл:	Jméno a adresa osoby oprávněné k vyplnění technického souboru:	Navn og adresse på den person, som er bemyndiget til at udarbejde den tekniske fil:
Benedikt von Riedesel General Manager, MacDon Europe GmbH Hagenauer Straße 59 65203 Wiesbaden (Germany) bvonriedesel@macdon.com	Бенедикт фон Рийдесел Управител, MacDon Europe GmbH Hagenauer Straße 59 65203 Wiesbaden (Германия) bvonriedesel@macdon.com	Benedikt von Riedesel generální ředitel, MacDon Europe GmbH Hagenauer Straße 59 65203 Wiesbaden (Německo) bvonriedesel@macdon.com	Benedikt von Riedesel Direktør, MacDon Europe GmbH Hagenauer Straße 59 D-65203 Wiesbaden (Tyskland) bvonriedesel@macdon.com

DE	ES	ET	FR
Wir, [1]	Nosotros [1]	Meie, [1]	Nous soussignés, [1]
Erklären hiermit, dass das Produkt:	declaramos que el producto:	deklareerime, et toode	Déclarons que le produit :
Maschinentyp: [2]	Tipo de máquina: [2]	Seadme tüüp: [2]	Type de machine : [2]
Name & Modell: [3]	Nombre y modelo: [3]	Nimi ja mudel: [3]	Nom et modèle : [3]
Seriennummer (n): [4]	Números de serie: [4]	Seerianumbrid: [4]	Numéro(s) de série : [4]
alle relevanten Vorschriften der Richtlinie 2006/42/EG erfüllt.	cumple con todas las disposiciones pertinentes de la directriz 2006/42/EC.	vastab kõigile direktiivi 2006/42/EÜ asjakohastele sätetele.	Est conforme à toutes les dispositions pertinentes de la directive 2006/42/EC.
Harmonisierte Standards wurden, wie in folgenden Artikeln angegeben, verwendet 7(2):	Se utilizaron normas armonizadas, según lo dispuesto en el artículo 7(2):	Kasutatud on järgnevaid harmoniseeritud standardeid, millele on viidatud ka punktis 7(2):	Utilisation des normes harmonisées, comme indiqué dans l'Article 7(2):
EN ISO 4254-1:2013 EN ISO 4254-7:2009	EN ISO 4254-1:2013 EN ISO 4254-7:2009	EN ISO 4254-1:2013 EN ISO 4254-7:2009	EN ISO 4254-1:2013 EN ISO 4254-7:2009
Ort und Datum der Erklärung: [5]	Lugar y fecha de la declaración: [5]	Deklaratsiooni koht ja kuupäev: [5]	Lieu et date de la déclaration : [5]
Name und Unterschrift der Person, die dazu befugt ist, die Erklärung auszustellen: [6]	Identidad y firma de la persona facultada para draw redactar la declaración: [6]	Deklaratsiooni koostamiseks volitatud isiku nimi ja allkiri: [6]	Identité et signature de la personne ayant reçu le pouvoir de rédiger cette déclaration : [6]
Name und Anschrift der Person, die dazu berechtigt ist, die technischen Unterlagen zu erstellen:	Nombre y dirección de la persona autorizada para elaborar el expediente técnico:	Tehnilise dokumendi koostamiseks volitatud isiku nimi ja aadress:	Nom et adresse de la personne autorisée à constituer le dossier technique :
Benedikt von Riedesel General Manager, MacDon Europe GmbH Hagenauer Straße 59 65203 Wiesbaden bvonriedesel@macdon.com	Benedikt von Riedesel Gerente general - MacDon Europe GmbH Hagenauer Straße 59 65203 Wiesbaden (Alemania) bvonriedesel@macdon.com	Benedikt von Riedesel Peadirektor, MacDon Europe GmbH Hagenauer Straße 59 65203 Wiesbaden (Saksamaa) bvonriedesel@macdon.com	Benedikt von Riedesel Directeur général, MacDon Europe GmbH Hagenauer Straße 59 65203 Wiesbaden (Allemagne) bvonriedesel@macdon.com

# EC Declaration of Conformity

IT	HU	LT	LV
<p>Noi, [1] Dichiaro che il prodotto: Tipo di macchina: [2] Nome e modello: [3] Numero(i) di serie: [4] soddisfa tutte le disposizioni rilevanti della direttiva 2006/42/CE.</p> <p>Utilizzo degli standard armonizzati, come indicato nell'Articolo 7(2):</p> <p style="text-align: center;">EN ISO 4254-1:2013 EN ISO 4254-7:2009</p> <p>Luogo e data della dichiarazione: [5] Nome e firma della persona autorizzata a redigere la dichiarazione: [6] Nome e persona autorizzata a compilare il file tecnico: Benedikt von Riedesel General Manager, MacDon Europe GmbH Hagenauer Straße 59 65203 Wiesbaden (Germania) bvonriedesel@macdon.com</p>	<p>Mi, [1] Ezennel kijelentjük, hogy a következő termék: Gép típusa: [2] Név és modell: [3] Szériaszám(ok): [4] teljesíti a következő irányelv összes vonatkozó előírásait: 2006/42/EK.</p> <p>Az alábbi harmonizált szabványok kerültek alkalmazásra a 7(2) cikkely szerint:</p> <p style="text-align: center;">EN ISO 4254-1:2013 EN ISO 4254-7:2009</p> <p>A nyilatkozattétel ideje és helye: [5] Azon személy kiléte és aláírása, aki jogosult a nyilatkozat elkészítésére: [6] Azon személy neve és aláírása, aki felhatalmazott a műszaki dokumentáció összeállítására: Benedikt von Riedesel Vezérigazgató, MacDon Europe GmbH Hagenauer Straße 59 65203 Wiesbaden (Németország) bvonriedesel@macdon.com</p>	<p>Mes, [1] Pareiškiamė, kad šis produktas: Mašinos tipas: [2] Pavadinimas ir modelis: [3] Serijos numeris (-iai): [4] atitinka taikomus reikalavimus pagal Direktyvą 2006/42/EB.</p> <p>Naudojami harmonizuoti standartai, kai nurodoma straipsnyje 7(2):</p> <p style="text-align: center;">EN ISO 4254-1:2013 EN ISO 4254-7:2009</p> <p>Deklaracijos vieta ir data: [5] Asmens tapatybės duomenys ir parašas asmens, atitinkanti šią deklaraciją: [6] Vardas ir pavardė asmens, kuris įgaliotas sudaryti šį techninį failą: Benedikt von Riedesel Generalinis direktorius, MacDon Europe GmbH Hagenauer Straße 59 65203 Wiesbaden (Vokietija) bvonriedesel@macdon.com</p>	<p>Mēs, [1] Deklarējam, ka produkts: Mašīnas tips: [2] Nosaukums un modelis: [3] Sērijas numurs(-i): [4] Atbilst visām būtiskajām Direktīvas 2006/42/EK prasībām.</p> <p>Piemēroti šādi saskaņotie standarti, kā minēts 7. panta 2. punktā:</p> <p style="text-align: center;">EN ISO 4254-1:2013 EN ISO 4254-7:2009</p> <p>Deklarācijas parakstīšanas vieta un datums: [5] Tās personas vārds, uzvārds un paraksts, kas ir pilnvarota sagatavot šo deklarāciju: [6] Tās personas vārds, uzvārds un adrese, kas ir pilnvarota sastādīt tehnisko dokumentāciju: Benedikts fon Rīdzelis Generāldirektors, MacDon Europe GmbH Hagenauer Straße 59 65203 Wiesbaden (Vācija) bvonriedesel@macdon.com</p>
<p>Wij, [1] Verklaren dat het product: Machinetype: [2] Naam en model: [3] Serienummer(s): [4] voldoet aan alle relevante bepalingen van de Richtlijn 2006/42/EC.</p> <p>Geharmoniseerde normen toegepast, zoals vermeld in Artikel 7(2):</p> <p style="text-align: center;">EN ISO 4254-1:2013 EN ISO 4254-7:2009</p> <p>Plaats en datum van verklaring: [5] Naam en handtekening van de bevoegde persoon om de verklaring op te stellen: [6] Naam en adres van de geautoriseerde persoon om het technisch dossier samen te stellen: Benedikt von Riedesel Algemeen directeur, MacDon Europe GmbH Hagenauer Straße 59 65203 Wiesbaden (Duitsland) bvonriedesel@macdon.com</p>	<p>My niżej podpisani, [1] Oświadczamy, że produkt: Typ urządzenia: [2] Nazwa i model: [3] Numer serijny/numery seryjne: [4] spełnia wszystkie odpowiednie przepisy dyrektywy 2006/42/WE.</p> <p>Zastosowaliśmy następujące (zharmonizowane) normy zgodnie z artykulem 7(2):</p> <p style="text-align: center;">EN ISO 4254-1:2013 EN ISO 4254-7:2009</p> <p>Data i miejsce oświadczenia: [5] Imię i nazwisko oraz podpis osoby upoważnionej do przygotowania deklaracji: [6] Imię i nazwisko oraz adres osoby upoważnionej do przygotowania dokumentacji technicznej: Benedikt von Riedesel Dyrektor generalny, MacDon Europe GmbH Hagenauer Straße 59 65203 Wiesbaden (Niemcy) bvonriedesel@macdon.com</p>	<p>Nós, [1] Declaramos, que o produto: Tipo de máquina: [2] Nome e Modelo: [3] Número(s) de Série: [4] cumpre todas as disposições relevantes da Directiva 2006/42/CE.</p> <p>Normas harmonizadas aplicadas, conforme referido no Artigo 7(2):</p> <p style="text-align: center;">EN ISO 4254-1:2013 EN ISO 4254-7:2009</p> <p>Local e data da declaração: [5] Identidade e assinatura da pessoa autorizada a elaborar a declaração: [6] Nome e endereço da pessoa autorizada a compilar o ficheiro técnico: Benedikt von Riedesel Gerente Geral, MacDon Europa Ltda. Hagenauer Straße 59 65203 Wiesbaden (Alemanha) bvonriedesel@macdon.com</p>	<p>Noi, [1] Declarăm, că următorul produs: Tipul mașinii: [2] Denumirea și modelul: [3] Număr (numere) serie: [4] corespunde tuturor dispozițiilor esențiale ale directivei 2006/42/EC.</p> <p>Au fost aplicate următoarele standarde armonizate conform articolului 7(2):</p> <p style="text-align: center;">EN ISO 4254-1:2013 EN ISO 4254-7:2009</p> <p>Data și locul declarației: [5] Identitatea și semnătura persoanei împuternicite pentru întocmirea declarației: [6] Numele și semnătura persoanei autorizate pentru întocmirea cărții tehnice: Benedikt von Riedesel Manager General, MacDon Europe GmbH Hagenauer Straße 59 65203 Wiesbaden (Germania) bvonriedesel@macdon.com</p>
<p>Mi, [1] Izjavljujemo da proizvod Tip mašine: [2] Naziv i model: [3] Serijski broj(ovi): [4] Ispunjava sve relevantne odredbe direktive 2006/42/EC.</p> <p>Korišćeni su usklađeni standardi kao što je navedeno u članku 7(2):</p> <p style="text-align: center;">EN ISO 4254-1:2013 EN ISO 4254-7:2009</p> <p>Datum i mesto izdavanja deklaracije: [5] Identitet i potpis lica ovlašćenog za sastavljanje deklaracije: [6] Ime i adresa osobe ovlašćene za sastavljanje tehničke datoteke: Benedikt von Riedesel Generalni direktor, MacDon Europe GmbH Hagenauer Straße 59 65203 Wiesbaden (Nemačka) bvonriedesel@macdon.com</p>	<p>Mi, [1] Intygat att produkten: Maskintyp: [2] Namn och modell: [3] Serienummer: [4] uppfyller alla relevanta villkor i direktivet 2006/42/EG.</p> <p>Harmonierade standarder används, såsom anges i artikel 7(2):</p> <p style="text-align: center;">EN ISO 4254-1:2013 EN ISO 4254-7:2009</p> <p>Plats och datum för intyget: [5] Identitet och signatur för person med befogenhet att upprätta intyget: [6] Namn och adress för person behörig att upprätta den tekniska dokumentationen: Benedikt von Riedesel Administrativ chef, MacDon Europe GmbH Hagenauer Straße 59 65203 Wiesbaden (Tyskland) bvonriedesel@macdon.com</p>	<p>Mi, [1] izjavljamo, da izdelek: Vrsta stroja: [2] Ime in model: [3] Serijska/-e številka/-e: [4] ustreza vsem zadevnim določbam Direktive 2006/42/ES.</p> <p>Uporabljeni usklajeni standardi, kot je navedeno v členu 7(2):</p> <p style="text-align: center;">EN ISO 4254-1:2013 EN ISO 4254-7:2009</p> <p>Kraj in datum izjave: [5] Istovetnost in podpis osebe, opolnomočene za pripravo izjave: [6] Ime in naslov osebe, pooblaščenca za pripravo tehnične datoteke: Benedikt von Riedesel Generalni direktor, MacDon Europe GmbH Hagenauer Straße 59 65203 Wiesbaden (Nemčija) bvonriedesel@macdon.com</p>	<p>My, [1] týmto prehlasujeme, že tento výrobok: Typ zariadenia: [2] Názov a model: [3] Výrobné číslo: [4] splňa príslušné ustanovenia a základné požiadavky smernice č. 2006/42/ES.</p> <p>Použitie harmonizované normy, ktoré sa uvádzajú v článku č. 7(2):</p> <p style="text-align: center;">EN ISO 4254-1:2013 EN ISO 4254-7:2009</p> <p>Miesto a dátum prehlásenia: [5] Meno a podpis osoby oprávnenej vypracovať toto prehlásenie: [6] Meno a adresa osoby oprávnenej zostaviť technický súbor: Benedikt von Riedesel Generálny riaditeľ MacDon Europe GmbH Hagenauer Straße 59 65203 Wiesbaden (Nemecko) bvonriedesel@macdon.com</p>



# EC Declaration of Conformity

[1] **MacDon**

MacDon Industries Ltd.  
680 Moray Street,  
Winnipeg, Manitoba, Canada  
R3J 3S3

[4] As per Shipping Document

[5] May 6, 2020

[2] Float Module

[6] \_\_\_\_\_

[3] MacDon FM100

Christoph Martens  
Product Integrity

EN	BG	CZ	DA
We, [1] Declare, that the product: Machine Type: [2] Name & Model: [3] Serial Number(s): [4] fulfils all the relevant provisions of the Directive 2006/42/EC. Harmonized standards used, as referred to in Article 7(2): EN ISO 4254-1:2013 EN ISO 4254-7:2009 Place and date of declaration: [5] Identity and signature of the person empowered to draw up the declaration: [6] Name and address of the person authorized to compile the technical file: Benedikt von Riedesel General Manager, MacDon Europe GmbH Hagenauer Straße 59 65203 Wiesbaden (Germany) bvonriedesel@macdon.com	Ние, [1] декларираме, че следният продукт: Тип машина: [2] Наименование и модел: [3] Серийен номер(а) [4] отговаря на всички приложими разпоредби на директива 2006/42/ЕО. Използвани са следните хармонизирани стандарти според чл. 7(2): EN ISO 4254-1:2013 EN ISO 4254-7:2009 Място и дата на декларацията: [5] Име и подпис на лицето, упълномощено да изготви декларацията: [6] Име и адрес на лицето, упълномощено да състави техническия файл: Бенедикт фон Рийдесел Управител, MacDon Europe GmbH Hagenauer Straße 59 65203 Wiesbaden (Германия) bvonriedesel@macdon.com	My, [1] Prohláujeme, že produkt: Typ zařízení: [2] Název a model: [3] Sériové(á) číslo(a): [4] splňuje všechna relevantní ustanovení směrnice 2006/42/EC. Byly použity harmonizované standardy, jak je uvedeno v článku 7(2): EN ISO 4254-1:2013 EN ISO 4254-7:2009 Místo a datum prohlášení: [5] Identita a podpis osoby oprávněné k vydání prohlášení: [6] Jméno a adresa osoby oprávněné k vyplnění technického souboru: Benedikt von Riedesel generální ředitel, MacDon Europe GmbH Hagenauer Straße 59 65203 Wiesbaden (Německo) bvonriedesel@macdon.com	Vi, [1] erklærer, at produktet: Maskintype [2] Navn og model: [3] Serienummer (-numre): [4] Opfylder alle bestemmelser i direktiv 2006/42/EF. Anvendte harmoniserede standarder, som henviser til i paragraf 7(2): EN ISO 4254-1:2013 EN ISO 4254-7:2009 Sted og dato for erklæringen: [5] Identitet på og underskrift fra den person, som er bemyndiget til at udarbejde erklæringen: [6] Navn og adresse på den person, som er bemyndiget til at udarbejde den tekniske fil: Benedikt von Riedesel Direktør, MacDon Europe GmbH Hagenauer Straße 59 D-65203 Wiesbaden (Tyskland) bvonriedesel@macdon.com

DE	ES	ET	FR
Wir, [1] Erklären hiermit, dass das Produkt: Maschinentyp: [2] Name & Modell: [3] Seriennummer (n): [4] alle relevanten Vorschriften der Richtlinie 2006/42/EG erfüllt. Harmonisierte Standards wurden, wie in folgenden Artikeln angegeben, verwendet 7(2): EN ISO 4254-1:2013 EN ISO 4254-7:2009 Ort und Datum der Erklärung: [5] Name und Unterschrift der Person, die dazu befugt ist, die Erklärung auszustellen: [6] Name und Anschrift der Person, die dazu berechtigt ist, die technischen Unterlagen zu erstellen: Benedikt von Riedesel General Manager, MacDon Europe GmbH Hagenauer Straße 59 65203 Wiesbaden bvonriedesel@macdon.com	Nosotros [1] declaramos que el producto: Tipo de máquina: [2] Nombre y modelo: [3] Números de serie: [4] cumple con todas las disposiciones pertinentes de la directriz 2006/42/EC. Se utilizaron normas armonizadas, según lo dispuesto en el artículo 7(2): EN ISO 4254-1:2013 EN ISO 4254-7:2009 Lugar y fecha de la declaración: [5] Identidad y firma de la persona facultada para draw redactar la declaración: [6] Nombre y dirección de la persona autorizada para elaborar el expediente técnico: Benedikt von Riedesel Gerente general - MacDon Europe GmbH Hagenauer Straße 59 65203 Wiesbaden (Alemania) bvonriedesel@macdon.com	Meie, [1] deklareerime, et toode Seadme tüüp: [2] Nimi ja mudel: [3] Seerianumberid: [4] vastab kõigile direktiivi 2006/42/EÜ asjakohastele sätetele. Kasutatud on järgnevaid harmoniseeritud standardeid, millele on viidatud ka punktis 7(2): EN ISO 4254-1:2013 EN ISO 4254-7:2009 Deklaratsiooni koht ja kuupäev: [5] Deklaratsiooni koostamiseks volitatud isiku nimi ja allkiri: [6] Tehnilise dokumendi koostamiseks volitatud isiku nimi ja aadress: Benedikt von Riedesel Peadirektor, MacDon Europe GmbH Hagenauer Straße 59 65203 Wiesbaden (Saksamaa) bvonriedesel@macdon.com	Nous soussignés, [1] Déclarons que le produit : Type de machine : [2] Nom et modèle : [3] Numéro(s) de série : [4] Est conforme à toutes les dispositions pertinentes de la directive 2006/42/EC. Utilisation des normes harmonisées, comme indiqué dans l'Article 7(2): EN ISO 4254-1:2013 EN ISO 4254-7:2009 Lieu et date de la déclaration : [5] Identité et signature de la personne ayant reçu le pouvoir de rédiger cette déclaration : [6] Nom et adresse de la personne autorisée à constituer le dossier technique : Benedikt von Riedesel Directeur général, MacDon Europe GmbH Hagenauer Straße 59 65203 Wiesbaden (Allemagne) bvonriedesel@macdon.com

# EC Declaration of Conformity

IT	HU	LT	LV
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<p>Wij, [1] Verklaren dat het product: Machinetype: [2] Naam en model: [3] Serienummer(s): [4] voldoet aan alle relevante bepalingen van de Richtlijn 2006/42/EC.</p> <p>Geharmoniseerde normen toegepast, zoals vermeld in Artikel 7(2):</p> <p style="text-align: center;">EN ISO 4254-1:2013 EN ISO 4254-7:2009</p> <p>Plaats en datum van verklaring: [5] Naam en handtekening van de bevoegde persoon om de verklaring op te stellen: [6] Naam en adres van de geautoriseerde persoon om het technisch dossier samen te stellen: Benedikt von Riedesel Algemeen directeur, MacDon Europe GmbH Hagenauer Straße 59 65203 Wiesbaden (Duitsland) bvonriedesel@macdon.com</p>	<p>My niżej podpisani, [1] Oświadczamy, że produkt: Typ urządzenia: [2] Nazwa i model: [3] Numer serijny/numery seryjne: [4] spełnia wszystkie odpowiednie przepisy dyrektywy 2006/42/WE.</p> <p>Zastosowaliśmy następujące (zharmonizowane) normy zgodnie z artykulem 7(2):</p> <p style="text-align: center;">EN ISO 4254-1:2013 EN ISO 4254-7:2009</p> <p>Data i miejsce oświadczenia: [5] Imię i nazwisko oraz podpis osoby upoważnionej do przygotowania deklaracji: [6] Imię i nazwisko oraz adres osoby upoważnionej do przygotowania dokumentacji technicznej: Benedikt von Riedesel Dyrektor generalny, MacDon Europe GmbH Hagenauer Straße 59 65203 Wiesbaden (Niemcy) bvonriedesel@macdon.com</p>	<p>Nós, [1] Declaramos, que o produto: Tipo de máquina: [2] Nome e Modelo: [3] Número(s) de Série: [4] cumpre todas as disposições relevantes da Directiva 2006/42/CE.</p> <p>Normas harmonizadas aplicadas, conforme referido no Artigo 7(2):</p> <p style="text-align: center;">EN ISO 4254-1:2013 EN ISO 4254-7:2009</p> <p>Local e data da declaração: [5] Identidade e assinatura da pessoa autorizada a elaborar a declaração: [6] Nome e endereço da pessoa autorizada a compilar o ficheiro técnico: Benedikt von Riedesel Gerente Geral, MacDon Europa Ltda. Hagenauer Straße 59 65203 Wiesbaden (Alemanha) bvonriedesel@macdon.com</p>	<p>Noi, [1] Declarăm, că următorul produs: Tipul mașinii: [2] Denumirea și modelul: [3] Număr (numere) serie: [4] corespunde tuturor dispozițiilor esențiale ale directivei 2006/42/EC.</p> <p>Au fost aplicate următoarele standarde armonizate conform articolului 7(2):</p> <p style="text-align: center;">EN ISO 4254-1:2013 EN ISO 4254-7:2009</p> <p>Data și locul declarației: [5] Identitatea și semnătura persoanei împuternicite pentru întocmirea declarației: [6] Numele și semnătura persoanei autorizate pentru întocmirea cărții tehnice: Benedikt von Riedesel Manager General, MacDon Europe GmbH Hagenauer Straße 59 65203 Wiesbaden (Germania) bvonriedesel@macdon.com</p>
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## Introduction

This instructional manual contains information on the D1 Series Draper Header and the FM100 Float Module. This manual must be used in conjunction with the combine operator's manual. The FM100 Float Module is used to attach a D1 Series Draper Header to a combine.

The D1 Series Draper Header is specially designed as a straight cut header and is equipped to work well in all straight cut conditions—whether cutting on or above the ground.

### Carefully read all the material provided before attempting to use the machine.

Use this manual as your first source of information about the machine. If you follow the instructions provided, your header will work well for many years.

MacDon provides warranty for Customers who operate and maintain their equipment as described in this manual. A copy of the MacDon Industries Limited Warranty Policy, which explains this warranty, should have been provided to you by your Dealer. Damage resulting from any of the following conditions will void the warranty:

- Accident
- Misuse
- Abuse
- Improper maintenance or neglect
- Abnormal or extraordinary use of the machine
- Failure to use the machine, equipment, component, or part in accordance with the manufacturer's instructions

The following conventions are used in this document:

- Right and left are determined from the operator's position. The front of the header faces the crop; the back of the header attaches to the float module and combine.
- Unless otherwise noted, use the standard torque values provided in Chapter *8.1 Torque Specifications, page 609*.

When setting up the machine or making adjustments, review and follow the recommended machine settings in all relevant MacDon publications. Failure to do so may compromise machine function and machine life and may result in a hazardous situation.

The Table of Contents and Index will guide you to specific areas of this manual. Study the Table of Contents to familiarize yourself with how the information is organized.

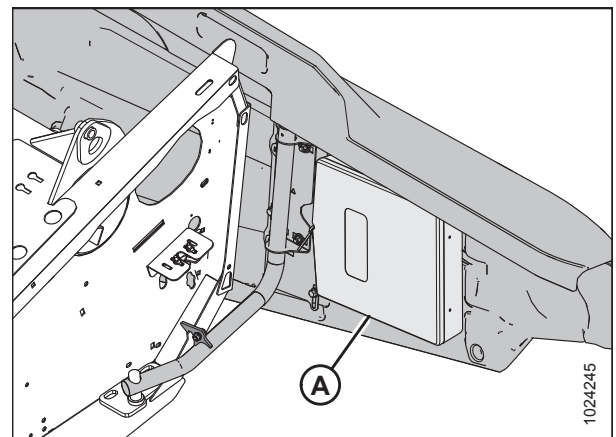
Keep this manual handy for frequent reference and to pass on to new Operators or Owners. A manual storage case (A) is located inside the header left endshield.

Call your MacDon Dealer if you need assistance, information, or additional copies of this manual.

#### NOTE:

Keep your MacDon publications up-to-date. The most current English version can be downloaded from our website ([www.macdon.com](http://www.macdon.com)) or from our Dealer-only site (<https://portal.macdon.com>) (login required).

This document is also available in French, Portuguese, and Russian. These versions can be downloaded from the dealer portal or from MacDon International.



**Manual Storage Location**

## Summary of Changes

At MacDon, we're continuously making improvements; occasionally these improvements affect product documentation. The following list provides an account of major changes from the previous version of this document.

Section	Summary of Change	Internal Use Only
Various	Added introductory statements to the beginnings of topics.	Technical Publications
<i>3.8.1 FM100 Feed Auger Configurations, page 58</i>	Updated the topics in this section.	Technical Publications
<i>Adjusting Contour Buddy Inboard Wheel Height, page 87</i>	Added topic.	Technical Publications
<i>Adjusting Contour Buddy Outboard Wheel Height, page 88</i>	Added topic	Technical Publications
<i>5.3.1 Maintenance Schedule/Record, page 399</i>	Revised topic.	Engineering
<i>Every 10 Hours, page 404</i>	Revised topic.	Engineering
<i>Every 50 Hours, page 406</i>	Revised topic.	Engineering

## Model and Serial Number

Record the model number, serial number, and model year of the header, combine float module, and transport / stabilizer wheel option (if installed) in the spaces provided.

### D1 Series Draper Header

Header Model: \_\_\_\_\_  
Serial Number: \_\_\_\_\_  
Model Year: \_\_\_\_\_

Header serial number plate (A) is located on the upper corner on the left endsheet.

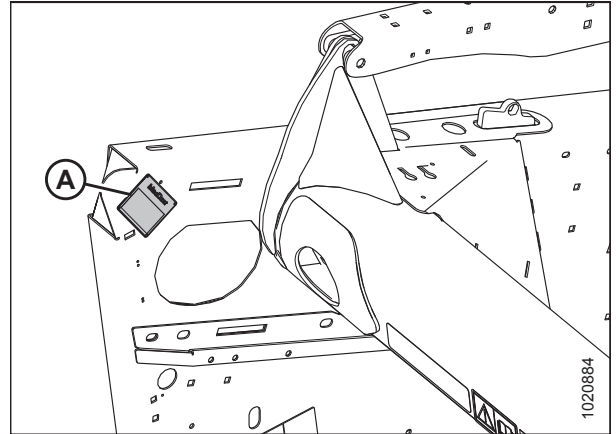


Figure 1: Header Serial Number Plate Location

### FM100 Float Module for Combine

Serial Number: \_\_\_\_\_  
Model Year: \_\_\_\_\_

Float module serial number plate (A) is located on the top left of the float module frame.

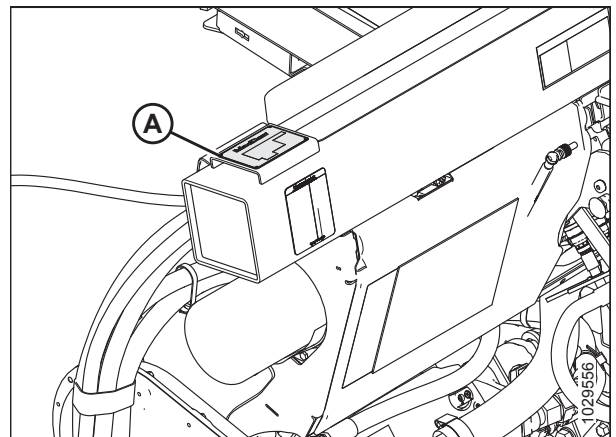


Figure 2: Float Module Serial Number Plate Location

### Transport / Stabilizer Wheel Option

Serial Number: \_\_\_\_\_  
Model Year: \_\_\_\_\_

Transport serial number plate (A) is located on the right axle assembly.



Figure 3: Transport / Stabilizer Wheel Location





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# Chapter 1: Safety

Understanding and following safety procedures consistently will help to ensure the safety of machine operators and bystanders.

## 1.1 Safety Alert Symbols

The safety alert symbol indicates important safety messages in this manual and on safety signs on the machine.

This symbol means:

- **ATTENTION!**
- **BECOME ALERT!**
- **YOUR SAFETY IS INVOLVED!**

Carefully read and follow the safety message accompanying this symbol.

### Why is safety important to you?

- Accidents disable and kill
- Accidents cost
- Accidents can be avoided



Figure 1.1: Safety Symbol

## 1.2 Signal Words

Three signal words, **DANGER**, **WARNING**, and **CAUTION**, are used to alert you to hazardous situations. Two signal words, **IMPORTANT** and **NOTE**, identify non-safety related information.

Signal words are selected using the following guidelines:

### **DANGER**

Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury.

### **WARNING**

Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury. It may also be used to alert against unsafe practices.

### **CAUTION**

Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may be used to alert against unsafe practices.

### **IMPORTANT:**

Indicates a situation that, if not avoided, could result in a malfunction or damage to the machine.

### **NOTE:**

Provides additional information or advice.

## 1.3 General Safety

Protect yourself when assembling, operating, and servicing machinery.

### CAUTION

The following general farm safety precautions should be part of your operating procedure for all types of machinery.

Wear all protective clothing and personal safety devices that could be necessary for the job at hand. Do **NOT** take chances. You may need the following:

- Hard hat
- Protective footwear with slip-resistant soles
- Protective glasses or goggles
- Heavy gloves
- Wet weather gear
- Respirator or filter mask

In addition, take the following precautions:

- Be aware that exposure to loud noises can cause hearing impairment or loss. Wear suitable hearing protection devices such as earmuffs or earplugs to help protect against loud noises.



Figure 1.2: Safety Equipment

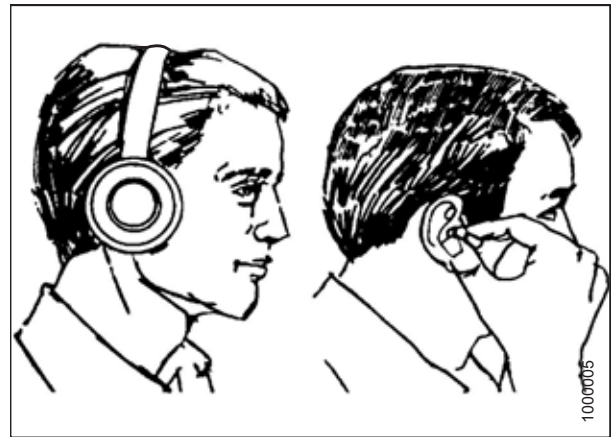


Figure 1.3: Safety Equipment

- Provide a first aid kit in case of emergencies.
- Keep a properly maintained fire extinguisher on the machine. Be familiar with its proper use.
- Keep young children away from machinery at all times.
- Be aware that accidents often happen when the Operator is tired or in a hurry. Take time to consider the safest way. **NEVER** ignore warning signs of fatigue.

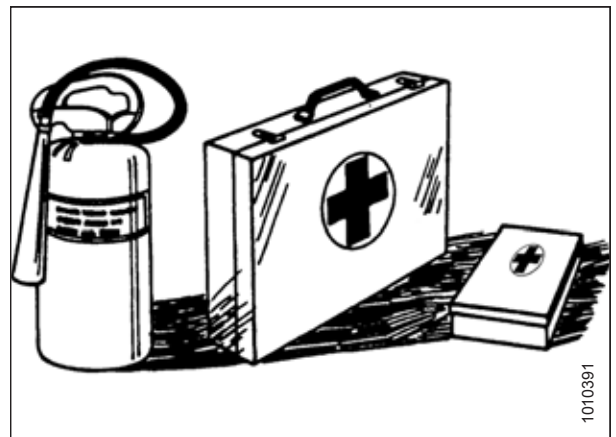


Figure 1.4: Safety Equipment

## SAFETY

- Wear close-fitting clothing and cover long hair. **NEVER** wear dangling items such as scarves or bracelets.
- Keep all shields in place. **NEVER** alter or remove safety equipment. Make sure driveline guards can rotate independently of shaft and can telescope freely.
- Use only service and repair parts made or approved by equipment manufacturer. Substituted parts may not meet strength, design, or safety requirements.



Figure 1.5: Safety around Equipment

- Keep hands, feet, clothing, and hair away from moving parts. **NEVER** attempt to clear obstructions or objects from a machine while the engine is running.
- Do **NOT** modify the machine. Unauthorized modifications may impair machine function and/or safety. It may also shorten the machine's life.
- To avoid injury or death from unexpected startup of the machine, **ALWAYS** stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

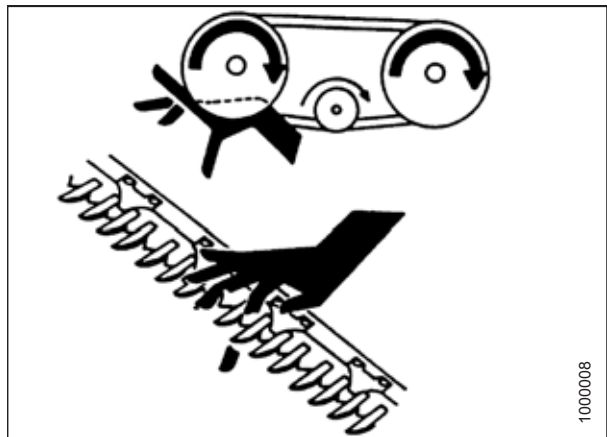


Figure 1.6: Safety around Equipment

- Keep service area clean and dry. Wet and/or oily floors are slippery. Wet spots can be dangerous when working with electrical equipment. Be sure all electrical outlets and tools are properly grounded.
- Keep work area well lit.
- Keep machinery clean. Straw and chaff on a hot engine are fire hazards. Do **NOT** allow oil or grease to accumulate on service platforms, ladders, or controls. Clean machines before storage.
- **NEVER** use gasoline, naphtha, or any volatile material for cleaning purposes. These materials may be toxic and/or flammable.
- When storing machinery, cover sharp or extending components to prevent injury from accidental contact.



Figure 1.7: Safety around Equipment

## 1.4 Maintenance Safety

Protect yourself when servicing machinery.

To ensure your safety while maintaining machine:

- Review the operator's manual and all safety items before operation and/or maintenance of the machine.
- Place all controls in Neutral, stop the engine, set the park brake, remove the ignition key, and wait for all moving parts to stop before servicing, adjusting, and/or repairing.
- Follow good shop practices:
  - Keep service areas clean and dry
  - Be sure electrical outlets and tools are properly grounded
  - Keep work area well lit



Figure 1.8: Safety around Equipment

- Relieve pressure from hydraulic circuits before servicing and/or disconnecting the machine.
- Make sure all components are tight and that steel lines, hoses, and couplings are in good condition before applying pressure to hydraulic systems.
- Keep hands, feet, clothing, and hair away from all moving and/or rotating parts.
- Clear the area of bystanders, especially children, when carrying out any maintenance, repairs, or adjustments.
- Install transport lock or place safety stands under the frame before working under the machine.
- If more than one person is servicing the machine at the same time, be aware that rotating a driveline or other mechanically-driven component by hand (for example, accessing a lubricant fitting) will cause drive components in other areas (belts, pulleys, and knives) to move. Stay clear of driven components at all times.
- Wear protective gear when working on the machine.
- Wear heavy gloves when working on knife components.

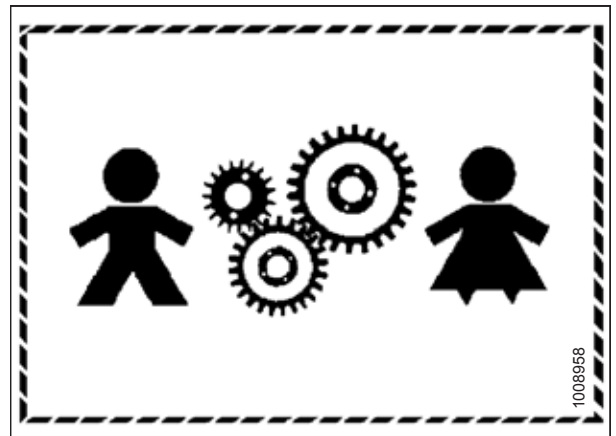


Figure 1.9: Equipment NOT Safe for Children



Figure 1.10: Safety Equipment

## 1.5 Hydraulic Safety

Protect yourself when assembling, operating, and servicing hydraulic components.

- Always place all hydraulic controls in Neutral before leaving the operator's seat.
- Make sure that all components in the hydraulic system are kept clean and in good condition.
- Replace any worn, cut, abraded, flattened, or crimped hoses and steel lines.
- Do **NOT** attempt any makeshift repairs to hydraulic lines, fittings, or hoses by using tapes, clamps, cements, or welding. The hydraulic system operates under extremely high-pressure. Makeshift repairs will fail suddenly and create hazardous and unsafe conditions.

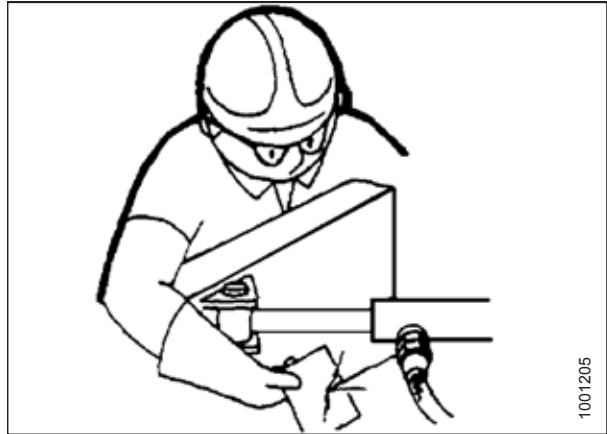


Figure 1.11: Testing for Hydraulic Leaks

- Wear proper hand and eye protection when searching for high-pressure hydraulic leaks. Use a piece of cardboard as a backstop instead of hands to isolate and identify a leak.
- If injured by a concentrated high-pressure stream of hydraulic fluid, seek medical attention immediately. Serious infection or toxic reaction can develop from hydraulic fluid piercing the skin.



Figure 1.12: Hydraulic Pressure Hazard

- Make sure all components are tight and steel lines, hoses, and couplings are in good condition before applying pressure to a hydraulic system.

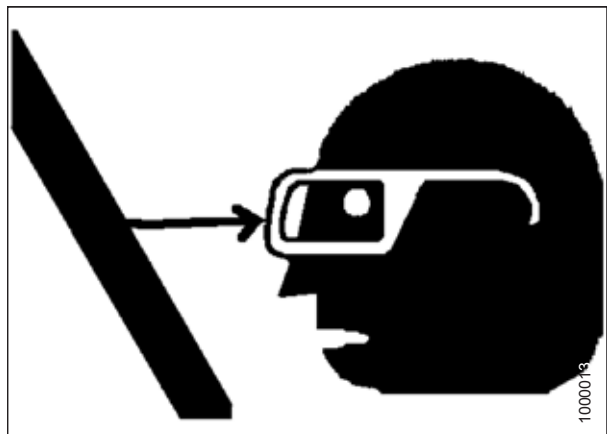


Figure 1.13: Safety around Equipment



## 1.6 Safety Signs

Safety signs are usually yellow decals placed on the machine where there is a risk of personal injury, or where the operator has to take extra precautions before operating controls. Operator manuals and technical manuals identify the location and meaning of all safety signs placed on the machine.

- Keep safety signs clean and legible at all times.
- Replace safety signs that are missing or illegible.
- If the original part on which a safety sign was installed is replaced, be sure the repair part displays the current safety sign.
- Replacement safety signs are available from your MacDon Dealer Parts Department.

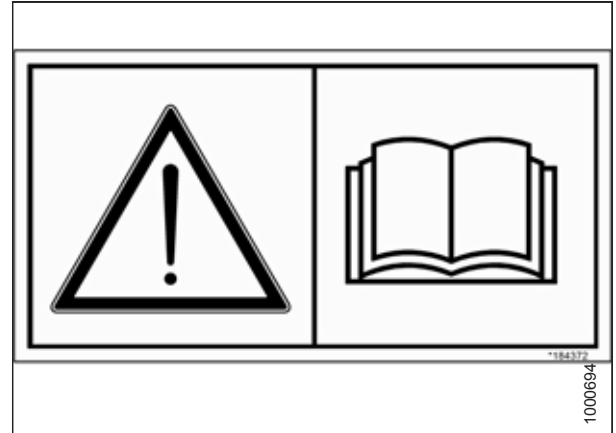


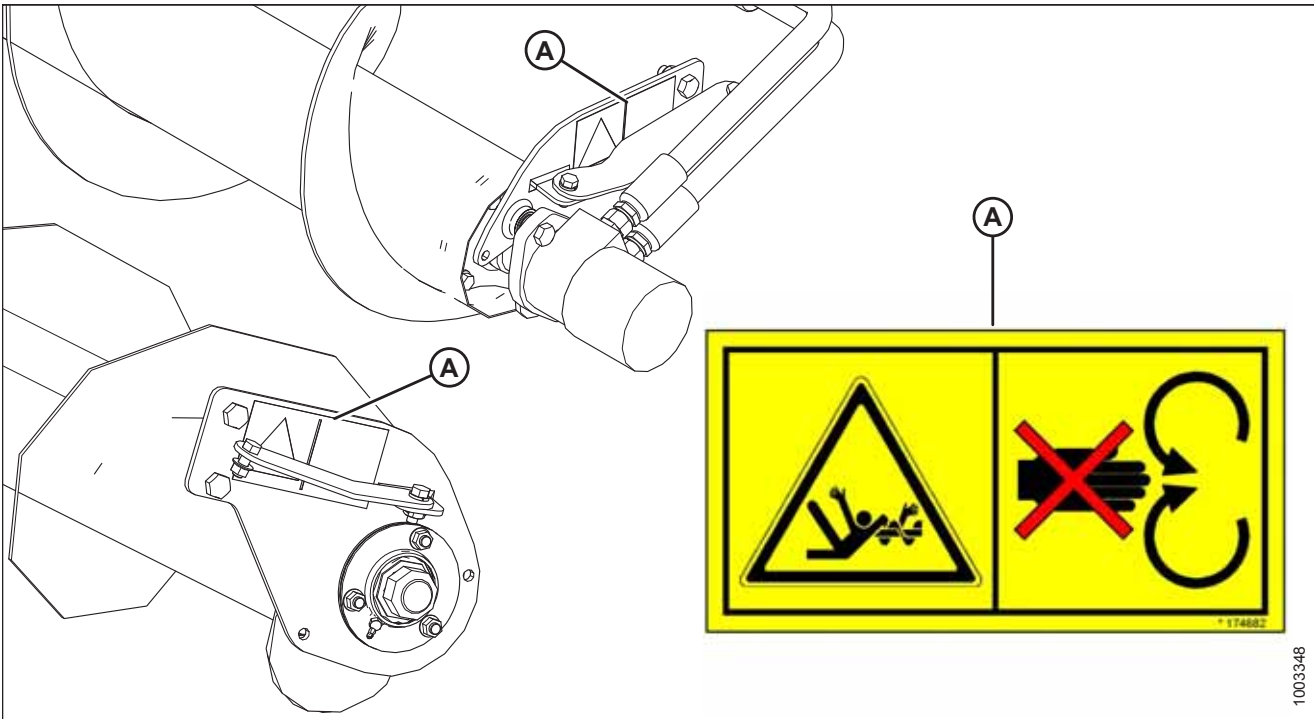
Figure 1.14: Operator's Manual Decal

### 1.6.1 Installing Safety Decals

If a safety decal is damaged it should be replaced.

1. Decide exactly where you are going to place the decal.
2. Clean and dry the installation area.
3. Remove the smaller portion of the split backing paper.
4. Place the decal in position and slowly peel back the remaining paper, smoothing the decal as it is applied.
5. Prick small air pockets with a pin and smooth out.

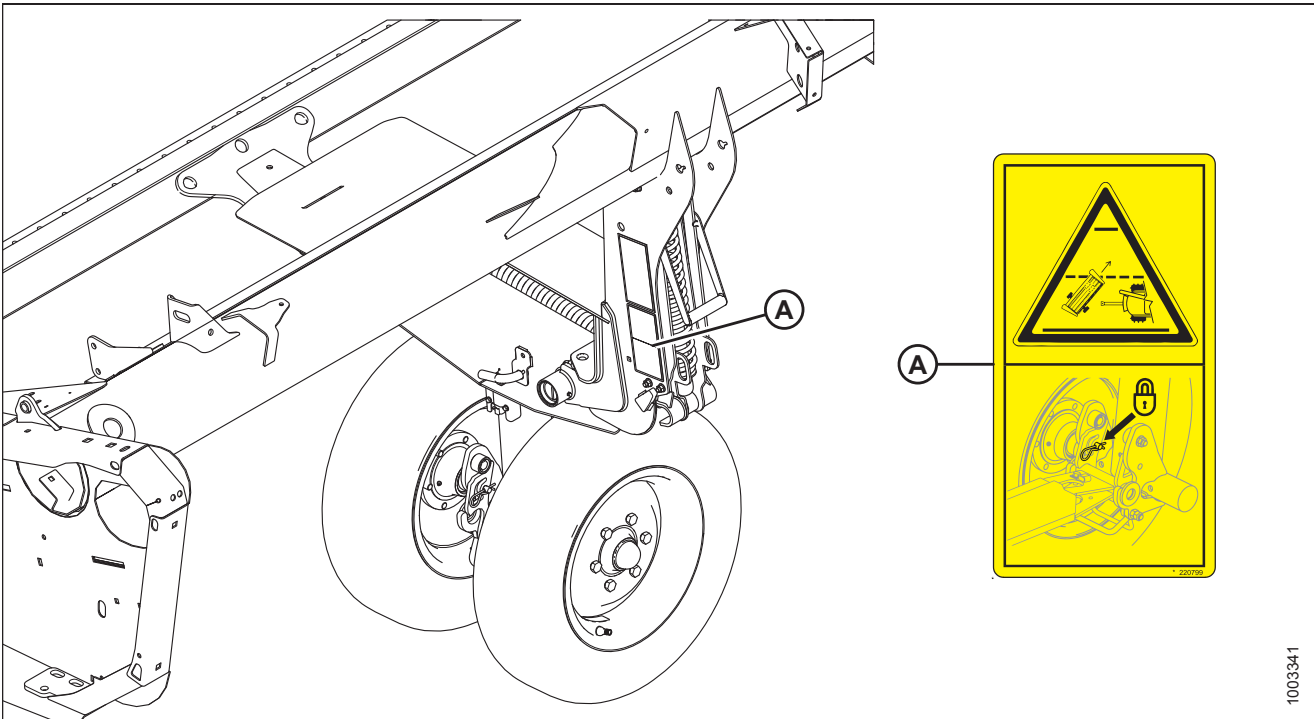
## 1.7 Safety Decal Locations



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Figure 1.15: Upper Cross Auger

A - MD #174682

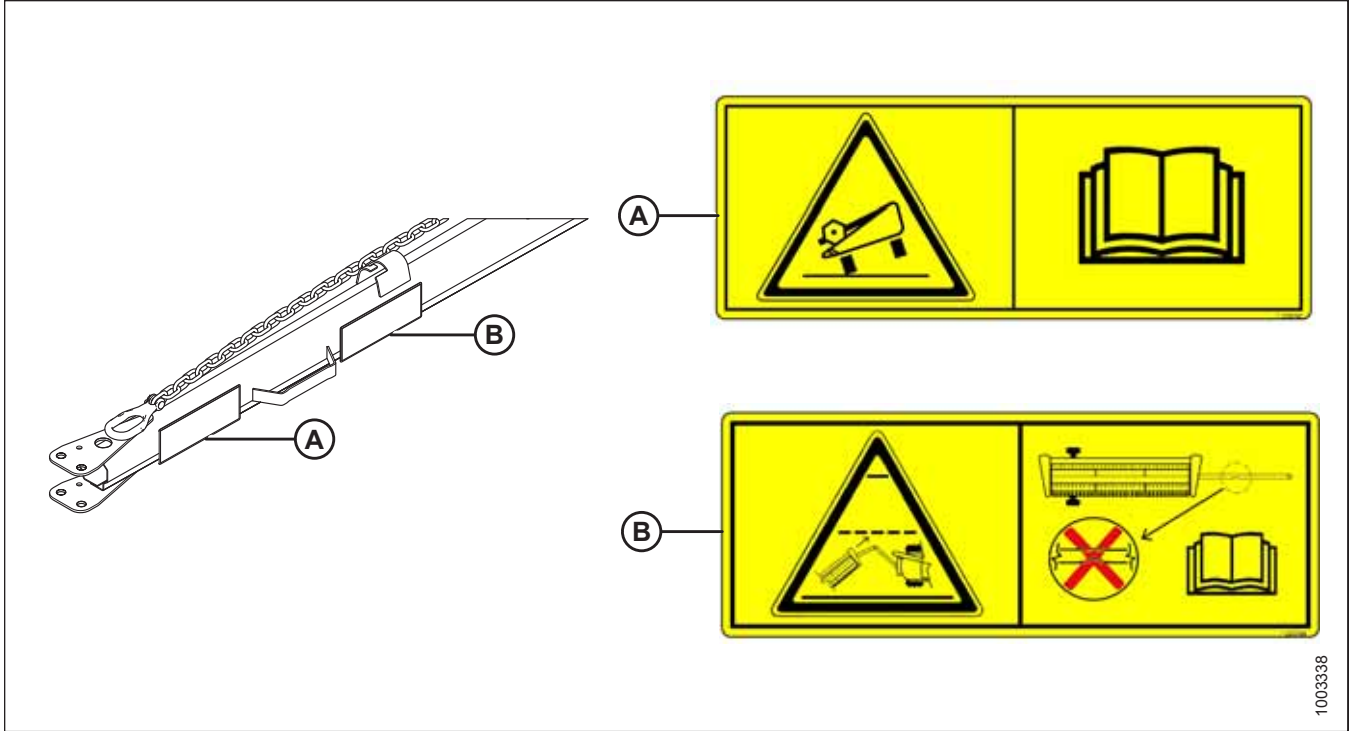


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Figure 1.16: Transport

A - MD #220799

SAFETY

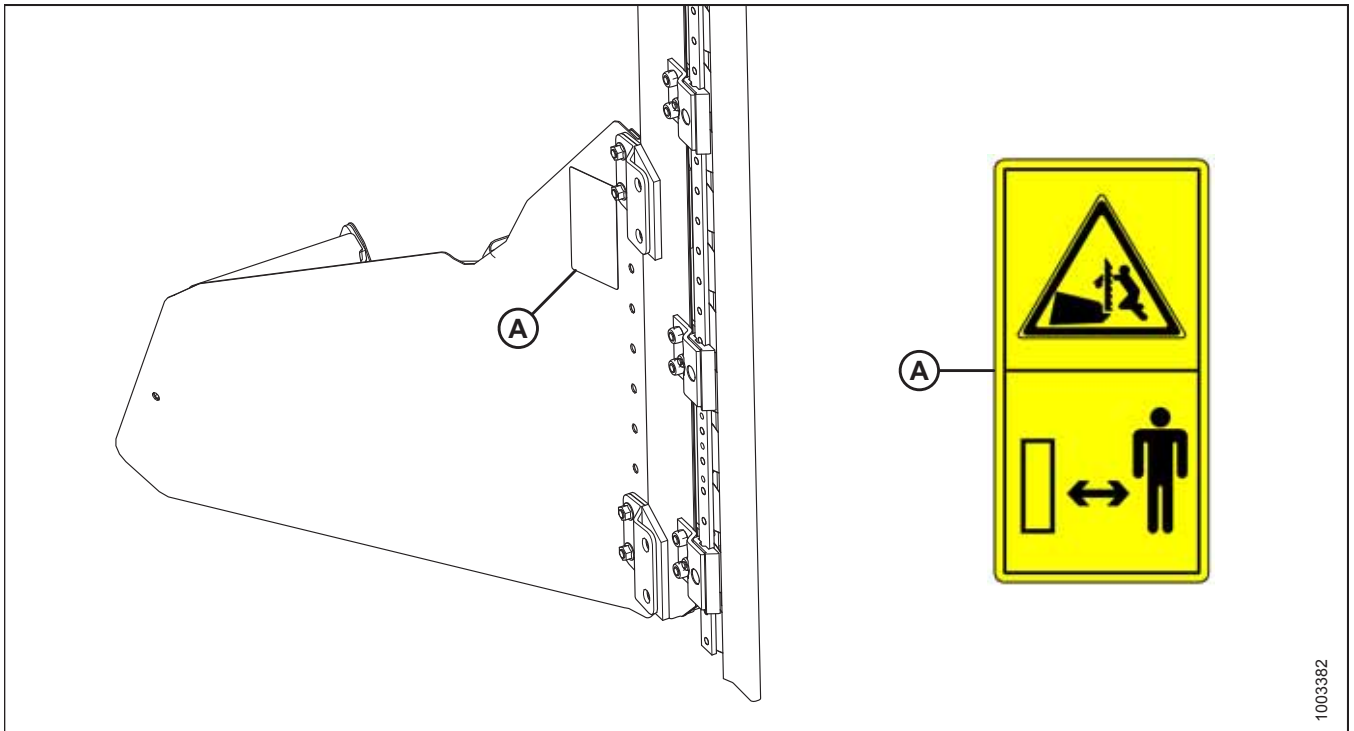


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Figure 1.17: Transport Tow-Bar

A - MD #220797

B - MD #220798



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Figure 1.18: Vertical Knife

A - MD #174684

SAFETY

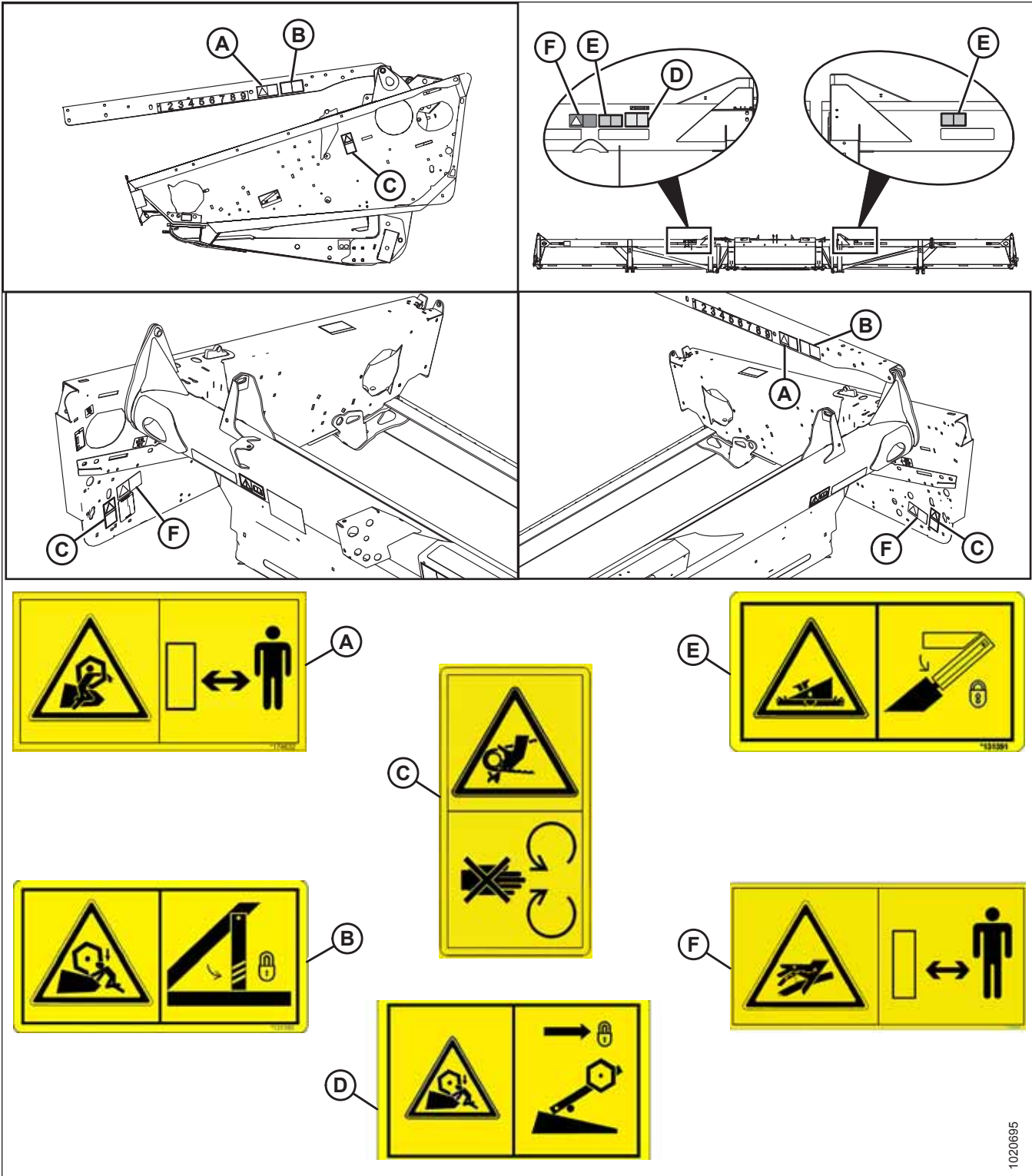


Figure 1.19: Endsheets, Reel Arms, and Backsheet

A - MD #174632

B - MD #131393

C - MD #184422

D - MD #131392 (Double Reel Only)

E - MD #131391 (Two Places)

F - MD #166466 (Three Places)

SAFETY

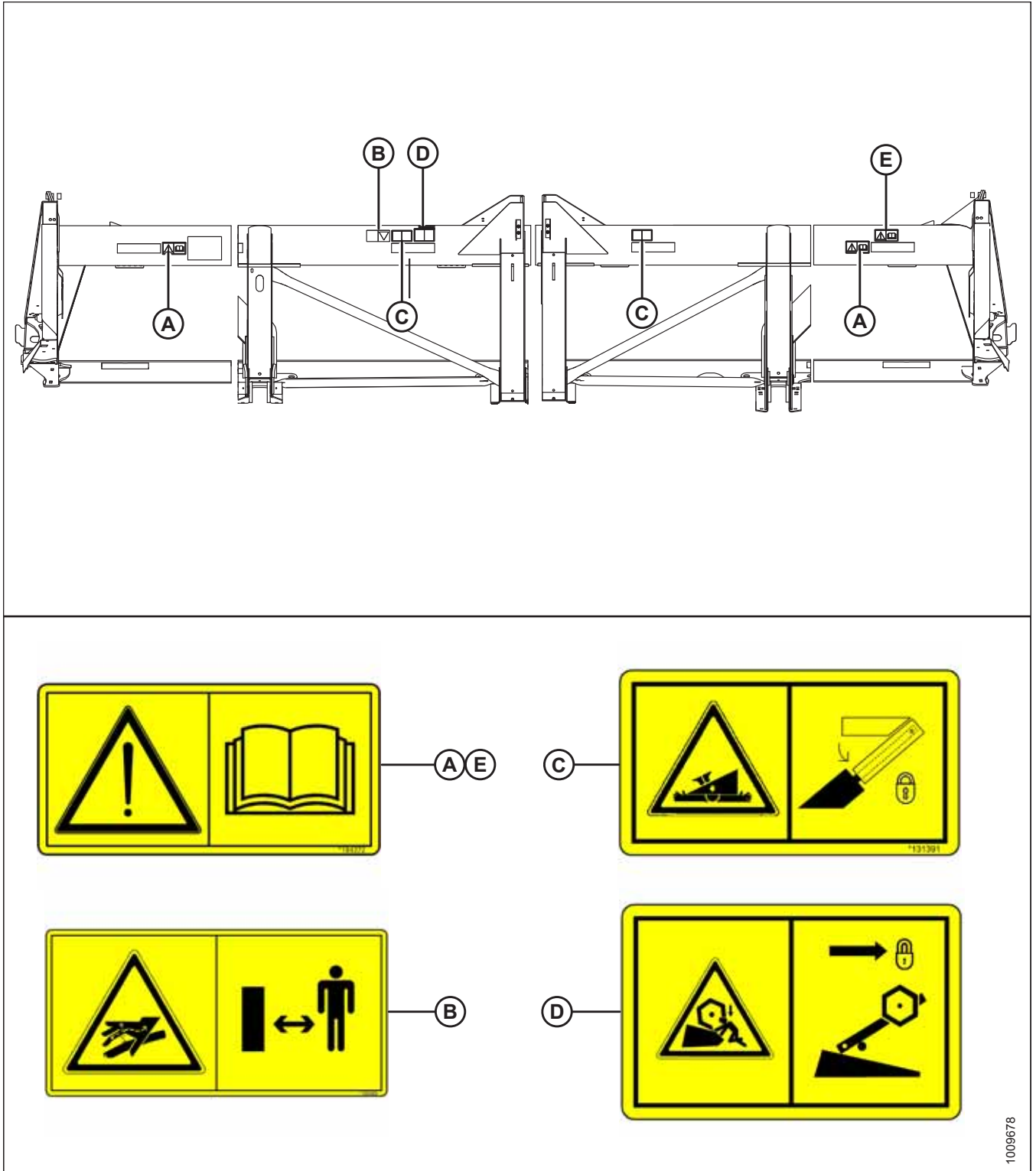


Figure 1.20: FD1® Series Backtube

A - MD #184372  
D - MD #131392

B - MD #166466  
E - MD #184372 (Split Frame)

C - MD #131391

SAFETY

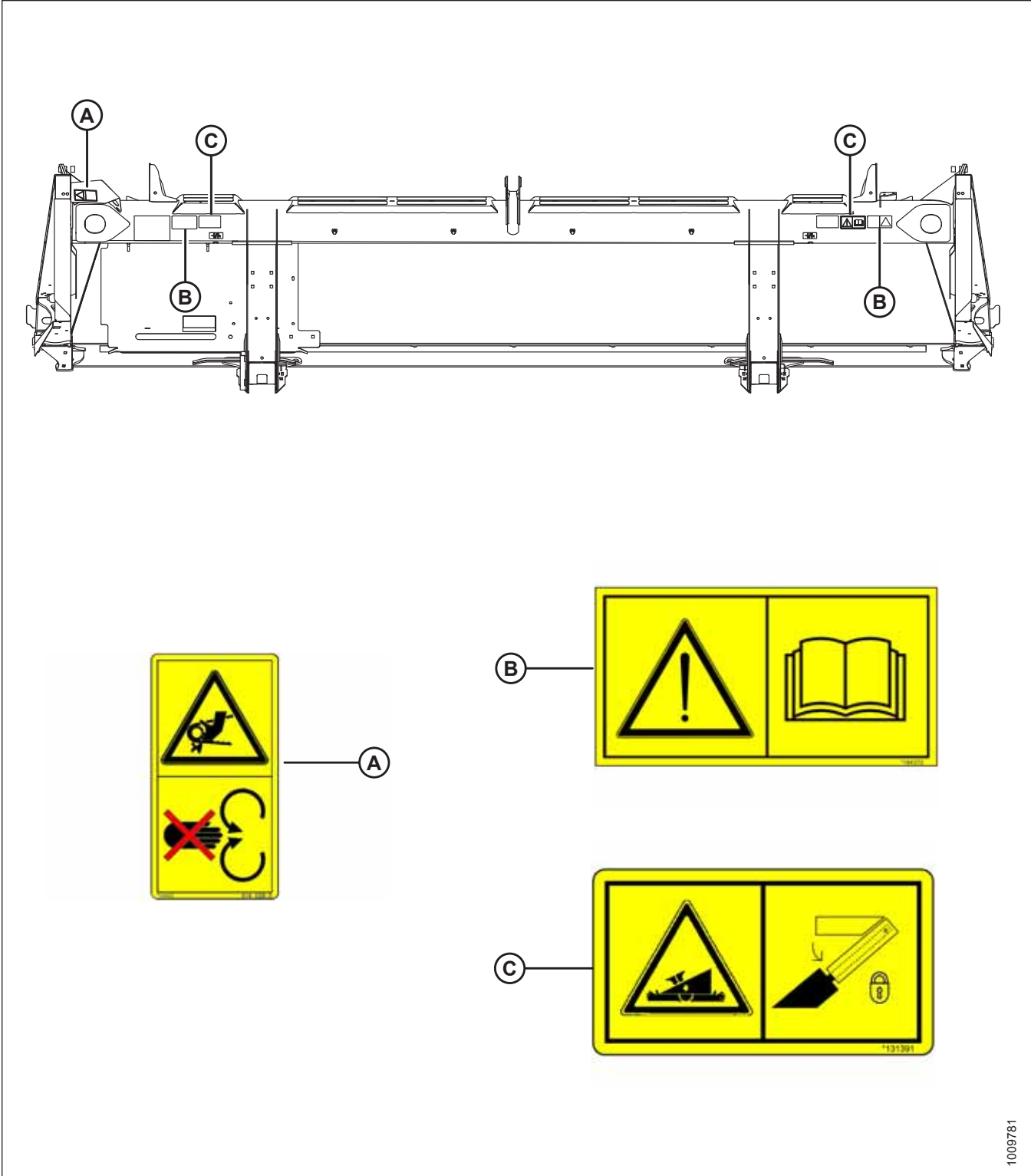


Figure 1.21: D115 Header Backtube

A - MD #184422

B - MD #184372

C - MD #131391

1009781

SAFETY

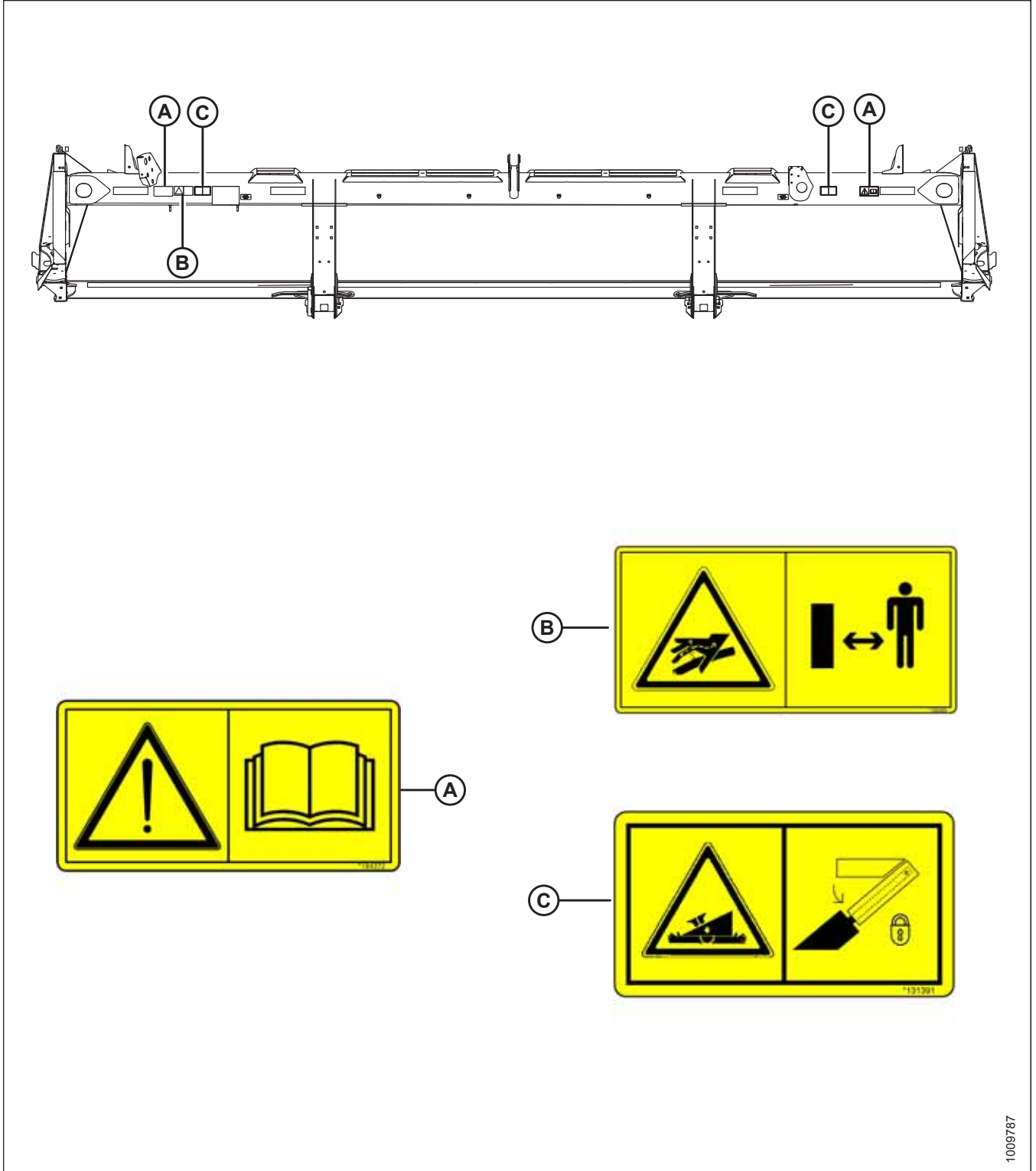


Figure 1.22: D120 Header Backtube

A - MD #184372

B - MD #166466

C - MD #131391

SAFETY

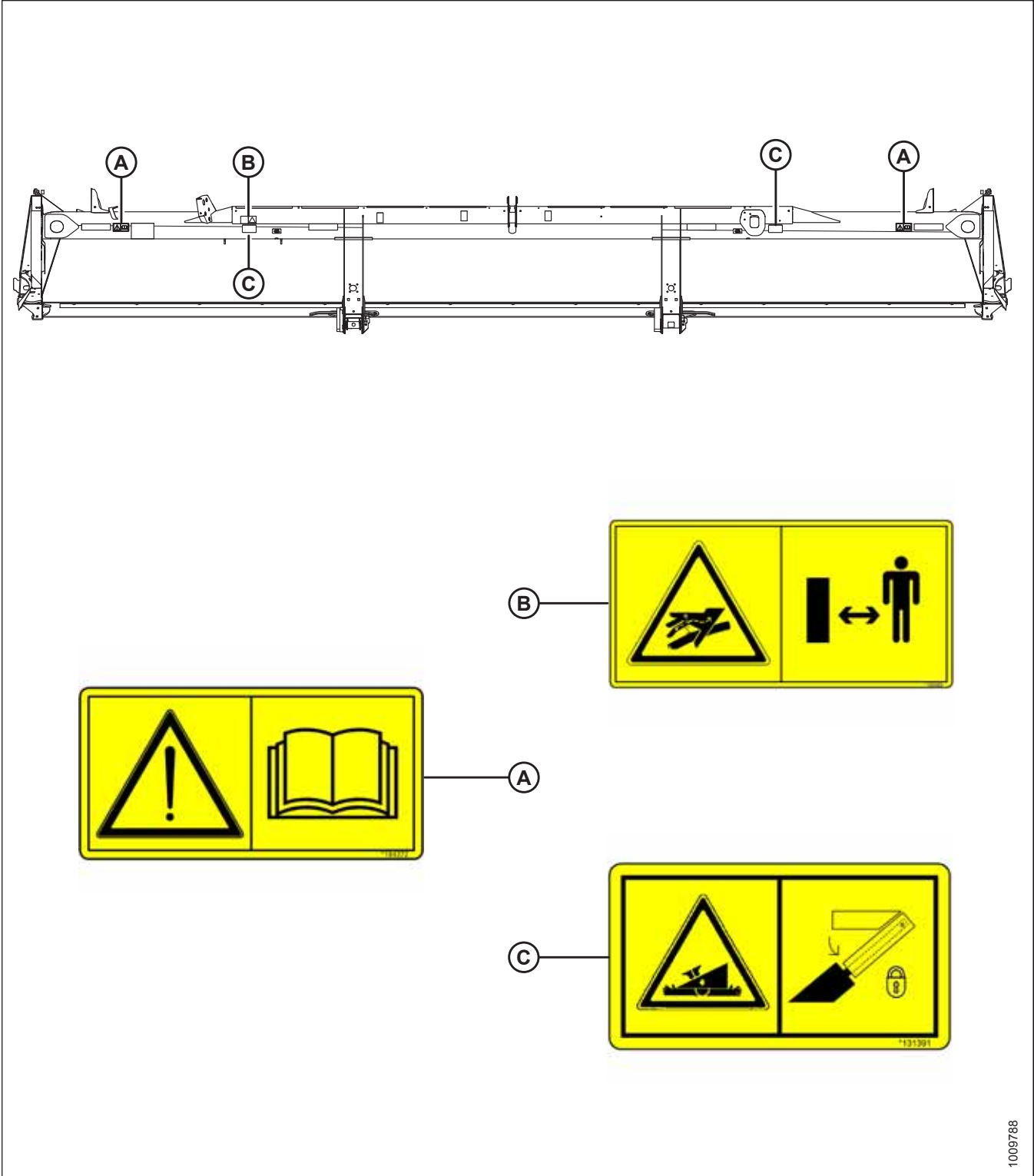


Figure 1.23: D125 Header Backtube

A - MD #184372

B - MD #166466

C - MD #131391



SAFETY

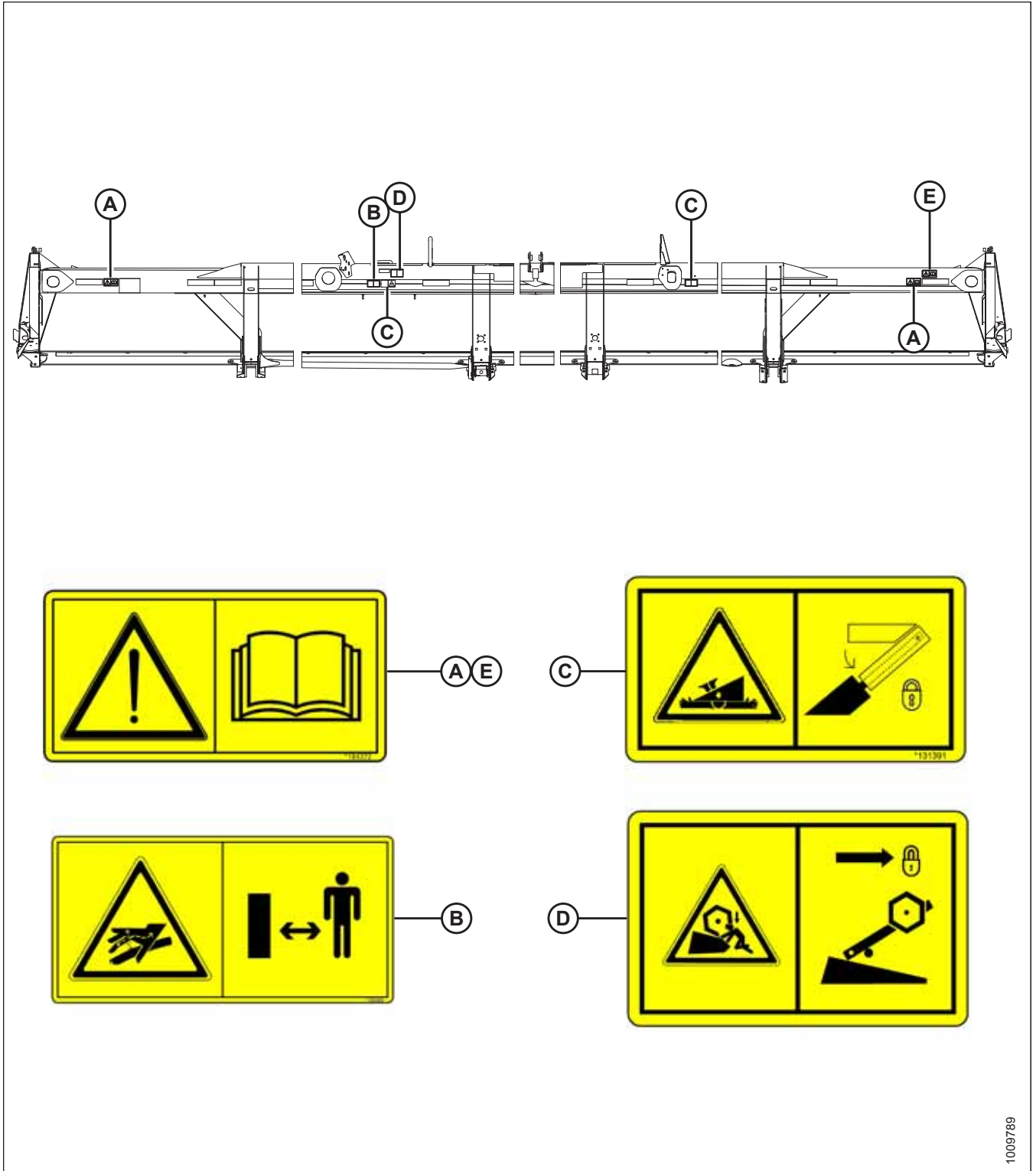


Figure 1.24: D130, D135, D140, and D145 Header Backtube

A - MD #184372 (Except D140 Split Frame)

B - MD #166466

C - MD #131391

D - MD #131392 (D130 and D135 Double Reel Only)

E - MD #184372 (D130 Split Frame)

1009789

SAFETY

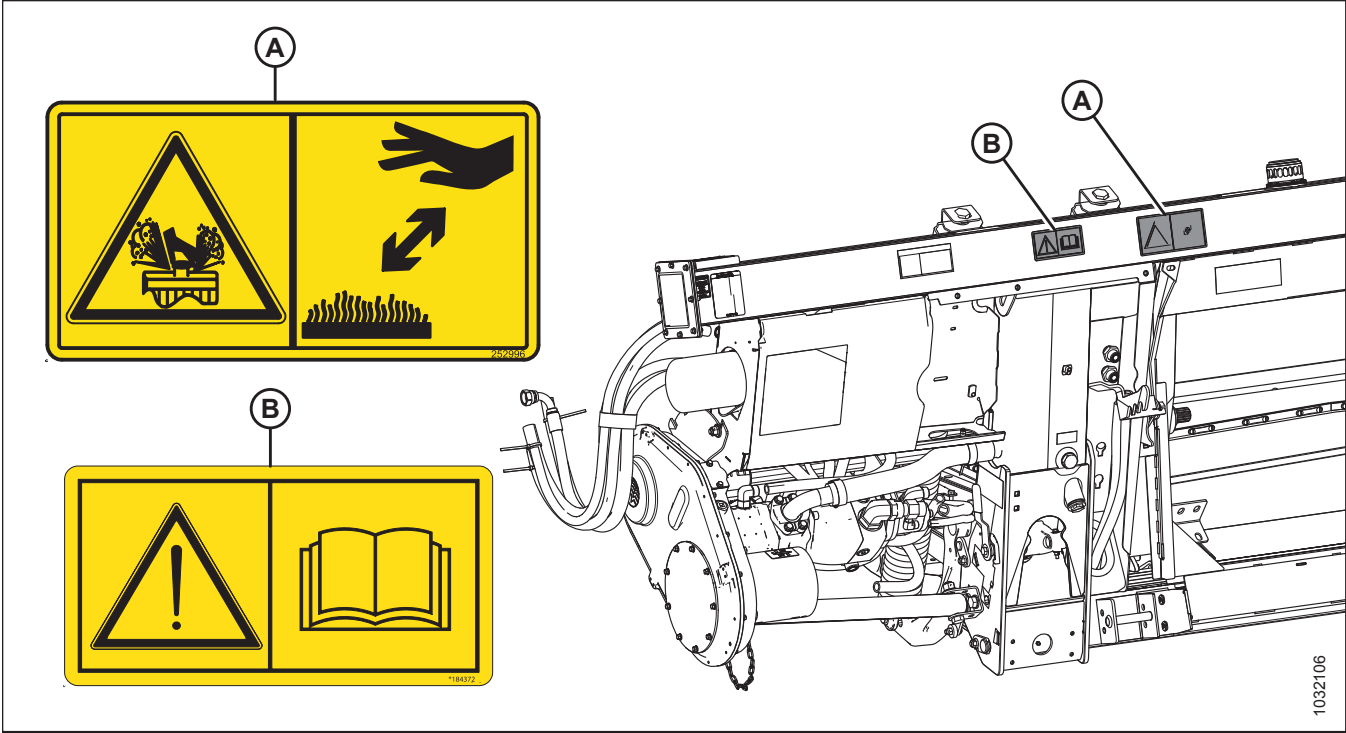


Figure 1.25: FM100 Float Module

A - MD #252996

B - MD #184372

## 1.8 Understanding Safety Signs

Make sure you understand the meanings of all safety signs placed on the machine.

### MD #113482

General hazard pertaining to machine operation and servicing

#### DANGER

To prevent injury or death from improper or unsafe machine operation:

- Read the operator's manual and follow all safety instructions. If you do not have a manual, obtain one from your Dealer.
- Do **NOT** allow untrained persons to operate the machine.
- Review the safety instructions with all Operators every year.
- Ensure that all the safety signs are installed and legible.
- Make certain everyone is clear of the machine before starting engine and during operation.
- Keep riders off of the machine.
- Keep all the shields in place and stay clear of the moving parts.
- Disengage the header drive, put the transmission in Neutral, and wait for all movement to stop before leaving the operator's position.
- Stop the engine and remove the key from the ignition before servicing, adjusting, lubricating, cleaning, or unplugging the machine.
- Engage the safety locks to prevent lowering of a raised unit before servicing it in the raised position.
- Use the slow moving vehicle emblem and flashing warning lights when operating on roadways unless prohibited by law.



Figure 1.26: MD #113482

### MD #131391

Header crushing hazard

#### DANGER

To prevent injury or death from fall of a raised header:

- Fully raise the header, stop the engine, remove the key, and engage the safety props on the combinethe windrower before going under header.
- Alternatively, rest header on ground, stop the engine, and remove the key before servicing.



Figure 1.27: MD #131391

## SAFETY

### MD #131392

Reel crushing hazard

#### WARNING

- To prevent injury from the fall of a raised reel; fully raise the reel, stop the engine, remove the key, and engage the safety prop on each reel support arm before working on or under the reel.

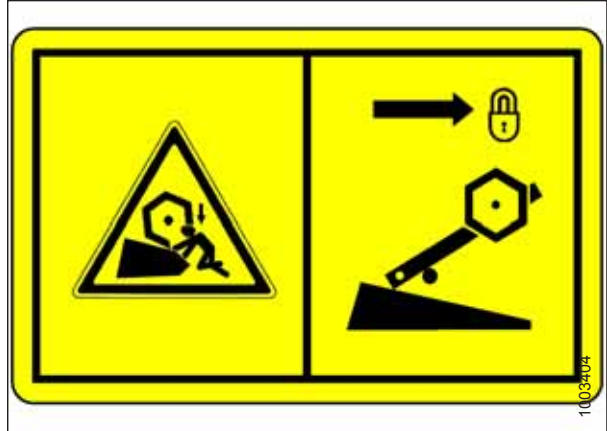


Figure 1.28: MD #131392

### MD #131393

Reel crushing hazard

#### WARNING

- To prevent injury from the fall of a raised reel; fully raise the reel, stop the engine, remove the key, and engage the mechanical safety lock on each reel support arm before working on or under the reel.



Figure 1.29: MD #131393

### MD #166466

High-pressure oil hazard

#### WARNING

To prevent serious injury, gangrene, or death:

- Do **NOT** go near leaks.
- Do **NOT** use a finger or skin to check for leaks.
- Lower the load or relieve hydraulic pressure before loosening fittings.
- High-pressure oil can easily puncture skin, and can cause serious injury, gangrene, or death.
- If injured, seek emergency medical help. Immediate surgery is required to remove oil.



Figure 1.30: MD #166466

## SAFETY

### MD #174436

High-pressure oil hazard

#### WARNING

To prevent serious injury, gangrene, or death:

- Do **NOT** go near leaks.
- Do **NOT** use a finger or skin to check for leaks.
- Lower the load or relieve hydraulic pressure before loosening fittings.
- High-pressure oil can easily puncture skin, and can cause serious injury, gangrene, or death.
- If injured, seek emergency medical help. Immediate surgery is required to remove oil.

### MD #174632

Reel entanglement hazard

#### DANGER

To prevent injury from entanglement with rotating reel:

- Stand clear of the header while the machine is running.

### MD #184372

General hazard pertaining to machine operation and servicing

#### DANGER

To prevent injury or death from improper or unsafe machine operation:

- Read the operator's manual and follow all safety instructions. If you do not have a manual, obtain one from your Dealer.
- Do **NOT** allow untrained persons to operate the machine.
- Review the safety instructions with all the Operators every year.
- Ensure that all the safety signs are installed and legible.
- Make certain everyone is clear of the machine before starting the engine and during operation.
- Keep riders off the machine.
- Keep all the shields in place and stay clear of the moving parts.



Figure 1.31: MD #174436



Figure 1.32: MD #174632

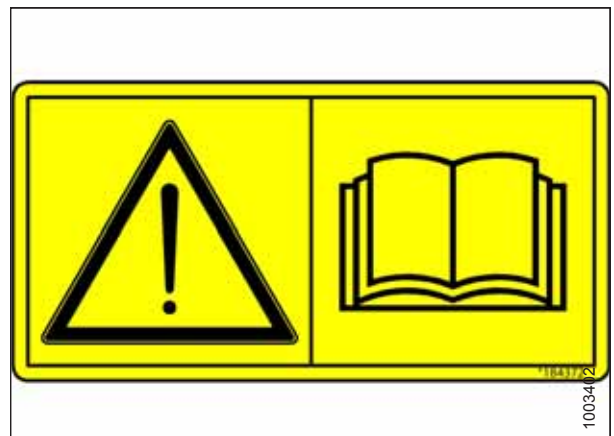


Figure 1.33: MD #184372

## SAFETY

- Disengage the header drive, put the transmission into Neutral, and wait for all movement to stop before leaving the operator's position.
- Stop the engine and remove the key from the ignition before servicing, adjusting, lubricating, cleaning, or unplugging the machine.
- Engage the safety props to prevent the lowering of a raised unit before servicing in the raised position.
- Use a slow moving vehicle emblem and flashing warning lights when operating on roadways unless prohibited by law.

### MD #184422

Hand and arm entanglement hazard

#### WARNING

To prevent injury:

- Stop the engine and remove the key before opening any shielding.
- Do **NOT** operate without the shields in place.



Figure 1.34: MD #184422

### MD #220797

Transport tipping hazard

#### DANGER

To prevent serious injury or death from transport tipping:

- Read the operator's manual for more information on potential tipping or rollover of the header while transporting.

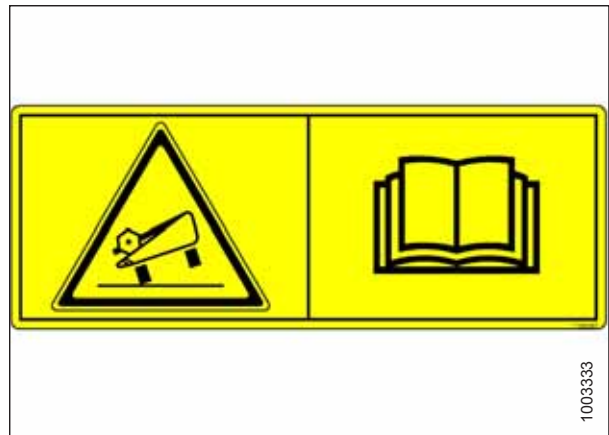


Figure 1.35: MD #220797

## SAFETY

### MD #220798

Loss of control hazard.

#### DANGER

To prevent serious injury or death from loss of control:

- Do **NOT** tow the header with a dented or otherwise damaged tow pole.
- Consult the operator's manual for more information.



Figure 1.36: MD #220798

### MD #220799

Loss of control hazard

#### WARNING

To prevent serious injury or death from loss of control:

- Ensure the tow-bar lock mechanism is locked.



Figure 1.37: MD #220799

### MD #252996

Hot fluid spray hazard

#### CAUTION

To prevent injury:

- Do **NOT** remove the fluid fill cap when the machine is hot.
- Allow the machine to cool down before opening the fluid fill cap.
- The fluid is under pressure and may be hot.



Figure 1.38: MD #252996

## SAFETY

### MD #279085

Auger entanglement hazard

#### DANGER

To prevent injury from the rotating auger:

- Stand clear of the auger while the machine is running.
- Stop the engine and remove the key before servicing auger.
- Do **NOT** reach into moving parts while the machine is running.



Figure 1.39: MD #279085

### MD #304865

Header crushing hazard

#### WARNING

To prevent injury or death from fall of raised header:

- Do **NOT** lift header at marked locations.
- Only use marked locations to lower header from vertical to horizontal position



Figure 1.40: MD #304865



## Chapter 2: Product Overview

The product overview provides the dimensions, details, and performance criteria for the various sizes and configurations

### 2.1 Definitions

The following terms, abbreviations, and acronyms may be used in this manual.

Term	Definition
AHHC	Automatic header height control
API	American Petroleum Institute
ASTM	American Society of Testing and Materials
Bolt	A headed and externally threaded fastener that is designed to be paired with a nut
Center-link	A hydraulic cylinder link between the header and machine used to change header angle
CGVW	Combined gross vehicle weight
D1 Series Header	MacDon D120, D125, D130, D135, D140, and D145 combine draper header
DDD	Double-draper drive
DK	Double knife
DKD	Double-knife drive
DR	Double reel
Export header	Header configuration typical outside North America
FFFT	Flats from finger tight
Finger tight	Finger tight is a reference position where sealing surfaces or components are making contact with each other, and fitting has been tightened to a point where fitting is no longer loose
FM100	Float module used with a D1 or FD1 Series header for combining
GSL	Ground speed lever
GVW	Gross vehicle weight
Hard joint	A joint made with use of a fastener where joining materials are highly incompressible
Header	A machine that cuts crop and feeds it into an attached combine
Hex key	A tool of hexagonal cross-section used to drive bolts and screws that have a hexagonal socket in head (internal-wrenching hexagon drive); also known as an Allen key and various other synonyms
hp	Horsepower
JIC	Joint Industrial Council: A standards body that developed standard sizing and shape for original 37° flared fitting
Knife	A cutting device which uses a reciprocating cutter (also called a sickle)
n/a	Not applicable
NPT	National Pipe Thread: A style of fitting used for low-pressure port openings. Threads on NPT fittings are uniquely tapered for an interference fit

**PRODUCT OVERVIEW**

<b>Term</b>	<b>Definition</b>
Nut	An internally threaded fastener that is designed to be paired with a bolt
ORB	O-ring boss: A style of fitting commonly used in port openings on manifolds, pumps, and motors
ORFS	O-ring face seal: A style of fitting commonly used for connecting hoses and tubes. This style of fitting is also commonly called ORS, which stands for O-ring seal
RoHS (Reduction of Hazardous Substances)	A directive by the European Union to restrict use of certain hazardous substances (such as hexavalent chromium used in some yellow zinc platings)
rpm	Revolutions per minute
SAE	Society of Automotive Engineers
Screw	A headed and externally threaded fastener that threads into preformed threads or forms its own thread into a mating part
SDD	Single-draped drive
SK	Single knife
Soft joint	A joint made with use of a fastener where joining materials are compressible or experience relaxation over a period of time
spm	Strokes per minute
SR	Single reel
Tension	Axial load placed on a bolt or screw, usually measured in Newtons (N) or pounds (lb.)
TFFT	Turns from finger tight
Timed knife drive	Synchronized motion applied at cutterbar to two separately driven knives from a single hydraulic motor
Torque	The product of a force X lever arm length, usually measured in Newton-meters (Nm) or foot-pounds (lbf-ft)
Torque angle	A tightening procedure where fitting is assembled to a precondition (finger tight) and then nut is turned farther a number of degrees to achieve its final position
Torque-tension	The relationship between assembly torque applied to a piece of hardware and axial load it induces in bolt or screw
Truck	A four-wheel highway/road vehicle weighing no less than 3400 kg (7500 lb.)
UCA	Upper cross auger
Untimed knife drive	Unsynchronized motion applied at cutterbar to two separately driven knives from a single hydraulic motor or two hydraulic motors
Washer	A thin cylinder with a hole or slot located in the center that is to be used as a spacer, load distribution element, or locking mechanism

## 2.2 D1 Series Draper Header Specifications

This is a list of all the specifications for D1 Series combine configured draper headers and FM100 Float Modules.

### D1 | FM100 | Attachments

The following symbol and letters are used in the tables below:

S: standard / O<sub>F</sub>: optional (factory installed) / O<sub>D</sub>: optional (dealer installed) / —: not available

**Table 2.1 Header Specifications**

Cutterbar			
Effective Cutting Width (Distance between Crop Divider Points)			
D120 header		6096 mm (240 in.)	S
D125 header		7620 mm (300 in.)	S
D130 header		9144 mm (360 in.)	S
D135 header		10,668 mm (420 in.)	S
D140 header		12,192 mm (480 in.)	S
D145 header		13,716 mm (540 in.)	S
Cutterbar lift range		Varies with combine model	—
Knife			
Single-knife drive (all sizes): One hydraulic motor with V-belt to one heavy duty knife drive box			O <sub>F</sub>
Double-knife timed drive 6.1–10.7 m (20–35 ft.): One hydraulic motor with two cogged belts to two heavy duty knife drive boxes			O <sub>F</sub>
Double-knife untimed drive 12.2–13.7 m (40–45 ft.): Two hydraulic motors with V-belts to two heavy duty knife drive boxes			O <sub>F</sub>
Knife stroke		76 mm (3 in.)	S
Single-knife speed <sup>1</sup>	D125 header	1200–1450 (strokes/min.)	S
Single-knife speed <sup>1</sup>	D130 header	1200–1400 (strokes/min.)	S
Single-knife speed <sup>1</sup>	D135 header	1100–1300 (strokes/min.)	S
Single-knife speed <sup>1</sup>	D140 header	1050–1200 (strokes/min.)	S
Double-knife speed <sup>1</sup>	D120 and D125 headers	1400–1700 (strokes/min.)	S
Double-knife speed <sup>1</sup>	D130 and D135 headers	1200–1500 (strokes/min.)	S
Double-knife speed <sup>1</sup>	D140 and D145 headers	1100–1400 (strokes/min.)	S

1. Under normal cutting conditions, set knife speed at the knife drive pulley between 600 and 640 rpm (1200 and 1280 spm). If set to low side of range, you could experience knife stalling.

**PRODUCT OVERVIEW**

**Table 2.1 Header Specifications (continued)**

<b>Knife Sections</b>			
Over-serrated, solid, bolted (9 serrations per inch)			O <sub>F</sub>
Over-serrated, solid, bolted (14 serrations per inch)			O <sub>F</sub>
Knife overlap at center (double-knife headers)	3 mm (1/8 in.)		S
<b>Guards and Hold-Downs</b>			
Guard: pointed, forged, double heat treated (DHT) Hold-down: Sheet metal, adjustment bolt			O <sub>F</sub>
Guard: pointed, forged, case hardened (CH) Hold-down: Sheet metal, adjustment bolt			O <sub>F</sub>
Guard: stub, forged bottom, forged top, adjustment plate			O <sub>F</sub>
Guard: stub, forged bottom, sheet metal top, adjustment bolt			O <sub>F</sub>
<b>Guard Angle (Cutterbar on Ground)</b>			
Center-link retracted	D120 and D125 headers	7.0°	S
Center-link retracted	D130, D135, D140, and D145 headers	2.0°	S
Center-link extended	D120 and D125 headers	12.4°	S
Center-link extended	D130, D135, D140, and D145 headers	7.4°	S
<b>Draper (Conveyor) and Decks</b>			
Draper width		1057 mm (41 19/32 in.)	S
Draper drive		Hydraulic	S
Draper speed (FM100 Float Module controlled)		193 m/min. (0–635 fpm)	S
<b>PR15 Pick-Up Reel</b>			S
Quantity of tine tubes		5, 6, or 9	—
Center tube diameter: All reel sizes except D135 single span		203 mm (8 in.)	—
D135 single span		254 mm (10 in.)	—
Finger tip radius	Factory assembled	800 mm (31 1/2 in.)	—
Finger tip radius	Adjustment range	766–800 mm (30 3/16 – 31 1/2 in.)	—
Effective reel diameter (via cam profile)		1650 mm (65 in.)	—
Finger length		290 mm (11 in.)	—
Finger spacing (staggered on alternate bats)		150 mm (6 in.)	—
Reel drive		Hydraulic	S
Reel speed (adjustable from cab, varies with combine model)		0–67 rpm	S

**PRODUCT OVERVIEW**

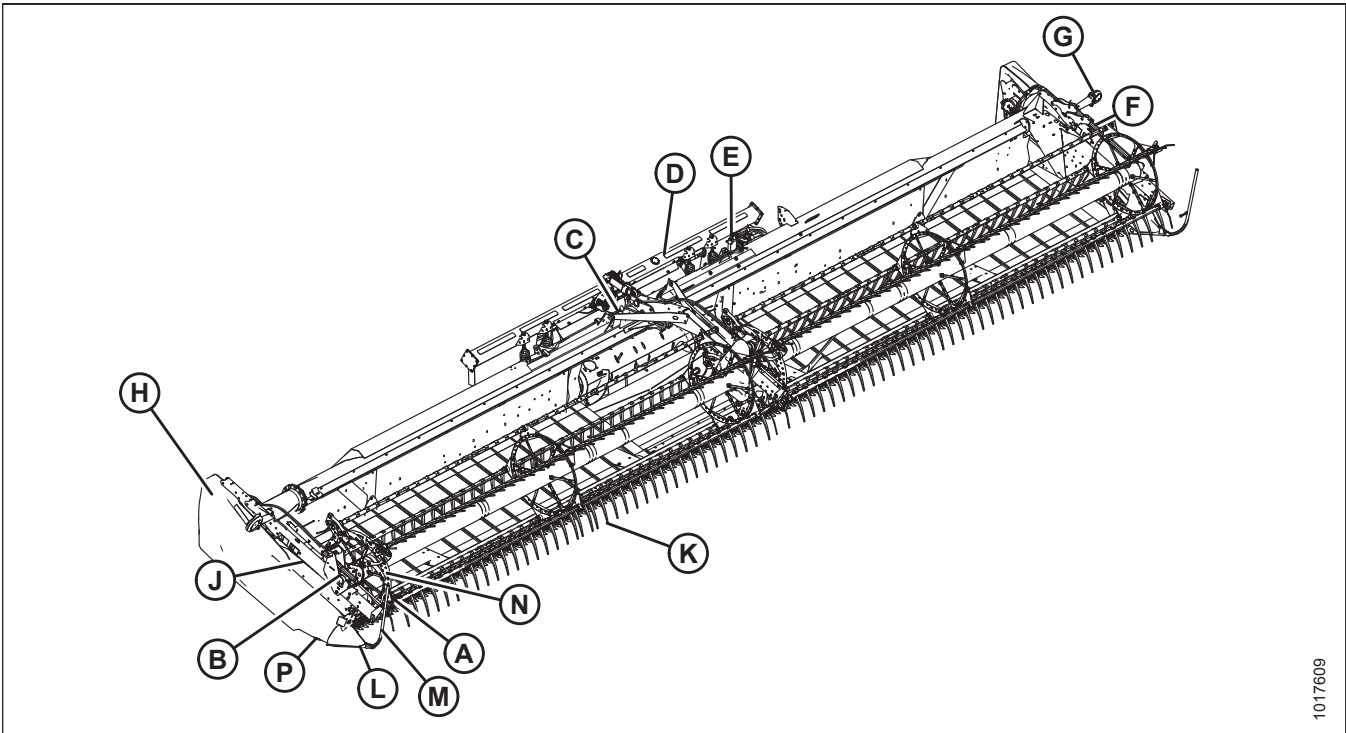
**Table 2.1 Header Specifications (continued)**

Frame and Structure				
Header width	Field mode		Cut width + 1384 mm (5.1 in.)	S
Header width	Transport mode: reel fore-aft fully retracted, shortest center-link	(A) long dividers removed	2500 mm (98 in.)	—
Header width	Transport mode: reel fore-aft fully retracted, shortest center-link	(B) long dividers installed	2684 mm (106 in.)	—
Header Weight <sup>2</sup>				
D115		1424–1442 kg (3140–3180 lb.)		
D120		1517–1623 kg (3345–3580 lb.)		
D125		1609–1756 kg (3547–3872 lb.)		
D130		2003–2341 kg (4415–5160 lb.)		
D135		2209–2626 kg (4870–5790 lb.)		
D140	North America frame		2540–2617 kg (5600–5770 lb.)	
D140	Export frame		2640–2665 kg (5820–5875 lb.)	
D145	North America frame		2749 kg (6060 lb.)	
D145	Export frame		2794 kg (6160 lb.)	

2. Estimated weight range for base header without performance options or float module. Variances are due to different package configurations.

## 2.3 Component Identification

### 2.3.1 D1 Series Draper Header for Combines



1017609

**Figure 2.1: D1 Series Draper Header – Double Reel Shown**

- |                        |  |                            |
|------------------------|--|----------------------------|
| A - Pick-Up Reel       | B - Reel Drive and Cam                 | C - Center-Link            |
| D - FM100 Float Module | E - Hydraulic Connections              | F - Reel Fore-Aft Cylinder |
| G - Transport Light    | H - Endshield                          | J - Reel Lift Cylinder     |
| K - Reel Fingers       | L - Divider Cone                       | M - Divider Rod            |
| N - Reel Endshields    | P - Knife Drive Box (Behind Endshield) |                            |

### 2.3.2 FM100 Float Module

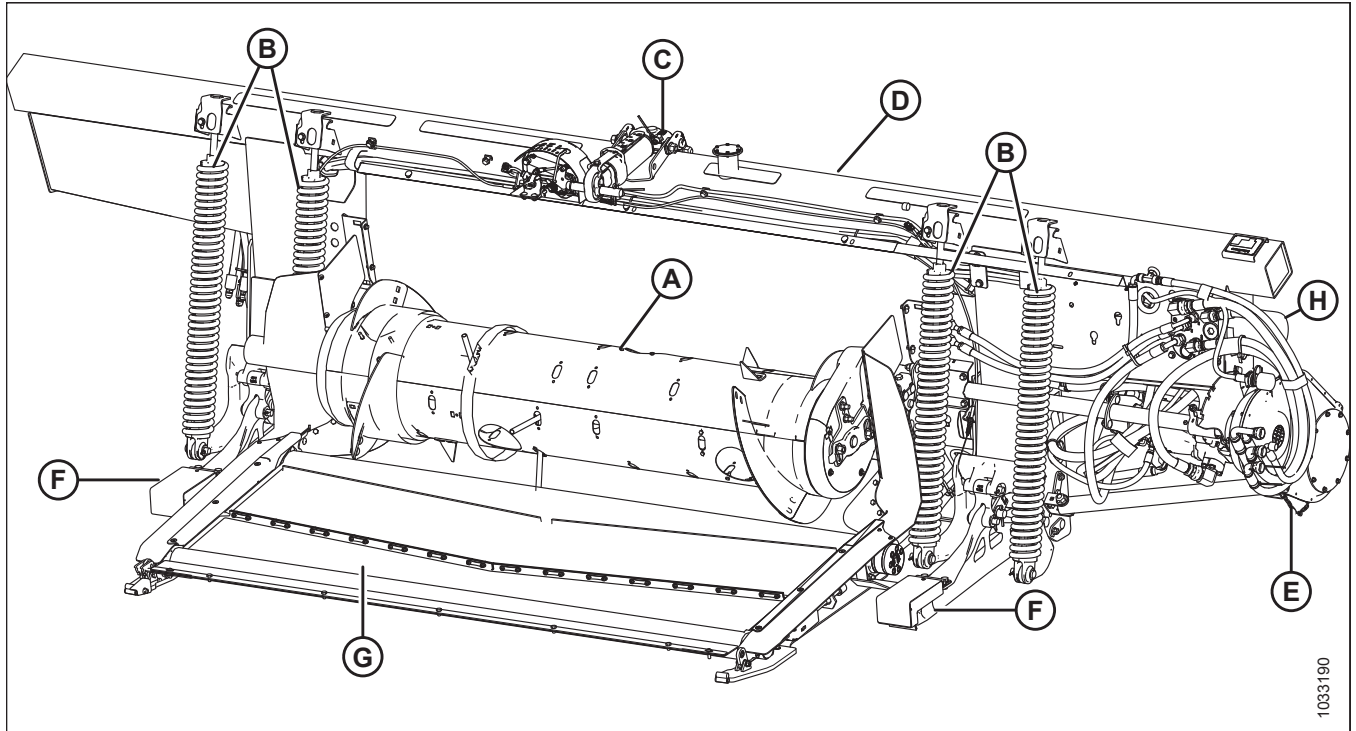


Figure 2.2: Header Side of FM100 Float Module

A - Feed Auger  
D - Hydraulic Reservoir  
G - Feed Draper

B - Header Float Springs  
E - Gearbox  
H - Hydraulic Filter

C - Center-Link  
F - Header Support Arms

1033190

PRODUCT OVERVIEW

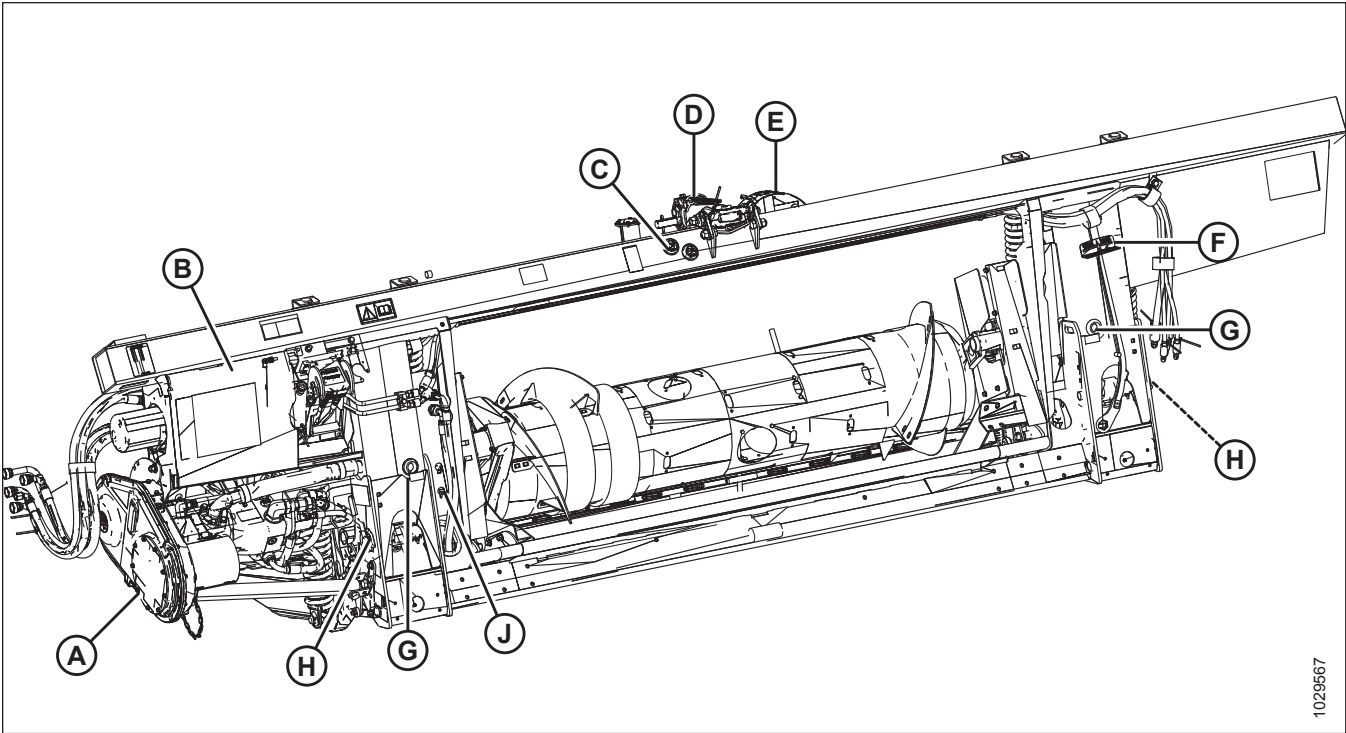


Figure 2.3: Combine Side of FM100 Float Module

A - Float Module Gearbox  
D - Center-Link  
G - Drain Hole (x2)

B - Hydraulic Compartment Cover  
E - Header Height Control Indicator  
H - Float Lock Handle (x2)

C - Reservoir Oil Level Sight Glass  
F - Torque Wrench  
J - Auto Header Height Control (AHHC) Sensor



## Chapter 3: Operation

### 3.1 Owner/Operator Responsibilities



#### CAUTION

- It is your responsibility to read and understand this manual completely before operating the header. Contact your MacDon Dealer if an instruction is not clear to you.
- Follow all safety messages in the manual and on safety decals on the machine.
- Remember that YOU are the key to safety. Good safety practices protect you and the people around you.
- Before allowing someone to operate the header, for however short a time or distance, make sure they have been instructed in its safe and proper use.
- Review the manual and all safety related items with all Operators annually.
- Be alert for other Operators not using recommended procedures or not following safety precautions. Correct these mistakes immediately, before an accident occurs.
- Do NOT modify the machine. Unauthorized modifications may impair the function and/or safety of the machine and may reduce the length of service you receive from your machine.
- The safety information given in this manual does not replace safety codes, insurance needs, or laws governing your area. Be sure your machine meets the standards set by these regulations.

## 3.2 Operational Safety

### CAUTION

Adhere to the following safety precautions:

- Follow all safety and operational instructions provided in your operator's manuals. If you do not have a combine manual, get one from your Dealer and read it thoroughly.
- Never attempt to start the engine or operate the machine except from the operator's seat.
- Check the operation of all controls in a safe, clear area before starting work.
- Do NOT allow riders on the combine.



Figure 3.1: No Riders

### CAUTION

- Never start or move the machine until you are sure all bystanders have cleared the area.
- Avoid travelling over loose fill, rocks, ditches, or holes.
- Drive slowly through gates and doorways.
- When working on inclines, travel uphill or downhill whenever possible. Be sure to keep transmission in gear when travelling downhill.
- Never attempt to get on or off a moving machine.
- Do NOT leave the operator's station while the engine is running.
- To avoid bodily injury or death from the unexpected startup of a machine, always stop the engine and remove the key before adjusting or removing plugged material from the machine.
- Check for excessive vibration and unusual noises. If there is any indication of trouble, shut down and inspect the machine. Follow the proper shutdown procedure. For instructions, refer to [3.5 Shutting down the Combine, page 41](#).
- Operate only in daylight or good artificial light.

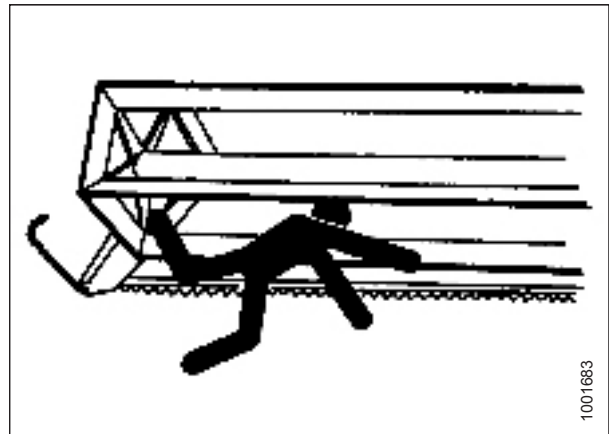


Figure 3.2: Bystander Safety

### 3.2.1 Header Safety Props

The header safety props located on the header lift cylinders prevent the lift cylinders from unexpectedly retracting and lowering the header. For instructions on operating the safety props, refer to your combine operator's manual.

### DANGER

To avoid bodily injury or death from the unexpected start-up or fall of raised machine, always stop the engine, remove the key, and engage the safety props before going under the header for any reason.

### 3.2.2 Reel Safety Props

The reel safety props are located on the reel support arms and prevent the reel from unexpectedly lowering.

#### WARNING

To prevent bodily injury from the fall of a raised reel, always engage the reel safety props before going under the raised reel for any reason.

#### IMPORTANT:

To prevent damage to the reel support arms, do **NOT** transport the header when the reel safety props are engaged.

#### *Engaging Reel Safety Props*

Engage the reel safety props whenever you intend to work on or around a raised reel. When engaged, the reel safety props prevent the reel from falling unexpectedly.

#### DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before making adjustments to the machine.

#### WARNING

To prevent bodily injury from the fall of a raised reel, always engage the reel safety props before going under the raised reel for any reason.

1. Raise the reel fully.
2. Shut down the engine, and remove the key from the ignition.
3. Move reel safety props (A) to the engaged position (as shown). **The prop MUST be placed on the top surface of raised lug (B), making contact with the cylinder mount, to ensure positive engagement.**

#### NOTE:

Keep pivot bolt (C) sufficiently tight so that the prop remains in the stored position when not in use, but can still be engaged using hand force.

4. Repeat the previous step on the opposite side of the header.

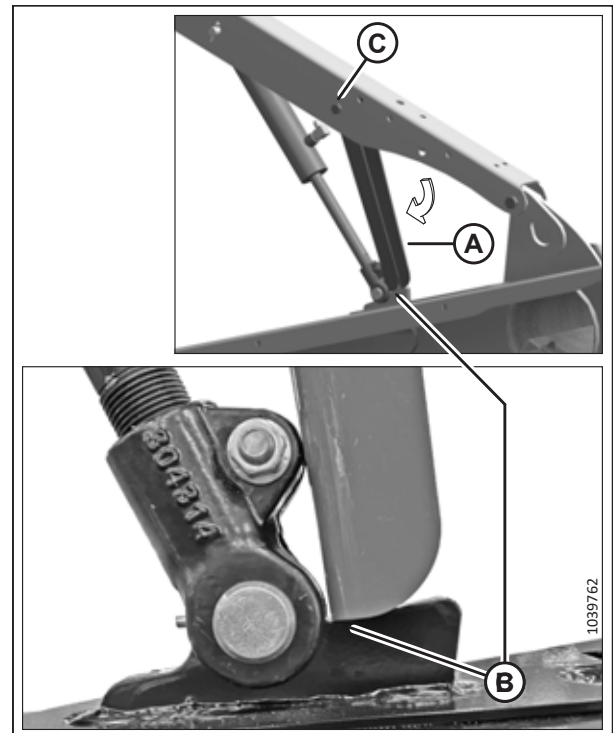


Figure 3.3: Engaged Reel Safety Prop – Left Shown

**THE CONTENT ON THIS PAGE HAS CHANGED SINCE THIS MANUAL (215547 REVISION A) WAS PUBLISHED.**

## OPERATION

4. Use handle (A) to move the lock rod to inboard position (B), which engages pin (C) under the prop.
5. Lower the reel until the safety props contact the outer arm cylinder mounts and the center arm pins.

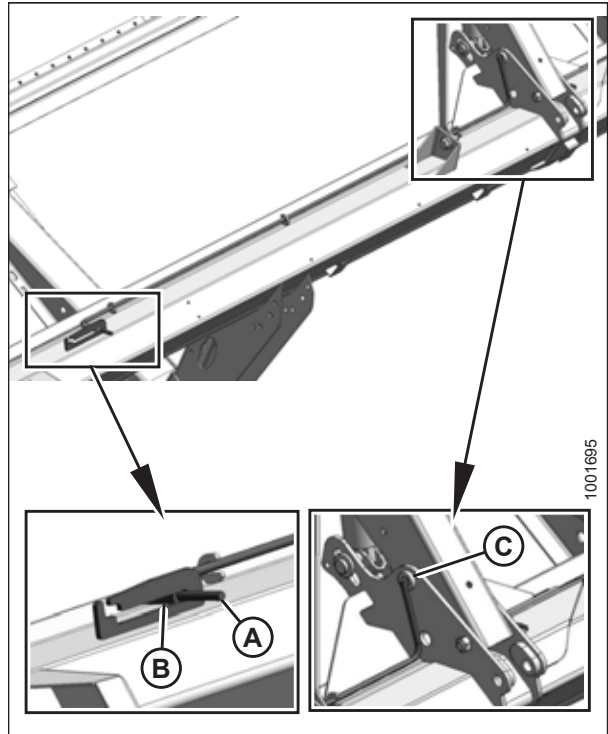


Figure 3.4: Reel Safety Prop – Center Arm

### *Disengaging Reel Safety Props*

1. Raise the reel to its maximum height.
2. Move reel safety props (A) back inside the reel arms. Repeat at the opposite end of the reel.

**NOTE:**

The left safety prop is shown in the illustration at right. The right safety prop is opposite.

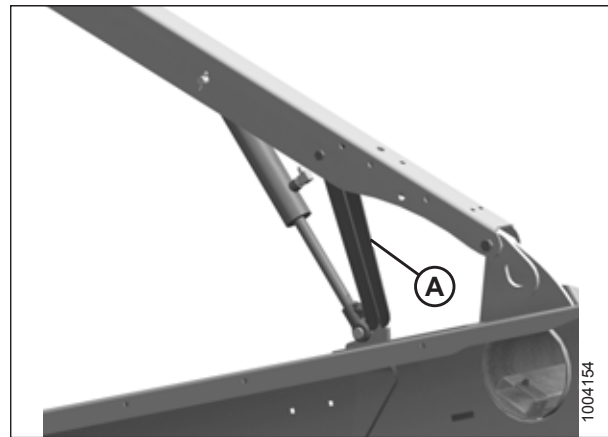


Figure 3.5: Reel Safety Prop

3. Use handle (B) on double-reel headers to move lock rod (A) to the outboard position.

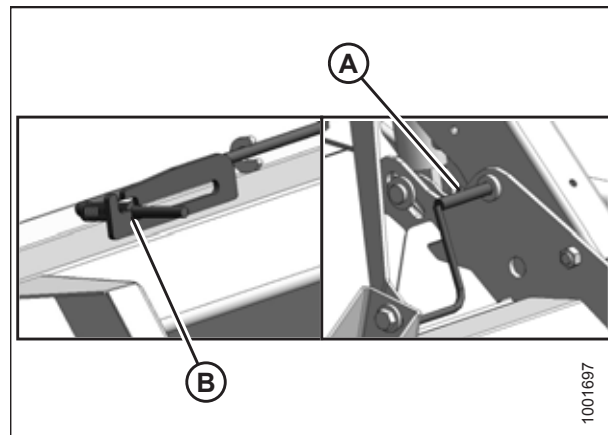


Figure 3.6: Reel Safety Prop – Center Arm

### 3.2.3 Header Endshields

A hinged, polyethylene endshield is fitted on each end of the header.

#### Opening Endshields

The endshields at either end of the header can be opened to access serviceable components or stored items.

1. On the backside of the header, push release lever (A) to unlock the endshield.
2. Pull the endshield open using handle depression (B).

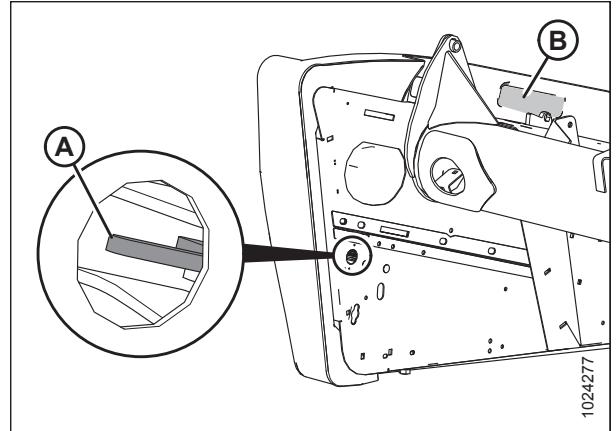


Figure 3.7: Left Endshield

3. Pull the endshield at handle depression (A). The endshield is retained by hinge tab (B) and will open in direction (C).

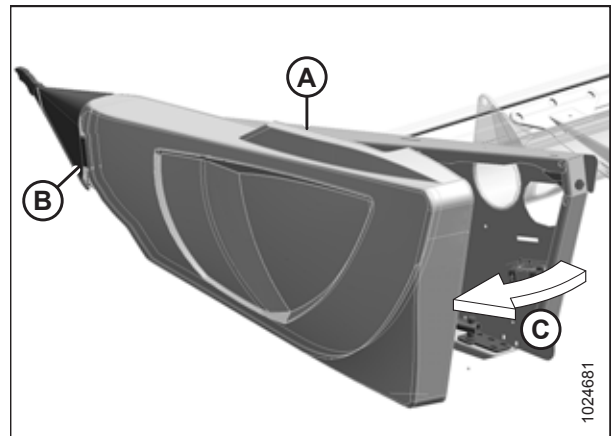


Figure 3.8: Left Endshield

4. If additional clearance is required, pull the endshield free of hinge tab (A) and swing the endshield toward the rear of the header.
5. Engage safety latch (B) on the hinge arm to secure the endshield in the fully open position.

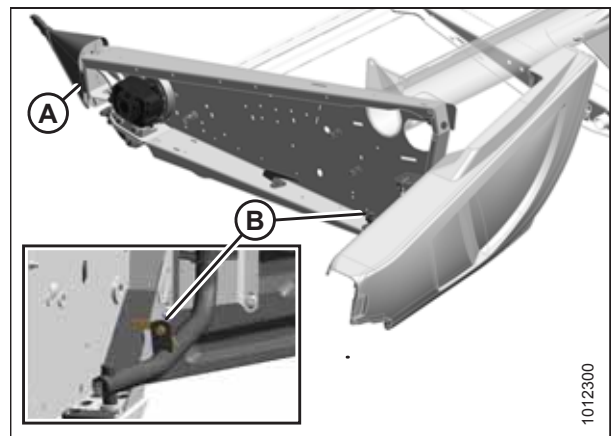


Figure 3.9: Left Endshield

## OPERATION

### Closing Endshields

Close and lock the endshields before moving the header.

1. Disengage lock (B) to allow the endshield to move.
2. Insert the front of the endshield behind hinge tab (A) and into the divider cone.

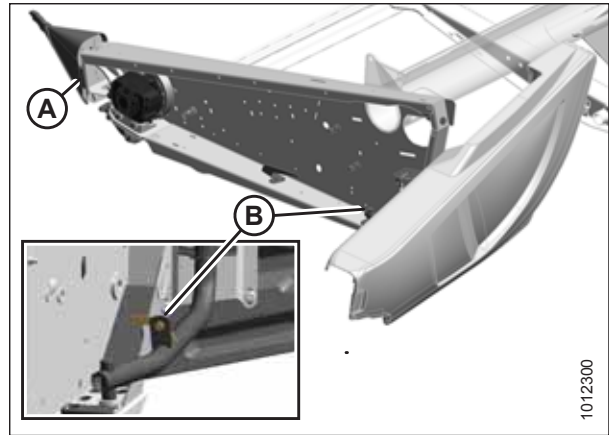


Figure 3.10: Left Endshield

3. Swing the endshield into the closed position [direction (A)]. Engage the lock with a firm push.
4. Check that the endshield is locked.

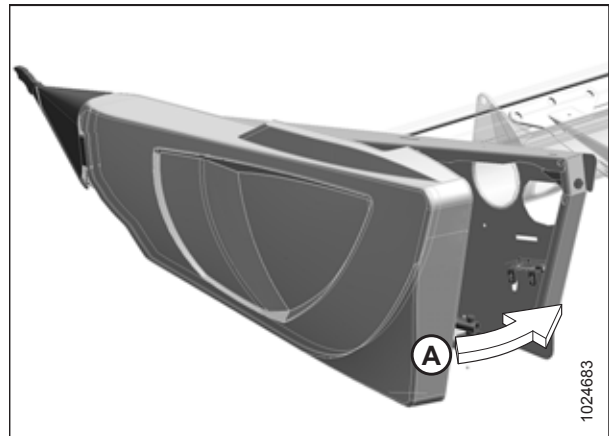


Figure 3.11: Left Endshield

### Removing Endshields

1. Fully open the endshield. For instructions, refer to [Opening Endshields, page 35](#).
2. Engage lock (A) to prevent endshield movement.
3. Remove self-tapping screw (B).
4. Slide the endshield upwards and remove it from hinge arm (C).

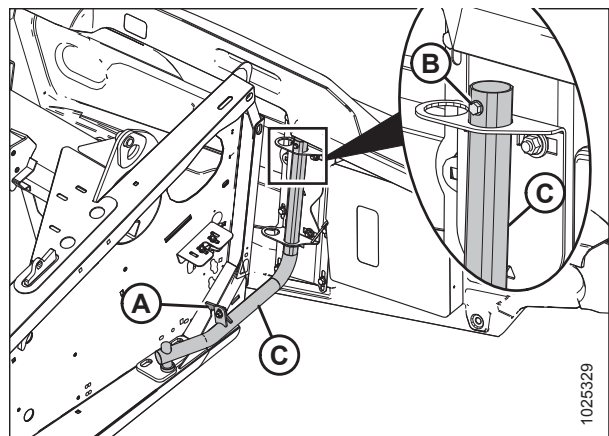


Figure 3.12: Left Endshield

## OPERATION

### Installing Endshields

1. Guide the endshield onto hinge arm (C) and slowly lower it.

**NOTE:**

Ensure hinge arm (C) is installed in the outboard hole on the hinge bracket, as shown in the illustration at right.

2. Install self-tapping screw (B).
3. Disengage lock (A) to allow endshield movement.
4. Close the endshield. For instructions, refer to [Closing Endshields, page 36](#).

**NOTE:**

Endshields may expand or contract when subjected to large temperature changes. The top pin and lower latch bracket positions can be adjusted to compensate for dimensional changes. For instructions, refer to [Checking and Adjusting Endshields, page 37](#).

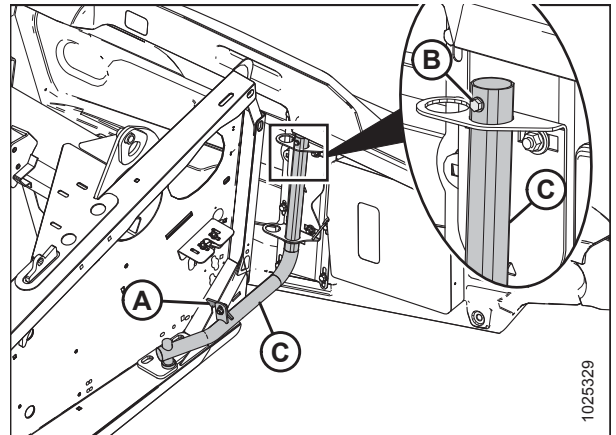


Figure 3.13: Left Endshield

### Checking and Adjusting Endshields

Endshields are subject to expansion or contraction caused by large temperature variations. The position of the top pin and lower latch can be adjusted to compensate for dimensional changes.

#### Checking the endshield

1. Measure gap (X) between the front end of the endshield and the header frame and compare to the measurement values in Table 3.1, page 37.

Table 3.1 Endshield Gap at Various Temperatures

Temperature in °C (°F)	Gap (X) mm (in.)
7 (45)	13–18 (1/2–23/32)
18 (65)	10–15 (3/8–19/32)
29 (85)	7–12 (9/32–15/32)
41 (105)	4–9 (5/32–11/32)

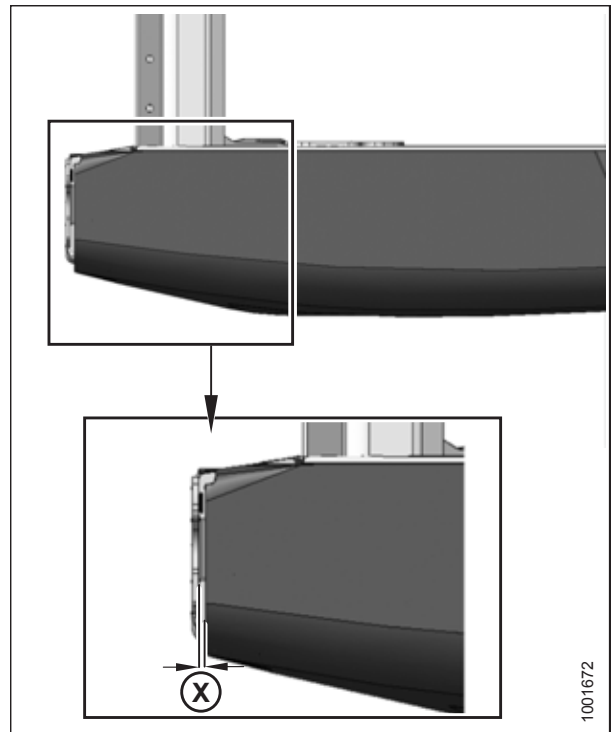


Figure 3.14: Gap between Endshield and Header Frame

## OPERATION

### Adjusting the endshield gap

1. Inside the endshield, loosen four bolts (A) on support tube bracket (B).

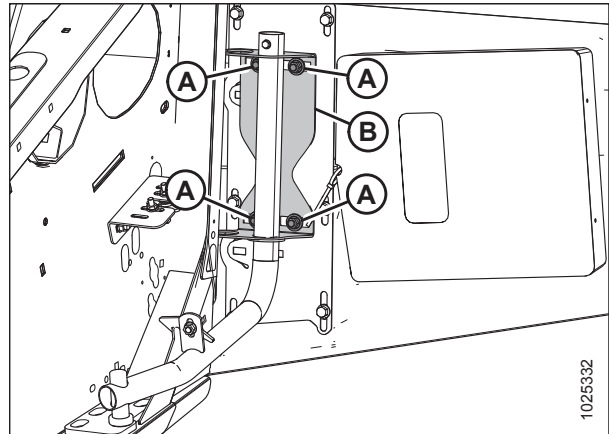


Figure 3.15: Left Endshield Support Tube

2. Loosen three bolts (A) on latch assembly (B).
3. Adjust latch assembly (B) to achieve the desired gap between the front end of the endshield and the header frame. Refer to Table 3.1, page 37 for the recommended endshield gap at various temperatures.
4. Tighten three bolts (A) on the latch assembly to 27 Nm (20 lbf-ft).

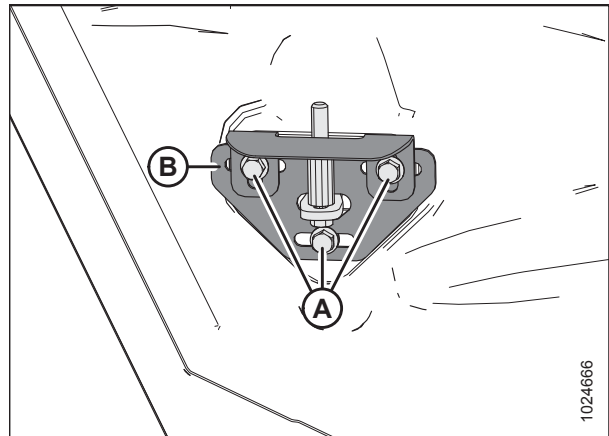


Figure 3.16: Left Endshield Latch Assembly

5. Tighten four bolts (A) on support tube bracket (B) to 31 Nm (23 lbf-ft).
6. Close the endshield. For instructions, refer to [Closing Endshields, page 36](#).

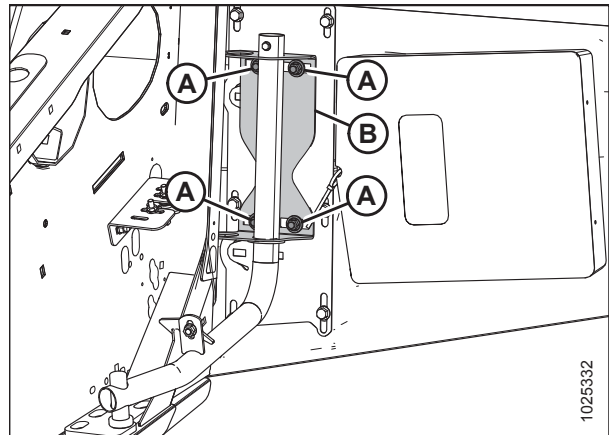


Figure 3.17: Left Endshield Support Tube



### 3.3 Daily Start-Up Check

#### CAUTION

- Clear the area of other persons, pets, etc. Keep children away from machinery. Walk around the machine to be sure no one is under, on, or close to it.
- Wear close-fitting clothing and protective shoes with slip-resistant soles.
- Remove foreign objects from the machine and surrounding area.
- Carry with you any protective clothing and personal safety devices that could be necessary through the day. Do NOT take chances. You may need a hard hat, protective glasses or goggles, heavy gloves, a respirator or filter mask, or wet weather gear.
- Protect against noise. Wear a suitable hearing protective device such as ear muffs or ear plugs to protect against objectionable or uncomfortably loud noises.



Figure 3.18: Safety Devices

Complete the following tasks each day before start-up:

1. Check the machine for leaks and any parts that are missing, broken, or not working correctly.

**NOTE:**

Use proper procedure when searching for pressurized fluid leaks. For instructions, refer to [5.3.5 Checking Hydraulic Hoses and Lines, page 404](#).

2. Clean all lights and reflectors on the machine.
3. Perform all daily maintenance. For instructions, refer to [5.3.1 Maintenance Schedule/Record, page 399](#).

### 3.4 Break-in Period

#### WARNING

Before investigating an unusual sound or attempting to correct a problem, shut off the engine and remove the key.

#### NOTE:

Until you become familiar with the sound and feel of your new header, be extra alert and attentive.

After attaching the header to the combine for the first time, follow these steps:

1. Operate the machine with the reels, drapers, and knives running slowly for 5 minutes. Watch and listen **FROM THE OPERATOR'S SEAT** for binding or interfering parts.

#### NOTE:

Reels and side drapers will not operate until oil flow fills the lines.

2. Refer to [5.3.2 Break-In Inspection, page 402](#) and perform all specified tasks.

### 3.5 Shutting down the Combine

Before leaving the operator's seat for any reason, shut down the combine.

 **DANGER**

**To avoid injury or death from unexpected start-up of machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.**

To shut down the combine, do the following:

1. Park on level ground whenever possible.
2. Lower the header fully.
3. Place all controls in NEUTRAL or PARK.
4. Disengage the header drive.
5. Lower and fully retract the reel.
6. Shut down the engine, and remove the key from the ignition.
7. Wait for all movement to stop.

## 3.6 Cab Controls

### WARNING

Be sure all bystanders are clear of machine before starting engine or engaging any header drives.

For instructions, refer to your combine operator's manual for identification of the following in-cab controls:

- Header engage/disengage control
- Header height
- Header angle
- Ground speed
- Reel speed
- Reel height
- Reel fore-aft position

## 3.7 Header Setup

### 3.7.1 Header Attachments

Optional attachments can improve performance in specific conditions or add features to the header. Optional attachments can be ordered and installed by your MacDon Dealer.

Refer to *6 Options and Attachments, page 581* for descriptions of available items.

### 3.7.2 Header Settings

The following tables provide a guideline for setting up the header; however, the suggested settings can be changed to suit various crops and conditions not covered in the tables.

For reel settings, refer to *3.7.4 Reel Settings, page 56*.

For FM100 auger configurations, refer to *3.8.1 FM100 Feed Auger Configurations, page 58*.

Table 3.2 Recommended D1 Series / FM100 Draper Header Settings for Cereals

Stubble Height	102 (<4)									
Stabilizer Wheels <sup>3</sup>	Storage									
Skid Shoe Position	Up or middle									
Crop Condition	Divider Rods	Draper Speed Setting <sup>4</sup>	Header Angle <sup>5,6</sup>	Reel Cam	Reel Speed % <sup>7</sup>	Reel Position	Upper Cross Auger			
Light	Off	8	B – C	3	10–15	6 or 7	Not required			
Normal	On	7	B – C	2	10	6 or 7	Not required			
Heavy	On	7	B – C	2	10	6 or 7	Recommended			
Lodged	Off	7	B – C	3 or 4	5–10	4 or 5	Not required			
Stubble Height	102–203 (4–8)									
Stabilizer Wheels	As required									
Skid Shoe Position	Down for lodged crop conditions, middle or down for other crop conditions									
Crop Condition	Divider Rods	Draper Speed Setting <sup>4</sup>	Header Angle <sup>5,6</sup>	Reel Cam	Reel Speed % <sup>7</sup>	Reel Position	Upper Cross Auger			
Light	Off	8	B – C	4	10–15	6 or 7	Not required			
Normal	On	7	A	2	10	6 or 7	Not required			
Heavy	On	7	A	2	10	6 or 7	Recommended			
Lodged	Off	7	D	3 or 4	5–10	4 or 5	Not required			

3. Stabilizer wheels are used to limit the side-to-side movement when cutting off the ground in rolling terrain and to minimize bouncing.
4. Setting on FM100 draper control.
5. Set header angle as shallow as possible (setting A) with center-link and skid shoes while maintaining cutting height.
6. Cutting height is controlled with a combination of skid shoes and header angle.
7. Percentage above ground speed.

Table 3.2 Recommended D1 Series / FM100 Draper Header Settings for Cereals (continued)

Stubble Height	203+ (8+)									
Stabilizer Wheels	As required									
Skid Shoe Position	Not applicable									
Crop Condition	Divider Rods	Draper Speed Setting <sup>4</sup>	Header Angle <sup>5, 6</sup>	Reel Cam	Reel Speed % <sup>7</sup>	Reel Position	Upper Cross Auger			
Light	Off	8	A	4	10-15	6 or 7	Not required			
Normal	On	7	A	2	10	6 or 7	Not required			
Heavy	On	7	B - C	2	10	6 or 7	Not required			
Lodged	Off	7	B - C	3 or 4	5-10	4 or 5	Not required			

Table 3.3 Recommended D1 Series / FM100 Draper Header Settings for Lentils

Stubble Height	On ground						
Stabilizer Wheels <sup>8</sup>	Storage						
Skid Shoe Position	Up or middle						
Crop Condition	Divider Rods	Draper Speed Setting <sup>9</sup>	Header Angle <sup>10, 11</sup>	Reel Cam	Reel Speed % <sup>12</sup>	Reel Position	Upper Cross Auger
Light	On	8	B – C	2	5–10	6 or 7	Not required
Normal	On	7	B – C	2	10	6 or 7	Not required
Heavy	On	7	B – C	2	10	6 or 7	Not required
Lodged	On	7	D	2	5–10	6 or 7	Not required

8. Stabilizer wheels are used to limit the side-to-side movement when cutting off the ground in rolling terrain and to minimize bouncing.
9. Setting on FM100 draper control.
10. Set header angle as shallow as possible (setting A) with center-link and skid shoes while maintaining cutting height.
11. Cutting height is controlled with a combination of skid shoes and header angle.
12. Percentage above ground speed.



Table 3.4 Recommended D1 Series / FM100 Draper Header Settings for Peas

Stubble Height	On ground						
Stabilizer Wheels <sup>13</sup>	Storage						
Skid Shoe Position	Up or middle						
Crop Condition	Divider Rods	Draper Speed Setting	Header Angle <sup>14, 15</sup>	Reel Cam	Reel Speed % <sup>16</sup>	Reel Position	Upper Cross Auger
Light	On	7	B – C	2	5–10	6 or 7	Recommended
Normal	On	7	B – C	2	10	6 or 7	Recommended
Heavy	On	7	B – C	2	10	4 or 5	Recommended
Lodged	On	7	D	2	5–10	4 or 5	Recommended

- 13. Stabilizer wheels are used to limit the side-to-side movement when cutting off the ground in rolling terrain and to minimize bouncing.
- 14. Set header angle as shallow as possible (setting A) with center-link and skid shoes while maintaining cutting height.
- 15. Cutting height is controlled with a combination of skid shoes and header angle.
- 16. Percentage above ground speed.

Table 3.5 Recommended D1 Series / FM100 Draper Header Settings for Canola

Stubble Height	102–203 (4–8)							
Stabilizer Wheels <sup>17</sup>	As required							
Skid Shoe Position	Down for light or heavy crop conditions, middle or down for normal or lodged crop conditions							
Crop Condition	Divider Rods	Draper Speed Setting <sup>18</sup>	Header Angle <sup>19, 20</sup>	Reel Cam	Reel Speed % <sup>21</sup>	Reel Position	Upper Cross Auger	
Light	On	7	A	2	5–10	6 or 7	Recommended	
Normal	On	7	B – C	1	10	6 or 7	Recommended	
Heavy	On	8	B – C	1	10	3 or 4	Recommended	
Lodged	On	7	D	2	5–10	3 or 4	Recommended	
Stubble Height	203+ (8+)							
Stabilizer Wheels <sup>17</sup>	As required							
Skid Shoe Position	Not applicable							
Crop Condition	Divider Rods	Draper Speed Setting <sup>18</sup>	Header Angle <sup>19, 20</sup>	Reel Cam	Reel Speed % <sup>21</sup>	Reel Position	Upper Cross Auger	
Light	On	7	A	2	5–10	6 or 7	Recommended	
Normal	On	7	B – C	2	10	6 or 7	Recommended	
Heavy	On	8	B – C	1 or 2	10	3 or 4	Recommended	
Lodged	On	7	D	2 or 3	5–10	3 or 4	Recommended	

17. Stabilizer wheels are used to limit the side-to-side movement when cutting off the ground in rolling terrain and to minimize bouncing.

18. Setting on FM100 draper control.

19. Set header angle as shallow as possible (setting A) with center-link and skid shoes while maintaining cutting height.

20. Cutting height is controlled with a combination of skid shoes and header angle.

21. Percentage above ground speed.

Table 3.6 Recommended D1 Series / FM100 Draper Header Settings for California Rice

Stubble Height	102 (<4)							
Stabilizer Wheels <sup>22</sup>	Storage							
Skid Shoe Position	Up or middle							
Crop Condition	Divider Rods <sup>23</sup>	Draper Speed Setting <sup>24</sup>	Header Angle <sup>25, 26</sup>	Reel Cam	Reel Speed % <sup>27</sup>	Reel Position	Upper Cross Auger	
Light	Rice divider rod	4	D	2	10-15	6 or 7	Not required	
Normal	Rice divider rod	4	B - C	2	10	4 or 5	Not required	
Heavy	Rice divider rod	4	B - C	2	10	4 or 5	Not required	
Lodged	Rice divider rod	4	D	2	5-10	4 or 5	Not required	
Stubble Height	102-203 (4-8)							
Stabilizer Wheels <sup>22</sup>	As required							
Skid Shoe Position	Middle or down							
Crop Condition	Divider Rods <sup>23</sup>	Draper Speed Setting <sup>24</sup>	Header Angle <sup>25, 26</sup>	Reel Cam	Reel Speed % <sup>27</sup>	Reel Position	Upper Cross Auger	
Light	Rice divider rod	4	D	3	10-15	6 or 7	Not required	
Normal	Rice divider rod	4	B - C	3	10	6 or 7	Not required	
Heavy	Rice divider rod	4	B - C	3	10	6 or 7	Not required	
Lodged	Rice divider rod	4	D	4	5-10	6 or 7	Not required	

22. Stabilizer wheels are used to limit the side-to-side movement when cutting off the ground in rolling terrain and to minimize bouncing.

23. The rice divider rod is available. Rice divider rod not required on both ends of header.

24. Setting on FM100 draper control.

25. Set header angle as shallow as possible (setting A) with center-link and skid shoes while maintaining cutting height.

26. Cutting height is controlled with a combination of skid shoes and header angle.

27. Percentage above ground speed.

Table 3.6 Recommended D1 Series / FM100 Draper Header Settings for California Rice (continued)

Stubble Height	203+ (8+)						
Stabilizer Wheels <sup>22</sup>	As required						
Skid Shoe Position	Not applicable						
Crop Condition	Divider Rods <sup>23</sup>	Draper Speed Setting <sup>24</sup>	Header Angle <sup>25, 26</sup>	Reel Cam	Reel Speed % <sup>27</sup>	Reel Position	Upper Cross Auger
Light	Rice divider rod	4	A	3	10-15	6 or 7	Not required
Normal	Rice divider rod	4	B - C	3	10	6 or 7	Not required
Heavy	Rice divider rod	4	B - C	3	10	6 or 7	Not required
Lodged	Rice divider rod	4	D	4	5-10	6 or 7	Not required

Table 3.7 Recommended D1 Series / FM100 Draper Header Settings for Delta Rice

Stubble Height	51-152 (2-6)							
Stabilizer Wheels <sup>28</sup>	As required							
Skid Shoe Position	Middle or down							
Crop Condition	Divider Rods	Draper Speed Setting <sup>29</sup>	Header Angle <sup>30, 31</sup>	Reel Cam	Reel Speed % <sup>32</sup>	Reel Position	Upper Cross Auger	
Light	Off	6	D	2 or 3	10-15	6 or 7	Not required	
Normal	Off	6	B - C	2 or 3	10	6 or 7	Not required	
Heavy	Off	6	B - C	2 or 3	10	6 or 7	Not required	
Lodged	Off	6	D	3 or 4	5-10	4 or 5	Not required	
Stubble Height	152+ (6+)							
Stabilizer Wheels <sup>28</sup>	As required							
Skid Shoe Position	Not applicable							
Crop Condition	Divider Rods	Draper Speed Setting <sup>29</sup>	Header Angle <sup>30, 31</sup>	Reel Cam	Reel Speed % <sup>32</sup>	Reel Position	Upper Cross Auger	
Light	Off	6	A	2 or 3	10-15	6 or 7	Not required	
Normal	Off	6	B - C	2 or 3	10	6 or 7	Not required	
Heavy	Off	6	B - C	2 or 3	10	6 or 7	Not required	
Lodged	Off	6	D	3 or 4	5-10	4 or 5	Not required	

28. Stabilizer wheels are used to limit the side-to-side movement when cutting off the ground in rolling terrain and to minimize bouncing.

29. Setting on FM100 draper control.

30. Set header angle as shallow as possible (setting A) with center-link and skid shoes while maintaining cutting height.

31. Cutting height is controlled with a combination of skid shoes and header angle.

32. Percentage above ground speed.

Table 3.8 Recommended D1 Series / FM100 Draper Header Settings for Edible Beans

Stubble Height	On ground						
Stabilizer Wheels <sup>33</sup>	Storage						
Skid Shoe Position	Up or middle						
Crop Condition	Divider Rods	Draper Speed Setting <sup>34</sup>	Header Angle <sup>35, 36</sup>	Reel Cam	Reel Speed % <sup>37</sup>	Reel Position	Upper Cross Auger
Light	On	8	D	2	5-10	6 or 7	Not required
Normal	On	7	B - C	2	10	6 or 7	Not required
Heavy	On	7	B - C	2	10	6 or 7	Not required
Lodged	On	7	D	2	5-10	6 or 7	Not required

33. Stabilizer wheels are used to limit the side-to-side movement when cutting off the ground in rolling terrain and to minimize bouncing.

34. Setting on FM100 draper control.

35. Set header angle as shallow as possible (setting A) with center-link and skid shoes while maintaining cutting height.

36. Cutting height is controlled with a combination of skid shoes and header angle.

37. Percentage above ground speed.

Table 3.9 Recommended D1 Series / FM100 Draper Header Settings for Flax

Stubble Height	51-153 (2-6)							
Stabilizer Wheels <sup>38</sup>	As required							
Skid Shoe Position	Down for lodged crop conditions, middle or down for other crop conditions							
Crop Condition	Divider Rods	Draper Speed Setting <sup>39</sup>	Header Angle <sup>40, 41</sup>	Reel Cam	Reel Speed % <sup>42</sup>	Reel Position	Upper Cross Auger	
Light	On	8	B - C	2	5-10	6 or 7	Not required	
Normal	On	7	A	2	10	6 or 7	Not required	
Heavy	On	7	B - C	2	10	6 or 7	Not required	
Lodged	On	7	D	2	5-10	6 or 7	Not required	

38. Stabilizer wheels are used to limit the side-to-side movement when cutting off the ground in rolling terrain and to minimize bouncing.

39. Setting on FM100 draper control.

40. Set header angle as shallow as possible (setting A) with center-link and skid shoes while maintaining cutting height.

41. Cutting height is controlled with a combination of skid shoes and header angle.

42. Percentage above ground speed.

### 3.7.3 Optimizing Header for Straight Combining Canola

Ripe canola can be straight combined, but most varieties are very susceptible to shelling and subsequent seed loss. This section provides recommended attachments, settings, and adjustments to optimize D1 Series Draper Headers for straight combining canola.

#### **Recommended attachments**

The optimization includes the following modifications to the header:

- Installing a full-length upper cross auger
- Installing vertical knives
- Installing short center reel braces

#### **NOTE:**

Each kit includes installation instructions and the necessary hardware. For more information, refer to [6 Options and Attachments, page 581](#).

#### **Recommended settings**

Optimizing the header requires adjustments to the following settings:

- Moving the reel fore-aft cylinders to the alternative aft location. For instructions, refer to [Repositioning Fore-Aft Cylinders on Double Reel, page 118](#) or [Repositioning Fore-Aft Cylinders on Single Reel, page 116](#).
- Adjust the reels fore-aft position. For instructions, refer to [Adjusting Reel Fore-Aft Position, page 116](#).
- Adjusting reel height so that fingers just engage the crop. For instructions, refer to [3.8.9 Reel Height, page 110](#).
- Setting reel cam to position 1. For instructions, refer to [Adjusting Reel Cam, page 128](#).
- Setting reel speed equal to ground speed and increase as required. For instructions, refer to [3.8.5 Reel Speed, page 104](#).
- Adjust the side draper speed to position nine on FM100 control valve. For instructions, refer to [3.8.7 Draper Speed, page 106](#).
- Change the auger from the rigid to the floating position. For instructions, refer to [3.8.14 Setting Feed Auger Position, page 135](#).
- Loosen the feed auger spring tension. For instructions, refer to [Checking and Adjusting Feed Auger Springs, page 54](#).

#### **Checking and Adjusting Feed Auger Springs**

The feed auger has an adjustable spring tensioning system that allows the auger to float on top of the crop instead of crushing and damaging it. The factory-set tension is adequate for most crop conditions.

#### **DANGER**

**To avoid bodily injury or death from the unexpected start-up or fall of raised machine, always stop the engine, remove the key, and engage the safety props before going under the header for any reason.**

1. Raise the header to its full height.
2. Shut down the engine, and remove the key from the ignition.
3. Engage the header lift cylinder safety props.



## OPERATION

4. At the left back corner of the header, check the thread length protruding past nut (A). The length should be 22–26 mm (7/8–1 in.).

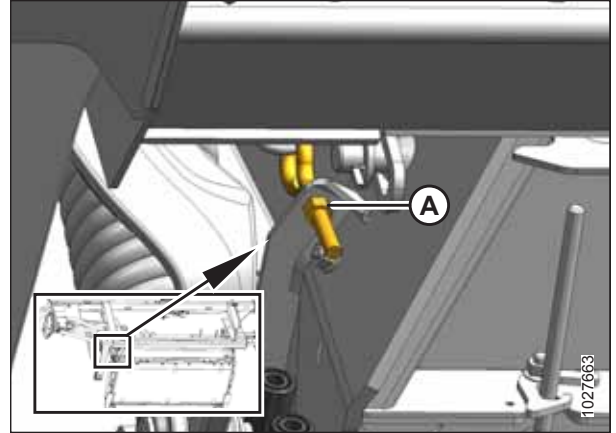


Figure 3.19: Spring Tensioner

***If adjustment is required, follow these steps:***

5. Loosen upper jam nut (A) on the spring tensioner.
6. Turn lower nut (B) until thread (C) protrudes 22–26 mm (7/8–1 in.).
7. Tighten jam nut (A).
8. Repeat Steps 5, page 55 to 7, page 55 on the opposite side.

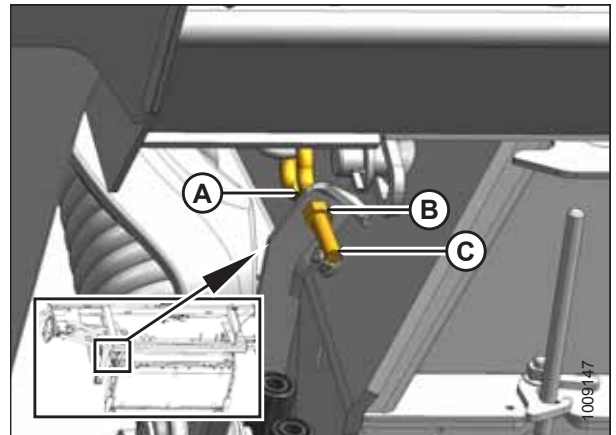


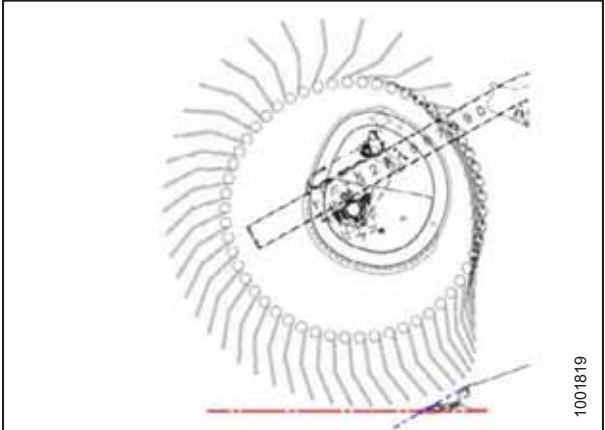
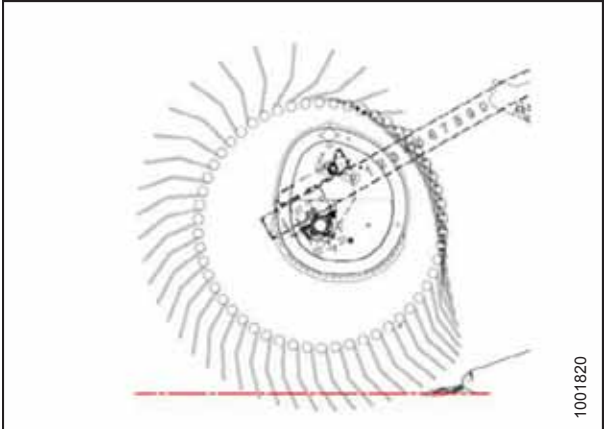
Figure 3.20: Spring Tensioner

OPERATION

**3.7.4 Reel Settings**

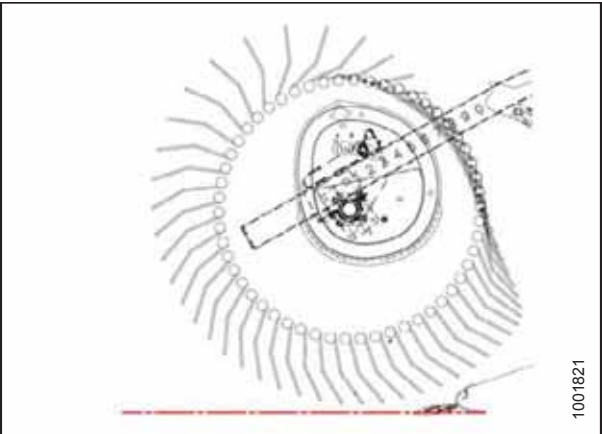
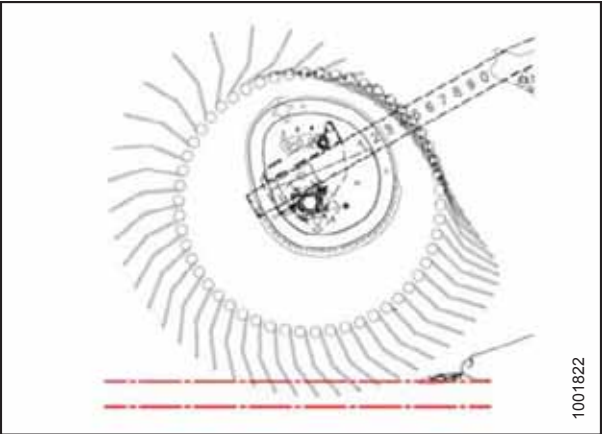
For proper operation of the reel follow the settings in the table below for optimal performance.

**Table 3.10 D1 Series Recommended Reel Settings**

Cam Setting Number (Finger Speed Gain)	Reel Position Number	Reel Finger Pattern
1 (0)	6 or 7	
2 (20%)	3 or 4	

## OPERATION

**Table 3.10 D1 Series Recommended Reel Settings (continued)**

Cam Setting Number (Finger Speed Gain)	Reel Position Number	Reel Finger Pattern
3 (30%)	6 or 7	
4 (35%)	2 or 3	

**NOTE:**

- Adjust the reel forward to get closer to the ground while tilting the header back. Fingers/tines will dig into the ground at extreme reel-forward positions, so adjust the skid shoes or header angle to compensate. Adjust the reel rearward to position the reel farther away from the ground when tilting the header forward.
- Header tilt can be increased to position the reel closer to the ground, or decreased to position the reel farther from the ground, while keeping material flowing onto drapers.
- To leave the maximum amount of stubble in lodged crop, raise the header and increase the header tilt to keep the reel close to the ground. Position the reel fully forward.
- The reel may have to be moved back to prevent lumps or plugging on the cutterbar in thinner crops.
- Minimum crop carrying capacity (the minimum area of exposed draper between the reel and the header backsheet) occurs with the reel in the farthest aft position.
- Maximum crop carrying capacity (the maximum area of exposed draper between the reel and the header backsheet) occurs with the reel in the farthest forward position.
- Due to the nature of the cam action, the tip speed of the fingers/tines at the cutterbar becomes higher than that of the reel speed at higher cam settings. For more information, refer to [Table 3.10, page 56](#).

### 3.8 Header Operating Variables

Satisfactory function of the header in all situations requires making adjustments to suit various crops and conditions.

Correct operation reduces crop loss and increases productivity. As well, proper adjustments and timely maintenance will increase the length of service you receive from your machine.

The variables listed in Table 3.11, page 58 and detailed on the following pages will affect the performance of your header.

You will quickly become adept at adjusting the machine to achieve the results you desire. Most of the adjustments have been preset at the factory, but the settings can be changed to suit crop conditions.

**Table 3.11 Operating Variables**

Variable	Refer to
Cutting height	<i>Cutting off the Ground, page 83;</i> <i>Cutting on the Ground, page 89</i>
Header float	<i>3.8.3 Header Float, page 90</i>
Header angle	<i>3.8.4 Header Angle, page 96</i>
Reel speed	<i>3.8.5 Reel Speed, page 104</i>
Ground speed	<i>3.8.6 Ground Speed, page 105</i>
Reel height	<i>3.8.9 Reel Height, page 110</i>
Reel fore-aft position	<i>3.8.10 Reel Fore-Aft Position, page 116</i>
Reel tine pitch	<i>3.8.11 Reel Tine Pitch, page 126</i>
Crop divider rods	<i>3.8.12 Crop Dividers, page 129</i>
Feed auger configurations	<i>3.8.1 FM100 Feed Auger Configurations, page 58</i>

#### 3.8.1 FM100 Feed Auger Configurations

The FM100 feed auger can be configured to suit various crop conditions; there are five configurations available.

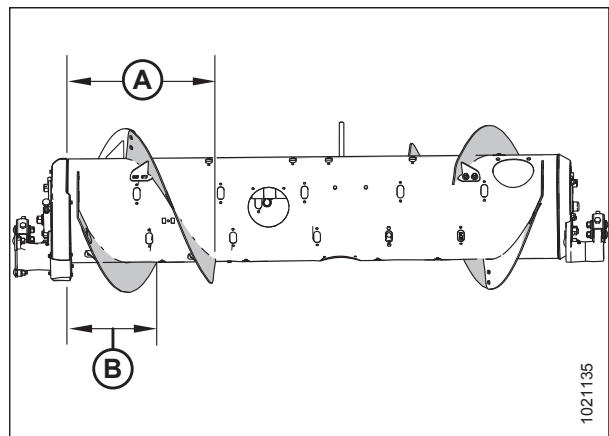
**NOTE:**

Dimensions (A) and (B) are the same for both ends of the auger. They should be within 15 mm (9/16 in.) of the numbers given.

**Narrow configuration** is a standard configuration for the following combines:

- AGCO IDEAL™ Series
- Gleaner® R6/75, R6/76, S6/77, S6/7/88, S96/7/8
- New Holland CR 920/940/960, 9020/40/60/65, 6090/7090, 8060/8070/8080

Narrow configuration uses 4 long bolt-on flightings (2 on the left and 2 on the right) and 18 feed auger fingers are recommended.



**Figure 3.21: Narrow Configuration – Rear View**

A - 514 mm (20 1/4 in.)

B - 356 mm (14 in.)

For more information on converting to Narrow configuration, refer to *Narrow Configuration – Auger Flighting, page 61*.

## OPERATION

### NOTE:

Dimensions (A) and (B) are the same for both ends of the auger. They should be within 15 mm (9/16 in.) of the numbers given.

**Medium configuration** is a standard configuration for the following combines:

- Case IH 2300/2500 Series
- Case IH 5/6/7088, 7/8010, 7/8/9120, 5/6/7130, 7/8/9230, 5/6/7140, 7/8/9240, 5/6/7150, 7/8/9250
- Challenger® 66/67/680B, 54/560C, 54/560E
- CLAAS 56/57/58/590R, 57/58/595R, 62/63/64/65/66/670, 73/74/75/76/77/780, 7000/8000, Tucano
- John Deere 95/96/97/9860, 95/96/97/9870, S65/66/67/68/690, T670, S76/77/78/790
- Massey Ferguson® 96/97/9895, 9520/40/60, 9545/65, 9380
- New Holland CR 970/980, 9070/9080, 8090/9090, X.90, X.80, 10.80/10.90
- New Holland CX 8X0, 80X0, 8.X0, 8080/8090
- Rostselmash Torum 760/780
- Versatile RT490

**Medium configuration** is an optional configuration for AGCO IDEAL™ Series.

Medium configuration uses 4 short bolt-on flightings (2 on the left and 2 on the right) and 22 feed auger fingers are recommended.

For more information on converting to Medium configuration, refer to [Medium Configuration – Auger Flighting, page 64](#).

### NOTE:

Dimensions (A) and (B) are the same for both ends of the auger. They should be within 15 mm (9/16 in.) of the numbers given.

**Wide configuration** is an optional configuration for the following combines:

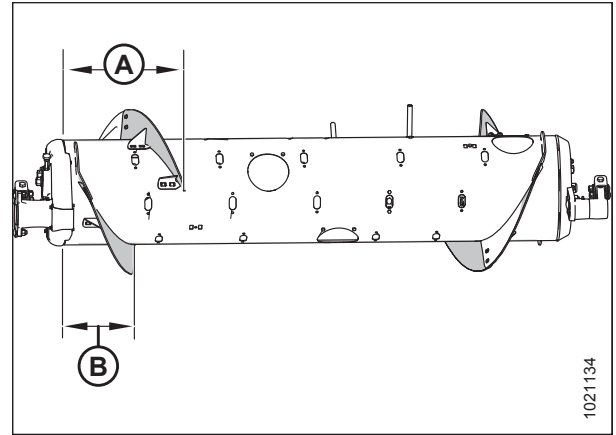
- Challenger® 670B/680B, 540C/560C, 540E/560E
- CLAAS 590R/595R, 660/670, 760/770/780, 8000
- John Deere T670
- Massey Ferguson® 9895, 9540, 9560, 9545, 9565, 9380
- New Holland CX 8X0, 80X0, 8.X0

Wide configuration uses 2 short bolt-on flightings (1 on the left and 1 on the right) and 30 feed auger fingers are recommended.

### NOTE:

This configuration may increase combine capacity on wide feeder house combines in certain crop conditions.

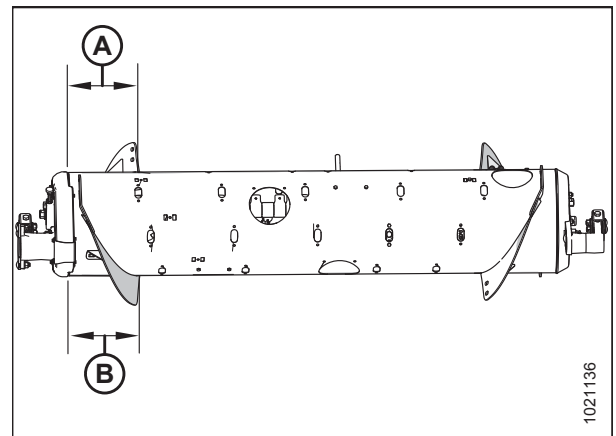
For more information on converting to Wide configuration, refer to [Wide Configuration – Auger Flighting, page 67](#).



**Figure 3.22: Medium Configuration – Rear View**

A - 410 mm (16 1/8 in.)

B - 260 mm (10 1/4 in.)



**Figure 3.23: Wide Configuration – Rear View**

A - 257 mm (10 1/8 in.)

B - 257 mm (10 1/8 in.)

## OPERATION

### NOTE:

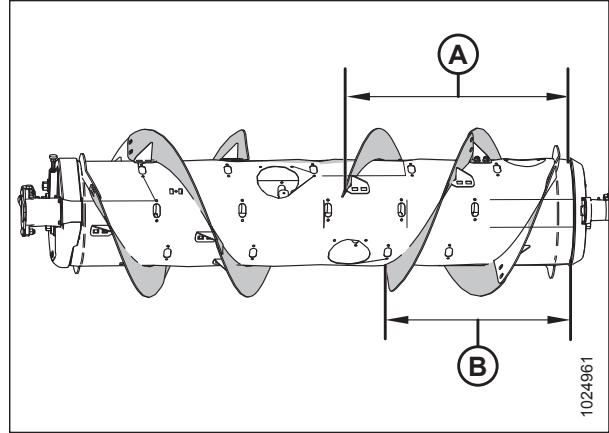
Dimensions (A) and (B) are the same for both ends of the auger. They should be within 15 mm (9/16 in.) of the numbers given.

**Ultra Narrow configuration** is an optional configuration that may improve feeding performance on combines with narrow feeder houses. It may also be helpful when harvesting rice.

Ultra Narrow configuration uses 8 long bolt-on flightings (4 on the left and 4 on the right) and 18 auger fingers are recommended.

### NOTE:

You will need to drill holes in the flighting and in the drum to install the extra flighting.



**Figure 3.24: Ultra Narrow Configuration – Rear View**

A - 760 mm (29 15/16 in.)

B - 602 mm (23 11/16 in.)

For more information on converting to Ultra Narrow configuration, refer to [Ultra Narrow Configuration – Auger Flighting, page 69](#).

**Ultra Wide configuration** is an optional configuration for the following combines:

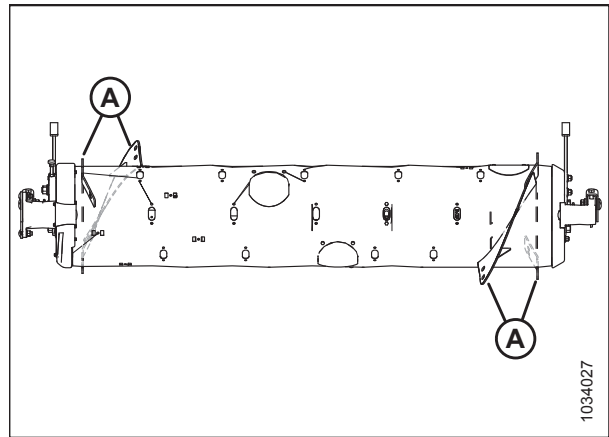
- CLAAS 590R/595R, 660/670, 760/770/780/7000/8000

The Ultra Wide configuration uses no bolt on flighting; only factory-welded flighting (A) is responsible for conveying the crop.

### NOTE:

This configuration may improve feeding for wide feeder house combines.

A total of 30 auger fingers are recommended for this configuration.



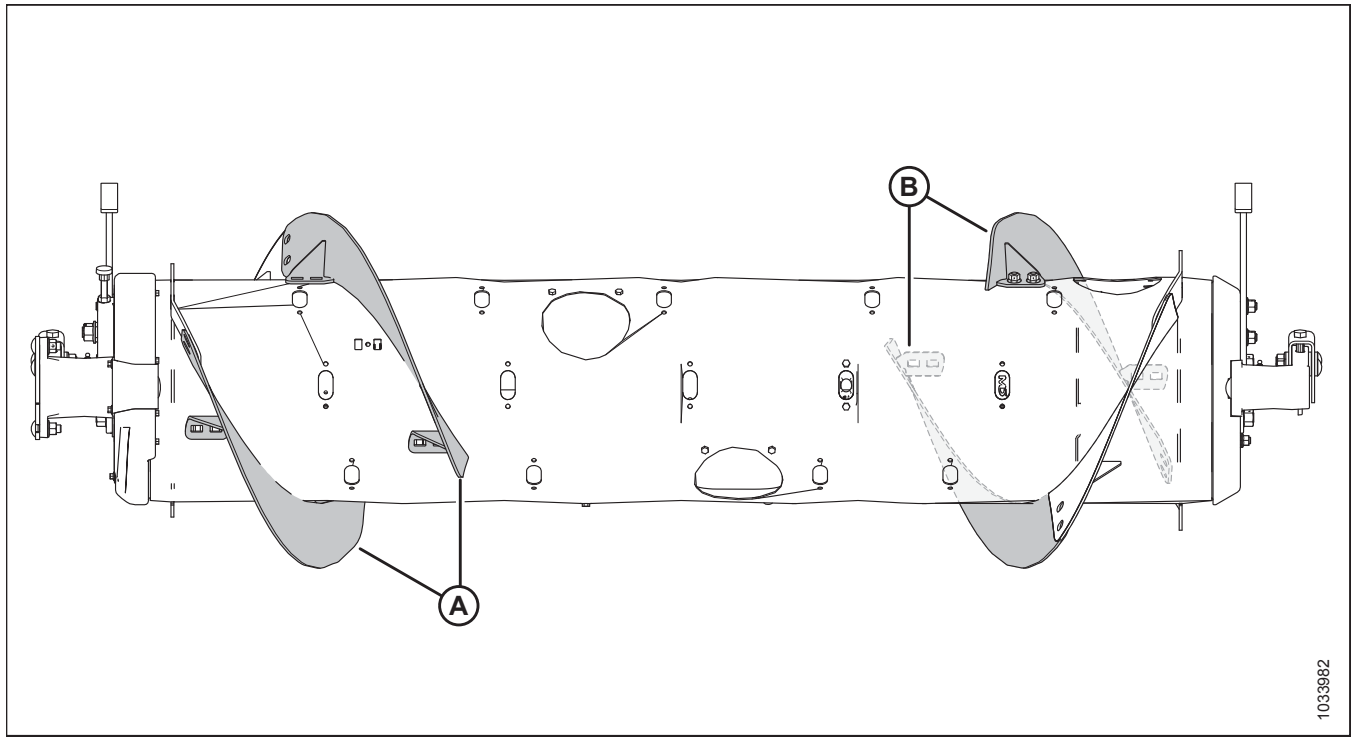
**Figure 3.25: Ultra Wide Configuration – Rear View**

For more information on converting to Ultra Wide configuration, refer to [Ultra Wide Configuration – Auger Flighting, page 73](#).

## OPERATION

### Narrow Configuration – Auger Flighting

Narrow configuration uses four long bolt-on flightings (two on the left and two on the right), and 18 auger fingers are recommended.



**Figure 3.26: Narrow Configuration**

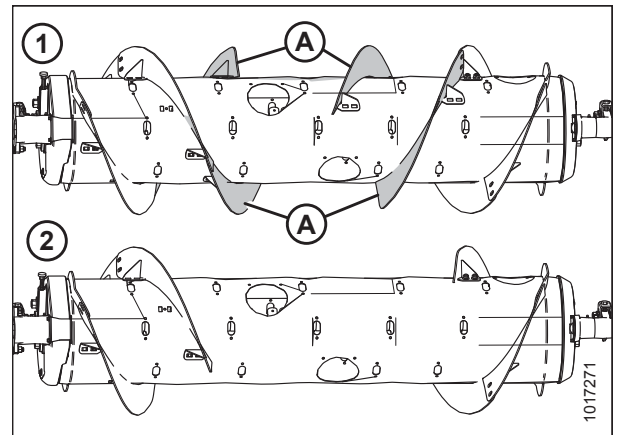
A - Left Long Flighting (MD #287889)

B - Right Long Flighting (MD #287890)

### To convert to Narrow configuration from Ultra Narrow Configuration:

Remove four flightings (A) from the auger and install additional auger fingers. A total of 18 auger fingers is recommended for this configuration.

- For flighting removal instructions, refer to [Removing Bolt-On Flighting, page 74](#).
- For finger installation instructions, refer to [Installing Feed Auger Fingers, page 446](#).



**Figure 3.27: Auger Configurations – Rear View**

1 - Ultra Narrow Configuration

2 - Narrow Configuration

## OPERATION

### To convert to Narrow configuration from Medium, Wide, or Ultra Wide configuration:

Two flighting kits (MD #287032 or B6400<sup>43</sup>) are required. You will need to replace any of the existing short flightings (A)<sup>44</sup> with long flightings (B) and remove the extra auger fingers. A total of 18 auger fingers is recommended for this configuration.

#### IMPORTANT:

Extra hardware is included in these kits. Be sure to use the correct hardware in the correct location to prevent damage and to maximize performance.

- For flighting replacement instructions, refer to [Removing Bolt-On Flighting, page 74](#) and [Installing Bolt-On Flighting, page 77](#).
- For finger removal instructions, refer to [Removing Feed Auger Fingers, page 444](#).

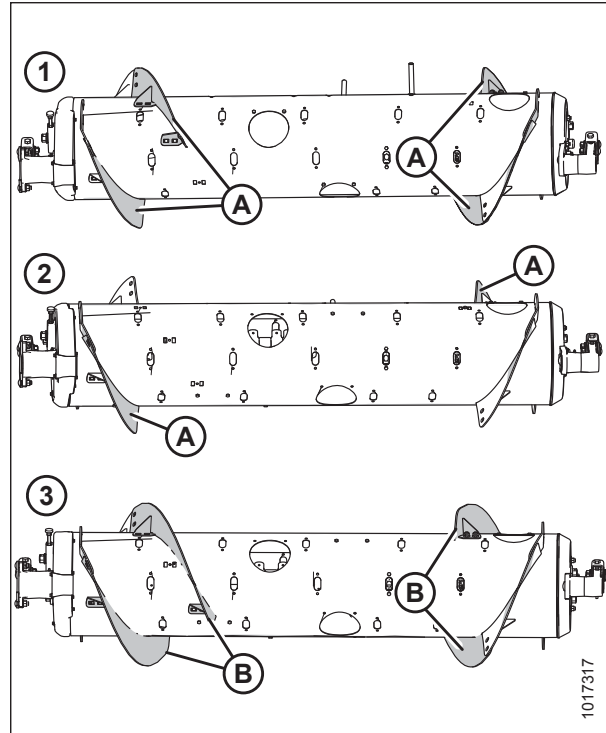


Figure 3.28: Auger Configurations – Rear View

1 - Medium Configuration

2 - Wide Configuration

3 - Narrow Configuration

#### NOTE:

If converting from Ultra Wide configuration, there is no existing bolt-on flighting to remove because that configuration uses only the factory-welded flighting (A).

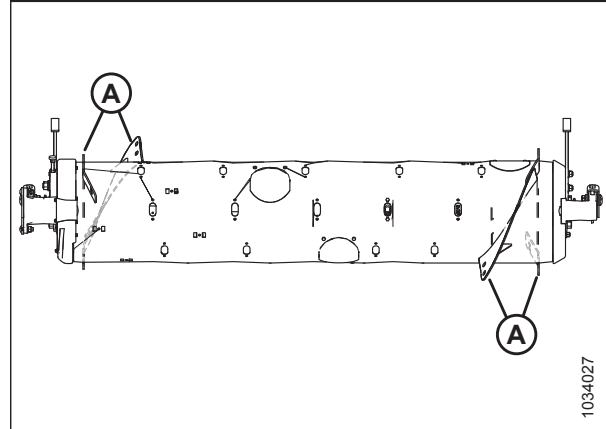


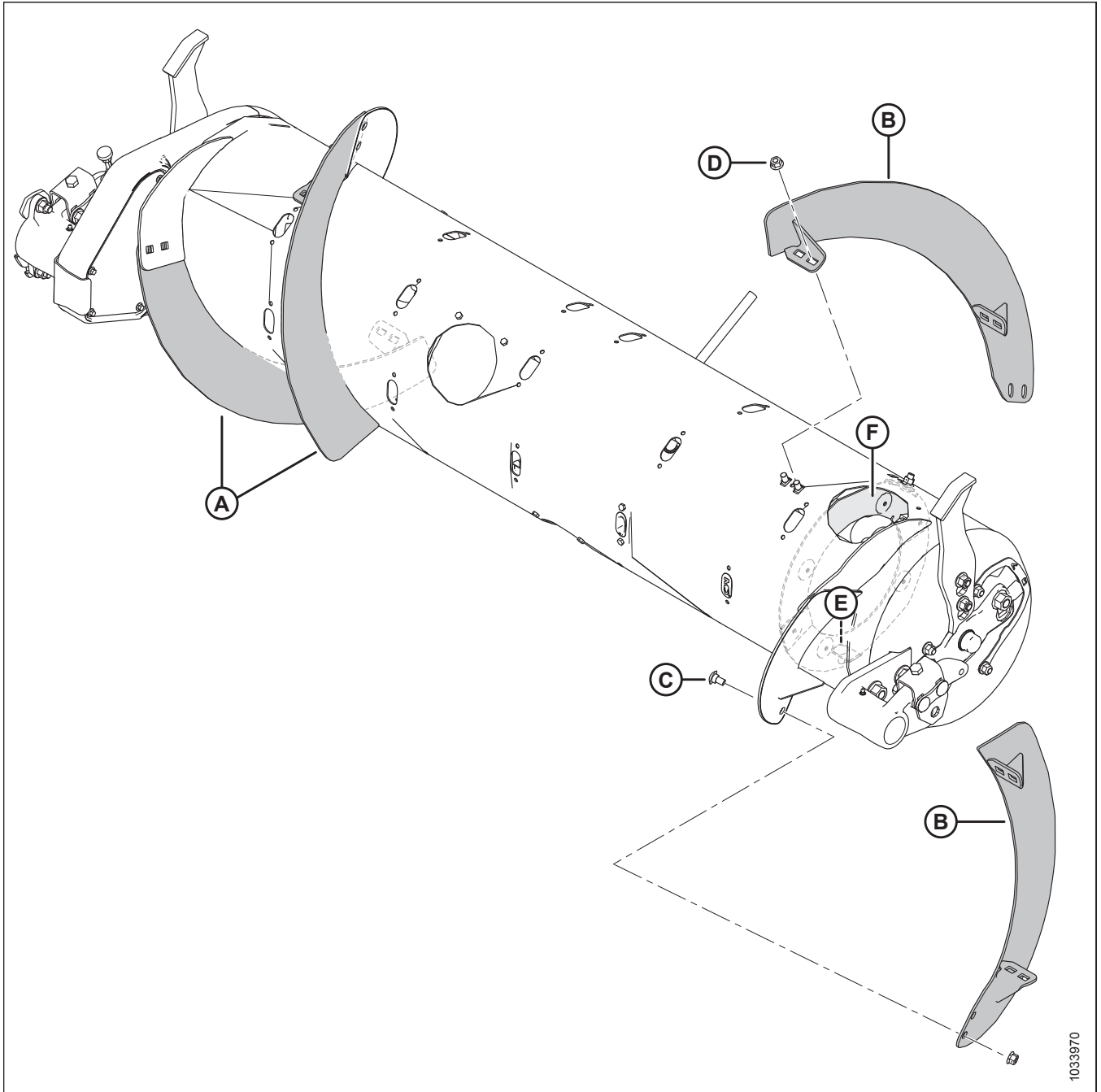
Figure 3.29: Ultra Wide Configuration

43. MD #287032 is available only through MacDon Parts. B6400 is available only through Whole Goods. Both kits contain wear-resistant flightings.

44. The quantity of existing short flightings is either 0, 2, or 4, depending on the current configuration.



## OPERATION



**Figure 3.30: Narrow Configuration**

A - Left Long Flighting (MD #287889)

C - M10 x 20 mm Carriage Bolt (MD #136178)

E - Existing M10 x 25 mm Carriage Bolt

B - Right Long Flighting (MD #287890)

D - M10 Center Lock Flange Nut (MD #135799)

F - Magnetic Reverser Shield

**NOTE:**

Magnetic reverser shield (F) is shown in the above illustration. References to the reverser shield do not apply to model year 2019 and prior units that do not have the reverser shield kit installed.

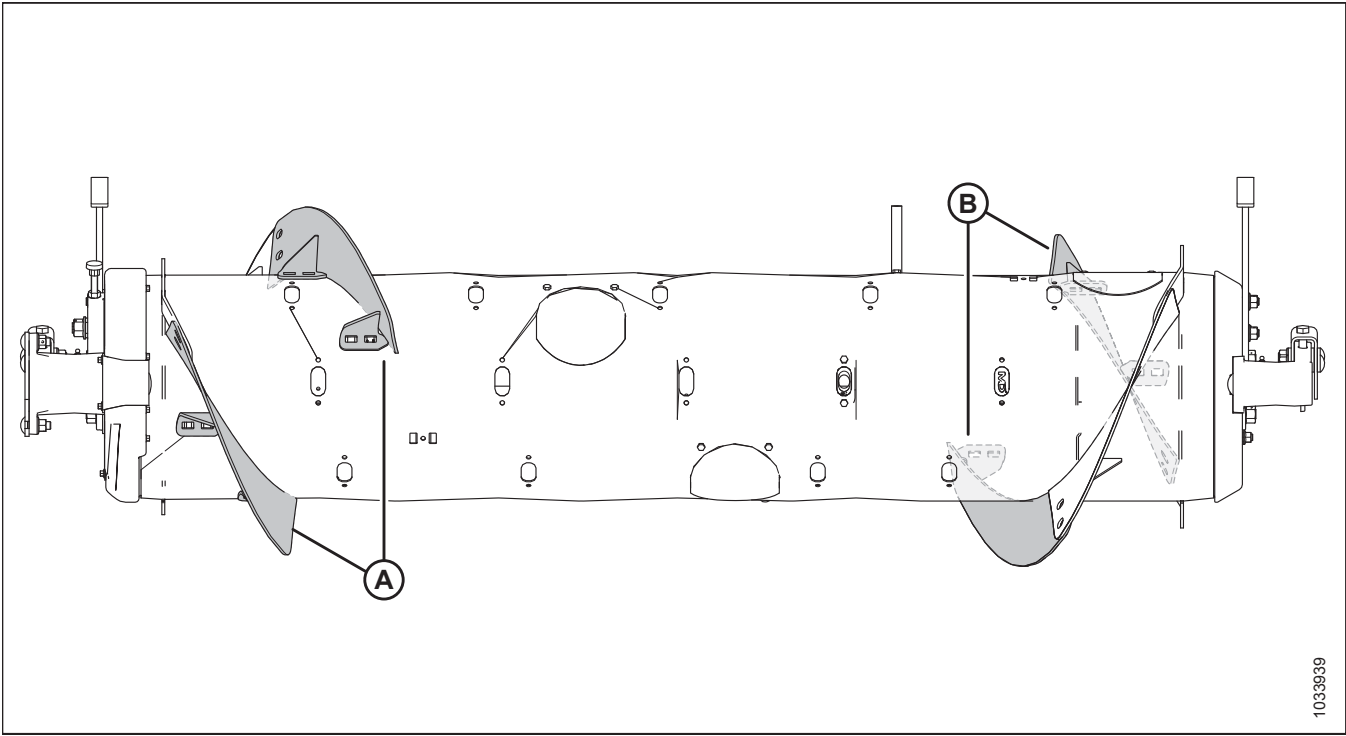
**NOTE:**

In the Narrow Configuration, one of the two existing 25 mm bolts (E) is used to secure both the flighting and reverser shield together. The second 25 mm bolt is used only on the reverser shield.

## OPERATION

### Medium Configuration – Auger Flighting

Medium configuration uses four short bolt-on flightings (two on the left and two on the right), and 22 auger fingers are recommended.



**Figure 3.31: Medium Configuration**

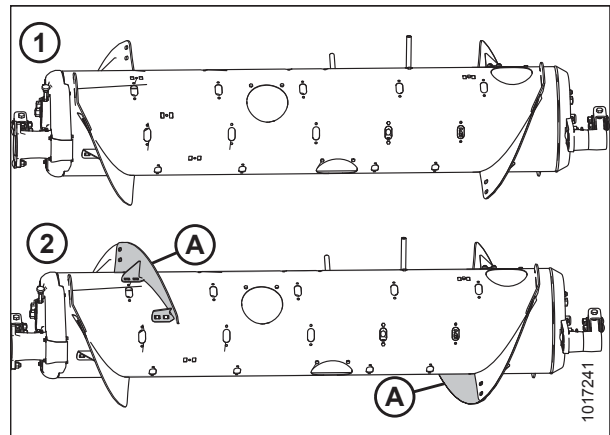
A - Left Short Flighting (MD #287888)

B - Right Short Flighting (MD #287887)

#### To convert to Medium configuration from Wide configuration:

One flighting kit (MD #287031) is required. You will need to install new flightings (A) and remove the extra auger fingers. A total of 22 auger fingers is recommended for this configuration.

- For flighting installation instructions, refer to [Installing Bolt-On Flighting, page 77](#).
- For finger removal instructions, refer to [Removing Feed Auger Fingers, page 444](#).



**Figure 3.32: Auger Configurations – Rear View**

1 - Wide Configuration

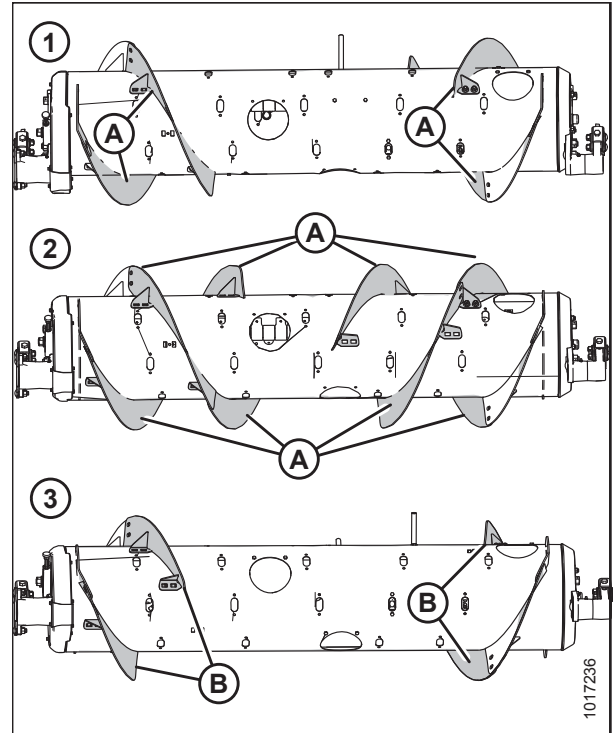
2 - Medium Configuration

## OPERATION

### To convert to Medium configuration from Narrow or Ultra Narrow configuration:

Two flighting kits (MD #287031) are required. You will need to replace long flightings (A)<sup>45</sup> with short flightings (B) and install additional auger fingers. A total of 22 auger fingers is recommended for this configuration.

- For flighting replacement instructions, refer to *Removing Bolt-On Flighting, page 74* and *Installing Bolt-On Flighting, page 77*.
- For finger installation instructions, refer to *Installing Feed Auger Fingers, page 446*.



**Figure 3.33: Auger Configurations – Rear View**

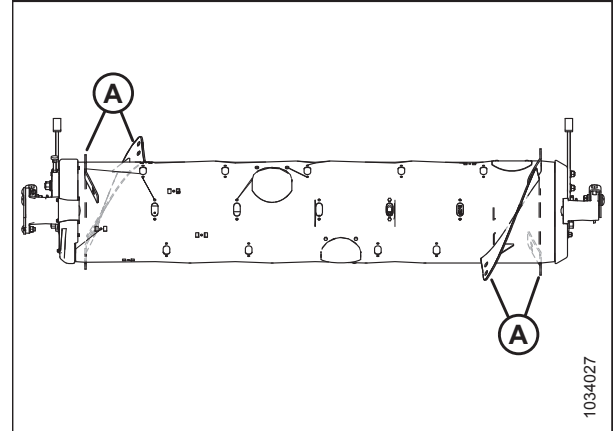
1 - Narrow Configuration  
3 - Medium Configuration

2 - Ultra Narrow Configuration

### To convert to Medium configuration from Ultra Wide configuration:

Two flighting kits (MD #287031) are required. You will need to install four short flightings onto the existing welded flightings (A) and remove the extra auger fingers. A total of 22 auger fingers is recommended for this configuration.

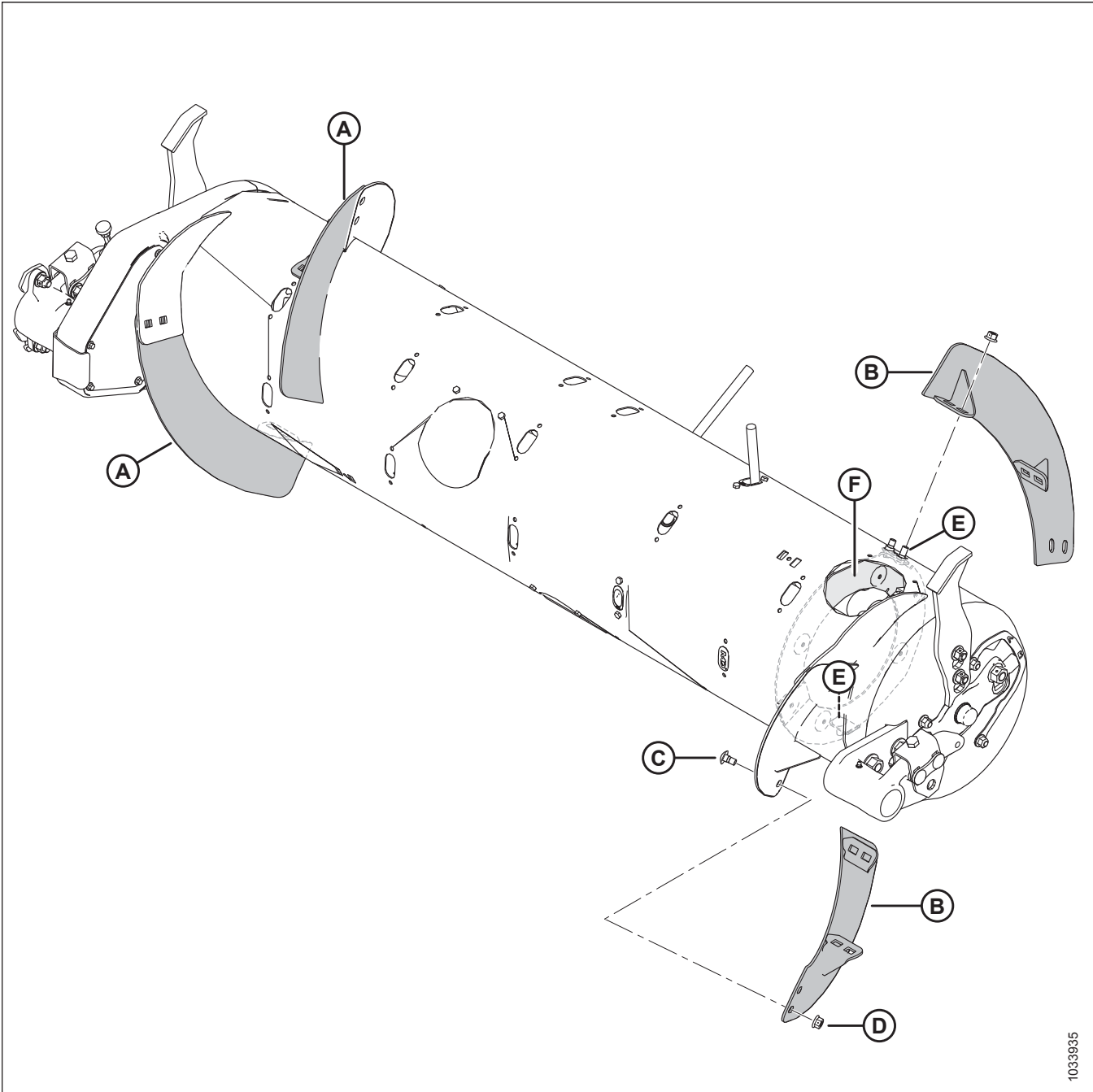
- For flighting installation instructions, refer to *Installing Bolt-On Flighting, page 77*.
- For finger removal instructions, refer to *Removing Feed Auger Fingers, page 444*.



**Figure 3.34: Ultra Wide Configuration**

45. The quantity of existing long flightings is either 4 or 8, depending on the current configuration.

## OPERATION



1033935

**Figure 3.35: Medium Configuration**

A - Left Short Flighting (MD #287888)

C - M10 x 20 mm Carriage Bolt (MD #136178)

E - Existing M10 x 25 mm Carriage Bolts

B - Right Short Flighting (MD #287887)

D - M10 Center Lock Flange Nut (MD #135799)

F - Magnetic Reverser Shield

### NOTE:

Magnetic reverser shield (F) is shown in the above illustration. References to the reverser shield do not apply to model year 2019 and prior units that do not have the reverser shield kit installed.

### NOTE:

In the Medium Configuration, use the existing 25 mm bolts to secure the flighting to the reverser shield at locations (E).

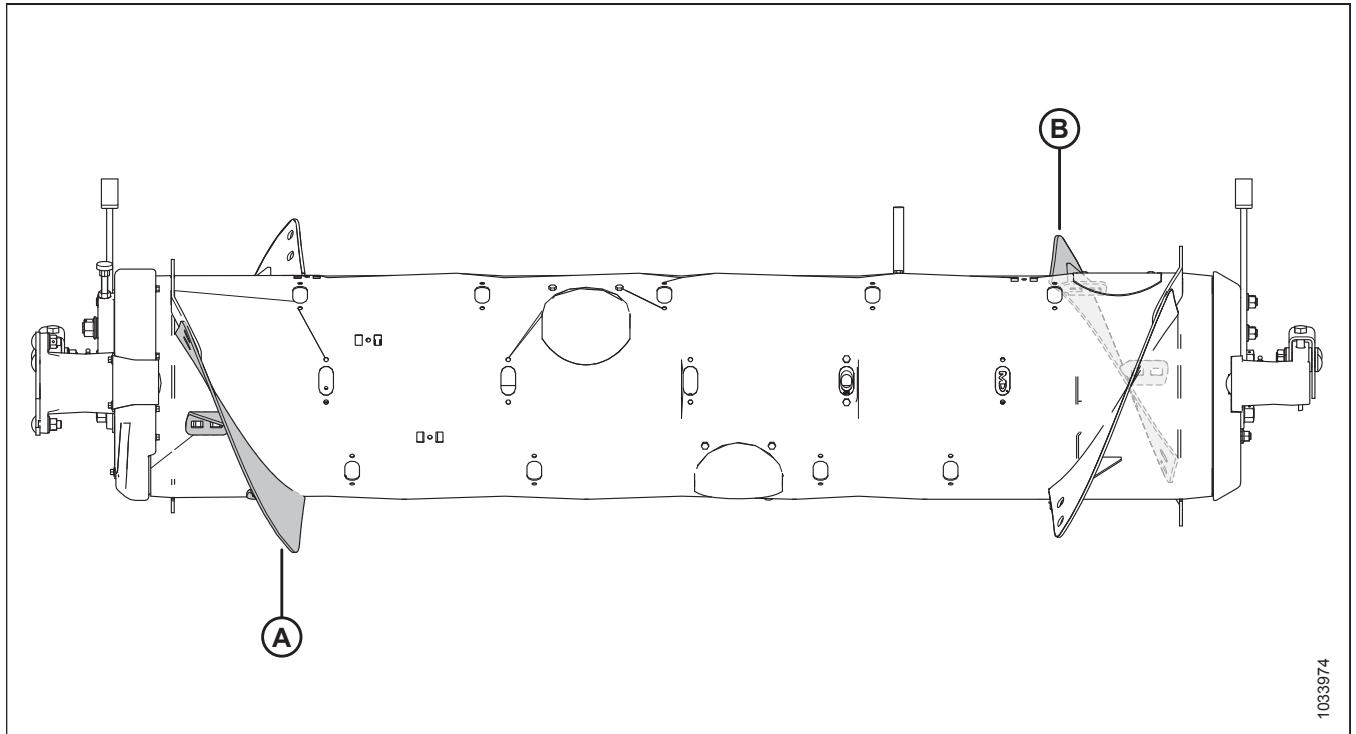
## OPERATION

### Wide Configuration – Auger Flighting

Wide configuration uses two short bolt-on flightings (one on the left and one on the right), and 30 auger fingers are recommended.

#### NOTE:

This configuration may increase combine capacity on wide feeder house combines in certain crop conditions.



**Figure 3.36: Wide Configuration**

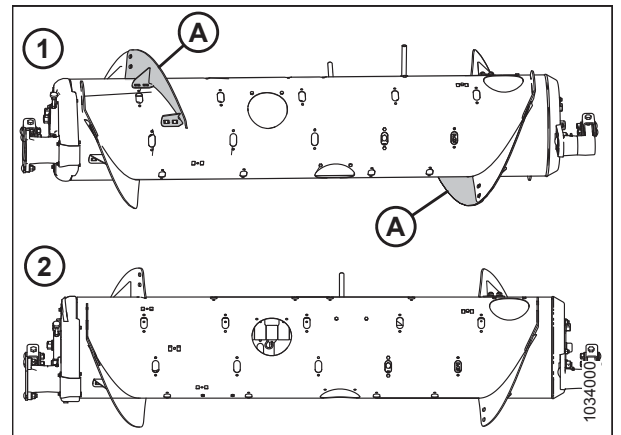
A - Left Short Flighting (MD #287888)

B - Right Short Flighting (MD #287887)

#### To convert to Wide configuration from Medium Configuration:

Remove existing flightings (A) from the auger and install additional auger fingers. A total of 30 auger fingers is recommended for this configuration.

- For flighting removal instructions, refer to [Removing Bolt-On Flighting, page 74](#).
- For finger installation instructions, refer to [Installing Feed Auger Fingers, page 446](#).



**Figure 3.37: Auger Configurations – Rear View**

1 - Medium Configuration

2 - Wide Configuration

## OPERATION

### To convert to Wide configuration from Ultra Wide configuration:

One flighting kit (MD #287031) is required. You will need to install two short flightings onto the existing welded flightings (A). A total of 30 auger fingers is recommended for this configuration.

- For flighting installation instructions, refer to [Installing Bolt-On Flighting, page 77](#).
- If required to remove auger fingers, refer to [Removing Feed Auger Fingers, page 444](#).

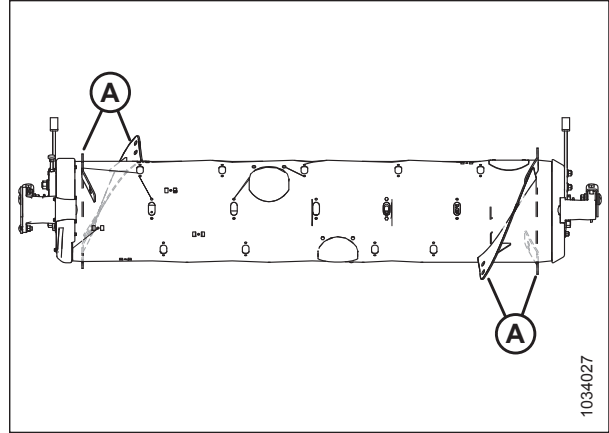


Figure 3.38: Ultra Wide Configuration

### To convert to Wide configuration from Narrow or Ultra Narrow configuration:

One flighting kit (MD #287031) is required. You will need to replace existing long flightings (A)<sup>46</sup> with short flightings (B) and install additional auger fingers. A total of 30 auger fingers is recommended for this configuration.

- For flighting replacement instructions, refer to [Removing Bolt-On Flighting, page 74](#) and [Installing Bolt-On Flighting, page 77](#).
- For finger installation instructions, refer to [Installing Feed Auger Fingers, page 446](#).

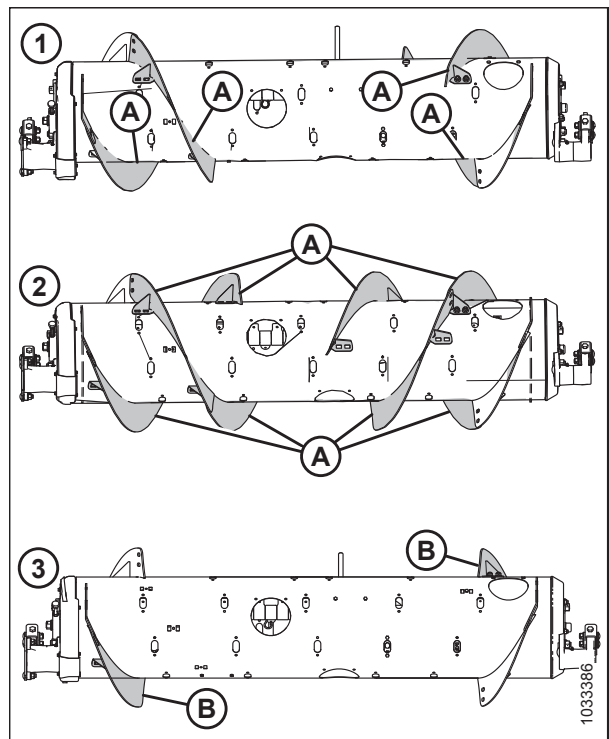


Figure 3.39: Auger Configurations – Rear View

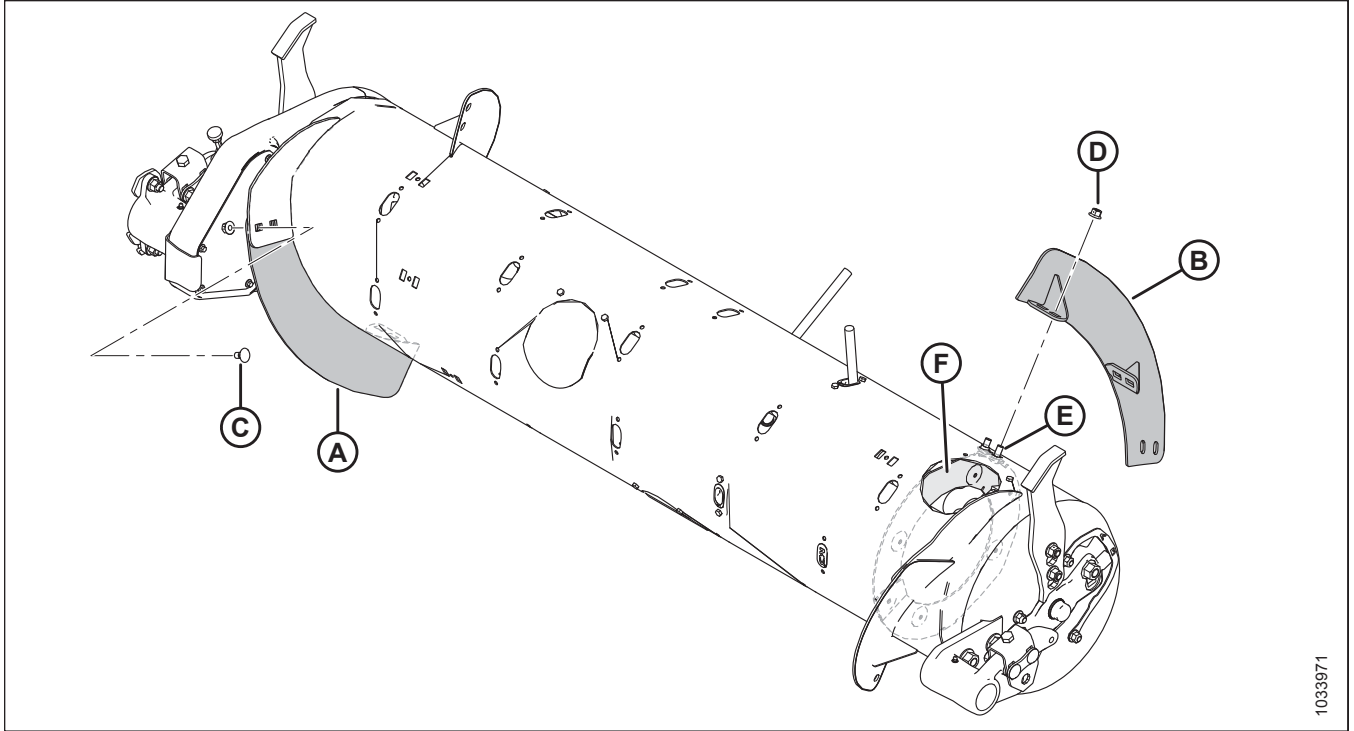
1 - Narrow Configuration

2 - Ultra Narrow Configuration

3 - Wide Configuration

46. The quantity of existing long flightings is either 4 or 8, depending on the current configuration.

## OPERATION



**Figure 3.40: Wide Configuration**

A - Left Short Flighting (MD #287888)

C - M10 x 20 mm Carriage Bolt (MD #136178)

E - Existing M10 x 25 mm Carriage Bolt

B - Right Short Flighting (MD #287887)

D - M10 Center Lock Flange Nut (MD #135799)

F - Magnetic Reverser Shield

**NOTE:**

Magnetic reverser shield (F) is shown in the above illustration. References to the reverser shield do not apply to model year 2019 and prior units that do not have the reverser shield kit installed.

**NOTE:**

In the Wide Configuration, one of the two existing 25 mm bolts (E) is used to secure both the flighting and reverser shield together. The second 25 mm bolt is used only on the reverser shield.

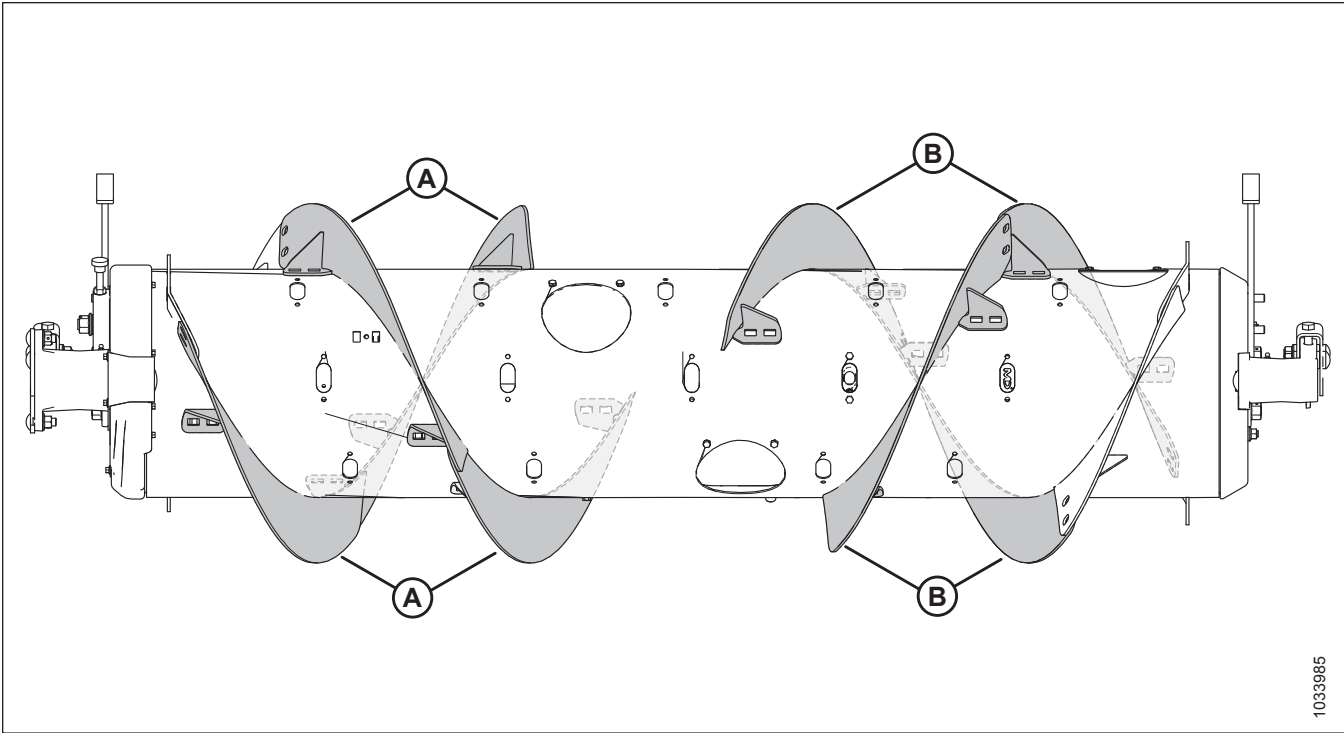
### *Ultra Narrow Configuration – Auger Flighting*

Ultra Narrow configuration uses eight long bolt-on flightings (four on the left and four on the right), and 18 auger fingers are recommended.

**NOTE:**

You will need to drill holes in the flighting and in the drum to install the four additional flightings.

## OPERATION



**Figure 3.41: Ultra Narrow Configuration**

A - Left Long Flighting (MD #287889)

B - Right Long Flighting (MD #287890)

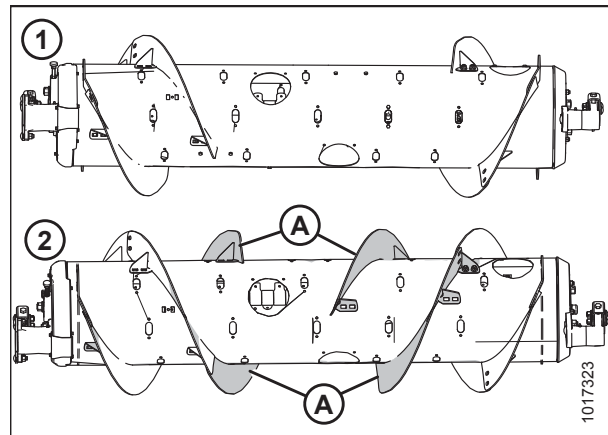
### To convert to Ultra Narrow configuration from Narrow Configuration:

Two flighting kits (MD #287032 or B6400<sup>47</sup>) and some hole-drilling are required to install flightings (A). Add or remove auger fingers as necessary to optimize feeding for your combine and crop conditions.

### IMPORTANT:

Extra hardware is included in these kits. Be sure to use the correct hardware at the correct location to prevent damage and to maximize performance.

- For flighting installation instructions, refer to [Installing Bolt-On Flighting, page 77](#).
- To install the additional flightings that require hole drilling, refer to [Installing Additional Bolt-On Flighting – Ultra Narrow Configuration Only, page 80](#)
- For finger installation/removal instructions, refer to [Installing Feed Auger Fingers, page 446](#) and [Removing Feed Auger Fingers, page 444](#).



**Figure 3.42: Auger Configurations – Rear View**

1 - Narrow Configuration

2 - Ultra Narrow Configuration

47. MD #287032 is available only through MacDon Parts. B6400 is available only through Whole Goods.



## OPERATION

### To convert to Ultra Narrow configuration from Medium, Wide, or Ultra Wide configuration:

Four flighting kits (MD #287032 or B6400<sup>48</sup>) and some hole-drilling are required to convert to this configuration.

You will need to replace existing short flightings (A)<sup>49</sup> with long flightings (B). Add or remove auger fingers as necessary to optimize feeding for your combine and crop conditions.

#### IMPORTANT:

Extra hardware is included in these kits. Be sure to use the correct hardware in the correct location to prevent damage and to maximize performance.

- For flighting replacement instructions, refer to [Removing Bolt-On Flighting, page 74](#) and [Installing Bolt-On Flighting, page 77](#).
- To install the additional flightings that require hole drilling, refer to [Installing Additional Bolt-On Flighting – Ultra Narrow Configuration Only, page 80](#)
- For finger installation/removal instructions, refer to [Installing Feed Auger Fingers, page 446](#) and [Removing Feed Auger Fingers, page 444](#).

#### NOTE:

If converting from Ultra Wide configuration, there is no existing bolt-on flighting to remove because that configuration uses only the factory-welded flighting (A).

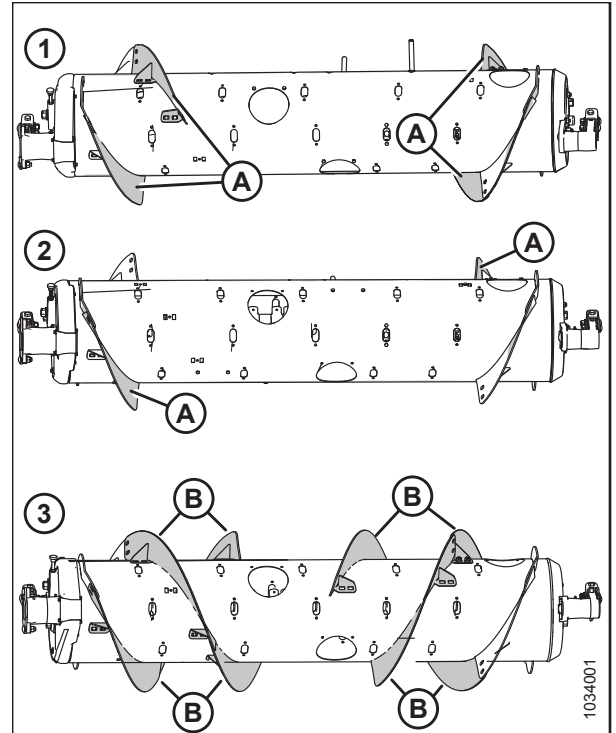


Figure 3.43: Auger Configurations – Rear View

1 - Medium Configuration

2 - Wide Configuration

3 - Ultra Narrow Configuration

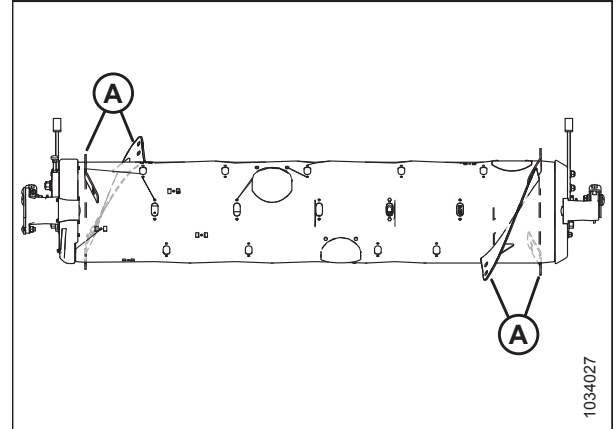
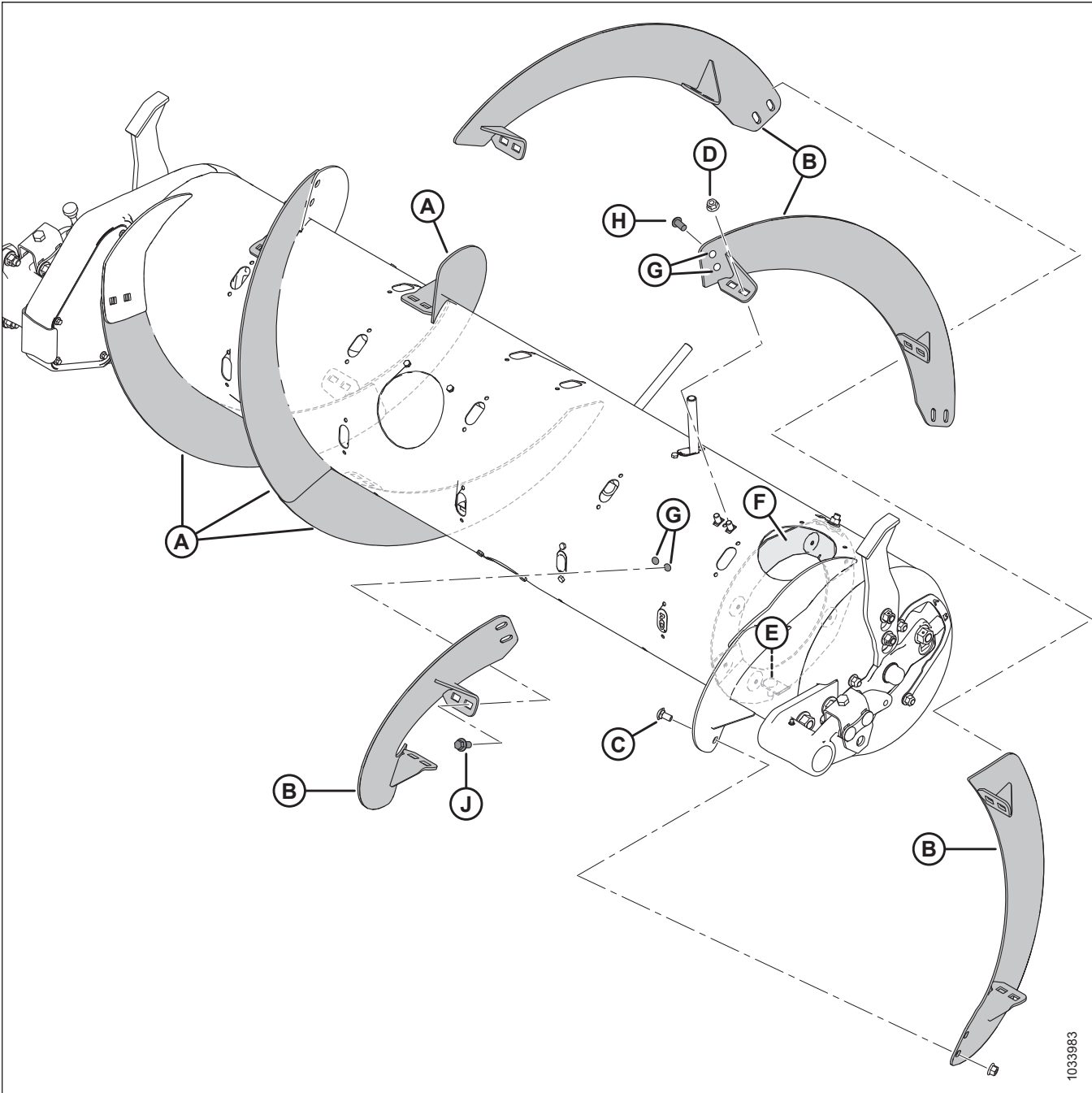


Figure 3.44: Ultra Wide Configuration

48. MD #287032 is available only through MacDon Parts. B6400 is available only through Whole Goods.

49. The quantity of existing short flightings is either 0, 2, or 4, depending on the current configuration.

## OPERATION



**Figure 3.45: Ultra Narrow Configuration**

A - Left Long Flighting (MD #287889)

B - Right Long Flighting (MD #287890)

C - M10 x 20 mm Carriage Bolt (MD #136178)

D - M10 Center Lock Flange Nut (MD #135799)

E - Existing M10 x 25 mm Carriage Bolt

F - Magnetic Reverser Shield

G - Drilled Holes – 11 mm (7/16 in.)<sup>50</sup>

H - M10 x 20 mm Button Head Bolt (MD #135723)<sup>51</sup>

J - M10 x 20 mm Flange Head Bolt (MD #152655)<sup>52</sup>

50. Each of the four additional flightings require six drilled holes to install (four in the auger and two in the adjacent flighting).

51. Used on the holes drilled in the existing flighting.

52. Used on the holes drilled in the auger.

## OPERATION

### NOTE:

Magnetic reverser shield (F) is shown in the above illustration. References to the reverser shield do not apply to model year 2019 and prior units that do not have the reverser shield kit installed.

### NOTE:

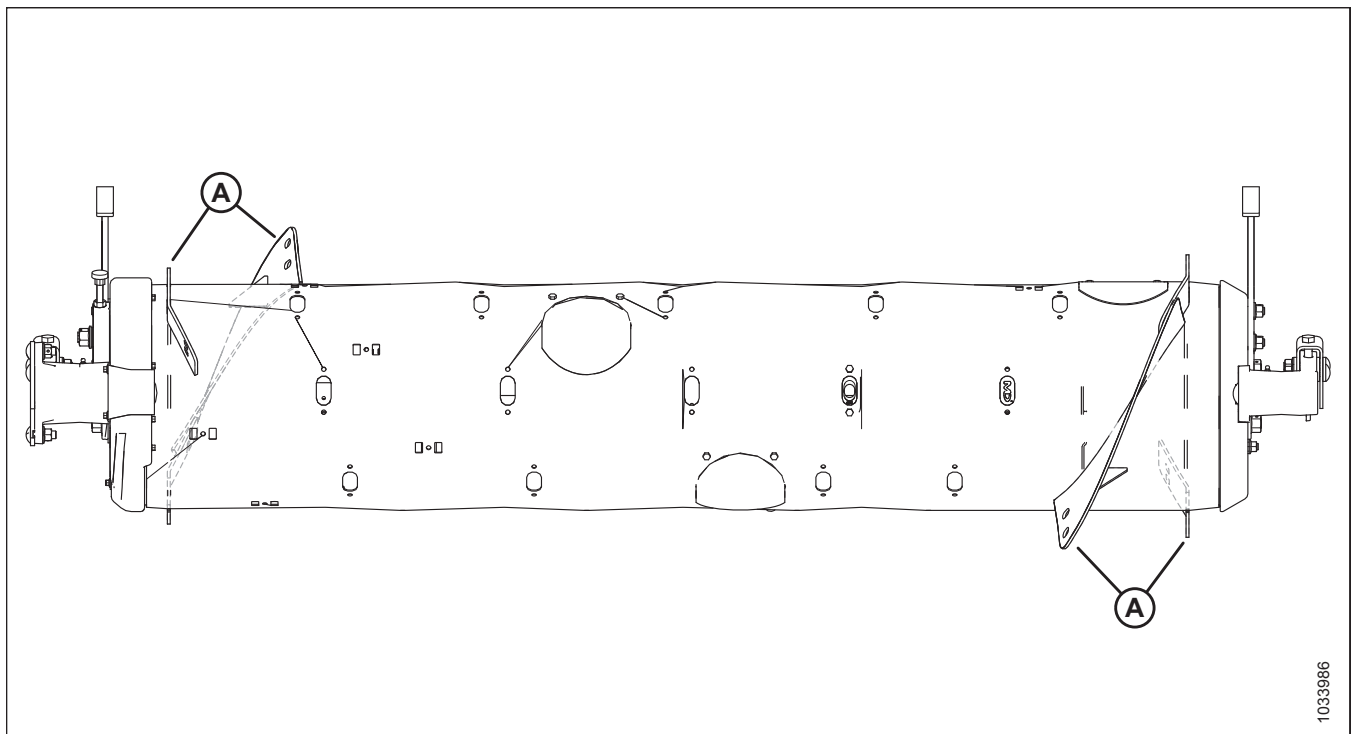
In the Ultra Narrow Configuration, one of the two existing 25 mm bolts (E) is used to secure both the flighting and reverser shield together. The second 25 mm bolt is used only on the reverser shield.

### *Ultra Wide Configuration – Auger Flighting*

Ultra Wide configuration uses no bolt-on flighting; only factory-welded flighting is responsible for conveying the crop. A total of 30 auger fingers is recommended for this configuration.

### NOTE:

This configuration may increase combine capacity on wide feeder house combines in certain crop conditions.



**Figure 3.46: Ultra Wide Configuration**

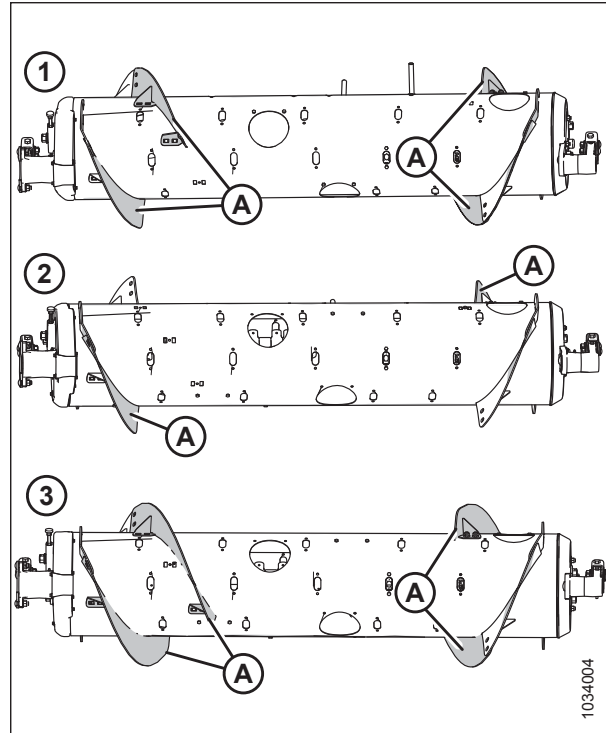
A - Factory-Welded Flighting

## OPERATION

### To convert to Ultra Wide configuration:

Remove all existing bolt-on flightings (A) from the auger and install additional auger fingers if required. A total of 30 auger fingers is recommended for this configuration.

- For flighting removal instructions, refer to *Removing Bolt-On Flighting, page 74*.
- For finger installation instructions, refer to *Installing Feed Auger Fingers, page 446*.



**Figure 3.47: Auger Configurations – Rear View**

1 - Medium Configuration

2 - Wide Configuration

3 - Narrow Configuration

### Removing Bolt-On Flighting

For information on the different flighting configurations, refer to *3.8.1 FM100 Feed Auger Configurations, page 58*.

To remove bolt-on flighting, follow these steps:

### DANGER

**To avoid bodily injury or death from unexpected start-up or fall of a raised machine, always stop engine and remove key before leaving the operator's seat, and always engage safety props before going under the machine for any reason.**

1. To improve access, remove the float module from the combine. For instructions, refer to the header operator's manual or technical manual.

#### NOTE:

All illustrations show the feed auger separated from the float module for clarity. The procedure can be performed with the feed auger installed in the float module.

## OPERATION

### NOTE:

Model year 2020 and later units have a magnetic reverser shield (A) factory-installed inside the auger at the right side. Any reference to the reverser shield does not apply to 2019 and prior units that don't have the reverser shield kit installed.

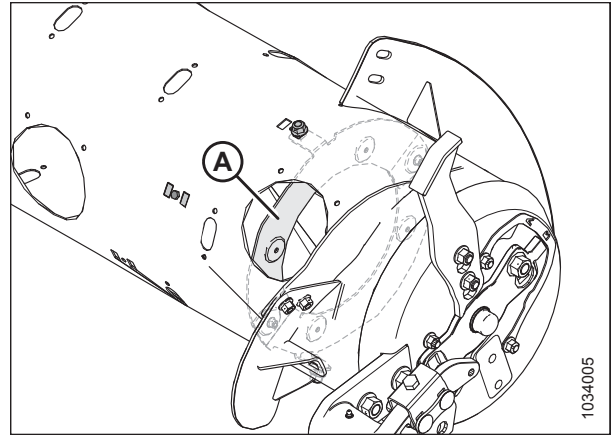


Figure 3.48: Reverser Shield

2. Rotate the auger as required.
3. Remove bolts (A) and access cover (B). Retain for reassembly. If necessary, remove multiple access covers.

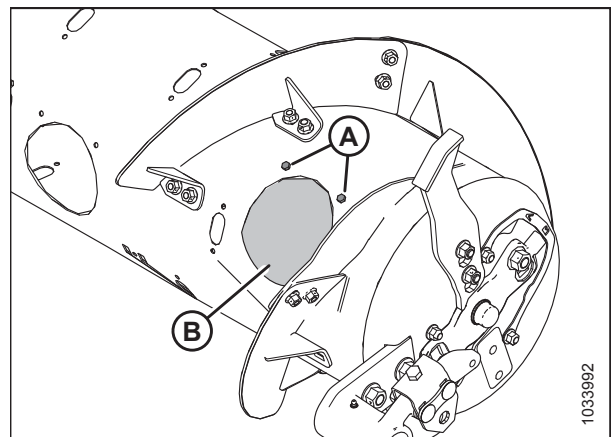


Figure 3.49: Auger Access Cover – Right Side

4. Remove bolts and nuts (B) and remove flighting (A). If the flighting attaches to the magnetic reverser shield (D), retain the bolt and nut at location (C) to reattach the reverser shield (D) to the auger after the flighting is removed. Bolt (C) is longer than bolts (B).

### NOTE:

Whenever modifying or servicing the auger, keep at least one side of the reverser shield attached to the drum if possible. A completely detached reverser shield is more difficult to install because the shield is magnetically attracted to the auger.

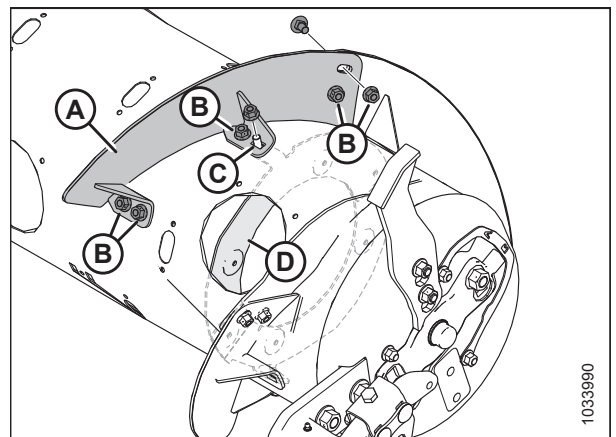


Figure 3.50: Short Flighting – Right Side

## OPERATION

### NOTE:

The long flighting (A) shown in this illustration does not attach to the reverser shield. The opposite long flighting does attach to the reverser shield at location (B).

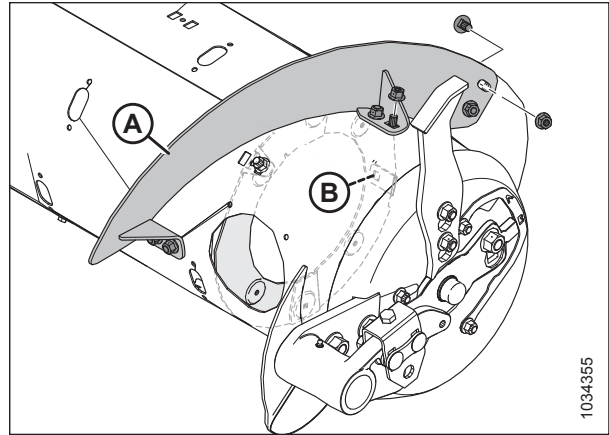


Figure 3.51: Long Flighting – Right Side

5. Install slot plug (A) with M6 bolt (B) and tee nut (C) at each location the flighting was removed from the auger. Torque to 9 Nm (80 lbf-in).

### NOTE:

If plug bolts are **NOT** new, coat bolts with medium-strength threadlocker (Loctite® 243 or equivalent) prior to installation.

### NOTE:

Slot plugs are not required at locations where the reverser shield attaches to the auger.

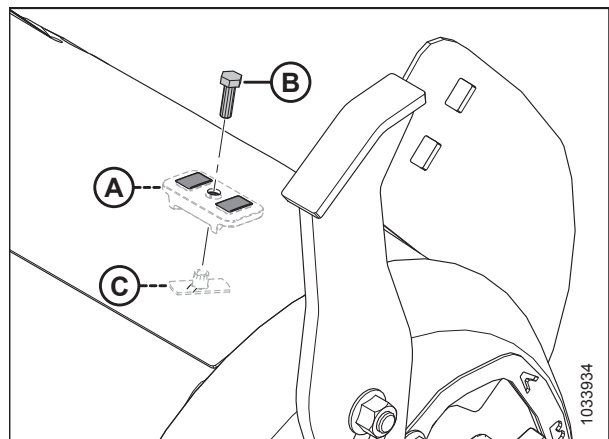


Figure 3.52: Installing Slot Plugs

6. Repeat the procedure to remove flighting (A) from the left side of the auger.

### NOTE:

References to the magnetic reverser shield do not apply to the left side.

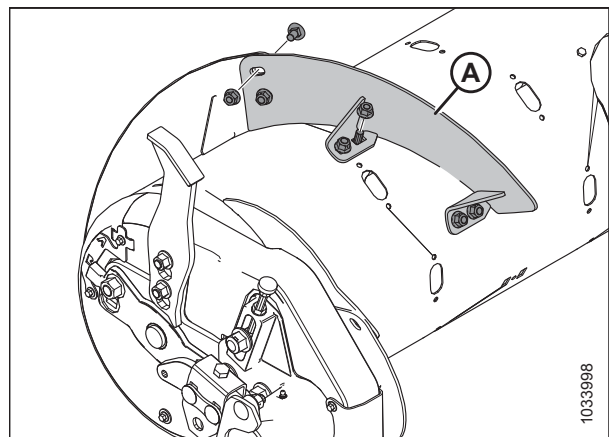


Figure 3.53: Short Flighting – Left Side

## OPERATION

7. Reinstall access cover(s) (A) using retained bolts (B) and the welded nuts inside the auger. Coat bolts with medium-strength threadlocker (Loctite® 243 or equivalent) and torque to 9 Nm (80 lbf-in).

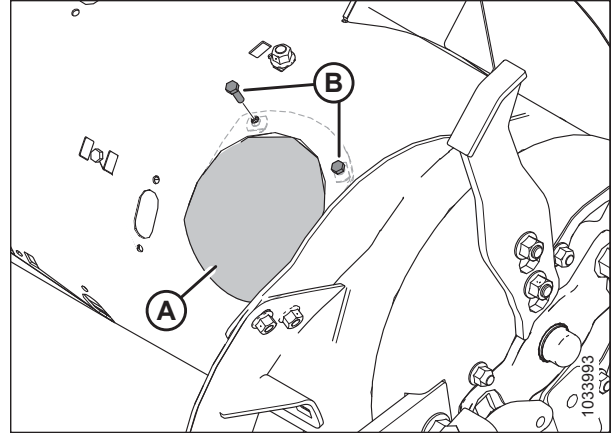


Figure 3.54: Access Cover – Right Side

### Installing Bolt-On Flighting

Before installing the bolt-on flighting, determine the quantity and type of flighting required. For information on the different flighting configurations, refer to [3.8.1 FM100 Feed Auger Configurations, page 58](#).

To install bolt-on flighting, follow these steps:

#### DANGER

To avoid bodily injury or death from unexpected start-up or fall of a raised machine, always stop engine and remove key before leaving the operator's seat, and always engage safety props before going under the machine for any reason.

1. To improve access and ease installation, remove the float module from the combine. For instructions, refer to the header operator's manual or technical manual.

#### NOTE:

All illustrations show the feed auger separated from the float module for clarity. The procedure can be performed with the feed auger installed in the float module.

#### NOTE:

Model year 2020 and later units have a magnetic reverser shield (A) factory-installed inside the auger at the right side. Any reference to the reverser shield does not apply to 2019 and prior units that don't have the reverser shield kit installed.

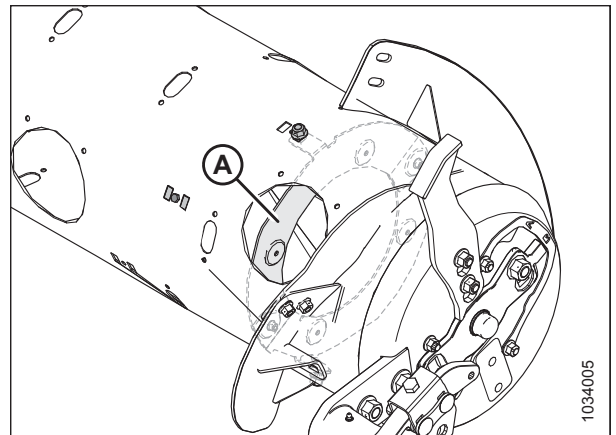


Figure 3.55: Reverser Shield

## OPERATION

2. Rotate the auger as required.
3. Remove bolts (A) and access cover (B). Retain for reassembly. If necessary, remove multiple access covers.

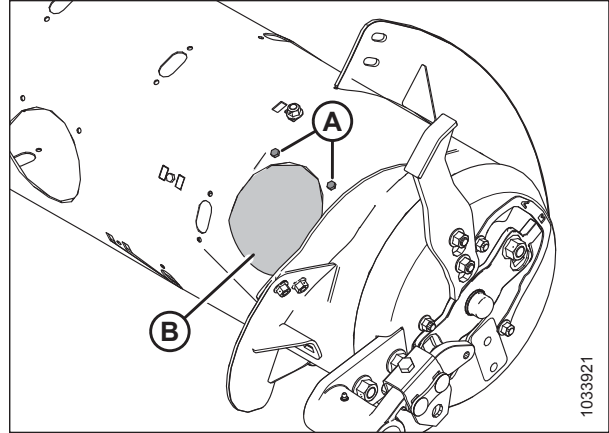


Figure 3.56: Auger Access Cover – Right

4. Line up the new bolt-on fighting (A) in position to determine which slot plugs need to be removed from the auger. The new fighting overlaps on the outboard side of the adjacent fighting.

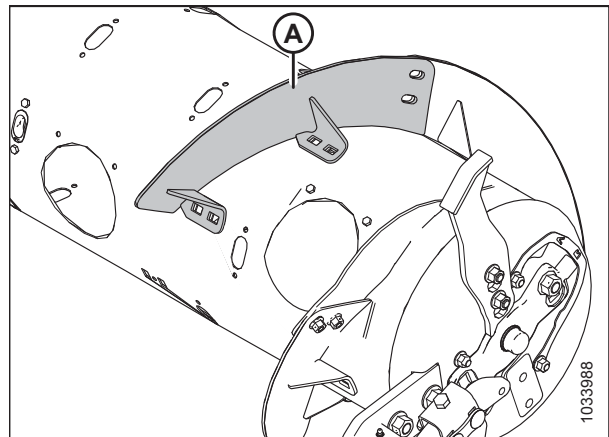


Figure 3.57: Right Side of the Auger

5. Remove applicable slot plugs(s) (A). If the new fighting will be installed at the same location the reverser shield (B) attaches to the auger, remove and retain hardware (C). The bolts that attach the reverser shield to the auger are slightly longer than the other fighting bolts.

### NOTE:

Whenever modifying or servicing the auger, keep at least one side of the reverser shield attached to the drum if possible. A completely detached reverser shield is more difficult to install because the shield is magnetically attracted to the auger.

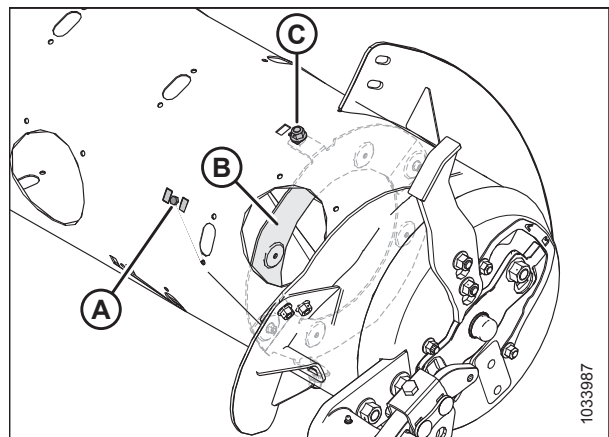


Figure 3.58: Right Side of the Auger



## OPERATION

- Install flighting (A) using M10 x 20 mm square neck carriage bolts and center lock nuts at locations (B). If the flighting attaches to the reverser shield (D), install the longer M10 x 25 mm bolt and center lock nut at location (C) to secure magnetic reverser shield to the auger and flighting.

**IMPORTANT:**

Bolt heads must be installed on the inside of the auger to avoid damaging internal components.

**IMPORTANT:**

The bolts that attach the flightings to each other must have the bolt heads on the inboard (crop side) of the flighting.

- Torque the six nuts and bolts to 47 Nm (35 lbf-ft) to eliminate deflection on the flighting, then retorquing them to 61 Nm (45 lbf-ft).

**NOTE:**

The long flighting (A) shown in this illustration does not attach to the reverser shield. The opposite long flighting does attach to the reverser shield at location (B).

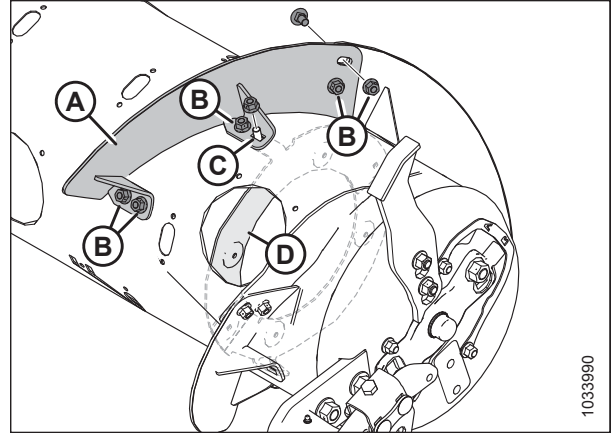


Figure 3.59: Short Flighting – Right

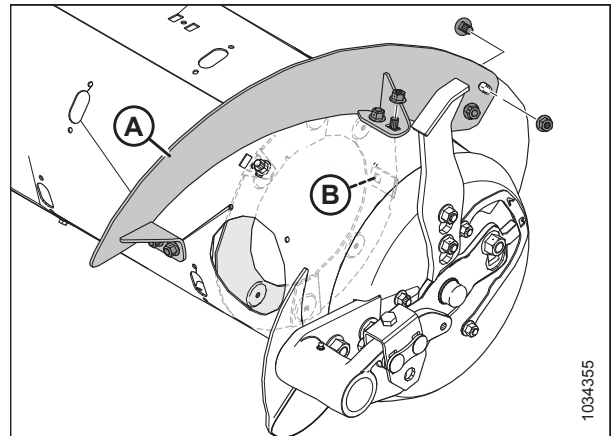


Figure 3.60: Long Flighting – Right

- Repeat the procedure to install flighting (A) on the left side of the auger. References to the magnetic reverser shield do not apply to the left side.

**NOTE:**

Flighting performs best when no gaps are present. If desired, use silicone sealant to fill the gaps.

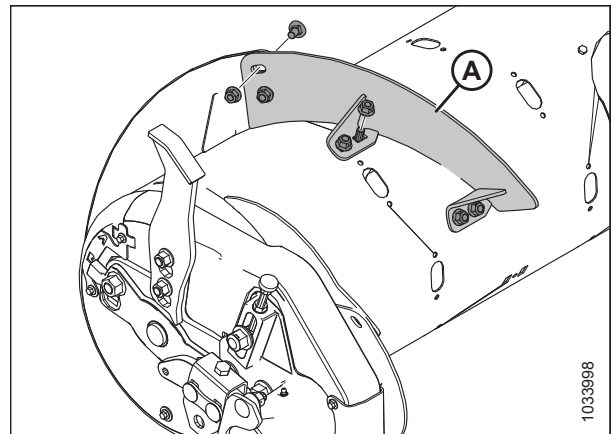


Figure 3.61: Short Flighting – Left

## OPERATION

- Reinstall access cover(s) (A) using retained bolts (B) and the welded nuts inside the auger. Coat bolts with medium-strength threadlocker (Loctite® 243 or equivalent) and torque to 9 Nm (80 lbf-in).

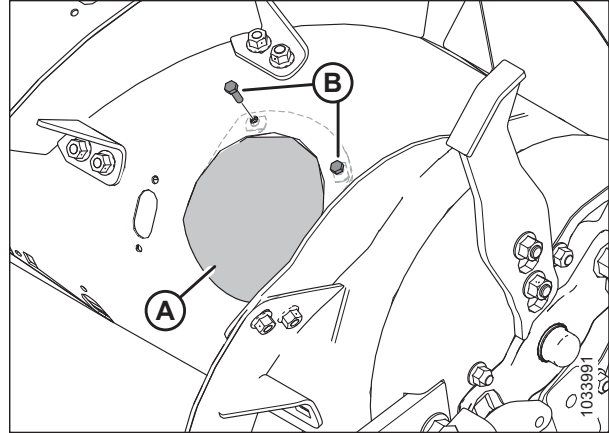


Figure 3.62: Access Cover – Right

- If converting to Ultra Narrow configuration and drilling is required to install the remaining flighting, proceed to [Installing Additional Bolt-On Flighting – Ultra Narrow Configuration Only, page 80](#).

### Installing Additional Bolt-On Flighting – Ultra Narrow Configuration Only

When converting to Ultra Narrow configuration, some hole drilling is required to install the additional flighting.

#### NOTE:

This procedure assumes the feed auger is currently in Narrow configuration (4 long flightings [A] installed).

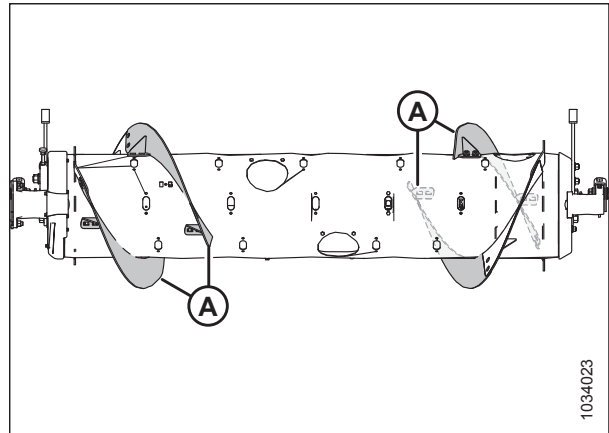


Figure 3.63: Narrow Configuration

To install the four additional long flightings for Ultra Narrow configuration, follow these steps:

### DANGER

To avoid bodily injury or death from unexpected start-up or fall of a raised machine, always stop engine and remove key before leaving the operator's seat, and always engage safety props before going under the machine for any reason.

- To improve access and ease installation, remove the float module from the combine. For instructions, refer to the header operator's manual or technical manual.

#### NOTE:

All illustrations show the feed auger separated from the float module for clarity. The procedure can be performed with the feed auger installed in the float module.

## OPERATION

2. Rotate the auger as required.
3. Place new flighting (A) outboard of existing flighting (B) on the left side of the auger, as shown.
4. Mark hole locations (C) onto existing flighting (B).
5. Remove nearest access cover to existing flighting (B). Retain hardware for reassembly.
6. Remove existing bolt-on flighting (B) from the auger. Retain hardware for reassembly.

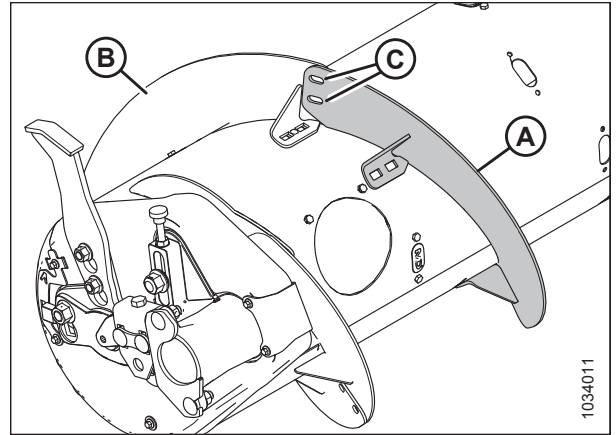


Figure 3.64: Left Side of Auger

7. Drill two 11 mm (7/16 in.) holes at the marked locations (A) on the existing flighting.
8. Reinstall the existing bolt-on flighting.

**IMPORTANT:**

Ensure carriage bolt heads are on the inside of the auger to prevent damage to internal components.

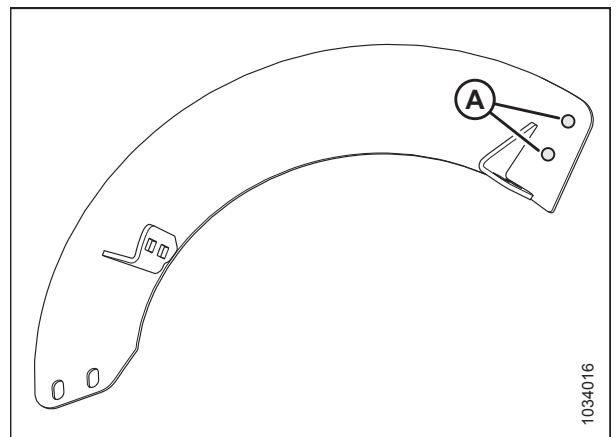


Figure 3.65: Drilling Locations

9. Place new flighting (A) into position on the auger, outboard of existing flighting (B).
10. Secure with two M10 x 20 mm button head bolts and center lock nuts (C).

**IMPORTANT:**

Ensure bolt heads are on the inboard (crop side) and nuts are on the outboard side of the flighting.

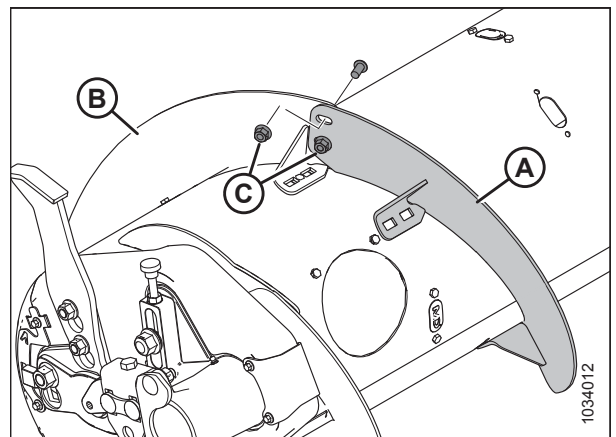


Figure 3.66: Left Side of Auger

## OPERATION

11. Stretch flighting (A) to fit auger tube as shown. Use slotted holes on flighting to get the best fit around the auger tube.

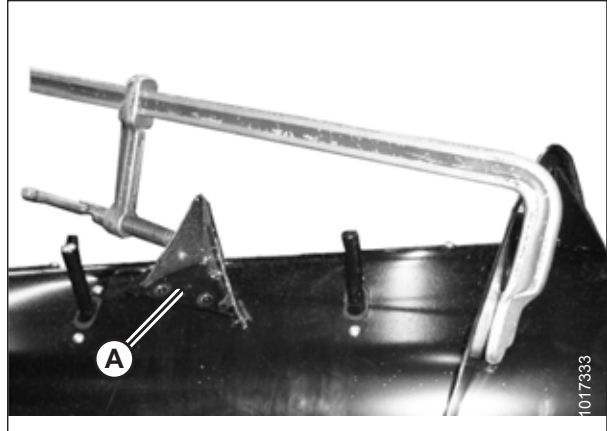


Figure 3.67: Flighting Stretched Axially

12. With flighting in desired position, mark four hole locations (A) and drill 11 mm (7/16 in.) holes in the auger tube.

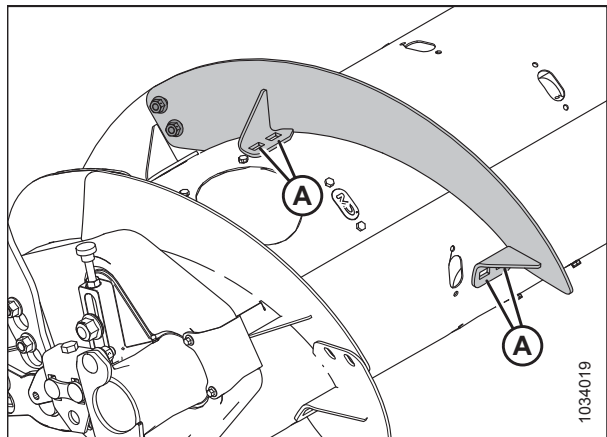


Figure 3.68: Flighting on Left Side of Auger

13. Remove nearest access cover(s) (B). Retain for reinstallation.
14. Secure flighting to the auger at drilled holes (A) using four M10 x 20 mm flange head bolts and center lock nuts.
15. Repeat Step 2, [page 81](#) to Step 14, [page 82](#) for the other flighting on the left side of the auger.

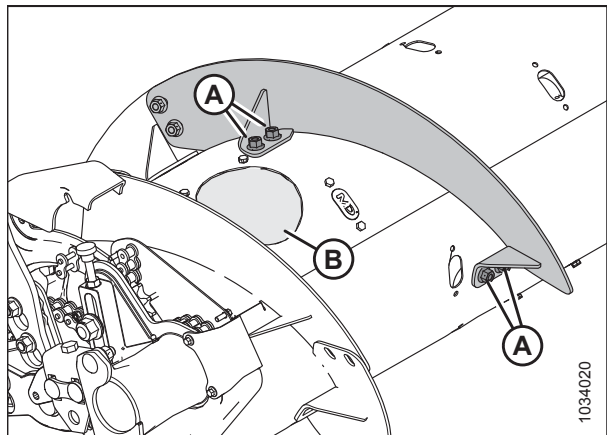


Figure 3.69: Left Side of Auger

## OPERATION

- Repeat Step 2, page 81 to Step 14, page 82 for both flightings on the right side of the auger.

**NOTE:**

One of the existing flightings (A) on the right side attaches to the magnetic reverser shield (C) with bolt (B). Bolt (B) is longer than the other flighting bolts and must be reused at the same location when reattaching the flighting and reverser shield to the auger.

**NOTE:**

Whenever modifying or servicing the auger, keep at least one side of the reverser shield attached to the drum if possible. A completely detached reverser shield is more difficult to install because the shield is magnetically attracted to the auger.

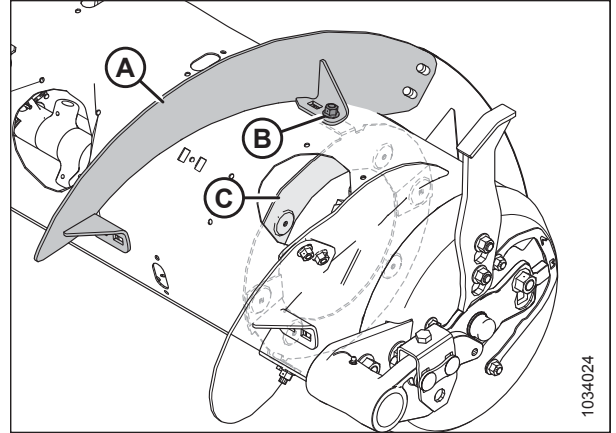


Figure 3.70: Flighting on Right Side of Auger

- Torque all flighting nuts and bolts to 47 Nm (35 lbf-ft) to eliminate deflection on flighting, then torque nuts and bolts again to 61 Nm (45 lbf-ft).

**NOTE:**

Flighting performs best when no gaps are present. If desired, use silicone sealant to fill the gaps.

- Add or remove auger fingers as necessary to optimize feeding for your combine and crop conditions. For instructions, refer to [Installing Feed Auger Fingers, page 446](#) or [Removing Feed Auger Fingers, page 444](#).
- If not adding or removing auger fingers, reinstall all access covers and secure with bolts. Coat bolts with medium-strength threadlocker (Loctite® 243 or equivalent) and torque to 9 Nm (80 lbf-in).

### 3.8.2 Cutting Height

The header design allows you to cut the crop above the ground at a desired stubble height or to cut the crop at ground level with the header on the ground. Cutting height will vary depending on a range of factors including crop type, crop conditions, etc.

#### *Cutting off the Ground*

The header's design allows you to cut crop above the ground at a desired stubble height. The cutting height will vary depending on factors including crop type, crop conditions, etc.

There are two options available for cutting off the ground:

- The stabilizer wheel system is designed to minimize bouncing at the header ends and may be used to float the header to achieve an even cutting height when cutting above ground level in cereal grains. The system produces even stubble height and greatly reduces Operator fatigue.

**NOTE:**

FlexDraper® headers must have the wings locked rigid when using the stabilizer wheel system.

- The ContourMax™ gauge wheels provide consistent cutting height information back to the header so it can flex, maintain accurate and consistent cutting height, and still use the combine's auto height control seamlessly. The gauge wheels contact the ground, which allows the cutterbar to remain at a fixed height above the ground even through rolling contours. There is no adjustment necessary to the factory auto height control settings.

**NOTE:**

FlexDraper® headers must have the wings unlocked when using the ContourMax™ system.

## OPERATION

The stabilizer wheel system (or stabilizer/transport wheel system) cutting height is controlled by the combine header height control.

The stabilizer wheel system (or stabilizer/transport speed transport wheel system) is available only for D130, D135, D140, and D145 headers.

If the stabilizer wheel only option is installed, refer to [Adjusting Stabilizer Wheels, page 84](#) to change the wheel position.

If the stabilizer/transport wheel option is installed, refer to [Adjusting Stabilizer/Transport Wheels, page 85](#) to change the wheel position.

### Adjusting Stabilizer Wheels

A properly adjusted header will achieve a balance between the amount of header weight carried by the float and the amount carried by the stabilizer wheels.

For header setting recommendations based on crop type and condition, refer to [3.7.2 Header Settings, page 43](#).

### DANGER

To avoid injury or death from unexpected start-up of machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Raise the header until the stabilizer wheels are off the ground.
2. Shut down the engine, and remove the key from the ignition.
3. Check that the float is working properly. For instructions, refer to [Checking and Adjusting Header Float, page 91](#).
4. Support the wheel weight by lifting slightly with one hand on support (B), and pull up on handle (A) to release the lock.
5. Lift the wheel using support (B), and engage the support channel into center slot (C) in the upper support.
6. Push down on handle (A) to lock.

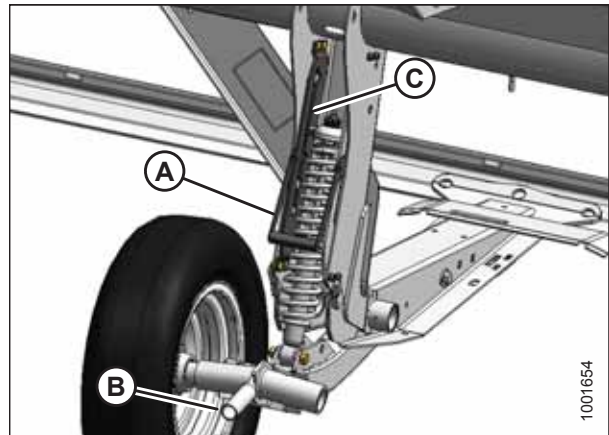


Figure 3.71: Stabilizer Wheel

7. Lower the header to the desired cutting height using the combine controls and check load indicator (A).

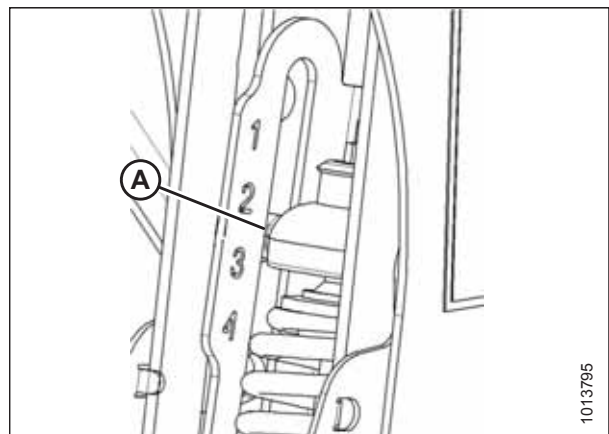


Figure 3.72: Load Indicator

## OPERATION

- Adjust the header angle to the desired working angle with the machine's header angle controls. If header angle is not critical, set it to mid-position.

### IMPORTANT:

Continuous operation with excessive spring compression (for example, load indicator reading greater than 4 or a compressed length [A] less than 295 mm [11 5/8 in.]) can result in damage to the suspension system.

- Use the combine's Auto Header Height Control (AHHC) to automatically maintain cutting height. For instructions, refer to [3.9 Auto Header Height Control, page 138](#) and your combine operator's manual for details.

### NOTE:

The height sensor on the FM100 Float Module connects in the cab to the combine's header control module.

### NOTE:

Header angle adjustments or AHHC ground pressure control may be used to adjust the cutting height while moving.

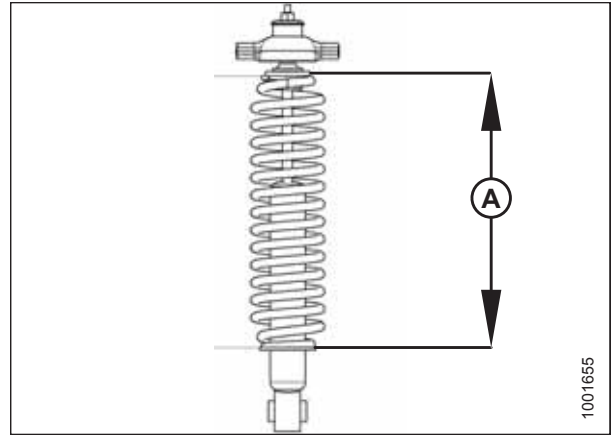


Figure 3.73: Spring Compression

### Adjusting Stabilizer/Transport Wheels

A properly adjusted header will achieve a balance between the amount of header weight carried by the float and the amount carried by the stabilizer/transport wheels.



## DANGER

To avoid injury or death from unexpected start-up of machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

- Raise the header so the stabilizer wheels are off the ground.
- Shut down the engine, and remove the key from the ignition.
- Check that the float is working properly. For instructions, refer to [Checking and Adjusting Header Float, page 91](#).

- Remove hairpin (A) from the latch on the right wheel assembly.
- Disengage latch (B), lift the wheel out of the hook, and place the wheels on the ground as shown.

### NOTE:

This reduces the weight of the assembly and makes adjusting the wheel position easier.

- Lift the left wheel slightly to support the weight, then pull handle (C) upwards to release the lock.
- Lift the left wheel to the desired height and engage the support channel into the slot (D) in the upper support.
- Push down on handle (C) to lock.
- Lift the right wheel back into the field position and ensure latch (B) is engaged.
- Secure the latch with hairpin (A).

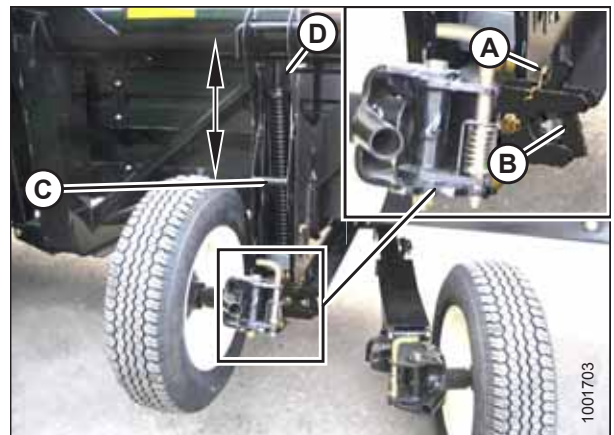


Figure 3.74: Right Wheel



## OPERATION

11. Support the wheel weight by lifting slightly with one hand, and pull up on handle (A) to release the lock.
12. Lift the wheels to the desired height, and engage the support channel into slot (B) in the upper support.
13. Push down on handle (A) to lock.

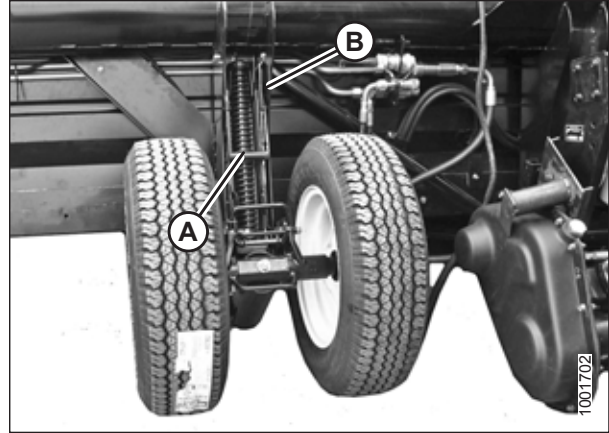


Figure 3.75: Left Wheel

14. Lower the header to the desired cutting height using the combine controls and check the load indicator (A).

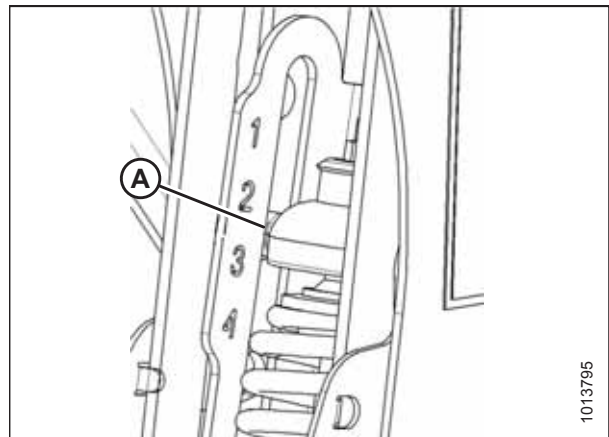


Figure 3.76: Load Indicator

15. Adjust the header angle to the desired working angle with the machine's header angle controls. If header angle is not critical, set it to mid-position.

### IMPORTANT:

Continuous operation with excessive spring compression (for example, load indicator reading greater than 4 or a compressed length [A] less than 295 mm [11 5/8 in.]) can result in damage to the suspension system.

16. Use the combine's auto header height control (AHHC) to automatically maintain cutting height. For instructions, refer to [3.9 Auto Header Height Control, page 138](#) and your combine operator's manual for details.

### NOTE:

The height sensor on the FM100 Float Module connects in the cab to the combine's header control module.

### NOTE:

Header angle adjustments or AHHC ground pressure control may be used to adjust the cutting height while moving.

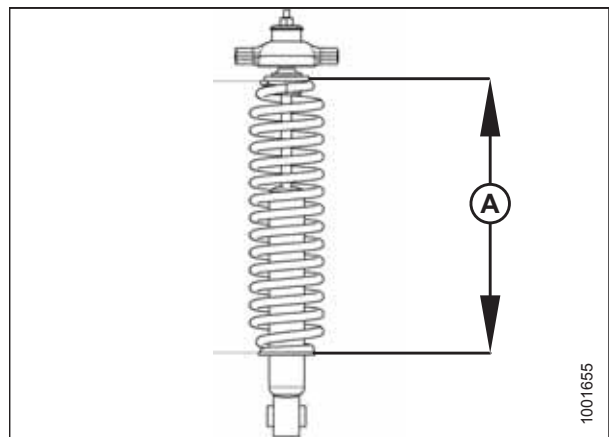


Figure 3.77: Spring Compression



## OPERATION

### Adjusting Contour Buddy Inboard Wheel Height

1. Support inboard axle support (A), and remove ring (B) and pin (C) to release rear of axle support. Retain ring and pin for reinstallation.

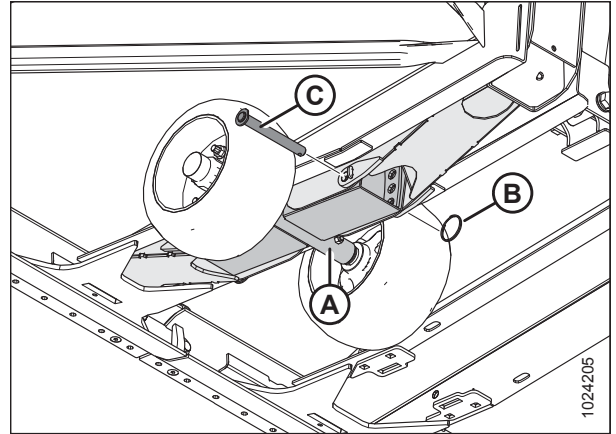


Figure 3.78: Inboard Wheel Assembly and Left Header Leg – View from Below, Right Opposite

#### NOTE:

Parts have been removed from the illustration at right for clarity.

2. Align the appropriate hole in inboard axle support (A) with axle frame support (B) to achieve desired inboard wheel height. Refer to Table 3.12, page 87.
3. Reinstall pin and ring removed in Step 1, page 87.
4. Repeat above procedure for opposite inboard wheel assembly.

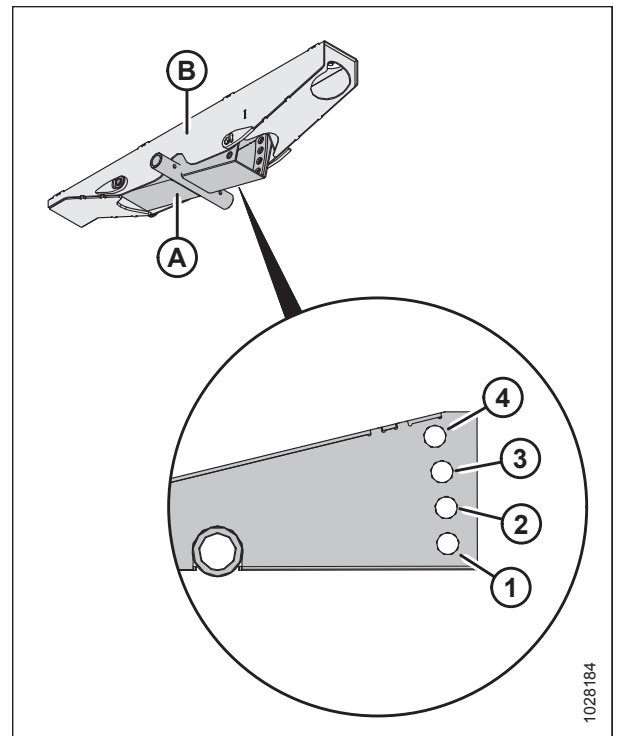


Figure 3.79: Inboard Axle Support – View from Below

Table 3.12 Inboard Wheel Height

Hole	Header Tilt Setting			
	A	B	C	D
1	229 mm (9.0 in.)	196 mm (7.7 in.)	160.0 mm (6.3 in.)	127.0 mm (5.0 in.)
2	236 mm (9.3 in.)	211 mm (8.3 in.)	178 mm (7.0 in.)	145 mm (5.7 in.)

## OPERATION

**Table 3.12 Inboard Wheel Height (continued)**

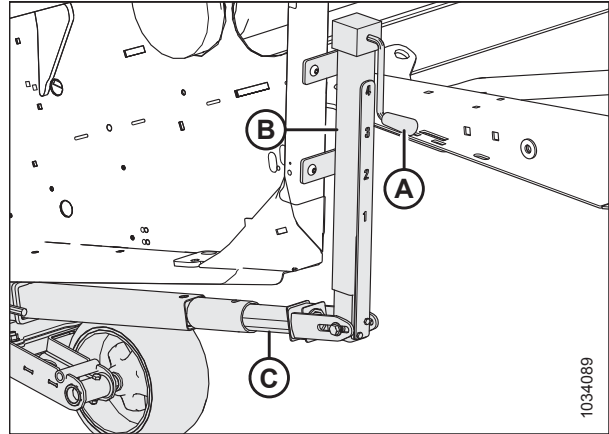
3	262 mm (10.3 in.)	229 mm (9.0 in.)	196 mm (7.7 in.)	163 mm (6.4 in.)
4	279 mm (11.0 in.)	249 mm (9.8 in.)	211 mm (8.3 in.)	180 mm (7.1 in.)

**NOTE:**

Refer to Figure 3.79, page 87 for hole positions. Heights listed above may vary depending on soil conditions, weight of crop on header, and angle of feeder house faceplate relative to the ground.

**Adjusting Contour Buddy Outboard Wheel Height**

1. Turn handle (A) on jack (B) clockwise to lower outboard wheel assembly (C), and counterclockwise to raise outboard wheel assembly.
2. Level the cutterbar by adjusting the outboard wheel assemblies up or down until the distance from the outboard ends of the cutterbar to the ground matches the distance from the center of the cutterbar to the ground.



**Figure 3.80: Jack and Outboard Wheel Assembly – View from Rear, Left Shown, Right Opposite**

## OPERATION

### Cutting on the Ground

Cutting on the ground is performed with the header fully lowered and the cutterbar on the ground. The orientation of the knife and knife guards relative to the ground (header angle) is controlled by the skid shoes and the center-link—it is **NOT** controlled by the header lift cylinders. The skid shoes and center-link allow you to adjust to field conditions and maximize the amount of material cut while reducing damage to the knife caused by stones and debris.

The header float system floats the header over the surface to compensate for ridges, trenches, and other variations in ground contour to prevent the cutterbar from pushing into the ground or leaving uncut crop.

Cutting height will vary depending on crop type, crop conditions, cutting conditions, etc.

Refer to the following for more information:

- [Adjusting Inner Skid Shoes, page 89](#)
- [Adjusting Outer Skid Shoes, page 90](#)
- [3.8.4 Header Angle, page 96](#)
- [3.8.3 Header Float, page 90](#)
- Also refer to [3.7.2 Header Settings, page 43](#)

### Adjusting Inner Skid Shoes

The skid shoes and center-link allow you to adjust to field conditions and maximize the amount of material cut while reducing damage to the knife caused by stones and debris.

#### DANGER

**To avoid bodily injury or death from the unexpected start-up or fall of raised machine, always stop the engine, remove the key, and engage the safety props before going under the header for any reason.**

1. Raise the header to full height and engage the safety props.
2. Shut down the engine, and remove the key from the ignition.
3. Raise the stabilizer wheels or transport wheels fully (if installed). For instructions, refer to the following:
  - [Adjusting Stabilizer Wheels, page 84](#)
  - [Adjusting Stabilizer/Transport Wheels, page 85](#)
4. Remove lynch pin (A) from each skid shoe.
5. Hold shoe (B) and remove pin (C) by disengaging from the frame and pulling away from the shoe.
6. Raise or lower skid shoe (B) to achieve the desired position using the holes in support (D) as a guide.
7. Install pin (C), engage in frame, and secure with lynch pin (A).
8. Check that all skid shoes are adjusted to the same position.

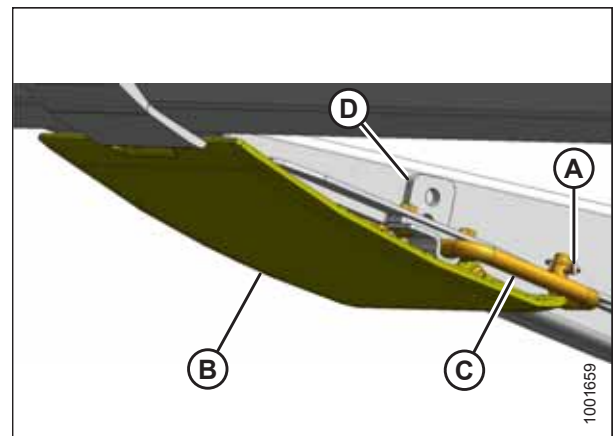


Figure 3.81: Inner Skid Shoe

9. Adjust the header angle to the desired working position using the machine's header angle controls. If the header angle is not critical, set it to the mid-position.
10. Check the header float. For instructions, refer to [3.8.3 Header Float, page 90](#).

## OPERATION

### Adjusting Outer Skid Shoes

The skid shoes and center-link allow you to adjust to field conditions and maximize the amount of material cut while reducing damage to the knife caused by stones and debris.

#### DANGER

To avoid bodily injury or death from the unexpected start-up or fall of raised machine, always stop the engine, remove the key, and engage the safety props before going under the header for any reason.

1. Raise the header to its full height and engage the safety props.
2. Shut down the engine, and remove the key from the ignition.
3. Raise the stabilizer wheels or transport wheels fully (if installed). For instructions, refer to the following:
  - [Adjusting Stabilizer Wheels, page 84](#)
  - [Adjusting Stabilizer/Transport Wheels, page 85](#)
4. Remove lynch pin (A) from each skid shoe (B).
5. Hold skid shoe (B) and remove pin (C) by disengaging from the frame and pulling away from the shoe.
6. Raise or lower skid shoe (B) to achieve the desired position using the holes in support (D) as a guide.
7. Reinstall pin (C), engage in the frame, and secure with lynch pin (A).
8. Check that all skid shoes are adjusted to the same position.
9. Check the header float. For instructions, refer to [3.8.3 Header Float, page 90](#).

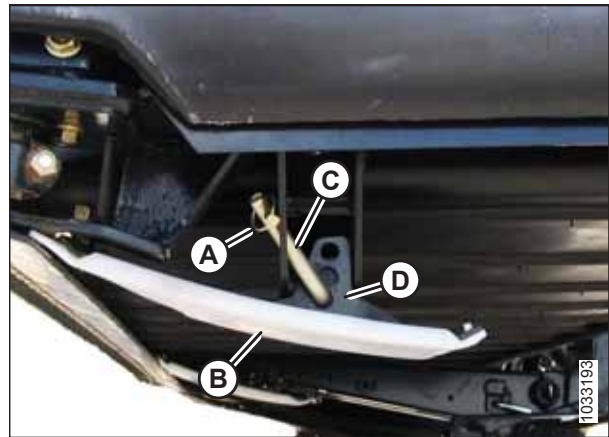


Figure 3.82: Outer Skid Shoe

### 3.8.3 Header Float

The header float system reduces the ground pressure at the cutterbar allowing the header to more easily follow the ground and quickly respond to sudden ground contour changes or obstacles.

Header float is indicated on float indicator (A). Values 0 to 4 represent the force of the cutterbar on the ground with 0 being the minimum and 4 being the maximum.

The maximum force is determined by the tension on the float module's adjustable float springs. Float can be changed to suit field and crop conditions and is dependent on what options have been installed on the header. For instructions, refer to [Checking and Adjusting Header Float, page 91](#).

The D1 Series Draper Header performs best with minimum ground pressure under normal conditions. Readjust the float if adding optional attachments to the header that affect header weight.

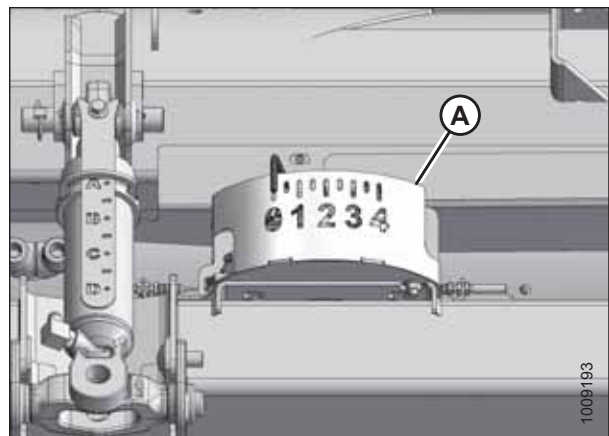


Figure 3.83: Float Indicator

## OPERATION

1. Set the float for cutting on the ground as follows:
  - a. Ensure the header float locks are disengaged. For instructions, refer to [Locking/Unlocking Header Float, page 96](#).
  - b. Lower the feeder house using the combine header controls until float indicator (A) reaches the desired float value (cutterbar ground force). Set the float indicator initially to float value 2 and adjust as necessary.
2. Set the float for cutting off the ground as follows:
  - a. Set up the stabilizer wheels. For instructions, refer to [Cutting off the Ground, page 83](#).
  - b. Note the float value on the float indicator and maintain this value during operation (disregard minor fluctuations on the indicator).

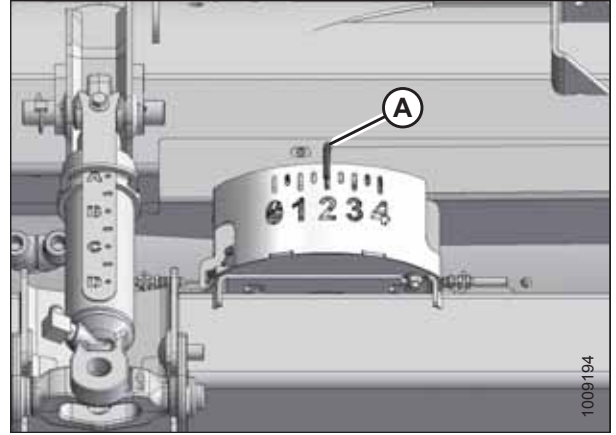


Figure 3.84: Cutting on the Ground

### Checking and Adjusting Header Float

The header is equipped with a suspension system that floats the header over the ground to compensate for ridges, trenches, and other variations in ground contour. If the header float is not set properly, it may cause the cutterbar to push into the ground or leave uncut crop. This procedure describes how to check header float and adjust to the factory-recommended settings.

### DANGER

**To avoid injury or death from unexpected start-up of machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.**

Use the following guidelines when adjusting float:

- Turn each adjustment bolt pair equally. Repeat torque wrench reading procedure on both sides of header.
- Set the header float as light as possible without causing excessive bouncing to prevent knife component breakage, soil scooping, and soil build-up at the cutterbar in wet conditions.
- To avoid excessive bouncing and leaving a ragged cut, use a slower ground speed with a light float setting, if necessary.
- When cutting off the ground, use the stabilizer wheels in conjunction with header float to minimize bouncing at the header ends and to control cut height. For instructions, refer to [Adjusting Stabilizer Wheels, page 84](#).

### NOTE:

If adequate header float cannot be achieved using all of the available adjustments, an optional heavy-duty spring is available. See your MacDon Dealer or refer to the header parts catalog for ordering information.

## OPERATION

To check and adjust header float, follow these steps:

1. Park the combine on a level surface.
2. Level the header and float module. If the header and float module are not level, perform the following checks before adjusting the float:

### IMPORTANT:

Do **NOT** use the float module springs to level the header.

- Check that the combine feeder house is level. For instructions, refer to your combine operator's manual.
  - Check that the top of the float module is level with the combine axle.
  - Ensure the combine tires are inflated equally.
3. Adjust the header until the cutterbar is 150–254 mm (6–10 in.) off the ground.
  4. Extend the header angle hydraulic cylinder to between **B** and **C** on indicator (A).
  5. Adjust the reel fore-aft position until it is between 5 and 6 on position indicator decal (A) located on the reel right arm.
  6. Lower the reel fully.
  7. Shut down the engine, and remove the key from the ignition.

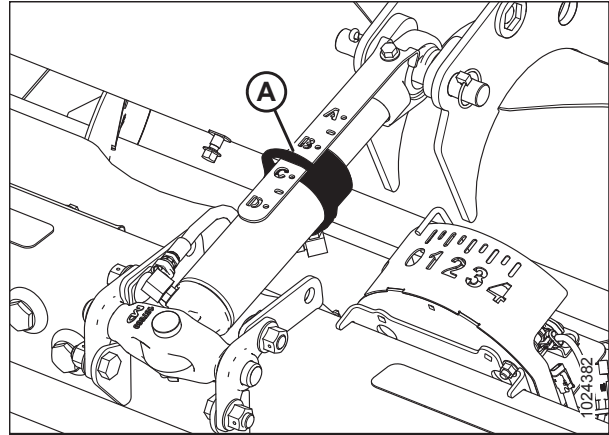


Figure 3.85: Center-Link

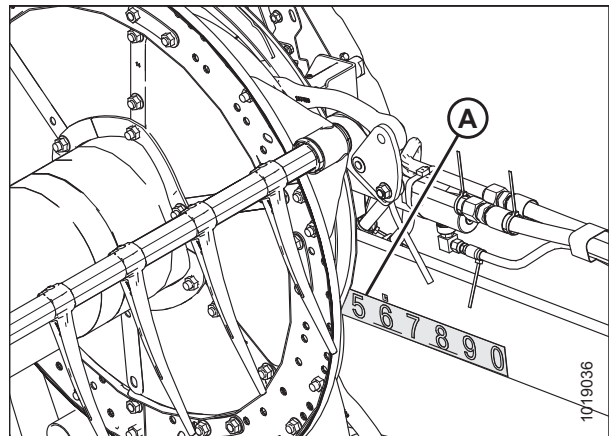


Figure 3.86: Fore-Aft Position

## OPERATION

8. Disengage both of the header float locks by pulling float lock handle (A) away from the float module and pushing the float lock handle down and into position (B) (**UNLOCK**).

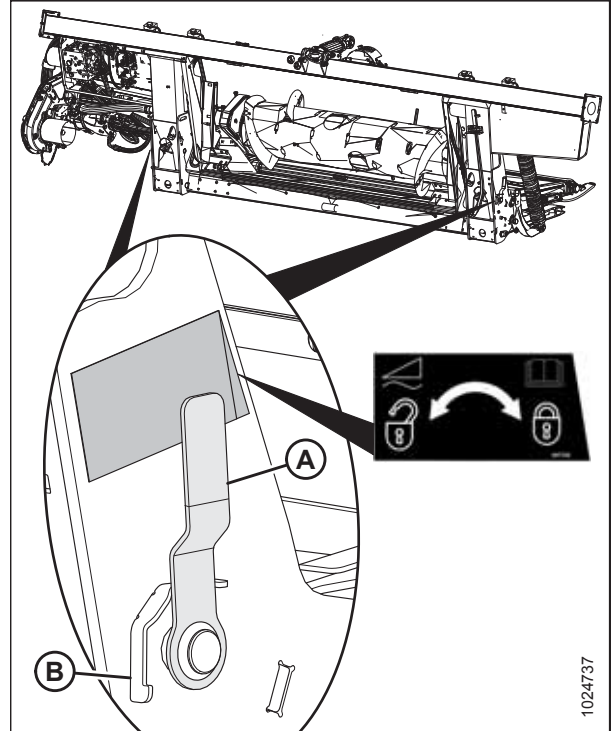


Figure 3.87: Header Float Lock in Locked Position

9. Place the stabilizer wheels and transport wheels (if equipped) in storage position as follows:
  - a. Support the wheel weight by lifting slightly with one hand, and pull up on handle (A) to release the lock.
  - b. Lift the wheels to the desired height, and engage the support channel into slot (B) in the upper support.
  - c. Push down on handle (A) to lock.

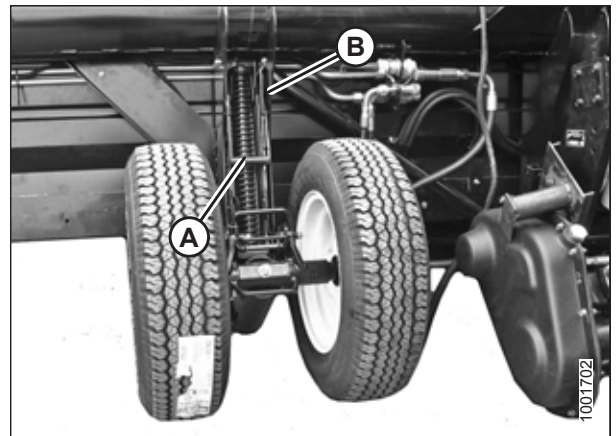


Figure 3.88: Left Wheel



## OPERATION

10. Remove supplied torque wrench (A) from its storage position at the right side of the float module frame. Pull in the direction shown to disengage the wrench from the hook.

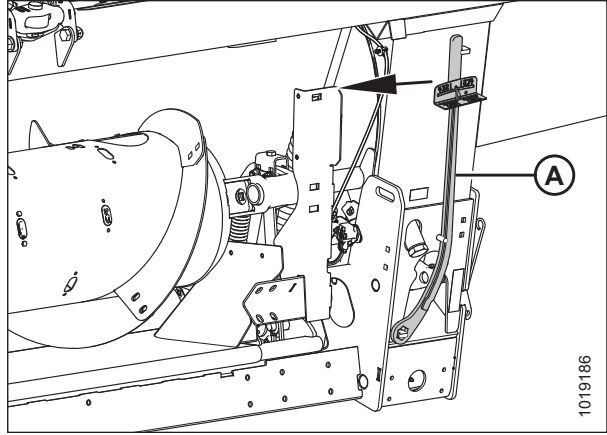


Figure 3.89: Torque Wrench Storage Location

11. Place torque wrench (A) onto float checking lever (B). Note the position of the wrench for checking left or right side.
12. Push down on the wrench to rotate bell crank (C) forward.

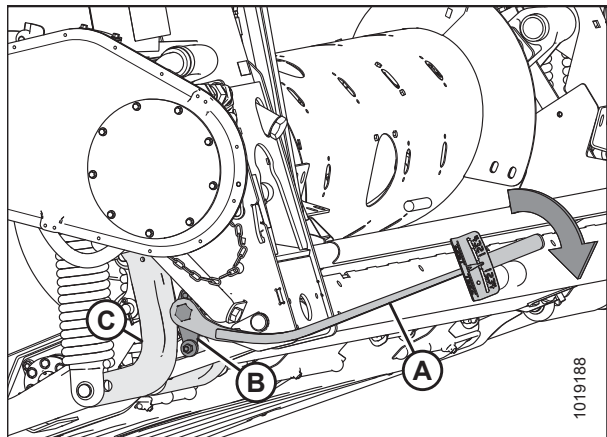


Figure 3.90: Float Module – Left Side

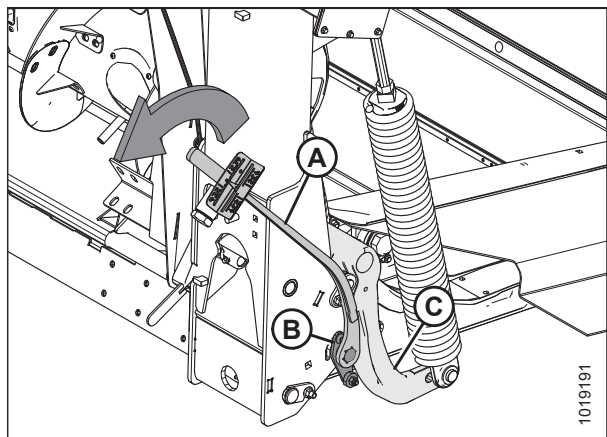


Figure 3.91: Float Module – Right Side



## OPERATION

13. Push down on the wrench until indicator (A) reaches a maximum reading and then begins to decrease. Note the maximum reading. Repeat at opposite side.
14. Use the following table as a guide for float settings:
  - If the reading on the wrench is high, the header is heavy
  - If the reading on the wrench is low, the header is light

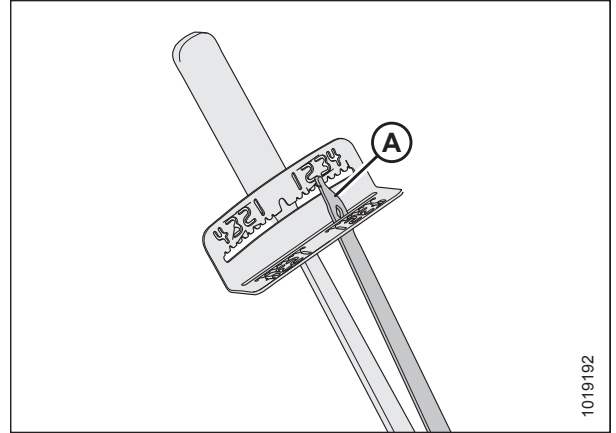


Figure 3.92: Torque Wrench

Table 3.13 Float Settings

Header Size	Indicator Reading	
	Cutting on the Ground	Cutting off the Ground
D120, D125, D130, and D135	1 1/2 to 2	2 to 2 1/2
D140 and D145	2 to 2 1/2	2 1/2 to 3

15. To access float spring adjustment bolts (A), loosen bolts (C) and rotate spring locks (B).
16. To increase float (decrease header weight), turn both adjustment bolts (A) on the left side clockwise. Repeat adjustment at opposite side.  
  
To decrease float (increase header weight), turn left side adjustment bolts (A) counterclockwise. Repeat at opposite side.

**NOTE:**

Turn each bolt pair equally.

17. Adjust the float so the wrench readings are equal on both sides of the header.
18. Lock adjustment bolts (A) with spring locks (B). Ensure bolt heads (A) are engaged in the spring lock cutouts. Tighten bolts (C) to secure the spring locks in place.

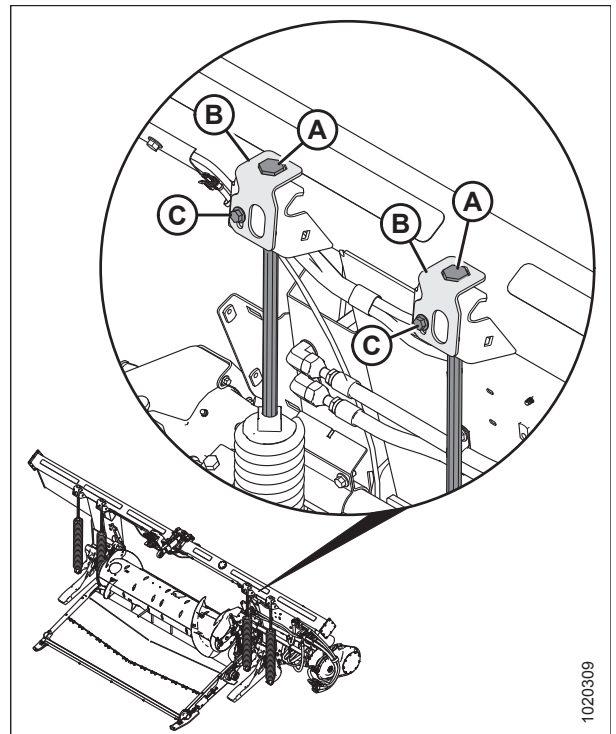


Figure 3.93: Float Adjustment – Left Side

## OPERATION

### *Locking/Unlocking Header Float*

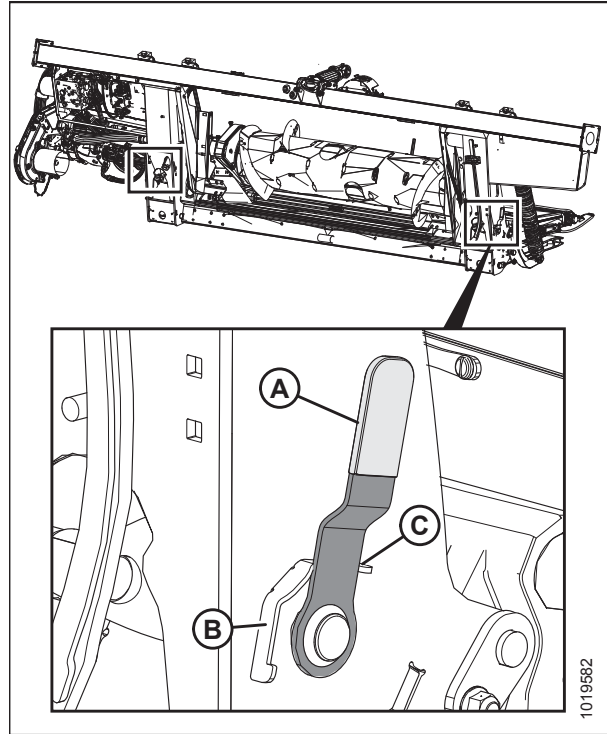
Two header float locks—one on each side of the float module—lock and unlock the header float system.

#### **IMPORTANT:**

The float locks must be engaged when the header is being transported with the float module attached so there is no relative movement between the float module and the header. The float locks must also be locked when detaching the float module from the combine in order to enable the feeder house to release the float module.

To **DISENGAGE (UNLOCK) FLOAT LOCKS**, pull the float lock handle (A) into position (B) (**UNLOCK**). In this position, the header is unlocked, and can float with respect to the float module.

To **ENGAGE (LOCK) FLOAT LOCKS**, push the float lock handle (A) into position (C) (**LOCK**). In this position, the header cannot move with respect to the float module.



**Figure 3.94: Float Lock in Locked Position**

### **3.8.4 Header Angle**

Header angle is the angle between the header and the ground. The header angle is adjustable to accommodate different crop conditions and/or soil types and can be adjusted using the center-link between the combine and the header. Some combines have an adjustable feeder house, which provides the operator an alternative method for controlling header angle.

For combine-specific adjustment details, refer to [Adjusting Header Angle from Combine, page 98](#).

## OPERATION

The header angle (A) controls the distance (B) between the cutterbar knife and the ground and is a critical component for effective cutting crop at ground level.

Adjusting the header angle pivots the header at the point of skid shoe/ground contact (C).

Guard angle (D) is the angle between the upper surface of the cutterbar guards and the ground.

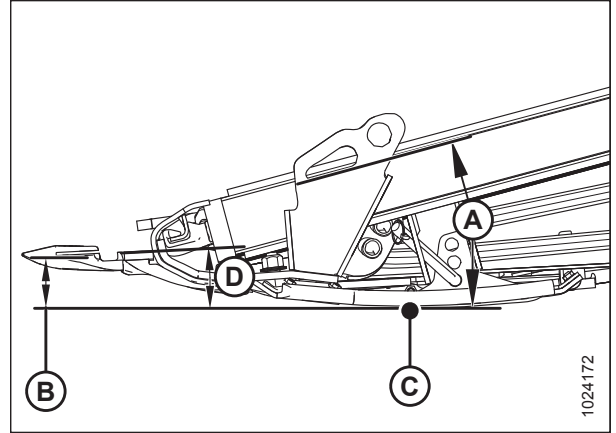


Figure 3.95: Header Angle

Set the header angle according to the type and condition of crop and soil as follows:

- Use shallower settings (A) (position A on the indicator) for normal cutting conditions and wet soil to reduce soil buildup at the cutterbar. Shallow angle settings also minimize damage to the knife in stony fields.
- Use steeper settings (D) (position D on the indicator) for lodged crops and crops that are close to the ground such as soybeans.

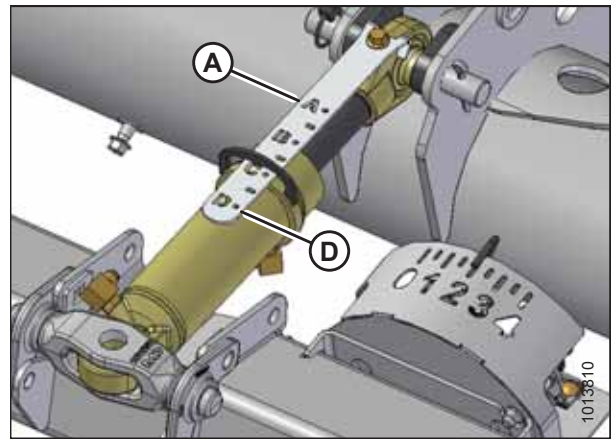


Figure 3.96: Center-Link

The shallowest angle (A) (center-link fully retracted) produces the highest stubble when cutting on the ground.

The steepest angle (D) (center-link fully extended) produces the lowest stubble when cutting on the ground.

Choose an angle that maximizes performance for your crop and field conditions. Refer to the table below for a summary of adjustment ranges.

**Table 3.14 D1 Series Header Angle**

Header Size	Guard Angle
6.1 and 7.6 m (20 and 25 ft.)	7.0–12.4°
9.1–13.7 m (30–45 ft.)	2.0–7.4°

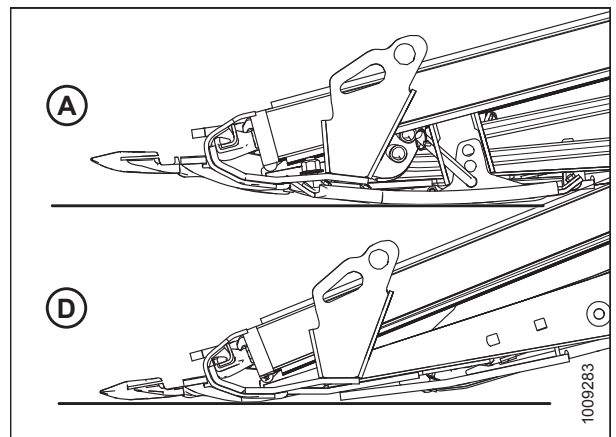


Figure 3.97: Guard Angles

For recommended header/guard angle settings for your particular crop conditions, refer to [3.7.2 Header Settings, page 43](#).

## OPERATION

### *Adjusting Header Angle from Combine*

The header angle is adjusted from the combine cab with a switch on the operator's control handle and an indicator on the center-link or on the monitor in the cab. The header angle is determined by the length of the center-link between the combine float module and the header, or by tilting the feeder house on selected combines.

#### **Case combines:**

Case combines use control handle switches to adjust the center-link to change the header angle.

1. Press and hold SHIFT button (A) on the backside of the control handle and press switch (B) to tilt the header forward or press switch (C) to tilt the header back.



Figure 3.98: Case Combine Controls

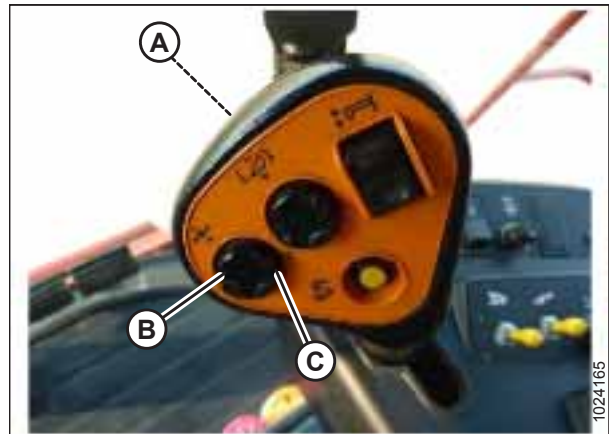


Figure 3.99: Case Combine Controls

## OPERATION

### ***New Holland combines:***

New Holland combines use control handle switches to adjust the center-link to change the header angle.

1. Press and hold SHIFT button (A) on the backside of the control handle and press switch (B) to tilt the header forward (steeper angle) or switch (C) to tilt the header back (shallower angle).

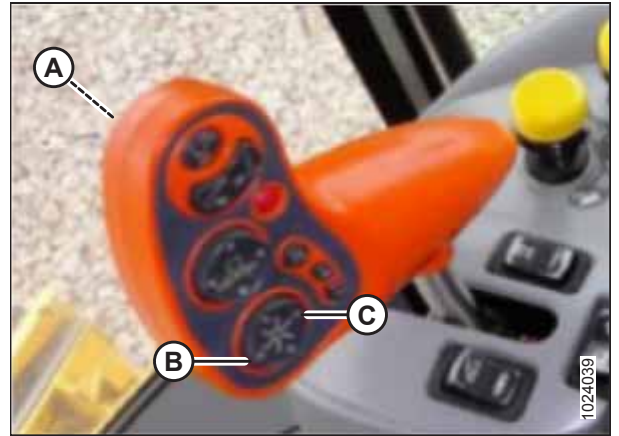


Figure 3.100: New Holland CR/CX Controls

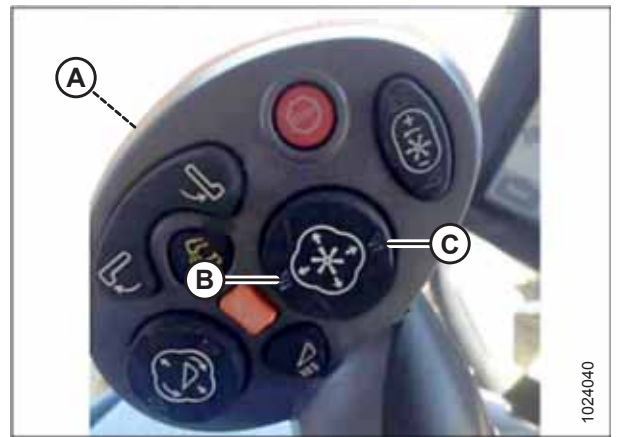


Figure 3.101: New Holland CR/CX Controls

## OPERATION

### AGCO combines:

AGCO combines use a combination of the reel fore-aft switches on the control handle and a Dealer-installed auxiliary rocker switch, which toggles between reel fore-aft and header tilt functionality. The location of the rocker switch varies with the combine model.

1. **Gleaner A only:** Open armrest cover (A) to expose a row of switches.
2. Press Dealer-installed rocker switch (B) to HEADER TILT position.

#### NOTE:

Gleaner A shown in the image, other Challenger and Massey Ferguson combine models have rocker switch on the console (not shown).

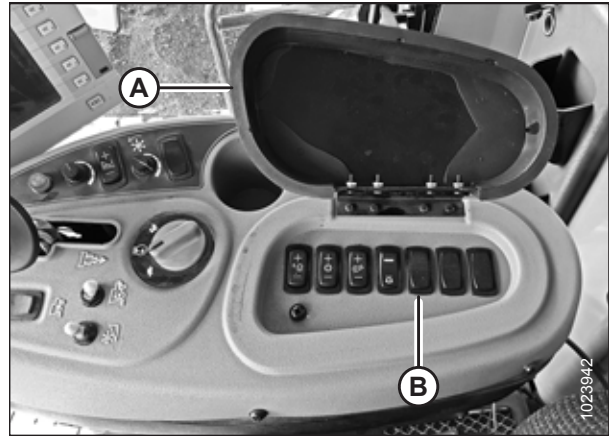


Figure 3.102: Gleaner A Console

3. To tilt the header forward (steeper angle), press button (A) on the control handle. To tilt the header back (shallower angle), press button (B) on the control handle.



Figure 3.103: Gleaner Controls

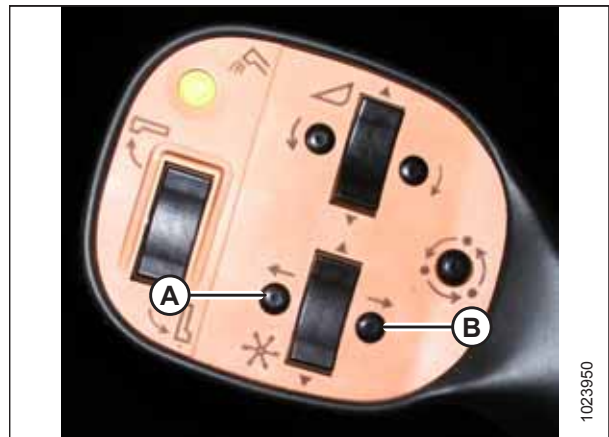


Figure 3.104: Gleaner Controls



## OPERATION



Figure 3.105: Challenger/Massey Ferguson Controls

### **CLAAS combines:**

**CLAAS (with factory-installed fore-aft / header tilt switch):** Newer CLAAS combines use a combination of the reel fore-aft switches on the control handle and a factory-installed auxiliary rocker switch which toggles between reel fore-aft and header tilt functionality.

1. Press HOTKEY switch (A) on the operator's console to deck plate position (the header icon [B] with the arrows pointing to each other).

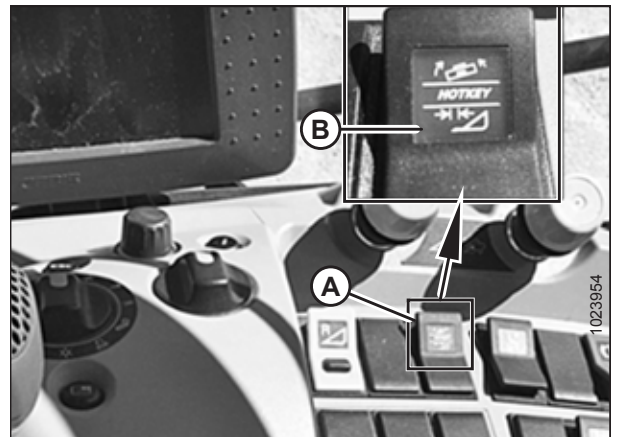


Figure 3.106: CLAAS 700 Console

## OPERATION

2. Press and hold switch (A) on the rear of the control handle.
3. To tilt the header forward (steeper angle), press switch (C).  
To tilt the header back (shallower angle), press switch (B).

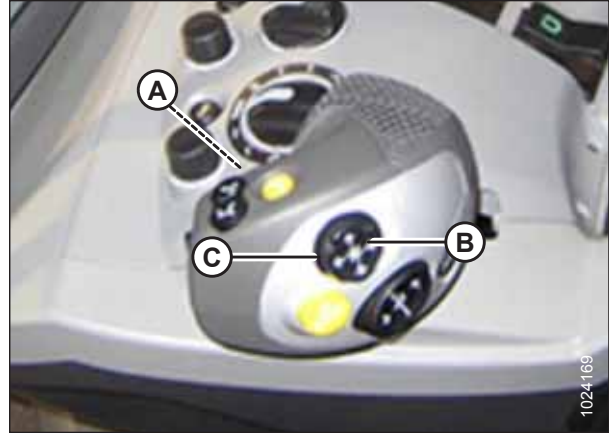


Figure 3.107: CLAAS 600/700 Control Handle

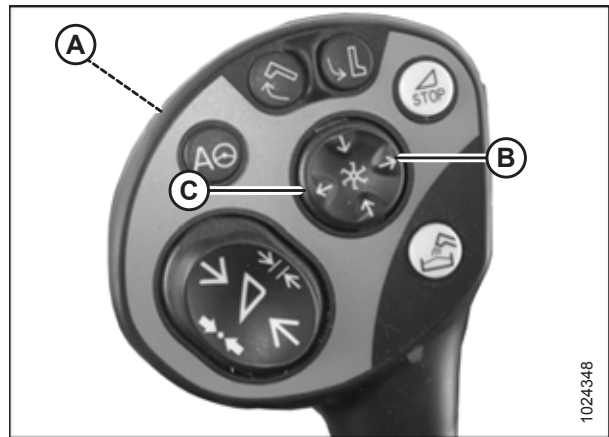


Figure 3.108: CLAAS 500 Control Handle

### *John Deere combines:*

**John Deere S700:** S700 Series combines can use a feeder house deckplate tilting system for header fore-aft adjustment. Set the deckplate at a mid-point position, and use the MacDon fore-aft and header tilt system for tilt functionality.

### **IMPORTANT:**

Damage to equipment may occur if both the deckplate and MacDon header tilt are adjusted to their maximum range.

1. To tilt the header forward (steeper angle), press switch (A).  
To tilt the header back (shallower angle), press switch (B).



Figure 3.109: John Deere 700 Controls



## OPERATION

**John Deere (except S700 Series):** Other John Deere combines use a combination of the reel fore-aft switches on the control handle and a Dealer-installed auxiliary rocker switch which toggles between reel fore-aft and header tilt functionality.

1. Press reel fore-aft / header tilt switch (A) on the console into HEADER TILT position.

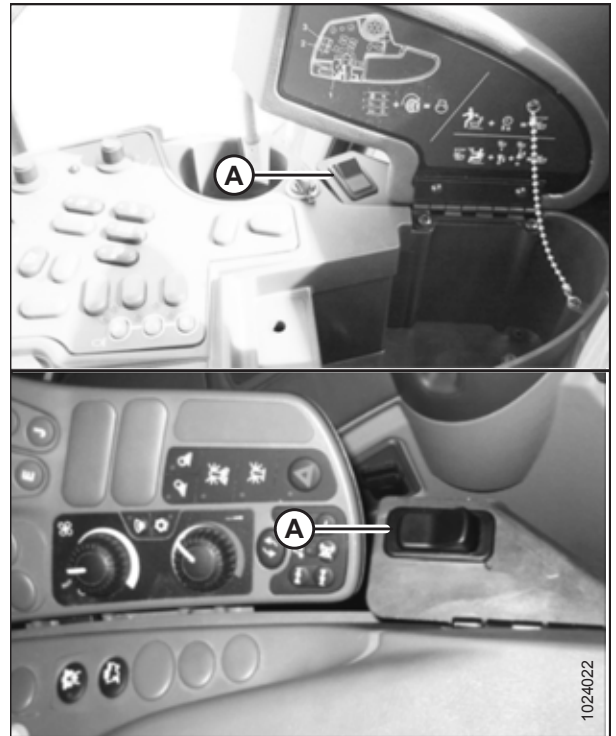


Figure 3.110: John Deere Consoles

2. To tilt the header forward (steeper angle), press switch (A).  
To tilt the header back (shallower angle), press switch (B).



Figure 3.111: John Deere Control Handle

## OPERATION

### *Versatile combines:*

Versatile combines use a combination of reel fore-aft switches on the control handle and a factory-installed auxiliary rocker switch on the combine control console that toggles between reel fore-aft and header tilt functionality.

1. Press ON switch (A) on console to place controls in HEADER TILT mode.
2. To tilt the header forward (steeper angle), press button (B) on control handle. To tilt the header back (shallower angle), press button (C) on control handle.



Figure 3.112: Versatile Control Handle and Console

### 3.8.5 Reel Speed

Reel speed is one of the factors that determines how crop is moved from the cutterbar onto the drapers.

The reel performs best when it appears to be driven by the ground. It should move the cut crop evenly through the cutterbar and onto the drapers without bunching and with minimal disturbance.

In standing crop, reel speed should be slightly higher than, or equal to, ground speed.

In flattened crop or crop that is leaning away from the cutterbar, the reel speed needs to be higher than the ground speed. To achieve this, either increase the reel speed or decrease the ground speed.

Excessive shattering of grain heads or crop loss over the header backtube may indicate that the reel speed is too high. Excessive reel speed also increases reel component wear and overloads the reel drive.

Slower reel speeds can be used with nine-bat reels, which is advantageous in shatter-prone crops.

#### **NOTE:**

Nine-bat reels are available on D120 and D125 headers from the factory. A conversion kit to change from a six-bat reel to a nine-bat reel is available for these headers.

For recommended reel speeds in specific crops and conditions, refer to [3.7.2 Header Settings, page 43](#).

The reel speed is adjustable using the controls in the combine cab. Refer to the combine operator's manual for adjustment details.

#### *Optional Reel Drive Sprockets*

Optional reel drive sprockets for use in special crop conditions are available as an alternative to the factory-installed sprocket.

The header is factory-equipped with a 19-tooth reel drive sprocket, which is suitable for most crops. Other sprockets are available that provide more torque to the reel in heavy cutting conditions or allow for higher reel speeds in light crops when operating at increased ground speeds. Refer to [Table 3.15, page 105](#), and contact your MacDon Dealer for ordering information.

## OPERATION

**Table 3.15 Optional Reel Drive Sprockets**

Machine Hydraulics	Combine	Application	Optional Drive Sprocket
13.79–14.48 MPa (2000–2100 psi)	Gleaner Transverse Rotary	Combining down rice	10 tooth
17.24 MPa (2500 psi)	CLAAS 500, 700 Series, Challenger Axial Rotary	Combining down rice	12 tooth
20.68 MPa (3000 psi)	New Holland CR, CX, Case IH 7010, 8010, 7120, 8120, 88 Series	Combining down rice	14 tooth
Low flow (under 42 L/min [11 gpm])	—	Combining light crops above 16 km/h (10 mph)	21 tooth

For installation details, refer to [5.14.3 Reel Drive Sprocket, page 566](#).

### 3.8.6 Ground Speed

Operating at the proper ground speed will cleanly cut crop and evenly distribute crop material into the combine.

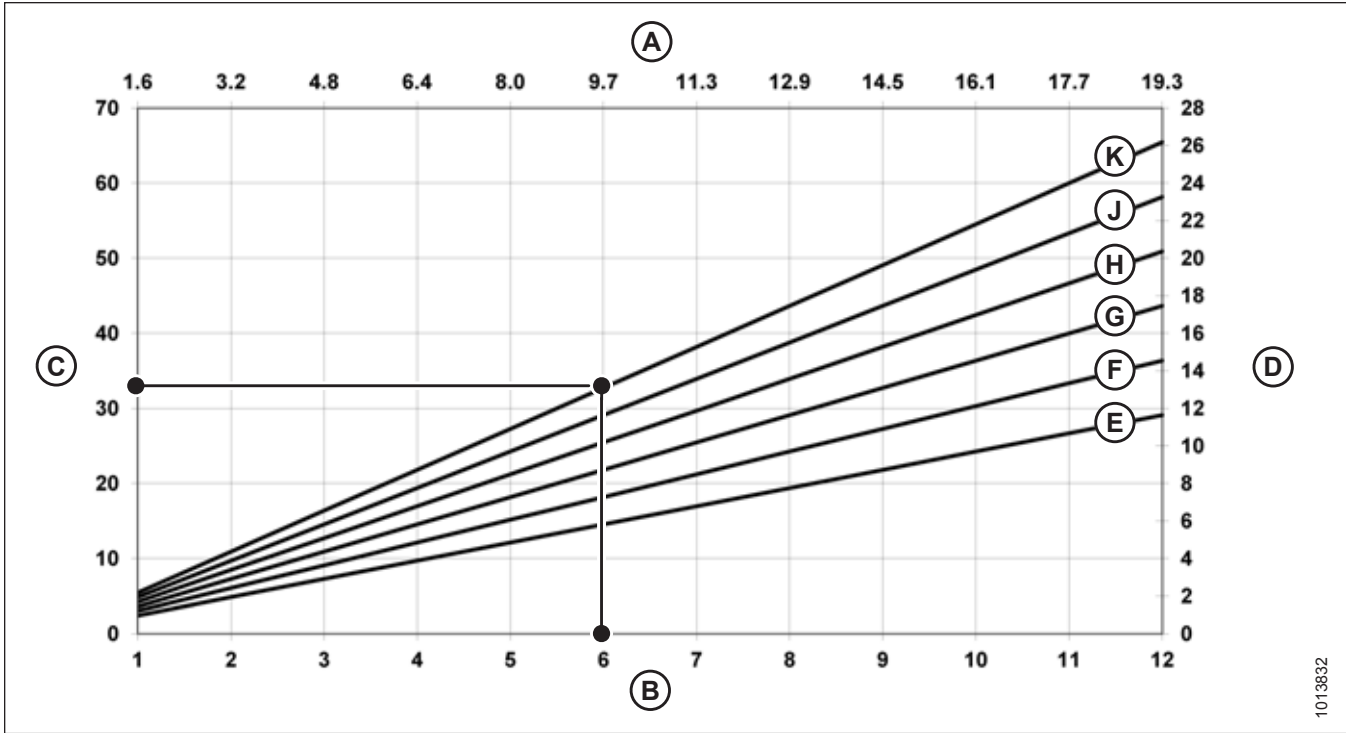
Reduce ground speed in difficult cutting conditions to reduce loads on cutting components and drives.

Use lower ground speeds in very light crops (e.g., short soybeans) to allow the reel to pull in short plants. Start at 4.8–5.8 km/h (3.0–3.5 mph) and adjust as required.

Higher ground speeds may require heavier float settings to prevent excessive bouncing that causes uneven cutting and possible damage to the cutting components. If ground speed is increased, draper and reel speeds should generally be increased to handle the extra material.

Figure [3.113, page 106](#) illustrates the relationship between ground speed and area cut for the various sized headers.

## OPERATION



**Figure 3.113: Ground Speed versus Acres**

A - Kilometers/Hour

B - Miles/Hour

C - Acres/Hour

D - Hectares/Hour

E - 6.1 m (20 ft.)

F - 7.6 m (25 ft.)

G - 9.1 m (30 ft.)

H - 10.7 m (35 ft.)

J - 12.2 m (40 ft.)

K - 13.7 m (45 ft.)

**Example:** A 13.7 m (45 ft.) header operating at a ground speed of 9.7 km/h (6 mph) would produce a cut area of approximately 13.4 hectares (33 acres) in one hour.

### 3.8.7 Draper Speed

Operating with the correct draper speed is an important factor for achieving good flow of cut crop away from the cutterbar.

The side drapers and feed draper operate independently of each other; therefore, the speeds are controlled differently. The side draper speed is adjusted with a manually adjustable control valve that is mounted on the float module. The float module feed draper speed is fixed to the combine feeder house speed and cannot be independently adjusted.

Adjust the side draper speed to achieve efficient crop feeding onto the float module feed draper. For instructions, refer to [Adjusting Side Draper Speed, page 107](#).

## OPERATION

### *Adjusting Side Draper Speed*

The side drapers carry the cut crop to the float module feed draper, which then feeds it into the combine. The side draper speed is adjustable to suit a variety of crops and crop conditions.

Side drapers (A) are driven by hydraulic motors and a pump that is powered by the combine feeder house drive through a gearbox on the float module. Side draper speed is adjustable with the flow control valve on the float module, which regulates the flow to the draper hydraulic motors. Side draper speed is also adjustable with an optional control in the cab.

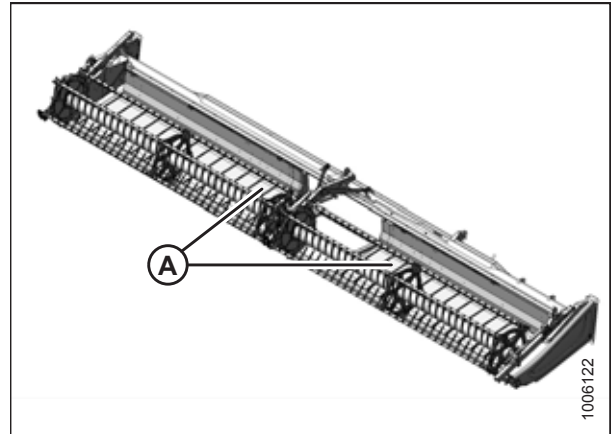


Figure 3.114: Side Drapers

### **DANGER**

To avoid injury or death from unexpected start-up of machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Lower the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. If the optional in-cab side draper speed control kit is installed, rotate knob (A) to the desired speed setting. Set the knob to 6 for normal crop delivery. Switch (B) activates the header tilt or reel fore-aft controls. For instructions, refer to *Adjusting Header Angle from Combine*, page 98.

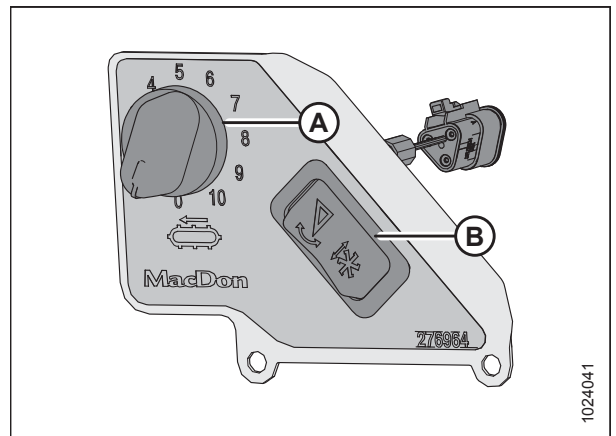


Figure 3.115: Optional In-Cab Side Draper Speed Control

## OPERATION

4. On the rear side of the float module, lift cover (A) to open.

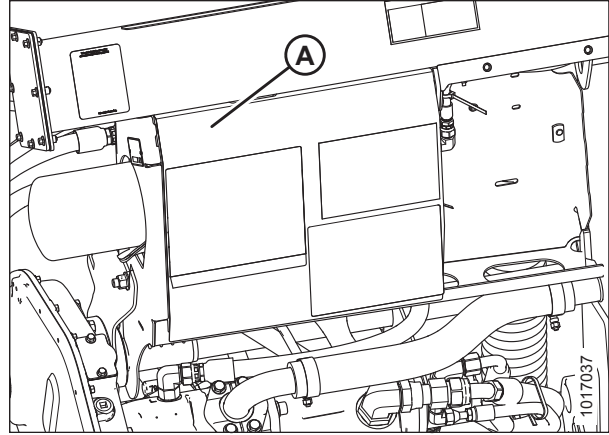


Figure 3.116: Hydraulic Compartment Cover

### NOTE:

Parts have been removed from the illustration at right to show the speed control valve clearly.

5. Locate side draper speed control (A). The speed control has settings from 0–9 on the barrel to indicate the draper speed. The flow control valve is factory-set to 6, which should be sufficient for normal crop feeding.
6. Rotate the speed control valve dial to adjust the speed.
7. Refer to one of the following for recommended draper speed settings:
  - [3.7.2 Header Settings, page 43](#)
  - [3.7.3 Optimizing Header for Straight Combining Canola, page 54](#)

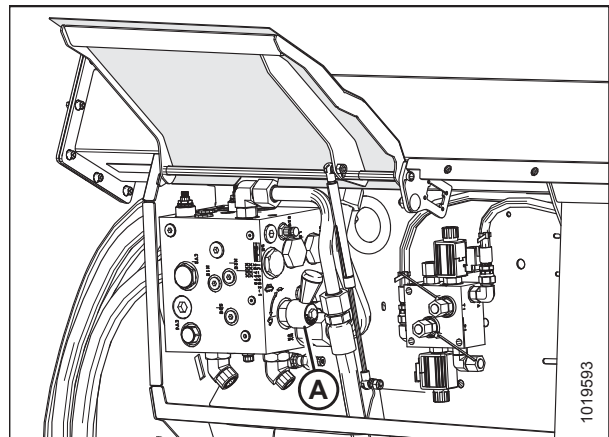


Figure 3.117: Flow Control Valve

### Feed Draper Speed

The feed draper moves the cut crop from the side drapers into the float module feed auger.

The float module feed draper (A) is driven by a hydraulic motor and a pump that is powered by the combine feeder house drive through a gearbox on the float module.

The feed draper speed is determined by the combine feeder house speed and cannot be independently adjusted.

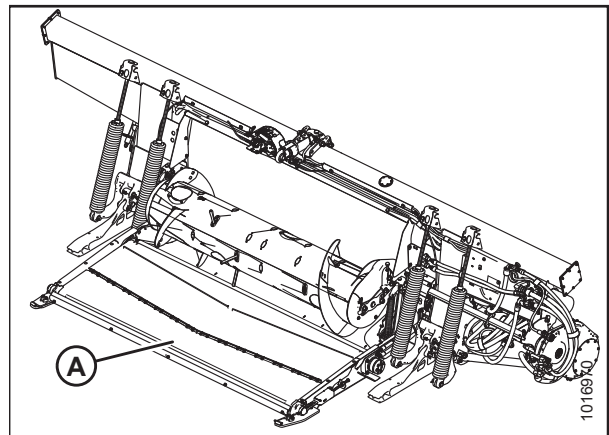


Figure 3.118: FM100 Float Module

### 3.8.8 Knife Speed Information

The header knife drive is powered by the FM100 hydraulic pump, which is driven by the combine feeder house. There is no separate adjustment to control the knife speed.

**IMPORTANT:**

For variable speed feeder houses, the rpm values shown at right represent the MINIMUM feeder house speeds.

**Table 3.16 Feeder House Speed**

Combine	Feeder House Speed (rpm)
Case IH	580
Challenger	625
CLAAS <sup>53</sup>	420
Gleaner	625
John Deere	490
Massey Ferguson	625
New Holland	580

**IMPORTANT:**

Ensure the D1 Series knife speed is within the range of rpm values in Table 3.17, page 109. For instructions, refer to *Checking Knife Speed, page 109*.

**IMPORTANT:**

Under normal cutting conditions, knife speed taken at the knife drive pulley should be set between 600 and 640 rpm (1200 and 1280 spm). If set to the low side of the range, you could experience knife stalling.

**Table 3.17 D1 Series Header Knife Speed**

Header Model	Recommended Knife Drive Speed Range (rpm)	
	Single-Knife Drive	Double-Knife Drive
D120	—	700–850
D125	600–725	700–850
D130	600–700	600–750
D135	550–650	600–750
D140	525–600	550–700
D145	—	550–700

#### Checking Knife Speed

The knife drive box is an enclosed oil bath with a 76.2 mm (3 in.) stroke. Knife drive boxes are belt driven by a hydraulic motor, and convert rotational motion into reciprocating motion at the knife. Double knife drive systems have two knife drive boxes, one at each end of the header. Overspeeding the knife drive box can lead to damage and excessive wear on the knife sections and guards.

 **DANGER**

To avoid injury or death from unexpected start-up of machine, always stop the engine and remove the key from the ignition before leaving the operator’s seat for any reason.

1. Shut down the engine, and remove the key from the ignition.

---

53. The rear shaft speed on CLAAS combines is 420 rpm (speed shown on cab display monitor also will be 420). The output shaft speed is actually 750 rpm.

## OPERATION

- Open the left endshield. For instructions, refer to [Opening Endshields, page 35](#).

### WARNING

Check to be sure all bystanders have cleared the area.

- Start the engine. For instructions, refer to the combine operator's manual.
- Engage the header drive, and run the combine at operating rpm.
- Run the machine for 10 minutes to warm up oil to 38°C (100°F).
- Measure the rpm of knife drive box pulley (A) with a hand-held tachometer.
- Shut down the engine, and remove the key from the ignition.
- Compare the pulley rpm measurement with the rpm values in the knife speed chart. Refer to [3.8.8 Knife Speed Information, page 109](#).
- Contact your MacDon Dealer if the pulley rpm measurement exceeds the specified rpm range for your header.

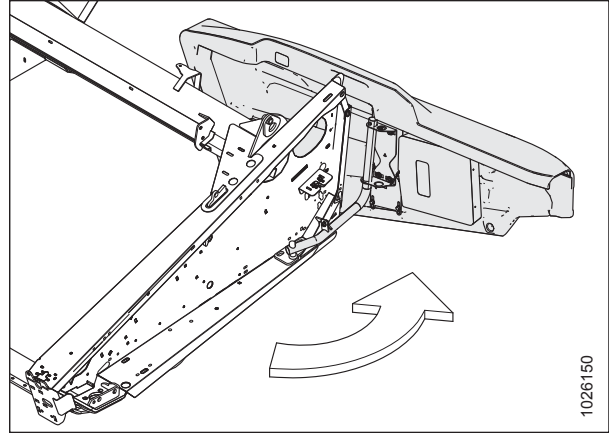


Figure 3.119: Left Endshield

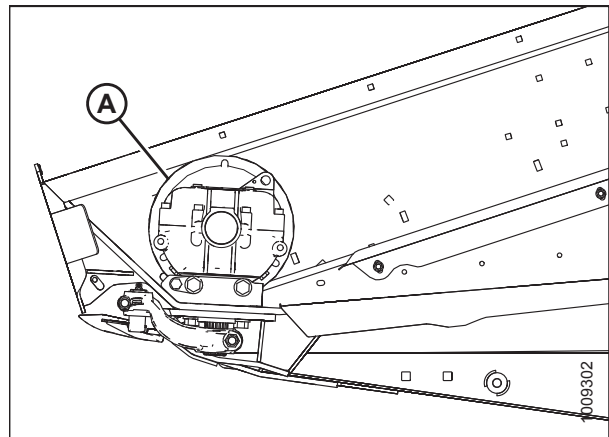


Figure 3.120: Knife Drive Pulley

## 3.8.9 Reel Height

The reel operating position depends on the type of crop and cutting conditions.

Set the reel height and fore-aft position to carry material past the knife and onto the drapers with minimal damage to the crop.

The reel height is controlled manually or with button presets on the ground speed lever (GSL) in the combine cab. Refer to your combine operator's manual for instructions on controlling reel height or setting up auto reel height presets. Where applicable, this manual contains instructions for presetting reel height on selected combines. Refer to [3.9 Auto Header Height Control, page 138](#) for more information.

For more information on fore-aft positioning, refer to [3.8.10 Reel Fore-Aft Position, page 116](#).

Table 3.18 Reel Position

Crop Condition	Reel Position
Lodged rice	<ul style="list-style-type: none"> <li>Lower the reel</li> <li>Change reel speed and/or cam setting</li> <li>Change fore-aft position by extending the reel</li> </ul>
Bushy or heavy standing (all)	Raised



## OPERATION

The following conditions might result if the reel is set too low:

- Crop loss over the header backtube
- Crop disturbance on the drapers caused by the reel fingers
- Crop pushed down by the tine tubes
- Tall crop wrapped around the reel drive and ends

The following conditions might result if the reel is set too high:

- Cutterbar plugging
- Crop lodging and being left uncut
- Grain stalks dropping ahead of cutterbar

For recommended reel heights for specific crops and crop conditions, refer to [3.7.2 Header Settings, page 43](#).

### IMPORTANT:

Maintain adequate clearance to prevent fingers contacting the knife or the ground. For instructions, refer to [5.13.1 Reel Clearance to Cutterbar, page 536](#).

### *Checking and Adjusting Reel Height Sensor*

The output voltage range of the auto reel height sensor can be checked from inside the combine or manually at the sensor.

For in-cab instructions, refer to the combine operator's manual.

### NOTE:

For CLAAS combines: To avoid a collision of the reel with the cab, the machine is equipped with an automatic reel height limitation. Some CLAAS combines have an automatic shutoff feature that engages when the automatic reel height limitation is reached. When raising the header by more than 80%, the reel is automatically lowered. The automatic lowering of the reel can be manually overridden, and a warning will appear on the CEBIS terminal.



### DANGER

**To avoid bodily injury or death from the unexpected start-up or fall of a raised machine, always stop engine and remove key before leaving the operator's seat, and always engage safety props before going under the machine for any reason.**



### WARNING

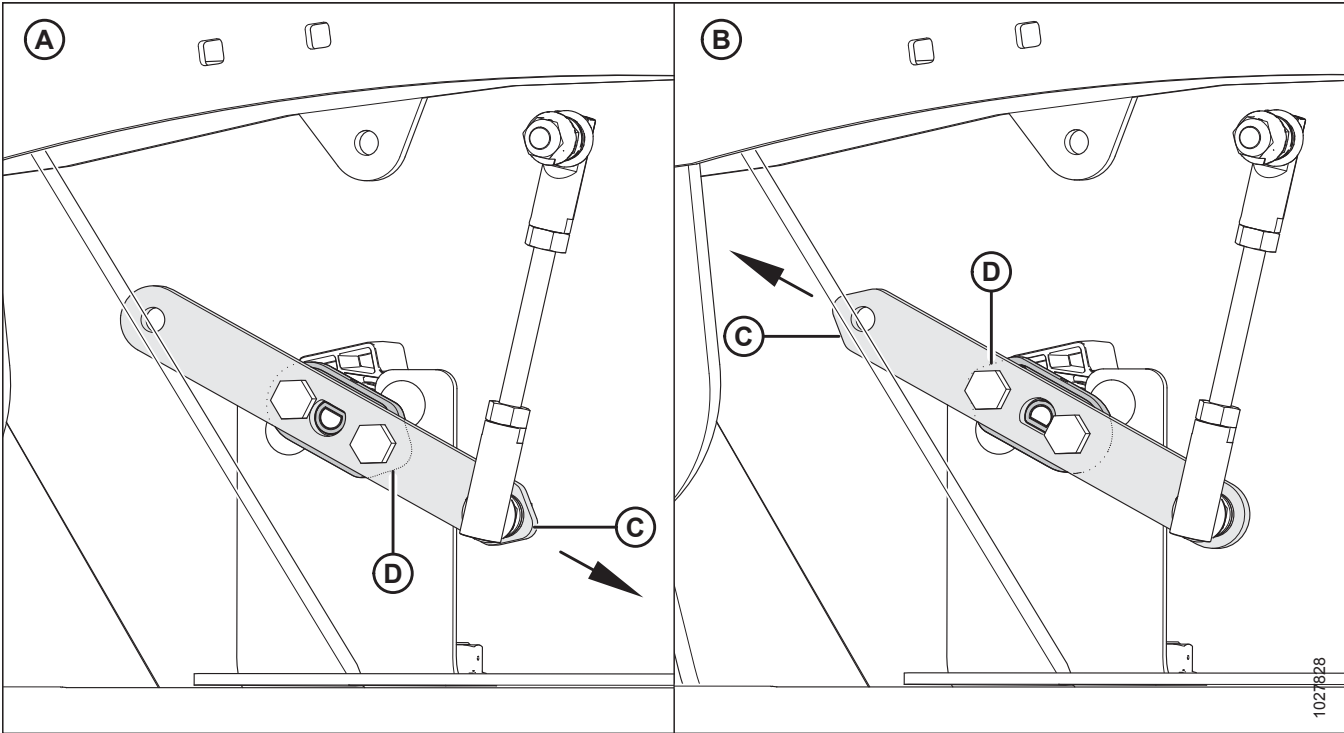
**Check to be sure all bystanders have cleared the area.**

### IMPORTANT:

Ensure minimum reel height is properly set before adjusting the reel height sensor. For instructions, refer to [5.13.1 Reel Clearance to Cutterbar, page 536](#) [Measuring Reel Clearance, page 536](#).

1. Shut down the engine, and remove the key from the ignition.

## OPERATION



**Figure 3.121: Sensor Arm/Pointer Configurations**

A - Case/New Holland Configuration

B - John Deere/CLAAS/AGCO IDEAL™ Configuration

C - Sensor Arm (Shown Semitransparent)

D - Sensor Pointer (Shown Under Sensor Arm)

- Check that sensor arm (C) and pointer (D) are configured properly for your machine. Refer to Figure 3.121, page 112.

**NOTE:**

- For configuration (A), pointer (D) points to the **FRONT** of the header.
- For configuration (B), pointer (D) points to the **REAR** of the header.
- The sensor arm is semitransparent in the illustration above, so you can see the sensor pointer behind it.

**IMPORTANT:**

To measure the output voltage of the reel height sensor, the combine engine needs to be running and supplying power to the sensor. Always engage the combine parking brake and stay away from the reel.

**Table 3.19 Reel Height Sensor Voltage Limits**

Combine Type	Voltage Range	
	X Voltage	Y Voltage
AGCO IDEAL™ Series	4.1–4.5 V	0.5–0.9 V
Case/New Holland	0.5–0.9 V	4.1–4.5 V
CLAAS	4.1–4.5 V	0.5–0.9 V
John Deere	4.1–4.5 V	0.5–0.9 V

**To check the voltage range manually, follow these steps:**

- Engage the combine’s parking brake.
- Start the engine. For instructions, refer to the combine operator’s manual.

## OPERATION

3. Lower the reel fully.
4. Use the combine display or a voltmeter (if measuring the sensor manually) to measure voltage range **Y**. Refer to Table 3.19, page 112 for range requirements.
5. If using a voltmeter, measure the voltage between the ground wire (pin 2) and the signal wire (pin 3) at the reel height sensor (B).
6. Shut down the engine, and remove the key from the ignition.
7. Adjust the length of threaded rod (A) to modify voltage range **Y**.

### NOTE:

Dimension (C) is factory set to 41.7 mm (1.6 in).

8. Repeat checking and adjusting until voltage range **Y** is within the range specified.
9. Start the engine.
10. Raise the reel fully.
11. Shut down the engine, and remove the key from the ignition.
12. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 33*.
13. Start the engine.
14. Use the combine display or a voltmeter (if measuring the sensor manually) to measure voltage range **X**. Refer to Table 3.19, page 112 for range requirements.
15. If using a voltmeter, measure the voltage between the ground (Pin 2 wire) and the signal (Pin 3 wire) at the reel height sensor (A).
16. Shut down the engine, and remove the key from the ignition.
17. Loosen two M5 hex nuts (B) and rotate sensor (A) to achieve voltage range **X**.
18. Repeat checking and adjusting until voltage range **X** is within the range specified.
19. Disengage the reel safety props. For instructions, refer to *Disengaging Reel Safety Props, page 34*.
20. Start the engine.
21. Lower the reel fully.
22. Recheck voltage range **Y** and ensure it is still within the range specified. Adjust if required.

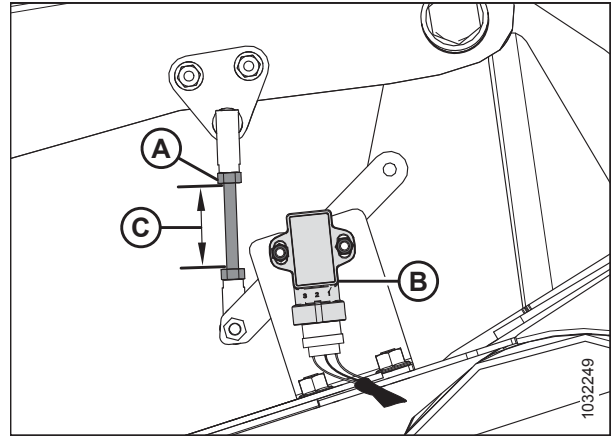


Figure 3.122: Reel Height Sensor – Right Reel Arm with Reel Down

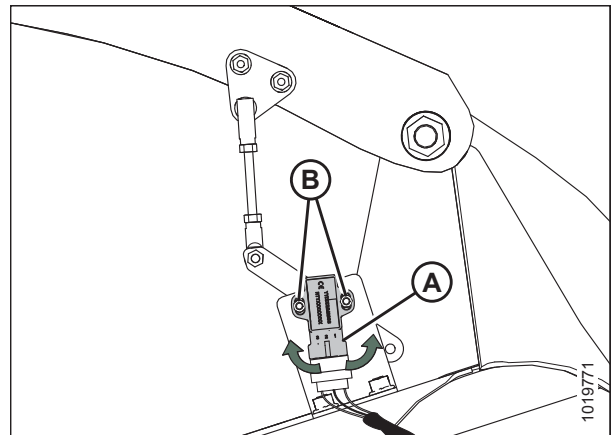


Figure 3.123: Reel Height Sensor – Right Reel Arm with Reel Up

## OPERATION

### Replacing Reel Height Sensor

The output voltage range of the auto reel height sensor can be checked from inside the combine or manually at the sensor. Replace the sensor if it fails.

#### DANGER

To avoid bodily injury or death from unexpected startup of machine, always stop the engine and remove the key before making adjustments to the machine.

1. Start the engine. For instructions, refer to the combine operator's manual.
2. Lower the header fully.
3. Shut down the engine, and remove the key from the ignition.
4. Disconnect the sensor from the harness.
5. Remove two hex head bolts (A) from sensor arm (B). Retain hardware for reinstallation.

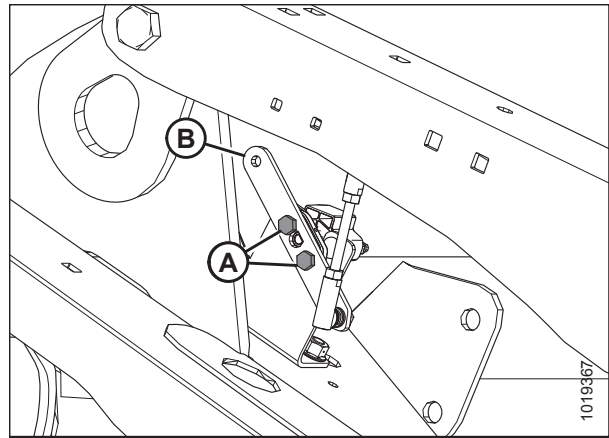


Figure 3.124: Reel Height Sensor – Right Reel Arm

6. Remove two nyloc nuts and bolts (A) from the reel height sensor and remove sensor (B).
7. Install new sensor (B) in the sensor bracket and attach using retained bolts (A) and nyloc nuts. Torque bolts (A) to 2–3 Nm (17–27 lbf-in).

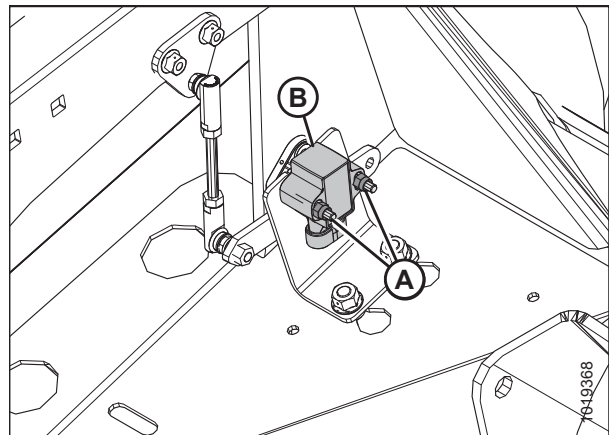


Figure 3.125: Reel Height Sensor – Right Reel Arm

## OPERATION

8. Connect sensor arm (B) using retained hex head bolts (A). Torque hex head bolts (A) to 4 Nm (35 lbf-in).
9. Connect the sensor to the harness.

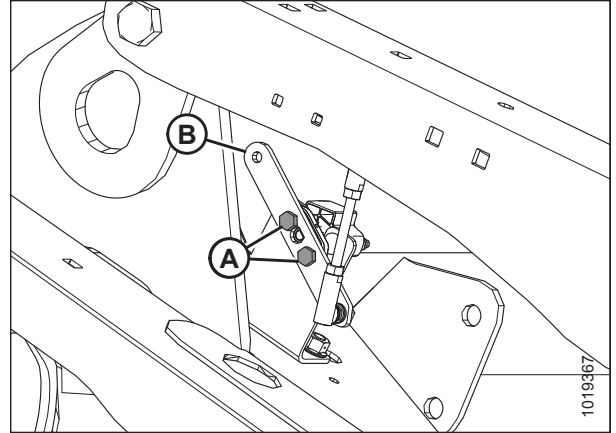


Figure 3.126: Reel Height Sensor – Right Reel Arm

10. Check that the sensor arm and the threaded rod are parallel. If not, loosen two center lock flange nuts (A), and adjust sensor mounting bracket (B) until threaded rod (C) is parallel with sensor arm (D). Tighten the center lock flange nuts.
11. Check the sensor voltage range. For instructions, refer to [Checking and Adjusting Reel Height Sensor, page 111](#).

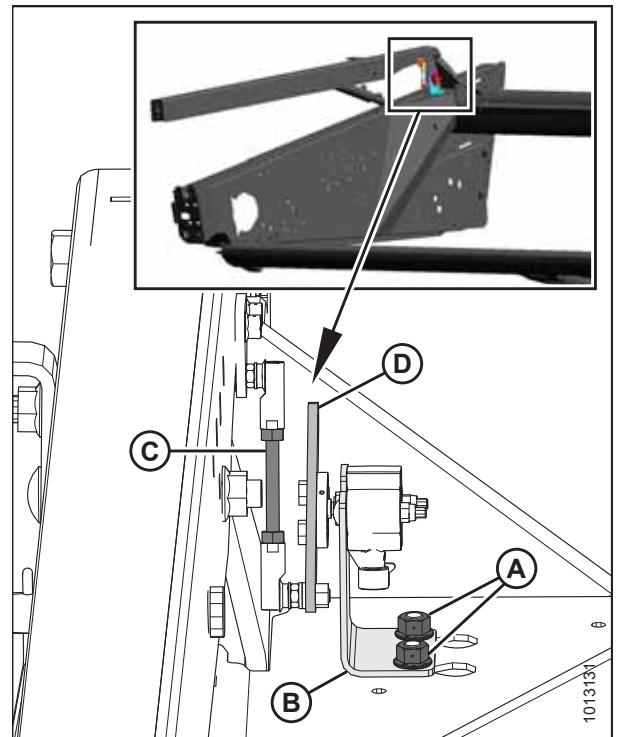


Figure 3.127: Reel Height Sensor – Front View of Right Reel Arm

### 3.8.10 Reel Fore-Aft Position

Reel fore-aft position is a critical factor for achieving the best results in adverse conditions. The factory-set reel position suits normal conditions, but the fore-aft position can be adjusted as required using the controls inside the cab.

Decal (A) is attached to the right reel support arm for identifying reel position. The aft edge of cam disc (B) is the reel fore-aft position marker.

For straight standing crop, center the reel over the cutterbar (4–5 on decal).

For crops that are down, tangled, or leaning, it may be necessary to move the reel ahead of the cutterbar (lower number on decal).

**NOTE:**

If experiencing difficulty picking up flattened crop, adjust to a steeper header angle. Refer to [3.8.4 Header Angle, page 96](#) for adjustment instructions. Adjust reel position only if header angle adjustments are not satisfactory.

For recommended reel positions in specific crops and crop conditions, refer to [3.7.2 Header Settings, page 43](#).

**NOTE:**

In crops that are difficult to pick up such as rice or severely lodged crops that require full forward positioning of the reel, set the reel tine pitch to provide proper placement of the crop onto the drapers. Refer to [3.8.11 Reel Tine Pitch, page 126](#) for adjustment details.

#### Adjusting Reel Fore-Aft Position

1. Select FORE-AFT mode on the selector switch in the cab.
2. Operate the hydraulics to move the reel to the desired position while using decal (A) as a reference.
3. Check the reel clearance to cutterbar after making changes to the cam setting. Refer to the following for measurement and adjustment procedures:
  - [5.13.1 Reel Clearance to Cutterbar, page 536](#)
  - [5.13.2 Reel Frown, page 540](#)

**IMPORTANT:**

Operating with the reel too far forward can result in the fingers contacting the ground. When operating with the reel in this position, lower the skid shoes or adjust the header tilt as required to avoid damaging the fingers.

#### Repositioning Fore-Aft Cylinders on Single Reel

The reel can be moved approximately 227 mm (9 in.) farther aft by repositioning the fore-aft cylinders on the reel arms. This may be desirable when straight-combining canola.

**⚠ DANGER**

To avoid injury or death from unexpected start-up of machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

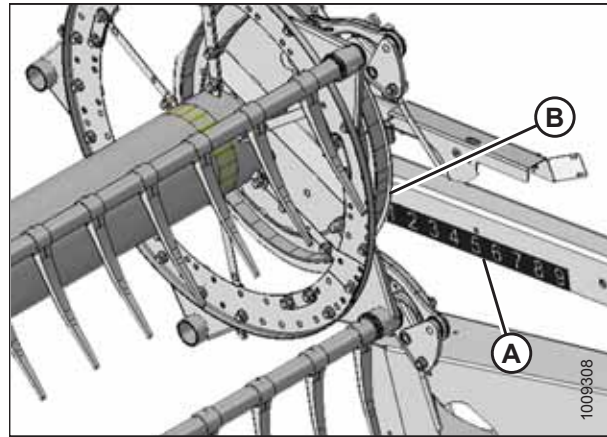


Figure 3.128: Fore-Aft Decal

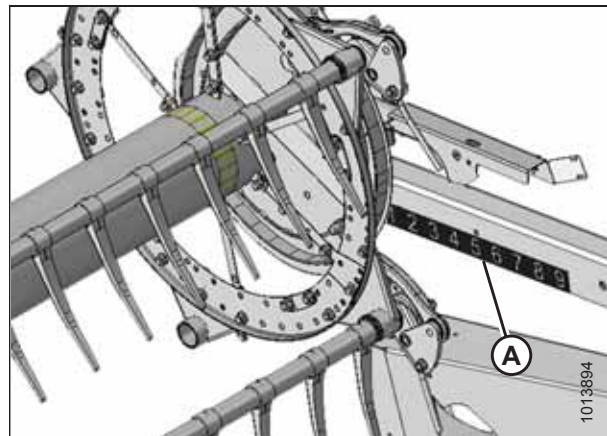


Figure 3.129: Fore-Aft Decal

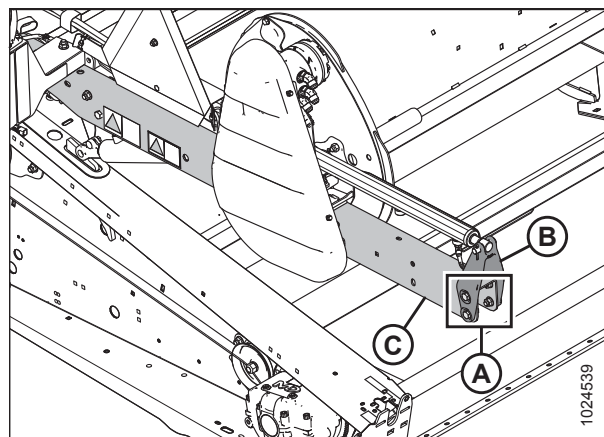
## OPERATION

### *Reposition the right reel arm cylinder as follows:*

#### **NOTE:**

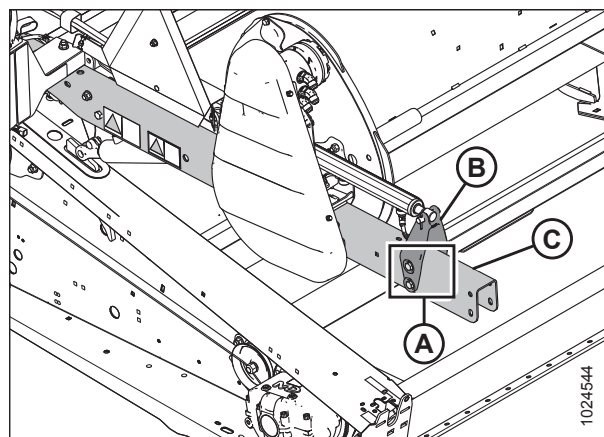
Reel components not shown in illustrations for improved clarity.

1. Position the reel fully aft with support arms horizontal.
2. Stop the engine and remove the key from the ignition.
3. Remove four nuts and bolts (A) securing cylinder bracket (B) to reel arm (C). Retain hardware.



**Figure 3.130: Right Reel Arm Cylinder in Forward Position**

4. Push/pull the reel until bracket (B) lines up with the aft set of holes in the reel arm (C).
5. Reinstall the four nuts and bolts (A) and secure the cylinder bracket (B) to the reel arm at the new position.



**Figure 3.131: Right Reel Arm Cylinder in Aft Position**

### *Reposition the left reel arm cylinder as follows:*

#### **NOTE:**

Reel components not shown in illustrations for improved clarity.



## OPERATION

1. Remove pin (A) securing cylinder (B) to bracket/light assembly (C).
2. Remove nuts and bolts (D) securing bracket/light assembly (C) to the reel arm, and remove the bracket/light assembly.
3. If necessary, remove the cable tie securing the harness to bracket/light assembly (C) or to the reel arm.
4. Swivel the light to the working position as shown.

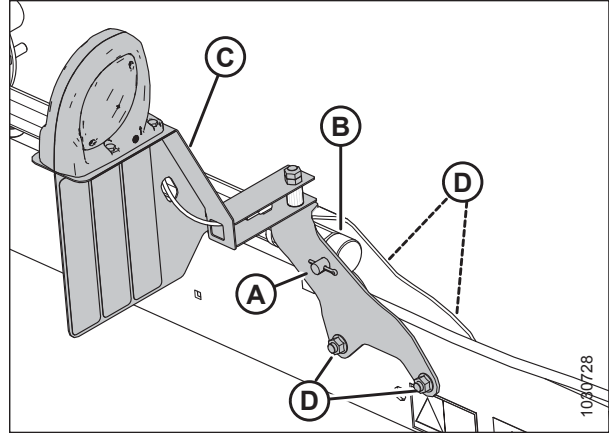


Figure 3.132: Left Reel Arm Cylinder in Forward Position

5. Reposition bracket/light assembly (C) on the reel arm as shown, and secure with four nuts and bolts (D). Tighten the hardware.
6. Push the reel back and attach cylinder (B) to bracket/light assembly (C) with pin (A). Secure the pin with a cotter pin.
7. Secure the light harness to bracket/light assembly (C) using a cable tie.
8. Check the reel clearance to the backsheet, the upper cross auger (if installed), and the reel braces.
9. Adjust the reel tine pitch if necessary. For instructions, refer to [3.8.11 Reel Tine Pitch, page 126](#).

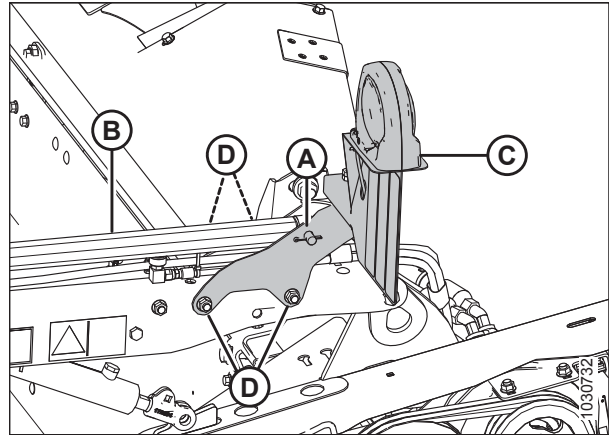


Figure 3.133: Left Reel Arm Cylinder in Aft Position

### *Repositioning Fore-Aft Cylinders on Double Reel*

The reel can be moved approximately 227 mm (9 in.) farther aft by repositioning the fore-aft cylinders on the reel arms. This may be desirable when straight-combining canola.

#### **NOTE:**

The Short Brace Kit for Center Reel Arm (MD #B5605) must be installed before repositioning the fore-aft cylinders.

If the Multi-Crop Rapid Reel Conversion option is installed, refer to [Repositioning Fore-Aft Cylinders with Multi-Crop Rapid Reel Conversion Option – Double Reel, page 121](#).

#### **NOTE:**

The Multi-Crop Rapid Reel Conversion option is **NOT** available for European-configured headers.

### **DANGER**

To avoid injury or death from unexpected start-up of machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

#### ***Reposition the center reel arm cylinder as follows:***

#### **NOTE:**

Some reel components are not shown in the illustrations for improved clarity.



## OPERATION

1. Position the reel fully aft with support arms horizontal.
2. Shut down the engine, and remove the key from the ignition.
3. Remove four nuts and bolts (A) securing cylinder bracket (B) to reel arm (C). Retain hardware.

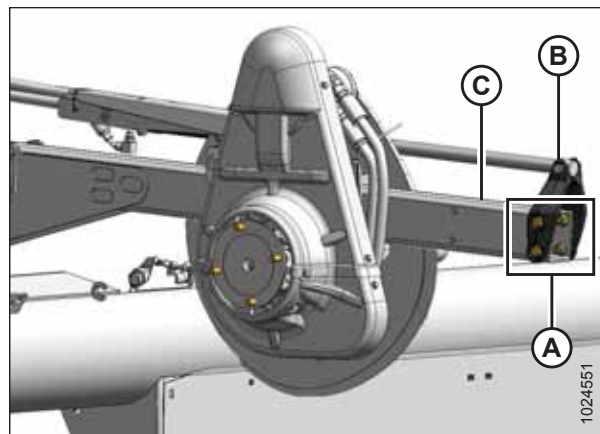


Figure 3.134: Center Arm – Forward Position

4. Push/pull reel until bracket (B) lines up with the aft set of holes in reel arm (C).
5. Reinstall four nuts and bolts (A) to secure bracket (B) to reel arm at new position.

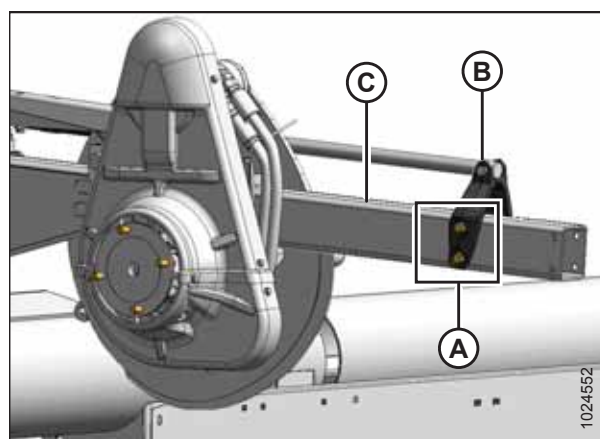


Figure 3.135: Center Arm – Aft Position

**Reposition the right reel arm cylinder as follows:**

### NOTE:

Some reel components are not shown in illustrations for improved clarity.

1. Remove four bolts (A) securing cylinder bracket (B) to reel arm (C).

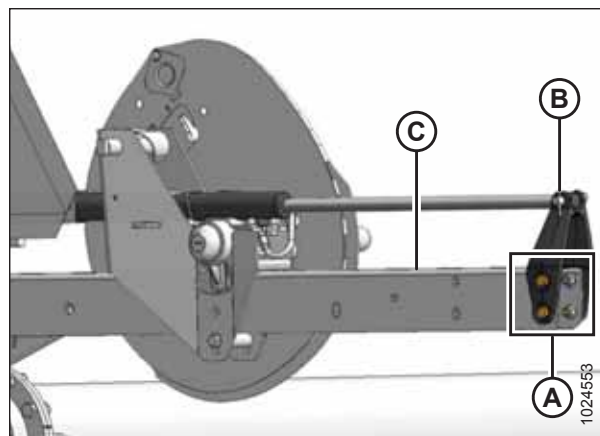


Figure 3.136: Right Reel Arm Cylinder in Forward Position

## OPERATION

2. Push the reel back until bracket (B) lines up with the aft set of holes in reel arm (C).
3. Reinstall four bolts (A) to secure the bracket to the reel arm at the new position.

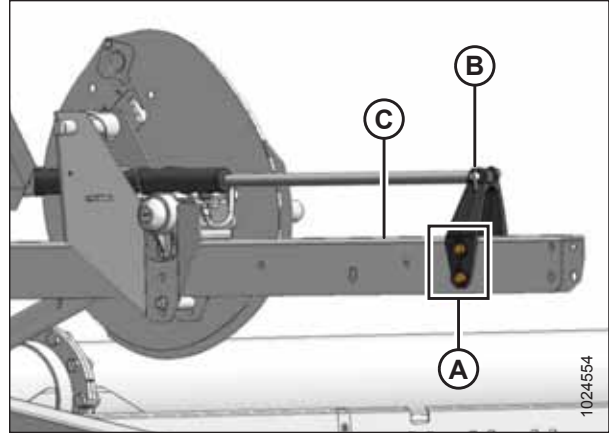


Figure 3.137: Right Reel Arm Cylinder in Aft Position

### **Reposition the left reel arm cylinder as follows:**

#### **NOTE:**

Some reel components are not shown in illustrations for improved clarity.

1. Remove pin (A) securing cylinder (B) to bracket/light assembly (C).
2. Remove four nuts and bolts (D) securing bracket/light assembly (C) to the reel arm and remove the bracket/light assembly. Retain the hardware.
3. Remove the cable tie (not shown) securing the harness to bracket/light assembly (C) or to the reel arm (if necessary).
4. Swivel the light to the working position as shown.

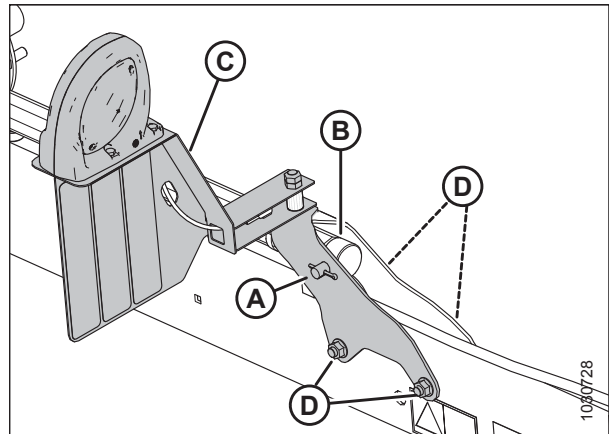


Figure 3.138: Left Reel Arm Cylinder in Forward Position

5. Reposition bracket/light assembly (C) onto the reel arm as shown, and secure using four nuts and bolts (D). Tighten the hardware.
6. Push the reel back and reinstall cylinder (B) onto bracket/light assembly (C) using pin (A). Secure the pin with a cotter pin.
7. Secure the light harness to bracket/light assembly (C) or to the reel arm using a cable tie (not shown).
8. Check reel clearance to the backsheet, the upper cross auger (if installed), and the reel braces.
9. Adjust reel tine pitch (if required). For adjustment procedures, refer to [3.8.11 Reel Tine Pitch, page 126](#).

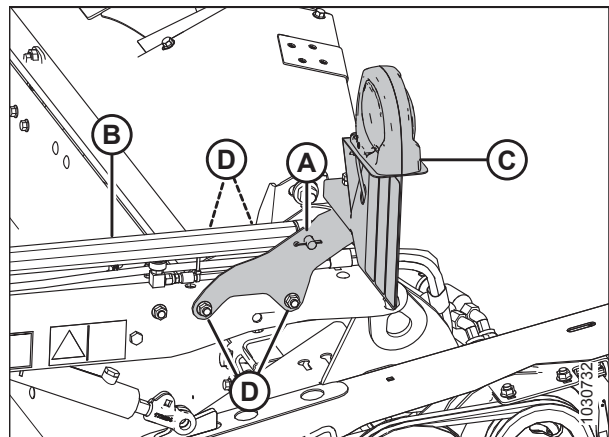


Figure 3.139: Left Reel Arm Cylinder in Aft Position

## OPERATION

### *Repositioning Fore-Aft Cylinders with Multi-Crop Rapid Reel Conversion Option – Double Reel*

The reel can be moved approximately 227 mm (9 in.) farther aft by repositioning the fore-aft cylinders on the reel arms. The Multi-Crop Rapid Reel Conversion option is applicable to **DOUBLE-REEL HEADERS ONLY**.

#### **NOTE:**

The Short Brace Kit for Center Reel Arm (MD #B5605) must be installed before repositioning the fore-aft cylinders.

#### **NOTE:**

Multi-Crop Rapid Reel Conversion option is **NOT** available for European-configured headers.

### **DANGER**

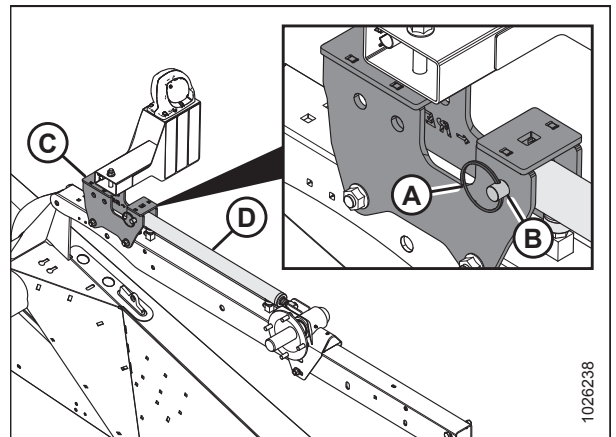
To avoid injury or death from unexpected start-up of machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

#### *Reposition the left reel arm cylinder as follows:*

#### **NOTE:**

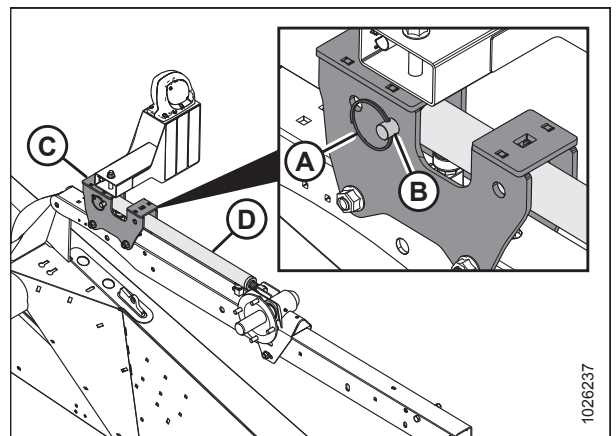
Some of the reel components are not shown in the illustrations for improved clarity.

1. Position the reel fully aft with the support arms horizontal.
2. Shut down the engine, and remove the key from the ignition.
3. Remove ring (A) and clevis pin (B) from the inboard side of bracket (C). Retain the ring and clevis pin.
4. Push the reel back until cylinder barrel (D) lines up with reel position 2 hole on the bracket.



**Figure 3.140: Left Reel Arm in Forward Position**

5. Reinstall clevis pin (B) at the new position and secure with ring (A).



**Figure 3.141: Left Reel Arm in Aft Position**

## OPERATION

### *Reposition the center reel arm cylinder as follows:*

6. Remove ring (A), clevis pin (B), and washers (C) from bracket (D). Retain the ring, clevis pin, and washers.

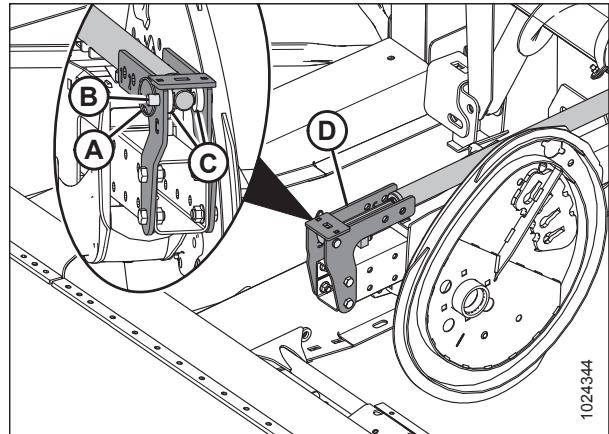


Figure 3.142: Center Reel Arm in Forward Position

7. Push the reel back until the end of cylinder (E) lines up with reel position 2 hole on bracket (D). Position washers (C) on both sides of the cylinder end inside the bracket.
8. Reinstall clevis pin (B) at the new position and secure with ring (A).

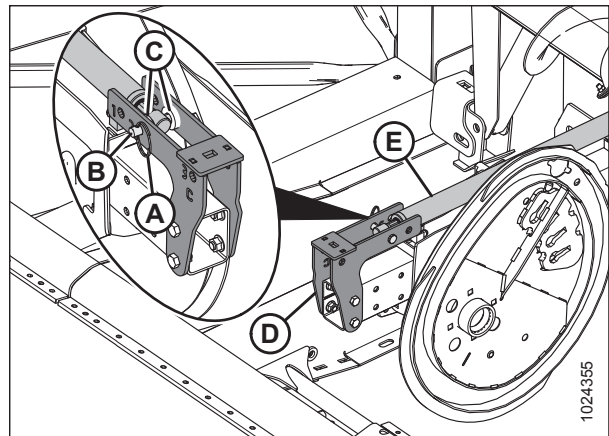


Figure 3.143: Center Reel Arm in Aft Position

### *Reposition the right reel arm cylinder as follows:*

9. Remove ring (A), clevis pin (B), and washers (C) from bracket (D). Retain the ring, clevis pin, and washers.
10. Push the reel back until the end of cylinder (E) lines up with reel position 2 hole on bracket (D).

#### **NOTE:**

The washers inside the center arm support bracket are not shown in the illustration at right.

11. Reinstall clevis pin (B) at the new position and secure with ring (A).

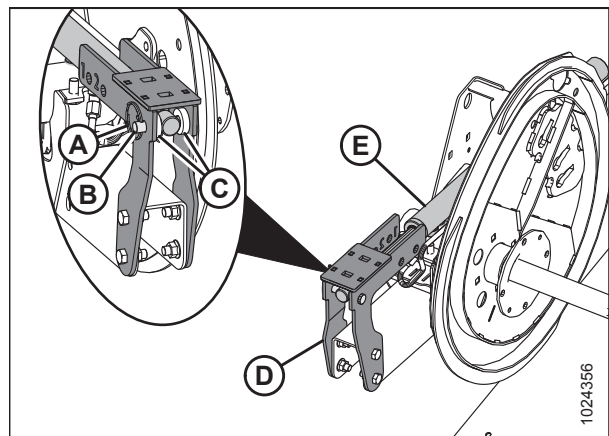


Figure 3.144: Right Reel Arm in Forward Position

## OPERATION

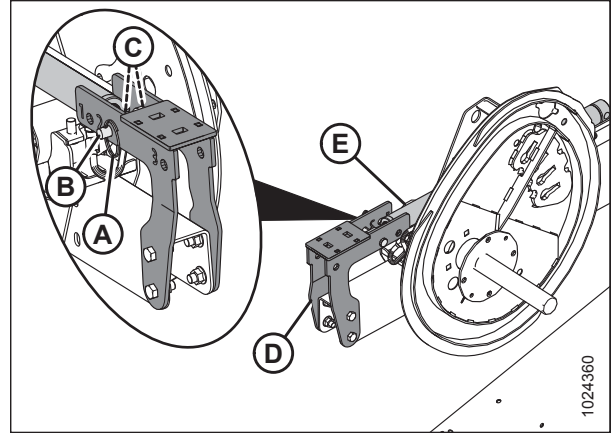


Figure 3.145: Right Reel Arm in Aft Position

### *Repositioning Fore-Aft Cylinders on European-Configured Headers – Double Reel*

The reel can be moved approximately 67 mm (2.6 in.) farther aft from the factory setting by repositioning the fore-aft cylinders on the reel arms. This may be desirable when straight-combining canola.

For instructions for repositioning the fore-aft cylinders on a non-European-configured header, refer to [Repositioning Fore-Aft Cylinders on Double Reel, page 118](#).

#### **Reposition center reel arm cylinder as follows:**

##### **NOTE:**

Some reel components are not shown in illustrations for improved clarity.

##### **NOTE:**

Reels on European-configured headers are at their most forward setting when cylinders are set in position 2 on the fore-aft arm brackets. Reels on these headers are in their most aft position when cylinders are set in position 1 on the fore-aft arm brackets.

1. Remove securing ring (A), pin (B), and the washers inside the center arm fore-aft support bracket (C). Retain the washers, pin, and ring.

##### **NOTE:**

The washers inside the center arm support bracket are not shown in illustration at right.

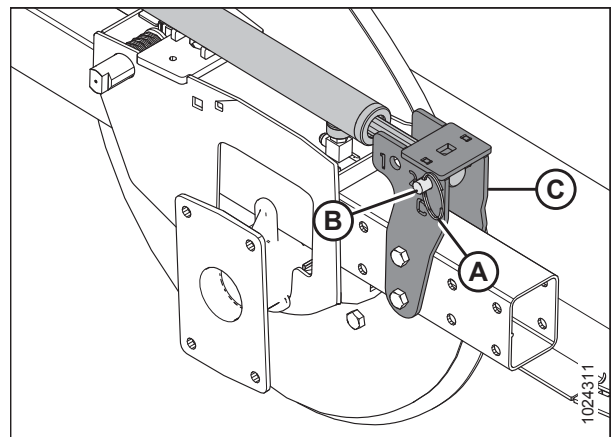


Figure 3.146: Center Reel Arm in Forward Position

## OPERATION

2. Push the reel back until the end of cylinder (A) lines up with aft setting holes (B) (position 1) in fore-aft support bracket (C). Position washers (D) on both sides of cylinder end (A) inside support bracket (C).

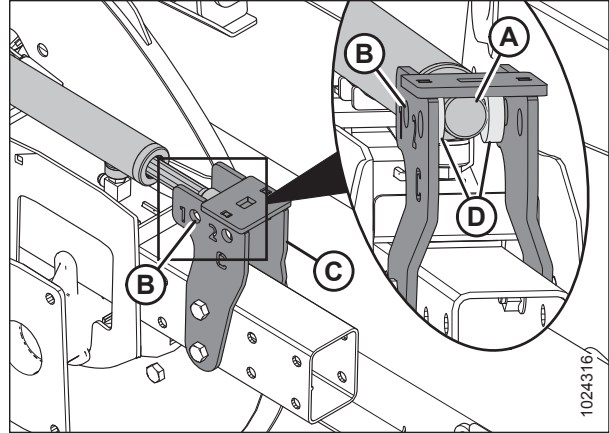


Figure 3.147: Center Reel Arm

3. Insert pin (A) and secure cylinder (B) and washers in center arm support bracket (C). Secure pin (A) with ring (D).

**NOTE:**

The washers inside center arm support bracket not shown in illustration at right.

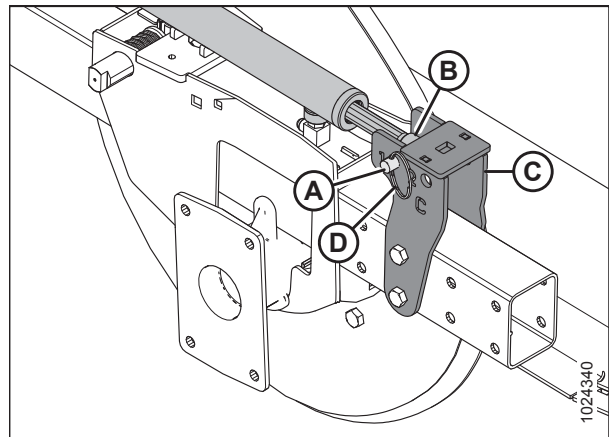


Figure 3.148: Center Reel Arm in Aft Position

**Reposition right reel arm cylinder as follows:**

4. Remove ring (A), pin (B), and washers (D) securing reel arm cylinder (C) to the interior of the right fore-aft arm bracket. Retain the washers, ring, and pin.

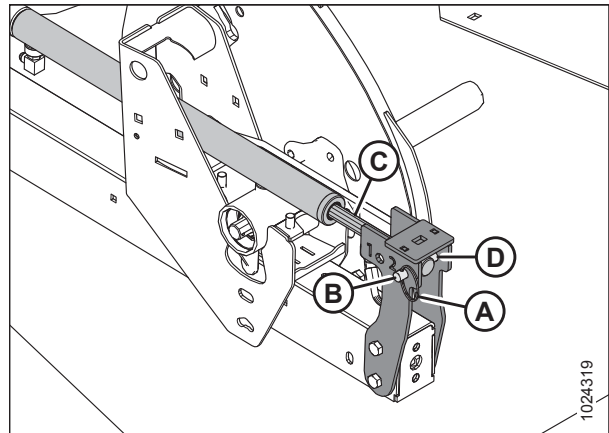


Figure 3.149: Right Reel Arm Cylinder in Forward Position

## OPERATION

5. Push the reel back until the end of cylinder (A) lines up with aft setting holes (B) in support bracket (C). Position washers (D) on both sides of cylinder end (A) inside support bracket (C).

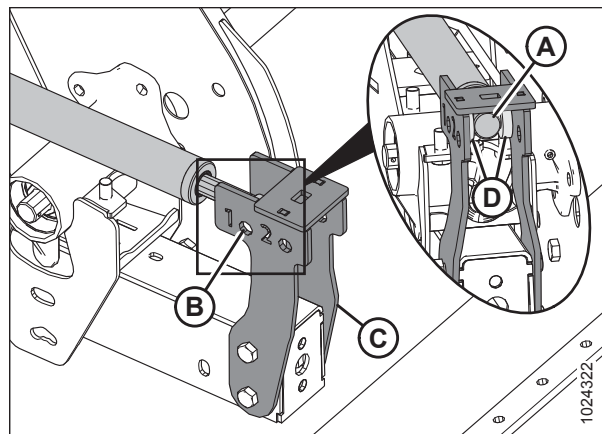


Figure 3.150: Right Reel Arm Cylinder

6. Insert pin (A) into the aft setting holes and through cylinder end (C) and washers (D). Secure the pin with ring (B).

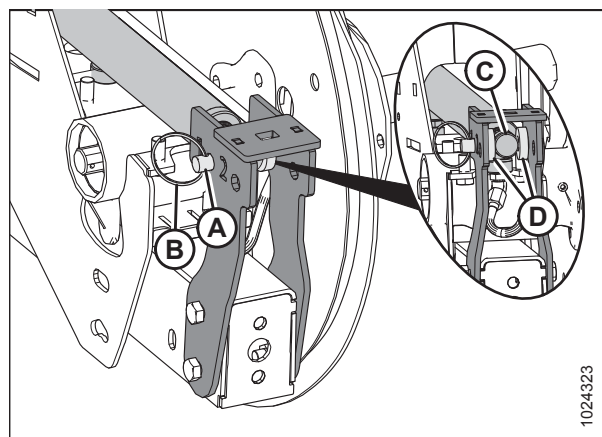


Figure 3.151: Right Reel Arm Cylinder in Aft Position

### ***Reposition left reel arm cylinder as follows:***

7. Remove ring (A) and pin (B) from inside left fore-aft support bracket (D) securing cylinder (C). Retain the pin and ring.

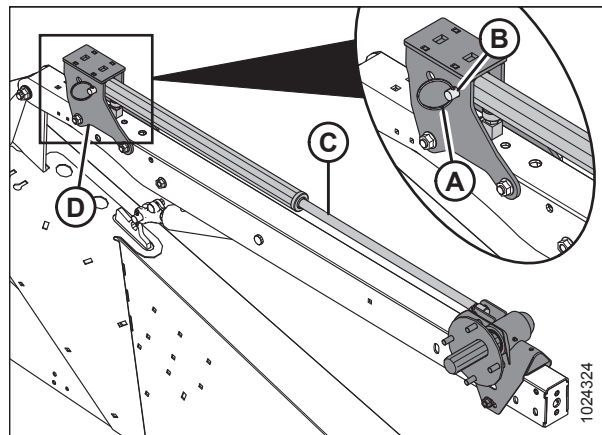


Figure 3.152: Left Reel Arm Cylinder in Forward Position



## OPERATION

8. Push the reel back toward the header until the end of cylinder (A) lines up with aft setting holes (B) in support bracket (C).

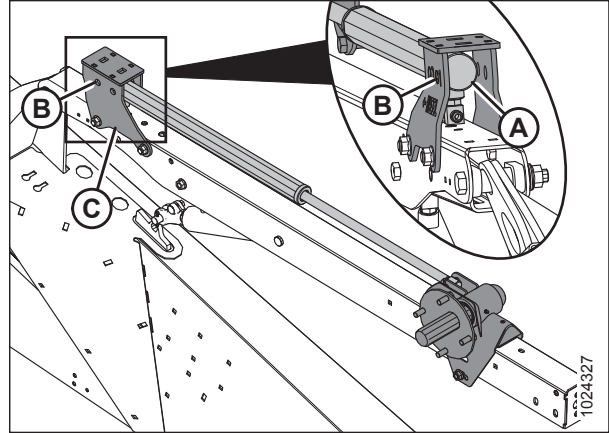


Figure 3.153: Left Reel Arm Cylinder

9. Insert clevis pin (A) into the aft setting holes in support bracket (B) and through the end of the cylinder (C). Secure the pin with ring (D).
10. Check reel clearance to the backsheet, the upper cross auger (if installed), and the reel braces.
11. Adjust the reel tine pitch if necessary. For instructions, refer to [3.8.11 Reel Tine Pitch, page 126](#).

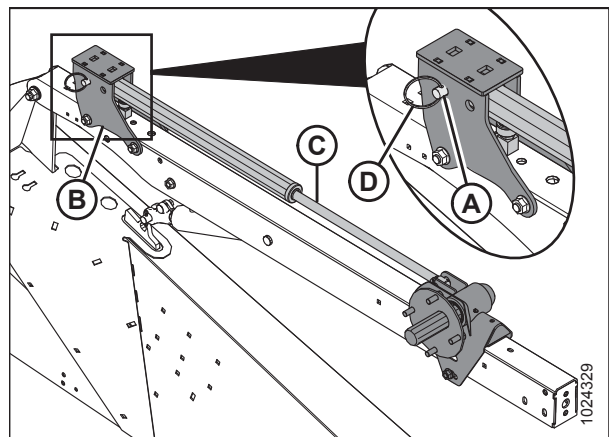


Figure 3.154: Left Reel Arm Cylinder in Aft Position

### 3.8.11 Reel Tine Pitch

The pick-up reel is designed to pick up flattened and severely lodged crops. Because the cam setting is mainly used to determine how the crop gets delivered onto the drapers, it is not always necessary to increase the tine pitch (select a higher cam setting) to pick up lodged crops.

#### IMPORTANT:

The following describes the conceptual and operational guidelines of the pick-up reel. Please read carefully before operating the machine.

The positioning of the fingers relative to the ground (tine pitch) is not significantly affected by the cam setting. For example, with the cam position range at 33°, the corresponding finger pitch range is only 5° at the lowest point of the reel's rotation.

For the best results, use the minimum cam setting that delivers the crop past the rear edge of the cutterbar and onto the drapers. For more information, refer to [3.7.2 Header Settings, page 43](#).

#### *Reel Cam Settings*

The cam position is used to adjust the reel fingers release point of the crop at the back of the reel to the drapers.

The following outlines the function of each cam setting and provides set-up guidelines for various crop conditions.

The setting numbers are visible above the slots on the cam disc. For instructions, refer to [Adjusting Reel Cam, page 128](#).



## OPERATION

### NOTE:

For recommended reel tine pitch in specific crops and crop conditions. For instructions, refer to [3.7.2 Header Settings, page 43](#)

**Cam Position 1, Reel Position 6 or 7** delivers the most even crop flow onto the drapers without fluffing or disturbing the material.

- This setting will release crop close to the cutterbar and works best if the cutterbar is on the ground.
- Some crops will not be delivered past the cutterbar when the cutterbar is raised off the ground and the reel is pushed forward; therefore, set the initial reel speed approximately equal to the ground speed.

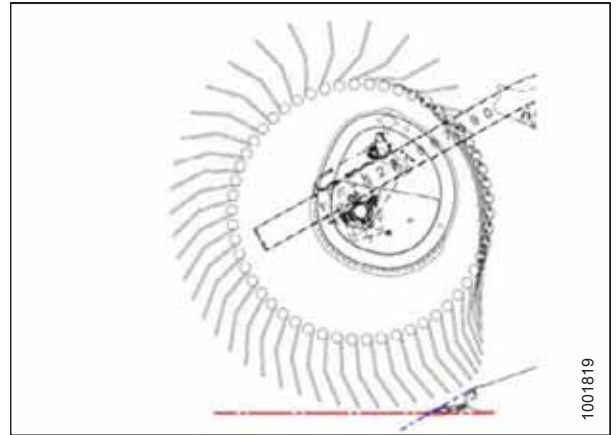


Figure 3.155: Finger Profile – Position 1

**Cam Position 2, Reel Position 3 or 4** is the recommended starting position for most crops and conditions.

- If the crop is stalling on the cutterbar when the reel is in the forward position, increase the cam setting to push the crop past the rear edge of the cutterbar.
- If the crop is getting fluffed or if there is a disruption to the flow across the drapers, decrease the cam setting.
- This setting generates a fingertip speed that is approximately 20% faster than the reel speed.

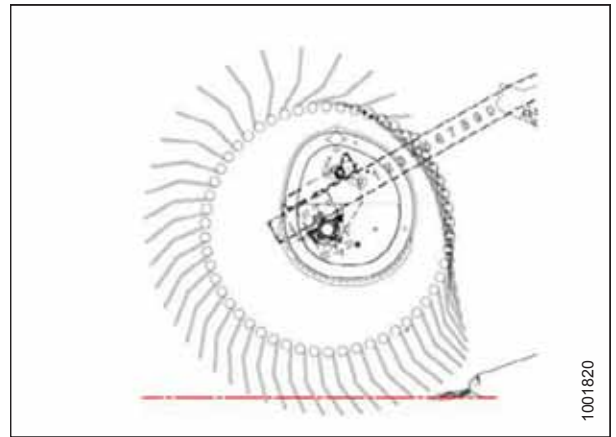


Figure 3.156: Finger Profile – Position 2

**Cam Position 3, Reel Position 6 or 7** is mainly used to leave long stubble.

- This position allows the reel to reach forward and lift the crop across the knife and onto the drapers.
- This setting generates a fingertip speed that is approximately 30% faster than the reel speed.

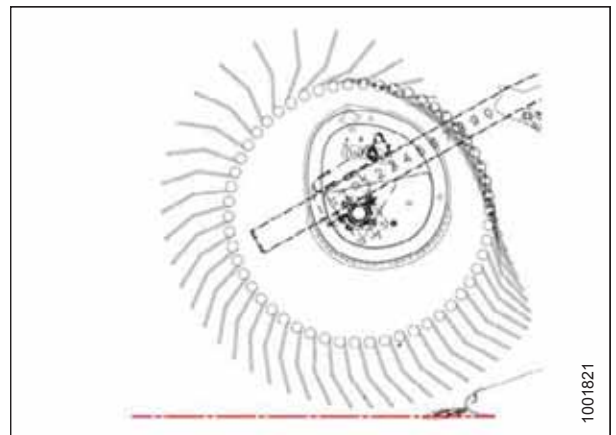


Figure 3.157: Finger Profile – Position 3

## OPERATION

**Cam Position 4, Reel Position 2 or 3** is used with the reel fully forward to leave the maximum amount of stubble in lodged crops.

- This position allows the reel to reach forward and lift the crop across the knife and onto the drapers.
- This setting generates a fingertip speed that is approximately 35% faster than the reel speed.

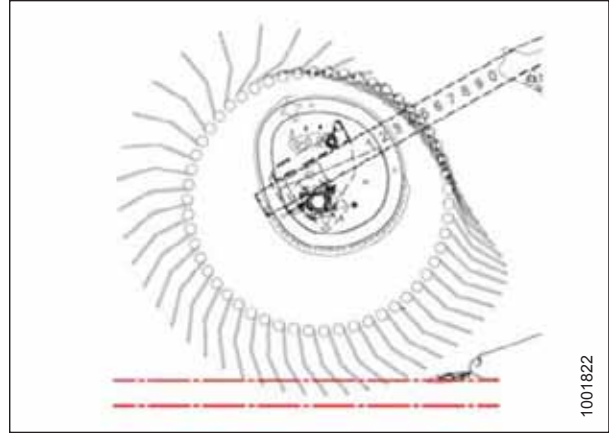


Figure 3.158: Finger Profile – Position 4

**Cam Position 4, Header Angle at Maximum, and Reel Fully Forward** provides the maximum amount of reel reach below the cutterbar to pick up lodged crops.

- Leaves a significant amount of stubble when cutting height is set to approximately 203 mm (8 in.). In damp materials such as rice, it is possible to double the ground speed because of the reduction of cut material.
- This setting generates a fingertip speed that is approximately 35% faster than the reel speed.

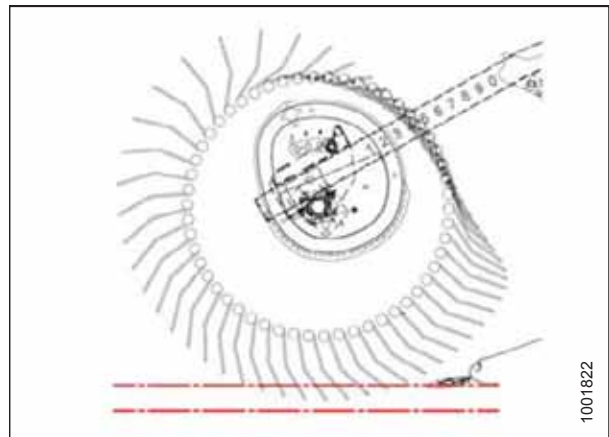


Figure 3.159: Finger Profile – Position 4

### NOTE:

Higher cam settings with the reel fore-aft position set between 4–5 sharply decrease the draper capacity because the reel disrupts the crop flow across the drapers and the fingers engage the crop that is moving on the drapers. High cam settings are recommended only with the reel at, or close to, full forward settings.

### Adjusting Reel Cam

The pick-up reel is designed to pick up flattened and severely lodged crops. Adjustment maybe required as crop conditions change.

### DANGER

To avoid injury or death from unexpected start-up of machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

### IMPORTANT:

The reel to cutterbar clearance should always be checked following adjustments to reel tine pitch and reel fore-aft positions. For information, refer to [5.13.1 Reel Clearance to Cutterbar, page 536](#).

### NOTE:

If there are multiple reel cams, the adjustments need to be made on all of the reel cams.

## OPERATION

1. Turn latch pin (A) counterclockwise using a 3/4 in. wrench to release the cam disc.
2. Use the wrench on bolt (B) to rotate the cam disc and align latch pin (A) with the desired cam disc hole position (C) (1 to 4).

### NOTE:

Bolt (B) is positioned through the cam disc (transparent view shown in illustration for improved clarity).

3. Turn latch pin (A) clockwise to engage and lock the cam disc.

### IMPORTANT:

Ensure the cam is secured into position before operating the machine.

4. Repeat the above procedure for the next reel(s).

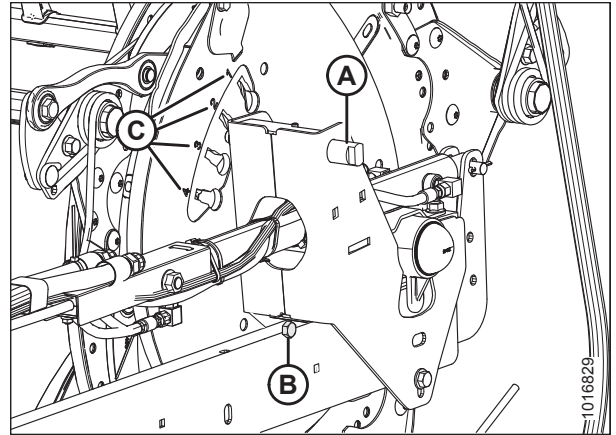


Figure 3.160: Cam Disc Positions

### 3.8.12 Crop Dividers

Crop dividers are used to help divide the crop when harvesting. They are removable to allow installation of vertical knives and to decrease transport width.

#### *Removing Crop Dividers with Latch Option from Header*



### DANGER

To avoid bodily injury or death from the unexpected start-up or fall of raised machine, always stop the engine, remove the key, and engage the safety props before going under the header for any reason.

1. Lower the reel fully. For instructions, refer to your combine operator's manual.
2. Raise the header fully. For instructions, refer to your combine operator's manual.
3. Shut down the engine, and remove the key from the ignition.
4. Engage the safety props. For instructions, refer to your combine operator's manual.
5. Open the endshield. For instructions, refer to [Opening Endshields, page 35](#).
6. Lift safety lever (A).
7. Hold onto crop divider (B), push lever (C) to open the latch, and lower the crop divider.

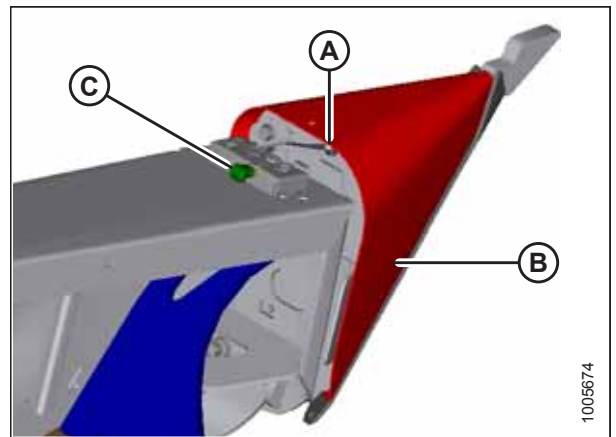


Figure 3.161: Crop Divider

## OPERATION

8. Lift the crop divider off of the endsheet and store it as follows:
  - a. Insert pin (A) on the crop divider into the hole in the endsheet at the location shown.
  - b. Lift the crop divider and position lugs (B) on the crop divider into the bracket on endsheet. Ensure the lugs engage the bracket.
9. Close the endshield. For instructions, refer to [Closing Endshields, page 36](#).

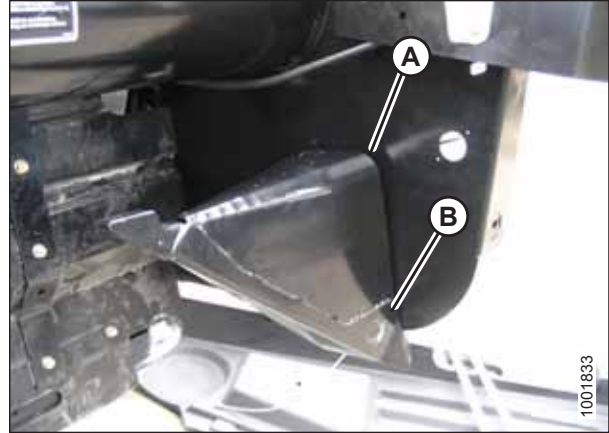


Figure 3.162: Stored Crop Divider

### *Removing Crop Dividers without Latch Option from Header*

#### **⚠ DANGER**

To avoid bodily injury or death from the unexpected start-up or fall of raised machine, always stop the engine, remove the key, and engage the safety props before going under the header for any reason.

1. Lower the reel fully. For instructions, refer to your combine operator's manual.
2. Raise the header fully. For instructions, refer to your combine operator's manual.
3. Shut down the engine, and remove the key from the ignition.
4. Engage the safety props. For instructions, refer to your combine operator's manual.
5. Open the endshield. For instructions, refer to [Opening Endshields, page 35](#).
6. Remove bolt (A), lock washer, and flat washer.
7. Lower crop divider (B), then lift it to remove it from the endsheet.
8. Close the endshield. For instructions, refer to [Closing Endshields, page 36](#).

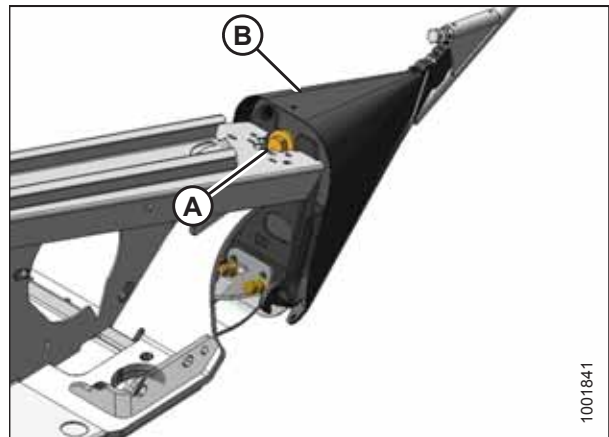


Figure 3.163: Crop Divider

### *Installing Crop Dividers with Latch Option onto Header*

#### **⚠ DANGER**

To avoid bodily injury or death from the unexpected start-up or fall of raised machine, always stop the engine, remove the key, and engage the safety props before going under the header for any reason.

1. Lower the reel fully. For instructions, refer to your combine operator's manual.
2. Raise the header fully. For instructions, refer to your combine operator's manual.

## OPERATION

3. Shut down the engine, and remove the key from the ignition.
4. Engage the safety props. For instructions, refer to your combine operator's manual.
5. Open the endshield. For instructions, refer to *Opening Endshields, page 35*.
6. Remove the crop divider from its storage location by lifting the crop divider to disengage lugs (A) at the lower end. Then lower it slightly to disengage pin (B) from the endsheet.

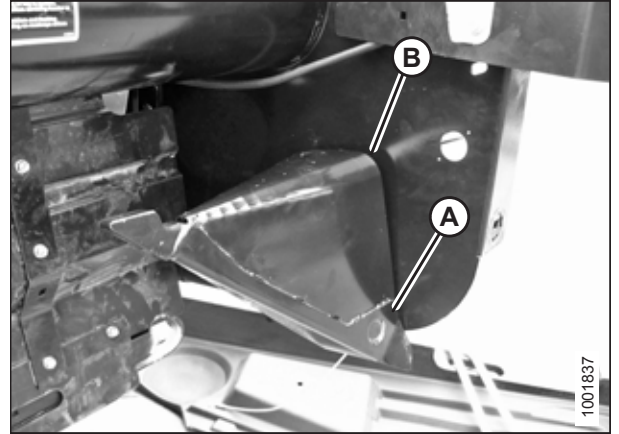


Figure 3.164: Stored Crop Divider

7. Position the crop divider as shown by inserting lugs (A) into the holes in the endsheet.
8. Lift the forward end of the crop divider until pin (B) at top of the crop divider engages and closes latch (C).
9. Push safety lever (D) downwards to lock the pin into latch (C).

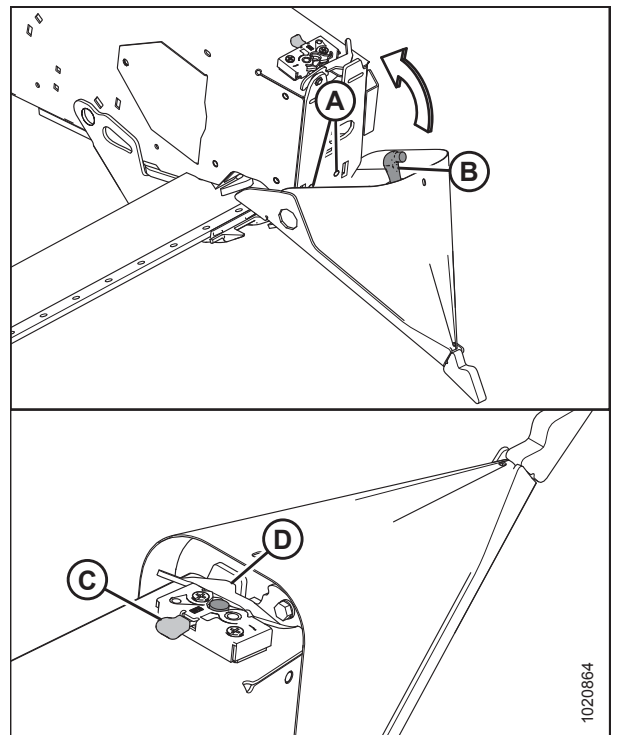


Figure 3.165: Crop Divider

## OPERATION

10. Pull the tip of the crop divider to ensure there is no lateral movement. If necessary, adjust bolts (A) to tighten the crop divider and eliminate any lateral movement.
11. Close the endshield. For instructions, refer to [Closing Endshields, page 36](#).

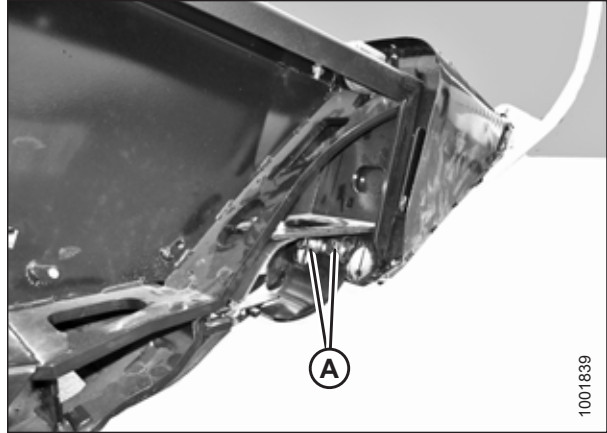


Figure 3.166: Crop Divider

### *Installing Crop Dividers without Latch Option onto Header*

#### **DANGER**

To avoid bodily injury or death from the unexpected start-up or fall of raised machine, always stop the engine, remove the key, and engage the safety props before going under the header for any reason.

1. Lower the reel fully. For instructions, refer to your combine operator's manual.
2. Raise the header fully. For instructions, refer to your combine operator's manual.
3. Shut down the engine, and remove the key from the ignition.
4. Engage the safety props. For instructions, refer to your combine operator's manual.
5. Open the endshield. For instructions, refer to [Opening Endshields, page 35](#).
6. Remove the crop divider from the storage location by lifting the crop divider to disengage lugs (A) at the lower end and then lowering it slightly to disengage pin (B) from the endsheet.

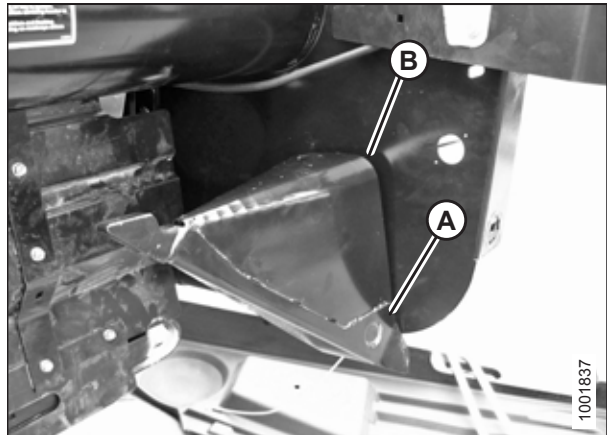


Figure 3.167: Stored Crop Divider



## OPERATION

- Position the crop divider as shown by inserting lugs (A) into the holes in the endsheet.

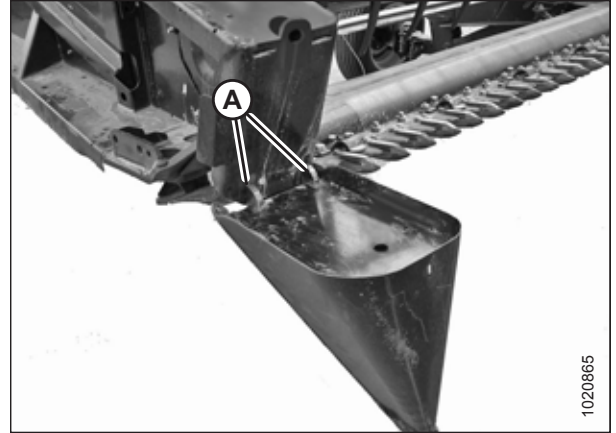


Figure 3.168: Crop Divider

- Lift the forward end of the crop divider and install bolt (A), and special stepped washer (B) (step towards divider). Tighten the bolt.
- Pull on the tip of the crop divider to ensure there is no lateral movement. If necessary, adjust bolts (C) to tighten the crop divider and eliminate any lateral movement.
- Close the endshield. For instructions, refer to [Closing Endshields, page 36](#).

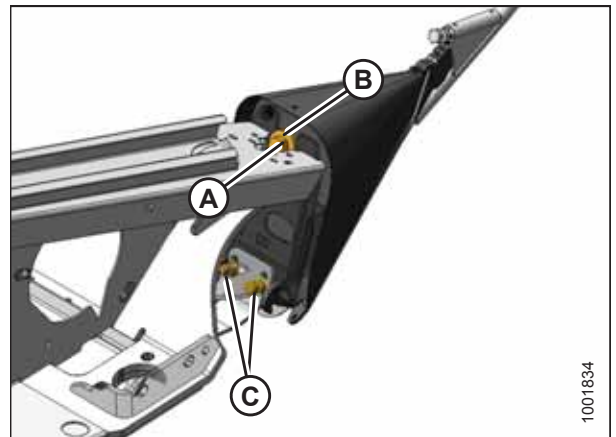


Figure 3.169: Crop Divider

### 3.8.13 Crop Divider Rods

Crop divider rods are used in conjunction with crop dividers. The removable crop divider rods are most useful when crop is bushy or down. In standing crops, using only crop dividers is recommended.

Table 3.20 Crop Divider Rods Recommended Use

With Divider Rods		Without Divider Rods
Alfalfa	Lodged cereal	Edible beans
Canola	Peas	Milo
Flax	Soybeans	Rice
Grass seed	Sudan grass	Soybeans
Lentils	Winter forage	Standing cereal

## OPERATION

### Removing Crop Divider Rods

1. Loosen bolt (A) and remove crop divider rod (B) from both sides of the header.

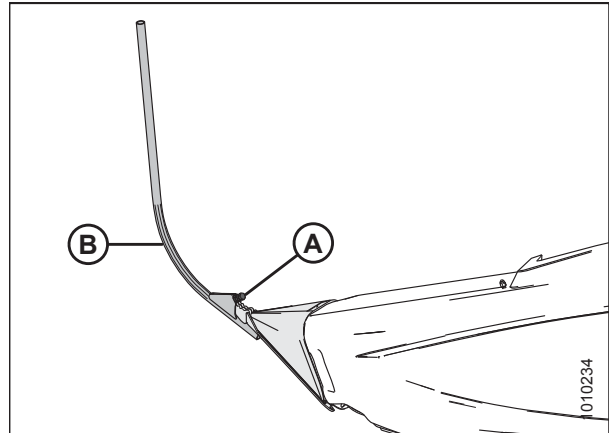


Figure 3.170: Crop Divider Rod

2. Store both crop divider rods (A) inboard on the right endsheet.

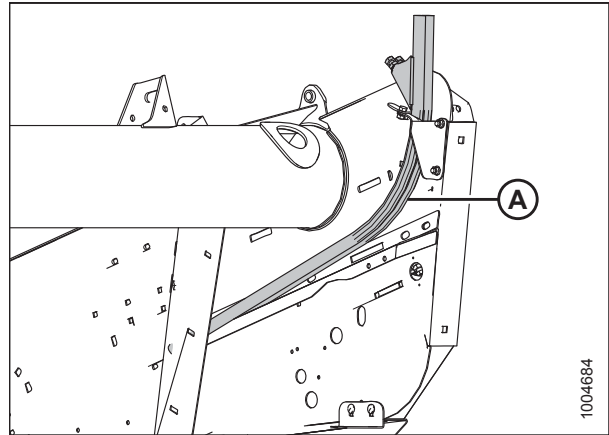


Figure 3.171: Right Endsheets

### Installing Crop Divider Rods

1. Remove crop divider rods (A) from their storage location on the inboard of the side endsheet.

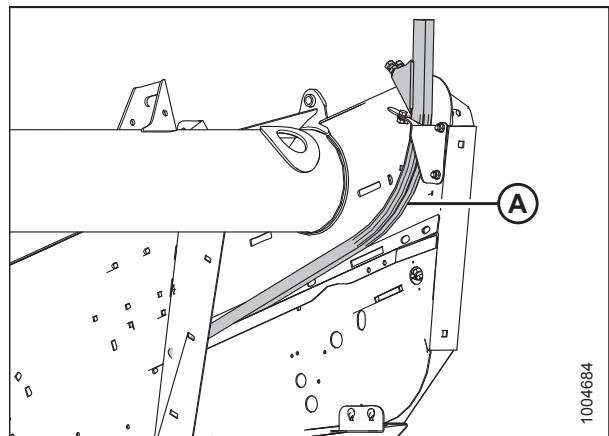


Figure 3.172: Right Endsheets



## OPERATION

2. Position crop divider rod (B) on the tip of the crop divider as shown and tighten bolt (A).
3. Repeat procedure at opposite end of header.

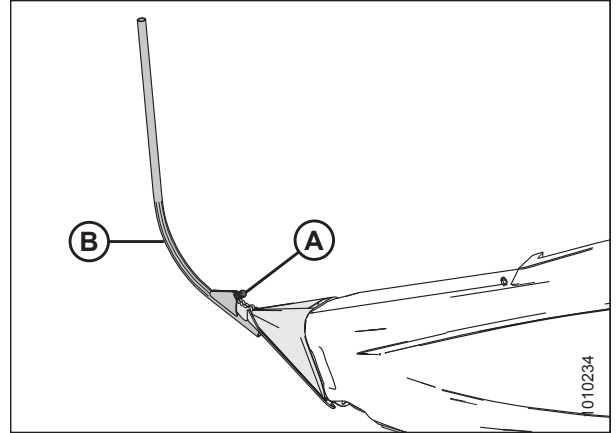


Figure 3.173: Divider Rod on Crop Divider

### *Rice Divider Rods*

Optional rice divider rods provide improved performance in tall and tangled rice crops. The installation and removal procedures for these rods are the same as the installation and removal procedures for standard crop divider rods. For more information, refer to [6.5.10 Rice Divider Rods, page 596](#).



Figure 3.174: Divider Rod for Rice

### 3.8.14 Setting Feed Auger Position

The auger position has two settings—floating and fixed. The factory setting is the floating position, and is recommended for most crop conditions.

#### **DANGER**

To avoid bodily injury or death from the unexpected start-up or fall of raised machine, always stop the engine, remove the key, and engage the safety props before going under the header for any reason.

## OPERATION

Auger float adjustment arms (A) are located at the bottom left and bottom right of the float module.

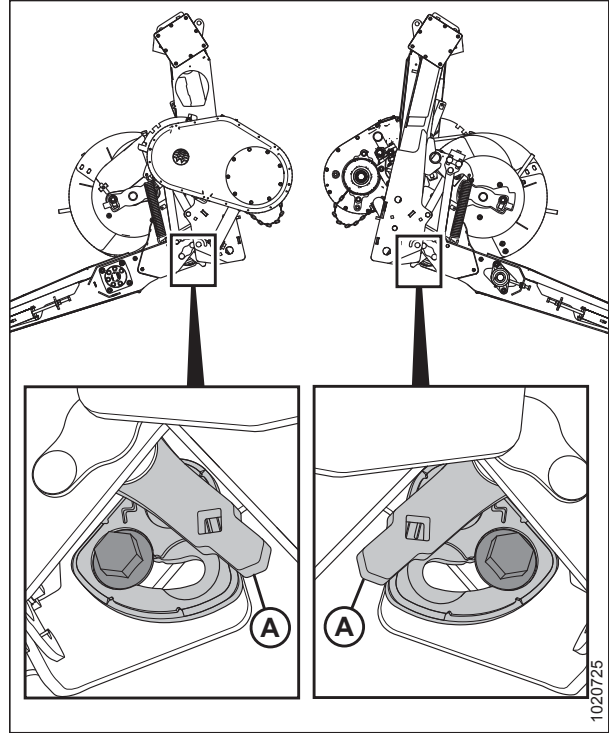


Figure 3.175: Auger Float Adjustment Arms

If bolt (A) is next to floating symbol (B), the auger is in the floating position. If bolt (A) is next to fixed symbol (C), the auger is in the fixed position.

### CAUTION

Make sure the left and right brackets are set to the same position; two bolts (A) must be in the same location to prevent damage to the machine during operation.

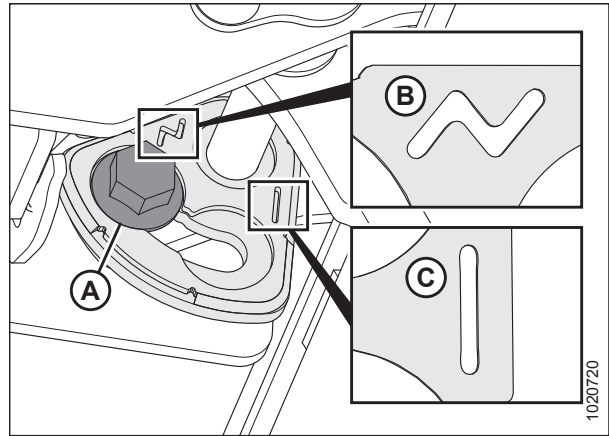


Figure 3.176: Auger Float Positions

## OPERATION

To set the auger position, follow these steps:

1. Extend the center-link to the steepest header angle.
2. Raise the header to full height, and engage the safety props.
3. Shut down the engine, and remove the key from the ignition.
4. Using a 21 mm wrench, loosen bolt (A) until the bolt head is clear of bracket (B).

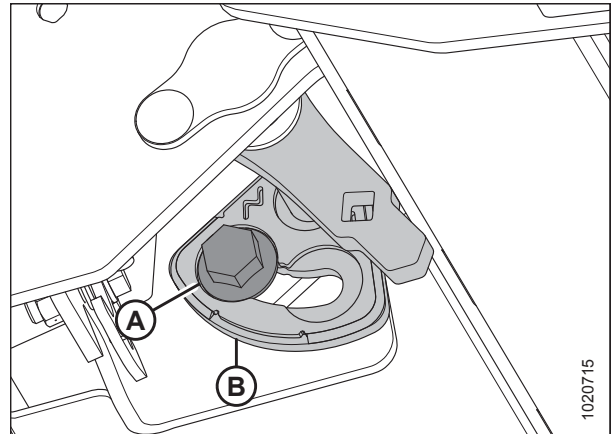


Figure 3.177: Left Auger Float Adjustment Arm

5. Using the same wrench, move arm (B) forward until bolt (A) is in the slot on the bracket next to fixed symbol (C). The arm can also be moved using a breaker bar in square hole (D).

**NOTE:**

If changing the auger position from fixed to floating, move the arm in the opposite direction.

6. Tighten bolt (A) to 122 Nm (90 lbf-ft).

**IMPORTANT:**

Bolts (A) must be properly seated in the recess on the bracket before tightening the bolt. If arm (B) can be moved after tightening the bolt, then bolt (A) is not seated properly.

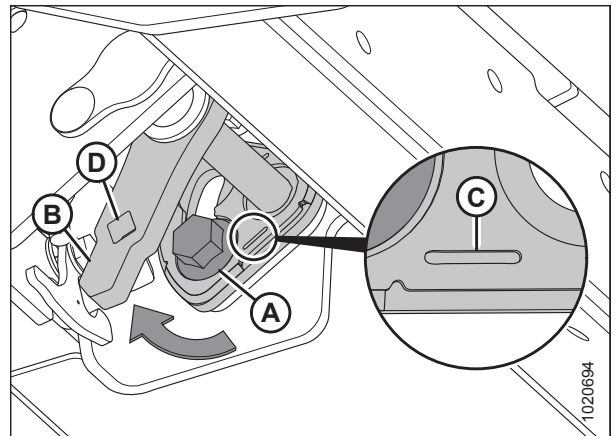


Figure 3.178: Left Auger Float Adjustment Arm

7. Repeat on the opposite side.

**IMPORTANT:**

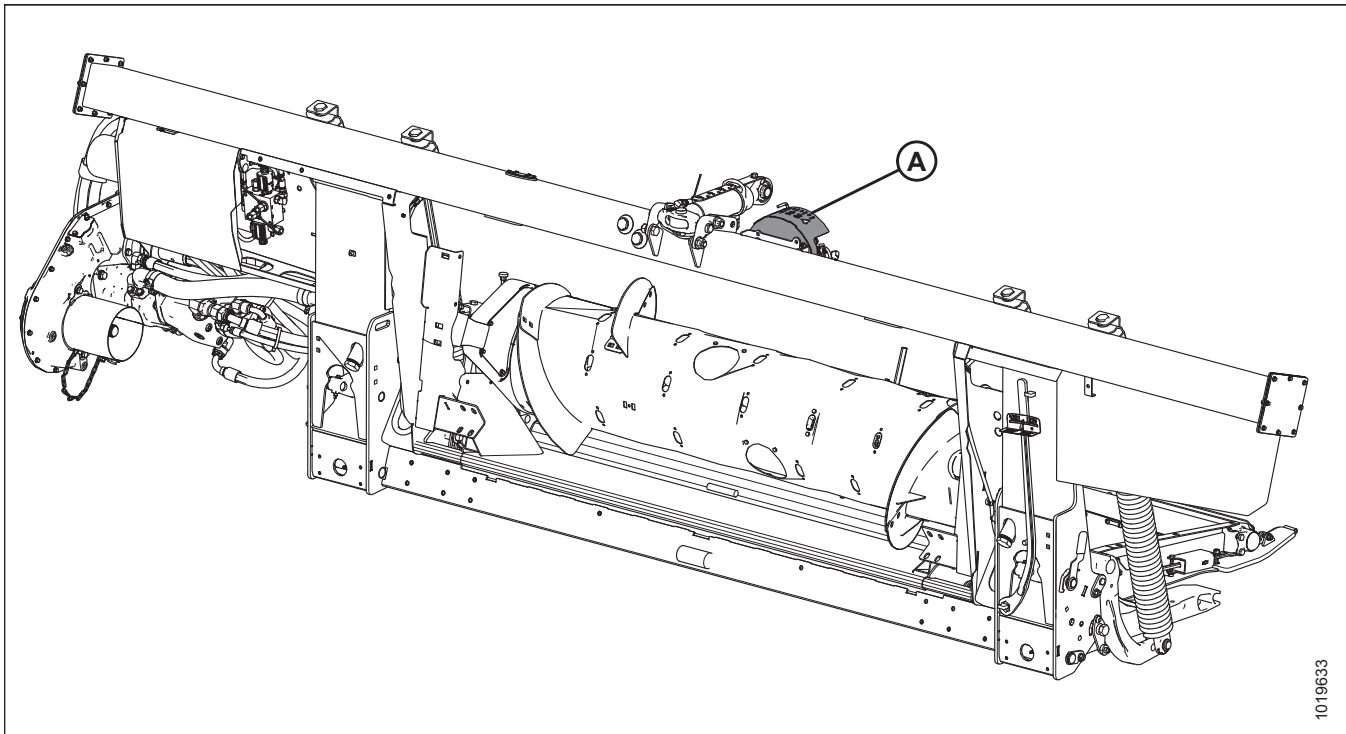
Bolt (A) on each side of the float module must be in the same position to prevent damage to the machine during operation.

### 3.9 Auto Header Height Control

MacDon's auto header height control (AHHC) feature works in conjunction with the AHHC option available on certain combine models.

A sensor is installed in float indicator box (A) on the FM100 Float Module. This sensor sends a signal to the combine allowing it to maintain a consistent cutting height and an optimum float as the header follows ground contours. A lateral tilt two-sensor system is also available as an optional kit.

For more information, refer to [6 Options and Attachments, page 581](#).



**Figure 3.179: FM100 Float Module**

FM100 Float Modules are factory-equipped for AHHC; however, before using the AHHC feature, you must do the following:

1. Ensure that the AHHC sensor's output voltage range is appropriate for the combine. For more information, refer to [3.9.3 Sensor Output Voltage Range – Combine Requirements, page 140](#).
2. Prepare the combine to use the AHHC feature (applies only to some combine models—refer to the following instructions for your combine).
3. Calibrate the AHHC system so that the combine can correctly interpret data from the height sensor on the float module (refer to the following instructions for your combine).

**NOTE:**

Once calibration is complete, you are ready to use the AHHC feature in the field. Individual combine settings can improve AHHC performance (refer to your combine instruction manual).

Refer to the following instructions for your specific combine model:

- [3.9.4 AGCO IDEAL™ Series Combines, page 150](#)
- [3.9.5 Case IH 5088/6088/7088 Combines, page 162](#)
- [3.9.7 Case IH 7010/8010, 120, 230, 240, and 250 Series Combines, page 173](#)
- [3.9.8 Challenger and Massey Ferguson 6 and 7 Series Combines, page 188](#)

## OPERATION

- [3.9.9 CLAAS 500 Series Combines, page 196](#)
- [3.9.10 CLAAS 600 and 700 Series Combines, page 205](#)
- [3.9.12 Gleaner R65/R66/R75/R76 and S Series Combines, page 226](#)
- [3.9.13 Gleaner S9 Series Combines, page 235](#)
- [3.9.14 John Deere 60 Series Combines, page 248](#)
- [3.9.15 John Deere 70 Series Combines, page 255](#)
- [3.9.16 John Deere S and T Series Combines, page 262](#)
- [3.9.18 New Holland Combines – CR/CX Series – 2014 and Prior, page 293](#)
- [3.9.19 New Holland Combines – CR Series – 2015 and Later, page 302](#)

### 3.9.1 Sensor Operation

The position sensors supplied with the auto header height control (AHHC) system are hall-effect sensors. Normal operating signal voltages for the sensors fall between 10% (0.5 VDC) and 90% (4.5 VDC). An increase in sensor voltage correlates to a decrease in ground pressure, or if you are cutting off the ground on gauge wheels, an increase in the header cut height.

Sensor errors result in a 0 V signal, indicating a faulty sensor, incorrect supply voltage, or a damaged wiring harness.

### 3.9.2 Troubleshooting Auto Header Height / Float Indicator

Use [Table 3.21, page 140](#) and [Figure 3.180, page 139](#) to determine the recommended repair procedure:

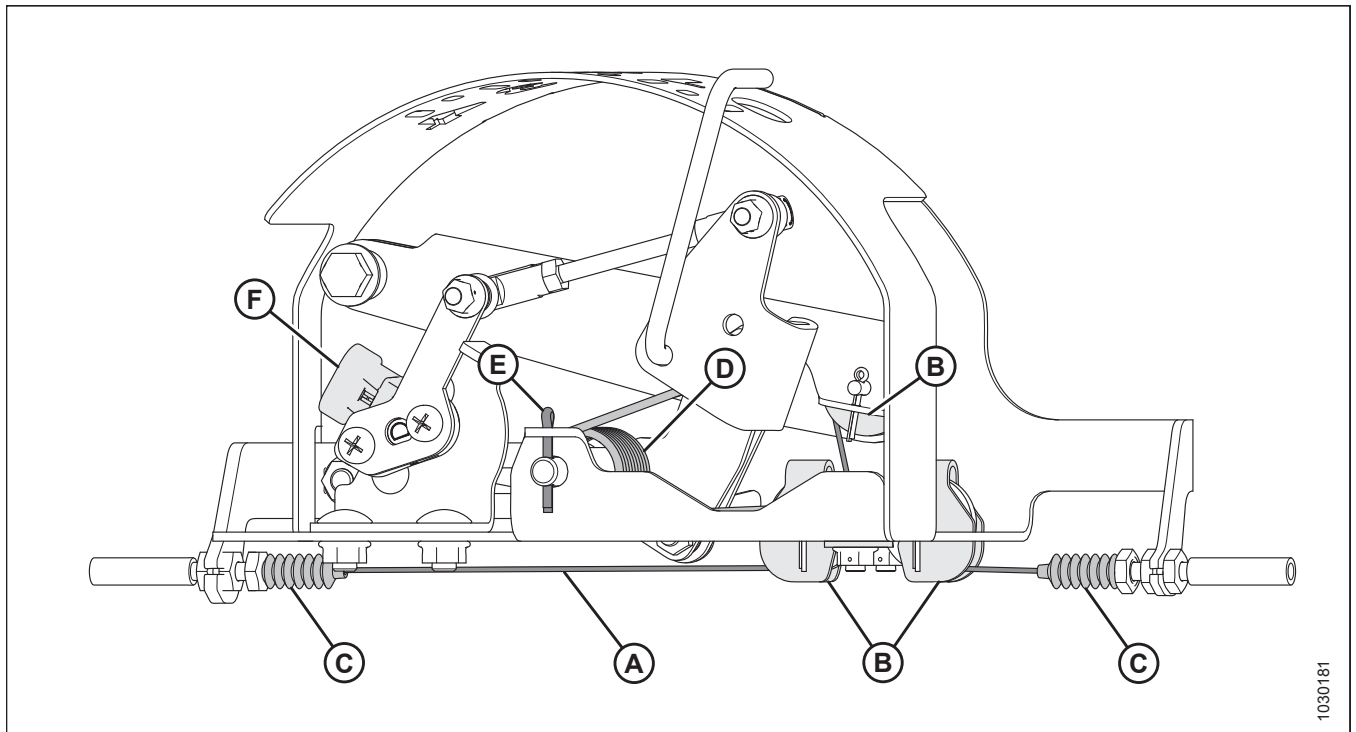


Figure 3.180: Float Indicator

1030181

## OPERATION

**Table 3.21 Auto Header Height / Float Indicator Troubleshooting**

Problem	Solution	Refer to
<b>Symptom: Float indicator not moving</b>		
Cable (A) is frayed	Replace cable.	See your MacDon Dealer
Excessive material built up inside float indicator / auto header height frame	Clean out material.	—
Cable (A) fell off of pulleys (B)	Check pulleys and replace them if necessary.	—
Rubber sheath (C) came off of cable (A) and got caught on the pulley	Install cable ties around the rubber sheath and cable to secure it.	—
Spring (D) seized from corrosion	Replace spring.	—
Cotter pin (E) has broken and the pin spins	Check for seized pin in bore, clean if necessary, and then replace cotter pin.	—
Voltage range too low or high	Adjust voltage range.	<a href="#">3.9.3 Sensor Output Voltage Range – Combine Requirements, page 140</a>
Faulty sensor (F)	Replace sensor.	See your MacDon Dealer

### 3.9.3 Sensor Output Voltage Range – Combine Requirements

The auto header height control (AHHC) sensor output must be within a specific voltage range for each combine, or the AHHC feature will not work properly.

**Table 3.22 Combine Voltage Limits**

Combine	Low Voltage Limit	High Voltage Limit	Range
AGCO IDEAL™ Series	0.5 V	4.5 V	2.5 V
Case IH 5088/6088/7088, 5130/6130/7130, 7010/8010, 7120/8120/9120, 7230/8230/9230, and 7240/8240/9240	0.5 V	4.5 V	2.5 V
Case IH 2588/2577	2.8 V	7.2 V	4.0 V
Challenger, Gleaner A, and Massey Ferguson	0.5 V	4.5 V	2.5 V
CLAAS 500/600/700 Series, 7000/8000 Series, and Tucano Series	0.5 V	4.5 V	2.5 V
Gleaner R and S Series	0.5 V	4.5 V	2.5 V
John Deere 60, 70, S, and T Series	0.5 V	4.5 V	2.5 V
New Holland CR/CX - 5 V system	0.7 V	4.3 V	2.5 V
New Holland CR/CX - 10 V system	2.8 V	7.2 V	4.1–4.4 V

**NOTE:**

Some combine models do not support checking sensor output voltage from the cab (early Case 23/2588 series, CLAAS 500/600/700 Series). For these models, check output voltage manually. For instructions, refer to [Manually Checking Voltage Range – One-Sensor System, page 141](#) or [Manually Checking Voltage Range – Two-Sensor System, page 144](#).

## OPERATION

### 10 Volt Adapter (MD #B6421) – New Holland Combines Only

New Holland combines with a 10 V system require the 10 V adapter (MD #B6421) for proper calibration of the auto header height control (AHHC) feature.

If a 10 V New Holland combine does not have the adapter (A) installed, the AHHC output will always read 0 V, regardless of sensor position.

**NOTE:**

A 10 V adapter is not available for the optional two-sensor system.

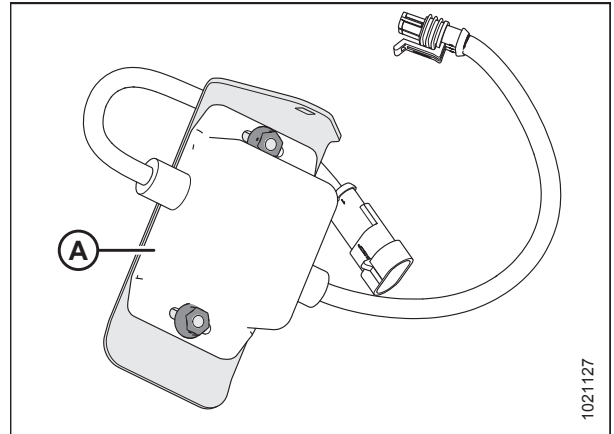


Figure 3.181: 10 V Adapter (MD #B6421)

Use a voltmeter to measure the voltage between Pin 1 (power) and Pin 2 (ground) wires at the AHHC sensor (A). This will determine whether the combine has a 5 V system or a 10 V system.

**NOTE:**

The combine key must be in the ON position, but the engine does not need to be running.

The three possible voltage readings are as follows:

- 0 V – combine key is in OFF position, or there is a faulty harness/bad connection
- 5 V – standard combine reading
- 10 V – 10 V combine reading; adapter (MD #B6421) is required

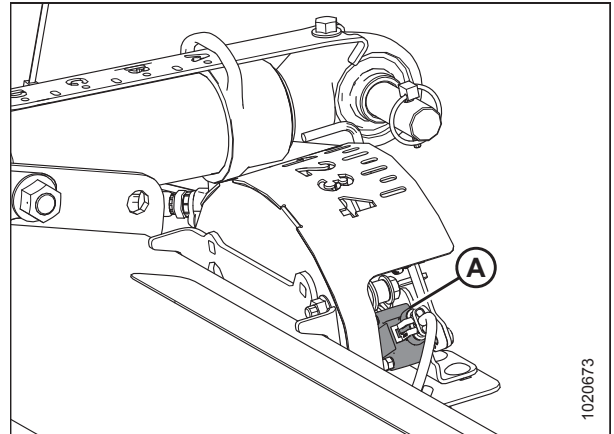


Figure 3.182: Float Indicator Box

### Manually Checking Voltage Range – One-Sensor System

The one-sensor system is standard for the FM100 Float Module. If equipped with the optional two-sensor system, refer to [Manually Checking Voltage Range – Two-Sensor System, page 144](#).

The output voltage range of the auto header height control (AHHC) sensors in some combines can be checked from the cab. For instructions, refer to your combine operator's manual or the AHHC instructions later in this document.

To manually check the sensor's output voltage range, follow these steps:

1. Extend the guard angle fully; the header angle indicator should be at **D**.
2. Position the header 150 mm (6 in.) above the ground, and unlock the float.

## OPERATION

3. Check that the float lock linkage is on down stops (washer [A] cannot be moved) at both locations.

**NOTE:**

If the header is **NOT** on down stops during the next two steps, the voltage may go out of range during operation causing a malfunction of the AHHC system. If the header is not on down stops, refer to [3.10 Leveling the Header, page 317](#) for instructions.

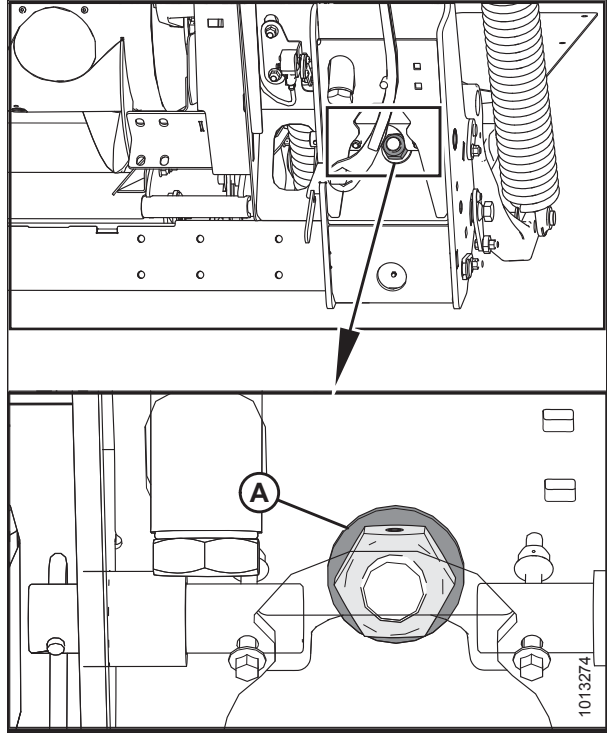


Figure 3.183: Down Stop Washer

4. Locate linkage assembly (A) in the float indicator box on top of the float module. Verify that dimension (B) is set to 55 mm (2 3/16 in.). If it is not, adjust linkage (A).

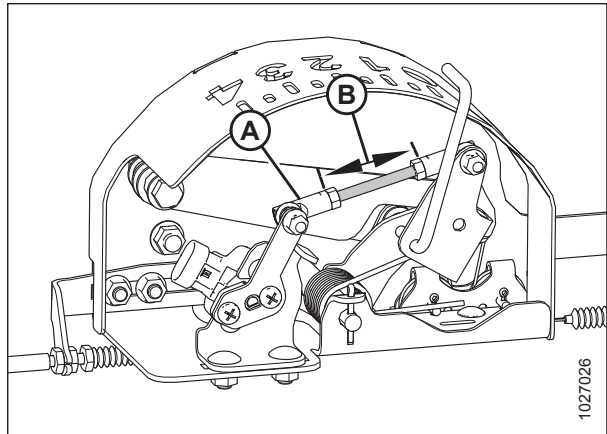


Figure 3.184: Float Indicator Box



## OPERATION

- Adjust cable take-up bracket (B) (if necessary) until float indicator pointer (A) is on 0.

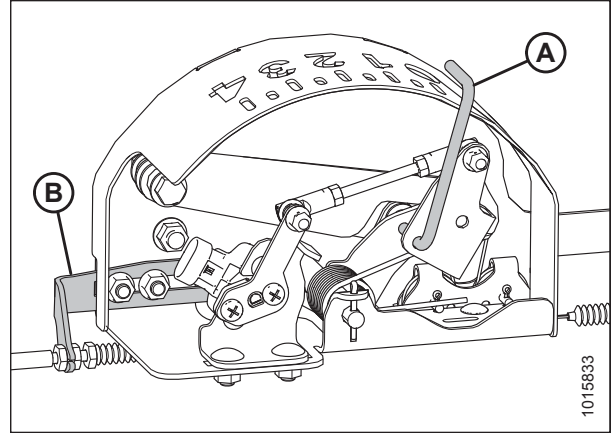


Figure 3.185: Float Indicator Box

- Use a voltmeter (A) to measure the voltage between the ground (Pin 2) and signal (Pin 3) wires at the AHHC sensor in the float indicator box. Ensure it is at the high voltage limit for the combine. For voltage limit chart, refer to Table 3.22, page 140.

**NOTE:**

The wiring harness connector must be attached to the sensor. Do **NOT** disconnect it.

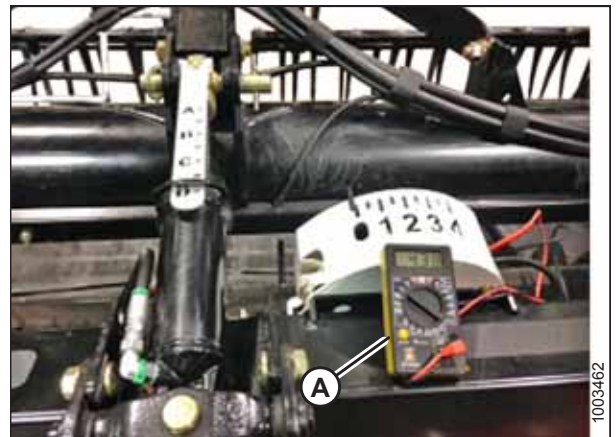


Figure 3.186: Measuring Voltage at Float Indicator Box

- Fully lower the combine feeder house, and float the header up off the down stops (the float indicator should be at 4, and the float module should be fully separated from the header).

**NOTE:**

You may need to hold the HEADER DOWN switch for a few seconds to ensure the feeder house is fully lowered.

- Use a voltmeter (A) to measure the voltage between the ground and signal wires at the AHHC sensor in the float indicator box. It should be at the low voltage limit for the combine. For voltage limit chart, refer to Table 3.22, page 140.

**NOTE:**

The wiring harness connector must be attached to the sensor. Do **NOT** disconnect it.

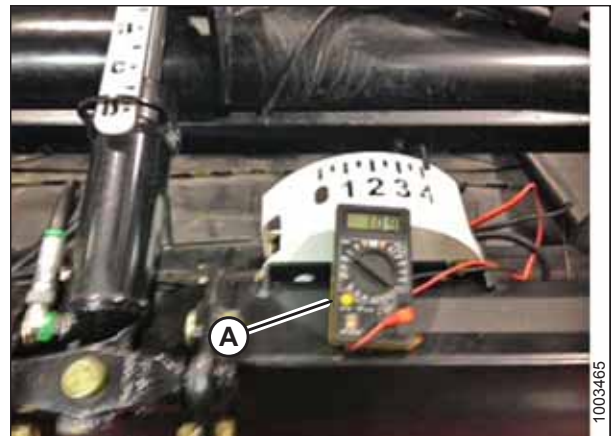


Figure 3.187: Measuring Voltage at Float Indicator Box

- If the sensor voltage is not within the low and high limits, or if the range between the low and high limits is insufficient, adjust the voltage limits. Refer to *Adjusting Voltage Limits – One-Sensor System*, page 147.

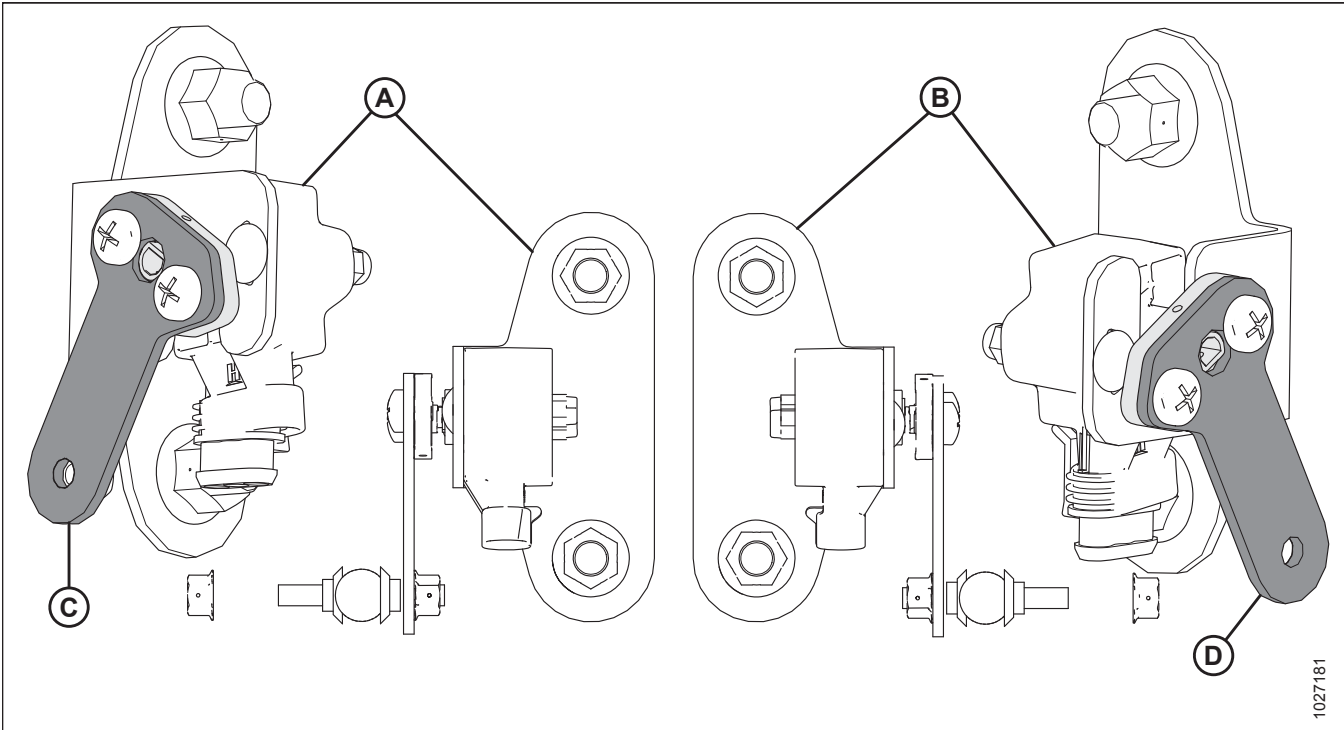
## OPERATION

### Manually Checking Voltage Range – Two-Sensor System

FM100 Float Modules equipped with the optional two-sensor system have a left and right sensors located on the back frame of the float module.

#### DANGER

To avoid injury or death from unexpected start-up of machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.



**Figure 3.188: Sensor Orientation**

1. Before adjusting the sensors, verify the sensor arms are properly installed on the sensors.
  - Left Sensor (A): The **POINT** on the arm of the sensor should face **AWAY** from the header. The point on the float sensor arm (C) should be installed in the same direction, facing away from the header.
  - Right Sensor (B): The **POINT** on the arm of the sensor should face **AWAY** from the header. The point on the float sensor arm (D) should be installed in the same direction, facing away from the header.

**To manually check the sensor's output voltage range, follow these steps:**

2. Extend the guard angle fully; the header angle indicator should be at **D**.
3. Position the header 150 mm (6 in.) above the ground, and unlock the float.

## OPERATION

4. Check that the float lock linkage is on down stops (washer [A] cannot be moved) at both locations.

**NOTE:**

If the header is not on the down stops during the next two steps, the voltage may go out of range during operation causing a malfunction of the AHHC system. If the header is not on the down stops, refer to [3.10 Leveling the Header](#), [page 317](#) for instructions.

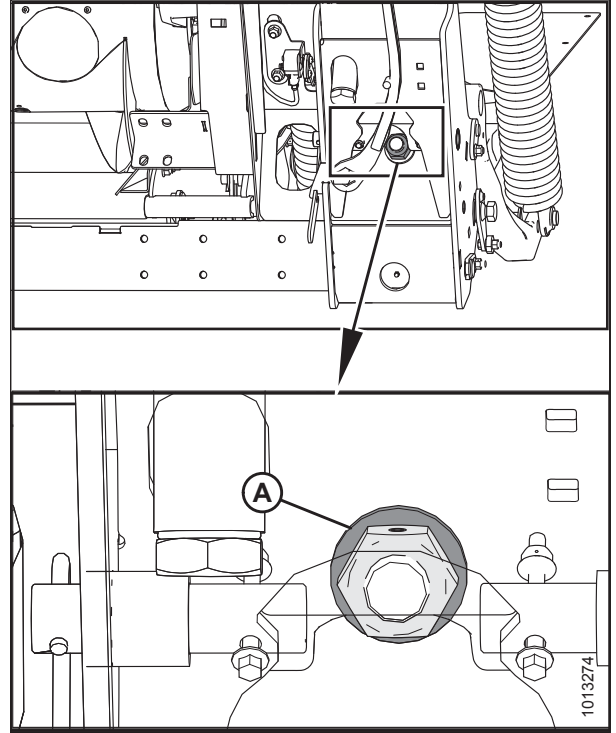


Figure 3.189: Down Stop Washer

5. Locate linkage assembly (A). Verify that dimension (B) is set to 55 mm (2 3/16 in.). If it is not, adjust linkage (A).

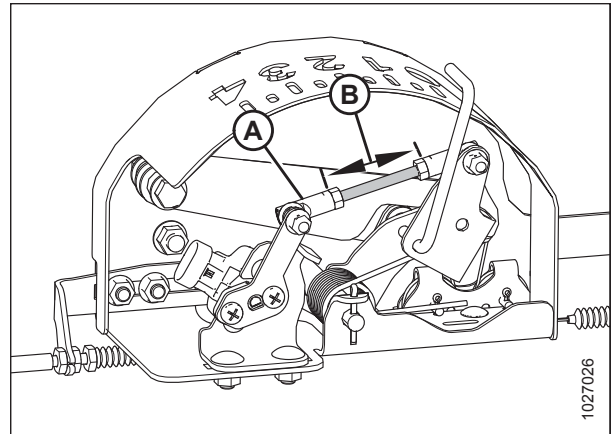


Figure 3.190: Float Indicator Box

## OPERATION

- Adjust cable take-up bracket (B) (if necessary) until pointer (A) on the float indicator is on **0**.

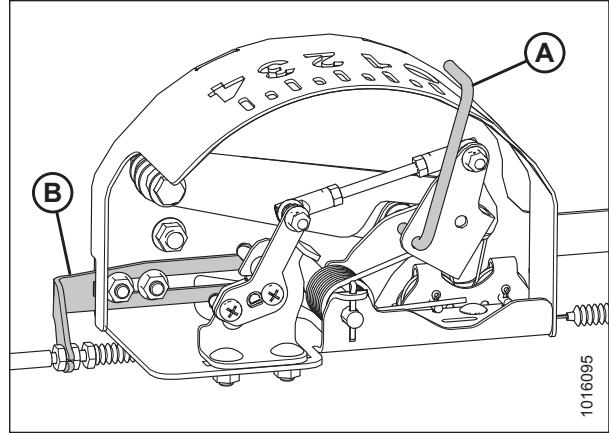


Figure 3.191: Float Indicator Box

- Use a voltmeter to measure the voltage between the ground (Pin 2) and signal (Pin 3) wires of AHHC sensor (A) at the back of the float module side frame. Ensure it is at the high voltage limit for the combine. For voltage limit chart, refer to Table 3.22, page 140.

**NOTE:**

The wiring harness connector must be attached to the sensor. Do **NOT** disconnect it.

- Repeat at the opposite side.

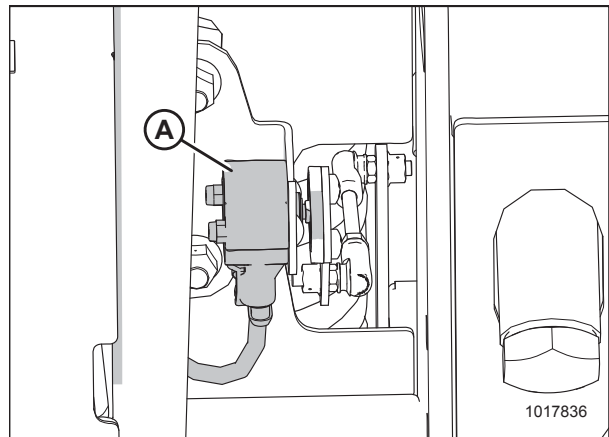


Figure 3.192: Optional Two-Sensor Kit – Right Sensor

- Fully lower the combine feeder house, and float the header up off the down stops (float indicator [A] should be at **4**, and the float module should be fully separated from the header).

**NOTE:**

You may need to hold the HEADER DOWN switch for a few seconds to ensure the feeder house is fully lowered.

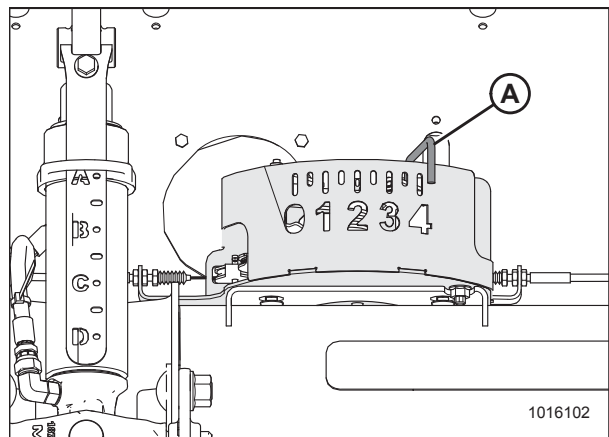


Figure 3.193: Float Indicator Box

## OPERATION

- Using a voltmeter, measure the voltage between the ground (Pin 2) and signal (Pin 3) wires of AHHC sensor (A) at the back of the side frame. Ensure it is at the low voltage limit for the combine. For voltage limit chart, refer to Table 3.22, page 140.

### NOTE:

The wiring harness connector must be attached to the sensor. Do **NOT** disconnect it.

- If the sensor voltage is not within the low and high limits, or if the range between the low and high limits is insufficient, adjust the voltage limits. For instructions, refer to *Adjusting Voltage Limits – Two-Sensor System*, page 148.
- Repeat at the opposite side.

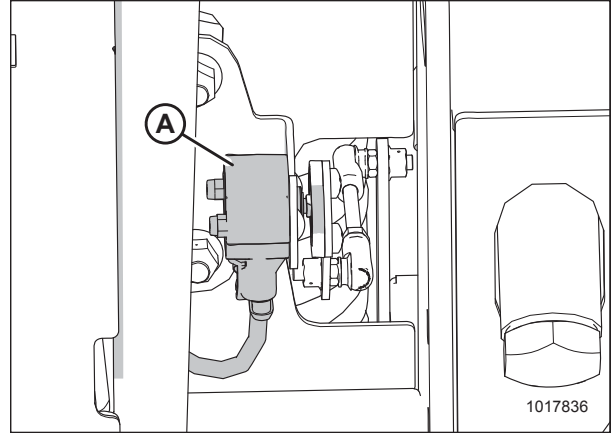


Figure 3.194: Optional Two-Sensor Kit – Right Sensor

### Adjusting Voltage Limits – One-Sensor System

Follow this procedure if you have checked the voltage range (either manually or from the cab) and found that the sensor voltage is not within the low and high limits, or that the range between the low and high limits is insufficient.

### DANGER

To avoid injury or death from unexpected start-up of machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

- Follow these steps to adjust the high voltage limit:
  - Extend guard angle fully; the header angle indicator should be at **D**.
  - Position header 152–254 mm (6–10 in.) above the ground; the float indicator should be at **0**.
  - Check the high voltage limit using the combine display or a voltmeter. For voltage limit chart, refer to Table 3.22, page 140.
  - Loosen sensor-mounting nuts (A).
  - Slide sensor support (B) to the right to increase the high voltage limit or to the left to decrease it.
  - Tighten sensor-mounting nuts (A).

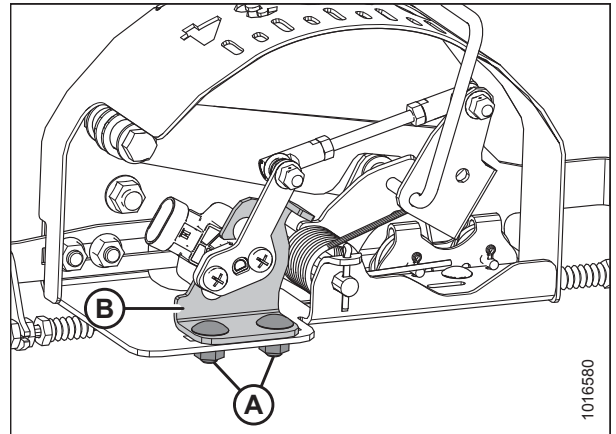


Figure 3.195: AHHC Sensor Assembly

## OPERATION

2. Follow these steps to adjust the low voltage limit:
  - a. Extend the guard angle fully; the header angle indicator should be at **D**.
  - b. Fully lower the header to the ground; the float indicator should be at **4**.
  - c. Check the low voltage limit using the combine display or voltmeter. For voltage limit chart, refer to Table 3.22, page 140.
  - d. Loosen sensor-mounting nuts (A).
  - e. Rotate sensor (B) clockwise to increase the low voltage limit or counterclockwise to decrease it.
  - f. Tighten sensor-mounting nuts (A).
3. After making adjustments, recheck both the upper and lower voltage limits to make sure they are within the required range according to Table 3.22, page 140.

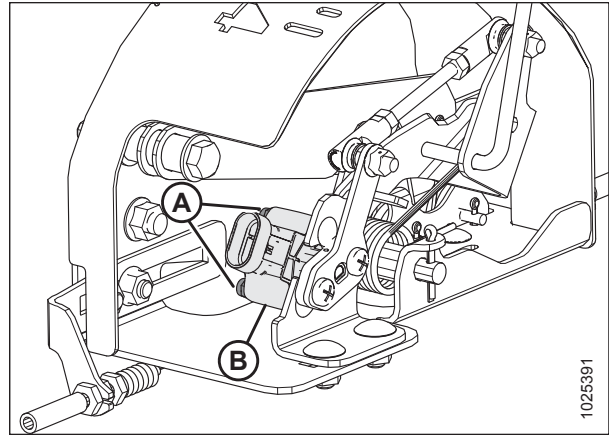


Figure 3.196: AHHC Sensor Assembly

### Adjusting Voltage Limits – Two-Sensor System

Follow this procedure if you have checked the voltage range (either manually or from the cab) and found that the sensor voltage is not within the low and high limits, or that the range between the low and high limits is insufficient.

### DANGER

To avoid injury or death from unexpected start-up of machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

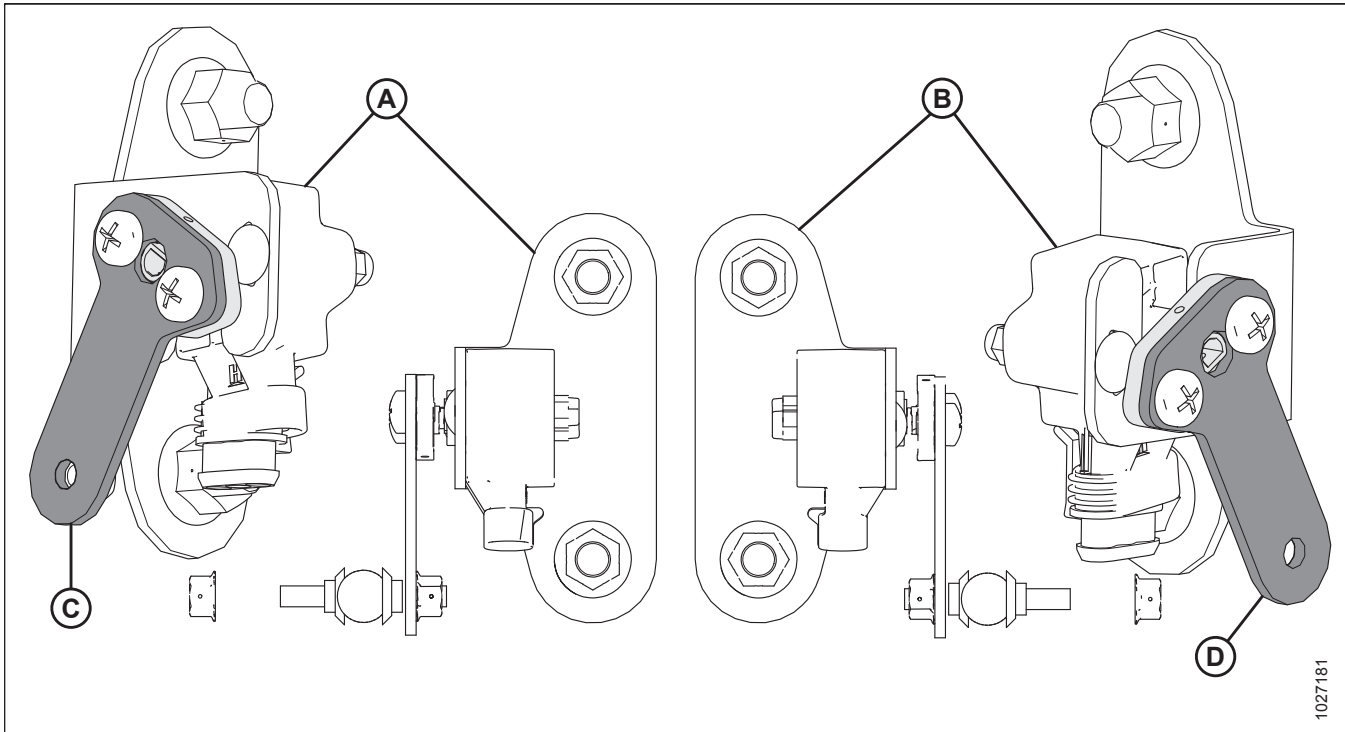


Figure 3.197: Sensor Orientation

1. Before adjusting the sensors, verify the sensor arms are properly installed on the sensors.

## OPERATION

- Left Sensor (A): The **POINT** on the arm of the sensor should face **AWAY** from the header. The point on the float sensor arm (C) should be installed in the same direction, facing away from the header.
- Right Sensor (B): The **POINT** on the arm of the sensor should face **AWAY** from the header. The point on the float sensor arm (D) should be installed in the same direction, facing away from the header.

### ***Follow these steps to adjust the left sensor voltage:***

2. Extend the guard angle fully; the header angle indicator should be at **D**.
3. Position the header 150–254 mm (6–10 in.) above the ground; the float indicator should be at **0**.
4. Loosen sensor-mounting nuts (A).
5. Check that the left sensor is at the correct high voltage limit.
6. Rotate sensor (B) counterclockwise to lower the voltage. Rotate the sensor clockwise to raise the voltage.
7. Tighten sensor-mounting nuts (A).

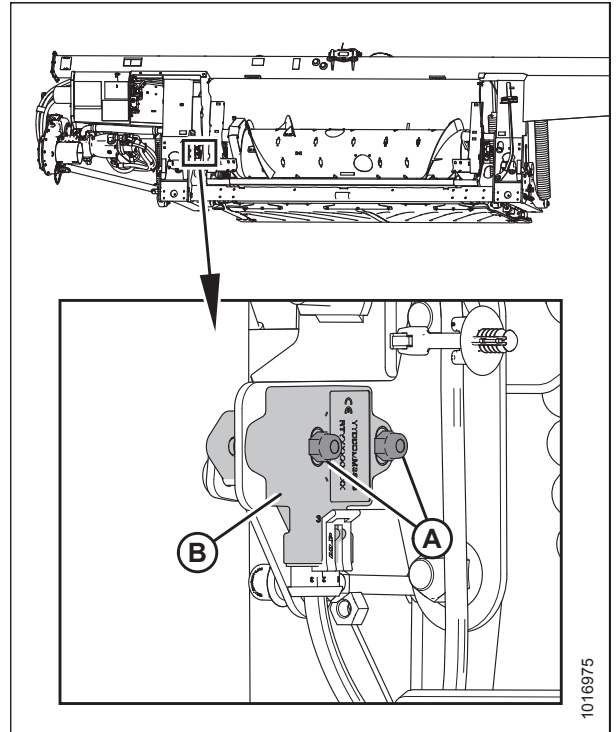


Figure 3.198: Optional Two-Sensor Kit – Left Sensor

### ***Follow these steps to adjust the right sensor voltage:***

8. Extend the guard angle fully; the header angle indicator should be at **D**.
9. Position the header 150–254 mm (6–10 in.) above the ground; the float indicator should be at **0**.



## OPERATION

10. Loosen sensor mounting nuts (A).
11. Rotate sensor (B) clockwise to lower the voltage. Rotate the sensor counterclockwise to raise the voltage.
12. Check that the right sensor is at the correct high voltage limit.
13. Tighten sensor mounting nuts (A).

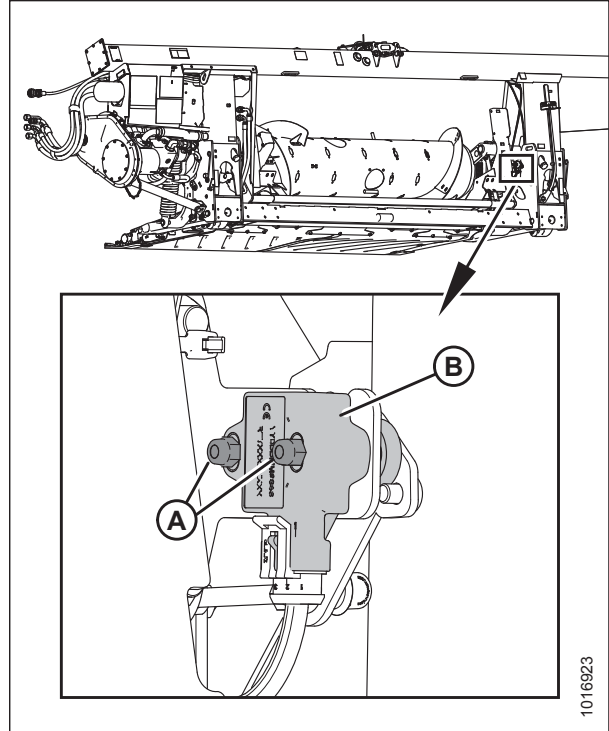


Figure 3.199: Optional Two-Sensor Kit – Right Sensor

14. Fully lower the header; float indicator (A) should be at 4.
15. Check that both of the sensors are at the correct low voltage limit.

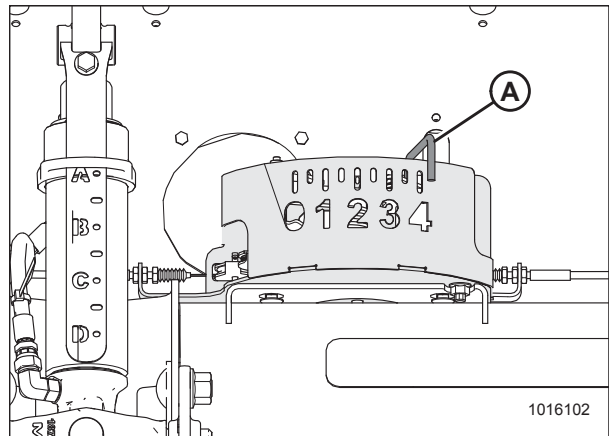


Figure 3.200: Float Indicator Box

### 3.9.4 AGCO IDEAL™ Series Combines

#### *Setting up the Header – AGCO IDEAL™ Series*

**NOTE:**

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.



## OPERATION

AGCO Tyton terminal (A) is used to set up and manage a MacDon header on an IDEAL™ series combine. Use the touch screen display to select the desired item on the page.



Figure 3.201: AGCO IDEAL™ Operator Station

A - Tyton Terminal    B - Control Handle  
C - Throttle        D - Header Control Cluster

1. On the top right of the home page, touch COMBINE icon (A). The COMBINE MAIN MENU opens.

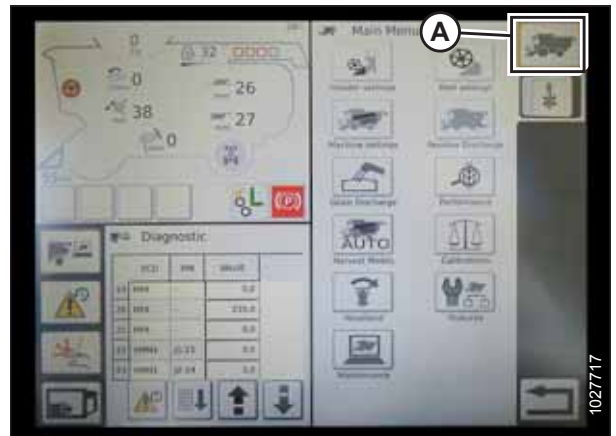


Figure 3.202: Combine Icon on Home Page

2. On the COMBINE MAIN MENU, touch HEADER SETTINGS (A). The HEADER SETTINGS page opens.

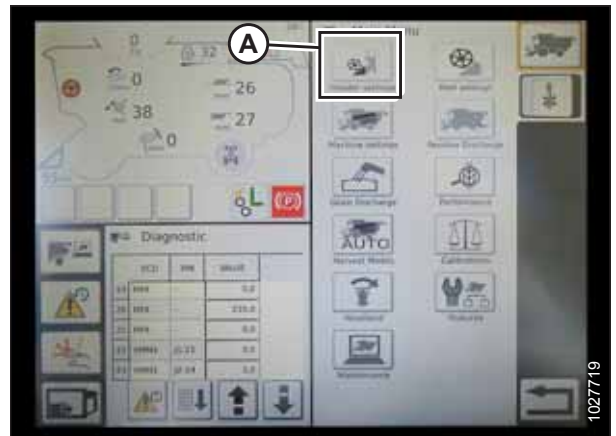


Figure 3.203: Header Settings in Combine Main Menu

## OPERATION

3. Touch HEADER CONFIGURATION field (A). A dialog box showing predefined headers opens.
  - If your MacDon header is already set up, it appears on the header list. Touch the MacDon header title (B) to highlight the selection in blue, and then touch green check mark (E) to continue.
  - If only default header (D) is shown, touch ABC button (C), and use the on-screen keyboard to enter the MacDon header information. When complete, select one of the following options to return to the HEADER SETTINGS page:
    - Green check mark (E) saves the settings
    - Garbage can icon (F) deletes the highlighted header from the list
    - Red X (G) cancels the change(s)

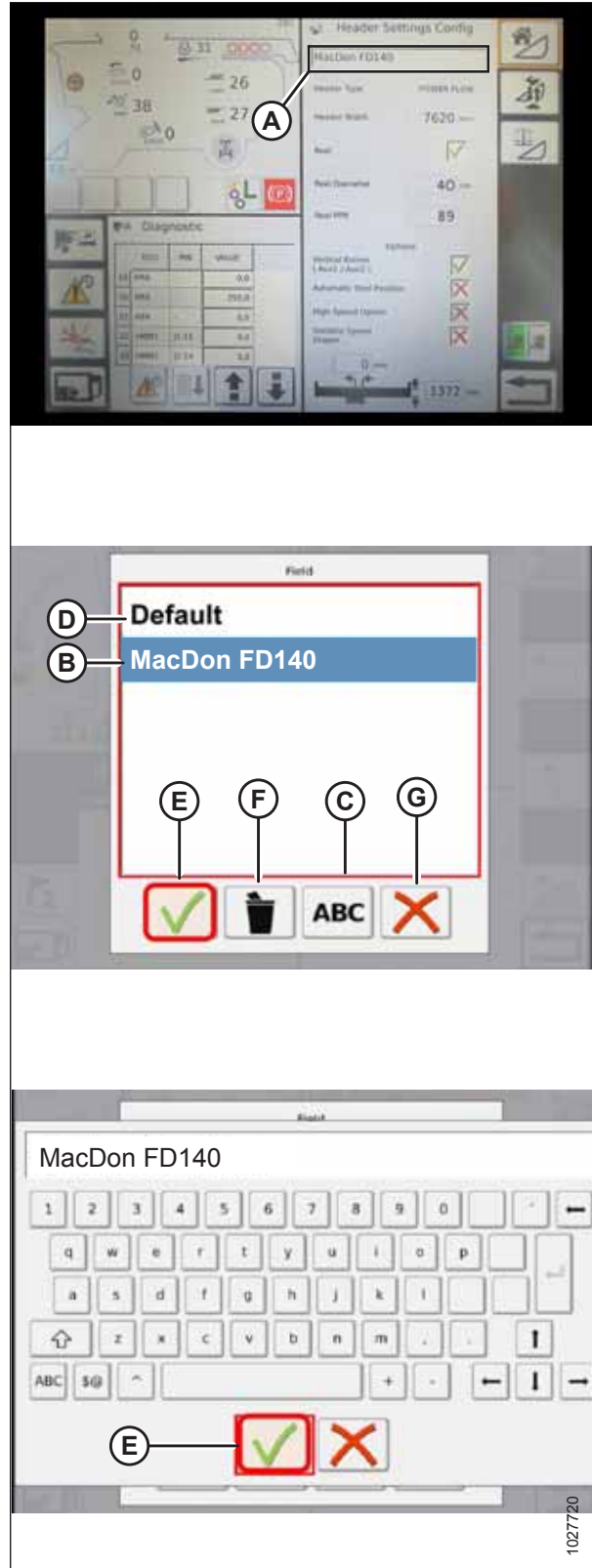


Figure 3.204: Header Configuration Menu on Header Settings Page

## OPERATION

- To specify the type of header installed on the machine, touch HEADER TYPE field (A).

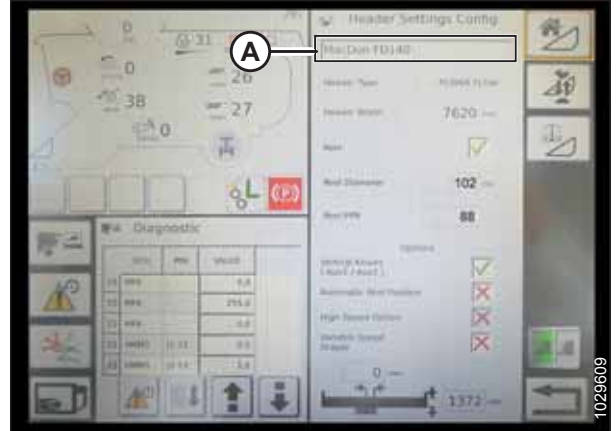


Figure 3.205: Header Settings

- From the list of predefined header types, touch POWER FLOW (A).
- Touch green check mark (B) to save the selection and continue.

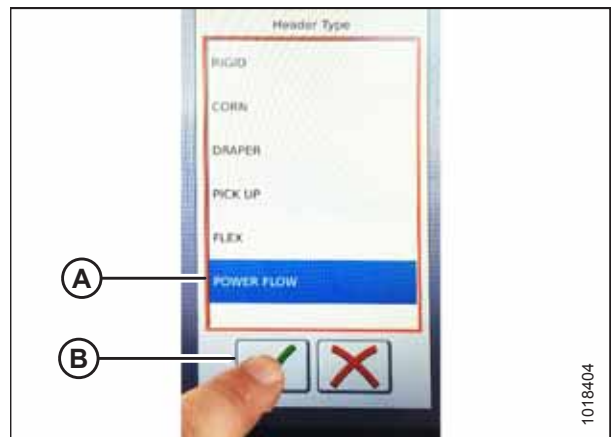


Figure 3.206: Header Type

- Make sure that REEL check box (A) is checked.

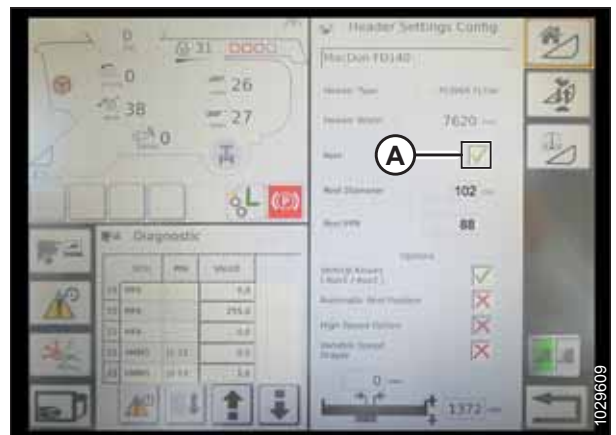


Figure 3.207: Header Settings

## OPERATION

8. Touch REEL DIAMETER field (A) and a numeric keypad displays. Enter **13** for a MacDon reel.
9. Touch REEL PPR (Pulses Per Revolution) field (B) and enter **18** as the value for your MacDon header.

**NOTE:**

PPR is determined by the number of teeth on the reel speed sprocket.

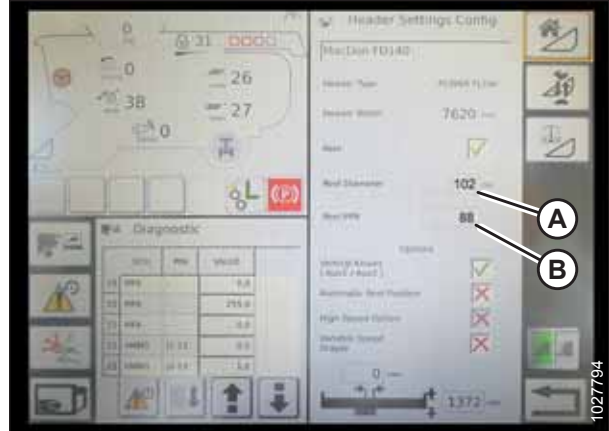


Figure 3.208: Header Settings

10. Touch green check mark (B) at the bottom of numeric keypad (A) when complete, or the red X to cancel.

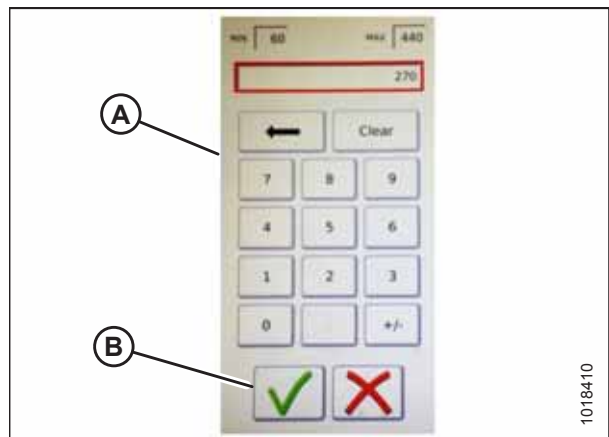


Figure 3.209: Numeric Keypad

11. When complete, touch green check mark (A) at the bottom of the HEADER SETTINGS page.

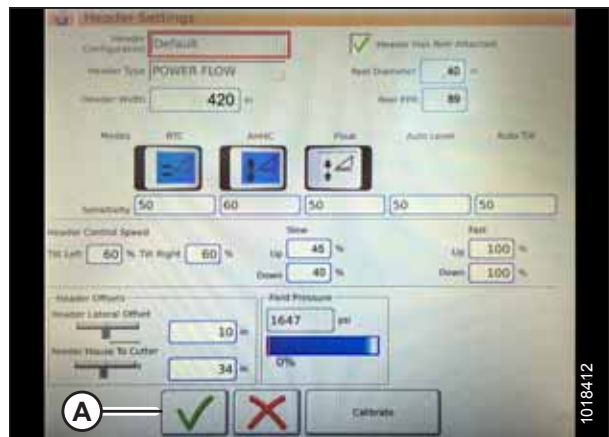


Figure 3.210: Header Settings Page

### Setting Minimum Reel Speed and Calibrating Reel – AGCO IDEAL™ Series

#### **WARNING**

Clear the area of other persons, pets etc. Keep children away from machinery. Walk around the machine to be sure no one is under, on, or close to it.

## OPERATION

### NOTE:

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

1. From the COMBINE MAIN MENU, touch REEL SETTINGS (A) to open the REEL SETTINGS page.

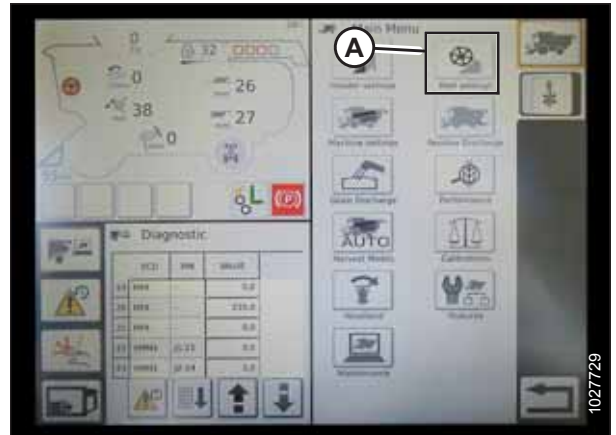


Figure 3.211: Reel Settings on Combine Main Menu

2. To set minimum reel speed, touch SPEED MINIMUM FIELD (B). The on-screen keyboard displays. Enter the desired value. Touch the green check mark to accept the new value, or the red X to cancel. The reel speed is shown in miles per hour (mph) and rotations per minute (rpm).

### NOTE:

At the bottom of the REEL SETTINGS page, the reel diameter and reel pulses per revolution (PPR) are displayed. These values have already been set in the HEADER SETTINGS page.

3. Reel speed is calibrated on the REEL SETTINGS page by touching CALIBRATE button (A) in the top right of the page.

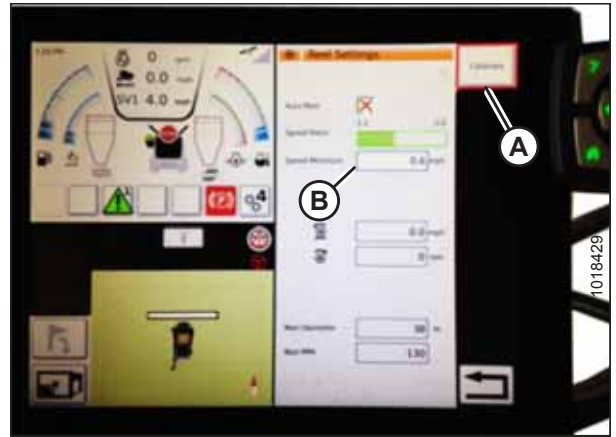


Figure 3.212: Reel Settings Calibration

### NOTE:

The CALIBRATION WIZARD opens and displays a hazard warning.

4. Make sure to meet all the conditions listed in the CALIBRATION WIZARD warning. Press the green check mark to accept and start reel calibration. Pressing the red X will cancel the calibration procedure.



Figure 3.213: Calibration Wizard

## OPERATION

5. A message appears in the CALIBRATION WIZARD stating that reel calibration has started. The reel will begin turning slowly and increase to high speed. A progress bar is provided. If necessary, touch the red X (not shown) to cancel. Otherwise, wait for the message that reel calibration has completed successfully. Touch the green check mark to save the calibrated settings.



Figure 3.214: Calibration Progress

### Setting up Automatic Header Controls – AGCO IDEAL™ Series

Automatic header functions are configured on the HEADER SETTINGS page.

#### NOTE:

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

1. **Automatic Control Functions:** There are toggle (OFF/ON) switches on the HEADER SETTINGS page for the automatic control functions. For MacDon headers, ensure the following two functions are enabled as shown:

- RTC (return to cut) (A)
- AHHC (automatic header height control) (B)

All other switches are disabled (not highlighted).

2. **Sensitivity** setting (C) controls how responsive a control (RTC or AHHC) is to a given change in sensor feedback. The setting fields are located directly below the toggle switches. To enter a new sensitivity setting, touch the setting field below the specific toggle switch, and enter the new value in the on-screen keyboard.

- Increase sensitivity if the combine does not change the feeder position quickly enough when in Auto Mode.
- Decrease sensitivity if the combine hunts for a position in Auto Mode.

#### NOTE:

Recommended sensitivity starting points for MacDon headers are:

- **50** for RTC (A)
- **60** for AHHC (B)

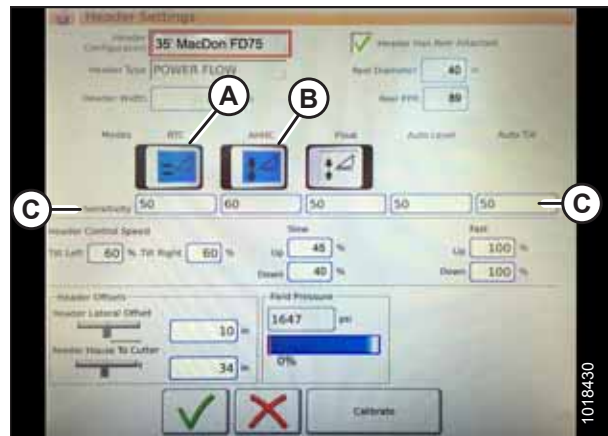


Figure 3.215: Automatic Controls and Sensitivity Settings



## OPERATION

3. **Header Speed:** HEADER CONTROL SPEED area (A) on the HEADER SETTINGS page is used to adjust the following speeds:

- Tilt left and right is the lateral tilt of the combine faceplate
- Header up and down (slow and fast speeds) is a two-stage button with slow speed on the first detent and fast on the second

**NOTE:**

Recommended header control speed starting points are:

- Slow: Up 45/Down 40
- Fast: Up 100/Down 100

4. **Header Offsets (A):** Offset distances are important for yield mapping. There are two adjustable dimensions on the HEADER SETTINGS page:

- Header Lateral Offset: the distance between the centerline of the header and the centerline of the machine. This should be set at **0** for a MacDon header.
- Feeder House to Cutter: the distance from the machine interface to the cutterbar. This should be set at **68** for a MacDon header.

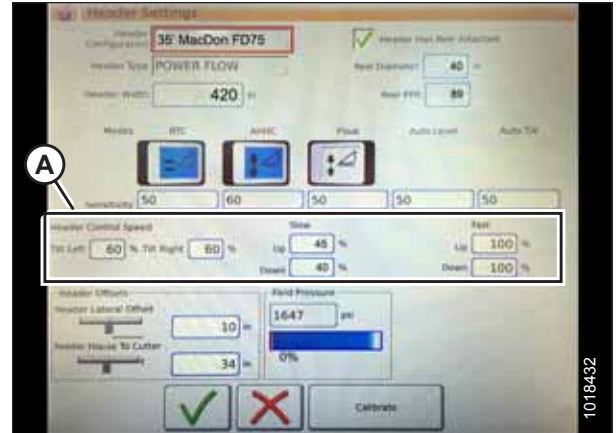


Figure 3.216: Header Speed Control Settings

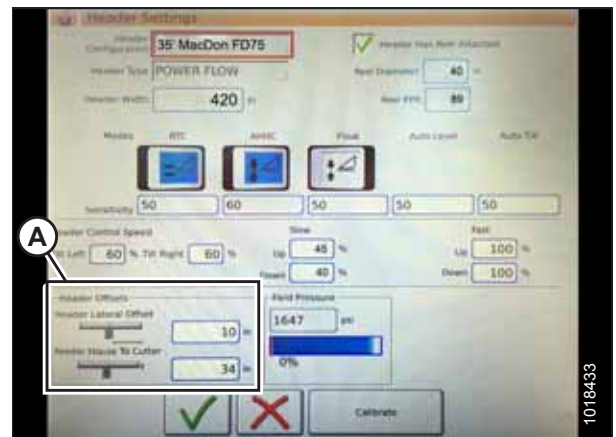


Figure 3.217: Header Offset Settings

### Calibrating the Header – AGCO IDEAL™ Series

The auto header height control (AHHC) sensor output must be calibrated for each combine, or the AHHC feature will not work properly.

### WARNING

Clear the area of other persons, pets etc. Keep children away from machinery. Walk around the machine to be sure no one is under, on, or close to it.

**NOTE:**

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

## OPERATION

1. On the COMBINE MAIN MENU, touch HEADER SETTINGS (A).

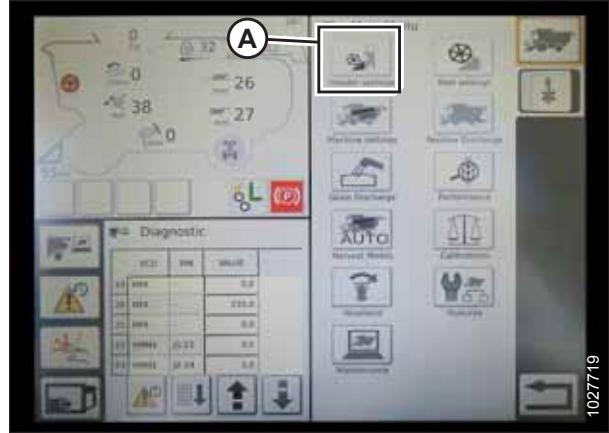


Figure 3.218: Combine Main Menu

2. Touch HEADER CALIBRATE (A) at the right side of the HEADER SETTINGS CONFIG page.

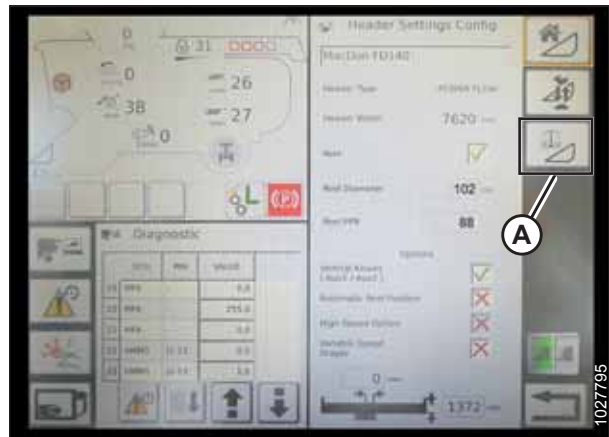


Figure 3.219: Header Settings Page

3. The hazard warning for HEADER CALIBRATION appears. Make sure that all conditions are met.
4. Touch the green check mark at the bottom of the page to start the calibration and follow the on-screen commands.



Figure 3.220: Header Calibration Warning



## OPERATION

A progress bar is provided and the calibration can be stopped by touching the red X. The header moves automatically and erratically during this process.

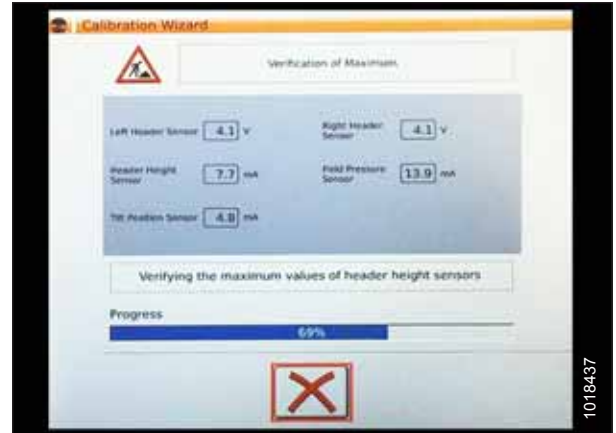


Figure 3.221: Calibration in Progress

5. When the calibration is complete:
  - Review summary information (A)
  - Review green check marks confirming calibrated functions (B)
  - Touch check mark (C) to save

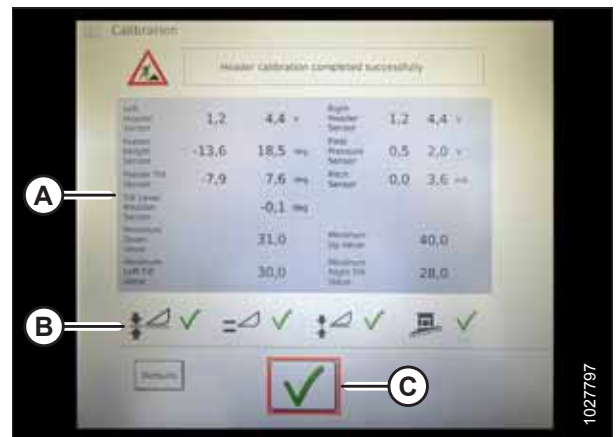


Figure 3.222: Completed Calibration Page

### NOTE:

Touch CALIBRATIONS icon (A) on the MAIN MENU page to display the CALIBRATION MENU where you can choose from a variety of calibrations including header and reel calibration.

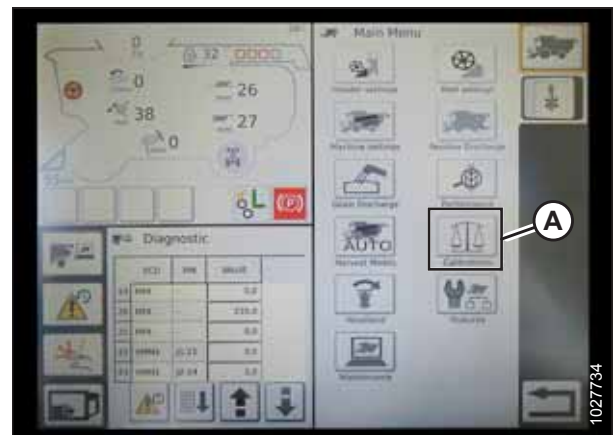


Figure 3.223: Direct Calibration Menu

### Operating the Header – AGCO IDEAL™ Series

#### NOTE:

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

## OPERATION

The following controls are used to operate the auto header height control (AHHC) functions:

- Tyton terminal (A)
- Control handle (B)
- Throttle (C)
- Header control cluster (D)

For instructions, refer to the combine operator's manual to familiarize yourself with the controls.



Figure 3.224: AGCO IDEAL™ Operator Station

1. With the header running, set lateral tilt to MANUAL by pressing switch (A) so the light above switch is off.
2. Engage the AHHC by pressing switch (B) so light above switch is on.



Figure 3.225: Header Control Cluster

3. Press AHHC control switch (A) on the control handle to engage the AHHC. The header moves to the current setpoint position.



Figure 3.226: AHHC on Control Handle

## OPERATION

4. Use HEADER HEIGHT SETPOINT control dial (A) as necessary to fine-tune the position.



Figure 3.227: Header Control Cluster

### Reviewing Header In-Field Settings – AGCO IDEAL™ Series

#### NOTE:

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

1. To view header group settings, touch HEADER icon (A) on the right side of the home page.
2. The following information is displayed:
  - CURRENT POSITION of header (B).
  - SETPOINT cut-off position (C) (indicated by red line)
  - HEADER symbol (D) – touch to adjust the setpoint cut-off position using the adjustment wheel on the right side of the Tyton terminal.
  - CUT HEIGHT for AHHC (E) – fine-tune with the header height setpoint control dial on the header control cluster.
  - HEADER WORKING WIDTH (F)
  - HEADER PITCH (G)
3. Touching a field opens the on-screen keyboard so that values can be adjusted. Enter the new value and touch the green check mark when complete.

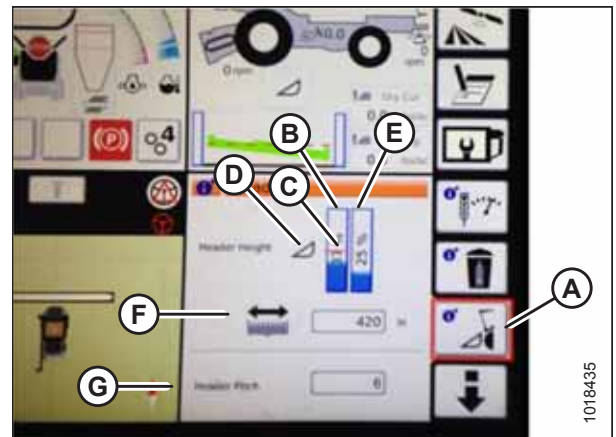


Figure 3.228: Header Groups

#### NOTE:

Adjustment wheel (A) is located on the right of the Tyton terminal.



Figure 3.229: Adjustment Wheel on Right of Tyton Terminal

## OPERATION

### NOTE:

HEADER HEIGHT SETPOINT control dial (A) is on the header control cluster.



Figure 3.230: Header Control Cluster

### 3.9.5 Case IH 5088/6088/7088 Combines

#### *Calibrating the Auto Header Height Control – Case IH 5088/6088/7088*

The auto header height control (AHHC) sensor output must be calibrated for each combine, or the AHHC feature will not work properly.

### NOTE:

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.



## WARNING

Check to be sure all bystanders have cleared the area.

### NOTE:

If the header float is set too light, it can prevent the calibration of the AHHC. You may need to set the float heavier for the calibration procedure so the header does not separate from the float module.

### NOTE:

For best performance of the auto header height control (AHHC) system, perform ground calibration with center-link set to **D**. When calibration is complete, adjust the center-link back to desired header angle. For instructions, refer to [3.8.4 Header Angle, page 96](#)

1. Ensure the center-link is set to **D**.
2. Set the float. For instructions, refer to [3.8.3 Header Float, page 90](#).
3. Position the fore-aft in midspan.
4. Start the combine engine, but do **NOT** engage the separator or feeder house.
5. Locate HEADER CONTROL switch (A) on the right console, and set it to HT (this is AHHC mode).

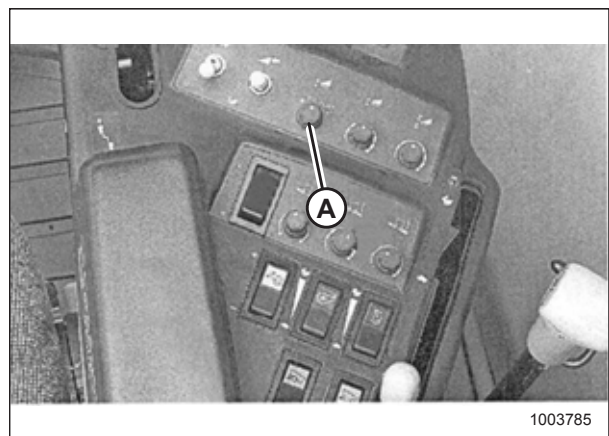


Figure 3.231: Right Console

## OPERATION

6. Press HEADER LOWER switch (A) on the control handle until the float module and header are fully lowered. You may need to hold the switch for several seconds.
7. Press HEADER RAISE switch (A) on the control handle. The header should stop at about the halfway point. Continue holding the HEADER RAISE switch, and the header will rise until the feeder house reaches its upper limit. The AHHC system is now calibrated.

**NOTE:**

If the float was set heavier to complete the AHHC calibration procedure, adjust it to the recommended operating float after the calibration is complete.

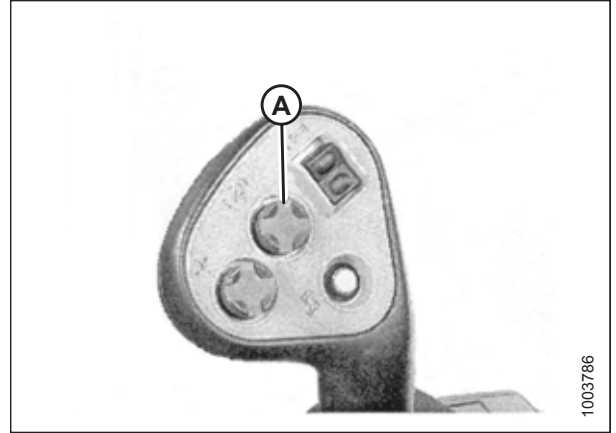


Figure 3.232: Control Handle – Case IH 2300/2500

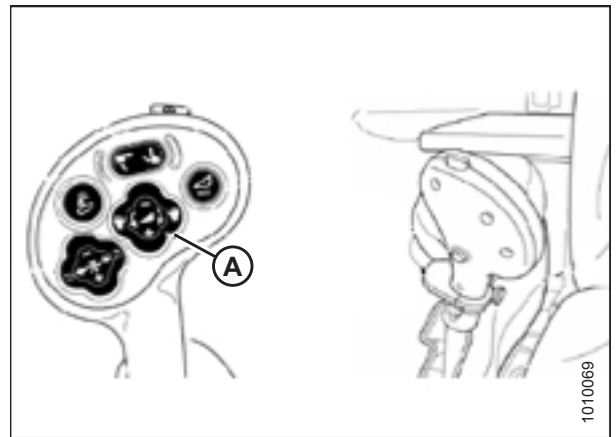


Figure 3.233: Control Handle – Case IH 5088/6088/7088

### *Setting the Sensitivity of the Auto Header Height – Case IH 5088/6088/7088*

The sensitivity adjustment controls the distance the cutterbar must travel up or down before the auto header height control (AHHC) reacts and raises or lowers the feeder house. When the sensitivity is set to maximum, only small changes in ground height are needed to cause the system to raise or lower the feeder house. When the sensitivity is set to minimum, large changes in the ground height are needed to cause the system to raise or lower the feeder house.

**NOTE:**

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

## OPERATION

1. Use HEADER SETTINGS key (A) to display the HEADER SENSITIVITY CHANGE page as shown in Figure 3.235, page 164.
2. Use the UP key (B) or DOWN key (C) to adjust the highlighted item. The height sensitivity setting range is 0 (least sensitive) to 250 (most sensitive) in increments of 10.

**NOTE:**

Adjustments take effect immediately. Use the CANCEL key to return to the original settings.

3. Use HEADER SETTINGS key (A) to highlight the next changeable item.
4. Use ENTER key (D) to save changes and return to the monitor screen. If there are no changes, the screen will return to the monitor screen after 5 seconds.



Figure 3.234: Combine Controls

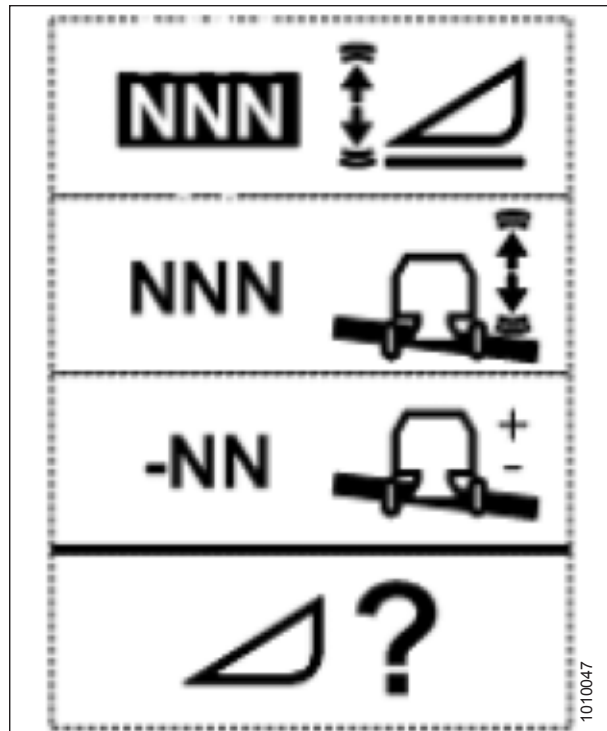


Figure 3.235: Height Sensitivity Change Page



### 3.9.6 Case IH 130 and 140 Series Mid-Range Combines

#### Setting up the Header on the Combine Display – Case IH 5130/6130/7130; 5140/6140/7140

1. On the main page of the combine display, select TOOLBOX (A).

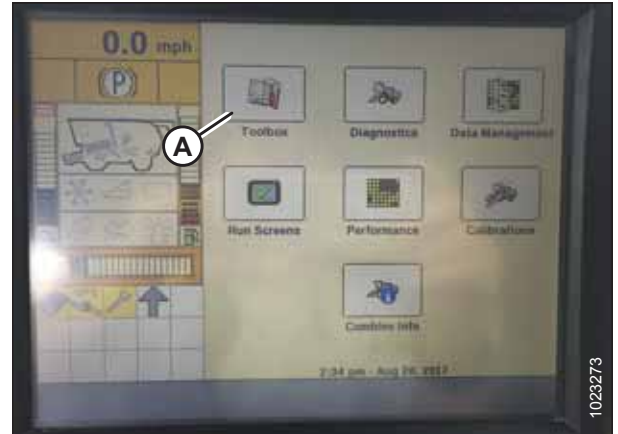


Figure 3.236: Case IH Combine Display

2. Select HEAD 1 tab (A). The HEADER SETUP page displays.

**NOTE:**

To locate the HEAD 1 tab, you may need to scroll to the right using side arrows (C).

3. From CUTTING TYPE menu (B), select PLATFORM.

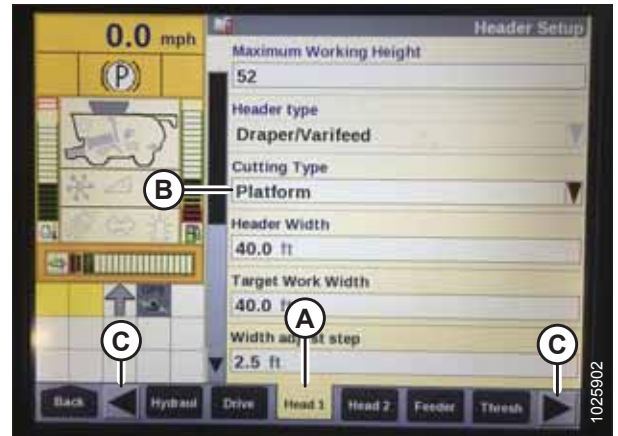


Figure 3.237: Case IH Combine Display

4. Select HEAD 2 tab (A). The HEADER SETUP 2 page displays.
5. From HEADER PRESSURE FLOAT menu (B), select NOT INSTALLED.
6. If you are operating a D1 Series Draper Header, from DRAPER GRAIN HEADER STYLE menu (C), select RIGID 2000 SERIES.



Figure 3.238: Case IH Combine Display

## OPERATION

7. Locate HHC HEIGHT SENSITIVITY field (A), and set as follows:

- **If using a two-sensor system:** Set HHC HEIGHT SENSITIVITY to 250.
- **If using a single-sensor system:** Set HHC HEIGHT SENSITIVITY to 180.

### NOTE:

If hunting occurs during operation, decrease this setting by 20 points at a time until hunting no longer occurs.

8. Set HHC TILT SENSITIVITY (B) to 150. Increase or decrease as desired.



Figure 3.239: Case IH Combine Display

9. From REEL DRIVE TYPE menu (A), select one of the following:

- 4 if you are using a standard 19-tooth drive sprocket.
- 5 if you are using an optional high-torque 14-tooth drive sprocket.
- 6 if you are using an optional high-torque 10-tooth drive sprocket.

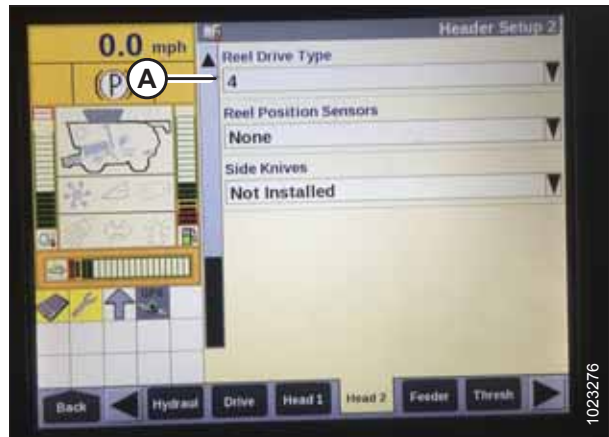


Figure 3.240: Case IH Combine Display

10. From REEL HEIGHT SENSOR menu (A), select YES.



Figure 3.241: Case IH Combine Display



## OPERATION

11. Locate AUTOTILT field (A).

- **If using a two-sensor system:** Select YES in the AUTOTILT field.
- **If using a single-sensor system:** Select NO in the AUTOTILT field.



Figure 3.242: Case IH Combine Display

### Checking Voltage Range from Combine Cab – Case IH 5130/6130/7130; 5140/6140/7140

#### NOTE:

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.



#### WARNING

Check to be sure all bystanders have cleared the area.

1. Check that the float lock linkage is on the down stops (washer [A] cannot be moved) at both locations.

#### NOTE:

If the header is not on the down stops during the next two steps, the voltage may go out of range during operation causing a malfunction of the auto header height control (AHHC) system. If the header is not on the down stops, refer to [3.10 Leveling the Header, page 317](#) for instructions.

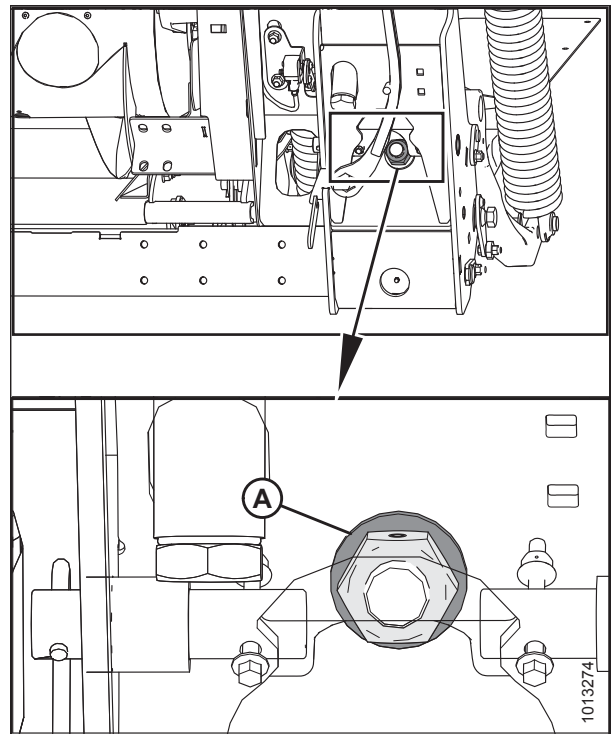


Figure 3.243: Float Lock

## OPERATION

2. Adjust cable take-up bracket (B) (if necessary) until pointer (A) on float indicator is on **0**.
3. Ensure the header float is unlocked.

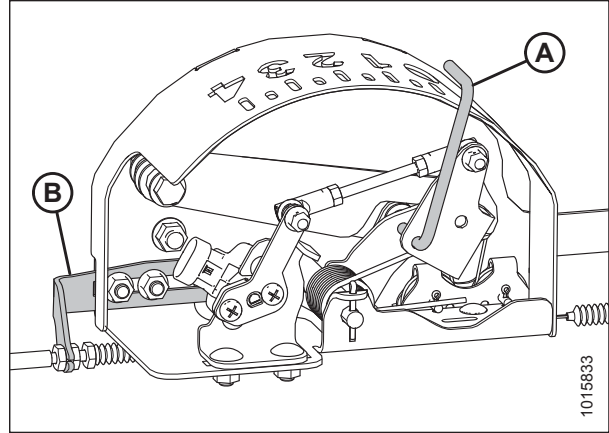


Figure 3.244: Float Indicator Box

4. On the main page of the combine display, select **DIAGNOSTICS (A)**. The **DIAGNOSTICS** page opens.

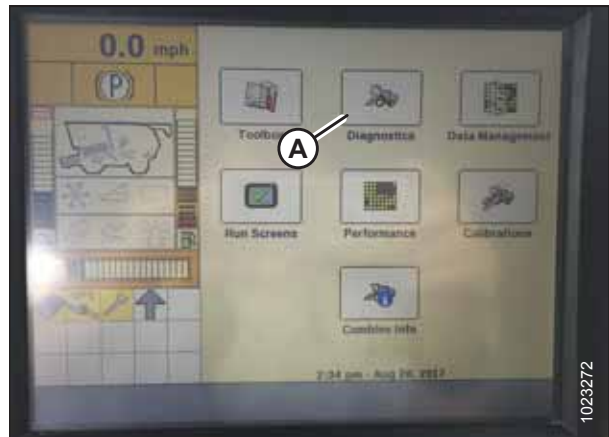


Figure 3.245: Case IH Combine Display

5. Select **SETTINGS (A)**. The **SETTINGS** page opens.
6. From the **GROUP** menu, select **HEADER (B)**.

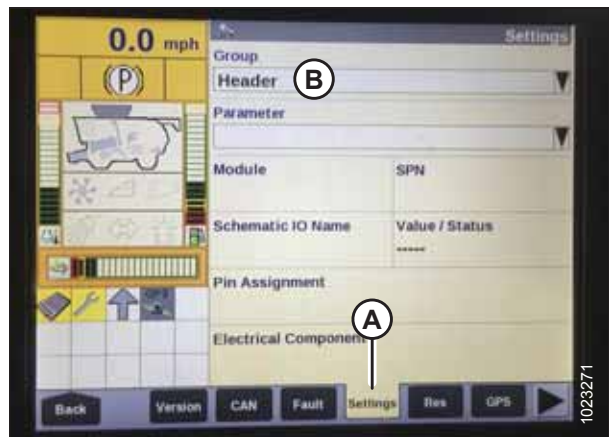


Figure 3.246: Case IH Combine Display

## OPERATION

- From the PARAMETER menu, select LEFT HEIGHT/TILT SENSOR (A).



Figure 3.247: Case IH Combine Display

- The SETTINGS page updates to display the voltage in VALUE/STATUS field (A). Lower the feeder house fully, and then raise it 254–306 mm (10–14 in.) off the ground to view the full range of voltage readings.
- If the sensor voltage is not within the low and high limits, or if the range between the low and high limits is insufficient, adjust the voltage limits. For instructions, refer to *Adjusting Voltage Limits – One-Sensor System*, page 147.



Figure 3.248: Case IH Combine Display

### *Calibrating Auto Header Height Control – Case IH 5130/6130/7130, 5140/6140/7140*

The auto header height control (AHHC) sensor output must be calibrated for each combine, or the AHHC feature will not work properly.

#### **WARNING**

Check to be sure all bystanders have cleared the area.

#### **NOTE:**

This procedure applies to combines with a software version below 28.00. For instructions on calibrating the AHHC for combines with software version 28.00 or above, refer to *Calibrating the Auto Header Height Control – Case IH Combines with Version 28.00 or Higher Software*, page 182.

#### **NOTE:**

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

#### **NOTE:**

If the header float is set too light, it can prevent the calibration of the AHHC. You may need to set the float heavier for the calibration procedure so the header does not separate from the float module.

## OPERATION

### NOTE:

For best performance of the auto header height control (AHHC) system, perform ground calibration with center-link set to **D**. When calibration is complete, adjust the center-link back to desired header angle. For instructions, refer to [3.8.4 Header Angle, page 96](#)

1. Ensure the center-link is set to **D**.
2. Ensure the header and float module electrical and hydraulic connections are made.
3. Start the combine engine, but do **NOT** engage the separator or the feeder house.
4. Locate HEADER CONTROL switch (A) on the right console, and set to HT (this is AHHC mode).
5. Hold the DOWN button for 10 seconds, or until the combine feeder house has been lowered all the way down (the feeder house will stop moving).
6. Push the RAISE button and hold it until the feeder house travels all the way up. It will stop 61 cm (2 ft.) above ground for 5 seconds, then it will resume lift. This is an indication that calibration is successful.

### NOTE:

If the float was set heavier to complete the AHHC calibration procedure, adjust it to the recommended operating float after the calibration is complete.

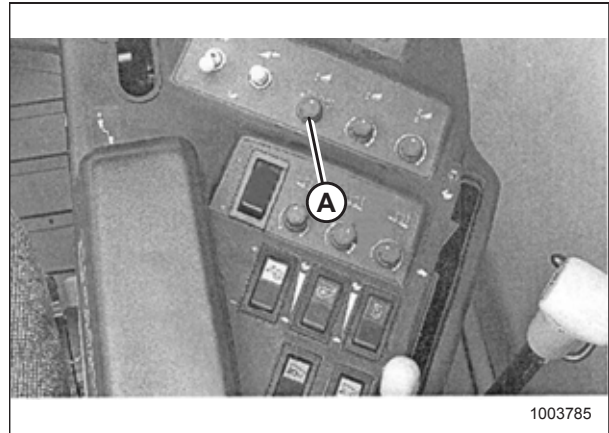


Figure 3.249: Right Console

### Setting Preset Cutting Height – Case 5130/6130/7130, 5140/6140/7140

### NOTE:

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

## WARNING

Check to be sure all bystanders have cleared the area.

1. Ensure indicator (A) is at position 0 (B) with the header 254–306 mm (10–14 in.) off the ground. If not, the float sensor output voltage should be checked. For instructions, refer to Step 5, [page 143](#).

### NOTE:

When the header is on the ground, the indicator should be at position 1 (C) for low ground pressure, and at position 4 (D) for high ground pressure. Crop and soil conditions determine the amount of float to use. The ideal setting is as light as possible without the header bouncing or missing crop. Operating with heavy settings prematurely wears the cutterbar wearplates.

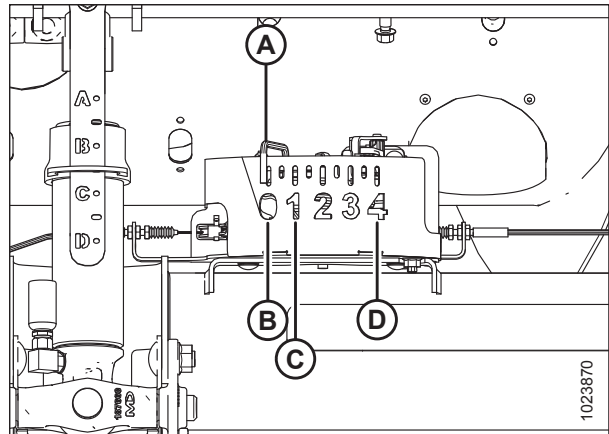


Figure 3.250: Float Indicator Box

## OPERATION

2. Engage the separator and header.
3. Manually raise or lower the header to the desired cutting height.
4. Press 1 on button (A). A yellow light next to the button will illuminate.

**NOTE:**

When setting presets, always set the header position before setting the reel position. If the header and the reel are set at the same time, the reel setting will not be saved.

5. Manually raise or lower the reel to the desired working position.
6. Press 1 on button (A). A yellow light next to the button will illuminate.
7. Manually raise or lower the header to a second desired cutting height.
8. Press 2 on button (A). A yellow light next to the button will illuminate.
9. Manually raise or lower the reel to the desired working position.
10. Press 2 on button (A). A yellow light next to the button will illuminate.

Up and down arrows should now appear in MANUAL HEIGHT box (A) on the RUN 1 page on the combine display. This indicates that the auto header height control (AHHC) is functioning.



Figure 3.251: Case Combine Console



Figure 3.252: Case Combine Console



Figure 3.253: Case Combine Display – Run 1 Page



## OPERATION

11. To enable the presets, activate AHHC button (A) to place the header on the ground. To enable the first preset, tap the button once. To enable the second preset, tap the button twice.

To lift the header to maximum working height, hold the SHIFT button on the back of the control handle while tapping AHHC button (A).



Figure 3.254: Case Combine Control Handle

12. The maximum working height can be adjusted on the HEADER SETUP page on the combine display. Enter the desired height in MAXIMUM WORKING HEIGHT field (A).



Figure 3.255: Case Combine Display – Header Setup Page

13. If you need to change the position of one of the presets, you can fine-tune this setting with button (A) on the combine console.



Figure 3.256: Case Combine Console

### 3.9.7 Case IH 7010/8010, 120, 230, 240, and 250 Series Combines

#### Checking Voltage Range from the Combine Cab – Case IH 8010

**NOTE:**

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

**⚠ DANGER**

Check to be sure all bystanders have cleared the area.

1. Position the header 150 mm (6 in.) above the ground, and unlock the float.
2. Check that float lock linkage is on down stops (washer [A] cannot be moved) at both locations.

**NOTE:**

If the header is not on the down stops during the next two steps, the voltage may go out of range during operation causing a malfunction of the AHHC system. If the header is not on the down stops, refer to [3.10 Leveling the Header](#), [page 317](#) for instructions.

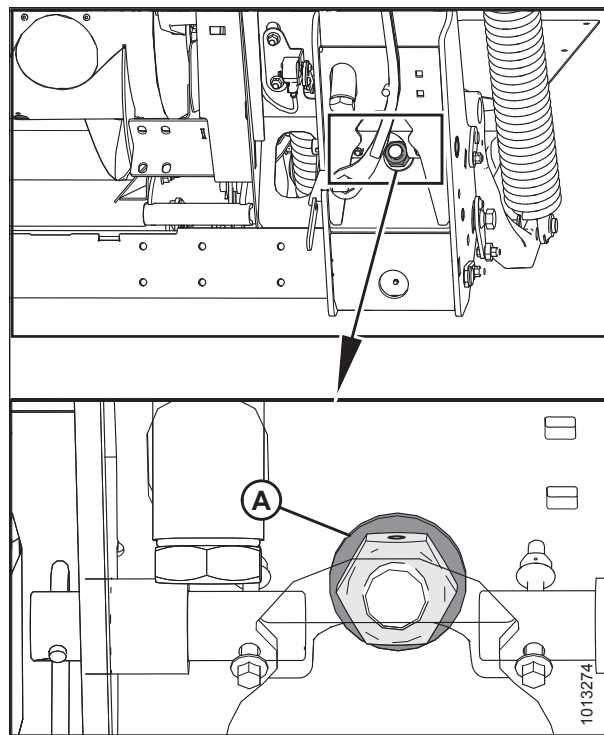


Figure 3.257: Float Lock

3. Adjust cable take-up bracket (B) (if necessary) until pointer (A) on the float indicator is on 0.

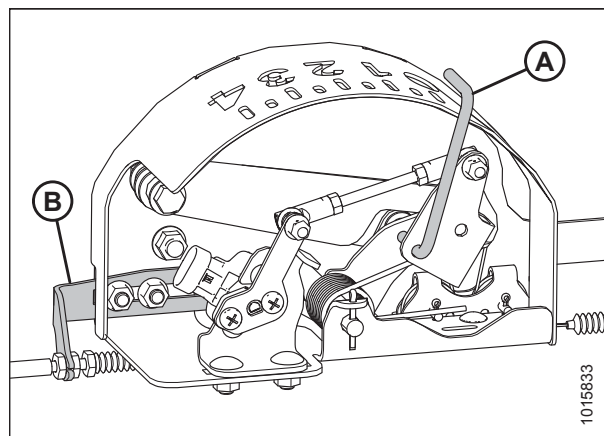


Figure 3.258: Float Indicator Box

OPERATION

4. Ensure the header float is unlocked.
5. Select DIAG (A) on the Universal display MAIN screen. The DIAG screen displays.

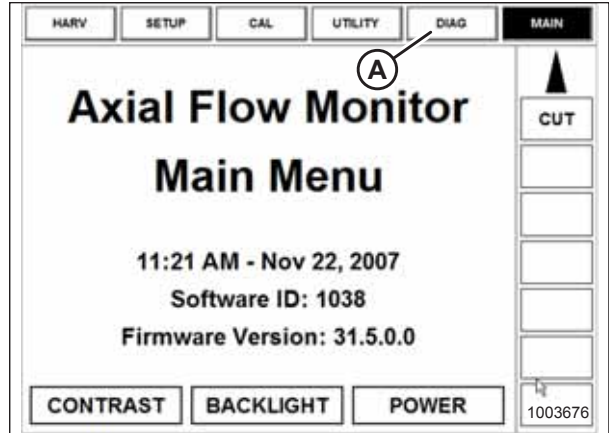


Figure 3.259: Case 8010 Combine Display

6. Select SUB SYSTEM (A). The SUB SYSTEM screen displays.

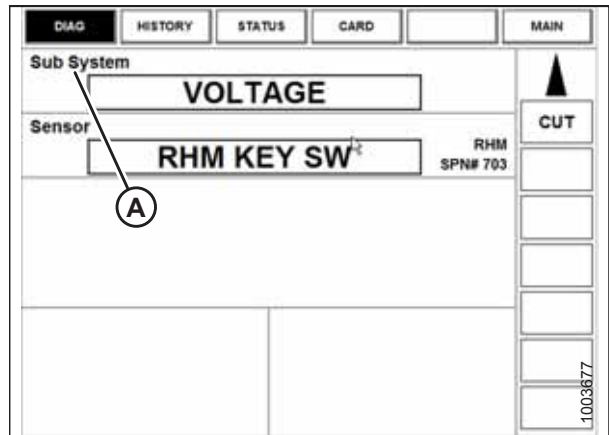


Figure 3.260: Case 8010 Combine Display

7. Select HDR HEIGHT/TILT (A). The SENSOR screen displays.

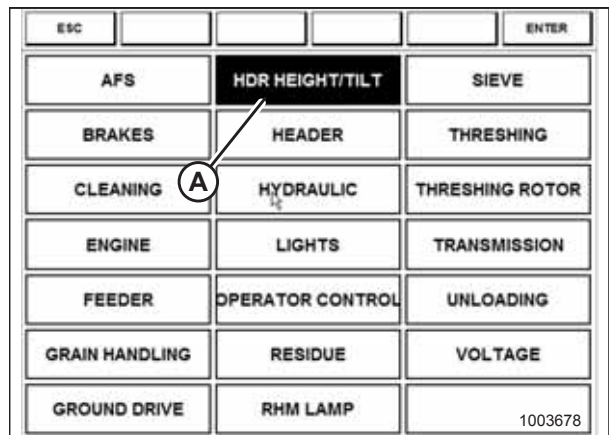


Figure 3.261: Case 8010 Combine Display



## OPERATION

8. Select LEFT SEN (A). The exact voltage is displayed. Raise and lower the header to see the full range of voltage readings.

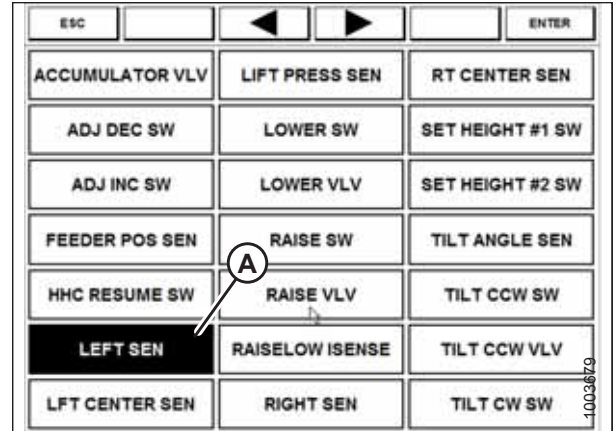


Figure 3.262: Case 8010 Combine Display

9. If the sensor voltage is not within the low and high limits, or if the range between the low and high limits is insufficient, adjust the voltage limits. For instructions, refer to *Adjusting Voltage Limits – One-Sensor System*, page 147.

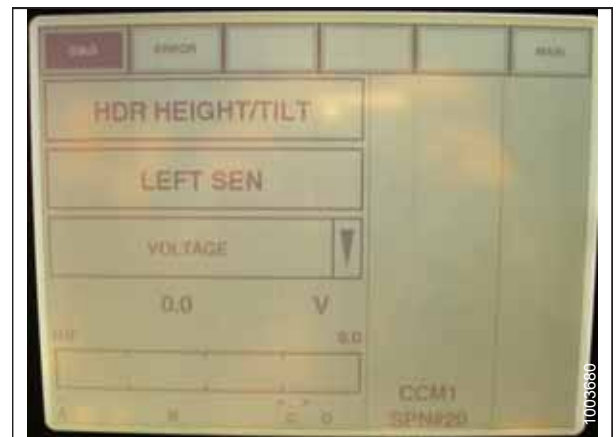


Figure 3.263: Case 8010 Combine Display

### Setting Header Controls – Case IH 8010

The following procedure applies to Case IH 8010 combines without a shift button on the control handle.

The REEL FORE-AFT switches (A) also control header fore-aft tilt if header is equipped with the fore-aft tilt option. The switches can be configured to allow the Operator to swap between reel fore-aft and header fore-aft tilt.

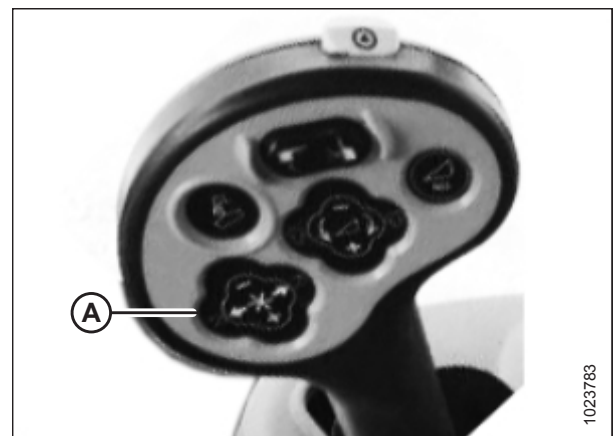


Figure 3.264: Case Combine Controls

## OPERATION

- To swap between reel fore-aft controls and header fore-aft tilt controls, go to the LAYOUT tab, select FORE/AFT CONTROL (A) from the legend, and place it on one of the operator-configurable screens (HARV1, HARV2, HARV3) or ADJUST under the RUN menu.

### NOTE:

H F/A (B) is displayed on the status bar on the right of the screen when HEADER is selected with the FORE/AFT CONTROL.

- If HEADER is selected with the FORE/AFT CONTROL, press the reel aft button on the control handle to tilt the header rearward, or press the reel fore button on the control handle to tilt the header forward.

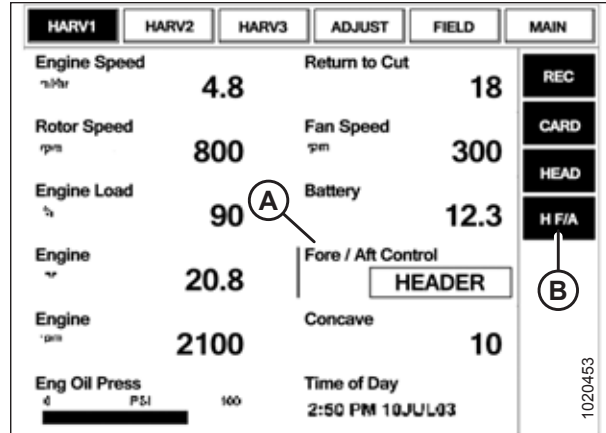


Figure 3.265: Case Combine Display

### Checking Voltage Range from the Combine Cab – Case IH 7010/8010, 120, 230, 240, and 250 Series Combines

### NOTE:

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

## DANGER

Check to be sure all bystanders have cleared the area.

- Check that the float lock linkage is on the down stops (washer [A] cannot be moved) at both locations.

### NOTE:

If the header is not on the down stops during the next two steps, the voltage may go out of range during operation causing a malfunction of the auto header height control (AHHC) system. If the header is not on the down stops, refer to [3.10 Leveling the Header, page 317](#) for instructions.

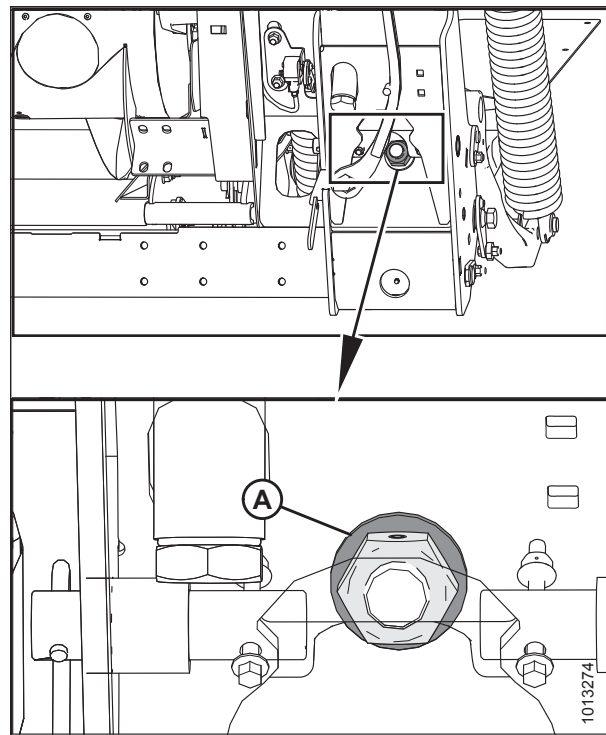


Figure 3.266: Float Lock

## OPERATION

- Adjust cable take-up bracket (B) (if necessary) until pointer (A) on the float indicator is on **0**.

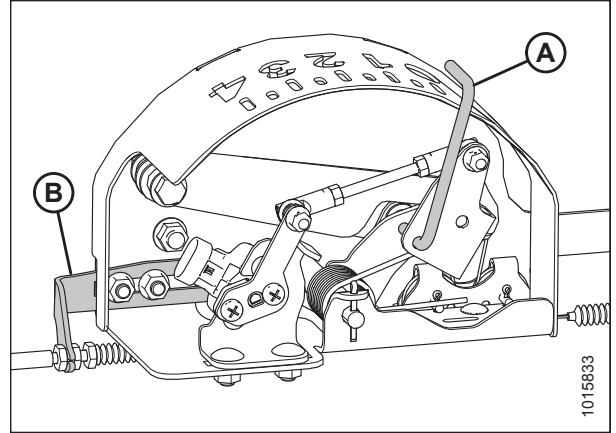


Figure 3.267: Float Indicator Box

- Ensure the header float is unlocked.
- Select DIAGNOSTICS (A) on the MAIN page. The DIAGNOSTICS page opens.
- Select SETTINGS. The SETTINGS page opens.

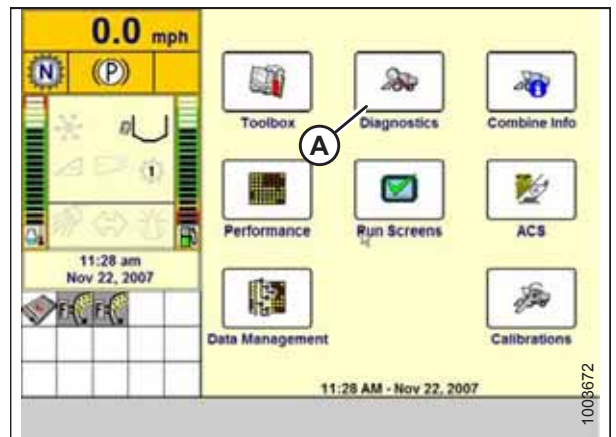


Figure 3.268: Case IH Combine Display

- Select GROUP arrow (A). The GROUP dialog box opens.

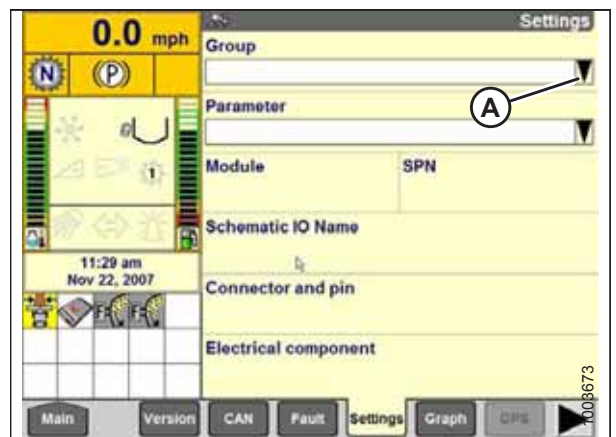


Figure 3.269: Case IH Combine Display

## OPERATION

7. Select HEADER HEIGHT/TILT (A). The PARAMETER page opens.

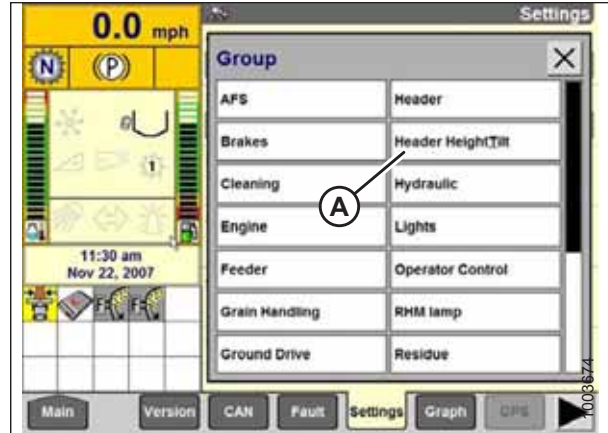


Figure 3.270: Case IH Combine Display

8. Select LEFT HEADER HEIGHT SEN (A), and then select GRAPH button (B). The exact voltage is displayed at top of page. Raise and lower the header to see the full range of voltage readings.
9. If the sensor voltage is not within the low and high limits, or if the range between the low and high limits is insufficient, adjust the voltage limits. For instructions, refer to *Adjusting Voltage Limits – One-Sensor System*, page 147.

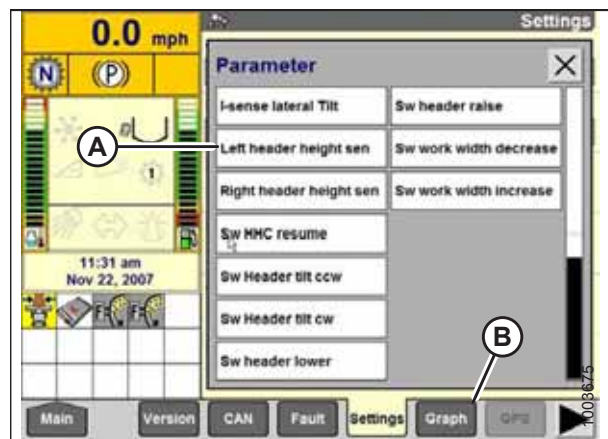


Figure 3.271: Case IH Combine Display

### *Calibrating the Auto Header Height Control – Case IH 7010/8010,120, 230, 240, and 250 Series Combines*

The auto header height control (AHHC) sensor output must be calibrated for each combine, or the AHHC feature will not work properly.

#### **WARNING**

Clear the area of other persons, pets etc. Keep children away from machinery. Walk around the machine to be sure no one is under, on, or close to it.

#### **NOTE:**

This procedure applies to combines with a software version below 28.00. For instructions on calibrating the AHHC for combines with software version 28.00 or above, refer to *Calibrating the Auto Header Height Control – Case IH Combines with Version 28.00 or Higher Software*, page 182.

#### **NOTE:**

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

#### **NOTE:**

If the header float is set too light, it can prevent the calibration of the AHHC. You may need to set the float heavier for calibration procedure so the header does not separate from the float module.

## OPERATION

### NOTE:

For best performance of the auto header height control (AHHC), perform these procedures with the center-link set to **D**. When setup and calibration are complete, adjust the center-link back to desired header angle. For instructions, refer to [3.8.4 Header Angle, page 96](#).

1. Ensure the center-link is set to **D**.
2. Ensure the header and float module electrical and hydraulic connections are made.
3. Select TOOLBOX (A) on the MAIN page.

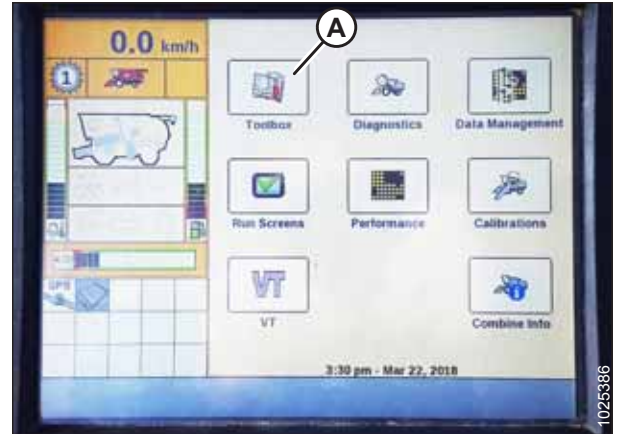


Figure 3.272: Case IH Combine Display

4. Select HEADER tab (A).

### NOTE:

To locate the HEADER tab, you may need to scroll to the right using side arrows (C).

5. Set the appropriate HEADER STYLE (B).



Figure 3.273: Case IH Combine Display

6. Set AUTO REEL SPEED SLOPE.

### NOTE:

The AUTO REEL SPEED SLOPE value automatically maintains the speed of the reel relative to ground speed. For example, if the value is set to 133, then the reel will turn be faster than ground speed. The reel should normally be slightly faster than ground speed; however, adjust the value according to crop conditions.

7. Set HEADER PRESSURE FLOAT to NO if equipped, and ensure REEL DRIVE is HYDRAULIC.

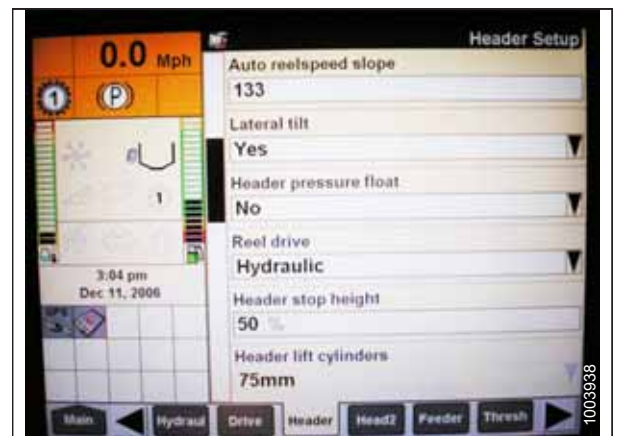


Figure 3.274: Case IH Combine Display



## OPERATION

8. Install REEL FORE-BACK to YES (if applicable).



Figure 3.275: Case IH Combine Display

9. Locate HHC HEIGHT SENSITIVITY field (A), and set as follows:

- **If using a two-sensor system:** Set HHC HEIGHT SENSITIVITY to 250.
- **If using a single-sensor system:** Set HHC HEIGHT SENSITIVITY to 180.

**NOTE:**

If hunting occurs during operation, decrease this setting by 20 points at a time until hunting no longer occurs.

10. Set HHC TILT SENSITIVITY (B) to 150. Increase or decrease as desired.



Figure 3.276: Case IH Combine Display

11. Install FORE/AFT CONTROL and HDR FORE/AFT TILT (if applicable).

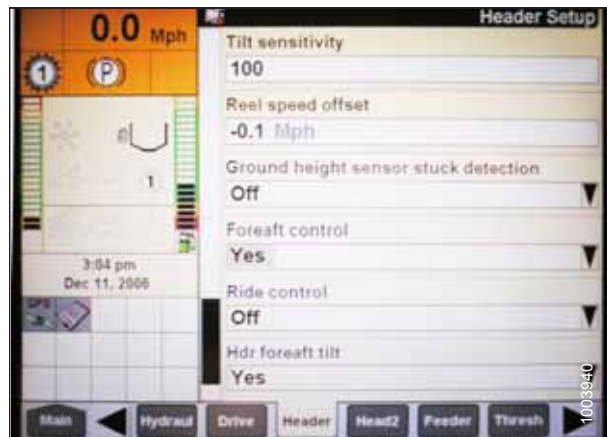


Figure 3.277: Case IH Combine Display

## OPERATION

12. Press HEAD2 (A) at the bottom of the page.
13. Ensure HEADER TYPE (B) is DRAPER.

**NOTE:**

If the recognition resistor is plugged in to the header harness, you will not be able to change this.

14. Set CUTTING TYPE (C) to PLATFORM.
15. Set the appropriate HEADER WIDTH (D) and HEADER USAGE (E).

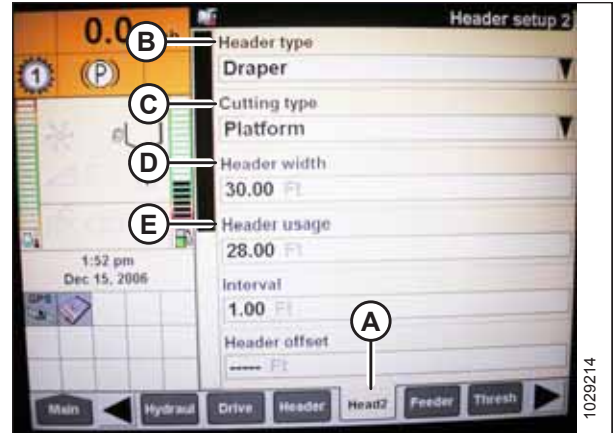


Figure 3.278: Case IH Combine Display

16. From the REEL HEIGHT SENSOR menu, select YES (A).



Figure 3.279: Case IH Combine Display

17. Locate AUTOTILT field (A).

- **If using a two-sensor system:** Select YES in the AUTOTILT field.
- **If using a single-sensor system:** Select NO in the AUTOTILT field.

**NOTE:**

If the float was set heavier to complete the AHHC calibration procedure, adjust it to the recommended operating float after the calibration is complete.



Figure 3.280: Case IH Combine Display

## OPERATION

### *Calibrating the Auto Header Height Control – Case IH Combines with Version 28.00 or Higher Software*

The auto header height control (AHHC) sensor output must be calibrated for each combine, or the AHHC feature will not work properly.

#### **WARNING**

Clear the area of other persons, pets etc. Keep children away from machinery. Walk around the machine to be sure no one is under, on, or close to it.

#### **NOTE:**

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

#### **NOTE:**

If the header float is set too light, it can prevent the calibration of the AHHC. You may need to set the float heavier for the calibration procedure so the header does not separate from the float module.

#### **NOTE:**

For best performance of the auto header height control (AHHC), perform these procedures with the center-link set to **D**. When setup and calibration are complete, adjust the center-link back to desired header angle. For instructions, refer to [3.8.4 Header Angle, page 96](#).

1. Ensure the header center-link is set to **D**.
2. Raise the header onto the down stops and unlock the float.
3. Select TOOLBOX (A) on the MAIN page.

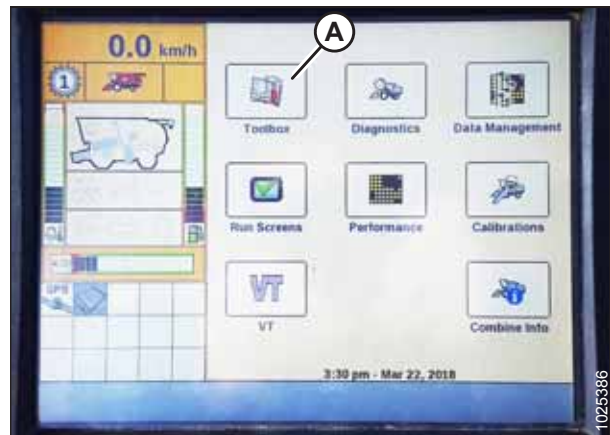


Figure 3.281: Case IH Combine Display



## OPERATION

4. Select HEAD 1 tab (A).

**NOTE:**

To locate the HEAD 1 tab, you may need to scroll to the right using side arrows (B).

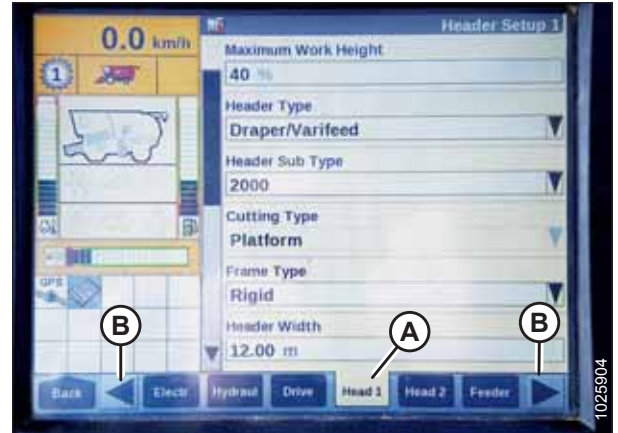


Figure 3.282: Case IH Combine Display

5. Locate the HEADER SUB TYPE field.
6. Select 2000 (A).



Figure 3.283: Case IH Combine Display

7. Select HEAD 2 tab (A).
8. In HEADER SENSORS field (B), select ENABLE.
9. In HEADER PRESSURE FLOAT field (C), select NO.
10. In HEIGHT/TILT RESPONSE field (D), select FAST.
11. In AUTO HEIGHT OVERRIDE field (E), select YES.
12. Press down arrow (F) to go to the next page.

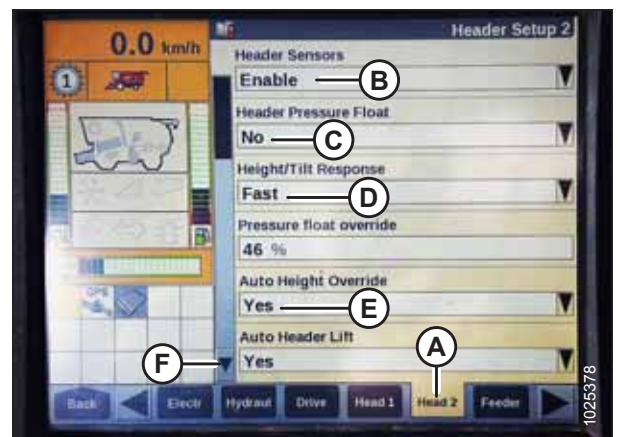


Figure 3.284: Case IH Combine Display

## OPERATION

13. Locate HHC HEIGHT SENSITIVITY field (A), and set as follows:

- **If using a single-sensor system:** Set HHC HEIGHT SENSITIVITY to 180.
- **If using a two-sensor system:** Set HHC HEIGHT SENSITIVITY to 250.

**NOTE:**

If hunting occurs during operation, decrease this setting by 20 points at a time until hunting no longer occurs.

14. Set HHC TILT SENSITIVITY (B) to 150. Increase or decrease as desired.



Figure 3.285: Case IH Combine Display

15. From the REEL HEIGHT SENSOR menu, select YES (A).



Figure 3.286: Case IH Combine Display

16. Locate AUTOTILT field (A).

- **If using a two-sensor system:** Select YES in the AUTOTILT field.
- **If using a single-sensor system:** Select NO in the AUTOTILT field.

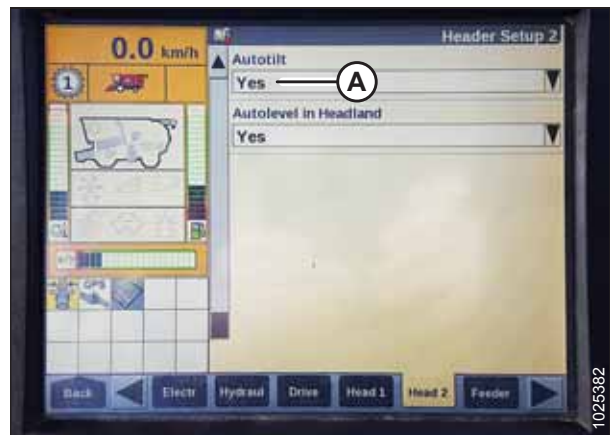


Figure 3.287: Case IH Combine Display

## OPERATION

### NOTE:

Icons (A) and (B) appear on the monitor only after engaging the separator and header, and then pressing HEADER RESUME button on the control panel.

17. Ensure AUTO HEIGHT icon (A) appears on the monitor and is displayed as shown at location (B). When the header is set for cutting on the ground, this verifies that the combine is correctly using the sensor on the header to sense ground pressure.

### NOTE:

AUTO HEIGHT field (B) may appear on any of the RUN tabs and not necessarily on the RUN 1 tab.



Figure 3.288: Case IH Combine Display

18. Select CALIBRATION on the combine display, and press the right arrow navigation key to enter the information box.
19. Select HEADER (A), and press ENTER. The CALIBRATION dialog box opens.

### NOTE:

You can use the up and down navigation keys to move between options.

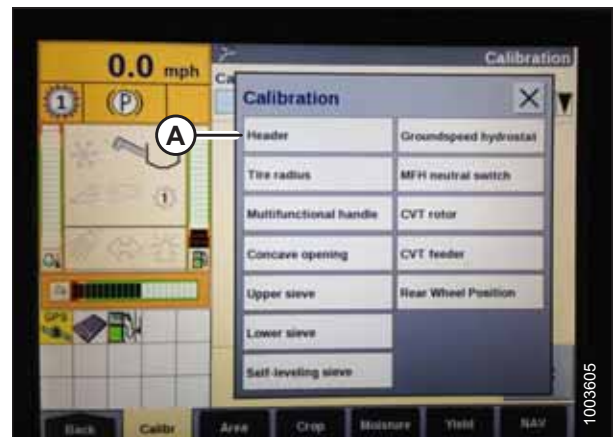


Figure 3.289: Case IH Combine Display

20. Follow the calibration steps in the order in which they appear in the dialog box. As you proceed through the calibration process, the display will automatically update to show the next step.

### NOTE:

Pressing the ESC key during any of the steps or letting the system sit idle for more than 3 minutes will cause the calibration procedure to stop.

### NOTE:

Refer to your combine operator's manual for an explanation of any error codes.



Figure 3.290: Case IH Combine Display

21. When all steps have been completed, CALIBRATION SUCCESSFUL message is displayed on the page. Exit the CALIBRATION menu by pressing the ENTER or ESC key.

### NOTE:

If the float was set heavier to complete the AHHC calibration procedure, adjust it to the recommended operating float after the calibration is complete.

## OPERATION

### Checking Reel Height Sensor Voltages – Case IH Combines

#### **WARNING**

Clear the area of other persons, pets etc. Keep children away from machinery. Walk around the machine to be sure no one is under, on, or close to it.

#### **NOTE:**

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

1. On the main page of the combine display, select **DIAGNOSTICS** (A). The **DIAGNOSTICS** page opens.

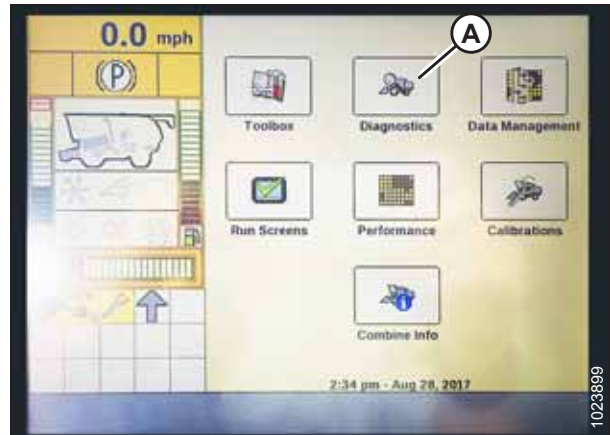


Figure 3.291: Case IH Combine Display

2. Select **SETTINGS** tab (A). The **SETTINGS** page opens.
3. From the **GROUP** menu, select **HEADER** (B).
4. From the **PARAMETER** menu, select **REEL VERTICAL POSITION** (C).



Figure 3.292: Case IH Combine Display

## OPERATION

5. Select GRAPH tab (A). The REEL VERTICAL POSITION graph displays.
6. Lower the reel to view high voltage (B). The voltage should be 4.1–4.5 V.
7. Raise the reel to view low voltage (C). The voltage should be 0.5–0.9 V.
8. If either voltage is out of range, refer to [Checking and Adjusting Reel Height Sensor](#), page 111.

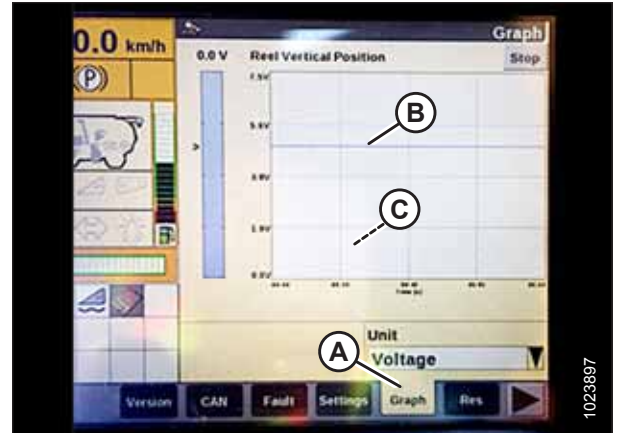


Figure 3.293: Case IH Combine Display

### Setting Preset Cutting Height – Case IH 7010/8010, 120, 230, 240, and 250 Series Combines

#### WARNING

Clear the area of other persons, pets etc. Keep children away from machinery. Walk around the machine to be sure no one is under, on, or close to it.

#### NOTE:

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

1. Ensure indicator (A) is at position 0 (B) with the header 254–306 mm (10–14 in.) off the ground. If not, the float sensor output voltage should be checked. For instructions, refer to Step 5, [page 143](#).

#### NOTE:

When the header is on the ground, the indicator should be at position 1 (C) for low ground pressure, and at position 4 (D) for high ground pressure. Crop and soil conditions determine the amount of float to use. The ideal setting is as light as possible without header bouncing or missing crop. Operating with heavy settings prematurely wears the cutterbar wearplates.

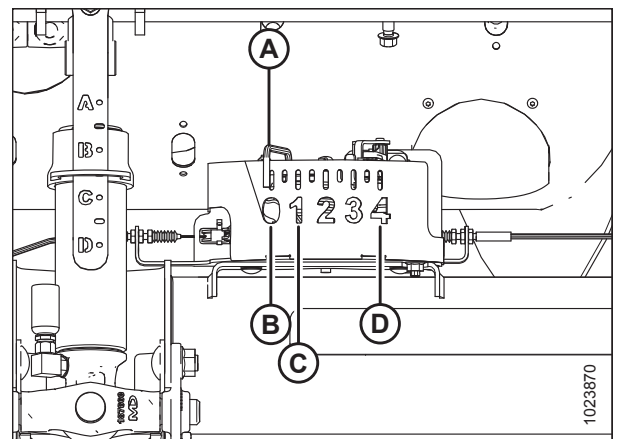


Figure 3.294: Float Indicator Box



## OPERATION

- Engage the separator and the header.
- Manually raise or lower the header to a desired cutting height.
- Press SET #1 switch (A). Light (C) beside switch (A) will illuminate.

**NOTE:**

Use switch (E) for fine adjustments.

**NOTE:**

When setting the presets, always set the header position before setting the reel position. If the header and the reel are set at the same time, the reel setting will not save.

- Manually raise or lower the reel to the desired position.
- Press SET #1 switch (A). Light (C) beside switch (A) will illuminate.
- Manually raise or lower the header to a second desired cutting height.
- Press SET #2 switch (B). Light (D) beside switch (B) will illuminate.
- Manually raise or lower the reel to a second desired working position.
- Press SET #2 switch (B). Light (D) beside switch (B) will illuminate.
- To swap between the set points, press HEADER RESUME (A).
- To raise the header at headlands, press and hold SHIFT button (B) at the back of the control handle and press HEADER RESUME switch (A). To lower header, press HEADER RESUME switch (A) once to return to header preset height.

**NOTE:**

Pressing HEADER RAISE/LOWER switches (C) and (D) disengages AUTO HEIGHT mode. Press HEADER RESUME (A) to re-engage.

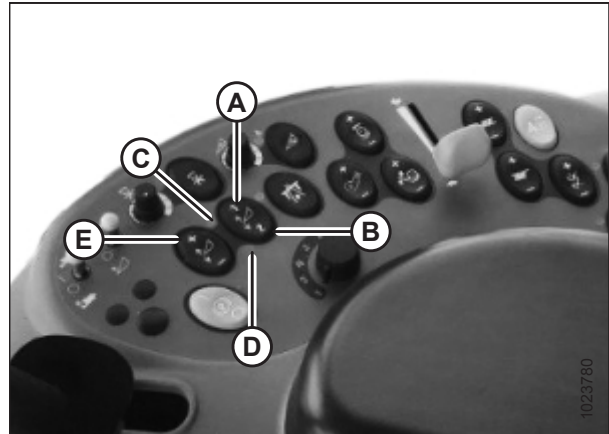


Figure 3.295: Case Combine Controls



Figure 3.296: Case Combine Controls

### 3.9.8 Challenger and Massey Ferguson 6 and 7 Series Combines

#### Checking Voltage Range from the Combine Cab – Challenger and Massey Ferguson



#### **WARNING**

Clear the area of other persons, pets etc. Keep children away from machinery. Walk around the machine to be sure no one is under, on, or close to it.

## OPERATION

### NOTE:

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

1. Check that the float lock linkage is on the down stops (washer [A] cannot be moved) at both locations.

### NOTE:

If the header is not on the down stops during the next two steps, the voltage may go out of range during operation, causing a malfunction of the auto header height control (AHHC) system. If the header is not on the down stops, refer to [3.10 Leveling the Header, page 317](#) for instructions.

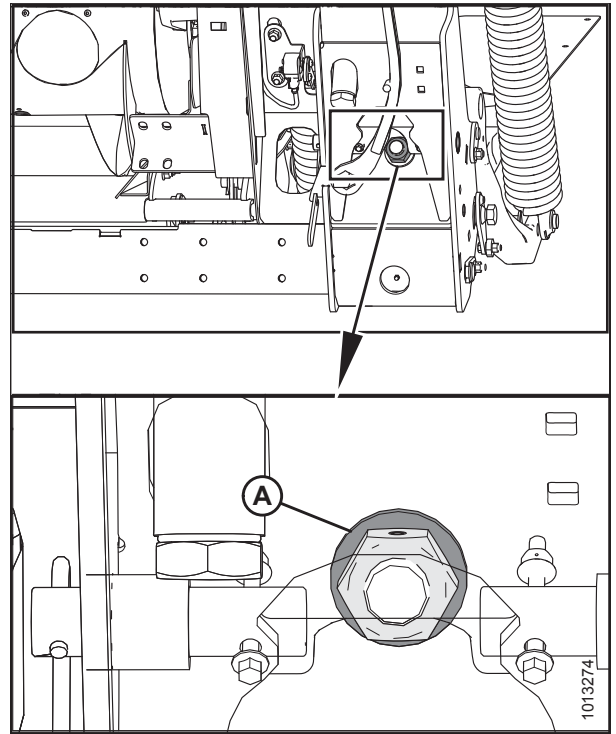


Figure 3.297: Float Lock

2. Adjust cable take-up bracket (B) (if necessary) until float indicator pointer (A) is on 0.

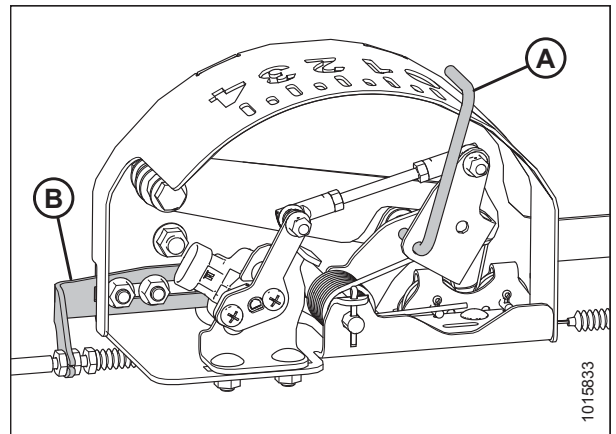


Figure 3.298: Float Indicator Box

## OPERATION

- Go to the FIELD page on the combine monitor, and then press the diagnostics icon. The MISCELLANEOUS page displays.
- Press VMM DIAGNOSTIC button (A). The VMM DIAGNOSTIC page displays.

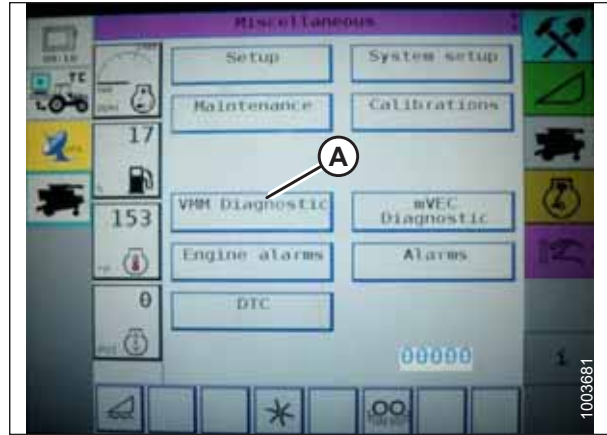


Figure 3.299: Challenger Combine Display

- Go to ANALOG IN tab (A), and then select VMM MODULE 3 by pressing the text box below the four tabs. The voltage from the AHC sensor is now displayed on page as HEADER HEIGHT RIGHT POT and HEADER HEIGHT LEFT POT. The readings may be slightly different.



Figure 3.300: Challenger Combine Display

- Fully lower the combine feeder house (float module should be fully separated from the header).

### NOTE:

You may need to hold the HEADER DOWN switch for a few seconds to ensure the feeder house is fully lowered.

- Read the voltage.
- Read the voltage.
- If the sensor voltage is not within the low and high limits, or if the range between the low and high limits is insufficient, adjust the voltage limits. For instructions, refer to [Adjusting Voltage Limits – One-Sensor System, page 147](#) or [Adjusting Voltage Limits – Two-Sensor System, page 148](#).



Figure 3.301: Challenger Combine Display

## Engaging the Auto Header Height Control – Challenger and Massey Ferguson

### NOTE:

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

The following system components are required in order for the auto header height control (AHC) to work:



## OPERATION

- Main module (PCB board) and header driver module (PCB board) mounted in card box in fuse panel module (FP)
  - Multifunction control handle operator inputs
  - Operator inputs mounted in the control console module (CC) panel
  - The electrohydraulic header lift control valve is an integral part of the system.
1. Scroll through the header control options on the combine display using the header control switch until AHHC icon (A) is displayed in the first message box. The AHHC will adjust the header height in relation to the ground according to the height setting and sensitivity setting.

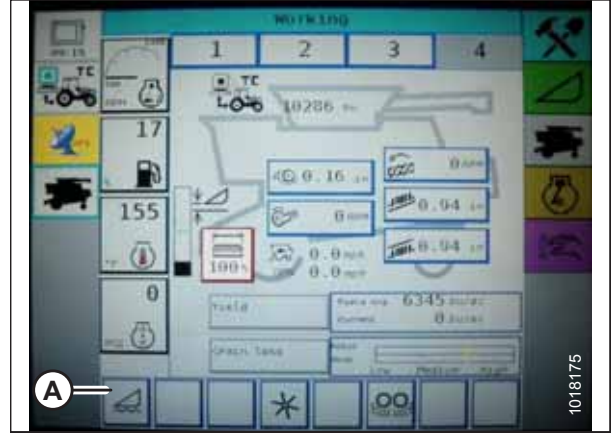


Figure 3.302: Challenger Combine Display

### *Calibrating the Auto Header Height Control – Challenger and Massey Ferguson*

The auto header height control (AHHC) sensor output must be calibrated for each combine, or the AHHC feature will not work properly.

#### **WARNING**

**Clear the area of other persons, pets etc. Keep children away from machinery. Walk around the machine to be sure no one is under, on, or close to it.**

#### **NOTE:**

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

#### **NOTE:**

If the header float is set too light, it can prevent the AHHC calibration. You may need to set the float heavier for the calibration procedure so the header doesn't separate from the float module.

#### **NOTE:**

For best performance of the auto header height control (AHHC) system, perform these procedures with the center-link set to **D**. When setup and calibration are complete, adjust the center-link back to desired header angle. For instructions, refer to [3.8.4 Header Angle, page 96](#).

## OPERATION

1. Ensure the center-link is set to **D**.
2. On the FIELD page, press DIAGNOSTICS icon (A). The MISCELLANEOUS page appears.

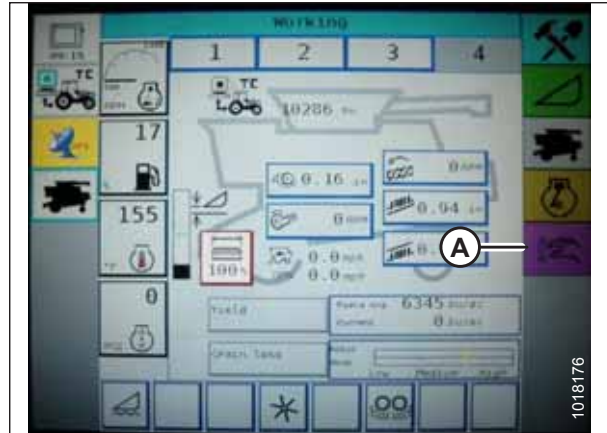


Figure 3.303: Challenger Combine Display

3. Press CALIBRATIONS button (A). The CALIBRATIONS page appears.

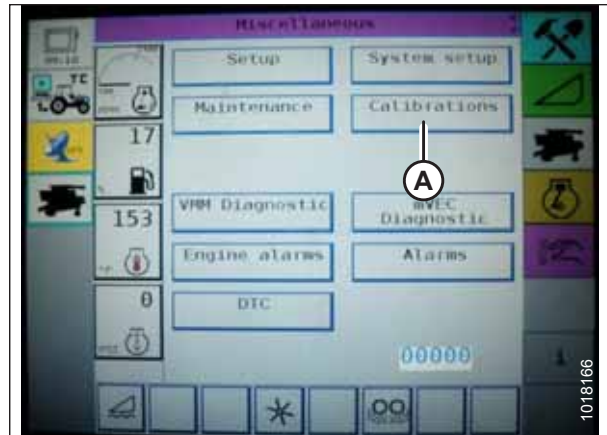


Figure 3.304: Challenger Combine Display

4. Press HEADER button (A). The HEADER CALIBRATION page displays a warning.

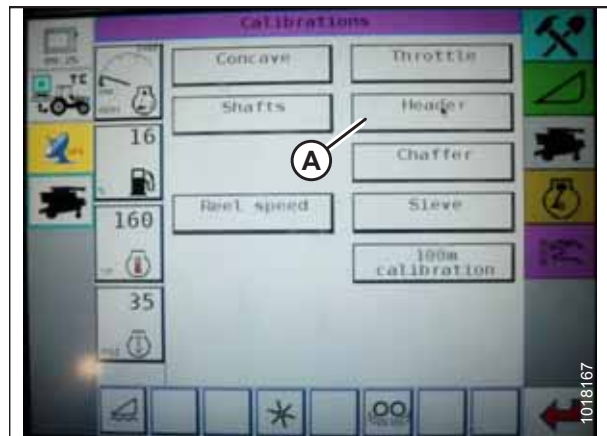


Figure 3.305: Challenger Combine Display

## OPERATION

5. Read the warning message, and then press the green check mark button.

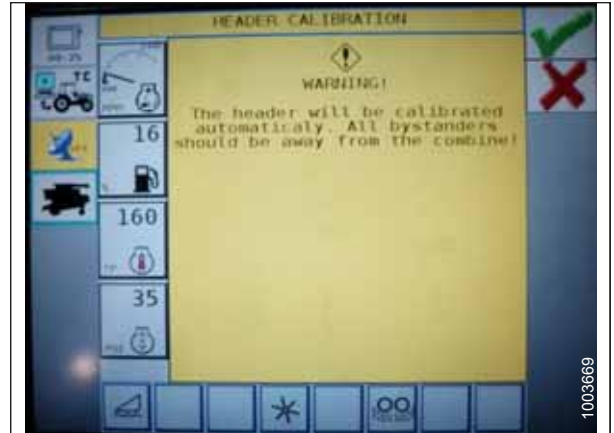


Figure 3.306: Challenger Combine Display

6. Follow the on-screen prompts to complete calibration.

### NOTE:

The calibration procedure can be canceled at any time by pressing the CANCEL button in the bottom right corner of the screen. While the header calibration is running, the calibration can also be canceled by using the UP, DOWN, TILT RIGHT, or TILT LEFT buttons on the control handle.

### NOTE:

If the combine does not have HEADER TILT installed or if it is inoperable, you may receive warnings during calibration. Press the green check mark if these warnings appear. This will not affect the AHHC calibration.

### NOTE:

If the float was set heavier to complete the AHHC calibration procedure, adjust to the recommended operating float after the calibration is complete.

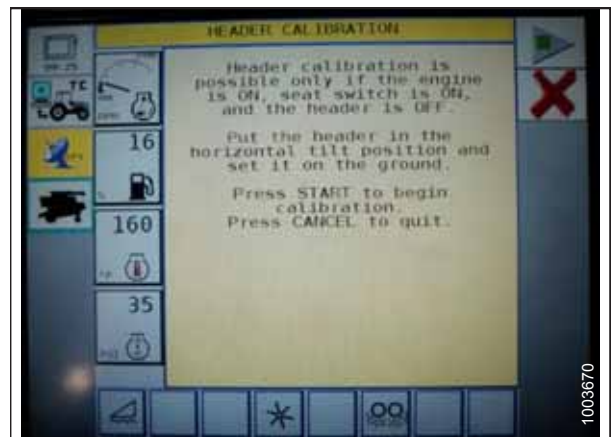


Figure 3.307: Challenger Combine Display

### *Adjusting the Header Height – Challenger and Massey Ferguson*

The auto header height control (AHHC) feature allows the operator to set specific header heights.



### WARNING

Clear the area of other persons, pets etc. Keep children away from machinery. Walk around the machine to be sure no one is under, on, or close to it.

### NOTE:

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

## OPERATION

Once the auto header height control (AHHC) is activated, press and release the HEADER LOWER button on the control handle. The AHHC will automatically lower the header to the selected height setting.

You can adjust the selected AHHC height using HEIGHT ADJUSTMENT knob (A) on the control console. Turning the knob clockwise increases the selected height, and turning the knob counterclockwise decreases the selected height.



Figure 3.308: Height Adjustment Knob on the Combine Control Console

### *Adjusting the Header Raise/Lower Rate – Challenger and Massey Ferguson*

#### **NOTE:**

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

1. Press Header icon (A) on the FIELD screen. The HEADER page displays.

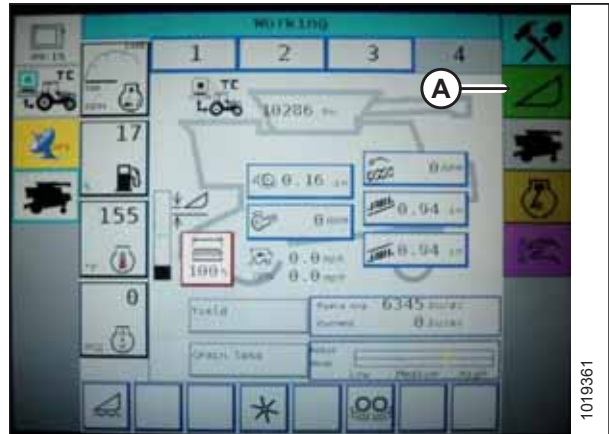


Figure 3.309: Challenger Combine Display

2. Press HEADER CONTROL (A). The HEADER CONTROL page displays.

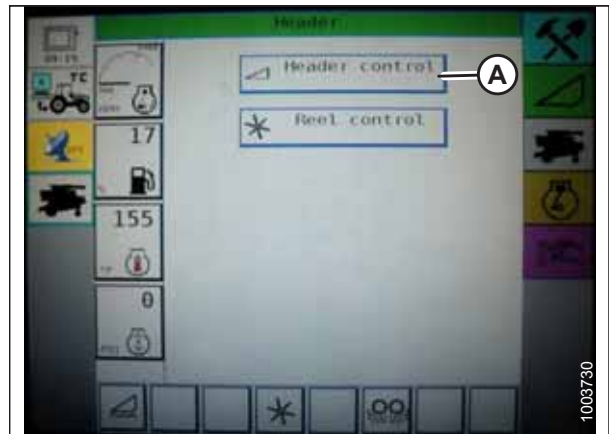


Figure 3.310: Challenger Combine Display

## OPERATION

3. Go to the TABLE SETTINGS tab.
4. Press the up arrow on MAX UP PWM to increase the percentage number and increase the raise speed. Press the down arrow on MAX UP PWM to decrease the percentage number and decrease the raise speed.
5. Press the up arrow on MAX DOWN PWM to increase the percentage number and increase the lower speed. Press the down arrow on MAX DOWN PWM to decrease the percentage number and decrease the lower speed.

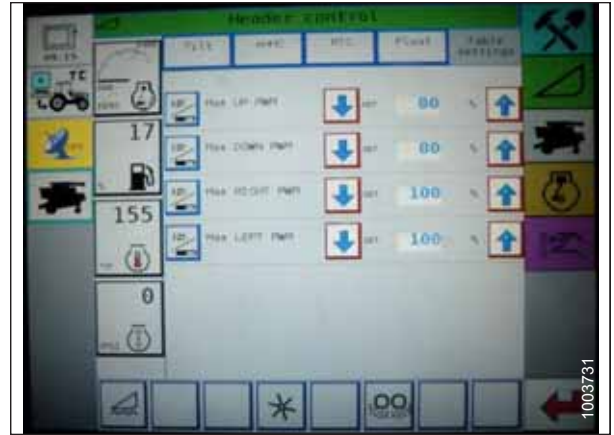


Figure 3.311: Challenger Combine Display

### *Setting the Sensitivity of the Auto Header Height Control – Challenger and Massey Ferguson*

The sensitivity adjustment controls the distance the cutterbar must travel up or down before the auto header height control (AHHC) reacts and raises or lowers the feeder house. When the sensitivity is set to maximum, only small changes in ground height are needed to cause the system to raise or lower the feeder house. When the sensitivity is set to minimum, large changes in the ground height are needed to cause the system to raise or lower the feeder house .

### **WARNING**

Clear the area of other persons, pets etc. Keep children away from machinery. Walk around the machine to be sure no one is under, on, or close to it.

### **NOTE:**

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

1. Press the HEADER icon on the FIELD page. The HEADER page appears.
2. Press HEADER CONTROL button (A). The HEADER CONTROL page appears. You can adjust sensitivity on this page using the up and down arrows.

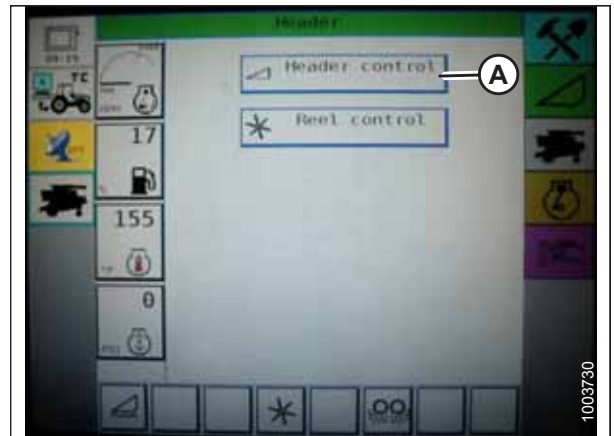


Figure 3.312: Challenger Combine Display



## OPERATION

3. Adjust the sensitivity to the maximum setting.
4. Activate the AHHC, and press the HEADER LOWER button on the control handle.
5. Decrease the sensitivity until the feeder house remains steady and does not bounce up and down.

**NOTE:**

This is the maximum sensitivity and is only an initial setting. The final setting must be made in the field, as the system reaction will vary with changing surfaces and operating conditions.

**NOTE:**

If maximum sensitivity is not needed, a less sensitive setting will reduce the frequency of header height corrections and component wear. Partially opening the accumulator valve will cushion the action of the header lift cylinders and reduce header hunting.



Figure 3.313: Challenger Combine Display

### 3.9.9 CLAAS 500 Series Combines

#### *Calibrating the Auto Header Height Control – CLAAS 500 Series*

The auto header height control (AHHC) sensor output must be calibrated for each combine, or the AHHC feature will not work properly.

**NOTE:**

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

**NOTE:**

If the header float is set too light, it can prevent the calibration of the AHHC. You may need to set the float heavier for the calibration procedure so the header does not separate from the float module.

**NOTE:**

For best performance of the auto header height control (AHHC), perform these procedures with the center-link set to **D**. When setup and calibration are complete, adjust the center-link back to desired header angle. For instructions, refer to [3.8.4 Header Angle, page 96](#).

1. Ensure the center-link is set to **D**.
2. Use < key (A) or > key (B) to select AUTO HEADER, and press OK key (C). The E5 page indicates whether the automatic header height is on or off.

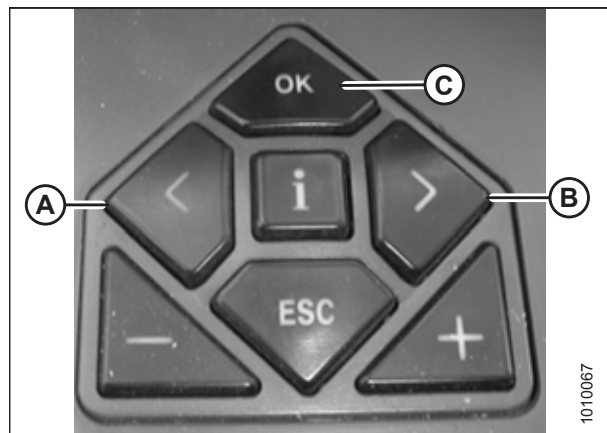


Figure 3.314: CLAAS Combine Controls

## OPERATION

- Use – key (A) or + key (B) to turn the AHHC on, and press OK key (C).
- Engage the threshing mechanism and the header.

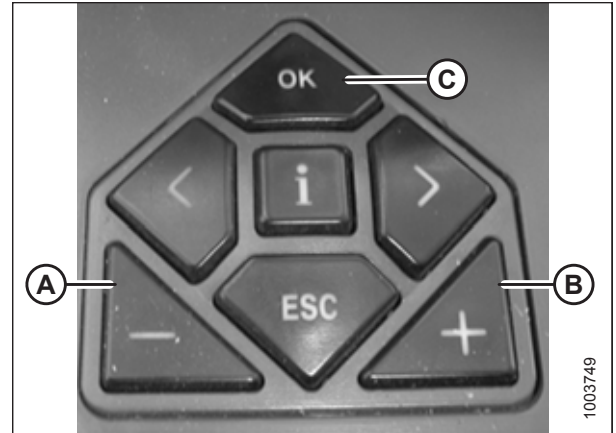


Figure 3.315: CLAAS Combine Controls

- Use the < or > key to select CUTT. HEIGHT LIMITS, and press the combine control's OK key.
- Follow the procedure displayed on the screen to program the upper and lower limits of the header into the CEBIS.

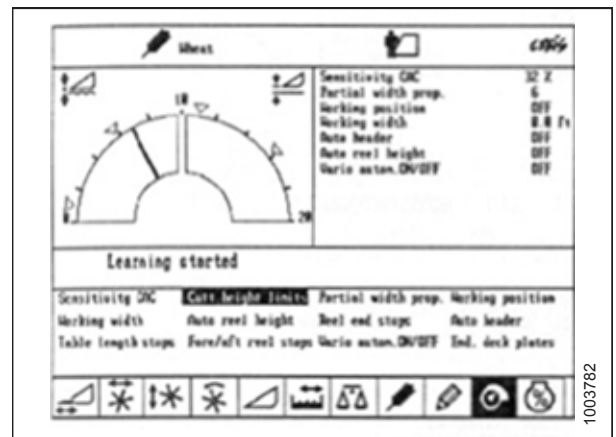


Figure 3.316: CLAAS Combine Display

- Use the < or > key to select SENSITIVITY CAC, and press the combine control's OK key.

**NOTE:**

Setting the sensitivity of the AHHC system affects the reaction speed of the AHHC on the header.

- Use the – key or the + key to change the reaction speed setting, and press the combine control's OK key.

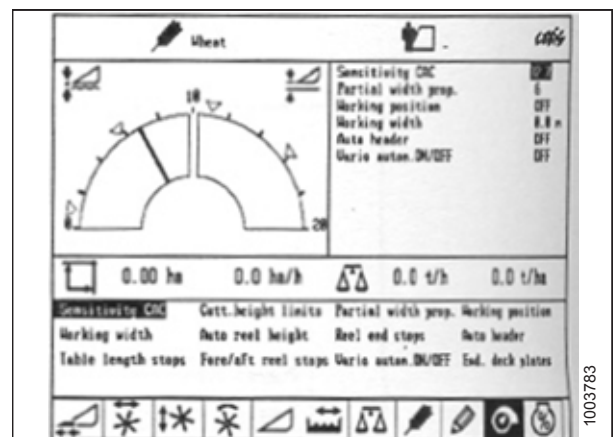


Figure 3.317: CLAAS Combine Display



## OPERATION

9. Use line (A) or value (B) to determine the sensitivity setting.

### NOTE:

The setting can be adjusted from 0–100%. When sensitivity is adjusted to 0%, the signals from the sensing bands have no effect on the automatic cutting height adjustment. When sensitivity is adjusted to 100%, the signals from the sensing bands have maximum effect on the automatic cutting height adjustment. The recommended starting point is 50%.

### NOTE:

If the float was set heavier to complete the AHHC calibration procedure, adjust it to the recommended operating float after the calibration is complete.

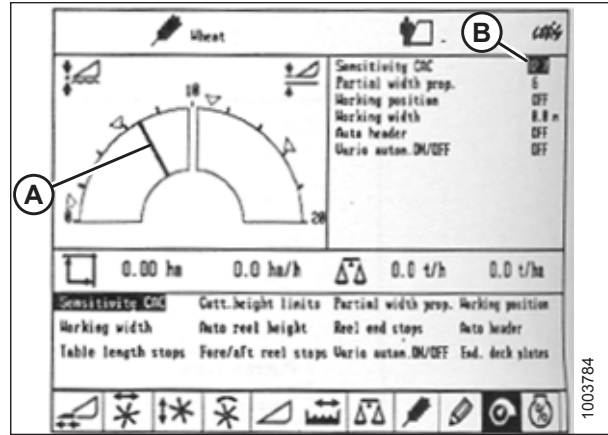


Figure 3.318: CLAAS Combine Display

### Setting Cutting Height – CLAAS 500 Series

Cutting heights can be programmed into the preset cutting height and auto contour systems. Use the preset cutting height system for cutting heights above 150 mm (6 in.), and use the auto contour system for cutting heights below 150 mm (6 in.).

### Setting Preset Cutting Height – CLAAS 500 Series

## DANGER

Check to be sure all bystanders have cleared the area.

### NOTE:

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

1. Start the engine.
2. Activate the machine enable switch.
3. Engage the threshing mechanism.
4. Engage the header.
5. Briefly press button (A) in order to activate the auto contour system, or briefly press button (B) in order to activate the preset cutting height system.

### NOTE:

Button (A) is used only with auto header height control (AHHC) function. Button (B) is used only with the return to cut function.



Figure 3.319: Control Handle Buttons

## OPERATION

6. Use < key (C) or > key (D) to select the CUTTING HEIGHT page, and press OK key (E).
7. Use – key (A) or + key (B) to set the desired cutting height. An arrow indicates the selected cutting height on the scale.

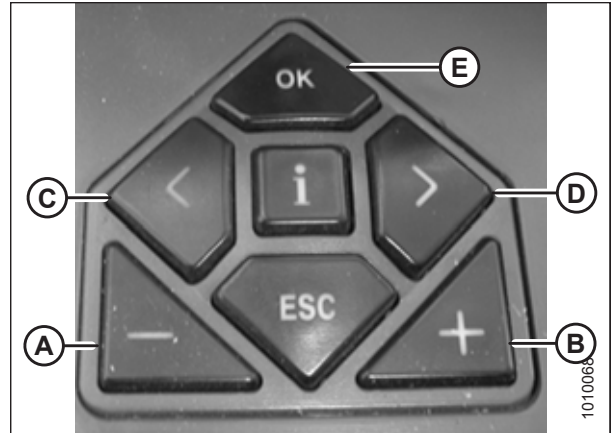


Figure 3.320: CLAAS Combine Controls

8. Briefly press button (A) or button (B) in order to select the set point.
9. Repeat Step 7, [page 199](#) for the set point.



Figure 3.321: Control Handle Buttons

## OPERATION

### Setting Cutting Height Manually – CLAAS 500 Series

#### DANGER

Check to be sure all bystanders have cleared the area.

#### NOTE:

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

1. Use button (A) to raise the header, or button (B) to lower the header to the desired cutting height.
2. Press and hold button (C) for 3 seconds to store the cutting height into the CEBIS (an alarm will sound when the new setting has been stored).
3. Program a second set point, if desired, by using button (A) to raise the header, or button (B) to lower the header to the desired cutting height, and briefly press button (C) to store the second set point into the CEBIS (an alarm will sound when the new setting has been stored).

#### NOTE:

For above-the-ground cutting, repeat Step 1, page 200, and use button (D) instead of button (C) while repeating Step 2, page 200.



Figure 3.322: Control Handle Buttons

### Setting the Sensitivity of the Auto Header Height Control – CLAAS 500 Series

The sensitivity adjustment controls the distance the cutterbar must travel up or down before the auto header height control (AHHC) reacts and raises or lowers the feeder house. When the sensitivity is set to maximum, only small changes in ground height are needed to cause the system to raise or lower the feeder house. When the sensitivity is set to minimum, large changes in the ground height are needed to cause the system to raise or lower the feeder house.

#### NOTE:

The upper and lower limits of the header must be programmed into CEBIS before adjusting the sensitivity of the AHHC system. The setting can be adjusted from 0–100%. When the sensitivity is adjusted to 0%, the signals from the sensing bands have no effect on the automatic cutting height adjustment. When the sensitivity is adjusted to 100%, the signals from the sensing bands have maximum effect on the automatic cutting height adjustment. The recommended starting point is 50%.

#### NOTE:

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

## OPERATION

1. Use < key (C) or > key (D) to select SENSITIVITY CAC, and press OK key (E).
2. Use – key (A) or + key (B) key to change the reaction speed setting, and press OK key (E).

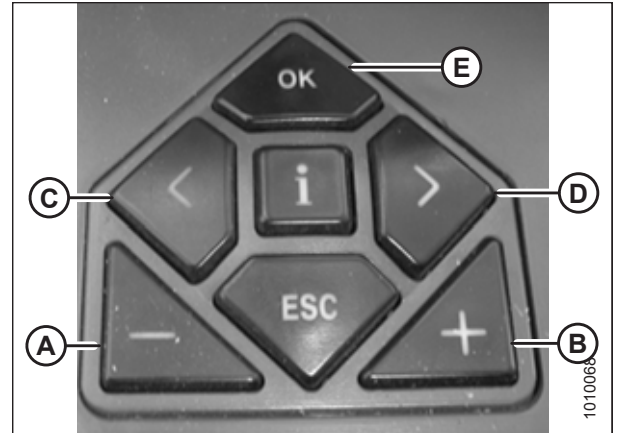


Figure 3.323: CLAAS Combine Controls

3. Use line (A) or value (B) to determine the sensitivity setting.

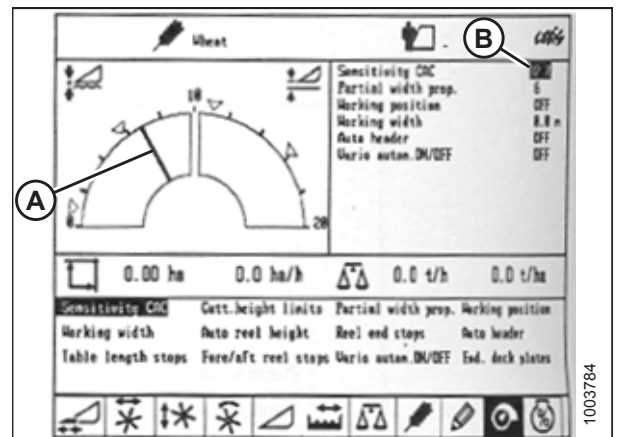
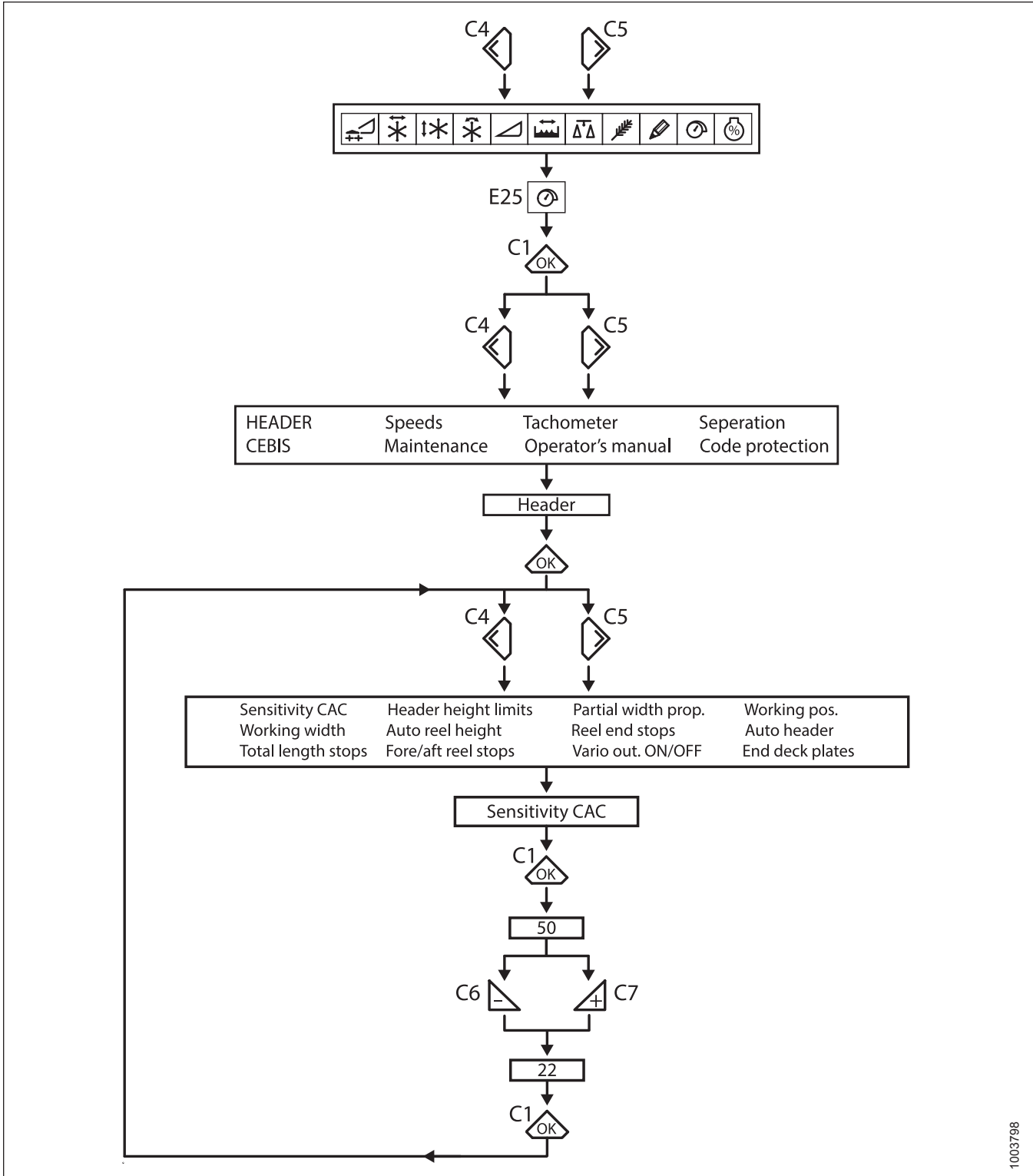


Figure 3.324: CLAAS Combine Display

OPERATION



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## OPERATION

### Adjusting Auto Reel Speed – CLAAS 500 Series

The preset reel speed can be set when the automatic header functions are activated.

#### NOTE:

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

1. Use the < or > key to select REEL WINDOW. Window E15 will display the current advance or retard speed of the reel in relation to the ground speed.

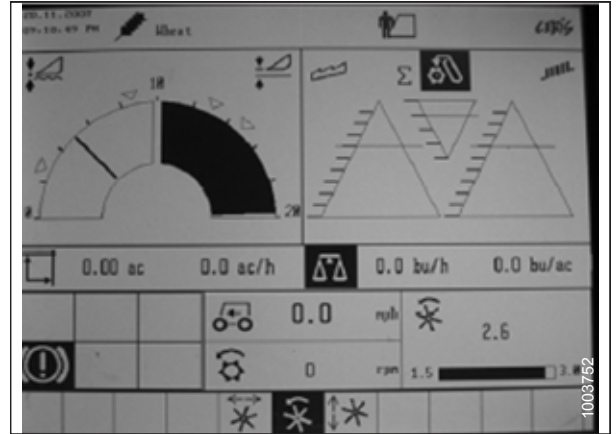


Figure 3.326: CLAAS Combine Display

2. Press OK key (C) to open the REEL SPEED window.
3. Use – key (A) or + key (B) to set the reel speed in relation to the current ground speed. Window E15 will display the selected reel speed.

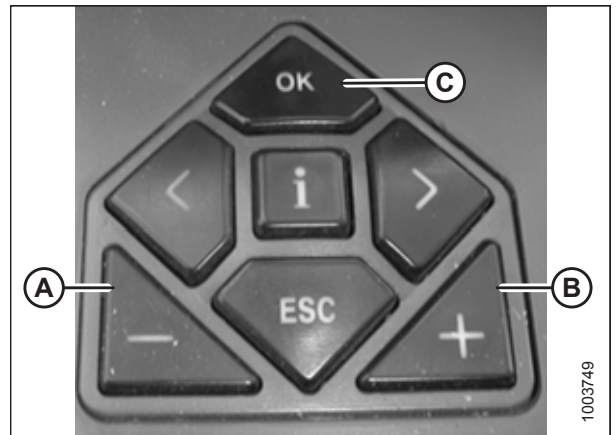


Figure 3.327: CLAAS Combine Controls

4. Manually adjust the reel speed by rotating the rotary switch to reel position (A), and then use the – or + key to set the reel speed.



Figure 3.328: CLAAS Combine Rotary Switch

## OPERATION

5. Press and hold button (A) or button (B) for 3 seconds to store the setting into the CEBIS (an alarm will sound when the new setting has been stored).

### NOTE:

Whenever button (A) or button (B) is pressed for 3 seconds, the current positions for reel speed and cutting height are stored.



Figure 3.329: CLAAS Control Handle Buttons

6. Use the < or > key to select the REEL WINDOW. Window E15 will display the current advance or retard speed of the reel in relation to the ground speed.



Figure 3.330: CLAAS Combine Display

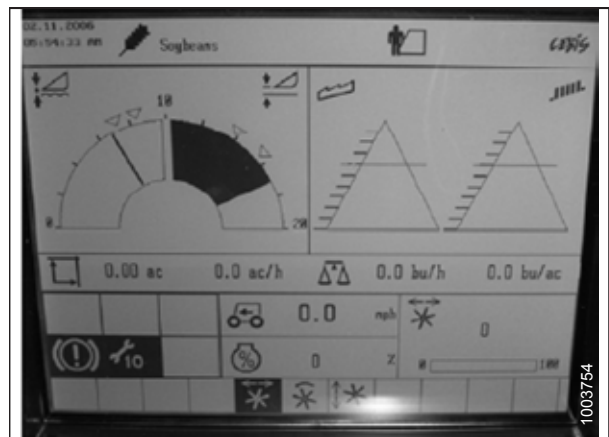


Figure 3.331: CLAAS Combine Display



## OPERATION

7. Press OK key (E), and use < key (C) or > key (D) to select the REEL FORE AND AFT window.
8. Use – key (A) or + key (B) to set the reel fore-aft position.

**NOTE:**

Control handle button (A) or button (B) (as shown in Figure 3.333, page 205) can also be used to set the reel fore-aft position.

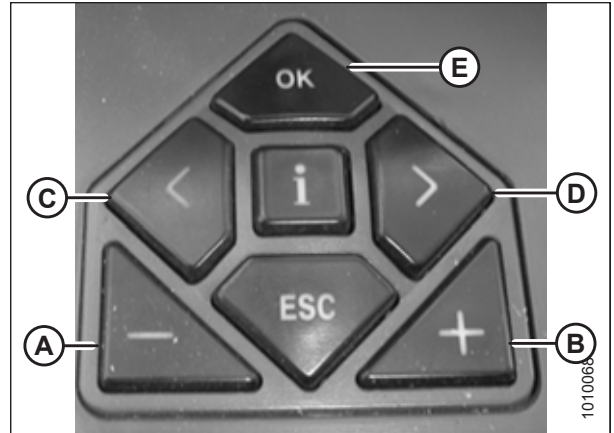


Figure 3.332: CLAAS Combine Controls

9. Press and hold button (A) or button (B) for 3 seconds to store the setting into the CEBIS (an alarm will sound when the new setting has been stored).

**NOTE:**

Whenever button (A) or button (B) is pressed for 3 seconds, the current positions for reel speed and cutting height are stored.



Figure 3.333: CLAAS Control Handle Buttons

### 3.9.10 CLAAS 600 and 700 Series Combines

#### *Calibrating the Auto Header Height Control – CLAAS 600 and 700 Series*

The auto header height control (AHHC) sensor output must be calibrated for each combine, or the AHHC feature will not work properly.

**NOTE:**

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

**NOTE:**

If the header float is set too light, it can prevent the AHHC calibration. You may need to set the float heavier for the calibration procedure so the header does not separate from the float module.

**NOTE:**

For best performance of the auto header height control (AHHC), perform these procedures with the center-link set to **D**. When setup and calibration are complete, adjust the center-link back to desired header angle. For instructions, refer to [3.8.4 Header Angle, page 96](#).

1. Ensure the center-link is set to **D**.
2. Ensure that the header float is unlocked.

## OPERATION

- Use control knob (A) to highlight AUTO CONTOUR icon (B) and press control knob (A) to select it.

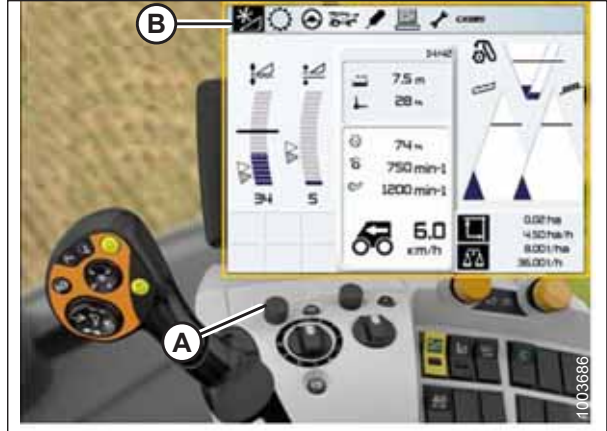


Figure 3.334: CLAAS Combine Display, Console, and Control Handle

- Use control knob (A) to highlight the icon that resembles a header with up and down arrows (not shown). Press control knob (A) to select it. Highlighted header icon (B) will be displayed on the screen.



Figure 3.335: CLAAS Combine Display, Console, and Control Handle

- Use control knob (A) to highlight the icon that resembles a header with up and down arrows (B). Press control knob (A) to select it.



Figure 3.336: CLAAS Combine Display, Console, and Control Handle

## OPERATION

6. Use control knob (A) to highlight the icon that resembles a screwdriver (B).
7. Engage the combine separator and feeder house.
8. Press control knob (A) and a progress bar will appear.



Figure 3.337: CLAAS Combine Display, Console, and Control Handle

9. Fully raise the feeder house. Progress bar (A) will advance to 25%.
10. Fully lower the feeder house. Progress bar (A) will advance to 50%.
11. Fully raise the feeder house. Progress bar (A) will advance to 75%.
12. Fully lower the feeder house. Progress bar (A) will advance to 100%.



Figure 3.338: CLAAS Combine Display, Console, and Control Handle

13. Ensure progress bar (A) displays 100%. The calibration procedure is now complete.

**NOTE:**

If the voltage is not within the range of 0.5–4.5 V at any time throughout the calibration process, the monitor will indicate learning procedure not concluded.

**NOTE:**

If the float was set heavier to complete the ground calibration procedure, adjust it to the recommended operating float after the calibration is complete.



Figure 3.339: CLAAS Combine Display, Console, and Control Handle

## OPERATION

### *Setting Cutting Height – CLAAS 600 and 700 Series*

The cutting height can have two different heights saved in the system. When harvesting they can be selected from the control handle.

#### **DANGER**

**Check to be sure all bystanders have cleared the area.**

#### **NOTE:**

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

1. Lower the header to desired the cutting height or ground pressure setting. The float indicator box should be set to 1.5.
2. Hold the left side of header raise and lower switch (A) until you hear a ping sound.

#### **NOTE:**

You can set two different cutting heights.



**Figure 3.340: CLAAS Combine Display, Console, and Control Handle**

### *Setting the Sensitivity of the Auto Header Height Control – CLAAS 600 and 700 Series*

The sensitivity adjustment controls the distance the cutterbar must travel up or down before the auto header height control (AHHC) reacts and raises or lowers the feeder house. When the sensitivity is set to maximum, only small changes in ground height are needed to cause the feeder house to raise or lower. When the sensitivity is set to minimum, large changes in the ground height are needed to cause the feeder house to raise or lower.

#### **NOTE:**

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

## OPERATION

1. Use control knob (A) to highlight HEADER/REEL icon (B). Press control knob (A) to select it. The HEADER/REEL dialog box opens.
2. Select the HEADER icon.

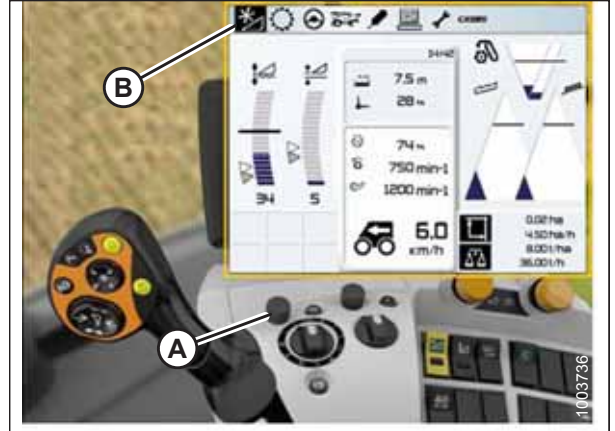


Figure 3.341: CLAAS Combine Display, Console, and Control Handle

3. Select FRONT ATTACHMENT PARAMETER SETTINGS icon (A). A list of settings appears.
4. Select SENSITIVITY CAC (B) from the list.



Figure 3.342: CLAAS Combine Display, Console, and Control Handle

5. Select SENSITIVITY CAC icon (A).

### NOTE:

To set the sensitivity, you will have to change CUTTING HEIGHT ADJUSTMENT (B) from the 0 default. The settings from 1–50 provide a faster response, whereas the settings from -1 to 50 provide a slower response. For best results, make adjustments in increments of 5.

6. If the reaction time between the header and the float module is too slow while cutting on the ground, increase the CUTTING HEIGHT ADJUSTMENT setting. If the reaction time between the header and the float module is too fast, decrease the CUTTING HEIGHT ADJUSTMENT setting.
7. If the header is lowered too slowly, increase the sensitivity. If the header hits the ground too hard or is lowered too quickly, decrease the sensitivity.



Figure 3.343: CLAAS Combine Display



## OPERATION

### Adjusting Auto Reel Speed – CLAAS 600 and 700 Series

The preset reel speed can be set when the automatic header functions are activated.

#### NOTE:

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

1. Use control knob (A) to highlight HEADER/REEL icon (B). Press control knob (A) to select it. The HEADER/REEL dialog box opens.

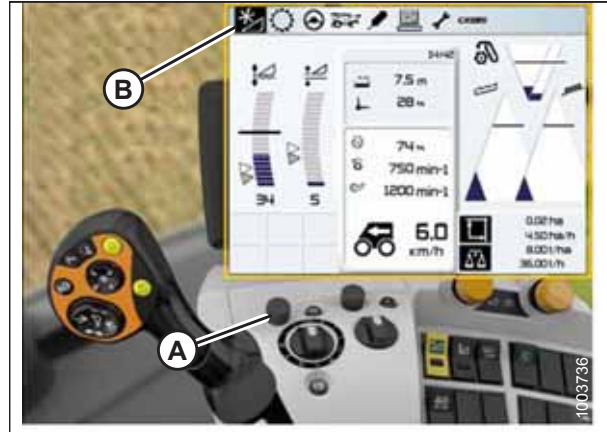


Figure 3.344: CLAAS Combine Display, Console, and Control Handle

2. Use control knob (A) to select REEL SPEED (B), and adjust the reel speed (if you are **NOT** using Auto Reel Speed). A graph displays in the dialog box.



Figure 3.345: CLAAS Combine Display, Console, and Control Handle

## OPERATION

3. Select ACTUAL VALUE (A) from the AUTO REEL SPEED dialog box (if you are using Auto Reel Speed). The ACTUAL VALUE dialog box indicates the auto reel speed.



Figure 3.346: CLAAS Combine Display, Console, and Control Handle

4. Use control knob (A) to raise or lower the reel speed.

**NOTE:**

This option is only available with the engine at full throttle.



Figure 3.347: CLAAS Combine Display, Console, and Control Handle

### *Calibrating Reel Height Sensor – CLAAS 600 and 700 Series*

The auto header height control (AHHC) sensor output must be calibrated for each combine, or the AHHC feature will not work properly.

**NOTE:**

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

**NOTE:**

If the header float is set too light, it can prevent the calibration of the AHHC. You may need to set the float heavier for the calibration procedure so the header does not separate from the float module.

**NOTE:**

For best performance of the auto header height control (AHHC) system, perform ground calibration with center-link set to **D**. When calibration is complete, adjust the center-link back to desired header angle. For instructions, refer to [3.8.4 Header Angle, page 96](#)

1. Start the engine.
2. Position the header 15–25 cm (6–10 in.) off the ground.



## OPERATION

### IMPORTANT:

Do **NOT** turn off the engine. The combine has to be at full idle for the sensors to calibrate properly.

3. Use control knob (A) to highlight FRONT ATTACHMENT icon (B). Press control knob (A) to select it.



Figure 3.348: CLAAS Combine Display, Console, and Control Handle

4. Use control knob (A) to highlight REEL icon (B). Press control knob (A) to select it.

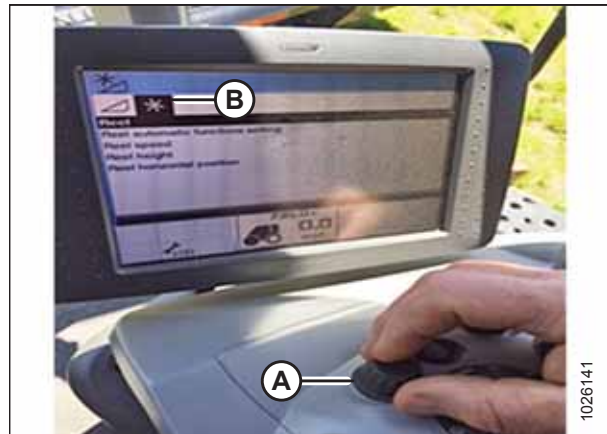


Figure 3.349: CLAAS Combine Display and Console

5. Highlight REEL HEIGHT icon (A). Press the control knob to select it.
6. Select LEARNING END STOPS (B) from the list.



Figure 3.350: CLAAS Combine Display and Console

## OPERATION

7. Use control knob (A) to highlight screwdriver icon (B).



Figure 3.351: CLAAS Combine Display, Console, and Control Handle

8. Press the control knob. A progress bar chart (A) will appear.
9. Follow the prompts on the screen to raise the reel.
10. Follow the prompts on the screen to lower the reel.



Figure 3.352: CLAAS Combine Display, Console, and Control Handle

11. Ensure progress bar chart displays 100% (A). The calibration procedure is now complete.



Figure 3.353: CLAAS Combine Display, Console, and Control Handle

## OPERATION

### Adjusting Auto Reel Height – CLAAS 600 and 700 Series

#### NOTE:

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

1. Use HOTKEY rotary dial (A) to select REEL icon (B).

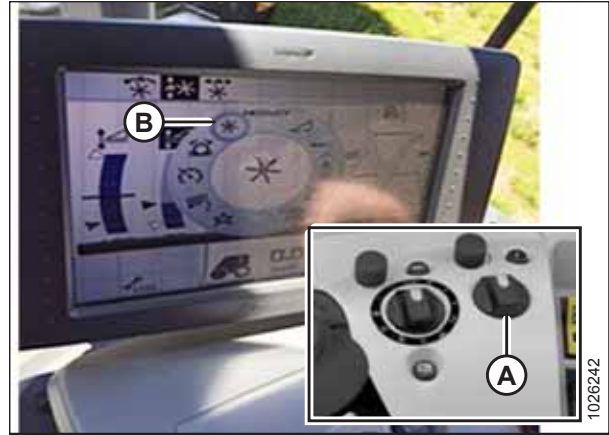


Figure 3.354: CLAAS Combine Display and Console

2. Use control knob (A) to select AUTO REEL HEIGHT icon (B) at the top of the page.

#### NOTE:

AUTO REEL HEIGHT icon (C) at the center of the page should be highlighted black. If it is not black, either the end stops have not been set or the AHHC is not active. For instructions, refer to [Calibrating Reel Height Sensor – CLAAS 600 and 700 Series, page 211](#).

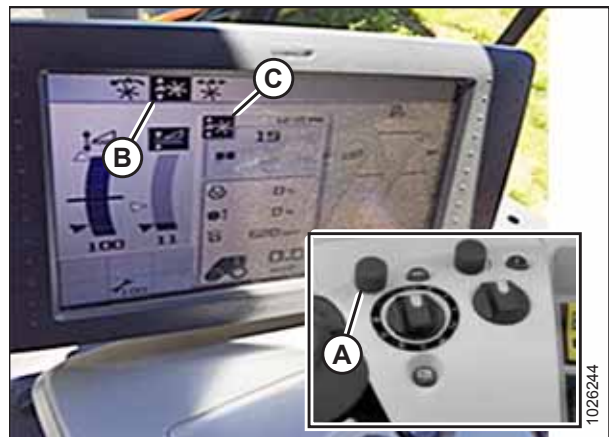


Figure 3.355: CLAAS Combine Display and Console

3. Adjust the auto reel height position for the current AHHC position using outer scroll knob (A). To lower the preset reel position, turn the scroll knob counterclockwise; to raise the preset reel position, turn the scroll knob clockwise. The display will update current setting (B).

#### NOTE:

If the AUTO REEL HEIGHT icon in the center of the page is not black, an AHHC position is not currently active.

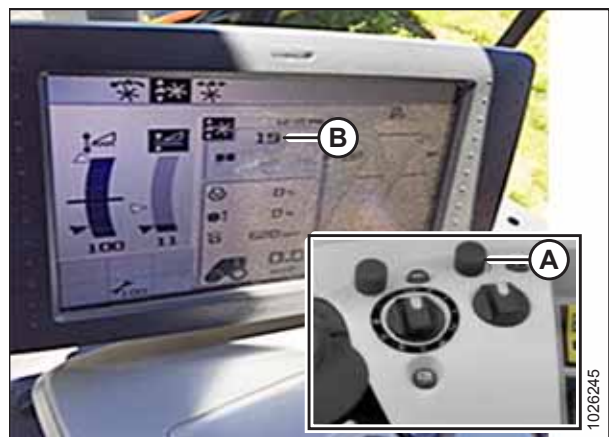


Figure 3.356: CLAAS Combine Display and Console

### 3.9.11 CLAAS 7000/8000 Series Combines

#### Setting up the Header – CLAAS 7000/8000 Series

Follow these steps to set up a MacDon header:

#### WARNING

Clear the area of other persons, pets etc. Keep children away from machinery. Walk around the machine to be sure no one is under, on, or close to it.

#### NOTE:

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

1. From the main page, select FRONT ATTACHMENT (A).



Figure 3.357: CEBIS Main Page

2. From the drop down list, select FRONT ATTACHMENT PARAMETERS (A).



Figure 3.358: Front Attachment Page

## OPERATION

3. From the FRONT ATTACHMENT PARAMETERS page, select FRONT ATTACHMENT TYPE (A).
4. From the drop down list, select FLEX CUTTERBAR PRODUCT BY OTHER MANUFACTURER (B).



Figure 3.359: Attachment Parameters Page

5. From the FRONT ATTACHMENT PARAMETERS page, select WORKING WIDTH (A).
6. Set the header width by sliding adjuster arrow (B) up or down.
7. Select check mark (C) to save the settings.

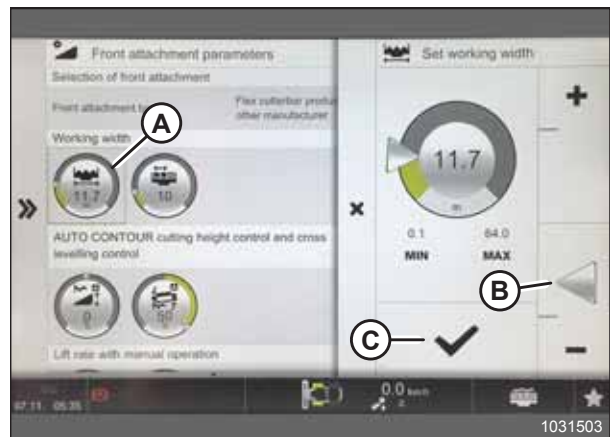


Figure 3.360: Attachment Parameters Page

### Setting up the Header Fore-Aft Tilt Function – CLAAS 7000/8000 Series

Follow these steps to setup the fore-aft tilt function on a MacDon header:

#### **WARNING**

Clear the area of other persons, pets etc. Keep children away from machinery. Walk around the machine to be sure no one is under, on, or close to it.

#### **NOTE:**

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.



## OPERATION

1. From the main page, select FRONT ATTACHMENT (A).



Figure 3.361: CEBS Main Page

2. From the drop down list, select FRONT ATTACHMENT PARAMETERS (A).



Figure 3.362: Front Attachment Page

3. From the FRONT ATTACHMENT PARAMETERS page, select FRONT ATTACHMENT TYPE (A).
4. From the drop down list, select FLEX CUTTERBAR PRODUCT BY OTHER MANUFACTURER (B).



Figure 3.363: Attachment Parameters Page

## OPERATION

- From the MAIN page, select SETTINGS (A).
- From the SETTINGS page, select FAVOURITE MANAGEMENT (B).



Figure 3.364: CEBIS Settings Page

- Add OTHER HEADER FUNCTIONS icon (A) as a favorite.

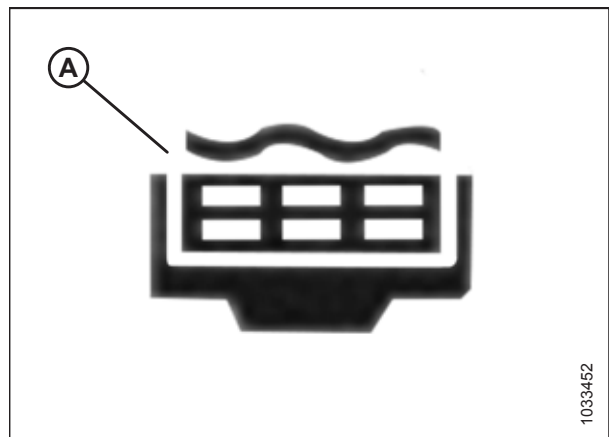


Figure 3.365: Other Header Functions Icon

- Select the OTHER HEADER FUNCTIONS icon so that it appears on the operator screen at location (A).
- You can now use the trigger (now shown) on the back of the handle to control the fore-aft and tilt of the header.

**NOTE:**

The FAVOURITE MANAGEMENT menu controls the trigger on the back of handle. The icon is showing at location (A) is the function controlled by the trigger.



Figure 3.366: CEBIS Main Page



## OPERATION

### Calibrating the Auto Header Height Control – CLAAS 7000/8000 Series

The auto header height control (AHHC) sensor output must be calibrated for each combine, or the AHHC feature will not work properly.

#### **WARNING**

Clear the area of other persons, pets etc. Keep children away from machinery. Walk around the machine to be sure no one is under, on, or close to it.

#### **NOTE:**

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

#### **NOTE:**

If the header float is set too light, it can prevent the calibration of the AHHC. You may need to set the float heavier for the calibration procedure so the header does not separate from the float module.

#### **NOTE:**

For best performance of the auto header height control (AHHC) system, perform ground calibration with center-link set to **D**. When calibration is complete, adjust the center-link back to desired header angle. For instructions, refer to [3.8.4 Header Angle, page 96](#)

1. From the MAIN page, select FRONT ATTACHMENT (A).



Figure 3.367: CEBIS Main Page

2. Select LEARNING PROCEDURES (A) from the menu.
3. SELECT FRONT ATTACHMENT HEIGHT (B).

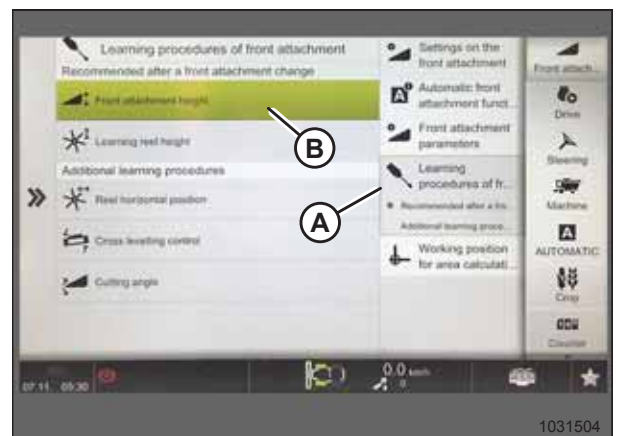


Figure 3.368: Learning Procedures Page

## OPERATION

4. Follow the prompts that appear in DESCRIPTION and NOTES fields (A).

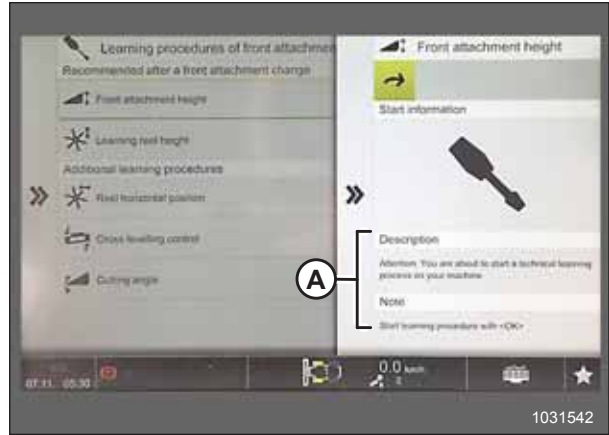


Figure 3.369: Front Attachment Height Page

5. When prompted, select OK button (A) to start the learning procedure.



Figure 3.370: Operator Controls

## OPERATION

- When prompted, raise the front attachment with button (A) on the multifunction lever.
- When prompted, lower the front attachment with button (B) on the multifunction lever.
- Repeat as prompted until calibration is complete.



Figure 3.371: Multifunction Lever

### Setting Cut and Reel Height Preset – CLAAS 7000/8000 Series

The reel and cut height setting can be stored in the combine. When harvesting the setting can be selected from the control handle.

#### **WARNING**

Clear the area of other persons, pets etc. Keep children away from machinery. Walk around the machine to be sure no one is under, on, or close to it.

#### **NOTE:**

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

- Set the desired cutting height with feeder house raise/lower buttons (A) on the multifunction lever.
- Set the desired reel position with buttons (B).
- Press and hold AUTO HEIGHT PRESET button (C) to store the settings.



Figure 3.372: Multifunction Lever

## OPERATION

A triangle (A) appears on the header height gauge indicating the preset level.



Figure 3.373: CEBIS Main Page

### *Setting the Sensitivity of the Auto Header Height Control – CLAAS 7000/8000 Series*

The sensitivity adjustment controls the distance the cutterbar must travel up or down before the auto header height control (AHHC) reacts and raises or lowers the feeder house. When the sensitivity is set to maximum, only small changes in ground height are needed to cause the system to raise or lower the feeder house. When the sensitivity is set to minimum, large changes in the ground height are needed to cause the system to raise or lower the feeder house.

#### **WARNING**

Clear the area of other persons, pets etc. Keep children away from machinery. Walk around the machine to be sure no one is under, on, or close to it.

#### **NOTE:**

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

1. From the main page, select FRONT ATTACHMENT (A).



Figure 3.374: CEBIS Main Page

## OPERATION

- From the drop down list, select FRONT ATTACHMENT PARAMETERS (A).



Figure 3.375: Front Attachment Parameters Page

- Scroll through the list and select DROP RATE WITH AUTO CONTOUR icon (A).
- Adjust the drop rate by sliding adjuster arrow (B) up or down.
- Select check mark (C) to confirm the settings.



Figure 3.376: Drop Rate with Auto Contour Page

### *Adjusting Auto Reel Speed – CLAAS 7000/8000 Series*

The preset reel speed can be set when the automatic header functions are activated.

### **! WARNING**

**Clear the area of other persons, pets etc. Keep children away from machinery. Walk around the machine to be sure no one is under, on, or close to it.**

### **NOTE:**

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

## OPERATION

1. From the main page, select FRONT ATTACHMENT (A).



Figure 3.377: CEBIS Main Page

2. From the list, select SETTINGS ON FRONT ATTACHMENT (A).
3. Select REEL TARGET VALUES (B).
4. Select REEL SPEED ADJUST icon (C).



Figure 3.378: Settings on Front Attachment Page

5. Adjust the reel speed target value by sliding adjuster arrow (A) up or down.
6. Select check mark (B) to save the setting.



Figure 3.379: Reel Speed Target Value Page



## OPERATION

### Calibrating Reel Height Sensor – CLAAS 7000/8000 Series

The auto header height control (AHHC) sensor output must be calibrated for each combine, or the AHHC feature will not work properly.

#### **WARNING**

Clear the area of other persons, pets etc. Keep children away from machinery. Walk around the machine to be sure no one is under, on, or close to it.

#### **NOTE:**

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

1. Position the header 15–25 cm (6–10 in.) off the ground.

#### **NOTE:**

Do **NOT** turn off the engine. The combine has to be at full idle for the sensors to calibrate properly.

2. From the main page, select FRONT ATTACHMENT (A).



Figure 3.380: CEBIS Main Page

3. Select LEARNING PROCEDURES FOR FRONT ATTACHMENT (A).
4. Select LEARNING REEL HEIGHT (B).

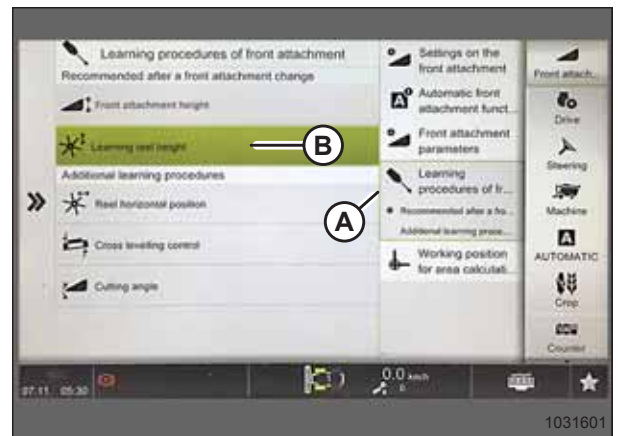


Figure 3.381: Front Attachment Page



## OPERATION

5. Follow the prompts that appear in DESCRIPTION and NOTES fields (A).

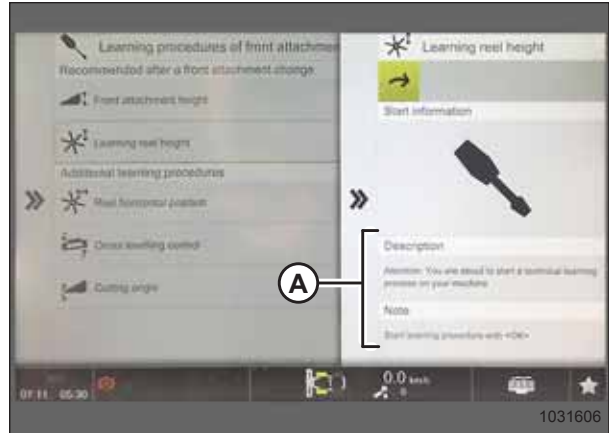


Figure 3.382: Learning Reel Height Page

6. When prompted, select OK button (A) to start the learning procedure.



Figure 3.383: Operator Controls

### 3.9.12 Gleaner R65/R66/R75/R76 and S Series Combines

#### Checking Voltage Range from the Combine Cab – Gleaner R65/R66/R75/R76 and Pre-2016 S Series

**NOTE:**

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

1. Unlock the float.

## OPERATION

2. Check that the float lock linkage is on the down stops (washer [A] cannot be moved) at both locations.

**NOTE:**

If the header is not on the down stops during the next two steps, the voltage may go out of range during operation causing a malfunction of the auto header height control (AHHC) system. If the header is not on the down stops, refer to [3.10 Leveling the Header, page 317](#) for instructions.

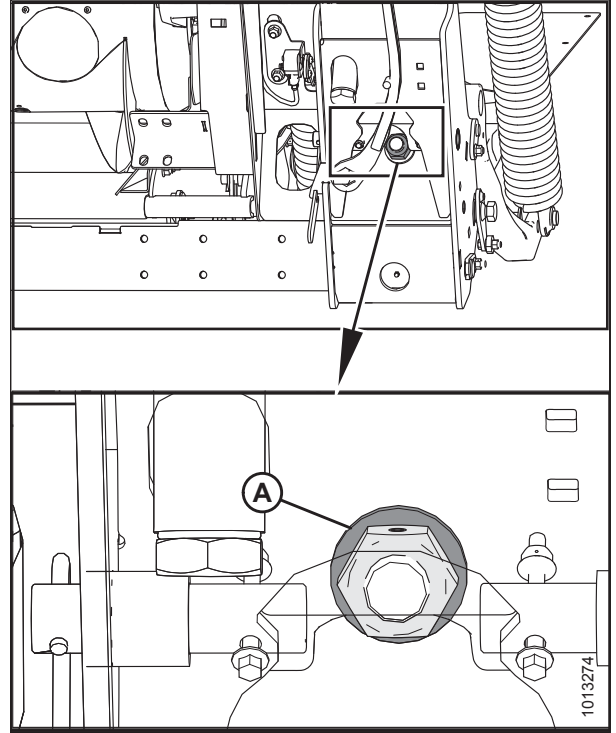


Figure 3.384: Float Lock

3. Adjust cable take-up bracket (B) (if necessary) until pointer (A) on the float indicator is on **0**.

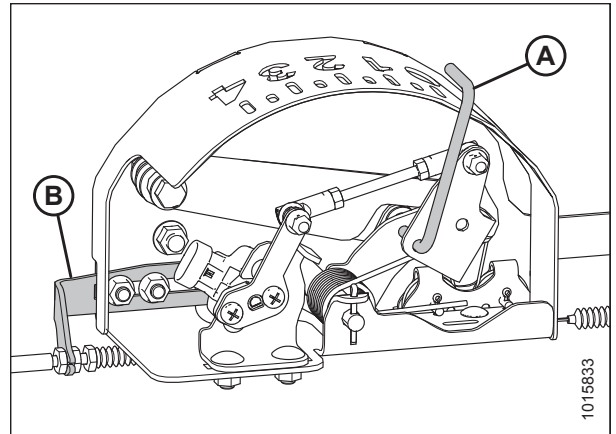


Figure 3.385: Float Indicator Box

## OPERATION



**Figure 3.386: Combine Heads-Up Display**

4. Ensure the header float is unlocked.
5. Press and hold button (A) on the heads-up display for 3 seconds to enter diagnostic mode.
6. Scroll down using button (B) until LEFT is displayed on the LCD screen.
7. Press OK button (C). The number indicated on the LCD screen is the voltage reading from the sensor of the auto header height control (AHHC). Raise and lower the header to see the full range of the voltage readings.

### *Engaging the Auto Header Height Control – Gleaner R65/R66/R75/R76 and Pre-2016 S Series*

#### **NOTE:**

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

The following system components are required in order for the auto header height control (AHHC) to work:

- Main module and header driver module mounted in card box in fuse panel (FP) module.
- Multifunction control handle operator inputs.
- Operator inputs mounted in the control console (CC) module panel.
- The electrohydraulic header lift control valve is an integral part of the system.

## OPERATION



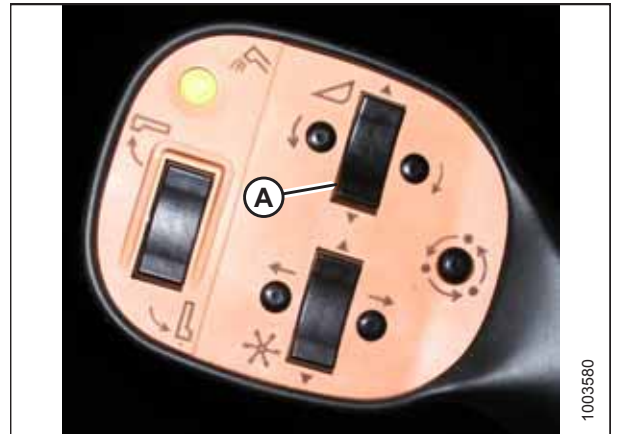
**Figure 3.387: Combine Auto Header Height Controls**

1. Press AUTO MODE button (A) until AHHC LED light (B) begins flashing. If the RTC light is flashing, press AUTO MODE button (A) again until it switches to the AHHC.

### **WARNING**

Check to be sure all bystanders have cleared the area.

2. Briefly press button (A) on the control handle. The AHHC light should change from flashing to solid. The header should drop to the ground. The AHHC is now engaged and can be adjusted for height and sensitivity.
3. Use the controls to adjust the height and sensitivity to the constant changing ground conditions such as shallow gullies and field drainage trenches.



**Figure 3.388: Control Handle**

### *Calibrating the Auto Header Height Control – Gleaner R65/R66/R75/R76 and Pre-2016 S Series*

The auto header height control (AHHC) sensor output must be calibrated for each combine, or the AHHC feature will not work properly.

#### **NOTE:**

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

## OPERATION

### NOTE:

If the header float is set too light, it can prevent the calibration of the AHHC. You may need to set the float heavier for calibration procedure so the header does not separate from the float module.

### NOTE:

For best performance of the auto header height control (AHHC) system, perform ground calibration with center-link set to **D**. When calibration is complete, adjust the center-link back to desired header angle. For instructions, refer to [3.8.4 Header Angle, page 96](#)



**Figure 3.389: Combine Auto Header Height Controls**

A - AUTO MODE Button  
D - Raise Header  
G - CAL2 Button

B - AHHC Light  
E - Lower Header

C - CAL1 Button  
F - AUTO Mode

### NOTE:

For best performance of the AHHC, perform these procedures with the center-link set to **D**. When setup and calibration are complete, adjust the center-link back to desired header angle. For instructions, refer to [3.8.4 Header Angle, page 96](#).

### NOTE:

Calibration should be done on flat, level ground without the header engaged. The header height and header tilt functions must not be in auto or standby modes. The engine rpm must be above 2000 rpm. The header tilt option on 2004 and earlier model combines does not work with MacDon headers. This system will have to be removed and disabled in order to calibrate the auto header height control (AHHC). For instructions, refer to the combine operator's manual.

1. Ensure the center-link is set to **D**.
2. Press AUTO MODE button (A) until AHHC light (B) is illuminated.
3. Press and hold CAL1 button (C) until you see the following lights flash: raise header (D), lower header (E), tilt auto mode (F), and AHHC (B).
4. Fully lower the header, and continue to hold the HEADER LOWER button for 5–8 seconds to ensure the float module has separated from the header.

## OPERATION

5. Press CAL2 button (G) until lower header light (E) stops flashing, and release it when raise header light (D) begins flashing.
6. Raise the header to its maximum height (ensure the header is resting on the down-stop pads).
7. Press CAL2 button (G) until raise header light (D) turns off.

**NOTE:**

The following steps are applicable only to 2005 and newer combines with the Smartrac feeder house.

8. Wait for the HEADER TILT LEFT light (not shown) to start flashing, and then tilt header to the maximum left position.
9. Press CAL2 button (G) until the HEADER TILT LEFT light (not shown) stops flashing, and release the button when the HEADER TILT RIGHT light (not shown) begins flashing.
10. Tilt the header to the maximum right position.
11. Press CAL2 button (G) until all of the following lights flash: raise header (D), lower header (E), height auto mode (A), right header and left header (not shown), and tilt auto mode (F).
12. Center the header.
13. Press CAL1 button (C) to exit calibration and save all values to the memory. All lights should stop flashing.

**NOTE:**

If the float was set heavier to complete the AHHC calibration procedure, adjust it to the recommended operating float after the calibration is complete.

### *Turning off the Accumulator – Gleaner R65/R66/R75/R76 and Pre-2016 S Series*

The accumulator will affect the combine's reaction time and greatly inhibit the auto header height control's performance.

Refer to the combine operator's manual for proper procedure when turning the accumulator off and on. For best performance, turn the feeder house accumulator off.

**NOTE:**

The accumulator is located in front of the front left axle beam.



**Figure 3.390: Combine Accumulator ON/OFF Switch**

A - Accumulator Lever (Off Position)



## OPERATION

### *Adjusting the Header Raise/Lower Rate – Gleaner R65/R66/R75/R76 and Pre-2016 S Series*

The auto header height control (AHC) system's stability is affected by hydraulic flow rates. Ensure that header raise (A) and header lower (B) adjustable restrictor's in the hydraulic manifold are adjusted so that it takes approximately 6 seconds to raise the header from ground level to maximum height (hydraulic cylinders fully extended), and approximately 6 seconds to lower the header from maximum height to ground level.

If there is too much header movement (for example, hunting) when the header is on the ground, adjust the lower rate to a slower rate of drop: 7 or 8 seconds.

#### **NOTE:**

Make this adjustment with the hydraulic system at normal operating temperature (54.4°C [130°F]) and the engine running at full throttle.



**Figure 3.391: Header Raise and Lower Adjustable Restrictor's**

### *Adjusting Ground Pressure – Gleaner R65/R66/R75/R76 and Pre-2016 S Series*

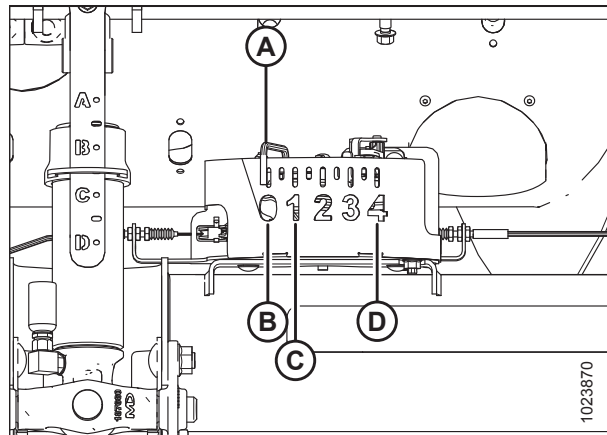
#### **NOTE:**

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

1. Ensure indicator (A) is at position 0 (B) with the header 254–306 mm (10–14 in.) off the ground. If not, the float sensor output voltage should be checked. For instructions, refer to [Checking Voltage Range from the Combine Cab – Gleaner R65/R66/R75/R76 and Pre-2016 S Series, page 226](#).

#### **NOTE:**

When the header is on the ground, the indicator should be at position 1 (C) for low ground pressure, and at position 4 (D) for high ground pressure. Crop and soil conditions determine the amount of float to use. The ideal setting is as light as possible without header bouncing or missing crop. Operating with heavy settings prematurely wears the cutterbar wearplates.



**Figure 3.392: Float Indicator Box**



## OPERATION

2. Ensure the header is in auto header height control (AHHC) mode. This is indicated by AUTO MODE LED light (A) displaying a continuous, solid light.
3. The header will lower to the height (ground pressure) corresponding to the position selected with height control knob (B). Turn the knob counterclockwise for minimum ground pressure, and clockwise for maximum ground pressure.



Figure 3.393: AHHC Console

### *Adjusting the Sensitivity of the Auto Header Height Control – Gleaner R65/R66/R75/R76 and Pre-2016 S Series*

#### **NOTE:**

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.



Figure 3.394: Auto Header Height Control Console

SENSITIVITY ADJUSTMENT dial (A) controls the distance the cutterbar must travel up or down before the auto header height control (AHHC) reacts and raises or lowers the feeder house.

When SENSITIVITY ADJUSTMENT dial (A) is set to maximum (turned completely clockwise), only small changes in ground height are needed to cause the feeder house to raise or lower. In this position, the cutterbar moves up and down approximately 19 mm (3/4 in.) before the control module signals the hydraulic control valve to raise or lower the header frame.

## OPERATION

When SENSITIVITY ADJUSTMENT dial (A) is set to minimum (turned completely counterclockwise), large changes in ground height are needed to cause the feeder house to raise or lower. In this position, the cutterbar moves up and down approximately 51 mm (2 in.) before the control module signals the hydraulic control valve to raise or lower the header frame.

The HEADER SENSE LINE input also changes the range of the sensitivity. When connected to a draper, the counterclockwise position (least sensitive) allows for approximately 102 mm (4 in.) of vertical travel before correction is made.

### *Troubleshooting Alarms and Diagnostic Faults – Gleaner R65/R66/R75/R76 and Pre-2016 S Series*

#### **NOTE:**

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

#### **Display type:**

Displayed on tachometer (A) as XX or XXX.



Figure 3.395: Tachometer

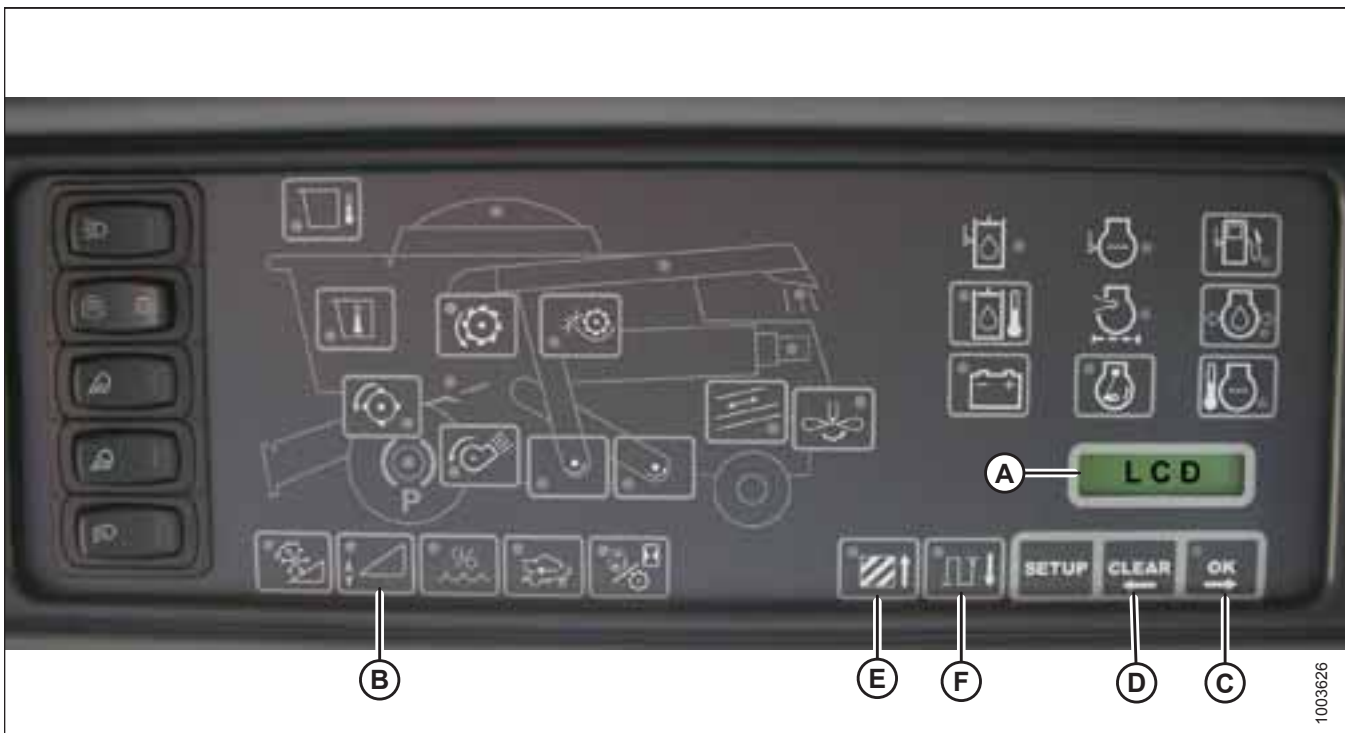


Figure 3.396: Combine Electronic Instrument Panel (EIP)

**NOTE:**

Displayed on LCD (A) as XX in. or XXX cm.

**Alarm conditions:**

If an error message is received from the fuse panel, an audible alarm sounds. The alarm buzzer sounds five times every 10 seconds. The LCD (A) on the electronic instrument panel (EIP) indicates the header system in error as HDR CTRL followed by HGT ERR for height, and HDR CTRL followed by TILT ERR for tilt. The header height LED flashes yellow two times every second.

When an alarm condition occurs, a green LED flashes on and off (green, yellow, or red depending on the input). In addition, a message is displayed on the LCD to identify the nature of the alarm. For example, HYD TEMP, OPEN, SHRT will be flashed alternately.

**Diagnostic fault failures:**

Refer to Figure 3.396, page 234.

Pressing header height switch (B) for a minimum of 5 seconds will put the EIP in header diagnostic mode. The LCD (shown on previous screen) will display the message HDR DIAG when the EIP has entered header diagnostic mode.

In this mode, after 3 seconds, header fault parameter labels are displayed on the EIP LCD. All the information displayed is read-only.

OK (C) and CLEAR (D) buttons allow you to scroll through the list of parameters. If there are no active fault codes, the EIP LCD will display NO CODE.

When a parameter is displayed, its label is displayed for 3 seconds, after which its value is automatically displayed.

Pressing OK button (C) while the value is displayed will advance to the next parameter and display its label.

When a parameter label is displayed and OK button (C) is pressed before 3 seconds, the parameter's value will be displayed.

Pressing AREA (E) will cycle through the options. When LEFT is displayed on the LCD, press OK button (C), and the auto header height control (AHHC) voltage will be shown on the display.

Press DIST button (F) to cycle back through the table.

Press CLEAR button (D) to exit header diagnostics and return to normal mode.

### 3.9.13 Gleaner S9 Series Combines

#### *Setting up the Header – Gleaner S9 Series*

**NOTE:**

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

## OPERATION

AGCO Tyton terminal (A) is used to set up and manage a MacDon draper header on a Gleaner S9 Series combine. Use the touch screen display to select the desired item on the screen.



Figure 3.397: Gleaner S9

A - Tyton Terminal      B - Control Handle  
C - Throttle              D - Header Control Cluster

1. On the top right quadrant of the home page, touch COMBINE icon (A). The COMBINE MAIN MENU opens.



Figure 3.398: Combine Icon on Home Page

2. On the COMBINE MAIN MENU, touch HEADER SETTINGS (A). The HEADER SETTINGS page opens.



Figure 3.399: Header Settings in Combine Main Menu

## OPERATION

3. Touch **HEADER CONFIGURATION** field (A). A dialog box showing predefined headers opens.
  - If your MacDon header is already set up, it appears on the header list. Touch MacDon header title (B) to highlight the selection in blue, and then touch green check mark (E) to continue.
  - If only default header (D) is shown, touch ABC button (C), and use the on-screen keyboard to enter the MacDon header information. When complete, select one of the following options to return to the **HEADER SETTINGS** page:
    - Green check mark (E) saves the settings
    - Garbage can icon (F) deletes the highlighted header from the list
    - Red X (G) cancels the change(s)

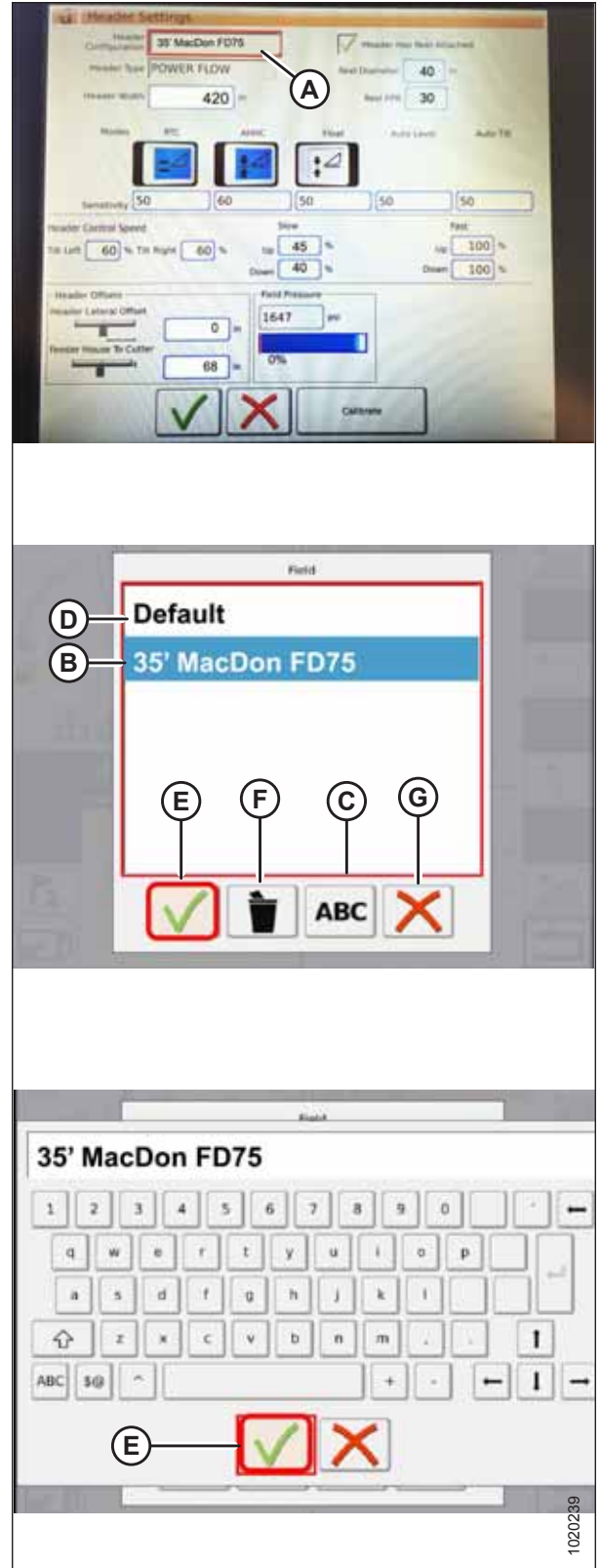


Figure 3.400: Header Configuration Menu on Header Settings Page



## OPERATION

- To specify the type of header installed on the machine, touch HEADER TYPE field (A).

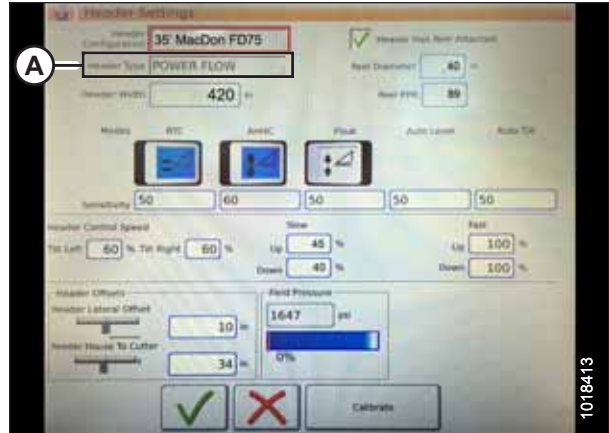


Figure 3.401: Header Settings

- A list of predefined header types appears.
  - For MacDon D1 Series Draper and FD1 Series FlexDraper® headers, touch POWER FLOW (A)
  - Touch green check mark (B) to save the selection and continue

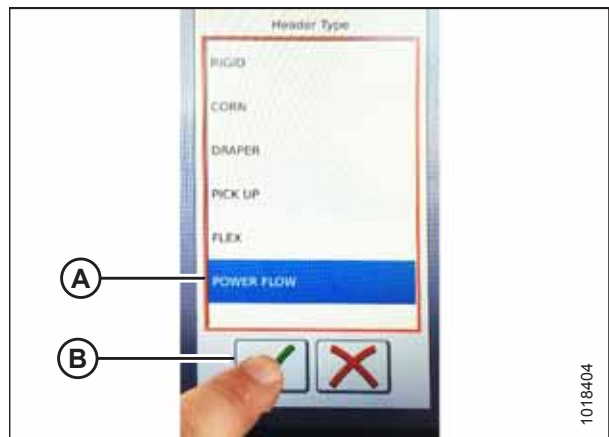


Figure 3.402: Header Type

- Make sure that HEADER HAS REEL ATTACHED check box (A) is checked.

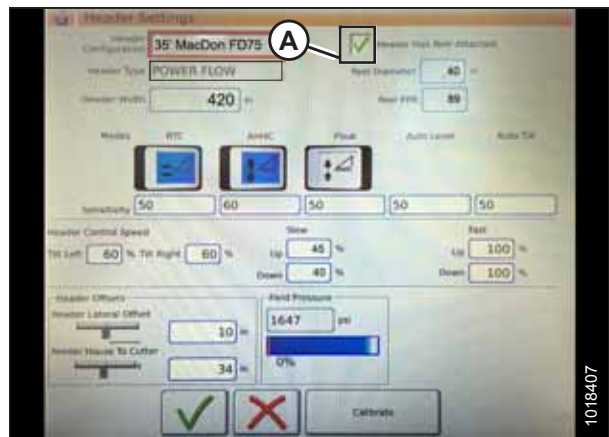


Figure 3.403: Header Settings

## OPERATION

7. Touch REEL DIAMETER field (A) and a numeric keypad displays. Enter **40** for a MacDon reel.
8. Touch REEL PPR (Pulses Per Revolution) field (B) and enter **30** as the value for your MacDon header.

### NOTE:

PPR is determined by the number of teeth on the reel speed sprocket.

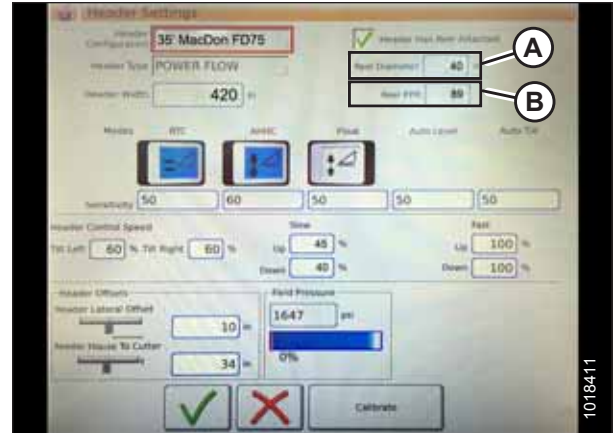


Figure 3.404: Header Settings

9. Touch green check mark (B) at the bottom of numeric keypad when complete, or the red X to cancel.

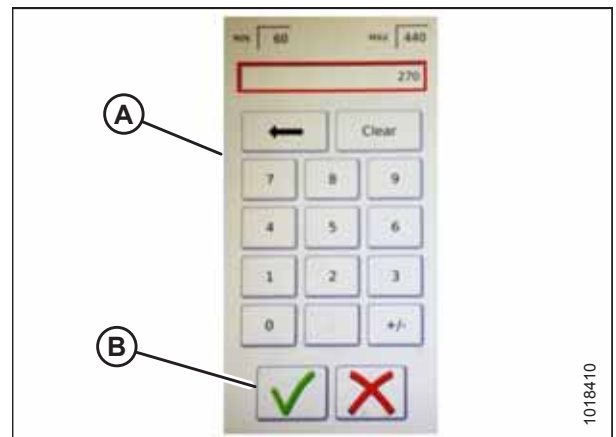


Figure 3.405: Numeric Keypad

10. When complete, touch green check mark (A) at the bottom of the HEADER SETTINGS page.

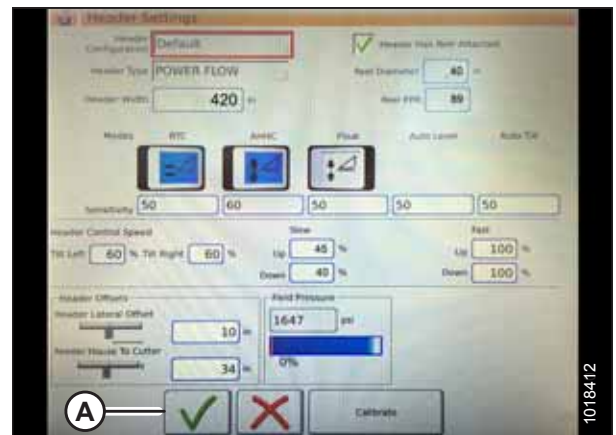


Figure 3.406: Header Settings Page

### Setting Minimum Reel Speed and Calibrating Reel – Gleaner S9 Series

#### **WARNING**

Clear the area of other persons, pets etc. Keep children away from machinery. Walk around the machine to be sure no one is under, on, or close to it.



## OPERATION

### NOTE:

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

1. From the COMBINE MAIN MENU, touch REEL SETTINGS (A) to open the REEL SETTINGS page.



Figure 3.407: Reel Settings on Combine Main Menu

2. To set the minimum reel speed, touch SPEED MINIMUM FIELD (B). The on-screen keyboard displays. Enter the desired value. Touch the green check mark to accept the new value, or the red X to cancel. The reel speed is shown in mph and rpm.

### NOTE:

At the bottom of the REEL SETTINGS page, the reel diameter and reel pulses per revolution (PPR) are displayed. These values have already been set in the HEADER SETTINGS page.

3. The reel speed is calibrated on the REEL SETTINGS page by touching CALIBRATE button (A) in the top right of the page.

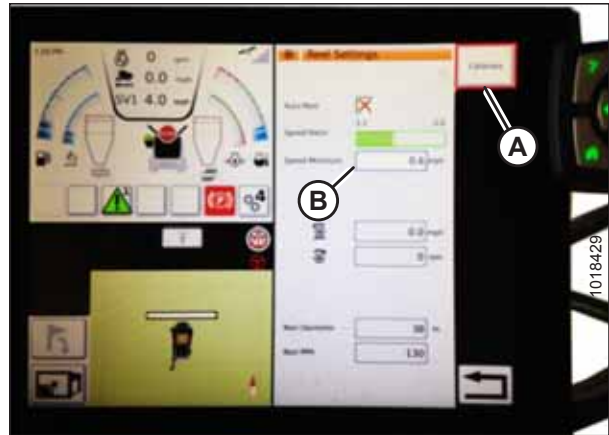


Figure 3.408: Reel Settings Calibration

4. The CALIBRATION WIZARD opens and displays a hazard warning.
5. Make sure to meet all the conditions listed in the CALIBRATION WIZARD warning. Press green check mark (A) to accept and start reel calibration. Pressing red X (B) will cancel the calibration procedure.

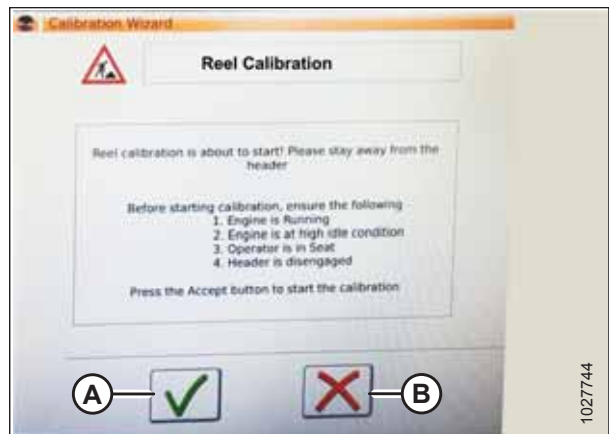


Figure 3.409: Calibration Wizard

## OPERATION

- A message appears in the CALIBRATION WIZARD stating that reel calibration has started. The reel will begin turning slowly and increase to high speed. A progress bar is provided. If necessary, touch the red X to cancel. Otherwise, wait for the message that reel calibration has completed successfully. Touch the green check mark to save the calibrated settings.



Figure 3.410: Calibration Progress

### Setting up Automatic Header Controls – Gleaner S9 Series

Automatic header functions are configured on the HEADER SETTINGS page.

#### NOTE:

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

- Automatic Control Functions:** There are toggle (OFF/ON) switches on the HEADER SETTINGS page for the automatic control functions. For MacDon headers, ensure the following two functions are enabled as shown:

- RTC (return to cut) (A)
- AHHC (automatic header height control) (B)

All other switches are disabled (not highlighted).

- Sensitivity** setting (C) controls how responsive a control (RTC or AHHC) is to a given change in sensor feedback. The setting fields are located directly below the toggle switches. To enter a new sensitivity setting, touch the setting field below the specific toggle switch, and enter the new value in the on-screen keyboard.

- Increase sensitivity if the combine does not change the feeder position quickly enough when in Auto Mode.
- Decrease sensitivity if the combine hunts for a position in Auto Mode.

#### NOTE:

Recommended sensitivity starting points for MacDon headers are:

- **50** for RTC (A)
- **60** for AHHC (B)

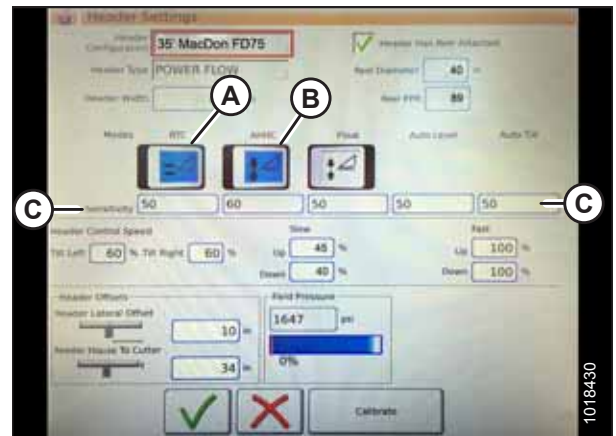


Figure 3.411: Automatic Controls and Sensitivity Settings

## OPERATION

3. **Header Speed:** HEADER CONTROL SPEED area (A) on the HEADER SETTINGS page is used to adjust the following speeds:

- Tilt left and right is the lateral tilt of the combine faceplate
- Header up and down (slow and fast speeds) is a two-stage button with slow speed on the first detent and fast on the second

**NOTE:**

Recommended header control speed starting points

- Slow: 45 up / 40 down
- Fast: 100 up / 100 down

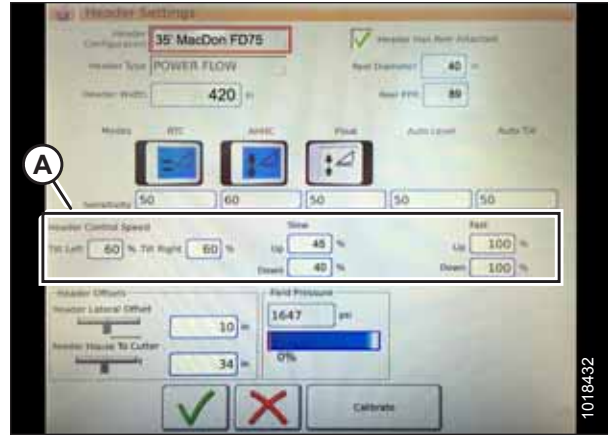


Figure 3.412: Header Speed Control Settings

4. **Header Offsets (A):** Offset distances are important for yield mapping. There are two adjustable dimensions on the HEADER SETTINGS page:

- Header Lateral Offset: the distance between the centerline of the header and the centerline of the machine. Set to 0 for a MacDon header.
- Feeder House to Cutter: the distance from the machine interface to the cutterbar. Set to 68 for a MacDon header.

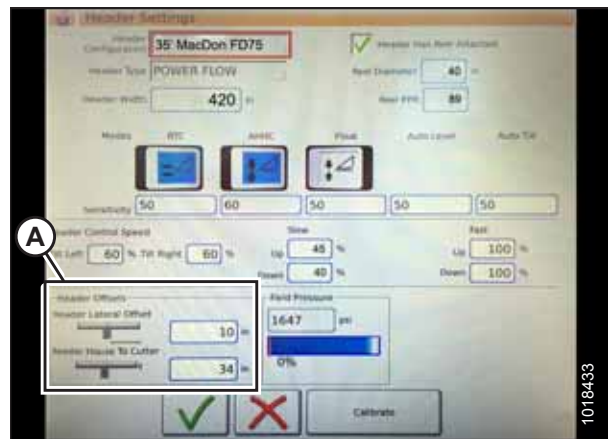
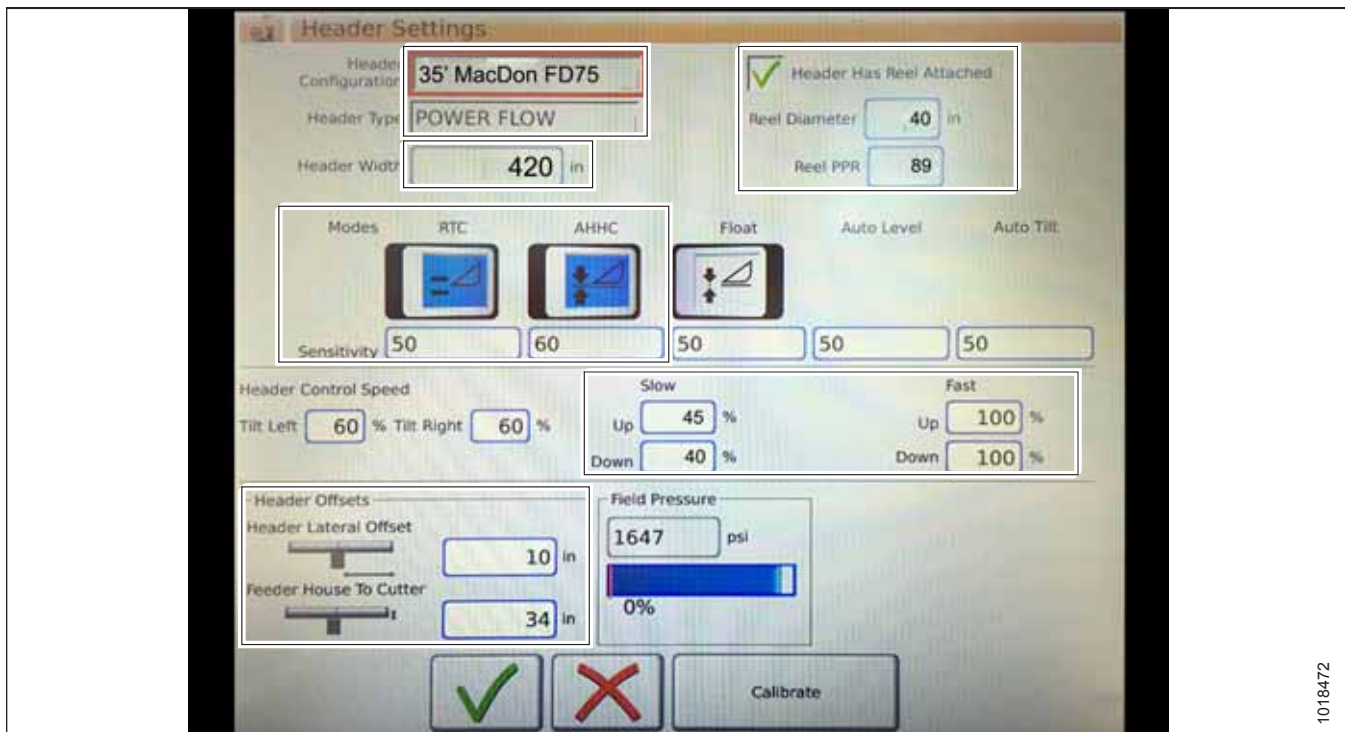


Figure 3.413: Header Offset Settings



## OPERATION

Figure 3.414: MacDon Header Settings Inputs

### Calibrating the Auto Header Height Control – Gleaner S9 Series

The auto header height control (AHHC) sensor output must be calibrated for each combine, or the AHHC feature will not work properly.

#### WARNING

Clear the area of other persons, pets etc. Keep children away from machinery. Walk around the machine to be sure no one is under, on, or close to it.

#### NOTE:

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

#### NOTE:

If the header float is set too light, it can prevent the calibration of the AHHC. You may need to set the float heavier for the calibration procedure so the header does not separate from the float module.

#### NOTE:

For best performance of the auto header height control (AHHC) system, perform ground calibration with center-link set to **D**. When calibration is complete, adjust the center-link back to desired header angle. For instructions, refer to [3.8.4 Header Angle, page 96](#)

1. On the COMBINE MAIN MENU, touch HEADER SETTINGS (A).



Figure 3.415: Combine Main Menu

2. Touch CALIBRATE (A) at the bottom right of the page. The HEADER CALIBRATION page displays.

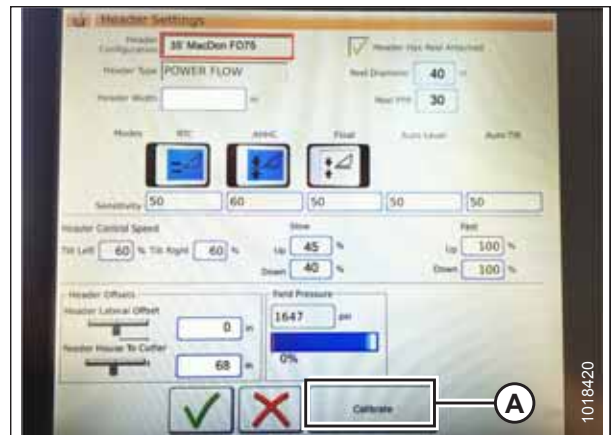


Figure 3.416: Header Settings Page



## OPERATION

The right side of the page shows Header Calibration information (A). Results are shown for a variety of sensors (B):

- Left and right header sensor (voltage) (values will be the same with MacDon headers)
- Header height sensor (mA)
- Tilt position sensor (mA)

The following valid modes are shown with check marks (C) below sensor values (B):

- Return to cut
- Automatic header height control

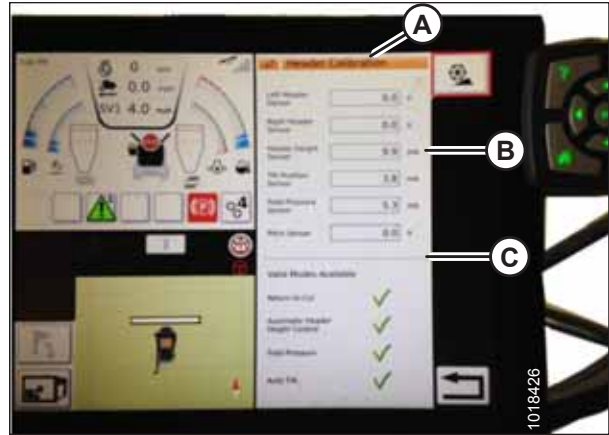


Figure 3.417: Header Calibration Page

### WARNING

Clear the area of other persons, pets etc. Keep children away from machinery. Walk around the machine to be sure no one is under, on, or close to it.

3. On the control handle, touch HEADER DOWN button (A). Sensor values start changing on the HEADER CALIBRATION page as the header lowers.



Figure 3.418: Header Down Switch

4. When the sensor values are stable, touch CALIBRATE icon (A).



Figure 3.419: Header Calibration

## OPERATION

- The hazard warning for HEADER CALIBRATION appears. Make sure that all conditions are met.
- Touch the green check mark at the bottom of the page to start the CALIBRATION WIZARD.



Figure 3.420: Header Calibration Warning

A calibration progress bar is displayed at the bottom of the screen. The process can be stopped at any time by touching the red X. The header moves automatically and erratically during this process.

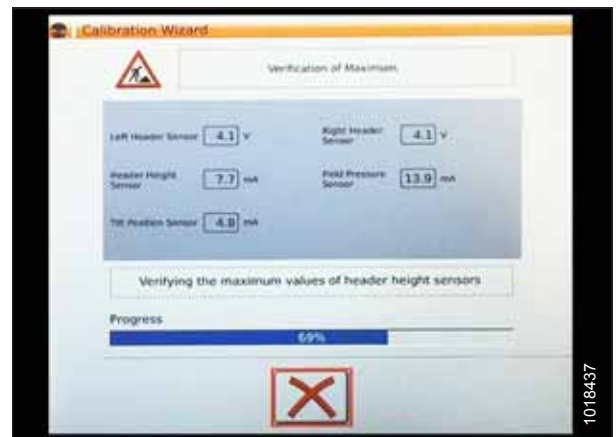


Figure 3.421: Calibration in Progress

- When the calibration is complete, a message displays, and summary information (A) is shown. Green check marks confirm the functions have been calibrated (B). Touch bottom green check mark (C) to save.



Figure 3.422: Completed Calibration Page

## OPERATION

### NOTE:

Touch CALIBRATION icon (A) on the COMBINE MAIN MENU page to display the CALIBRATION MENU where you can choose from a variety of calibrations including header and reel calibration.



Figure 3.423: Direct Calibration Menu

### Operating the Auto Header Height Control – Gleaner S9 Series

#### NOTE:

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

The following controls are used to operate the auto header height control (AHC) functions:

- Tyton terminal (A)
- Control handle (B)
- Throttle (C)
- Header control cluster (D)

Use the combine operator's manual to familiarize yourself with the controls.



Figure 3.424: Gleaner S9 Operator Controls

1. With the header running, set lateral tilt switch (A) to MANUAL.
2. Engage the AHC by pressing switch (B) upward to the I position.



Figure 3.425: Header Control Cluster



## OPERATION

3. Press AHHC control switch (A) on the control handle to engage the AHHC. The header moves to the current setpoint position.



Figure 3.426: AHHC on Control Handle

4. Use HEADER HEIGHT SETPOINT control dial (A) as necessary to fine-tune the position.



Figure 3.427: Header Control Cluster

### Reviewing Header In-Field Settings – Gleaner S9 Series

#### NOTE:

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

1. To view the header group settings, touch HEADER icon (A) on the right side of the home page.

The following information is displayed:

- CURRENT POSITION of header (B).
- SETPOINT cut-off position (C) (indicated by red line)
- HEADER symbol (D) – touch to adjust the setpoint cut-off position using the scroll wheel on the right side of the Tyton terminal.
- CUT HEIGHT for AHHC (E) – fine-tune with the header height setpoint control dial on the header control cluster.
- HEADER WORKING WIDTH (F)
- HEADER PITCH (G)

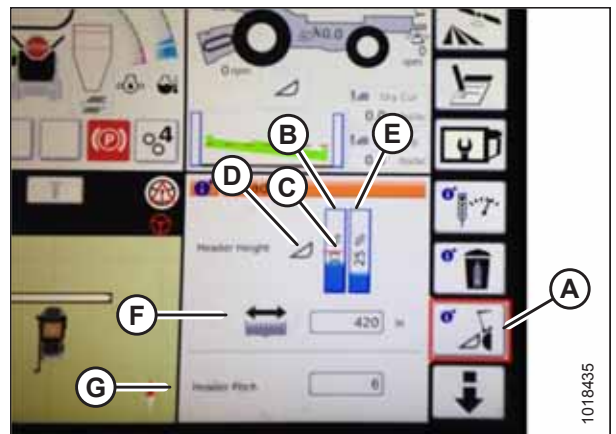


Figure 3.428: Header Groups

## OPERATION

2. Touching a field opens the on-screen keyboard, so that the values can be adjusted. Enter the new value and touch the green check mark when complete.

**NOTE:**

Scroll wheel (A) is located on the right side of the Tyton terminal.



Figure 3.429: Adjustment Wheel on Right Side of Tyton Terminal

**NOTE:**

HEADER HEIGHT SETPOINT control dial (A) is on the header control cluster.



Figure 3.430: Header Control Cluster

### 3.9.14 John Deere 60 Series Combines

#### *Checking Voltage Range from the Combine Cab – John Deere 60 Series*

The auto header height control sensor needs to operate in a specific voltage range in order to work properly.

**NOTE:**

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

**⚠ DANGER**

**Check to be sure all bystanders have cleared the area.**

1. Position the header 150 mm (6 in.) above the ground.
2. Unlock the float.

## OPERATION

3. Check that the float lock linkage is on the down stops (washer [A] cannot be moved) at both locations.

**NOTE:**

If the header is not on the down stops during the next two steps, the voltage may go out of range during operation causing a malfunction of the AHHC system. If the header is not on the down stops, refer to [3.10 Leveling the Header](#), [page 317](#) for instructions.

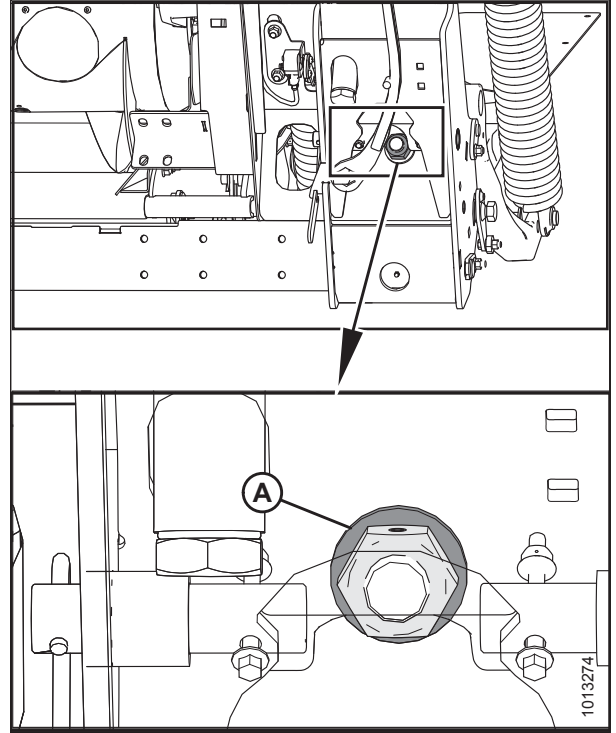


Figure 3.431: Float Lock

4. Adjust cable take-up bracket (B) (if necessary) until float indicator pointer (A) is on 0.

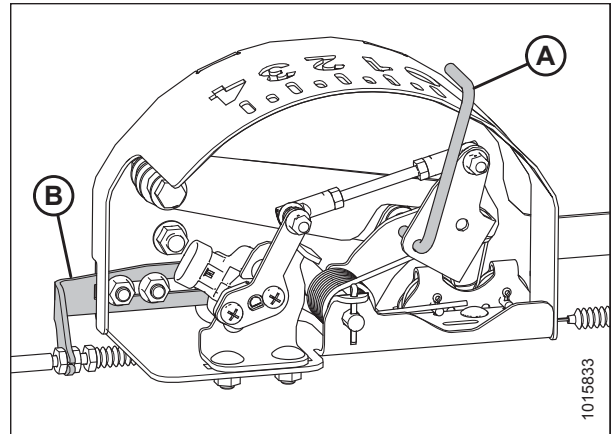
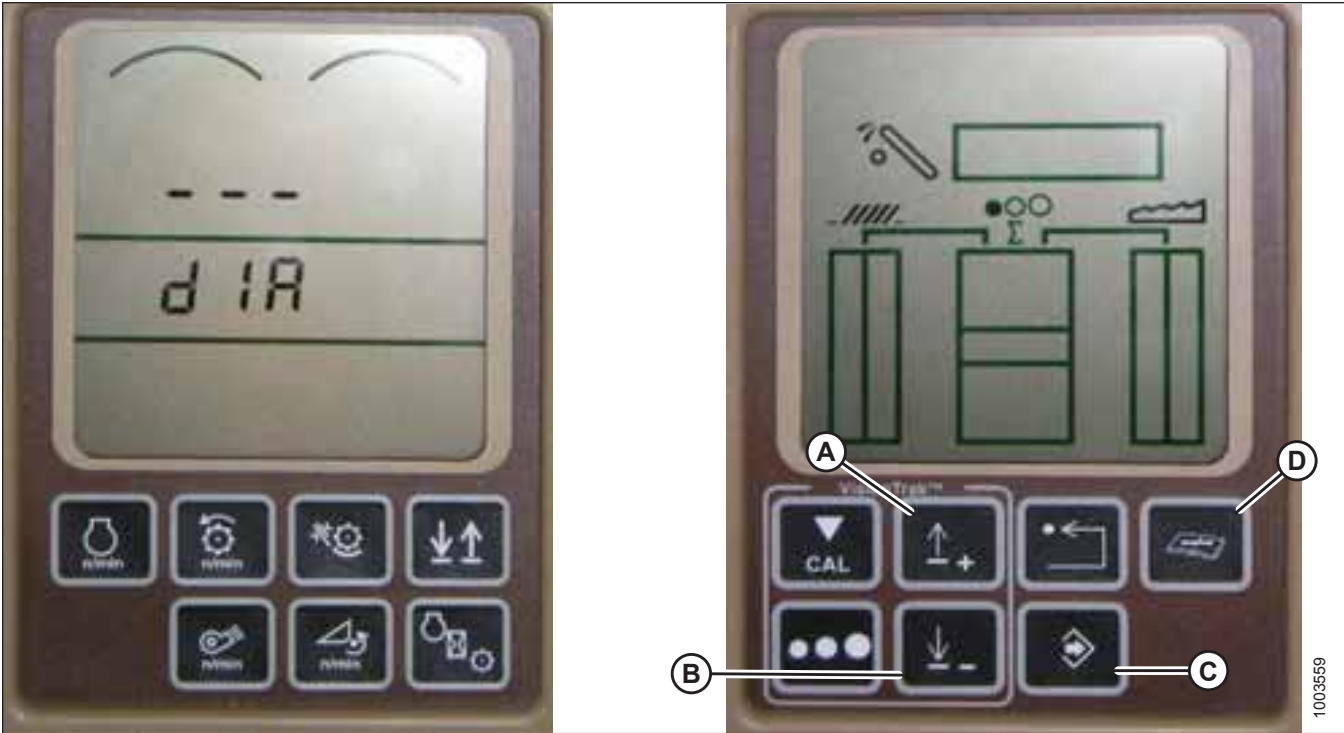


Figure 3.432: Float Indicator Box

## OPERATION



**Figure 3.433: John Deere Combine Display**

5. Press DIAGNOSTIC button (D) on the display—DIA appears on the display.
6. Press UP button (A) until EO1 appears on the display—this is the header adjustments.
7. Press ENTER button (C).
8. Press the UP (A) or DOWN button (B) until 24 is shown on the top portion of the display—this is the voltage reading for the sensor.
9. Ensure the header float is unlocked.
10. Start the combine, and fully lower the feeder house to the ground.

**NOTE:**

You may need to hold the HEADER DOWN switch for a few seconds to ensure the feeder house is fully lowered.

11. Check the sensor reading on the display. The reading should be above 0.5 V.
12. Raise the header so it is just off the ground. The reading on the display should read below 4.5 V.
13. If the sensor voltage is not within the low and high limits or if the range between the low and high limits is insufficient, refer to [Adjusting Voltage Limits – One-Sensor System, page 147](#).

### *Calibrating the Auto Header Height Control – John Deere 60 Series*

The auto header height control (AHHC) sensor output must be calibrated for each combine, or the AHHC feature will not work properly.

## DANGER

Check to be sure all bystanders have cleared the area.

**NOTE:**

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

## OPERATION

### NOTE:

If the header float is set too light, it can prevent the calibration of the AHHC. You may need to set the float heavier for the calibration procedure so header does not separate from the float module.

### NOTE:

For best performance of the auto header height control (AHHC) system, perform ground calibration with center-link set to **D**. When calibration is complete, adjust the center-link back to desired header angle. For instructions, refer to [3.8.4 Header Angle, page 96](#)

1. Ensure the center-link is set to **D**.
2. Rest the header on the down stops.
3. Unlock the float.
4. Start the combine.
5. Press DIAGNOSTIC button (A) on the display. DIA appears on the display.
6. Press CAL button (B). DIA-CAL appears on the display.

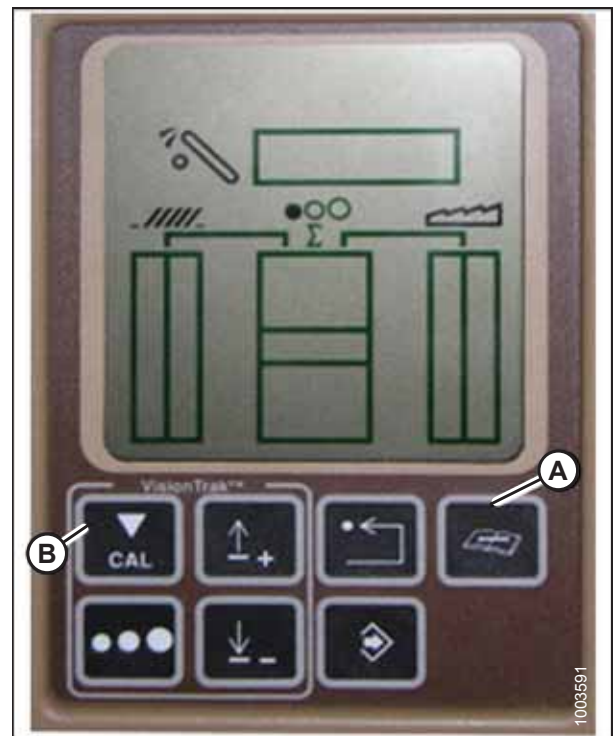


Figure 3.434: John Deere Combine Display

## OPERATION

7. Press the UP or DOWN buttons until HDR appears on the display.
8. Press the ENTER button. HDR H-DN appears on the display.
9. Fully lower the feeder house to the ground.

**NOTE:**

You may need to hold the HEADER DOWN switch for a few seconds to ensure the feeder house is fully lowered.

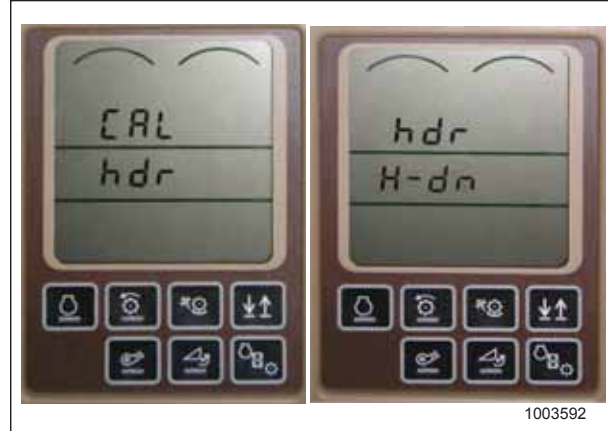


Figure 3.435: John Deere Combine Display

10. Press CAL button (A) to save the calibration of the header. HDR H-UP appears on the display.
11. Raise the header 1 m (3 ft.) off the ground and press CAL button (A). EOC appears on the display.
12. Press ENTER button (B) to save the calibration of the header. The AHHC is now calibrated.

**NOTE:**

If an error code appears during calibration, the sensor is out of voltage range and will require adjustment. For instructions, refer to [Checking Voltage Range from the Combine Cab – John Deere 60 Series, page 248](#).

**NOTE:**

After the calibration is complete, adjust combine operation settings to ensure proper field operation.

**NOTE:**

If the float was set heavier to complete the AHHC calibration procedure, adjust it to the recommended operating float after the calibration is complete.

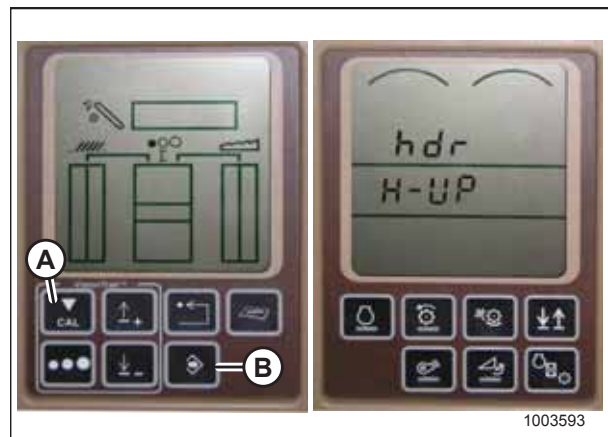


Figure 3.436: John Deere Combine Display

### Turning the Accumulator Off – John Deere 60 Series

The accumulator is a hydraulic device that cushions the shock of hydraulic fluid when installing a heavy header onto the combine. The accumulator should not be used when operating the combine with a D1 and FM100 Float Module attached.

**NOTE:**

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.



## OPERATION

1. Press DIAGNOSTIC button (A) on the display. DIA appears on the display.
2. Press UP button (B) until EO1 appears on the display, and press ENTER (D). This is the header adjustment.
3. Press UP (B) or DOWN (C) button until 132 is displayed on the top portion of the display. This is the reading for the accumulator.
4. Press ENTER (D) to select 132 as the accumulator reading (this will allow you to change the display to a three-digit number so it has a 0 in it, for example, x0x).
5. Press UP (B) or DOWN (C) button until the desired number is displayed, and press CAL button (E).
6. Press ENTER (D) to save the changes. The accumulator is now deactivated.

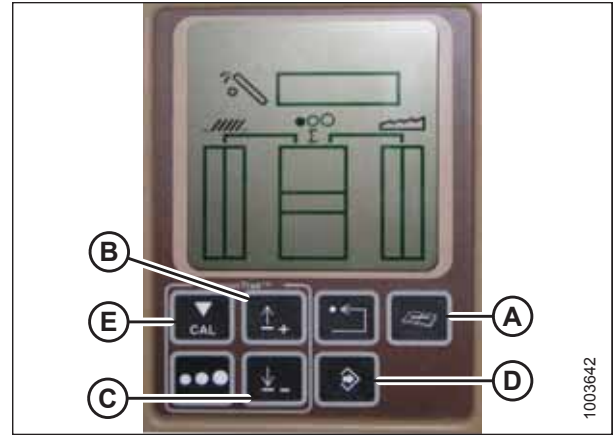


Figure 3.437: John Deere Combine Display

### Setting the Sensing Grain Header Height to 50 – John Deere 60 Series

#### NOTE:

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

1. Press DIAGNOSTIC button (A) on the display. DIA appears on the display.
2. Press UP button (B) until EO1 appears on the display, and press ENTER (D). This is the header adjustment.
3. Press UP (B) or DOWN (C) button until 128 is shown on the top portion of the display. This is the reading for the sensor.
4. Press ENTER (D) to select 128 as the sensor reading (this will allow you to change the display to a three-digit number so it has a 50 in it).
5. Press UP (B) or DOWN (C) button until the desired number is displayed, and press CAL button (E).
6. Press ENTER (D) to save the changes. The height is now set.

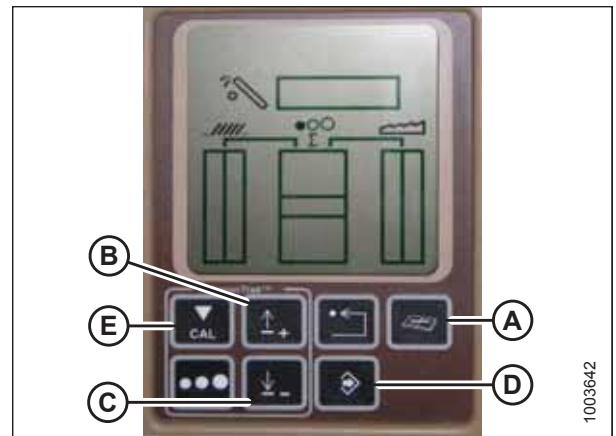


Figure 3.438: John Deere Combine Display

#### NOTE:

Do **NOT** use the active header float function (A) in combination with the MacDon auto header height control (AHHC)—the two systems will counteract one another. Header symbol (B) on the display should **NOT** have a wavy line under it and should appear exactly as shown on the Active Header Control Display in Figure 3.439, page 253.

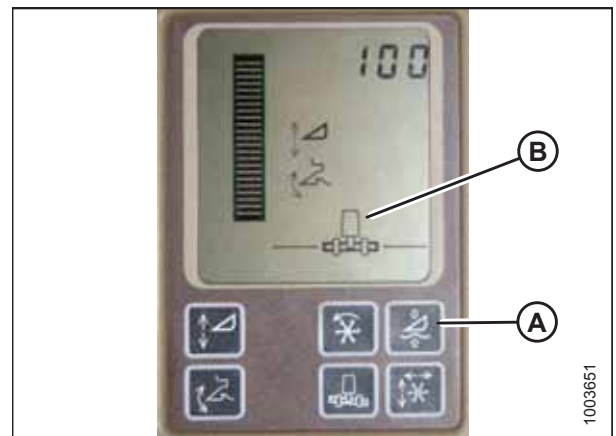


Figure 3.439: John Deere Combine Display



## OPERATION

### *Setting the Sensitivity of the Auto Header Height Control – John Deere 60 Series*

The sensitivity adjustment controls the distance the cutterbar must travel up or down before the auto header height control (AHHC) reacts and raises or lowers the feeder house.

When the sensitivity is set to maximum, only small changes in ground height are needed to cause the feeder house to raise or lower. When the sensitivity is set to minimum, large changes in the ground height are needed to cause the feeder house to raise or lower.

**NOTE:**

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

**NOTE:**

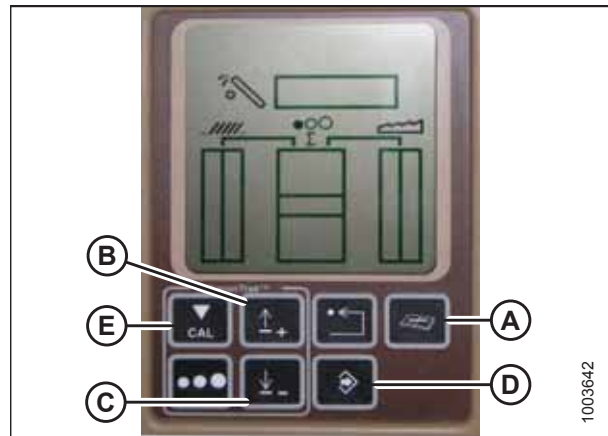
The numbers shown on the displays in these illustrations are for reference purposes only; they are not intended to represent the specific settings for your equipment.

1. Press DIAGNOSTIC button (A) on the display. DIA appears on the display.
2. Press UP button (B) until EO1 appears on the display, and press ENTER (D). This is the header adjustment.
3. Press UP (B) or DOWN (C) button until 112 is shown on the display. This is your sensitivity setting.

**NOTE:**

The lower the reading, the higher the sensitivity. Ideal operating range is typically between 50 and 80.

4. Press ENTER (D) to select 112 as the sensitivity setting (this will allow you to change the first digit of the number sequence).
5. Press UP (B) or DOWN (C) until the desired number is displayed, then press CAL button (E). This will bring you to the second digit. Repeat this procedure until the desired setting is achieved.
6. Press ENTER (D) to save changes.



**Figure 3.440: John Deere Combine Display**

### *Adjusting the Threshold for the Drop Rate Valve – John Deere 60 Series*

This procedure explains how to adjust the point at which the restrictor valve opens allowing full flow to the lift cylinders.

**NOTE:**

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

**NOTE:**

The numbers shown on the displays in these illustrations are for reference purposes only; they are not intended to represent the specific settings for your equipment.

## OPERATION

1. Press DIAGNOSTIC button (A) on the display. DIA appears on the display.
2. Press UP button (B) until EO1 appears on the display and press ENTER (C). This is the header adjustment.
3. Press UP (B) or DOWN button until 114 is shown on the top portion of the display. This is the setting that adjusts when the fast drop rate starts with respect to the dead band.

### NOTE:

The default setting is 100. Ideal operating range is typically between 60 and 85.

4. Press ENTER (C) to select 114 as the fast drop rate (this will allow you to change the first digit of the number sequence).
5. Press UP (A) or DOWN (B) until the desired number is displayed, then press CAL button (C). This will bring you to the second digit. Repeat this procedure until the desired setting is achieved.
6. Press ENTER (D) to save changes.

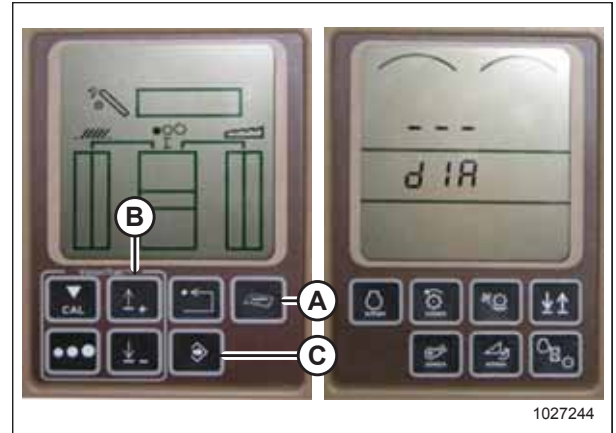


Figure 3.441: John Deere Combine Display

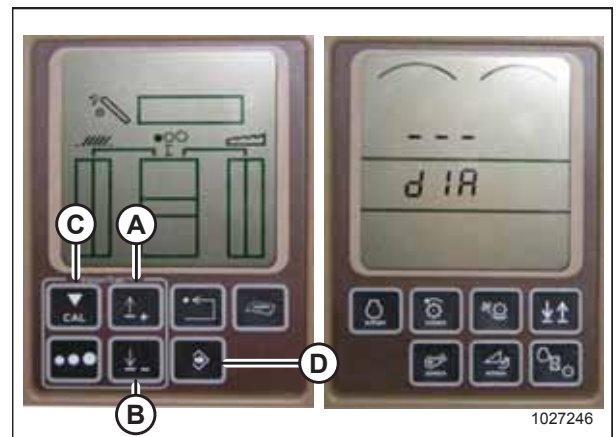


Figure 3.442: John Deere Combine Display

### 3.9.15 John Deere 70 Series Combines

#### *Checking Voltage Range from the Combine Cab – John Deere 70 Series*

### NOTE:

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.



## DANGER

Check to be sure all bystanders have cleared the area.

1. Unlock the float.

## OPERATION

2. Check that the float lock linkage is on the down stops (washer [A] cannot be moved) at both locations.

**NOTE:**

If the header is not on the down stops during the next two steps, the voltage may go out of range during operation causing a malfunction of the AHHC system. If the header is not on the down stops, refer to [3.10 Leveling the Header](#), [page 317](#) for instructions.

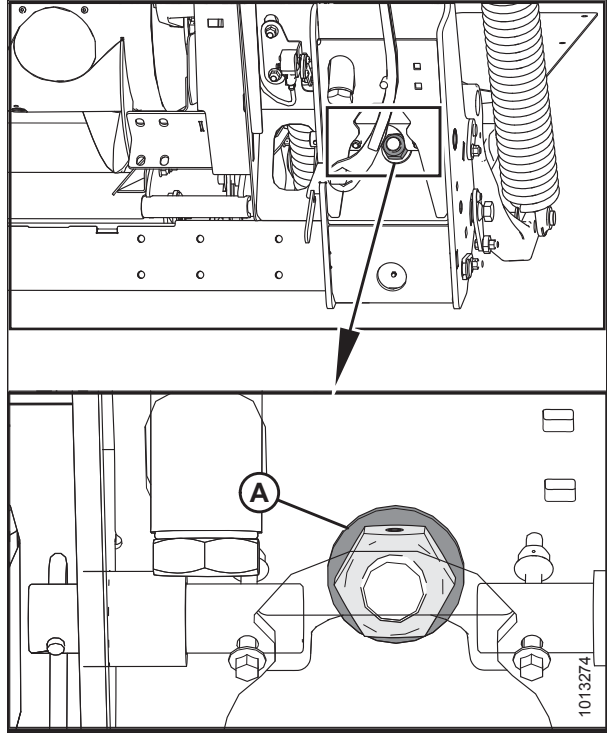


Figure 3.443: Float Lock

3. Adjust cable take-up bracket (B) (if necessary) until pointer (A) on the float indicator is on **0**.

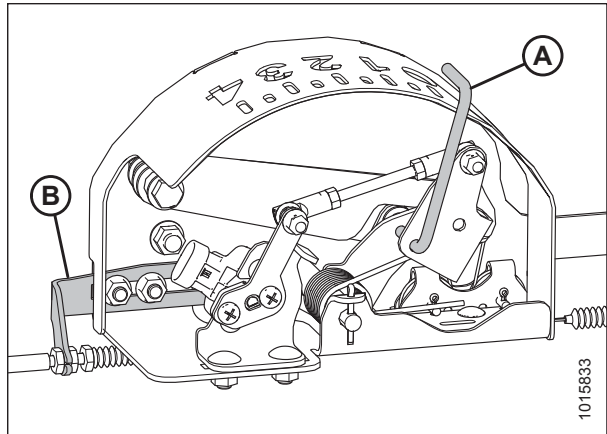


Figure 3.444: Float Indicator Box

## OPERATION

4. Press HOME PAGE button (A) on the main page of the screen.



Figure 3.445: John Deere Combine Display

5. Ensure three icons (A) shown in the illustration at right appear on the display.



Figure 3.446: John Deere Combine Display

6. Use scroll knob (A) to highlight the middle icon (the green i) and press check mark button (B) to select it. This will bring up the Message Center.

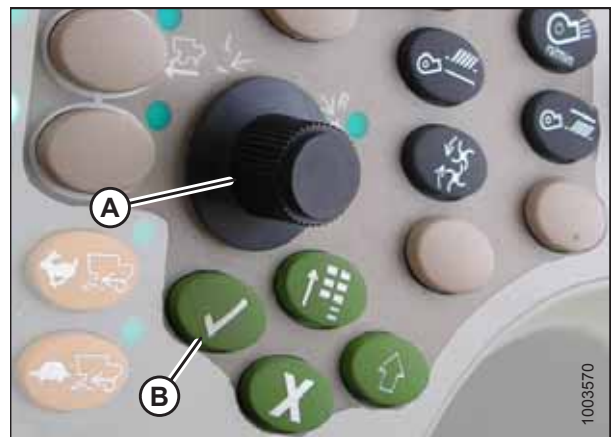


Figure 3.447: John Deere Combine Control Console

## OPERATION

- Use the scroll knob to highlight DIAGNOSTIC ADDRESSES (A) from the right column and select it by pressing the check mark button.
- Use the scroll knob to highlight drop-down box (B) and press the check mark button to select it.



Figure 3.448: John Deere Combine Display

- Use the scroll knob to highlight LC 1.001 VEHICLE (A) and press the check mark button to select it.



Figure 3.449: John Deere Combine Display

- Use the scroll knob to highlight down arrow (A) and press the check mark button to scroll through the list until 029 DATA (B) is displayed and voltage reading (C) appears on the display.

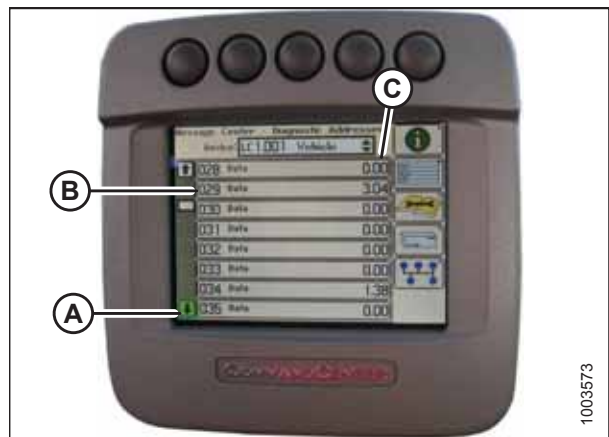


Figure 3.450: John Deere Combine Display

- Ensure the header float is unlocked.
- Start the combine and fully lower the feeder house to the ground.

### NOTE:

You may need to hold the HEADER DOWN switch for a few seconds to ensure the feeder house is fully lowered.

- Check the sensor reading on the display.

## OPERATION

14. Raise the header so it is just off the ground and recheck the sensor reading.
15. If the sensor voltage is not within the low and high limits or if the range between the low and high limits is insufficient, refer to [Adjusting Voltage Limits – One-Sensor System, page 147](#).

### Calibrating Feeder House Speed – John Deere 70 Series

The feeder house speed must be calibrated before you calibrate the auto header height control (AHHC) system.

For instructions, refer to the combine operator's manual.

### Calibrating the Auto Header Height Control – John Deere 70 Series

The auto header height control (AHHC) sensor output must be calibrated for each combine, or the AHHC feature will not work properly.



## DANGER

Check to be sure all bystanders have cleared the area.

### NOTE:

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

### NOTE:

If the header float is set too light, it can prevent the calibration of the AHHC. You may need to set the float heavier for the calibration procedure so the header does not separate from the float module.

### NOTE:

For best performance of the auto header height control (AHHC) system, perform ground calibration with center-link set to **D**. When calibration is complete, adjust the center-link back to desired header angle. For instructions, refer to [3.8.4 Header Angle, page 96](#)

1. Ensure the center-link is set to **D**.
2. Rest the header on the down stops.
3. Unlock the float.
4. Start the combine.
5. Press the button located fourth from the left along the top of display (A) to select the icon that resembles an open book with a wrench on it (B).
6. Press top button (A) a second time to enter diagnostics and calibration mode.



Figure 3.451: John Deere Combine Display

## OPERATION

7. Select HEADER in box (A) by scrolling down to the box using the scroll knob, and then pressing the check mark button (knob and button are shown in Figure 3.453, page 260).
8. Scroll down to the lower right icon that resembles an arrow in a diamond (B) and press the check mark button to select it.

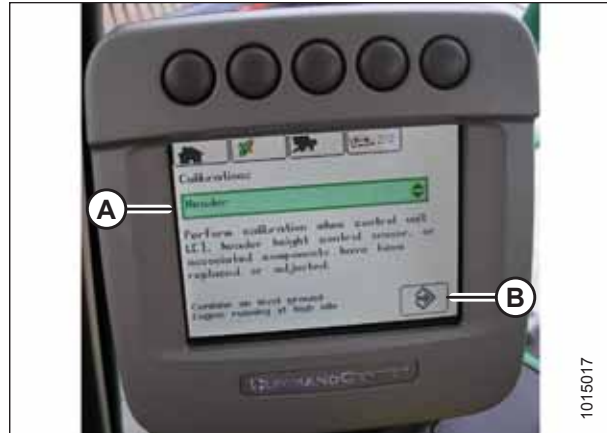


Figure 3.452: John Deere Combine Display

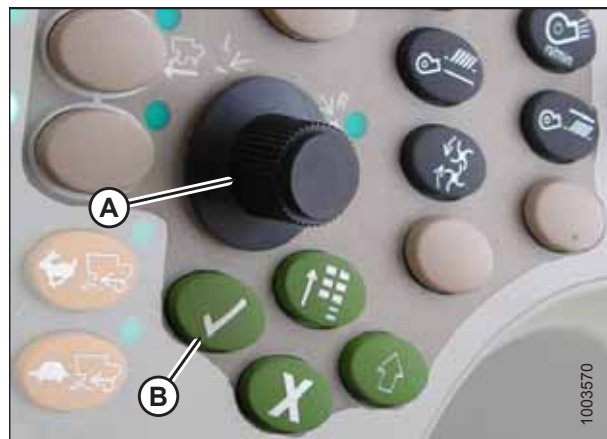


Figure 3.453: John Deere Combine Control Console

A - Scroll Knob

B - Check Mark Button

9. Follow the steps listed on the page to perform the calibration.

### NOTE:

If an error code appears on the display, the sensor is not in the correct working range. Check and adjust the range. For instructions, refer to *Checking Voltage Range from the Combine Cab – John Deere S and T Series*, page 262.

### NOTE:

If the float was set heavier to complete the AHHC calibration procedure, adjust it to the recommended operating float after the calibration is complete.

### *Setting the Sensitivity of the Auto Header Height Control – John Deere 70 Series*

The sensitivity adjustment controls the distance the cutterbar must travel up or down before the auto header height control (AHHC) reacts and raises or lowers the feeder house.

When the sensitivity is set to maximum, only small changes in ground height are needed to cause the feeder house to raise or lower. When the sensitivity is set to minimum, large changes in the ground height are needed to cause the feeder house to raise or lower.

### NOTE:

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.



## OPERATION

1. Press button (A) twice. The current sensitivity setting will appear on the display (the lower the reading, the lower the sensitivity).
2. Use scroll knob (B) to adjust the sensitivity setting. The adjustment will be saved automatically.

**NOTE:**

If the page remains idle for a short period of time, it will automatically return to the previous page. Pressing check mark button (C) also will return the display to the previous page.

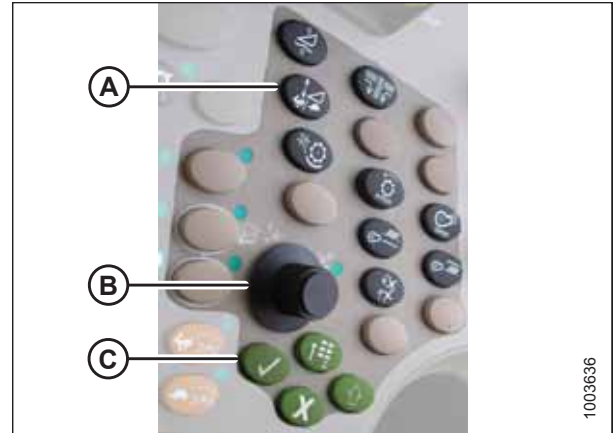


Figure 3.454: John Deere Combine Control Console

**NOTE:**

The numbers shown on the displays in these illustrations are for reference purposes only; they are not intended to represent the specific settings for your equipment.



Figure 3.455: John Deere Combine Display

### *Adjusting the Manual Header Raise/Lower Rate – John Deere 70 Series*

The weight of the header will dictate the rate at which the header can be raised or lowered during operation.

**NOTE:**

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

## OPERATION

1. Press button (A) and the current raise/lower rate setting will appear on the display (the lower the reading, the slower the rate).
2. Use scroll knob (B) to adjust the rate. The adjustment will be saved automatically.

### NOTE:

If the display remains idle for a short period of time, it will automatically return to the previous page. Pressing check mark button (C) will also return the display to the previous page.

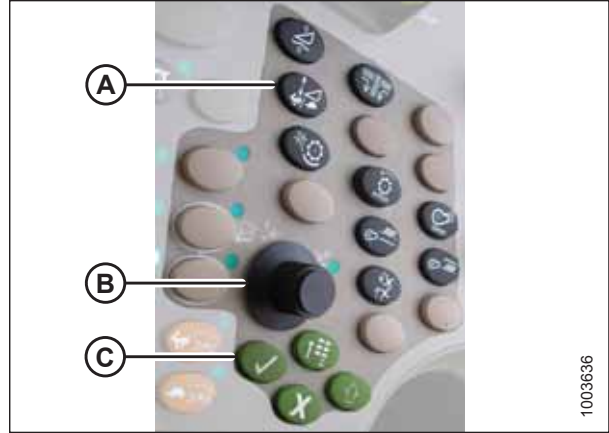


Figure 3.456: John Deere Combine Control Console

### NOTE:

The numbers shown on the displays in these illustrations are for reference purposes only; they are not intended to represent the specific settings for your equipment.



Figure 3.457: John Deere Combine Display

## 3.9.16 John Deere S and T Series Combines

### *Checking Voltage Range from the Combine Cab – John Deere S and T Series*

#### NOTE:

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

### **DANGER**

Check to be sure all bystanders have cleared the area.

1. Unlock the float.

## OPERATION

2. Check that the float lock linkage is on the down stops (washer [A] cannot be moved) at both locations.

**NOTE:**

If the header is not on the down stops during the next two steps, the voltage may go out of range during operation causing a malfunction of the AHHC system. If the header is not on the down stops, refer to [3.10 Leveling the Header](#), [page 317](#) for instructions.

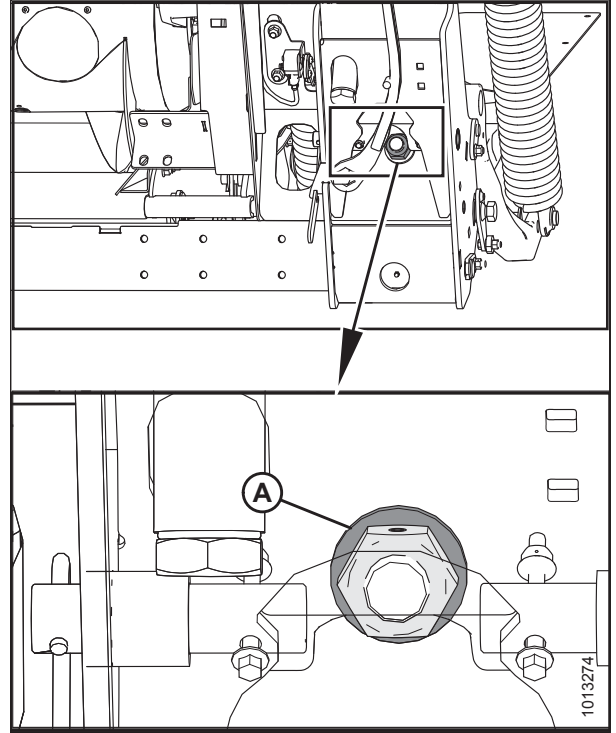


Figure 3.458: Float Lock

3. Adjust cable take-up bracket (B) (if necessary) until pointer (A) on the float indicator is on **0**.

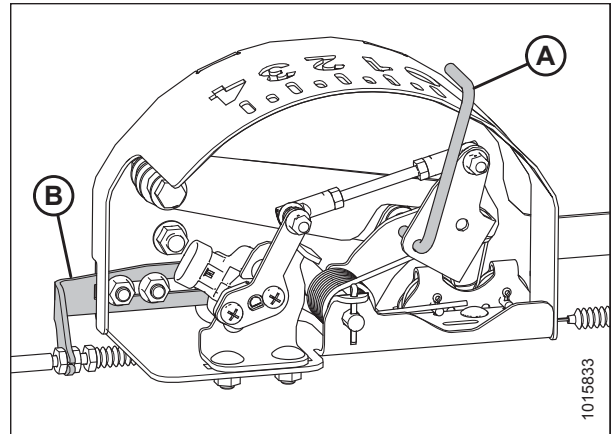


Figure 3.459: Float Indicator Box

## OPERATION

4. Press CALIBRATION icon (A) on the main page of the display. The CALIBRATION page appears.



Figure 3.460: John Deere Combine Display

5. Press DIAGNOSTIC READINGS icon (A) on the CALIBRATION page. The DIAGNOSTIC READINGS page appears. This page provides access to calibrations, header options, and diagnostic information.

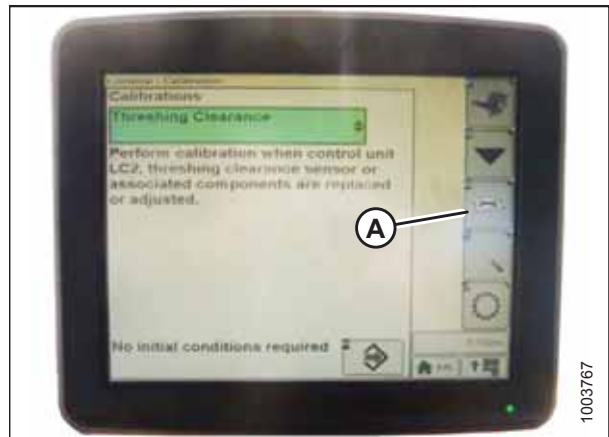


Figure 3.461: John Deere Combine Display

6. Select AHHC RESUME (A) and a list of calibration options appears.



Figure 3.462: John Deere Combine Display

## OPERATION

7. Select the AHHC SENSING option.
8. Press icon (A). The AHHC SENSING menu appears and five pages of information are displayed.



Figure 3.463: John Deere Combine Display

9. Press icon (A) until it reads Page 5 near the top of the page and the following sensor readings appear:
  - LEFT HEADER HEIGHT
  - CENTER HEADER HEIGHT
  - RIGHT HEADER HEIGHT

A reading is displayed for both the left and right sensors. On the MacDon header, there may be one sensor located in the float indicator box (standard) or two sensors located at the back of the float module side frame (optional).



Figure 3.464: John Deere Combine Display

10. Ensure the header float is unlocked.
11. Start the combine and fully lower the feeder house to the ground.

### NOTE:

You may need to hold the HEADER DOWN switch for a few seconds to ensure the feeder house is fully lowered.

12. Check the sensor reading on the display.
13. If the sensor voltage is not within the low and high limits or if the range between the low and high limits is insufficient, refer to [Adjusting Voltage Limits – One-Sensor System, page 147](#).

### Calibrating the Auto Header Height Control – John Deere S and T Series

The auto header height control (AHHC) sensor output must be calibrated for each combine, or the AHHC feature will not work properly.



### WARNING

Check to be sure all bystanders have cleared the area.

### NOTE:

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

## OPERATION

### NOTE:

If header float is set too light, it can prevent the calibration of the AHHC. You may need to set the float heavier for the calibration procedure so header does not separate from the float module.

### NOTE:

For best performance of the auto header height control (AHHC) system, perform ground calibration with center-link set to **D**. When calibration is complete, adjust the center-link back to desired header angle. For instructions, refer to [3.8.4 Header Angle, page 96](#)

1. Ensure the center-link is set to **D**.
2. Rest the header on the down stops.
3. Unlock the float.
4. Press DIAGNOSTIC icon (A) on the main page of the display. The CALIBRATION screen appears.



Figure 3.465: John Deere Combine Display

5. Select THRESHING CLEARANCE (A) and a list of calibration options appears.

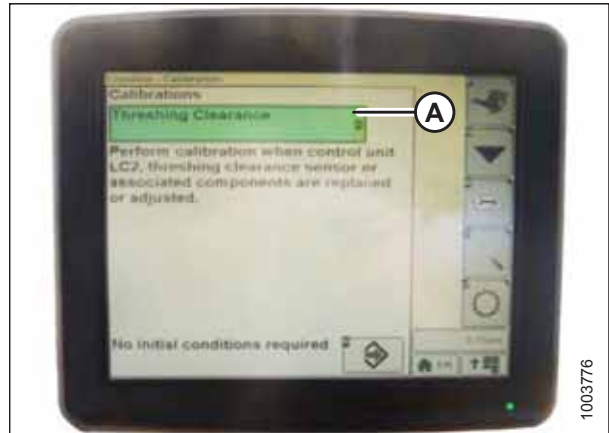


Figure 3.466: John Deere Combine Display

## OPERATION

6. Select FEEDER HOUSE SPEED (A) from the list of calibration options.

**NOTE:**

Feeder house speed calibration must be done before header calibration.



Figure 3.467: John Deere Combine Display

7. With FEEDER HOUSE SPEED selected, press icon (A). The icon will turn green.

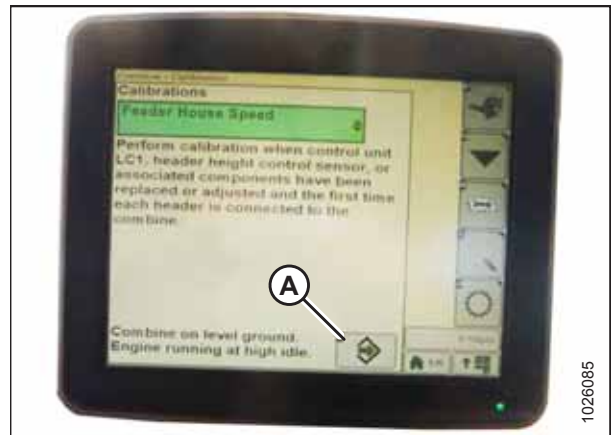


Figure 3.468: John Deere Combine Display

8. Press icon (A) and instructions will appear on screen to guide you through the remaining calibration steps.



Figure 3.469: John Deere Combine Display



## OPERATION

9. Select HEADER (A) from the list of calibration options.

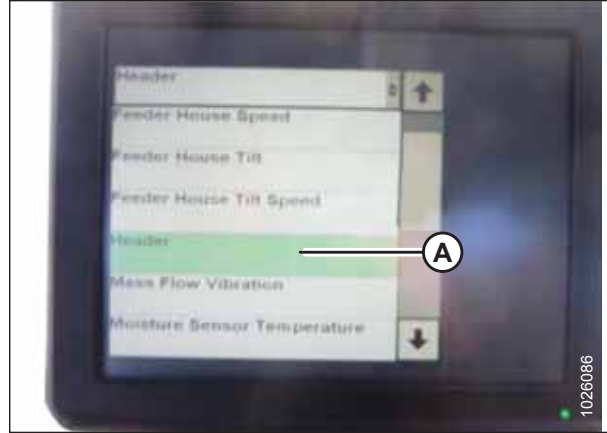


Figure 3.470: John Deere Combine Display

10. With HEADER selected, press icon (A). The icon will turn green.

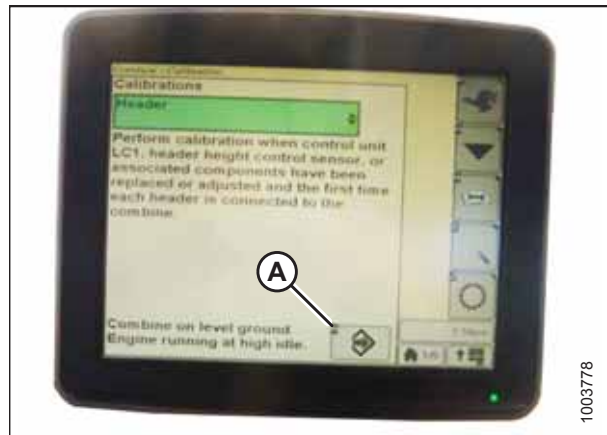


Figure 3.471: John Deere Combine Display

11. Press icon (A) and instructions will appear on screen to guide you through the remaining calibration steps.

### NOTE:

If an error code appears during calibration, the sensor is out of voltage range and will require adjustment. For instructions, refer to [Checking Voltage Range from the Combine Cab – John Deere S and T Series, page 262](#).

### NOTE:

If the float was set heavier to complete the AHHC calibration procedure, adjust it to the recommended operating float after the calibration is complete.



Figure 3.472: John Deere Combine Display

### *Setting the Sensitivity of the Auto Header Height Control – John Deere S and T Series*

The sensitivity adjustment controls the distance the cutterbar must travel up or down before the auto header height control (AHHC) reacts and raises or lowers the feeder house.

When the sensitivity is set to maximum, only small changes in ground height are needed to cause the feeder house to raise or lower. When the sensitivity is set to minimum, large changes in the ground height are needed to cause the feeder house to raise or lower.

## OPERATION

### NOTE:

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

1. Press button (A) twice and the current sensitivity setting will appear on the display.



Figure 3.473: John Deere Combine Command Center

2. Press – or + icons (A) to adjust rates.

### NOTE:

The numbers shown on the combine display in this illustration are for reference purposes only; they are not intended to represent the specific settings for your equipment.



Figure 3.474: John Deere Combine Display

### *Adjusting the Manual Header Raise/Lower Rate – John Deere S and T Series*

### NOTE:

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

## OPERATION

1. Ensure indicator (A) is at position 0 (B) with the header 152 mm (6 in.) off the ground. If not, the float sensor output voltage should be checked. Refer to Step 5, page 143.

### NOTE:

When the header is on the ground, the indicator should be at position 1 (C) for low ground pressure, and at position 4 (D) for high ground pressure. Crop and soil conditions determine the amount of float to use. The ideal setting is as light as possible without header bouncing or missing crop. Operating with heavy settings prematurely wears the cutterbar wearplates.

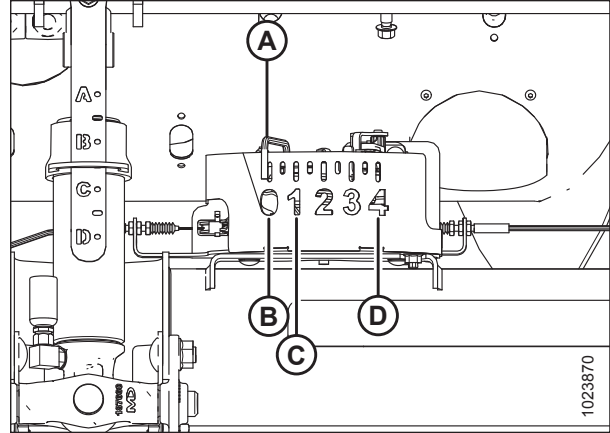


Figure 3.475: Float Indicator Box

2. Press button (A) and the current sensitivity setting will appear on the display.



Figure 3.476: John Deere Combine Command Center

3. Press – or + icons (A) to adjust rates.

### NOTE:

The numbers shown on the combine display in this illustration are for reference purposes only; they are not intended to represent the specific settings for your equipment.

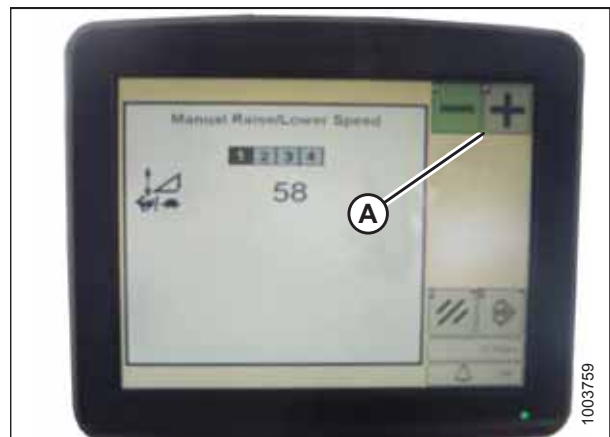


Figure 3.477: John Deere Combine Display

## OPERATION

### Setting Preset Cutting Height – John Deere S and T Series

The reel and cut height setting can be stored in the combine. When harvesting the setting can be selected from the control handle.

#### NOTE:

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

1. Ensure indicator (A) is at position 0 (B) with the header (152 mm [6 in.]) off the ground. If not, the float sensor output voltage should be checked. Refer to Step 5, page 143.

#### NOTE:

When the header is on the ground, the indicator should be at position 1 (C) for low ground pressure, and at position 4 (D) for high ground pressure. Crop and soil conditions determine the amount of float to use. The ideal setting is as light as possible without header bouncing or missing crop. Operating with heavy settings prematurely wears the cutterbar wearplates.

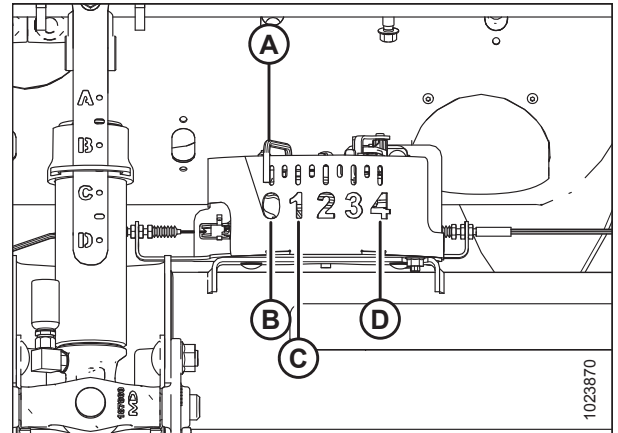


Figure 3.478: Float Indicator Box

2. Press COMBINE – HEADER SETUP icon (A) on the main page. The COMBINE – HEADER SETUP page appears. This page is used to set various header settings such as reel speed, header width, and height of feeder house for acre counter engagement.



Figure 3.479: Combine Display

3. Select COMBINE – HEADER SETUP AHC icon (A). The COMBINE – HEADER SETUP AHC page appears.



Figure 3.480: Combine Display

## OPERATION

4. Select AUTO HEIGHT SENSING (A), RETURN TO CUT (B), and REEL POSITION (C) icons.

**NOTE:**

If REEL POSITION icon (C) cannot be selected (no check mark), the reel height sensor requires calibration. For instructions, refer to *Calibrating Reel Height Sensor – John Deere S and T Series, page 279*.

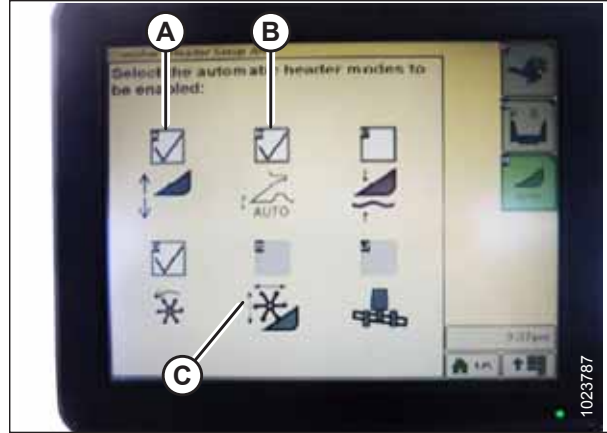


Figure 3.481: Combine Display

5. Engage the header.
6. Move the header to the desired position and use knob (A) to fine tune the position.
7. Move the reel to the desired position.



Figure 3.482: Combine Control Console

8. Press and hold preset switch 2 (B) until 1 reel height icon flashes on display.
9. Repeat previous three steps for preset switch 3 (C).
10. Select an appropriate ground pressure setting. Use preset button 2 (B) on the control handle for a low ground pressure setting in muddy or soft soil conditions, and preset 3 (C) for a high ground pressure setting in firm soil conditions and a higher ground speed.

**NOTE:**

Preset button 1 (A) is reserved for header lift on the headland and is not used for cutting on the ground.



Figure 3.483: Control Handle Buttons

## OPERATION

### NOTE:

When the AHHC is engaged, AHHC icon (A) appears on the display and the number indicating which button was pressed (B) is shown on the page.

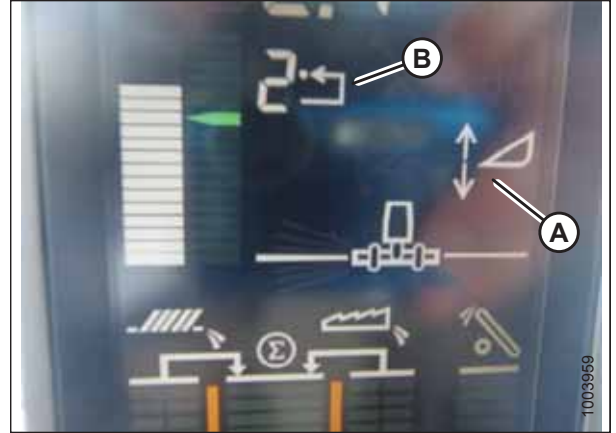


Figure 3.484: Combine Display

### *Calibrating Feeder House Fore-Aft Tilt Range – John Deere S and T Series*

For best performance of the auto header height control (AHHC), perform these procedures with the center-link set to **D**. When setup and calibration are complete, adjust the center-link back to desired header angle. For instructions, refer to [3.8.4 Header Angle, page 96](#).

This procedure applies only to model year 2015 and later John Deere S and T Series combines.

### NOTE:

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

The feeder house fore/aft tilt is controlled by buttons (C) and (D) at the back of the control handle.



Figure 3.485: John Deere Control Handle



## OPERATION

### NOTE:

The feeder house fore/aft tilt controls can be changed to work with buttons E and F by pressing control handle icon (A) and then selecting FEEDER HOUSE FORE/AFT TILT from drop-down menu (B).

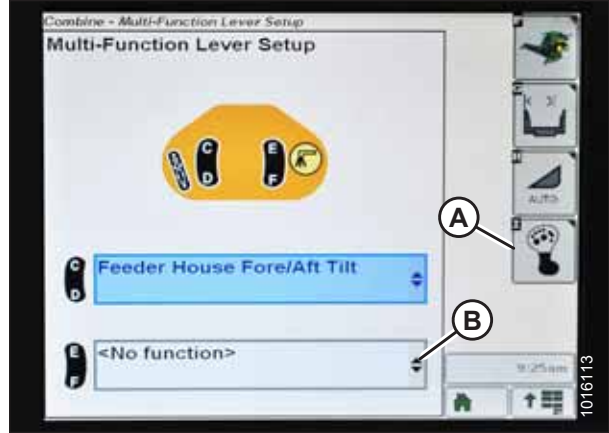


Figure 3.486: John Deere Combine Display

To calibrate the feeder house fore-aft tilt range, follow these steps:

1. Ensure the center-link is set to **D**.
2. Rest the header on the down stops and unlock the float.
3. Press DIAGNOSTIC icon (A) on the main page of the display. The CALIBRATION page displays.



Figure 3.487: John Deere Combine Display

4. Select CALIBRATIONS drop-down menu (A) to view the list of calibration options.

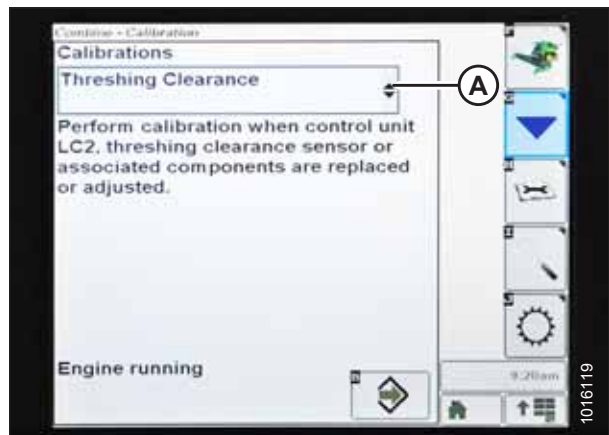


Figure 3.488: John Deere Combine Display



## OPERATION

5. Press arrow (A) to cycle up through the calibration options and select FEEDER HOUSE FORE/AFT TILT RANGE.

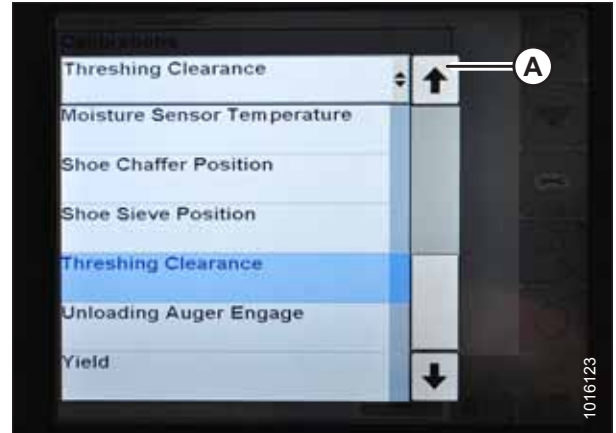


Figure 3.489: John Deere Combine Display

6. Press ENTER icon (A).

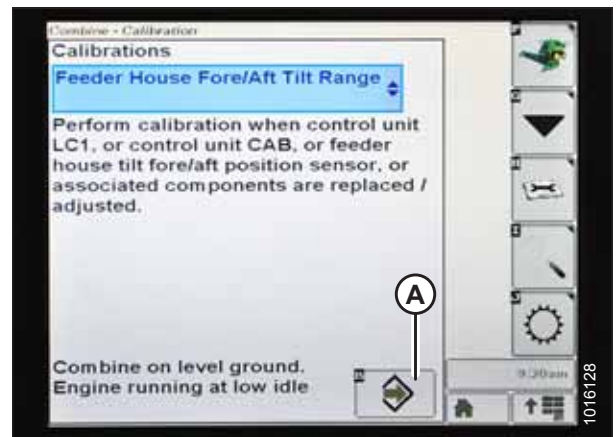


Figure 3.490: John Deere Combine Display

7. Follow the instructions that appear on the page. As you proceed through the calibration process, the display will automatically update to show the next step.

### NOTE:

If an error code appears during calibration, the sensor is out of voltage range and will require adjustment. For instructions, refer to [Checking Voltage Range from the Combine Cab – John Deere S and T Series, page 262](#).

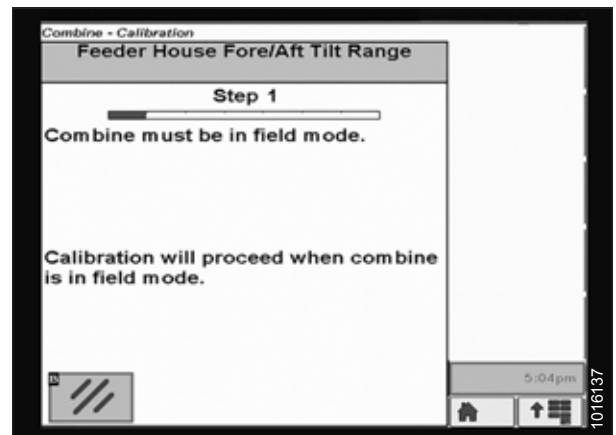


Figure 3.491: John Deere Combine Display

### Checking Reel Height Sensor Voltages – John Deere S and T Series

#### NOTE:

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

## OPERATION

1. Press CALIBRATION icon (A) on the main page of the display. The CALIBRATION page appears.



Figure 3.492: John Deere Combine Display

2. Press DIAGNOSTIC READINGS icon (A) on the CALIBRATION page. The DIAGNOSTIC READINGS page appears. This page provides access to calibrations, header options, and diagnostic information.

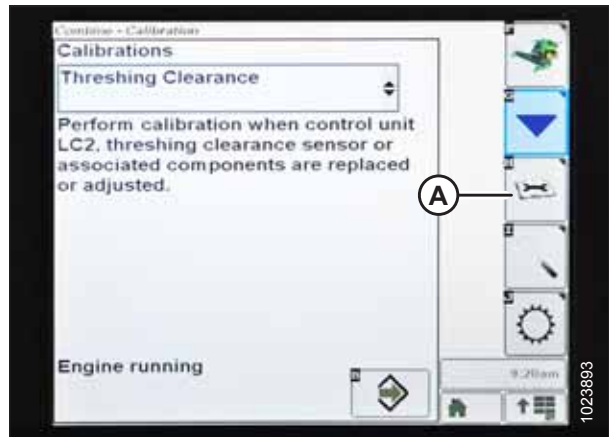


Figure 3.493: John Deere Combine Display

3. Select drop-down menu (A) to view the list of calibration options.

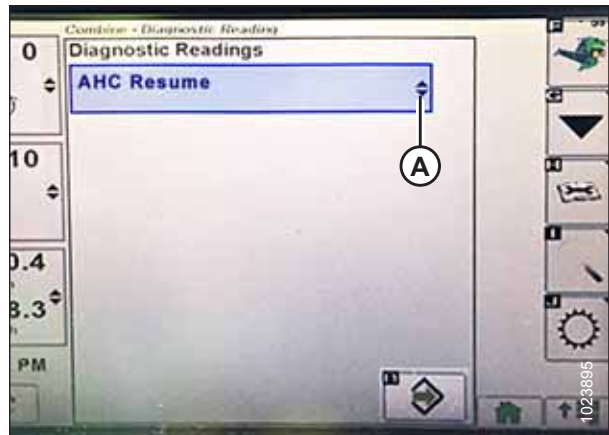


Figure 3.494: John Deere Combine Display

## OPERATION

4. Scroll down and select REEL RESUME (A).



Figure 3.495: John Deere Combine Display

5. Press ENTER icon (A). The REEL RESUME page displays.

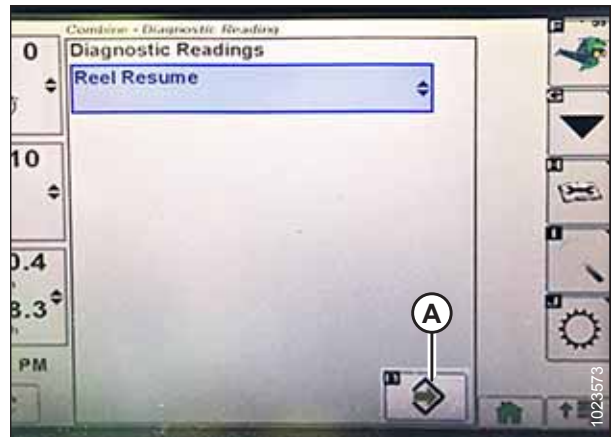


Figure 3.496: John Deere Combine Display

6. Press NEXT PAGE icon (A) to cycle to page 3.
7. Lower the reel to view low voltage (B). The voltage should be 0.5–0.9 V.

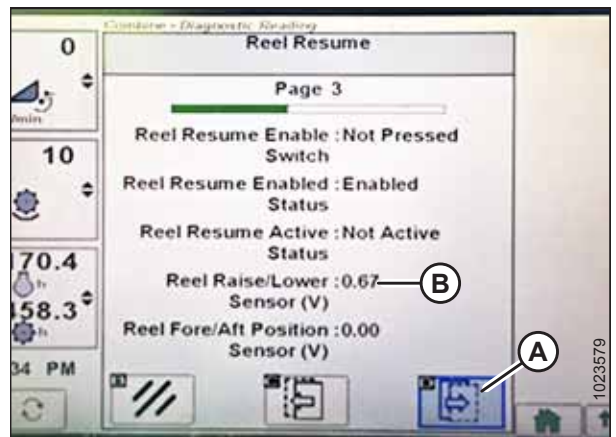


Figure 3.497: John Deere Combine Display

## OPERATION

8. Raise the reel to view high voltage (A). The voltage should be 4.1–4.5 V.
9. If either voltage is not within the correct range, refer to [Checking and Adjusting Reel Height Sensor, page 111](#).

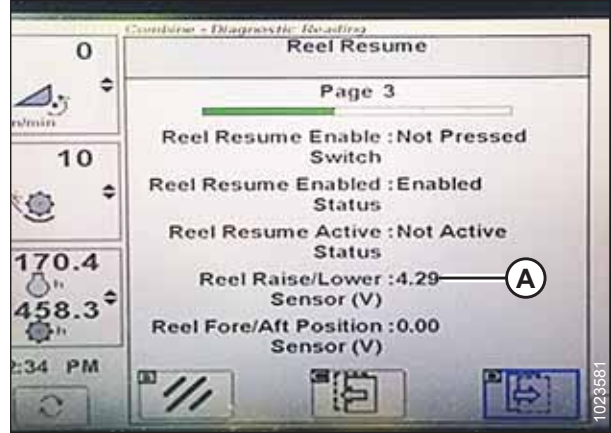


Figure 3.498: John Deere Combine Display

## OPERATION

### Calibrating Reel Height Sensor – John Deere S and T Series

This procedure applies only to model year 2015 and later John Deere S and T Series combines.

#### NOTE:

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

1. Position the header 15–25 cm (6–10 in.) off the ground.

#### IMPORTANT:

Do **NOT** turn off the engine. The combine has to be at full idle for the sensors to calibrate properly.

2. Press DIAGNOSTIC icon (A) on the main page of the display. The CALIBRATION page is shown.



Figure 3.499: John Deere Combine Display

3. Select CALIBRATIONS drop-down menu (A) to view the list of calibration options.
4. Scroll through the list of options and select REEL POSITION.
5. Press ENTER icon (B).

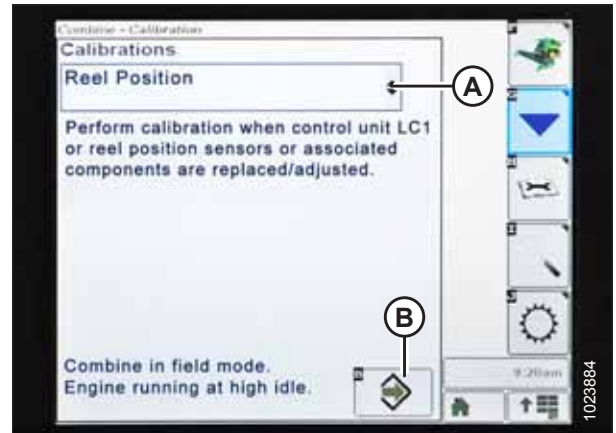


Figure 3.500: John Deere Combine Display

## OPERATION

6. Follow the instructions that appear on the page. As you proceed through the calibration process, the display will automatically update to show the next step. This calibration requires you to use reel raise (A) and reel lower (B) switches on the control handle.



Figure 3.501: John Deere Control Handle

7. Press and hold REEL LOWER switch until the reel is fully lowered. Continue holding REEL LOWER switch until prompted by the display.



Figure 3.502: John Deere Combine Display

8. Press and hold REEL RAISE switch until reel is fully raised. Continue holding REEL RAISE switch until prompted by the display.

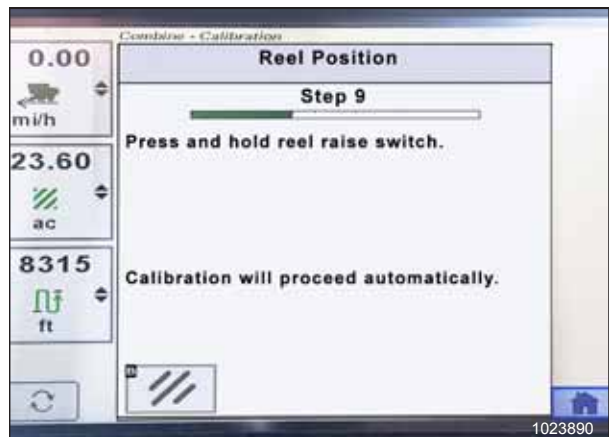


Figure 3.503: John Deere Combine Display

## OPERATION

- When all steps have been completed, CALIBRATION COMPLETE message is displayed on the page. Exit the CALIBRATION menu by pressing ENTER icon (A).

**NOTE:**

If an error code appears during calibration, the sensor is out of voltage range and will require adjustment. For instructions, refer to *Checking Reel Height Sensor Voltages – John Deere S and T Series, page 275*.



Figure 3.504: John Deere Combine Display

### 3.9.17 John Deere S7 Series Combines

#### Setting up Header – John Deere S7 Series

**NOTE:**

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

- Press header button (A) on the panel below the display. The HEADER page opens.



Figure 3.505: John Deere S7 Display



## OPERATION

2. Select HEADER TYPE field (A). The HEADER DETAILS dialog box opens.



Figure 3.506: John Deere S7 Display – Header Page

3. Verify correct header width is displayed under WIDTH.
4. To change header width, select field (A). The WIDTH dialog box opens.



Figure 3.507: John Deere S7 Display – Header Details Window

5. Use the on-screen keypad to enter the correct header width, and then press OK.



Figure 3.508: John Deere S7 Display – Setting Header Width

## OPERATION

6. Press close button (A) in the top right corner to return to the HEADER page.



Figure 3.509: John Deere S7 Display – Header Details Dialog Box

7. Raise/lower speed (A), tilt speed (B), height sensitivity (C), and tilt sensitivity (D) can all be adjusted from this page. Select the option you would like to adjust. The following example shows the raise/lower speed adjustment.

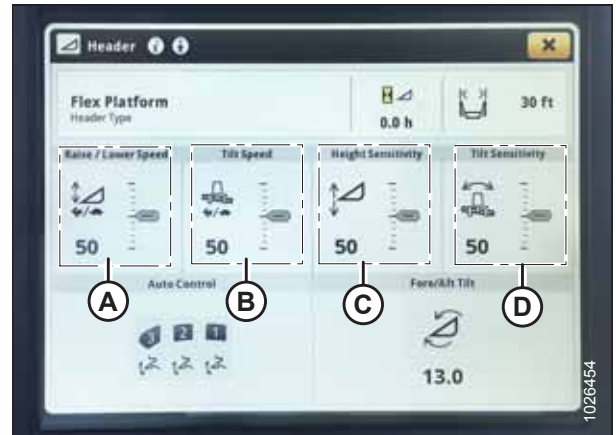


Figure 3.510: John Deere S7 Display – Header Page

8. Use + and – buttons (A) to adjust the setting.
9. Press the close button in top right corner of the window to return to the HEADER page.

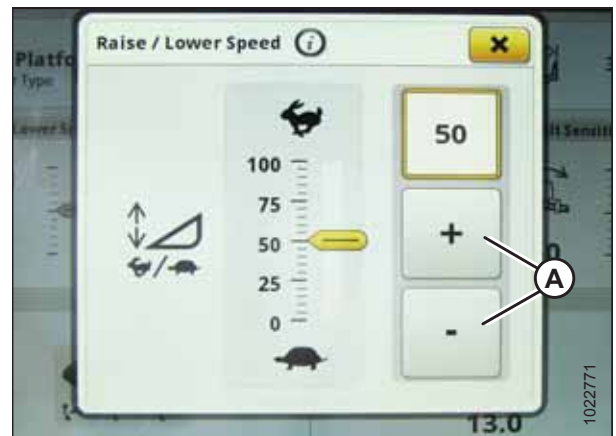


Figure 3.511: John Deere S7 Display – Raise/Lower Speed Adjustment

## OPERATION

10. Select AUTO CONTROL icons (A). The AUTO HEADER CONTROLS page opens.

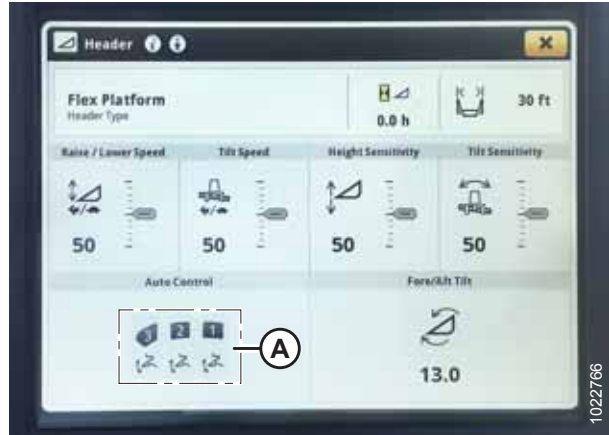


Figure 3.512: John Deere S7 Display – Header Page

11. If the header has not been calibrated yet, an error icon will appear on HEIGHT SENSING button (A). Select button (A) to view the error message.



Figure 3.513: John Deere S7 Display – Auto Header Controls

12. Read the error message and then press OK.
13. Proceed to *Checking Voltage Range from the Combine Cab – John Deere S7 Series, page 285.*



Figure 3.514: John Deere S7 Display – Height Sensing Error Message

## OPERATION

### Checking Voltage Range from the Combine Cab – John Deere S7 Series

The auto header height sensor output must be within a specific range, or the feature will not work properly.

**Table 3.23 Voltage Range**

Combine	Low Voltage Limit	High Voltage Limit	Minimum Range
John Deere S7 Series	0.5 V	4.5 V	3.0 V

**NOTE:**

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

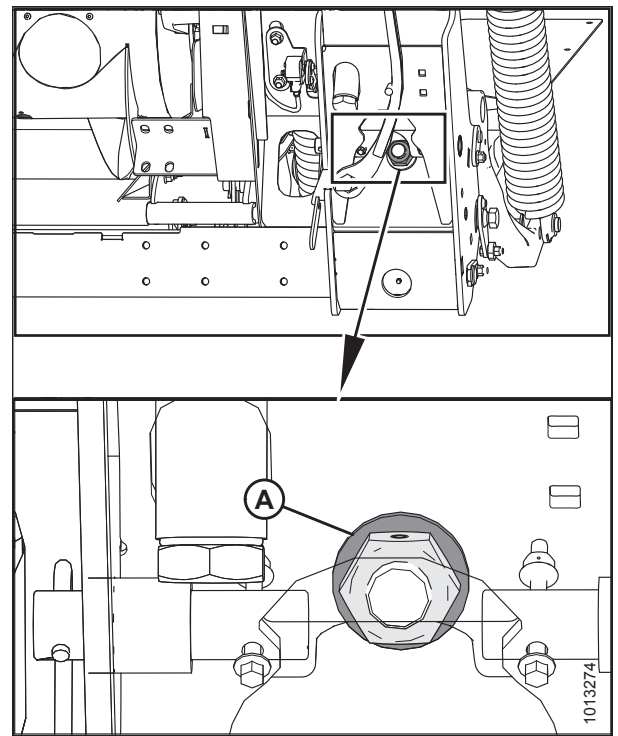
**⚠ WARNING**

Check to be sure all bystanders have cleared the area.

1. Unlock the float.
2. Check that the float lock linkage is on the down stops (washer [A] cannot be moved) at both locations.

**NOTE:**

If the header is not on the down stops during next two steps, voltage may go out of range during operation causing a malfunction of auto header height control (AHHC) system.



**Figure 3.515: Float Lock**

## OPERATION

- Adjust cable take-up bracket (B) (if necessary) until pointer (A) on the float indicator is on **0**.

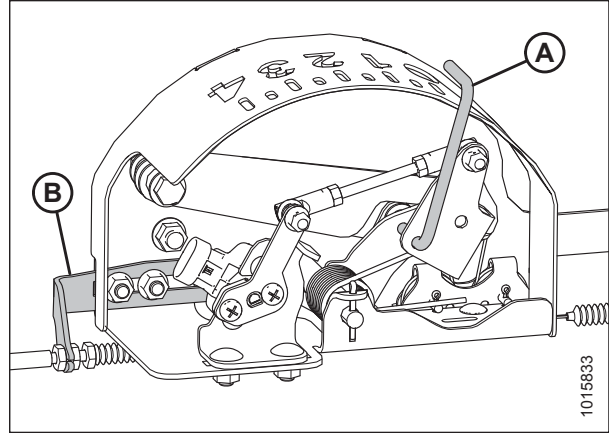


Figure 3.516: Float Indicator Box

- On the HARVESTING page, select MENU icon (A) in the bottom right corner of the page.



Figure 3.517: John Deere S7 Display – Harvesting Page

- On the MENU page, select SYSTEM tab (A). The MENU opens.
- Select DIAGNOSTICS CENTER icon (B). The DIAGNOSTICS CENTER page opens.

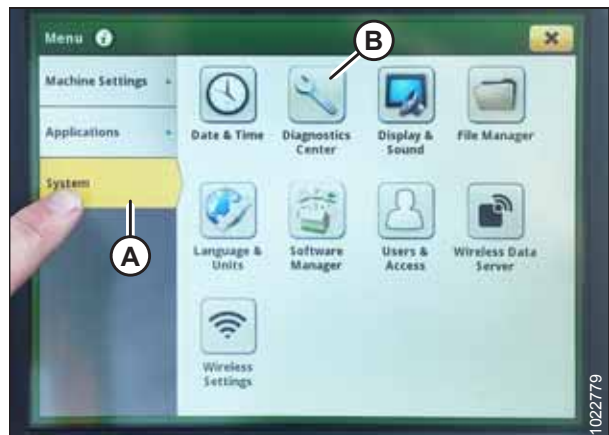


Figure 3.518: John Deere S7 Display – Menu

## OPERATION

7. Select AHC - SENSING (A). The AHC - SENSING\DIAGNOSTICS page displays.

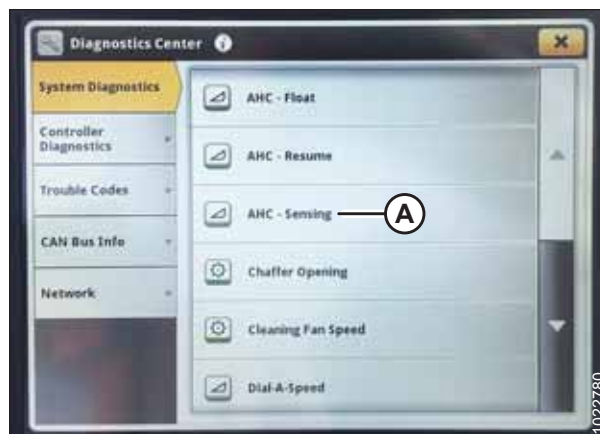


Figure 3.519: John Deere S7 Display – Diagnostics Center

8. Select SENSOR tab (A) to view the sensor voltages. Center header height sensor voltage (B) must be between 0.5 and 4.5 V, with at least 3 V of variation between 0 and 4 on the float indicator box.

### NOTE:

If the optional Auto Lateral Tilt AHHC kit is installed, the left and right header height sensors must also be in the same 0.5–4.5 V range.

9. If sensor voltage adjustment is required, refer to [Adjusting Voltage Limits – One-Sensor System, page 147](#).

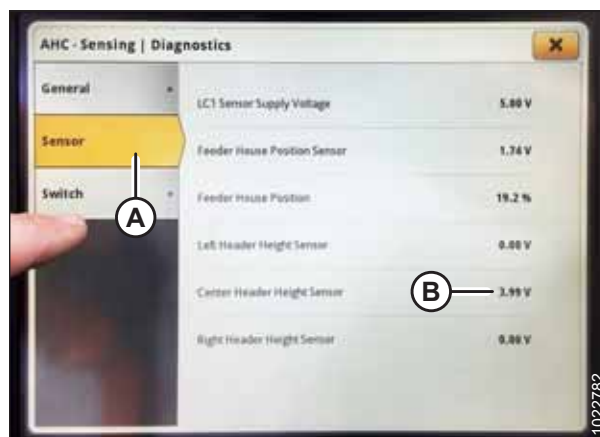


Figure 3.520: John Deere S7 Display – Checking Sensor Voltage

### Calibrating Feeder House – John Deere S7 Series

Feeder house calibration must be done before header calibration.



### DANGER

Check to be sure all bystanders have cleared the area.

### NOTE:

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

### NOTE:

For best performance of the auto header height control (AHHC) system, perform ground calibration with center-link set to **D**. When calibration is complete, adjust the center-link back to desired header angle. For instructions, refer to [3.8.4 Header Angle, page 96](#)

1. Ensure the center-link is set to **D**.
2. Rest the header on the down stops and unlock the float module float.



## OPERATION

3. On the HARVESTING page, select MENU icon (A) in the bottom right corner of page. The MENU opens.



Figure 3.521: John Deere S7 Display – Harvesting Page

4. Select MACHINE SETTINGS tab (A).
5. Select CALIBRATIONS & PROCEDURES icon (B). The CALIBRATIONS & PROCEDURES page displays.

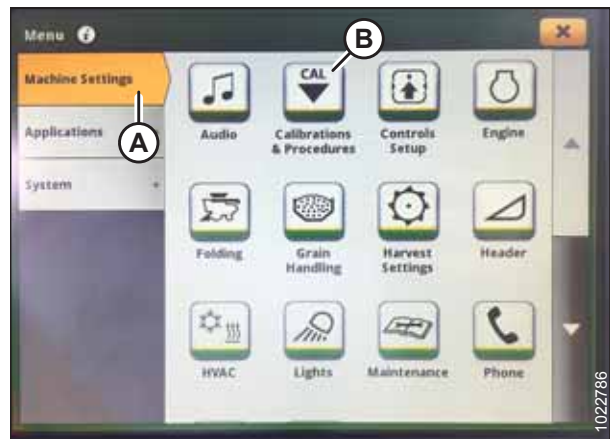


Figure 3.522: John Deere S7 Display – Machine Settings

6. Select HEADER tab (A).
7. Select FEEDER HOUSE RAISE SPEED CALIBRATION (B). The FH RAISE SPEED CALIBRATION page displays.

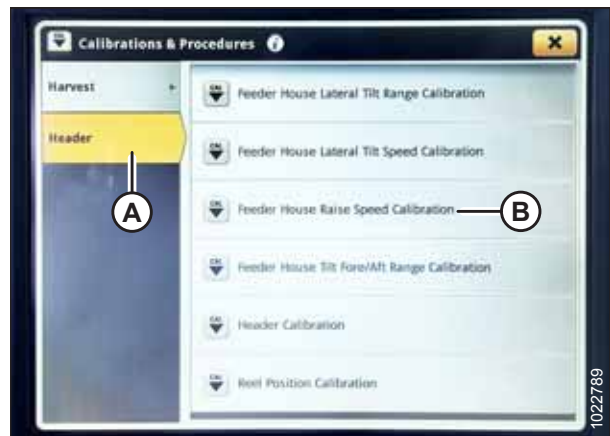


Figure 3.523: John Deere S7 Display – Calibrations and Procedures



## OPERATION

8. Select CALIBRATE (A) at the bottom of the page. A calibration overview displays.

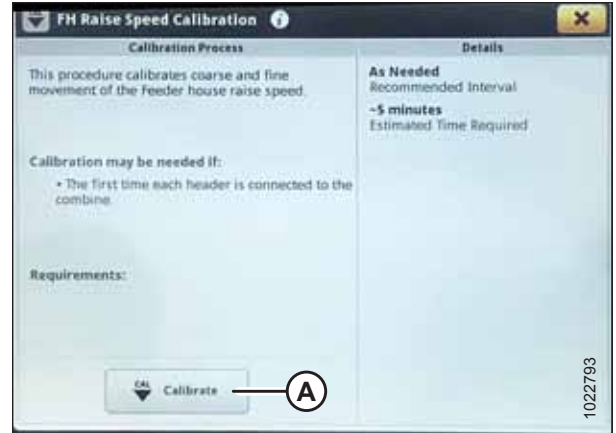


Figure 3.524: John Deere S7 Display – Feeder House Calibration

9. Read the calibration overview, and then press START.



Figure 3.525: John Deere S7 Display – Feeder House Calibration

10. Follow the instructions on the page. As you proceed through the calibration process, the display will automatically update to show next step.



Figure 3.526: John Deere S7 Display – Feeder House Calibration

## OPERATION

11. When calibration is complete, select SAVE to confirm calibration.



Figure 3.527: John Deere S7 Display – Feeder House Calibration

### Calibrating Header – John Deere S7 Series



#### DANGER

Never start or move the machine until you are sure all bystanders have cleared the area.

Feeder house calibration must be done before header calibration. If feeder house has not yet been calibrated, refer to [Calibrating Feeder House – John Deere S7 Series, page 287](#).

#### NOTE:

For best performance of the auto header height control (AHHC) system, perform ground calibration with center-link set to **D**. When calibration is complete, adjust the center-link back to desired header angle. For instructions, refer to [3.8.4 Header Angle, page 96](#)

#### NOTE:

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

1. Ensure the center-link is set to **D**.
2. Rest the header on down stops and unlock the float module float.
3. On the HARVESTING page, select MENU icon (A) in the bottom right corner of screen. The MENU opens.



Figure 3.528: John Deere S7 Display – Harvesting Page

## OPERATION

4. Select MACHINE SETTINGS tab (A).
5. Select CALIBRATIONS & PROCEDURES icon (B). The CALIBRATIONS & PROCEDURES page displays.



Figure 3.529: John Deere S7 Display – Machine Settings

6. Select HEADER tab (A).
7. Select HEADER CALIBRATION (B). The HEADER CALIBRATION page displays.

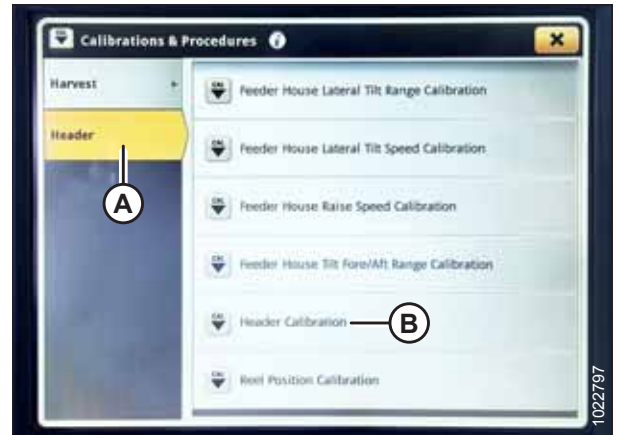


Figure 3.530: John Deere S7 Display – Calibrations and Procedures

8. Select CALIBRATE (A) at bottom of page. The calibration overview window opens.

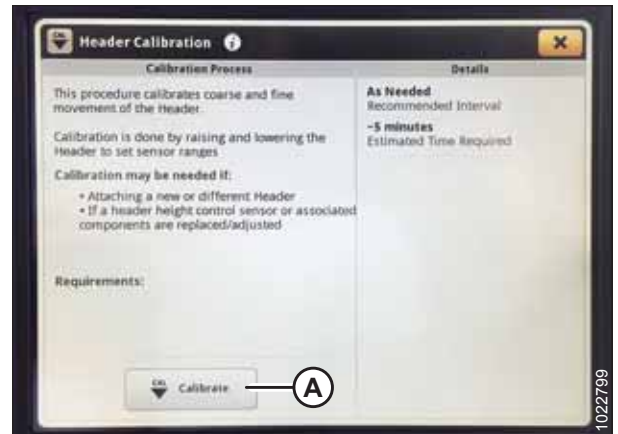


Figure 3.531: John Deere S7 Display – Header Calibration

## OPERATION

9. Press button (A) on the console to set the engine to high idle.



Figure 3.532: John Deere S7 Console

10. Select START on CALIBRATION OVERVIEW page.
11. Follow the instructions that appear on combine display. As you proceed through calibration process, display will automatically update to show next step.

### NOTE:

If an error code appears during calibration, sensor is out of voltage range and will require adjustment. For instructions, refer to [Adjusting Voltage Limits – One-Sensor System, page 147](#).



Figure 3.533: John Deere S7 Display – Header Calibration

12. When calibration is complete, select SAVE to confirm calibration.



Figure 3.534: John Deere S7 Display – Header Calibration

### 3.9.18 New Holland Combines – CR/CX Series – 2014 and Prior

This section applies only to pre-2015 CR/CX models. For New Holland CR models 6.80, 6.90, 7.90, 8.90, 9.90, and 10.90, refer to [3.9.19 New Holland Combines – CR Series – 2015 and Later, page 302](#).

#### Checking Voltage Range from the Combine Cab – New Holland CR/CX Series

**NOTE:**

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator’s manual for updates.

**NOTE:**

For New Holland CR models 6.80, 6.90, 7.90, 8.90, 9.90, and 10.90, refer to [3.9.19 New Holland Combines – CR Series – 2015 and Later, page 302](#).

 **DANGER**

Check to be sure all bystanders have cleared the area.

1. Unlock the float.
2. Check that the float lock linkage is on the down stops (washer [A] cannot be moved) at both locations.

**NOTE:**

If the header is not on the down stops during the next two steps, the voltage may go out of range during operation causing a malfunction of the AHHC system. If the header is not on the down stops, refer to [3.10 Leveling the Header, page 317](#) for instructions.

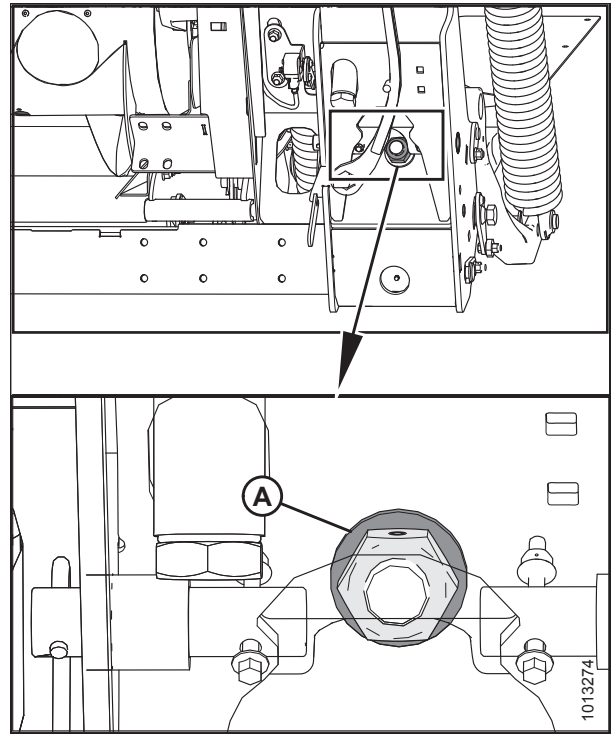


Figure 3.535: Float Lock

## OPERATION

- Adjust cable take-up bracket (B) (if necessary) until float indicator pointer (A) is on **0**.

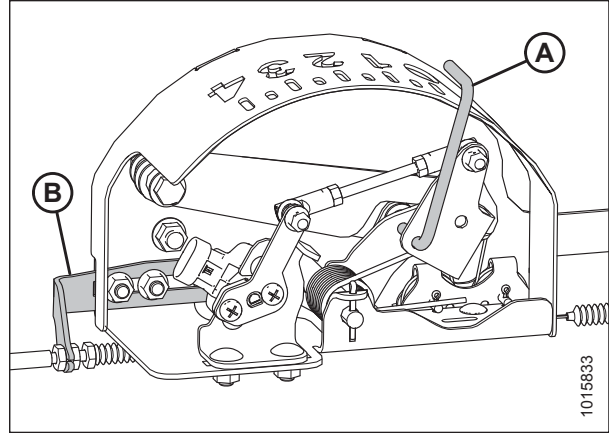


Figure 3.536: Float Indicator Box

- Ensure the header float is unlocked.
- Select **DIAGNOSTICS** (A) on the main page. The **DIAGNOSTICS** page displays.
- Select **SETTINGS**. The **SETTINGS** page displays.

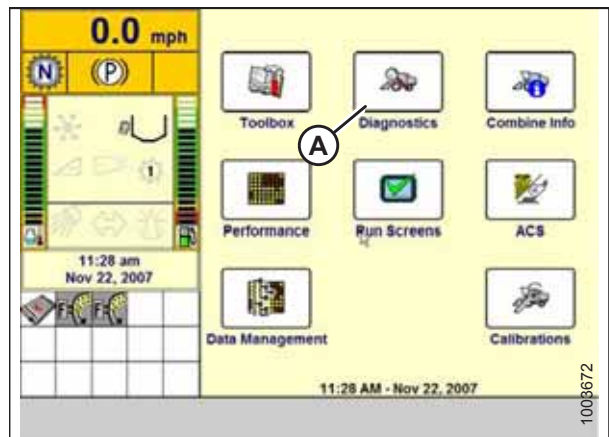


Figure 3.537: New Holland Combine Display

- Select **GROUP** drop-down arrow (A). The **GROUP** dialog box displays.

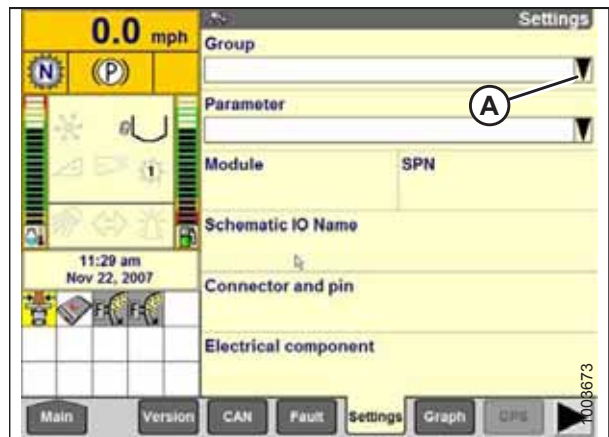


Figure 3.538: New Holland Combine Display



## OPERATION

8. Select HEADER HEIGHT/TILT (A). The PARAMETER page displays.

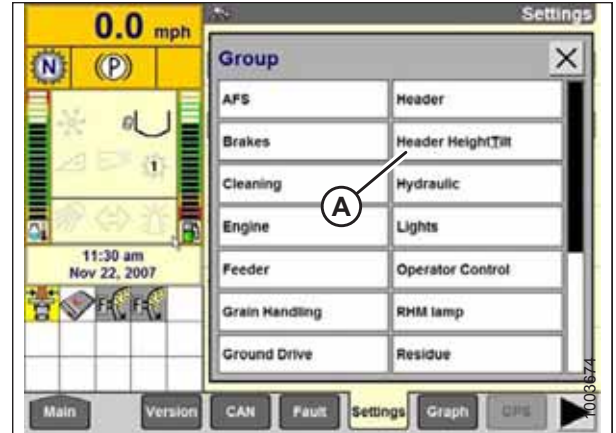


Figure 3.539: New Holland Combine Display

9. Select LEFT HEADER HEIGHT SEN (A), and then select GRAPH button (B). The exact voltage is displayed at the top of the page.
10. Raise and lower the header to see the full range of voltage readings.
11. If the sensor voltage is not within the low and high limits, or if the range between the low and high limits is insufficient, adjust the voltage limits. For instructions, refer to [Adjusting Voltage Limits – One-Sensor System, page 147](#).

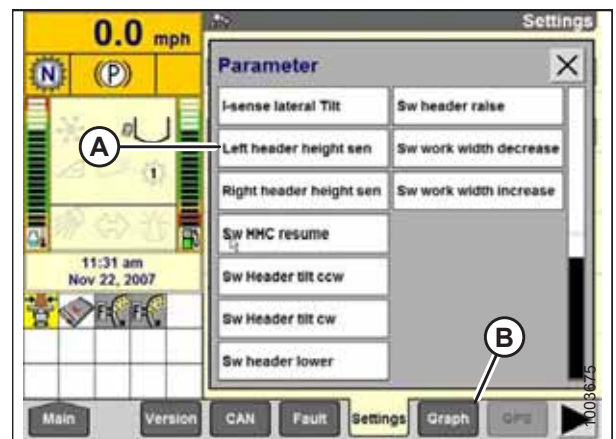


Figure 3.540: New Holland Combine Display

### Setting up Auto Header Height Control – New Holland CR/CX Series

#### NOTE:

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

#### NOTE:

For New Holland CR models 6.80, 6.90, 7.90, 8.90, 9.90, and 10.90, refer to [3.9.19 New Holland Combines – CR Series – 2015 and Later, page 302](#).



## OPERATION

1. Select HEADER LATERAL FLOAT on the combine display, and press ENTER.
2. Use the up and down navigation keys to move between options, and select INSTALLED.



Figure 3.541: New Holland Combine Display

3. Select HEADER AUTOFLOAT, and press ENTER.
4. Use the up and down navigation keys to move between options, and select INSTALLED.



Figure 3.542: New Holland Combine Display

### *Calibrating the Auto Header Height Control – New Holland CR/CX Series*

The auto header height control (AHHC) sensor output must be calibrated for each combine, or the AHHC feature will not work properly.

#### **DANGER**

Check to be sure all bystanders have cleared the area.

#### **NOTE:**

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

#### **NOTE:**

For New Holland CR models 6.80, 6.90, 7.90, 8.90, 9.90, and 10.90, refer to [3.9.19 New Holland Combines – CR Series – 2015 and Later, page 302](#).

#### **NOTE:**

If the header float is set too light, it can prevent the calibration of the AHHC. You may need to set the float heavier for the calibration procedure so header does not separate from the float module.

## OPERATION

### NOTE:

For best performance of the auto header height control (AHHC) system, perform ground calibration with center-link set to **D**. When calibration is complete, adjust the center-link back to desired header angle. For instructions, refer to [3.8.4 Header Angle, page 96](#)

Check the following conditions before starting the header calibration procedure:

- The header is attached to the combine.
- The combine is on level ground, with the header level to the ground.
- The header is on down stops, and the center-link is set to **D**.
- The engine is running.
- The combine is not moving.
- No faults have been received from the Header Height Controller (HHC) module.
- The header/feeder is disengaged.
- The lateral float buttons are **NOT** pressed.
- The ESC key is **NOT** pressed.

### To calibrate the AHHC, follow these steps:

1. Select CALIBRATION on the combine display, and press the RIGHT ARROW navigation key to enter the information box.
2. Select HEADER (A), and press ENTER. The CALIBRATION dialog box opens.

### NOTE:

You can use the up and down navigation keys to move between the options.



Figure 3.543: New Holland Combine Display

3. Follow the calibration steps in the order in which they appear in the dialog box. As you proceed through the calibration process, the display will automatically update to show the next step.

### NOTE:

Pressing the ESC key during any of the steps or letting the system sit idle for more than 3 minutes will cause the calibration procedure to stop.

### NOTE:

Refer to your combine operator's manual for an explanation of any error codes.



Figure 3.544: New Holland Combine Display

## OPERATION

- When all steps have been completed, a CALIBRATION SUCCESSFUL message is displayed on the screen. Exit the CALIBRATION menu by pressing the ENTER or ESC key.

### NOTE:

If the float was set heavier to complete the AHHC calibration procedure, adjust it to the recommended operating float after the calibration is complete.

- If the unit does not function properly, conduct the maximum stubble height calibration.

### *Calibrating Maximum Stubble Height – New Holland CR/CX Series*

This procedure describes how to calibrate the area counter to stop or start counting at the correct height. Program the header to a height that will never be reached while cutting. The area counter will stop counting when the header is above the programmed height, and will begin counting when the header is below the programmed height.

Select the height of the header that corresponds to the description above.

### IMPORTANT:

- If the value is set too low, the area counter may **NOT** be accurate since the header is sometimes raised above this threshold although the combine is still cutting.
- If the value is set too high, the area counter will keep counting even when the header is raised (but below this threshold) and the combine is no longer cutting crop.

## DANGER

Check to be sure all bystanders have cleared the area.

- Select the MAXIMUM STUBBLE HEIGHT calibration dialog box. As you proceed through the calibration process, the display will automatically update to show the next step.

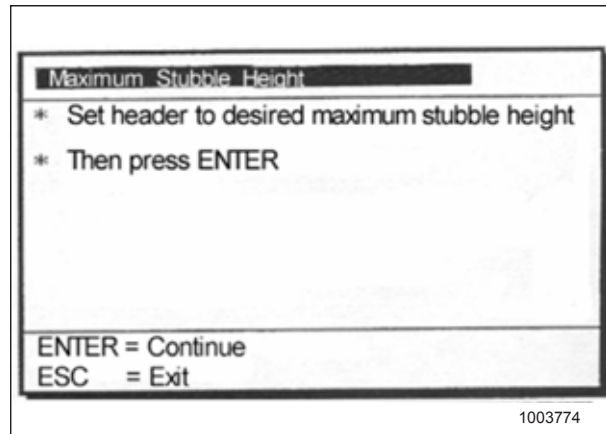


Figure 3.545: New Holland Calibration Dialog Box

## OPERATION

2. Move the header to the correct position using the header up or down control switch on the multifunction handle.
3. Press ENTER to continue. As you proceed through the calibration process, the display will automatically update to show the next step.
4. Press ENTER or ESC to close the calibration screen. The calibration is now complete.

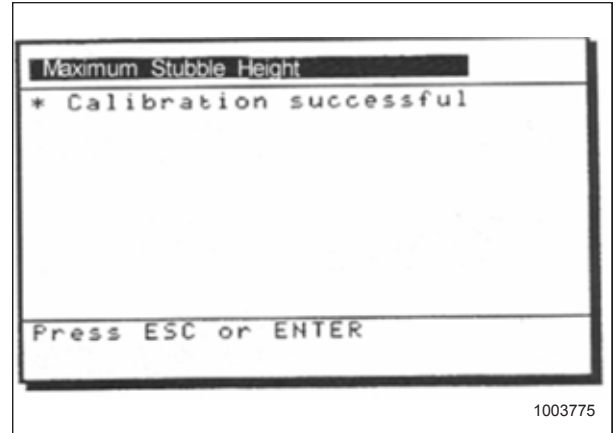


Figure 3.546: New Holland Calibration Dialog Box

### Adjusting Header Raise Rate – New Holland CR/CX Series

If necessary, the header raise rate (the first speed on the HEADER HEIGHT rocker switch of the multifunctional handle) can be adjusted.

**NOTE:**

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

**NOTE:**

For New Holland CR models 6.80, 6.90, 7.90, 8.90, 9.90, and 10.90, refer to [3.9.19 New Holland Combines – CR Series – 2015 and Later, page 302](#).

1. Select HEADER RAISE RATE on the combine display.
2. Use the + or – buttons to change the setting.
3. Press ENTER to save the new setting.

**NOTE:**

The raise rate can be changed from 32–236 in increments of 34. The factory setting is 100.

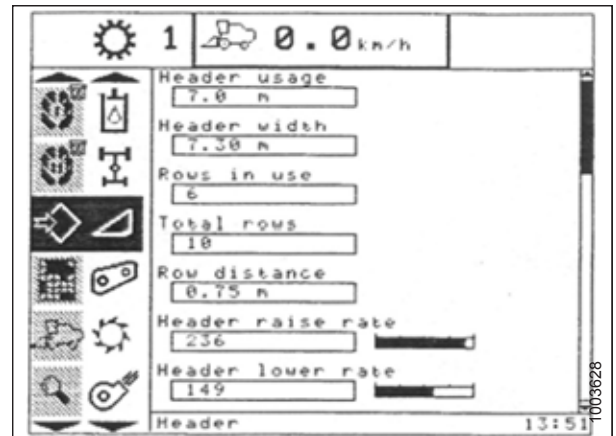


Figure 3.547: New Holland Combine Display

### Setting the Header Lower Rate – New Holland CR/CX Series

If necessary, the header lower rate (the automatic header height control button or second speed on the header height rocker switch of the multifunction handle) can be adjusted.

**NOTE:**

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

## OPERATION

### NOTE:

For New Holland CR models 6.80, 6.90, 7.90, 8.90, 9.90, and 10.90, refer to [3.9.19 New Holland Combines – CR Series – 2015 and Later, page 302](#).

1. Select HEADER LOWER RATE on the combine display.
2. Use the + or – buttons to change the setting to 50.
3. Press ENTER to save the new setting.

### NOTE:

The header lower rate can be changed from 2–247 in increments of 7. It is factory-set to 100.

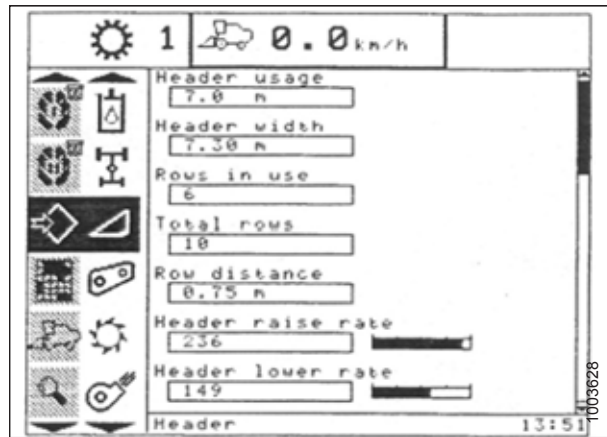


Figure 3.548: New Holland Combine Display

### Setting the Sensitivity of the Auto Header Height Control – New Holland CR/CX Series

The sensitivity adjustment controls the distance the cutterbar must travel up or down before the auto header height control (AHC) reacts and raises or lowers the feeder house.

When the sensitivity is set to maximum, only small changes in ground height are needed to cause the feeder house to raise or lower. When the sensitivity is set to minimum, large changes in the ground height are needed to cause the feeder house to raise or lower.

### NOTE:

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

### NOTE:

For New Holland CR models 6.80, 6.90, 7.90, 8.90, 9.90, and 10.90, refer to [3.9.19 New Holland Combines – CR Series – 2015 and Later, page 302](#).



## DANGER

Check to be sure all bystanders have cleared the area.

## OPERATION

1. Engage the threshing mechanism and the feeder house.
2. Select HEIGHT SENSITIVITY on the combine display screen.
3. Use the + or – buttons to change the setting to 200.
4. Press ENTER to save the new setting.

**NOTE:**

The sensitivity can be changed from 10–250 in increments of 10. It is factory-set to 100.

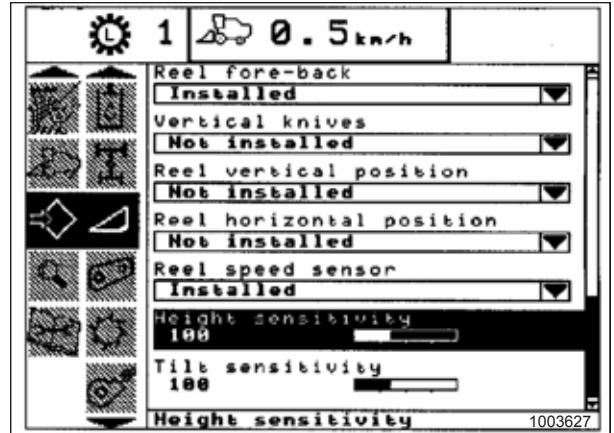


Figure 3.549: New Holland Combine Display

### Setting Preset Cutting Height – New Holland CR/CX Series

The cut height setting can be stored in the combine. When harvesting the setting can be selected from the control handle.

**NOTE:**

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

**NOTE:**

For New Holland CR models 6.80, 6.90, 7.90, 8.90, 9.90, and 10.90, refer to [3.9.19 New Holland Combines – CR Series – 2015 and Later, page 302](#).

**NOTE:**

Indicator (A) should be at position 0 (B) with the header (152 mm [6 in.]) off the ground. If not, the float sensor output voltage should be checked. Refer to [Step 5, page 143](#). When the header is on the ground, the indicator should be at position 1 (C) for low ground pressure, and at position 4 (D) for high ground pressure. Crop and soil conditions determine the amount of float to use. The ideal setting is as light as possible without header bouncing or missing crop. Operating with heavy settings prematurely wears the cutterbar wearplates.

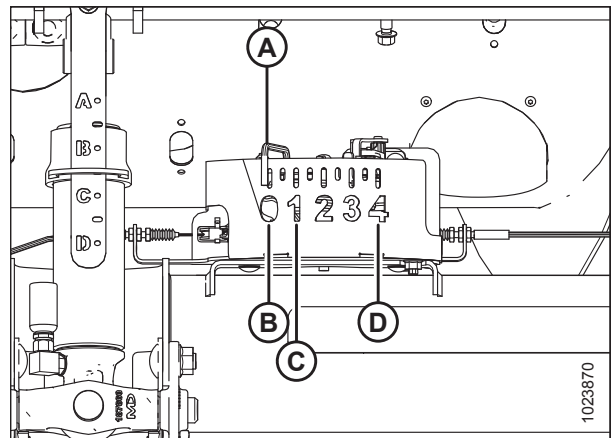


Figure 3.550: Float Indicator Box



## OPERATION

1. Engage the threshing mechanism and the feeder house with switches (A) and (B).
2. Set HEADER MEMORY rocker switch (D) in STUBBLE HEIGHT/AUTOFLOAT mode position (A) or (B).
3. Raise or lower the header to the desired cutting height using HEADER HEIGHT and HEADER LATERAL FLOAT momentary switch (C).
4. Lightly press AUTOMATIC HEADER HEIGHT CONTROL button (E) for a minimum of 2 seconds to store the height position. A beep will confirm the setting.

### NOTE:

It is possible to store two different header height values by using HEADER MEMORY rocker switch (D) in STUBBLE HEIGHT/AUTOFLOAT mode position (A) or (B).

5. Raise or lower the reel to the desired working height using REEL HEIGHT momentary switch (E).
6. Lightly press AUTOMATIC HEADER HEIGHT CONTROL button (E) for a minimum of 2 seconds to store the height position. A beep will confirm the setting.
7. To change one of the memorized header height set points while the combine is in use, use HEADER HEIGHT AND HEADER LATERAL FLOAT rocker switch (A) (slow up/down) to raise or lower header to the desired value. Lightly press AUTOMATIC HEADER HEIGHT CONTROL button (B) for a minimum of 2 seconds to store the new height position. A beep will confirm setting.

### NOTE:

Fully pressing AUTOMATIC HEADER HEIGHT CONTROL button (B) will disengage float mode.

### NOTE:

It is not necessary to press rocker switch (C) again after changing header height set point.

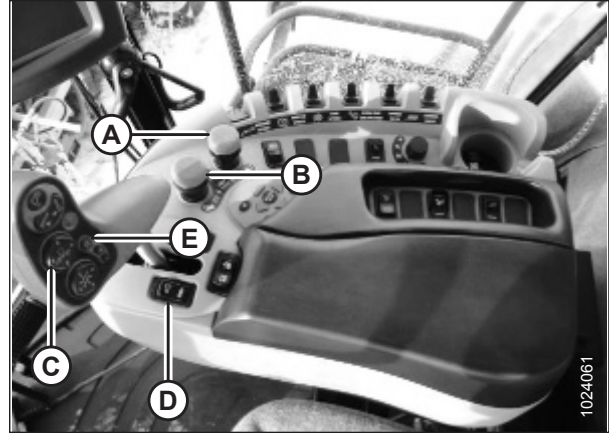


Figure 3.551: New Holland Combine Controls

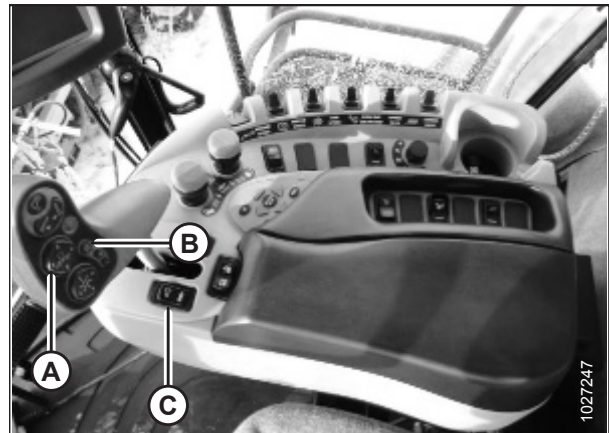


Figure 3.552: New Holland Combine Controls

### 3.9.19 New Holland Combines – CR Series – 2015 and Later

This section applies only to 2015 and later CR models (6.80, 6.90, 7.90, 8.90, 9.90, and 10.90). For other pre-2015 New Holland combine models, refer to [3.9.18 New Holland Combines – CR/CX Series – 2014 and Prior, page 293](#).

#### Checking Voltage Range from the Combine Cab – New Holland CR Series

### NOTE:

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

### NOTE:

This section applies only to 2015 and later CR models (6.80, 6.90, 7.90, 8.90, 9.90, and 10.90). For other pre-2015 New Holland combine models, refer to [3.9.18 New Holland Combines – CR/CX Series – 2014 and Prior, page 293](#).



**⚠ DANGER**

Check to be sure all bystanders have cleared the area.

1. Unlock the float.
2. Check that the float lock linkage is on the down stops (washer [A] cannot be moved) at both locations.

**NOTE:**

If the header is not on the down stops during the next two steps, the voltage may go out of range during operation causing a malfunction of the auto header height control (AHHC) system. If the header is not on the down stops, refer to [3.10 Leveling the Header, page 317](#) for instructions.

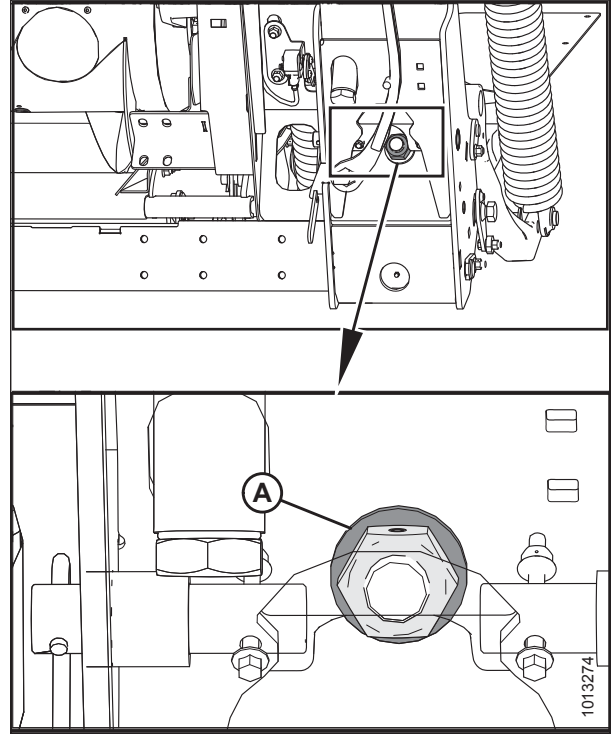


Figure 3.553: Float Lock

3. Adjust cable take-up bracket (B) (if necessary) until float indicator pointer (A) is on 0.
4. Ensure the header float is unlocked.

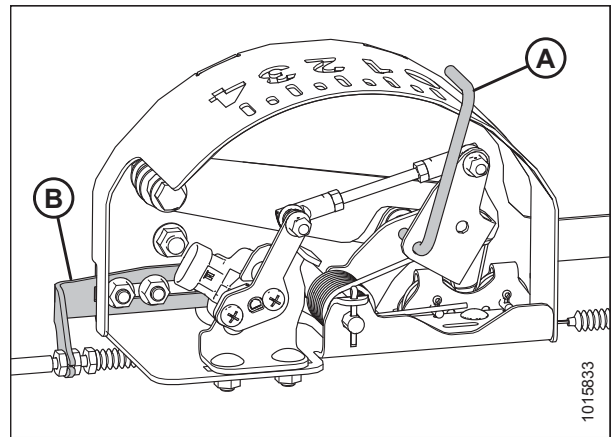


Figure 3.554: Float Indicator Box

## OPERATION

5. Select DIAGNOSTICS (A) on the main page. The DIAGNOSTICS page displays.

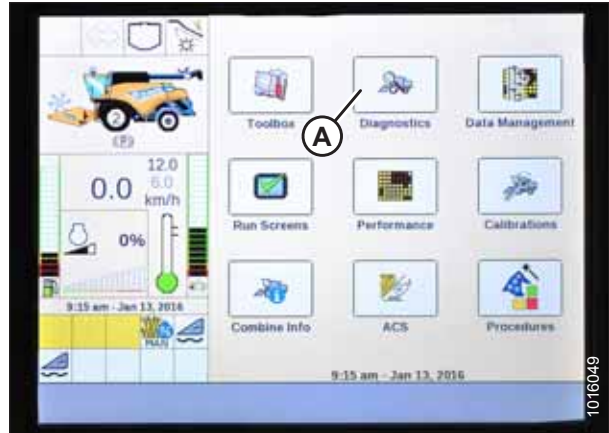


Figure 3.555: New Holland Combine Display

6. Select SETTINGS (A). The SETTINGS page displays.



Figure 3.556: New Holland Combine Display

7. Select HEADER HEIGHT/TILT (A) from the GROUP drop-down menu.
8. Select HEADER HEIGHT SENS. L (B) from the PARAMETER drop-down menu.



Figure 3.557: New Holland Combine Display

## OPERATION

9. Select GRAPH (A). The exact voltage (B) is displayed at the top of the page.
10. Raise and lower the header to see the full range of voltage readings.
11. If the sensor voltage is not within the low and high limits, or if the range between the low and high limits is insufficient, adjust the voltage limits. For instructions, refer to *Adjusting Voltage Limits – One-Sensor System, page 147*.

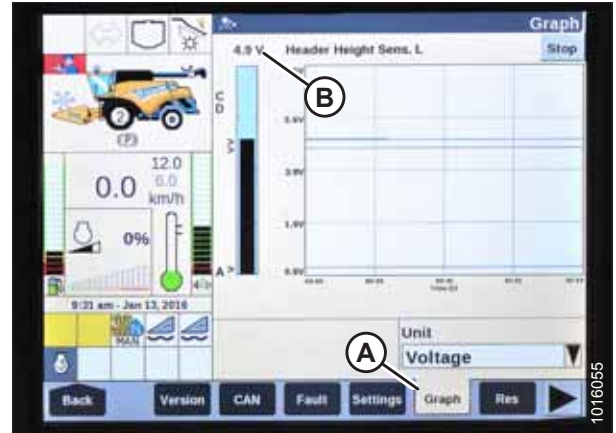


Figure 3.558: New Holland Combine Display

### Setting up Auto Header Height Control – New Holland CR Series

For best performance of the auto header height control (AHHC), perform these procedures with the center-link set to **D**. When setup and calibration are complete, adjust the center-link back to desired header angle.

#### NOTE:

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

#### NOTE:

This section applies only to 2015 and later CR models (6.80, 6.90, 7.90, 8.90, 9.90, and 10.90). For other pre-2015 New Holland combine models, refer to *3.9.18 New Holland Combines – CR/CX Series – 2014 and Prior, page 293*.

1. Ensure the center-link is set to **D**.
2. Select TOOLBOX (A) on the main page. The TOOLBOX page displays.



Figure 3.559: New Holland Combine Display

## OPERATION

3. Simultaneously press UNLOAD (A) and RESUME (B) buttons on the control handle.

### NOTE:

Software in some New Holland combines may not allow you to change the header from FLEX to PLATFORM or the header type from DEFAULT to 80/90 at the main menu. This is now a dealer setting. If you need to change the dealer setting, contact your MacDon Dealer.



Figure 3.560: New Holland Combine Controls

4. Select HEAD 1 (A). The HEADER SETUP 1 page displays.
5. Select CUTTING TYPE drop-down arrow (B) and change the CUTTING TYPE to PLATFORM (C).



Figure 3.561: New Holland Combine Display

6. Select HEADER SUB TYPE drop-down arrow (A). The HEADER SUB TYPE dialog box displays.



Figure 3.562: New Holland Combine Display

## OPERATION

- Set HEADER SUB TYPE to 80/90 (A) for a New Holland combine.



Figure 3.563: New Holland Combine Display

- Select HEAD 2 (A). The HEADER SETUP 2 page displays.



Figure 3.564: New Holland Combine Display

- Select the AUTOFLOAT drop-down arrow and set AUTOFLOAT to INSTALLED (A).
- Select the AUTO HEADER LIFT drop-down arrow and set AUTO HEADER LIFT to INSTALLED (B).

**NOTE:**

With AUTO HEADER LIFT installed and AHHC engaged, the header will lift up automatically when you pull back on the control handle.

- Set the values for MANUAL HHC RAISE RATE (C) and MANUAL HHC LOWER RATE (D) for best performance according to ground conditions.



Figure 3.565: New Holland Combine Display



## OPERATION

- Set the values for HHC HEIGHT SENSITIVITY (A) and HHC TILT SENSITIVITY (B) for best performance according to ground conditions.



Figure 3.566: New Holland Combine Display

- From REEL HEIGHT SENSOR menu (A), select YES.



Figure 3.567: New Holland Combine Display

### Calibrating the Auto Header Height Control – New Holland CR Series

The auto header height control (AHHC) sensor output must be calibrated for each combine, or the AHHC feature will not work properly.

#### DANGER

Check to be sure all bystanders have cleared the area.

#### NOTE:

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

#### NOTE:

This section applies only to 2015 and later CR models (6.80, 6.90, 7.90, 8.90, 9.90, and 10.90). For other pre-2015 New Holland combine models, refer to [3.9.18 New Holland Combines – CR/CX Series – 2014 and Prior, page 293](#).

#### NOTE:

If the header float is set too light, it can prevent the calibration of the AHHC. You may need to set the float heavier for the calibration procedure so the header does not separate from the float module.

## OPERATION

### NOTE:

For best performance of the auto header height control (AHHC) system, perform ground calibration with center-link set to **D**. When calibration is complete, adjust the center-link back to desired header angle. For instructions, refer to [3.8.4 Header Angle, page 96](#)

Check the following conditions before starting the header calibration procedure:

- The header is attached to the combine.
- The combine is on level ground, with the header level to the ground.
- The header is on down stops, and the center-link is set to **D**.
- The engine is running.
- The combine is not moving.
- No faults have been received from the header height controller (HHC) module.
- The header/feeder is disengaged.
- The lateral float buttons are **NOT** pressed.
- The ESC key is **NOT** pressed.

To calibrate the AHHC, follow these steps:

1. Select CALIBRATIONS (A) on the main page. The CALIBRATION page is shown.



Figure 3.568: New Holland Combine Display

2. Select CALIBRATION drop-down arrow (A).



Figure 3.569: New Holland Combine Display



## OPERATION

3. Select HEADER (A) from the list of calibration options.



Figure 3.570: New Holland Combine Display

4. Follow the calibration steps in the order in which they appear on the page. As you proceed through the calibration process, the display will automatically update to show the next step.

**NOTE:**

Pressing the ESC key during any of the steps or letting the system sit idle for more than 3 minutes will cause the calibration procedure to stop.

**NOTE:**

Refer to your combine operator's manual for an explanation of any error codes.



Figure 3.571: New Holland Combine Display

5. When all steps have been completed, CALIBRATION COMPLETED message is displayed on the page.

**NOTE:**

If the float was set heavier to complete AHHC calibration procedure, adjust it to the recommended operating float after the calibration is complete.



Figure 3.572: New Holland Combine Display

### Checking Reel Height Sensor Voltages – New Holland CR Series

**NOTE:**

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

## OPERATION

1. On the main page of the combine display, select DIAGNOSTICS (A). The DIAGNOSTICS page opens.



Figure 3.573: New Holland Combine Display

2. Select SETTINGS tab (A). The SETTINGS page opens.
3. From GROUP menu (B), select HEADER.
4. From PARAMETER menu (C), select REEL VERTICAL POSITION.



Figure 3.574: New Holland Combine Display

5. Select GRAPH tab (A). The REEL VERTICAL POSITION graph displays.
6. Lower the reel to view high voltage (B). The voltage should be 4.1–4.5 V.
7. Raise the reel to view low voltage (C). The voltage should be 0.5–0.9 V.
8. If either voltage is out of range, refer to [Checking and Adjusting Reel Height Sensor, page 111](#).

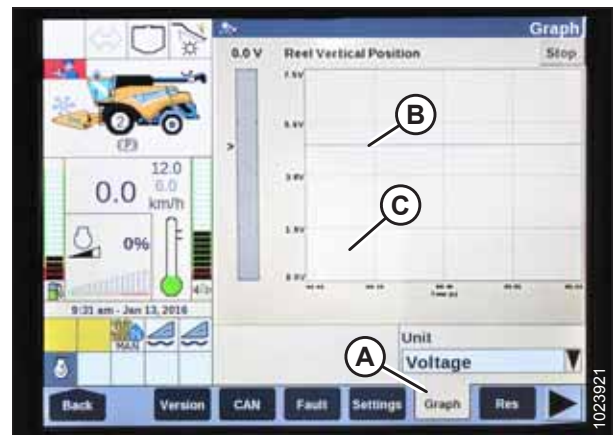


Figure 3.575: New Holland Combine Display

### Setting Preset Cutting Height – New Holland CR Series

The cut height setting can be stored in the combine. When harvesting the setting can be selected from the control handle.

#### NOTE:

This section applies only to 2015 and later CR models (6.80, 6.90, 7.90, 8.90, 9.90, and 10.90). For other pre-2015 New Holland combine models, refer to [3.9.18 New Holland Combines – CR/CX Series – 2014 and Prior, page 293](#).

## OPERATION

The console has two buttons used for auto height presets. The toggle switch that was present on previous models is now configured as shown at right. MacDon headers only require first two buttons (A) and (B). Third button (C) is not configured.

### DANGER

Check to be sure all bystanders have cleared the area.



Figure 3.576: New Holland Combine Controls

*To set preset cutting height, follow these steps:*

1. Engage the separator and the header.
2. Select preset button 1 (A). A yellow light on the button will illuminate.
3. Raise or lower the header to the desired cutting height.



Figure 3.577: New Holland Combine Controls

4. Hold RESUME button (C) on the multifunction handle to set the preset.

#### NOTE:

When setting presets, always set the header position before setting the reel position. If the header and reel are set at the same time, the reel setting will not save.

5. Raise or lower the reel to the desired working position.
6. Hold RESUME button (C) on the multifunction handle to set the preset.
7. Repeat Step 2, page 312 to Step 6, page 312, using preset button 2.



Figure 3.578: New Holland Combine Multifunction Handle

## OPERATION

- Lower the header to the ground.
- Select RUN SCREENS (A) on the main page.



Figure 3.579: New Holland Combine Display

- Select the RUN tab that shows MANUAL HEIGHT.

### NOTE:

The MANUAL HEIGHT field may appear on any of the RUN tabs. When an auto height preset button is pressed, the display will change to AUTO HEIGHT (A).

- Press one of the auto height preset buttons to select a preset cutting height.



Figure 3.580: New Holland Combine Display

### Setting Maximum Work Height – New Holland CR Series

#### NOTE:

This section applies only to 2015 and later CR models (6.80, 6.90, 7.90, 8.90, 9.90, and 10.90). For other pre-2015 New Holland combine models, refer to [3.9.18 New Holland Combines – CR/CX Series – 2014 and Prior](#), page 293.

- Select TOOLBOX (A) on the main page. The TOOLBOX page displays.



Figure 3.581: New Holland Combine Display



## OPERATION

2. Select FEEDER (A). The FEEDER SETUP page displays.
3. Select MAXIMUM WORK HEIGHT field (B).

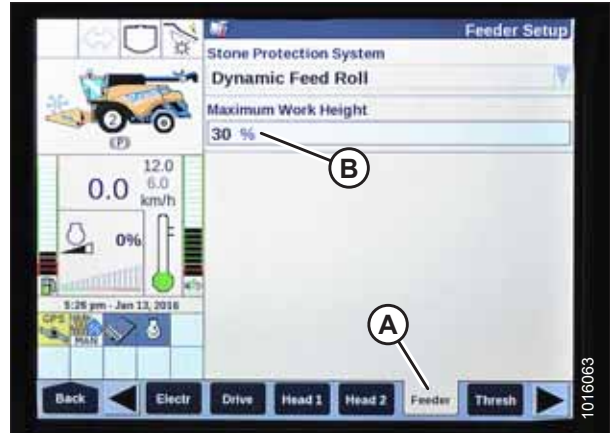


Figure 3.582: New Holland Combine Display

4. Set MAXIMUM WORK HEIGHT to desired value.
5. Press SET and then press ENTER.



Figure 3.583: New Holland Combine Display

### *Configuring Reel Fore-Aft, Header Tilt, and Header Type – New Holland CR Series*

This procedure applies only to 2016 New Holland CR models 6.90, 7.90, 8.90, and 9.90.

#### **NOTE:**

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator's manual for updates.

## OPERATION

1. Simultaneously press UNLOAD (A) and RESUME (B) buttons on the control handle.



Figure 3.584: New Holland Combine Controls

2. On the HEAD 1 page, change the CUTTING TYPE from FLEX to PLATFORM as shown at location (A).



Figure 3.585: New Holland Combine Display

3. On the HEAD 2 page, change HEADER SUB TYPE from DEFAULT to 80/90 as shown at location (A).



Figure 3.586: New Holland Combine Display

## OPERATION

There are now two different buttons for ON GROUND presets. The toggle switch that was present on previous models is now configured as shown at right. MacDon headers only require first two buttons (A) and (B). Third button down (C) is not configured.



Figure 3.587: New Holland Combine Controls



### 3.10 Leveling the Header

The float module is factory-set to provide the proper level for the header and should not normally require adjustment.

If the header is **NOT** level, perform the following checks prior to adjusting the leveling linkages:

- Check the combine tire pressures.
- Check that the combine feeder house is level. For instructions, refer to your combine operator's manual.
- Check that the top of the float module is level and parallel with the feeder house.

**NOTE:**

The float springs are **NOT** used to level the header.

#### DANGER

To avoid injury or death from unexpected start-up of machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Park the combine on level ground.
2. Set the header approximately 150 mm (6 in.) off the ground, and check that the float linkage is against the down stops. Note the high and low end of the header.
3. Shut down the engine, and remove the key from the ignition.
4. Check, and if necessary adjust the float. For instructions, refer to *Checking and Adjusting Header Float, page 91*.
5. Adjust the header level by making small adjustments (1/4–1/2 turn) to nut (A) on each float lock. Adjust each side equally but in opposite directions as follows:

**NOTE:**

Set screw (B) does not require loosening for adjustments up to one-half turn of nut (A).

- a. On low side of header, turn nut (A) **CLOCKWISE** to raise header.
- b. On high side of header, turn nut (A) **COUNTERCLOCKWISE** to lower header.

**NOTE:**

Adjustment of more than two turns in either direction may adversely affect header float.

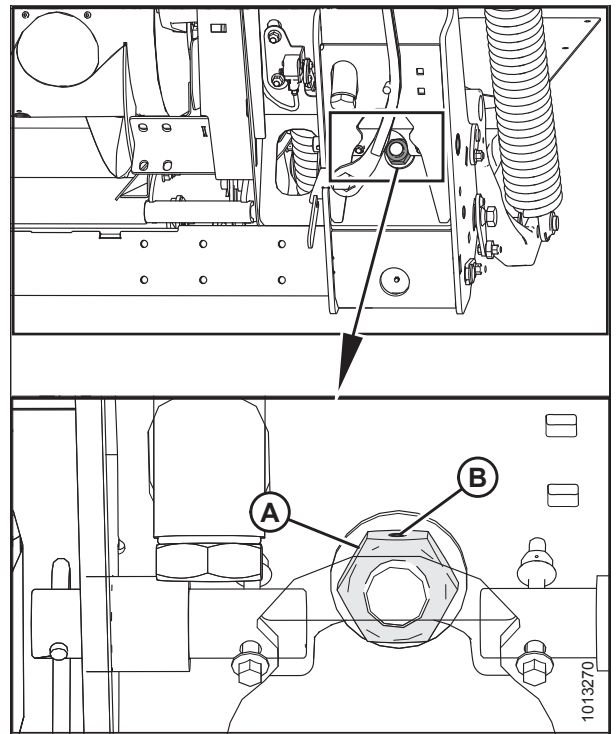


Figure 3.588: Float Lock

## OPERATION

**NOTE:**

Ensure a minimum clearance of 2–3 mm (1/8 in.) (A) between the frame and the back of the bell crank lever.

**NOTE:**

Check the float after leveling the header. For instructions, refer to *Checking and Adjusting Header Float*, page 91.

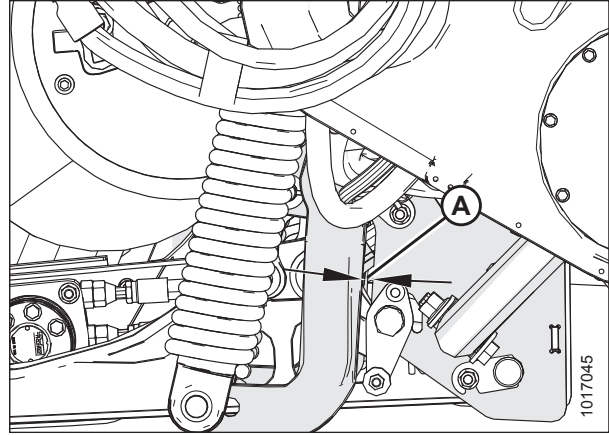


Figure 3.589: Bell Crank

### 3.11 Unplugging the Cutterbar

The cutterbar is located on the front of the header. It supports the knife and guards which are used to cut the crop.

#### DANGER

To avoid bodily injury or death from the unexpected start-up or fall of a raised machine, always stop engine and remove key before leaving the operator's seat, and always engage safety props before going under the machine for any reason.

#### CAUTION

Wear heavy gloves when working around or handling knives.

#### CAUTION

Lowering rotating reel on a plugged cutterbar will damage the reel components.

To unplug cutterbar, reverse the combine feeder house. If the cutterbar is still plugged, do the following:

1. Stop the forward movement of the machine and disengage the header drives.
2. Raise the header to prevent it from filling with dirt, and engage the header drive clutch.
3. If the plug does **NOT** clear, disengage the header drive clutch and fully raise the header.
4. Shut down the engine, and remove the key from the ignition.
5. Engage the header safety props.
6. Clean off the cutterbar by hand.

#### **NOTE:**

If cutterbar plugging persists, refer to [7 Troubleshooting, page 599](#).

### 3.12 Unplugging the Float Module Feed Draper

Crop sometimes gets wedged between the feed draper and the feed deck.

1. Stop the forward movement of the machine and disengage the header drives.
2. Raise the header slightly off the ground, and raise the reel.
3. Reverse the combine feed according to the manufacturer specifications (reverse feed varies among different combine models).
4. Turn the side draper speed down to 0.
5. Engage the header drive.
6. Slowly increase the side draper speed to the previous settings once the plug has been cleared.

### 3.13 Upper Cross Auger

The upper cross auger (UCA) (A) improves delivery of very bulky crops across the header.

**IMPORTANT:**

If the UCA is installed, a case drain line must be installed on the right draper motor. See your MacDon Dealer for details.

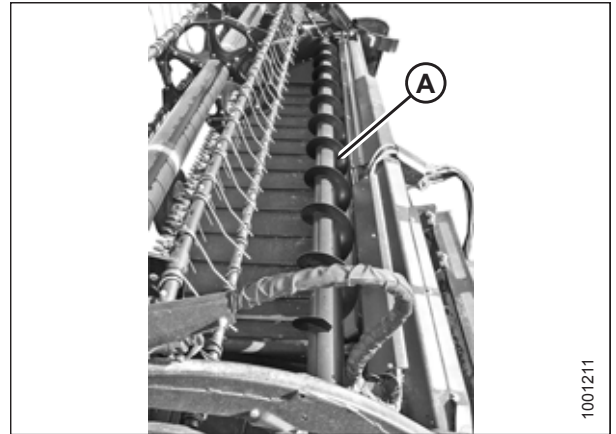


Figure 3.590: Upper Cross Auger

#### 3.13.1 Removing Upper Cross Auger Flighting

A short section of flighting can be removed from the inboard ends of the upper cross auger (UCA) to accommodate crops that are prone to wrapping or if the flighting is damaged and needs to be replaced. Follow these steps to remove flighting:

**⚠ DANGER**

To avoid bodily injury or death from the unexpected start-up or fall of a raised machine, always stop engine and remove key before leaving the operator's seat, and always engage safety props before going under the machine for any reason.

1. Lower header to ground and fully raise reel. Stop engine, and remove key from ignition.
2. Engage reel safety props.
3. Remove bolts (A) securing clamp sets (B) to flighting.
4. Remove bolts (C) in clamp sets (B) and remove clamps from auger tube.
5. Slightly twist flighting (D) away from auger tube and remove flighting.

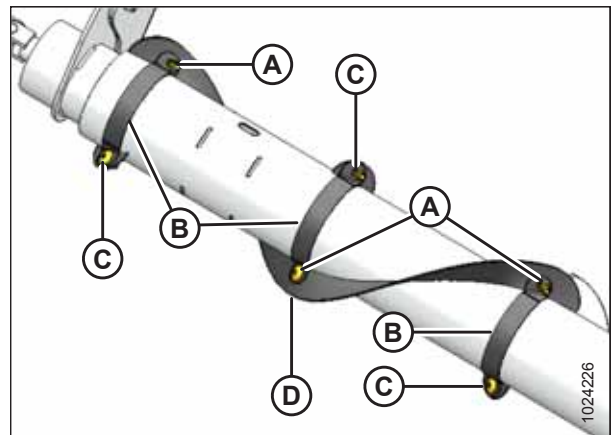


Figure 3.591: Right Auger, Left Auger Opposite

### 3.13.2 Installing Upper Cross Auger Flighting

A short section of removable flighting can be installed at the inboard ends of the upper cross auger (UCA). This flighting can aid in feeding cut crop into the combine (especially when combining canola), but should not be installed when combining crops prone to wrapping on the auger. Follow these steps to install flighting:

#### DANGER

To avoid bodily injury or death from the unexpected start-up or fall of a raised machine, always stop engine and remove key before leaving the operator's seat, and always engage safety props before going under the machine for any reason.

1. Lower header to ground and fully raise reel. Stop engine, and remove key from ignition.
2. Engage reel safety props.
3. Install flighting (A) onto auger tube. Twist flighting slightly to slide over auger tube.
4. Install clamp sets (B) on auger tube, and attach to flighting with 3/8 x 1 torx head machine screws (C) and smooth face lock nuts. Screw heads must face direction of rotation (X). Do **NOT** tighten screws (C) and lock nuts.

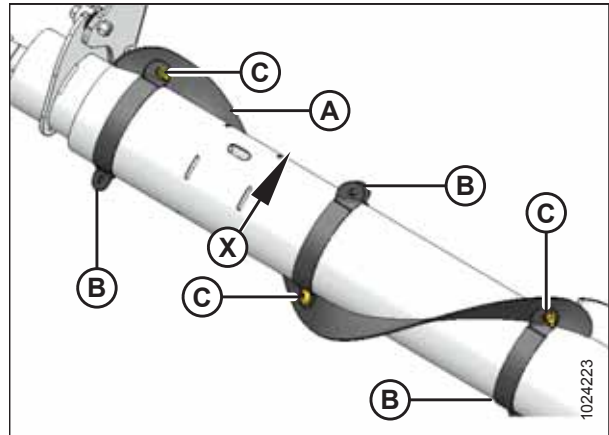


Figure 3.592: Right Auger, Left Auger Opposite

5. Position filler plates (A) between clamp (B) ends and install 3/8 x 1 torx head machine screws (C) and smooth face lock nuts. Screw heads must face direction of rotation (X). Do **NOT** tighten screws (C) and lock nuts.
6. Position end of flighting (D) against backside of existing flighting and temporarily clamp in position.
7. Tighten screws (C) and screws (E) installed in Step 4, [page 322](#).
8. Remove temporary clamping.

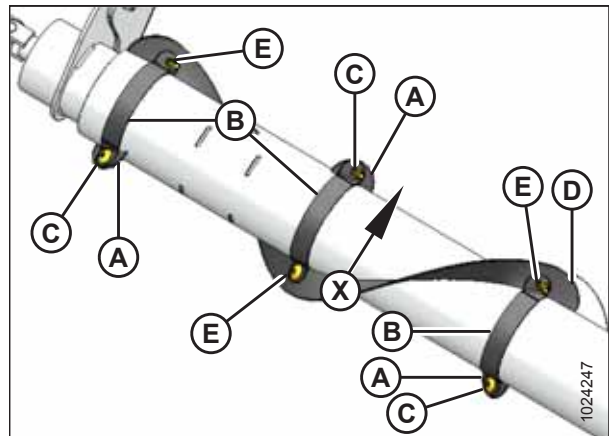


Figure 3.593: Right Auger, Left Auger Opposite

## 3.14 Transporting the Header

### WARNING

Do NOT drive the combine with the header attached on a road or highway at night, or in conditions which reduce visibility, such as fog or rain. The width of the header may not be apparent under these conditions.

### 3.14.1 Transporting Header on Combine

#### CAUTION

- Check local laws for width regulations and lighting or marking requirements before transporting on roads.
- Follow all recommended procedures in your combine operator's manual for transporting, towing, etc.
- Disengage the header drive clutch when travelling to and from the field.
- Before driving the combine on a roadway, be sure the flashing amber lamps, red tail lamps, and head lamps are clean and working properly. Pivot the amber lamps for best visibility by approaching traffic. Always use the lamps when travelling on roads to provide adequate warning to the other vehicles.
- Do NOT use field lamps on roads—they may confuse the other drivers.
- Before driving on a roadway, clean the slow moving vehicle signs and reflectors, adjust the rear view mirrors, and clean the windows.
- Lower the reel fully and raise the header unless transporting in hills.
- Maintain adequate visibility and be alert for roadside obstructions, oncoming traffic, and bridges.
- When travelling downhill, reduce speed and keep the header at a minimum height to provide maximum stability if forward momentum is stopped for any reason. Raise the header completely at bottom of a grade to avoid contacting the ground.
- Travel at safe speeds to ensure complete machine control and stability at all times.

### 3.14.2 Towing

Headers with the Transport/Stabilizer Wheel option can be towed behind a combine or an agricultural tractor. For instructions, refer to the combine operator's manual.



## OPERATION

### *Attaching Header to Towing Vehicle*

#### CAUTION

Adhere to the following transport instructions to prevent loss of control leading to bodily injury and/or machine damage:

- The weight of the towing vehicle must exceed the header weight to ensure adequate control and braking performance. Refer to *2.2 D1 Series Draper Header Specifications, page 25* for weights.
- Do NOT tow with any highway-capable vehicle. Use only an agricultural tractor, agricultural combine, or a properly configured MacDon windrower.
- Ensure the reel is fully lowered and back on the support arms to increase header stability during transport. For headers with hydraulic reel fore-aft, never connect the fore-aft couplers to each other or the circuit will be complete and the reel could creep forward during transport.
- Check that all the pins are properly secured in the transport position at the wheel supports, cutterbar support, and hitch.
- Check the tire condition and pressure prior to transporting.
- Connect hitch to towing vehicle using a proper hitch pin with a spring locking pin or other suitable fastener.
- Attach the hitch safety chain to the towing vehicle. Adjust the safety chain length to provide only enough slack to permit turning.
- Connect the header seven-pole plug wiring harness to the mating receptacle on the towing vehicle (the seven-pole receptacle is available from your MacDon Dealer parts department.)
- Ensure all lights are functioning properly, and clean the slow moving vehicle sign and other reflectors. Use flashing warning lights unless prohibited by law.

### *Towing the Header*

#### CAUTION

Adhere to the following transport instructions to prevent loss of control leading to bodily injury and/or machine damage:

- Do NOT exceed 32 km/h (20 mph).
- Reduce transport speed to less than 8 km/h (5 mph) in slippery and rough conditions.
- Turn corners at only very low speeds (8 km/h [5 mph] or less) as header stability is reduced while cornering. Do NOT accelerate when making or coming out of a turn.
- Obey all highway traffic regulations in your area when transporting on public roads. Use flashing amber lights unless prohibited by law.

### 3.14.3 Converting from Transport to Field Position

#### Removing Tow-Bar

1. Block the tires to prevent the header from rolling, and unhook the header from the towing vehicle.
2. Disconnect electrical connector (A) on the tow-bar.
3. Remove pin (B) from the tow-bar, and disassemble outer section (C) from inner section (D).

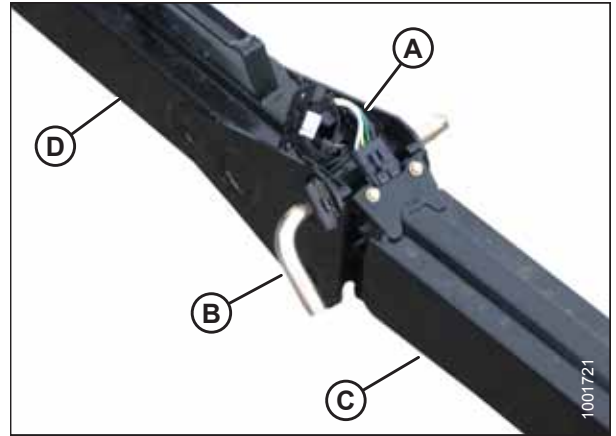


Figure 3.594: Tow-Bar Assembly

4. Disconnect electrical connector (A) at the front wheel.

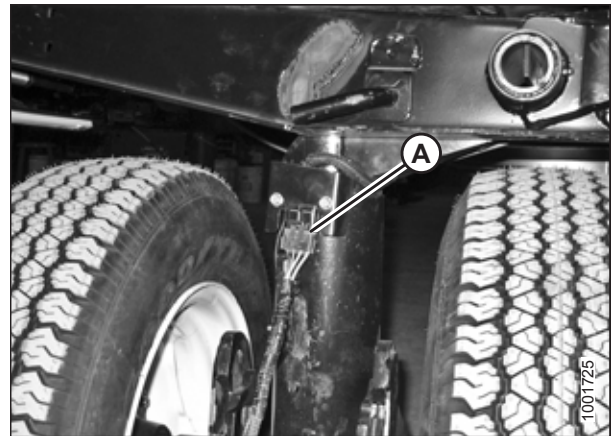


Figure 3.595: Wiring Connector

5. Remove clevis pin (A) and set aside for reinstallation.
6. Push latch (B) and lift tow-bar (C) from the hook. Release latch.
7. Install clevis pin (A).

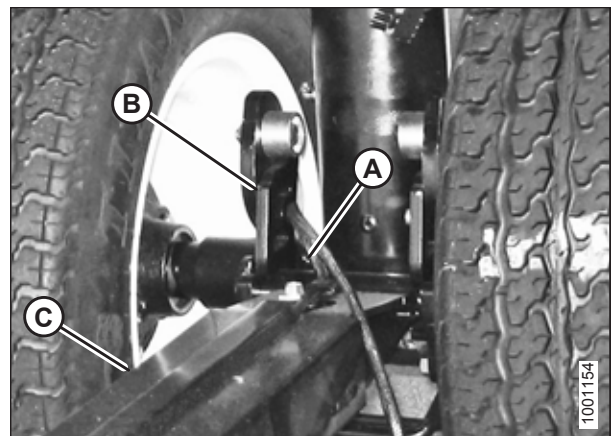


Figure 3.596: Tow-Bar Latch

## OPERATION

### Storing the Tow-Bar

The tow-bar consists of two sections, an inner half (A) and an outer half (B), to make storage and handling easier.

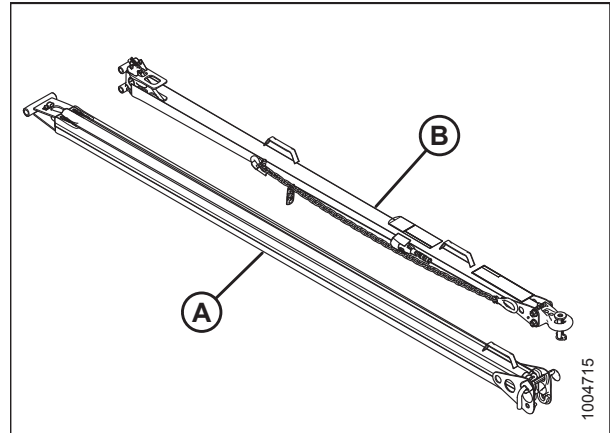


Figure 3.597: Tow-Bar Assembly

1. Place the inner end of the outer half of the tow-bar into the cradle (A) on the left side of the header backtube.
2. Secure the clevis/pintle end of the tow-bar in support (B) on the endsheet using hitch pin (C). Secure with a lynch pin.
3. Install rubber strap (D) on cradle (A).

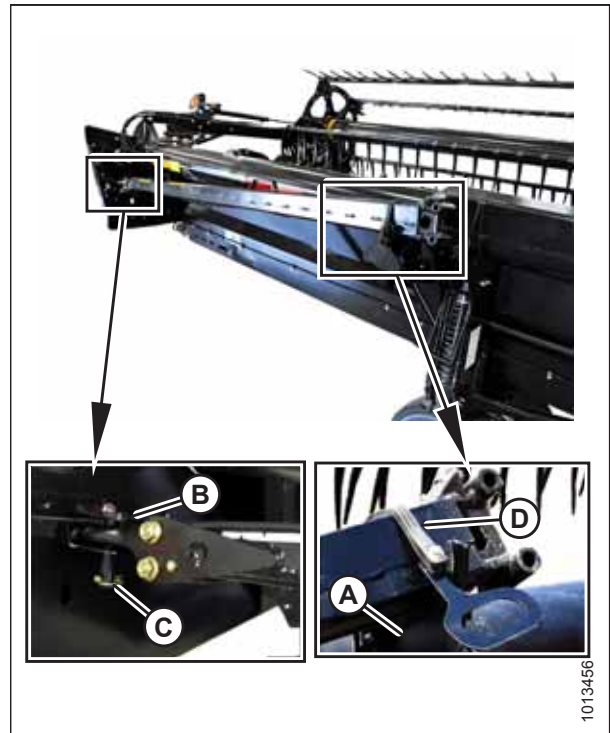


Figure 3.598: Tow-Bar Storage – Left Side

## OPERATION

4. Place the inner end of the inner half of the tow-bar into the cradle (A) on the right side of the header backtube.
5. Secure the tube end of the tow-bar in support (B) on the endsheet using clevis pin (C). Secure with a hairpin.
6. Install rubber strap (D) on cradle (A).

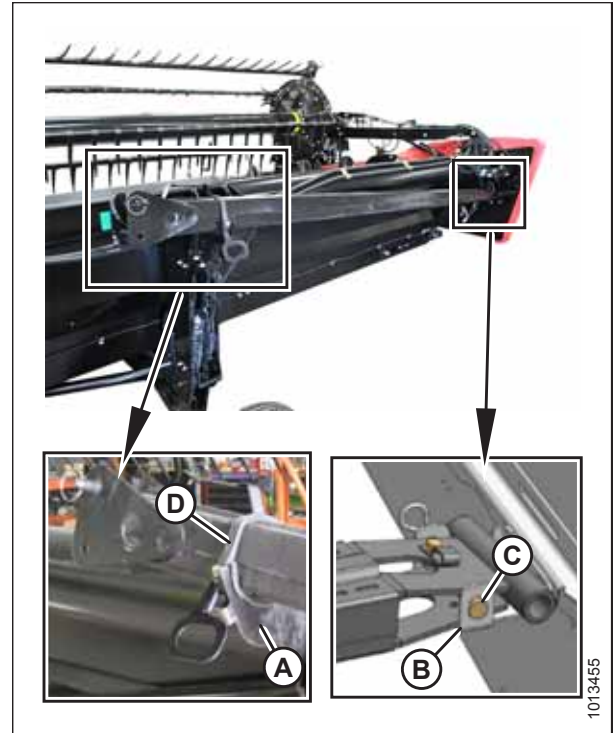


Figure 3.599: Tow-Bar Storage – Right Side

7. Attach the header to the combine. For instructions, refer to [4 Header Attachment/Detachment, page 341](#).

### IMPORTANT:

Carrying the tow-bar on the header will affect the main header float. For instructions, refer to [Checking and Adjusting Header Float, page 91](#).

8. Place the transport wheels into field position. For instructions, refer to the following:
  - [Moving Front \(Left\) Wheels into Field Position, page 327](#)
  - [Moving Rear \(Right\) Wheels into Field Position, page 329](#)

### Moving Front (Left) Wheels into Field Position



### DANGER

To avoid bodily injury or death from the unexpected start-up or fall of raised machine, always stop the engine, remove the key, and engage the safety props before going under the header for any reason.

1. Raise the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Engage the header safety props.

## OPERATION

4. Swivel the front wheel assembly (A) so the wheels are aligned with the lower frame.
5. Remove pin (B) and pull the wheel assembly towards the rear of the header. Store the pin in hole (C) at the top of the leg.
6. Pull handle (D) upwards to release and lower the linkage into the vertical support.

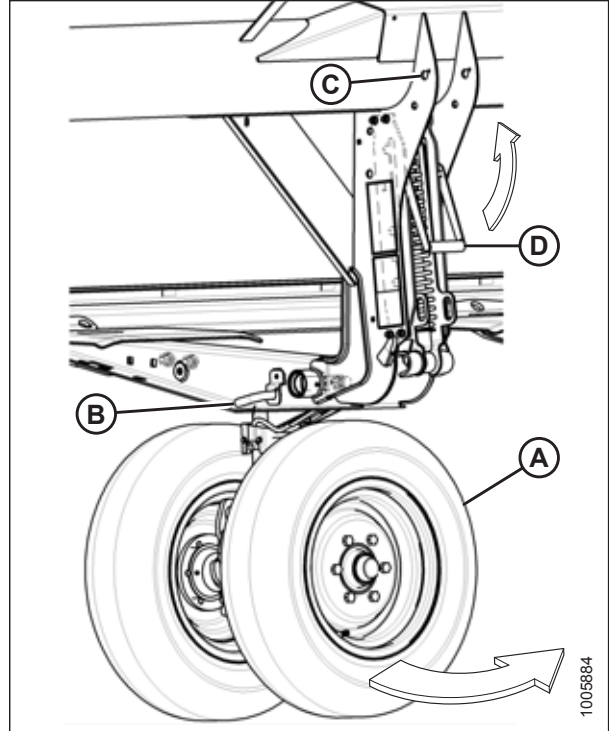


Figure 3.600: Front Wheels

7. Align lift hook (A) with lug (B) and lift the wheel assembly to engage the pin in the lift hook. Ensure latch (C) is engaged.
8. Install clevis pin (D) and secure to the center of the axle with hairpin.

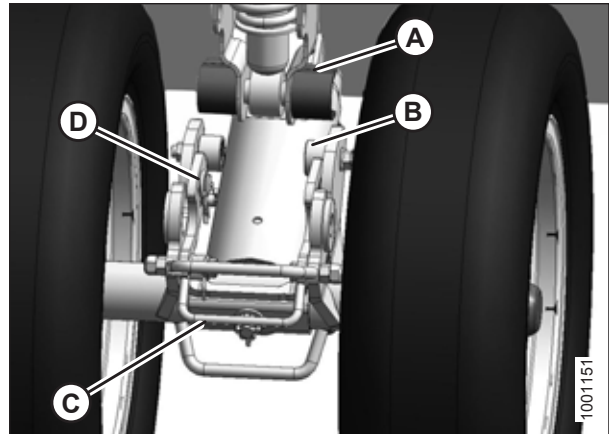


Figure 3.601: Front Wheels

## OPERATION

9. Lift the wheel assembly to the desired height and slide linkage (A) into the appropriate slot in the vertical support.
10. Push down on handle (B) to lock.

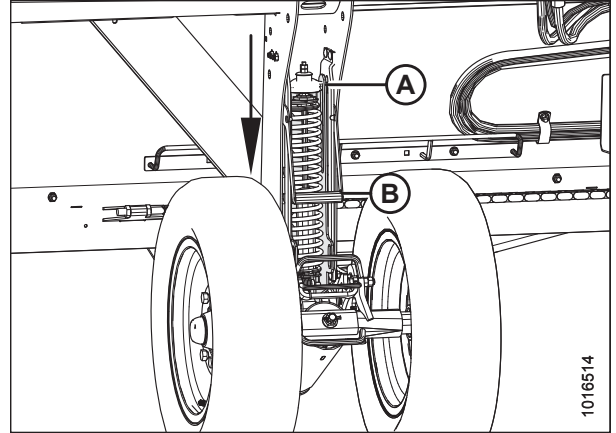


Figure 3.602: Front Wheels

### *Moving Rear (Right) Wheels into Field Position*

1. Pull pin (A) on the left rear wheel. Swivel the wheel clockwise and lock with the pin.

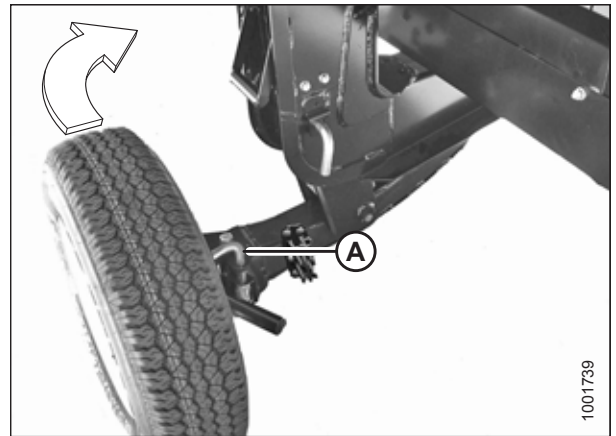


Figure 3.603: Rear Wheel – Right Side

2. Remove pin (A) and store at location (B).
3. Pull handle (C) upwards to release.
4. Lift the wheel to the desired height, and engage the support channel into slot (D) in the vertical support.
5. Push down on handle (C) to lock.

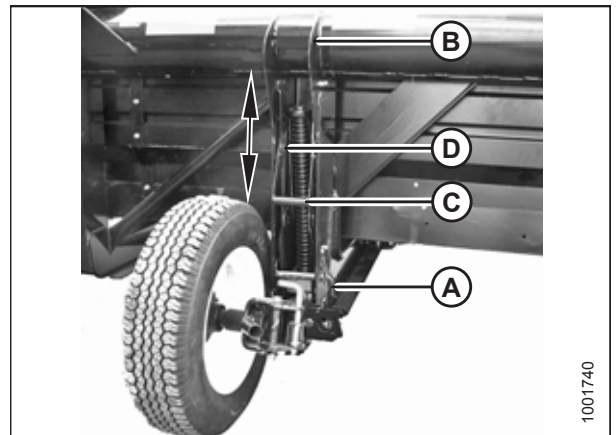


Figure 3.604: Rear Wheel – Right Side

## OPERATION

6. Pull pin (A) on brace (B) on the right wheel in front of the cutterbar. Disengage the brace from the cutterbar, and lower the brace against axle (C).
7. Remove pin (D), lower support (E) onto axle, and reinsert the pin into the support.
8. Swing axle (C) clockwise towards the rear of the header.

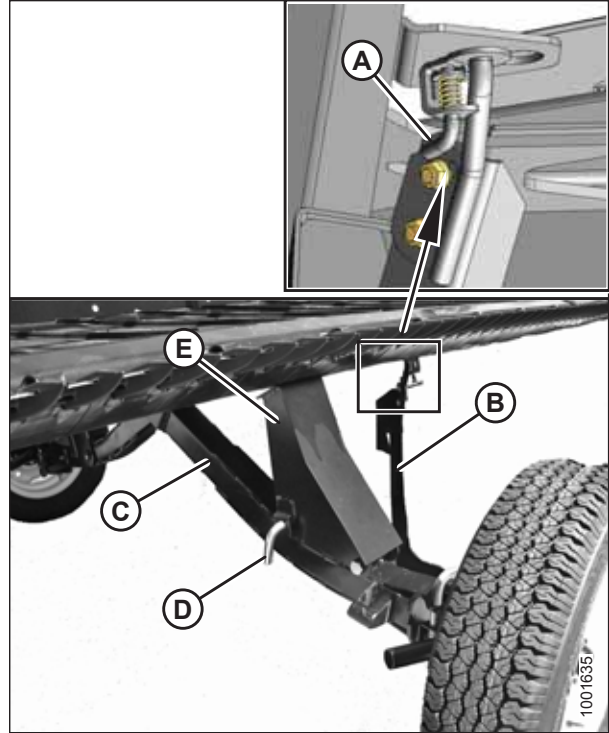


Figure 3.605: Rear Wheel – Right Side

9. Pull pin (A) on the right axle, swivel the wheel counterclockwise to the position shown, and lock with pin (A).
10. Remove hairpin (B) from latch (C).
11. Lift the wheel, lift latch (C), and engage lug (D) onto the left axle. Ensure the latch closes.
12. Secure the latch with hairpin (B), ensuring the open end of the pin faces the rear of the combine.

### IMPORTANT:

Check that the wheels are locked and that the handle is in the locked position.

### NOTE:

The hairpin can become dislodged by crop if installed with the open end facing the cutterbar.

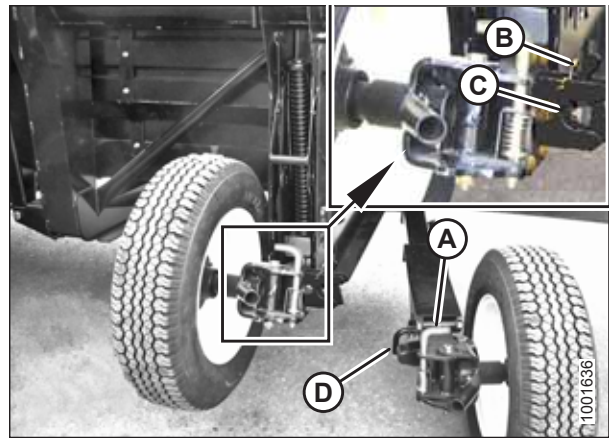


Figure 3.606: Rear Wheels



## OPERATION

13. Complete the conversion by ensuring left wheels (A) and right wheels (B) are in the position shown.

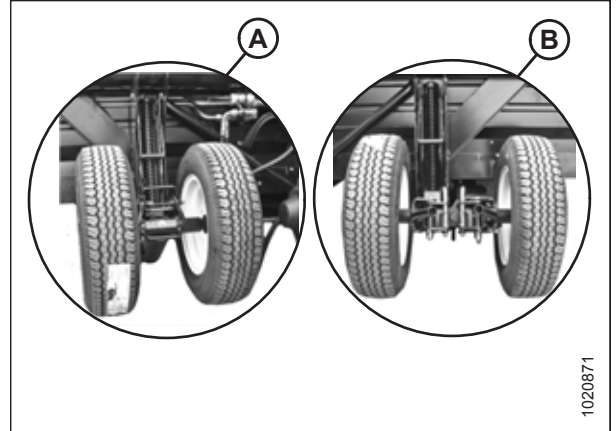


Figure 3.607: Field Position

### 3.14.4 Converting from Field to Transport Position

#### *Moving Front (Left) Wheels into Transport Position*

#### **DANGER**

To avoid bodily injury or death from the unexpected start-up or fall of raised machine, always stop the engine, remove the key, and engage the safety props before going under the header for any reason.

#### **CAUTION**

Stand clear of wheels and release linkage carefully as wheels will drop once the mechanism is released.

1. Pull handle (B) upwards to release and raise linkage (A) fully upwards into the vertical support.
2. Raise the header fully.
3. Shut down the engine, and remove the key from the ignition.
4. Engage the header safety props.

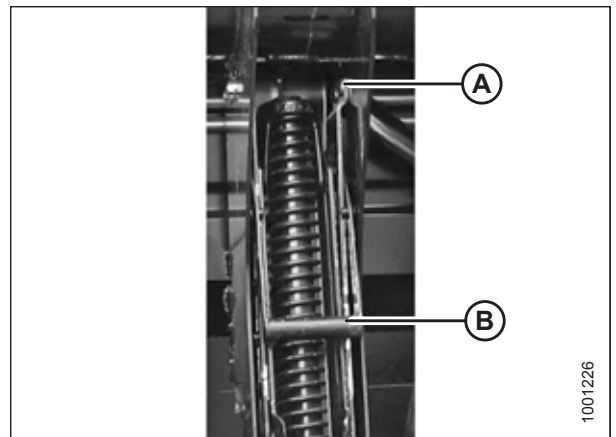


Figure 3.608: Suspension Linkage

## OPERATION

5. Remove the hairpin and clevis pin (A).
6. Pull the latch handle (B) to release suspension linkage (C), and pull the suspension linkage away from spindle (D).
7. Lower the wheels slowly.

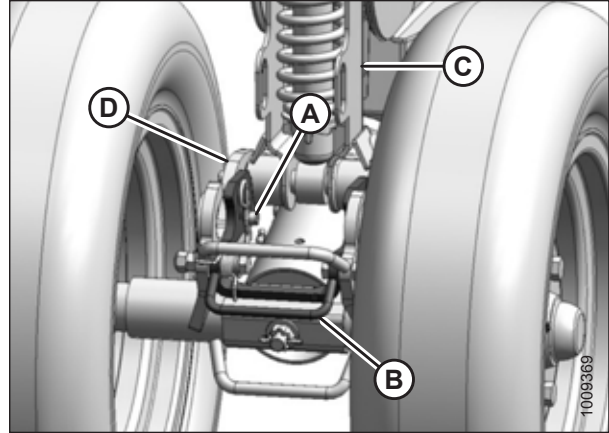


Figure 3.609: Left Front Wheels

8. Lower handle (A) to lock.

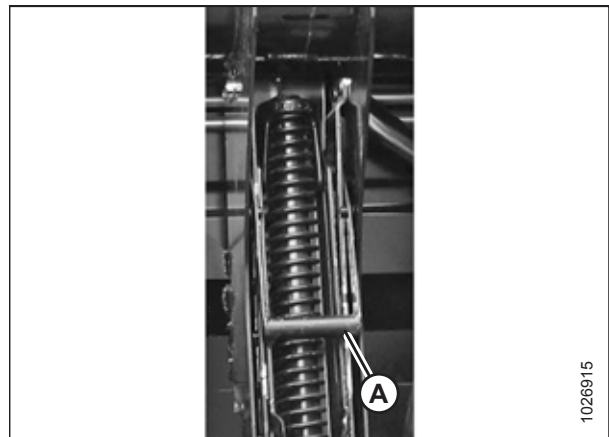


Figure 3.610: Suspension Linkage

## OPERATION

9. Remove pin (A) from storage at the top of leg (B).
10. Move and swivel the wheels clockwise until connector (C) is turned towards the front end of the header.
11. Insert pin (A) and turn to lock.
12. Lower the header until the left wheels are just touching the ground.

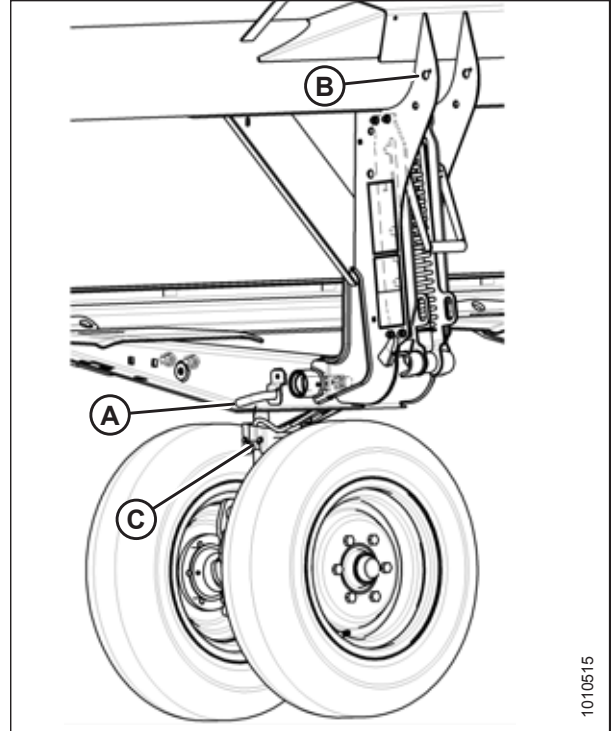


Figure 3.611: Left Front Wheels

### *Moving Rear (Right) Wheels into Transport Position*

1. Remove hairpin (A) from latch (B).
2. Lift latch (B), disengage right axle (C), and lower to the ground.

### CAUTION

**Stand clear of wheels and release linkage carefully as wheels will drop once the mechanism is released.**

3. Pull handle (D) carefully to release the spring and lower the wheel to the ground.
4. Lift the wheel and linkage with handle (E) and position the linkage in the bottom slot.
5. Lower handle (C) to lock.

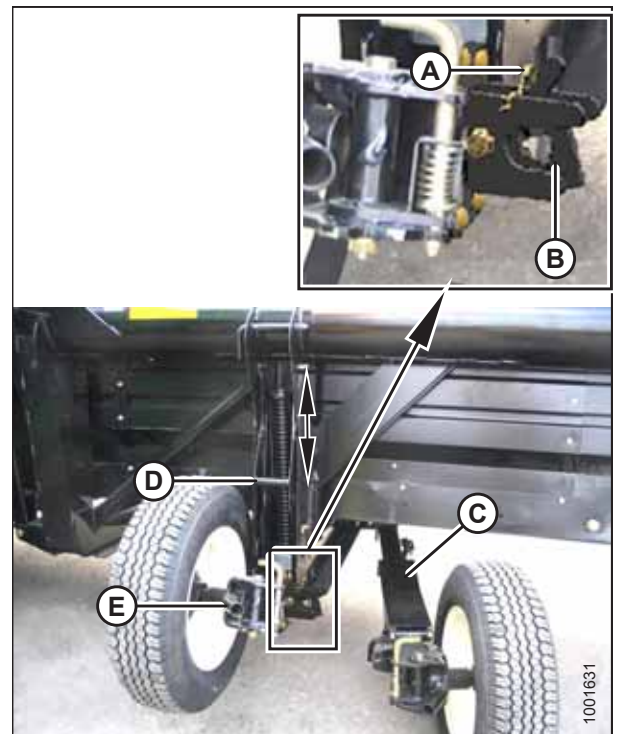


Figure 3.612: Rear Wheels

## OPERATION

6. Remove pin (A) and install at location (B) to secure the linkage. Turn the pin to lock.
7. Pull pin (D), swivel wheel (C) counterclockwise 90°, and release the pin to lock.

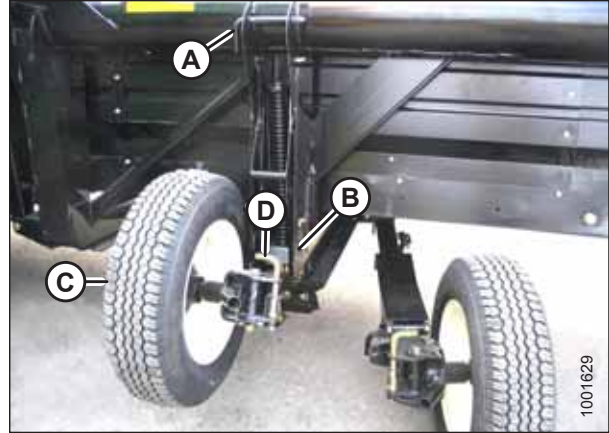


Figure 3.613: Rear Wheels

8. Ensure the left wheel is in the transport position as shown.



Figure 3.614: Left Wheel in Transport Position

9. Pull pin (A) and swivel right rear wheel (B) clockwise 90°.



Figure 3.615: Right Rear Wheel

## OPERATION

10. Lock wheel (A) with pin (B). Move right axle (C) to the front of the header.

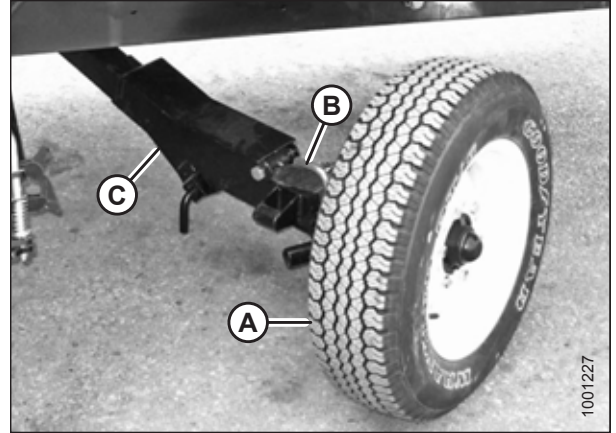


Figure 3.616: Right Rear Wheel

11. Remove pin (A), raise support (B) to the position shown, and reinsert pin.

**IMPORTANT:**

Ensure pin (A) engages the tube on the axle.

12. Swing brace (C) into the position shown and insert the brace into slot (D) behind the cutterbar. Position the brace so that pin (E) engages the hole in bracket (F). The right wheel is now in transport position.
13. Disengage the header cylinder lift stops.
14. Detach the header's hydraulic and electrical connections from the combine. For instructions, refer to [4 Header Attachment/Detachment, page 341](#).
15. Start the combine and lower the header to the ground.

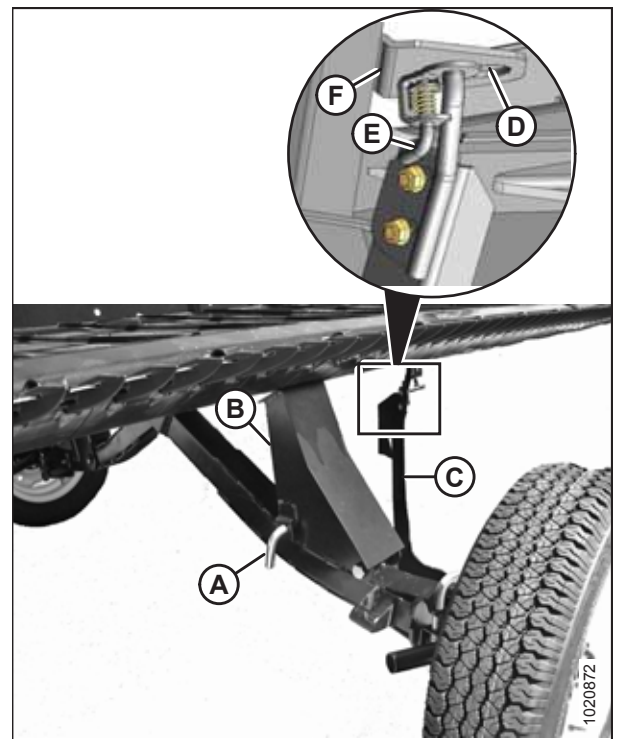


Figure 3.617: Right Rear Wheel Position

## OPERATION

### Attaching Tow-Bar

The tow-bar consists of two sections which make storage and handling easier.

1. Unhook rubber strap (D) from cradle (A) on the right side of the header.
2. Remove clevis pin (C) and detach the tube end from support (B).
3. Replace clevis pin (C).
4. Lift the inner half of the tow-bar off the header and place it near the left side of the header.

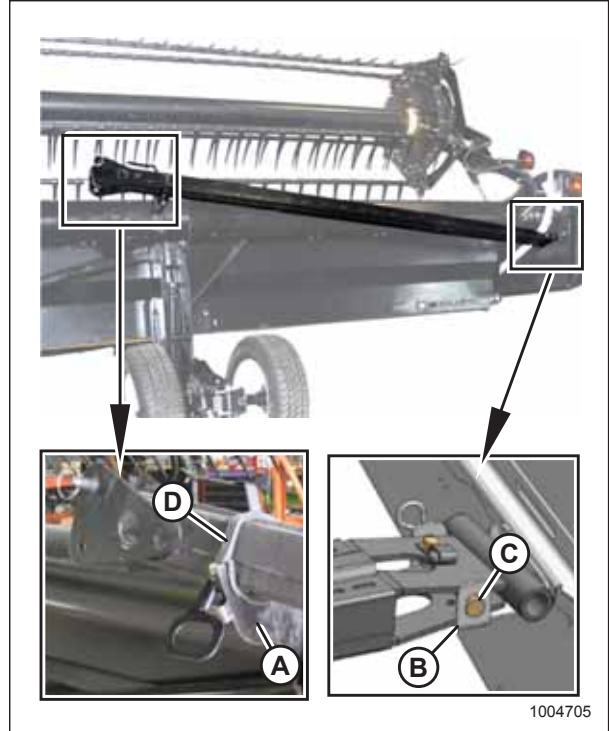


Figure 3.618: Tow-Bar Removal – Right Side

5. Unhook rubber strap (D) from cradle (A) on the left side of the header.
6. Remove hitch pin (C) from support (B), and remove the tow-bar.
7. Install rubber strap (D) on cradle (A).

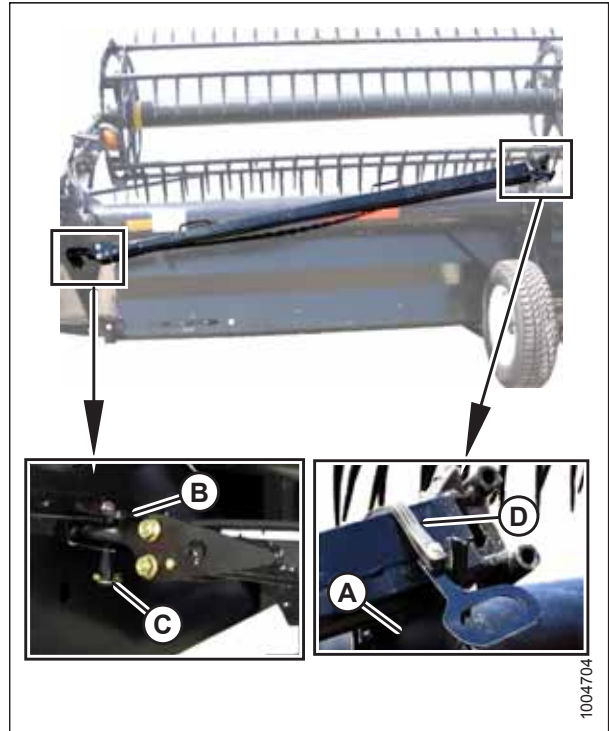


Figure 3.619: Tow-Bar Removal – Left Side



## OPERATION

8. Connect outer half (B) of the tow-bar to inner half (A).

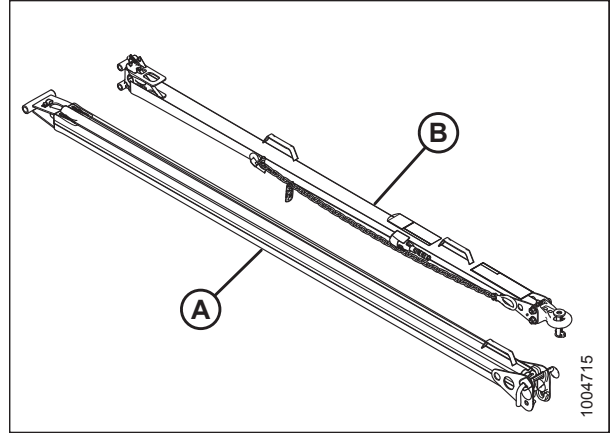


Figure 3.620: Tow-Bar Assembly

9. Lift outer half (B) and insert it into inner half (A).

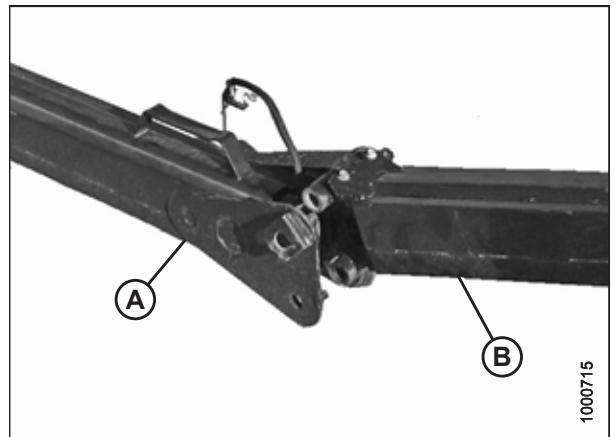


Figure 3.621: Tow-Bar Assembly

10. Secure the two halves together with L-pin (A) and then turn to lock. Secure L-pin with ring (B).
11. Connect the electrical harness to connector (C).

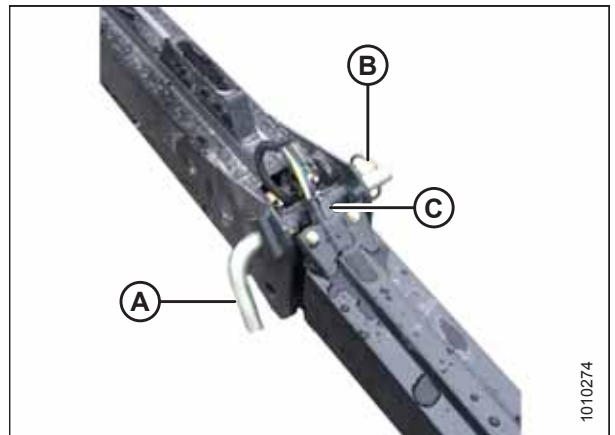


Figure 3.622: Tow-Bar Assembly



## OPERATION

12. Position tow-bar (A) onto the axle, and push against latch (B) until the tow-bar pins drop into hooks (C).
13. Check that latch (B) has engaged the tow-bar.
14. Install clevis pin (D) and secure with hairpin.

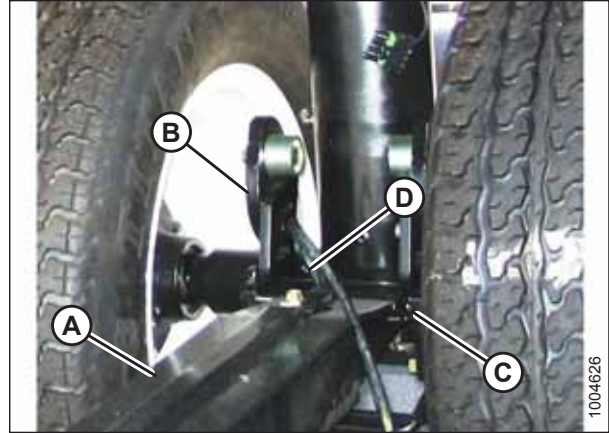


Figure 3.623: Attaching Tow-Bar

15. Connect electrical harness (A) at the front wheel.



Figure 3.624: Harness Connection

### 3.15 Storing the Header

Perform the following procedures at the end of each operating season:

 **CAUTION**

Never use gasoline, naphtha, or any volatile material for cleaning purposes. These materials may be toxic and/or flammable.

 **CAUTION**

**Cover cutterbar and knife guards to prevent injury from accidental contact.**

1. Clean the header thoroughly.
2. Store the machine in a dry, protected place if possible. If storing outside, always cover it with a waterproof canvas or other protective material.

**NOTE:**

If storing the machine outside, remove the drapers and store them in a dark, dry place. If not removing the drapers, store the header with the cutterbar lowered so that water and snow will not accumulate on the drapers. The weight of water and snow accumulation puts excessive stress on the drapers and header.

3. Lower the header onto blocks to keep the cutterbar off the ground.
4. Lower the reel completely. If stored outside, tie the reel to the frame to prevent rotation caused by the wind.
5. Repaint all worn or chipped painted surfaces to prevent rust.
6. Loosen the drive belts.
7. Lubricate the header thoroughly leaving excess grease on the fittings to keep moisture out of the bearings.
8. Apply grease to the exposed threads, cylinder rods, and sliding surfaces of components.
9. Check for worn components and repair them as necessary.
10. Check for broken components and order the replacements from your Dealer. Immediate repair of these items will save time and effort at the beginning of next season.
11. Replace or tighten any missing or loose hardware. Refer to [8.1 Torque Specifications, page 609](#).



# Chapter 4: Header Attachment/Detachment

This chapter includes instructions for setting up, attaching, and detaching the header.

Combine	Refer to
Case IH 7010/8010, 120, 130, 230, 240, 250 Series	<a href="#">4.2 Case IH Combines, page 342</a>
Gleaner R and S Series, Challenger 660, 670, 680B, 540C, 560C, Massey Ferguson 9690, 9790, 9895, 9520, 9540, 9560	<a href="#">4.3 AGCO Challenger, Gleaner, and Massey Ferguson Combines, page 350</a>
AGCO IDEAL™ Series	<a href="#">3.9.4 AGCO IDEAL™ Series Combines, page 150</a>
John Deere 60, 70, S, and T Series	<a href="#">4.5 John Deere Combines, page 363</a>
CLAAS 500 (including R Series), 600, and 700 Series, 7000/8000 Series, and Tucano	<a href="#">4.6 CLAAS Combines, page 370</a>
New Holland CR, CX	<a href="#">4.7 New Holland Combines, page 377</a>

**NOTE:**

Ensure the applicable functions (e.g., Automatic Header Height Control [AHHC], draper header option, hydraulic center-link option, hydraulic reel drive) are enabled on the combine and the combine computer. Failure to do so may result in improper header operation.

## 4.1 FM100 Setup

The following sections outline the recommended float module setup guidelines for your specific combine model and crop type; however, the recommendations cannot cover all conditions.

If feeding problems develop with the float module, refer to [7 Troubleshooting, page 599](#).

### 4.1.1 Using Auger Flighting

The auger flighting on the FM100 can be configured for specific combines and crop conditions. For instructions, refer to [3.8.1 FM100 Feed Auger Configurations, page 58](#) for combine/crop specific configurations.

### 4.1.2 Using Stripper Bars

Stripper bar kits may have been supplied with your header to improve feeding in certain crops such as rice.

For servicing information, refer to [5.11 FM100 Stripper Bars and Feed Deflectors, page 510](#).

## 4.2 Case IH Combines

### 4.2.1 Attaching Header to Case IH Combine

#### DANGER

To avoid injury or death from unexpected start-up of machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Shut down the engine, and remove the key from the ignition.
2. On the combine, ensure lock handle (A) is positioned so hooks (B) can engage the float module.

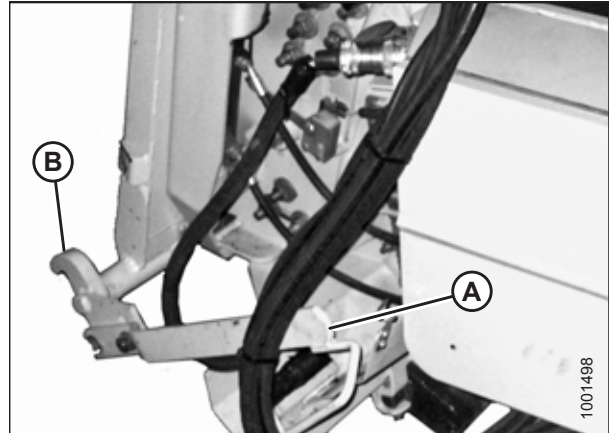


Figure 4.1: Feeder House Locks

#### DANGER

Never start or move the machine until you are sure all bystanders have cleared the area.

3. Start the engine and slowly drive the combine up to the header until feeder house saddle (A) is directly under float module top cross member (B).
4. Raise the feeder house slightly to lift the header, ensuring the feeder saddle is properly engaged in the float module frame.
5. Shut down the engine, and remove the key from the ignition.

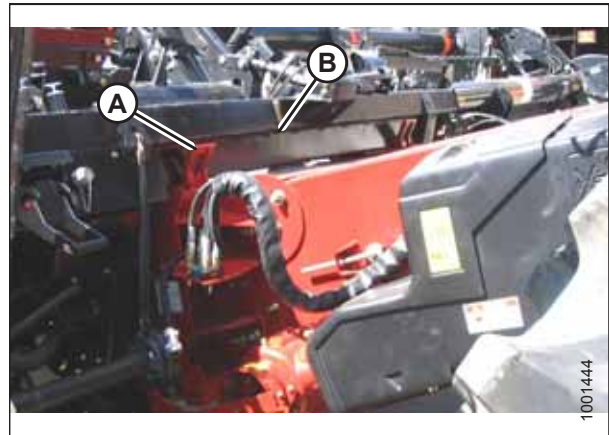


Figure 4.2: Combine and Float Module

## HEADER ATTACHMENT/DETACHMENT

6. On the left side of the feeder house, lift lever (A) on the float module and push handle (B) on the combine to engage locks (C) on both sides of the feeder house.
7. Push down on lever (A) so the slot in the lever engages the handle and locks the handle in place.
8. If lock (C) does not fully engage the pin on the float module, loosen bolts (D) and adjust lock. Retighten bolts.

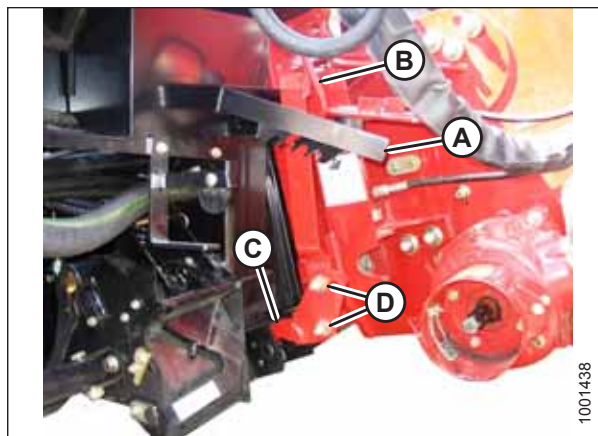


Figure 4.3: Combine and Float Module

9. Open the cover on receptacle (A) located on the left side of the float module.
10. Press lock button (B) and pull handle (C) to the fully-open position.
11. Clean the receptacle mating surfaces.

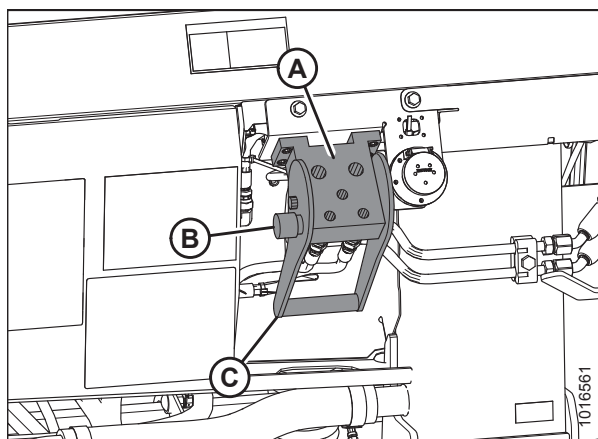


Figure 4.4: Float Module Receptacle

12. Remove hydraulic quick coupler (A) from the combine, and clean the mating surfaces.



Figure 4.5: Combine Connectors

## HEADER ATTACHMENT/DETACHMENT

13. Position the coupler onto coupler receptacle (A) and push handle (B) (not shown) to engage the multicoupler pins into the receptacle.
14. Push handle (B) to the closed position until lock button (C) snaps out.

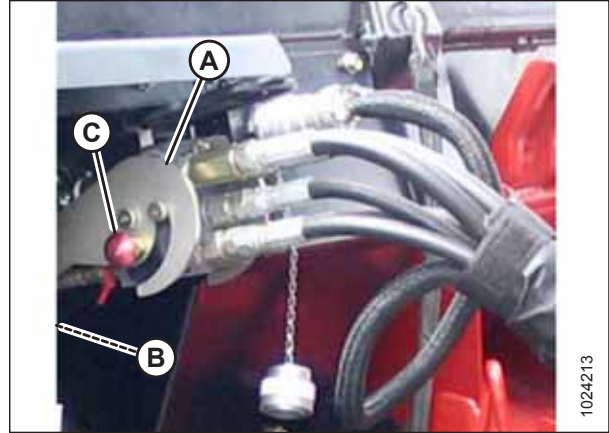


Figure 4.6: Hydraulic Connection

15. Remove the cover from electrical receptacle (A). Ensure the receptacle is clean and has no signs of damage.

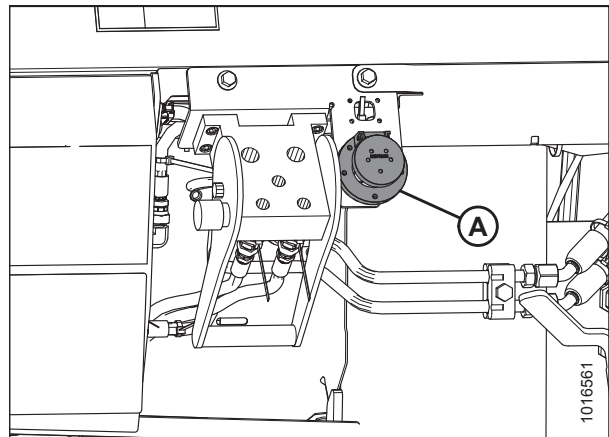


Figure 4.7: Electrical Receptacle

16. Remove electrical connector (A) from the storage cup on the combine and route it to the float module receptacle.



Figure 4.8: Combine Connectors



## HEADER ATTACHMENT/DETACHMENT

- Align the lugs on connector (A) with the slots in receptacle (B), push the connector onto the receptacle, and turn the collar on the connector to lock it in place.

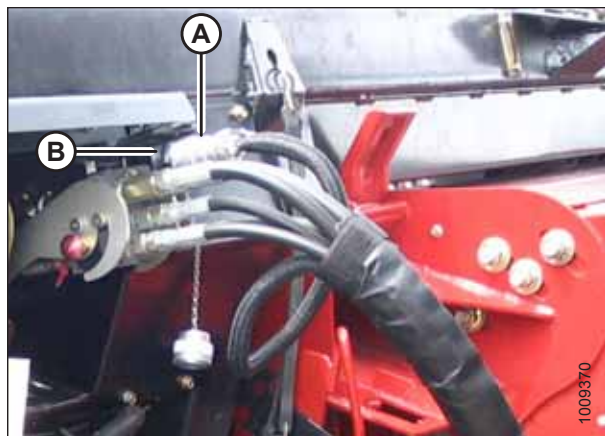


Figure 4.9: Electrical Connection

- Detach safety chain (C) from support bracket (B).
- Pull collar (D) back to release driveline (A) from support bracket.

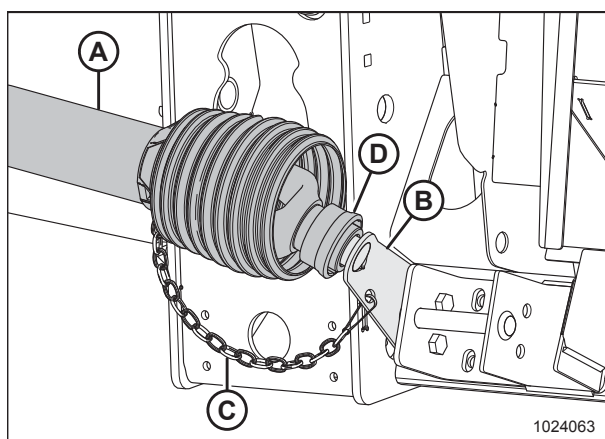


Figure 4.10: Driveline in Storage Position

- Pull back collar (A) on the end of the driveline, and push the driveline onto combine output shaft (B) until the collar locks.

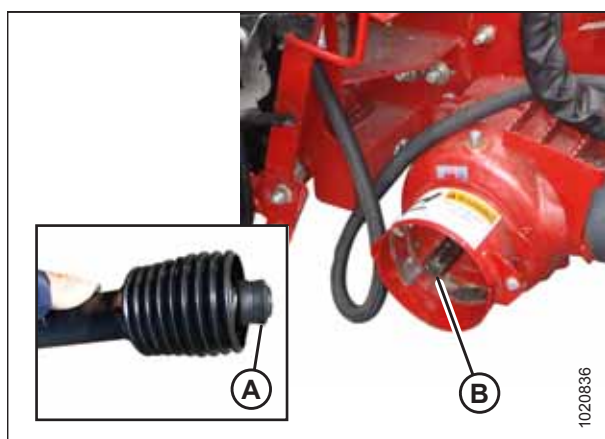


Figure 4.11: Combine Output Shaft

## HEADER ATTACHMENT/DETACHMENT

21. Disengage the float locks by pulling each float lock handle (A) away from the float module and setting it in unlocked position (B).

**NOTE:**

Illustration at right shows the right side of the header. Float lock on left side of header opposite.

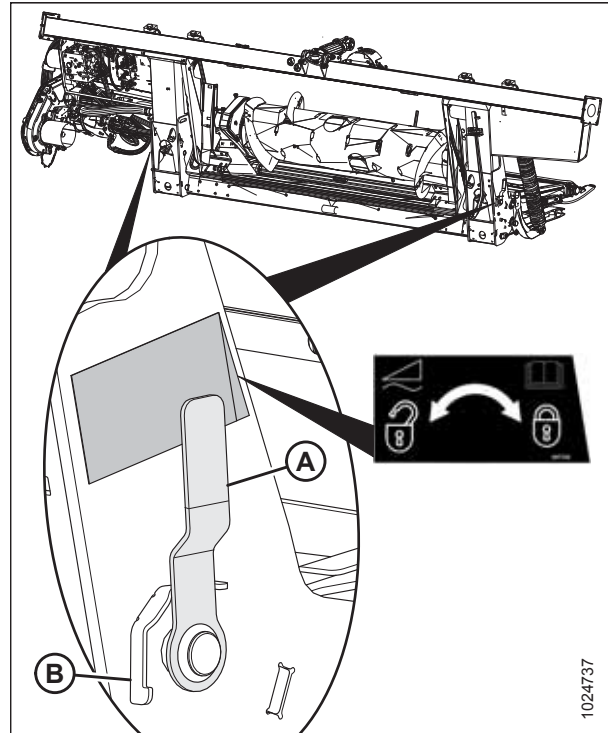


Figure 4.12: Float Lock Handle

### 4.2.2 Detaching Header from Case IH Combine

**⚠ DANGER**

To avoid bodily injury or death from the unexpected start-up or fall of raised machine, always stop the engine, remove the key, and engage the safety props before going under the header for any reason.

## HEADER ATTACHMENT/DETACHMENT

1. Park the combine on a level surface.
2. Position the header slightly above the ground.
3. Shut down the engine, and remove the key from the ignition.

### IMPORTANT:

If transport wheels are installed, the header may be detached in either transport or field mode. If detaching with the wheels in field mode, set the wheels to the storage or uppermost working position, otherwise the header may tilt forward, making reattachment difficult. For instructions, refer to [Adjusting Stabilizer/Transport Wheels, page 85](#).

### IMPORTANT:

If stabilizer wheels are installed, set the wheels to the storage or uppermost working position, otherwise the header may tilt forward, making reattachment difficult. For instructions, refer to [Adjusting Stabilizer Wheels, page 84](#).

4. Engage the float locks by pulling each float lock handle (A) away from the float module and setting it in locked position (B).

### NOTE:

Illustration at right shows the right side of the header. Float lock on left side of header opposite.

5. Push back collar (A) on the end of the driveline and pull the driveline out of combine output shaft (B) until the collar disengages.

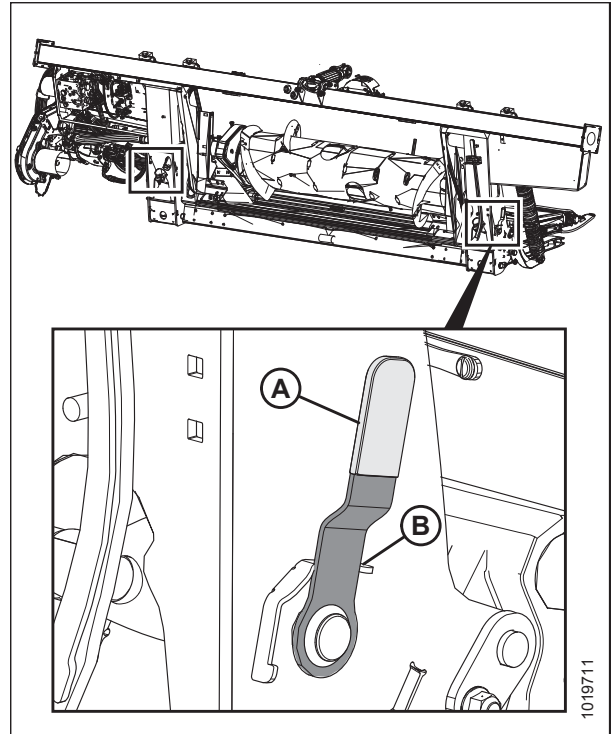


Figure 4.13: Float Lock Handle

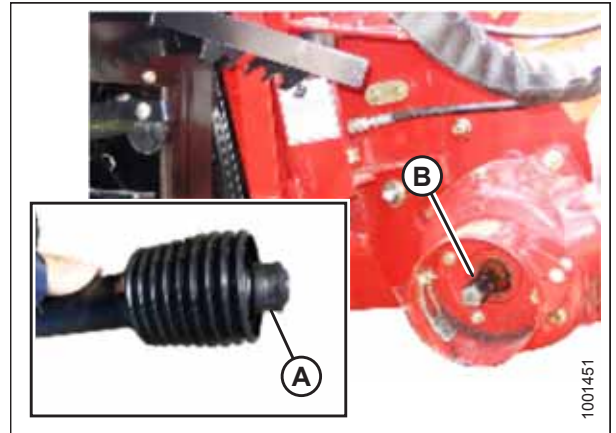


Figure 4.14: Driveline

## HEADER ATTACHMENT/DETACHMENT

6. Store driveline (A) on driveline support bracket (B) by pulling back collar (C) on the driveline and fitting it over support bracket body (D). Release the collar so it locks into place over the support bracket body.
7. Attach safety chain (E) to support bracket (B).

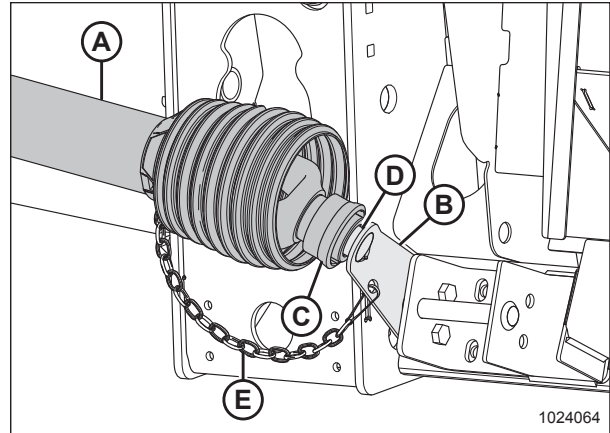


Figure 4.15: Driveline

8. Remove electrical connector (A) and replace cover (B).
9. Push in lock button (C) and pull handle (D) to release multicoupler (E).

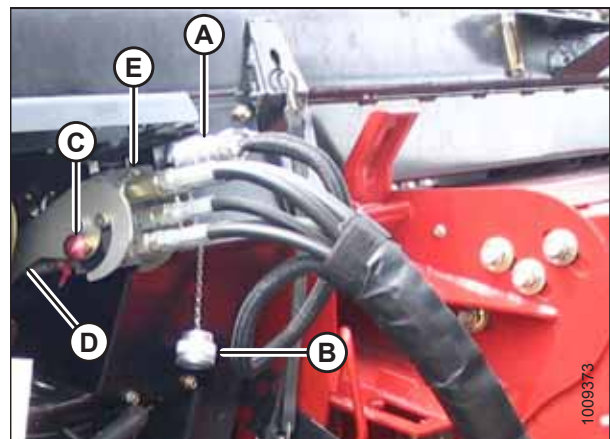


Figure 4.16: Multicoupler

10. Position multicoupler (A) onto storage plate (B) on the combine.
11. Place the electrical connector (C) in the storage cup (D).

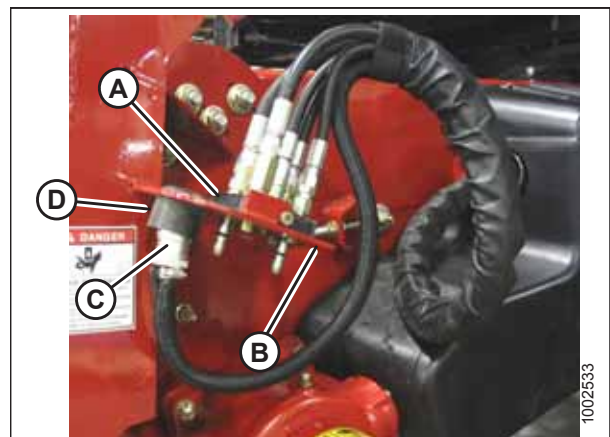


Figure 4.17: Multicoupler Storage

## HEADER ATTACHMENT/DETACHMENT

12. Push handle (A) on the float module receptacle to the closed position until lock button (B) snaps out. Close the cover.

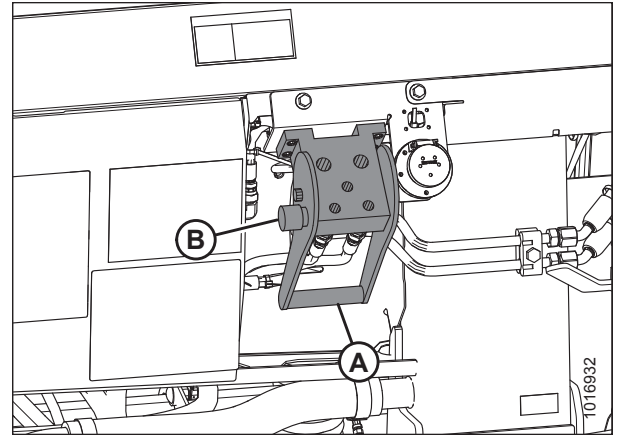


Figure 4.18: Float Module Receptacle

13. Lift lever (A) and pull, and lower handle (B) to disengage feeder house/float module lock (C).
14. Lower the feeder house until it disengages the float module support.
15. Back the combine away slowly from the float module.

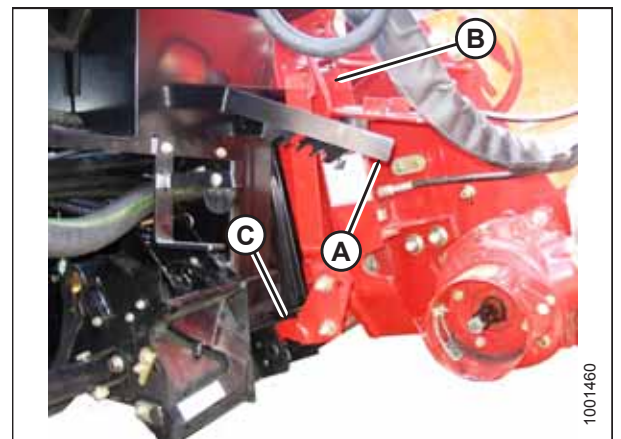


Figure 4.19: Feeder House Locks

## 4.3 AGCO Challenger, Gleaner, and Massey Ferguson Combines

### 4.3.1 Attaching Header to an AGCO Challenger, Gleaner, or Massey Ferguson Combine

**⚠ DANGER**

To avoid injury or death from unexpected start-up of machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Shut down the engine, and remove the key from the ignition.
2. Use lock handle (B) to retract lugs (A) at the base of the feeder house.

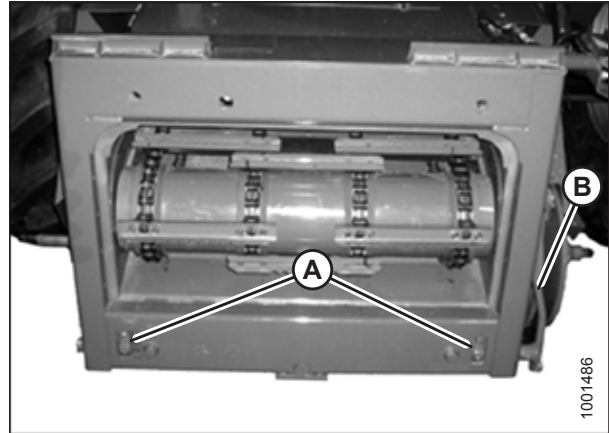


Figure 4.20: AGCO Group Feeder House

**⚠ DANGER**

Never start or move the machine until you are sure all bystanders have cleared the area.

3. Start the engine and slowly approach the header until the feeder house is directly under float module top cross member (A) and alignment pins (C) (refer to Figure 4.22, page 351) on the feeder house are aligned with holes (B) in the float module frame.

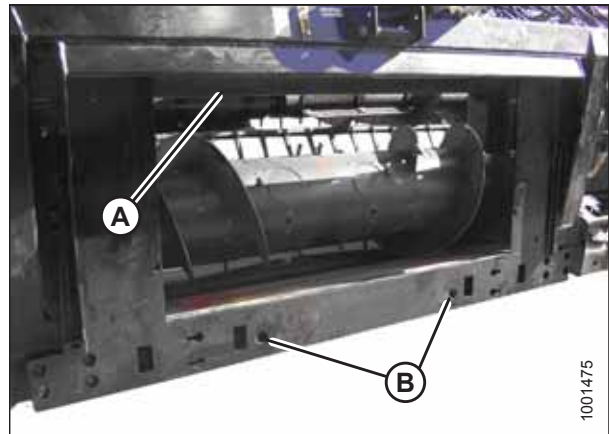


Figure 4.21: Float Module



## HEADER ATTACHMENT/DETACHMENT

### NOTE:

Your combine feeder house may not be exactly as shown.

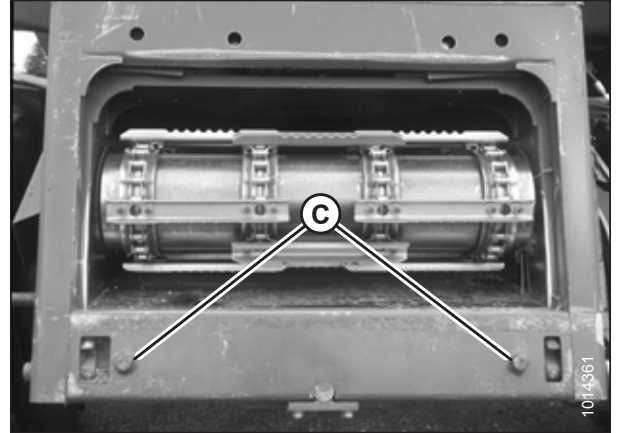


Figure 4.22: AGCO Group Alignment Pins

4. Raise the feeder house slightly to lift the header, ensuring feeder house saddle (A) is properly engaged in the float module frame.
5. Shut down the engine, and remove the key from the ignition.



Figure 4.23: Feeder House and Float Module

6. Use lock handle (B) to engage lugs (A) with the float module.

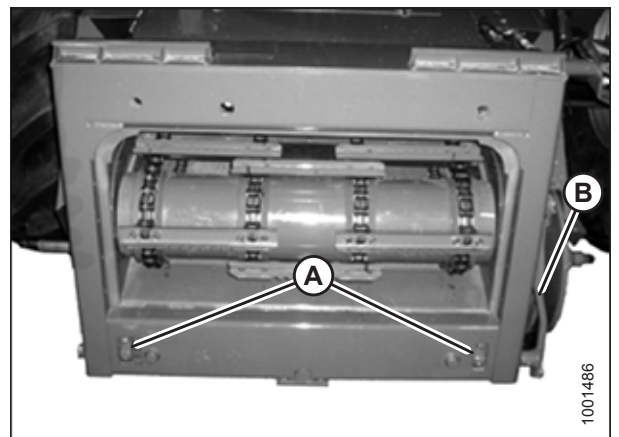


Figure 4.24: AGCO Group Feeder House

### DANGER

Never start or move the machine until you are sure all bystanders have cleared the area.

7. Start the engine. For instructions, refer to the combine operator's manual.
8. Lower the header fully.



## HEADER ATTACHMENT/DETACHMENT

### NOTE:

The float module is equipped with a multicoupler that connects to the combine. If your combine is equipped with individual connectors, a multicoupler kit (single-point connector) must be installed. Refer to Table 4.1, page 352 for a list of kits and installation instructions that are available through your combine Dealer.

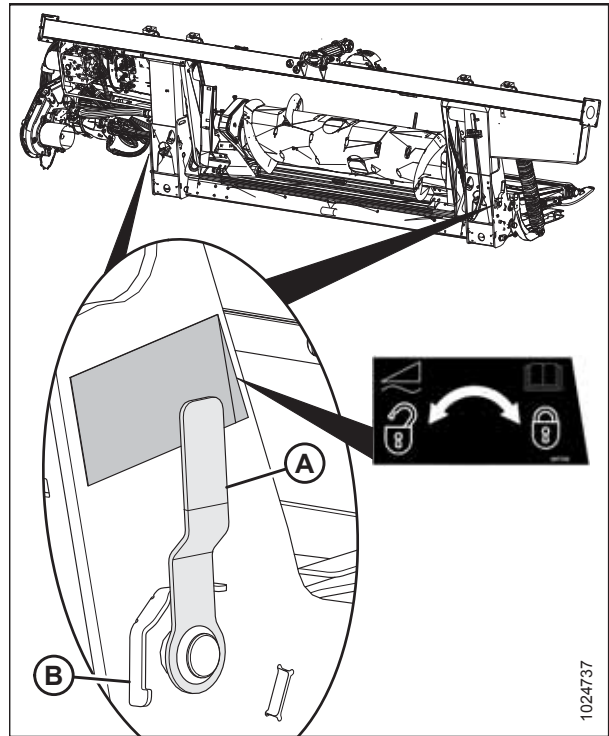
**Table 4.1 Multicoupler Kits**

Combine	AGCO Kit Number
Challenger	71530662
Gleaner R/S Series	71414706
Massey Ferguson	71411594

9. Disengage the float locks by pulling each float lock handle (A) away from the float module and setting it in unlocked position (B).

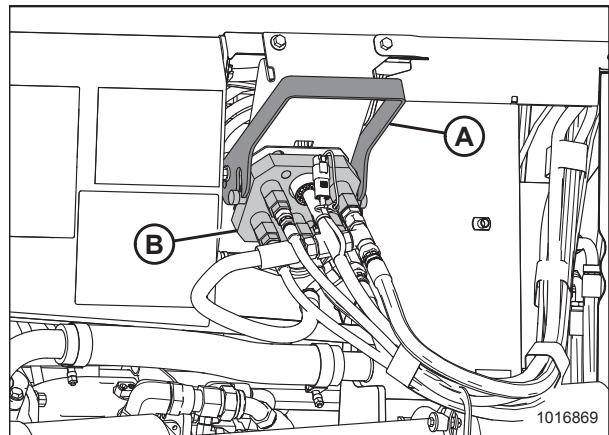
### NOTE:

Illustration at right shows the right side of the header. Float lock on left side of header opposite.



**Figure 4.25: Float Lock Handle**

10. Raise handle (A) to release multicoupler (B) from float module.



**Figure 4.26: Float Module Multicoupler**

## HEADER ATTACHMENT/DETACHMENT

11. Push handle (A) on the combine to the fully-open position.
12. Clean the mating surfaces of multicoupler (B) and receptacle if necessary.

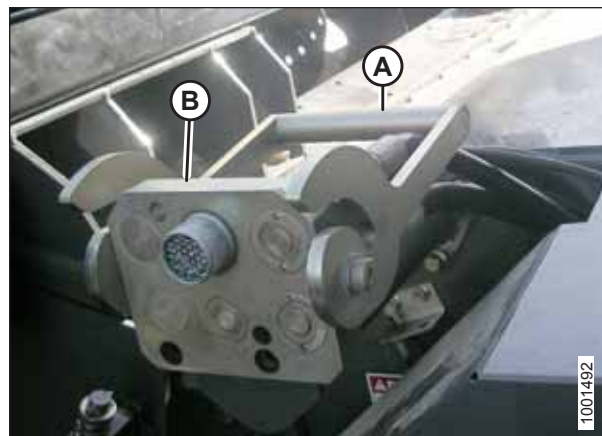


Figure 4.27: Combine Receptacle

13. Position multicoupler (A) onto the combine receptacle, and pull handle (B) to fully engage the multicoupler into the receptacle.
14. Connect reel fore-aft/header tilt selector harness (C) to combine harness (D).

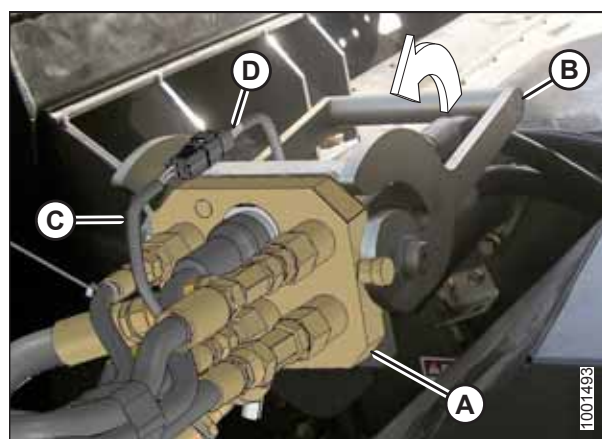


Figure 4.28: Multicoupler

15. Detach safety chain (C) from support bracket (B).
16. Pull collar (D) back to release driveline (A) from support bracket. Remove the driveline from support bracket.

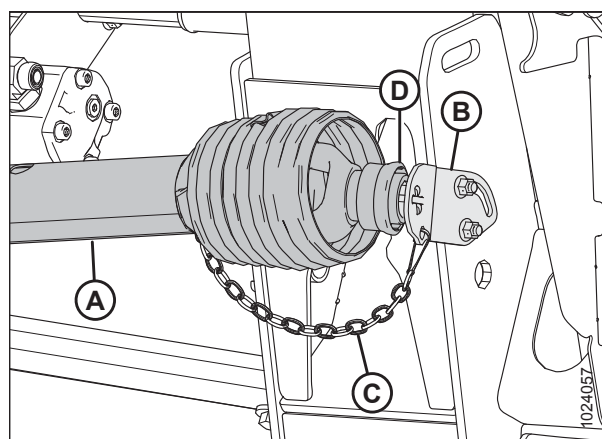


Figure 4.29: Driveline

## HEADER ATTACHMENT/DETACHMENT

17. Pull back collar (A) on the end of the driveline, and push the driveline onto combine output shaft (B) until the collar locks.

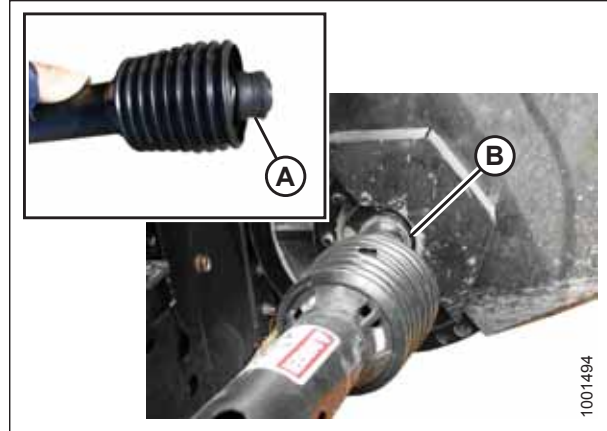


Figure 4.30: Driveline

### 4.3.2 Detaching Header from a Challenger, Gleaner, or Massey Ferguson Combine

#### DANGER

To avoid bodily injury or death from the unexpected start-up or fall of raised machine, always stop the engine, remove the key, and engage the safety props before going under the header for any reason.

1. Choose a level area and position the header slightly above the ground.
2. Shut down the engine, and remove the key from the ignition.

#### IMPORTANT:

If transport wheels are installed, the header may be detached in either transport or field mode. If detaching with the wheels in field mode, set the wheels to the storage or uppermost working position, otherwise the header may tilt forward, making reattachment difficult. For instructions, refer to [Adjusting Stabilizer/Transport Wheels, page 85](#).

#### IMPORTANT:

If stabilizer wheels are installed, set the wheels to the storage or uppermost working position, otherwise the header may tilt forward, making reattachment difficult. For instructions, refer to [Adjusting Stabilizer Wheels, page 84](#).

3. Engage the float locks by pulling each float lock handle (A) away from the float module and setting it in locked position (B).

#### NOTE:

Illustration at right shows the right side of the header. Float lock on left side of header opposite.

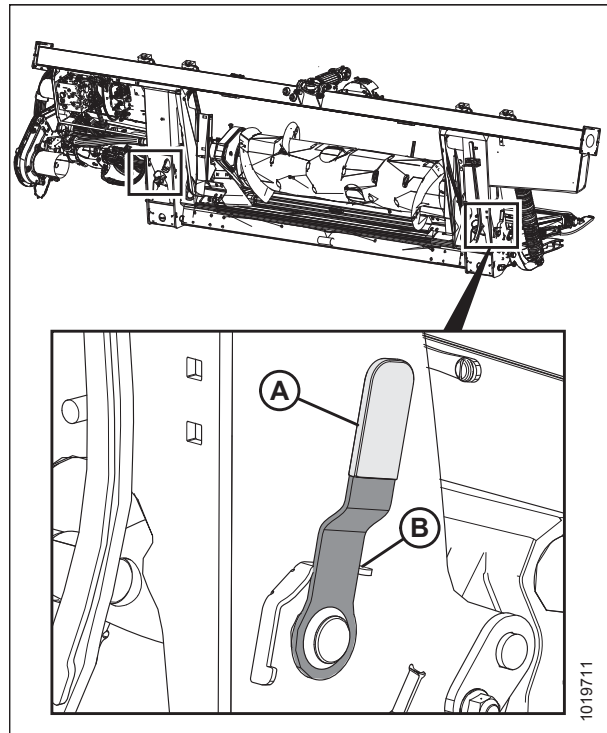


Figure 4.31: Float Lock Handle – Right Shown in Detail, Left Opposite

## HEADER ATTACHMENT/DETACHMENT

4. Disconnect driveline (A) from combine output shaft (B).

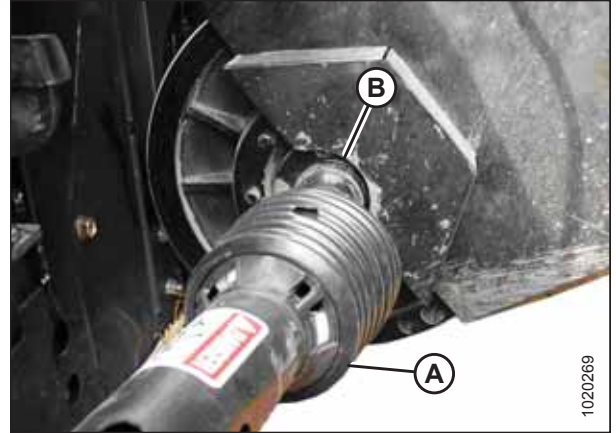


Figure 4.32: Driveline

5. Store driveline (A) on driveline support bracket (B) by pulling back collar (C) on the driveline and fitting it over support bracket body (D). Release the collar so it locks into place over the support bracket body.

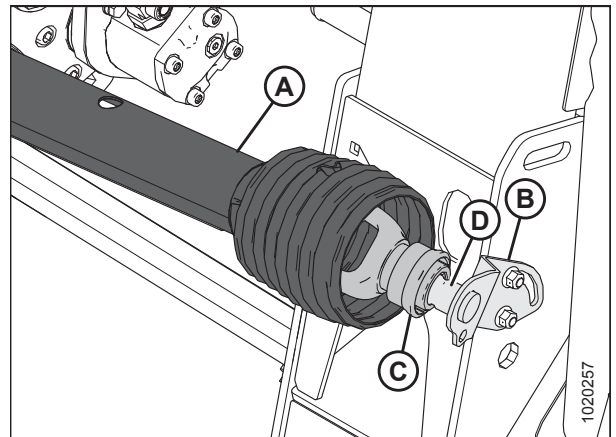


Figure 4.33: Driveline

6. Disconnect the harness at connector (A).
7. Move handle (B) on the combine multicoupler to the full open position to release multicoupler (C) from the combine.

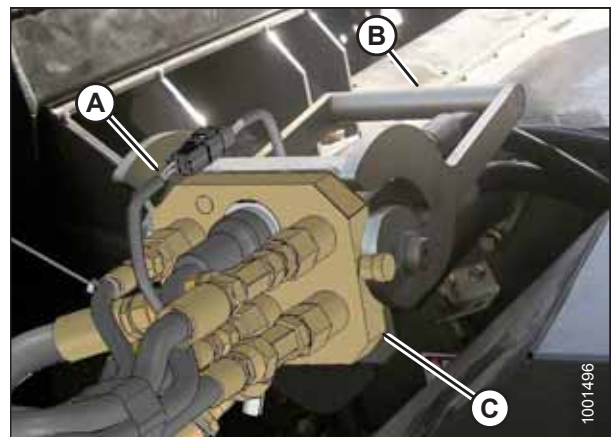


Figure 4.34: Multicoupler

## HEADER ATTACHMENT/DETACHMENT

8. Raise handle (A) on the float module, and place multicoupler (B) on the float module receptacle.
9. Lower handle (A) to lock multicoupler (B).

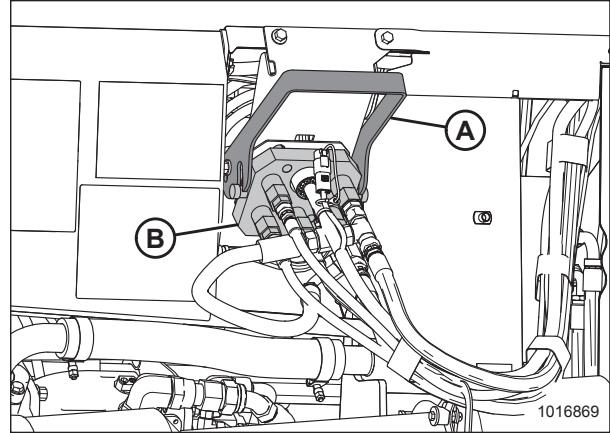


Figure 4.35: Float Module Multicoupler

10. Use lock handle (B) to retract lugs (A) at the base of the feeder house.

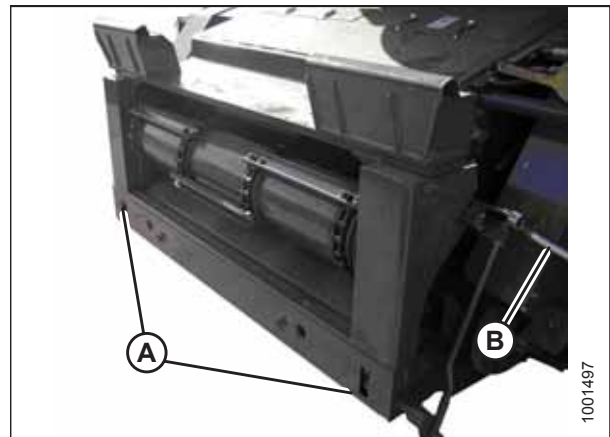


Figure 4.36: Challenger and Massey Ferguson

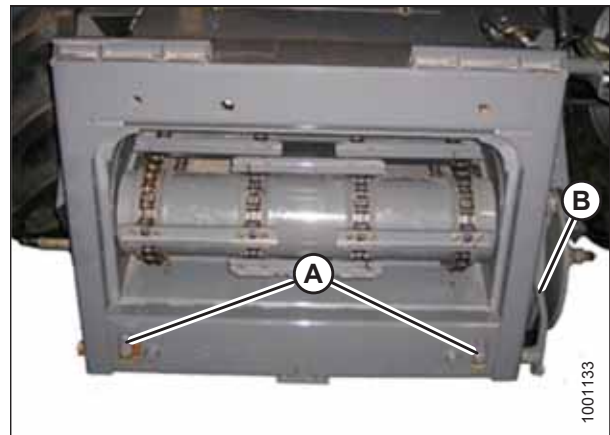


Figure 4.37: Gleaner R and S Series

## HEADER ATTACHMENT/DETACHMENT

11. Lower the feeder house until saddle (A) disengages and clears float module support (B).
12. Back the combine away slowly from the float module.

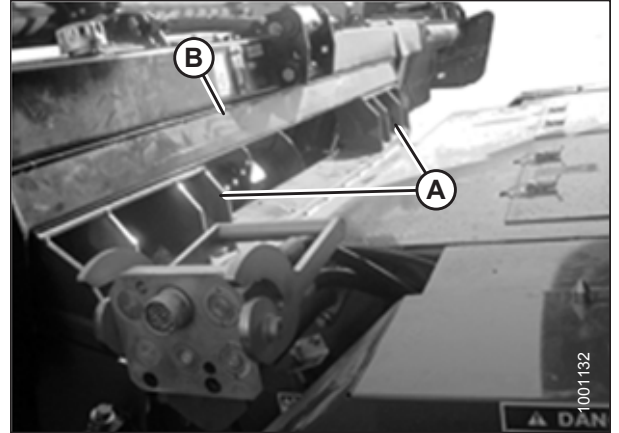


Figure 4.38: Float Module on Combine



## 4.4 AGCO IDEAL™ Series Combines

### 4.4.1 Attaching Header to an AGCO IDEAL™ Series Combine

#### WARNING

To avoid bodily injury or death from unexpected startup of machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Shut down the engine, and remove the key from the ignition.
2. Pull lever (A) up to retract pins (B) at the bottom left and right sides of the feeder house.
3. Start the engine. For instructions, refer to the combine operator's manual.

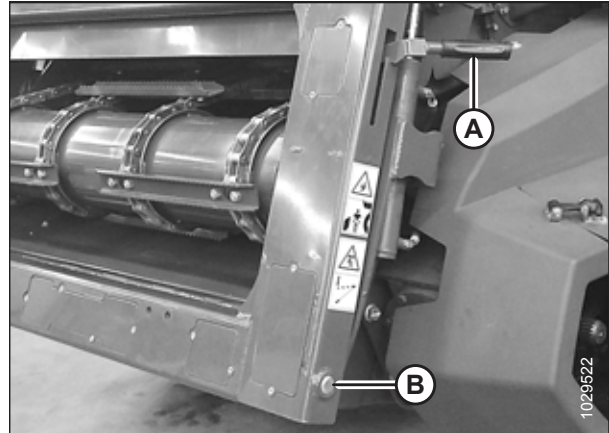


Figure 4.39: Feeder House

4. Drive the combine slowly up to the header until the feeder house is directly under top beam (A), and pins (B) are under hooks (C) on the transition frame.

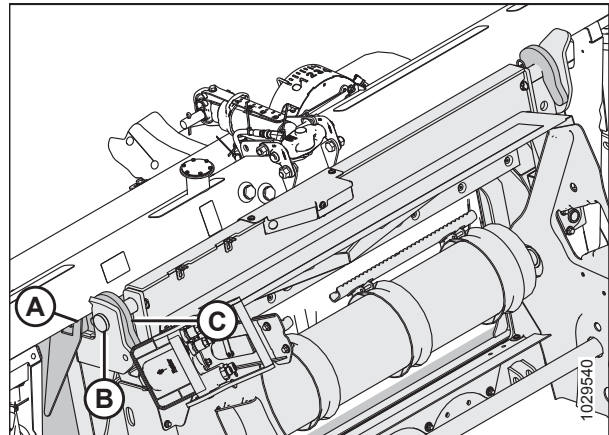


Figure 4.40: Feeder House



## HEADER ATTACHMENT/DETACHMENT

5. Raise feeder house until transition frame top beam (A) is fully resting on the feeder house. Raise the header slightly off the ground.

### IMPORTANT:

The full weight of the header must be on the feeder house, **NOT** on pins (B).

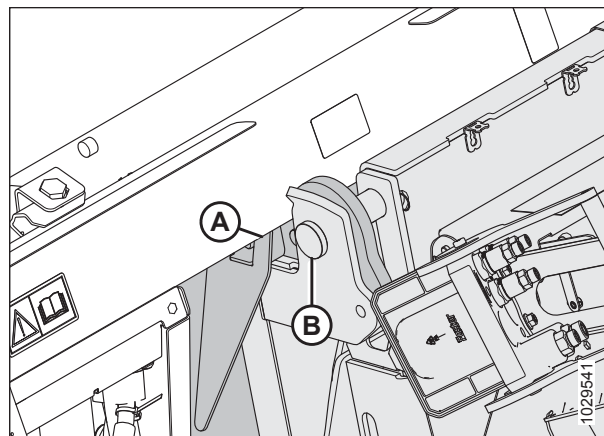


Figure 4.41: Top Beam Resting on Feeder House

6. Position bottom of feeder house so that locking pins (B) align with the holes in mount (C).
7. Push lever (A) down to extend locking pins (B) so they engage in mount (C).

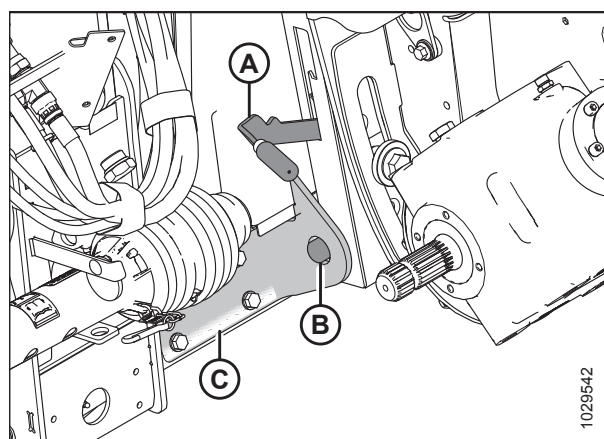


Figure 4.42: Feeder House Locking Pins

8. Rotate lock disc (A) upward and remove driveline (B) from the support.

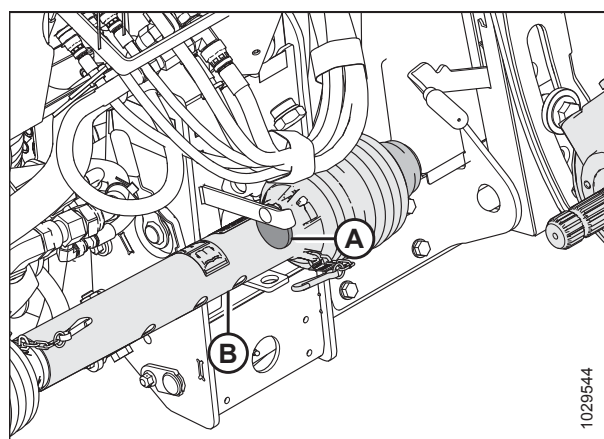


Figure 4.43: Driveline in Storage Position

## HEADER ATTACHMENT/DETACHMENT

9. Pull back collar (A) on end of driveline and push onto combine output shaft (B) until collar locks.

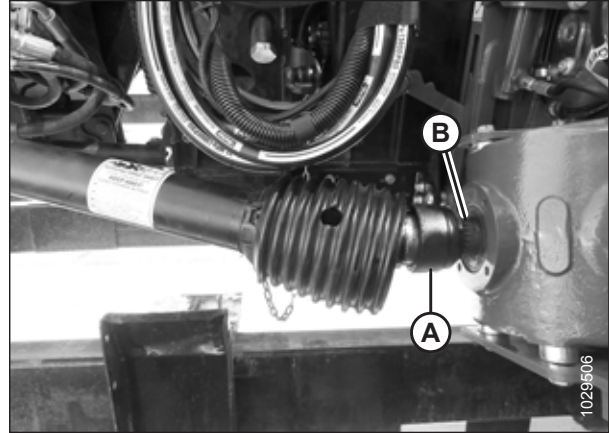


Figure 4.44: Connecting Driveline to Combine

10. Lower handle (A) to release multicoupler (B) from header.
11. Open cover (C) on the combine receptacle.
12. Push handle (D) to fully open position.
13. Clean mating surfaces of coupler and receptacle if necessary.

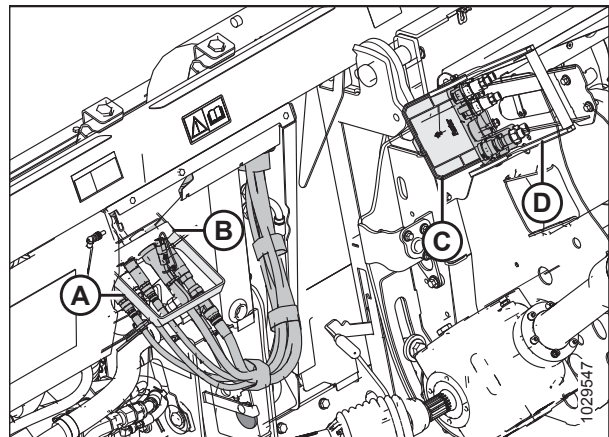


Figure 4.45: Multicoupler Receptacles

14. Position coupler (A) onto combine receptacle, and pull handle (B) to fully engage multicoupler into receptacle.

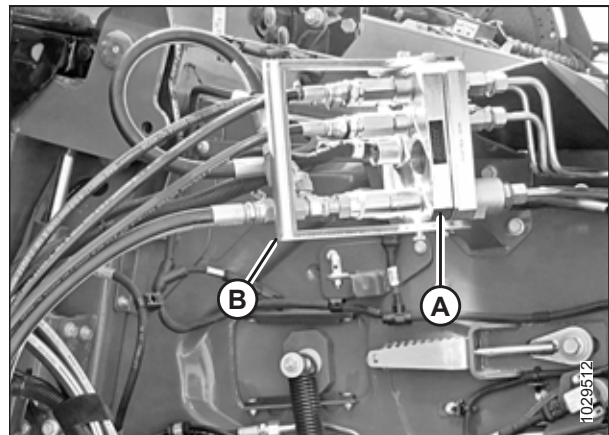


Figure 4.46: Multicoupler

### 4.4.2 Detaching Header from an AGCO IDEAL™ Series Combine

#### **WARNING**

To avoid bodily injury or death from unexpected startup of machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

## HEADER ATTACHMENT/DETACHMENT

1. Park the combine on a level surface.
2. Lower the header fully.
3. Shut down the engine, and remove the key from the ignition.
5. Push combine receptacle handle (B) to fully-open position to release multicoupler (A).

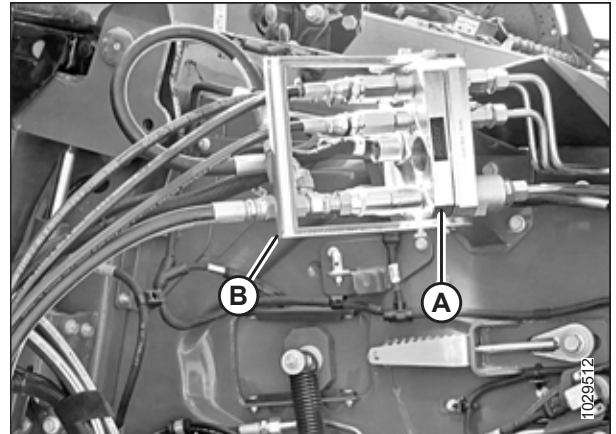


Figure 4.47: Combine Receptacle

6. Position multicoupler (B) onto header receptacle, and move handle (A) to a vertical position to lock the multicoupler.

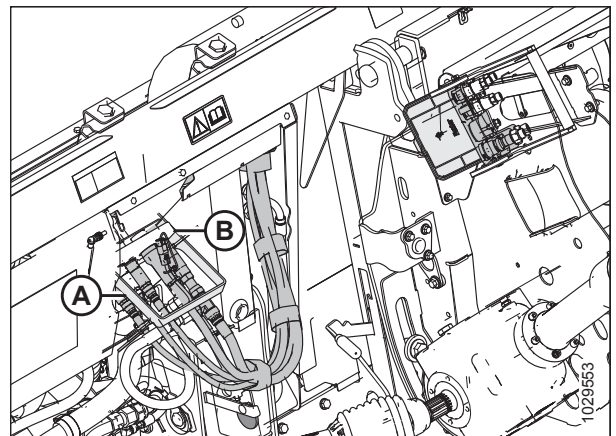


Figure 4.48: Locking Multicoupler

7. Pull back driveline collar (A) and remove the driveline from combine output shaft (B).

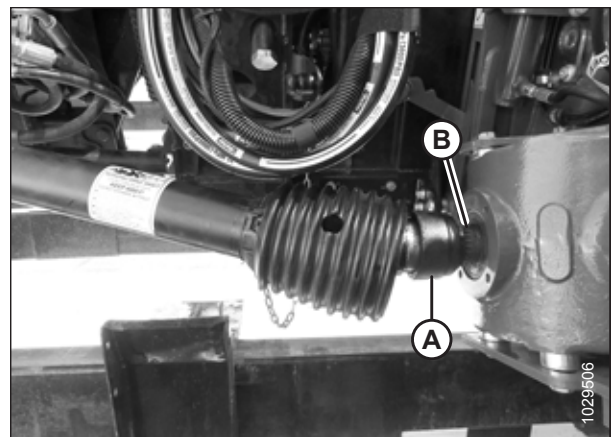


Figure 4.49: Detaching Driveline

## HEADER ATTACHMENT/DETACHMENT

8. Rotate lock disc (A) and slide driveline (B) onto the support.
9. Lower lock disc (A) to secure driveline (B) onto the support.

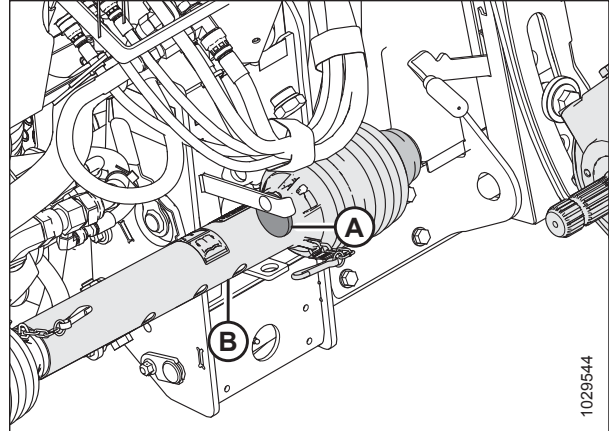


Figure 4.50: Driveline in Storage Position

10. Pull lever (A) up to retract pins (B) at the base of the feeder house.

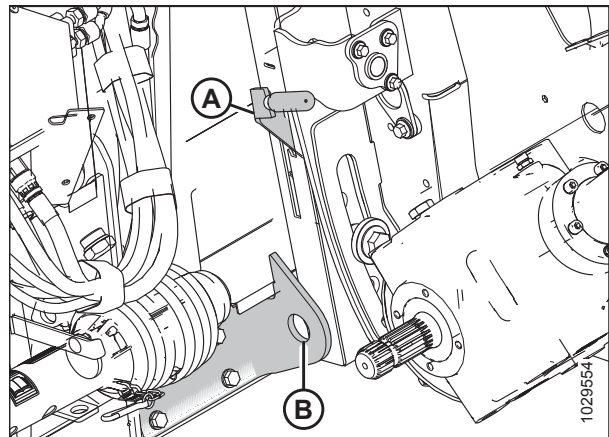


Figure 4.51: Feeder House Locking Pins

11. Start the combine and lower the header to the ground until feeder house pins (A) are clear of hooks (B).
12. Slowly back combine away from header.

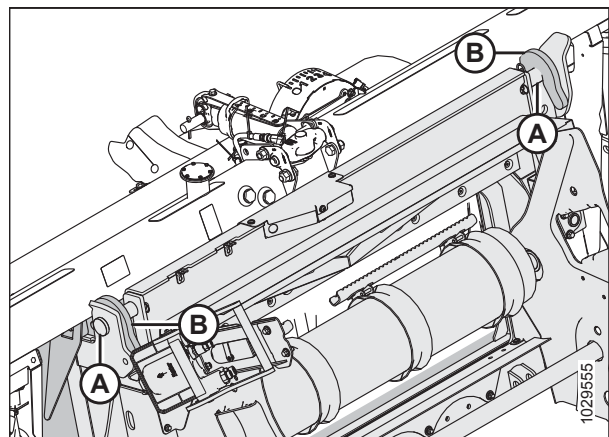


Figure 4.52: Lowering Feeder House

## 4.5 John Deere Combines

The D1 Series Draper Header is compatible with John Deere 60, 70, S, and T Series combines.

### 4.5.1 Attaching Header to John Deere Combine

#### DANGER

To avoid injury or death from unexpected start-up of machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Shut down the engine, and remove the key from the ignition.
2. Push handle (A) on the combine multicoupler receptacle towards the feeder house to retract pins (B) at the bottom corners of the feeder house. Clean the receptacle.

#### DANGER

Never start or move the machine until you are sure all bystanders have cleared the area.

3. Start the engine and slowly drive the combine up to the header until feeder house saddle (C) is directly under float module top cross member (D).
4. Raise the feeder house slightly to lift the header ensuring the feeder house saddle is properly engaged in the float module frame.
5. Shut down the engine, and remove the key from the ignition.
6. Pull handle (A) on the float module to release multicoupler (B) from the storage position. Remove the multicoupler, and push the handle back into the float module to store.

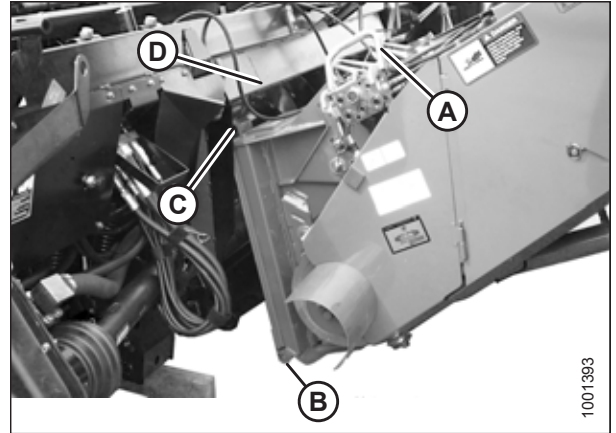


Figure 4.53: Combine and Float Module

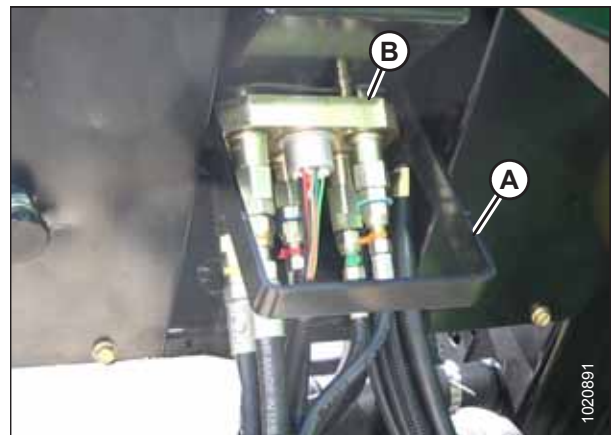


Figure 4.54: Multicoupler Storage



## HEADER ATTACHMENT/DETACHMENT

7. Position multicoupler (A) onto the receptacle, and pull handle (B) to engage the lugs on the multicoupler into the handle.
8. Pull handle (B) to a horizontal position and ensure multicoupler (A) is fully engaged into the receptacle.

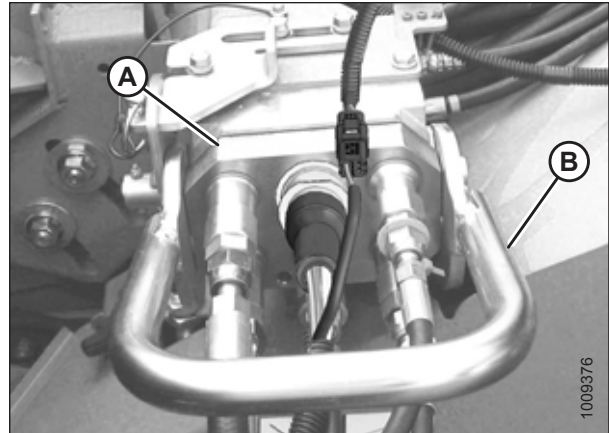


Figure 4.55: Multicoupler

9. Ensure that both feeder house pins (A) are fully engaged into the float module brackets.

**NOTE:**

If pins (A) do not fully engage the float module brackets, loosen bolts (B) and adjust the bracket as required.

10. Tighten bolts (B).

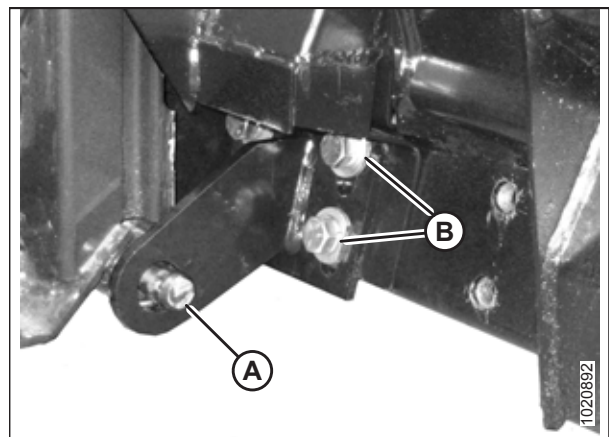


Figure 4.56: Feeder House Pin

11. Slide latch (A) to lock handle (B) in position and secure with lynch pin (C).
12. If the float module is equipped with the reel fore-aft/header tilt selector, connect harness (D) to combine connector (E).

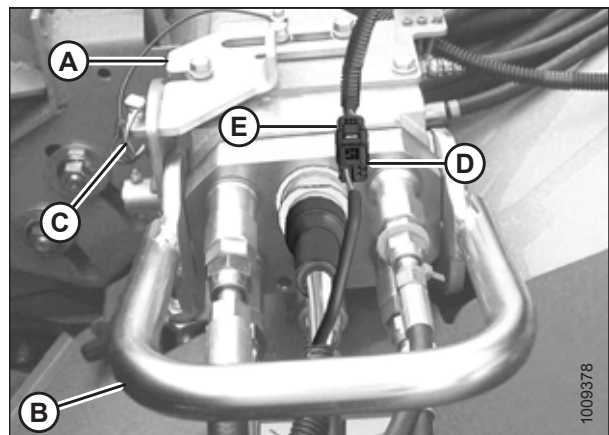


Figure 4.57: Multicoupler

## HEADER ATTACHMENT/DETACHMENT

13. Detach safety chain (C) from support bracket (B).
14. Pull collar (D) back to release driveline (A) from support bracket. Remove the driveline from the support bracket.

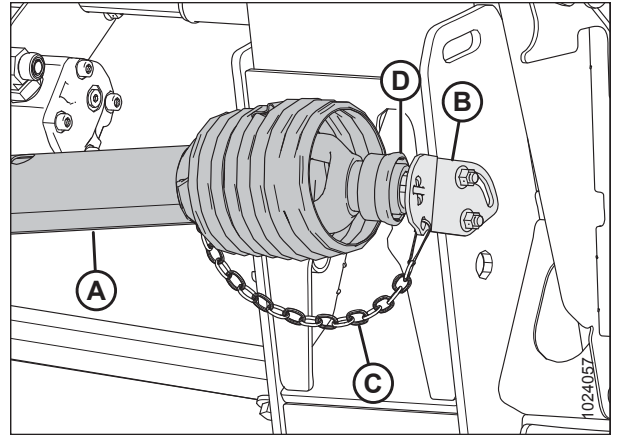


Figure 4.58: Driveline

15. Pull back collar (A) on the end of the driveline, and push the driveline onto combine output shaft (B) until the collar locks.

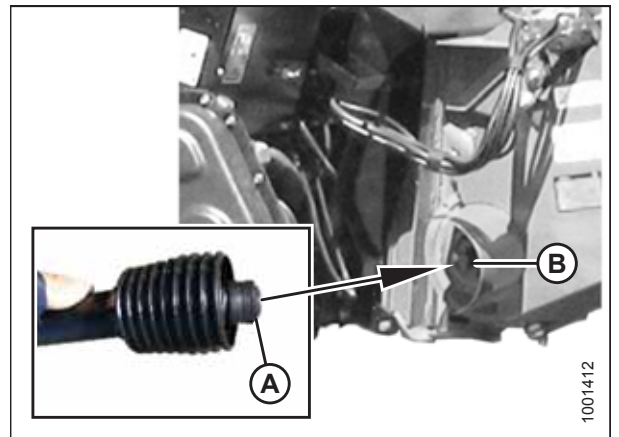


Figure 4.59: Driveline



## HEADER ATTACHMENT/DETACHMENT

16. Disengage the float locks by pulling each float lock handle (A) away from the float module, and setting it in unlocked position (B).

**NOTE:**

Illustration at right shows the right side of the header. Float lock on left side of header opposite.

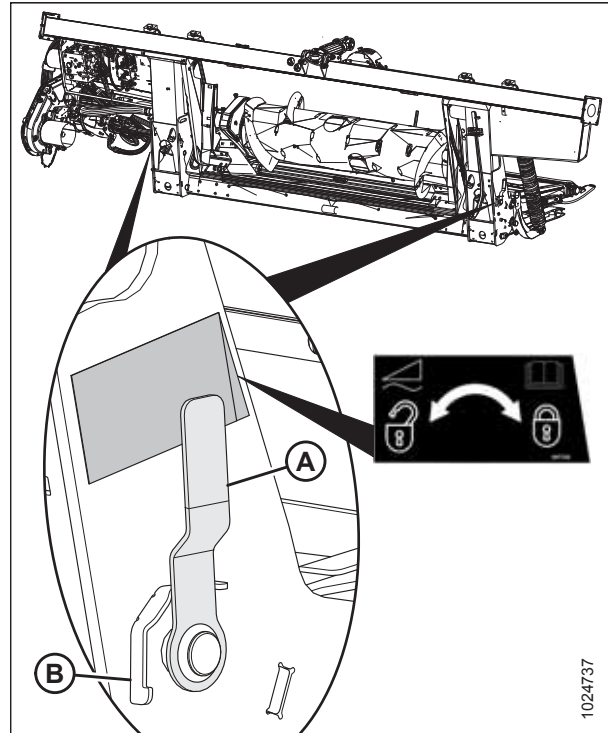


Figure 4.60: Float Lock Handle

### 4.5.2 Detaching Header from John Deere Combine

**⚠ DANGER**

To avoid bodily injury or death from the unexpected start-up or fall of raised machine, always stop the engine, remove the key, and engage the safety props before going under the header for any reason.

## HEADER ATTACHMENT/DETACHMENT

1. Choose a level area and position the header slightly above the ground.
2. Shut down the engine, and remove the key from the ignition.

### IMPORTANT:

If transport wheels are installed, the header may be detached in either transport or field mode. If detaching with the wheels in field mode, set the wheels to the storage or uppermost working position, otherwise the header may tilt forward, making reattachment difficult. For instructions, refer to [Adjusting Stabilizer/Transport Wheels, page 85](#).

### IMPORTANT:

If stabilizer wheels are installed, set the wheels to the storage or uppermost working position, otherwise the header may tilt forward, making reattachment difficult. For instructions, refer to [Adjusting Stabilizer Wheels, page 84](#).

3. Engage the float locks by pulling each float lock handle (A) away from the float module and setting it in locked position (B).

### NOTE:

Illustration at right shows the right side of the header. Float lock on left side of header opposite.

4. Open shield (A) on the combine, pull back the collar on driveline (B), and pull the driveline off the combine output shaft.

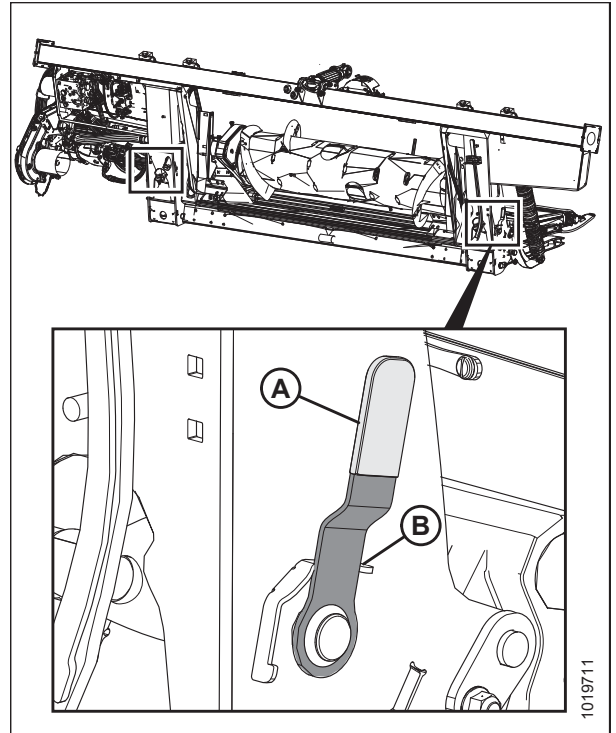


Figure 4.61: Float Lock Handle

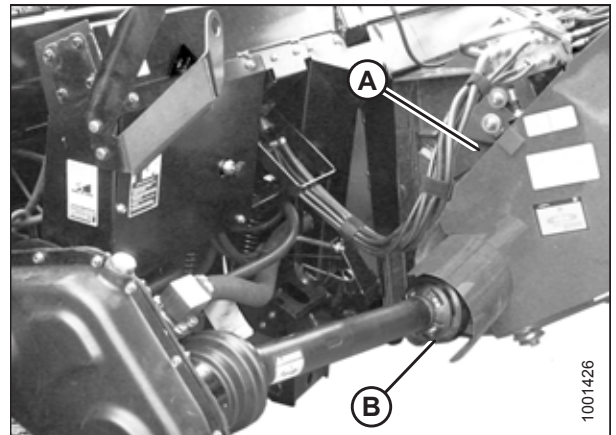


Figure 4.62: Driveline

## HEADER ATTACHMENT/DETACHMENT

5. Store driveline (A) on driveline support bracket (B) by pulling back collar (C) on the driveline and fitting it over support bracket body (D). Release the collar so it locks into place over the support bracket body.

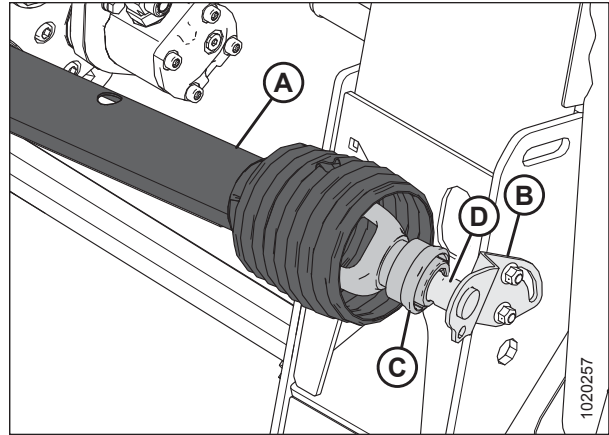


Figure 4.63: Driveline

6. Lift handle (A) on the float module.

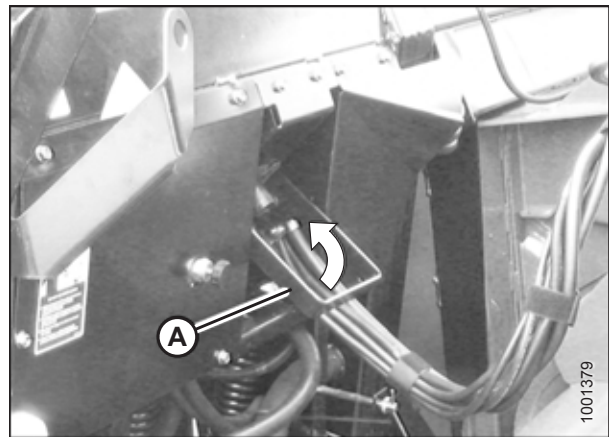


Figure 4.64: Multicoupler Storage

7. Disconnect harness (A) from the combine connector.
8. Remove lynch pin (B) and slide lock (C) to release handle (D).
9. Lift handle (D) to full vertical position to release multicoupler (E) from the combine.

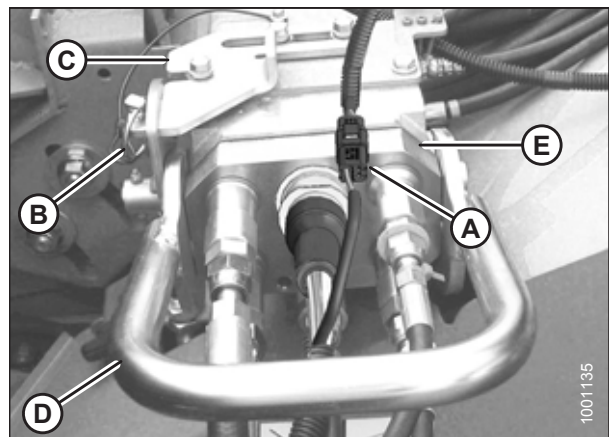


Figure 4.65: Multicoupler

## HEADER ATTACHMENT/DETACHMENT

10. Position multicoupler (A) on the float module receptacle and lower handle (B) to lock the multicoupler.

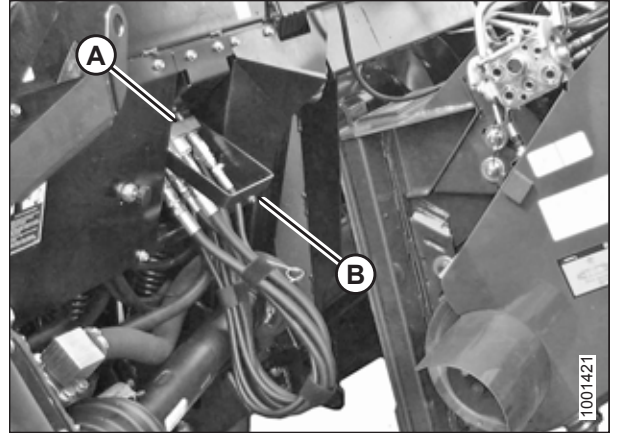


Figure 4.66: Multicoupler Storage

11. Push handle (A) on the combine towards the feeder house to disengage feeder house pin (B) from the float module.

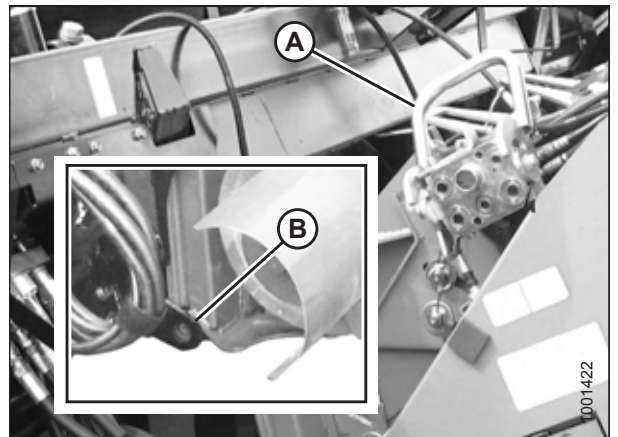


Figure 4.67: Feeder House Locks

12. Lower the feeder house until saddle (A) disengages and clears float module support (B).
13. Back the combine away slowly from the float module.

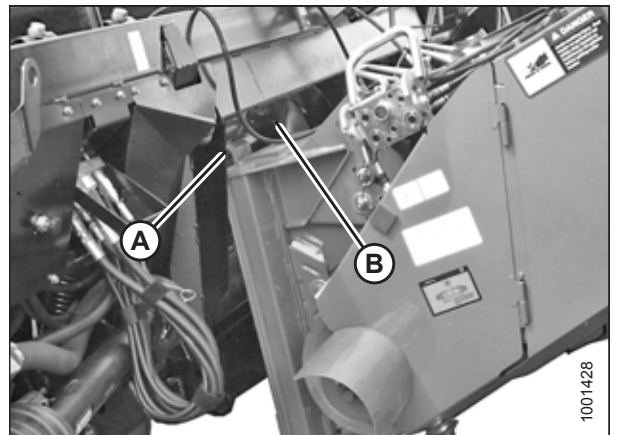


Figure 4.68: Float Module and Feeder House

## 4.6 CLAAS Combines

The D1 Series Draper Header is compatible with CLAAS 500, 600, and 700 series, Tucano, and 7000, 8000 series combines.

**NOTE:**

Older Tucano combines (model year 2006 and prior) are incompatible with D1 Series Draper Headers.

### 4.6.1 Attaching Header to CLAAS Combine

**⚠ DANGER**

To avoid injury or death from unexpected start-up of machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Shut down the engine, and remove the key from the ignition.
2. Move handle (A) on the float module into the raised position, and ensure pins (B) at the bottom corners of the float module are retracted.

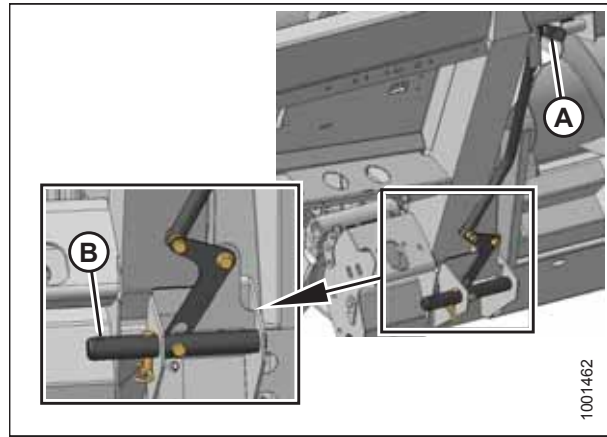


Figure 4.69: Pins Retracted

**⚠ DANGER**

Never start or move the machine until you are sure all bystanders have cleared the area.

3. Start the engine and slowly drive the combine up to the header until feeder house saddle (A) is directly under float module top cross member (B).
4. Raise the feeder house slightly to lift the header, ensuring the feeder saddle is properly engaged in the float module frame.
5. Shut down the engine, and remove the key from the ignition.

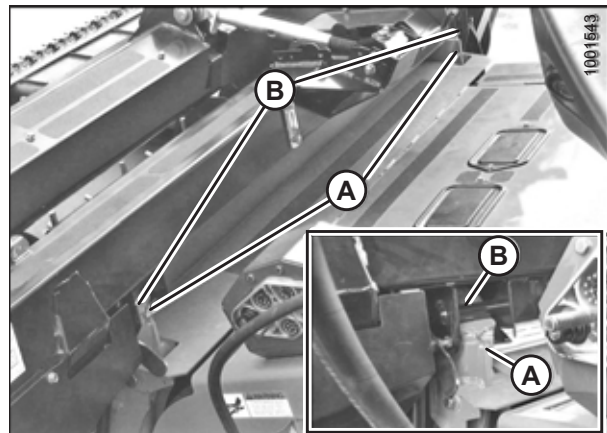


Figure 4.70: Header on Combine

## HEADER ATTACHMENT/DETACHMENT

6. Remove locking pin (B) from float module pin (A).

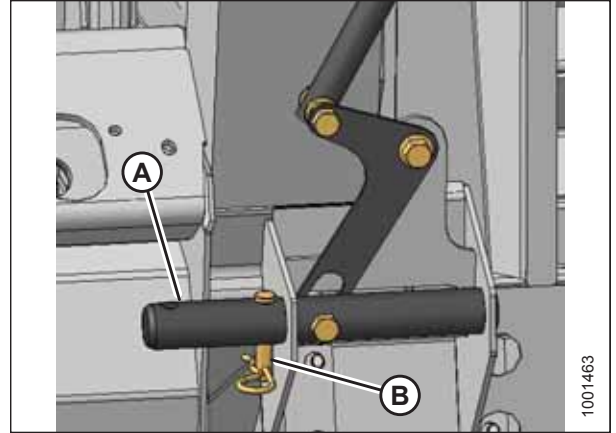


Figure 4.71: Locking Pins

7. Lower handle (A) to engage float module pins (B) into the feeder house. Reinsert locking pin (C) and secure with the hairpin.

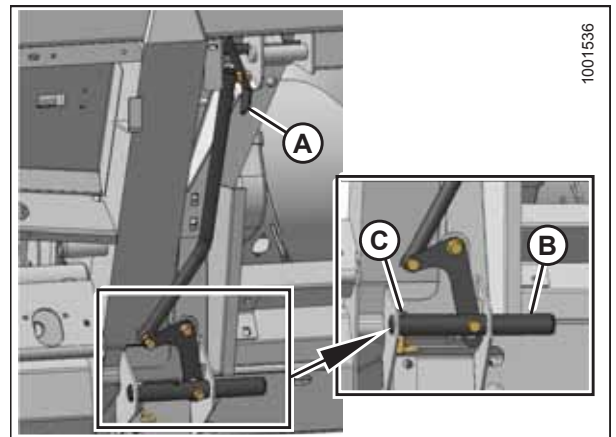


Figure 4.72: Engaging Pins

8. Unscrew knob (A) on combine coupler (B) to release the coupler from the receptacle.
9. Clean coupler (B) and receptacle.

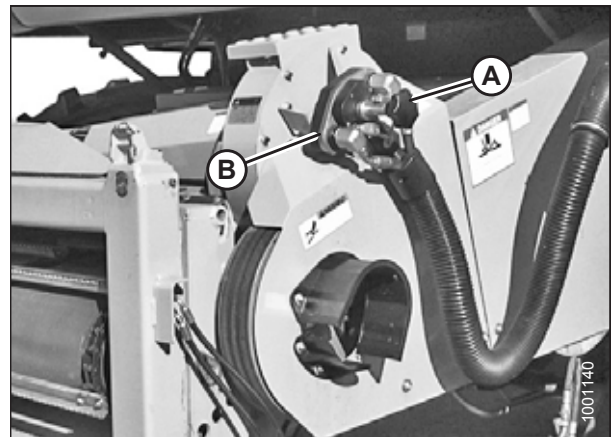


Figure 4.73: Combine Coupler



## HEADER ATTACHMENT/DETACHMENT

10. Place float module receptacle cover (A) onto the combine receptacle.

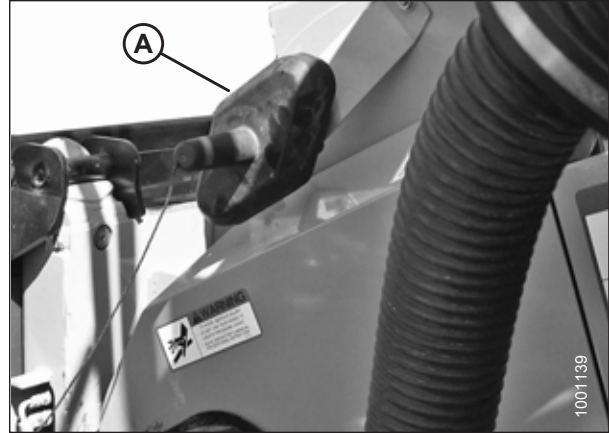


Figure 4.74: Receptacle Cover

11. Clean mating surface of coupler (A) and position onto float module receptacle (C).
12. Turn knob (B) to secure the coupler to the receptacle.

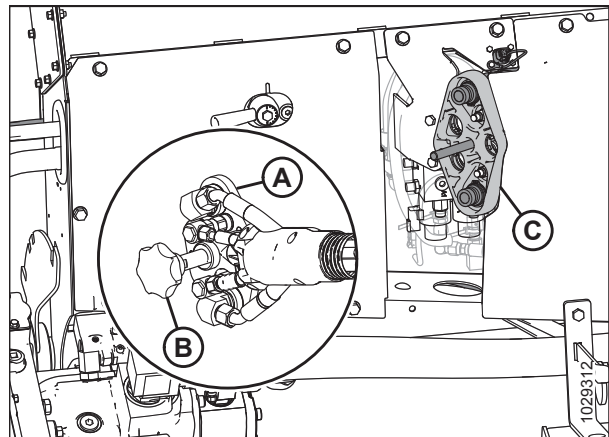


Figure 4.75: Coupler

13. Detach safety chain (C) from support bracket (B).
14. Pull collar (D) back to release driveline (A) from support bracket. Remove the driveline from the support bracket.

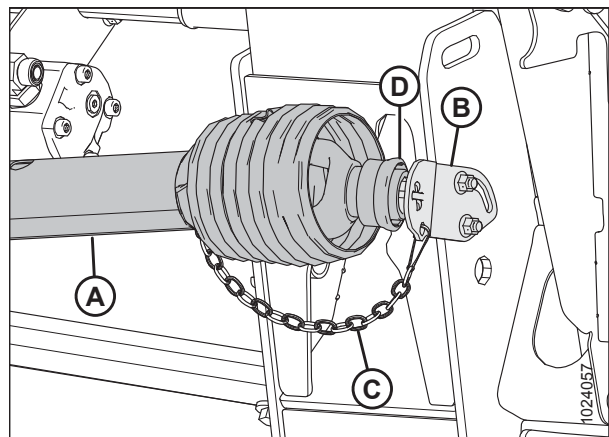


Figure 4.76: Driveline



## HEADER ATTACHMENT/DETACHMENT

15. Attach driveline (A) to the combine output shaft.

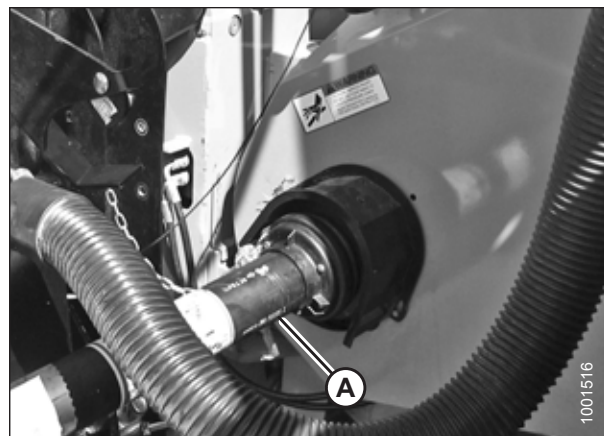


Figure 4.77: Driveline and Output Shaft

16. Disengage both header float locks by pulling each float lock handle (A) away from the float module and setting it in unlocked position (B).

**NOTE:**

Illustration at right shows the right side of the header. Float lock on left side of header opposite.

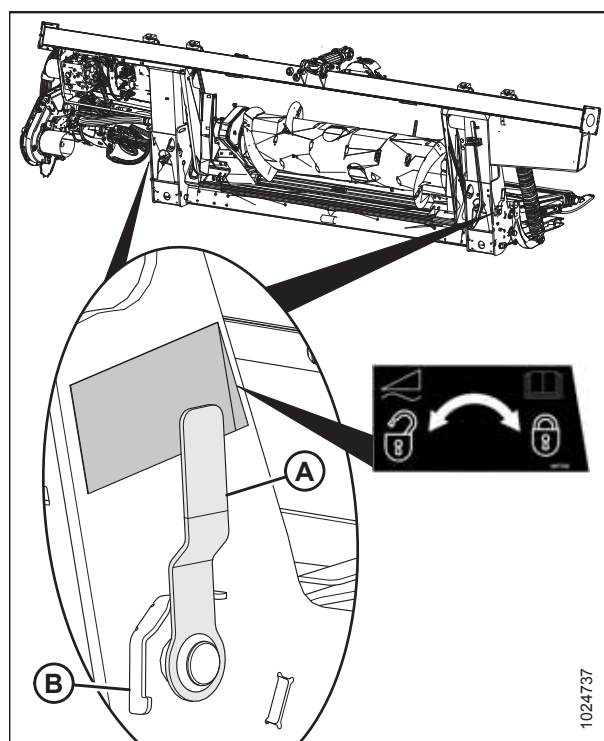


Figure 4.78: Float Lock Handle

### 4.6.2 Detaching Header from CLAAS Combine

**⚠ DANGER**

To avoid injury or death from unexpected start-up of machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

## HEADER ATTACHMENT/DETACHMENT

1. Choose a level area and position the header slightly above the ground.
2. Shut down the engine, and remove the key from the ignition.

### IMPORTANT:

If transport wheels are installed, the header may be detached in either transport or field mode. If detaching with the wheels in field mode, set the wheels to the storage or uppermost working position, otherwise the header may tilt forward, making reattachment difficult. For instructions, refer to [Adjusting Stabilizer/Transport Wheels, page 85](#).

### IMPORTANT:

If stabilizer wheels are installed, set the wheels to the storage or uppermost working position, otherwise the header may tilt forward, making reattachment difficult. For instructions, refer to [Adjusting Stabilizer Wheels, page 84](#).

3. Engage the float locks by pulling each float lock handle (A) away from the float module and setting it in locked position (B).

### NOTE:

Illustration at right shows the right side of the header. Float lock on left side of header opposite.

4. Disconnect driveline (A) from the combine.

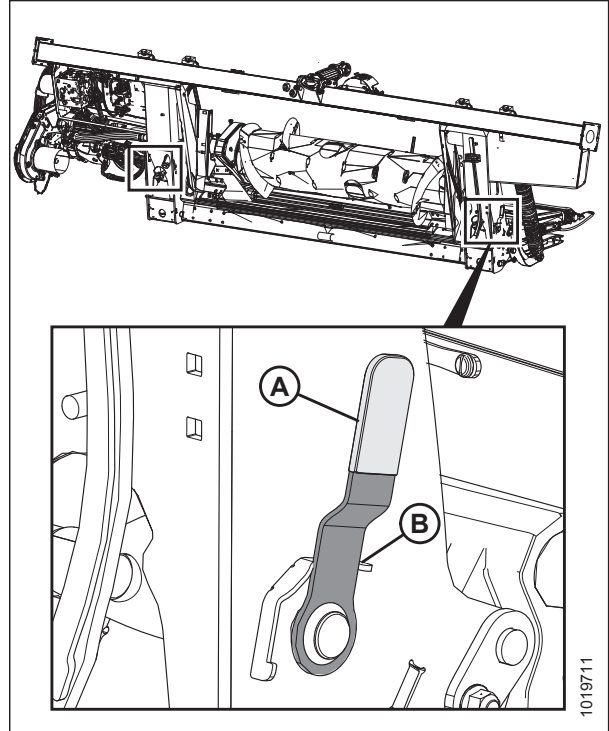


Figure 4.79: Float Lock Handle

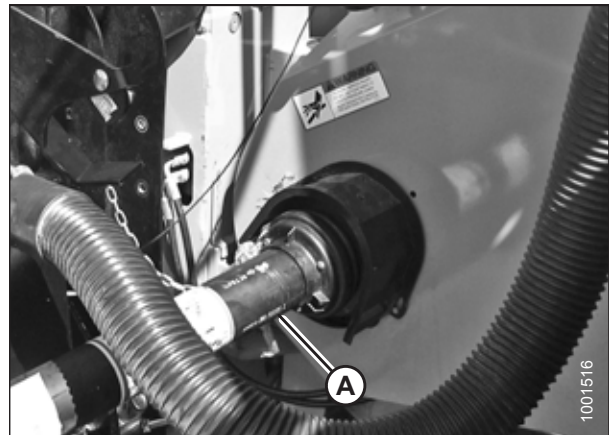


Figure 4.80: Driveline

## HEADER ATTACHMENT/DETACHMENT

5. Store driveline (A) on driveline support bracket (B) by pulling back collar (C) on the driveline and fitting it over support bracket body (D). Release the collar so it locks into place over the support bracket body.

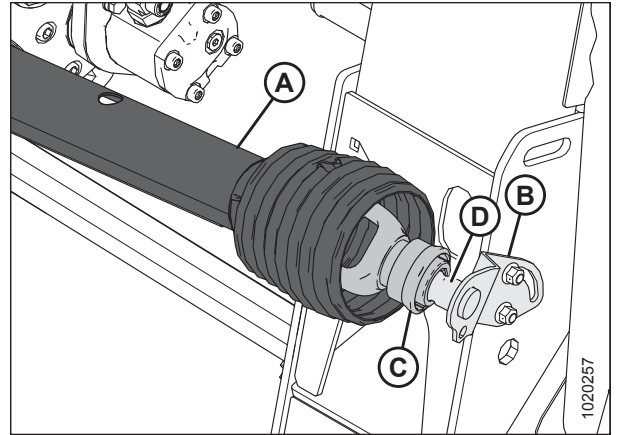


Figure 4.81: Driveline

6. Remove cover (A) from the combine receptacle.

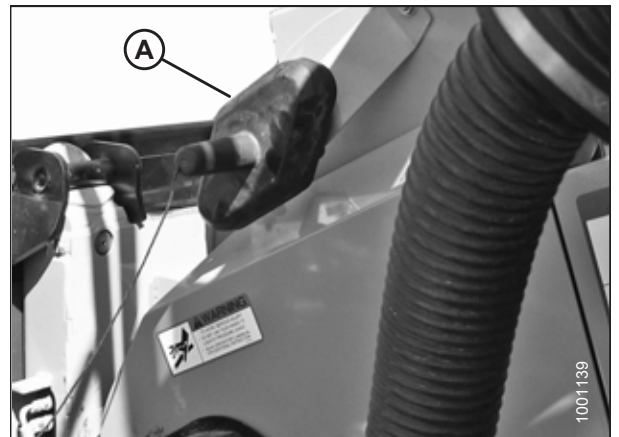


Figure 4.82: Cover

7. Position coupler (A) onto the combine receptacle, and turn knob (B) to secure the coupler to the receptacle.

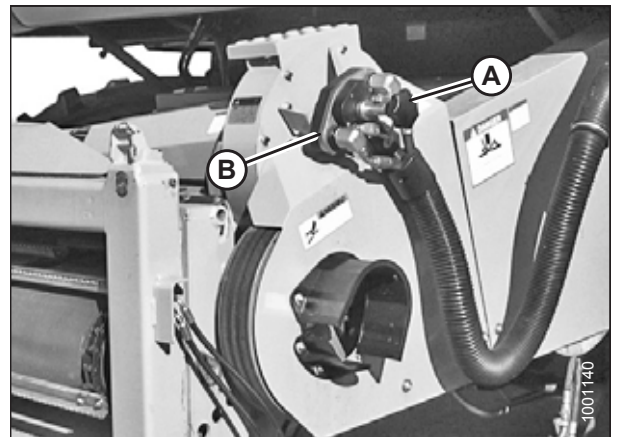


Figure 4.83: Combine Coupler

## HEADER ATTACHMENT/DETACHMENT

- Place cover (A) on the float module receptacle.

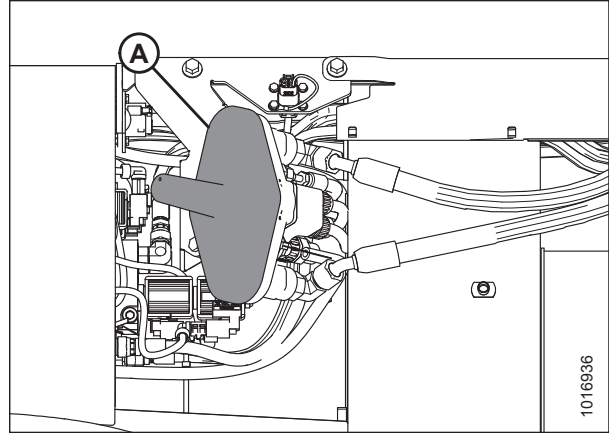


Figure 4.84: Float Module

- Remove locking pin (A) from float module pin (B).
- Raise handle (C) to disengage float module pins (B) from the feeder house.
- Replace locking pin (A) in the float module pin, and secure with the hairpin.

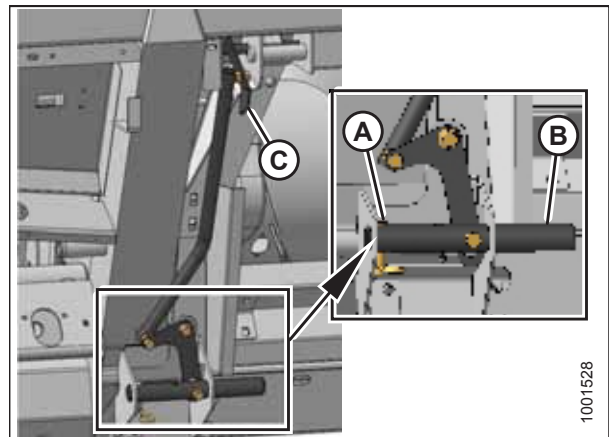


Figure 4.85: Feeder House Locks

- Lower the feeder house until feeder house posts (A) disengage float module (B).
- Back the combine away slowly from the float module.

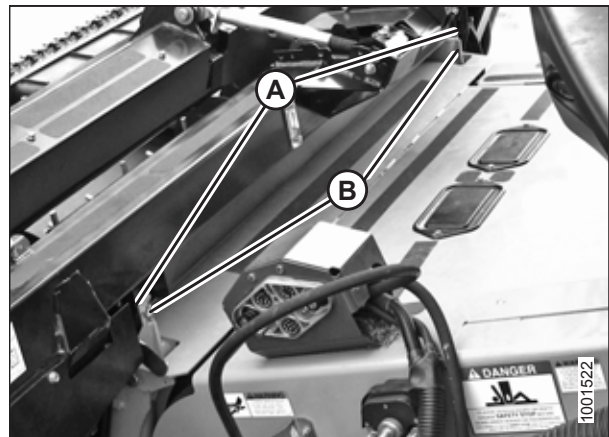


Figure 4.86: Header on Combine

## 4.7 New Holland Combines

The D1 Series Draper Header is compatible with the following New Holland combines:

**Table 4.2 Header and Combine Compatibility**

Series	Combine Model
CR	920, 940, 960, 970, 980
	9020, 9040, 9060, 9065, 9070, 9080
	6090, 7090, 8080, 8090, 9090
	6.80, 6.90, 7.90, 8.90, 9.90, 10.90
CX	840, 860, 870, 880
	8070, 8080, 8090
	8080 Elevation, 8090 Elevation

### 4.7.1 Attaching Header to New Holland CR/CX Combine

#### DANGER

To avoid injury or death from unexpected start-up of machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Ensure handle (A) is positioned so locks (B) can engage the float module.

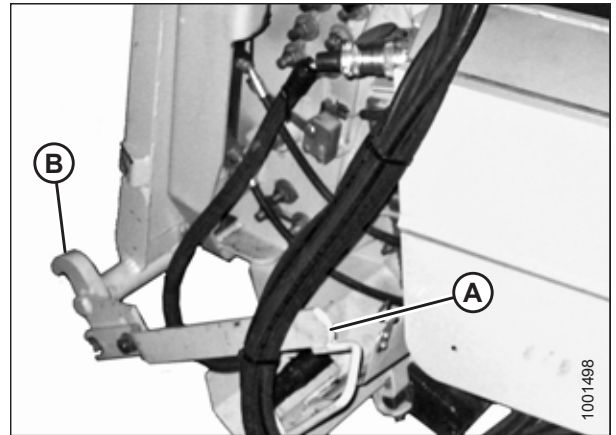


Figure 4.87: Feeder House Locks

## HEADER ATTACHMENT/DETACHMENT

### DANGER

Never start or move the machine until you are sure all bystanders have cleared the area.

2. Start the engine and slowly drive the combine up to the float module until feeder house saddle (A) is directly under float module top cross member (B).
3. Raise the feeder house slightly to lift the header, ensuring the feeder saddle is properly engaged in the float module frame.
4. Shut down the engine, and remove the key from the ignition.

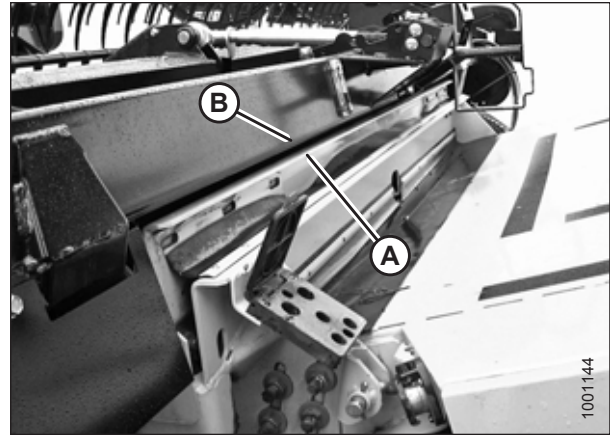


Figure 4.88: Header on Combine

5. Lift lever (A) on the float module on the left side of the feeder house, and push handle (B) on the combine to engage locks (C) on both sides of the feeder house.
6. Push down on lever (A) so the slot in the lever engages the handle and locks the handle in place.
7. If the lock does not fully engage pin (D) on the float module when lever (A) and handle (B) are engaged, loosen bolts (E) and adjust lock (C). Retighten bolts.

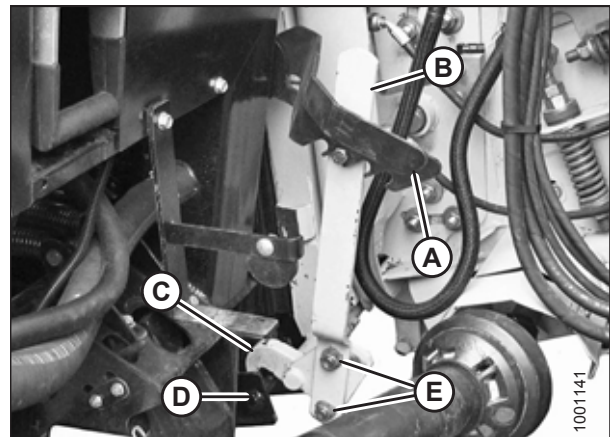


Figure 4.89: Feeder House Locks

8. Open the cover on receptacle (A) located on the left side of the float module.
9. Push in lock button (B) and pull handle (C) to the fully open position.
10. Clean the receptacle mating surfaces.

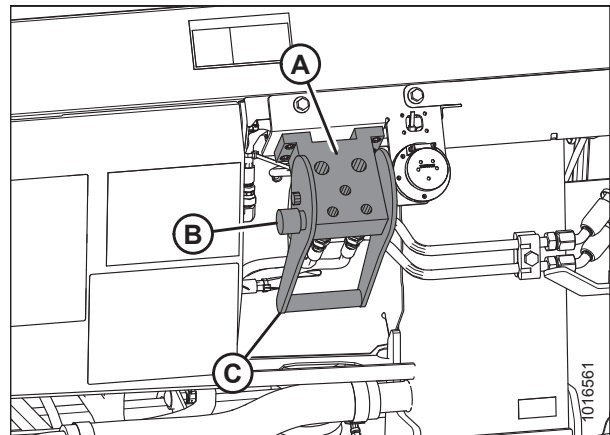


Figure 4.90: Float Module Receptacle



## HEADER ATTACHMENT/DETACHMENT

11. Remove hydraulic quick coupler (A) from the storage plate on the combine, and clean the mating surface of the coupler.

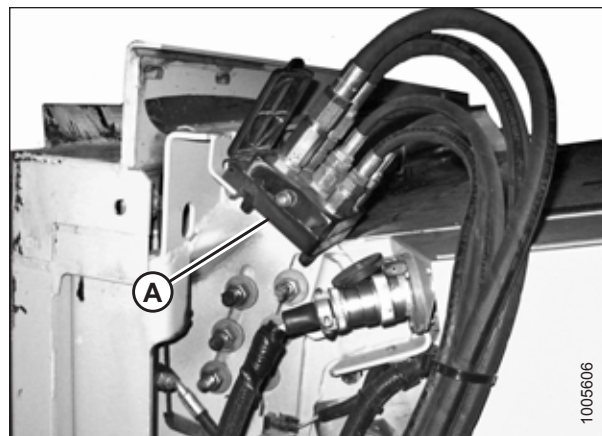


Figure 4.91: Combine Coupler

12. Position coupler (A) onto the float module receptacle, and push handle (B) to engage the pins into the receptacle.
13. Push handle (B) to closed position until lock button (C) snaps out.
14. Remove the cover on the float module electrical receptacle.
15. Remove connector (D) from the combine.
16. Align lugs on connector (D) with the slots in the float module receptacle, and push the connector onto the receptacle. Turn the collar on the connector to lock it in place.

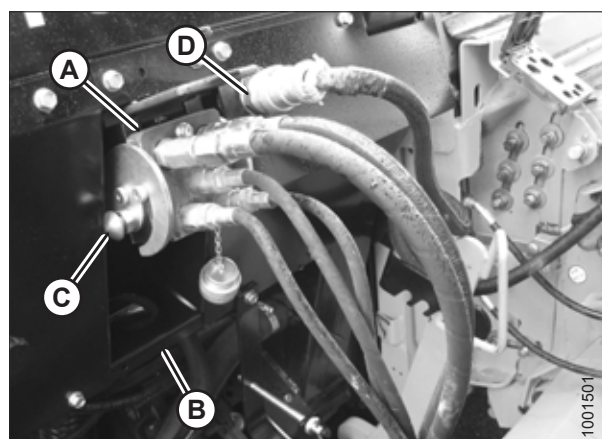


Figure 4.92: Connections

17. Detach safety chain (C) from support bracket (B).
18. Pull collar (D) back to release driveline (A) from support bracket. Remove the driveline from support bracket.

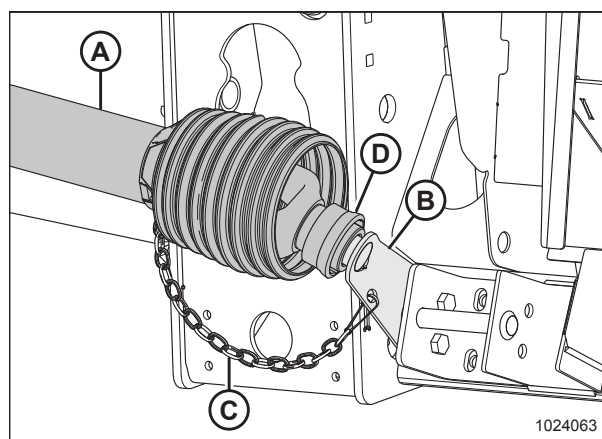


Figure 4.93: Driveline in Storage Position



## HEADER ATTACHMENT/DETACHMENT

19. Pull back the collar on the end of the driveline, and push the driveline onto combine output shaft (A) until the collar locks.

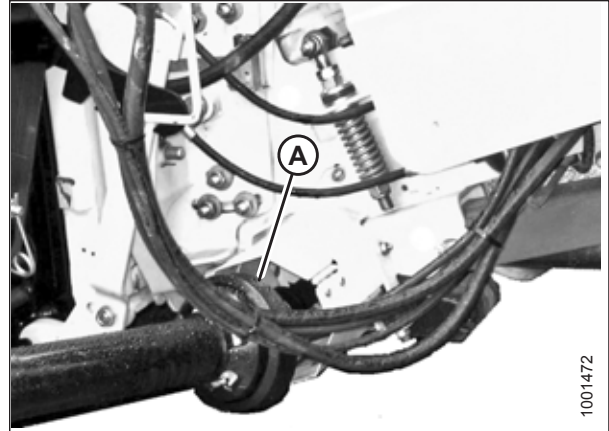


Figure 4.94: Driveline and Output Shaft

20. Disengage the float locks by pulling each float lock handle (A) away from the float module and setting it in unlocked position (B).

**NOTE:**

Illustration at right shows the right side of the header. Float lock on left side of header opposite.

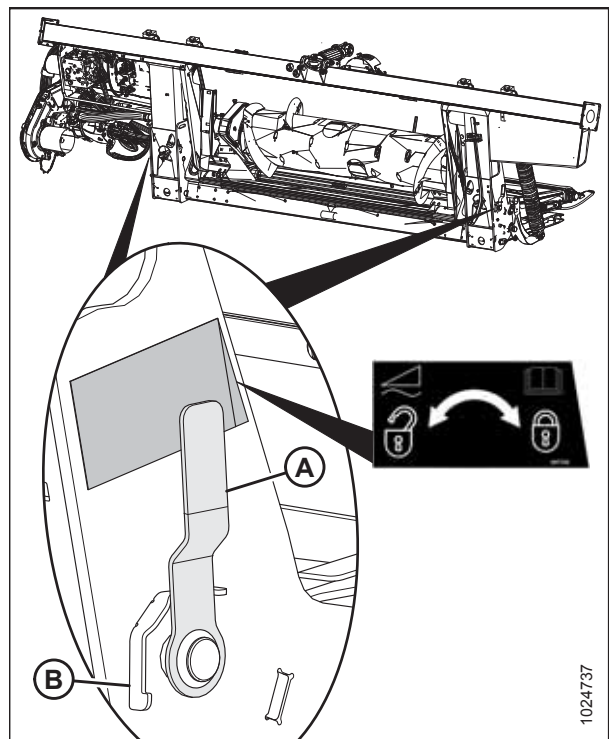


Figure 4.95: Float Lock Handle

## 4.7.2 Detaching Header from New Holland CR/CX Combine

### DANGER

To avoid injury or death from unexpected start-up of machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Choose a level area and position the header slightly above the ground.
2. Stop the engine and remove the key from the ignition.

**IMPORTANT:**

If transport wheels are installed, the header may be detached in either transport or field mode. If detaching with the wheels in field mode, set the wheels to the storage or uppermost working position, otherwise the header may tilt forward, making reattachment difficult. For instructions, refer to [Adjusting Stabilizer/Transport Wheels, page 85](#).

**IMPORTANT:**

If stabilizer wheels are installed, set the wheels to the storage or uppermost working position, otherwise the header may tilt forward, making reattachment difficult. For instructions, refer to [Adjusting Stabilizer Wheels, page 84](#).

3. Engage the float locks by pulling each float lock handle (A) away from the float module and setting it in the locked position (B).

**NOTE:**

Illustration at right shows the right side of the header. Float lock on left side of header opposite.

4. Disconnect driveline (A) from the combine.

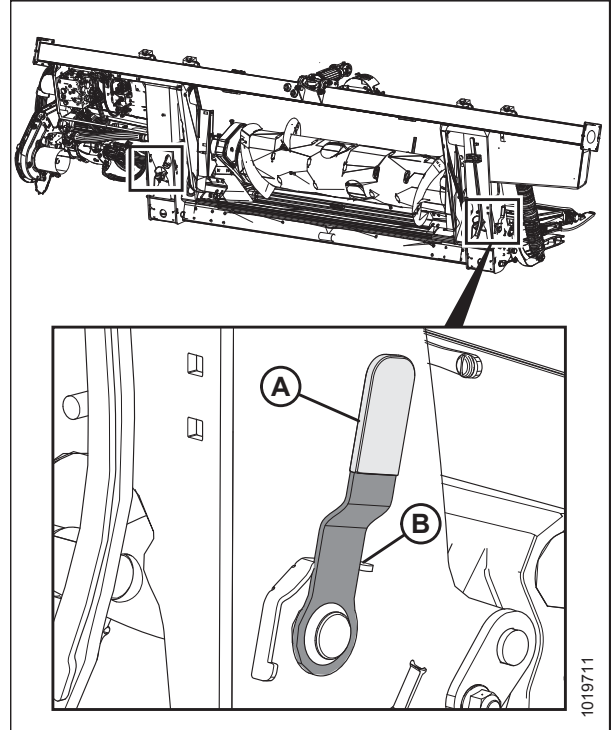


Figure 4.96: Float Lock Handle

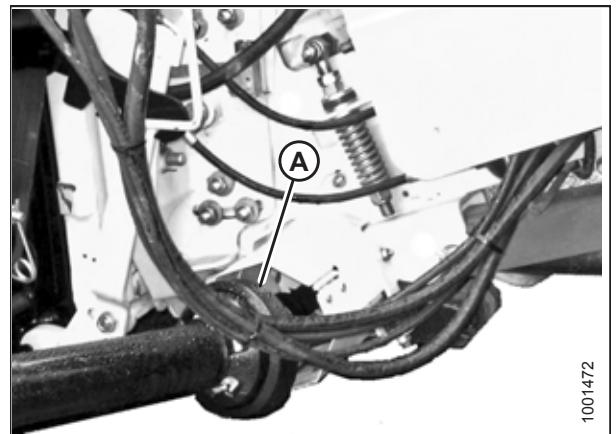


Figure 4.97: Driveline

## HEADER ATTACHMENT/DETACHMENT

5. Store driveline (A) on driveline support bracket (B) by pulling back collar (C) on the driveline and fitting it over support bracket weldment (D). Release the collar so it locks into place over the weldment.
6. Attach safety chain (E) to support bracket (B).

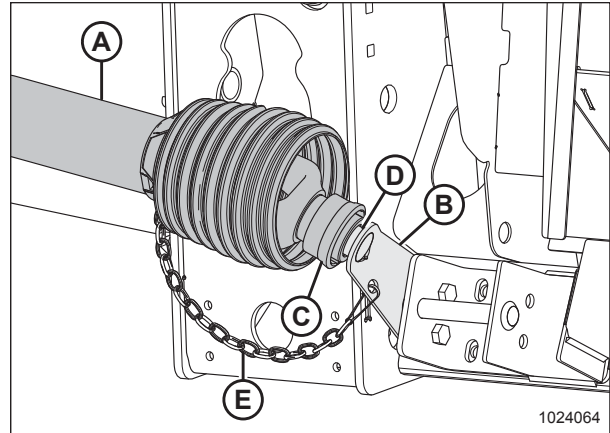


Figure 4.98: Driveline

7. Push in lock button (B), and pull handle (C) to release multicoupler (A).

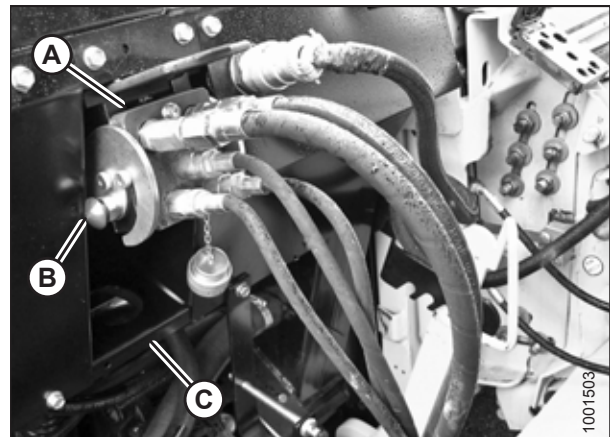


Figure 4.99: Float Module Connections

8. Push handle (A) to the closed position until lock button (B) snaps out. Close the cover.

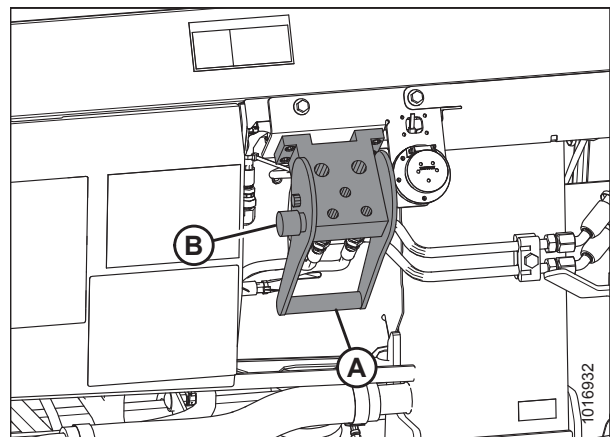


Figure 4.100: Float Module Receptacles

## HEADER ATTACHMENT/DETACHMENT

9. Position hydraulic quick coupler (A) onto storage plate (B) on the combine.

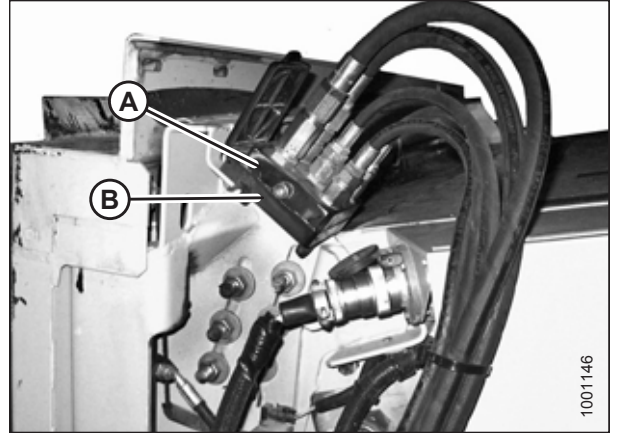


Figure 4.101: Combine Coupler

10. Remove electrical connector (A) from the float module.

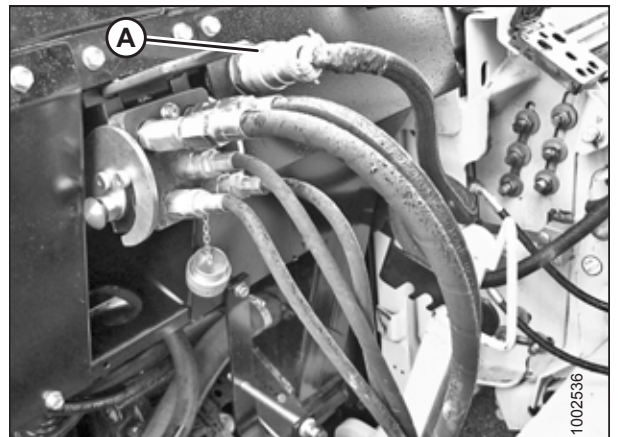


Figure 4.102: Float Module Connections

11. Connect the electrical connector to the combine at location (A).

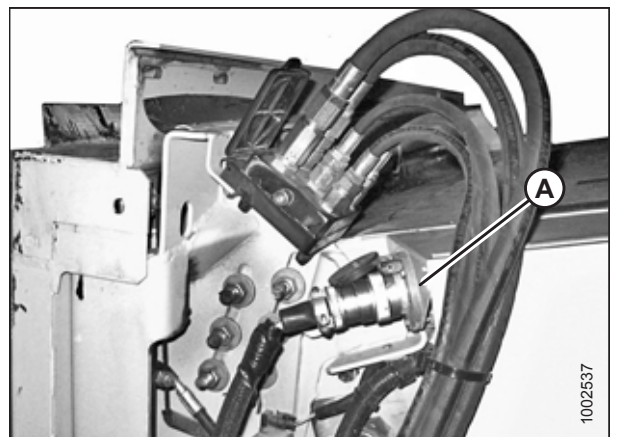


Figure 4.103: Combine Couplers

## HEADER ATTACHMENT/DETACHMENT

12. Replace cover (A) on the float module receptacle.

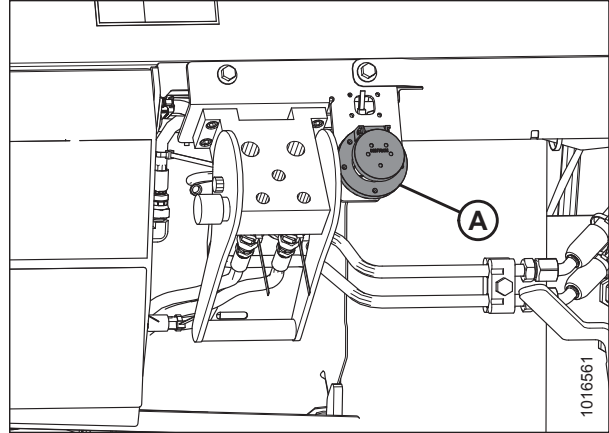


Figure 4.104: Float Module Receptacles

13. Lift lever (A) and pull and lower handle (B) to disengage feeder house/float module lock (C).

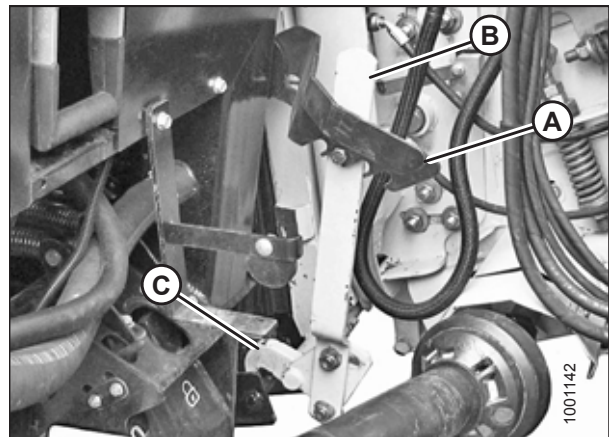


Figure 4.105: Feeder House Locks

14. Lower feeder house (A) until the feeder house disengages float module support (B).
15. Back the combine slowly away from the header.

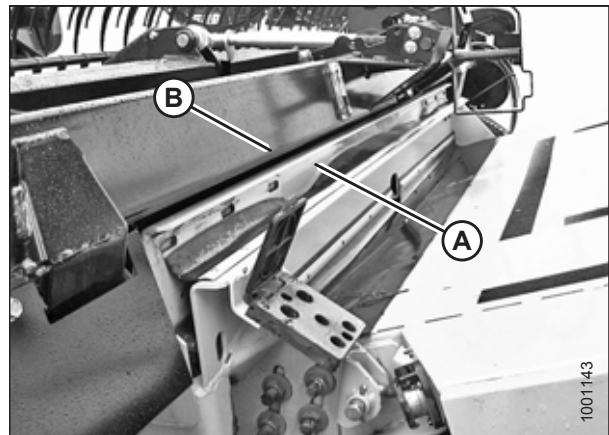


Figure 4.106: Header on Combine

### 4.7.3 CR Feeder Deflectors

This section is for New Holland CR combines only. If operating a New Holland CX combine, remove feed deflectors.

**For New Holland CR combines only:** Short feeder deflectors have been factory-installed on the float module to improve feeding into the feeder house. Remove the feeder deflectors if necessary. For instructions, refer to [5.11.3 Replacing Feed Deflectors on New Holland CR Combines, page 511](#).

## HEADER ATTACHMENT/DETACHMENT

Long feeder kits are provided for narrow feeder house combines and can be installed to replace the short feeder deflectors.

**Table 4.3 FM100 Feeder Kits for CR Model Combines**

<b>Feeder House Size</b>	<b>Feeder Kit Size</b>	<b>MacDon Part Number</b>
1250–1350 mm (49–65 in.)	Short: 200 mm (7 7/8 in.)	MD #213613, 213614
1100 mm (43-1/2 in.) and below	Long: 325 mm (12 13/16 in.)	MD #213592, 213593

## 4.8 Attaching and Detaching Header to and from FM100 Float Module

Attaching/detaching procedures are the same for all makes and models of combines. Headers can be attached to the float module from either field or transport configurations.

The procedures in this manual require that the float module remains attached to the combine. Attach/detach the float module only if performing the following tasks:

- Detaching the header for use on a windrower
- Changing headers
- Performing certain maintenance tasks

### 4.8.1 Attaching Header to FM100 Float Module

D1 Series headers can be attached to the float module from either field or transport configuration.

#### DANGER

To avoid bodily injury or death from the unexpected start-up or fall of a raised machine, always stop engine and remove key before leaving the operator's seat, and always engage safety props before going under the machine for any reason.

#### NOTE:

Stabilizer/ transport wheels can be used to support the header. For instructions, refer to [Adjusting Stabilizer/Transport Wheels](#), page 85.

1. Prop up hydraulic center-link (A) with a pin (or equivalent tool) at location (B) as shown.

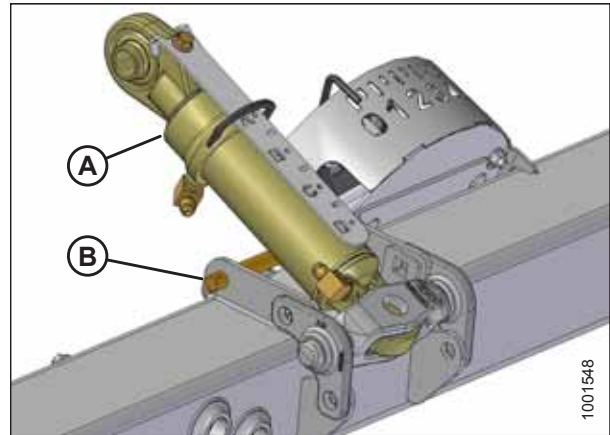


Figure 4.107: Center-Link



## HEADER ATTACHMENT/DETACHMENT

2. Remove ring (A) from pin (B), and remove the pins from the header legs at the delivery opening.

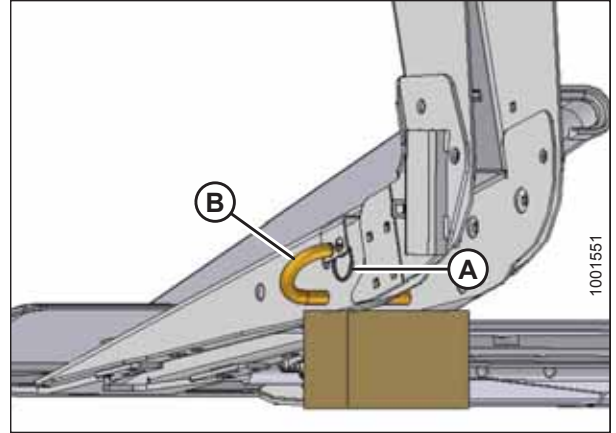


Figure 4.108: D1 Series Combine Header with Block under Leg

3. Ensure latches (A) at the front corners of the float module are rotated towards the rear of the float module.

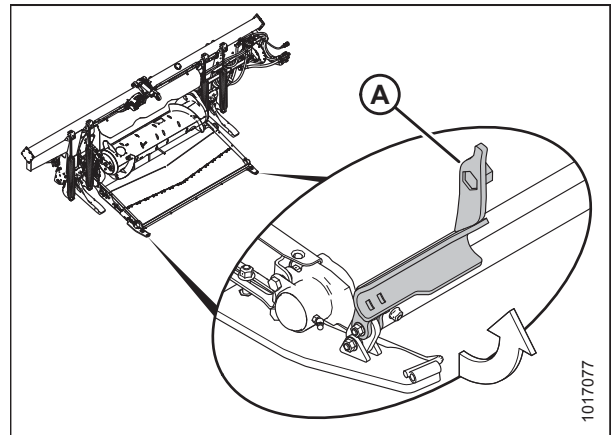


Figure 4.109: Latch



### CAUTION

Be sure all bystanders are clear of machine before starting engine or engaging any header drives.

4. Start the engine, and lower the combine feeder house so float module arms (A) are aligned with header legs (B).
5. Drive slowly forward while maintaining alignment between float module arms (A) and header legs (B).
6. Keep float module arms (A) just under header legs (B) to ensure the float module legs seat properly in the header linkage supports at location (C).

#### IMPORTANT:

Keep the hydraulic hoses clear to avoid damaging them while driving into the header.

7. Drive slowly forward until float module arms (A) contact the stops in legs (B).

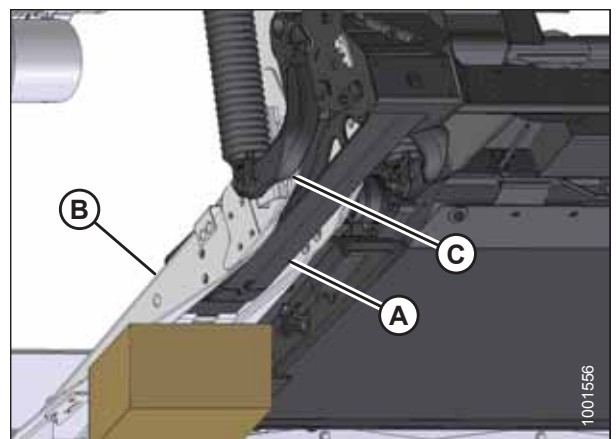


Figure 4.110: Float Module Underside

## HEADER ATTACHMENT/DETACHMENT

8. Adjust the length of center-link (A) using the header angle hydraulics to approximately align center-link eye (B) with the hole in the header bracket.
9. Shut down the engine, and remove the key from the ignition.

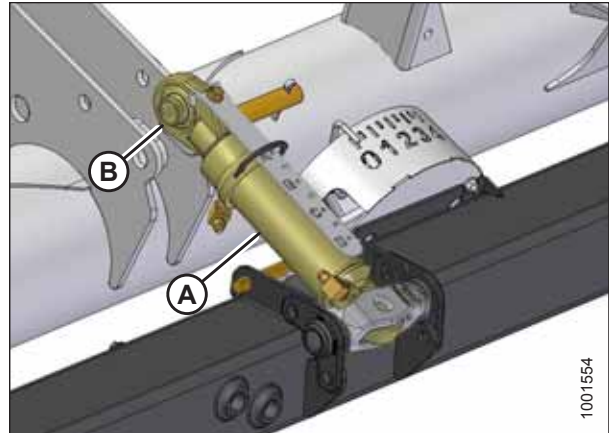


Figure 4.111: Center-Link

10. Connect the center-link as follows:
  - a. Pull pin (B) partially out of bracket (C), and remove the prop from under center-link (A).
  - b. Install pin (B) through center-link bracket (C), and secure with lynch pin.

### CAUTION

Always connect center-link before fully raising header.

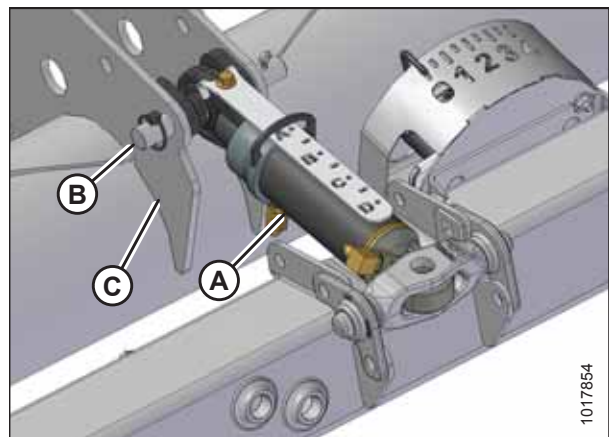


Figure 4.112: Center-Link

### CAUTION

Be sure all bystanders are clear of machine before starting engine or engaging any header drives.

11. Start the engine and slowly raise the float module while making sure the float module legs engage the header legs.
12. Raise the header to its full height, stop the engine, and remove the key from the ignition.
13. Engage the safety props on the combine.

## HEADER ATTACHMENT/DETACHMENT

14. Replace pin (B) in the header legs and secure with ring (A).

Loosen nut and bolt (A), and reposition hook (B) as shown to engage float module arm. Tighten bolt and nut (A).

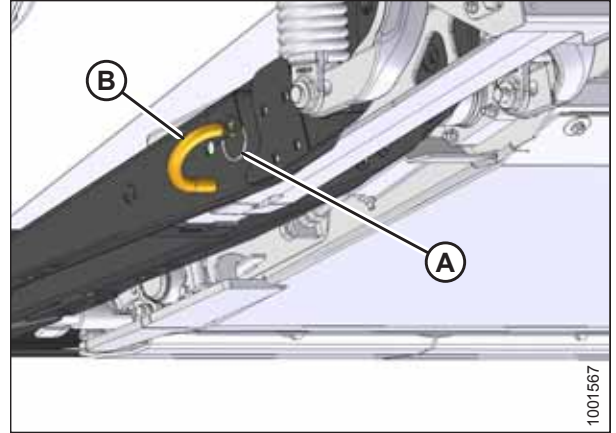


Figure 4.113: Header Leg

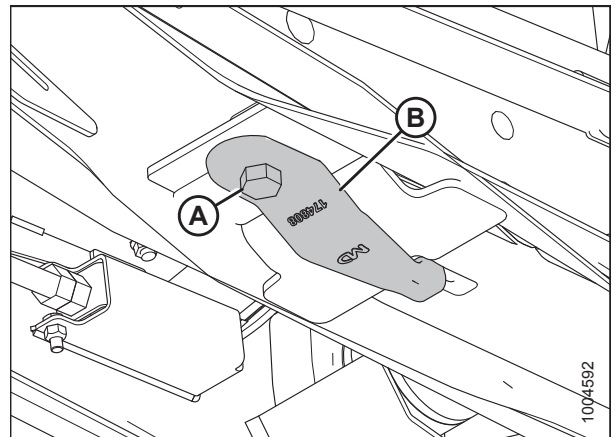


Figure 4.114: Float Module Underside

15. Match the colored cable ties and connect reel hydraulics (A) at the right end of the float module.

**NOTE:**

If optional multicoupler is installed for reel hydraulics, raise handle on float module, and place coupler on float module receptacle. Lower handle to lock coupler.

**CAUTION**

Be sure all bystanders are clear of machine before starting engine or engaging any header drives.

16. Remove the lift cylinder locks, start the engine, and lower the header to the ground. Adjust the header angle to the steepest setting (longest center-link).
17. Raise the reel to its full height.
18. Shut down the engine and remove the key from the ignition.
19. Engage the reel safety props.

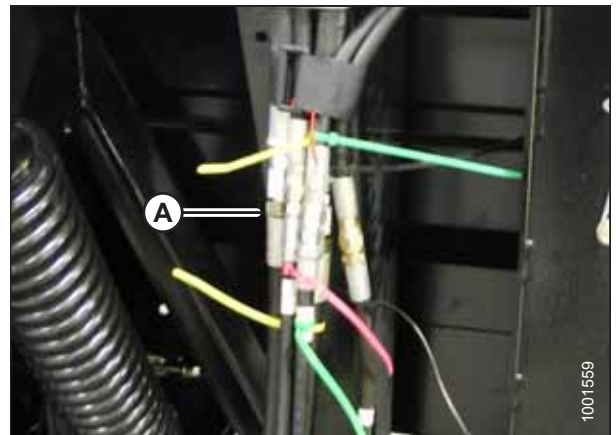


Figure 4.115: Reel Hydraulics

## HEADER ATTACHMENT/DETACHMENT

### **WARNING**

Keep hands clear of the area between guards and knife at all times.

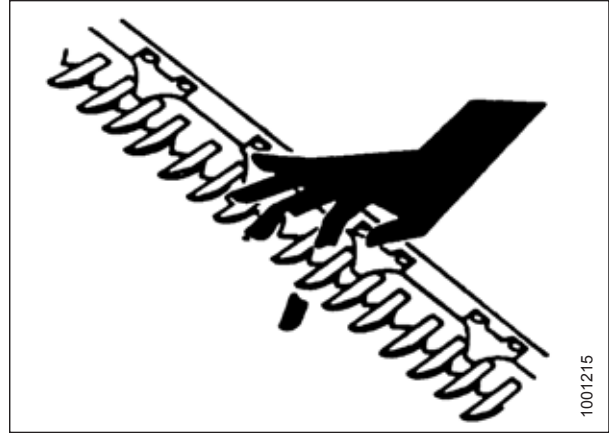


Figure 4.116: Cutterbar Hazard

20. Remove screw (A) and remove nut and bolt (B) from both sides of the opening to allow the attachment of the float module deck.
21. Rotate latch (C) forward and down to engage the transition pan tube.

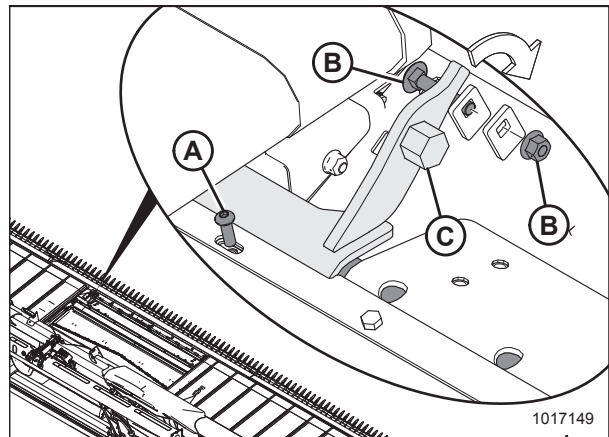


Figure 4.117: Float Module Latch

22. Use a 24 mm (15/16 in.) wrench on hex bolt (C) to rotate latch downwards and slightly raise the feed deck. Install nut and bolt (B) to lock the latch position.
23. Install screw (A).
24. Repeat for the opposite side of the feed draper deck.

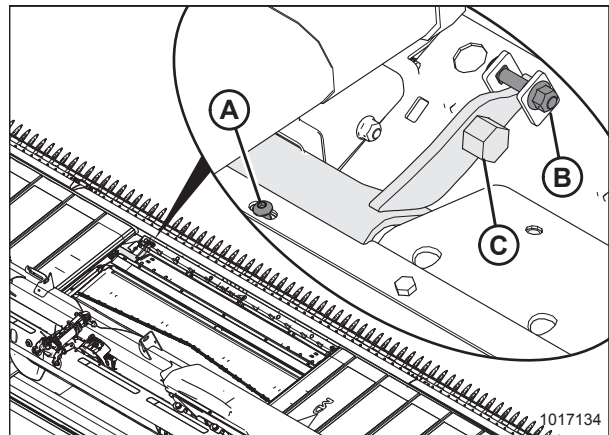


Figure 4.118: Float Module Latch

## HEADER ATTACHMENT/DETACHMENT

25. Install fillers (B) on transition pan support angle (C) using two bolts (A).

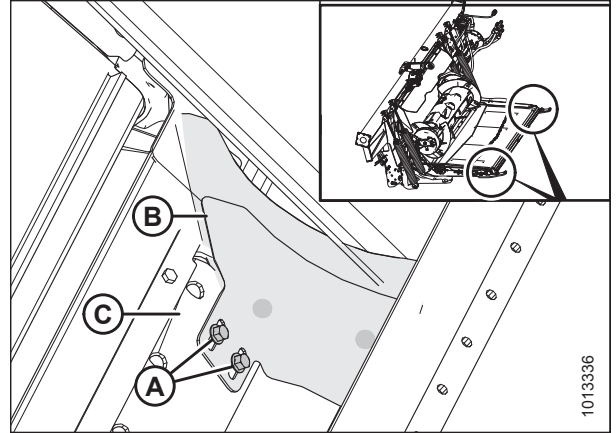


Figure 4.119: Fillers

26. Match the colored cable ties, and connect the knife and draper drive hydraulics (A).
27. Attach electrical connector (B) as follows:
- Remove the cover on the receptacle. Ensure it is clean and damage free.
  - Align the lugs on the connector with the slots in the receptacle, push the connector onto the receptacle, and turn the collar on the connector to lock it in place.
  - Attach the cover to the mating cover on the combine wiring harness.

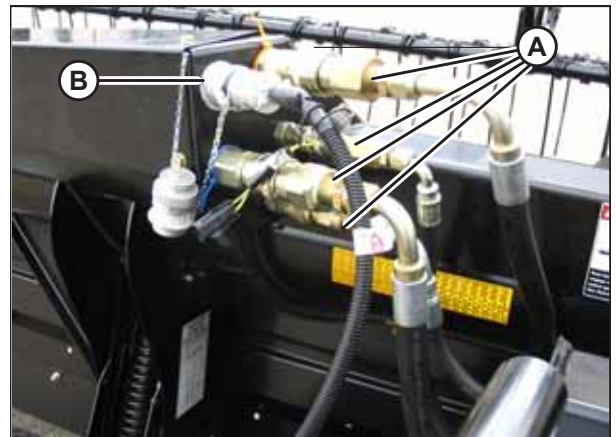


Figure 4.120: Header Connections

28. Connect the quick disconnects (if installed) as follows:
- Remove the covers (if installed) from the receptacles and hose ends.
  - Check the connectors and clean if necessary.
  - Push hose connector (A) onto mating receptacle (B) until the collar on the mating receptacle snaps into the lock position.

**NOTE:**

Ensure the hoses are clear of the driveline and adjacent structure.

**NOTE:**

It is not necessary to bleed the system by loosening fittings.

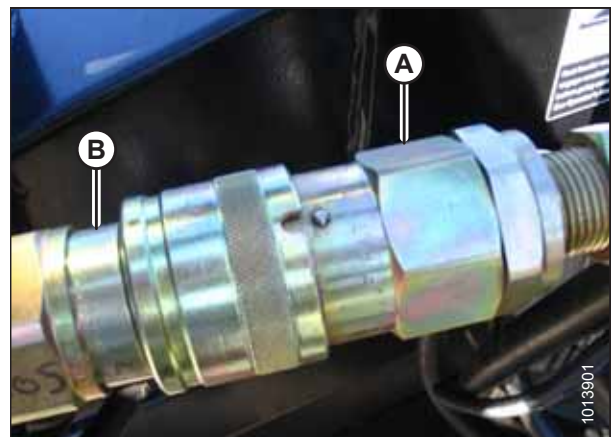


Figure 4.121: Quick Disconnect Coupling

29. Check the float and confirm the header is level. For instructions, refer to the following:

- [Checking and Adjusting Header Float, page 91](#)
- [3.10 Leveling the Header, page 317](#)



### CAUTION

Be sure all bystanders are clear of machine before starting engine or engaging any header drives.

## HEADER ATTACHMENT/DETACHMENT

30. Start the combine and perform the following inspections:
  - Raise and lower the reel to ensure the hoses are properly connected.
  - Run the header to ensure the hoses are properly connected.
31. Check for leaks.

### 4.8.2 Detaching Header from FM100 Float Module

#### DANGER

To avoid bodily injury or death from the unexpected start-up or fall of raised machine, always stop the engine, remove the key, and engage the safety props before going under the header for any reason.

#### WARNING

Keep hands clear of the area between guards and knife at all times.

#### CAUTION

Wear heavy gloves when working around or handling knives.

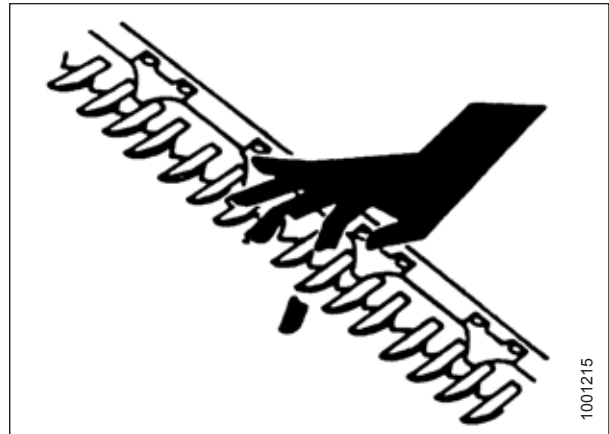


Figure 4.122: Cutterbar Hazard

1. Start the engine and the lower header.
2. Increase clearance under the float module feed draper by tilting the header and fully extending cylinder (B) until indicator (A) is at position D.
3. Raise the reel to its full height.
4. Stop the engine and the remove key from the ignition.
5. Engage the reel safety props.

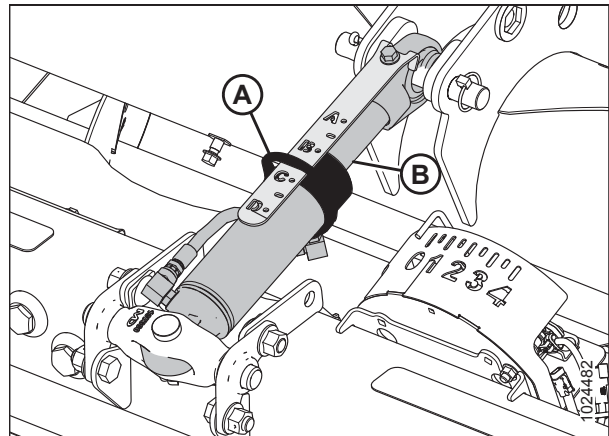


Figure 4.123: Center-Link



## HEADER ATTACHMENT/DETACHMENT

- Engage the float locks by pulling each float lock handle (A) away from the float module and setting it in locked position (B).

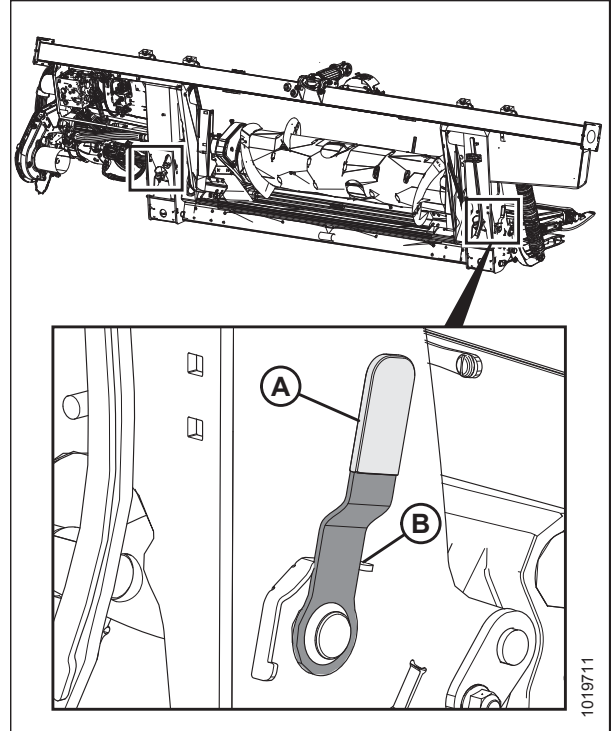


Figure 4.124: Float Lock

- Remove two bolts (A) and fillers (B) from transition pan support angle (C). Repeat on opposite side.

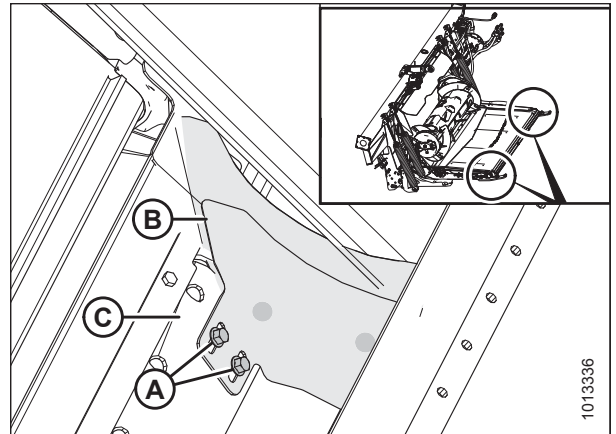


Figure 4.125: Fillers



## HEADER ATTACHMENT/DETACHMENT

8. Remove and retain screw (A).
9. Remove the 9/16 in. nut from bolt (B).
10. Use a 24 mm (15/16 in.) wrench on hex bolt (C) to rotate latch downwards and slightly raise the feed deck to remove bolt (B).
11. Rotate latch (C) up and back to lower the float module deck and disengage the transition pan tube.
12. Install screw (A).
13. Repeat for the opposite side of the feed draper deck.

### DANGER

**Never start or move the machine until you are sure all bystanders have cleared the area.**

14. Disengage the reel safety props, start the engine, lower the reel, and fully raise the header.
15. Stop the engine, remove the key from the ignition, and engage the combine safety props.
16. Remove ring (A) from pin (B), and remove the pins from the header legs at the delivery opening.

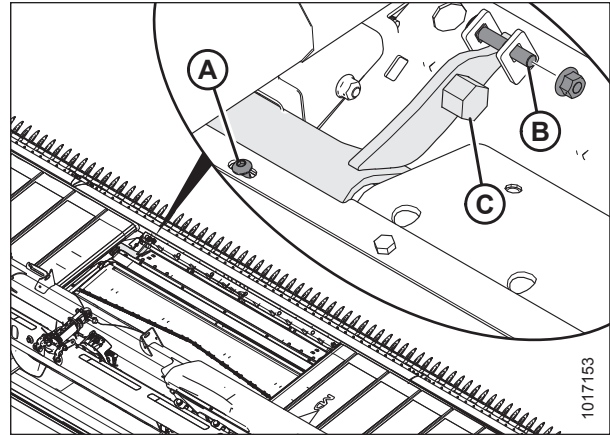


Figure 4.126: Float Module Latch

17. Place a 150 mm (6 in.) block under jack stand (A) to assist with center-link disconnection.
18. Disengage the combine safety props, start the engine, and lower the header until the jack stand rests on the block or until the stabilizer wheels are on the ground.

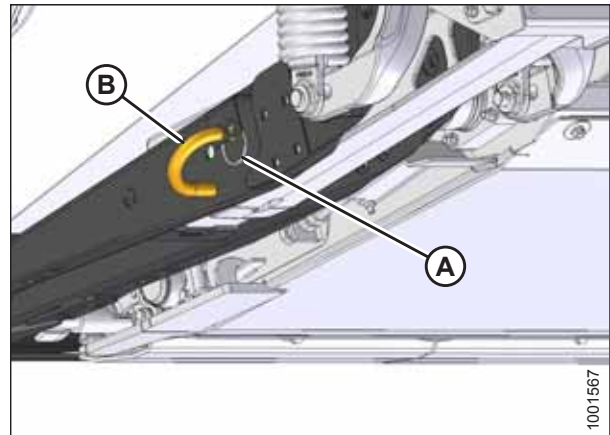


Figure 4.127: Header Leg

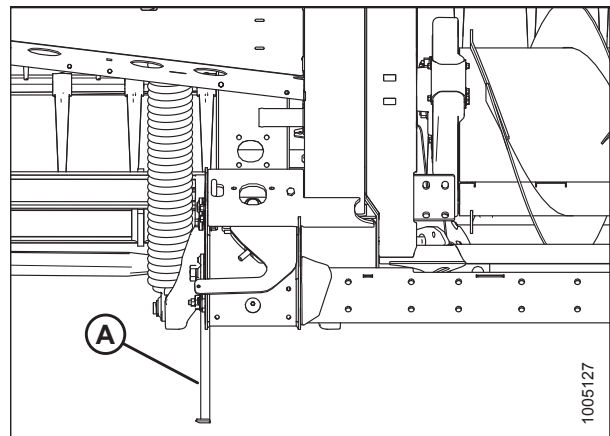


Figure 4.128: Jack Stand

## HEADER ATTACHMENT/DETACHMENT

19. Disconnect the hydraulic center-link as follows:
  - a. Remove lynch pin and clevis pin (A), and lift center-link (B) clear of the bracket.
  - b. Replace clevis pin (A) and secure with lynch pin.

**NOTE:**

It may be necessary to raise or lower the feeder house to adjust the length of the center-link and relieve excess load on the center-link.

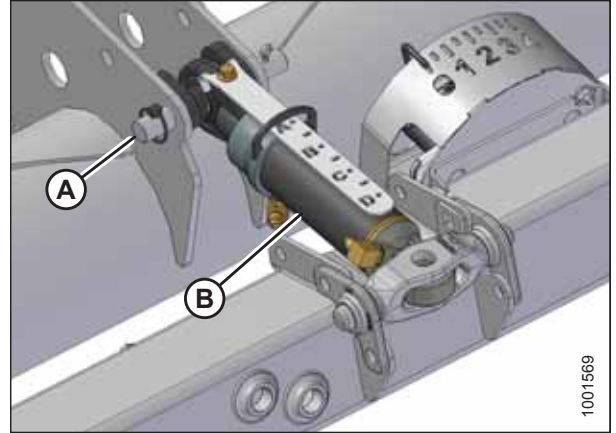


Figure 4.129: Hydraulic Center-Link

20. Disconnect knife and draper drive hydraulic hoses (A). Immediately cap the hoses to prevent oil loss.
21. Store and secure the hoses on the float module frame.
22. Disconnect electrical connector (B) by turning the collar counterclockwise and pulling on the connector to disengage.
23. Store and secure the hoses and electrical connector on the float module.

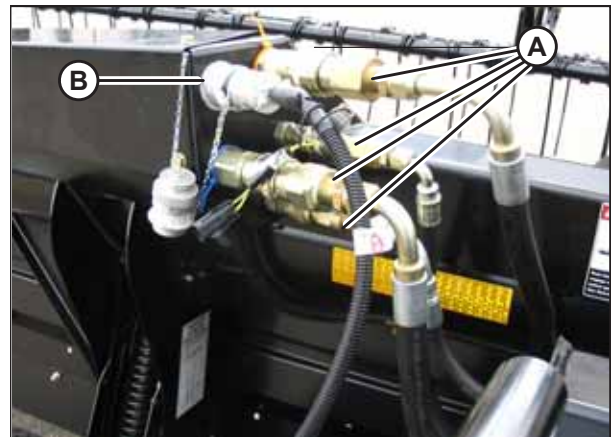


Figure 4.130: Header Connections

24. Disconnect the quick disconnects (if installed) as follows:
  - a. Line up slot (A) in the collar with pin (B) on the connector.
  - b. Push the collar towards the pin, and pull the connector to disengage.
  - c. Install plugs or caps on the hose ends (if equipped).

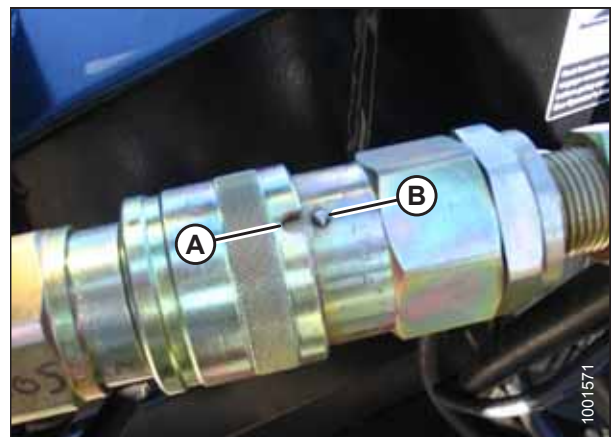


Figure 4.131: Quick Disconnect Coupling

## HEADER ATTACHMENT/DETACHMENT

### NOTE:

If colored plastic ties are missing, replace them before disconnecting hoses.

25. Disconnect reel hydraulics (A). Immediately cap hoses to prevent oil loss.

### NOTE:

If the optional multicoupler is installed for the reel hydraulics, press the button on the side, raise the handle on the float module, and remove the coupler.

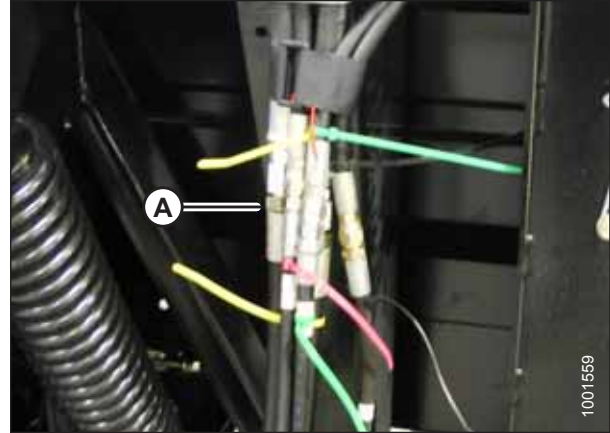


Figure 4.132: Reel Hydraulics

26. Store and secure the hoses and electrical connector on the float module at position (A) as shown.
27. Ensure the header is on the ground or is supported by the wheels in transport mode.

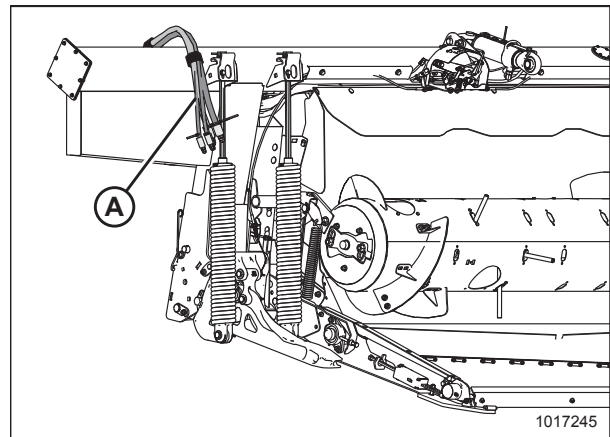


Figure 4.133: Hose Storage

### DANGER

Never start or move the machine until you are sure all bystanders have cleared the area.

28. Start the engine and slowly back away in a straight line from header.
29. Stop the engine and remove the key from the ignition.
30. Replace pins (B) in the header legs and secure with rings (A).

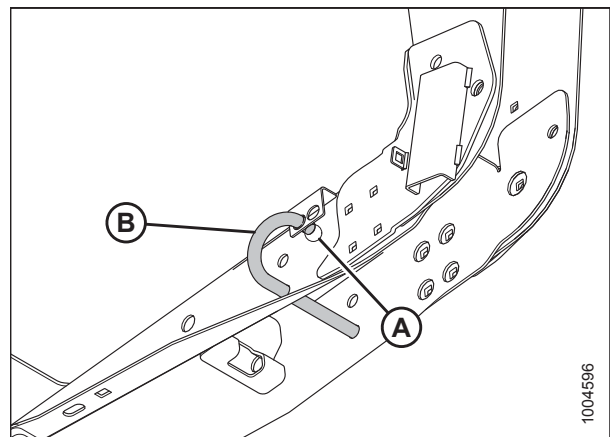


Figure 4.134: Header Leg

## Chapter 5: Maintenance and Servicing

The following instructions provide information about routine header service. A parts catalog is provided in the plastic manual case inside the left endshield of the header.

Log hours of operation and use the maintenance record provided (refer to [5.3.1 Maintenance Schedule/Record, page 399](#)) to keep track of your scheduled maintenance.

### 5.1 Preparing Machine for Servicing



#### **DANGER**

**To avoid bodily injury or death from the unexpected start-up or fall of a raised machine, always stop engine and remove key before leaving the operator's seat, and always engage safety props before going under the machine for any reason.**



#### **CAUTION**

**To avoid personal injury, follow all the safety precautions listed before servicing header or opening drive covers.**

1. Lower the header fully. If it is necessary to service the header in the raised position, always engage the safety props.
2. Shut down the engine, and remove the key from the ignition.
3. Engage the park brake.
4. Wait for all moving parts to stop.

## 5.2 Maintenance Specifications

### 5.2.1 Installing a Sealed Bearing

1. Clean the shaft and apply a rust-preventive coating.
2. Install flangette (A), bearing (B), second flangette (C), and then lock the collar (D).

**NOTE:**

The locking cam is only on one side of the bearing.

3. Install flangette bolts (E). Do **NOT** tighten.
4. Position the shaft correctly, and lock the lock collar with a punch. Lock the collar in the same direction the shaft rotates, and tighten the set screw in the collar.
5. Tighten flangette bolts (E).
6. Loosen the flangette bolts on the mating bearing (one turn) and then retighten. This will allow the bearing to properly line up.

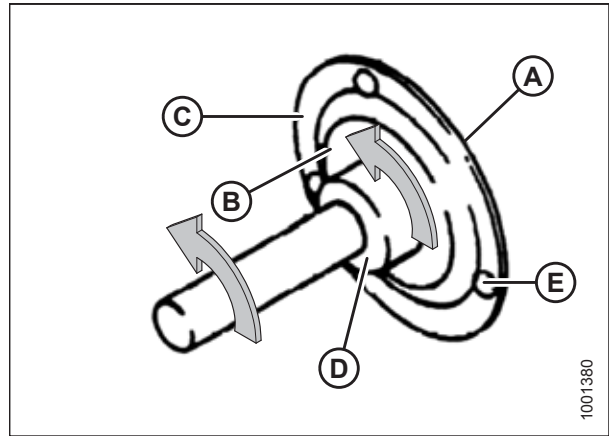


Figure 5.1: Sealed Bearing

## 5.3 Maintenance Requirements

Regular maintenance is the best insurance against early wear and untimely breakdowns. Following the maintenance schedule will increase your machine’s life. Log hours of operation, use the maintenance record, and keep copies of your maintenance records (refer to [5.3.1 Maintenance Schedule/Record, page 399](#)).

Periodic maintenance requirements are organized according to service intervals. If a service interval specifies more than one timeframe, e.g., 100 hours or annually, service the machine at whichever interval is reached first.

**IMPORTANT:**

Recommended intervals are for average conditions. Service the machine more often if operating under adverse conditions (severe dust, extra heavy loads, etc.).

When servicing the machine, refer to the appropriate section in this Maintenance and Servicing chapter and use only specified fluids and lubricants. Refer to inside back cover for recommended fluids and lubricants.



**CAUTION**

Carefully follow safety messages. For instructions, refer to [5.1 Preparing Machine for Servicing, page 397](#) and [1 Safety, page 1](#).

### 5.3.1 Maintenance Schedule/Record

Recording maintenance allows the user to keep track of when maintenance is performed.

**NOTE:**

MacDon recommends keeping a record of daily maintenance as evidence of a properly maintained machine; however, daily maintenance records are not required to meet normal warranty conditions.

Action:		✓ – Check				⬇ – Lubricate				▲ – Change			
	Hour meter reading												
	Service date												
	Serviced by												
<b>First Use</b>		Refer to <a href="#">5.3.2 Break-In Inspection, page 402</a> .											
<b>End of Season</b>		Refer to <a href="#">5.3.4 End-of-Season Service, page 403</a> .											
<b>10 Hours or Daily (Whichever Occurs First)<sup>54</sup></b>													
✓	Hydraulic hoses and lines; refer to <a href="#">5.3.5 Checking Hydraulic Hoses and Lines, page 404</a>												
✓	Knife sections, guards, and hold-downs; refer to <a href="#">5.8 Knife, page 456</a>												
✓	Tire pressure; refer to <a href="#">5.15.3 Checking Tire Pressure, page 579</a>												
⬇	Feed draper rollers, refer to <a href="#">Every 10 Hours, page 404</a>												
✓	Link holder hooks; refer to <a href="#">5.10.7 Checking Link Holder Hooks, page 508</a>												
<b>25 Hours</b>													
✓	Hydraulic oil level at reservoir; refer to <a href="#">5.4.1 Checking Oil Level in Hydraulic Reservoir, page 420</a>												
⬇	Knifeheads; refer to <a href="#">Every 25 Hours, page 405</a>												

54. MacDon recommends keeping a record of daily maintenance as evidence of a properly maintained machine; however, daily maintenance records are not required to meet normal warranty conditions.

**MAINTENANCE AND SERVICING**

50 Hours or Annually													
◆	Driveline and driveline universals; refer to <i>Every 50 Hours, page 406</i>												
◆	Upper cross auger center support and U-joint; refer to <i>Every 50 Hours, page 406</i>												
◆	Feed/center draper roller bearings, 3 locations; refer to <i>Every 50 Hours, page 406</i>												
▲	Knife drive box lubricant (first 50 hours only); refer to <i>Changing Oil in Knife Drive Box, page 476</i>												
▲	Header drive gearbox lubricant (first 50 hours only); refer to <i>Changing Oil in Header Drive Gearbox, page 419</i>												
100 Hours or Annually (Whichever Occurs First)													
✓	Auger to pan and feed draper clearance; refer to <i>5.7.1 Adjusting Auger to Pan Clearance, page 434</i>												
✓	Draper seal; refer to <i>5.12.5 Adjusting Deck Height, page 523</i>												
✓	Gearbox lubricant level; refer to <i>Checking Oil Level in Header Drive Gearbox, page 418</i>												
✓	Reel drive chain tension; refer to <i>5.14.2 Reel Drive Chain Tension, page 564</i>												
✓	Reel finger/cutterbar clearance; refer to <i>Adjusting Reel Clearance, page 538</i>												
✓	Knife drive belt tension; refer to <i>5.9.2 Knife Drive Belts, page 477</i>												
✓	Wheel bolt torque; refer to <i>5.15.1 Checking Wheel Bolt Torque, page 578</i>												
✓	Knife drive box lubricant level; refer to <i>Checking Knife Drive Box, page 468</i>												
✓	Knife drive box mounting bolts; refer to <i>Checking Knife Drive Box Mounting Bolts, page 470</i>												
◆	Auger drive chain; refer to <i>Every 100 Hours, page 407</i>												
◆	Float pivots; refer to <i>Every 100 Hours, page 407</i>												
◆	Float module auger pivots; refer to <i>Every 100 Hours, page 407</i>												
◆	Float spring tensioners; refer to <i>Every 100 Hours, page 407</i>												
◆	Reel drive chain; refer to <i>Every 100 Hours, page 407</i>												





### 5.3.2 Break-In Inspection

Break-in inspection involves checking belts, fluids, and performing general machine inspections for loose hardware or other areas of concern. Break-in inspections ensure that all components can operate for an extended period without requiring service or replacement. The break-in period is the first 50 hours of operation after the machine’s initial start up.

Inspection Instance	Item	Refer to
5 Minutes	Check hydraulic oil level in reservoir (check after first run-up and after the hydraulic hoses have filled with oil).	<a href="#">5.4.1 Checking Oil Level in Hydraulic Reservoir, page 420</a>
5 Hours	Check for loose hardware and tighten to required torque.	<a href="#">8.1 Torque Specifications, page 609</a>
5 Hours	Check knife drive belts tension (check periodically for first 50 hours).	<ul style="list-style-type: none"> <li>• <a href="#">Checking and Tensioning, page 479</a></li> <li>• <a href="#">Checking and Tensioning Timed Double-Knife Drive Belts, page 484</a></li> </ul>
10 Hours	Check auger drive chain tension.	<a href="#">5.7.2 Checking Auger Drive Chain Tension, page 436</a>
10 Hours	Check knife drive box mounting bolts.	<a href="#">Checking Knife Drive Box Mounting Bolts, page 470</a>
50 Hours	Change float module gearbox oil.	<a href="#">Changing Oil in Header Drive Gearbox, page 419</a>
50 Hours	Change float module hydraulic oil filter.	<a href="#">5.4.4 Changing Oil Filter, page 423</a>
50 Hours	Change knife drive box lubricant.	<a href="#">Changing Oil in Knife Drive Box, page 476</a>
50 Hours	Check gearbox chain tension.	<a href="#">5.6.5 Adjusting Gearbox Drive Chain Tension, page 432</a>
50 Hours	Check deck height adjustment.	<a href="#">5.12.5 Adjusting Deck Height, page 523</a>

### 5.3.3 Preseason Servicing

Perform the following procedures at the beginning of each operating season:

 **CAUTION**

- Review this manual to refresh your memory on the safety and operating recommendations.
  - Review all the safety decals and other decals on the header and note the hazard areas.
  - Be sure all the shields and guards are properly installed and secured. Never alter or remove safety equipment.
  - Be sure you understand and have practiced safe use of all controls. Know the capacity and operating characteristics of the machine.
  - Ensure you have a first aid kit and fire extinguisher. Know where they are and how to use them.
1. Lubricate the machine completely. For instructions, refer to [5.3.6 Lubrication and Servicing, page 404](#).
  2. Adjust the tension on the drive belts. For instructions, refer to [Checking and Tensioning, page 479](#) or [Checking and Tensioning Timed Double-Knife Drive Belts, page 484](#).
  3. Perform all annual maintenance tasks. For instructions, refer to [5.3.1 Maintenance Schedule/Record, page 399](#).

### 5.3.4 End-of-Season Service

Perform the following procedures at the end of each operating season:



#### CAUTION

Never use gasoline, naphtha, or any volatile material for cleaning purposes. These materials may be toxic and/or flammable.



#### CAUTION

Cover cutterbar and knife guards to prevent injury from accidental contact.

1. Clean the header thoroughly.
2. Bring the machine for storage in a dry and protected place if possible. If storing outside, always cover the machine with a waterproof canvas or other protective material.

#### NOTE:

If storing the machine outside, remove the drapers and store them in a dark, dry place. If not removing the drapers, store the header with the cutterbar lowered so water and snow will not accumulate on the drapers. The weight of water and snow accumulation puts excessive stress on the drapers and header.

3. Lower the header onto blocks to keep the cutterbar off the ground.
4. Lower the reel completely. If stored outside, tie the reel to the frame to prevent rotation caused by the wind.
5. Repaint all worn or chipped painted surfaces to prevent rust.
6. Loosen the drive belts.
7. Lubricate the header thoroughly leaving excess grease on the fittings to keep moisture out of the bearings.
8. Apply grease to exposed threads, cylinder rods, and sliding surfaces of components.
9. Lubricate the knife. Refer to the inside back cover for recommended lubricants.
10. Check for worn components and repair as necessary.
11. Check for broken components and order replacements from your Dealer. Immediate repair of these items will save time and effort at the beginning of next season.
12. Replace or tighten any missing or loose hardware. For instructions, refer to [8.1 Torque Specifications, page 609](#).

### 5.3.5 Checking Hydraulic Hoses and Lines

Check hydraulic hoses and lines daily for signs of leaks.

#### WARNING

- Avoid high-pressure fluids. Escaping fluid can penetrate the skin causing serious injury. Relieve pressure before disconnecting hydraulic lines. Tighten all connections before applying pressure. Keep hands and body away from pin holes and nozzles which eject fluids under high pressure.
- If any fluid is injected into the skin, it must be surgically removed within a few hours by a doctor familiar with this type of injury or gangrene may result.



Figure 5.2: Hydraulic Pressure Hazard

- Use a piece of cardboard or paper to search for leaks.

#### IMPORTANT:

Keep hydraulic coupler tips and connectors clean. Allowing dust, dirt, water, or foreign material to enter the system is the major cause of hydraulic system damage. Do **NOT** attempt to service hydraulic systems in the field. Precision fits require a perfectly clean connection during overhaul.



Figure 5.3: Testing for Hydraulic Leaks

### 5.3.6 Lubrication and Servicing

#### CAUTION

To avoid personal injury, before servicing header or opening drive covers, follow procedures in [5.1 Preparing Machine for Servicing, page 397](#).

Refer to inside back cover for recommended lubricants.

Log hours of operation and use the Maintenance Record provided to keep a record of scheduled maintenance. For more maintenance information, refer to [5.3.1 Maintenance Schedule/Record, page 399](#).

#### *Service Intervals*

##### **Every 10 Hours**

Use high temperature extreme pressure (EP2) performance grease with 1% max molybdenum disulphide (NLGI Grade 2) lithium base unless otherwise specified.

## MAINTENANCE AND SERVICING

**Knife:** Lubricate the knife every 10 hours or daily, except in sandy conditions. In sandy conditions, lubricate it less as sand will stick to the lubricant.

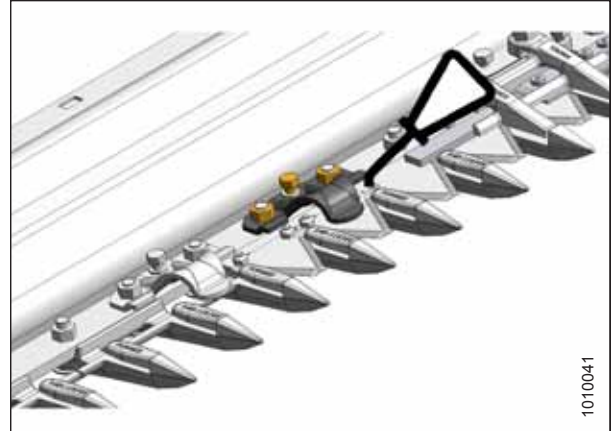


Figure 5.4: Lubricating Knife

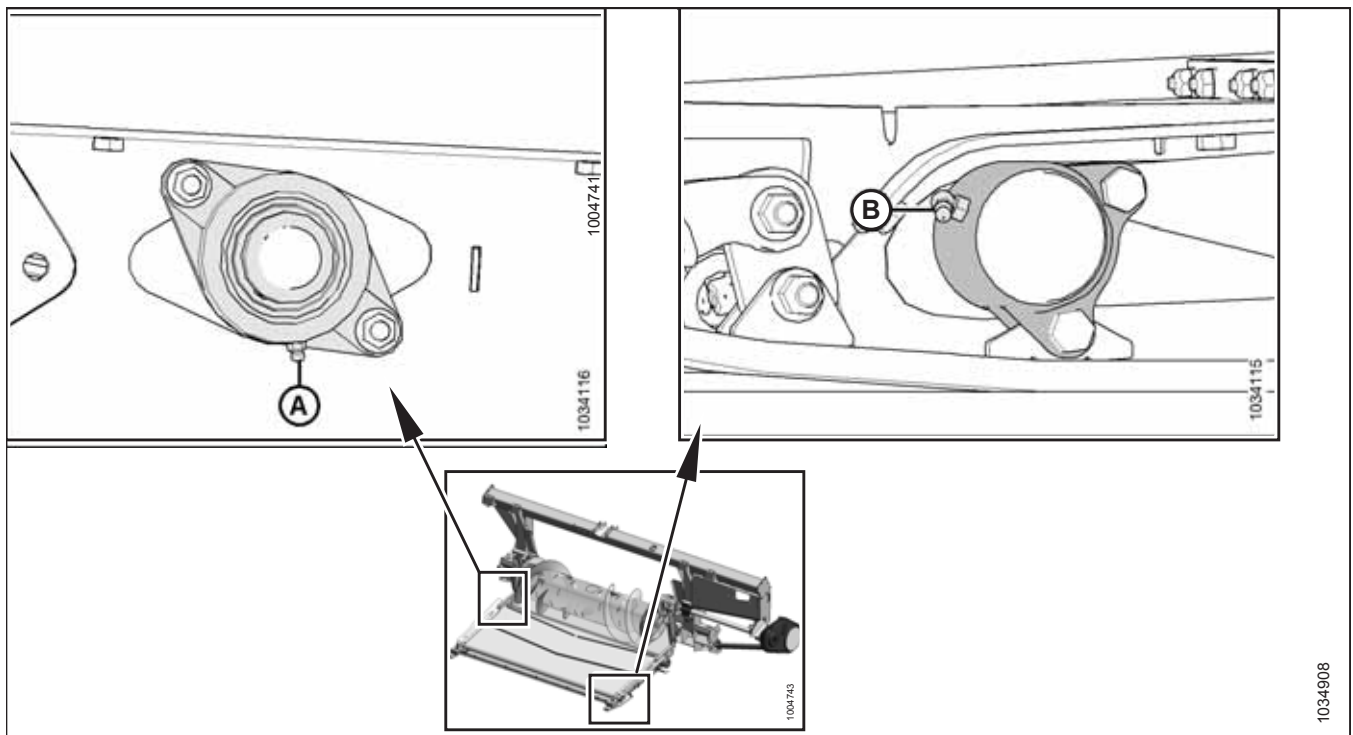


Figure 5.5: Every 10 Hours

A - Drive Roller Bearing

**IMPORTANT:**

When greasing the drive roller bearing, clear any debris and excess grease from around the bearing and bearing housing. Inspect the condition of the bearing and bearing housing. Grease the feed draper drive roller bearing until grease comes out of the seal. Wipe any excess grease from area after greasing.

B - Idler Roller Bearing (Both Sides)

**IMPORTANT:**

When greasing the idler roller bearings, clear any debris and excess grease from around the bearing housing. Inspect the condition of the roller and bearing housing. Grease the feed draper idler roller bearing until grease comes out of the seal. Initial greasing on a new header may require additional grease (may require 5–10 pumps). Wipe any excess grease from area after greasing.

### Every 25 Hours

Use high temperature extreme pressure (EP2) performance grease with 1% max molybdenum disulphide (NLGI Grade 2) lithium base unless otherwise specified.

## MAINTENANCE AND SERVICING

**Knifehead:** Lubricate the knifehead (A) every 25 hours. Check for signs of excessive heating on the first few guards after greasing. If required, relieve the pressure by pressing the check-ball in the grease fitting.

### IMPORTANT:

Overgreasing the knifehead puts pressure on the knife, causing it to rub against the guards, resulting in excessive wear from binding. Do **NOT** overgrease the knifehead. Apply only one to two pumps using a mechanical grease gun (do **NOT** use an electric grease gun). If more than six to eight pumps of the grease gun are required to fill the cavity, replace the seal in the knifehead. For instructions, refer to [5.8.3 Removing Knifehead Bearing](#), page 458.

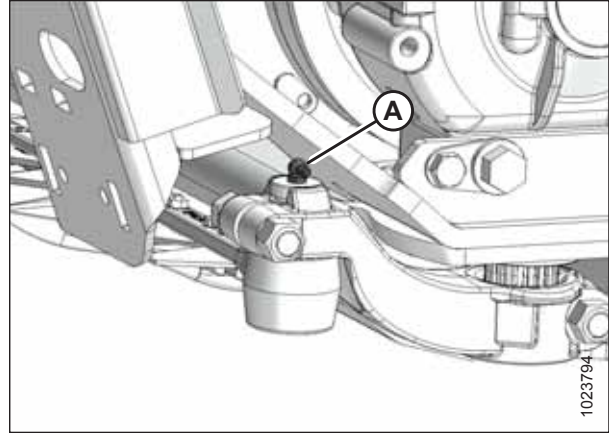


Figure 5.6: Knifehead

### Every 50 Hours

#### NOTE:

Use high temperature extreme pressure (EP2) performance grease with 1% max molybdenum disulphide (NLGI Grade 2) lithium base unless otherwise specified.

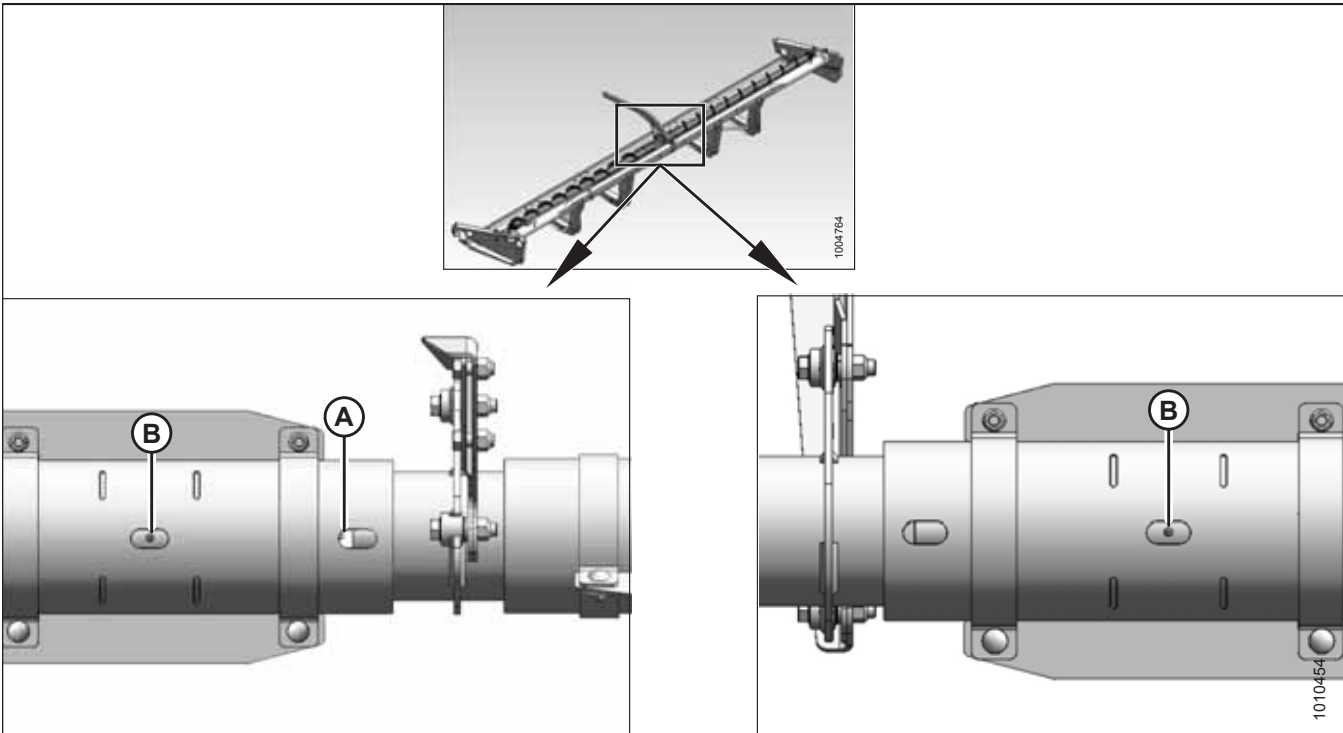


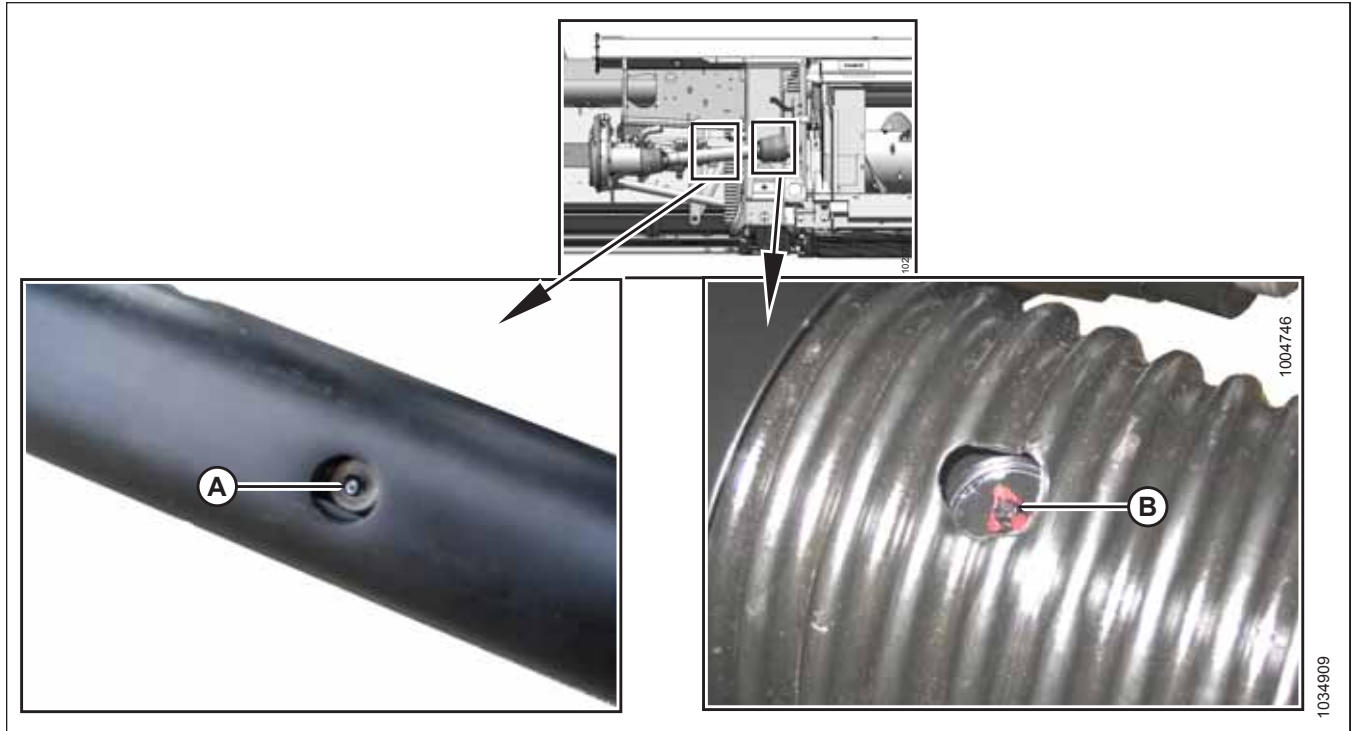
Figure 5.7: Every 50 Hours

A - Upper Cross Auger U-joint<sup>55</sup>

B - Upper Cross Auger Bearing (Two Places)<sup>56</sup>

55. U-joint has an extended lubrication cross and bearing kit. Stop greasing when greasing becomes difficult or if U-joint stops taking grease. Overgreasing will damage U-joint. Six to eight pumps are sufficient at first grease (factory). Increase grease interval as U-joint wears and requires more than six pumps.
56. Use high temperature extreme pressure (EP2) performance grease with 1.5–5.0% max molybdenum disulphide (NLGI Grade 2) lithium base.

## MAINTENANCE AND SERVICING



**Figure 5.8: Every 50 Hours**

A - Driveline Slip Joint<sup>57</sup>

B - Driveline Universal (Two Places)

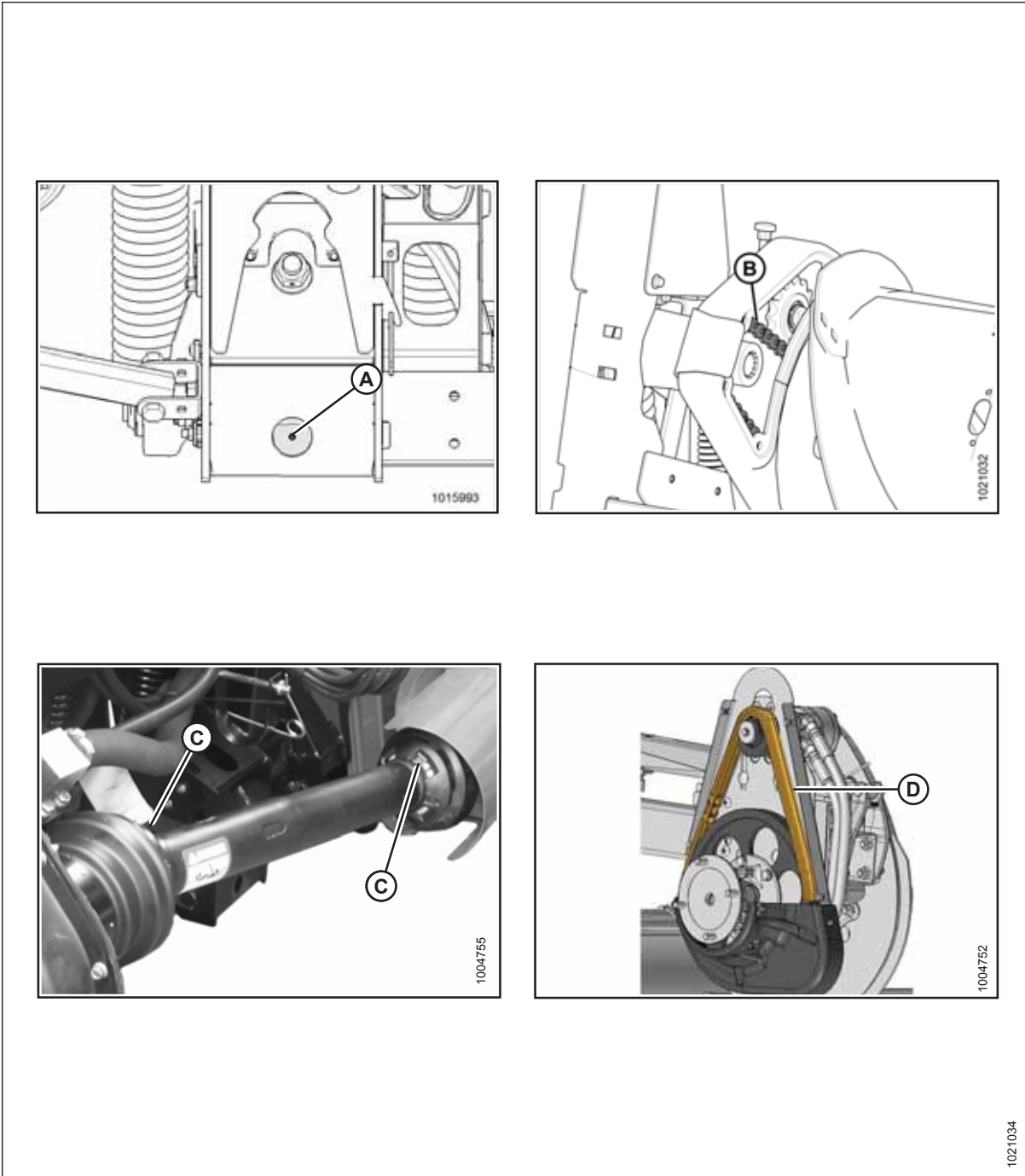
### Every 100 Hours

Use high temperature extreme pressure (EP2) performance grease with 1% max molybdenum disulphide (NLGI Grade 2) lithium base unless otherwise specified.

57. Use high temperature extreme pressure (EP2) performance grease with 10% max molybdenum disulphide (NLGI Grade 2) lithium base.

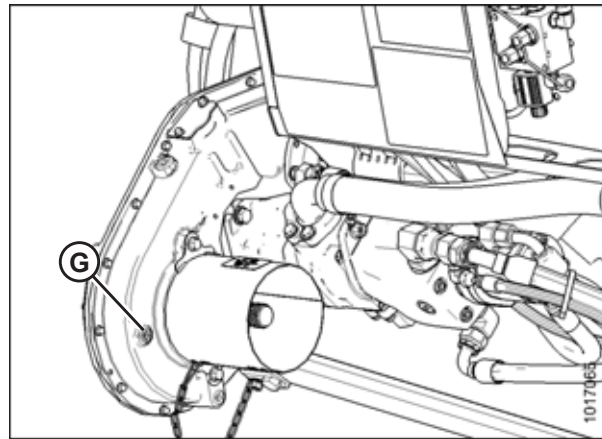
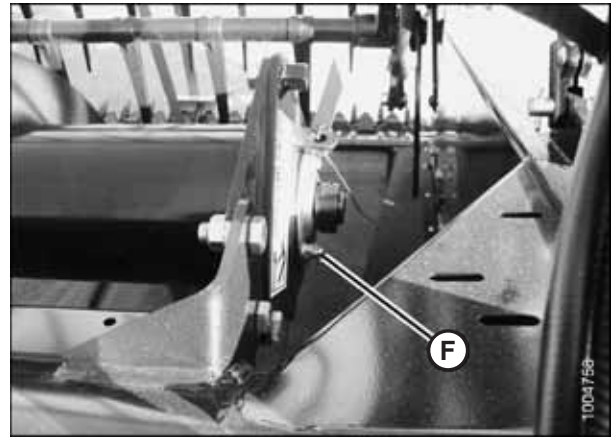
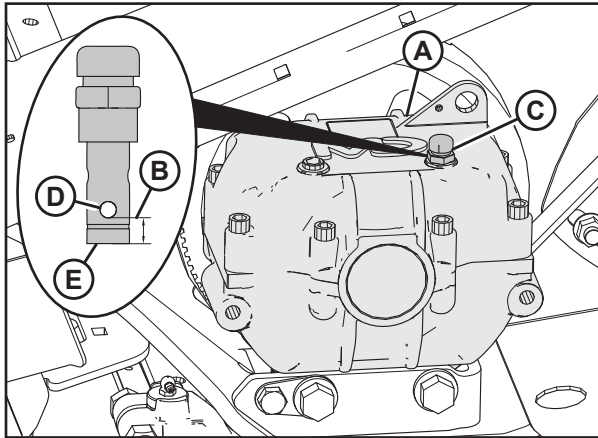


## MAINTENANCE AND SERVICING



**Figure 5.9: Every 100 Hours**

- A - Float Pivot – Right and Left
- B - Auger Drive Chain (refer to *Lubricating Auger Drive Chain, page 417*)
- C - Driveline Guard – Two Places
- D - Reel Drive Chain – One Place (refer to *Lubricating Reel Drive Chain – Double Reel, page 414*)



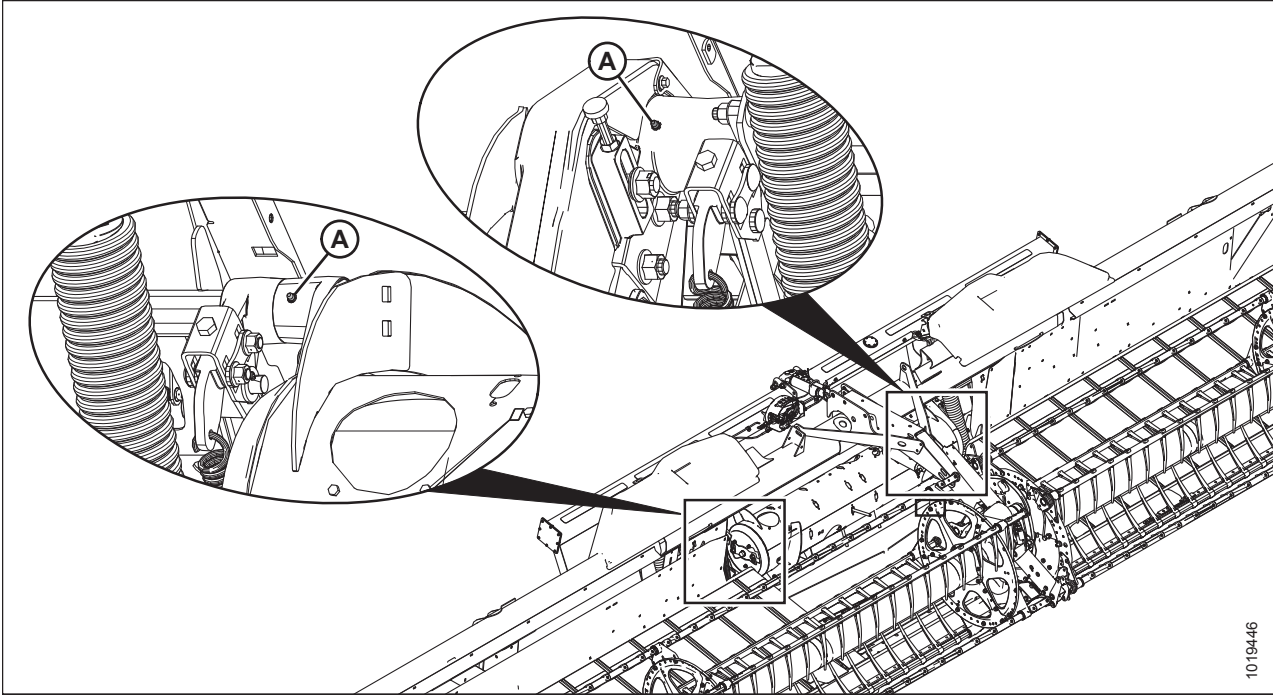
**Figure 5.10: Every 100 Hours**

A - Knife Drive Box (Check Oil Level [B] on Dipstick [C]: Between Lowest Edge of Hole [D] and Bottom [E] of Dipstick)

F - Upper Cross Auger Bearing (One Place)

G - Main Drive Gearbox Oil Level (refer to [Lubricating Header Drive Gearbox, page 418](#))

## MAINTENANCE AND SERVICING

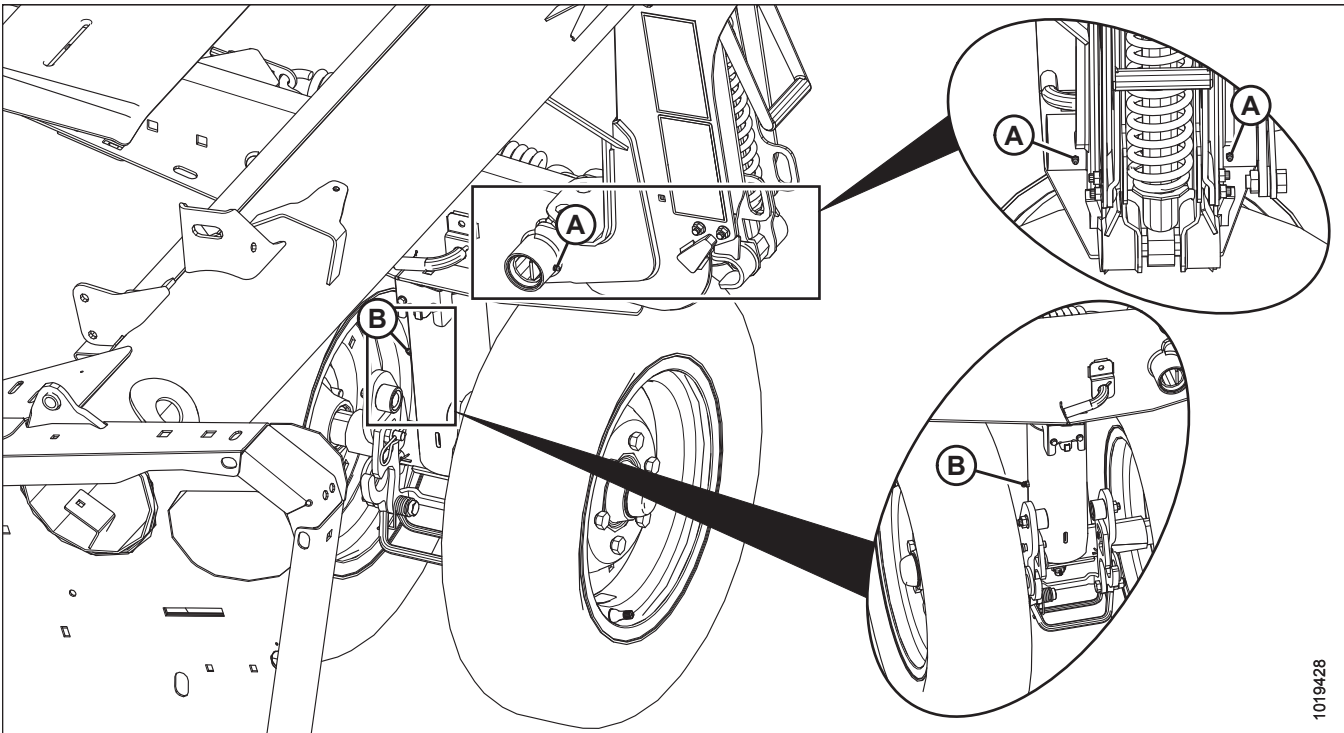


**Figure 5.11: Every 100 Hours**

A - Auger Pivots

### Every 250 Hours

Use high temperature extreme pressure (EP2) performance grease with 1% max molybdenum disulphide (NLGI Grade 2) lithium base unless otherwise specified.



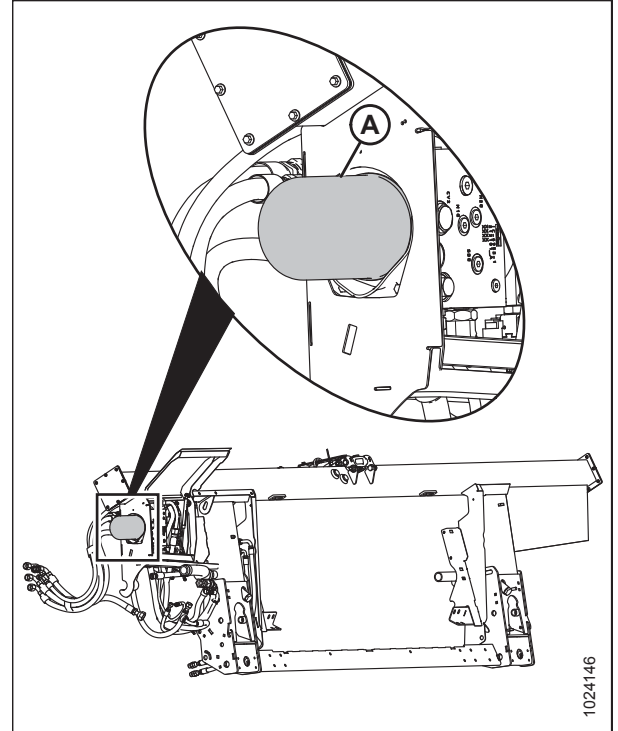
**Figure 5.12: Every 250 Hours**

A - Frame/Wheel Pivot (Front and Rear) – Both Sides

B - Front Wheel Pivot (One Place)

## MAINTENANCE AND SERVICING

Change oil filter (A) every 250 hours of operation. For instructions, refer to [5.4.4 Changing Oil Filter, page 423](#) for instructions.

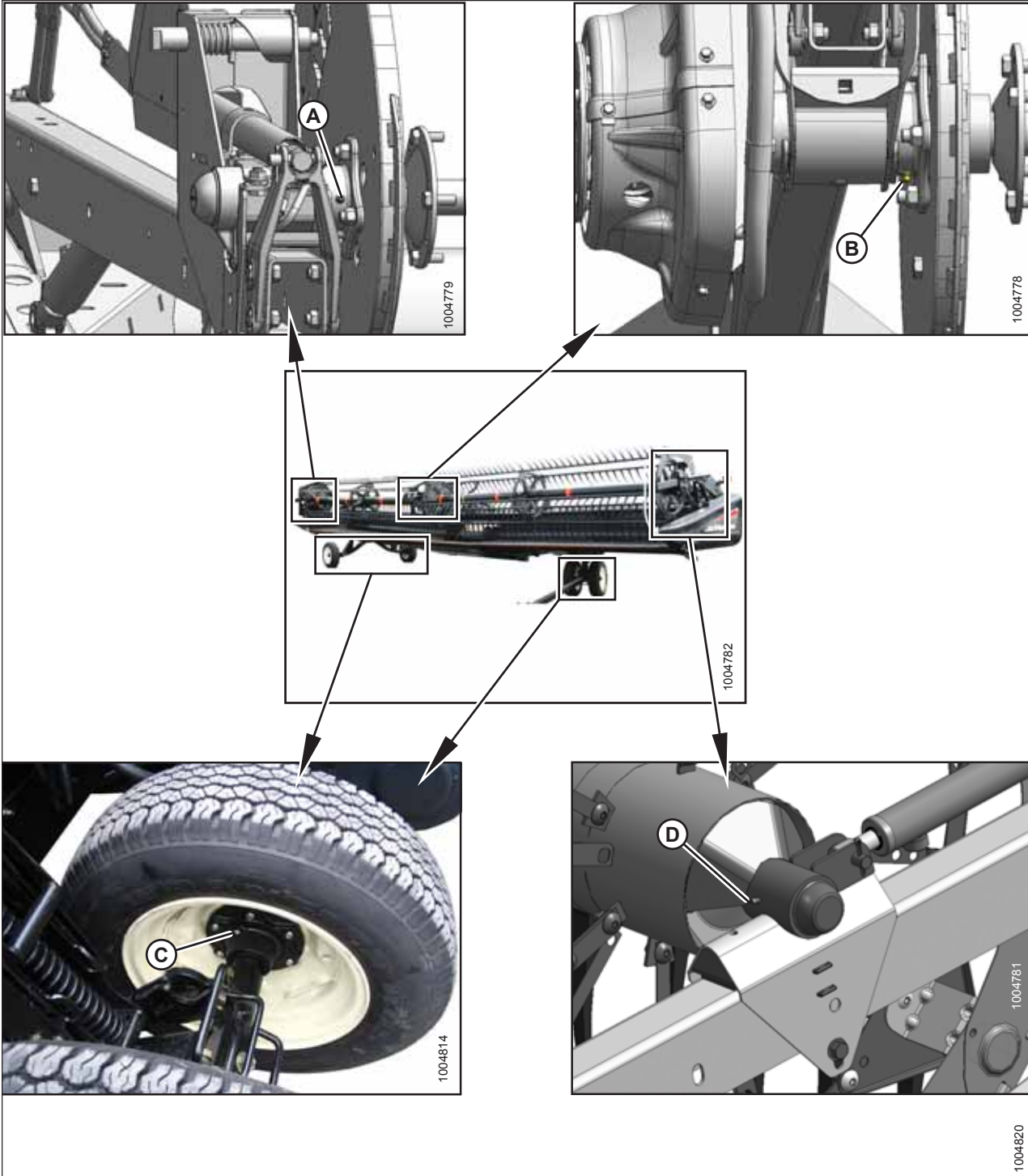


**Figure 5.13: Every 250 Hours**

### **Every 500 Hours**

Use high temperature extreme pressure (EP2) performance grease with 1% max molybdenum disulphide (NLGI Grade 2) lithium base unless otherwise specified.

MAINTENANCE AND SERVICING



### Greasing Procedure

Greasing points are identified on the machine by decals showing a grease gun and grease interval in hours of operation. Grease point layout decals are located on the header and on the right side of the float module.

#### DANGER

To avoid injury or death from unexpected start-up of machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

Refer to inside back cover for recommended lubricants.

Log hours of operation and use the Maintenance Record provided to keep a record of scheduled maintenance. For more maintenance information, refer to [5.3.1 Maintenance Schedule/Record, page 399](#).

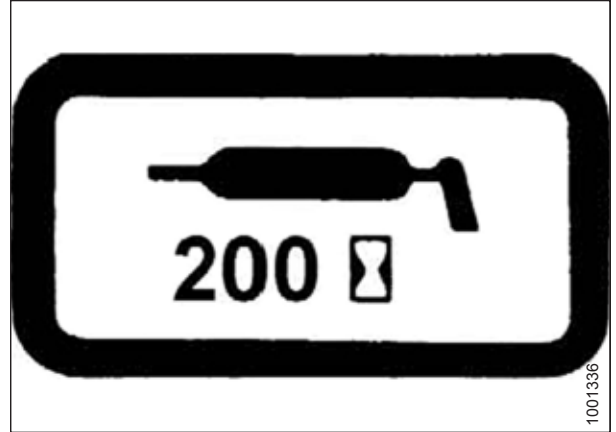


Figure 5.15: Greasing Interval Decal

1. Shut down the engine, and remove the key from the ignition.



## MAINTENANCE AND SERVICING

2. Wipe grease fitting with a clean cloth before greasing to avoid injecting dirt and grit.

### IMPORTANT:

Use clean, high-temperature, extreme-pressure grease only.

3. Inject grease through fitting with grease gun until grease overflows fitting (except where noted).
4. Leave excess grease on fitting to keep out dirt.
5. Replace any loose or broken fittings immediately.
6. Remove and thoroughly clean any fitting that will not take grease. Also clean lubricant passageway. Replace fitting if necessary.

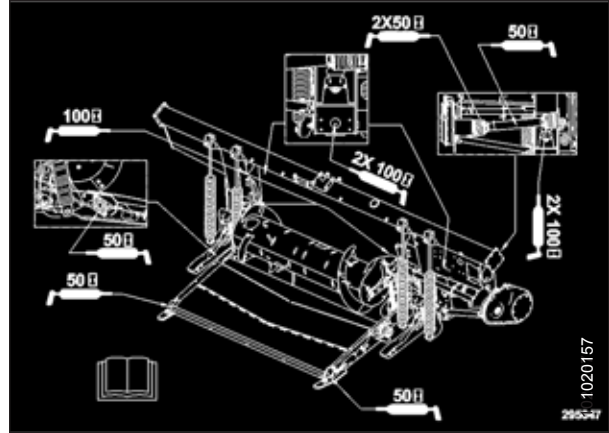


Figure 5.16: FM100 Grease Point Decal

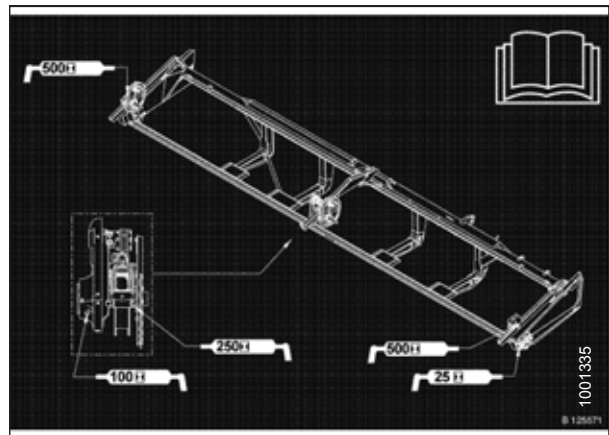


Figure 5.17: Single-Knife Header Grease Point Decal

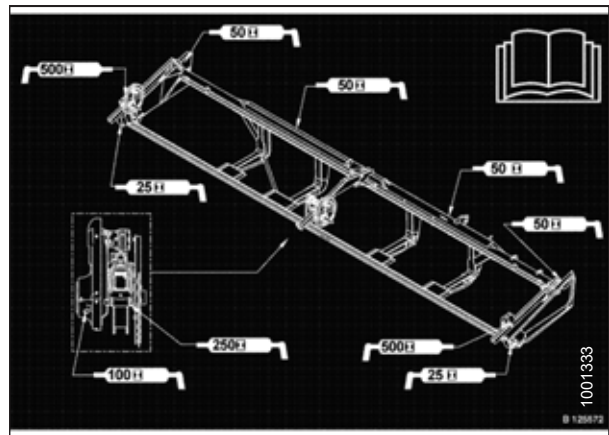


Figure 5.18: Double-Knife Header Grease Point Decal

### Lubricating Reel Drive Chain – Double Reel

#### DANGER

To avoid injury or death from unexpected start-up of machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.



## MAINTENANCE AND SERVICING

1. Remove six bolts (A) securing upper cover (B) to the reel drive and lower cover (C).
2. Remove upper cover (B).

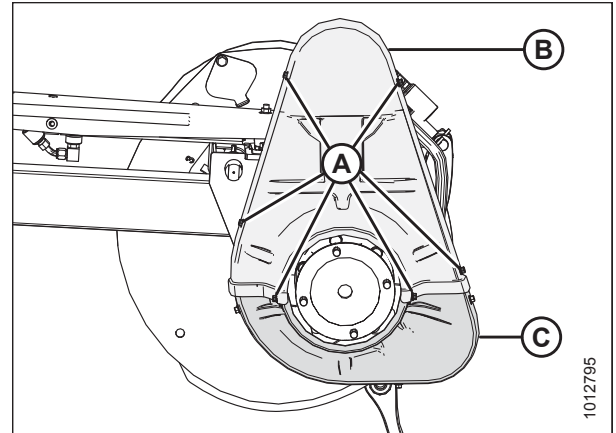


Figure 5.19: Drive Cover – Double Reel

3. Remove three bolts (A) and remove lower cover (B) if necessary.

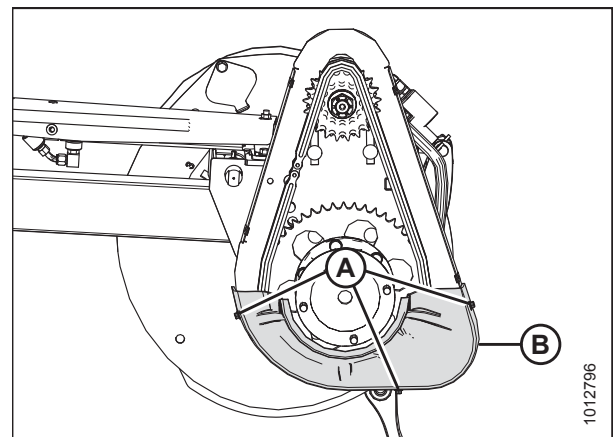


Figure 5.20: Lower Drive Cover

4. Apply a liberal amount of grease to the chain (A).

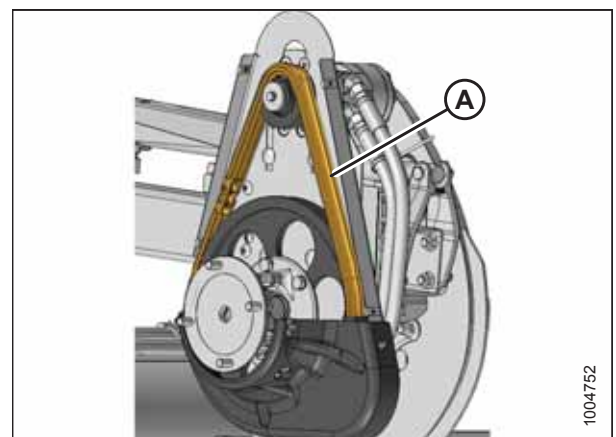


Figure 5.21: Drive Chain

## MAINTENANCE AND SERVICING

5. Position lower drive cover (B) onto the reel drive (if previously removed), and secure with three bolts (A). Torque bolts to 12–13.2 Nm (9–10 lbf·ft).

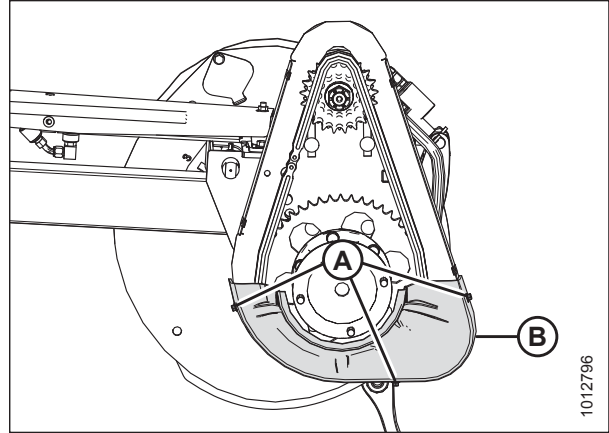


Figure 5.22: Lower Drive Cover – Double Reel

6. Position upper drive cover (B) onto the reel drive and lower cover (C), and secure with six bolts (A). Torque bolts to 12–13.2 Nm (9–10 lbf·ft).

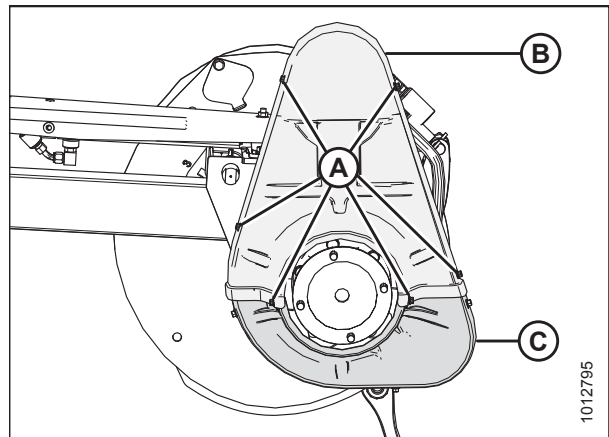


Figure 5.23: Drive Cover – Double Reel

*Lubricating Auger Drive Chain*



To avoid injury or death from unexpected start-up of machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

Lubricate the auger drive chain every 100 hours. The auger drive chain can be lubricated with the float module attached to the combine, but it is easier with the float module detached.

The auger drive cover consists of an upper and lower cover, and a metal inspection panel. Only the metal inspection panel needs to be removed to grease the chain.

1. Remove four bolts (A) and metal inspection panel (B).

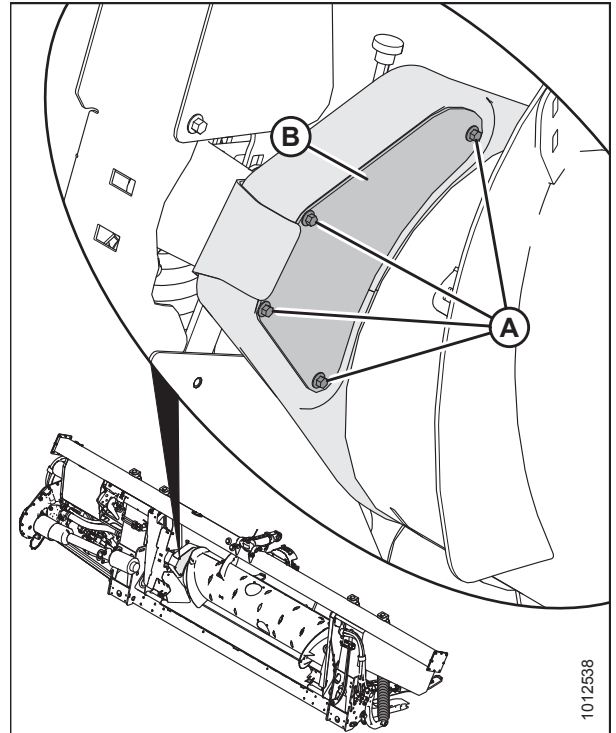


Figure 5.24: Auger Drive Inspection Panel

2. Apply a liberal amount of grease to chain (A), drive sprocket (B), and idler sprocket (C).
3. Rotate the auger and apply grease to more areas of the chain, if necessary.

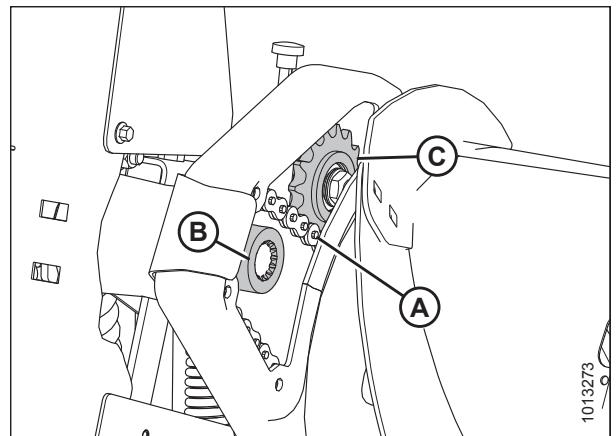


Figure 5.25: Auger Drive Chain

## MAINTENANCE AND SERVICING

4. Reinstall metal inspection panel (B) and secure with four bolts (A).

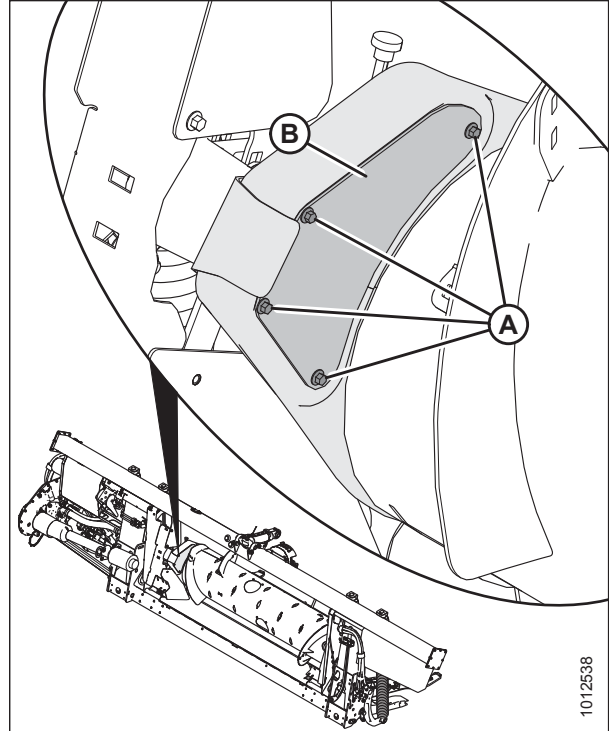


Figure 5.26: Auger Drive Inspection Panel

### *Lubricating Header Drive Gearbox*

#### **Checking Oil Level in Header Drive Gearbox**

Check the header drive gearbox oil level every 100 hours.

#### **DANGER**

To avoid injury or death from unexpected start-up of machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Lower the header to the ground and ensure the gearbox is in working position.
2. Shut down the engine, and remove the key from the ignition.
3. Remove oil level plug (A) and check that the oil level is up to the bottom of the hole.
4. Reinstall oil level plug (A).
5. Add oil if required. For instructions, refer to [Adding Oil to Header Drive Gearbox, page 419](#).

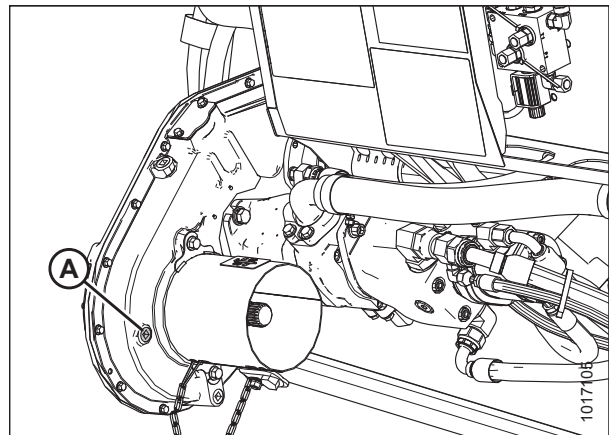


Figure 5.27: Header Drive Gearbox

### Adding Oil to Header Drive Gearbox

#### DANGER

To avoid injury or death from unexpected start-up of machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Lower the cutterbar to the ground, and ensure the gearbox is in working position.
2. Shut down the engine, and remove the key from the ignition.
3. Remove filler plug (B) and oil level plug (A).
4. Add oil into filler plug hole (B) until it runs out of oil level plug hole (A). Refer to the inside back cover for recommended fluids and lubricants.
5. Replace oil level plug (A) and filler plug (B).

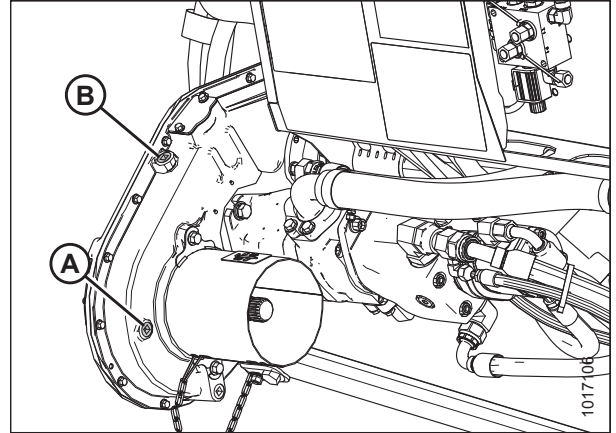


Figure 5.28: Header Drive Gearbox

### Changing Oil in Header Drive Gearbox

Change the header drive gearbox oil after the first 50 hours of operation and every 1000 hours (or 3 years) thereafter.

#### DANGER

To avoid injury or death from unexpected start-up of machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Start engine.
2. Engage the header to warm up the oil.
3. Raise or lower the header to position oil drain plug (A) at its lowest point.
4. Shut down the engine, and remove the key from the ignition.
5. Place a suitably sized container (approximately 4 liters [1 US gal]) underneath the gearbox drain to collect the oil.
6. Remove oil drain plug (A) and filler plug (C), and allow the oil to drain.
7. Replace oil drain plug (A) and remove oil level plug (B).
8. Add oil through filler plug hole (C) until it runs out of oil level hole (B). Refer to this manual's inside back cover for recommended lubricants.

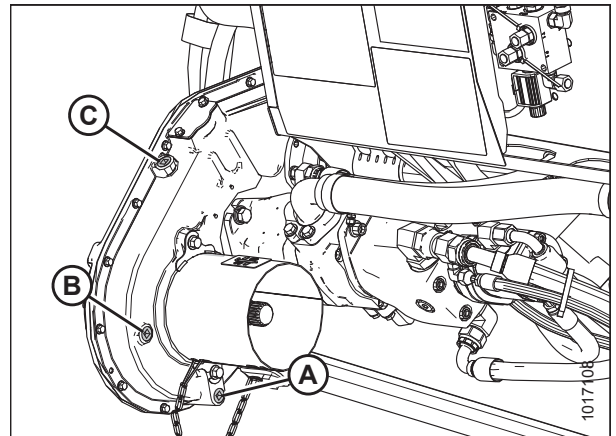


Figure 5.29: Header Drive Gearbox

#### NOTE:

The header drive gearbox holds approximately 2.5 liters (2.6 quarts) of oil.

9. Replace oil level plug (B) and filler plug (C).

## 5.4 Hydraulics

The FM100 Float Module's hydraulic system drives the float module feed draper, header drapers, and knife drives. The combine's hydraulic system drives the reel hydraulics.

The float module frame acts as an oil reservoir. Refer to inside back cover for oil requirements.

### 5.4.1 Checking Oil Level in Hydraulic Reservoir

Check the hydraulic oil level in the reservoir every 25 hours.

1. Check the oil level using lower sight (A) and upper sight (B) with the cutterbar just touching the ground and with the center-link retracted.

**NOTE:**

Check the level when the oil is cold.

**NOTE:**

For extremely hilly terrain, a hillside extension kit can be installed. For more information, refer to [6.1.1 Hillside Extension Kit, page 581](#).

2. Ensure the oil is at the appropriate level for the terrain as follows:
  - **Hilly terrain:** Maintain level so lower sight (A) is full, and upper sight (B) is up to one-half filled.
  - **Normal terrain:** Maintain level so lower sight (A) is one-half full, and upper sight (B) is empty.

**NOTE:**

It may be necessary to slightly reduce the oil level when ambient temperatures are above 35°C (95°F) to prevent overflow at the breather when normal operating temperatures are reached.

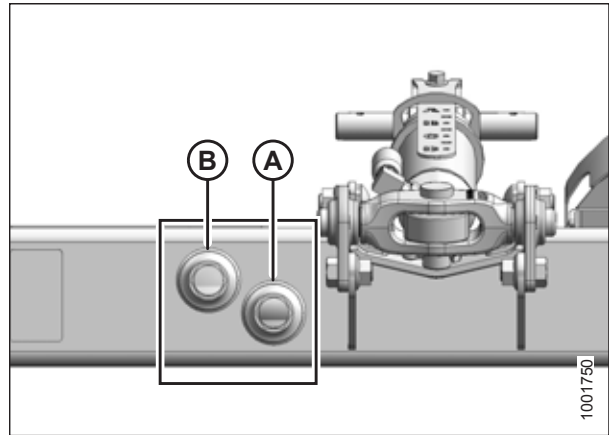


Figure 5.30: Oil Level Sight Glass

### 5.4.2 Adding Oil to Hydraulic Reservoir

Follow this procedure to top up the oil in the hydraulic reservoir. To change the hydraulic oil, refer to [5.4.3 Changing Oil in Hydraulic Reservoir, page 421](#).

**⚠ DANGER**

To avoid injury or death from unexpected start-up of machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Shut down the engine, and remove the key from the ignition.

- Clean any dirt or debris from filler cap (A).

**CAUTION**

Oil reservoir can have up to 10 psi of pressure, remove the cap slowly.

- Loosen and remove filler cap (A) by turning it counterclockwise.
- Add warm oil (approximately 21°C [70°F]) and fill to the required level. Refer to this manual's inside back cover for oil type and specification.

**IMPORTANT:**

Warm oil will flow through the screen better than cold oil. Do **NOT** remove the screen.

- Reinstall filler cap (A).
- Recheck oil level. For instructions, refer to [5.4.1 Checking Oil Level in Hydraulic Reservoir, page 420](#).

### 5.4.3 Changing Oil in Hydraulic Reservoir

Change the hydraulic oil in the reservoir every 1000 hours or 3 years (whichever comes first).

**DANGER**

To avoid injury or death from unexpected start-up of machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

- Start the engine. For instructions, refer to the combine operator's manual.
- Engage the header to warm up the oil.
- Shut down the engine, and remove the key from the ignition.

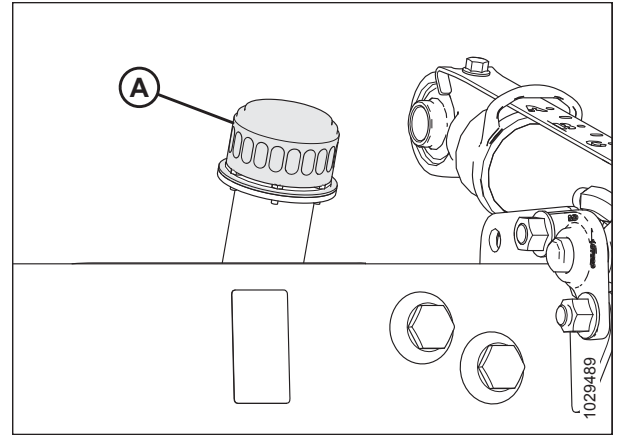


Figure 5.31: Oil Reservoir Filler Cap



## MAINTENANCE AND SERVICING

- Place a suitably sized container (at least 40 liters [10 gallons]) under each of the two oil drain plugs (A) located at the back on each side of the frame.

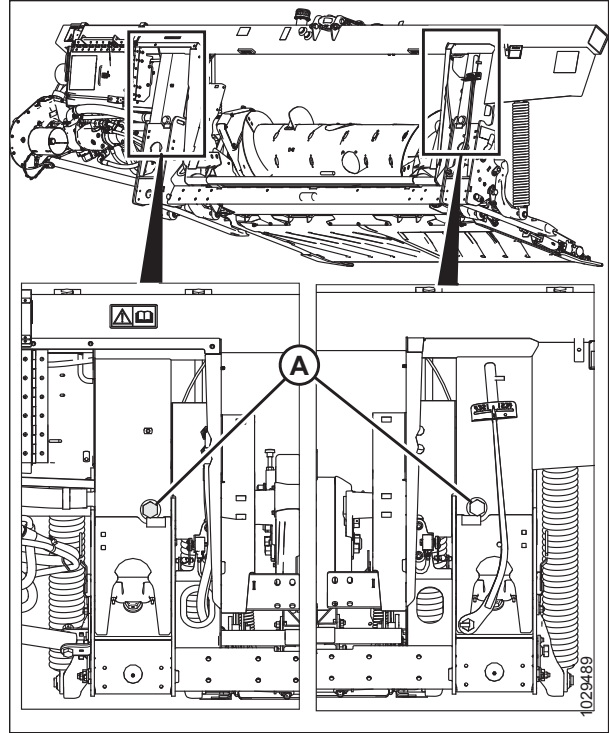


Figure 5.32: Reservoir Drain

- Clean any dirt or debris from filler cap (A).

### CAUTION

Oil reservoir can have up to 10 psi of pressure, remove the cap slowly.

- Loosen and remove filler cap (A) by turning it counterclockwise.

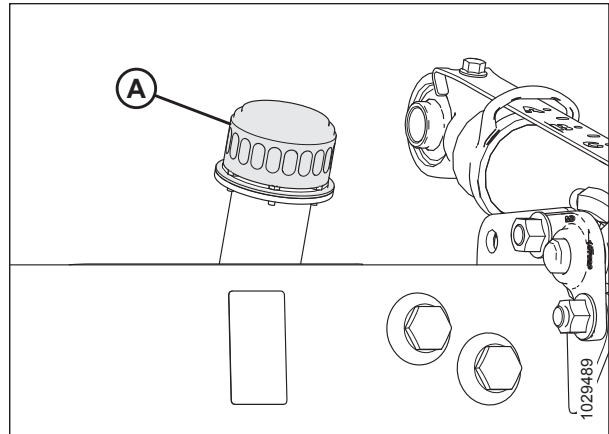


Figure 5.33: Oil Reservoir Filler Cap

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7. Remove oil drain plugs (A) with a 1 1/2 in. hex socket and allow the oil to drain.
8. Replace oil drain plugs (A) when reservoir is empty.
9. Change the oil filter if required. For instructions, refer to [5.4.4 Changing Oil Filter, page 423](#).
10. Add approximately 85 liters (22.5 gallons) of oil to the reservoir. For instructions, refer to [5.4.2 Adding Oil to Hydraulic Reservoir, page 420](#).

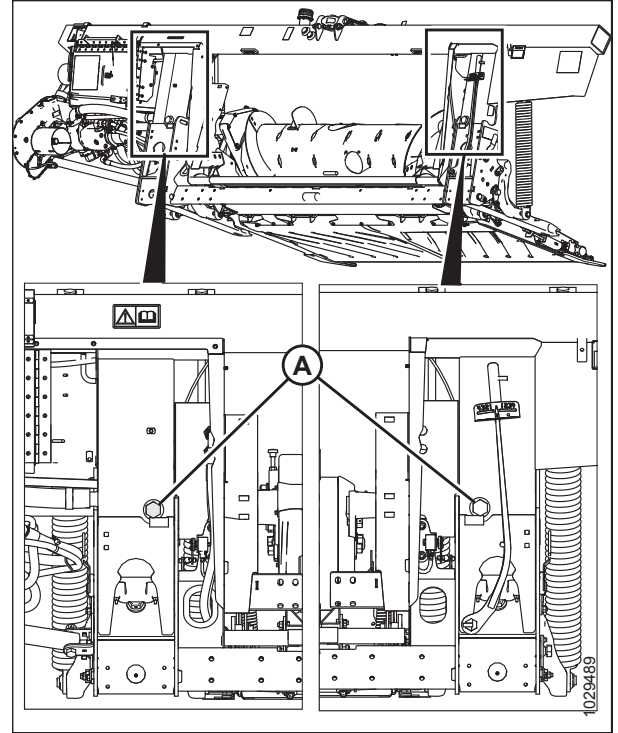


Figure 5.34: Reservoir Drain

### 5.4.4 Changing Oil Filter

Change the oil filter after the first 50 hours of operation and every 250 hours thereafter.

Obtain filter (MD #202986) from your MacDon Dealer.

#### DANGER

To avoid injury or death from unexpected start-up of machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Clean around the mating surfaces of the filter (B) and manifold (A).
- NOTE:**  
Cover opened in illustration at right to show manifold (A).
2. Place a suitably sized container (approximately 1 liter [0.26 gallons]) under the oil drain spout (C) to collect oil runoff.
  3. Remove spin-off filter (B) and clean the exposed filter port in manifold (A).
  4. Apply a thin film of clean oil to the O-ring provided with the new filter.
  5. Turn the new filter into manifold (A) until the O-ring contacts the mating surface. Tighten the filter an additional 1/2 to 3/4 turn by hand.

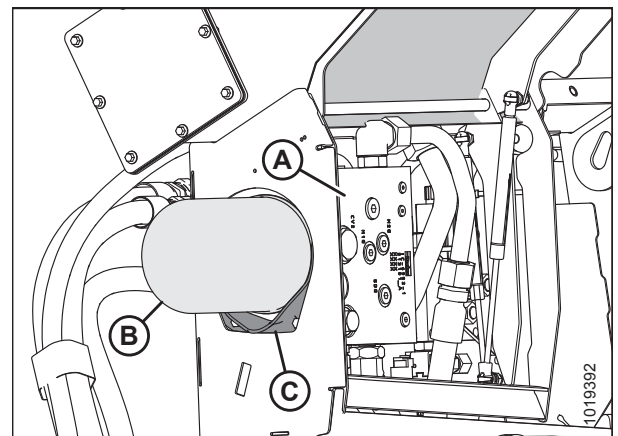


Figure 5.35: FM100 Hydraulics

## MAINTENANCE AND SERVICING

### **IMPORTANT:**

Do **NOT** use a filter wrench to install the new filter.  
Overtightening can damage the O-ring and filter.

## 5.5 Electrical System

The electrical system for the header is powered by the combine. The header has various lights and sensors that require power.

### 5.5.1 Replacing Light Bulbs

#### DANGER

To avoid bodily injury or death from unexpected startup of machine, always stop the engine and remove the key before making adjustments to the machine.

1. Shut down the engine, and remove the key from the ignition.
2. Use a Phillips screwdriver to remove screws (A) from the fixture, and remove the plastic lens. Retain screws (A).
3. Replace the bulb, and reinstall the plastic lens and screws.

**NOTE:**

Use trade #1156 bulb for amber transport lights and #1157 for the red tail light (Transport option).

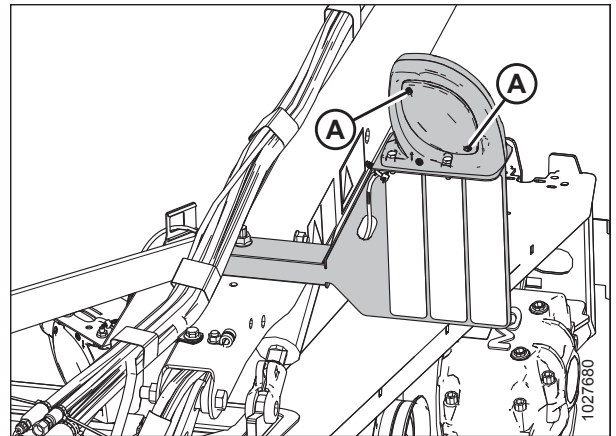


Figure 5.36: Left Transport Light

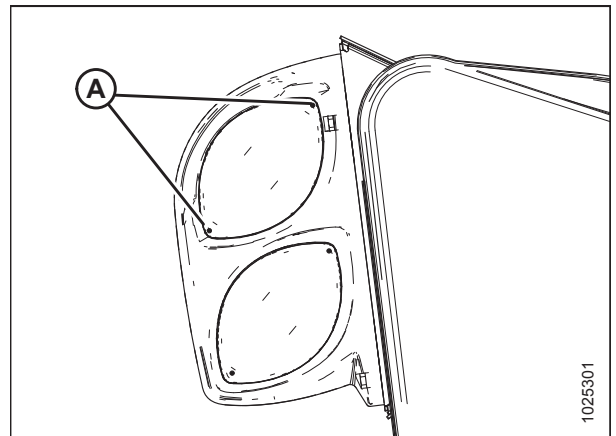


Figure 5.37: Transport Option – Red and Amber Lights

## 5.6 Header Drive

The header drive consists of a driveline from the combine to the FM100 Float Module gearbox that drives the feed auger and hydraulic pumps. The pumps provide hydraulic power to the drapers, knives, and optional equipment.

### 5.6.1 Removing Driveline

#### DANGER

To avoid injury or death from unexpected start-up of machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

#### NOTE:

The driveline normally remains attached to the float module and is stored on the support bracket provided when not in use.

1. Shut down the combine, and remove the key from the ignition.
  2. If the float module is attached to the combine, remove the driveline from the combine by pulling the quick disconnect collar to release the driveline yoke at the combine shaft.
  3. Remove two nuts (A) securing shield (B) to the gearbox.
  4. Slide shield (B) over the driveline shield to expose the quick disconnect on the gearbox. Do **NOT** disconnect tether (C).
  5. Pull the quick disconnect collar to release the driveline yoke, and pull the driveline off the gearbox shaft.
  6. Slide shield (B) off the driveline.
- 
7. Pull driveline collar (A) away from power take-off (PTO) support (B). Slide yoke (C) off support (B), and release collar (A).

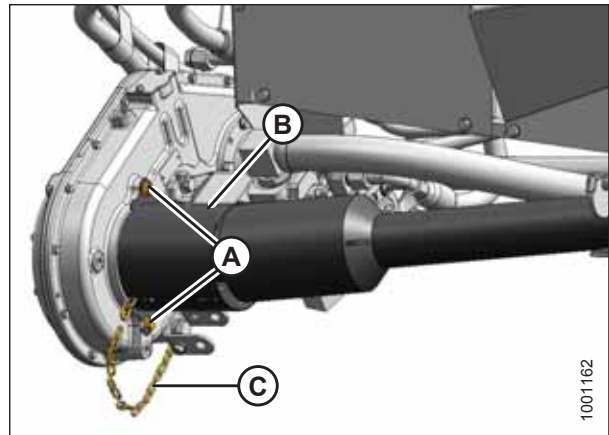


Figure 5.38: Float Module End of Driveline

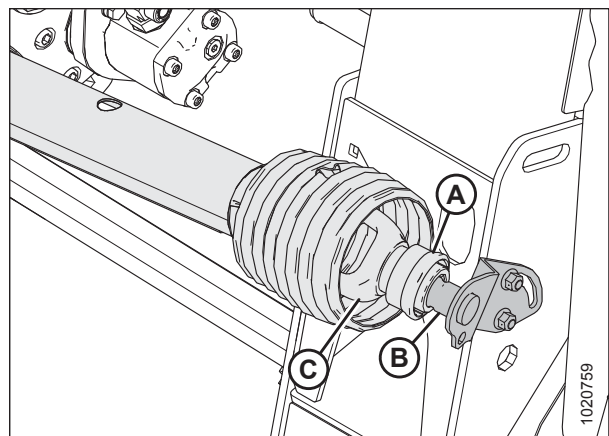


Figure 5.39: Combine End of Driveline

## 5.6.2 Installing Driveline

### DANGER

To avoid bodily injury or death from unexpected start-up of machine, always stop engine and remove key from ignition before leaving operator's seat for any reason.

#### IMPORTANT:

If the combine output shaft splines match the float module input shaft splines, ensure the driveline is installed with the longer guard at the float module gearbox end.

#### IMPORTANT:

Ensure the driveline length corresponds with the length specifications for your specific equipment. For more information, refer to [2.2 D1 Series Draper Header Specifications, page 25](#).

1. Position the combine end of driveline (A) onto storage support (B). Pull back collar (C) on the driveline and slide the driveline onto the support until it locks in place. Release collar (C).
2. For drivelines equipped with safety chains, attach chain (D) at the combine end to driveline storage support (B).

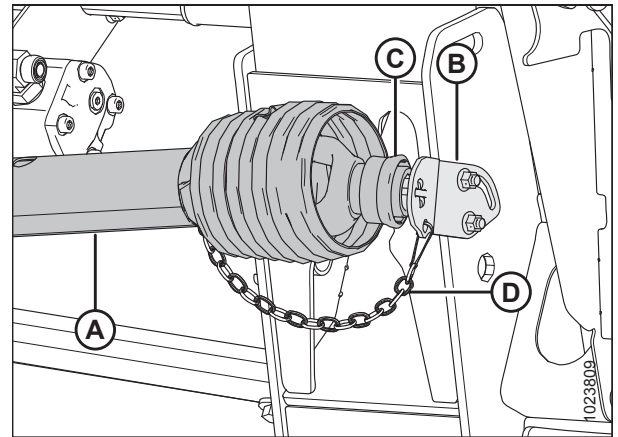


Figure 5.40: Combine End of Driveline

3. Slide shield (A) over driveline (B).
4. Position the driveline quick disconnect onto the float module gearbox shaft, pull back the collar, and slide it onto the shaft until it locks in place. Release the collar.
5. Position shield (A) on the gearbox and secure with bolts (C).
6. For drivelines equipped with safety chains, attach chain (D) at the module end to chain (E) on the shield.

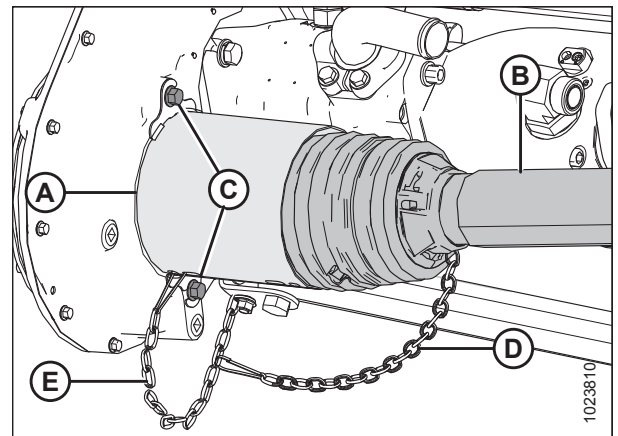


Figure 5.41: Float Module End of Driveline

### 5.6.3 Removing Driveline Guard

The main driveline guard must remain attached to the driveline during operation, but it can be removed for maintenance purposes.

#### DANGER

To avoid injury or death from unexpected start-up of machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

#### NOTE:

The driveline does **NOT** need to be removed from the float module in order to remove the driveline guard.

1. Shut down the combine, and remove the key from the ignition.
2. Pull driveline collar (A) away from power take-off (PTO) support (B). Slide yoke (C) off support (B), and release collar (A).

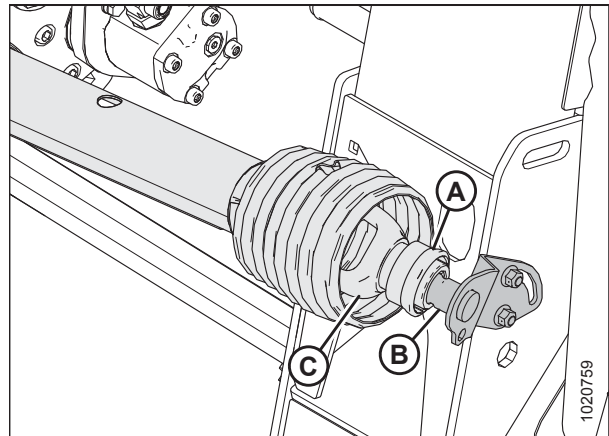


Figure 5.42: Combine End of Driveline

3. Lift the combine end of driveline (A) from the hook, and extend the driveline until it separates. Hold the float module end of driveline (B) to prevent it from dropping and hitting the ground.



Figure 5.43: Separated Driveline



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4. Use a slotted screwdriver to release grease fitting/lock (A).



Figure 5.44: Driveline Guard

5. Rotate driveline guard locking ring (A) counterclockwise using a screwdriver until lugs (B) line up with the slots in the guard.
6. Pull the guard off the driveline.

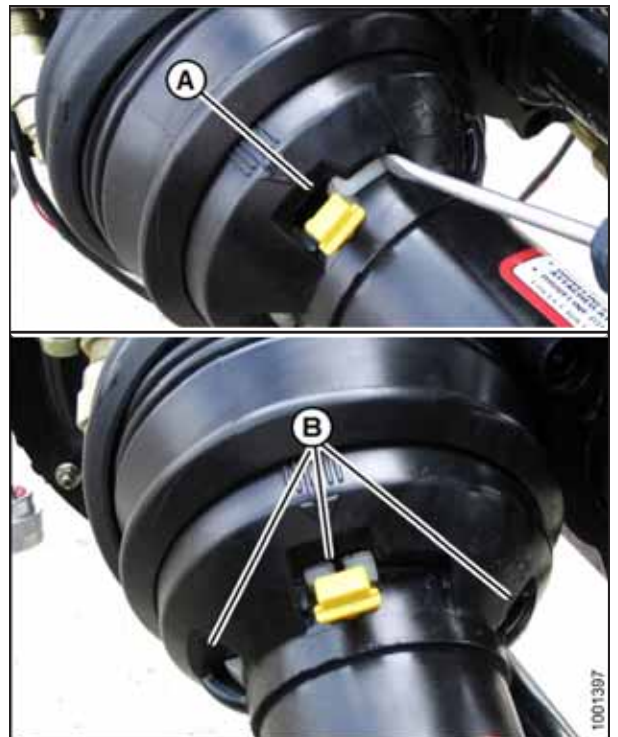


Figure 5.45: Driveline Guard

### 5.6.4 Installing Driveline Guard

1. Slide the guard onto the driveline, and line up the slotted lug on locking ring (A) with arrow (B) on the guard.



Figure 5.46: Driveline Guard

2. Push the guard onto the ring until the locking ring is visible in slots (A).



Figure 5.47: Driveline Guard

3. Use a slotted screwdriver to rotate ring (A) clockwise and lock ring in guard.



Figure 5.48: Driveline Guard

4. Push grease fitting (A) back into the guard.



Figure 5.49: Driveline Guard

5. Assemble the driveline.

**IMPORTANT:**

The splines are keyed to align the universals. Align weld (A) with missing spline (B) when assembling. Failure to align the halves of the shaft can cause excessive vibration and feed auger/gearbox failures.

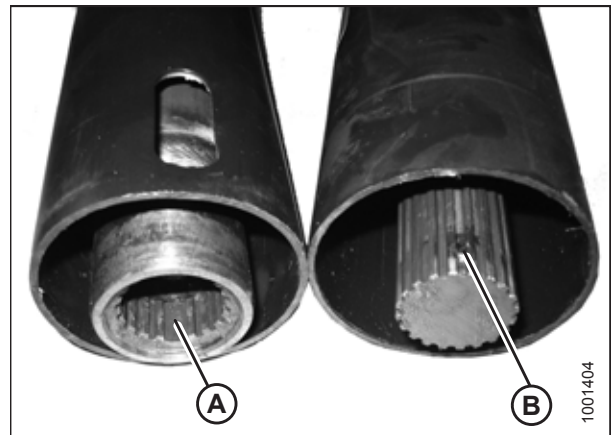


Figure 5.50: Driveline

6. Position the combine end of driveline (A) on power take-off (PTO) storage support (B). Pull back collar (C) on the driveline and slide driveline onto the support until driveline yoke (D) locks onto support. Release collar (C).

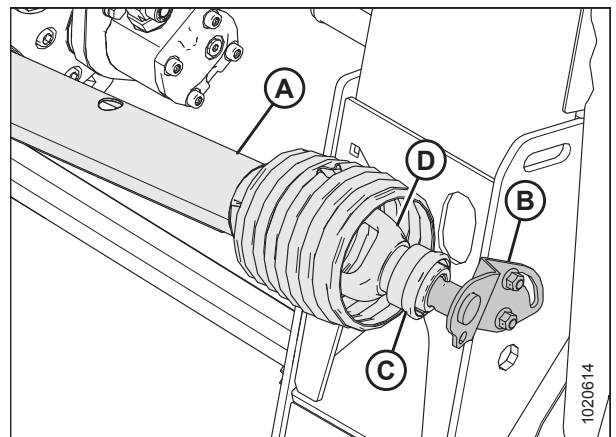


Figure 5.51: Combine End of Driveline

### 5.6.5 Adjusting Gearbox Drive Chain Tension

The gearbox drive chain tension is factory-set, but tension adjustments are required after the first 50 hours, then every 500 hours or annually (whichever comes first). The gearbox drive chain, located inside the gearbox, requires no other regular maintenance.

**⚠ DANGER**

To avoid injury or death from unexpected start-up of machine, always stop the engine and remove the key from the ignition before leaving the operator’s seat for any reason.

1. Lower the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Remove two bolts and chain adjusting cover (A). Ensure there is no gasket (B) damage.
4. Remove retainer plate (C).
5. Tighten bolt (D) to 6.8 Nm (60 lbf-in).
6. Refer to Table 5.1, page 432 and back off (loosen) bolt (D) based on your gearbox configuration.

**NOTE:**

A properly tensioned chain has 10–14 mm (3/8–9/16 in.) of deflection at its midpoint.

7. Reinstall retainer plate (C).
8. Reinstall two bolts and chain adjusting cover (A) and gasket (B). Torque hardware to 9.5 Nm (84 lbf-in).

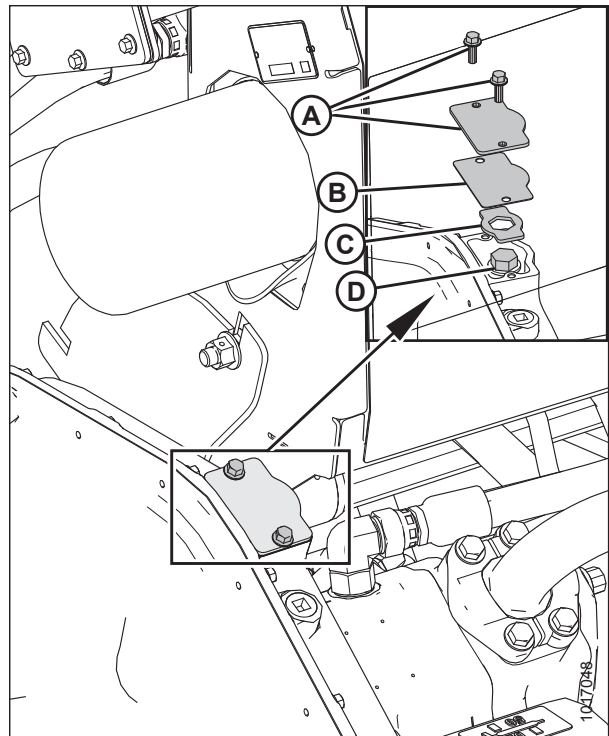


Figure 5.52: Chain Tensioner

Table 5.1 Adjusting Bolt Tightness on Configured Gearboxes

Gearbox Configuration	Gear Ratios	Back Off Amounts
CLAAS	18/38 sprocket ratio, 74 pitch chain	1 turn or 360 degrees
CLAAS	22/38 sprocket ratio, 74 pitch chain	1/2 turn or 180 degrees
Case, New Holland, and AGCO (Challenger, Gleaner, Massey Ferguson)	29/38 sprocket ratio, 78 pitch chain	1 turn or 360 degrees
Case, New Holland, and AGCO (Challenger, Gleaner, Massey Ferguson) (Europe)	31/38 sprocket ratio, 78 pitch chain	1 1/8 turn or 405 degrees
AGCO IDEAL™ Series	29/38 sprocket ratio, 78 pitch chain	1 turn or 360 degrees

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**Table 5.1 Adjusting Bolt Tightness on Configured Gearboxes (continued)**

<b>Gearbox Configuration</b>	<b>Gear Ratios</b>	<b>Back Off Amounts</b>
John Deere	24/38 sprocket ratio, 74 pitch chain	1 2/3 turn or 600 degrees
John Deere (Europe)	31/38 sprocket ratio, 80 pitch chain	2 1/2 turn or 900 degrees
John Deere	37/38 sprocket ratio, 80 pitch chain	2 1/2 turn or 900 degrees
Special	20/38 sprocket ratio, 74 pitch chain	3/4 turn or 270 degrees
Special	22/38 sprocket ratio, 74 pitch chain	1 turn or 360 degrees
Special	26/38 sprocket ratio, 76 pitch chain	1 turn or 360 degrees

## 5.7 Auger

The FM100 Float Module auger feeds the cut crop from the draper decks into the combine feeder house.

### 5.7.1 Adjusting Auger to Pan Clearance

#### DANGER

To avoid injury or death from unexpected start-up of machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

#### IMPORTANT:

Maintain an appropriate distance between the auger and the auger pan. Too little clearance may result in the fingers or flighting contacting and damaging the feed draper or pan when operating the header at certain angles. Look for evidence of contact when greasing the float module.

1. Extend the center-link to the steepest header angle, and position the header 150–254 mm (6–10 in.) off the ground.
2. Shut down the engine, and remove the key from the ignition.
3. Ensure the float lock linkage is on the down stops (washer [A] cannot be moved) at both locations.

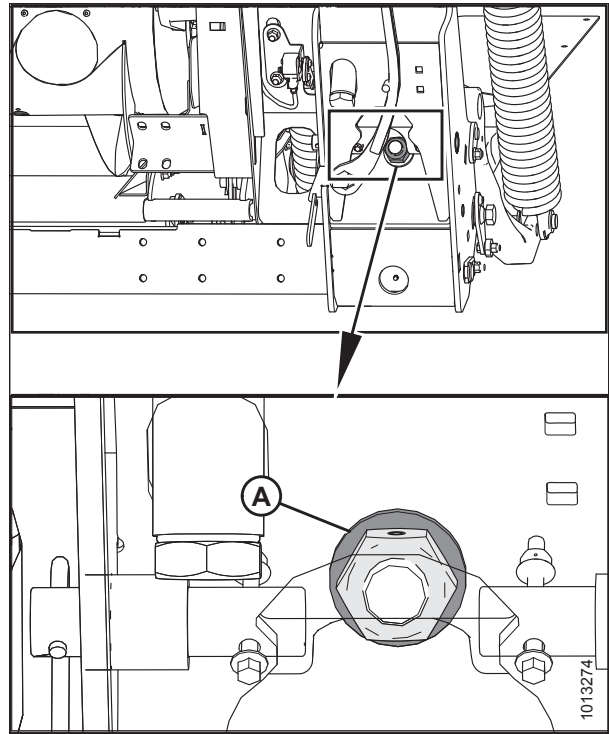


Figure 5.53: Float Lock

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4. Before adjusting the auger to pan clearance, check the auger float position to determine how much clearance is required:
  - If bolt head (A) is closest to floating symbol (B), the auger is in the floating position.

### IMPORTANT:

Make sure bolts (A) are set at the same location on both ends of the header to avoid damaging the machine during operation.

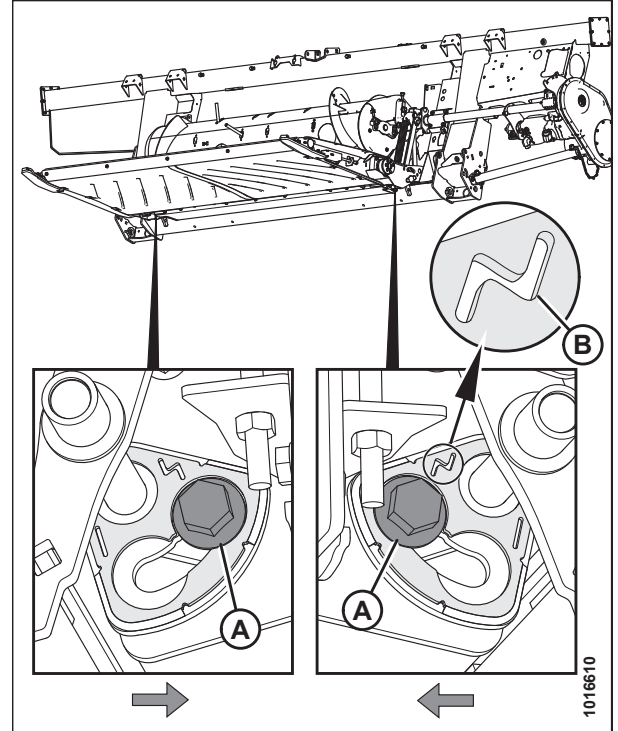


Figure 5.54: Floating Position

- If bolt head (A) is closest to fixed symbol (B), the auger is in the fixed position.

### IMPORTANT:

Make sure bolts (A) are set at the same location on both ends of the header to avoid damaging the machine during operation.

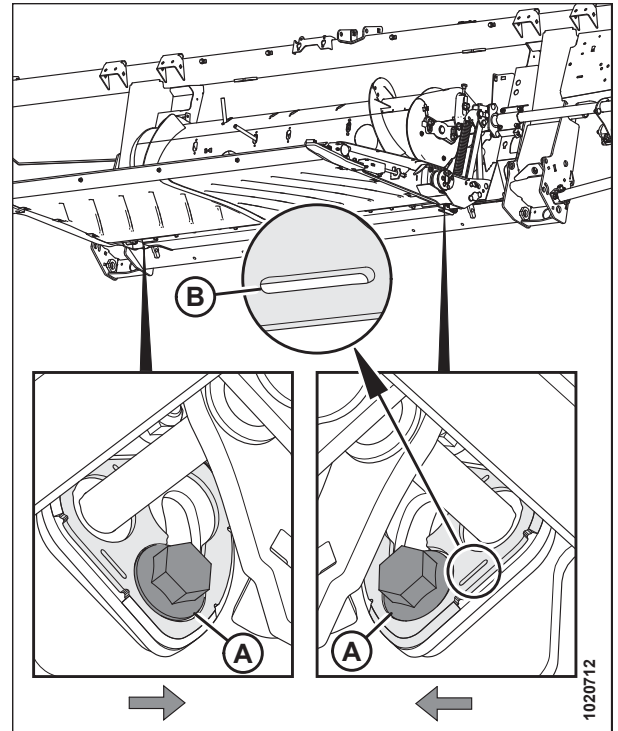


Figure 5.55: Fixed Position



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5. Loosen two nuts (B) and rotate the auger to position the flighting over the feed pan.
6. Turn bolt (A) clockwise to increase clearance (C); turn bolt (A) counterclockwise to decrease clearance (C).
  - If the feed auger is in the fixed position, set clearance to 22–26 mm (7/8–1.0 in.).
  - If the feed auger is in the floating position, set clearance to 11–15 mm (7/16–5/8 in.).

**NOTE:**

The clearance increases between 25–40 mm (1–1 1/2 in.) when the center-link is fully retracted.

7. Repeat Steps 5, [page 436](#) and 6, [page 436](#) for the opposite end of the auger.

**IMPORTANT:**

Adjusting one side of the auger can affect the other side. Always double-check both sides of the auger after making final adjustments.

8. Tighten nuts (B) on both ends of the feed auger. Torque the nuts to 96 Nm (71 lbf·ft).
9. Rotate the drum and double-check clearances.

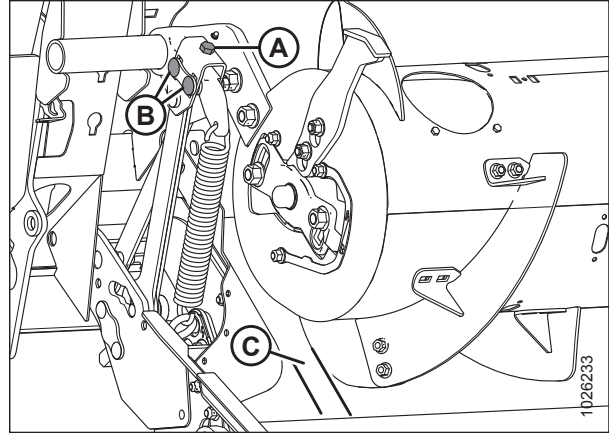


Figure 5.56: Auger Clearance

### 5.7.2 Checking Auger Drive Chain Tension

The auger is chain-driven by the float module drive system sprocket attached to the side of the auger.

#### DANGER

To avoid bodily injury or death from the unexpected start-up or fall of a raised machine, always stop engine and remove key before leaving the operator's seat, and always engage safety props before going under the machine for any reason.

1. Lower the header fully.
2. Raise the reel fully.
3. Shut down the engine, and remove the key from the ignition.
4. Engage the reel safety props. For instructions, refer to [Engaging Reel Safety Props, page 33](#).
5. Detach the header from the combine. For instructions, refer to [4 Header Attachment/Detachment, page 341](#).
6. Shut down the engine, and remove the key from the ignition.

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7. On the left side of the feed auger, remove four bolts (A) and inspection panel (B).
8. Remove bolts (C) and remove indicator/clamp (D) that holds the two covers together.
9. Remove bolt (E).
10. Remove bolt and washer (H) that secure that bottom cover.
11. Rotate bottom cover (F) forward to remove.

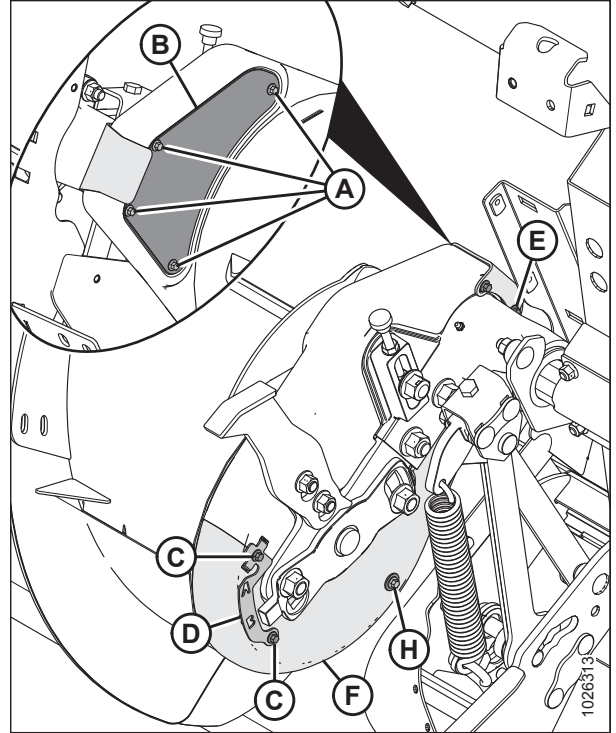


Figure 5.57: Feed Auger Drive – Rear View

12. Check chain at mid span (A). There should be 4 mm (0.16 in.) of deflection. If adjustment is required, refer to [5.7.3 Adjusting Auger Drive Chain Tension, page 438](#).

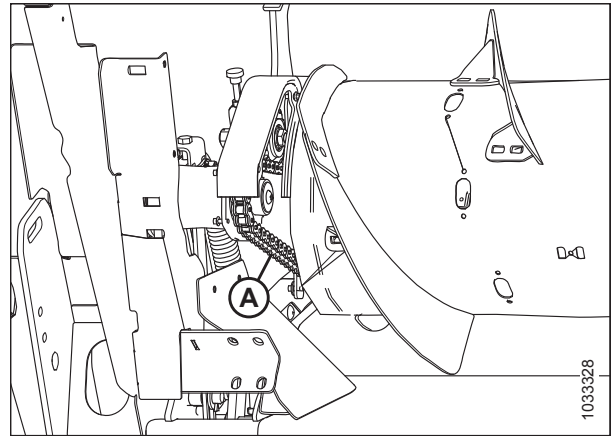


Figure 5.58: Feed Auger Chain – Rear View

## MAINTENANCE AND SERVICING

13. Position bottom cover (F) and secure with bolt and washer (H).
14. Install bolt (E).
15. Secure bottom cover to the top cover with clamp/indicator (D) and bolts (C).
16. Install inspection panel (B) and secure with four bolts (A). Tighten bolts (A) and torque to 2.7–4.1 Nm (24–36 lbf-in).

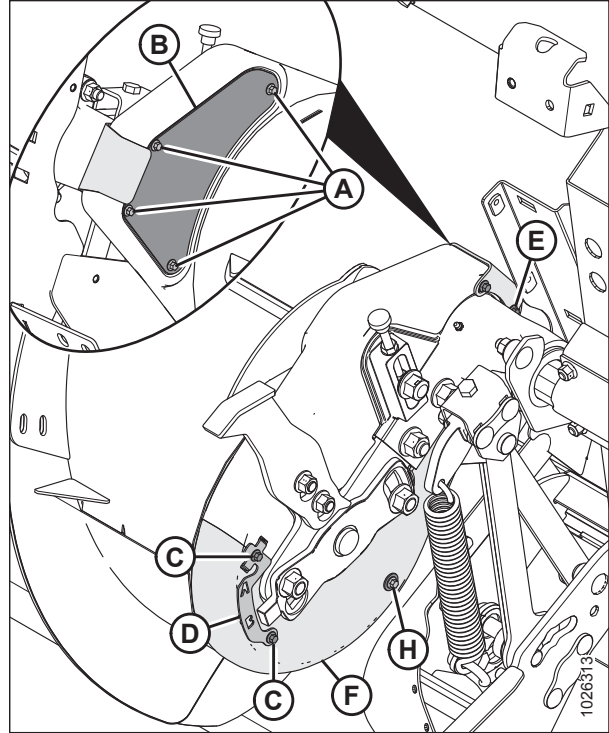


Figure 5.59: Feed Auger Drive – Rear View

### 5.7.3 Adjusting Auger Drive Chain Tension

The auger is chain-driven by the float module drive system sprocket attached to the side of the auger.

#### DANGER

To avoid bodily injury or death from the unexpected start-up or fall of a raised machine, always stop engine and remove key before leaving the operator's seat, and always engage safety props before going under the machine for any reason.

1. Lower the header fully.
2. Raise the reel fully.
3. Shut down the engine, and remove the key from the ignition.
4. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 33*.
5. Detach the header from the combine. For instructions, refer to *4 Header Attachment/Detachment, page 341*.
6. Shut down the engine, and remove the key from the ignition.

## MAINTENANCE AND SERVICING

7. Remove four bolts (A) and inspection panel (B) to view chain.

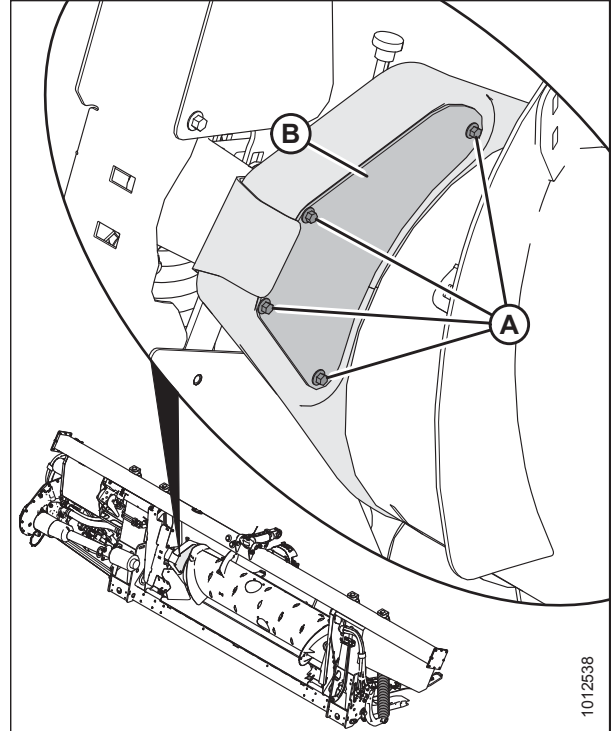


Figure 5.60: Left Side of Auger Drive – Rear View

8. Loosen jam nut (B).
9. Loosen idler nut (A) slightly to allow idler to move by turning adjuster (C).
10. Rotate auger in reverse to take up slack in upper strand of chain.

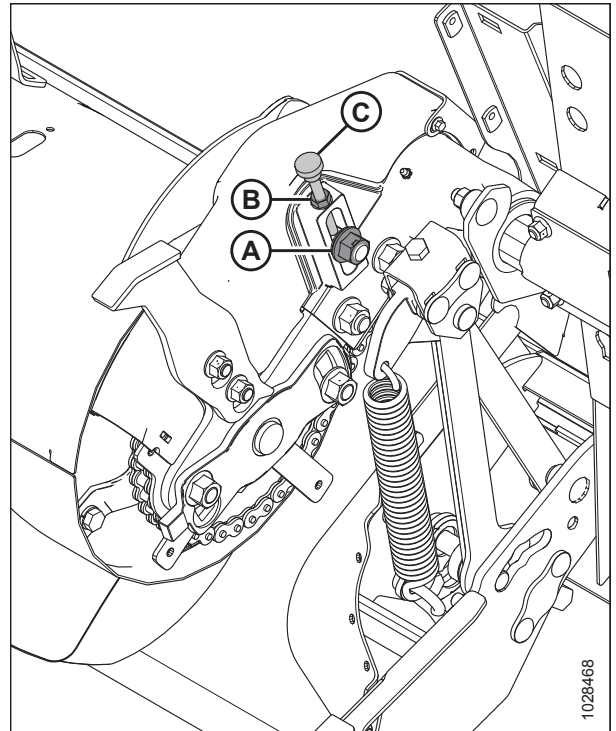


Figure 5.61: Left Side of Auger Drive – Front View

## MAINTENANCE AND SERVICING

11. Turn adjuster thumbscrew (A) clockwise to increase tension until chain deflection (B) is 4 mm (0.16 in.) at midspan.

**IMPORTANT:**

Do **NOT** overtighten.

**NOTE:**

Covers removed from illustration.

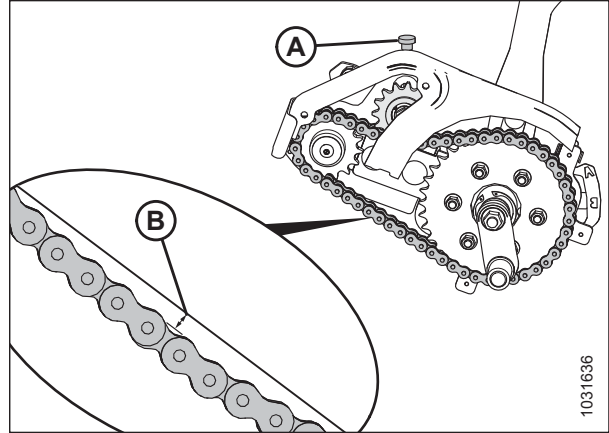


Figure 5.62: Feed Auger Chain Deflection

12. When adjustment is complete, tighten jam nut (A).
13. Tighten the idler nut (B) and torque to 258–271 Nm (190–200 lbf·ft).
14. Recheck midspan chain deflection after tightening idler and jam nut.

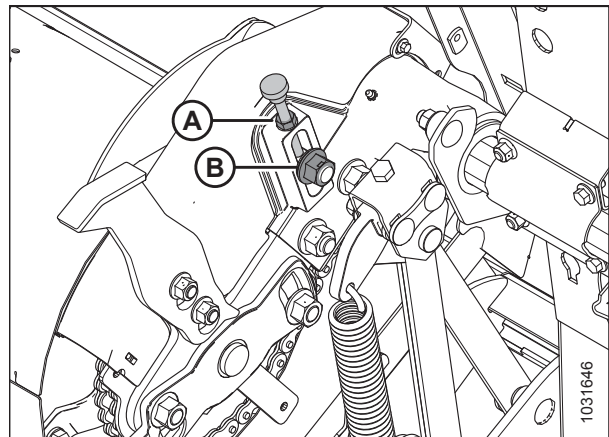


Figure 5.63: Feed Auger Chain – Front View

15. Install inspection panel (B) and secure with four bolts (A).
16. Torque bolts (A) to 2.7–4.1 Nm (24–36 lbf·in).

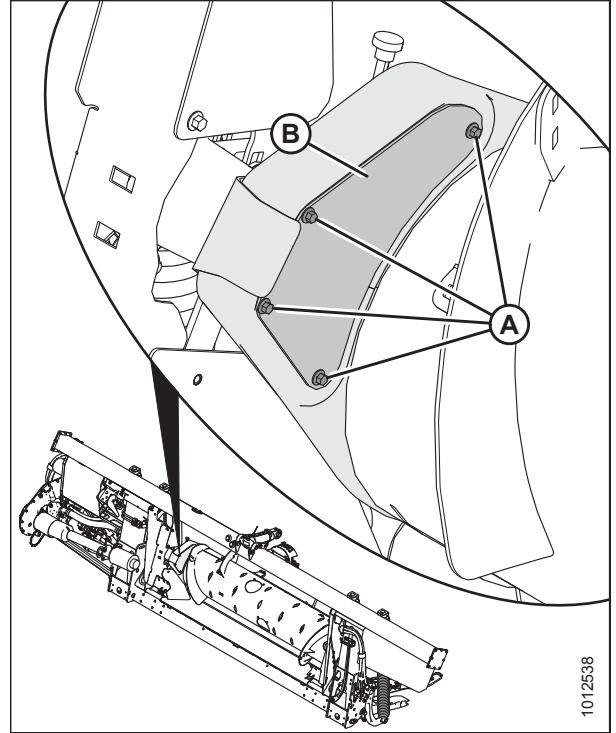


Figure 5.64: Left Side of Auger Drive – Rear View

### 5.7.4 Installing Auger Drive Chain

**NOTE:**

Illustrations show the left side of the auger.

1. Place drive chain (B) over the sprocket on the drive side of auger (A).

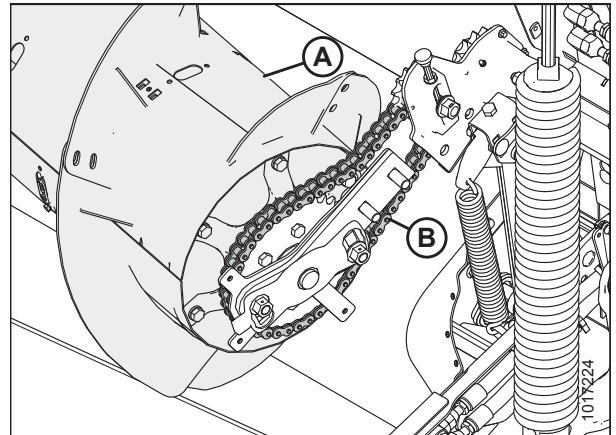


Figure 5.65: Auger Drive

## MAINTENANCE AND SERVICING

- Place drive sprocket (B) into chain (A) and align the sprocket onto the shaft.

**NOTE:**

Shoulder of drive sprocket (B) should face the auger.

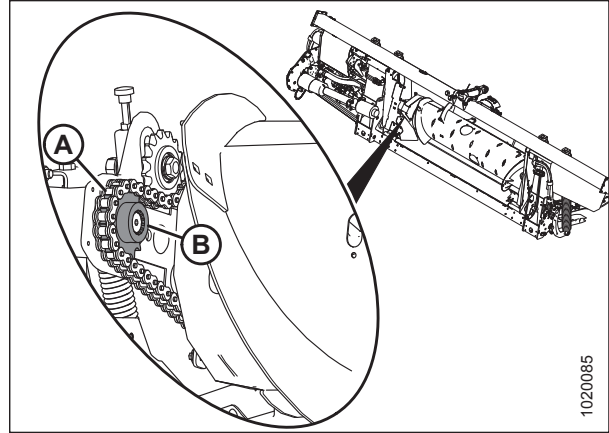


Figure 5.66: Auger Drive

- Apply medium-strength threadlocker (Loctite® 243 or equivalent) to threads of screw (A).
- Install washer (B) and secure it with screw (A).

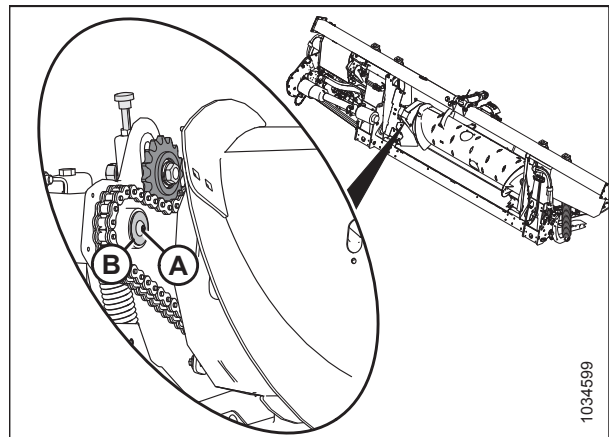


Figure 5.67: Auger Drive

- Slide the auger drum assembly toward the casting, and then reinstall two bolts and nuts (A).

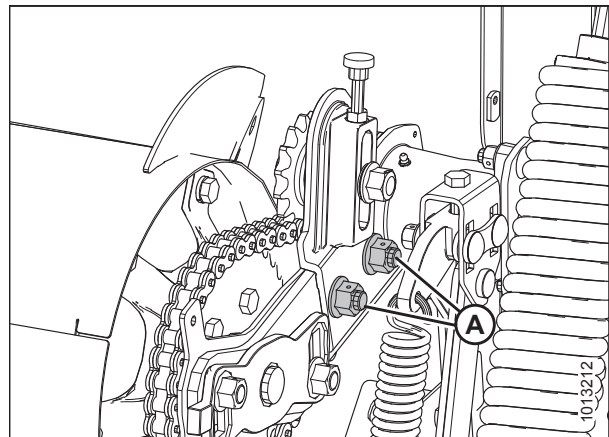


Figure 5.68: Auger Drive



## MAINTENANCE AND SERVICING

6. Rotate the auger in reverse to take up the slack in the lower strand of the chain.

**IMPORTANT:**

Do **NOT** loosen thin nut (C) on the inboard side of the idler sprocket spindle.

7. Turn adjuster thumbscrew (D) clockwise to move idler sprocket (B) until it is **FINGER TIGHT ONLY**.

**IMPORTANT:**

Do **NOT** overtighten.

8. Tighten idler nut (A) and torque to 258–271 Nm (190–200 lbf-ft).

9. Tighten jam nut (A).

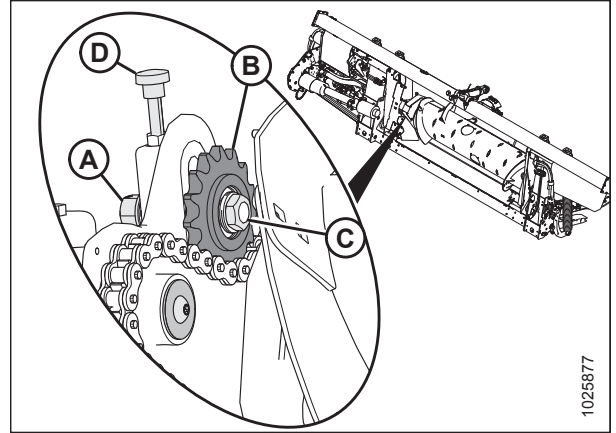


Figure 5.69: Auger Drive

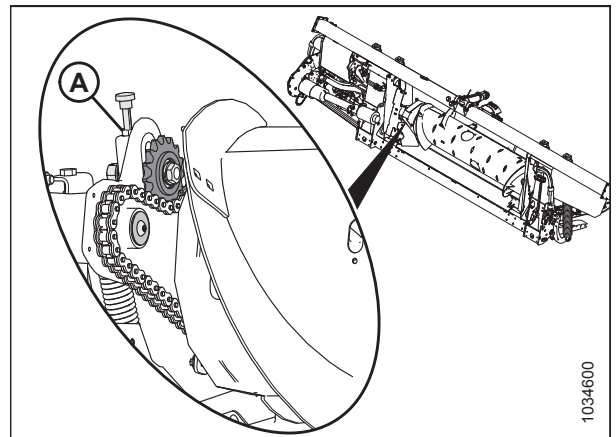


Figure 5.70: Auger Drive

## MAINTENANCE AND SERVICING

10. Position bottom cover (H) and secure with bolt and washer (J).
11. Position top cover (G). Secure top and bottom covers with clamp/indicator (D) and bolts (C).
12. Install inspection panel (B) and secure with four bolts (A). Tighten bolts (A) and torque to 2.7–4.1 Nm (24–36 lbf-in).
13. Install cover retainer (F) and secure with two bolts (E).

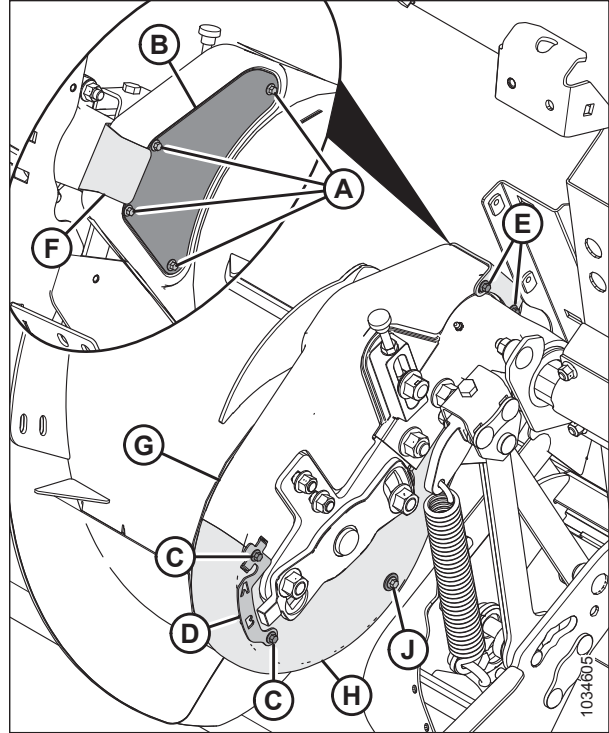


Figure 5.71: Auger

14. Remove wooden blocks (A) from the feed draper.

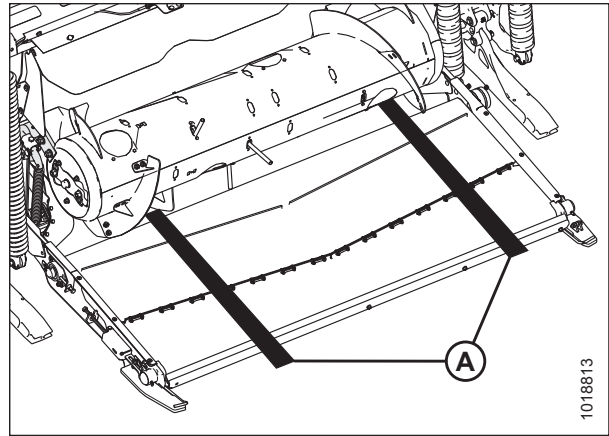


Figure 5.72: Blocks under the Auger

### 5.7.5 Auger Fingers

The FM100 auger uses retracting tines to feed the crop into the combine feeder house. Some conditions may require the removal or installation of fingers for optimal crop feeding. Replace any worn or damaged fingers.

#### *Removing Feed Auger Fingers*

#### **DANGER**

To avoid bodily injury or death from the unexpected start-up or fall of a raised machine, always stop engine and remove key before leaving the operator's seat, and always engage safety props before going under the machine for any reason.

## MAINTENANCE AND SERVICING

### IMPORTANT:

When removing auger fingers, work from outside inward. Make sure there is an equal number of fingers on both sides of the auger when complete.

1. Start the engine. For instructions, refer to the combine operator's manual.
2. Raise the reel fully.
3. Shut down the engine, and remove the key from the ignition.
4. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 33*.
5. Remove bolts (A) and access cover (B) closest to the finger you are removing. Retain parts for reinstallation.

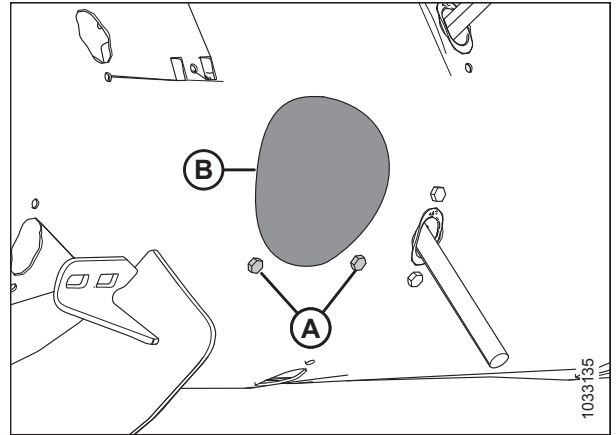


Figure 5.73: Auger Access Hole Cover

6. Remove hair pin (A). Pull finger (B) out of finger holder (C).  
Push finger (B) through guide (D) and into the drum. Pull the finger out of the drum access hole.  
If the finger broke, remove any remnants from holder (C) and from inside the drum.

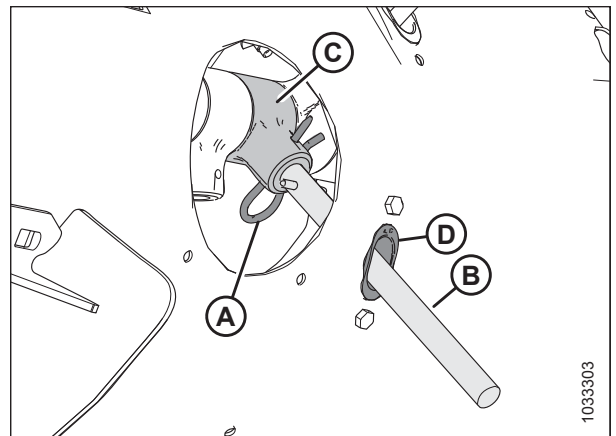


Figure 5.74: Auger Finger

## MAINTENANCE AND SERVICING

- Remove and retain two bolts (A) and tee nuts (not shown) securing finger guide (B) to the auger. Remove guide (B).

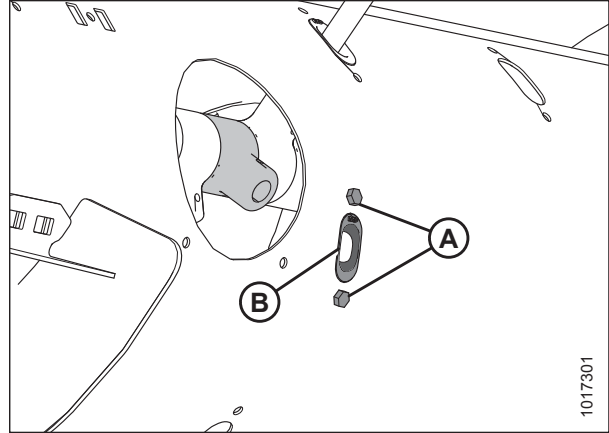


Figure 5.75: Auger Finger Hole

- Position plug (A) into the hole from inside the auger. Secure with two M6 hex head bolts (B) and tee nuts. Torque to 9 Nm (80 lbf-in).

**NOTE:**

Bolts (B) come with a threadlocker patch that will wear off if the bolts are removed. If reinstalling bolts (B), apply medium-strength threadlocker (Loctite® 243 or equivalent) before installation.

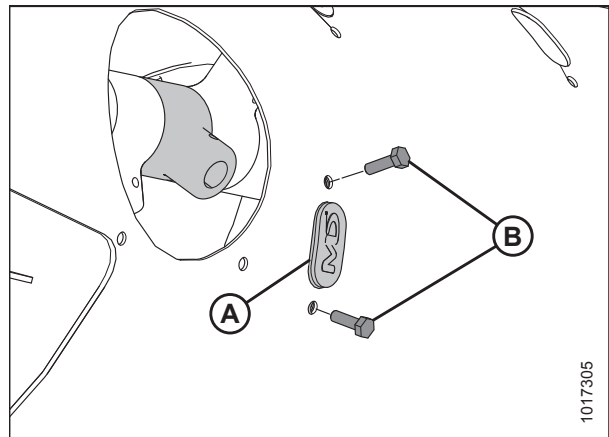


Figure 5.76: Plug

- Secure access cover (B) in place with bolts (A). Torque bolts to 9 Nm (80 lbf-in).

**NOTE:**

Bolts (A) come with a threadlocker patch that will wear off if the bolts are removed. If reinstalling bolts (A), apply medium-strength threadlocker (Loctite® 243 or equivalent) before installation.

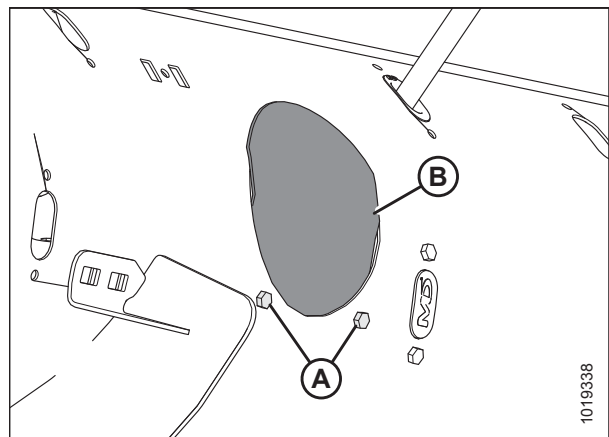


Figure 5.77: Auger Access Hole Cover

### Installing Feed Auger Fingers

**⚠ DANGER**

To avoid bodily injury or death from the unexpected start-up or fall of a raised machine, always stop engine and remove key before leaving the operator's seat, and always engage safety props before going under the machine for any reason.

## MAINTENANCE AND SERVICING

### IMPORTANT:

When installing additional fingers, ensure you install an equal number on each side of the auger.

1. Raise the reel fully.
2. Shut down the engine, and remove the key from the ignition.
3. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 33*.
4. Remove bolts (A) and access cover (B) closest to the finger you are removing. Retain parts for reinstallation.

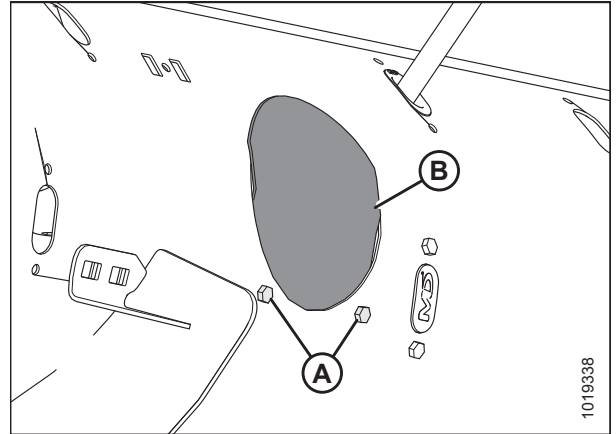


Figure 5.78: Auger Access Hole Cover

5. If you are replacing an existing auger finger, refer to Step 6, *page 447*, otherwise proceed to Step 7, *page 448* for installation instructions for new auger fingers.
6. Remove hairpin (A). Pull finger (B) out of finger holder (C).  
Push finger (B) through guide (D) and into the drum. Pull the finger out of the drum access hole.  
If the finger broke, remove any remnants from holder (C) and from inside the drum.

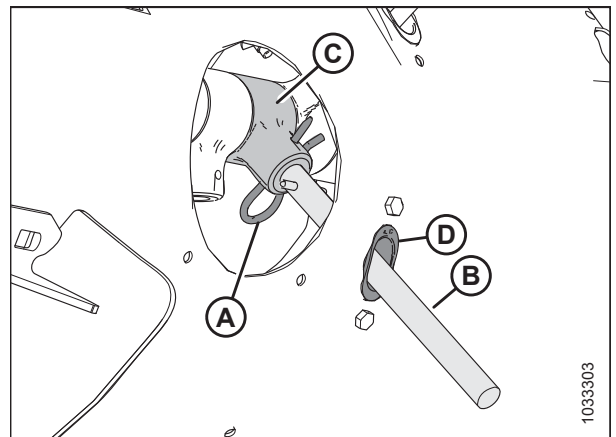


Figure 5.79: Auger Finger

## MAINTENANCE AND SERVICING

- Remove and retain two bolts (A) and tee-nuts (not shown) from guide (B). Remove guide (B).
- Install guide (B) as follows:

**NOTE:**

Bolts (A) come with a threadlocker patch that will wear off if the bolts are removed. If reinstalling bolts (A), apply medium-strength threadlocker (Loctite® 243 or equivalent) before installation.

Insert guide (B) from inside the auger and secure it with bolts (A) and tee nuts (not shown).

**IMPORTANT:**

Always install a new guide when replacing a solid finger.

- Torque bolts (A) to 9 Nm (80 lbf-in).
- Proceed to Step 14, page 449.

**Installing a new auger finger:**

- Remove two bolts (B), tee nuts (not shown), and plug (A).

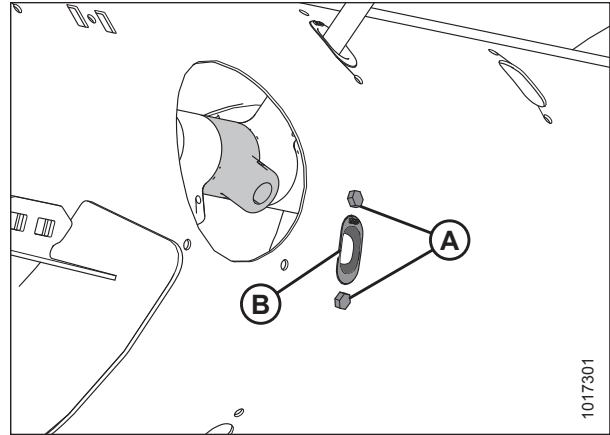


Figure 5.80: Auger Finger Hole

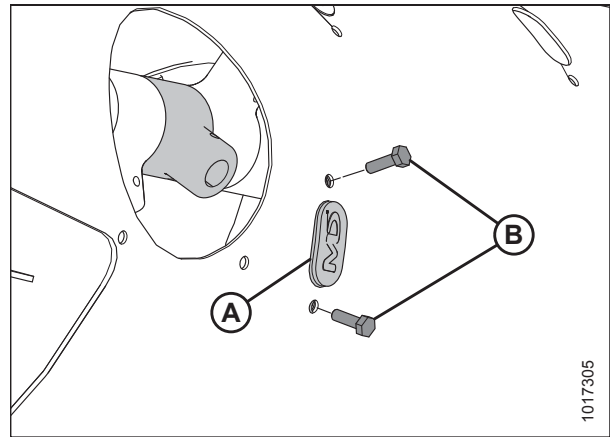


Figure 5.81: Auger Finger Hole

- Install guide (B) as follows:

**NOTE:**

Bolts (A) come with a threadlocker patch that will wear off if the bolts are removed. If reinstalling bolts (A), apply medium-strength threadlocker (Loctite® 243 or equivalent) before installation.

Insert guide (B) from inside the auger and secure it with bolts (A) and tee nuts (not shown).

**IMPORTANT:**

Always install a new guide when replacing a solid finger.

- Torque bolts (A) to 9 Nm (80 lbf-in).

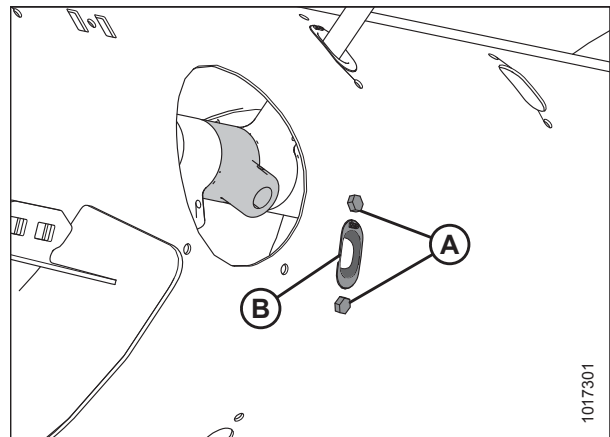


Figure 5.82: Auger Finger Hole

## MAINTENANCE AND SERVICING

- Place auger finger (A) inside the drum. Insert auger finger (A) up through the bottom of guide (B) and insert other end into holder (C).
- Secure the finger by inserting hairpin (D) into the holder. Make sure the round end (S-shaped side) of the hairpin faces the chain drive side of the auger. Make sure the closed end of the hairpin points in the direction of auger-forward rotation.

### IMPORTANT:

Position the hairpin correctly as described in this step to prevent the hairpin from falling out during operation. If fingers are lost, the header might not be able to feed crop into the combine properly. Fingers that fall into the drum might damage internal components.

- Secure access cover (B) in place with bolts (A). Torque bolts to 9 Nm (80 lbf-in).

### NOTE:

Bolts (A) come with a threadlocker patch that will wear off if the bolts are removed. If reinstalling bolts (A), apply medium-strength threadlocker (Loctite® 243 or equivalent) before installation.

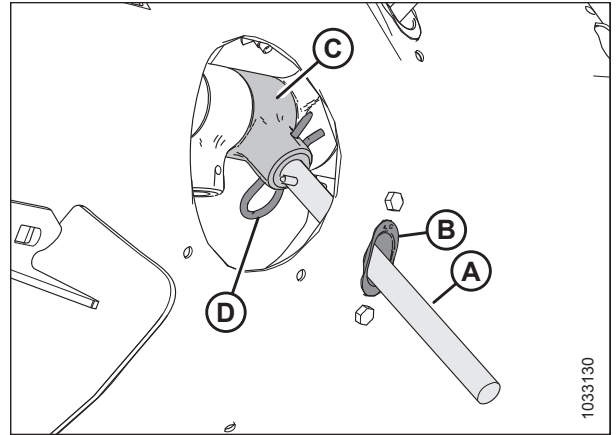


Figure 5.83: Auger Finger

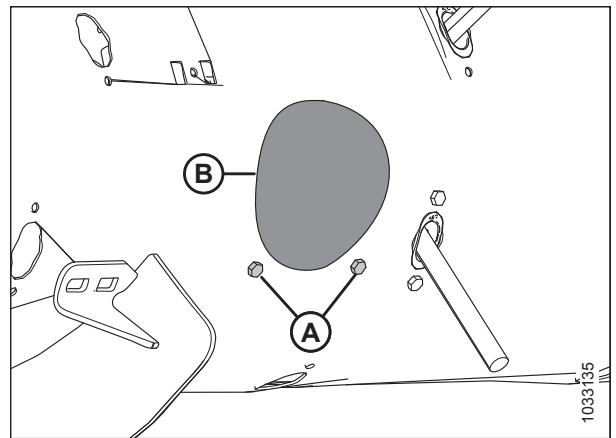


Figure 5.84: Auger Access Hole Cover

### Replacing Broken Finger Holder

To replace a broken finger holder, follow these procedures.

### NOTE:

Order the Split Finger Holder kit (MD #213026) for parts to replace broken finger holders on an FM100.

### Removing Broken Finger Holder

To remove the broken finger holder, follow these steps:

### WARNING

To avoid bodily injury or death from unexpected startup or fall of raised machine, always stop engine, remove key, and engage safety props before leaving operator's seat for any reason.

- Raise the reel.
- Shut down the engine, and remove the key from the ignition.
- Engage the reel safety props.



## MAINTENANCE AND SERVICING

4. Remove bolts (A) and remove access cover (B) closest to the broken finger holder.

**NOTE:**

Inspect for excessively damaged or worn finger guides (C). Replace as required.

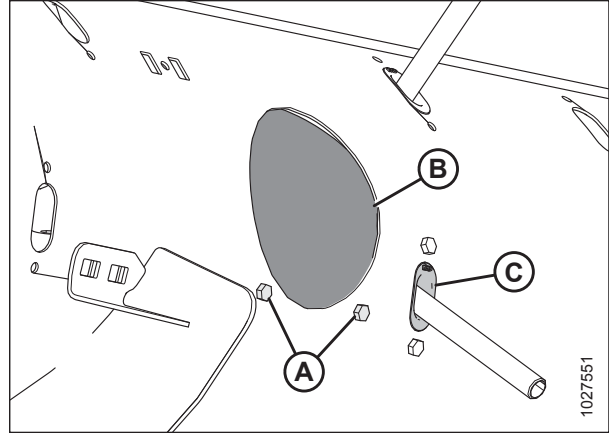


Figure 5.85: Access Cover

5. Remove the remains of the broken finger holder from the finger shaft. You may need to use a chisel and hammer, a saw, or a cutoff disc.

**IMPORTANT:**

Be careful not to damage the finger shaft or finger holders on either side of broken holder.

**NOTE:**

If the auger finger in the broken holder is not bent, broken, or otherwise damaged, you can reuse it in the new finger holder.



Figure 5.86: Broken Finger Holder

### Installing Split Finger Holder

To install a split finger holder, follow these steps:

**NOTE:**

Unless otherwise specified, all parts are provided in kit (MD #213026, MD #274276, or MD #276839).

## MAINTENANCE AND SERVICING

1. Separate the two halves of the split finger holder.
2. Press two tee nuts (A) into the top half of split finger holder (B).
3. Snap top half of split finger holder (B) on the finger shaft in place of the removed finger holder.

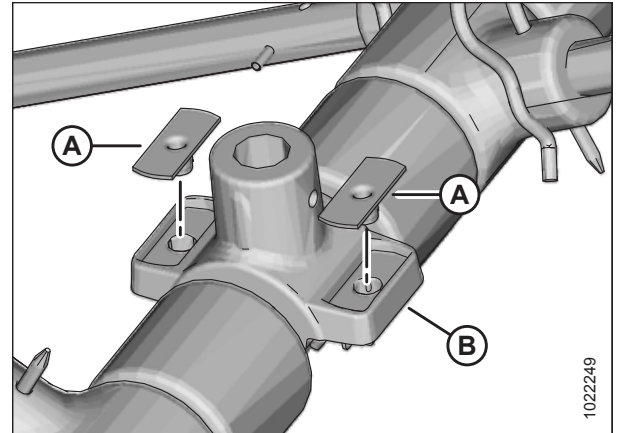


Figure 5.87: Top Half of Split Finger Holder Assembly

4. Inspect (new or retained) auger finger (A) before installation:
  - Make sure finger is straight.
  - Make sure the finger is **NOT** cracked at breakaway groove (B).

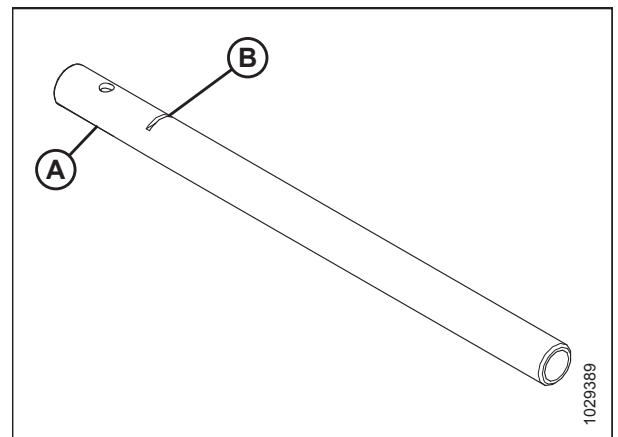


Figure 5.88: Hollow Finger

5. Insert (new or retained) auger finger (A) through the empty finger guide on the outside of the auger drum and into top half of finger holder (B).
6. Secure finger (A) in place with hairpin (C). Ensure the closed end of the hairpin points in the direction of auger-forward rotation.

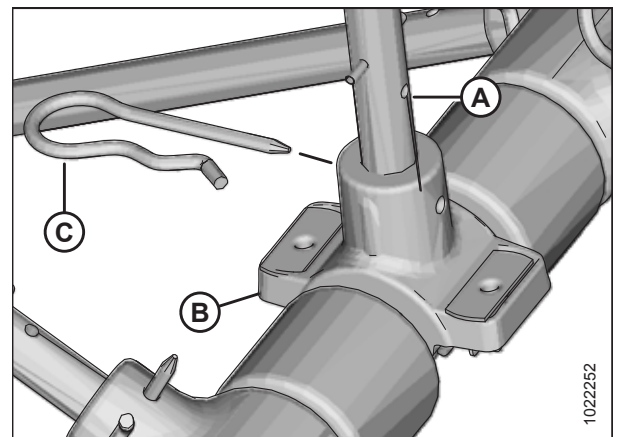


Figure 5.89: Finger Installed in Split Finger Holder

## MAINTENANCE AND SERVICING

7. Press bottom half of split finger holder (B) onto top half (A), and secure it in place with two M6 hex head bolts (C).

**NOTE:**

Only one bolt is shown in the illustration. The other bolt is installed on the other side of the finger shaft.

8. Torque bolts (C) to 9 Nm (80 lbf·in).

**NOTE:**

Bolts (C) come with a threadlocker patch that will wear off if the bolts are removed. If reinstalling bolts (C), apply medium-strength threadlocker (Loctite® 243 or equivalent) before installation.

9. Make sure there are no loose parts or debris in the auger.

10. Apply medium-strength threadlocker (Loctite® 243 or equivalent) to bolts (A). Install access cover (B) using bolts (A).

11. Torque bolts (A) to 9 Nm (80 lbf·in).

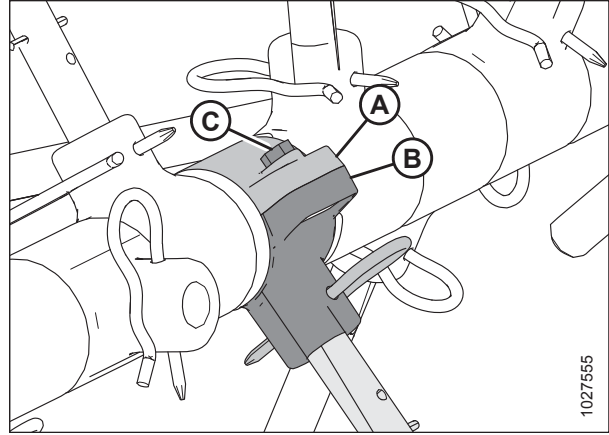


Figure 5.90: Bottom Half of Split Finger Holder

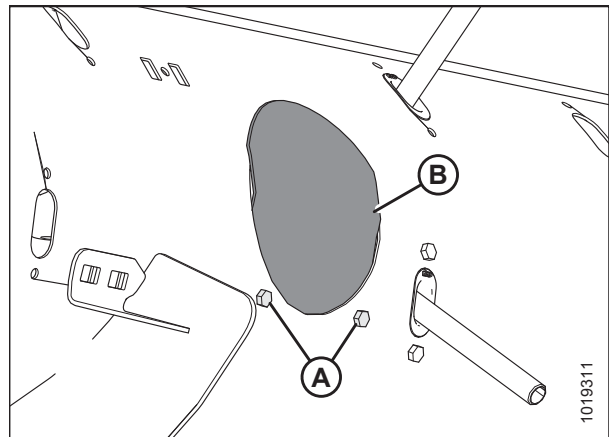


Figure 5.91: Access Cover

### Replacing Feed Auger Finger Guides

1. Remove finger (A). For instructions, refer to [Removing Feed Auger Fingers](#), page 444.
2. Remove the two bolts securing guide (B) to the feed auger.

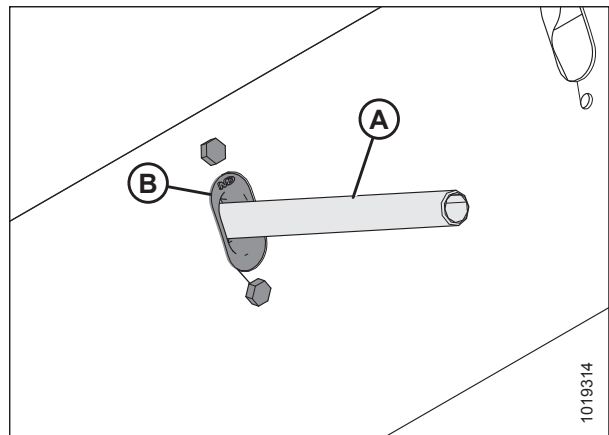


Figure 5.92: Auger Finger

## MAINTENANCE AND SERVICING

- If guide bolts (A) are not new bolts, coat bolts (A) with medium-strength threadlocker (Loctite® 243 or equivalent). Insert plastic finger guide (B) from inside the auger and secure it with bolts and tee nuts. Torque bolts to 9 Nm (80 lbf-in). From inside the auger, position the plastic guide (B) and secure with bolts (A).
- Replace the finger. For instructions, refer to [Installing Feed Auger Fingers, page 446](#).

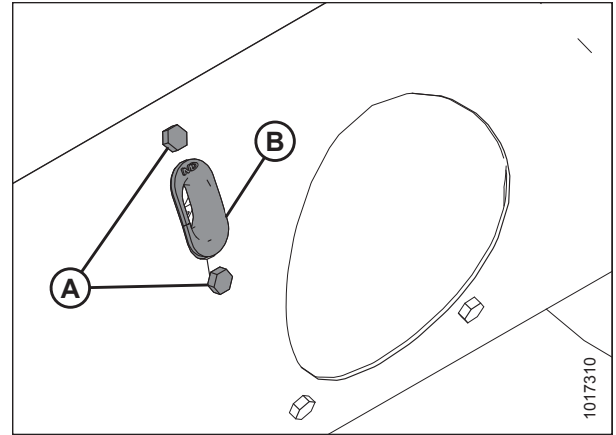


Figure 5.93: Auger Finger Guide

### Checking Auger Finger Timing

This procedure is for checking the setting that determines where the fingers are fully extended from the auger.

#### DANGER

To avoid bodily injury or death from the unexpected start-up or fall of a raised machine, always stop engine and remove key before leaving the operator's seat, and always engage safety props before going under the machine for any reason.

#### NOTE:

Left side of auger shown.

- Raise the reel fully.
- Shut down the engine, and remove the key from the ignition.
- Engage the reel safety props. For instructions, refer to [Engaging Reel Safety Props, page 33](#).
- Check that indicator (C) is set to the same position at each end of the auger.

#### NOTE:

There are two different auger tine extension positions: **A** and **B**. Position **A** (A) is used for canola and position **B** (B) is used for grains. The factory setting for the indicator is position **B** (B).

#### CAUTION

To avoid damaging the auger beyond repair, it is extremely important that both sides are at the same setting.

- To adjust the indicator position, refer to [Adjusting Auger Finger Timing, page 454](#).
- Disengage the reel safety props. For instructions, refer to [Disengaging Reel Safety Props, page 34](#).

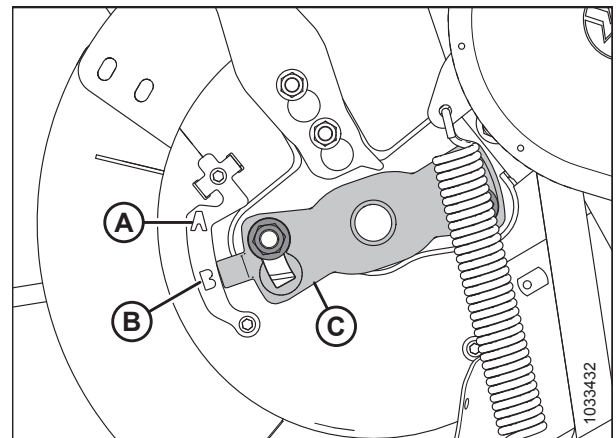


Figure 5.94: Auger Tine Timing – Left Side of Auger Shown

### Adjusting Auger Finger Timing

To adjust auger finger timing, follow these steps:

**⚠ DANGER**

To avoid bodily injury or death from the unexpected start-up or fall of a raised machine, always stop engine and remove key before leaving the operator's seat, and always engage safety props before going under the machine for any reason.

**NOTE:**

Left side of auger shown.

1. Raise the reel fully.
2. Shut down the engine, and remove the key from the ignition.
3. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 33*.
4. Locate finger timing indicator (C) at the end of the auger. There are two auger tine extension positions: Position **A** (A) and position **B** (B).
5. Loosen nuts (D) and adjust finger timing indicator (C) to the desired position.

**IMPORTANT:**

The timing indicator on both ends of the auger must be set at the same position; if not, the auger will be damaged beyond repair.

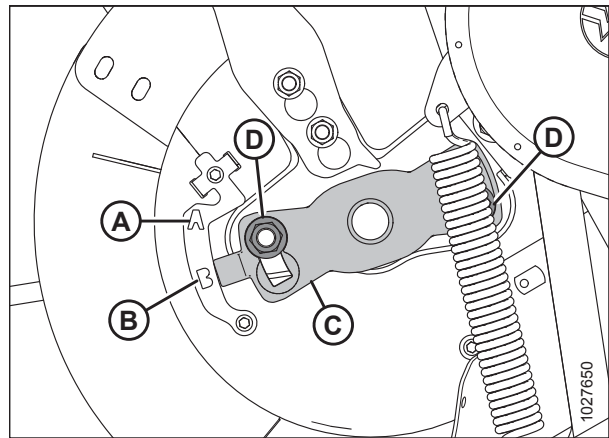


Figure 5.95: Auger Tine Timing Indicator

**NOTE:**

If finger timing indicator (A) is pointing at position **A**, it indicates that at that point the auger fingers will be fully extended. This allows the crop to be engaged and released earlier before entering the feeder house. This setting is best used for canola or bushy crops.

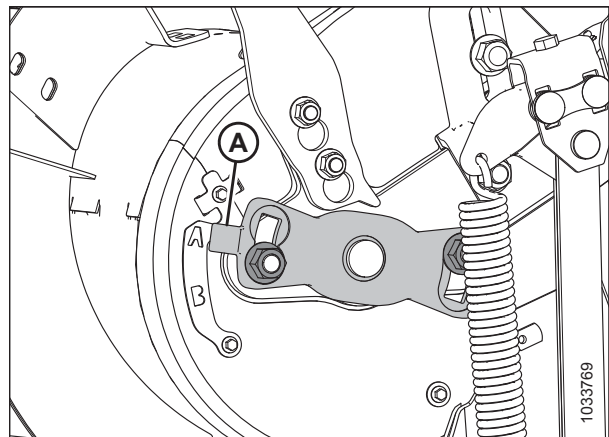


Figure 5.96: Auger Position A

## MAINTENANCE AND SERVICING

### NOTE:

If finger timing indicator (A) is pointing at position B, it indicates that at that point the auger fingers will be fully extended. This allows the crop to be engaged and released later before entering the feeder house. This setting is best used for grains or beans.

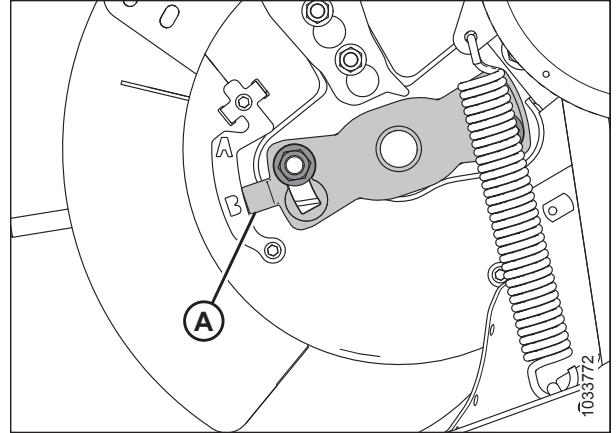


Figure 5.97: Auger Position B

6. Tighten nuts (A) once adjustment is complete. Torque nuts to 92–138 Nm (68–102 lbf·ft).
7. Disengage the reel safety props. For instructions, refer to [Disengaging Reel Safety Props, page 34](#).

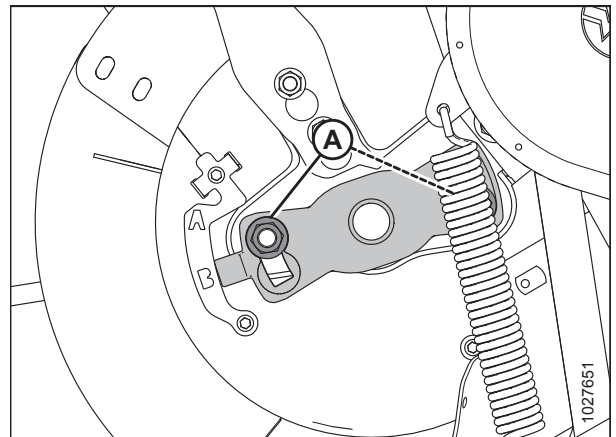


Figure 5.98: Auger Tine Timing Indicator

### Using Auger Flighting

The auger flighting on the FM100 can be configured for specific combines and crop conditions. For instructions, refer to [3.8.1 FM100 Feed Auger Configurations, page 58](#) for combine/crop specific configurations.

## 5.8 Knife

### WARNING

Keep hands clear of the area between guards and knife at all times.

### CAUTION

Wear heavy gloves when working around or handling knives.

### CAUTION

To avoid personal injury, before servicing machine or opening drive covers, refer to [5.1 Preparing Machine for Servicing, page 397](#).

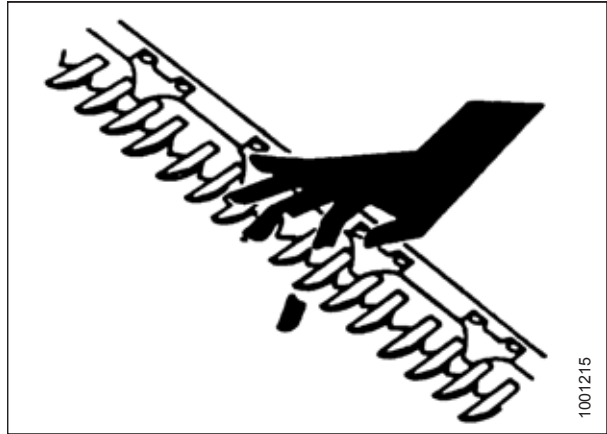


Figure 5.99: Cutterbar Hazard

### 5.8.1 Replacing Knife Section

Inspect the knife sections daily and ensure they are firmly bolted to the knife back and are not worn or damaged (worn and damaged sections leave behind uncut plants). Worn or damaged sections can be replaced without removing the knife from the cutterbar.

### DANGER

To avoid bodily injury or death from the unexpected start-up or fall of a raised machine, always stop engine and remove key before leaving the operator's seat, and always engage safety props before going under the machine for any reason.

#### IMPORTANT:

Do **NOT** mix finely and coarsely serrated knife sections on the same knife.

1. Raise the reel fully.
2. Shut down the engine, and remove the key from the ignition.
3. Engage the reel safety props. For instructions, refer to [Engaging Reel Safety Props, page 33](#).



## MAINTENANCE AND SERVICING

4. Stroke the knife as required to center knife section (A) between guards (E).
5. Remove and retain nuts (B).
6. Remove bars (C) and lift knife section (A) off the knife bar.
7. Remove splice bar (D) if knife section is under the bar.
8. Clean dirt off the knife back, and position the new knife section onto the knife back.
9. Reposition bars (C) and/or splice bars (D), and install nuts (B).

**NOTE:**

If replacing screws, ensure they are fully inserted. Do **NOT** use nuts to draw screws into the knife bar.

10. Torque nuts to 9.5 Nm (7 lbf-ft).

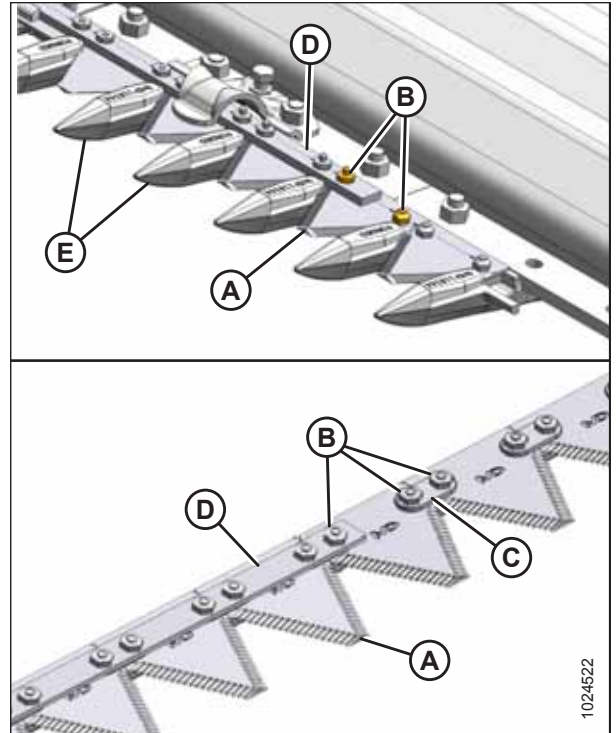


Figure 5.100: Cutterbar

### 5.8.2 Removing Knife

**⚠ DANGER**

To avoid bodily injury or death from the unexpected start-up or fall of a raised machine, always stop engine and remove key before leaving the operator's seat, and always engage safety props before going under the machine for any reason.

**⚠ WARNING**

Stand to the rear of the knife during removal to reduce the risk of injury from cutting edges. Wear heavy gloves when handling the knife.

1. Raise the reel fully.
2. Shut down the engine, and remove the key from the ignition.
3. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props*, page 33.

## MAINTENANCE AND SERVICING

4. Manually stroke the knife to its outer limit.
5. Clean the area around the knifehead.
6. Remove grease fitting (B) from the pin.

**NOTE:**

Removing the grease fitting will make it easier to reinstall the knifehead pin later.

7. Remove bolt and nut (A).
8. Use a screwdriver or chisel in slot (C) to release the load on the knifehead pin.

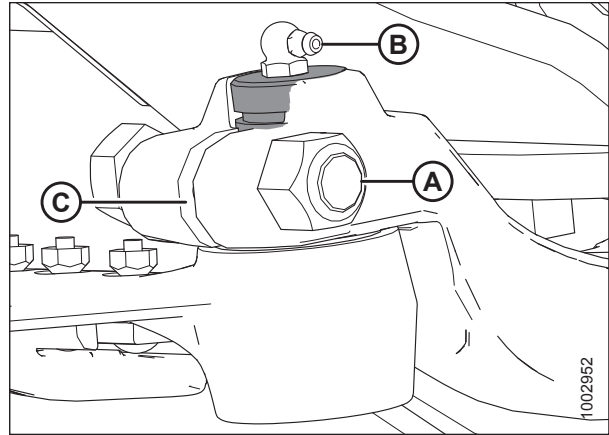


Figure 5.101: Knifehead

9. Use a screwdriver or chisel to pry the pin upwards in the pin groove until the pin is clear of the knifehead.
10. Push the knife assembly inboard until it is clear of the output arm.
11. Seal the knifehead bearing with plastic or tape to keep out dirt and debris unless it is being replaced.
12. Wrap a chain around the knifehead and pull out the knife.

### 5.8.3 Removing Knifehead Bearing

**⚠ DANGER**

To avoid bodily injury or death from the unexpected start-up or fall of a raised machine, always stop engine and remove key before leaving the operator's seat, and always engage safety props before going under the machine for any reason.

**⚠ WARNING**

Stand to the rear of the knife during removal to reduce the risk of injury from cutting edges. Wear heavy gloves when handling the knife.

1. Raise the reel fully.
2. Shut down the engine, and remove the key from the ignition.
3. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 33*.
4. Remove the knife. For instructions, refer to *5.8.2 Removing Knife, page 457*.

**NOTE:**

Because the bearing is being replaced, it is not necessary to wrap the knifehead to protect the bearing.

- Use a flat-ended tool with the same diameter as pin (A). Tap seal (B), bearing (C), plug (D), and O-ring (E) from the underside of the knifehead.

**NOTE:**

Seal (B) can be replaced without removing the bearing. When changing the seal, check the pin and needle bearing for wear and replace if necessary.

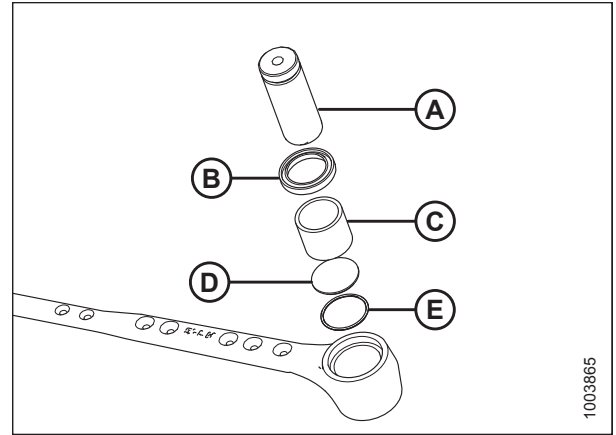


Figure 5.102: Knifehead Bearing Assembly

### 5.8.4 Installing Knifehead Bearing

- Place O-ring (E) and plug (D) into the knifehead.

**IMPORTANT:**

Install the bearing with the stamped end (the end with the identification markings) facing up.

- Use a flat-ended tool (A) with the same approximate diameter as bearing (C), and push the bearing into the knifehead until the top of the bearing is flush with the step in the knifehead.
- Install seal (B) into the knifehead with the lip facing outwards.

**IMPORTANT:**

To prevent premature knifehead or knife drive box failure, ensure there is a tight fit between the knifehead pin and the needle bearing, and between the knifehead pin and the output arm.

- Install the knife. For instructions, refer to [5.8.5 Installing Knife, page 459](#).

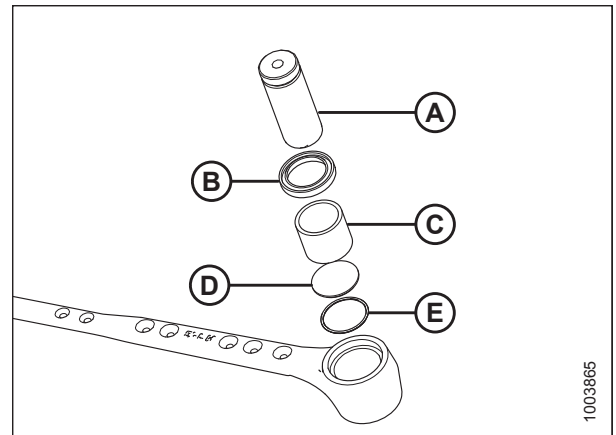


Figure 5.103: Knifehead Bearing Assembly

### 5.8.5 Installing Knife

**⚠ DANGER**

To avoid bodily injury or death from the unexpected start-up or fall of a raised machine, always stop engine and remove key before leaving the operator's seat, and always engage safety props before going under the machine for any reason.

**⚠ WARNING**

Stand to the rear of the knife during removal to reduce the risk of injury from cutting edges. Wear heavy gloves when handling the knife.

- Raise the reel fully.
- Shut down the engine, and remove the key from the ignition.
- Engage the reel safety props. For instructions, refer to [Engaging Reel Safety Props, page 33](#).

## MAINTENANCE AND SERVICING

- Slide the knife into place and align the knifehead with the output arm.
- Install knifehead pin (A) through output arm (C) and into the knifehead.

### NOTE:

Remove the grease fitting from the knifehead pin for easier installation of knifehead pin.

- Position the pin so that groove (B) is 1.5 mm (1/16 in.) above output arm (C).
- Secure pin with 5/8 x 3 in. hex head bolt and nut (D), and torque to 217 Nm (160 lbf-ft).

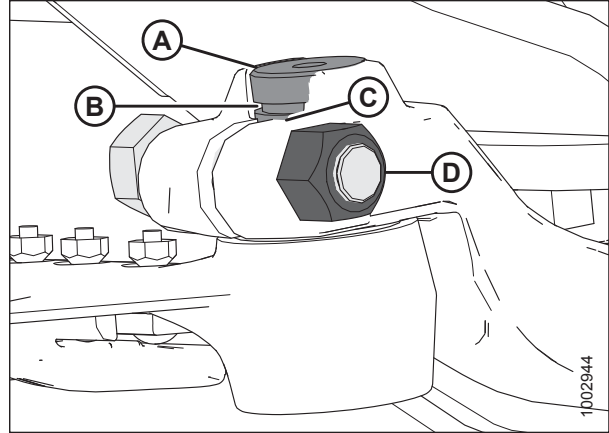


Figure 5.104: Knifehead

- Install grease fitting (A) into the knifehead pin, and turn the grease fitting for easy access.
- Slowly apply grease to the knifehead until slight downward movement of the knifehead is observed.

### IMPORTANT:

Do **NOT** overgrease the knifehead. Overgreasing leads to knife misalignment causing excessive heating of guards and overloading of drive systems. If overgreasing occurs, remove the grease fitting to release pressure.

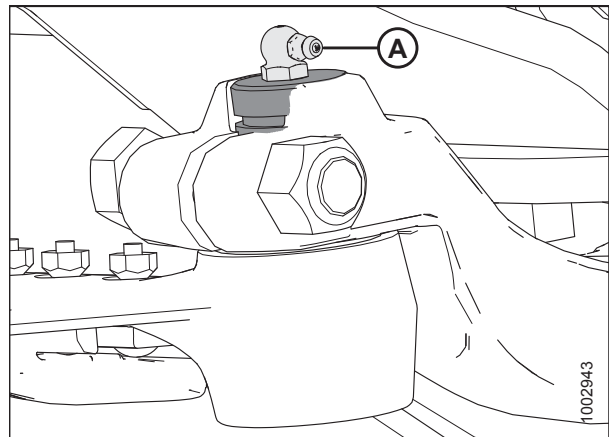


Figure 5.105: Knifehead

### 5.8.6 Spare Knife

A spare knife can be stored in the header frame backtube (A) at the left end of the header. Ensure the spare knife is secured in place.

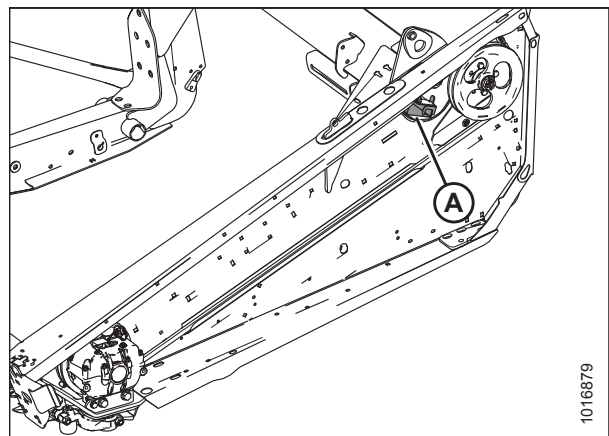


Figure 5.106: Spare Knife

### 5.8.7 Knife Guards

Perform **DAILY** inspections to ensure the knife guards are aligned and the knife sections are contacting the shear surfaces of the knife guards. Depending on your cutting needs, you may be using either pointed guards or short knife guards.

#### *Adjusting Pointed Knife Guards*

#### **DANGER**

To avoid bodily injury or death from unexpected startup of machine, always stop the engine and remove the key before making adjustments to the machine.

1. Shut down the engine, and remove the key from the ignition.
2. Position tool (A) as shown, and pull up to adjust the guard tips upwards.

**NOTE:**

Use guard straightening tool (MD #140135) available from your MacDon Dealer.



Figure 5.107: Upward Adjustment

3. Position tool (A) as shown, and push down to adjust the guard tips downwards.

**NOTE:**

If material is tough to cut, install short knife guards with top guard and adjuster plate. A kit is available from your MacDon Dealer. For more information, refer to [6.3.5 Stub Guard Conversion Kit](#), page 586.

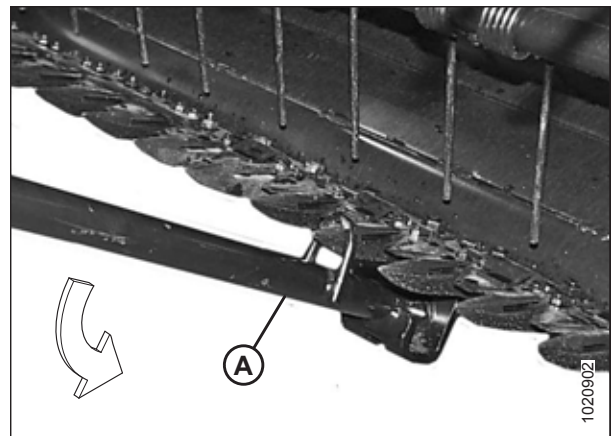


Figure 5.108: Downward Adjustment

#### *Replacing Pointed Guards*

This procedure replacing standard and drive side guards.

#### **DANGER**

To avoid bodily injury or death from unexpected startup of machine, always stop the engine and remove the key before making adjustments to the machine.

1. Shut down the engine, and remove the key from the ignition.

## MAINTENANCE AND SERVICING

2. Stroke the knife manually until the knife sections are spaced midway between the guards.
3. Remove two nuts (B) and bolts attaching guard (A) and hold-down (C) (if applicable) to the cutterbar.
4. Remove guard (A), hold-down (C), and the plastic wearplate (if installed).

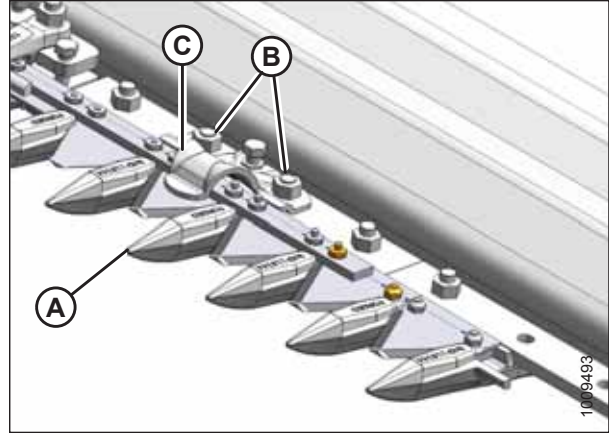


Figure 5.109: Pointed Guards

### IMPORTANT:

The first four outboard guards (B) on the drive sides of the header do **NOT** have ledger plates. Ensure proper replacement guards are installed at these locations.

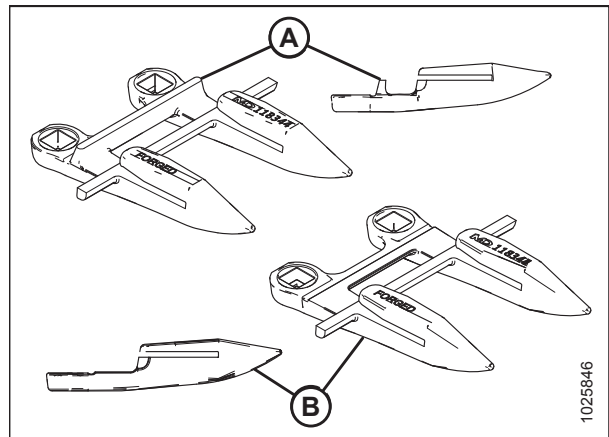


Figure 5.110: Pointed Guards

A - Standard

B - Drive Side

5. Position new guard (A), hold-down (C), and the plastic wearplate (if applicable) onto the cutterbar. Secure with two nuts (B) and bolts, but do **NOT** tighten.
6. Check and adjust the clearance between the hold-downs and the knife. For instructions, refer to or [Adjusting Hold-Downs with Pointed Guards, page 464](#).

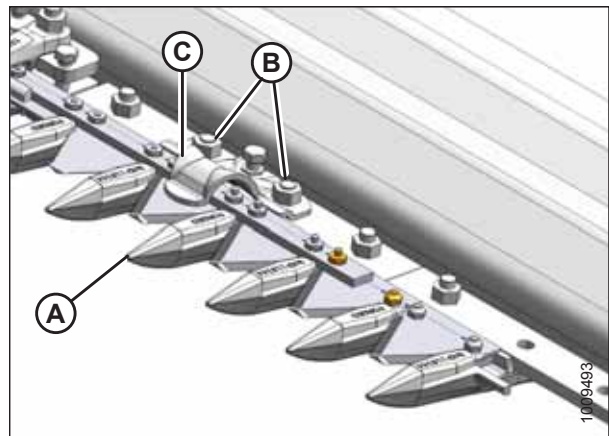


Figure 5.111: Pointed Guards

### Replacing Stub Knife Guards

Stub knife guards, complete with top guides and adjuster plates, are designed to cut tough crops and are factory-installed at the outer ends of specific headers.

#### DANGER

To avoid bodily injury or death from unexpected startup of machine, always stop the engine and remove the key before making adjustments to the machine.

1. Shut down the engine, and remove the key from the ignition.
2. Stroke the knife manually until the knife sections are spaced midway between the guards.
3. Remove two nuts (A) and bolts attaching guard (B) and top guide (C) to the cutterbar.
4. Remove guard (B), the plastic wearplate (if installed), top guide (C), and adjuster bar (D).

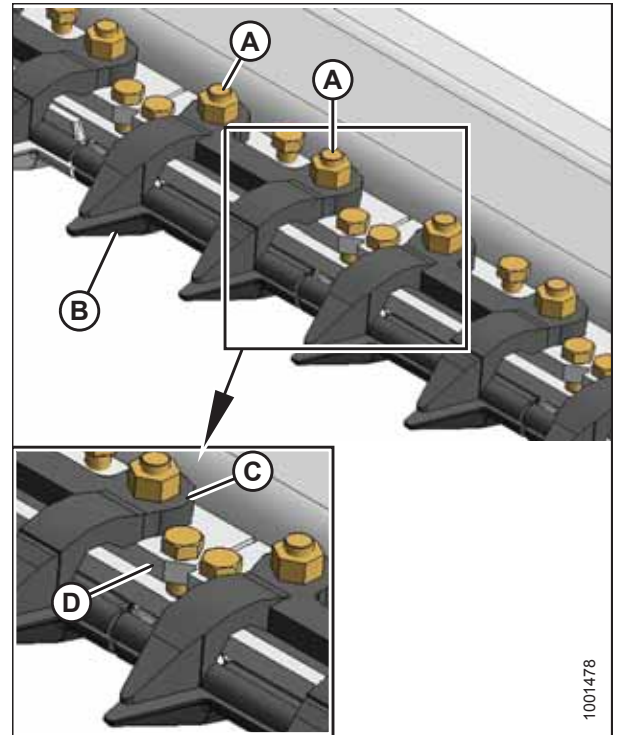


Figure 5.112: Stub Knife Guards

#### IMPORTANT:

The first four outboard guards (A) on the drive sides of the header do **NOT** have ledger plates. Ensure the proper replacement guards are installed at these locations.

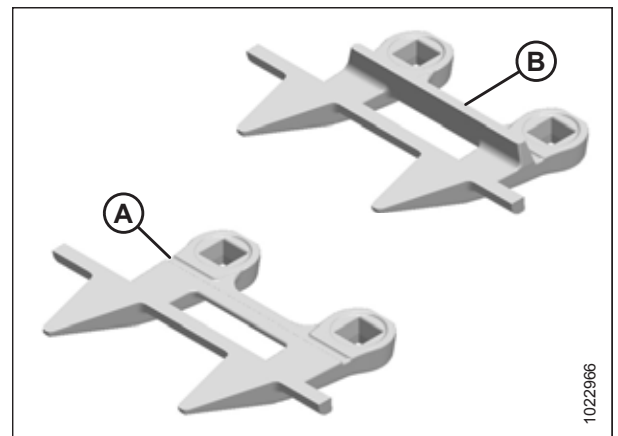


Figure 5.113: Stub Knife Guards

A - Drive Side Guard

B - Standard Guard with Ledger Plate



## MAINTENANCE AND SERVICING

5. Position the plastic wearplate (if applicable), replacement guard (B), adjuster bar (D), and top guide (C), and then install bolts and nuts (A). Do **NOT** tighten.
6. Check and adjust the clearance between the hold-downs and the knife. For instructions, refer to [Adjusting Hold-Down with Stub Guards, page 466](#).

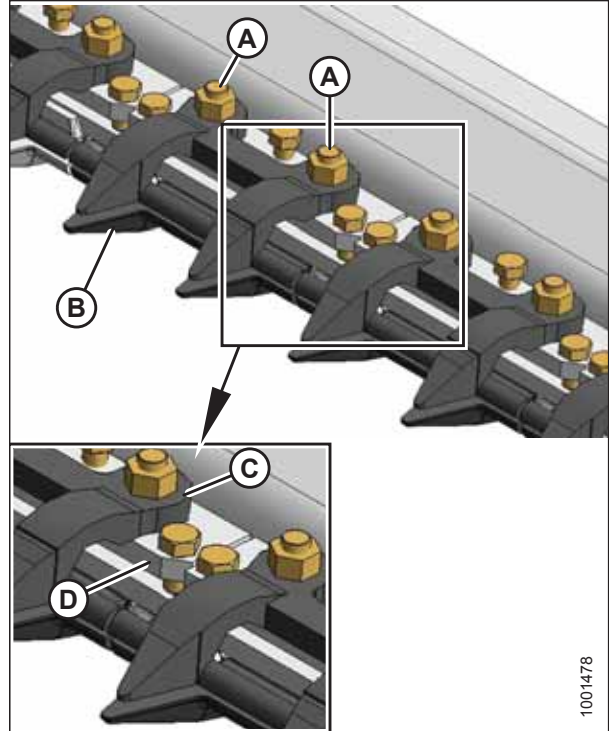


Figure 5.114: Stub Knife Guards

### Checking Knife Hold-Downs

Perform daily inspections to ensure the knife hold-downs are preventing the knife sections from lifting off the guards while permitting the knife to slide without binding. Use a feeler gauge to measure the clearance between the hold-downs and knife sections, and refer to the following for adjustment procedures:

- [Adjusting Hold-Downs with Pointed Guards, page 464](#)
- [Adjusting Hold-Down with Stub Guards, page 466](#)

#### NOTE:

Align guards prior to adjusting the hold-downs. For instructions, refer to [Adjusting Pointed Knife Guards, page 461](#).

### Adjusting Hold-Downs with Pointed Guards



#### WARNING

To avoid bodily injury or death from the unexpected startup of the machine, always stop engine and remove the key before adjusting the machine.

1. Shut down the engine, and remove the key from the ignition.

## MAINTENANCE AND SERVICING

2. Use a feeler gauge to measure the clearance between the standard guard hold-down (A) and the knife section. Ensure the clearance is 0.1–0.6 mm (0.004–0.024 in.).
3. To lower the front of the hold-down and decrease clearance, turn bolt (B) clockwise; to raise the front of the hold-down and increase clearance, turn bolt (B) counterclockwise.

### NOTE:

For larger adjustments, it may be necessary to loosen nuts (C), turn adjuster bolt (B), and then retighten nuts.

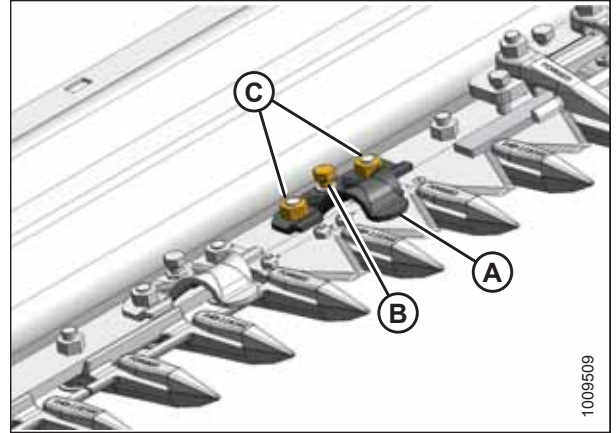


Figure 5.115: Standard Guard Hold-Down

4. Use a feeler gauge to measure the clearance between the center guard hold-down (A) and the knife section. Ensure the clearance is between the following measurements:
  - **At hold-down tip (B):** 0.1–0.4 mm (0.004–0.016 in.)
  - **At rear of hold-down (C):** 0.1–1.0 mm (0.004–0.040 in.)
5. Adjust the clearance as follows:
  - a. Tighten nuts (D) until finger tight.
  - b. Turn three adjuster bolts (E) clockwise to raise the front of the hold-down and increase clearance, or counterclockwise to lower the front of the hold-down and decrease clearance.
  - c. When all the adjustments are complete and the specified clearances are achieved, torque nuts (D) to 88 Nm (65 lbf-ft).

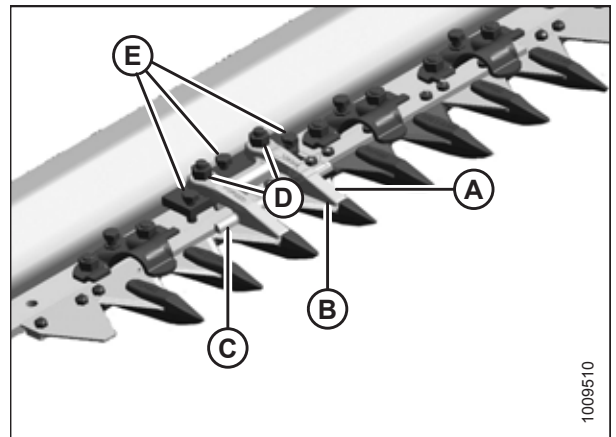


Figure 5.116: Center Guard Hold-Down



### WARNING

Check to be sure all bystanders have cleared the area.

6. Complete the hold-down adjustments, run the header at low engine speed, and listen for noise caused by insufficient clearance.

### IMPORTANT:

Insufficient hold-down clearance will result in overheating of the knife and guards—readjust as necessary.

Adjusting Hold-Down with Stub Guards

**WARNING**

To avoid bodily injury or death from the unexpected startup of the machine, always stop engine and remove the key before adjusting the machine.

1. Shut down the engine, and remove the key from the ignition.
2. Use a feeler gauge to measure the clearance between stub guard hold-down (A) and the knife section. Ensure the clearance is between the following measurements:
  - **At hold-down tip (B):** 0.1–0.4 mm (0.004–0.016 in.)
  - **At rear of hold-down (C):** 0.1–1.0 mm (0.004–0.040 in.)
3. Adjust the clearance as follows:
  - a. Tighten nuts (D) until they are finger tight.
  - b. To lower the front of the hold-down and decrease clearance, turn three adjuster bolts (E) clockwise; to raise the front of the hold-down and increase clearance, turn adjuster bolts (E) counterclockwise.
  - c. Torque nuts (D) to 88 Nm (65 lbf-ft) after all the adjustments are complete and the specified clearances are achieved.

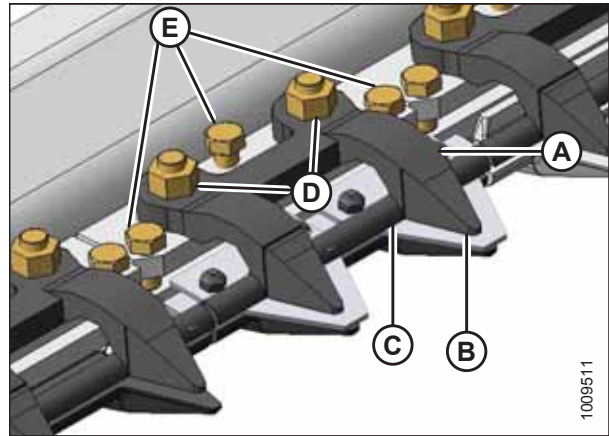


Figure 5.117: stub Guards

**WARNING**

Check to be sure all bystanders have cleared the area.

4. Complete the hold-down adjustments, run the header at low engine speed, and listen for noise caused by insufficient clearance.

**IMPORTANT:**

Insufficient hold-down clearance will result in overheating of the knife and guards—readjust as necessary.

**5.8.8 Knifehead Shield**

The knifehead shield attaches to the endsheet and reduces the knifehead opening to prevent cut crop from accumulating in the knifehead cutout.

The shields and mounting hardware are available from your MacDon Dealer.

**IMPORTANT:**

Remove the shields when using the cutterbar on the ground in muddy conditions. Mud may pack into the cavity behind the shield which could result in knife drive box failure.

*Installing Knifehead Shield*

The knifehead shield is supplied in flattened form, but it can be bent to suit installation on pointed or stub guard cutterbars. Knifehead shields differ slightly depending on header size and guard configuration, so ensure you are using the proper knifehead shield for your header. Refer to your parts catalog for proper replacement parts.

**DANGER**

To avoid bodily injury or death from the unexpected start-up or fall of raised machine, always stop the engine, remove the key, and engage the safety props before going under the header for any reason.

**CAUTION**

Wear heavy gloves when working around or handling knives.

1. Raise the reel to its full height, and lower the header to the ground.
2. Shut down the engine, and remove the key from the ignition.
3. Engage the reel safety props.
4. Place knifehead shield (A) against the endsheet as shown. Align the shield so the cutout matches the profile of the knifehead and/or hold-downs.
5. Bend knifehead shield (A) along the slit to conform to the endsheet.
6. Align the mounting holes and secure with two 3/8 x 1/2 in. Torx® head bolts (B).
7. Tighten bolts (B) just enough to hold knifehead shield (A) in place while allowing it to be adjusted as close to the knifehead as possible.
8. Manually rotate the knife drive box pulley to move the knife and check for areas of contact between the knifehead and knifehead shield (A). Adjust the shield to eliminate interference with the knife if necessary.
9. Tighten bolts (B).

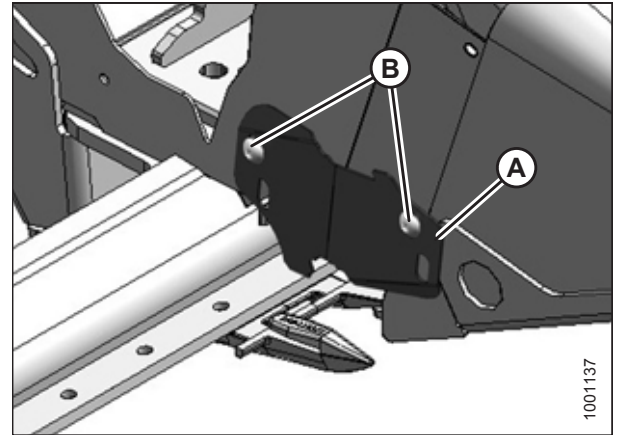


Figure 5.118: Knifehead Shield

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## 5.9 Knife Drive System

The knife drive system transforms pumped hydraulic pressure into a mechanical motion that stokes a series of serrated knife blades at the front of the header back and forth to cut a variety of crops.

### 5.9.1 Knife Drive Box

Knife drive boxes are belt-driven by a hydraulic motor, and convert rotational motion into the reciprocating motion of the knife.

#### CAUTION

To avoid personal injury, before servicing machine or opening drive covers, refer to [5.1 Preparing Machine for Servicing](#), page 397.

Double-knife headers have a knife drive box (A) at each end.

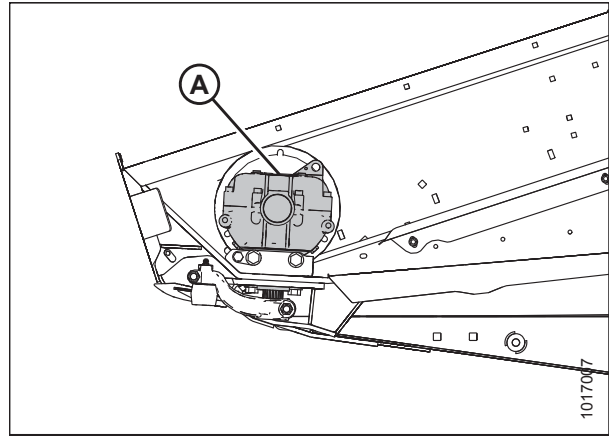


Figure 5.119: Left Knife Drive Box Shown – Right Similar

#### *Checking Knife Drive Box*

Single-knife headers have one knife drive box and double-knife headers have two knife drive boxes. To access the knife drive box(es), the endshield(s) must be fully opened.

#### DANGER

To avoid bodily injury or death from unexpected startup of machine, always stop the engine and remove the key before making adjustments to the machine.

## MAINTENANCE AND SERVICING

1. Shut down the engine, and remove the key from the ignition.
2. Press down on latch (A) in the opening on the inboard side of the endsheet.
3. Pull endshield open using handle depression (B).

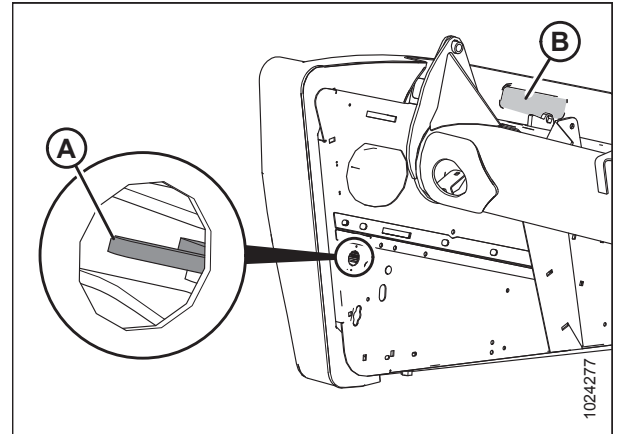


Figure 5.120: Endshield Latch Access

4. Swivel the endshield toward the back of the header and use safety latch (B) to secure endshield support tube (A) to the endsheet.

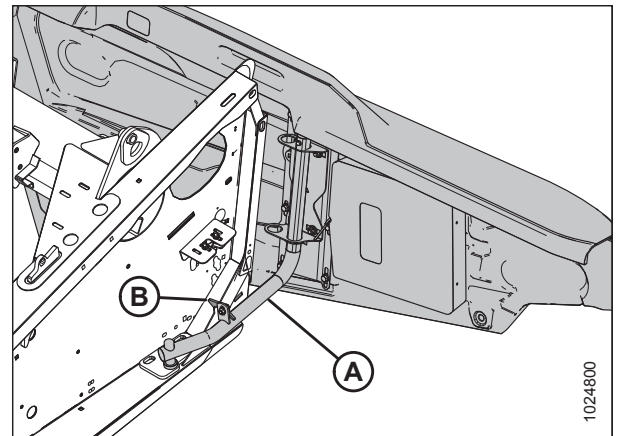


Figure 5.121: Left Endshield Support Tube

### IMPORTANT:

The knife drive box breather is shipped in position (A) (forward) to prevent oil loss during transport. The breather **MUST** be repositioned to location (B) to prevent oil loss during normal operation. Failure to do so can result in damage to the knife drive box.

5. Check position of plug (A) and breather (B) at knife drive box. Position **MUST** be as shown.
6. Remove breather (B) and check oil level. The oil level should be between bottom edge (C) of lower hole (D) and bottom (E) of the breather.

### NOTE:

Check oil level with top of knife drive box horizontal and with breather (B) screwed in.

7. Reinstall breather and tighten.

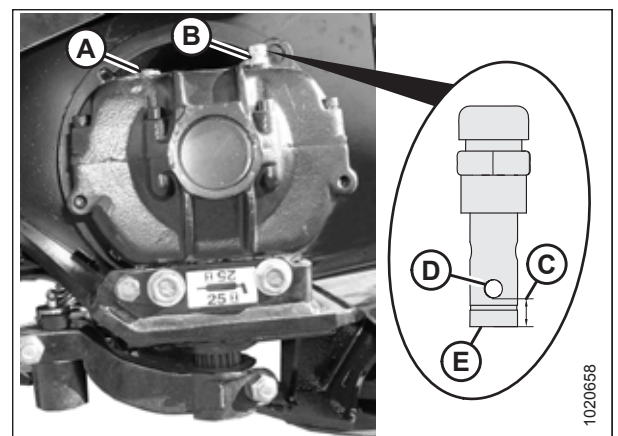


Figure 5.122: Knife Drive Box

### Checking Knife Drive Box Mounting Bolts

Check the torque on the four knife drive box mounting bolts (A) and (B) after the first 10 hours of operation and every 100 hours thereafter.

1. Torque side bolts (A) first, then torque bottom bolts (B).  
Torque all bolts to 271 Nm (200 lbf-ft).

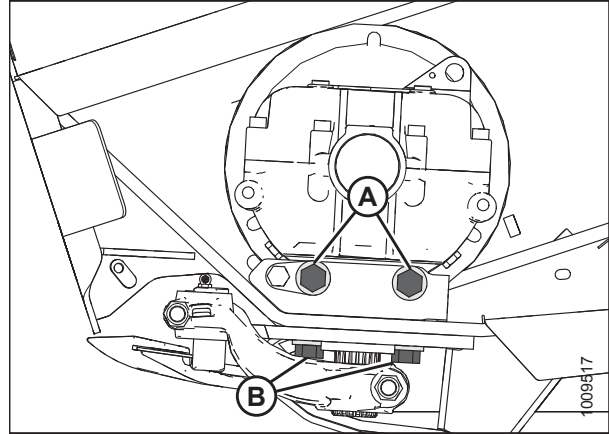


Figure 5.123: Knife Drive Box

### Removing Knife Drive Box

The knife drive box is an enclosed oil bath with a 76.2 mm (3 in.) stroke. Knife drive boxes are belt driven by a hydraulic motor, and convert rotational motion into reciprocating motion at the knife. Double knife drive systems have two knife drive boxes, one at each end of the header. The knife drive box may need to be removed for repair at the Dealership.

### DANGER

To avoid bodily injury or death from unexpected startup of machine, always stop the engine and remove the key before making adjustments to the machine.

#### For timed double-knife headers:

#### NOTE:

The procedure is the same for both ends of a timed double-knife header. Images shown are for the left end—the right end is opposite.

1. Shut down the engine, and remove the key from the ignition.
2. Open the endshield. For instructions, refer to [Opening Endshields, page 35](#).
3. Loosen the two nuts (A) on the idler bracket to relieve the belt tension.
4. Loosen nut (B) on the idler pulley and slide the idler down to loosen the belt.
5. Proceed to Step 11, [page 471](#).

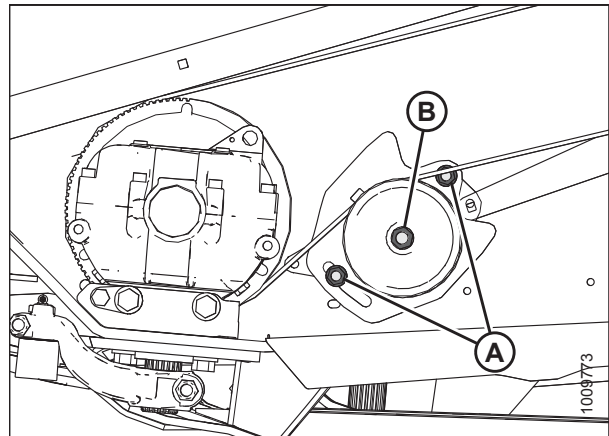


Figure 5.124: Timed Double-Knife Drive



## MAINTENANCE AND SERVICING

### *For single-knife and untimed double-knife headers:*

6. Shut down the engine, and remove the key from the ignition.
7. Open the endshield. For instructions, refer to [Opening Endshields, page 35](#).
8. Loosen the two bolts (A) securing the motor assembly to the header endsheet.
9. Loosen the belt tension by turning tensioning bolt (B) counterclockwise.
10. Proceed to Step 11, [page 471](#).

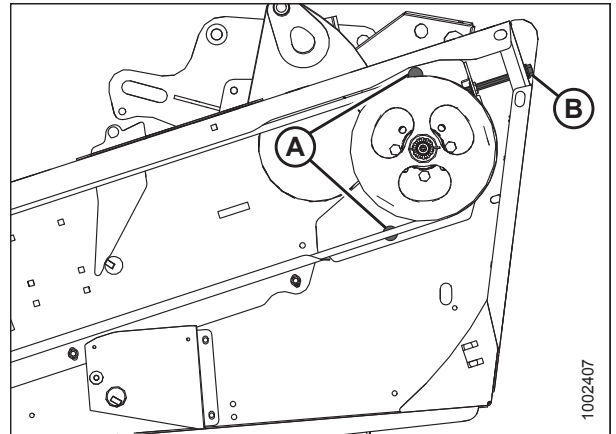


Figure 5.125: Knife Drive

### *For both timed and untimed headers:*

11. To provide clearance between the knife drive box pulley and the endsheet, open access cover (A) on the endsheet behind the cutterbar.

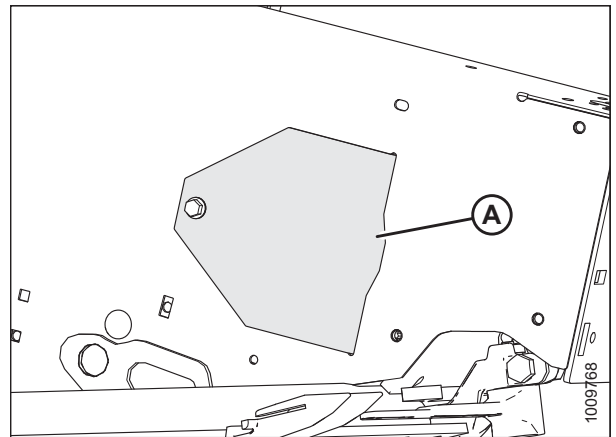


Figure 5.126: Access Cover

12. Remove belt (A) from drive pulley (B).
13. Slip belt (A) over and behind knife drive box pulley (C). Use the notch in the pulley to assist with belt removal.

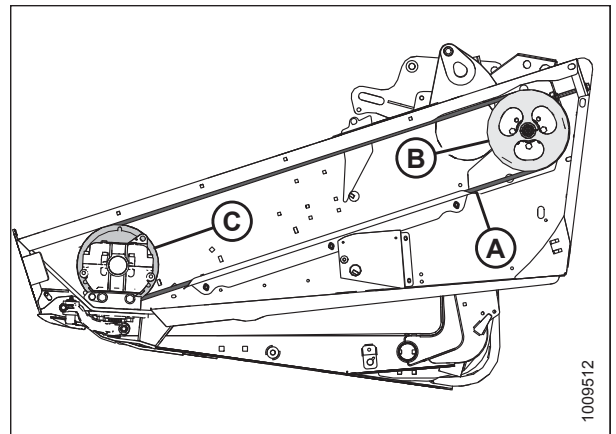


Figure 5.127: Knife Drive

## MAINTENANCE AND SERVICING

14. Manually stroke the knife to its outer limit.
15. Clean the area around the knifehead.
16. Remove grease fitting (B) from the pin.

**NOTE:**

Removing the grease fitting will make it easier to reinstall the knifehead pin later.

17. Remove bolt and nut (A).
18. Use a screwdriver or chisel in slot (C) to release the load on the knifehead pin.
19. Use a screwdriver or chisel to pry the pin upwards in the pin groove until the pin is clear of the knifehead.
20. Push the knife assembly inboard until it is clear of the output arm.
21. Seal the knifehead bearing with plastic or tape to keep out dirt and debris unless it is being replaced.
22. Remove bolt (A) that clamps knife drive arm (B) to the knife drive box output shaft.
23. Remove knife drive arm (B) from the knife drive box output shaft.
24. Remove the four knife drive box mounting bolts (C) and (D).

**NOTE:**

If shims are set on bolts (C) between the knife drive box and housing, mark the location of the shims for later reinstallation.

**NOTE:**

Do **NOT** remove bolt (E); it is factory-set to properly position the knife drive box in the correct fore-aft position.

**CAUTION**

The knife drive box and pulley weigh over 35 kg (65 lb.) Use care when removing or installing. Lug (L) can be used for lifting.

25. Remove the knife drive box from the header and set aside.

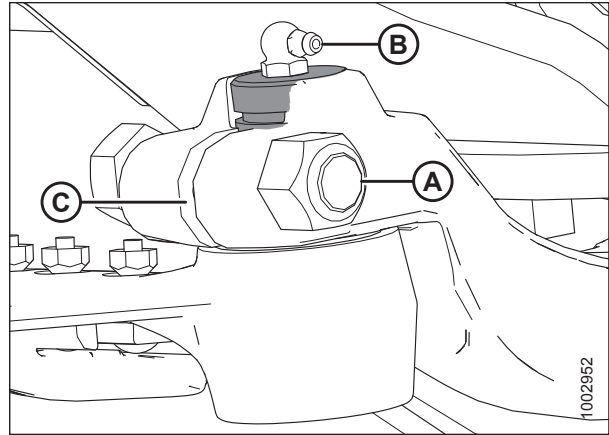


Figure 5.128: Knifehead

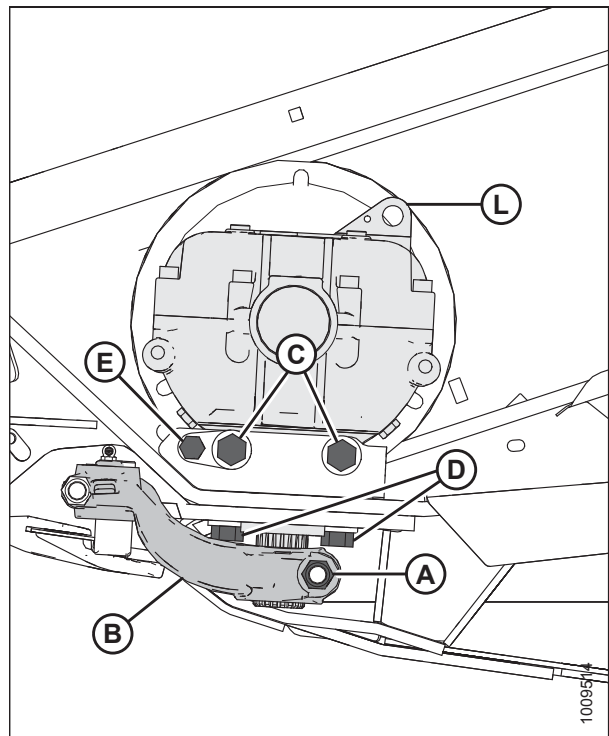


Figure 5.129: Knife Drive Box

### Removing Knife Drive Box Pulley

Before removing the knife drive box pulley, remove the knife drive box from the header. For instructions, refer to [Removing Knife Drive Box, page 470](#).

## MAINTENANCE AND SERVICING

1. Loosen and remove knife drive box pulley clamping bolt (A) and nut (B).
2. Using a three-jaw puller, remove knife drive box pulley (C).

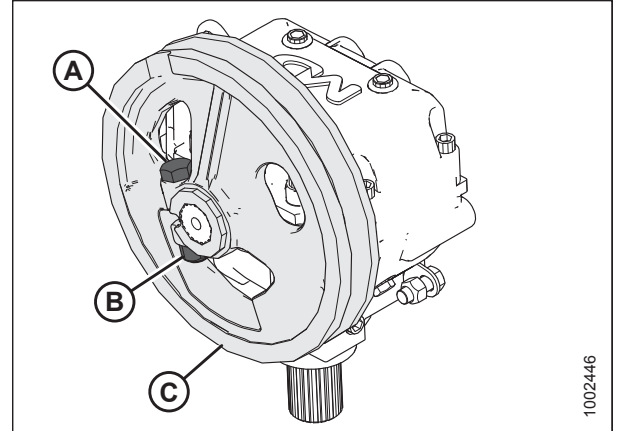


Figure 5.130: Knife Drive Box and Pulley

### Installing Knife Drive Box Pulley

1. Ensure the splines and bores in the pulley and drive arm are free of paint, oil, and solvents.
2. Apply two bands (A) of medium-strength threadlocker (Loctite® 243 or equivalent) around the shaft as shown at right. Apply one band at the end of the spline and the second band in the middle.
3. Press pulley (B) onto the shaft until flush with the end of the shaft.

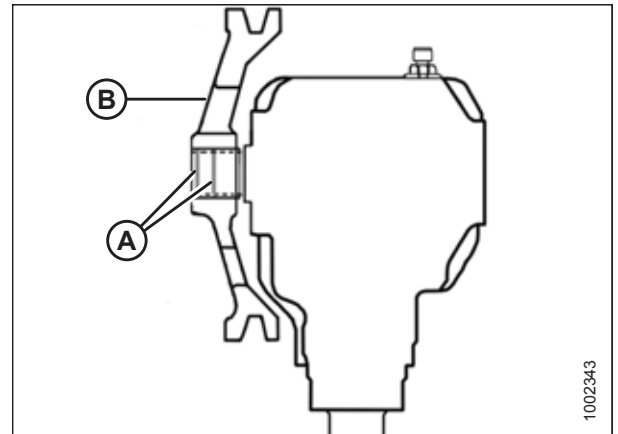


Figure 5.131: Knife Drive Box

4. Secure pulley (C) with a 5/8 x 3 in. hex head bolt (A) and a distorted thread NC lock nut (B). Torque bolt to 217 Nm (160 lbf-ft).

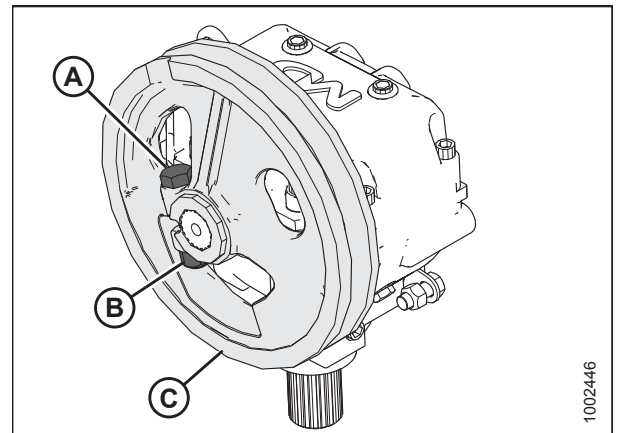


Figure 5.132: Knife Drive Box and Pulley

*Installing Knife Drive Box*

The knife drive box is an enclosed oil bath with a 76.2 mm (3 in.) stroke. Knife drive boxes are belt driven by a hydraulic motor, and convert rotational motion into reciprocating motion at the knife. Double knife drive systems have two knife drive boxes, one at each end of the header.

**NOTE:**

If the pulley was removed from the knife drive box, refer to *Installing Knife Drive Box Pulley, page 473*. If the pulley was **NOT** removed, proceed to Step 1, *page 474*.

**CAUTION**

The knife drive box and pulley weigh over 35 kg (65 lb.) Use care when removing or installing. Lug (L) can be used for lifting.

1. Position the knife drive box onto the header mount and install the belt onto the pulley.
2. Secure the knife drive box to the frame using two 5/8 x 1 3/4 in. grade 8 hex head bolts (A) on the side and two 5/8 x 2 1/4 in. grade 8 hex head bolts (B) on the bottom.

**NOTE:**

If shims were removed from bolts (A) in Step 24, *page 472*, install them again in the same place between the knife drive box and housing.

3. Tighten knife drive box side bolts (A) slightly, then tighten bottom bolts (B) to ensure proper contact with the vertical and horizontal mounting surfaces. Do **NOT** torque the bolts at this time.

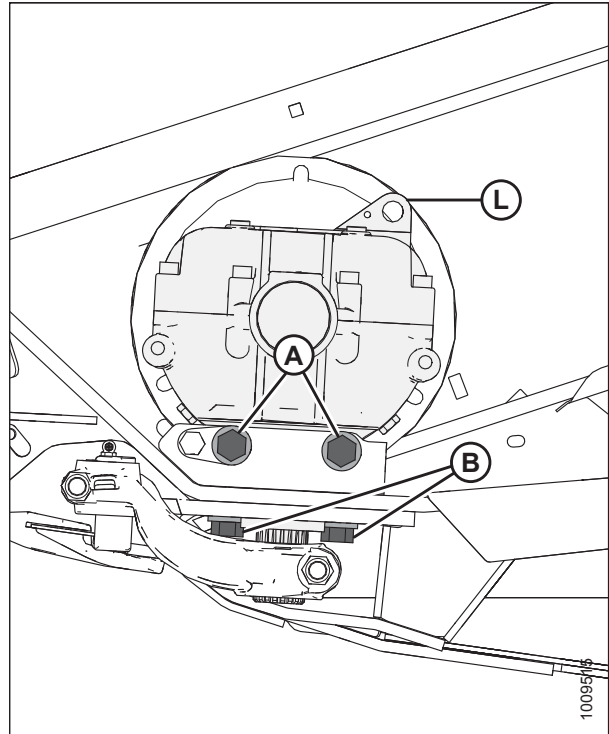


Figure 5.133: Knife Drive Box

4. Apply two bands (A) of medium-strength threadlocker (Loctite® 243 or equivalent) to the output shaft as shown. Apply one band at the end of the output shaft and the second band in the middle.
5. Slide output arm (B) onto the output shaft. Rotate the pulley to ensure the splines are properly aligned and the drive arm clears the frame on the inboard stroke.

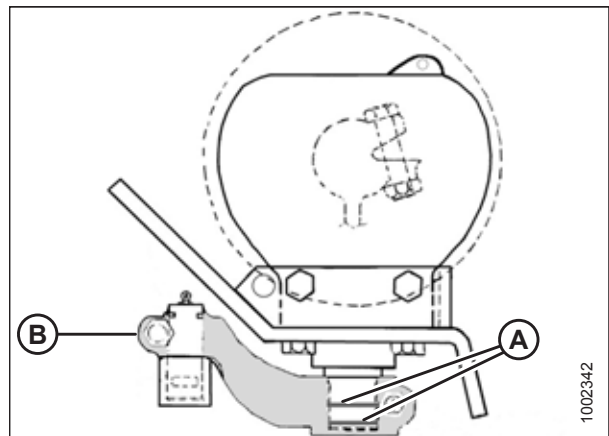


Figure 5.134: Knife Drive Box

## MAINTENANCE AND SERVICING

6. Position output arm (A) to the farthest outboard position.
7. Move output arm (A) up or down on the splined shaft until it is almost contacting knifehead (B) (exact clearance [C] is set during the knifehead pin installation).

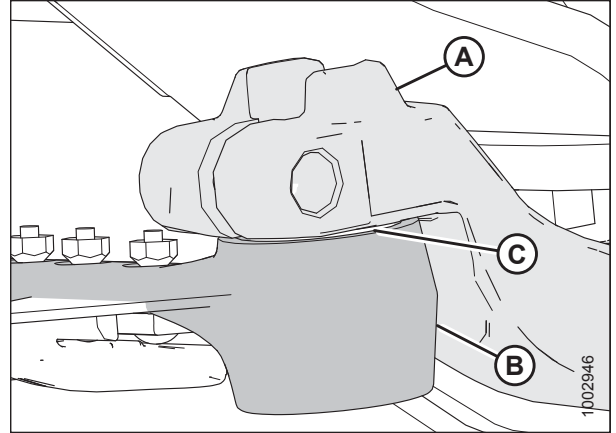


Figure 5.135: Knifehead

8. Torque output arm bolt (A) to 217 Nm (160 lbf-ft).

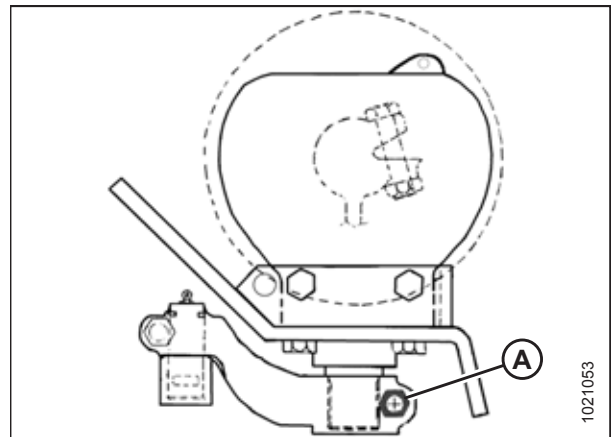


Figure 5.136: Knife Drive Box

9. Slide the knife into place and align the knifehead with the output arm.
10. Install knifehead pin (A) through output arm (C) and into the knifehead.

**NOTE:**

Remove the grease fitting from the knifehead pin for easier installation of knifehead pin.

11. Position the pin so that groove (B) is 1.5 mm (1/16 in.) above output arm (C).
12. Secure pin with 5/8 x 3 in. hex head bolt and nut (D), and torque to 217 Nm (160 lbf-ft).

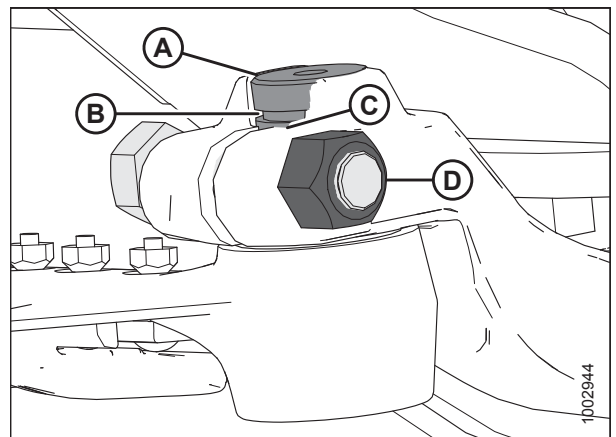


Figure 5.137: Knifehead

## MAINTENANCE AND SERVICING

13. Install grease fitting (A) into the knifehead pin, and turn the grease fitting for easy access.
14. Slowly apply grease to the knifehead until a slight downward movement of the knifehead is observed.

### IMPORTANT:

Do **NOT** overgrease the knifehead. Overgreasing leads to knife misalignment causing excessive heating of guards and overloading of drive systems. If overgreasing occurs, remove the grease fitting to release pressure.

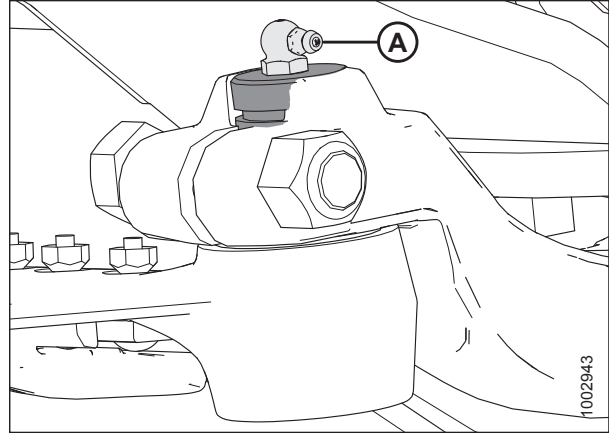


Figure 5.138: Knifehead

15. Tighten the knife drive box side bolts (A) first, then tighten bottom bolts (B). Torque to 271 Nm (200 lbf-ft).
16. Move the output arm to the mid-stroke position, and ensure the knife bar doesn't contact the front of the first guard. If the knife drive box requires adjustment, contact your MacDon Dealer.
17. Install and tension the knife drive belts.
  - For untimed headers, refer to [Checking and Tensioning](#), page 479.
  - For timed double-knife headers, also check the knife timing. For instructions, refer to [Adjusting Timed Double-Knife Timing](#), page 486.
  - For double-knife headers, refer to [Checking and Tensioning Timed Double-Knife Drive Belts](#), page 484.
18. Close the endshield. For instructions, refer to [Closing Endshields](#), page 36.

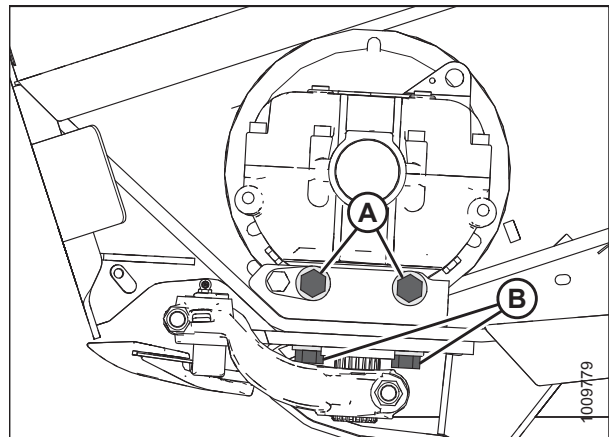


Figure 5.139: Knife Drive Box

### Changing Oil in Knife Drive Box

Change the knife drive box lubricant after the first 50 hours of operation and every 1000 hours (or 3 years) thereafter.

### DANGER

To avoid bodily injury or death from unexpected startup of machine, always stop the engine and remove the key before making adjustments to the machine.

1. Raise the header and place a container large enough to hold approximately 2.2 liters (2.3 quarts) under the knife drive box to collect the oil.
2. Shut down the engine, and remove the key from the ignition.
3. Open the endshield. For instructions, refer to [Opening Endshields](#), page 35.

4. Remove breather/dipstick (A) and drain plug (B).
5. Allow the oil to drain from the knife drive box and into the container placed below it.
6. Reinstall drain plug (B).
7. Add oil to the knife drive box. Refer to inside back cover for recommended fluids and lubricants.
8. Reinstall breather/dipstick (A).
9. Close the endshield. For instructions, refer to *Closing Endshields, page 36*.

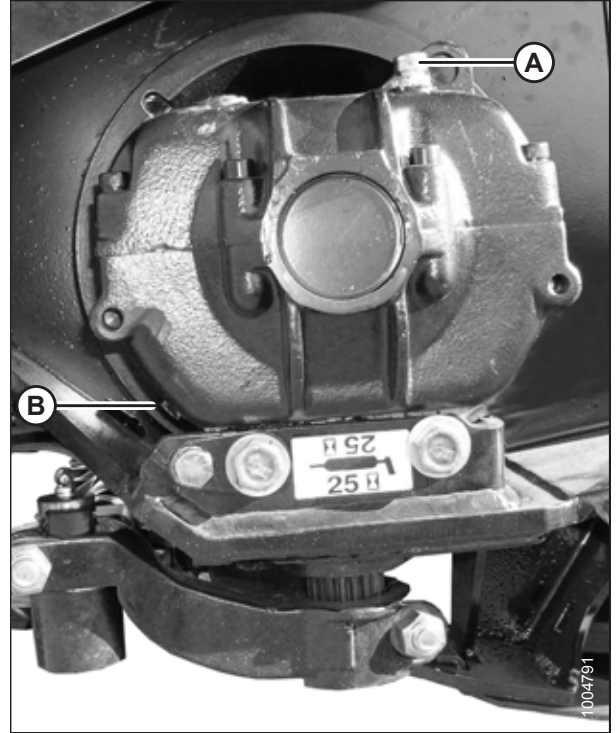


Figure 5.140: Knife Drive Box

## 5.9.2 Knife Drive Belts

### *Non-Timed Knife Drive Belts*

The knife drive box is driven by a V-belt that is powered by a hydraulic motor on the header left endsheet. There is an identical drive system at the opposite end of D140 and D145 double-knife headers.

### Removing Single-Knife and Untimed Double-Knife Drive Belts

The procedure for removing untimed double-knife drive belts is the same for both sides of the header.

### DANGER

To avoid bodily injury or death from unexpected startup of machine, always stop the engine and remove the key before making adjustments to the machine.

1. Shut down the engine, and remove the key from the ignition.
2. Open the endshield. For instructions, refer to *Opening Endshields, page 35*.
3. Loosen the two bolts (A) securing the motor assembly to the header endsheet.
4. Loosen the belt tension by turning tensioning bolt (B) counterclockwise.

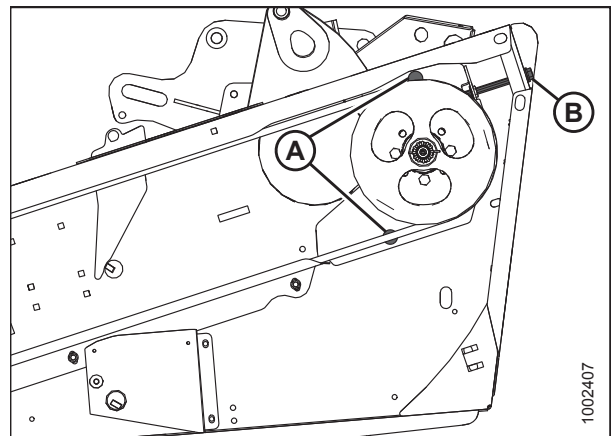


Figure 5.141: Knife Drive



## MAINTENANCE AND SERVICING

5. To provide clearance between the knife drive box pulley and the endsheet, open access cover (A) on the endsheet behind the cutterbar.

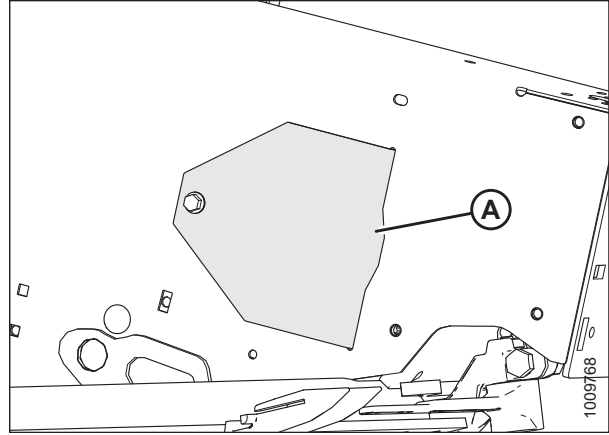


Figure 5.142: Access Cover

6. Remove belt (A) from drive pulley (B).
7. Slip belt (A) over and behind knife drive box pulley (C). Use the notch in the pulley to assist with belt removal.

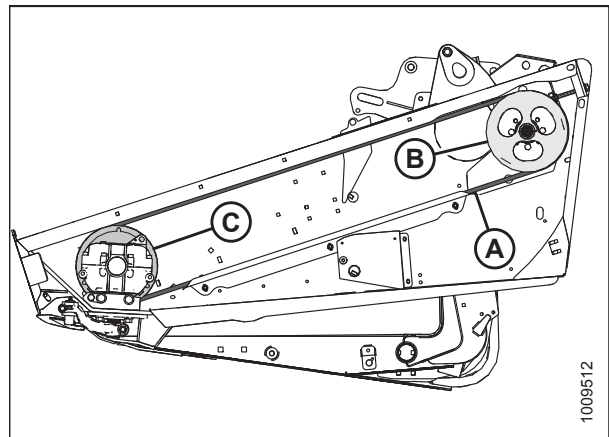


Figure 5.143: Knife Drive

### Installing Single-Knife and Untimed Double-Knife Drive Belts

The procedure for installing untimed double-knife drive belts is the same for both sides of the header.

#### DANGER

To avoid bodily injury or death from unexpected startup of machine, always stop the engine and remove the key before making adjustments to the machine.

1. Shut down the engine, and remove the key from the ignition.

## MAINTENANCE AND SERVICING

2. Route knife drive belt (A) around knife drive box pulley (C) and knife drive pulley (B). Use the notch in the pulley to assist with the belt installation.

### NOTE:

Ensure the drive motor is fully forward. Do **NOT** pry the belt over the pulley.

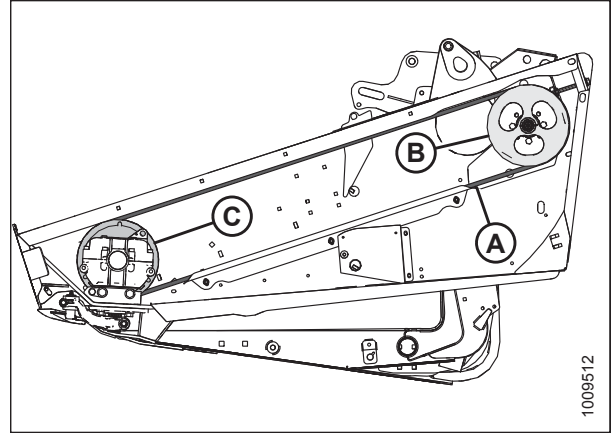


Figure 5.144: Knife Drive

3. Tension the knife drive belt. For instructions, refer to [Checking and Tensioning, page 479](#).
4. Install access cover (A) and secure with bolt.
5. Close the endshield. For instructions, refer to [Closing Endshields, page 36](#).

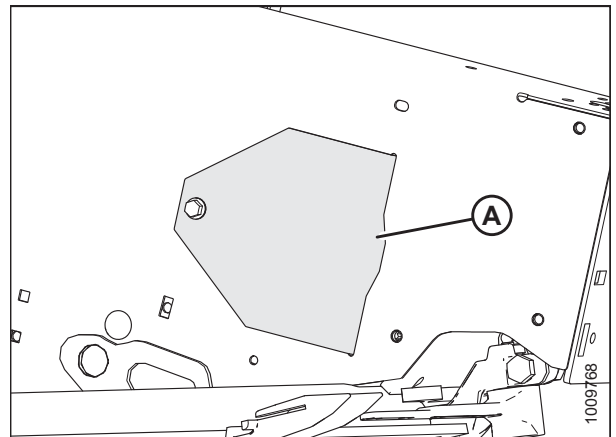


Figure 5.145: Access Cover

### Checking and Tensioning

Correct knife drive belt tension is necessary for the knife sections to stroke properly. Single-knife headers have one knife-drive belt on the left side of the header. Double-knife untimed headers have two knife-drive belts, one on each side of the header.

### DANGER

To avoid bodily injury or death from unexpected startup of machine, always stop the engine and remove the key before making adjustments to the machine.

### IMPORTANT:

To prolong the belt and drive life, do **NOT** overtighten the belt.

1. Shut down the engine, and remove the key from the ignition.
2. Open the left endshield. For instructions, refer to [Opening Endshields, page 35](#).

## MAINTENANCE AND SERVICING

- Loosen two bolts (A) securing the motor assembly to the header endsheet.

**NOTE:**

The belt guide has been removed from the illustrations for clarity.

- Check drive belt tension. A properly tensioned drive belt (C) should deflect 24–28 mm (15/16–1 1/8 in.) when 133 N (30 lbf) of force is applied at the midspan.
- If the belt needs to be tensioned, turn adjuster bolt (B) clockwise to move the drive motor until proper tension is set.

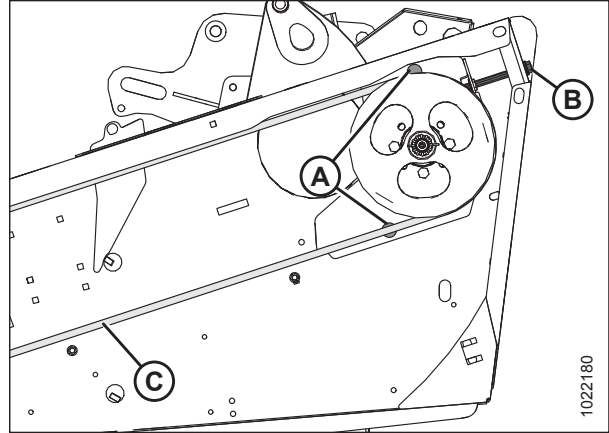


Figure 5.146: Knife Drive

- Ensure clearance between belt (A) and belt guide (B) is 1 mm (1/16 in.).
- Loosen three bolts (C), and adjust the position of guide (B) as required.
- Tighten three bolts (C).
- Close the endshield. For instructions, refer to [Closing Endshields, page 36](#).

**NOTE:**

Readjust the tension of a new belt after a short run-in period (about 5 hours).

- Double-knife headers:** Repeat the procedure on the other side of the header.

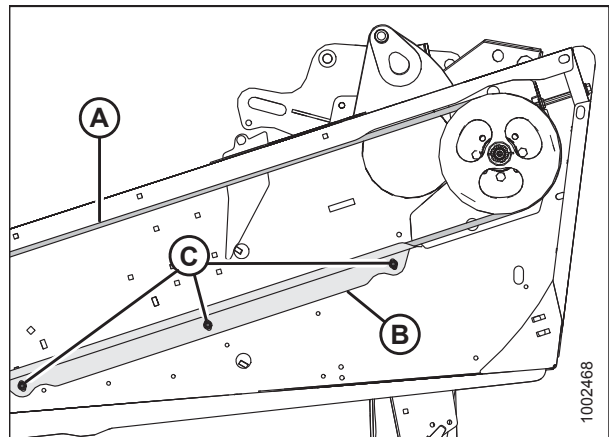


Figure 5.147: Knife Drive

### Timed Double-Knife Drive Belts

Knife drive boxes are belt driven by a hydraulic motor, and convert rotational motion into reciprocating motion at the knife. Double knife drive systems have two knife drive boxes, one at each end of the header. Timing is achieved using cogged belts on both sides of the header.

### Removing Timed Drive V-Belts

#### DANGER

To avoid bodily injury or death from unexpected startup of machine, always stop the engine and remove the key before making adjustments to the machine.

- Shut down the engine, and remove the key from the ignition.

## MAINTENANCE AND SERVICING

2. Open the endshield. For instructions, refer to [Opening Endshields, page 35](#).
3. Loosen the two bolts (A) securing the motor assembly to the header endsheet.
4. Turn adjuster bolt (B) counterclockwise to loosen and remove the two V-belts (C).

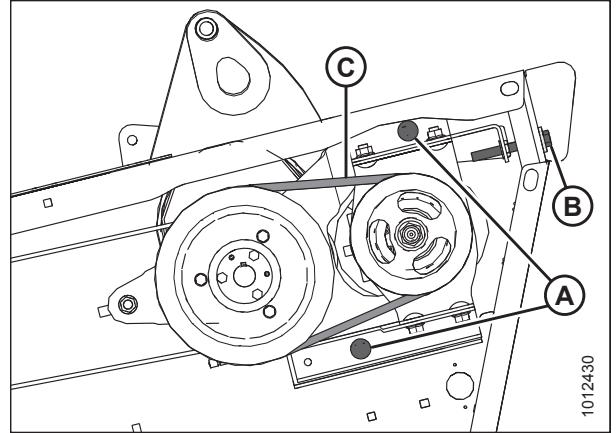


Figure 5.148: Knife Drive V-Belts

### Installing Timed Drive V-Belts

#### NOTE:

Install new V-belts in matching pairs.

#### DANGER

To avoid bodily injury or death from unexpected startup of machine, always stop the engine and remove the key before making adjustments to the machine.

1. Shut down the engine, and remove the key from the ignition.
2. Position V-belts (C) onto the pulleys.

#### NOTE:

Ensure the drive motor is fully forward. Do **NOT** pry the belts over the pulley.

3. Turn adjuster bolt (B) clockwise to tighten the V-belts. A properly tensioned V-belt should deflect 4 mm (5/32 in.) when a force of 52–77 N (12–17 lbf) is applied at midspan.

#### IMPORTANT:

To prolong the life of V-belts and drives. Do **NOT** overtighten the V-belts.

4. Tighten the two bolts (A) on the endsheet.
5. Close the endshield. For instructions, refer to [Closing Endshields, page 36](#).
6. Check the tension of the new V-belts after a short run-in period (about 5 hours).

### Removing Timed Knife Drive Belt

The timed knife drive belt removal procedure is the same for both sides of the header.

#### DANGER

To avoid bodily injury or death from unexpected startup of machine, always stop the engine and remove the key before making adjustments to the machine.

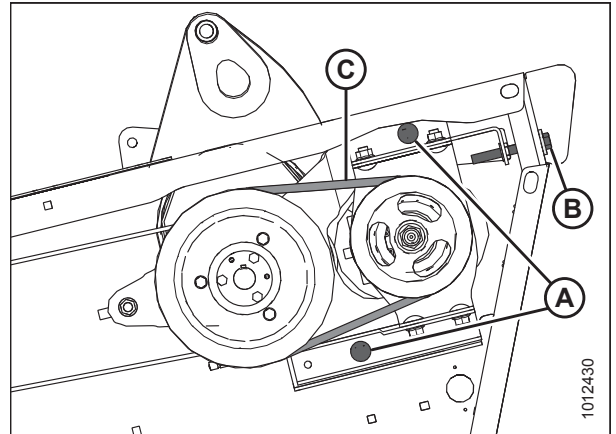


Figure 5.149: Knife Drive V-Belts

## MAINTENANCE AND SERVICING

1. Shut down the engine, and remove the key from the ignition.
2. Open the endshield. For instructions, refer to [Opening Endshields, page 35](#).
3. Loosen two nuts (A) on the belt idler bracket to relieve the belt tension.
4. Loosen nut (B) on the idler pulley and slide the idler downwards to loosen the belt.

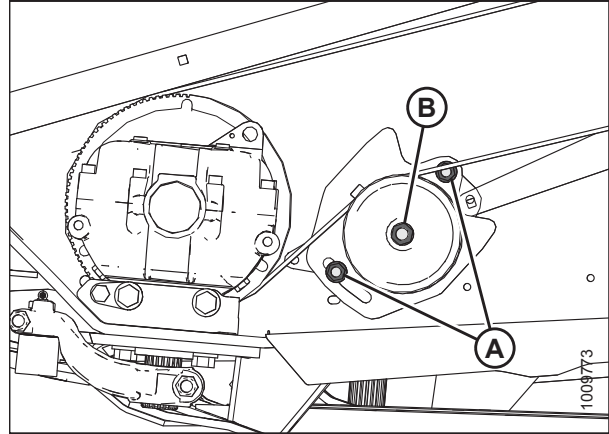


Figure 5.150: Knife Drive

5. **Left drive ONLY:** Loosen two bolts (A) on the endsheet.
6. **Left drive ONLY:** Turn adjuster bolt (B) counterclockwise to loosen, and remove two V-belts (C).

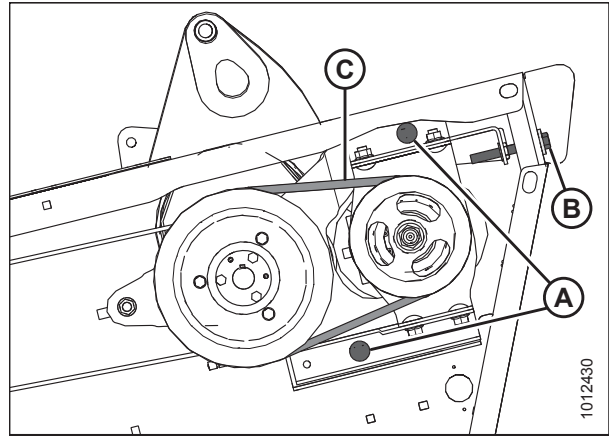


Figure 5.151: Knife Drive V-Belts

7. Open access cover (A) on the endsheet behind the cutterbar to provide clearance between the knife drive box pulley and the endsheet.
8. Remove the knife drive belt.

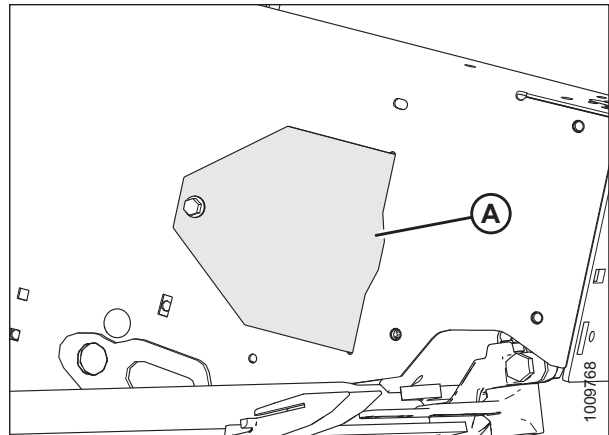


Figure 5.152: Access Cover

**Installing Timed Knife Drive Belt**

The procedure for installing timed knife drive belts is the same for both sides of the header.

**⚠ DANGER**

To avoid bodily injury or death from unexpected startup of machine, always stop the engine and remove the key before making adjustments to the machine.

1. Shut down the engine, and remove the key from the ignition.
2. Route knife drive belt (A) around pulley (B) and knife drive box pulley (C).

**NOTE:**

Ensure the drive motor is fully forward. Do **NOT** pry the belt over the pulley.

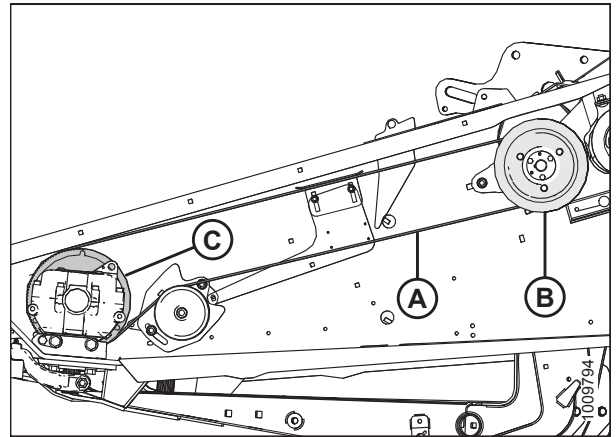


Figure 5.153: Timed Knife Drive Belt – Left Shown

3. Install V-belts (C) onto the pulleys.

**NOTE:**

Ensure the drive motor is fully forward, do **NOT** pry the belts over the pulley.

4. Turn adjuster bolt (B) clockwise to tighten the V-belts. A properly tensioned V-belt should deflect 4 mm (5/32 in.) when a force of 52–77 N (12–17 lbf) is applied at the midspan.

**IMPORTANT:**

To prolong the life of V-belts and drives, do **NOT** overtighten the V-belts.

**NOTE:**

If the belt is out of alignment, refer to [Adjusting Tracking for Timed Double-Knife Belt, page 488](#).

5. Tighten the two bolts (A) on the endsheet.

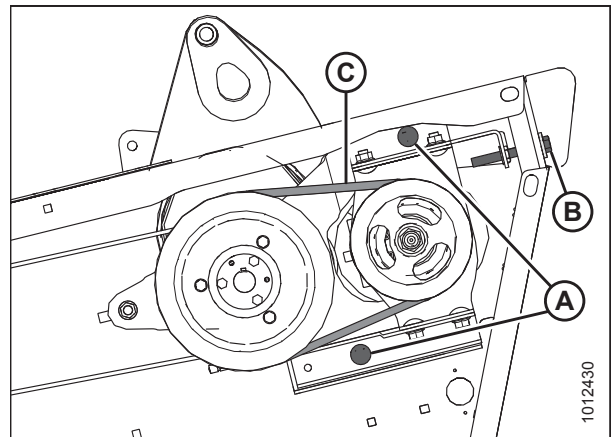


Figure 5.154: Knife Drive V-Belts

## MAINTENANCE AND SERVICING

6. Ensure the knives are timed before tightening the belt. For instructions, refer to [Adjusting Timed Double-Knife Timing, page 486](#).
7. Slide idler pulley (A) up the slot on support bracket (B) to take up the slack in the timing belt.

### NOTE:

Ensure nut (C) is as high as possible in the slot on support bracket (B).

8. Tighten nut (D) to 212–234 Nm (157–173 lbf-ft).

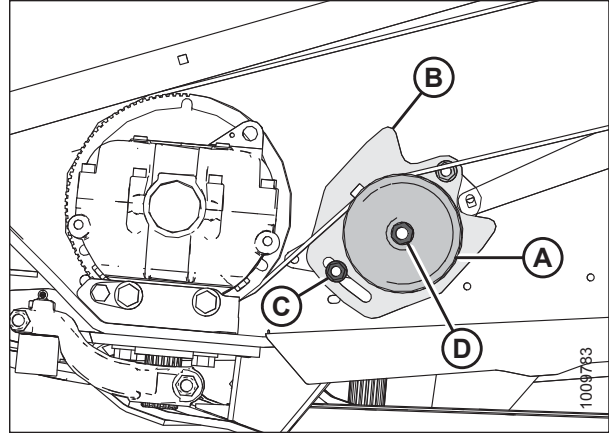


Figure 5.155: Knife Drive

9. Tension the knife drive belt. For instructions, refer to [Checking and Tensioning Timed Double-Knife Drive Belts, page 484](#).
10. Install access cover (A) and secure with bolt.
11. Close the endshield. For instructions, refer to [Closing Endshields, page 36](#).

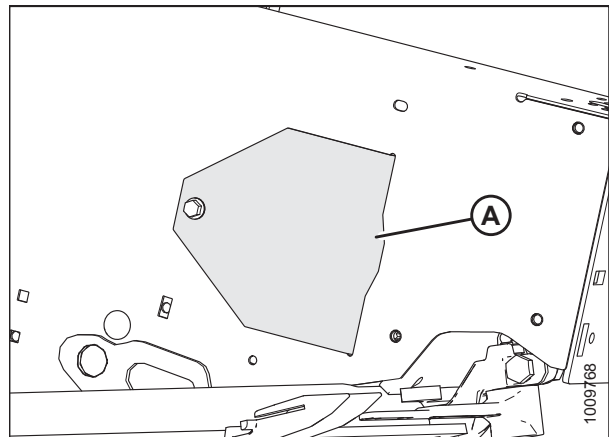


Figure 5.156: Access Cover

### Checking and Tensioning Timed Double-Knife Drive Belts

Correct knife drive belt tension is necessary for the knife sections to stroke properly. Double-knife timed headers have two knife drive belts, one on each of the side of header, and an additional v-belt on the left side. The additional v-belt is tensioned in a separate procedure.

### DANGER

To avoid bodily injury or death from unexpected startup of machine, always stop the engine and remove the key before making adjustments to the machine.

### IMPORTANT:

To prolong belt and drive life, do **NOT** overtighten the belt.

### IMPORTANT:

Do **NOT** use the adjuster bolt at the drive pulley to adjust timing belt tension.

1. Shut down the engine, and remove the key from the ignition.
2. Open the endshield. For instructions, refer to [Opening Endshields, page 35](#).



## MAINTENANCE AND SERVICING

3. Check drive belt tension. A properly tensioned belt (A) should deflect 13 mm (1/2 in.) at the midpoint of the upper span when a force of 27 N (6 lbf) is applied.

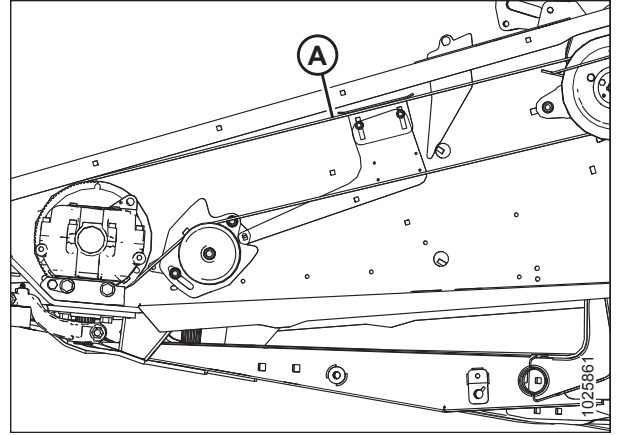


Figure 5.157: Knife Drive – Left Side

4. If the belt needs to be tensioned, loosen two nuts (A) on knife drive belt idler bracket (B).
5. Position pry bar (C) under the idler bracket, and push the bracket upwards until a force of 27 N (6 lbf) deflects the belt 13 mm (1/2 in.) at the midpoint of the upper span.

**IMPORTANT:**

Protect the machine's paint by placing a piece of wood (D) under pry bar (C).

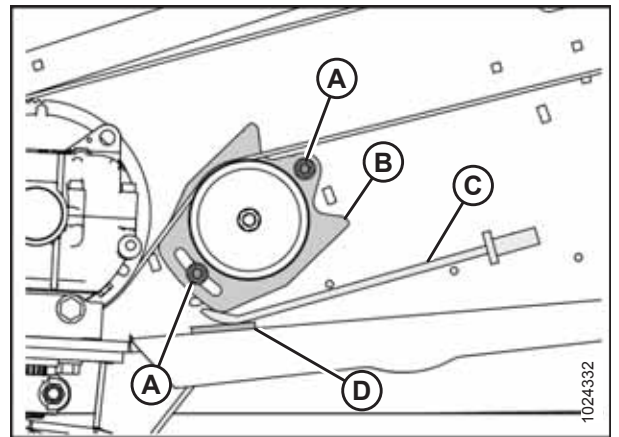


Figure 5.158: Knife Drive – Left Side

6. After achieving the proper belt tension, tighten nuts (C) to 77 Nm (57 lbf-ft).
7. Remove pry bar (A) and piece of wood (B).
8. Readjust the tension of a new belt after a short run-in period (about 5 hours).

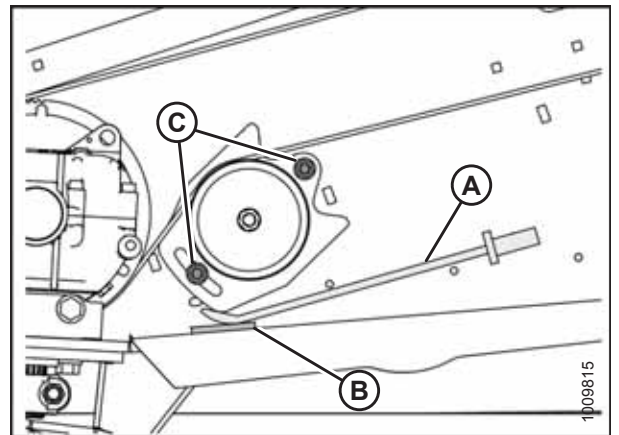


Figure 5.159: Knife Drive – Left Side

## MAINTENANCE AND SERVICING

9. Ensure clearance (A) between belt (B) and guide (C) is 0.5–1.5 mm (1/32–1/16 in.).
10. Loosen bolts (D) and adjust the guide if necessary. Tighten bolts.
11. Close the endshield. For instructions, refer to [Closing Endshields, page 36](#).
12. Repeat this procedure on the opposite side of the header.

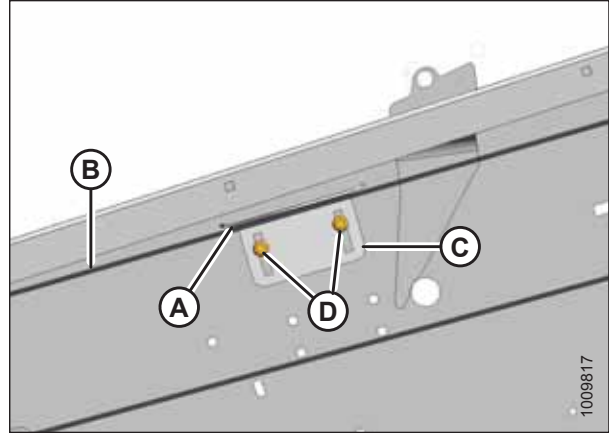


Figure 5.160: Belt Guide – Left Side

### Adjusting Timed Double-Knife Timing

Timed double-knife drive headers (10.7 m [35 ft.] and smaller) require the knives to be properly timed to move in opposite directions.

#### DANGER

To avoid bodily injury or death from unexpected startup of machine, always stop the engine and remove the key before making adjustments to the machine.

1. Shut down the engine, and remove the key from the ignition.
2. Open both endshields. For instructions, refer to [Opening Endshields, page 35](#).
3. Remove the right belt. For instructions, refer to [Removing Timed Knife Drive Belt, page 481](#).
4. Rotate the left knife drive box-driven pulley clockwise until left knife (A) is at the center of inboard stroke (B) (moving towards the center of the header).

#### NOTE:

The center stroke is when knife sections (C) are centered between the guard points.

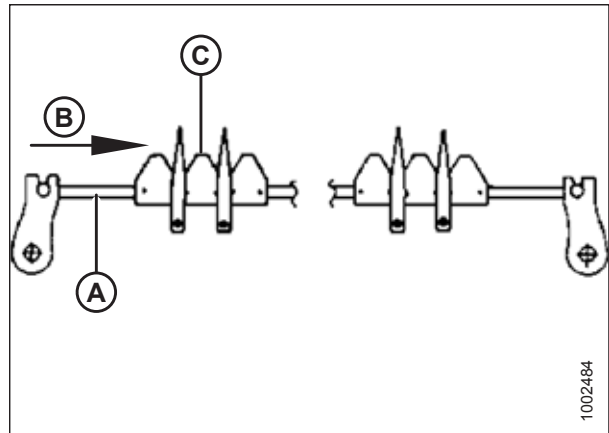


Figure 5.161: Adjusting Timing – Left Side

## MAINTENANCE AND SERVICING

5. Rotate the right knife drive box pulley counterclockwise until right knife (A) is at the center of inboard stroke (B) (moving towards the center of the header).

**NOTE:**

The center stroke is when knife sections (C) are centered between the guard points.

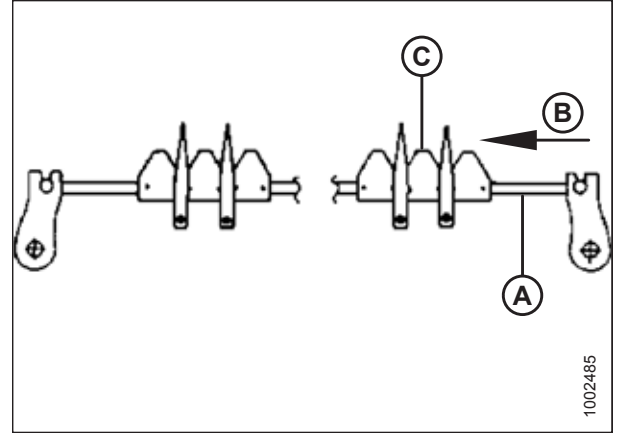


Figure 5.162: Adjusting Timing – Right Side

6. Install right belt (A).

**NOTE:**

Ensure the knife drive box drive pulley and driven pulley do **NOT** rotate during belt installation.

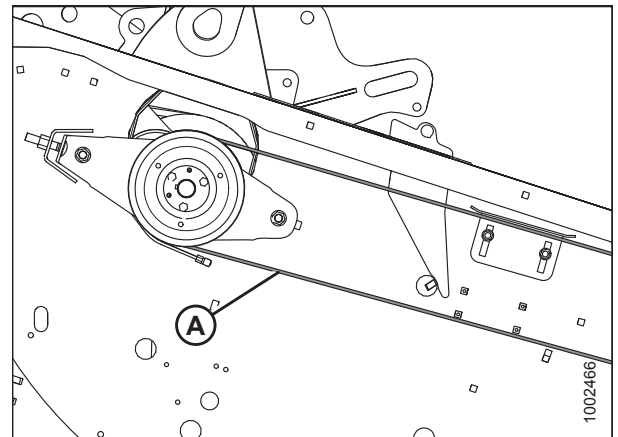


Figure 5.163: Knife Drive – Right Side

7. Slide idler pulley (A) up by hand to remove most of the belt slack. Tighten nut (B).
8. Rotate idler pulley bracket (A) downwards, and slide the idler pulley up by hand to remove most of the belt slack. Tighten nut (B).

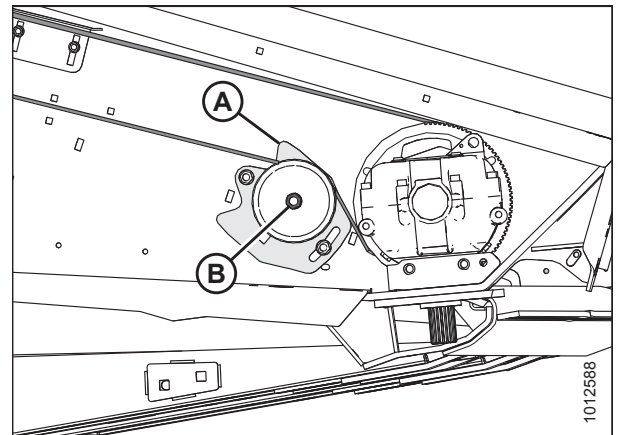


Figure 5.164: Knife Drive – Right Side

## MAINTENANCE AND SERVICING

- Position pry bar (A) under idler bracket (C), and push the bracket upwards until a force of 27 N (6 lbf) deflects the belt 13 mm (1/2 in.) at the midpoint of the upper span.

### IMPORTANT:

Protect the paint by placing a piece of wood (B) under pry bar (A).

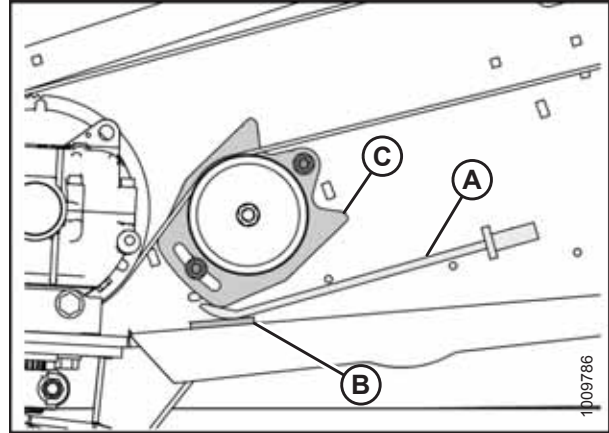


Figure 5.165: Idler Bracket – Left Side

- Tighten nuts (C) to 73–80 Nm (54–59 lbf-ft) after achieving the proper belt tension.
- Ensure the timing belts are properly seated in the grooves on both driver and driven pulleys.
- To check for correct knife timing, rotate the drive slowly by hand, and observe where the knives overlap at the center of the header.

### IMPORTANT:

The knives must begin moving at the exact same time, and must move in opposite directions.

- If necessary, adjust the knife timing by loosening right drive belt (B) just enough to reposition pulley (A) to the next cog(s), and proceed as follows:
  - If the right knife leads the left knife, rotate right driven pulley (A) clockwise.
  - If the right knife lags the left knife, rotate right driven pulley (A) counterclockwise.

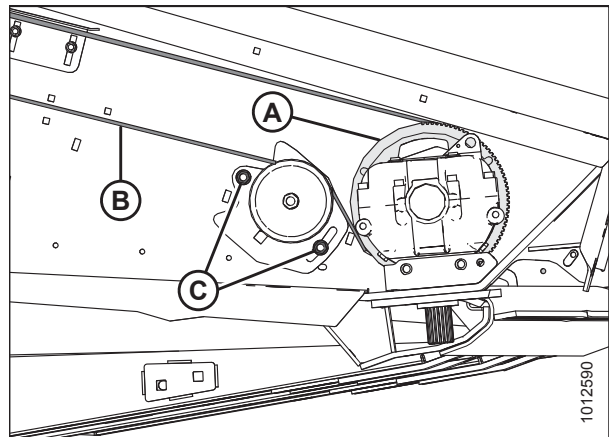


Figure 5.166: Knife Drive – Right Side

- Ensure the drive pulleys do not rotate, and tension the right drive belts (refer to Steps 8, page 487 to 10, page 488).

### IMPORTANT:

Do **NOT** use the adjuster bolt at the drive pulley to adjust the timing belt tension.

- Recheck the timing (refer to Step 12, page 488) and readjust if necessary (refer to Step 13, page 488).
- Close both endshields. Refer to *Closing Endshields*, page 36.

### Adjusting Tracking for Timed Double-Knife Belt

Proper belt tracking will ensure longer belt life. Belts that are not tracking properly are subject to premature failure; ensure the pulleys are aligned and parallel.

Two people are required for this procedure—one to operate the combine and header, and the other to observe and adjust the belt tracking.

### IMPORTANT:

Cogged timing belts should be centered on the knife drive box pulley and positioned at least 2 mm (3/32 in.) from either edge of the pulley when the header is running (a gap should be visible between the belt and the edge of the pulley).

**NOTE:**

The belt should not make continuous contact with the flanges of the drive pulley, but occasional contact is acceptable.

**⚠ DANGER**

To avoid injury or death from unexpected start-up of machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Shut down the combine engine and remove the key from the ignition.
2. Open both endshields. For instructions, refer to *Opening Endshields, page 35*.

**⚠ CAUTION**

Exercise extreme care when operating the header with the endshields open.

3. Operate the header. Observe the belt tracking on both the drive pulley and the knife drive box pulley on both sides of the header.
4. Shut down the engine, and remove the key from the ignition.
5. If the belt is tracking towards the inboard side of the drive pulley, the likely cause is a toe-out problem (A) and (B). If the belt tends to move towards the low tension [inboard] side of the pulley, proceed to Step 8, page 490.
6. If the belt is tracking towards the outboard side of the drive pulley, the likely cause is a toe-in problem (C) and (D). If the belt tends to move towards the high tension [outboard] side of the pulley, proceed to Step 8, page 490.

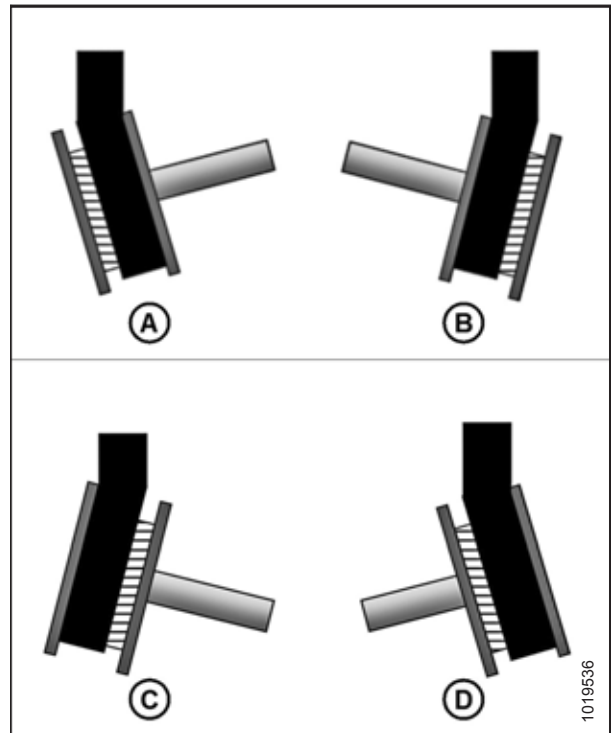


Figure 5.167: Knife Drive Pulley

## MAINTENANCE AND SERVICING

7. If belt (A) is tracking to one side of the knife drive box pulley (B), the likely cause is an out-of-position idler pulley (C). Proceed to Step 10, page 491.

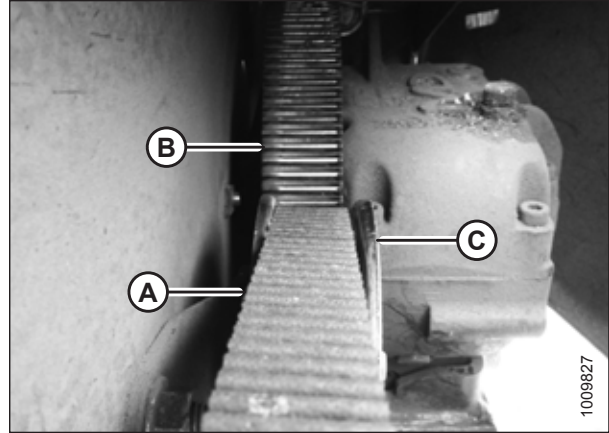


Figure 5.168: Knife Drive Belt

8. If there is a tracking problem on the drive pulley, adjust the position of the cross-shaft support tube as follows:
- a. Loosen nut (A) on support assembly (B).
  - b. To correct a toe-out condition, slide support assembly (B) rearward in slot (C).
  - c. To correct a toe-in condition, slide support assembly (B) forward.
  - d. Tighten nut (A).
  - e. Operate the header and check the belt tracking. Adjust the support assembly as required.
  - f. If belt tracking problems continue, proceed to Step 10, page 491.

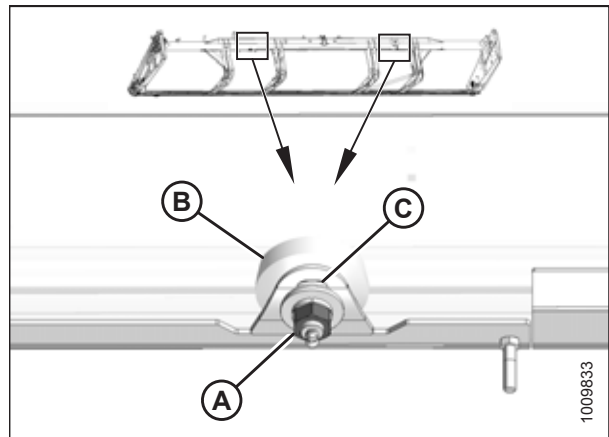


Figure 5.169: Cross-Shaft Support

9. Correct a tracking problem on the knife drive box pulley by adjusting the idler position as follows:
- a. Loosen nuts (A) and (B), and move the bracket and idler until the belt is loose.
  - b. Remove nut (B) securing the idler to the bracket, and remove the lock washer, idler pulley, and flat washer.
  - c. Install idler pulley (C) using flat washer(s) as required to align the idler pulley with the knife drive box pulley.
  - d. Install lock washer (D) and nut (B).
  - e. Tension the belt. For instructions, refer to *Checking and Tensioning Timed Double-Knife Drive Belts*, page 484.
  - f. Operate the header and check the belt tracking.

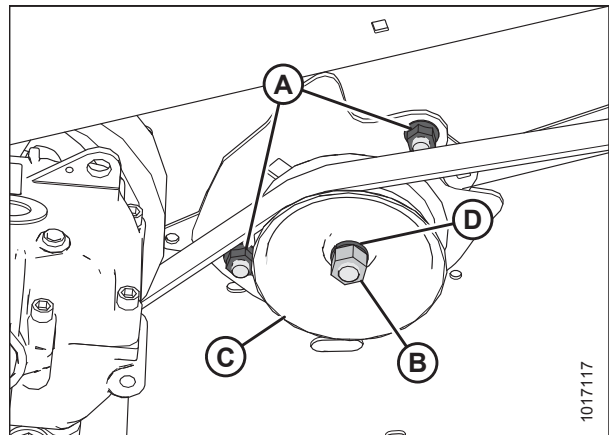


Figure 5.170: Knife Drive

## MAINTENANCE AND SERVICING

10. If further adjustment is required to correct drive pulley tracking, proceed as follows:
  - a. Loosen nut (A) on the idler and nuts (B) on the idler bracket.
  - b. Loosen nuts (C) at the drive pulley location.
  - c. To correct toe-in problems, turn adjuster bolt (D) clockwise to enable the belt to track inboard.
  - d. To correct toe-out problems, turn adjuster bolt (D) counterclockwise to enable the belt to track outboard.
  - e. Tighten nuts (C) at the drive pulley location.
  - f. Tension the belt. For instructions, refer to *Checking and Tensioning Timed Double-Knife Drive Belts*, page 484.
  - g. Operate the header, check the belt tracking, and readjust the drive pulley as necessary.

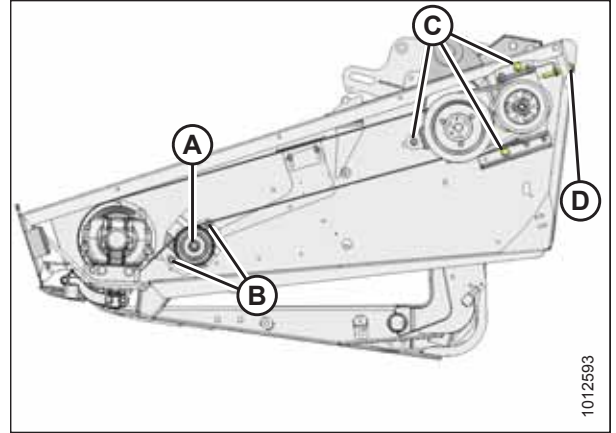


Figure 5.171: Knife Drive – Left Side

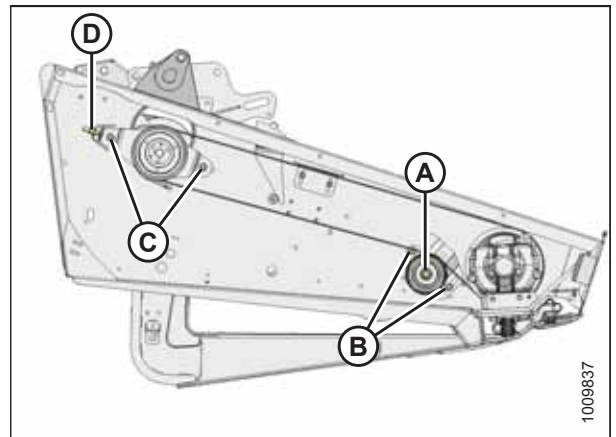


Figure 5.172: Knife Drive – Right Side



## 5.10 Feed Draper

The feed draper is located on the FM100 Float Module and conveys cut crop to the auger.

### CAUTION

To avoid personal injury, before servicing machine or opening drive covers, refer to [5.1 Preparing Machine for Servicing, page 397](#).

### 5.10.1 Replacing Feed Draper

Replace the feed draper if it has torn, cracked, or missing slats.

### DANGER

To avoid bodily injury or death from the unexpected start-up or fall of a raised machine, always stop engine and remove key before leaving the operator's seat, and always engage safety props before going under the machine for any reason.

1. Raise the header fully.
2. Engage the header safety props.
3. Shut down the engine, and remove the key from the ignition.
4. Raise the reel fully.
5. Engage the reel safety props. For instructions, refer to [Engaging Reel Safety Props, page 33](#).
6. Loosen jam nut (A) and turn bolt (B) counterclockwise to release the draper tension. Repeat at the opposite side of the header.

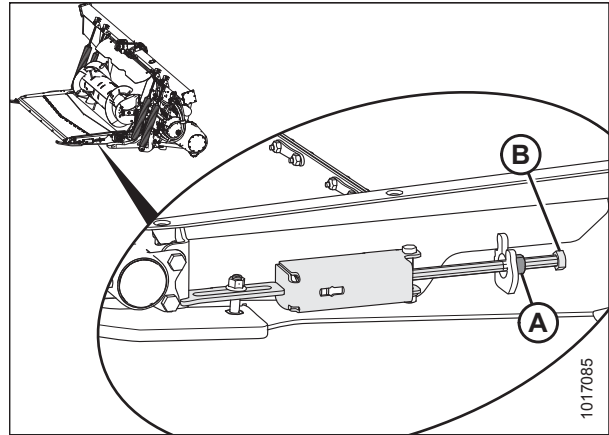


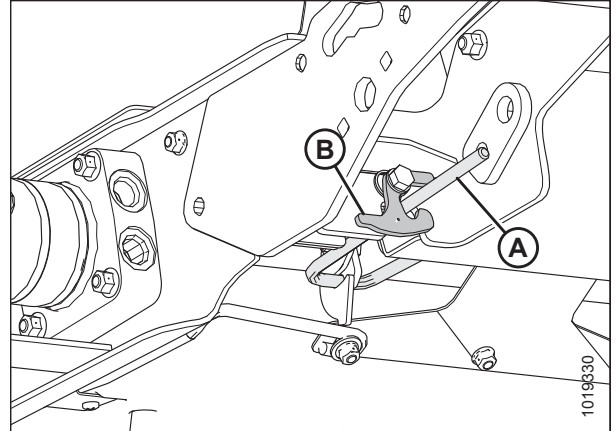
Figure 5.173: Feed Draper Tensioner

## MAINTENANCE AND SERVICING

7. Unlatch feed deck pan handle (A) from pan handle latch supports (B) on each side of the feed deck. This will drop the door down and allow access to feed deck draper and rollers.

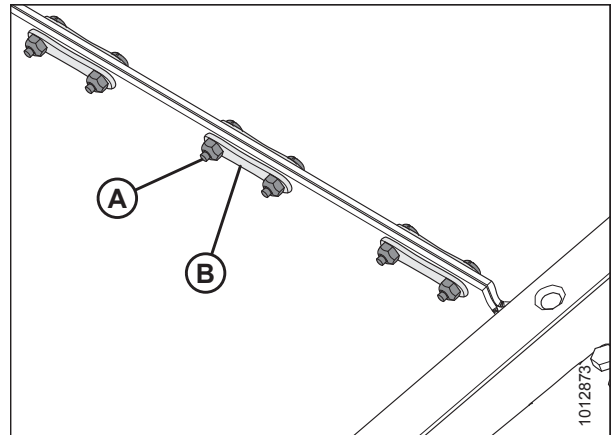
**NOTE:**

Some parts removed from illustration for clarity.



**Figure 5.174: Feed Deck Pan Handle and Left Pan Handle Latch**

8. Remove nuts and screws (A), and remove draper connector straps (B).
9. Pull the draper from the deck.



**Figure 5.175: Draper Connector**

## MAINTENANCE AND SERVICING

10. Install new draper (A) over drive roller (B). Make sure the draper guides fit into drive roller grooves (C).
11. Pull draper along bottom of feed deck and over idler roller (D).

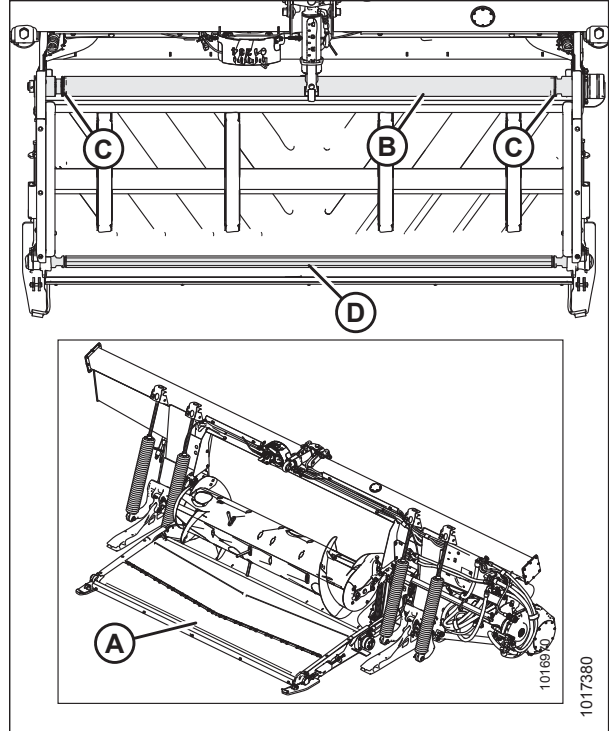


Figure 5.176: Float Module Feed Draper

12. Connect the draper joint with connector straps (B) and secure with nuts and screws (A). Ensure the screw heads face towards the rear of the deck, and tighten only until the end of the screws are flush with the nuts.
13. Adjust the draper tension. For instructions, refer to [5.10.2 Checking and Adjusting Feed Draper Tension](#), page 495.

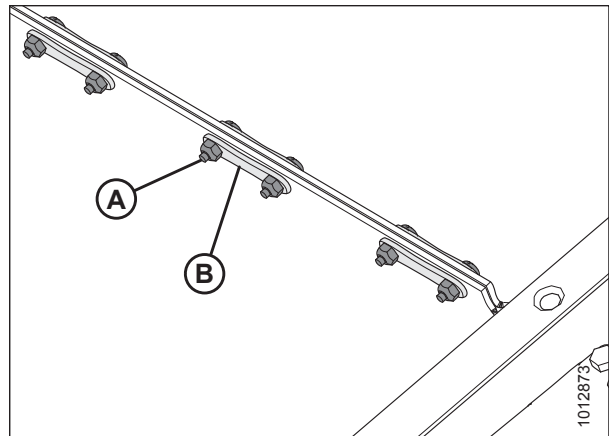


Figure 5.177: Draper Connector Straps

14. Close the feed deck by latching pan handle latch supports (B) on each side of the feed deck to feed deck pan handle (A).

**NOTE:**

Some parts removed from illustration for clarity.

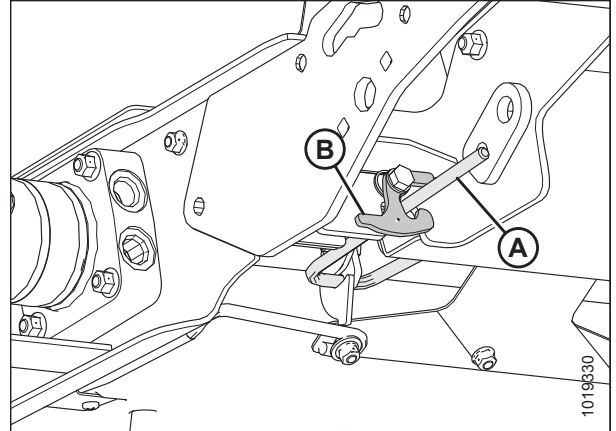


Figure 5.178: Feed Deck Pan Handle and Left Pan Handle Latch

### 5.10.2 Checking and Adjusting Feed Draper Tension

**⚠ DANGER**

To avoid bodily injury or death from the unexpected start-up or fall of a raised machine, always stop engine and remove key before leaving the operator's seat, and always engage safety props before going under the machine for any reason.

1. Raise the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Engage the header safety props.

**Checking draper tension:**

4. Ensure the draper guide (the rubber track on the underside of the draper) is properly engaged in the groove on the drive roller, and the idler roller is between the guides.

**NOTE:**

Illustrations show the left side of the float module. The right side is opposite.

**NOTE:**

The default position of spring retainer (A) (white indicator) is centered (B) in the spring box window; however, the position of the spring retainer varies with draper tracking adjustment at the factory.

5. Check the position of white indicator (A). If the feed draper tracks properly and the spring retainers on both sides of the draper are correctly positioned, then no adjustment is necessary.
6. If adjustment is necessary, proceed to Step 7, page 496.

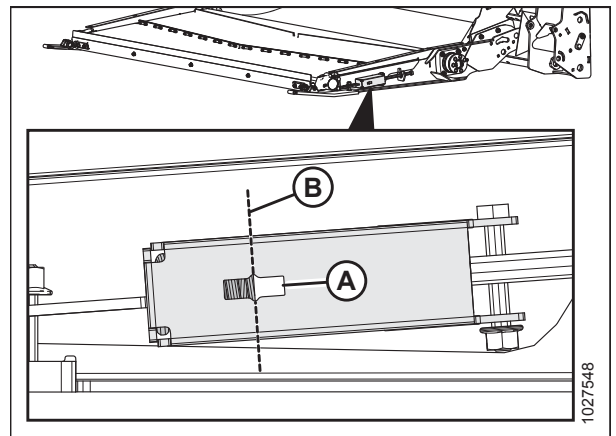


Figure 5.179: Feed Draper Tensioner

**Adjusting draper tension:**

7. Adjust the draper tension by loosening jam nut (A) and turning bolt (B) clockwise to increase draper tension or turning bolt (B) counterclockwise to decrease draper tension. Draper tension can be adjusted as follows:

- Loosened to 3 mm (1/8 in.) (D) (aft of center in indicator window [E])
- Tightened to 6 mm (1/4 in.) (C) (forward of center in indicator window [E])

**NOTE:**

For small tension adjustments, you may need to only adjust one side of the draper. For larger tension adjustments and to avoid uneven draper tracking, you may need to adjust both sides of the draper an equal amount.

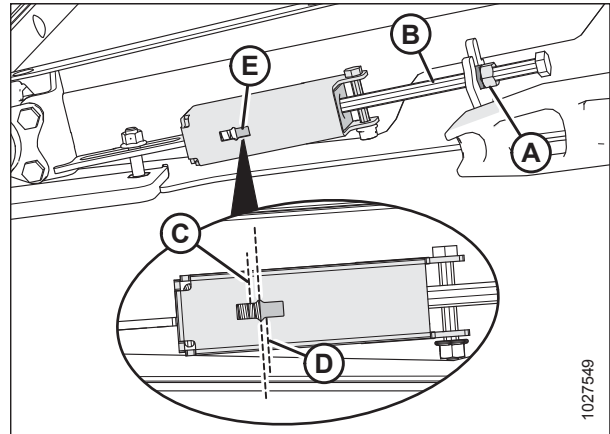


Figure 5.180: Feed Draper Tensioner

8. Tighten jam nut (A).

### 5.10.3 Feed Draper Drive Roller

This roller is powered and moves the draper on the float module, conveying crop to the auger.

*Removing Feed Draper Drive Roller*

**⚠ DANGER**

To avoid bodily injury or death from the unexpected start-up or fall of a raised machine, always stop engine and remove key before leaving the operator's seat, and always engage safety props before going under the machine for any reason.

1. Raise the header fully.
2. Raise the reel fully.
3. Engage the header safety props.
4. Engage the reel safety props.
5. Loosen jam nut (A) and turn bolt (B) counterclockwise to release the draper tension. Repeat at the opposite side of the header.

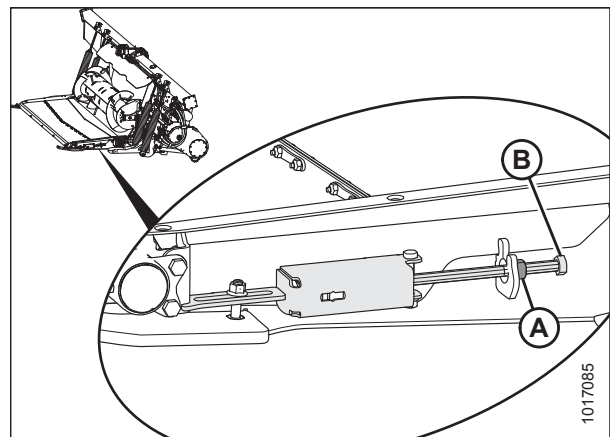


Figure 5.181: Feed Draper Tensioner

## MAINTENANCE AND SERVICING

6. Remove nuts and screws (A), and remove draper connector straps (B).
7. Pull the draper from the deck.

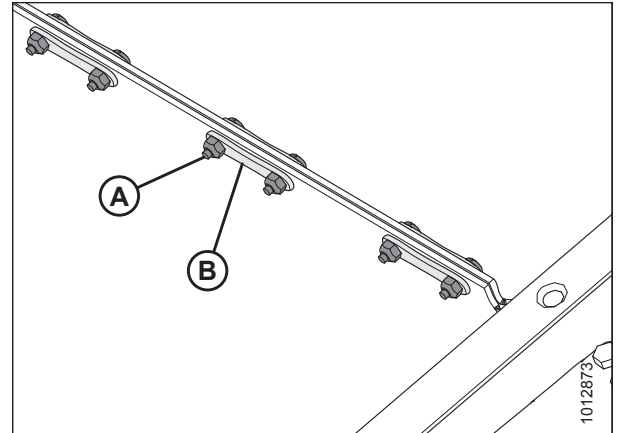


Figure 5.182: Draper Connector

8. Remove two bolts (B) from drive roller cover (A).

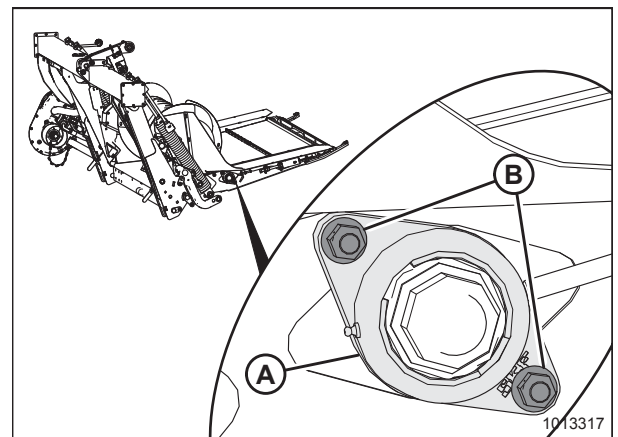


Figure 5.183: Drive Roller Bearing

9. Move drive roller cover plate (A) as shown.

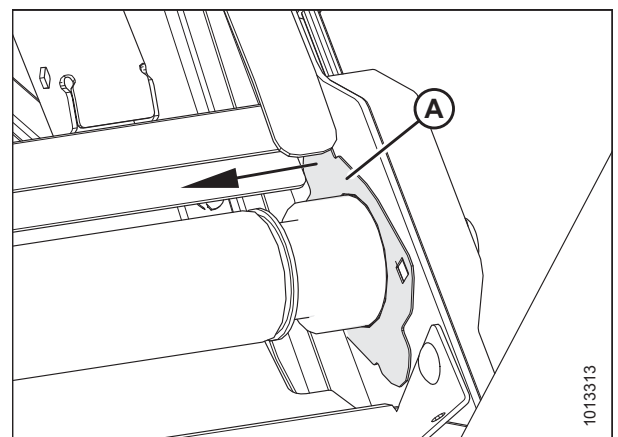


Figure 5.184: Drive Roller

## MAINTENANCE AND SERVICING

- Slide drive roller (A) with bearing assembly (B) as shown until left end comes off of spline.

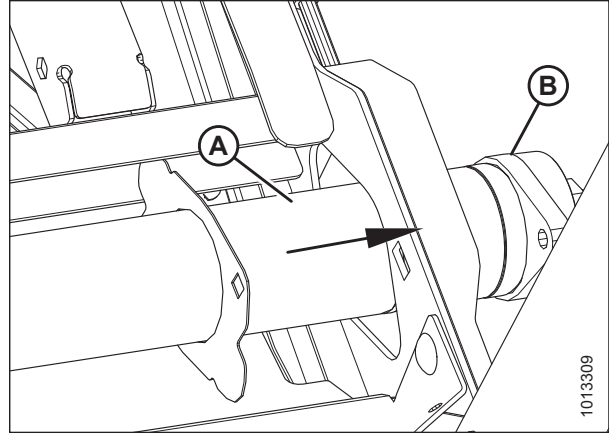


Figure 5.185: Drive Roller

- Lift left end out of the frame.
- Slide assembly (A) as shown, guiding bearing housing (B) through frame opening (C).
- Remove roller (A).

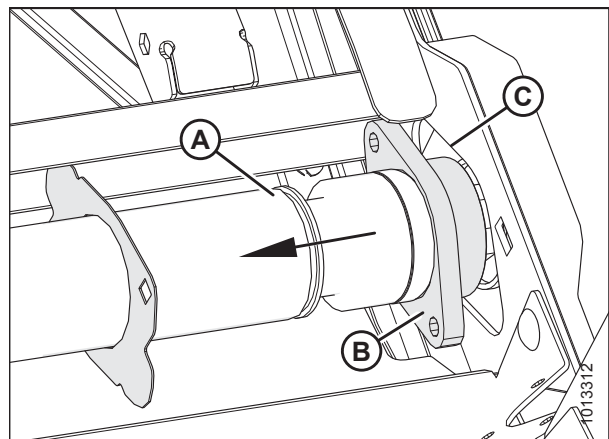


Figure 5.186: Drive Roller

### *Installing Feed Draper Drive Roller*

- Apply grease to the spline.
- Slide drive roller cover plate (A) onto end of roller (B) as shown.
- Guide bearing end (C) of drive roller through frame opening (D).

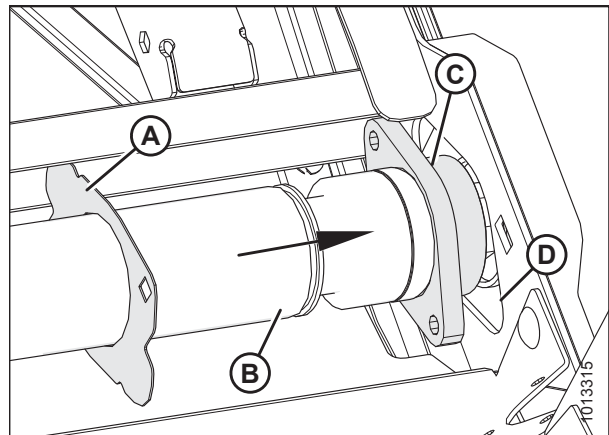


Figure 5.187: Drive Roller – Bearing End



## MAINTENANCE AND SERVICING

- Slide left end of drive roller (A) onto motor spline (B) as shown.

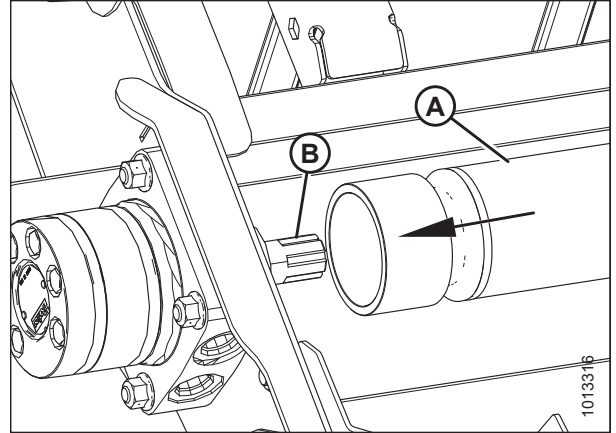


Figure 5.188: Motor

- Secure bearing and housing (A) with the drive roller cover plate on the frame using two bolts (B).
- Install the feed deck draper. For instructions, refer to [5.10.1 Replacing Feed Draper, page 492](#).
- Tension the feed draper. For instructions, refer to [5.10.2 Checking and Adjusting Feed Draper Tension, page 495](#).

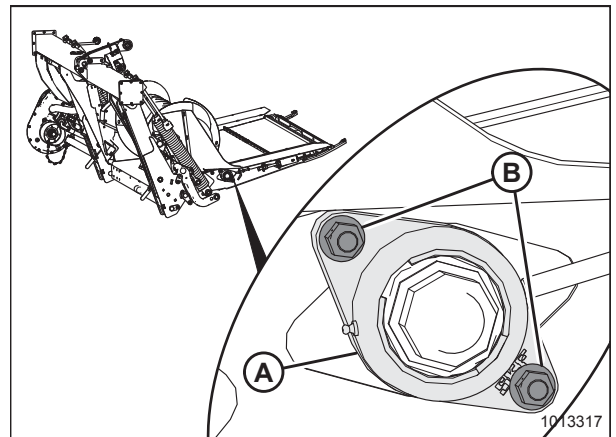


Figure 5.189: Drive Roller Bearing

### *Replacing Feed Draper Drive Roller Bearing*

#### Removing Feed Draper Drive Roller Bearing

### DANGER

To avoid bodily injury or death from the unexpected start-up or fall of a raised machine, always stop engine and remove key before leaving the operator's seat, and always engage safety props before going under the machine for any reason.

- Raise the reel fully.
- Raise the header fully.
- Shut down the engine, and remove the key from the ignition.
- Engage the header safety props.
- Engage the reel safety props. For instructions, refer to [Engaging Reel Safety Props, page 33](#).

## MAINTENANCE AND SERVICING

- Loosen jam nut (A) and turn bolt (B) counterclockwise to release the draper tension. Repeat at the opposite side of the header.

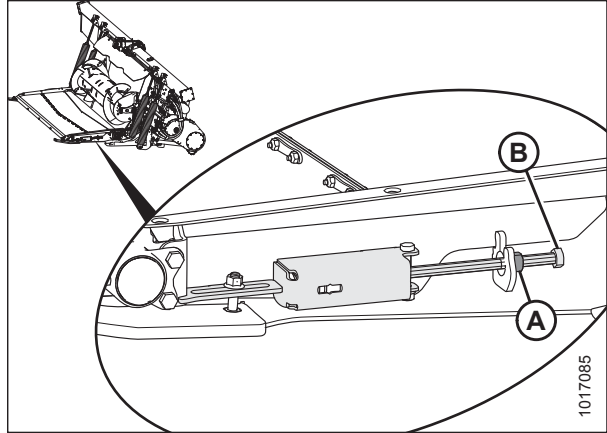


Figure 5.190: Feed Draper Tensioner

- Loosen set screw (B) on bearing lock (A).
- Using a hammer and punch, tap bearing lock (A) in the direction opposite to the auger rotation to release the lock.

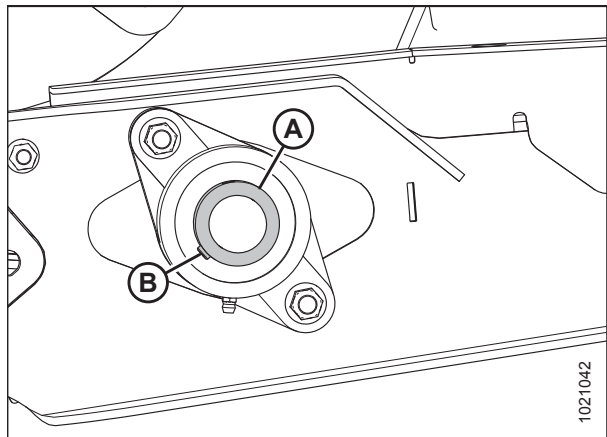


Figure 5.191: Feed Draper Drive Roller Bearing

- Remove two nuts (A).

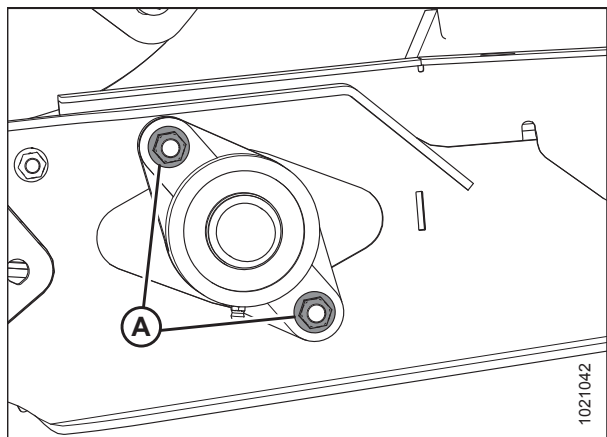


Figure 5.192: Feed Draper Drive Roller Bearing

- Remove bearing housing (A).

**NOTE:**

If the bearing is seized on the shaft, it may be easier to remove the drive roller assembly. For instructions, refer to [Removing Feed Draper Drive Roller, page 496](#).

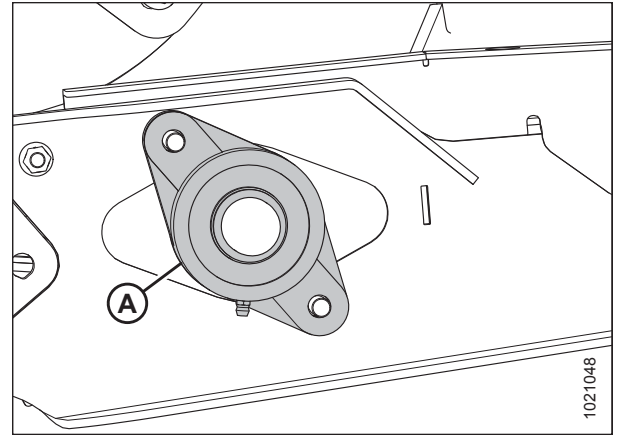


Figure 5.193: Feed Draper Drive Roller Bearing

**Installing Feed Draper Drive Roller Bearing**

- Install drive roller bearing housing (A) onto shaft (B), and secure with two bolts and nuts (C).

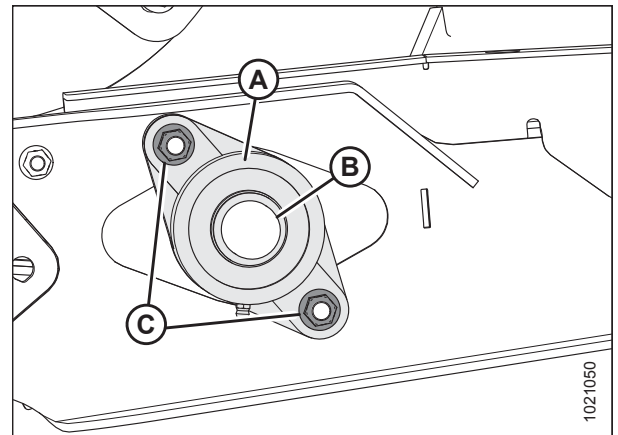


Figure 5.194: Feed Draper Drive Roller Bearing

- Install bearing lock collar (A) onto the shaft.
- Using a hammer and punch, tap the bearing lock in the direction of auger rotation to lock.
- Tighten bearing lock set screw (B).
- Tension the feed draper. For instructions, refer to [5.10.2 Checking and Adjusting Feed Draper Tension, page 495](#).

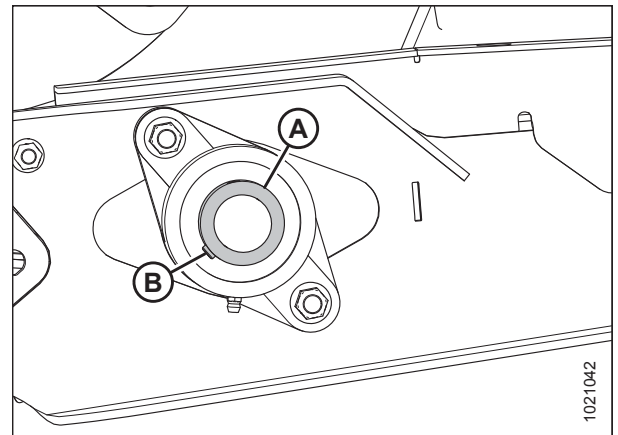


Figure 5.195: Feed Draper Drive Roller Bearing

### 5.10.4 Feed Draper Idler Roller

This roller is non-powered and driven by the feed draper drive roller. Like the drive roller, it conveys crop across the feed draper to the auger.

#### Removing Feed Draper Idler Roller

1. Engage the header safety props.
2. Loosen jam nut (A) and turn bolt (B) counterclockwise to release the draper tension. Repeat at the opposite side of the header.

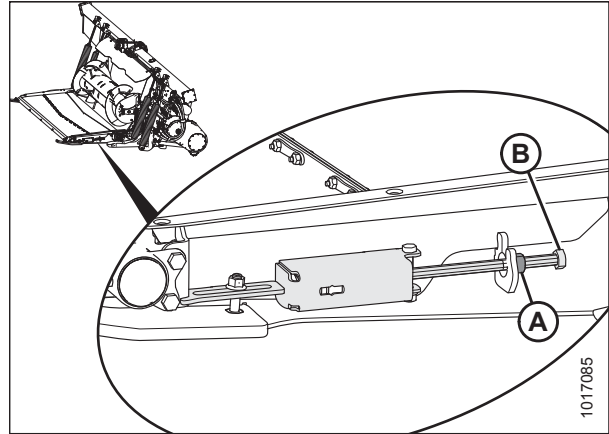


Figure 5.196: Feed Draper Tensioner

3. Remove nuts and screws (A), and remove draper connector straps (B).
4. Open the draper.

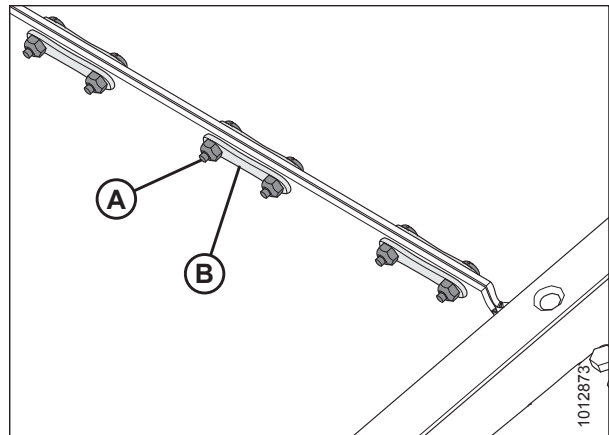


Figure 5.197: Draper Connector

5. Remove nut (D) to have better access to the other two nuts (C).
6. Remove two bolts (A) and nuts (C) from both ends of the idler roller.
7. Remove idler roller assembly (B).

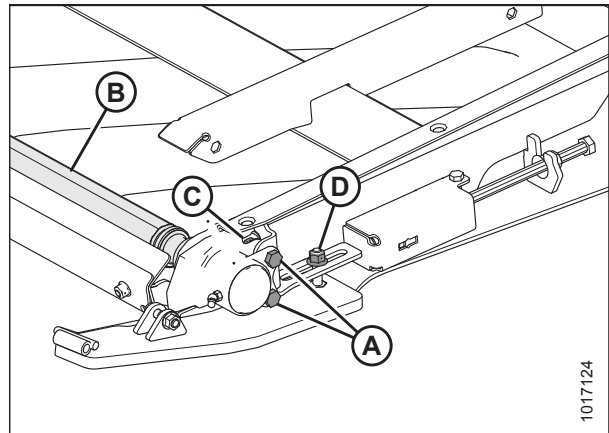


Figure 5.198: Idler Roller

### Replacing Feed Draper Idler Roller Bearing

Feed draper idler roller bearings need to be replaced if they are wore out.

**NOTE:**

If replacing bearings on one side only, follow the link below, but only remove the hardware from the side that is being replaced. For instructions, refer to [Removing Feed Draper Idler Roller, page 502](#).

**NOTE:**

If replacing both bearings, remove the idler roller from the feed deck. For instructions, refer to [Removing Feed Draper Idler Roller, page 502](#).

1. Remove dust cap (A).

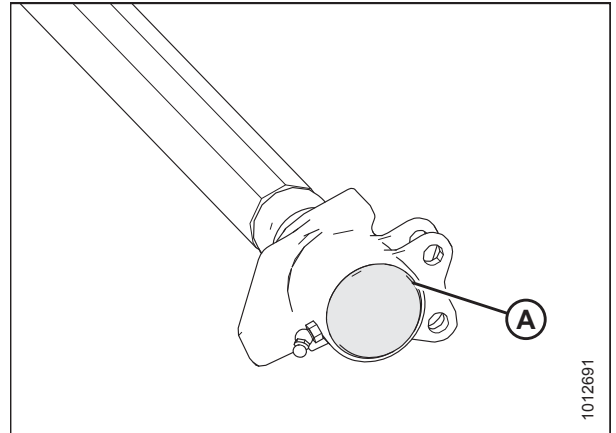


Figure 5.199: Idler Roller

2. Remove nut (A).
3. Slide bearing assembly (B) off of the shaft.

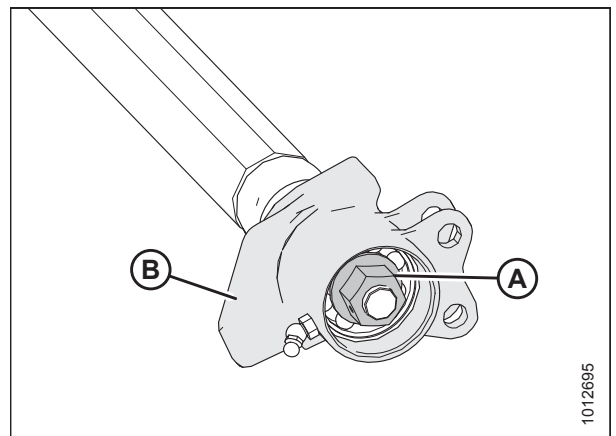


Figure 5.200: Idler Roller

## MAINTENANCE AND SERVICING

- Secure housing (D) and remove internal retaining ring (A).

**NOTE:**

If the grease fitting protrudes into the housing, remove it before removing the bearing (B) and seals (C).

- Use a hydraulic press to remove bearing (B), and two seals (C).
- Install seals (C) into housing (D).

**NOTE:**

Ensure the flat side of the seals are facing inward towards the roller.

- Install bearing (B), and internal retaining ring (A).

**NOTE:**

The open side of the bearing should be facing away from the roller.

- Brush the shaft with oil. Carefully rotate housing (D) onto the shaft by hand to prevent seal damage.
- Secure the bearing assembly to the shaft with nut (A). Torque to 88 Nm (65 lbf-ft)
- Fill the bearing cavity and dust cap with grease, then install dust cap (B).
- If the grease fitting was removed, reinstall it and continue filling the housing cavity with grease.
- Install the feed draper idler roller on header. For instructions, refer to [Installing Feed Draper Idler Roller](#), page 504.

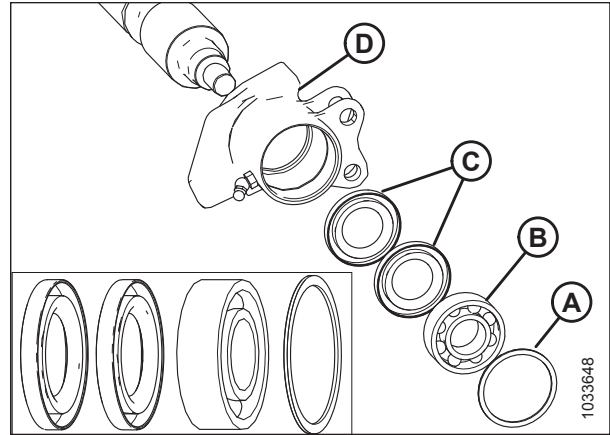


Figure 5.201: Bearing Assembly

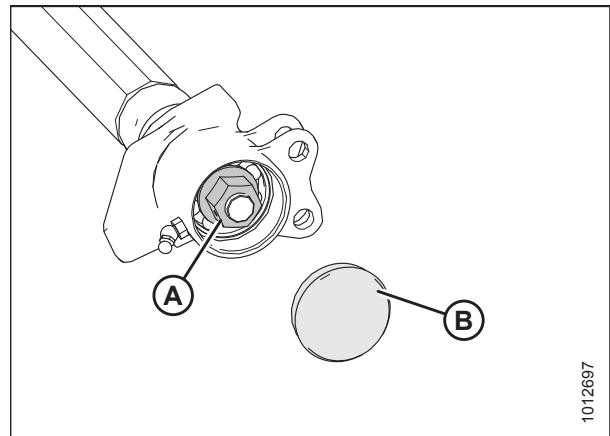


Figure 5.202: Idler Roller

### Installing Feed Draper Idler Roller

- Position idler roller assembly (B) in the float module deck.
- Install two bolts (A) and nuts (C) at both ends of the idler roller.

**NOTE:**

Do **NOT** overtighten bolts (A).

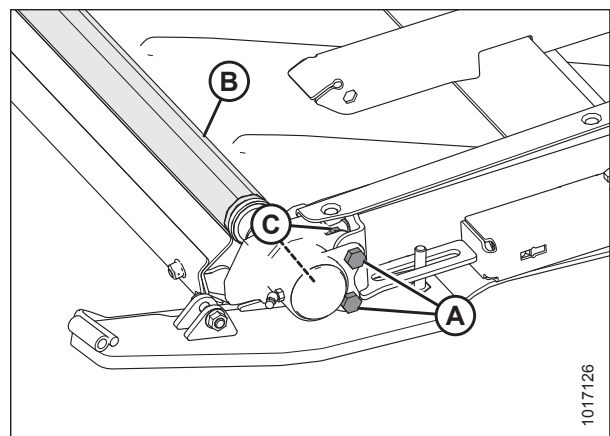


Figure 5.203: Idler Roller

3. Install nut (A).

**IMPORTANT:**

Maintain a 2–4 mm (1/16–3/16 in.) gap (C) between plate (B) and nut (A) to allow the idler roller to float and to move when belt is tensioned or adjusted.

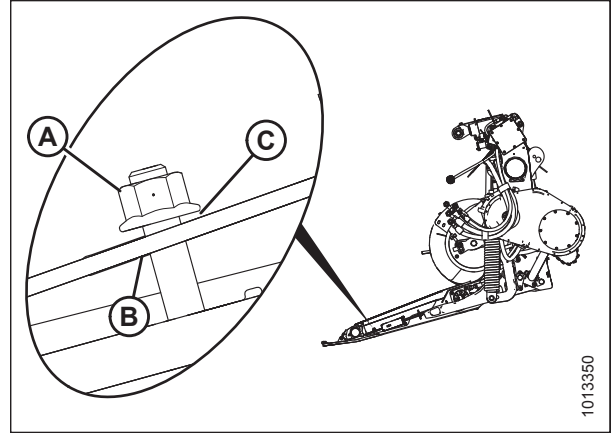


Figure 5.204: Idler Roller

4. Close the feed draper and secure with connector straps (B), screws (A), and nuts.
5. Tension the feed draper. For instructions, refer to [5.10.2 Checking and Adjusting Feed Draper Tension, page 495](#).

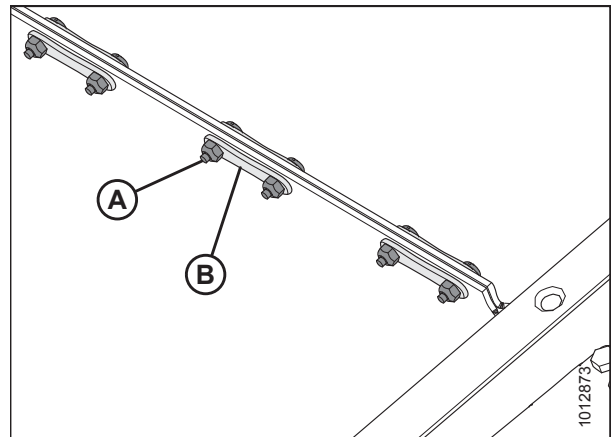


Figure 5.205: Draper Connector

### 5.10.5 Lowering FM100 Feed Deck Pan

**⚠ DANGER**

To avoid bodily injury or death from the unexpected start-up or fall of a raised machine, always stop engine and remove key before leaving the operator's seat, and always engage safety props before going under the machine for any reason.

1. Start the engine.
2. Raise the header fully.
3. Shut down the engine, and remove the key from the ignition.
4. Engage the header safety props.



## MAINTENANCE AND SERVICING

5. Rotate latches (A) to unlock handle (B).

**NOTE:**

Parts have been removed from illustration at right for clarity.

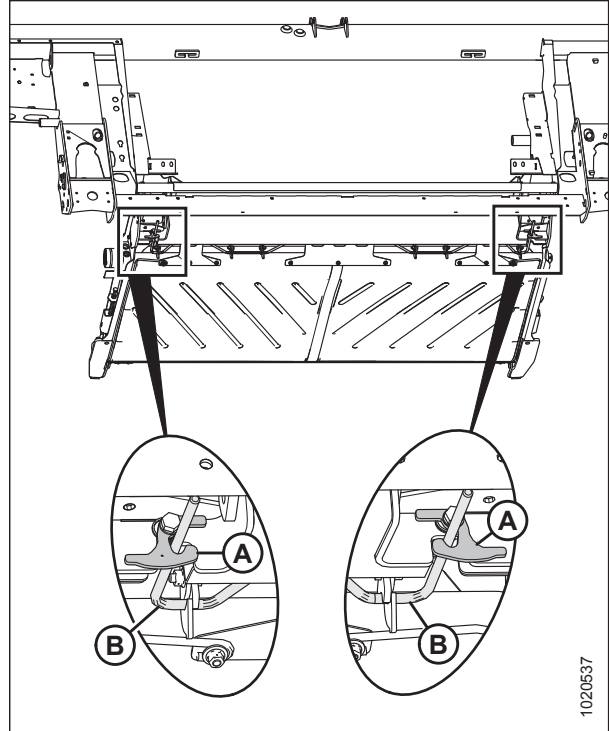


Figure 5.206: Feed Deck Pan – Rear View

6. Hold pan (A) and rotate handles (B) downward to release pan.

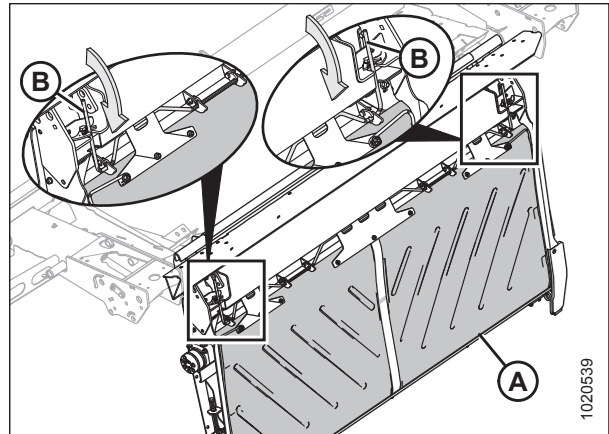


Figure 5.207: Underside of Feed Deck Pan

## MAINTENANCE AND SERVICING

7. Lower pan (A) and check for shipping materials/debris that may have fallen under float module draper.

**NOTE:**

Illustration at right shows rear view of feed deck.

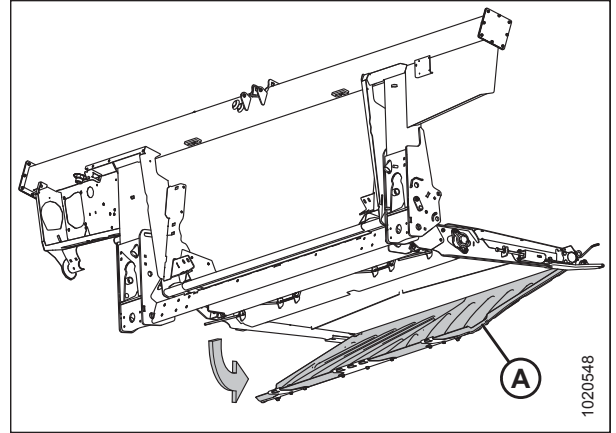


Figure 5.208: Feed Deck Pan

### 5.10.6 Raising FM100 Feed Deck Pan

1. Raise feed deck pan (A).
2. Engage lock handle (B) in feed deck pan hooks (C).
3. Rotate handles (B) upwards, bringing feed deck pan (A) into locking position.

**NOTE:**

Ensure that all three deck pan hooks (C) are secured on lock handle (B).

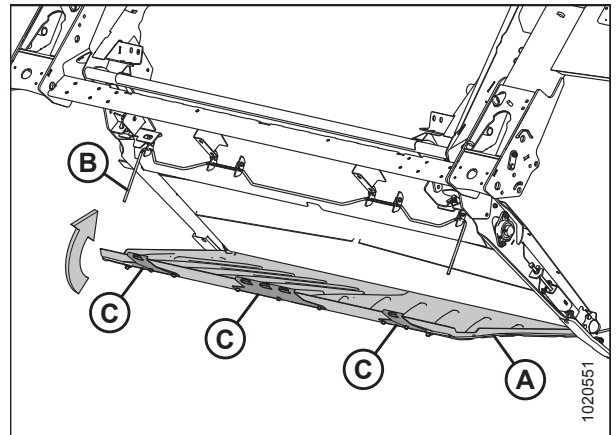


Figure 5.209: Underside of Feed Deck Pan – Rear View

## MAINTENANCE AND SERVICING

4. Hold feed deck pan (A) in place, and rotate latches (B) to lock handle (C).

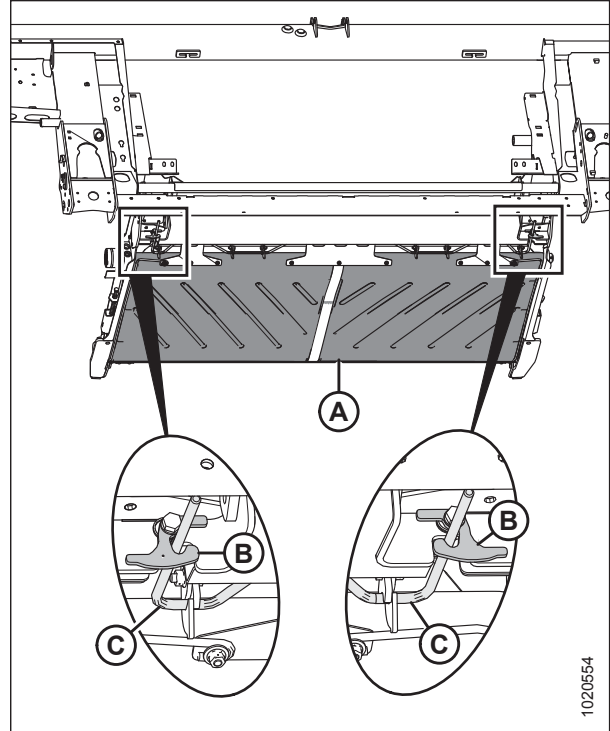


Figure 5.210: Feed Deck Pan – Rear View

### 5.10.7 Checking Link Holder Hooks

Check the left and right link holder hooks **DAILY** to ensure they are not cracked or broken.

#### DANGER

To avoid bodily injury or death from unexpected start-up or fall of raised machine, always stop engine, remove key, and engage safety props before going under header for any reason.

1. Shut down the engine, and remove the key from the ignition.
2. Before operation, ensure both link holder hooks (A) are engaged on the float module under the feed deck as shown.

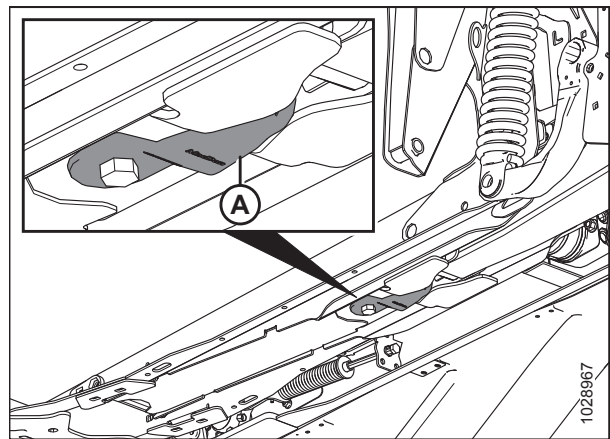


Figure 5.211: Feed Deck – View from Below

## MAINTENANCE AND SERVICING

- Undamaged link holder hook (A)
- Damaged/broken link holder hook (B)
- Stretched link holder (not shown)

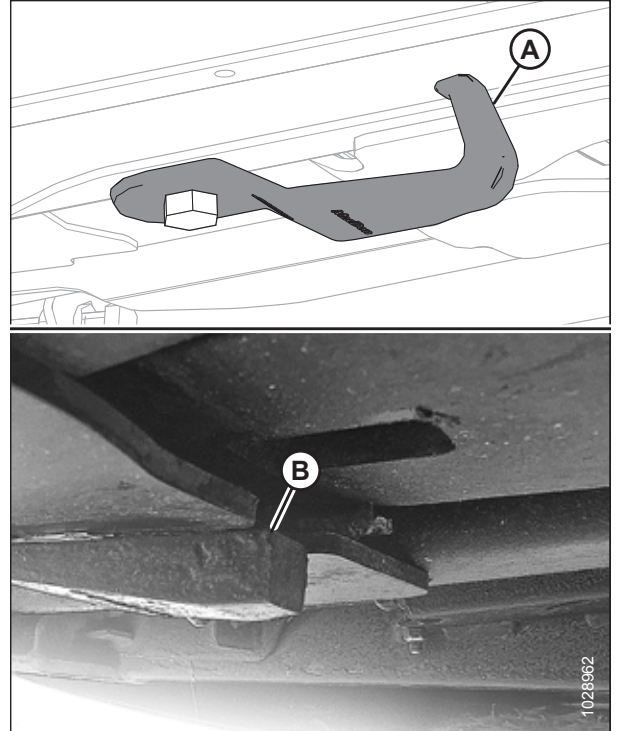


Figure 5.212: Link Holder Hooks

### NOTE:

To move hook (A) to storage position, loosen bolt (B) and rotate the hook 90°.

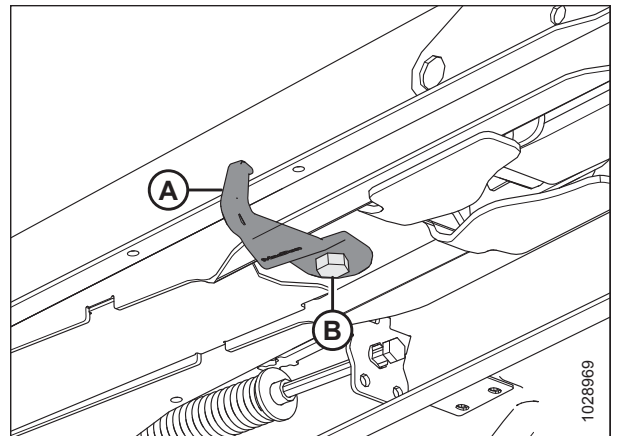


Figure 5.213: Link Holder Hook in Storage Position

## 5.11 FM100 Stripper Bars and Feed Deflectors

### 5.11.1 Removing Stripper Bars

1. Detach the header from the combine. For instructions, refer to [4 Header Attachment/Detachment, page 341](#).
2. Remove four bolts and nuts (A) securing stripper bar (B) to the float module frame, and remove the stripper bar.
3. Repeat at the opposite side of the header.

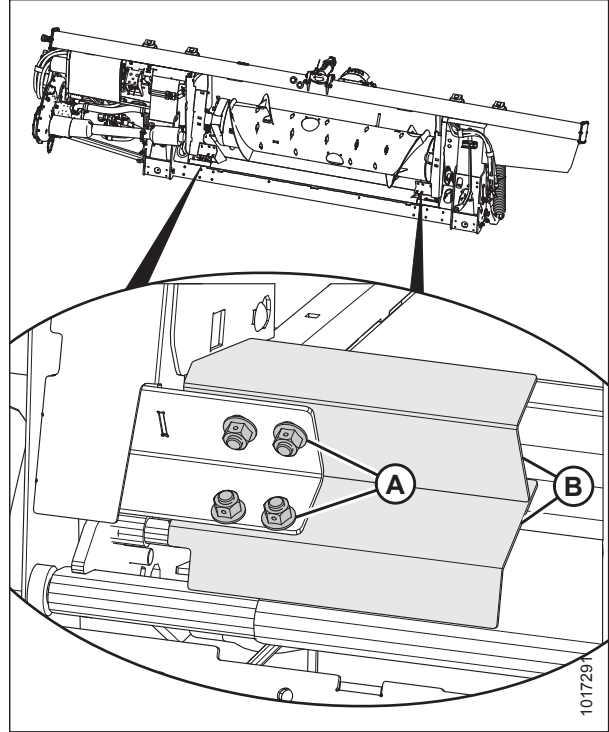


Figure 5.214: Stripper Bar

### 5.11.2 Installing Stripper Bars

1. Detach the header from the combine. For instructions, refer to [4 Header Attachment/Detachment, page 341](#).

2. Position stripper bar (B) as shown so the notch is at the corner of the frame.

**NOTE:**

It is ok to only install the upper two bolts on the stripper bars, if the lower two bolts are too difficult to install.

3. Secure stripper bar (B) to the float module with four bolts and nuts (A). Ensure the nuts are facing the combine.
4. Repeat at the opposite side of the header.

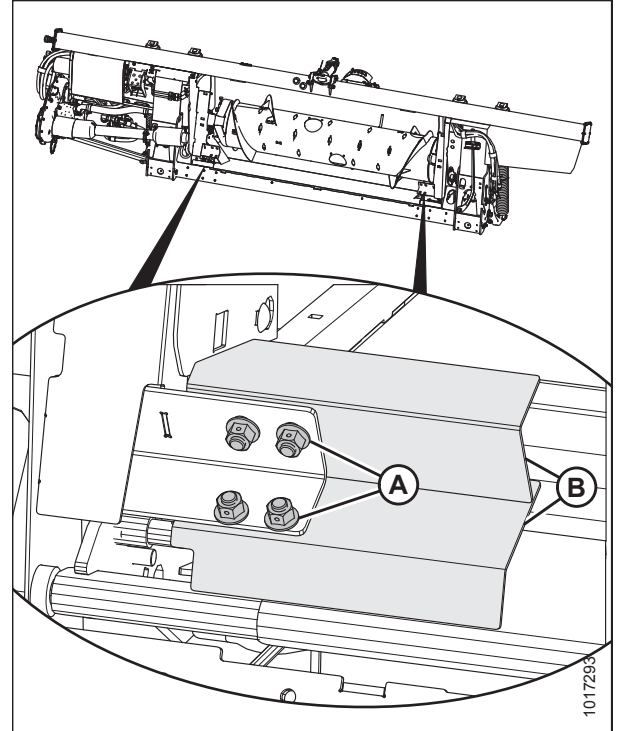


Figure 5.215: Stripper Bar

### 5.11.3 Replacing Feed Deflectors on New Holland CR Combines

This section is for New Holland CR combines only. If operating a New Holland CX combine, remove feed deflectors.

1. Detach the header from the combine. For instructions, refer to [4 Header Attachment/Detachment, page 341](#).
2. Remove two bolts and nuts (B) securing feed deflector (A) to the float module frame, and remove the feed deflector.
3. Position replacement feed deflector (A), and secure with bolts and nuts (B) (ensure the nuts are facing the combine). Do **NOT** tighten nuts.

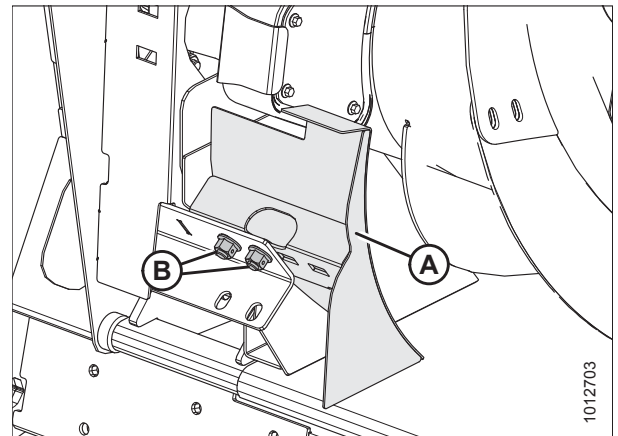


Figure 5.216: Feed Deflector

## MAINTENANCE AND SERVICING

4. Adjust deflector (A) so that distance (C) between pan and deflector is 4–6 mm (5/32–1/4 in.).
5. Tighten nuts (B).
6. Repeat for opposite deflector.
7. Attach header to the combine. For instructions, refer to Chapter 4 *Header Attachment/Detachment*, page 341.
8. After attaching the header to the combine, fully extend the center-link and check the gap between the deflector and pan. Maintain the 4–6 mm (5/32–1/4 in.) gap.

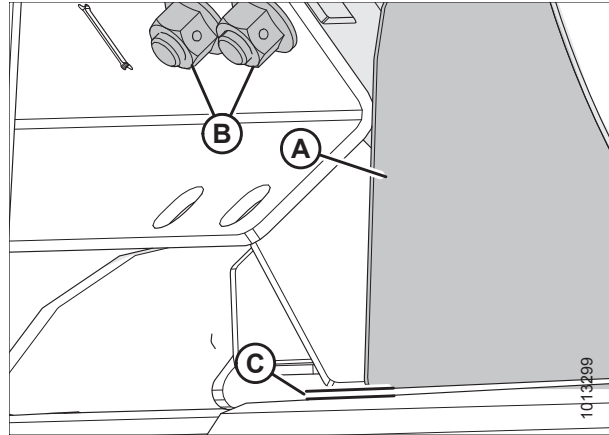


Figure 5.217: Pan and Deflector Distance

### 5.11.4 Replacing Feed Deflectors on Gleaner Combines

#### WARNING

To avoid bodily injury or death from the unexpected startup of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Detach the header from the combine. For instructions, refer to 4 *Header Attachment/Detachment*, page 341.
2. Loosen nuts (A) and slide panel (B) up to access the deflector adjustment bolts.

**NOTE:**

The auger has been removed from the illustration for clarity.

**NOTE:**

Left deflector assembly shown. Right deflector assembly opposite.

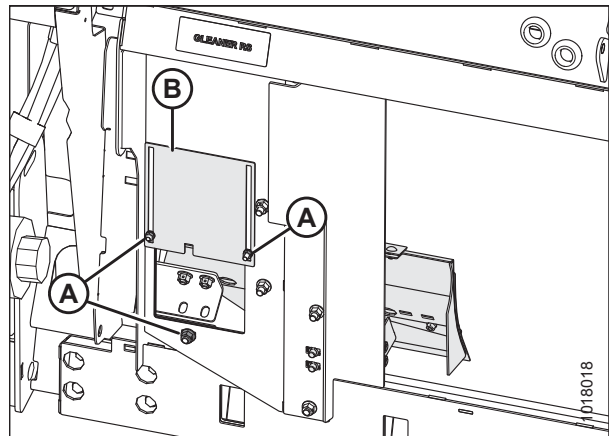


Figure 5.218: Rear View Showing Access Panel

3. Remove two bolts and nuts (B) securing feed deflector (A) to the float module frame, and remove the feed deflector. Retain hardware.

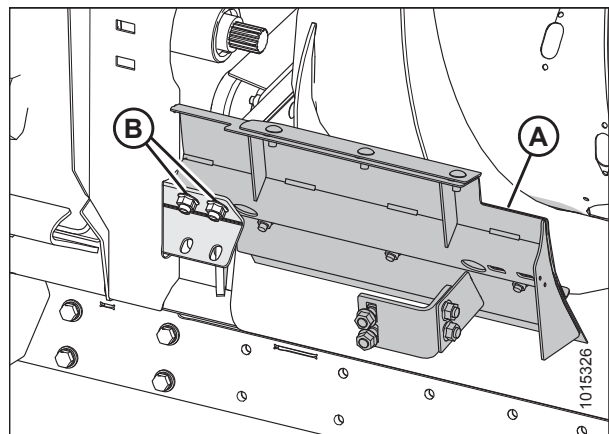


Figure 5.219: Feed Deflector



## MAINTENANCE AND SERVICING

4. Remove two bolts and nuts (A) securing feed deflector (B) to the float module frame. Retain hardware.
5. Remove two bolts and nuts (C) securing feed deflector (B) to support (D). Retain hardware.

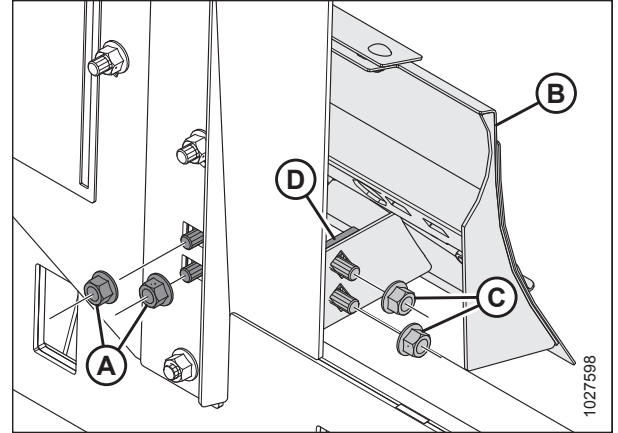


Figure 5.220: Feed Deflector

6. Set new feed deflector (A) in place on the float module frame and secure in place using bolts and nuts (B) retained from Step 3, [page 512](#). If hardware (B) is damaged, replace with two 25 mm short-necked carriage bolts and two flange lock nuts.
7. Attach the float module and header to the combine. For instructions, refer to [4 Header Attachment/Detachment, page 341](#).
8. Fully retract center-link (position A on the indicator).
9. Shut down the engine and remove the key.

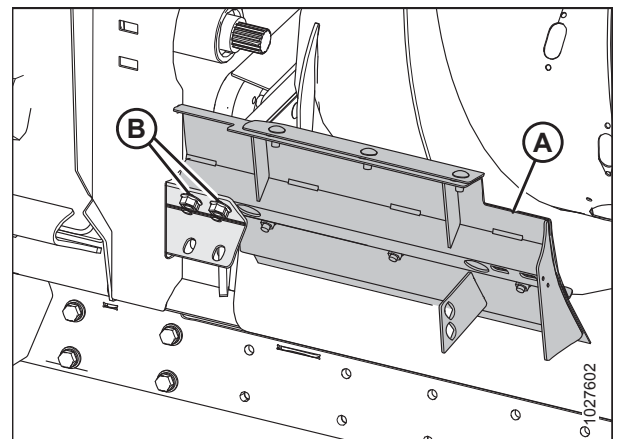


Figure 5.221: Feed Deflector

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- To adjust the deflector, loosen nuts (A) and position the deflector so that distance (B) between the feed pan and the deflector is 20–22 mm (13/16–7/8 in.).

**NOTE:**

The auger has been removed from the illustration for clarity.

- Tighten nuts (A).

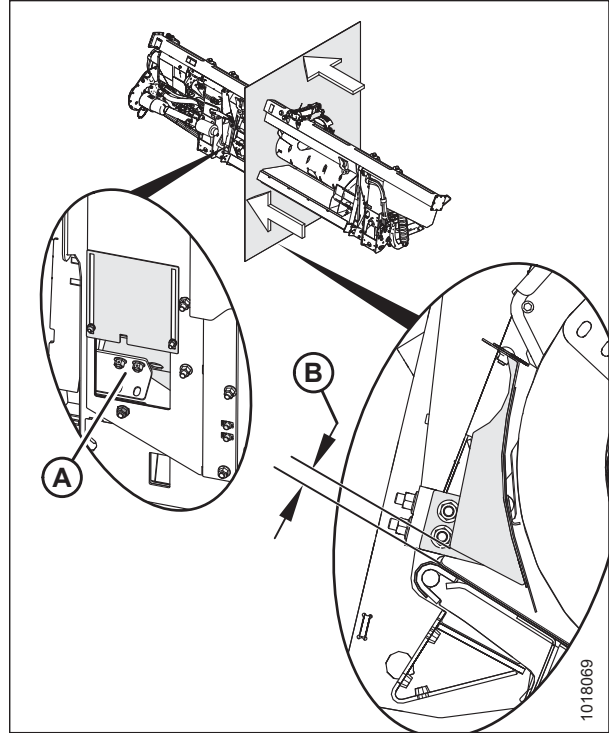


Figure 5.222: Rear View Showing Access Panel

- If there is a gap larger than 4 mm (3/16 in.) between stainless steel deflector panel (B) (part of the deflector assembly) and the feed pan, loosen hardware (A) and adjust the stainless steel adjusting panel until it contacts the stainless steel feed pan. Tighten hardware.

**NOTE:**

The auger has been removed from the illustration for clarity.

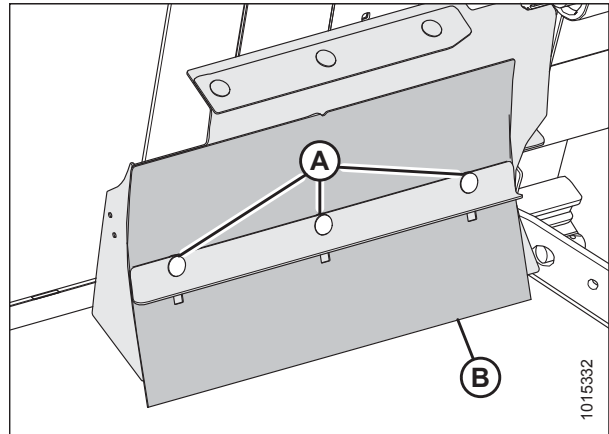


Figure 5.223: Front View of Stainless Steel Adjusting Panel

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13. If necessary, loosen hardware (A), and then adjust the position of stripper (B) on top of the deflector. The stripper edge should extend over the front of the deflector top bend so that dimension (C) is 7.6 mm (5/16 in.).

**NOTE:**

The auger has been removed from the illustration for clarity.

14. Retighten hardware (A).

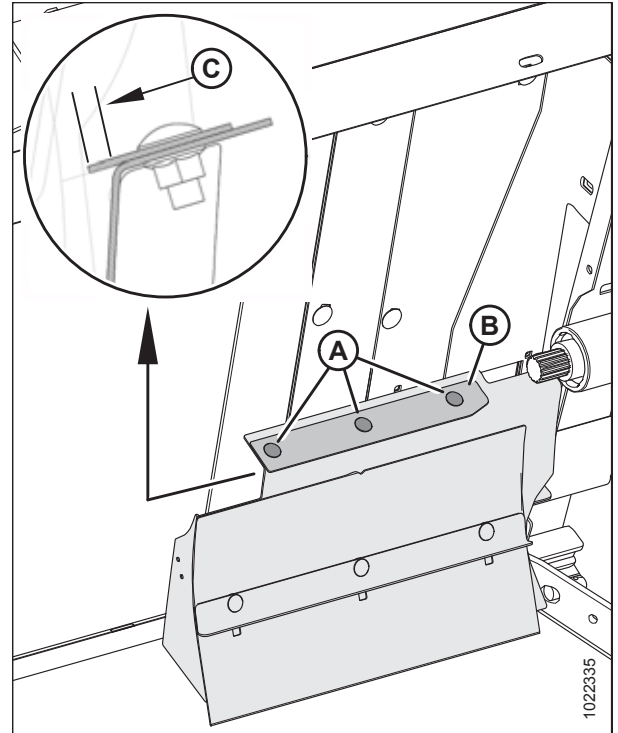


Figure 5.224: Stripper Position

15. Close access panel (B) and tighten nuts (A).

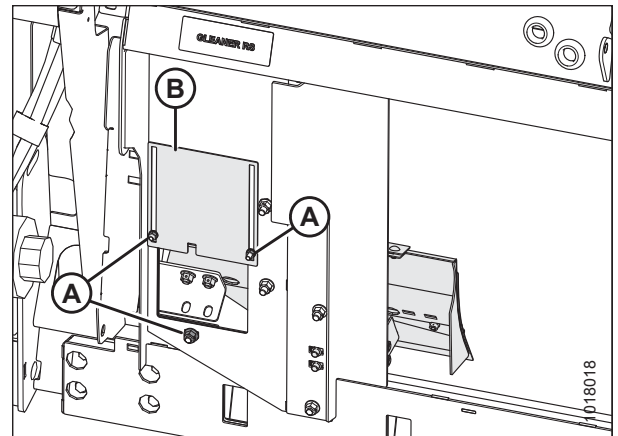


Figure 5.225: Rear View Showing Access Panel



## 5.12 Header Side Drapers

There are two header side drapers. They convey cut crop to the float module feed draper and auger. Replace the drapers if torn, cracked, or missing slats.

### 5.12.1 Removing Side Drapers

#### DANGER

To avoid bodily injury or death from the unexpected start-up or fall of a raised machine, always stop engine and remove key before leaving the operator's seat, and always engage safety props before going under the machine for any reason.

1. Start the engine. For instructions, refer to the combine operator's manual.
2. Raise the reel fully.
3. Raise the header fully.
4. Move the draper until the draper joint is in the work area.

#### NOTE:

The decks on the header can also be shifted towards the center to provide an opening at the endsheets.

5. Shut down the engine, and remove the key from the ignition.
6. Engage the header safety props.
7. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 33*.
8. Release the tension on the draper. For instructions, refer to *5.12.3 Checking and Adjusting Draper Tension, page 520*.
9. Remove screws (A) and tube connectors (B) at the draper joint.
10. Pull the draper from the deck.

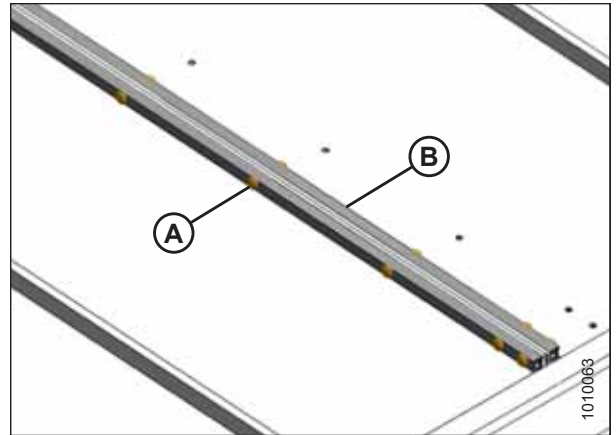


Figure 5.227: Draper Connector

### 5.12.2 Installing Side Drapers

#### DANGER

To avoid bodily injury or death from the unexpected start-up or fall of a raised machine, always stop engine and remove key before leaving the operator's seat, and always engage safety props before going under the machine for any reason.

#### WARNING

To avoid bodily injury from fall of raised reel, always engage reel safety props before going under raised reel for any reason.

## MAINTENANCE AND SERVICING

1. Start the engine. For instructions, refer to the combine operator's manual.
2. Raise the reel fully.
3. Raise the header fully.
4. Shut down the engine, and remove the key from the ignition.
5. Engage the header safety props.
6. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 33*.
7. Check the deck height before installing the drapers. For instructions, refer to *5.12.5 Adjusting Deck Height, page 523*.
8. Apply talc, baby powder, or talc/graphite lubricant mix to the underside of the draper guides and to the draper surface that forms the seal with the cutterbar.
9. Insert the draper into the deck at the outboard end under the rollers. Pull the draper into the deck while feeding it at the end.
10. Feed in the draper until it can be wrapped around the drive roller.
11. Insert the opposite end of the draper into the deck over the rollers. Pull the draper fully into the deck.



Figure 5.228: Installing Draper

12. Loosen mounting bolts (B) on rear deck deflector (A) (this may help with draper installation).

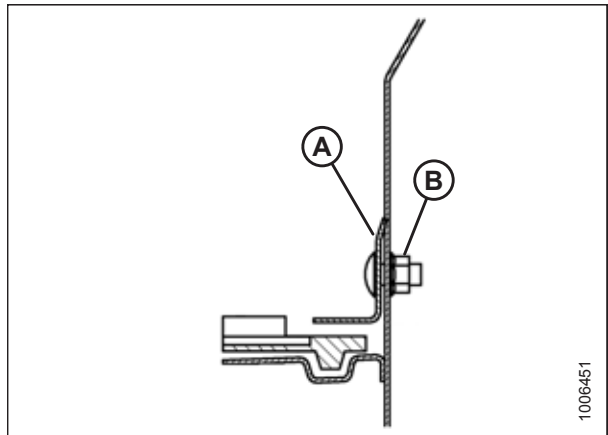


Figure 5.229: Draper Seal

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- Attach the ends of the draper with tube connectors (B), screws (A) (with the heads facing the center opening), and nuts.
- Adjust the draper tension. For instructions, refer to [5.12.3 Checking and Adjusting Draper Tension, page 520](#).

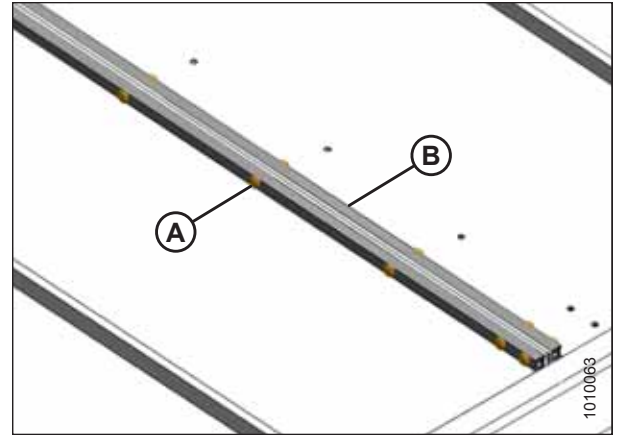


Figure 5.230: Draper Connector

- Check clearance (A) between drapers (B) and cutterbar (C). Clearance should be 1–3 mm (1/16–1/8 in.). If adjustment is necessary, refer to [5.12.5 Adjusting Deck Height, page 523](#).

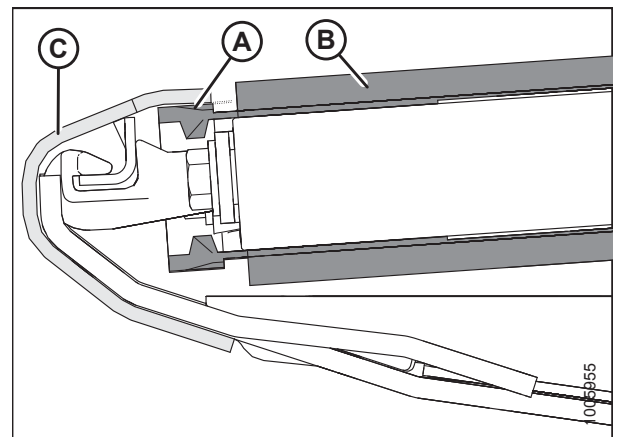


Figure 5.231: Draper Seal

- If backsheet deflector (A) requires adjustment, loosen nut (D) and move the deflector until there is a 1–7 mm (1/32–5/16 in.) gap (C) between draper (B) and the deflector.
- Operate the drapers with the engine at idle so the talc or talc/graphite lubricant makes contact and adheres to the draper seal surfaces.

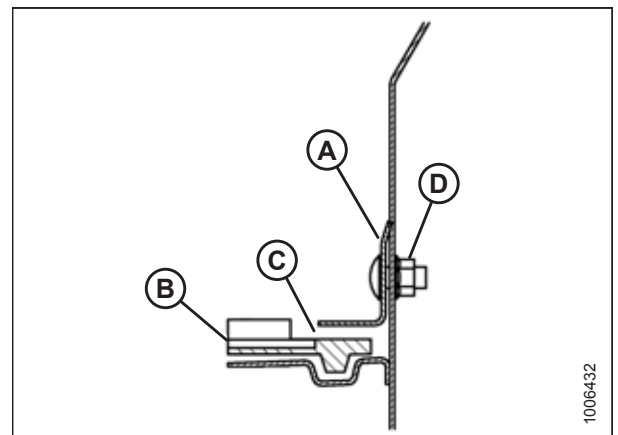


Figure 5.232: Draper Seal



### 5.12.3 Checking and Adjusting Draper Tension

The drapers are tensioned at the factory and rarely need adjustment. If adjustment is required, tension the drapers just enough to prevent slipping and to keep the draper from sagging below the cutterbar. Adjust drapers on both sides of the header.

**⚠ DANGER**

To avoid bodily injury or death from unexpected start-up or fall of raised machine, always stop engine, remove key, and engage safety props before going under machine for any reason.

1. Ensure white indicator bar (A) is at the halfway point in the window. If adjustment is required, proceed to Step 2, [page 520](#).

**⚠ WARNING**

Check to be sure all bystanders have cleared the area.

2. Start the engine and fully raise the header.
3. Shut down the engine, and remove the key from the ignition.
4. Engage the header safety props.

5. Ensure the draper guide (the rubber track on the underside of the draper) is properly engaged in groove (A) on the drive roller.

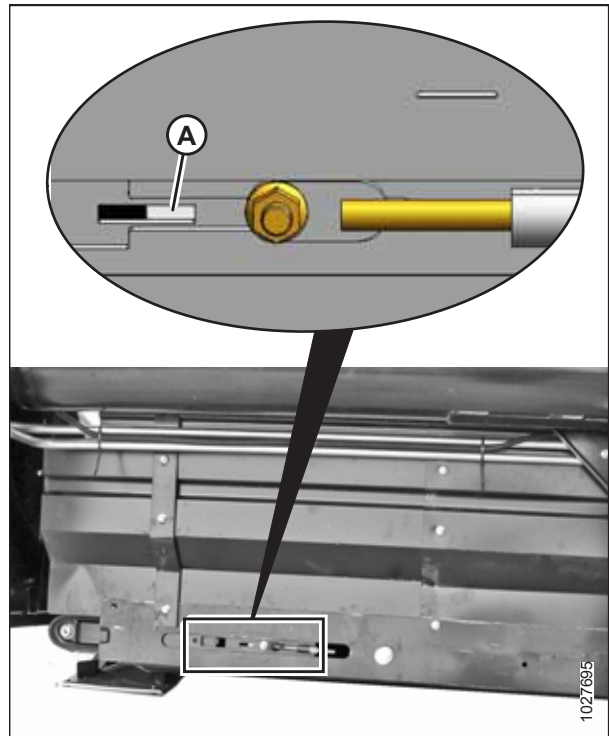


Figure 5.233: Left Tension Adjuster Shown – Right Opposite

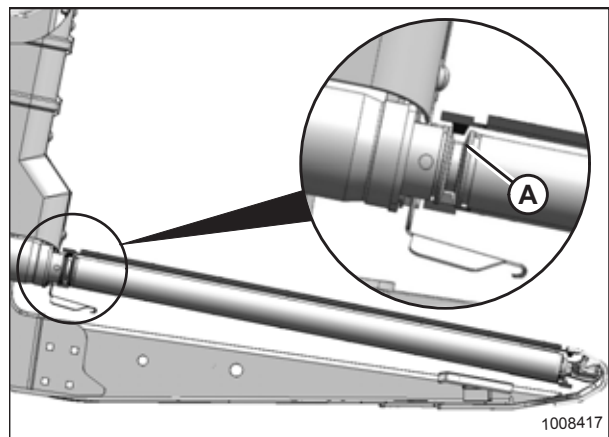


Figure 5.234: Drive Roller

6. Ensure idler roller (A) is between draper guides (B).

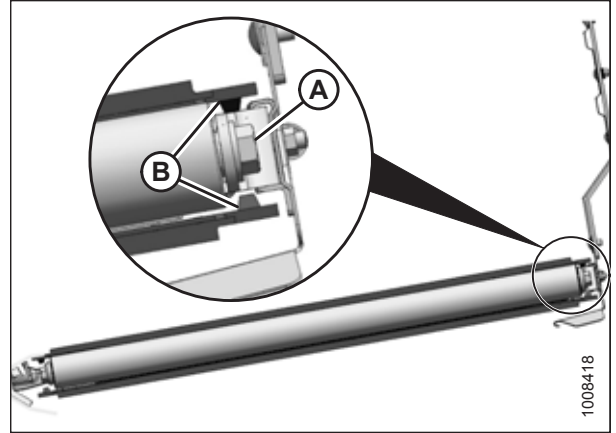


Figure 5.235: Idler Roller

**IMPORTANT:**

Do **NOT** adjust nut (C). This nut is used for draper alignment only.

7. To loosen draper tension, turn adjuster bolt (A) counterclockwise. White indicator bar (B) will move outboard in the direction of arrow (D) to indicate that the draper is loosening. Loosen until the white indicator bar is at the halfway point in the window.
8. To tighten draper tension, turn adjuster bolt (A) clockwise. White indicator bar (B) will move inboard in direction of arrow (E) to indicate that the draper is tightening. Tighten until the white indicator bar is at the halfway point in the window.

**IMPORTANT:**

To avoid premature failure of the draper, draper rollers, and/or tightener components, do **NOT** operate if the white bar is not visible.

**IMPORTANT:**

To prevent scooping dirt, ensure the draper is tight enough that it does not sag below the point where the cutterbar contacts the ground.

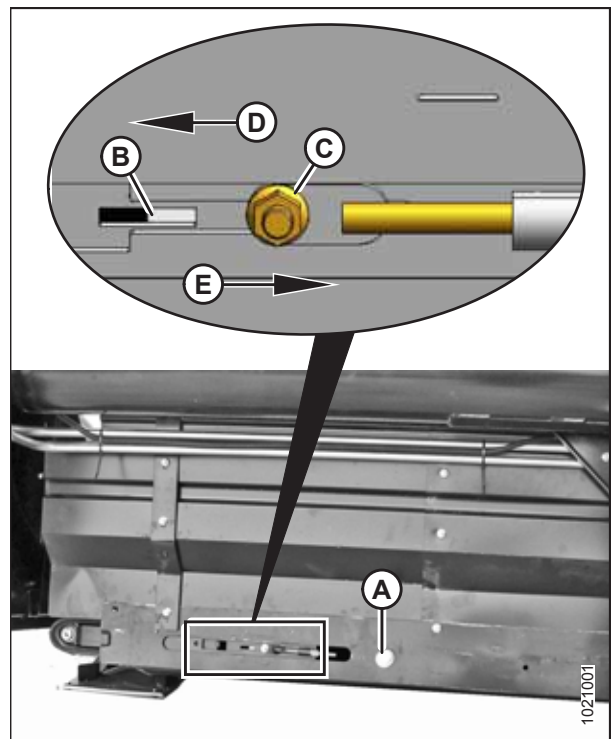


Figure 5.236: Left Tension Adjuster Shown – Right Opposite

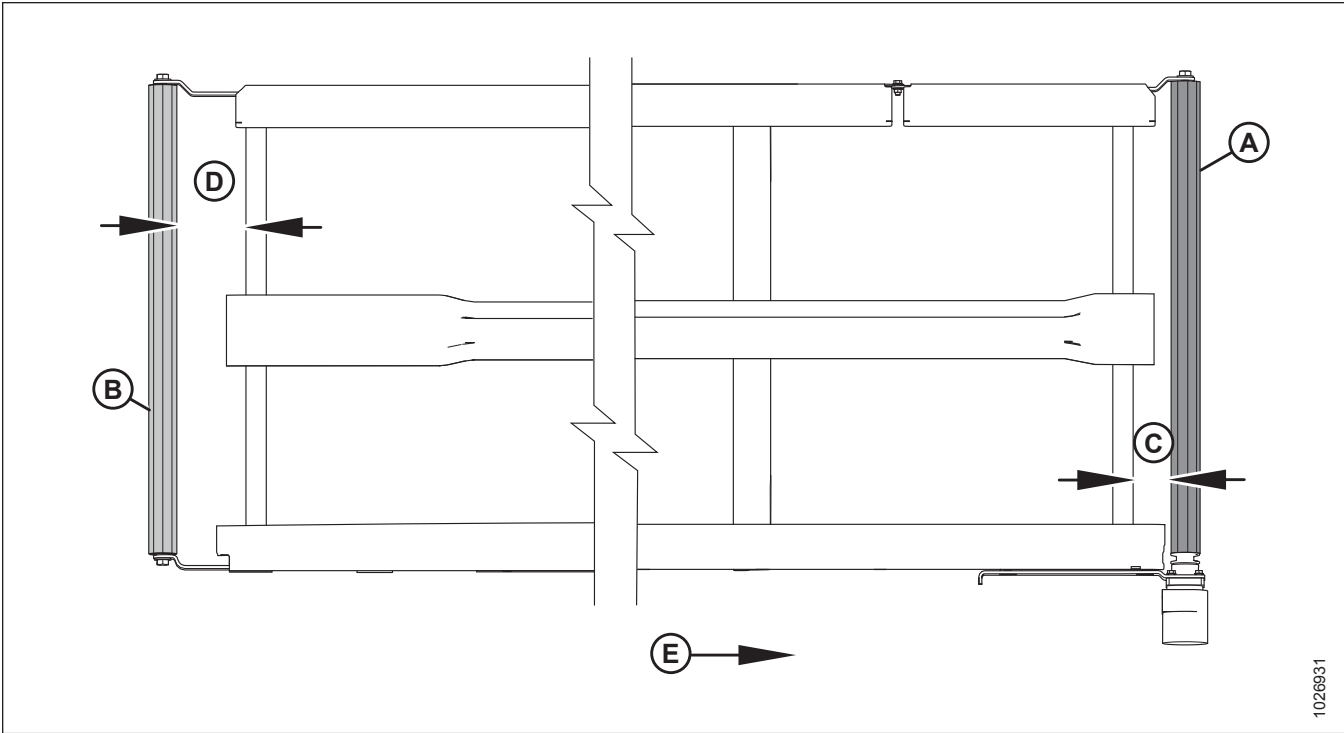
### 5.12.4 Adjusting Side Draper Tracking

The side draper tracking is adjusted by aligning the drive and idler draper rollers.

**NOTE:**

The left draper deck is shown in the illustrations in this procedure. The right deck is opposite.

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**Figure 5.237: Draper Tracking Overview**

A - Drive Roller  
D - Idler Roller Adjust

B - Idler Roller  
E - Draper Direction

C - Drive Roller Adjust

1. To determine which roller requires adjustment and which adjustments are necessary, refer to the following table:

**Table 5.2 Draper Tracking**

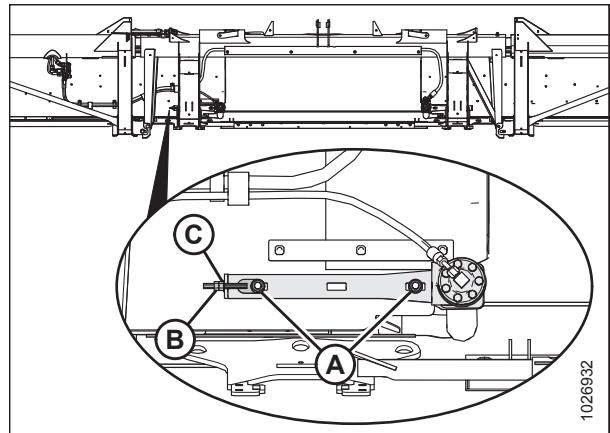
Tracking	Adjustment Location	Method
Backward	Increase drive roller (C)	Tighten adjuster nut (C)
Forward	Decrease drive roller (C)	Loosen adjuster nut (C)
Backward	Increase idler roller (D)	Tighten adjuster nut (C)
Forward	Decrease idler roller (D)	Loosen adjuster nut (C)

2. Refer to Table 5.2, page 522 and adjust drive roller (either by increasing or decreasing its alignment) as follows:

- a. Loosen nuts (A) and jam nut (B).
- b. Turn adjuster nut (C).

**NOTE:**

Some parts were removed from the illustration for clarity.



**Figure 5.238: Left Deck Drive Roller – Right Side Opposite**

3. Refer to Table 5.2, *page 522* and adjust nut (C) to adjust the idler roller (either by increasing or decreasing its alignment) as follows:
  - a. Loosen nut (A) and jam nut (B).
  - b. Turn adjuster nut (C).

**NOTE:**

If the draper does not track at the idler roller end after the idler roller adjustment, the drive roller is likely not square to the deck. Adjust the drive roller, and then readjust the idler roller.

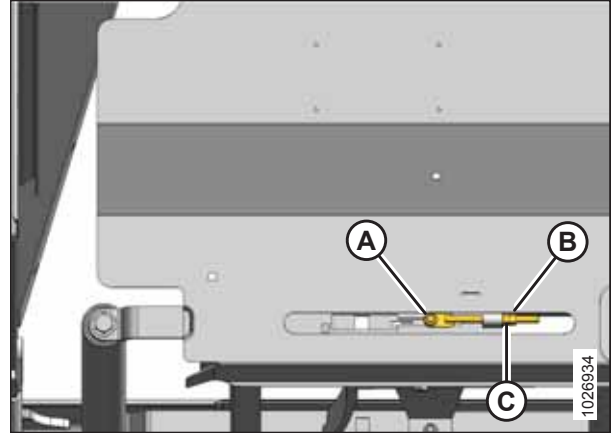


Figure 5.239: Left Deck Idler Roller – Right Side Opposite

### 5.12.5 Adjusting Deck Height

Maintain the deck height such that the draper runs just below the cutterbar.



**DANGER**

To avoid injury or death from unexpected start-up of machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.



**WARNING**

To avoid bodily injury from fall of raised reel, always engage reel safety props before going under raised reel for any reason.

**IMPORTANT:**

New factory-installed drapers are pressure and heat checked at the factory. The gap (deck seal) between draper and cutterbar is set to 0–3 mm (0.00–0.12 in.) at the factory to prevent material from entering into the side drapers and stalling them. When installing new drapers, however, it is **NEVER** acceptable for the gap to be less than 1 mm (0.04 in.) because new drapers are very tacky and there can be a buildup of powder coat on the underside of the cutterbar that can cause excessive drag and extremely high running pressure. A gap of 1–3 mm (0.04–0.12 in.) is acceptable. Follow this procedure to check the gap and adjust if required.

1. Lower the header onto blocks.
2. Raise the reel fully.
3. Shut down the engine, and remove the key from the ignition.
4. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 33*.

## MAINTENANCE AND SERVICING

5. With the header in working position, check that clearance (A) between draper (B) and cutterbar (C) is 1–3 mm (0.04–0.12 in.).

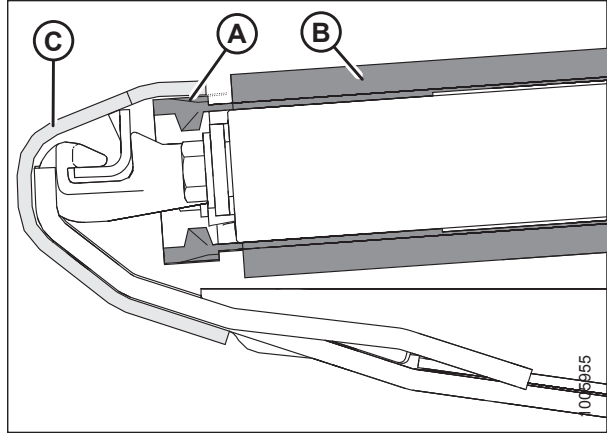


Figure 5.240: Draper Seal

6. Take measurement at deck supports (A) with the header in working position. Depending on the header size, there are between two and eight supports per deck.
7. Loosen the draper tension. For instructions, refer to [5.12.3 Checking and Adjusting Draper Tension, page 520](#).

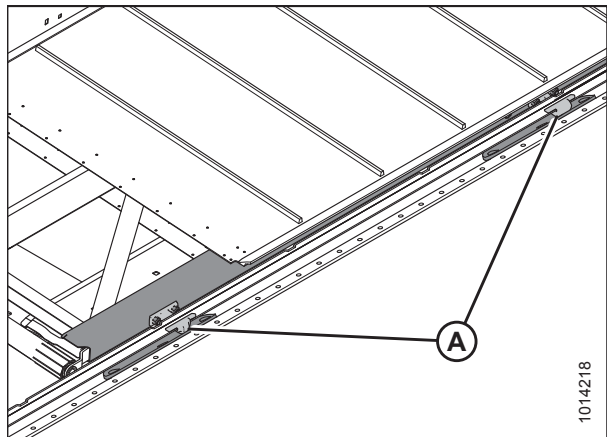


Figure 5.241: Draper Deck Supports

8. Lift front edge of draper (A) past cutterbar (B) to expose the deck support.
9. Measure and note the thickness of the draper belt.

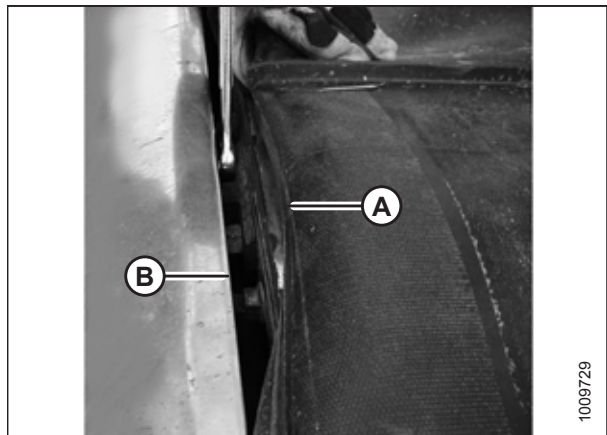


Figure 5.242: Deck Adjustment

## MAINTENANCE AND SERVICING

- Loosen two lock nuts (A) on deck support (B) one half-turn **ONLY**.

**NOTE:**

The deck is shown with the draper removed. The number of deck supports (B) is determined by the header width as follows:

- **D120:** Four supports
- **D125 and D130:** Six supports
- **D135 and D140:** Eight supports
- **D145:** Ten supports

- Tap deck (C) with a hammer to lower the deck relative to the deck supports. Tap deck support (B) using a punch to raise the deck relative to the deck supports.
- Locate a gauge that is the same thickness as the draper belt, plus 1 mm (0.04 in.). Slide the thickness gauge along deck (A) under the cutterbar in order to properly set the gap.
- To create a seal, adjust deck (A) so that clearance (B) between cutterbar (C) and deck is the same thickness as the draper belt plus 1 mm (0.04 in.).

**NOTE:**

When checking clearance at either roller, measure from the roller tube, **NOT** the deck.

- Tighten deck support hardware (D).
- Recheck gap (B) with thickness gauge. For instructions, refer to Step 12, [page 525](#).
- Tension the draper. For instructions, refer to [5.12.3 Checking and Adjusting Draper Tension, page 520](#).
- If required, adjust backsheet deflector (A) by loosening nut (D) and moving the deflector until there is a 1–7 mm (0.04–0.28 in.) gap (C) between draper (B) and the deflector.
- Disengage the reel safety props.
- Lower the reel fully.
- Shut down the engine, and remove the key from the ignition.

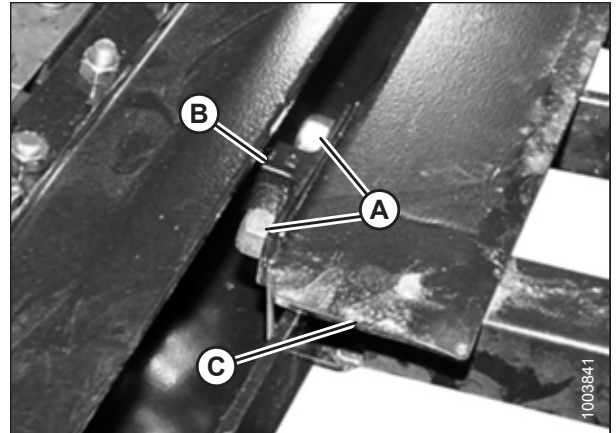


Figure 5.243: Deck Support

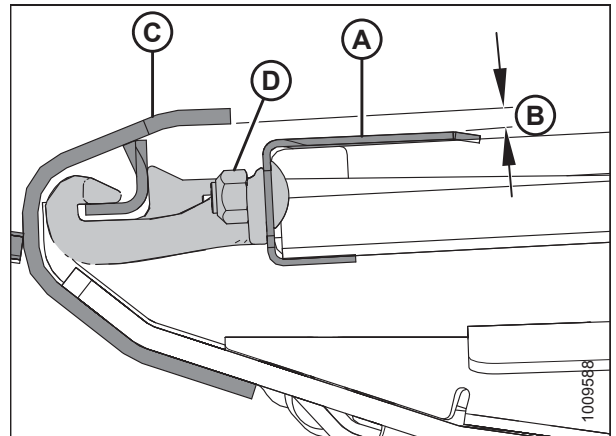


Figure 5.244: Deck Support

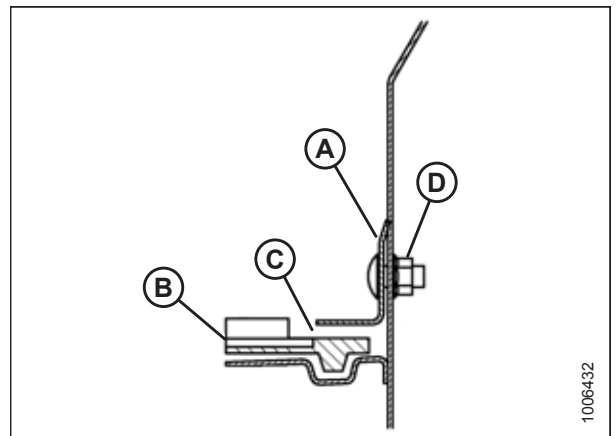


Figure 5.245: Backsheet Deflector

## 5.12.6 Draper Roller Maintenance

The draper rollers have non-greaseable bearings; however, the external seal should be checked every 200 hours (more frequently in sandy conditions) to achieve maximum bearing life.

### *Inspecting Draper Roller Bearing*

Using an infrared thermometer, check for bad draper roller bearings as follows:

1. Engage the header and run the drapers for approximately 3 minutes.
2. Check the temperature of the draper roller bearings at each of roller arms (A), (B), and (C) on each deck. Ensure the temperature does not exceed 44°C (80°F) above the ambient temperature.

Replace roller bearings that exceed maximum recommended temperature. For instructions, refer to:

- [Replacing Feed Draper Idler Roller Bearing, page 503](#)
- [Replacing Side Draper Drive Roller Bearing, page 531](#)

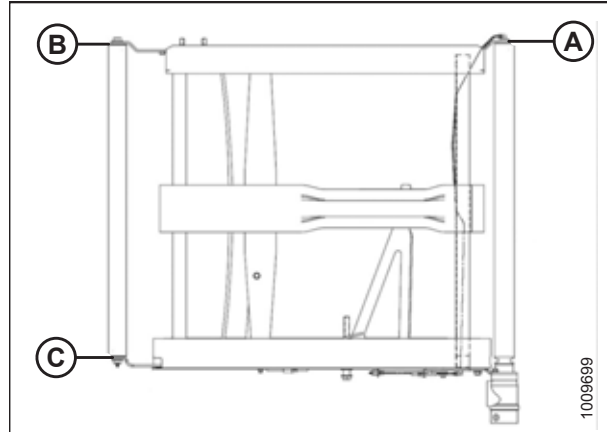


Figure 5.246: Roller Arms

### *Draper Deck Idler Roller*

#### Removing Side Draper Deck Idler Roller

### **⚠ DANGER**

To avoid bodily injury or death from the unexpected start-up or fall of a raised machine, always stop engine and remove key before leaving the operator's seat, and always engage safety props before going under the machine for any reason.

### **⚠ DANGER**

Never start or move the machine until you are sure all bystanders have cleared the area.

1. If the draper connector is not visible, engage the header until the connector is accessible (preferably close to the outboard end of the deck).
2. Start the engine.
3. Raise the reel fully.
4. Raise the header fully.
5. Shut down the engine, and remove the key from the ignition.
6. Engage the reel safety props. For instructions, refer to [Engaging Reel Safety Props, page 33](#).
7. Engage the header safety props.



## MAINTENANCE AND SERVICING

- Loosen the draper by turning adjuster bolt (A) counterclockwise.

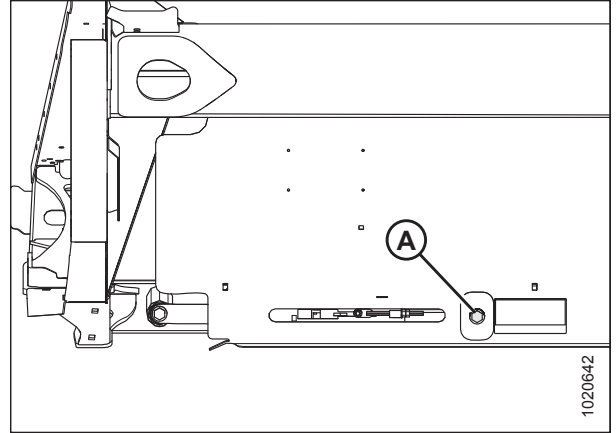


Figure 5.247: Tensioner

- Remove screws (A), tube connectors (B), and nuts from the draper joint to uncouple the draper.
- Pull the draper off the idler roller.

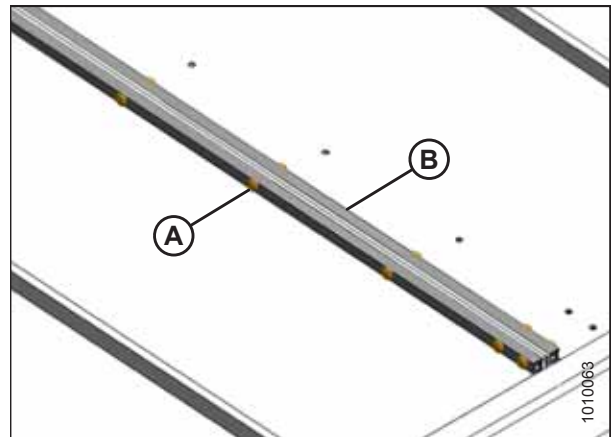


Figure 5.248: Draper Connector

- Remove bolt (A) and washer from the idler roller at the back of the header deck.
- Remove bolt (B) and washer from the idler roller at the front of the header deck.
- Spread roller arms (C) and (D), and remove the idler roller.

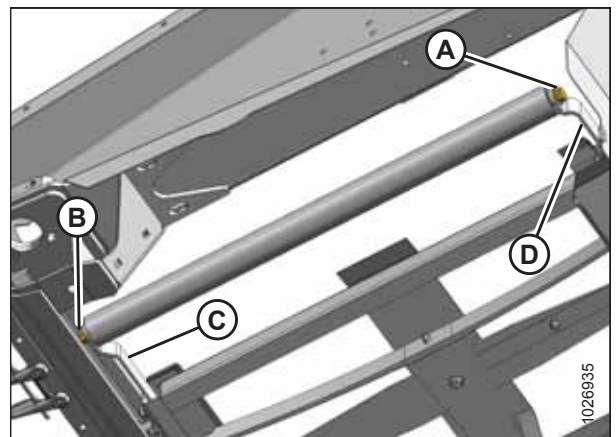


Figure 5.249: Idler Roller

### Replacing Header Draper Idler Roller Bearing

- Remove the draper idler roller assembly. For instructions, refer to [Removing Side Draper Deck Idler Roller, page 526](#).

## MAINTENANCE AND SERVICING

2. Remove bearing assembly (A) and seal (B) from roller tube (C) as follows:
  - a. Attach slide hammer (D) to threaded shaft (E) in the bearing assembly.
  - b. Tap out bearing assembly (A) and seal (B).
3. Clean the inside of roller tube (C), check the tube for signs of wear or damage, and replace if necessary.

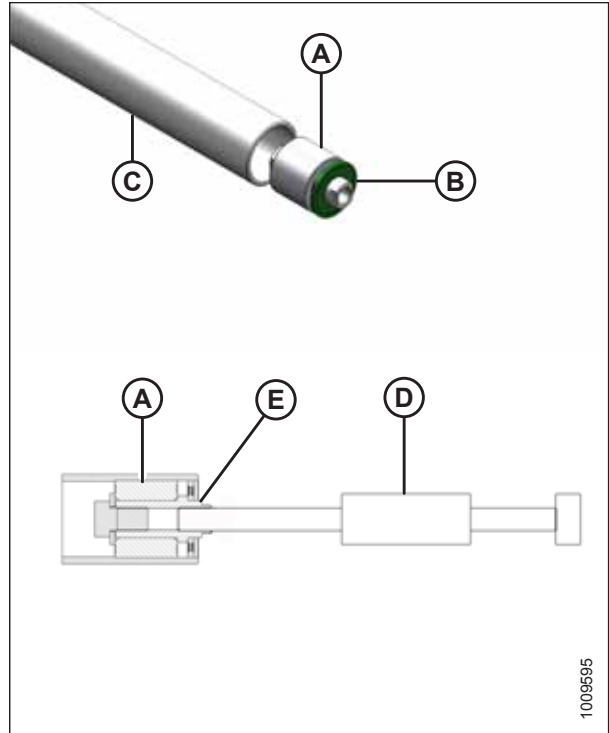


Figure 5.250: Roller Bearing

4. Install new bearing assembly (A) by pressing the outer race of the bearing into the tube until it is 14–15 mm (9/16–19/32 in.) (B) from the outside edge of the tube.
5. Apply grease in front of bearing assembly (A). Refer to the inside back cover of this book for grease specifications.
6. Install new seal (C) at the roller opening, and install a flat washer (1.0 in. I.D. x 2.0 in. O.D.) on the seal.
7. Tap seal (C) into the roller opening with a suitably sized socket. Tap the washer and bearing assembly (A) until the seal is 3–4 mm (1/8–3/16 in.) (D) from the outside edge of the tube.

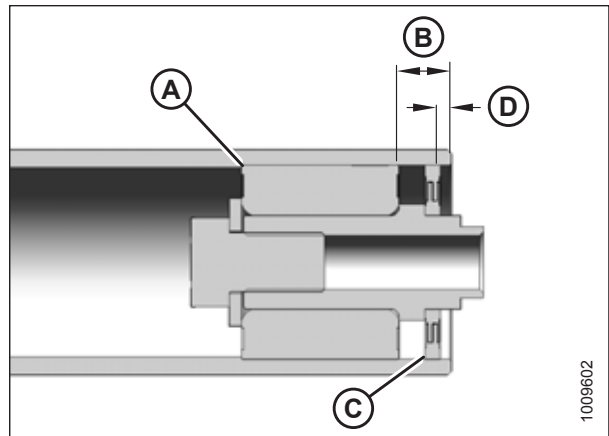


Figure 5.251: Roller Bearing

**Installing Header Draper Idler Roller**

1. Position the stub shaft into the idler roller in forward arm (B) on the deck.
2. Push on the roller to slightly deflect the forward arm so the stub shaft at the rear of the roller can be slipped into rear arm (C).
3. Install bolts (A) with washers, and torque to 93 Nm (70 lbf-ft).
4. Wrap the draper over the idler roller, close the draper, and set the tension. For instructions, refer to [5.12.2 Installing Side Drapers, page 517](#).
5. Run the machine and verify the draper tracks correctly. Adjust the draper tracking if required. For instructions, refer to [5.12.4 Adjusting Side Draper Tracking, page 521](#).

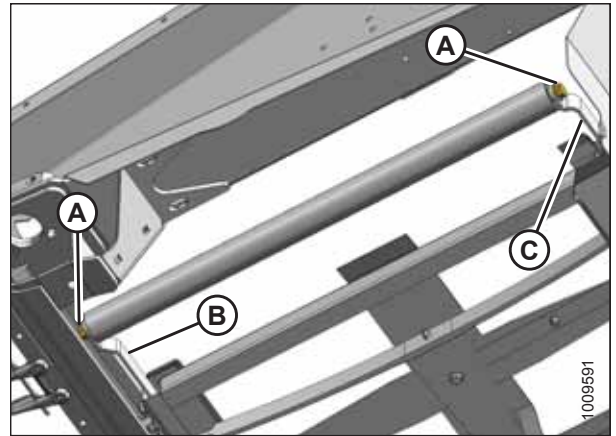


Figure 5.252: Idler Roller

*Draper Deck Drive Roller*

**Removing Side Draper Drive Roller**

** DANGER**

To avoid bodily injury or death from the unexpected start-up or fall of a raised machine, always stop engine and remove key before leaving the operator's seat, and always engage safety props before going under the machine for any reason.

** DANGER**

Never start or move the machine until you are sure all bystanders have cleared the area.

1. Start the engine.
2. If the draper connector is not visible, engage the header until the connector is accessible (preferably close to the outboard end of the deck).
3. Raise the reel fully.
4. Raise the header fully.
5. Shut down the engine, and remove the key from the ignition.
6. Engage the reel safety props. For instructions, refer to [Engaging Reel Safety Props, page 33](#).
7. Engage the header safety props.

## MAINTENANCE AND SERVICING

- Loosen the draper by turning adjuster bolt (A) counterclockwise.

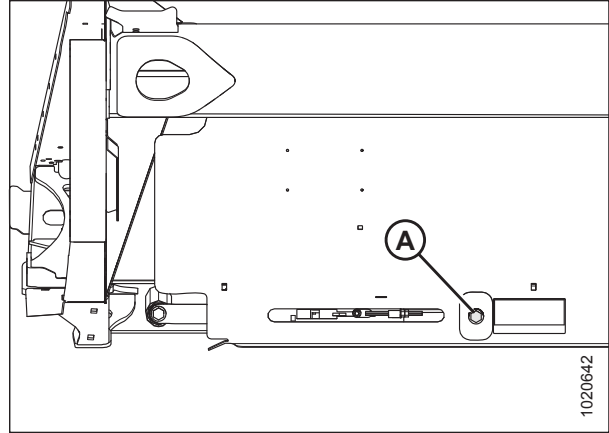


Figure 5.253: Draper Tensioner

- Remove tube connectors (B), screws (A), and nuts from the draper joint.
- Pull the draper off the drive roller.

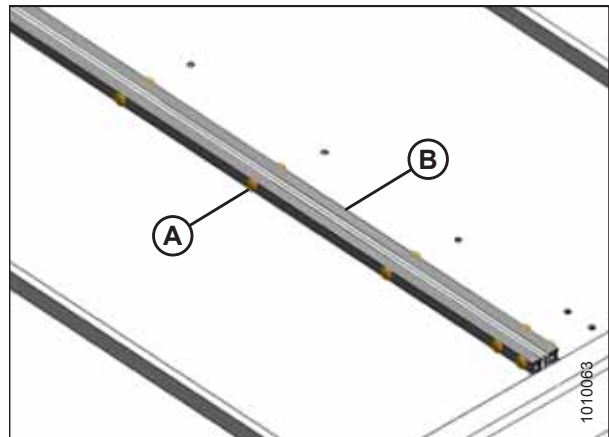


Figure 5.254: Draper Connector

- Align the set screws with hole (A) in the guard. Remove the two set screws holding the motor onto the drive roller.

**NOTE:**

The set screws are 1/4 turn apart.

- Remove four bolts (B) securing the motor to the drive roller arm.

**NOTE:**

It may be necessary to remove plastic shield (C) to gain access to the top bolt.

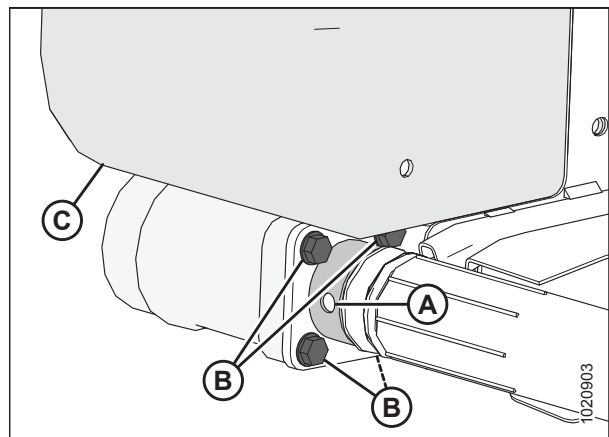


Figure 5.255: Drive Roller

## MAINTENANCE AND SERVICING

13. Remove bolt (A) securing the opposite end of drive roller (B) to the support arm.
14. Remove drive roller (B).

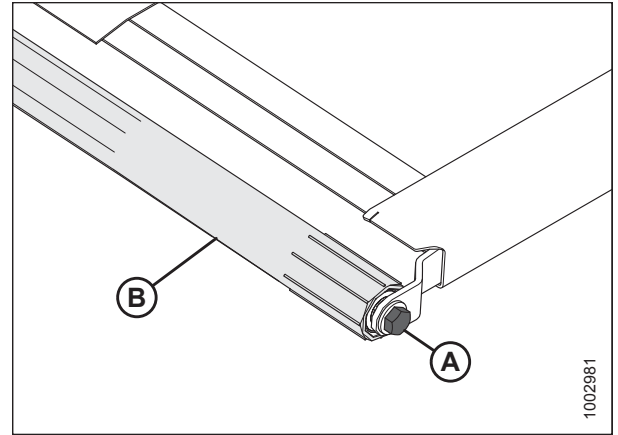


Figure 5.256: Drive Roller

### Replacing Side Draper Drive Roller Bearing

1. Remove the draper idler roller assembly. For instructions, refer to *Removing Side Draper Drive Roller, page 529*.
2. Remove bearing assembly (A) and seal (B) from roller tube (C) as follows:
  - a. Attach slide hammer (D) to threaded shaft (E) in the bearing assembly.
  - b. Tap out bearing assembly (A) and seal (B).
3. Clean the inside of roller tube (C), check the tube for signs of wear or damage, and replace if necessary.

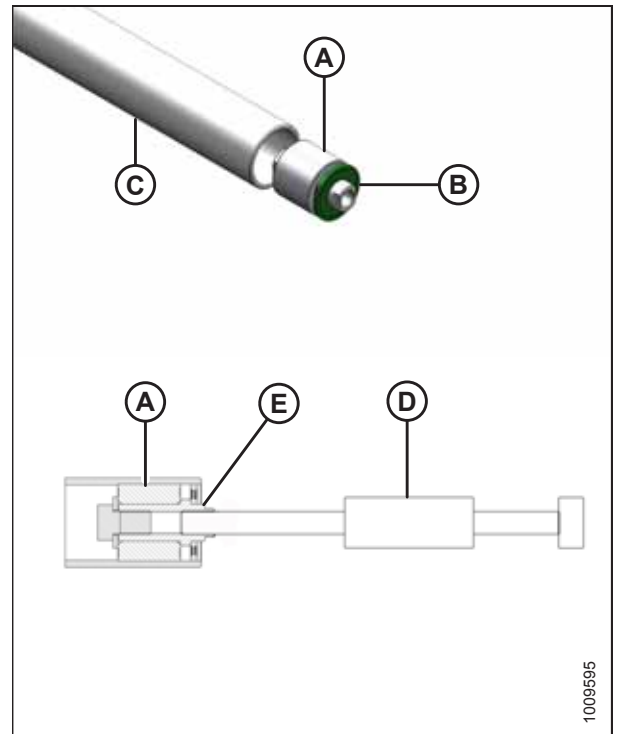


Figure 5.257: Roller Bearing

## MAINTENANCE AND SERVICING

4. Install new bearing assembly (A) by pressing the outer race of the bearing into the tube until it is 14–15 mm (9/16–19/32 in.) (B) from the outside edge of the tube.
5. Apply grease in front of bearing assembly (A). Refer to the inside back cover of this book for grease specifications.
6. Install new seal (C) at the roller opening, and install a flat washer (1.0 in. I.D. x 2.0 in. O.D.) on the seal.
7. Tap seal (C) into the roller opening with a suitably sized socket. Tap the washer and bearing assembly (A) until the seal is 3–4 mm (1/8–3/16 in.) (D) from the outside edge of the tube.

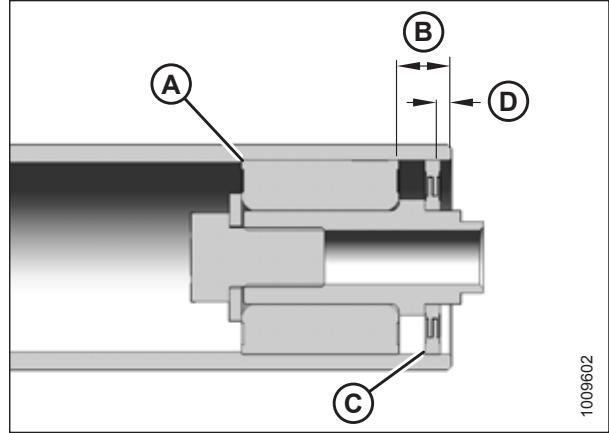


Figure 5.258: Roller Bearing

### Installing Side Draper Drive Roller

1. Position drive roller (B) between the roller support arms.
2. Install bolt (A) to secure the drive roller to the arm closest to the cutterbar. Torque bolt to 95 Nm (70 lbf-ft).
3. Grease the motor shaft and insert into the end of drive roller (B).

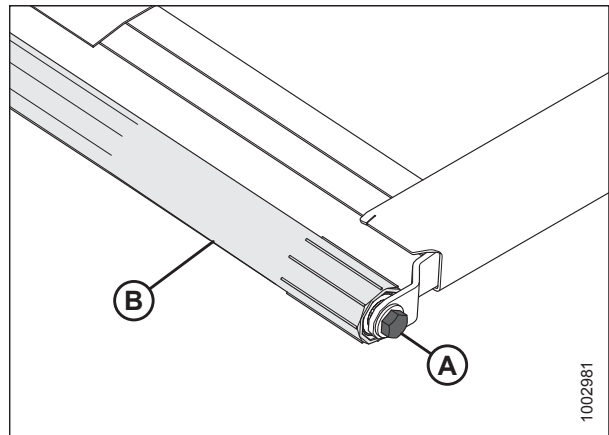


Figure 5.259: Drive Roller

4. Secure the motor to the roller support with four bolts (B). Torque to 27 Nm (20 lbf-ft).

#### NOTE:

Tighten any loosened bolts and reinstall plastic shield (C) if previously removed.

5. Ensure the motor is all the way into the roller, and tighten the two set screws (not shown) through access hole (A).

#### NOTE:

The set screws are 1/4 turn apart.

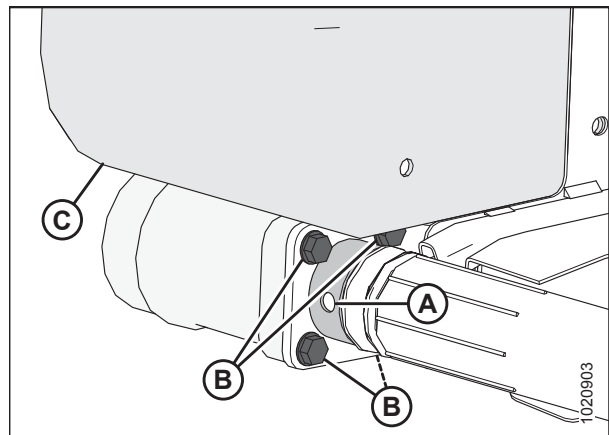


Figure 5.260: Drive Roller

- Wrap the draper over the drive roller and attach the ends of the draper using tube connectors (B), screws (A), and nuts.

**NOTE:**

The heads of the screws must face the center opening.

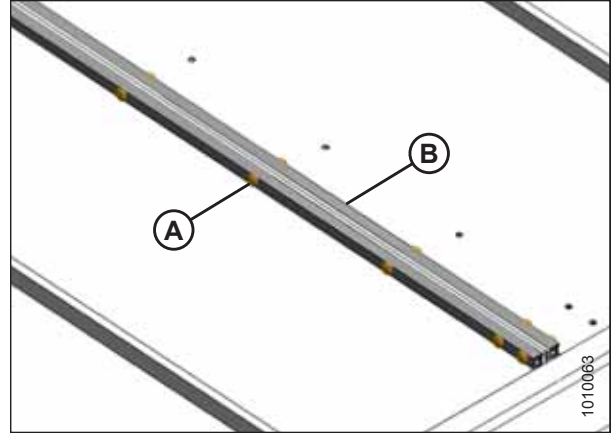


Figure 5.261: Draper Connector

- Tension the draper. Locate adjuster bolt (A) and follow the directions on decal (B), or refer to [5.12.3 Checking and Adjusting Draper Tension, page 520](#) for proper draper tensioning.
- Disengage the reel and header safety props.

**⚠ DANGER**

Never start or move the machine until you are sure all bystanders have cleared the area.

- Start the engine and lower the header and reel.
- Run the machine to verify the draper tracks correctly. If additional adjustment is necessary, refer to [5.12.4 Adjusting Side Draper Tracking, page 521](#).

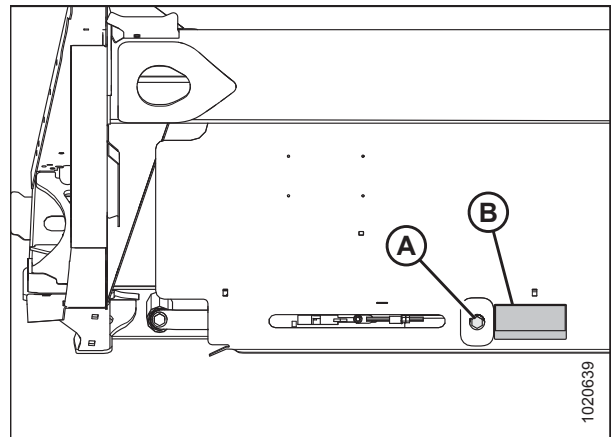


Figure 5.262: Draper Tensioner — Left Side Shown

### 5.12.7 Draper Deflectors

Narrow draper deflectors can reduce bunching at the ends of the header when decks are set for center delivery.

#### Removing Narrow Draper Deflectors

**⚠ DANGER**

To avoid bodily injury or death from the unexpected start-up or fall of a raised machine, always stop engine and remove key before leaving the operator's seat, and always engage safety props before going under the machine for any reason.

**⚠ DANGER**

Never start or move the machine until you are sure all bystanders have cleared the area.

- Raise the reel to its full height and lower the header to the ground.
- Move the decks manually after shutting down the combine.
- Stop the engine, remove the key, and engage the reel safety props.



## MAINTENANCE AND SERVICING

4. Open the endshield.
5. Remove two Torx® head screws (A) and lock nuts.
6. Remove three carriage bolts (B) and lock nuts, and remove aft deflector (C).

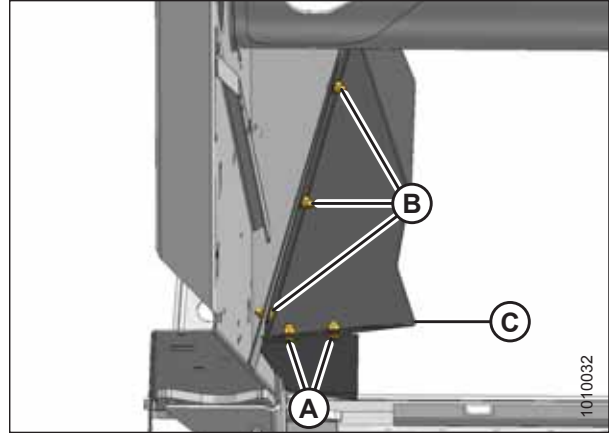


Figure 5.263: Aft Deflector

7. Remove four screws (A) and remove deflector (B).
8. Repeat for the opposite end of the header.

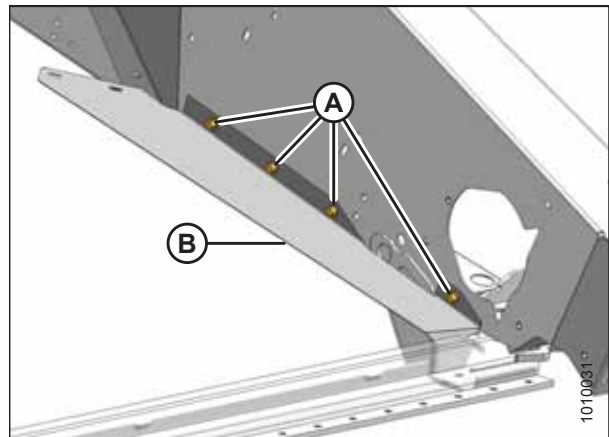


Figure 5.264: Forward Deflector – Left Side

### *Installing Narrow Draper Deflectors*

#### **DANGER**

To avoid bodily injury or death from the unexpected start-up or fall of a raised machine, always stop engine and remove key before leaving the operator's seat, and always engage safety props before going under the machine for any reason.

#### **DANGER**

Never start or move the machine until you are sure all bystanders have cleared the area.

1. Raise the reel to its full height and lower the header to the ground.
2. Move the decks manually after shutting down the combine.
3. Stop the engine, remove the key, and engage the reel safety props.

## MAINTENANCE AND SERVICING

4. Open the endshield.
5. Position forward deflector (B) onto the endsheet and temporarily install forward and aft  $3/8 \times 5/8$  in. self tapping screws (A).
6. Check the fit of the forward end of deflector (B) on the cutterbar and ensure there is no gap between the deflector and the cutterbar. Remove and bend the deflector as required to obtain the best fit.
7. Install two  $3/8 \times 5/8$  in. self tapping screws (A) and tighten all four screws.

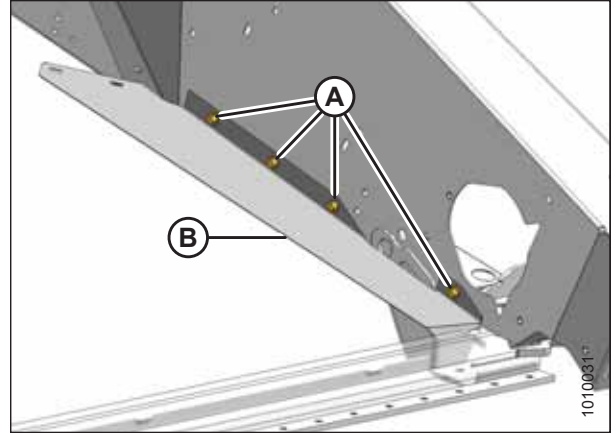


Figure 5.265: Forward Deflector

8. Position aft deflector (C) as shown and install three  $3/8 \times 3/4$  in. carriage bolts (B) and lock nuts.
9. Install two Torx® head screws (A) and lock nuts with the heads facing down.
10. Tighten all fasteners.
11. Repeat for the opposite end of the header.

**NOTE:**

The draper deflector may be damaged by the reel tines if the reel height is set incorrectly. For instructions about setting the reel height, refer to [3.8.9 Reel Height, page 110](#).

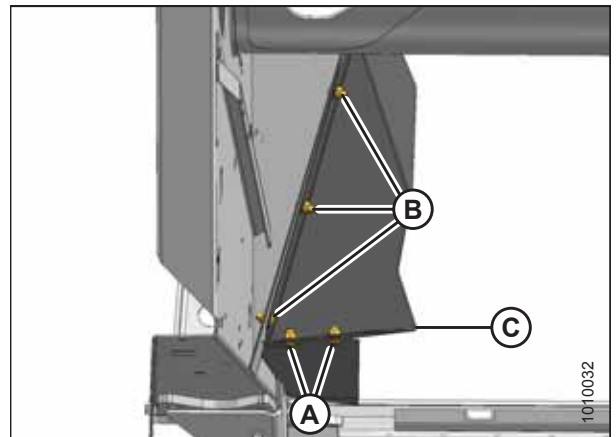


Figure 5.266: Rear Deflector – Left Side

## 5.13 Reel

The reel features a uniquely shaped cam, which allows the fingers to get underneath lodged crop and pick it up before it is cut.

### CAUTION

To avoid personal injury, before servicing machine or opening drive covers, refer to [5.1 Preparing Machine for Servicing](#), page 397.

### 5.13.1 Reel Clearance to Cutterbar

The minimum clearance between the reel fingers and the cutterbar ensures that the reel fingers do not contact the cutterbar during operation. The clearance is set at the factory, but some adjustment may be necessary before operation.

The finger to guard/cutterbar clearances with reels fully lowered are shown in the table below.

Table 5.3 Finger to Guard/Cutterbar Clearance

Header Width	(X) 3 mm (+/- 1/8 in.) at Reel Ends	
	Single Reel	Double Reel
D120	20 mm (3/4 in.)	—
D125	25 mm (1 in.)	—
D130	45 mm (1 3/4 in.)	20 mm (3/4 in.)
D135	60 mm (2 3/8 in.)	20 mm (3/4 in.)
D140	—	20 mm (3/4 in.)
D145	—	20 mm (3/4 in.)

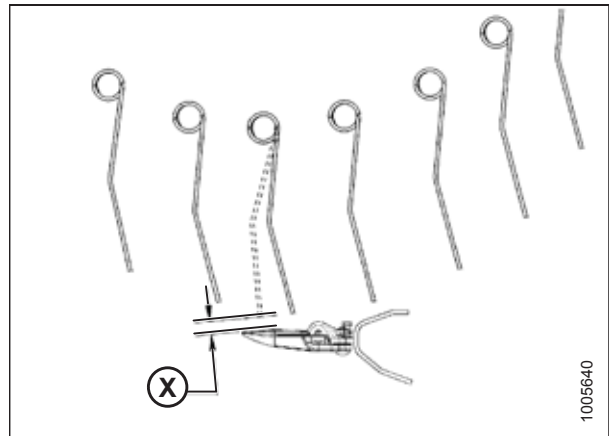


Figure 5.267: Finger Clearance

#### Measuring Reel Clearance

Measure the clearance between the reel fingers and the cutterbar to check if any adjustment is required before operating the reel.

### DANGER

Never start or move the machine until you are sure all bystanders have cleared the area.

### DANGER

To avoid injury or death from unexpected start-up of machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Start the engine.
2. Park the combine on a level surface.
3. Lower the header fully.

## MAINTENANCE AND SERVICING

4. Set the fore-aft position to the middle position (5) on fore-aft position decal (A).
5. Lower the reel fully.
6. Shut down the engine, and remove the key from the ignition.

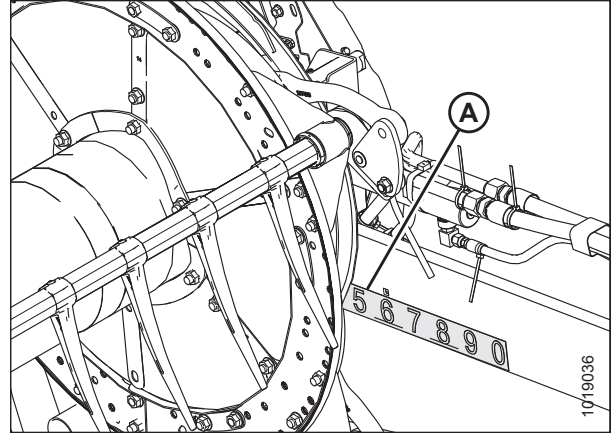


Figure 5.268: Fore-Aft Position

7. Measure clearance (X) between guard (A) and finger (B) at certain measurement locations. For clearance specifications, refer to [5.13.1 Reel Clearance to Cutterbar, page 536](#).

For the measurement locations, refer to [Figure 5.270, page 537](#).

**NOTE:**

The reel is factory-set to provide more clearance at the center of the reel than at the ends (frown) to compensate for reel flexing.

**NOTE:**

When measuring reel clearance at the center of a double-reel header, measure the lowest reel.

**Measurement locations (A) for Single and Double Reels:** Outer ends of the reel (two places).

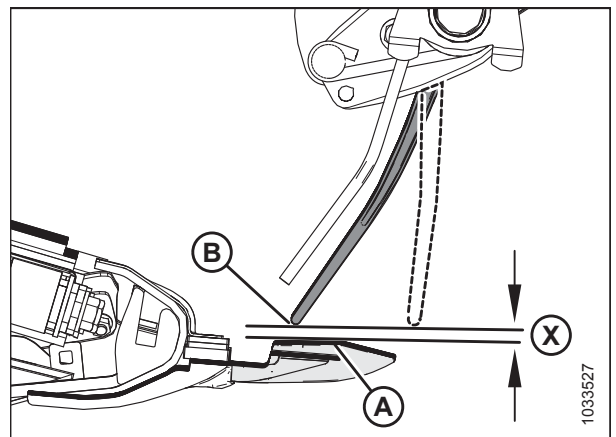


Figure 5.269: Clearance

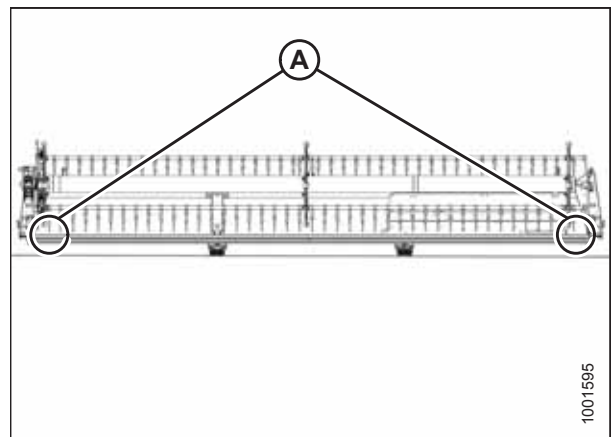


Figure 5.270: Measurement Locations for Single and Double Reels – Single Reel Shown

8. Adjust the reel clearance, if required. For instructions, refer to [Adjusting Reel Clearance, page 538](#).

### Adjusting Reel Clearance

Adjust the reel until there is enough clearance to prevent the reel fingers from contacting the cutterbar during operation.

#### DANGER

To avoid bodily injury or death from the unexpected start-up or fall of raised machine, always stop the engine, remove the key, and engage the safety props before going under the header for any reason.

1. Raise the reel fully.
2. Shut down the engine, and remove the key from the ignition.
3. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 33*.
4. Adjust the outboard reel arm lift cylinders to set the clearance at the outboard ends of the reel as follows:
  - a. Loosen bolt (A).
  - b. Turn cylinder rod (B) out of clevis to raise reel and increase clearance to cutterbar, or turn cylinder rod into clevis to lower reel and decrease clearance.
  - c. Tighten bolt (A).
  - d. Repeat at opposite side.

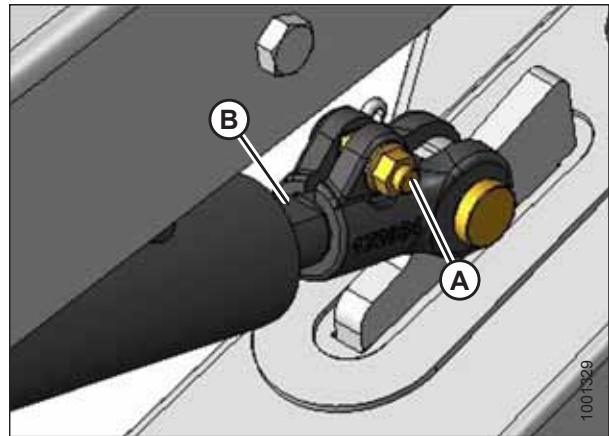


Figure 5.271: Outside Reel Arm

5. **Double reel:** adjust center arm lift cylinder stop (A) to change clearance at inboard ends of reels as follows:
  - a. Loosen nut (B).

**NOTE:**  
To make adjustment easier, lower reel onto the safety props after loosening nut (B).

  - b. Turn nut (C) counterclockwise to raise reel and increase clearance to cutterbar, or clockwise to lower reel and decrease clearance.
  - c. Tighten nut (B).

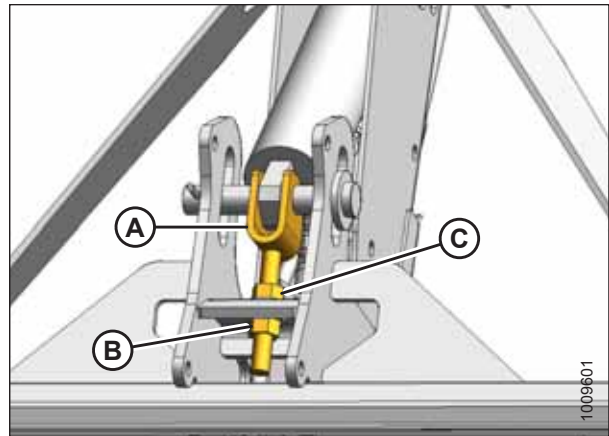


Figure 5.272: Underside of Center Arm

6. Check measurements and, if necessary, repeat adjustment procedures.

#### DANGER

Never start or move the machine until you are sure all bystanders have cleared the area.

7. Start engine.
8. Move the reel back to ensure the steel end fingers do **NOT** contact the deflector shields.
9. If contact occurs, adjust the reel upward to maintain the clearance at all reel fore-aft positions. If contact cannot be avoided after adjusting the reel, trim the steel end fingers to obtain proper clearance.

## MAINTENANCE AND SERVICING

10. Periodically check for evidence of contact during operation, and adjust clearance as required.
11. Shut down the engine, and remove the key from the ignition.

### 5.13.2 Reel Frown

The reel is factory-set to frown (providing more clearance at the center of the reel than at the ends) to compensate for reel flexing.

#### Adjusting Reel Frown

The reel is factory-set to frown (provide more clearance at the center of the reel than at the ends) to compensate for reel flexing.

#### DANGER

To avoid bodily injury or death from unexpected startup of machine, always stop the engine and remove the key before making adjustments to the machine.

1. Position the reel over the cutterbar (between 4 and 5 on fore-aft position decal [A]) to provide adequate clearance at all reel fore-aft positions.
2. Record the measurement at each reel disc location for each reel tube.

**NOTE:**

Measure the frown profile before disassembling the reel for servicing so the profile can be maintained during reassembly.

3. Shut down the engine, and remove the key from the ignition.

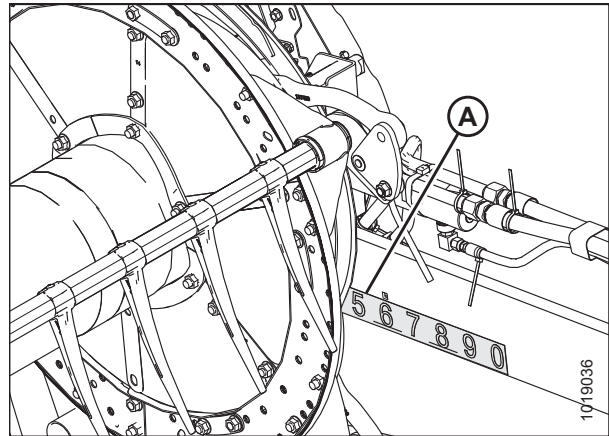


Figure 5.273: Fore-Aft Position Decal

4. Start with the reel disc closest to the center of the header and proceed outward towards the ends, adjusting the header profile as follows:

- a. Remove bolts (A).
- b. Loosen bolt (B) and adjust arm (C) until the desired measurement is obtained between the reel tube and cutterbar.

**NOTE:**

Allow the reel tubes to curve naturally and position the hardware accordingly.

- c. Reinstall bolts (A) in the aligned holes and tighten.

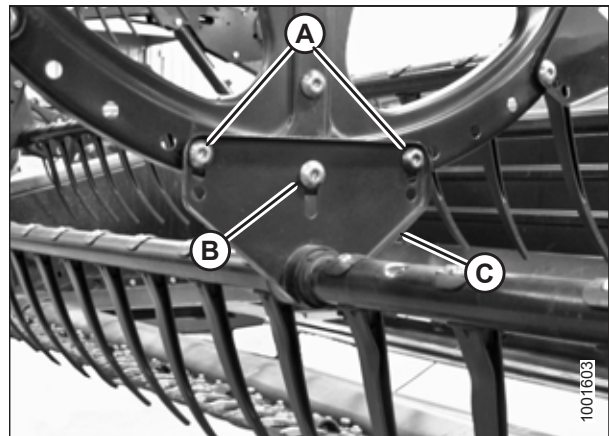


Figure 5.274: Center Reel Disc

### 5.13.3 Centering the Reel

#### DANGER

To avoid injury or death from unexpected start-up of machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Start combine and lower reel and header fully.
2. Shut down the engine, and remove the key from the ignition.



## MAINTENANCE AND SERVICING

3. Measure clearance at locations (A) between reel and both endsheets. The clearances should be the same if the reel is centered. To see locations (A) in greater detail, refer to Figure 5.276, page 541.

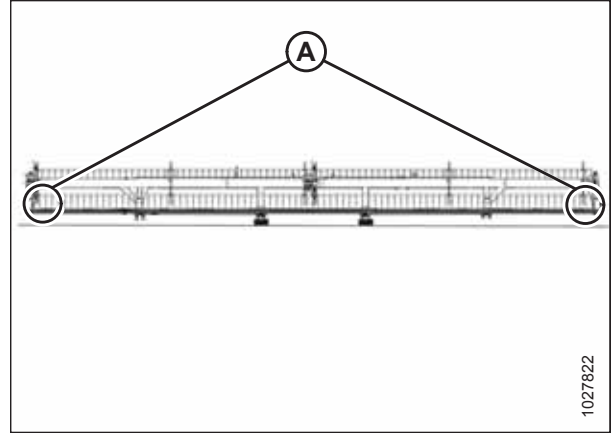


Figure 5.275: Measurement Locations

### NOTE:

The picture to the right shows reel endshield (A) and header endsheet (B). Measure the clearance between reel endshield (A) and header endsheet (B) at both ends of the header. The clearances should be the same if the reel is centered.

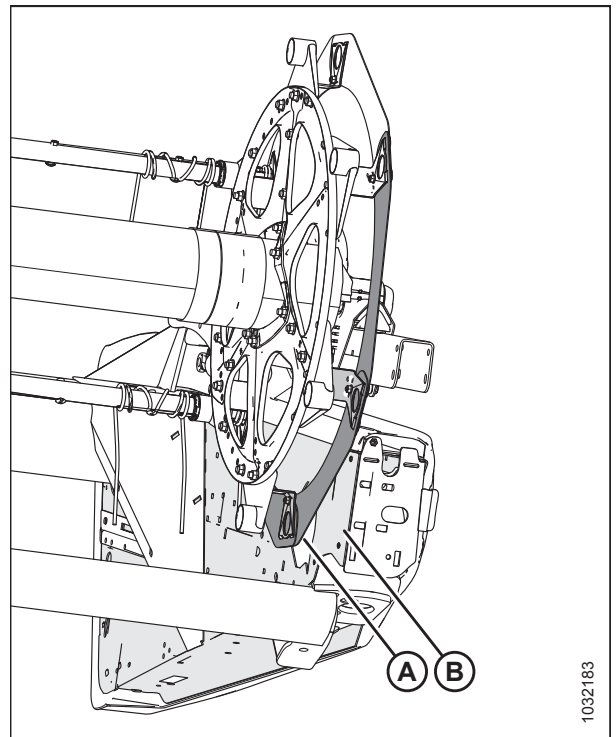


Figure 5.276: Reel Endshield and Header Endsheet

### Centering Reel on Double-Reel Header

#### DANGER

To avoid bodily injury or death from unexpected startup of machine, always stop the engine and remove the key before making adjustments to the machine.

#### DANGER

Never start or move the machine until you are sure all bystanders have cleared the area.

1. Start the engine.
2. Raise the header enough to put 150 mm (6 in.) blocks under the outboard skid shoes.

## MAINTENANCE AND SERVICING

3. Lower the header onto the blocks, the ends of the header will be higher than the center section, causing the header to smile.
4. Shut down the engine, and remove the key from the ignition.
5. Measure clearance (A) at locations (B) between reel tine tube and endsheet at both ends of header. The clearances should be the same if reel is centered. Refer to the following steps to center reel.

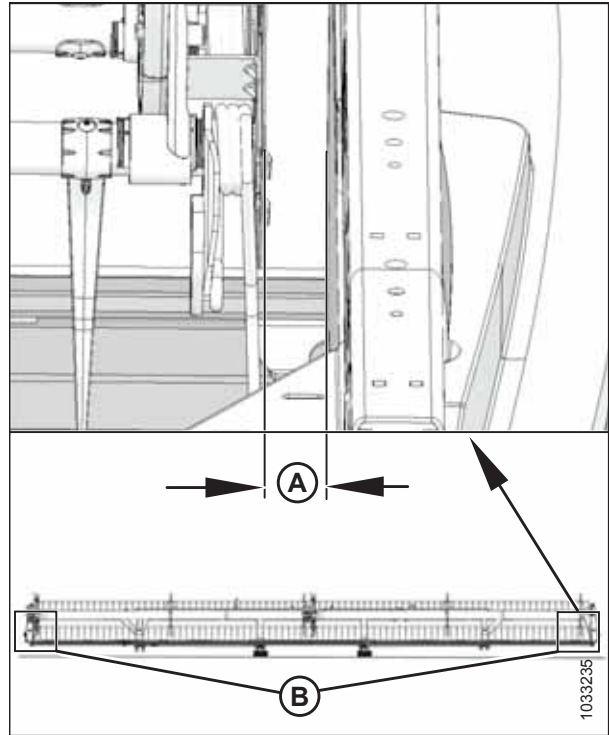


Figure 5.277: Centering Reel

6. Loosen bolts (A) on each brace (B).
7. Move the forward end of reel center support arm (C) laterally as required to center both reels.
8. Tighten bolts (A) and torque to 382 Nm (282 lbf-ft).

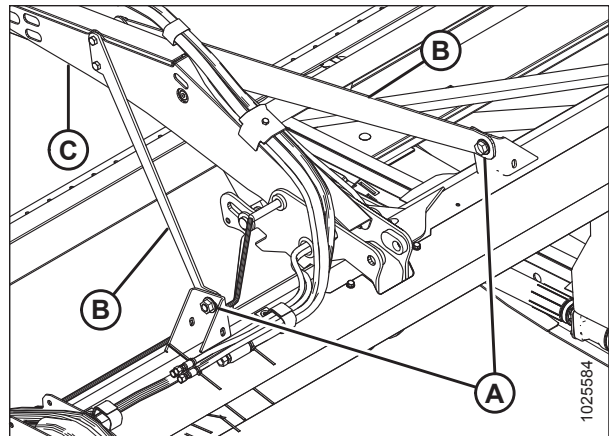


Figure 5.278: Reel Center Support Arm Braces – Non-European Configured

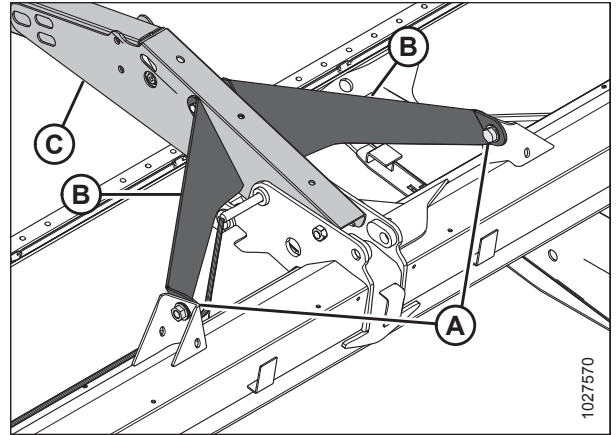


Figure 5.279: Reel Center Support Arm and Braces – European Configured

### Centering Single Reel

A centered reel picks up crop evenly and prevents debris from accumulating at the ends of the reel. Adjust the reel support arms at both ends of the header to center the reel.

### DANGER

To avoid bodily injury or death from unexpected startup of machine, always stop the engine and remove the key before making adjustments to the machine.

1. Shut down the engine, and remove the key from the ignition.
2. Measure clearance (A) at locations (B) between the reel tine tube and the endsheet at both ends of the header. The clearances should be the same if the reel is centered.
  - If the reel is not centered, proceed to Step 3, [page 544](#).
  - If the reel is centered, proceed to [5.12.3 Checking and Adjusting Draper Tension, page 520](#).

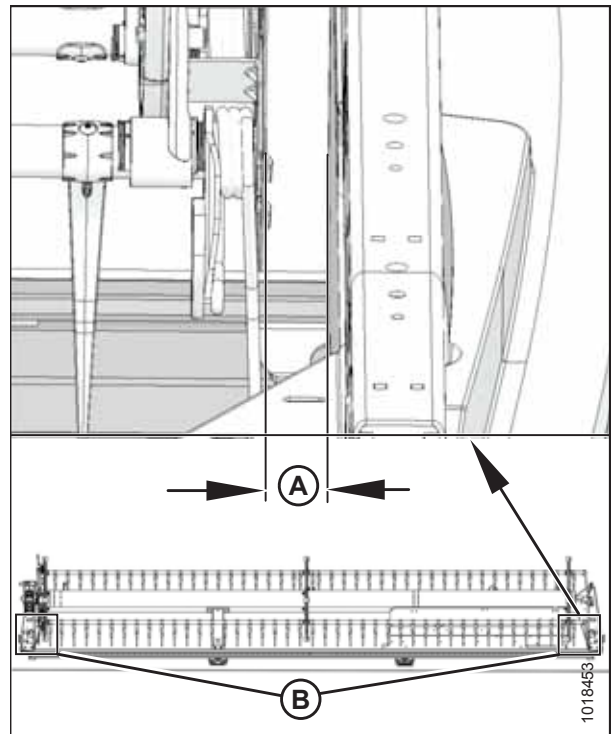


Figure 5.280: Single-Reel Measurement Locations

## MAINTENANCE AND SERVICING

3. Loosen bolt (A) on brace (B) at both ends of the reel.
4. Move the forward end of reel support arm (C) laterally as required to center the reel.
5. Tighten bolt (A) and torque to 359 Nm (265 lbf-ft). Repeat at opposite side.

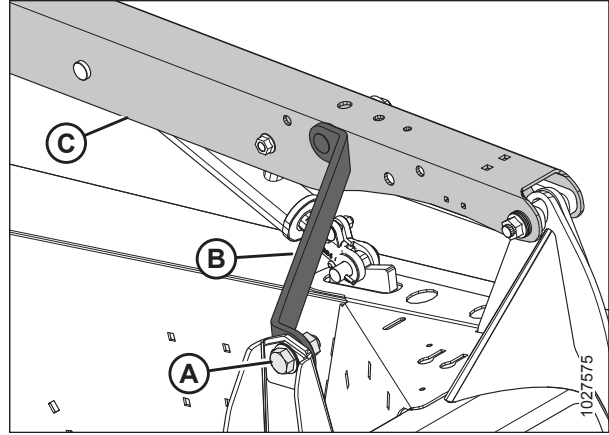


Figure 5.281: Reel Support Arm

### 5.13.4 Reel Fingers

#### IMPORTANT:

Keep the reel fingers in good condition and straighten or replace them as necessary.

#### *Removing Steel Fingers*



#### DANGER

To avoid bodily injury or death from the unexpected start-up or fall of a raised machine, always stop engine and remove key before leaving the operator's seat, and always engage safety props before going under the machine for any reason.



#### WARNING

To avoid bodily injury from fall of raised reel, always engage reel safety props before going under raised reel for any reason.

#### IMPORTANT:

Ensure the tine tube is supported at all times to avoid damaging it and other components.

1. Lower the header fully.
2. Raise the reel fully.
3. Shut down the engine, and remove the key from the ignition.
4. Engage the reel safety props. For instructions, refer to [Engaging Reel Safety Props, page 33](#).
5. Remove the tine tube bushings from the applicable tine tube at the center and left reel discs. For instructions, refer to [Removing Bushings from Reels, page 547](#).

6. Attach tine tube arms (B) to the reel disc at original attachment locations (A).
7. Cut the damaged finger so it can be removed from the tine tube.
8. Remove bolts from the existing fingers and slide the fingers over to replace the finger that was cut off in Step 7, [page 545](#) (remove tine tube arms [B] from the tine tubes as necessary).

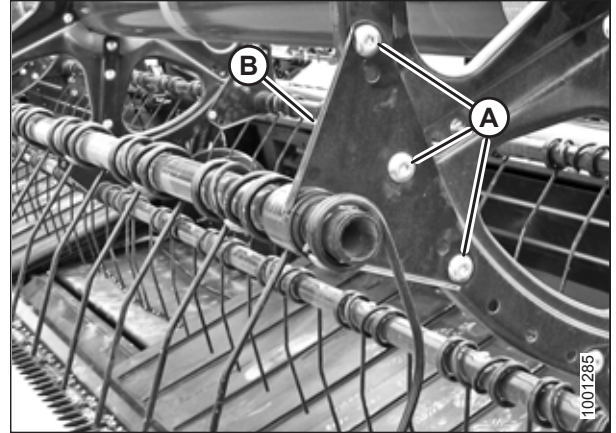


Figure 5.282: Tine Tube Arm

### Installing Steel Fingers

#### DANGER

To avoid injury or death from unexpected start-up of machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

#### WARNING

To avoid bodily injury from fall of raised reel, always engage reel safety props before going under raised reel for any reason.

#### IMPORTANT:

Ensure the tine tube is supported at all times to prevent damage to the tube and other components.

#### NOTE:

This procedure assumes a finger has already been removed from the machine. For instructions about removing fingers, refer to [Removing Steel Fingers, page 544](#).

1. Slide the new finger and tine tube arm (A) onto the end of the tube.
2. Install the tine tube bushings. For instructions, refer to [Installing Bushings onto Reels, page 552](#).
3. Attach the fingers to the tine tube with bolts and nuts (B).

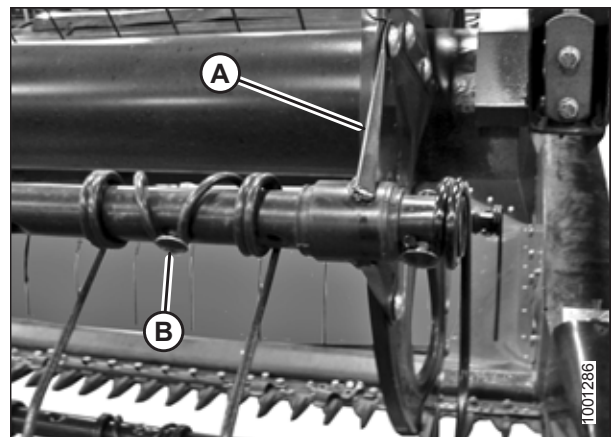


Figure 5.283: Tine Tube

*Removing Plastic Fingers*

**⚠ DANGER**

To avoid bodily injury or death from the unexpected start-up or fall of a raised machine, always stop engine and remove key before leaving the operator's seat, and always engage safety props before going under the machine for any reason.

1. Lower the header fully.
2. Raise the reel fully.
3. Shut down the engine, and remove the key from the ignition.
4. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 33*.
5. Remove screw (A) using a Torx® Plus 27 IP socket wrench.



Figure 5.284: Removing Plastic Finger

6. Push the clip at the top of the finger back towards the reel tube as shown and remove the finger from the tube.



Figure 5.285: Removing Plastic Finger

*Installing Plastic Fingers*

**⚠ DANGER**

To avoid injury or death from unexpected start-up of machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

**⚠ WARNING**

To avoid bodily injury from fall of raised reel, always engage reel safety props before going under raised reel for any reason.

**NOTE:**

This procedure assumes a finger has already been removed from the machine. For instructions, refer to *Removing Plastic Fingers*, page 546.

1. Position the new finger on the rear of the tine tube. Engage the lug at the bottom of the finger in the lower hole in the tine tube.
2. Lift the top flange gently and rotate the finger as shown until the lug in the top of the finger engages the upper hole in the tine tube.



Figure 5.286: Installing Plastic Finger

**IMPORTANT:**

Do **NOT** apply force to the finger prior to tightening the mounting screw. Applying force without tightening the mounting screw will break the finger or shear the locating pins.

3. Install screw (A) using a Torx® Plus 27 IP socket wrench and torque to 8.5–9.0 Nm (75–80 lbf·in).

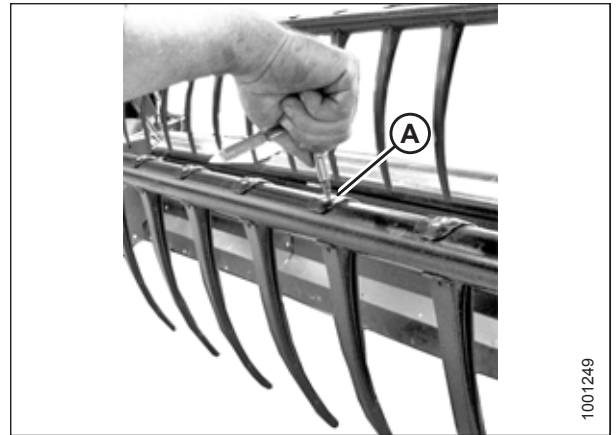


Figure 5.287: Installing Plastic Finger

### 5.13.5 Tine Tube Bushings

#### *Removing Bushings from Reels*

Bushing are located at the point where the reel tine connects to the reel disc.



**DANGER**

To avoid bodily injury or death from the unexpected start-up or fall of a raised machine, always stop engine and remove key before leaving the operator's seat, and always engage safety props before going under the machine for any reason.

**IMPORTANT:**

Ensure the tine tube is supported at all times to prevent damage to the tube and other components.

1. Lower the header fully.
2. Raise the reel fully.
3. Shut down the engine, and remove the key from the ignition.



## MAINTENANCE AND SERVICING

- Engage the reel safety props. For instructions, refer to [Engaging Reel Safety Props, page 33](#).

**NOTE:**

If replacing only the cam end bushing, proceed to Step 10, [page 549](#).

### Center disc and tail end bushings

- Remove the reel endshields and endshield support (C) from the tail end of the reel at the applicable tine tube location.

**NOTE:**

There are no endshields on the center disc.

- Remove bolts (A) securing tine tube arm (B) to the disc.

**IMPORTANT:**

Note the hole locations in the arm and disc and ensure bolts (A) are reinstalled at the original locations.

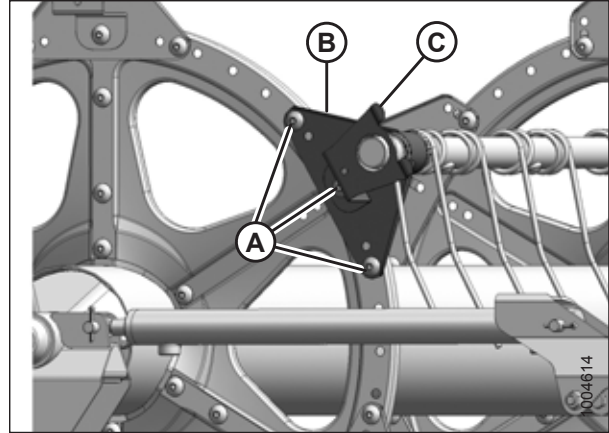


Figure 5.288: Tail End

- Release bushing clamps (A) using a small screwdriver to separate the serrations. Pull the clamp off the tine tube.

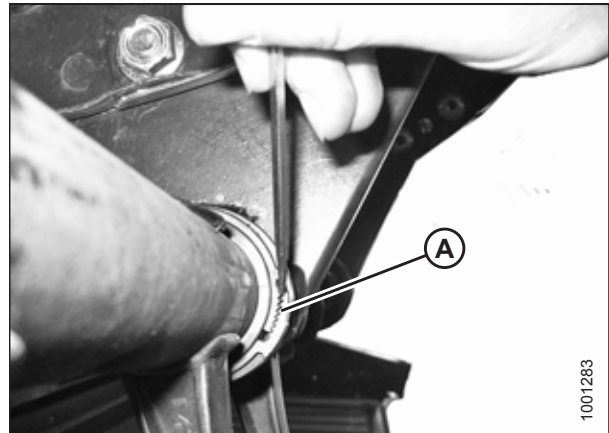


Figure 5.289: Bushing Clamp

- Rotate tine tube arm (A) until clear of the disc and slide the arm inboard off of bushing (B).
- Remove bushing halves (B). If required, remove the next steel or plastic finger, so the arm can slide off the bushing. Refer to the following procedures as necessary:
  - [Removing Plastic Fingers, page 546](#)
  - [Removing Steel Fingers, page 544](#)

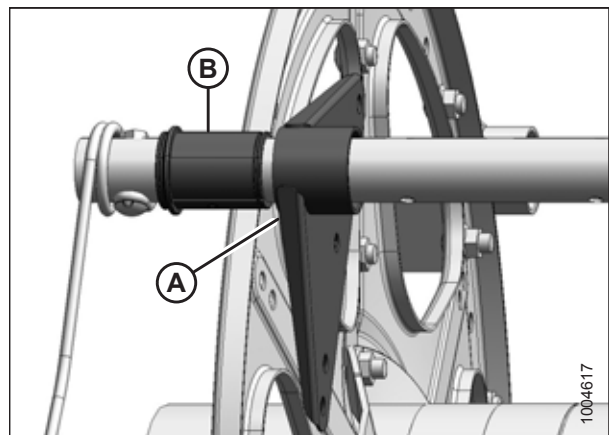


Figure 5.290: Bushing

**Cam end bushings**

10. Remove the endshields and endshield support (A) at the applicable tine tube location on the cam end.

**NOTE:**

Removing cam end bushings requires the tine tube to be moved through the disc arms to expose the bushing.

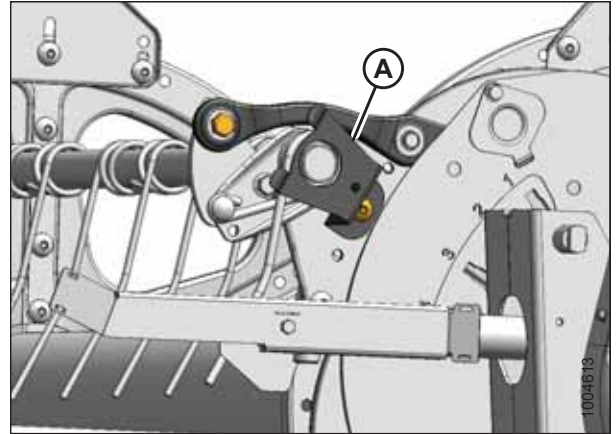


Figure 5.291: Cam End

11. Remove the reel endshields and endshield support (C) from the tail end of the reel at the applicable tine tube location.

**NOTE:**

There are no endshields on the center disc.

12. Remove bolts (A) securing tine tube arms (B) to the tail and center discs.

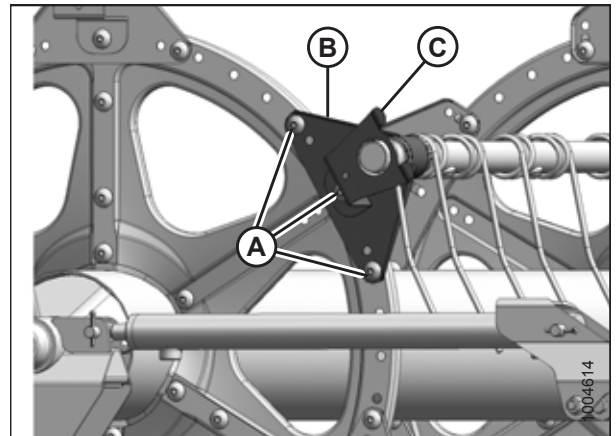


Figure 5.292: Tail End

**Tine tube reinforcing kit (option)<sup>58</sup>**

13. Release the bushing clamps or disconnect the support channels from the tine tube support (if installed) depending on which tine tube is being moved. Three tine tubes (A) require channel disconnection and two tine tubes (B) require only bushing clamp removal.

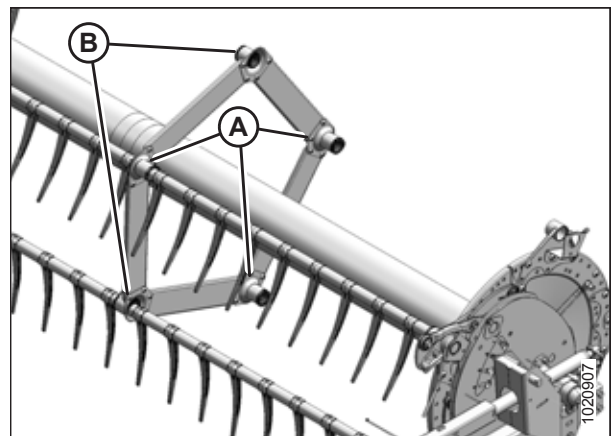


Figure 5.293: Tine Tube Supports

58. 5-Bat Reel MD #B5825, 6-Bat Reel MD #B5826.

## MAINTENANCE AND SERVICING

14. Remove bolt (A) from the cam linkage so tine tube (B) is free to rotate.

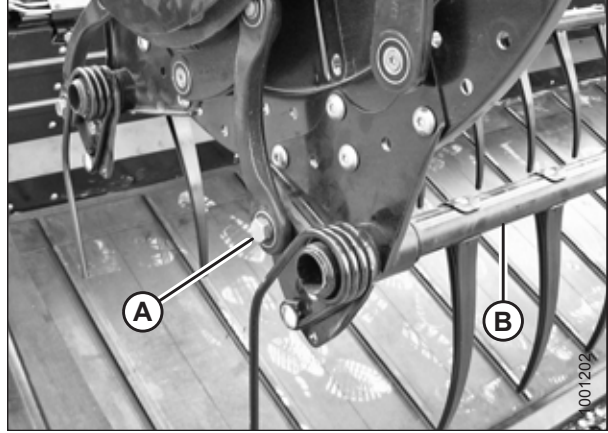


Figure 5.294: Cam End

15. Release bushing clamps (A) at the cam disc using a small screwdriver to separate the serrations. Move the clamps off the bushings.

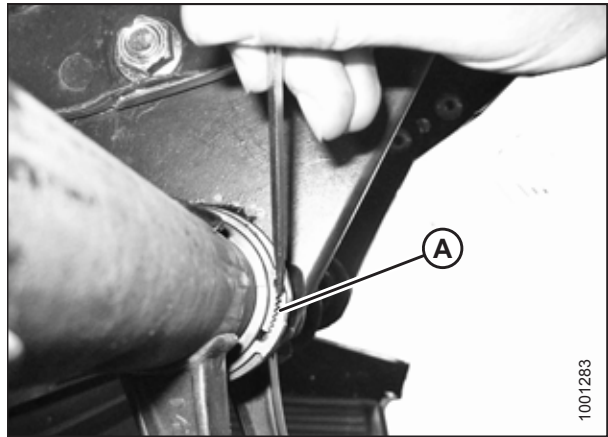


Figure 5.295: Bushing Clamp

16. Slide tine tube (A) outboard to expose bushing (B).
17. Remove bushing halves (B). If required, remove the next steel or plastic finger so the arm can slide off the bushing. Refer to the following procedures if necessary:
  - [Removing Plastic Fingers, page 546](#)
  - [Removing Steel Fingers, page 544](#)

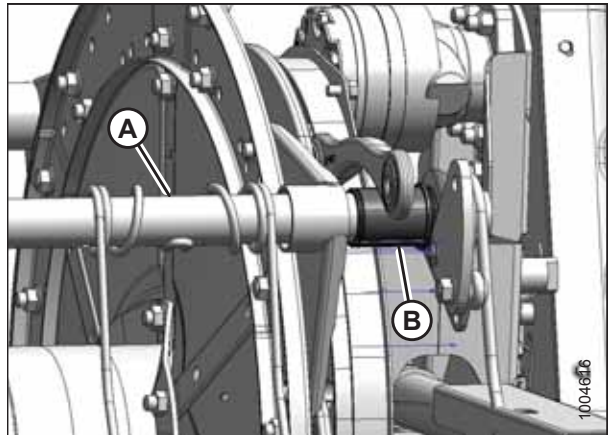
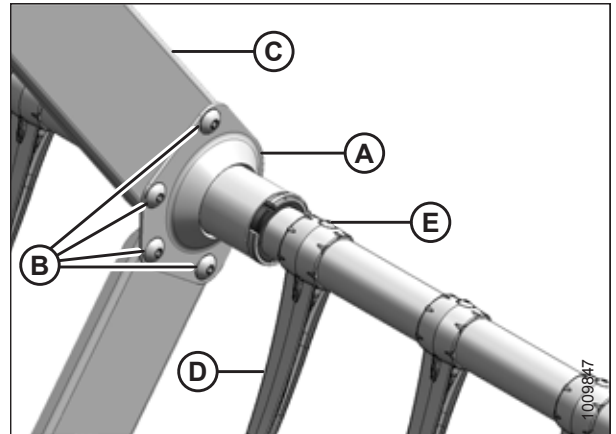


Figure 5.296: Cam End

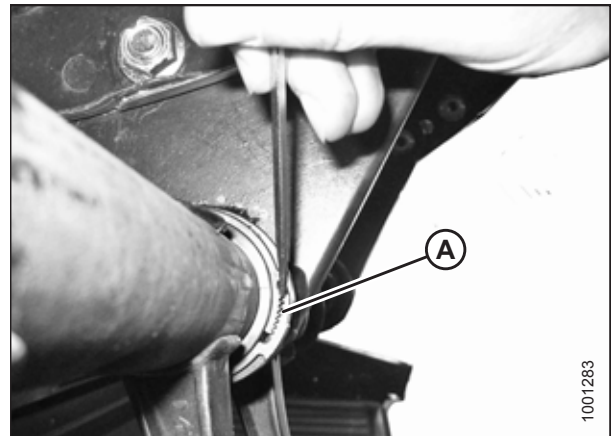
***Tine tube reinforcing kit bushings (option)***

18. Locate support (A) that requires a new bushing.
19. Remove four bolts (B) securing channel (C) to support (A).
20. Remove screw (E) and remove finger (D) if it is too close to the support to allow access to the bushing. For instructions, refer to [Removing Plastic Fingers, page 546](#) or [Removing Steel Fingers, page 544](#).



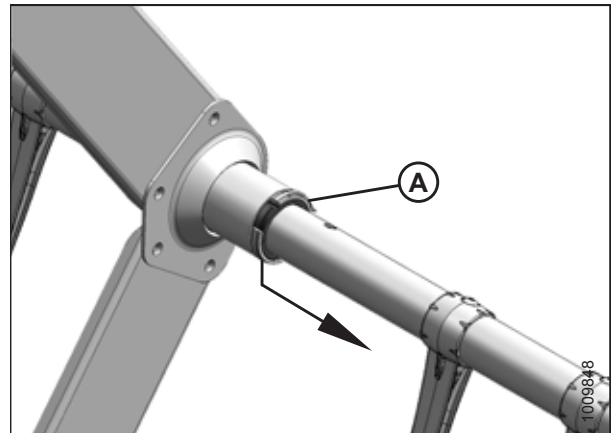
**Figure 5.297: Tine Tube Support**

21. Release bushing clamps (A) using a small screwdriver to separate the serrations.



**Figure 5.298: Bushing Clamp**

22. Move clamps (A) off the bushings.



**Figure 5.299: Tine Tube Reinforcing Kit Bushing Clamp (Option)**

## MAINTENANCE AND SERVICING

23. On each reel, there are three right-facing supports (A). Slide the support off bushing halves (B).

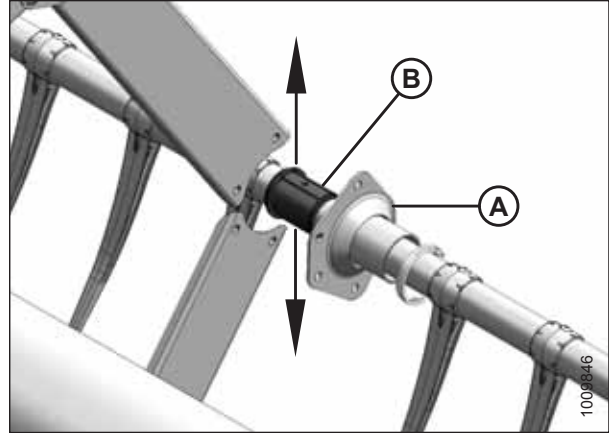


Figure 5.300: Tine Tube Reinforcing Kit Support (Option)

24. On each reel, there are two left-facing supports (A). Rotate the supports until the flanges clear the channels before moving them off bushing (B). Move the tube slightly away from the reel if necessary.

25. Remove bushing halves (B) from the tine tubes.

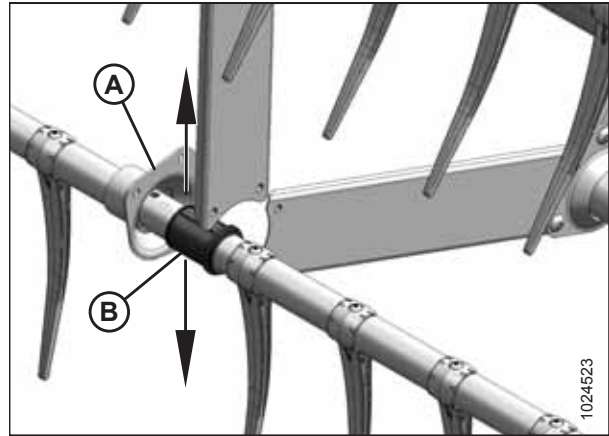


Figure 5.301: Tine Tube Reinforcing Kit Opposite Support (Option)

### *Installing Bushings onto Reels*

#### **NOTE:**

This procedure assumes the steps for *Removing Bushings from Reels, page 547* have been completed.



#### **WARNING**

To avoid bodily injury from fall of raised reel, always engage reel safety props before going under raised reel for any reason.

#### **IMPORTANT:**

Ensure the tine tube is supported at all times to prevent damage to the tube or other components.

## MAINTENANCE AND SERVICING

Use a pair of modified channel lock pliers (A) to install bushing clamps (C). Secure pliers in a vise and grind a notch (B) into the end of each arm to fit the clamp as shown.

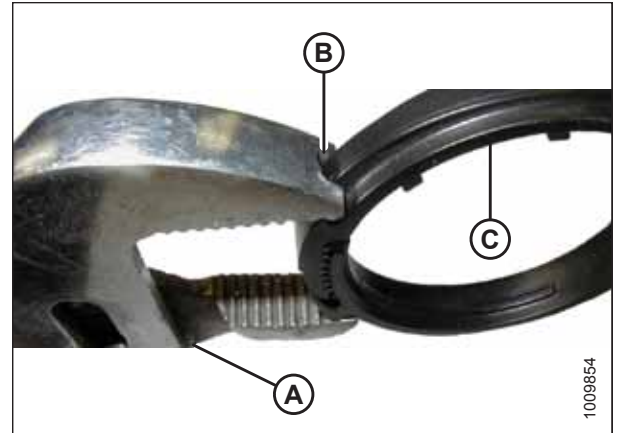


Figure 5.302: Modified Channel Lock Pliers

### Cam end bushings

1. Position bushing halves (B) on tine tube (A) with the flangeless end adjacent to the tine tube arm, and position the lug in each bushing half into the hole in the tine tube.
2. Slide tine tube (A) towards the tail end of the reel to insert bushing (B) into the tine tube arm. If the tine tube supports are installed, ensure the bushings at those locations slide into the support.
3. Reinstall the previously removed fingers. Refer to the following procedures as necessary:
  - [Removing Plastic Fingers, page 546](#)
  - [Removing Steel Fingers, page 544](#)
4. Install bushing clamp (A) onto the tine tube adjacent to the flangeless end of bushing (B).
5. Position clamp (A) on bushing (B) so the edges of the clamp and bushing are flush when the clamp is fit into the groove on the bushing and the lock tabs are engaged.

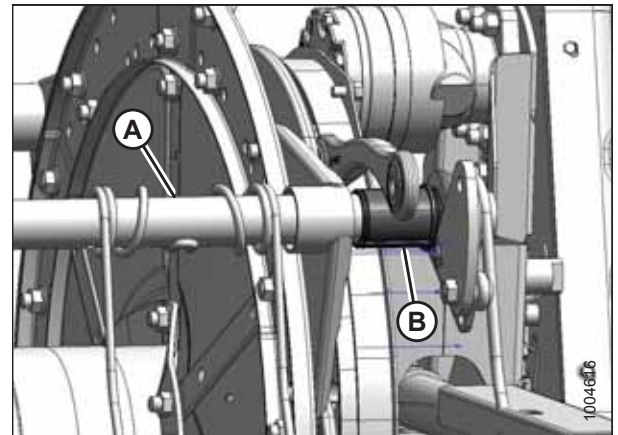


Figure 5.303: Cam End

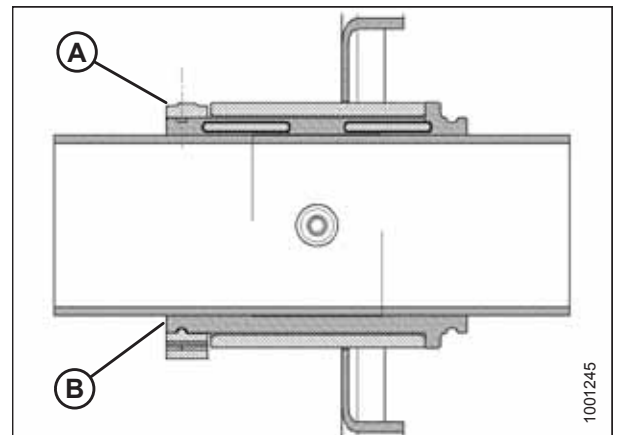


Figure 5.304: Bushing



## MAINTENANCE AND SERVICING

6. Tighten clamp (A) using modified channel lock pliers (B) until finger pressure will **NOT** move the clamp.

**IMPORTANT:**

Overtightening clamp may result in breakage.

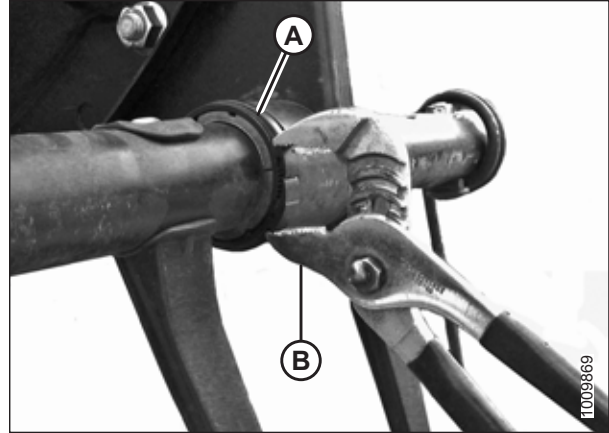


Figure 5.305: Installing Clamp

7. Line up tine tube (B) with the cam arm and install bolt (A). Torque bolt to 165 Nm (120 lbf-ft).

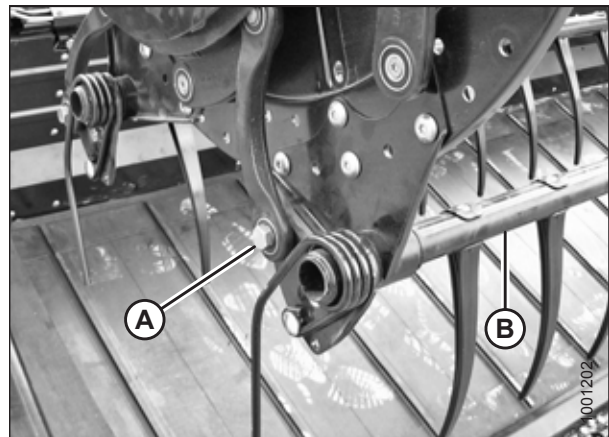


Figure 5.306: Cam End

8. Install bolts (A) securing tine tube arm (B) to the center disc.
9. Install tine tube arm (B) and endshield support (C) to the tail end of the reel at the applicable tine tube location and secure with bolts (A).

**NOTE:**

There are no endshields on the center discs.

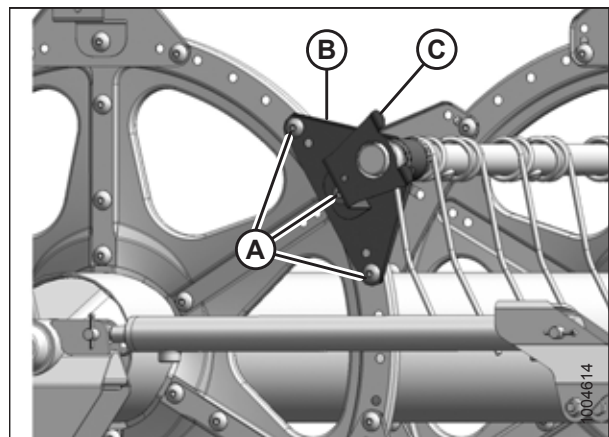


Figure 5.307: Tail End



10. Install endshield support (A) at the applicable tine tube location at the cam end.
11. Reinstall the reel endshields. For instructions, refer to [Replacing Reel Endshields, page 559](#).

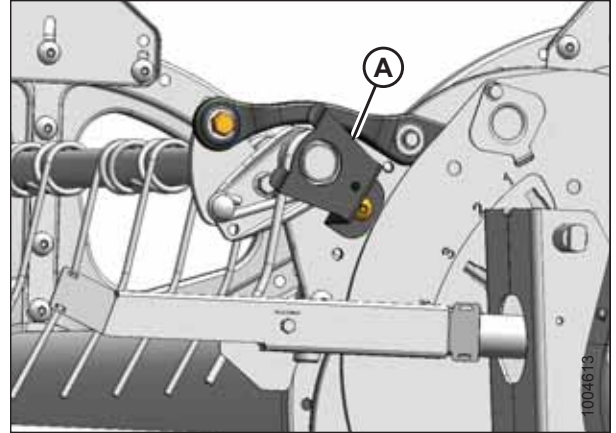


Figure 5.308: Cam End

**Center disc and tail end bushings**

12. Position bushing halves (B) on tine tube (A) with the flangeless end adjacent to the tine tube arm, and position the lug in each bushing half into the hole in the tine tube.
13. Slide tine tube (A) onto bushing (B) and position against the disc at the original location.
14. Reinstall the previously removed fingers. For instructions, refer to:
  - [Removing Plastic Fingers, page 546](#)
  - [Removing Steel Fingers, page 544](#)

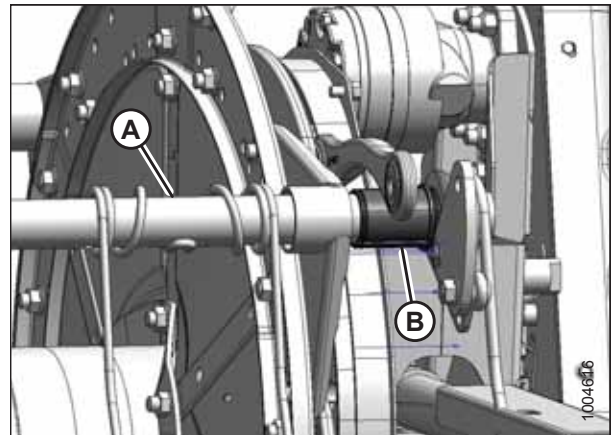


Figure 5.309: Cam End

15. Install bushing clamp (A) onto the tine tube adjacent to the flangeless end of bushing (B).
16. Position clamp (A) on bushing (B) so the edges of the clamp and bushing are flush when the clamp is fit into the groove on the bushing and the lock tabs are engaged.

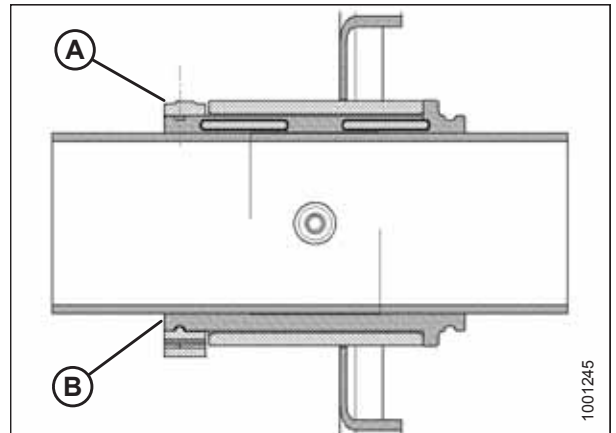


Figure 5.310: Bushing

## MAINTENANCE AND SERVICING

17. Tighten clamp (A) using modified channel lock pliers (B) until finger pressure will **NOT** move the clamp.

**IMPORTANT:**

Overtightening clamp may result in breakage.

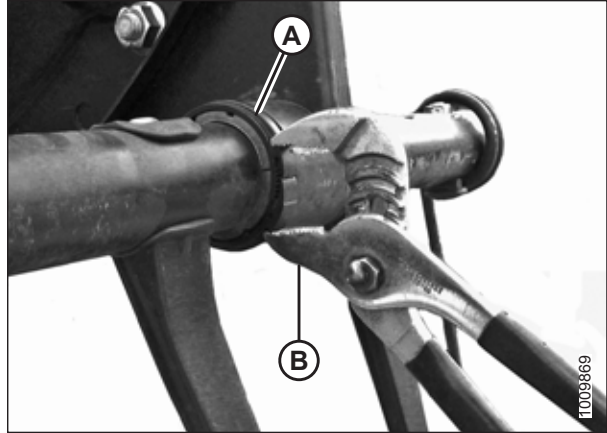


Figure 5.311: Installing Clamp

18. Install bolts (A) securing tine tube arm (B) to the center disc.
19. Install tine tube arm (B) and endshield support (C) to the tail end of the reel at the applicable tine tube location and secure with bolts (A).

**NOTE:**

There are no endshields on the center discs.

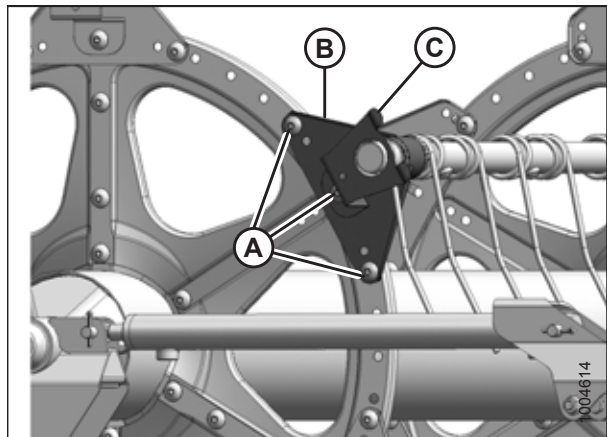


Figure 5.312: Tail End

**Tine tube reinforcing kit (option)<sup>59</sup>**

20. Position bushing halves (B) on tine tube (A) with the flangeless end adjacent to the tine tube arm, and position the lug in each bushing half into the hole in the tine tube.

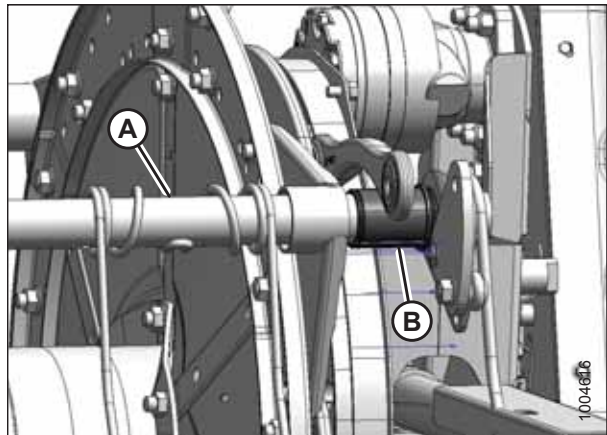


Figure 5.313: Cam End

<sup>59</sup> 5-bat reel (MD #B5825), 6-bat reel (MD #B5826).

## MAINTENANCE AND SERVICING

21. On each reel, there are three right-facing supports (A). Slide the support onto bushing (B).

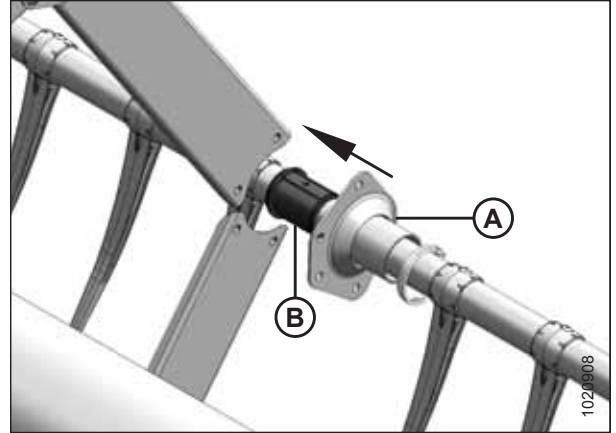


Figure 5.314: Tine Tube Reinforcing Kit Support (Option)

22. On each reel, there are two left-facing supports (A). Rotate support (A) until its flanges clear channels (C) before moving the support onto bushing (B).

**NOTE:**

If necessary, move tine tube (D) slightly away from the reel to allow the support flange enough room to clear the channel.

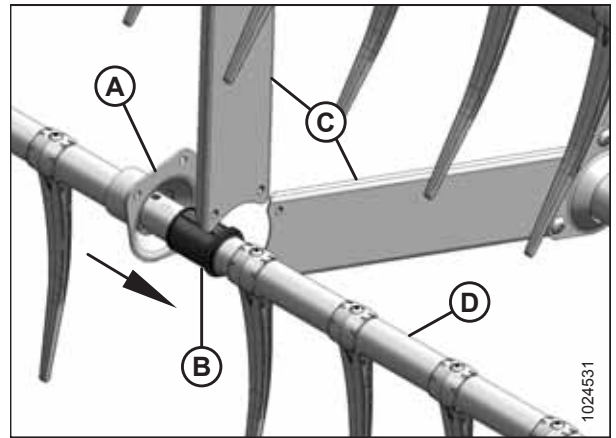


Figure 5.315: Tine Tube Reinforcing Kit Opposite Support (Option)

23. Install bushing clamp (A) onto the tine tube adjacent to the flangeless end of bushing (B).
24. Position clamp (A) on bushing (B) so the edges of the clamp and bushing are flush when the clamp is fit into the groove on the bushing and the lock tabs are engaged.

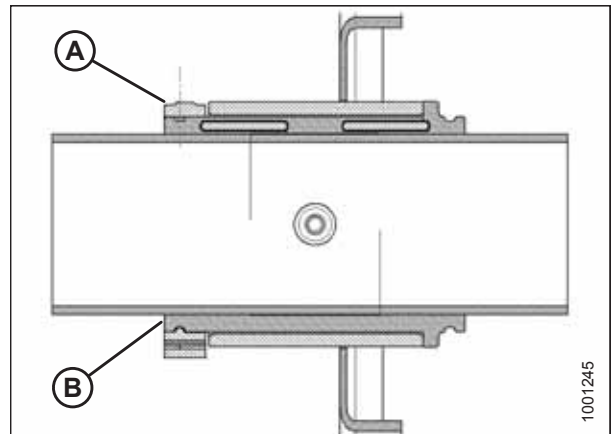


Figure 5.316: Bushing

## MAINTENANCE AND SERVICING

25. Tighten clamp (A) using modified channel lock pliers (B) until finger pressure will **NOT** move the clamp.

**IMPORTANT:**

Overtightening clamp may result in breakage.

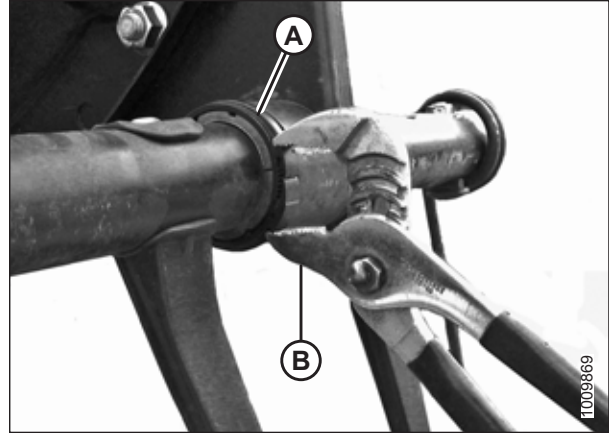


Figure 5.317: Installing Clamp

26. Reattach channels (C) to the three right-facing supports (A) on each reel with screws (B) and nuts. Torque screws to 43 Nm (32 lbf-ft).

27. Using screws (E), reinstall any fingers (D) that were previously removed. For instructions, refer to:

- [Installing Plastic Fingers, page 546](#)
- [Installing Steel Fingers, page 545](#)

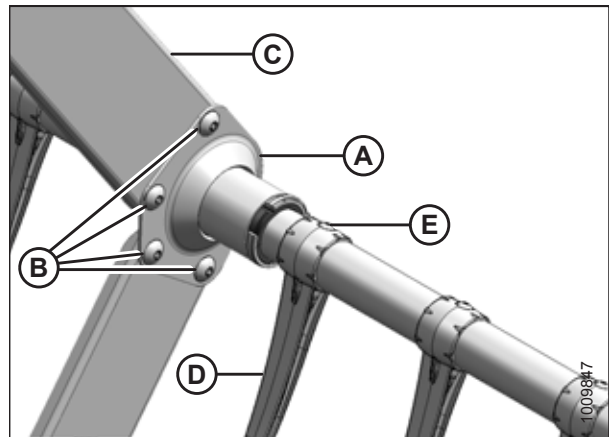


Figure 5.318: Tine Tube Reinforcing Kit Support (Option)

28. Reattach channels (C) to two left-facing supports (A) on each reel with screws (B) and nuts. Torque screws to 43 Nm (32 lbf-ft).

29. Using screws (E), reinstall any fingers (D) that were previously removed. For instructions, refer to:

- [Installing Plastic Fingers, page 546](#)
- [Installing Steel Fingers, page 545](#)

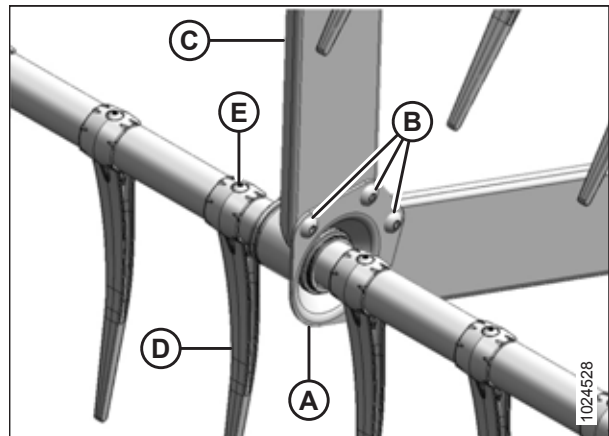


Figure 5.319: Tine Tube Reinforcing Kit Opposite Support (Option)

### 5.13.6 Reel Endshields

Reel endshields and supports do not require regular maintenance, but they should be checked periodically for damage and loose or missing fasteners. Slightly dented or deformed endshields and supports are repairable, but it's necessary to replace severely damaged components.

You can attach reel endshields to either end of the reel.

#### Replacing Reel Endshields



#### DANGER

To avoid injury or death from unexpected start-up of machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Lower the header and reel.
2. Shut down the engine, and remove the key from the ignition.
3. Rotate the reel manually until reel endshield (A) requiring replacement is accessible.
4. Remove three bolts (B).

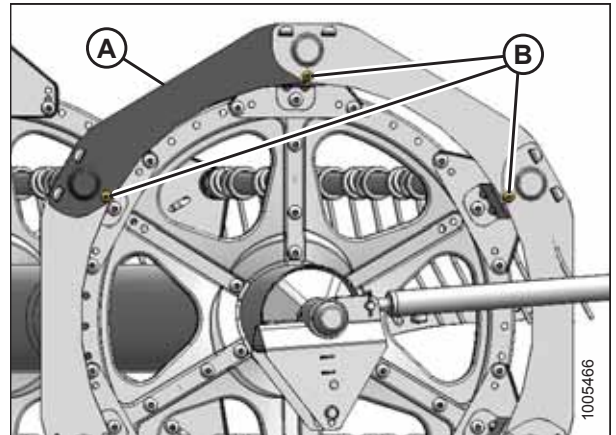


Figure 5.320: Reel Endshields

5. Lift the end of reel endshield (A) off support tabs (B).

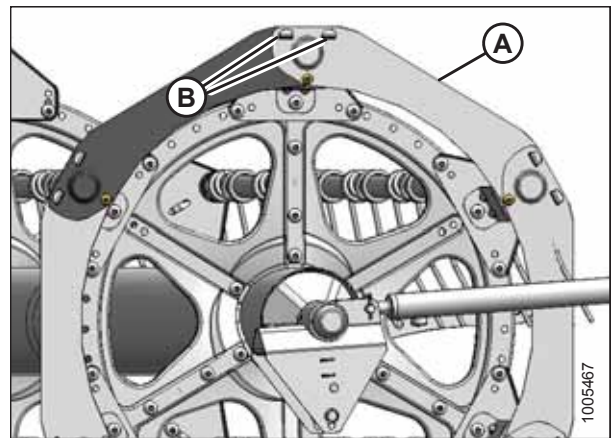


Figure 5.321: Reel Endshields



## MAINTENANCE AND SERVICING

6. Remove the reel endshield from the supports.

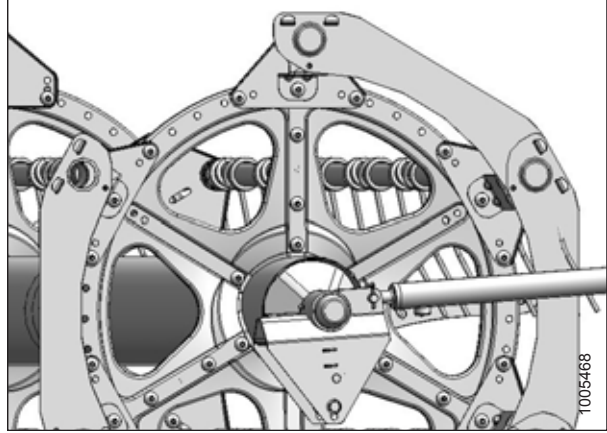


Figure 5.322: Reel Endshield Removed

7. Slightly lift the end of reel endshield (A) off of support tabs (B).
8. Install new reel endshield (C), behind reel endshield (A).
9. Reattach reel endshield (C), then (A) onto support tabs (B).
10. Reinstall three bolts (D).
11. Tighten all hardware.

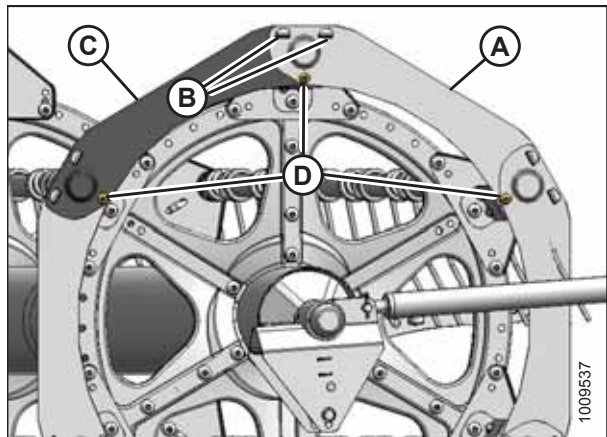


Figure 5.323: Reel Endshields

### Replacing Reel Endshield Supports

#### DANGER

To avoid injury or death from unexpected start-up of machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Lower the header and reel.
2. Shut down the engine, and remove the key from the ignition.
3. Rotate the reel manually until the reel endshield support requiring replacement is accessible.
4. Remove bolt (B) from support (A).
5. Remove bolts (C) from support (A) and two adjacent supports.

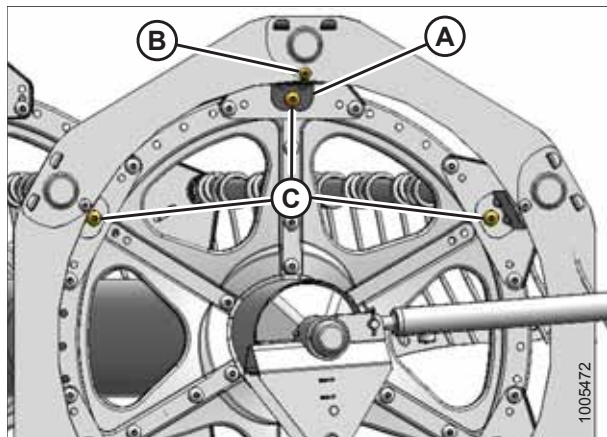


Figure 5.324: Reel Endshield Supports

## MAINTENANCE AND SERVICING

6. Move reel endshields (A) away from the tine tube and rotate support (B) towards the reel to remove it.
7. Insert tabs of new support (B) into the slots in reel endshields (A). Ensure the tabs engage both reel endshields.
8. Secure support (B) to the disc sector with bolt (C) and nut. Do **NOT** tighten.
9. Secure reel endshields (A) to support (B) with bolt (D) and nut. Do **NOT** tighten.
10. Reattach the supports with bolts (E) and nuts.
11. Check the clearance between the tine tube and reel endshield support and adjust if necessary.
12. Torque nuts to 27 Nm (20 lbf·ft).

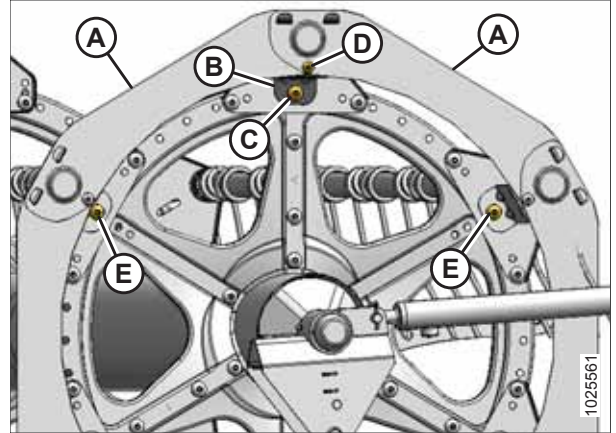


Figure 5.325: Reel Endshield Supports



## 5.14 Reel Drive

The hydraulically driven reel motor drives the chain that is attached to the right end of the reel on a single-reel header, and between the reels on a double-reel header.

### 5.14.1 Reel Drive Cover

The reel drive cover protects the reel drive components from dirt and debris.

#### *Removing Reel Drive Cover*

#### **DANGER**

To avoid injury or death from unexpected start-up of machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Shut down the engine, and remove the key from the ignition.

#### *Single-reel drive:*

2. Remove four bolts (A) securing cover (B) to the reel drive.

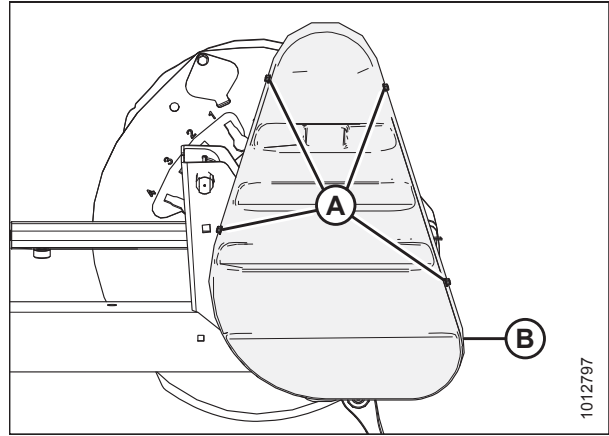


Figure 5.326: Drive Cover – Single Reel

#### *Double-reel drive:*

3. Remove six bolts (A) securing upper cover (B) to the reel drive and lower cover (C).
4. Remove upper cover (B).

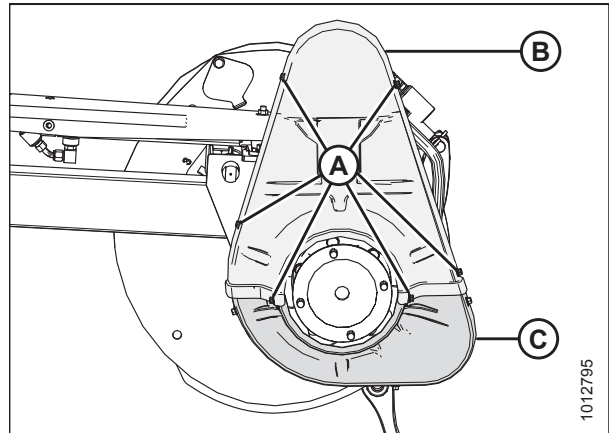


Figure 5.327: Drive Cover – Double Reel

## MAINTENANCE AND SERVICING

5. Remove three bolts (A) and remove lower cover (B) if necessary.

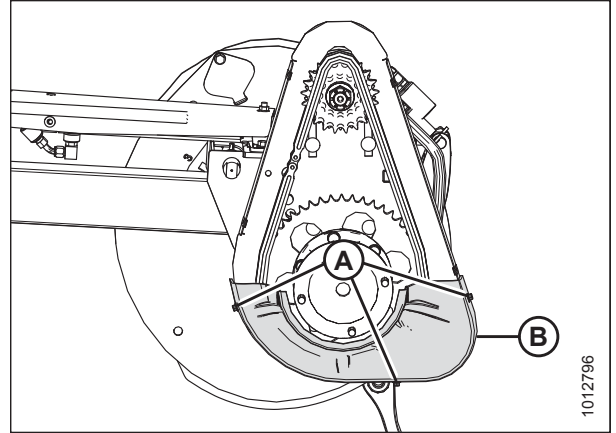


Figure 5.328: Lower Drive Cover

### Installing Reel Drive Cover

#### DANGER

To avoid injury or death from unexpected start-up of machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Shut down the engine, and remove the key from the ignition.

#### *Single-reel drive:*

2. Position drive cover (B) onto the reel drive, and secure with four bolts (A). Torque bolts to 12–13.2 Nm (9–10 lbf·ft).

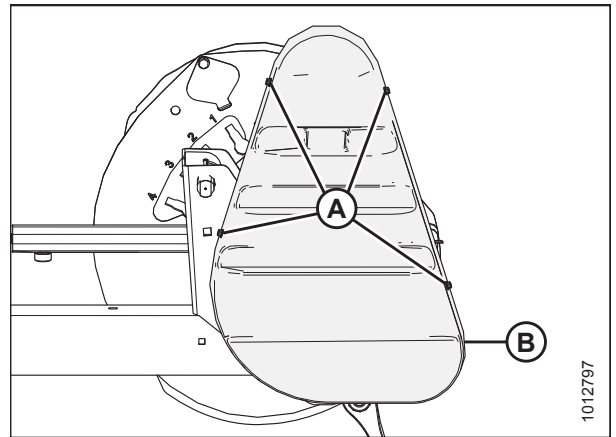


Figure 5.329: Drive Cover – Single Reel

**Double-reel drive:**

3. Position lower drive cover (B) onto the reel drive (if previously removed), and secure with three bolts (A). Torque bolts to 12–13.2 Nm (9–10 lbf-ft).

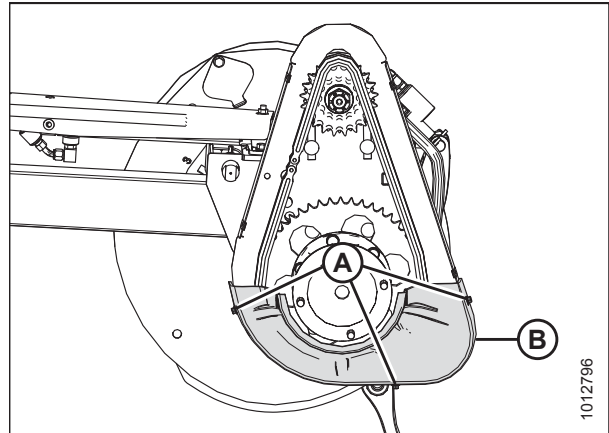


Figure 5.330: Lower Drive Cover – Double Reel

4. Position upper drive cover (B) onto the reel drive and lower cover (C), and secure with six bolts (A). Torque bolts to 12–13.2 Nm (9–10 lbf-ft).

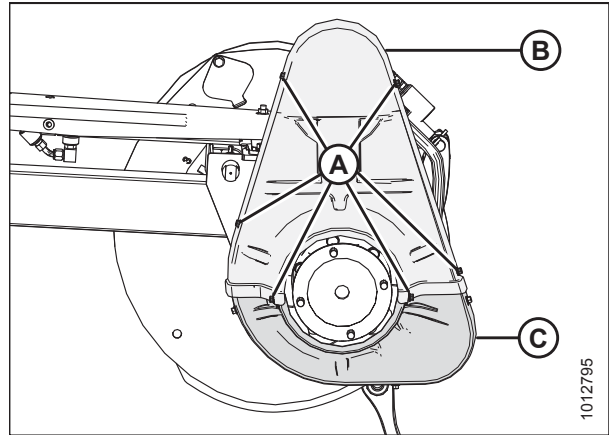


Figure 5.331: Drive Cover – Double Reel

### 5.14.2 Reel Drive Chain Tension

*Loosening Reel Drive Chain*

**⚠ DANGER**

To avoid bodily injury or death from unexpected startup of machine, always stop the engine and remove the key before making adjustments to the machine.

1. Lower the header fully.
2. Adjust the reel to full forward position for easier access to the work area.
3. Shut down the engine, and remove the key from the ignition.
4. Remove the drive cover. For instructions, refer to [Removing Reel Drive Cover, page 562](#).

## MAINTENANCE AND SERVICING

- Loosen six nuts (A).

**NOTE:**

Parts removed from illustration for clarity.

- Slide motor (B) and motor mount (C) down towards the reel shaft.

**IMPORTANT:**

Do **NOT** operate the reel with the reel cover removed.

- To retighten the drive chain, refer to [Tightening Reel Drive Chain](#), page 565.

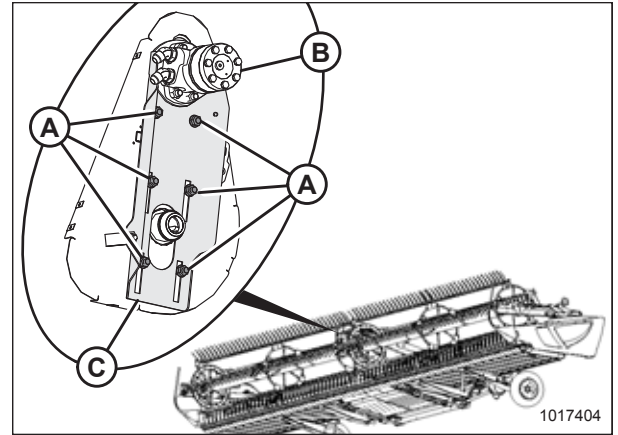


Figure 5.332: Reel Drive

### Tightening Reel Drive Chain



**DANGER**

To avoid bodily injury or death from unexpected startup of machine, always stop the engine and remove the key before making adjustments to the machine.

- Lower the header fully.
- Adjust the reel to full forward position for easier access to the work area.
- Shut down the engine, and remove the key from the ignition.
- Remove the drive cover. For instructions, refer to [Removing Reel Drive Cover](#), page 562.
- Slide motor (A) and motor mount (B) upward until chain (C) is tight.
- Ensure there is 3 mm (1/8 in.) of slack at the chain midspan. Adjust if necessary.

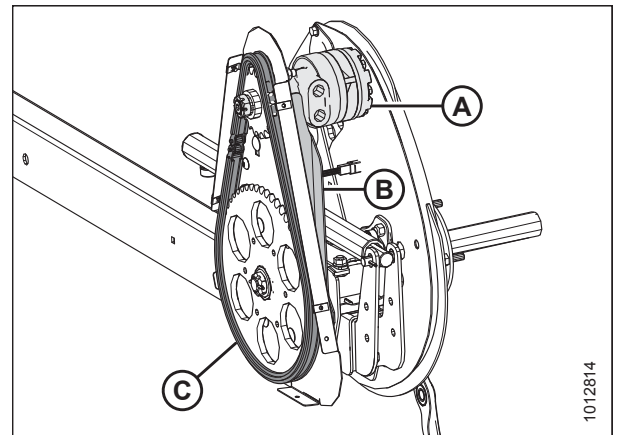


Figure 5.333: Single-Reel Drive – Double Reel Similar

## MAINTENANCE AND SERVICING

7. Tighten six nuts (A). Torque to 73 Nm (54 lbf-ft).
8. Install the drive cover. For instructions, refer to *Installing Reel Drive Cover, page 563*.

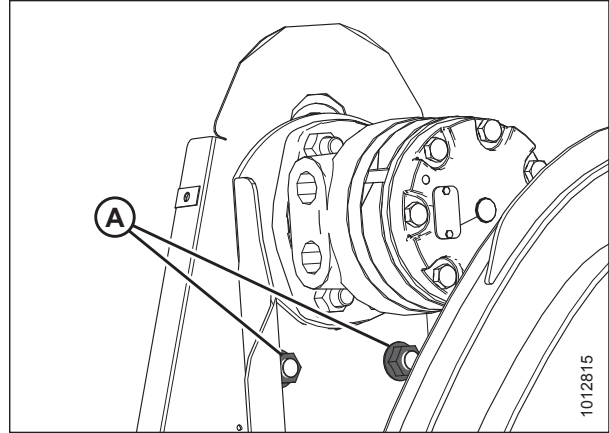


Figure 5.334: Single-Reel Drive – Double Reel Similar

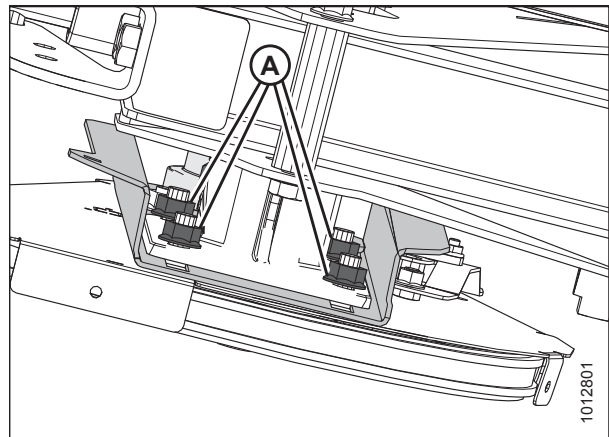


Figure 5.335: Single-Reel Drive – Viewed from Underside of Reel

### 5.14.3 Reel Drive Sprocket

The reel drive sprocket is attached to the reel drive motor.

For Case IH and New Holland combine models, configure the combine according to the reel sprocket size in order to optimize the auto reel to ground speed control. Refer to the combine service manual for more information.

#### *Removing Reel Drive Sprocket*

#### **DANGER**

To avoid injury or death from unexpected start-up of machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Shut down the engine, and remove the key from the ignition.
2. Remove the reel drive cover. For instructions, refer to *Removing Reel Drive Cover, page 562*.

## MAINTENANCE AND SERVICING

3. Loosen reel drive chain (A). For instructions, refer to [Loosening Reel Drive Chain, page 564](#).
4. Remove reel drive chain (A) from reel drive sprocket (B).

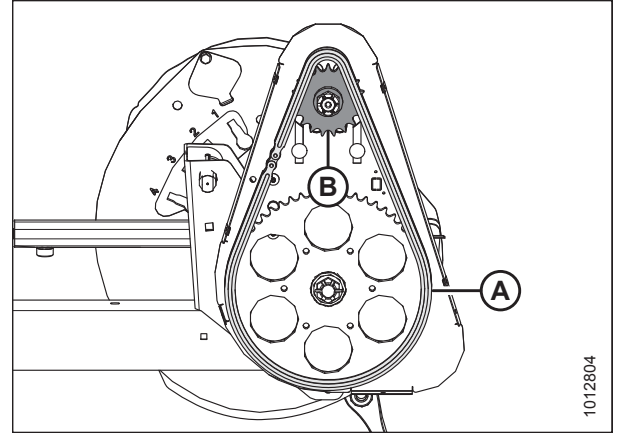


Figure 5.336: Reel Drive Sprocket

5. Remove cotter pin (A), slotted nut (B), and flat washer (C) from the motor shaft.
6. Remove reel drive sprocket (D). Ensure the key remains in the shaft.

### IMPORTANT:

To avoid damaging the motor, use a puller if the drive sprocket (D) does not come off by hand. Do **NOT** use a pry bar and/or hammer to remove the drive sprocket.

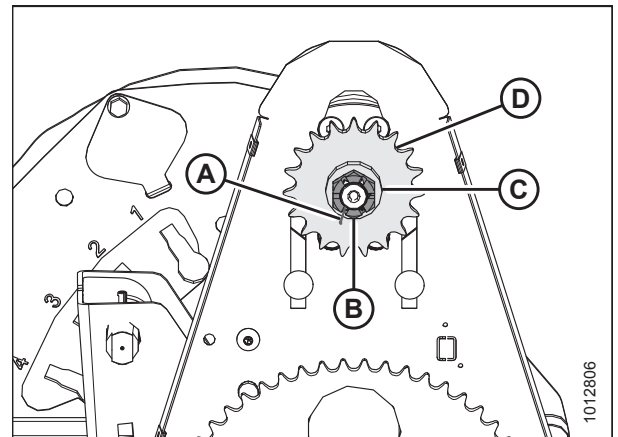


Figure 5.337: Reel Drive Sprocket

### Installing Reel Drive Sprocket

#### DANGER

To avoid injury or death from unexpected start-up of machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Align the keyway in sprocket (D) with the key on the motor shaft, and slide the sprocket onto the shaft. Secure with flat washer (C) and slotted nut (B).
2. Torque slotted nut (B) to 54 Nm (40 lbf-ft).
3. Install cotter pin (A). If necessary, tighten slotted nut (B) to the next slot to install the cotter pin.

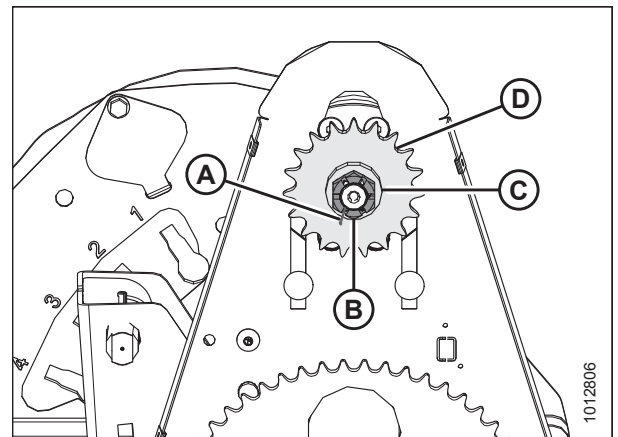


Figure 5.338: Reel Drive

## MAINTENANCE AND SERVICING

4. Install drive chain (A) onto drive sprocket (B).
5. Tighten the drive chain. For instructions, refer to [Tightening Reel Drive Chain, page 565](#).
6. Reinstall the reel drive cover. For instructions, refer to [Installing Reel Drive Cover, page 563](#).

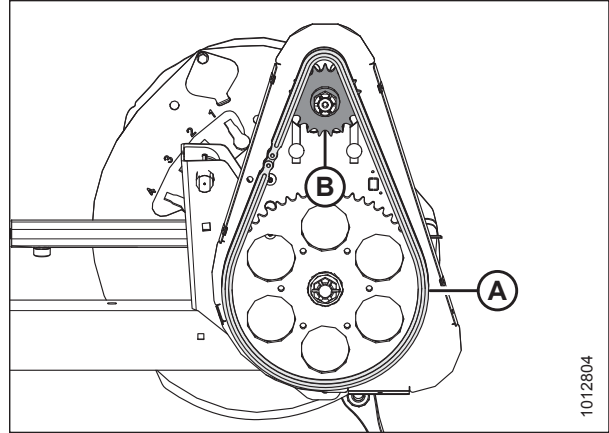


Figure 5.339: Reel Drive

### 5.14.4 Double-Reel Drive U-Joint

The double-reel drive U-joint allows each reel to move independently.

Lubricate the U-joint according to the specifications. For instructions, refer to [5.3.6 Lubrication and Servicing, page 404](#).

Replace the U-joint if severely worn or damaged. For instructions, refer to [Removing Double-Reel Drive U-Joint, page 568](#).

#### *Removing Double-Reel Drive U-Joint*

#### DANGER

To avoid injury or death from unexpected start-up of machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Shut down the engine, and remove the key from the ignition.
2. Remove the drive cover. For instructions, refer to [Removing Reel Drive Cover, page 562](#).
3. Support the inboard end of the right reel with a front end loader and nylon slings (A) or equivalent lifting devices.

#### **IMPORTANT:**

To avoid damaging or denting the center tube, support the reel as close to the end disc as possible.

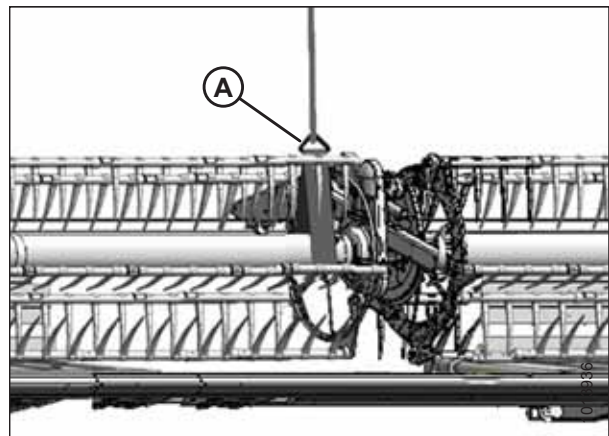


Figure 5.340: Supporting Reel



## MAINTENANCE AND SERVICING

4. Remove four bolts (A) securing the reel tube to U-joint flange (B), and move the reel sideways.

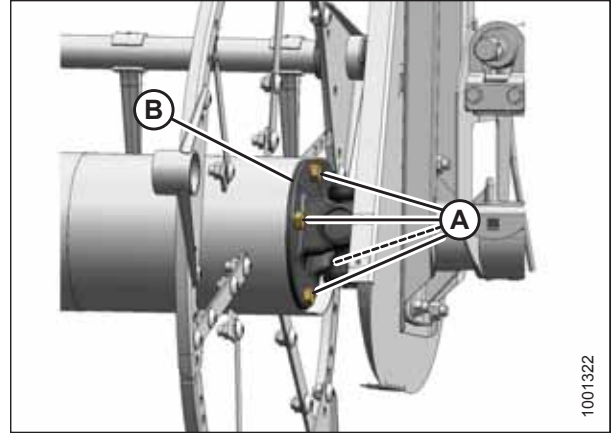


Figure 5.341: U-Joint

5. Remove six bolts (A) attaching U-joint flange (B) to driven sprocket (C).
6. Remove the U-joint.

**NOTE:**

It may be necessary to move the right reel sideways so that the U-joint can clear the tube.

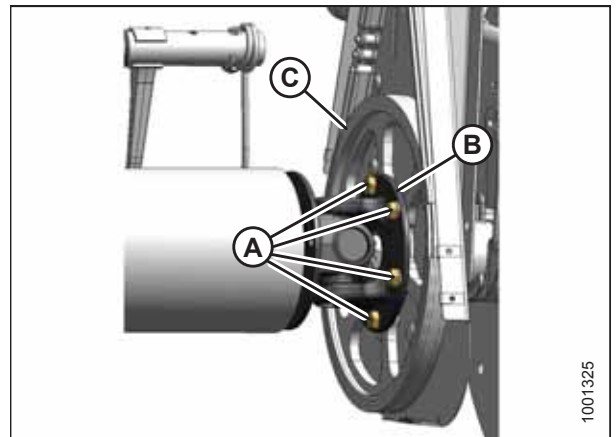


Figure 5.342: U-Joint

### *Installing Double-Reel U-Joint*

1. Position U-joint flange (B) onto driven sprocket (C) as shown.
2. Apply medium-strength threadlocker (Loctite® 243 or equivalent), and install six bolts (A) and hand-tighten. Do **NOT** torque the bolts.

**NOTE:**

Only four bolts (A) are shown in the illustration at right.

**NOTE:**

It may be necessary to move the right reel sideways so that the U-joint can clear the reel tube.

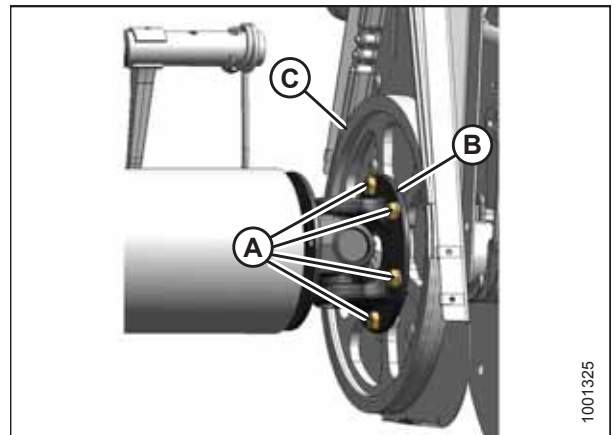


Figure 5.343: U-Joint

## MAINTENANCE AND SERVICING

3. Position the right reel tube against the reel drive and engage the stub shaft into the U-joint pilot hole.
4. Rotate the reel until the holes in the end of the reel tube and U-joint flange (B) line up.
5. Apply medium-strength threadlocker (Loctite® 243 or equivalent) to four 1/2 in. bolts (A) and secure in the flange.
6. Torque the ten bolts to 108 Nm (80 lbf-ft).

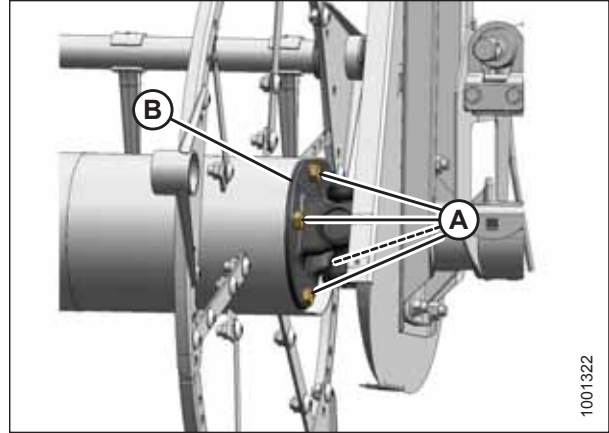


Figure 5.344: U-Joint

7. Remove sling (A) from the reel.
8. Install the drive cover. For instructions, refer to [Installing Reel Drive Cover, page 563](#).

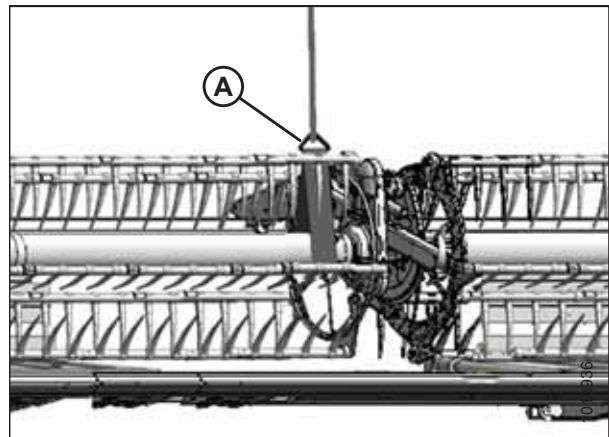


Figure 5.345: Supporting Reel

### 5.14.5 Reel Drive Motor

The reel drive motor is used on the reel drive system on single-reel and double-reel draper headers. This motor does not require regular maintenance or servicing. If problems occur with the motor, remove it and have it serviced by your MacDon Dealer.

#### *Removing Reel Drive Motor*

#### **DANGER**

**To avoid injury or death from unexpected start-up of machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.**

1. Shut down the engine, and remove the key from the ignition.
2. Loosen the drive chain. For instructions, refer to [Loosening Reel Drive Chain, page 564](#).
3. Remove the drive sprocket. For instructions, refer to [Removing Reel Drive Sprocket, page 566](#).

## MAINTENANCE AND SERVICING

4. Mark hydraulic lines (A) and their connections on motor (B) to ensure correct reinstallation.

### NOTE:

Before disconnecting the hydraulic lines, clean the motor's ports and exterior surfaces.

5. Disconnect hydraulic lines (A) at motor (B). Cap or plug open ports and lines.
6. Remove four nuts and bolts (C), and remove motor (B). Retrieve the spacer (if installed) from between motor (B) and the motor mount.
7. If the motor is being replaced, remove the hydraulic fittings from the old motor and install them in the new motor using the same orientations.

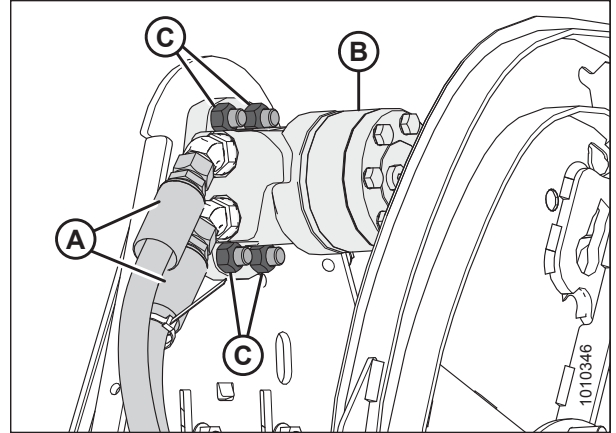


Figure 5.346: Reel Motor and Hoses

### Installing Reel Drive Motor

1. Slide motor mount (A) up or down so the motor mounting holes (B) are accessible through the openings in the chain case.

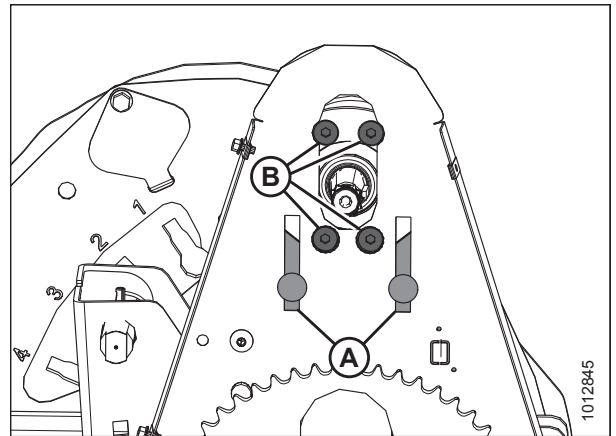


Figure 5.347: Reel Drive Motor Mounting Holes

2. Attach motor (A) (and spacer if previously removed) to motor mount (B) with four 1/2 x 1 3/4 in. countersunk bolts and nuts (C).
3. If installing a new motor, install the hydraulic fittings (not shown) from the original motor.

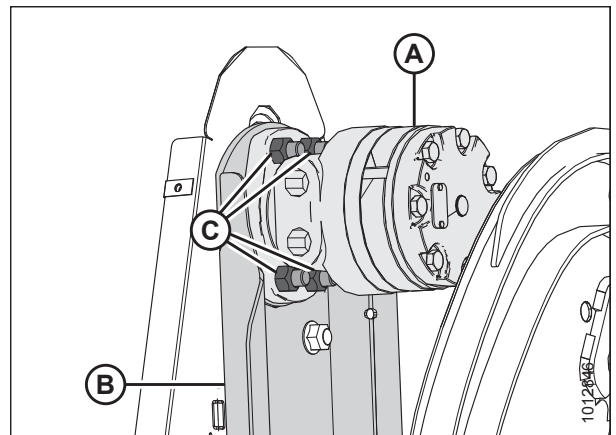


Figure 5.348: Reel Drive Motor

## MAINTENANCE AND SERVICING

4. Remove the caps or plugs from the ports and lines and connect hydraulic lines (A) to hydraulic fittings (B) on motor (C).

**NOTE:**

Ensure hydraulic lines (A) are installed in their original locations.

5. Install the drive sprocket. For instructions, refer to [Installing Reel Drive Sprocket, page 567](#).
6. Tighten the drive chain. For instructions, refer to [Tightening Reel Drive Chain, page 565](#).

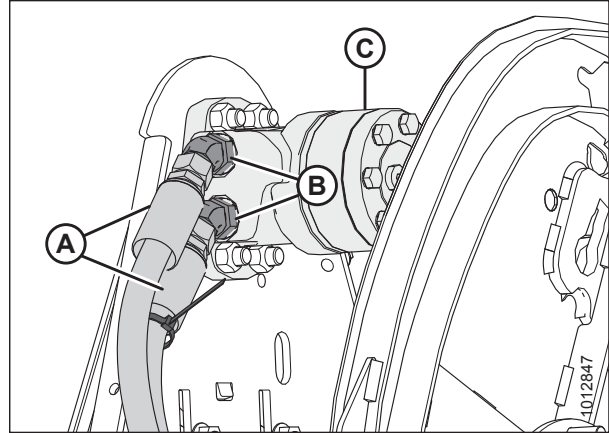


Figure 5.349: Reel Motor and Hoses

### 5.14.6 Replacing Drive Chain on Double Reel

**⚠ DANGER**

To avoid bodily injury or death from unexpected startup of machine, always stop the engine and remove the key before making adjustments to the machine.

1. Shut down the engine, and remove the key from the ignition.
2. Remove the reel drive cover. For instructions, refer to [Removing Reel Drive Cover, page 562](#).
3. Loosen the drive chain. For instructions, refer to [Loosening Reel Drive Chain, page 564](#).
4. Support the inboard end of the right reel with a front end loader and nylon slings (A) or equivalent lifting devices.

**IMPORTANT:**

Avoid damaging or denting the center tube by supporting the reel as close to the end of the reel as possible.

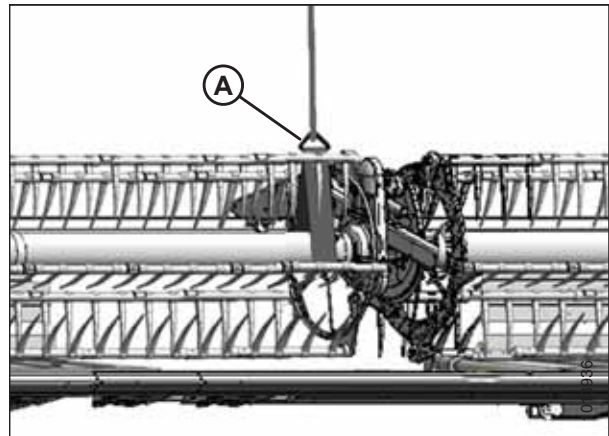


Figure 5.350: Supporting Reel

## MAINTENANCE AND SERVICING

5. Remove four bolts (A) securing the reel tube to U-joint flange (B).

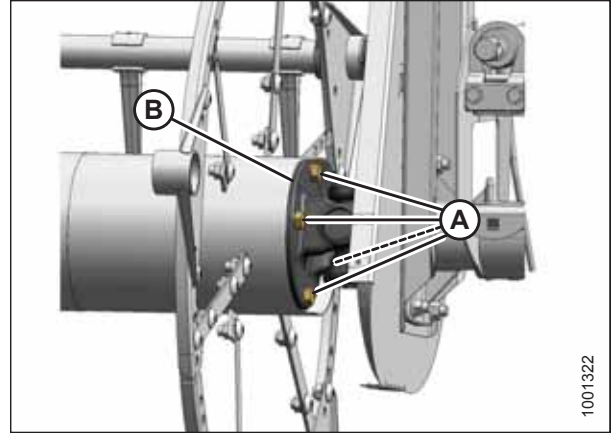


Figure 5.351: U-Joint

6. Move the right reel sideways to separate reel tube (A) from U-joint (B).
7. Remove drive chain (C).
8. Route chain (C) over U-joint (B) and position onto the sprockets.

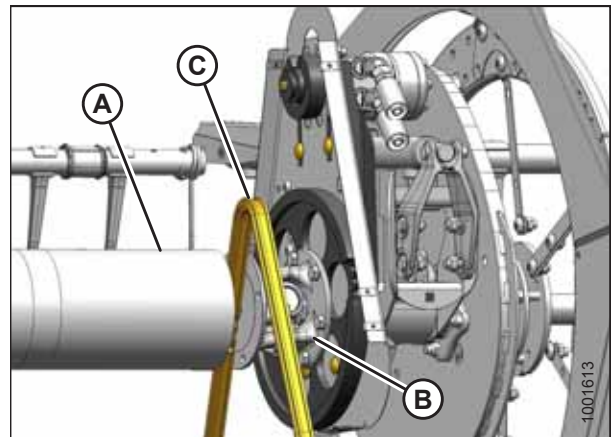


Figure 5.352: Replacing Chain

9. Position the right reel tube against the reel drive and engage the stub shaft into the U-joint pilot hole.
10. Rotate the reel until the holes in end of the reel tube and U-joint flange line up.
11. Apply medium-strength threadlocker (Loctite® 243 or equivalent) to four 1/2 in. bolts (A) and secure to the flange with lock washers.
12. Torque to 102–115 Nm (75–85 lbf·ft).

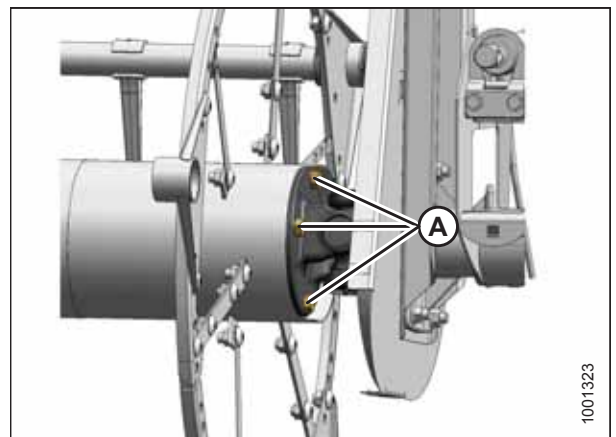


Figure 5.353: U-Joint

13. Remove temporary reel sling (A).
14. Tighten the drive chain. For instructions, refer to [Tightening Reel Drive Chain, page 565](#).
15. Reinstall the reel drive cover. For instructions, refer to [Installing Reel Drive Cover, page 563](#).

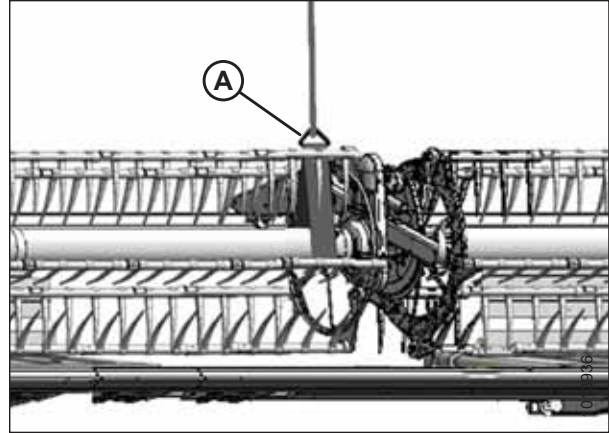


Figure 5.354: Supporting Reel

### 5.14.7 Replacing Single-Reel Header Drive Chain

#### DANGER

To avoid injury or death from unexpected start-up of machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Shut down the engine, and remove the key from the ignition.
2. Remove the reel drive cover. For instructions, refer to [Removing Reel Drive Cover, page 562](#).
3. Loosen the drive chain. For instructions, refer to [Loosening Reel Drive Chain, page 564](#).
4. Lift chain (A) off drive sprocket (B).
5. Lower the chain until it is free from lower sprocket (C), and then remove the chain from the drive.
6. Position new chain (A) around the bottom teeth on lower sprocket (C).
7. Lift the chain onto drive sprocket (B), ensuring all the links are properly engaged in the teeth.
8. Tighten the drive chain. For instructions, refer to [Tightening Reel Drive Chain, page 565](#).
9. Reinstall the reel drive cover. For instructions, refer to [Installing Reel Drive Cover, page 563](#).

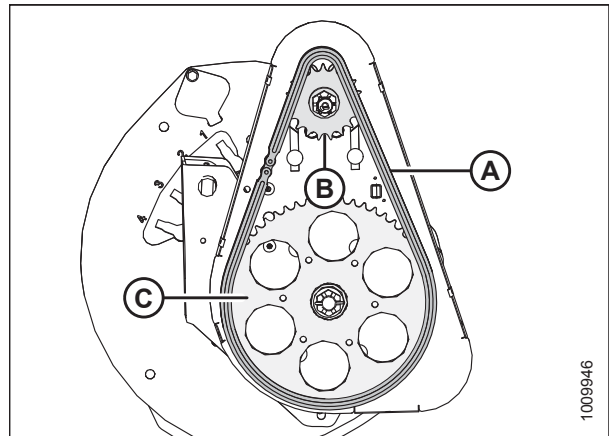


Figure 5.355: Reel Drive

### 5.14.8 Replacing Reel Speed Sensor

The reel speed sensors (and the procedures for replacing them) vary with the combine model.

Refer to the following topics depending on your combine model:

- [Replacing AGCO Reel Speed Sensor, page 575](#)
- [Replacing John Deere Reel Speed Sensor, page 576](#)
- [Replacing CLAAS Reel Speed Sensor, page 577](#)



Replacing AGCO Reel Speed Sensor

**⚠ DANGER**

To avoid injury or death from unexpected start-up of machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Shut down the engine, and remove the key from the ignition.
2. Remove the drive cover. For instructions, refer to *Removing Reel Drive Cover*, page 562.
3. Disconnect electrical connector (A).

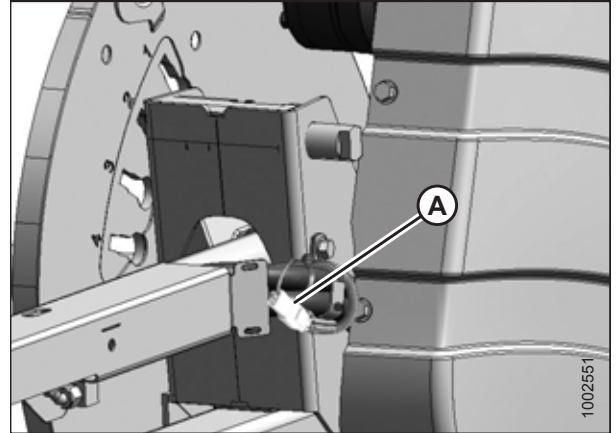


Figure 5.356: Electrical Harness

4. Cut cable tie (A) securing the harness to the cover.
5. Remove two screws (B), sensor (C), and the harness. If necessary, bend cover (D) to remove the harness.
6. Feed the wire of the new sensor behind cover (D) and through the chain case.
7. Locate the new sensor in support (E) and attach with two screws (B).
8. Adjust the gap between sensor disc (F) and sensor (C) to 3.5 mm (0.14 in.).

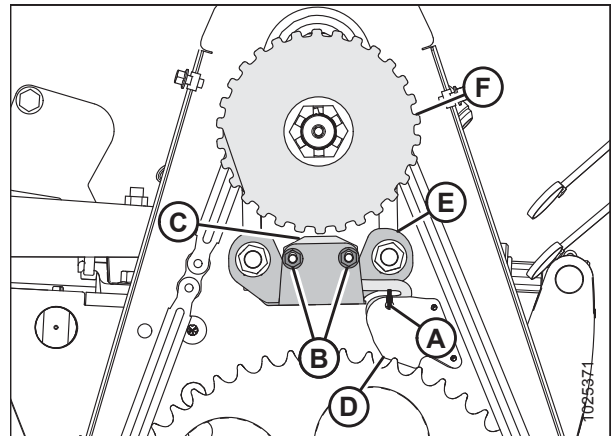


Figure 5.357: Speed Sensor



9. Connect sensor harness with header harness (A).

**IMPORTANT:**

Ensure the sensor electrical harness does **NOT** contact the chain or sprocket.

10. Reinstall the drive cover. For instructions, refer to *Installing Reel Drive Cover, page 563*.
11. Verify proper operation of the sensor.

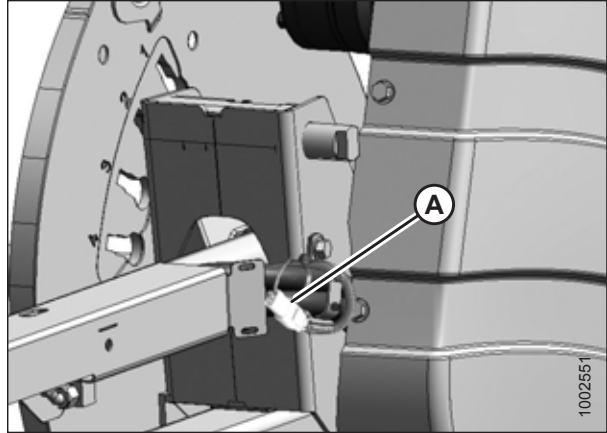


Figure 5.358: Electrical Harness

*Replacing John Deere Reel Speed Sensor*

**⚠ DANGER**

To avoid injury or death from unexpected start-up of machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Shut down the engine, and remove the key from the ignition.
2. Remove the drive cover. For instructions, refer to *Removing Reel Drive Cover, page 562*.
3. Disconnect electrical connector (D).
4. Remove top nut (C) and remove sensor (B).
5. Remove the top nut from the new sensor and position the sensor into the support. Secure with top nut (C).
6. Adjust the gap between sensor disc (A) and sensor (B) to 1 mm (0.04 in.) using nut (C).
7. Connect to sensor connector at (D) and to sensor harness (E).

**IMPORTANT:**

Ensure the sensor electrical harness does **NOT** contact the chain or sprocket.

8. Reinstall the drive cover. For instructions, refer to *Installing Reel Drive Cover, page 563*.

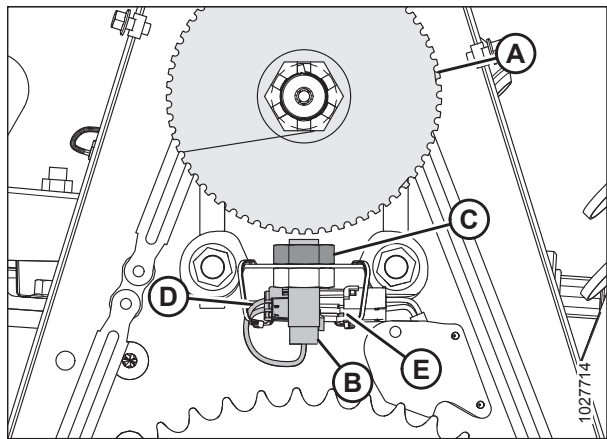


Figure 5.359: Speed Sensor

*Replacing CLAAS 400 Series Reel Speed Sensor*

**⚠ DANGER**

To avoid injury or death from unexpected start-up of machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Shut down the engine, and remove the key from the ignition.
2. Remove the drive cover. For instructions, refer to *Removing Reel Drive Cover, page 562*.
3. Disconnect electrical connector located behind the chain case.

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4. Remove and discard top nut (A) and sensor (B).
5. Remove the top nut from the new sensor, and position new sensor (B) into the support. Secure with top nut (A).
6. Adjust the gap between sensor disc (C) and sensor (B) to 3.5 mm (0.14 in.) using nuts (A) and (D).
7. Route harness through knockout hole (E) and connect to the harness behind the chain case.

### IMPORTANT:

Ensure the sensor electrical harness does **NOT** contact the chain or sprocket.

8. Reinstall the drive cover. For instructions, refer to *Installing Reel Drive Cover, page 563*.

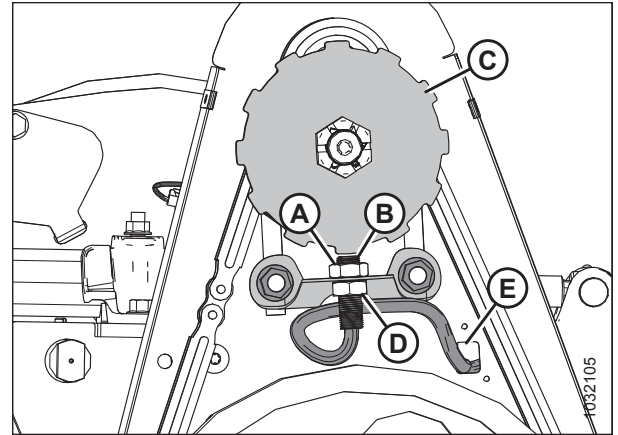


Figure 5.360: Speed Sensor

### Replacing CLAAS Reel Speed Sensor

#### DANGER

To avoid injury or death from unexpected start-up of machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Shut down the engine, and remove the key from the ignition.
2. Remove the drive cover. For instructions, refer to *Removing Reel Drive Cover, page 562*.
3. Disconnect the electrical connector located behind the chain case from sensor (A).
4. Remove cable ties (B).
5. Remove shield (C) and rivets (D).
6. Remove nut (E) and remove sensor (A).
7. Position new sensor (A) into support (F). Secure with nut (E).
8. Adjust the gap between sensor disc (C) and sensor (B) to 3.5 mm (0.14 in.) using nuts (A) and (D).
9. Route harness through knockout hole in panel and connect to sensor (A). Secure harness in place with shield (C) and rivets (D).
10. Secure harness to sensor support with cable ties (B) as shown.

### IMPORTANT:

Ensure the sensor electrical harness does **NOT** contact the chain or sprocket.

11. Reinstall the drive cover. For instructions, refer to *Installing Reel Drive Cover, page 563*.

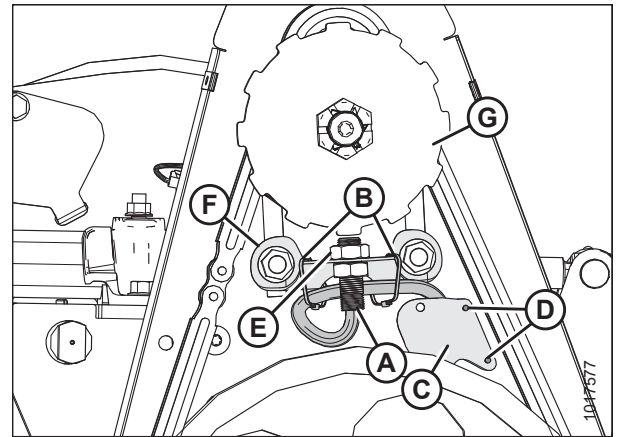


Figure 5.361: Speed Sensor

## 5.15 Transport System (Option)

Refer to [6.4.4 Stabilizer Wheels and Transport Package, page 589](#) for more information.

### 5.15.1 Checking Wheel Bolt Torque

If a transport system is installed, follow these steps to torque the wheel bolts:

#### DANGER

To avoid bodily injury or death from unexpected startup of machine, always stop the engine and remove the key before making adjustments to the machine.

1. Turn off the engine and remove the key.
2. Follow the bolt tightening sequence shown, and torque the wheel bolts to 110–120 Nm (80–90 lbf·ft).

#### IMPORTANT:

Whenever a wheel is removed and reinstalled, check the wheel bolt torque after one hour of operation and every 100 hours thereafter.

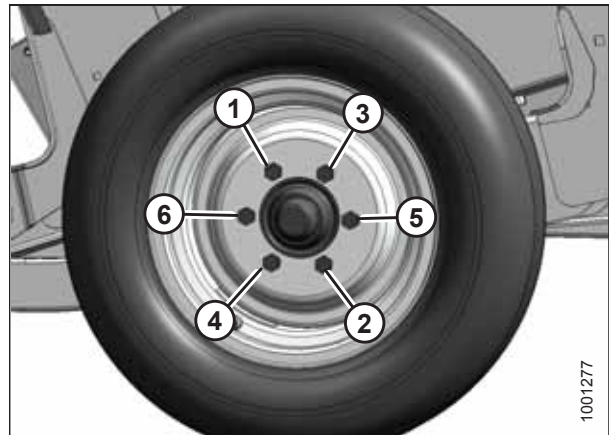


Figure 5.362: Bolt Tightening Sequence

### 5.15.2 Checking Axle Bolt Torque

If a transport system is installed, do the following steps to torque the axle bolts:

#### DANGER

To avoid bodily injury or death from unexpected startup of machine, always stop the engine and remove the key before making adjustments to the machine.

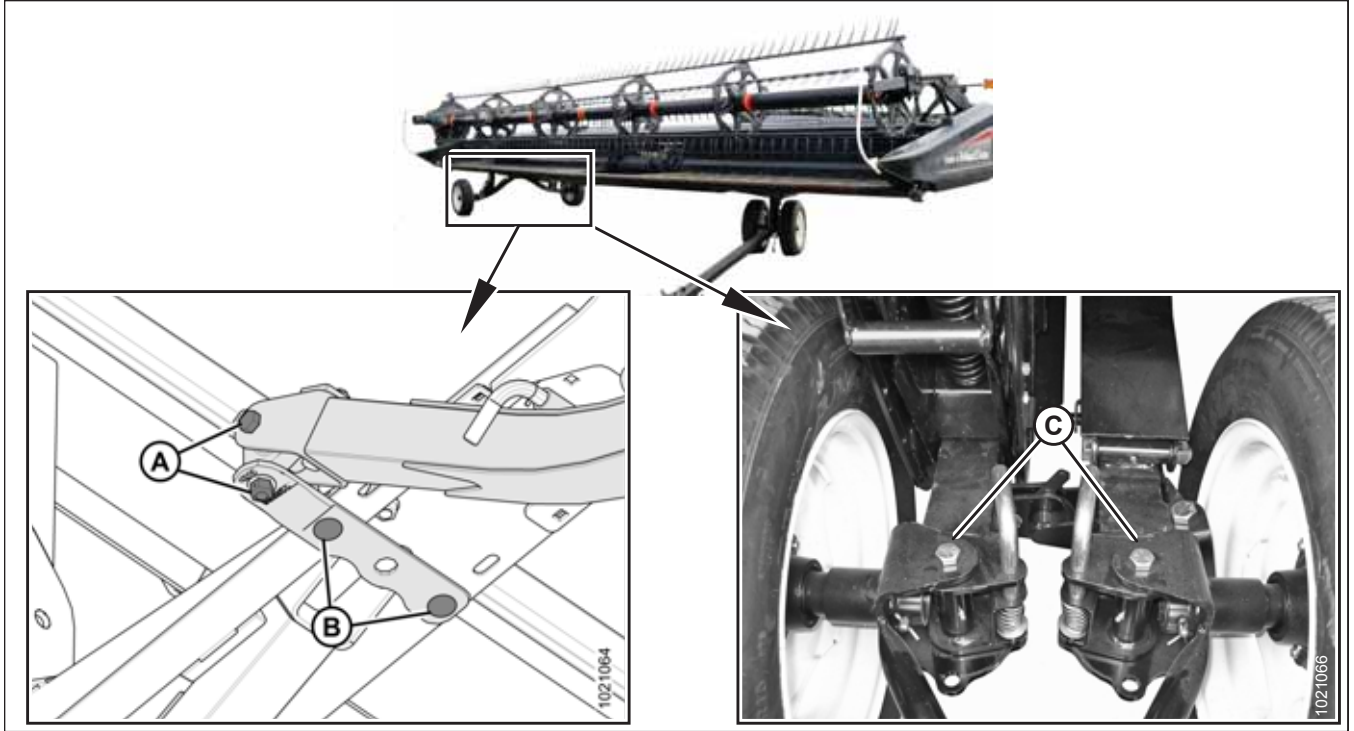


Figure 5.363: Axle Bolts

1. Check and tighten axle bolts **DAILY** until torque is maintained as follows:

- (A): 244 Nm (180 lbf-ft)
- (B): 203 Nm (150 lbf-ft)
- (C): 244 Nm (180 lbf-ft)

### 5.15.3 Checking Tire Pressure

Check the tire inflation pressure and inflate according to the information provided in Table 5.4, page 580.

#### **WARNING**

- Service tires safely.
- A tire can explode during inflation, which could cause serious injury or death.
- Do NOT stand over tire. Use a clip-on chuck and extension hose.
- Do NOT exceed maximum inflation pressure indicated on tire label or sidewall.
- Replace tires that have defects.
- Replace wheel rims that are cracked, worn, or severely rusted.
- Never weld a wheel rim.
- Never use force on an inflated or partially inflated tire.
- Make sure the tire is correctly seated before inflating to operating pressure.

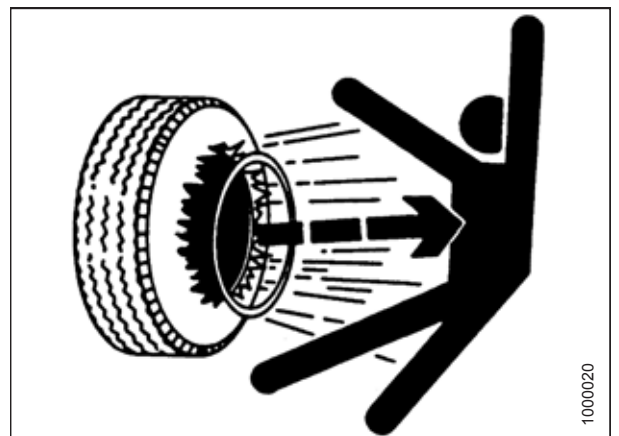


Figure 5.364: Inflation Warning

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- If the tire is not correctly positioned on the rim or is overinflated, the tire bead can loosen on one side causing air to escape at high speed and with great force. An air leak of this nature can thrust the tire in any direction endangering anyone in the area.
- Make sure all the air is removed from the tire before removing the tire from the rim.
- Do NOT remove, install, or repair a tire on a rim unless you have the proper equipment and experience to perform the job.
- Take the tire and rim to a qualified tire repair shop.

Table 5.4 Tire Pressure

Size	Load Range	Pressure
ST205/75 R15	D	517 kPa (75 psi)
ST205/75 R15	E	586 kPa (85 psi)

## Chapter 6: Options and Attachments

The following options and attachments are available for use with your header. See your MacDon Dealer for availability and ordering information.

### 6.1 FM100 Float Module

The float module is used to attach the header to the combine. It combines the crop flow from both side drapers and also pulls crop into the combine feeder house.

#### 6.1.1 Hillside Extension Kit

The Hillside Extension kit allows overfilling the hydraulic reservoir on FM100 Float Modules. This allows operation on steep hillsides while maintaining oil supply to the suction side of pump.

Installation instructions are included in the kit.

MD #B6057

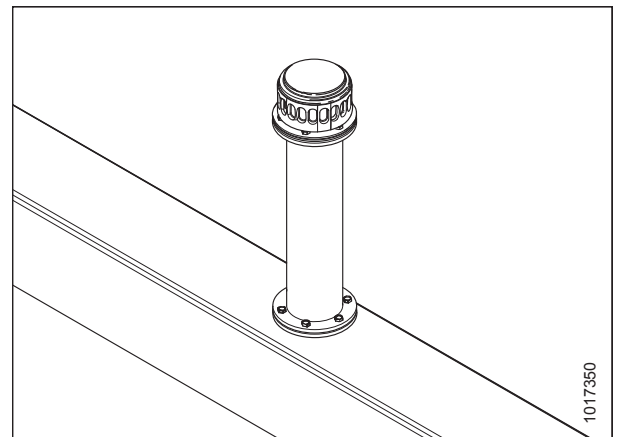


Figure 6.1: Hillside Extension Kit

## 6.2 Reel

### 6.2.1 Multi-Crop Rapid Reel Conversion Kit

For use on double-reel headers only, the Multi-Crop Rapid Reel Conversion kit decreases the time required to change the fore-aft cylinder position on the reel support arm from the normal operating location to a farther aft location that minimizes crop disturbance. The kit also allows the reel fore-aft cylinders to be quickly moved to the normal operating location.

MD #B6590

**NOTE:**

The Multi-Crop Rapid Reel Conversion kit is not available for European-configured D1 Series headers.

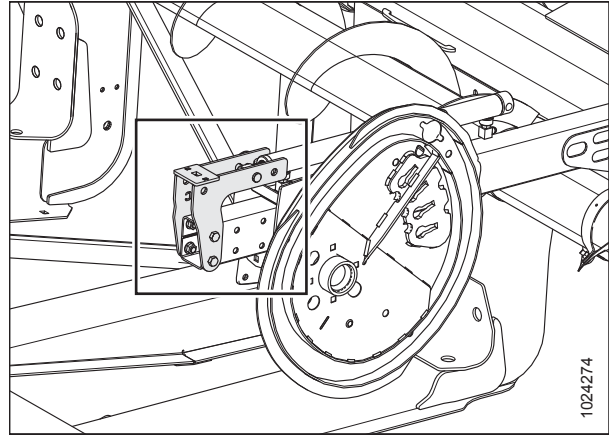


Figure 6.2: Center Arm – Left and Right Arms Similar

### 6.2.2 Reel Arm Extension Kit – European-Configured Headers Only

This kit provides extensions for the outer reel support arms on an European-configured D1 Series header. These extensions provide the additional reel arm length required to properly install a Vertical Knife Mount kit (MD #B6137, MD #B6138) onto the header. The Reel Arm Extension kit also includes reel fore-aft brackets allowing quick reel repositioning from the reel's most forward position to its most rearward position.

**NOTE:**

Parts removed from illustration for clarity.

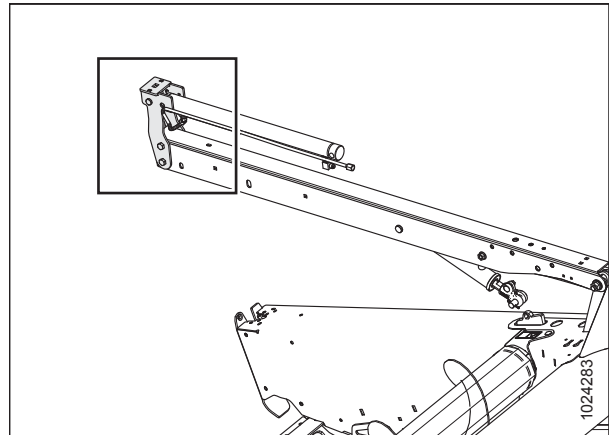


Figure 6.3: Right Arm – Center and Left Arms Similar



### 6.2.3 Reel Arm Extension Kit – North American-Configured Headers Only

This kit provides extensions for the outer reel support arms on a North American-configured D1 Series header. These extensions provide the additional reel arm length required to properly install a Vertical Knife Mount kit (MD #B6608, MD #B6609) onto the header. The Reel Arm Extension kit also includes reel fore-aft brackets allowing quick reel repositioning from the reel's most forward position to its most rearward position.

**NOTE:**

Parts removed from illustration for clarity.

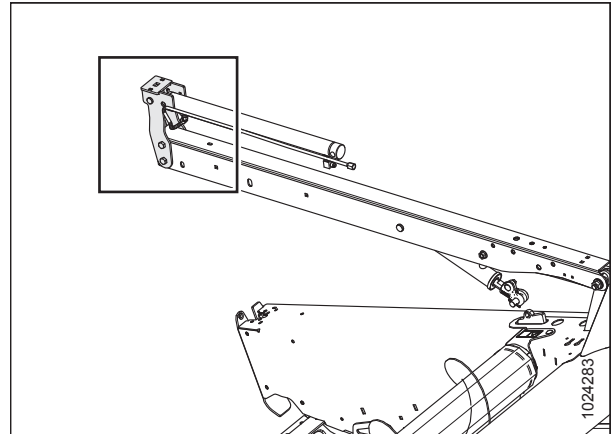


Figure 6.4: Right Arm – Center and Left Arms Similar

### 6.2.4 Lodged Crop Reel Finger Kit

Steel fingers (A) provided in the Lodged Crop Reel Finger kit attach to the ends of every other tine bar and help to clear material in heavy, hard-to-cut crops such as lodged rice.

Each kit contains three fingers for the cam end of the reel and three fingers for the tail end. Hardware and installation instructions are included in the kit.

MD #B4831

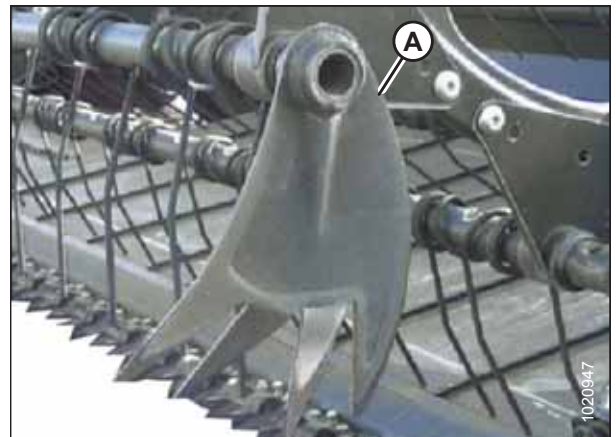


Figure 6.5: Lodged Crop Fingers

### 6.2.5 PR15 Tine Tube Reel Conversion Kit

These kits allow conversion from a six-bat reel to a nine-bat reel.

**Steel fingers:**

- D115 – MD #B6514
- D120 – MD #B6515
- D125 – MD #B5656
- D130 – MD #B5657<sup>60</sup>

**Plastic fingers:**

- D115 – MD #B6516
- D120 – MD #B6517

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60. Double-reel units only.

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- D125 – MD #B5937
- D130 – MD #B6029<sup>61</sup>

### NOTE:

All six-bat to nine-bat reel conversion kits include reel endshields.

### 6.2.6 Reel Endshield Kit

The steel shields provided in the reel endshield kit attach to the ends of the reels and help to clear material in heavy, hard-to-cut crops. They are standard equipment on all headers (except those with nine-bat reels). Hardware and installation instructions are included in the kit.

See your MacDon Dealer for more information.

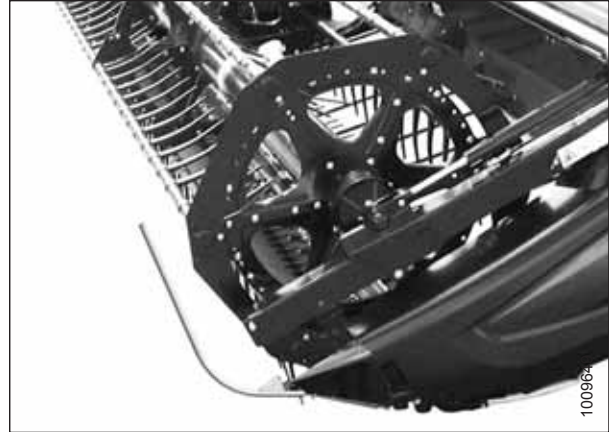


Figure 6.6: Reel Endshields

### 6.2.7 Tine Tube Reinforcing Kit

Tine tube reinforcing kits are available for five- and six-bat reels. They are designed to support high reel loads when cutting extremely heavy crops. Installation instructions are provided in the kit.

- Five-Bat Reels – MD #B5825
- Six-Bat Reels – MD #B5826



Figure 6.7: Five-Bat Reinforcing Kit Shown – Six-Bat Reinforcing Kit Similar

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61. Double-reel units only.

## 6.3 Cutterbar

The cutterbar is located on the front of the header. It supports the knife and guards which is used to cut the crop.

### 6.3.1 Cutterbar Wearplate

Cutterbar wearplates are recommended for cutting on the ground when the soil is adhering to the steel.

Order one of the following bundles based on header size:

- 4.6 m (15 ft.) – MD #B4864
- 6.1 m (20 ft.) – MD #B4865
- 7.6 m (25 ft.) – MD #B4838
- 9.1 m (30 ft.) – MD #B4839
- 10.6 m (35 ft.) – MD #B4840
- 12.1 m (40 ft.) – MD #B4841
- 13.7 m (45 ft.) – MD #B5114



Figure 6.8: Cutterbar Wearplates

### 6.3.2 Knife Cutout Cover

Knife cutout covers attach to the endsheets and prevent cut crop, particularly severely lodged crop, from passing through the knifehead opening and accumulating in the knife drive box and endsheet.

Order the following kits according to your header size:

- D120–D125 – MD #220102 (stub guards)
- D130–D140 – MD #220103 (stub guards)

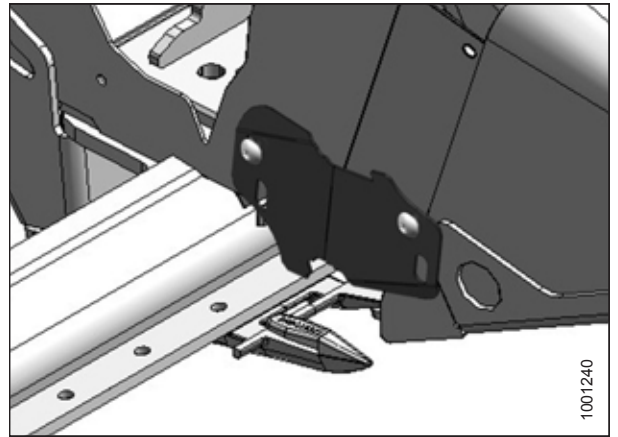


Figure 6.9: Knife Cutout Cover

### 6.3.3 Extended Center Filler

The Extended Center Filler kit (MD #B6450) includes a reinforced flap (3 mm [1/8 in.] thick) which extends onto the feed draper of a MacDon FM100 Float Module to help reduce loss when cutting crops such as beans and peas. Installation instructions are included with the kit.

MD #B6450

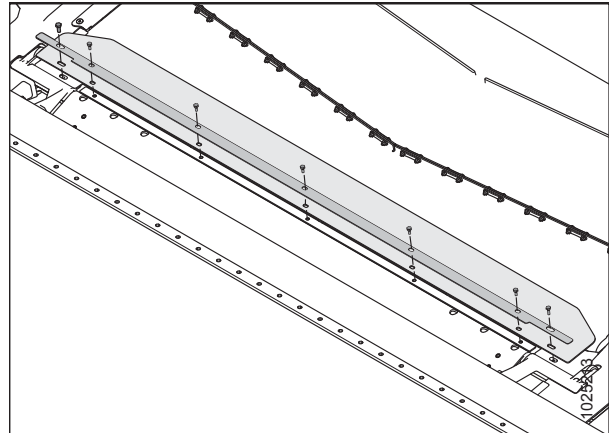


Figure 6.10: Extended Filler

### 6.3.4 Rock Retarder

Rock retarder (A) consists of a steel angle that is bolted to the cutterbar immediately aft of the knife, and helps prevent rocks and large debris from being swept onto the drapers with the crop. Installation instructions are included with the kit.

Order bundles by header size:

- D125, D130, and D135 – MD #B5084
- D140 and D145 – MD #B5085

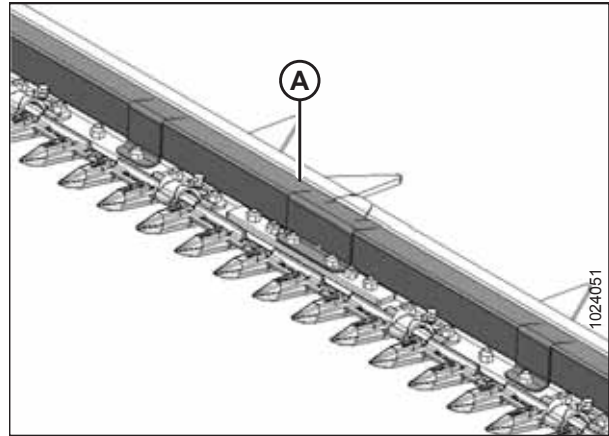


Figure 6.11: Rock Retarder

### 6.3.5 Stub Guard Conversion Kit

Stub guards, complete with top guides and adjuster shoes, are designed to cut tough crops.

Installation and adjustment instructions are included in the kits.

Order one of the following bundles according to your header size:

- 4.6 m (15 ft.) – MD #B5009
- 6.1 m (20 ft.) – MD #B5010
- 7.6 m (25 ft.) – MD #B5011
- 9.1 m (30 ft.) – MD #B5012
- 10.7 m (35 ft.) – MD #B5013

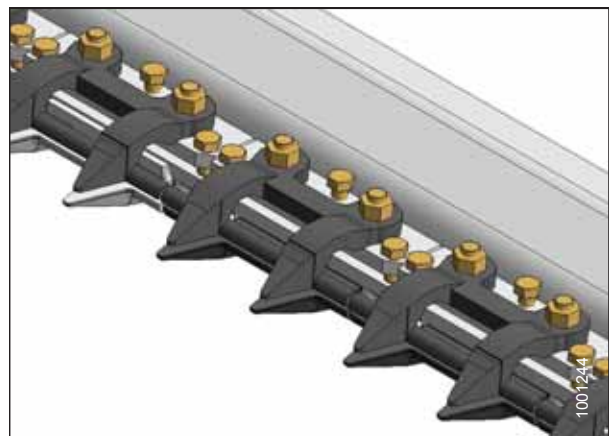


Figure 6.12: Stub Guards

### 6.3.6 Vertical Knives

These hydraulically driven knives install in place of the standard divider cones and help to minimize crop shatter at the dividers when harvesting canola/rapeseed.

Three types of kits are required to install vertical knives on the header:

- One set of knives – MD #B6410
- Two mounting kits (for the left and right sides of the header) – refer to "Knife Mounts" in Table 6.1, page 587.
- One plumbing kit – refer to "Knife Plumbing" in Table 6.1, page 587.

**Table 6.1 Kits Required to Install Vertical Knives on a Header**

Required Kit	Kits per Header
Knives	Order one of MD #B6410
Knife Mounts	Order the set of bundles according to your header configuration:  <b>Non-European:</b> <ul style="list-style-type: none"> <li>• One of MD #B6608 <sup>62</sup></li> <li>• One of MD #B6609 <sup>63</sup></li> </ul> <b>European:</b> <ul style="list-style-type: none"> <li>• One of MD #B6137 <sup>64</sup></li> <li>• One of MD #B6138 <sup>65</sup></li> </ul>
Knife Plumbing	Order one of the following bundles according to your model of header: <ul style="list-style-type: none"> <li>• D115 – MD #B6263</li> <li>• D120 – MD #B6264</li> <li>• D125 – MD #B6265</li> <li>• D130 single reel – MD #B6266</li> <li>• D130 double reel – MD #B6255</li> <li>• D135 single reel – MD #B6267</li> <li>• D135 double reel – MD #B6256</li> <li>• D140 – MD #B6257</li> <li>• D145 – MD #B6258</li> </ul>

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62. The Left Vertical Knife Mount kit (MD #B6608) cannot be installed onto the header by itself and must be installed with the Right Vertical Knife Mount kit (MD #B6609).

63. The Right Vertical Knife Mount kit (MD #B6609) can be installed onto the header either by itself or with the Left Vertical Knife Mount kit (MD #B6608).

64. The Left Vertical Knife Mount kit (MD #B6137) cannot be installed onto the header by itself and must be installed with the Right Vertical Knife Mount kit (MD #B6138).

65. The Right Vertical Knife Mount kit (MD #B6138) can be installed onto the header either by itself or with the Left Vertical Knife Mount kit (MD #B6137).

## 6.4 Header

Header options add features or enhancements to the header frame rather than a specific system or function.

### 6.4.1 Divider Quick Latch Kit

Divider Quick Latch kits attach to the endsheets. They allow for quick removal and storage of endsheet divider cones and, if required, reduce the transport width of the header. Installation instructions are included in the kit.

MD #B6158

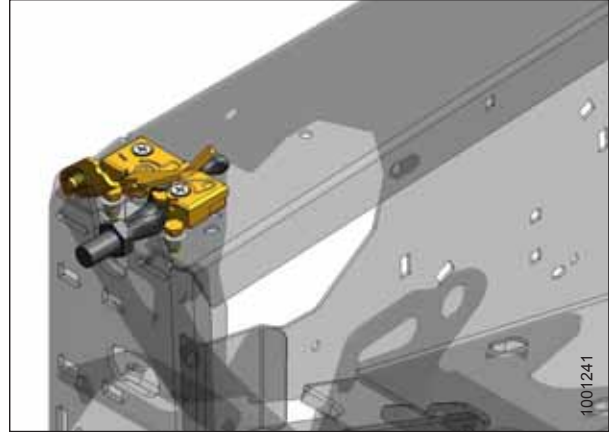


Figure 6.13: Divider Latch

### 6.4.2 Stabilizer Wheels

Stabilizer wheels help stabilize the header in field conditions that would otherwise cause the header to bounce, resulting in uneven cutting heights. Installation and adjustment instructions are included in the kit.

Available as an attachment for use with D130, D135, D140, and D145 headers.

MD #C1986

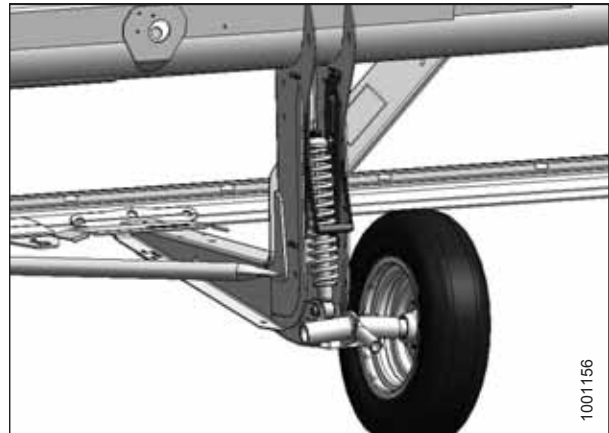


Figure 6.14: Stabilizer Wheel

### 6.4.3 Secondary Stabilizer Wheel

The secondary stabilizer wheel is added to existing stabilizer wheels to help stabilize the header in field conditions that would otherwise cause the header to bounce and result in uneven cutting height. Installation and adjustment instructions are included with the kit.

Available as an attachment for use with D130, D135, D140, and D145 headers.

MD #B6179<sup>66</sup>

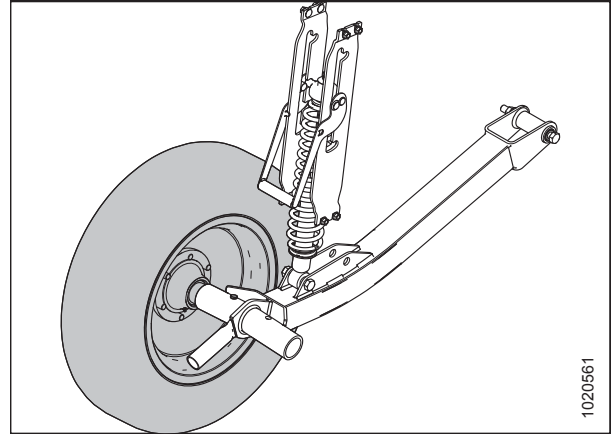


Figure 6.15: Secondary Stabilizer Wheel

### 6.4.4 Stabilizer Wheels and Transport Package

The Stabilizer Wheels and Transport Package help to stabilize the header in field conditions that would otherwise cause the header to bounce, resulting in uneven cutting heights. This system is similar to the Stabilizer Wheel (MD #C1986) option. For instructions, refer to [6.4.2 Stabilizer Wheels, page 588](#).

The Stabilizer Wheels and Transport Package are also used to convert the header into transport mode for slow-speed towing behind a properly-configured combine (or agricultural tractor). A tow pole and installation instructions are included in the kit.

Non-European configured header: MD #C2007

European configured header: MD #C2008



Figure 6.16: Stabilizer Wheels and Transport

66. Kit consists of one wheel assembly; two kits are required to upgrade both sides of the header.



### 6.4.5 Stubble Light Kit

Stubble lights are used in low light conditions and allow the operator to see the stubble cut behind the header. The Stubble Light Mounting kit is available for MacDon D130, D135, D140, and D145 headers. This kit is currently compatible with John Deere combines only.

MD #B6634

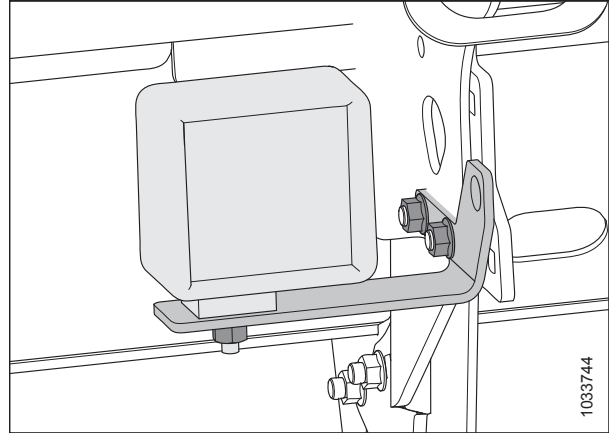


Figure 6.17: Stubble Light Installed on Headers Equipped with Transport

### 6.4.6 Skid Shoe Kits

Skid Shoe kits provide improved performance when cutting low to the ground.

Installation instructions are included in the kits.

- MD #B5615 – Inboard Skid Shoes
- MD #B4963 – Outboard Skid Shoes

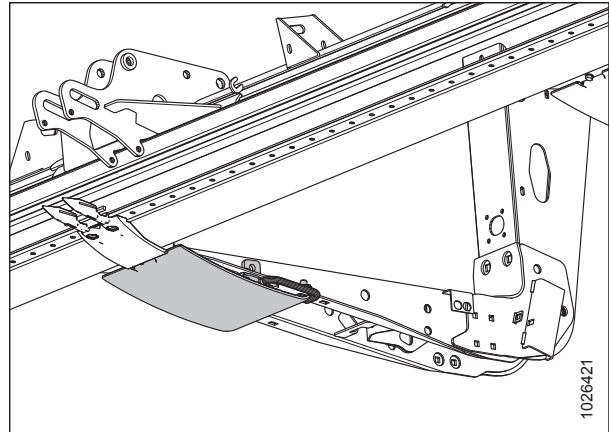


Figure 6.18: Center Skid Shoe – Inboard Shown, Outboard Similar

### 6.4.7 Steel Skid Shoes

Steel skid shoes offer extra abrasion resistance.

**IMPORTANT:**

Not recommended for wet mud or conditions prone to sparking.

Installation instructions are included with kit.

MD #B6583

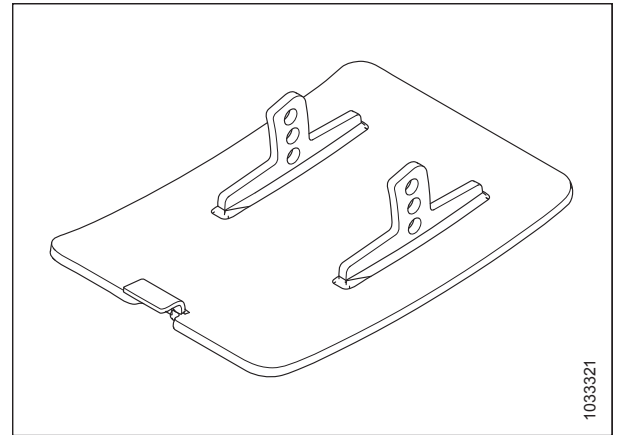


Figure 6.19: Steel Skid Shoe

## 6.5 Crop Delivery

Crop delivery is the process of how the crop gets from the cutterbar to the feeder house.

### 6.5.1 FM100 Dual Auto Header Height Control Sensor Kit

This kit adds two sensors to the float linkage, adding automatic lateral tilt compensation for the header. When installed, the combine will automatically tilt the feeder house from side to side to follow uneven terrain during operation.

**NOTE:**

Not recommended for extremely hilly conditions.

Installation instructions are included in the kit.

MD #B6211

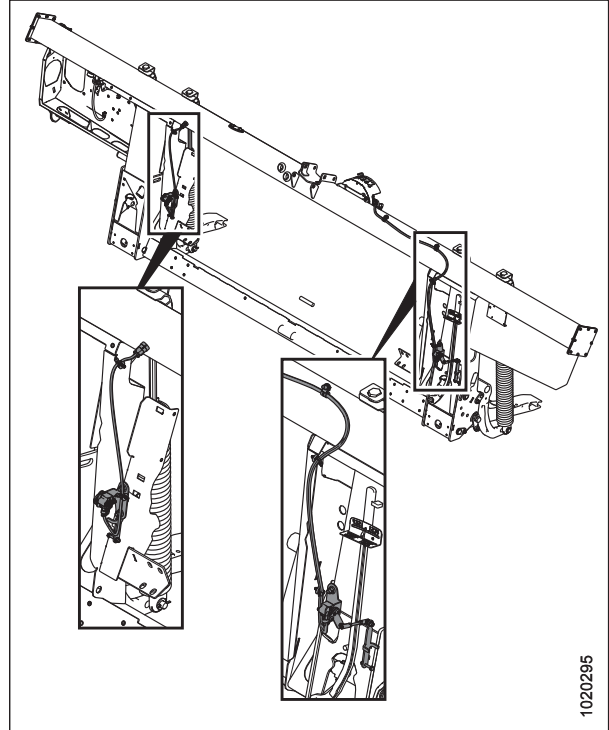


Figure 6.20: Dual AHC Sensors

### 6.5.2 FM100 Feed Auger Flighting

Auger flighting (A) on the FM100 can be configured to specific combines and crop conditions. Refer to [3.8.1 FM100 Feed Auger Configurations, page 58](#) for combine/crop specific configurations.

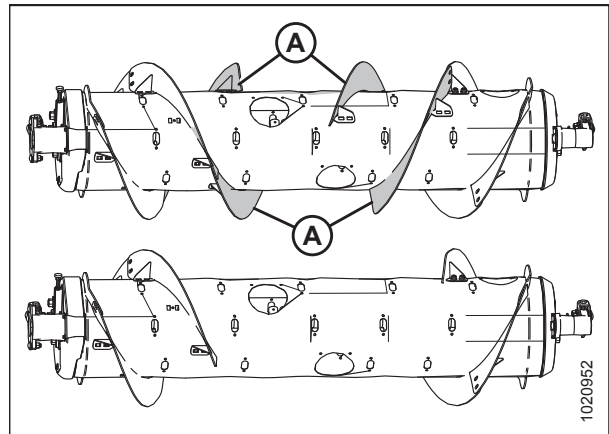


Figure 6.21: FM100 Feed Auger Flighting

### 6.5.3 In-Cab Draper Speed Control Kit

Installing this kit allows Operators to adjust the side draper's speed from the combine's cab.

**NOTE:**

The John Deere cab draper control is shown in the illustration below. The Case New Holland and generic cab draper control look and operate similarly to it.

Installation instructions are included in the kit.

- MD #B6701 – Cab Draper Control, John Deere
- MD #B6702 – Cab Draper Control, Case New Holland
- MD #B6703 – Cab Draper Control, Generic

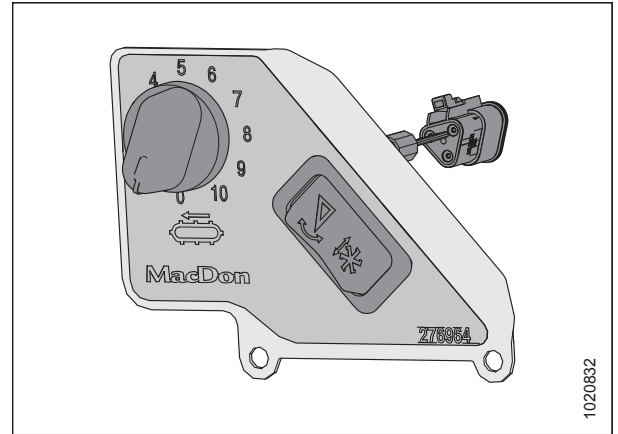


Figure 6.22: In-Cab Draper Speed Control Panel

### 6.5.4 Wide Draper Deflector

Wide metal draper deflectors attach to the inboard side of the endsheets to prevent material from falling through the gap between the endsheet and the draper.

Kit includes extra parts for various cutterbar layouts.

Installation instructions are included with the kit.

**IMPORTANT:**

The wide draper deflector is **NOT** compatible with the Lodged Crop Reel Finger (MD #B4831) option.

MD #B6551

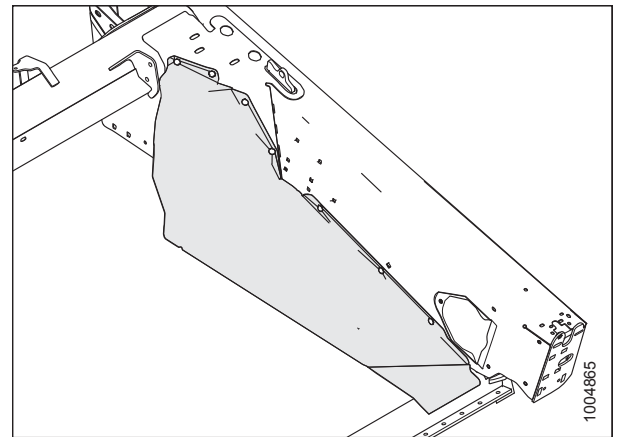
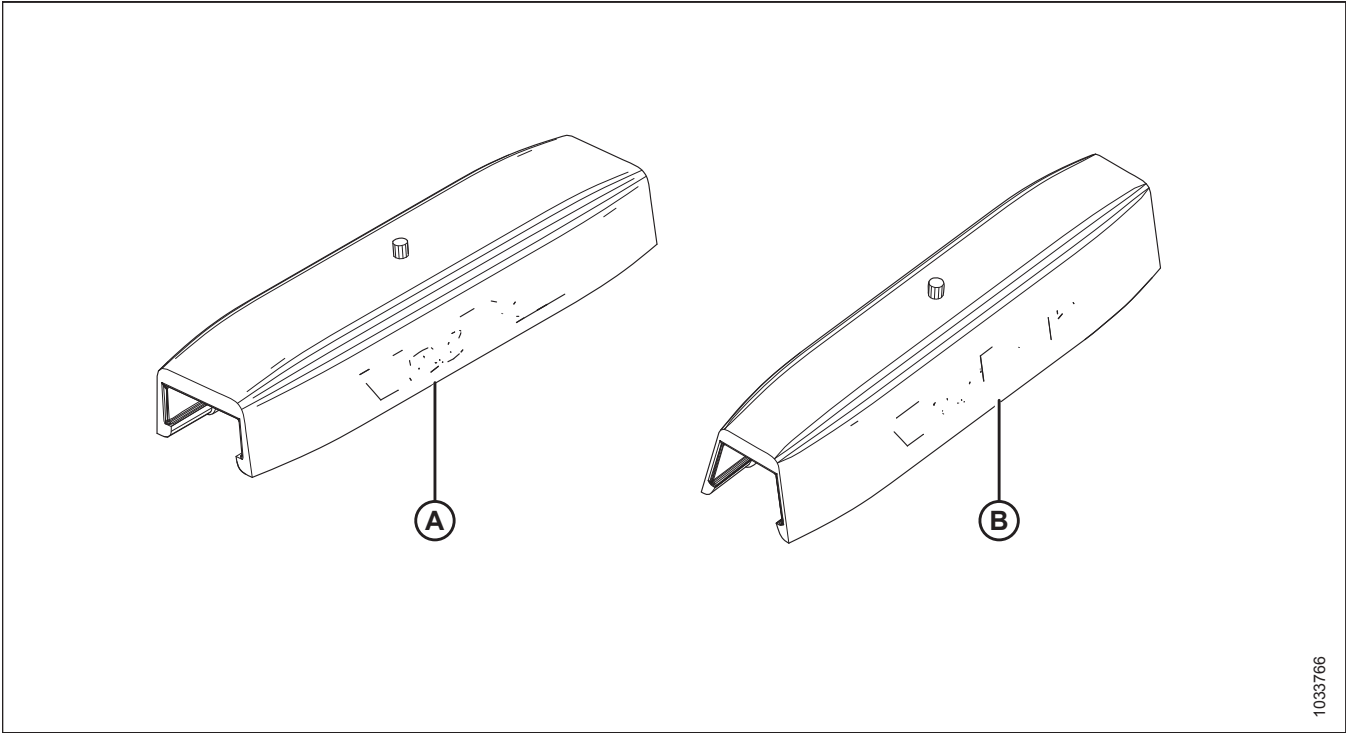


Figure 6.23: Wide Draper Deflector

### 6.5.5 Draper Clips

Draper clips offer additional wear protection for the draper cleats. They may prove useful in situations where conditions are dry or consistently hot.



**Figure 6.24: Draper Clips**

Installation instructions are included with the kit.

- MD #294859 for square cleats (A) (for drapers MD #172195, MD #172196, MD #172197, MD #172198)
- MD #294858 for tapered cleats (B) (for drapers MD #220635, MD #220636, MD #220637, MD #220638, MD #220639, MD #220640)

### 6.5.6 Stripper Bar Kit

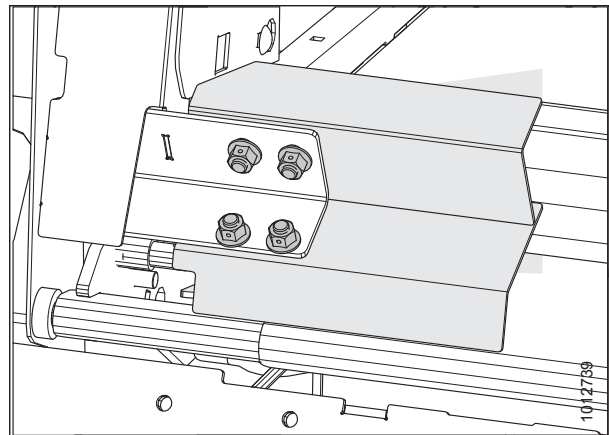
Stripper bars improve feeding in certain crops such as rice. They are **NOT** recommended in cereal crops.

Instructions are included with the kit.

Select the stripper bar kit based on combine feeder house width. For information, refer to Table 6.2, page 595.

**NOTE:**

MD #B6043 is for John Deere S6X0 Series only.



**Figure 6.25: Stripper Bar Kit**

## OPTIONS AND ATTACHMENTS

**Table 6.2 Stripper Bar Configurations and Recommendations**

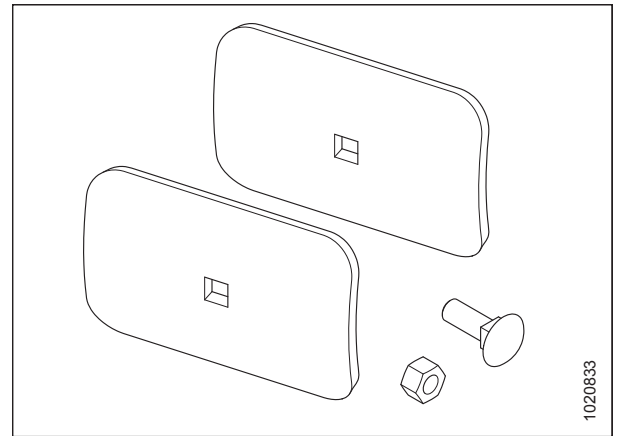
Bundle (MD #)	Stripper Bar Length	Opening Width (Installed on FM100)	Recommended Feeder House Width
B6042	265 mm (10 1/2 in.)	1317 mm (52 in.)	1250–1350 mm (49–65 in.)
B6043	265 mm (10 1/2 in.) (with cutout)	1317 mm (52 in.)	For John Deere S6X0 Series only
B6044	325 mm (13 in.)	1197 mm (47 in.)	For specialty crops only
B6045	365 mm (14 1/2 in.)	1117 mm (44 in.)	1100 mm (43 1/2 in.) and below
B6046	403 mm (16 in.)	1041 mm (41 in.)	For specialty crops only
B6213	515 mm (20 in.)	817 mm (32 in.)	For specialty crops only

### 6.5.7 Auger Dent Repair Kit

This kit allows Operators to repair dents close to the finger/guide area that the feed auger may have sustained during regular use.

Attachment hardware and installation instructions are included in the kit.

MD #237563



**Figure 6.26: Auger Dent Repair Kit**

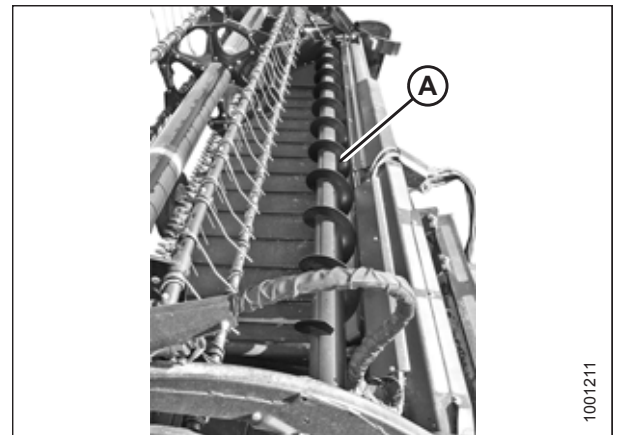
### 6.5.8 Upper Cross Auger

Upper Cross Auger (A) attaches in front of the backtube and improves crop feeding into the center of the header in heavy crop conditions. It is ideal for high-volume harvesting of forages, oats, canola, mustard, and other tall, bushy, hard-to-feed crops.

Order from the following list of kits according to your header model:

**For North American D1 Series headers:**

- D115 – MD #B6280
- D120 – MD #B6281
- D125 – MD #B6461
- D130 – MD #B6462
- D135 – MD #B6463



**Figure 6.27: Upper Cross Auger**

## OPTIONS AND ATTACHMENTS

- D140 – MD #B6464
- D145 – MD #B6465<sup>67</sup>

### 6.5.9 European Combine Upper Cross Auger

European Combine Upper Cross Auger (UCA) (A) attaches in front of the backtube and improves crop feeding at the center of the header in heavy crop conditions.

This kit is ideal for high-volume harvesting of forages, oats, canola, rapeseed, mustard, and other tall, bushy, and hard-to-feed crops.

#### IMPORTANT:

This optional kit is **ONLY** available for European markets, and should **ONLY** be used on combines. Do **NOT** use the European Combine UCA on self-propelled windrowers, as damage will occur at higher operating speeds.

Installation instructions are included with the kit.

Order from the following bundles according to header model:

- D125 – MD #B6584
- D130 – MD #B6585
- D135 – MD #B6586
- D140 – MD #B6587
- D145 – MD #B6588<sup>68</sup>

### 6.5.10 Rice Divider Rods

Rice divider rods attach to the left and right crop dividers and divide tall and tangled rice crops in a similar manner to standard crop divider rods performing in standing crops.

Installation instructions are included in the kit.

MD #B5609

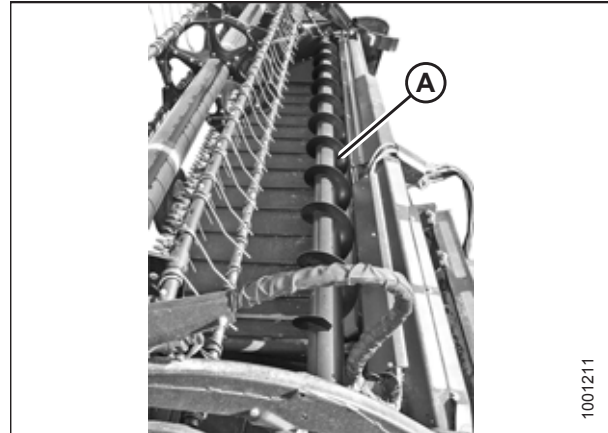


Figure 6.28: Upper Cross Auger



Figure 6.29: Rice Divider Rod

67. This is a 12.2 m (40 ft.) auger, and is backtube-mounted. It does **NOT** span the full length of the header.

68. This is a 12.2 m (40 ft.) auger, and is backtube-mounted. It does **NOT** span the full length of the header.



### 6.5.11 Full Interface Filler Kit

The Full Interface Filler Kit eliminates the gap between the feed deck and header frame, increases seed collection.

**NOTE:**

This kit is only available for European-configured headers.

Installation instructions are included in the kit.

MD #B6446

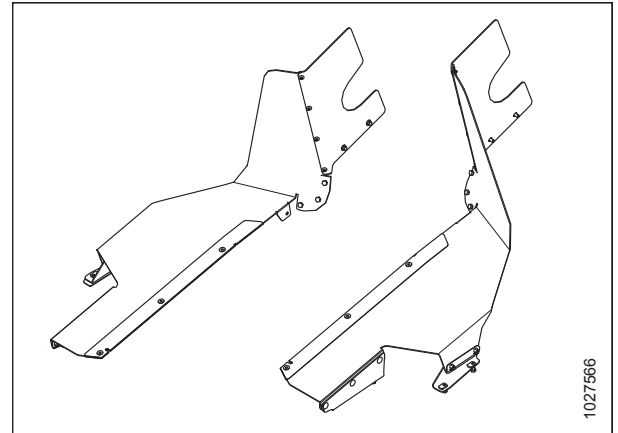


Figure 6.30: Full Interface Filler Kit



# Chapter 7: Troubleshooting

Machinery can sometimes have issues with installed parts or with operation in certain conditions.

## 7.1 Crop Loss

Use the following tables to determine the issue with crop loss and find the recommended repair procedure.

**Table 7.1 Troubleshooting Crop Loss at Cutterbar**

Problem	Solution	Refer to
<b>Symptom: Does not pick up downed crop</b>		
Cutterbar too high	Lower cutterbar	<ul style="list-style-type: none"> <li><i>3.8.4 Cutting off the Ground, page 83</i></li> <li><i>3.8.5 Cutting on the Ground, page 89</i></li> </ul>
Header angle too low	Increase header angle	<i>3.8.4 Header Angle, page 96</i>
Reel too high	Lower reel	<i>3.8.9 Reel Height, page 110</i>
Reel too far back	Move reel forward	<i>3.8.10 Reel Fore-Aft Position, page 116</i>
Ground speed too fast for reel speed	Increase reel speed or reduce ground speed	<ul style="list-style-type: none"> <li><i>3.8.5 Reel Speed, page 104</i></li> <li><i>3.8.6 Ground Speed, page 105</i></li> </ul>
Reel fingers not lifting crop sufficiently	Increase finger pitch aggressiveness	<i>3.8.11 Reel Tine Pitch, page 126</i>
Reel fingers not lifting crop sufficiently	Install crop lifters	See your MacDon Dealer
<b>Symptom: Heads shattering or breaking off</b>		
Reel speed too fast	Reduce reel speed	<i>3.8.5 Reel Speed, page 104</i>
Reel too low	Raise reel	<i>3.8.9 Reel Height, page 110</i>
Ground speed too fast	Reduce ground speed	<i>3.8.6 Ground Speed, page 105</i>
Crop too ripe	Operate at night when humidity is higher	—
<b>Symptom: Material accumulating in gap between cut-out in endsheet and knifehead</b>		
Crop heads leaning away from knifehead hole in endsheet	Add knifehead shields (except in damp or sticky soils)	<i>5.8.8 Knifehead Shield, page 466</i>
<b>Symptom: Strips of uncut material</b>		
Crowding uncut crop	Allow enough room for crop to be fed to cutterbar	—
Broken knife sections	Replace broken sections	<i>5.8.1 Replacing Knife Section, page 456</i>
<b>Symptom: Excessive bouncing at normal field speed</b>		
Float set too light	Adjust header float	<i>3.8.3 Header Float, page 90</i>
<b>Symptom: Divider rod running down standing crop</b>		

## TROUBLESHOOTING

**Table 7.1 Troubleshooting Crop Loss at Cutterbar (continued)**

Problem	Solution	Refer to
Divider rods too long	Remove divider rod	<i>3.8.12 Crop Dividers, page 129</i>
<b>Symptom: Crop not being cut at ends</b>		
Reel not frowning or not centered in header	Adjust reel horizontal position or reel frown	<ul style="list-style-type: none"> <li>• <i>3.8.10 Reel Fore-Aft Position, page 116</i></li> <li>• <i>5.13.2 Reel Frown, page 540</i></li> </ul>
Knife hold-downs not adjusted properly	Adjust hold-downs so knife works freely but still keep sections from lifting off guards	<ul style="list-style-type: none"> <li>• <i>Adjusting Hold-Downs with Pointed Guards, page 464</i></li> <li>• <i>Adjusting Hold-Down with Stub Guards, page 466</i></li> </ul>
Knife sections or guards are worn or broken	Replace all worn and broken cutting parts	<i>5.8 Knife, page 456</i>
Header is not level	Level header	<i>3.10 Leveling the Header, page 317</i>
Reel fingers not lifting crop properly ahead of knife	Adjust reel position and/or finger pitch	<ul style="list-style-type: none"> <li>• <i>3.8.10 Reel Fore-Aft Position, page 116</i></li> <li>• <i>3.8.11 Reel Tine Pitch, page 126</i></li> </ul>
Divider runs down thick crop at ends preventing proper feeding due to material bridging the guards	Replace 3–4 end guards with stub guards	<ul style="list-style-type: none"> <li>• <i>5.8.7 Knife Guards, page 461</i></li> <li>• <i>6.3.5 Stub Guard Conversion Kit, page 586</i></li> <li>• See your MacDon Dealer</li> </ul>
<b>Symptom: Bushy or tangled crop flows over divider rod, builds up on endsheets</b>		
Divider rods providing insufficient separation	Install long divider rods	<i>3.8.12 Crop Dividers, page 129</i>
<b>Symptom: Cut grain falling ahead of cutterbar</b>		
Ground speed too slow	Increase ground speed	<i>3.8.6 Ground Speed, page 105</i>
Reel speed too slow	Increase reel speed	<i>3.8.5 Reel Speed, page 104</i>
Reel too high	Lower reel	<i>3.8.9 Reel Height, page 110</i>
Cutterbar too high	Lower cutterbar	<ul style="list-style-type: none"> <li>• <i>Cutting off the Ground, page 83</i></li> <li>• <i>Cutting on the Ground, page 89</i></li> </ul>
Reel too far forward	Move reel back on arms	<i>3.8.10 Reel Fore-Aft Position, page 116</i>
Cutting at speeds over 10 km/h (6 mph) with 10-tooth reel drive sprocket	Replace with 19-tooth reel drive sprocket	<i>5.14.3 Reel Drive Sprocket, page 566</i>
Worn or broken knife components	Replace components	<i>5.8 Knife, page 456</i>

## 7.2 Cutting Action and Knife Components

Use the following tables to determine the issue with the cutting action or knife components and find the recommended repair procedure.

**Table 7.2 Troubleshooting Cutting Action and Knife Components**

Problem	Solution	Refer to
<b>Symptom: Ragged or uneven cutting of crop</b>		
Knife hold-down clips not adjusted properly	Adjust hold-down clips	<ul style="list-style-type: none"> <li>• <i>Adjusting Hold-Downs with Pointed Guards, page 464</i></li> <li>• <i>Adjusting Hold-Down with Stub Guards, page 466</i></li> </ul>
Knife sections or guards are worn or broken	Replace all worn and broken cutting parts	<i>5.8 Knife, page 456</i>
Knife is not operating at recommended speed	Check combine engine speed and feeder house	Combine operator's manual
Ground speed too fast for reel speed	Reduce ground speed or increase reel speed	<ul style="list-style-type: none"> <li>• <i>3.8.5 Reel Speed, page 104</i></li> <li>• <i>3.8.6 Ground Speed, page 105</i></li> </ul>
Reel fingers not lifting crop properly ahead of knife	Adjust reel position/finger pitch	<ul style="list-style-type: none"> <li>• <i>3.8.10 Reel Fore-Aft Position, page 116</i></li> <li>• <i>3.8.11 Reel Tine Pitch, page 126</i></li> </ul>
Cutterbar too high	Lower cutting height	<i>Cutting off the Ground, page 83 or Cutting on the Ground, page 89</i>
Header angle too flat	Steepen header angle	<i>3.8.4 Header Angle, page 96</i>
Bent knife causing binding of cutting parts	Straighten bent knife and align guards	<i>5.8.7 Knife Guards, page 461</i>
Cutting edge of guards not close enough or parallel to knife sections	Align guards	<i>5.8.7 Knife Guards, page 461</i>
Tangled/tough-to-cut crop	Install short guards	<ul style="list-style-type: none"> <li>• MacDon Dealer</li> <li>• <i>Adjusting Hold-Downs with Pointed Guards, page 464 or Adjusting Hold-Down with Stub Guards, page 466</i></li> <li>• <i>6.3.5 Stub Guard Conversion Kit, page 586</i></li> </ul>
Reel too far back	Move reel forward	<i>3.8.10 Reel Fore-Aft Position, page 116</i>
Loose knife drive belt	Adjust drive belt tension	<i>Checking and Tensioning, page 479</i>
<b>Symptom: Knife plugging</b>		
Reel too high or too far forward	Lower reel or move reel rearward	<ul style="list-style-type: none"> <li>• <i>3.8.9 Reel Height, page 110</i></li> <li>• <i>3.8.10 Reel Fore-Aft Position, page 116</i></li> </ul>

## TROUBLESHOOTING

**Table 7.2 Troubleshooting Cutting Action and Knife Components (continued)**

Problem	Solution	Refer to
Ground speed too slow	Increase ground speed	<i>3.8.6 Ground Speed, page 105</i>
Loose knife drive belt	Adjust drive belt tension	<i>Checking and Tensioning, page 479</i>
Improper knife hold-down clip adjustment	Adjust hold-down	<ul style="list-style-type: none"> <li>• <i>Adjusting Hold-Downs with Pointed Guards, page 464</i></li> <li>• <i>Adjusting Hold-Down with Stub Guards, page 466</i></li> </ul>
Dull or broken knife section	Replace knife section	<i>5.8.1 Replacing Knife Section, page 456</i>
Bent or broken guards	Align or replace guards	<i>5.8.7 Knife Guards, page 461</i>
Reel fingers not lifting crop properly ahead of knife	Adjust reel position/ finger pitch	<ul style="list-style-type: none"> <li>• <i>3.8.10 Reel Fore-Aft Position, page 116</i></li> <li>• <i>3.8.11 Reel Tine Pitch, page 126</i></li> </ul>
Steel pick-up fingers contacting knife	Increase reel clearance to cutterbar or adjust header frown	<ul style="list-style-type: none"> <li>• <i>5.13.1 Reel Clearance to Cutterbar, page 536</i></li> <li>• <i>5.13.2 Reel Frown, page 540</i></li> </ul>
Float too heavy	Adjust springs for lighter float	<i>3.8.3 Header Float, page 90</i>
Mud or dirt build-up on cutterbar	Raise cutterbar by lowering skid shoes	<i>Cutting on the Ground, page 89</i>
Mud or dirt build-up on cutterbar	Flatten header angle	<i>3.8.4 Header Angle, page 96</i>
Knife is not operating at recommended speed	Check engine speed of combine or header knife speed	<ul style="list-style-type: none"> <li>• Combine operator's manual</li> <li>• <i>Checking Knife Speed, page 109</i></li> </ul>
<b>Symptom: Excessive header vibration</b>		
Knife on double-knife drive not timed <sup>69</sup>	Adjust knife timing <sup>69</sup>	<i>Adjusting Timed Double-Knife Timing, page 486</i>
Knife not operating at recommended speed	Feeder house speed or incorrect setting on header	Combine operator's manual
Excessive knife wear	Replace knife	<ul style="list-style-type: none"> <li>• <i>5.8.2 Removing Knife, page 457</i></li> <li>• <i>5.8.5 Installing Knife, page 459</i></li> </ul>
Loose or worn knifehead pin or drive arm	Tighten or replace parts	<i>5.8.1 Replacing Knife Section, page 456</i>
Incorrect knife speed	Adjust knife speed	<i>Checking Knife Speed, page 109</i>
Driveline U-joints worn	Replace U-joints	<ul style="list-style-type: none"> <li>• <i>Removing Double-Reel Drive U-Joint, page 568</i></li> <li>• <i>Installing Double-Reel U-Joint, page 569</i></li> </ul>

<sup>69</sup>. Applies to timed double-knife drive headers only.

## TROUBLESHOOTING

**Table 7.2 Troubleshooting Cutting Action and Knife Components (continued)**

Problem	Solution	Refer to
Bent cutterbar	Straighten cutterbar	MacDon Dealer
<b>Symptom: Excessive breakage of knife sections or guards</b>		
Knife hold-down clips not adjusted properly	Adjust hold-down clips	<ul style="list-style-type: none"> <li>• <i>Adjusting Hold-Downs with Pointed Guards, page 464</i> or</li> <li>• <i>Adjusting Hold-Down with Stub Guards, page 466</i></li> </ul>
Cutterbar operating too low in stony conditions	Raise cutterbar using skid shoes	<i>Cutting on the Ground, page 89</i>
Float is set too heavy	Adjust float springs for lighter float	<i>3.8.3 Header Float, page 90</i>
Bent or broken guard	Straighten or replace guard	<i>5.8.7 Knife Guards, page 461</i>
Header angle too steep	Flatten header angle	<i>3.8.4 Header Angle, page 96</i>
<b>Symptom: Knife back breakage</b>		
Bent or broken guard	Straighten or replace guard	<i>5.8.7 Knife Guards, page 461</i>
Worn knifehead pin	Replace knifehead pin	<ul style="list-style-type: none"> <li>• <i>5.8.3 Removing Knifehead Bearing, page 458</i></li> <li>• <i>5.8.4 Installing Knifehead Bearing, page 459</i></li> </ul>
Dull knife	Replace knife	<ul style="list-style-type: none"> <li>• <i>5.8.2 Removing Knife, page 457</i></li> <li>• <i>5.8.5 Installing Knife, page 459</i></li> </ul>



**TROUBLESHOOTING**

## 7.3 Reel Delivery

Use the following tables to determine the cause of reel delivery problems and the recommended repair procedure.

**Table 7.3 Troubleshooting Reel Delivery**

Problem	Solution	Refer to
<b>Symptom – Reel not releasing material in normal standing crop</b>		
Reel speed too fast	Reduce reel speed	<i>3.8.5 Reel Speed, page 104</i>
Reel too low	Raise reel	<i>3.8.9 Reel Height, page 110</i>
Reel tines too aggressive	Reduce cam setting	<i>3.8.11 Reel Tine Pitch, page 126</i>
Reel too far back	Move reel forward	<i>3.8.10 Reel Fore-Aft Position, page 116</i>
<b>Symptom – Reel not releasing material in lodged and standing crop (reel fully lowered)</b>		
Reel tines too aggressive for standing crop	Reduce cam setting (one or two)	<i>3.8.11 Reel Tine Pitch, page 126</i>
<b>Symptom – Wrapping on reel end</b>		
Reel tines too aggressive	Reduce cam setting	<i>3.8.11 Reel Tine Pitch, page 126</i>
Reel too low	Raise reel	<i>3.8.9 Reel Height, page 110</i>
Reel speed too fast	Reduce reel speed	<i>3.8.5 Reel Speed, page 104</i>
Crop conditions	Install optional endshields	<i>6.2.6 Reel Endshield Kit, page 584</i>
Reel not centered in header	Center reel in header	<i>5.13.3 Centering the Reel, page 540</i>
<b>Symptom – Reel releases crop too quickly</b>		
Reel tines not aggressive enough	Increase cam setting	<i>3.8.11 Reel Tine Pitch, page 126</i>
Reel too far forward	Move reel back	<i>3.8.10 Reel Fore-Aft Position, page 116</i>
<b>Symptom – Reel will not lift</b>		
Reel lift couplers are incompatible or defective	Change quick coupler	MacDon dealer
<b>Symptom – Reel will not turn</b>		
Quick couplers not properly connected	Connect couplers	Combine operator's manual.
Reel drive chain disconnected or broken	Connect/replace chain	<ul style="list-style-type: none"> <li>• <i>5.14.6 Replacing Drive Chain on Double Reel, page 572</i></li> <li>• <i>5.14.7 Replacing Single-Reel Header Drive Chain, page 574</i></li> </ul>

## TROUBLESHOOTING

**Table 7.3 Troubleshooting Reel Delivery (continued)**

Problem	Solution	Refer to
<b>Symptom – Reel motion uneven under no load</b>		
Excessive slack in reel drive chain	Tighten chain	<i>Tightening Reel Drive Chain, page 565</i>
<b>Symptom – Reel motion is uneven or stalls in heavy crops</b>		
Reel speed too fast	Reduce reel speed	<i>3.8.5 Reel Speed, page 104</i>
Reel fingers not aggressive enough	Move to a more aggressive finger pitch notch	<i>3.8.11 Reel Tine Pitch, page 126</i>
Reel too low	Raise reel	<i>3.8.9 Reel Height, page 110</i>
Relief valve on combine (not on combine float module) has low relief pressure setting	Increase relief pressure to manufacturer's recommendations	Combine operator's manual
Low oil reservoir level on combine <b>NOTE:</b> Sometimes there is more than one reservoir	Fill to proper level	Combine operator's manual
Relief valve malfunction	Replace relief valve	Combine operator's manual
Cutting tough crops with standard torque (19-tooth) reel drive sprocket	Replace with high torque (10-tooth or 14-tooth) reel drive sprocket	<i>5.14.3 Reel Drive Sprocket, page 566</i>
<b>Symptom – Plastic fingers cut at tip</b>		
Insufficient reel to cutterbar clearance	Increase clearance	<i>5.13.1 Reel Clearance to Cutterbar, page 536</i>
<b>Symptom – Plastic fingers bent rearward at tip</b>		
Reel digging into ground with reel speed slower than ground speed	Raise header	<ul style="list-style-type: none"> <li>• <i>Cutting off the Ground, page 83</i></li> <li>• <i>Cutting on the Ground, page 89</i></li> </ul>
Reel digging into ground with reel speed slower than ground speed	Decrease header tilt	<i>3.8.4 Header Angle, page 96</i>
Reel digging into ground with reel speed slower than ground speed	Move reel aft	<i>3.8.10 Reel Fore-Aft Position, page 116</i>
<b>Symptom – Plastic fingers bent forward at tip</b>		
Reel digging into ground with reel speed faster than ground speed	Raise header	<ul style="list-style-type: none"> <li>• <i>Cutting off the Ground, page 83</i></li> <li>• <i>Cutting on the Ground, page 89</i></li> </ul>
Reel digging into ground with reel speed faster than ground speed	Decrease header tilt	<i>3.8.4 Header Angle, page 96</i>
Reel digging into ground with reel speed faster than ground speed	Move reel aft	<i>3.8.10 Reel Fore-Aft Position, page 116</i>
<b>Symptom – Plastic fingers bent close to tine tube</b>		

## TROUBLESHOOTING

**Table 7.3 Troubleshooting Reel Delivery (continued)**

Problem	Solution	Refer to
Excessive plugging at cutterbar with wads of crop accumulating at cutterbar while maintaining reel operation	Correct plugging/cutting issues	<i>3.11 Unplugging the Cutterbar, page 319</i>
Excessive plugging at cutterbar with wads of crop accumulating at cutterbar while maintaining reel operation	Stop reel before plugging becomes excessive	<i>3.11 Unplugging the Cutterbar, page 319</i>

## 7.4 Troubleshooting – Header and Drapers

Use the following tables to determine the issue with the header and the drapers and find the recommended repair procedure.

**Table 7.4 Header and Drapers Troubleshooting**

Problem	Solution	Refer to
<b>Symptom: Insufficient header lift</b>		
Low relief pressure	Increase relief pressure	MacDon Dealer
<b>Symptom: Insufficient side draper speed</b>		
Speed control set too low	Increase speed control setting	<a href="#">3.8.7 Draper Speed, page 106</a>
Combine header drive too slow	Adjust to correct speed for combine model	Combine operator's manual
<b>Symptom: Insufficient feed draper speed</b>		
Relief pressure too low	Test side draper hydraulic system	MacDon Dealer
Worn out gear pump	Replace gear pump	MacDon Dealer
Combine header drive too slow	Adjust to correct speed for combine model	Combine operator's manual
<b>Symptom: Feed draper will not move</b>		
Drapers are loose	Tighten drapers	<a href="#">5.10.2 Checking and Adjusting Feed Draper Tension, page 495</a>
Drive or idler roller wrapped with material	Loosen draper and clean rollers	<a href="#">5.10.2 Checking and Adjusting Feed Draper Tension, page 495</a>
Slat or connector bar jammed by frame or material	Loosen draper and clear obstruction	<a href="#">5.10.2 Checking and Adjusting Feed Draper Tension, page 495</a>
Roller bearing seized	Replace roller bearing	<a href="#">5.12.6 Draper Roller Maintenance, page 526</a>
Low hydraulic oil	Fill the combine hydraulic oil reservoir to full level	Combine operator's manual
Incorrect relief setting at flow control valve	Adjust relief setting	MacDon Dealer
Drapers are loose	Tighten drapers	<a href="#">5.12.3 Checking and Adjusting Draper Tension, page 520</a>
Drive or idler roller wrapped with material	Loosen draper and clean rollers	<a href="#">5.12.3 Checking and Adjusting Draper Tension, page 520</a>
Slat or connector bar jammed by frame or material	Loosen draper and clear obstruction	<a href="#">5.12.3 Checking and Adjusting Draper Tension, page 520</a>
Roller bearing seized	Replace roller bearing	<a href="#">5.12.6 Draper Roller Maintenance, page 526</a>
Low hydraulic oil	Fill combine hydraulic oil reservoir to full level	Combine operator's manual
Incorrect compensator setting at pump	Adjust compensator setting	MacDon Dealer

## TROUBLESHOOTING

**Table 7.4 Header and Drapers Troubleshooting (continued)**

Problem	Solution	Refer to
Material not feeding evenly off knife	Lower reel	<a href="#">3.8.9 Reel Height, page 110</a>
Material not feeding evenly off knife	Install stub guards	<ul style="list-style-type: none"> <li>• <a href="#">5.8.7 Knife Guards, page 461</a></li> <li>• <a href="#">6.3.5 Stub Guard Conversion Kit, page 586</a></li> <li>• MacDon Dealer</li> </ul>
<b>Symptom: Hesitation in flow of bulky crop</b>		
Header angle too low	Increase header angle	<a href="#">3.8.4 Header Angle, page 96</a>
Material overload on drapers	Increase side draper speed	<a href="#">3.8.7 Draper Speed, page 106</a>
Material overload on drapers	Install upper cross auger	<a href="#">6.5.8 Upper Cross Auger, page 595</a>
Material overload on drapers	Add flighting extensions	MacDon Dealer
<b>Symptom: Drapers back-feed</b>		
Drapers running too slow in heavy crop	Increase draper speed	<a href="#">3.8.7 Draper Speed, page 106</a>
<b>Symptom: Crop is thrown across opening and under opposite side draper</b>		
Drapers running too fast in light crop	Reduce draper speed	<a href="#">3.8.7 Draper Speed, page 106</a>
<b>Symptom: Material accumulates inside or under front edge of draper</b>		
Deck height improperly adjusted	Adjust deck height	<a href="#">5.12.5 Adjusting Deck Height, page 523</a>
<b>Symptom: Material accumulating on end deflectors and releasing in bunches</b>		
End deflectors too wide	For headers with manual deck shift only, trim deflector or replace with narrow deflector (MD #172381)	<a href="#">3.11 Unplugging the Cutterbar, page 319</a>

# Chapter 8: Reference

Use this section as a source for reference information.

## 8.1 Torque Specifications

The following tables provide correct torque values for various bolts, cap screws, and hydraulic fittings.

- Tighten all bolts to torque values specified in charts (unless otherwise noted throughout this manual).
- Replace hardware with same strength and grade of bolt.
- Use torque value tables as a guide and periodically check tightness of bolts.
- Understand torque categories for bolts and cap screws by using their identifying head markings.

### Jam nuts

When applying torque to finished jam nuts, multiply the torque applied to regular nuts by  $f=0.65$ .

### Self-tapping screws

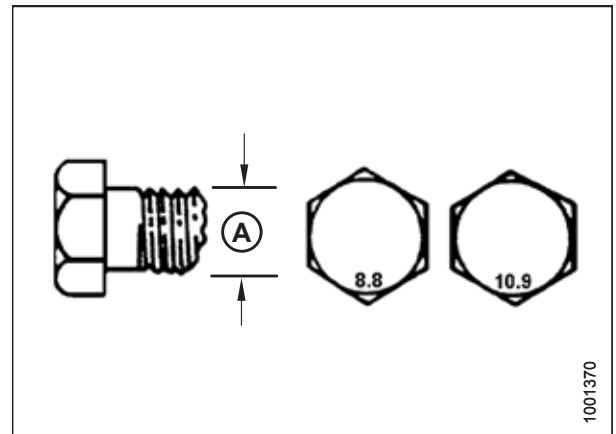
Standard torque is to be used (**NOT** to be used on critical or structurally important joints).

### 8.1.1 Metric Bolt Specifications

Torque values shown in following tables are valid for non-greased, or non-oiled threads and heads; therefore, do **NOT** grease or oil bolts or cap screws unless otherwise specified in this manual.

**Table 8.1 Metric Class 8.8 Bolts and Class 9 Free Spinning Nut**

Nominal Size (A)	Torque (Nm)		Torque (lbf·ft) (*lbf·in)	
	Min.	Max.	Min.	Max.
3-0.5	1.4	1.6	*13	*14
3.5-0.6	2.2	2.5	*20	*22
4-0.7	3.3	3.7	*29	*32
5-0.8	6.7	7.4	*59	*66
6-1.0	11.4	12.6	*101	*112
8-1.25	28	30	20	23
10-1.5	55	60	40	45
12-1.75	95	105	70	78
14-2.0	152	168	113	124
16-2.0	236	261	175	193
20-2.5	460	509	341	377
24-3.0	796	879	589	651



**Figure 8.1: Bolt Grades**

REFERENCE

Table 8.2 Metric Class 8.8 Bolts and Class 9 Distorted Thread Nut

Nominal Size (A)	Torque (Nm)		Torque (lbf·ft) (*lbf·in)	
	Min.	Max.	Min.	Max.
3-0.5	1	1.1	*9	*10
3.5-0.6	1.5	1.7	*14	*15
4-0.7	2.3	2.5	*20	*22
5-0.8	4.5	5	*40	*45
6-1.0	7.7	8.6	*69	*76
8-1.25	18.8	20.8	*167	*185
10-1.5	37	41	28	30
12-1.75	65	72	48	53
14-2.0	104	115	77	85
16-2.0	161	178	119	132
20-2.5	314	347	233	257
24-3.0	543	600	402	444

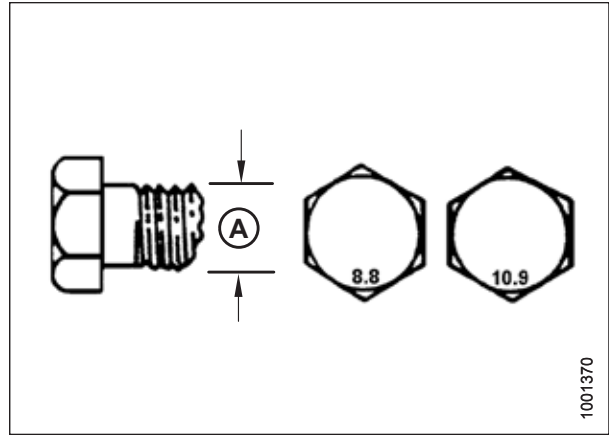


Figure 8.2: Bolt Grades

Table 8.3 Metric Class 10.9 Bolts and Class 10 Free Spinning Nut

Nominal Size (A)	Torque (Nm)		Torque (lbf·ft) (*lbf·in)	
	Min.	Max.	Min.	Max.
3-0.5	1.8	2	*18	*19
3.5-0.6	2.8	3.1	*27	*30
4-0.7	4.2	4.6	*41	*45
5-0.8	8.4	9.3	*82	*91
6-1.0	14.3	15.8	*140	*154
8-1.25	38	42	28	31
10-1.5	75	83	56	62
12-1.75	132	145	97	108
14-2.0	210	232	156	172
16-2.0	326	360	242	267
20-2.5	637	704	472	521
24-3.0	1101	1217	815	901

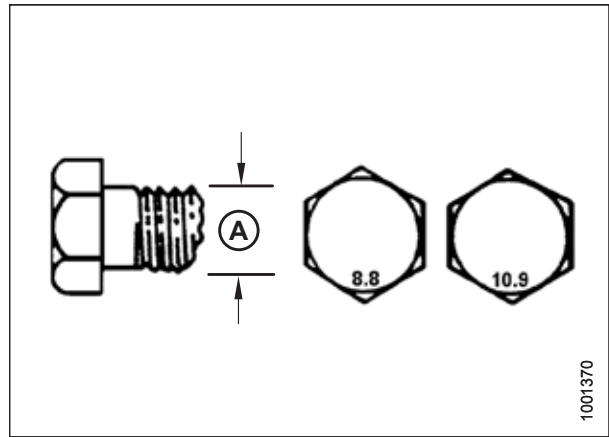


Figure 8.3: Bolt Grades



REFERENCE

Table 8.4 Metric Class 10.9 Bolts and Class 10 Distorted Thread Nut

Nominal Size (A)	Torque (Nm)		Torque (lbf-ft) (*lbf-in)	
	Min.	Max.	Min.	Max.
3-0.5	1.3	1.5	*12	*13
3.5-0.6	2.1	2.3	*19	*21
4-0.7	3.1	3.4	*28	*31
5-0.8	6.3	7	*56	*62
6-1.0	10.7	11.8	*95	*105
8-1.25	26	29	19	21
10-1.5	51	57	38	42
12-1.75	90	99	66	73
14-2.0	143	158	106	117
16-2.0	222	246	165	182
20-2.5	434	480	322	356
24-3.0	750	829	556	614

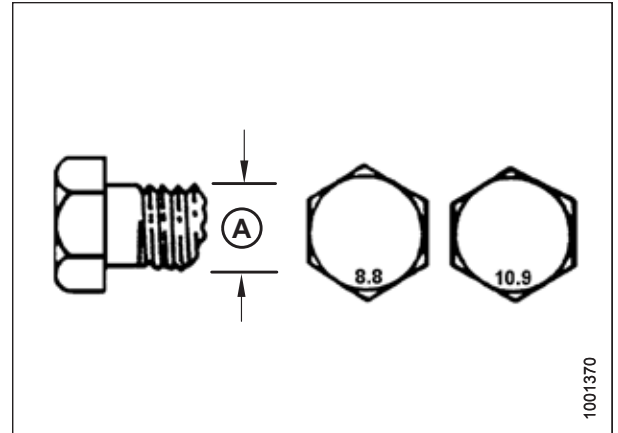


Figure 8.4: Bolt Grades

### 8.1.2 Metric Bolt Specifications Bolting into Cast Aluminum

Torque values shown in following tables are valid for non-greased, or non-oiled threads and heads; therefore, do **NOT** grease or oil bolts or cap screws unless otherwise specified in this manual.

Table 8.5 Metric Bolt Bolting into Cast Aluminum

Nominal Size (A)	Bolt Torque			
	8.8 (Cast Aluminum)		10.9 (Cast Aluminum)	
	Nm	lbf-ft	Nm	lbf-ft
M3	–	–	–	1
M4	–	–	4	2.6
M5	–	–	8	5.5
M6	9	6	12	9
M8	20	14	28	20
M10	40	28	55	40
M12	70	52	100	73
M14	–	–	–	–
M16	–	–	–	–

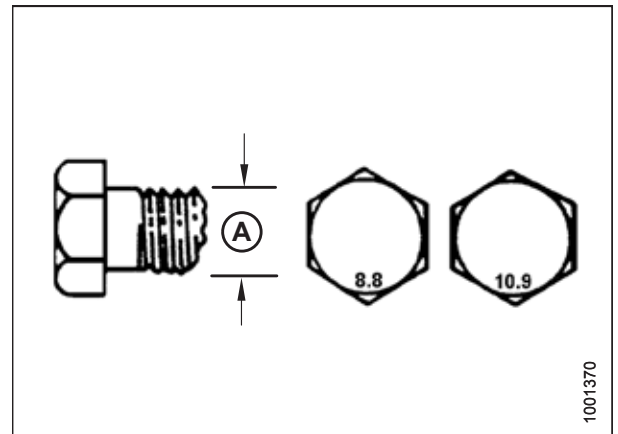


Figure 8.5: Bolt Grades

### 8.1.3 Flare-Type Hydraulic Fittings

1. Check flare (A) and flare seat (B) for defects that might cause leakage.
2. Align tube (C) with fitting (D) and thread nut (E) onto fitting without lubrication until contact has been made between flared surfaces.
3. Torque fitting nut (E) to specified number of flats from finger tight (FFFT) or to a given torque value in Table 8.6, page 612.
4. Use two wrenches to prevent fitting (D) from rotating. Place one wrench on fitting body (D), and tighten nut (E) with other wrench to torque shown.
5. Assess final condition of connection.

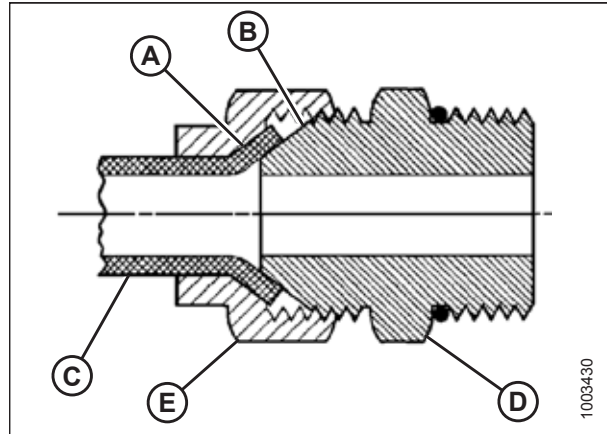


Figure 8.6: Hydraulic Fitting

Table 8.6 Flare-Type Hydraulic Tube Fittings

SAE Dash Size	Thread Size (in.)	Torque Value <sup>70</sup>		Flats from Finger Tight (FFFT)	
		Nm	lbf-ft	Tube	Swivel Nut or Hose
-2	5/16-24	4-5	3-4	—	—
-3	3/8-24	7-8	5-6	—	—
-4	7/16-20	18-19	13-14	2 1/2	2
-5	1/2-20	19-21	14-15	2	2
-6	9/16-18	30-33	22-24	2	1 1/2
-8	3/4-16	57-63	42-46	2	1 1/2
-10	7/8-14	81-89	60-66	1 1/2	1 1/2
-12	1 1/16-12	113-124	83-91	1 1/2	1 1/4
-14	1 3/16-12	136-149	100-110	1 1/2	1 1/4
-16	1 5/16-12	160-176	118-130	1 1/2	1
-20	1 5/8-12	228-250	168-184	1	1
-24	1 7/8-12	264-291	195-215	1	1
-32	2 1/2-12	359-395	265-291	1	1
-40	3-12	—	—	1	1

70. Torque values shown are based on lubricated connections as in reassembly.

### 8.1.4 O-Ring Boss Hydraulic Fittings – Adjustable

Torque values are shown in following table below.

1. Inspect O-ring (A) and seat (B) for dirt or obvious defects.
2. Back off lock nut (C) as far as possible. Ensure that washer (D) is loose and is pushed toward lock nut (C) as far as possible.
3. Check that O-ring (A) is **NOT** on threads and adjust if necessary.
4. Apply hydraulic system oil to O-ring (A).

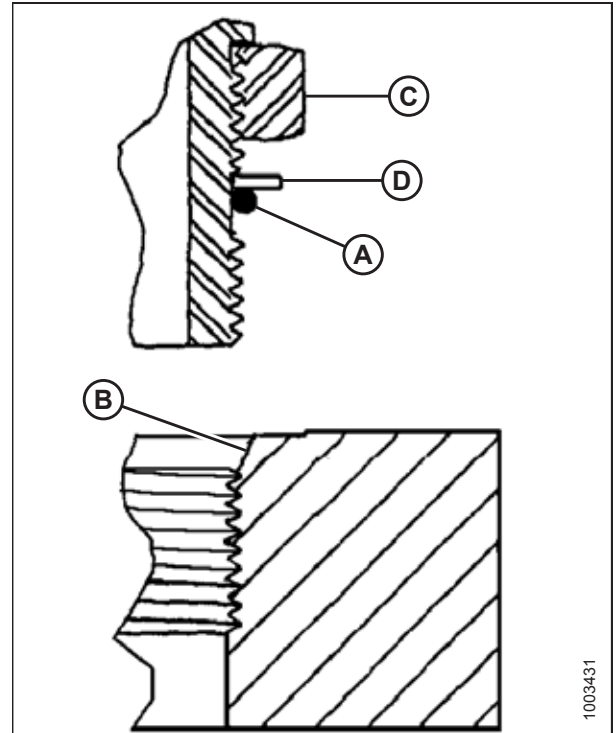


Figure 8.7: Hydraulic Fitting

5. Install fitting (B) into port until backup washer (D) and O-ring (A) contact part face (E).
6. Position the angle fittings by unscrewing no more than one turn.
7. Turn lock nut (C) down to washer (D) and tighten to torque shown. Use two wrenches, one on fitting (B) and other on lock nut (C).
8. Check the final condition of the fitting.

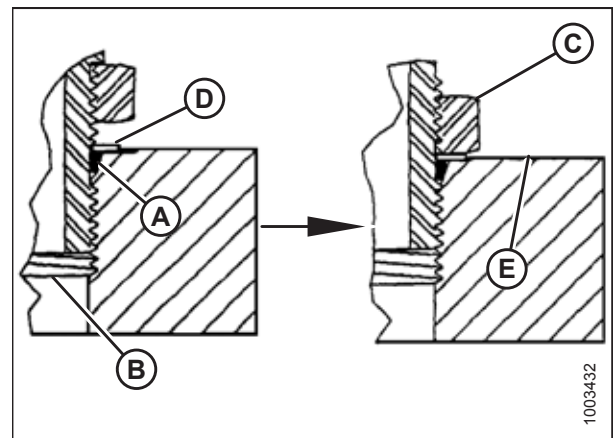


Figure 8.8: Hydraulic Fitting

REFERENCE

**Table 8.7 O-Ring Boss (ORB) Hydraulic Fittings – Adjustable**

SAE Dash Size	Thread Size (in.)	Torque Value <sup>71</sup>	
		Nm	lbf·ft (*lbf·in)
-2	5/16-24	6-7	*53-62
-3	3/8-24	12-13	*106-115
-4	7/16-20	19-21	14-15
-5	1/2-20	21-33	15-24
-6	9/16-18	26-29	19-21
-8	3/4-16	46-50	34-37
-10	7/8-14	75-82	55-60
-12	1 1/16-12	120-132	88-97
-14	1 3/8-12	153-168	113-124
-16	1 5/16-12	176-193	130-142
-20	1 5/8-12	221-243	163-179
-24	1 7/8-12	270-298	199-220
-32	2 1/2-12	332-365	245-269

71. Torque values shown are based on lubricated connections as in reassembly.

### 8.1.5 O-Ring Boss Hydraulic Fittings – Non-Adjustable

Torque values are shown in following table below.

1. Inspect O-ring (A) and seat (B) for dirt or obvious defects.
2. Check that O-ring (A) is **NOT** on the threads and adjust if necessary.
3. Apply hydraulic system oil to the O-ring.
4. Install fitting (C) into port until the fitting is hand-tight.
5. Torque fitting (C) according to values in Table 8.8, page 615.
6. Check the final condition of the fitting.

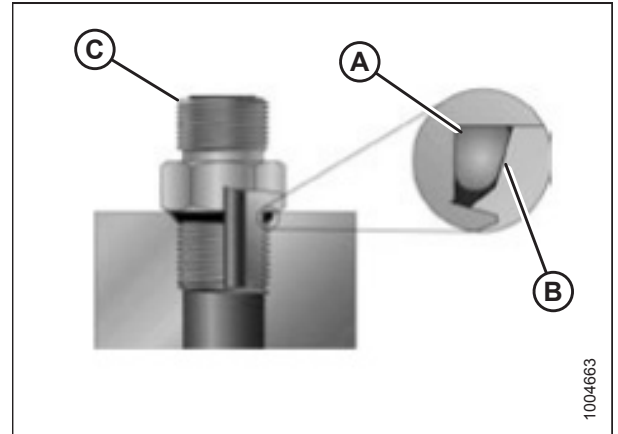


Figure 8.9: Hydraulic Fitting

Table 8.8 O-Ring Boss (ORB) Hydraulic Fittings – Non-Adjustable

SAE Dash Size	Thread Size (in.)	Torque Value <sup>72</sup>	
		Nm	lbf·ft (*lbf·in)
-2	5/16-24	6-7	*53-62
-3	3/8-24	12-13	*106-115
-4	7/16-20	19-21	14-15
-5	1/2-20	21-33	15-24
-6	9/16-18	26-29	19-21
-8	3/4-16	46-50	34-37
-10	7/8-14	75-82	55-60
-12	1 1/16-12	120-132	88-97
-14	1 3/8-12	153-168	113-124
-16	1 5/16-12	176-193	130-142
-20	1 5/8-12	221-243	163-179
-24	1 7/8-12	270-298	199-220
-32	2 1/2-12	332-365	245-269

72. Torque values shown are based on lubricated connections as in reassembly.

### 8.1.6 O-Ring Face Seal Hydraulic Fittings

Torque values are shown in following table below.

1. Check the components to ensure that the sealing surfaces and fitting threads are free of burrs, nicks, scratches, and any foreign material.



Figure 8.10: Hydraulic Fitting

2. Apply hydraulic system oil to O-ring (B).
3. Align the tube or hose assembly so that the flat face of sleeve (A) or (C) comes in full contact with O-ring (B).
4. Thread tube or hose nut (D) until it is hand-tight. The nut should turn freely until it is bottomed out.
5. Torque the fittings according to values in Table 8.9, page 616.

**NOTE:**

If applicable, hold the hex on fitting body (E) to prevent the rotation of fitting body and the hose when tightening fitting nut (D).

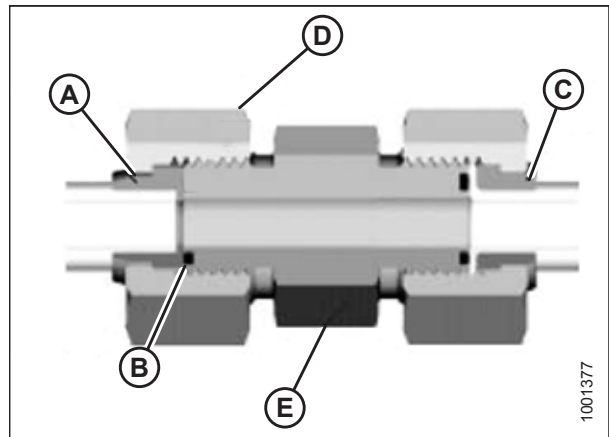


Figure 8.11: Hydraulic Fitting

6. Use three wrenches when assembling unions or joining two hoses together.
7. Check the final condition of the fitting.

**Table 8.9 O-Ring Face Seal (ORFS) Hydraulic Fittings**

SAE Dash Size	Thread Size (in.)	Tube O.D. (in.)	Torque Value <sup>73</sup>	
			Nm	lbf-ft
-3	Note <sup>74</sup>	3/16	–	–
-4	9/16	1/4	25–28	18–21
-5	Note <sup>74</sup>	5/16	–	–
-6	11/16	3/8	40–44	29–32
-8	13/16	1/2	55–61	41–45

73. Torque values and angles shown are based on lubricated connection as in reassembly.

74. O-ring face seal type end not defined for this tube size.

**REFERENCE**

**Table 8.9 O-Ring Face Seal (ORFS) Hydraulic Fittings (continued)**

SAE Dash Size	Thread Size (in.)	Tube O.D. (in.)	Torque Value <sup>75</sup>	
			Nm	lbf-ft
-10	1	5/8	80–88	59–65
-12	1 3/16	3/4	115–127	85–94
-14	Note <sup>74</sup>	7/8	–	–
-16	1 7/16	1	150–165	111–122
-20	1 11/16	1 1/4	205–226	151–167
-24	1–2	1 1/2	315–347	232–256
-32	2 1/2	2	510–561	376–414

### 8.1.7 Tapered Pipe Thread Fittings

Torque values are shown in following table below.

Assemble pipe fittings as follows:

1. Check components to ensure that the fitting and port threads are free of burrs, nicks, scratches, and any form of contamination.
2. Apply pipe thread sealant (paste type) to the external pipe threads.
3. Thread the fitting into the port until it is hand-tight.
4. Torque the connector to the appropriate torque angle. The turns from finger tight (TFFT) and flats from finger tight (FFFT) values are shown in Table 8.10, page 617. Make sure that the tube end of a shaped connector (typically 45° or 90°) is aligned to receive the incoming tube or hose assembly. Always finish alignment of fitting in the direction of tightening. Never back off (loosen) the pipe threaded connectors to achieve alignment.
5. Clean all the residue and any excess thread conditioner with an appropriate cleaner.
6. Assess the final condition of the fitting. Pay special attention to the possibility of cracks to port opening.
7. Mark the final position of the fitting. If a fitting leaks, disassemble the fitting and check it for damage.

**NOTE:**

Overtorque failure of fittings may not be evident until fittings are disassembled.

**Table 8.10 Hydraulic Fitting Pipe Thread**

Tapered Pipe Thread Size	Recommended TFFT	Recommended FFFT
1/8–27	2–3	12–18
1/4–18	2–3	12–18
3/8–18	2–3	12–18
1/2–14	2–3	12–18
3/4–14	1.5–2.5	12–18

75. Torque values and angles shown are based on lubricated connection as in reassembly.



REFERENCE

Table 8.10 Hydraulic Fitting Pipe Thread (continued)

Tapered Pipe Thread Size	Recommended TFFT	Recommended FFFT
1-11 1/2	1.5-2.5	9-15
1 1/4-11 1/2	1.5-2.5	9-15
1 1/2-11 1/2	1.5-2.5	9-15
2-11 1/2	1.5-2.5	9-15

## 8.2 Conversion Chart

Both SI units (including metric) and US customary units (sometimes referred to as standard units) of measurement are used in this manual. A list of those units along with their abbreviations and conversion factors is provided here for your reference.

**Table 8.11 Conversion Chart**

Quantity	SI Units (Metric)		Factor	US Customary Units (Standard)	
	Unit Name	Abbreviation		Unit Name	Abbreviation
Area	hectare	ha	x 2.4710 =	acre	acres
Flow	liters per minute	L/min	x 0.2642 =	US gallons per minute	gpm
Force	Newton	N	x 0.2248 =	pound force	lbf
Length	millimeter	mm	x 0.0394 =	inch	in.
Length	meter	m	x 3.2808 =	foot	ft.
Power	kilowatt	kW	x 1.341 =	horsepower	hp
Pressure	kilopascal	kPa	x 0.145 =	pounds per square inch	psi
Pressure	megapascal	MPa	x 145.038 =	pounds per square inch	psi
Pressure	bar (Non-SI)	bar	x 14.5038 =	pounds per square inch	psi
Torque	Newton meter	Nm	x 0.7376 =	pound feet or foot pounds	lbf-ft
Torque	Newton meter	Nm	x 8.8507 =	pound inches or inch pounds	lbf-in
Temperature	degrees Celsius	°C	(°C x 1.8) + 32 =	degrees Fahrenheit	°F
Velocity	meters per minute	m/min	x 3.2808 =	feet per minute	ft/min
Velocity	meters per second	m/s	x 3.2808 =	feet per second	ft/s
Velocity	kilometers per hour	km/h	x 0.6214 =	miles per hour	mph
Volume	liter	L	x 0.2642 =	US gallon	US gal
Volume	milliliter	mL	x 0.0338 =	ounce	oz.
Volume	cubic centimeter	cm <sup>3</sup> or cc	x 0.061 =	cubic inch	in. <sup>3</sup>
Weight	kilogram	kg	x 2.2046 =	pound	lb.



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# Recommended Fluids and Lubricants

Ensure your machine operates at top efficiency by using clean fluids and lubricants only.

- Use clean containers to handle all fluids and lubricants.
- Store fluids and lubricants in an area protected from dust, moisture, and other contaminants.

Lubricant	Specification	Description	Use	Capacities
<b>Grease</b>	SAE multi-purpose	High temperature extreme pressure (EP) performance grease with 1% max. molybdenum disulphide (NLGI grade 2) lithium base	As required unless otherwise specified	—
<b>Grease</b>	SAE multi-purpose	High temperature extreme pressure (EP) performance grease with 10% max. molybdenum disulphide (NLGI grade 2) lithium base	Driveline slip-joints	—
<b>Gear Lubricant</b>	SAE 85W-140	API service class GL-5	Knife drive box	2.2 liters (2.3 quarts)
<b>Gear Lubricant</b>	SAE 85W-140	API service class GL-5	Main drive gearbox	2.5 liters (2.6 quarts)
<b>Hydraulic Oil</b>	Single grade transmission/ hydraulic fluid (THF). Recommended viscosity: <ul style="list-style-type: none"> <li>• 60.1 cSt @ 40° C (104° F)</li> <li>• 9.5 cSt @ 100° C (212° F)</li> </ul> Recommended brands: <ul style="list-style-type: none"> <li>• AGCO Power Fluid 821 XL</li> <li>• Case Hy-Tran Ultraction</li> <li>• John Deere Hy-Gard J20C</li> <li>• Petro-Canada Duratran</li> </ul>	Lubricant trans / hydraulic oil	Header drive systems reservoir	85 liters (22.5 US gallons)

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