MacDon

D65
Draper Header for Windrowers

Operator's Manual

214327 Revision B

Original Instruction

The Harvesting Specialists.

D65 Draper Header for Windrowers

1003985

Published: September 2022

Declaration of Conformity

CE

EC Declaration of Conformity

[1] MacDon

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

[2] Windrower Draper Header

[3] MacDon D65 Series

[4] 321190-18—346189-18

[5] July 31, 2017

[6] _____
Christoph Martens
Product Integrity

EN

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

BG

Ние, [1]

декларираме, че следният продукт:

Тип машина: [2]

Наименование и модел: [3]

Сериен 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 Рийдезел
Управител, MacDon Europe GmbH
Hagenauer Straße 59
65203 Wiesbaden (Германия)
bvonriedesel@macdon.com

CZ

My, [1]

Prohlašujeme, 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

DA

Vi, [1]

erklærer, at prduktet:

Maskintype [2]

Navn og model: [3]

Serienummer (-numre): [4]

Opfylder alle bestemmelser i direktiv 2006/42/EF.

Anvendte harmoniserede standarder, som henvist 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

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

ES

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

ET

Meie, [1]

deklareerime, et toode

Seadme tüüp: [2]

Nimi ja mudel: [3]

Seerianumbrid: [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

FR

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

The Harvesting Specialists MacDon

1022881

EC Declaration of Conformity

IT

Noi, [1]

Dichiariamo 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.

Utilizzo degli standard armonizzati, come indicato nell'Articolo 7(2):

EN ISO 4254-1:2013

EN ISO 4254-7:2009

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

HU

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.

Az alábbi harmonizált szabványok kerültek alkalmazásra a 7(2) cikkely szerint:

EN ISO 4254-1:2013

EN ISO 4254-7:2009

A nyilatkozattétel ideje és helye: [5]

Azon személy kilétе 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

LT

Mes, [1]

Pareiškiame, kad šis produktas:

Mašinos tipas: [2]

Pavadinimas ir modelis: [3]

Serijos numeris (-iai): [4]

atitinka taikomus reikalavimus pagal Direktyvą 2006/42/EB.

Naudojami harmonizuoti standartai, kai nurodoma straipsnyje 7(2):

EN ISO 4254-1:2013

EN ISO 4254-7:2009

Deklaracijos vieta ir data: [5]

Asmens tapatybės duomenys ir parašas asmens, įgalioto sudaryti 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

LV

Mēs, [1]

Deklarējam, ka produkts:

Mašīnas tips: [2]

Nosaukums un modelis: [3]

Sērijas numurs(-i): [4]

Atbilst visām būtiskajām Direktīvas 2006/42/EK prasībām.

Piemēroti šādi saskaņotie standarti , kā minēts 7. panta 2. punktā:

EN ISO 4254-1:2013

EN ISO 4254-7:2009

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 Rīdīzels
Ģenerāldirektors, MacDon Europe GmbH
Hagenauer Straße 59
65203 Wiesbaden (Vācija)
bvonriedesel@macdon.com

NL

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.

Geharmoniseerde normen toegepast, zoals vermeld in Artikel 7(2):

EN ISO 4254-1:2013

EN ISO 4254-7:2009

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

PO

My niżej podpisani, [1]

Oświadczamy, że produkt:

Typ urządzenia: [2]

Nazwa i model: [3]

Numer seryjny/numery seryjne: [4]

spełnia wszystkie odpowiednie przepisy dyrektywy 2006/42/WE.

Zastosowaliśmy następujące (zharmonizowane) normy zgodnie z artykułem 7(2):

EN ISO 4254-1:2013

EN ISO 4254-7:2009

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

PT

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.

Normas harmonizadas aplicadas, conforme referido no Artigo 7(2):

EN ISO 4254-1:2013

EN ISO 4254-7:2009

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

RO

Noi, [1]

Declarăm, că următorul produs:

Tipul maşinii: [2]

Denumirea şi modelul: [3]

Număr (numere) serie: [4]

corespunde tuturor dispoziţiilor esenţiale ale directivei 2006/42/EC.

Au fost aplicate următoarele standarde armonizate conform articolului 7(2):

EN ISO 4254-1:2013

EN ISO 4254-7:2009

Data şi locul declaraţiei: [5]

Identitatea şi semnătura persoanei împuternicite pentru întocmirea declaraţiei: [6]

Numele şi semnătura persoanei autorizate pentru întocmirea cărţii tehnice:

Benedikt von Riedesel
Manager General, MacDon Europe GmbH
Hagenauer Straße 59
65203 Wiesbaden (Germania)
bvonriedesel@macdon.com

SR

Mi, [1]

Izjavljujemo da proizvod

Tip mašine: [2]

Naziv i model: [3]

Serijski broj(evi): [4]

Ispunjava sve relevantne odredbe direktive 2006/42/EC.

Korišæeni su usklađeni standardi kao što je navedeno u èlanu 7(2):

EN ISO 4254-1:2013

EN ISO 4254-7:2009

Datum i mesto izdavanja deklaracije: [5]

Identitet i potpis lica ovlašæenog za sastavljanje deklaracije: [6]

Ime i adresa osobe ovlašæene za sastavljanje tehniè-ke datoteke:

Benedikt von Riedesel
Generalni direktor, MacDon Europe GmbH
Hagenauer Straße 59
65203 Wiesbaden (Nemačka)
bvonriedesel@macdon.com

SV

Vi, [1]

Intygar att produkten:

Maskintyp: [2]

Namn och modell: [3]

Serienummer: [4]

uppfyller alla relevanta villkor i direktivet 2006/42/EG.

Harmonierade standarder används, såsom anges i artikel 7(2):

EN ISO 4254-1:2013

EN ISO 4254-7:2009

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

SL

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.

Uporabljeni usklajeni standardi, kot je navedeno v členu 7(2):

EN ISO 4254-1:2013

EN ISO 4254-7:2009

Kraj in datum izjave: [5]

Istovetnost in podpis osebe, opolnomočene za pripravo izjave: [6]

Ime in naslov osebe, pooblaščene za pripravo tehnične datoteke:

Benedikt von Riedesel
Generalni direktor, MacDon Europe GmbH
Hagenauer Straße 59
65203 Wiesbaden (Nemčija)
bvonriedesel@macdon.com

SK

My, [1]

týmto prehlasujeme, že tento výrobok:

Typ zariadenia: [2]

Názov a model: [3]

Výrobné číslo: [4]

spĺňa príslušné ustanovenia a základné požiadavky smernice č. 2006/42/ES.

Použité harmonizované normy, ktoré sa uvádzajú v Článku č. 7(2):

EN ISO 4254-1:2013

EN ISO 4254-7:2009

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

1022882

Introduction

This manual contains information on the D65 Draper Header for Windrowers. Teamed with your windrower and optional hay conditioner, the D65 Draper Header is designed to cut your grain, hay, or specialty crop and lay it into uniform, fluffy windrows.

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.

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.

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 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.

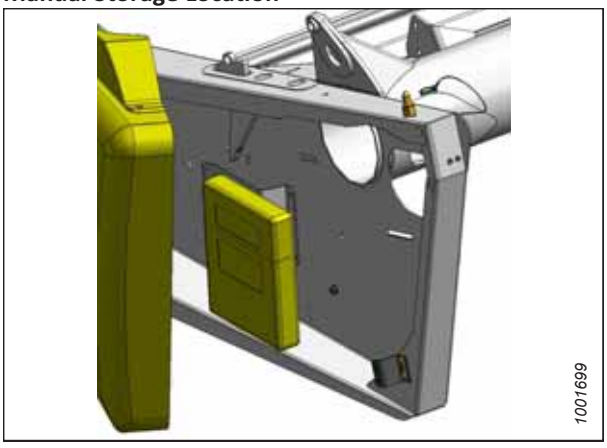
Keep this manual handy for frequent reference and to pass on to new Operators or Owners. A manual storage case is located inside the header left endshield.

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 version can be downloaded from our website (*www.macdon.com*) or from our Dealer-only site (*https://portal.macdon.com*) (login required).

Manual Storage Location



This manual is also available in the following languages:

- Chinese
- Russian

Translated manuals can be ordered from MacDon or downloaded from the Dealer Portal (*https://portal.macdon.com*) or our International website (*http://www.macdon.com/world*).

The following conventions are used in this document:

- Right and left are determined from the operator's position. The front of the header is the side that faces the crop; the back of the header is the side that connects to the windrower.

- Unless otherwise noted, use the standard torque values provided in Chapter *8 Reference, page 269* of this document.

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
1.3 General Safety, page 3	Added "hoodies" to the list of dangling items that you should never wear when you are near equipment.	Product Support
1.7 Safety Decal Locations, page 8	Removed vertical knife illustration 1003382 because the vertical knife is not recommended for use with windrowers.	Product Support
1.7 Safety Decal Locations, page 8	Replaced illustration 1009122 with Figure *1.18, page 10* to show the correct decal locations. Revised Figure *1.19, page 11* to Figure *1.23, page 15* to show new decal locations.	Technical Publications ECN 55510
1.8 Understanding Safety Signs, page 16	Removed vertical knife decal MD #174684 (illustration 1003383) because the vertical knife is not recommended for use with windrowers.	Product Support
Engaging Reel Safety Props, page 33	Added DANGER and Step *2, page 33*. Revised Step *3, page 33* and the associated illustration. Revised Step *4, page 33* to clarify which step to repeat.	Technical Publications Product Integrity
Disengaging Reel Safety Props, page 34	Added DANGER and Step *2, page 34*. Revised Step *4, page 34* to clarify which step to repeat.	Technical Publications
Repositioning Fore-Aft Cylinders on Single Reel, page 62	Revised all illustrations to show the new lighting assemblies.	ECN 54889
Repositioning Fore-Aft Cylinders on Double Reel, page 64	Revised Figure *3.42, page 65* and Figure *3.43, page 66* to show the new lighting assemblies.	ECN 54889
Repositioning Fore-Aft Cylinders with Multi-Crop Rapid Reel Conversion Option, page 66	Revised all illustrations to show new brackets.	ECN 55986
3.9.1 Shifting Decks Hydraulically, page 82	Added Step *1, page 82* for headers with transport/stabilizer wheels.	Technical Publications
3.14.1 Removing Beater Bars, page 93	Added NOTE: • Some newer upper cross augers do not have beater bars.	ECN 61273
3.14.2 Installing Beater Bars, page 94	Added NOTE: • Some newer upper cross augers do not have beater bars.	ECN 61273
Precautions for Towing a Header, page 97	Revised the following statement for clarity: • **NOW:** Turn corners at only very low speeds 8 km/h (5 mph) or less. Header stability is reduced while cornering. • **WAS:** Turn corners at only very low speeds 8 km/h ([5 mph] or less). Header stability is reduced while cornering because front wheel moves to the left.	Product Integrity
Storing the Tow-Bar, page 99	Added Figure *3.87, page 99* for clarity. Revised Step *4, page 100* and Step *5, page 100*, and Figure *3.89, page 100* to mention L-pin/ring instead of clevis pin/hairpin. Added NOTE's to explain the exact appearance of the storage cradle will vary according to the model of header.	Technical Publications ECN 44402

Section	Summary of Change	Internal Use Only
5.3.1 Maintenance Schedule/ Record, page 122	All upper cross auger (UCA) greasing points moved to the 50-hour interval.	Technical Publications ECN 61273
Service Intervals, page 126	Created new Figure *5.7, page 127* and Figure *5.8, page 128* to show the new versus old UCA kit, and because upper cross auger (UCA) greasing points were moved to the 50-hour interval.	Technical Publications ECN 61273
5.4.1 Replacing Light Bulbs, page 137	Added DANGER and Step *1, page 137*. Revised Figure *5.23, page 137* to show the new lighting assembly.	ECN 54889
5.7.1 Removing Side Drapers, page 179	Added 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. Moved Step *5, page 179* and Step *6, page 179*.	Technical Publications
5.7.2 Installing Side Drapers, page 180	Added Step *1, page 180* to Step *5, page 180*. Step *6, page 180* was a NOTE.	Technical Publications
Removing Draper Idler Roller, page 189	Added 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.	Technical Publications
Removing Draper Deck Drive Roller, page 192	Added 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. Moved Step *4, page 192* and Step *5, page 192*.	Technical Publications
Removing Wide Draper Deflectors, page 196	Replaced the following DANGER with the following DANGER and WARNING: • Old DANGER: To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key before leaving the operator's seat, and always engage the safety props before going under the machine for any reason. • New 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. Split Step *3, page 196* and Step *6, page 196* into separate steps.	Technical Publications

Section	Summary of Change	Internal Use Only
Installing Wide Draper Deflectors, page 197	Added the following DANGER and WARNING: • 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. Split Step *3, page 198* and Step *7, page 198* into separate steps.	Technical Publications
Removing Narrow Draper Deflectors, page 199	Replaced the following DANGER with the following DANGER and WARNING: • Old DANGER: To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key before leaving the operator's seat, and always engage the safety props before going under the machine for any reason. • New 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. Split Step *3, page 199* and Step *6, page 199* into separate steps.	Technical Publications
Installing Narrow Draper Deflectors, page 200	Replaced the following DANGER with the following DANGER and WARNING: • Old DANGER: To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key before leaving the operator's seat, and always engage the safety props before going under the machine for any reason. • New 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. Split Step *3, page 200* and Step *6, page 200* into separate steps.	Technical Publications

Section	Summary of Change	Internal Use Only
Removing Steel Tines, page 208	Replaced the following DANGER with the following DANGER: • Old DANGER: To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine, remove the key, and engage the safety props before going under the header for any reason. • New 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. Moved Step *4, page 208* to after the engine is shut off.	Technical Publications
Removing Bushings from Five-, Six-, or Nine-Bat Reels, page 211	Replaced the following DANGER with the following DANGER: • Old DANGER: To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine, remove the key, and engage the safety props before going under the header for any reason. • New 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. Moved Step *4, page 211* to after the engine is shut off.	Technical Publications
7.4 Header and Drapers, page 263	Added NOTE to troubleshooting information for upper cross auger beater bars because the new UCA kits do not have beater bars • Some newer upper cross augers do not have beater bars.	ECN 61273
—	Removed “Vertical Knife Mounts” topic because the vertical knife is not recommended for use with windrowers.	Product Support
6.4.3 Draper Clips, page 251	Added topic.	ECN 54224 ECN 58960
8.3 Unloading and Assembly, page 280	Corrected part numbers of the unloading and assembly manuals.	Technical Publications

Model and Serial Number

Record the model number, serial number, and model year of the header and Slow Speed Transport/Stabilizer Wheel option (if installed) on the lines below.

NOTE:

Right and left designations are determined from the operator's position, facing forward.

Draper Header

Header Model: _____

Serial Number: _____

Year: _____

The serial number plate (A) is located in the lower corner on the left endsheet.

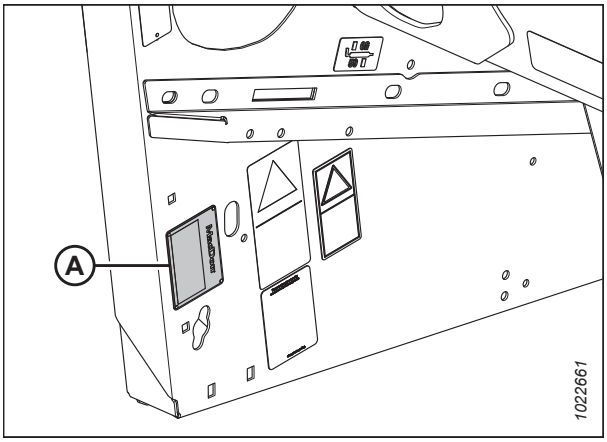


Figure 1: Header

Slow Speed Transport/Stabilizer Wheel Option

Serial Number: _____

Year: _____

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

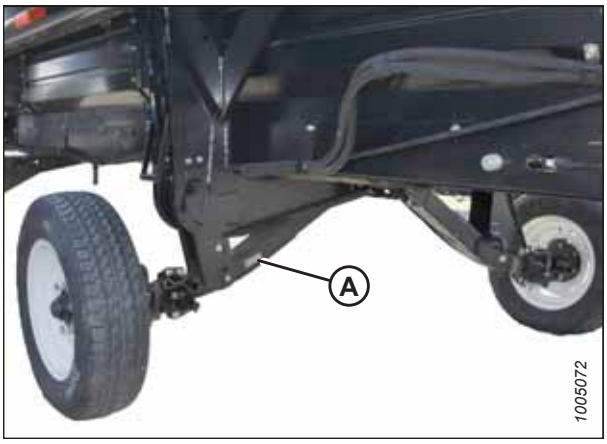


Figure 2: Transport/Stabilizer Option

Chapter 1: Safety

Understanding and consistently following these safety procedures will help to ensure the safety of those operating the machine and of 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 it is not prevented, will result in death or serious injury.

WARNING

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

CAUTION

Indicates a potentially hazardous situation that, if it is not prevented, may result in minor or moderate injury. It may also be used to alert you to unsafe practices.

IMPORTANT:

Indicates a situation that, if not prevented, 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

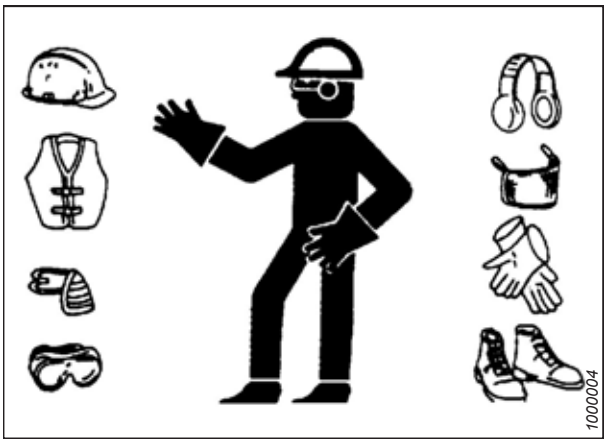


Figure 1.2: Safety Equipment

In addition, take the following precautions:

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

Figure 1.3: Safety Equipment

- Provide a first aid kit in case of emergencies.
- Keep a properly maintained fire extinguisher on the machine. Familiarize yourself with its use.
- Keep young children away from machinery at all times.
- Be aware that accidents often happen when Operators are fatigued or in a hurry. Take time to consider the safest way to accomplish a task. **NEVER** ignore the signs of fatigue.

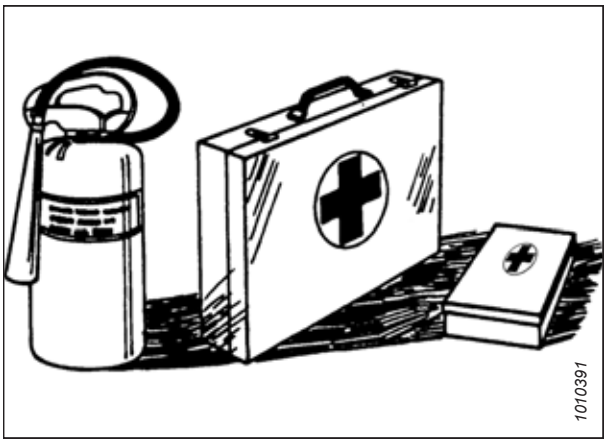


Figure 1.4: Safety Equipment

- Wear close-fitting clothing and cover long hair. **NEVER** wear dangling items such as hoodies, scarves or bracelets.
- Keep all shields in place. **NEVER** alter or remove safety equipment. Ensure that the driveline guards can rotate independently of their shaft, and that they can telescope freely.
- Use only service and repair parts made or approved by the equipment manufacturer. Parts from other manufacturers may not meet the correct 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 the functionality and/or safety of the machine. It may also shorten the machine's service life.
- To avoid 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.

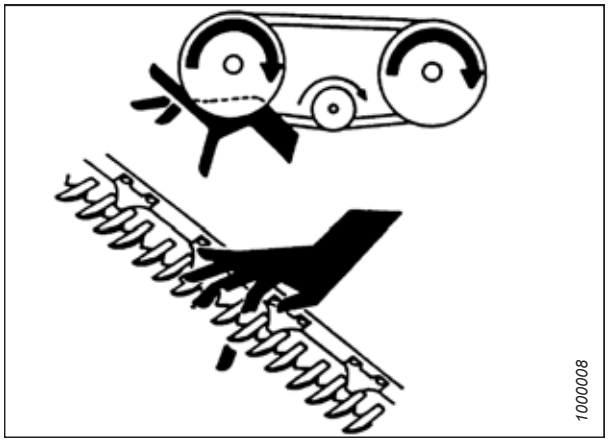


Figure 1.6: Safety around Equipment

- Keep the machine service area clean and dry. Wet and/or oily floors are slippery. Wet spots can be dangerous when working with electrical equipment. Ensure that all electrical outlets and tools are properly grounded.
- Keep the 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 they are stored.
- **NEVER** use gasoline, naphtha, or any volatile material for cleaning purposes. These materials may be toxic and/or flammable.
- When storing machinery, cover any sharp or extending components to prevent injury from accidental contact.

Figure 1.7: Safety around Equipment

1.4 Maintenance Safety

Protect yourself when maintaining machinery.

To ensure your safety while maintaining the machine:

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

Figure 1.8: Safety around Equipment

- Relieve pressure from hydraulic circuits before servicing and/or disconnecting the machine.
- Ensure that 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 the 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 another 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.

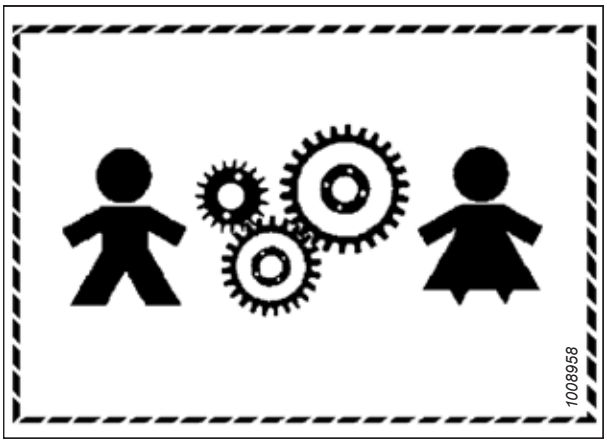


Figure 1.9: Equipment is NOT Safe for Children

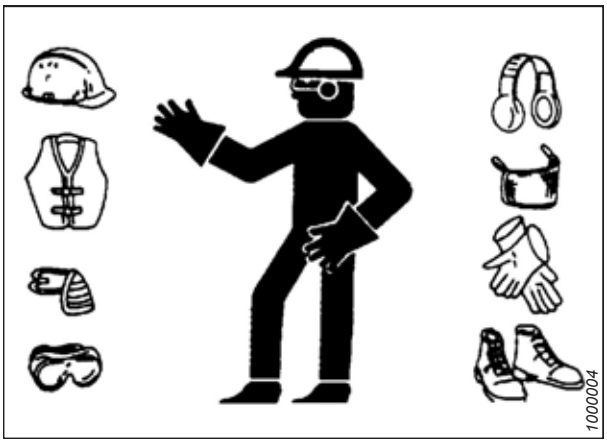


Figure 1.10: Safety Equipment

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.
- Ensure that all the 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 can fail suddenly and create hazardous conditions.

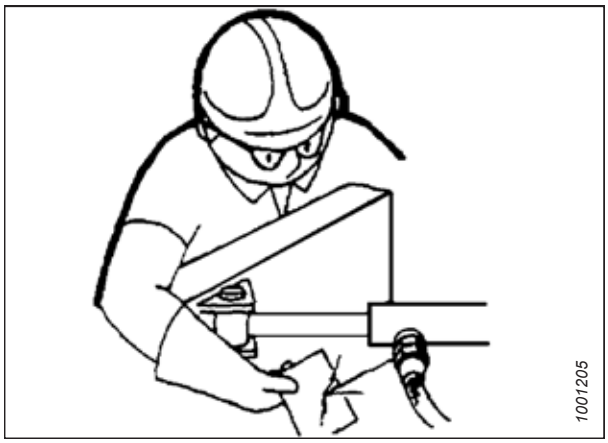


Figure 1.11: Testing for Hydraulic Leaks

- Wear proper hand and eye protection when searching for high-pressure hydraulic fluid leaks. Use a piece of cardboard as a backstop instead of your 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

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

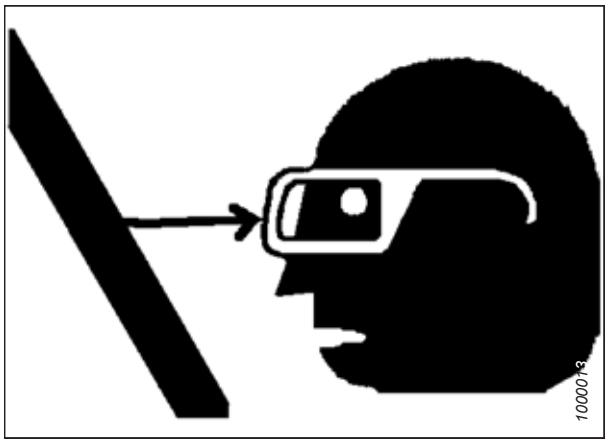


Figure 1.13: Safety around Equipment

1.6 Safety Signs

Safety signs are decals placed on the machine where there is a risk of personal injury, or where the Operator should take extra precautions before operating the controls. They are usually yellow.

- 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, ensure that the repair part displays the current safety sign.
- Replacement safety signs are available from your MacDon Dealer.

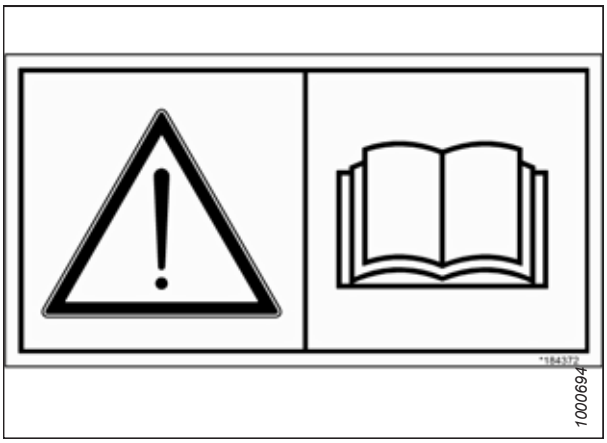


Figure 1.14: Operator's Manual Decal

1.6.1 Installing Safety Decals

Replace any safety decals that are worn or damaged.

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 them out.

1.7 Safety Decal Locations

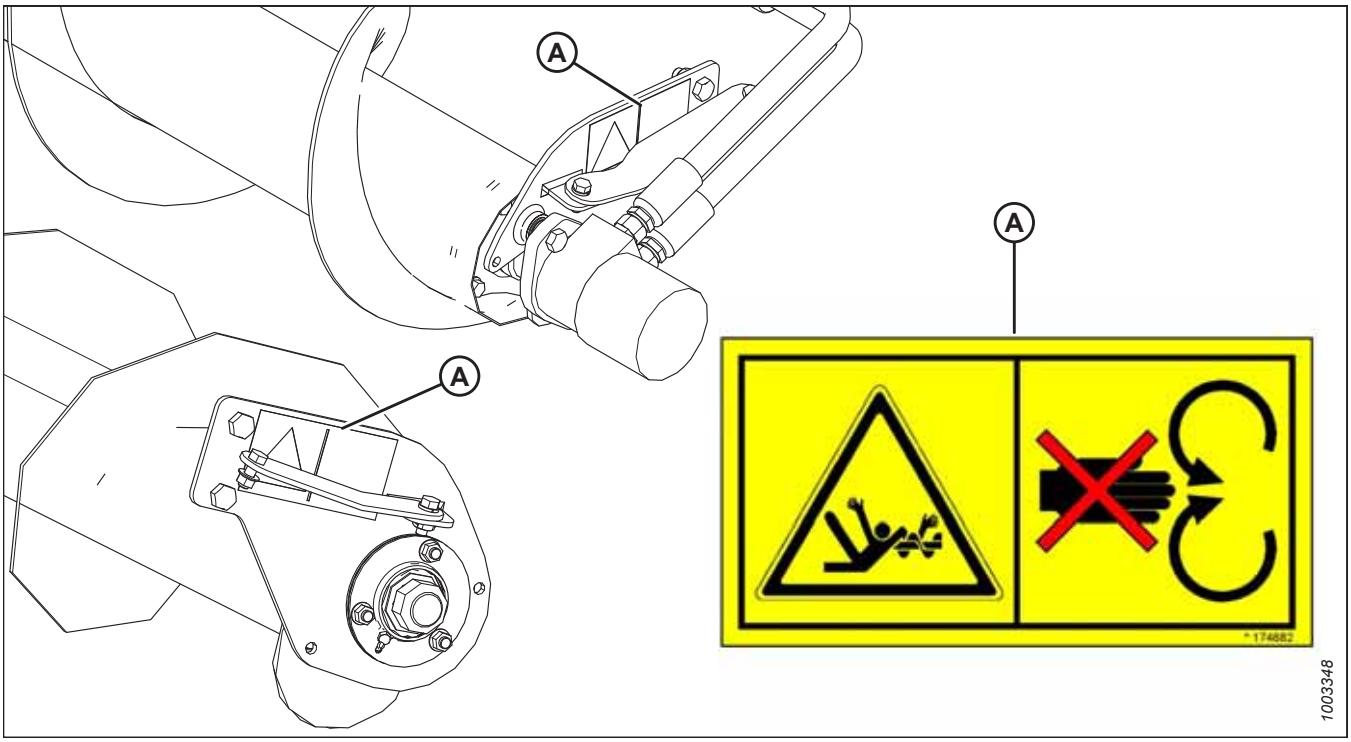


Figure 1.15: Upper Cross Auger

A - MD #174682

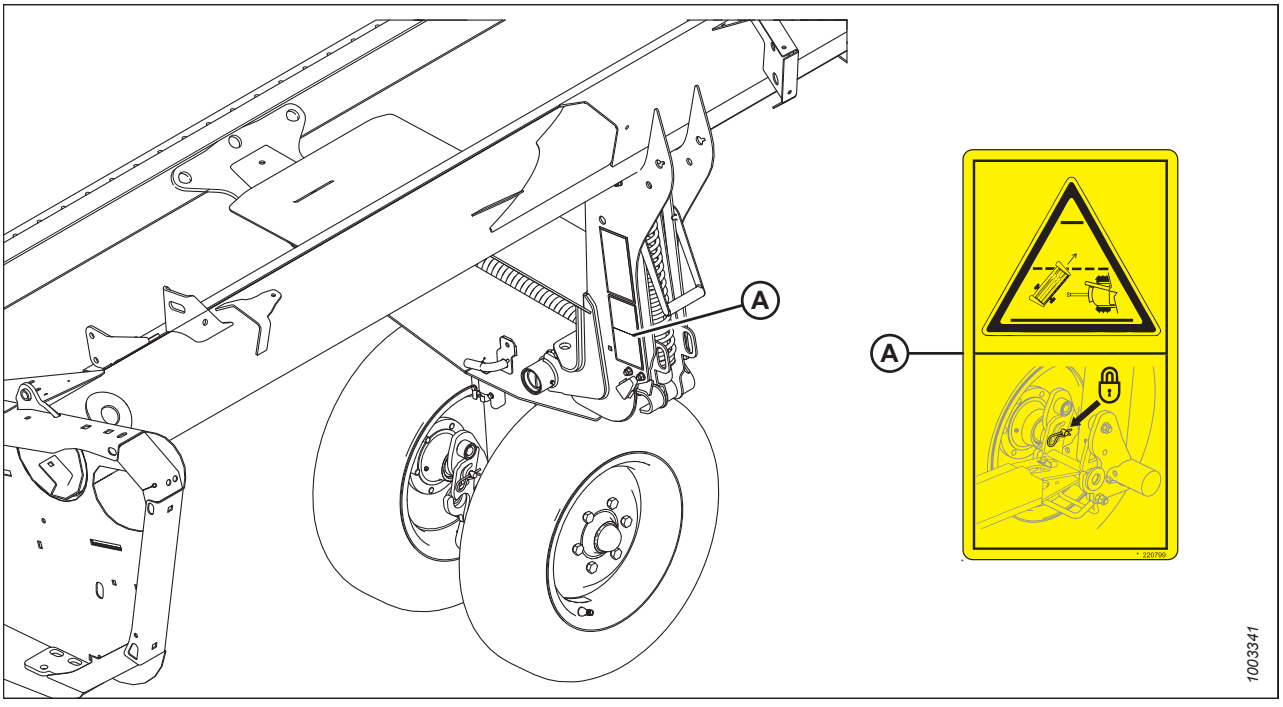


Figure 1.16: Slow Speed Transport

A - MD #220799

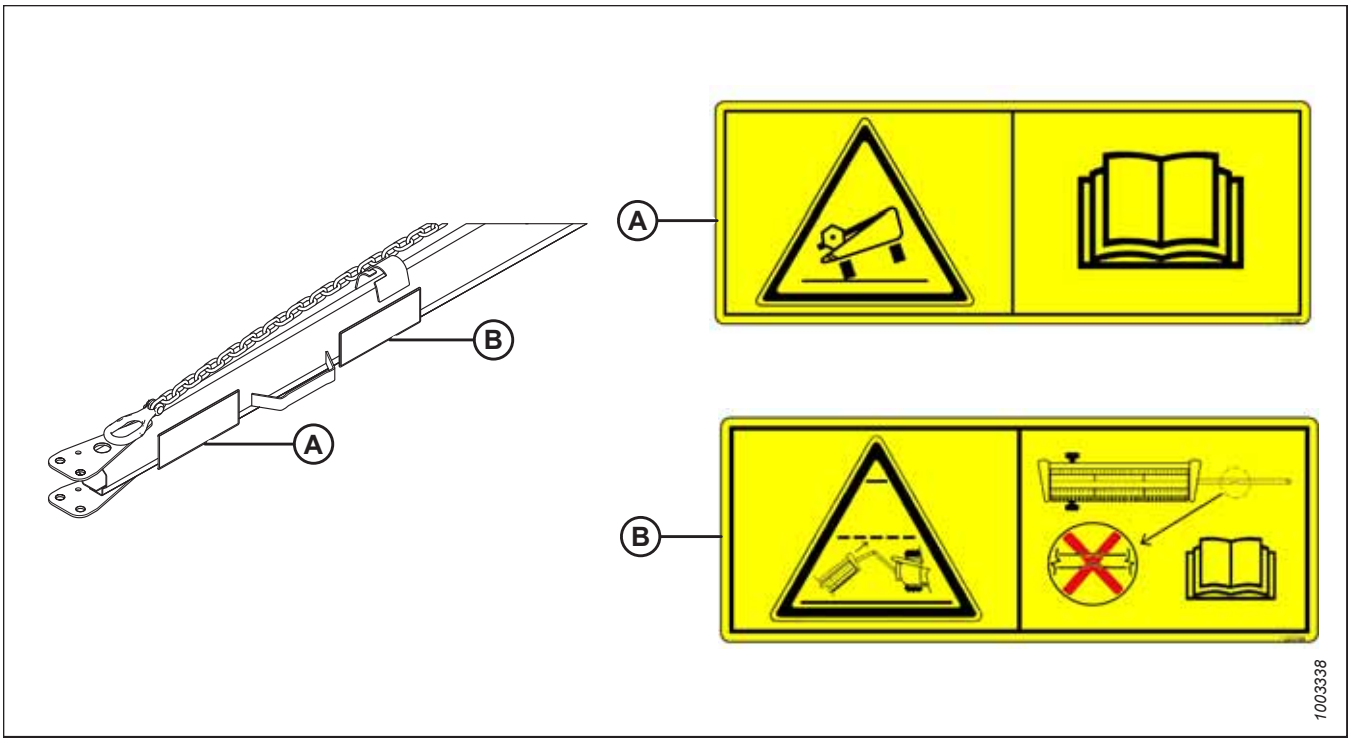


Figure 1.17: Slow Speed Transport Tow-Bar

A - MD #220797 **B - MD #220798**

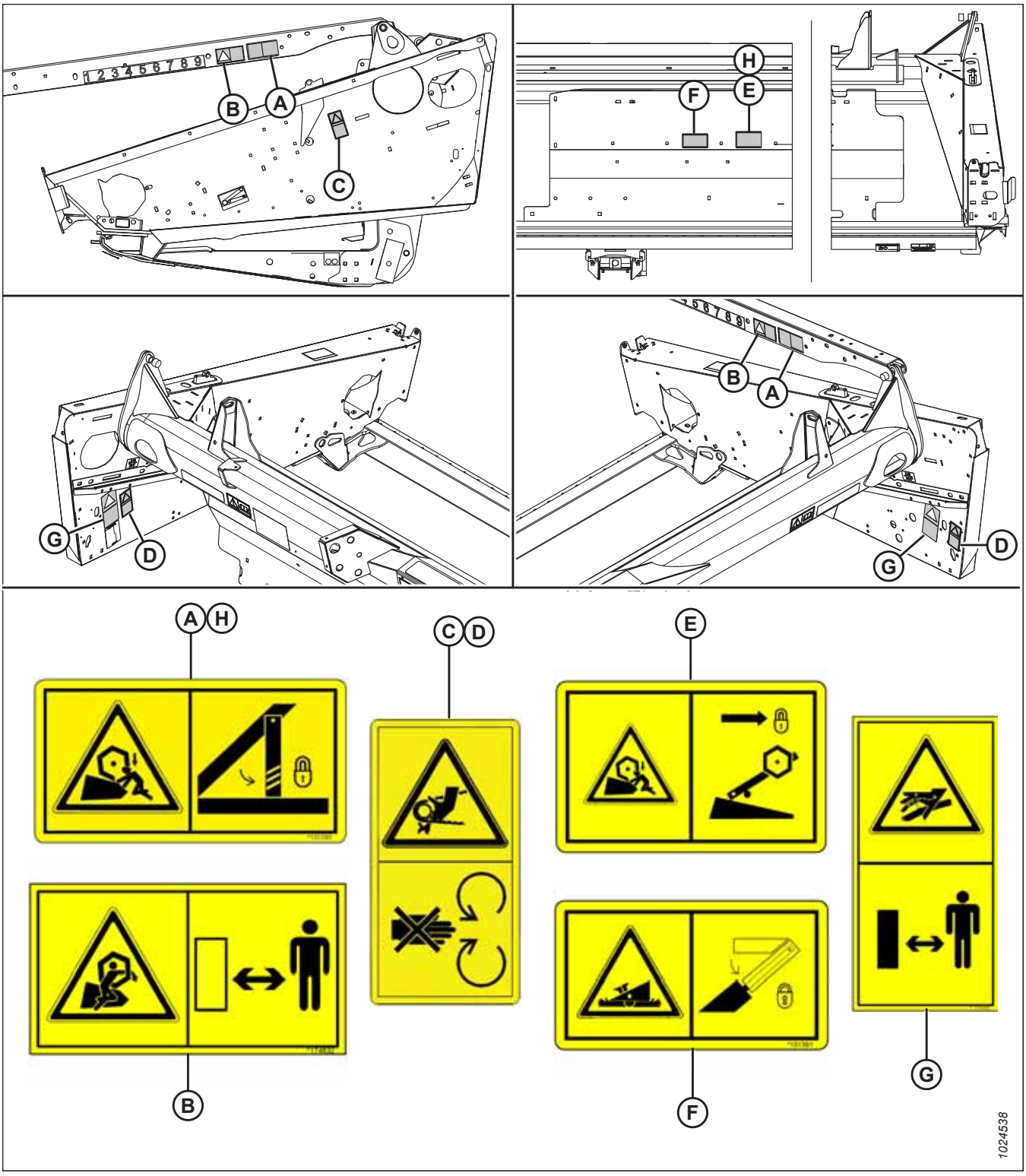


Figure 1.18: Endsheets, Reel Arms, Backsheet

A - MD #131393 (2 Places)

B - MD #174632 (2 Places)

C - MD #184422 (Single Knife – Left Side Only, Double Knife – Both Sides)

D - MD #184422 (Single Knife – Left Side Only[1], Double Knife – Both Sides

E - MD #131392 (Double Reel – 2 Places)

F - MD #131391 (2 Places)

G - MD #174436

H - MD #131393 (Single Reel – 2 Places)

1. There is no decal on 4.6 m (15 ft.) headers.

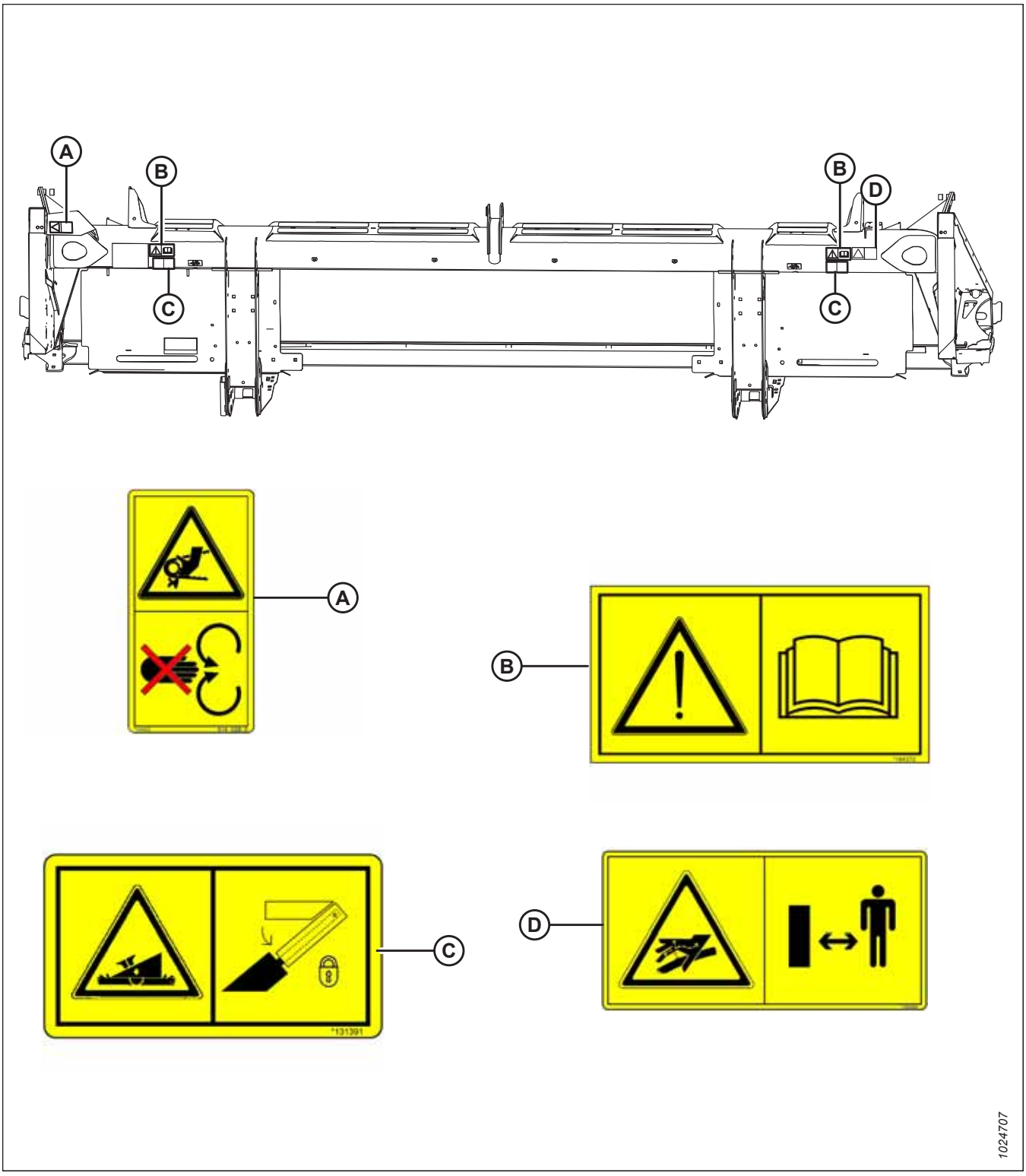


Figure 1.19: Backtube – 4.5 m (15 ft.) Draper Rigid Header

A - MD #184422 **B - MD #184372** **C - MD #131391** **D - MD #166466**

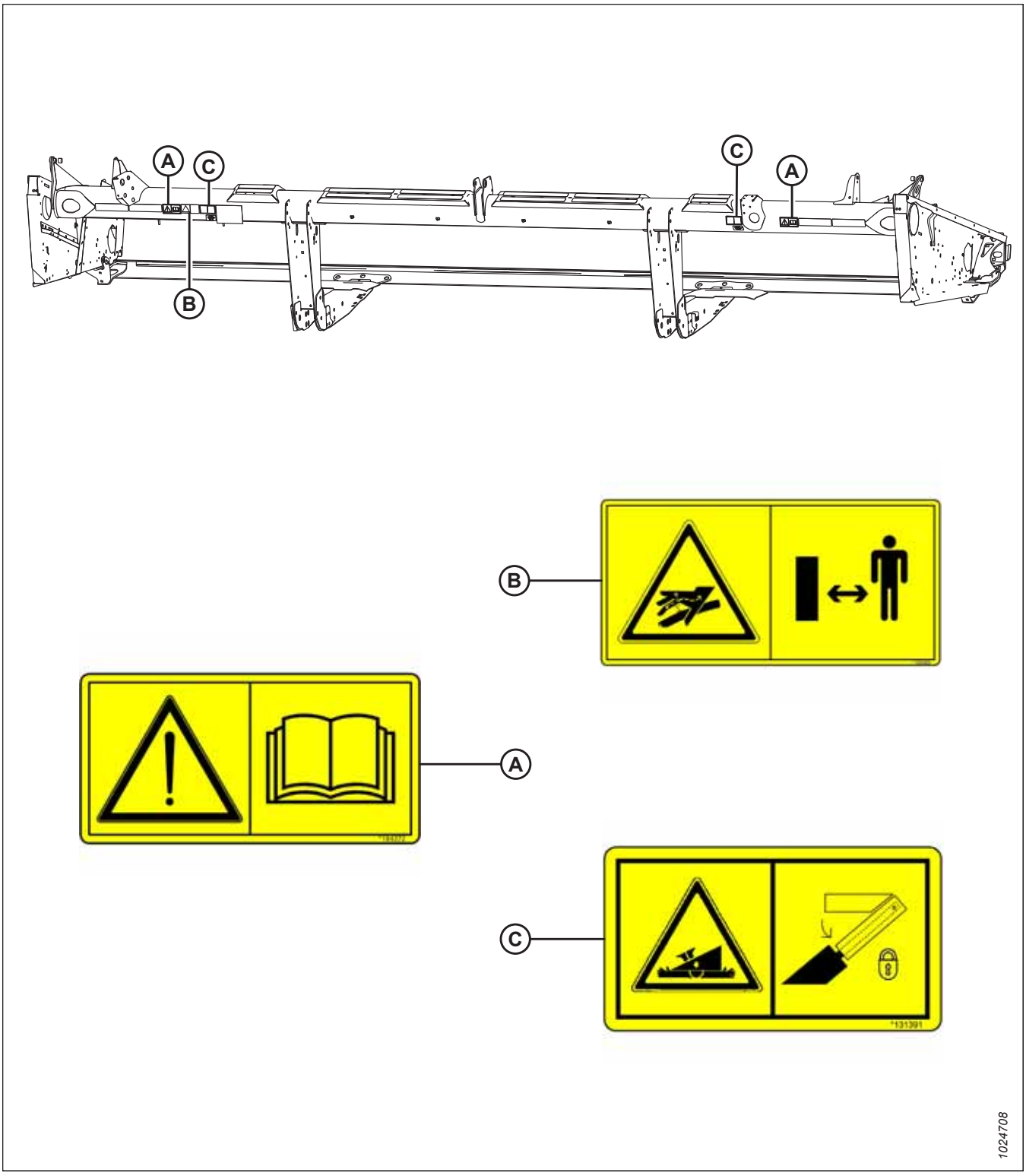


Figure 1.20: Backtube – 6.1 m (20 ft.) Rigid Header

A - MD #184372 **B - MD #166466** **C - MD #131391**

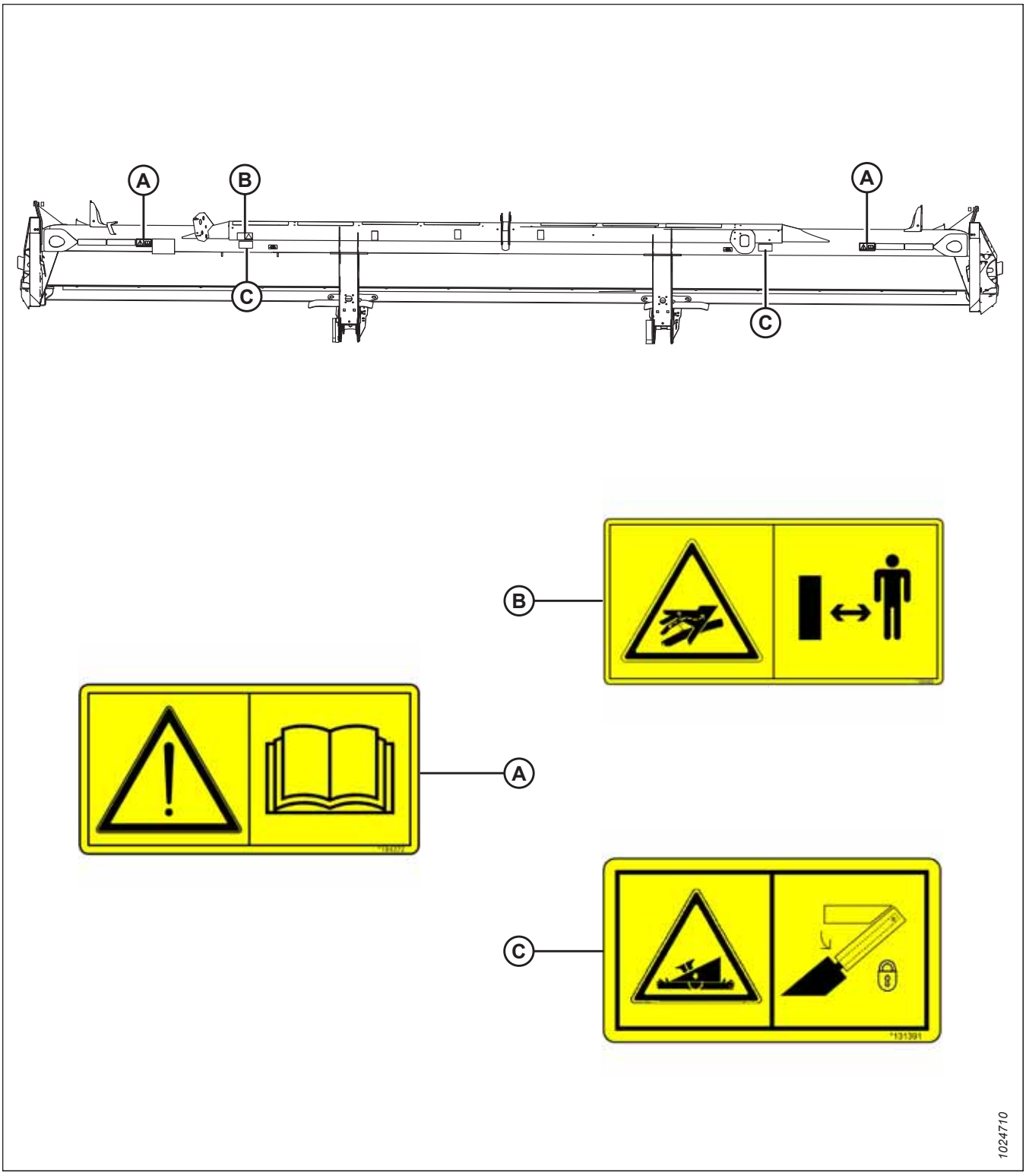


Figure 1.21: Backtube – 7.6 m (25 ft.) Rigid Header

A - MD #184372 **B - MD #166466** **C - MD #131391**

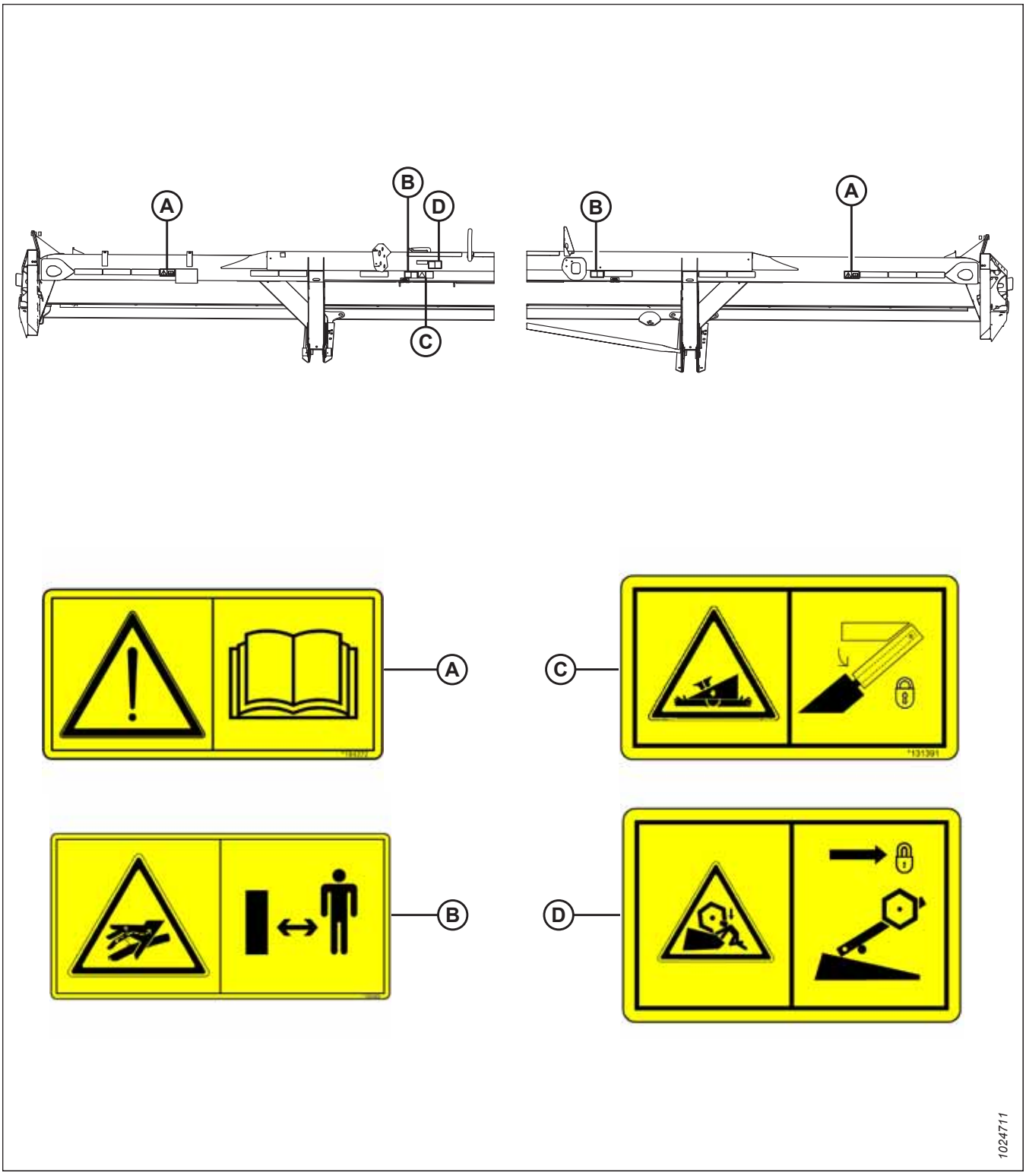


Figure 1.22: Backtube – 9.1 and 10.7 m (30 and 35 ft.) Rigid Header

A - MD #184372 **B - MD #131391** **C - MD #166466** **D - MD #131392 (Double Reel Only)**

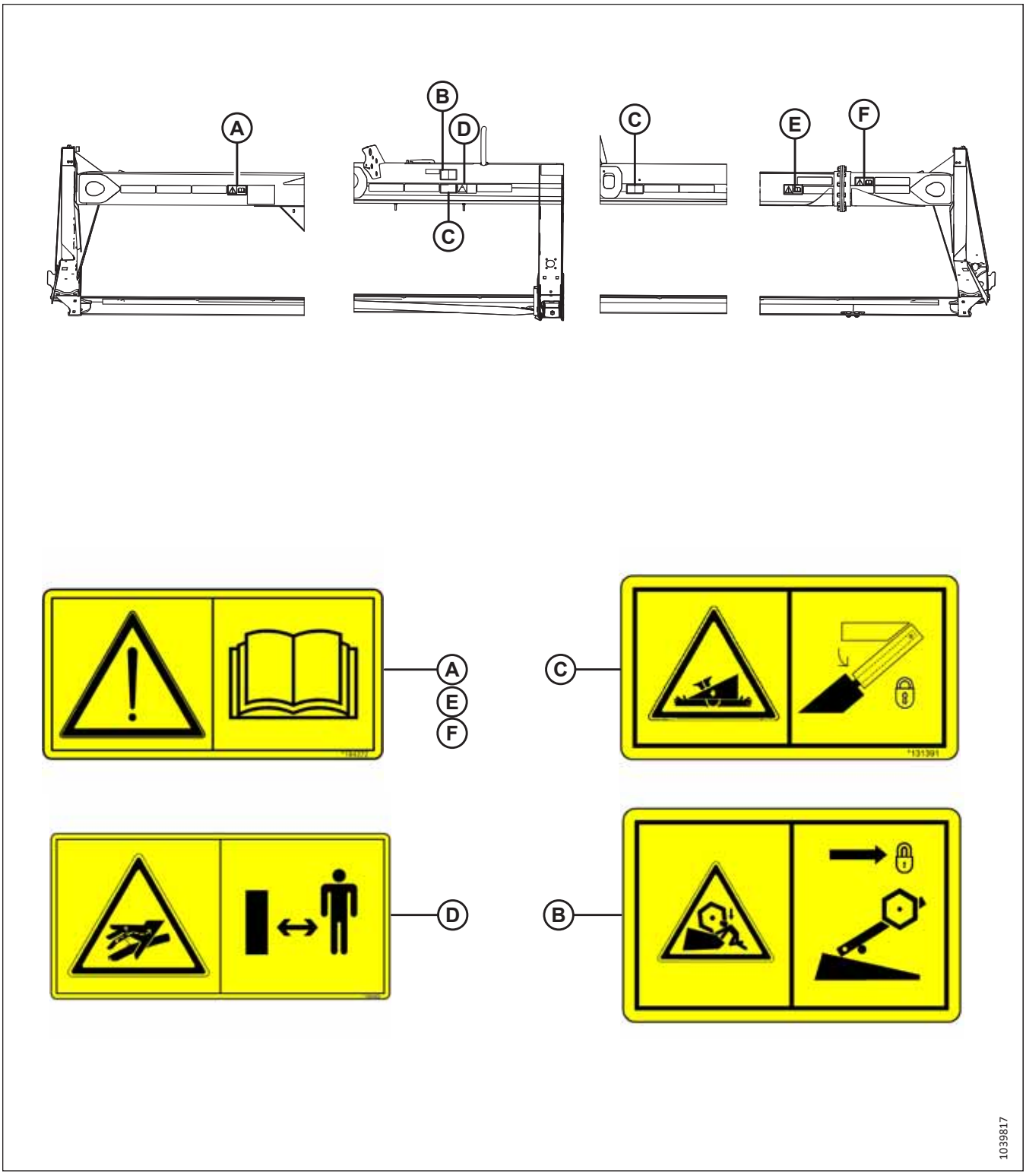


Figure 1.23: Backtube – 12.1 m (40 ft.) Rigid Header

A - MD #184372
B - MD #131392
C - MD #131391
D - MD #166466
E - MD #184372 (One-piece frame only)
F - MD #184372 (Split frame only)

1.8 Understanding Safety Signs

Refer to this topic to learn the hazards that each type of safety decal denotes.

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 1.24: 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 windrower before going under header.
- Alternately, rest the header on the ground, stop the engine, and remove the key from the ignition.

Figure 1.25: MD #131391

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 from the ignition, and engage the safety prop on each reel support arm before working on or under the reel.

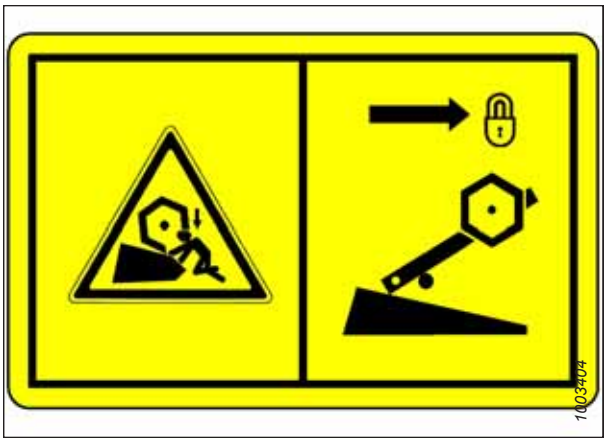


Figure 1.26: MD #131392

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 from the ignition, and engage the safety prop on each reel support arm before working on or under the reel.

Figure 1.27: MD #131393

MD #166466

High-pressure oil hazard

WARNING

High-pressure hydraulic fluid can penetrate human skin, which can cause serious injury such as gangrene, which can be fatal. To prevent this:

- Do **NOT** go near hydraulic fluid leaks.
- Do **NOT** use a finger or skin to check for hydraulic fluid leaks.
- Lower the load or relieve the pressure in the hydraulic system before loosening any hydraulic fittings.
- If you are injured, seek emergency medical help. **IMMEDIATE** surgery is required to remove hydraulic fluid which has penetrated the skin.

Figure 1.28: MD #166466

MD #174436

High-pressure oil hazard

WARNING

High-pressure hydraulic fluid can penetrate human skin, which can cause serious injury such as gangrene, which can be fatal. To prevent this:

- Do **NOT** go near hydraulic fluid leaks.
- Do **NOT** use a finger or skin to check for hydraulic fluid leaks.
- Lower the load or relieve the pressure in the hydraulic system before loosening any hydraulic fittings.
- If you are injured, seek emergency medical help. **IMMEDIATE** surgery is required to remove hydraulic fluid which has penetrated the skin.

Figure 1.29: MD #174436

MD #174632

Reel entanglement hazard

DANGER

To prevent injury from entanglement with the rotating reel:

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

Figure 1.30: MD #174632

MD #174682

Auger entanglement hazard

DANGER

To prevent injury:

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

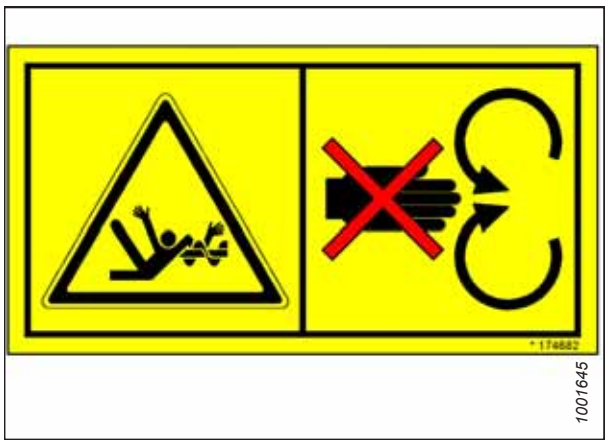


Figure 1.31: MD #174682

MD #184372

General hazard pertaining to machine operation and servicing

DANGER

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

- 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 these safety instructions with all machine Operators every year.
- Ensure that all safety signs are installed and are legible.
- Make certain that bystanders are clear of the header before starting the engine and during operation of the header.
- Keep riders off of the machine.
- Keep all shields in place. Stay clear of moving parts.
- 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.
- Before servicing a header in the raised position, engage the windrower's cylinder safety props.
- Display a slow-moving vehicle emblem and activate the header's warning lights when operating the header on roadways (unless these actions are prohibited by law).

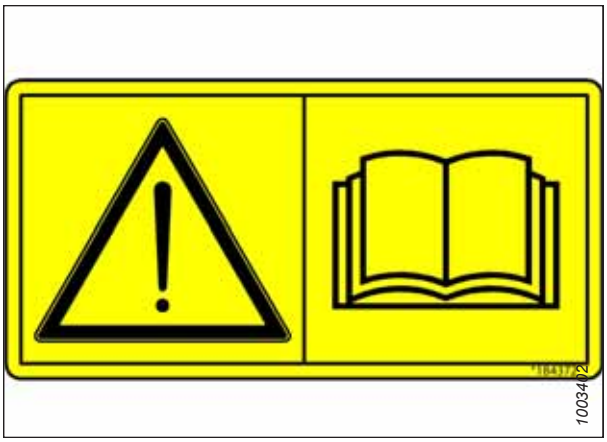


Figure 1.32: MD #184372

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 the header without the shields in place.

Figure 1.33: MD #184422

MD #193147

Loss of control hazard

DANGER

To prevent injury or death from loss of control:

- Ensure the tow-bar lock mechanism is locked.

Figure 1.34: MD #193147

MD #220797

Header tipping hazard – transport mode

DANGER

To prevent serious injury or death from the header tipping over while in transport mode:

- Read the operator's manual for more information on potential tipping or rollover hazards that the header may be subject to while it is transport mode.

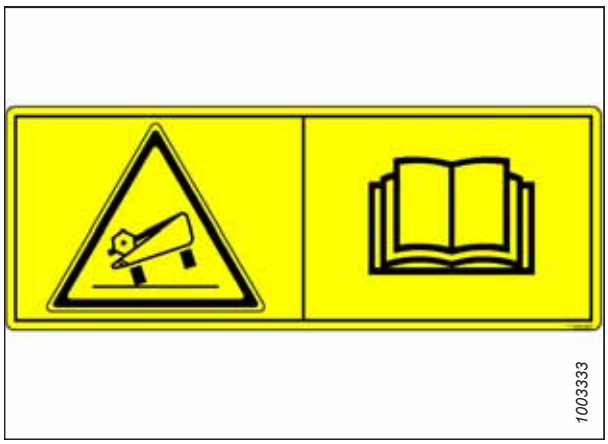


Figure 1.35: MD #220797

MD #220798

Loss of control hazard.

DANGER

To prevent serious injury or death from loss of control:

- Do **NOT** tow the header with a damaged tow bar.
- 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 that the tow-bar lock mechanism is locked.

Figure 1.37: MD #220799

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 are used in this manual.

Term	Definition
API	American Petroleum Institute
ASTM	American Society of Testing and Materials
Bolt	A headed and externally threaded fastener designed to be paired with a nut
Cab-forward	Windrower operation mode, in which the Operator's seat faces the header
CDM	Cab display module on an M Series Windrower
Center-link	A hydraulic cylinder or manually adjustable turnbuckle type connection between the header and the vehicle, which is used to change the angle of the header relative to the vehicle
CGVW	Combined gross vehicle weight
D Series Header	MacDon D50, D60, and D65 rigid draper headers
DK	Double knife
DKD	Double-knife drive
DWA	Double Windrow Attachment
Engine-forward	Windrower operation with Operator and engine facing in direction of travel
Export header	The header configuration typical outside North America
FFFT	Flats from finger tight
Finger tight	Finger tight is a reference position in which the given sealing surfaces or components are making contact with each other and the fitting has been tightened by hand to a point where the fitting is no longer loose and cannot be tightened further by hand
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 and lays crop into a windrow when attached to a windrower
Hex key	A tool of hexagonal cross-section used to drive bolts and screws that have a hexagonal socket in the head (internal-wrenching hexagon drive); also known as an Allen key
ISC	Intermediate Speed Control
JIC	Joint Industrial Council: A standards body that developed standard sizing and shape for original 37° flared fitting
M Series Windrowers	MacDon M100, M105, M150, M155, M155*E4*, M200, and M205 Windrowers
n/a	Not applicable
N-DETENT	The slot opposite the NEUTRAL position on the operator's console of M Series SP Windrowers
North American header	The header configuration typical in North America
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
Nut	An internally threaded fastener 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

Term	Definition
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
SAE	Society of Automotive Engineers
Screw	A headed and externally threaded fastener that threads into preformed threads or forms its own thread when inserted into a mating part
Self-Propelled (SP) Windrower	Self-propelled machine consisting of a power unit and a header. It is designed to cut and lay crops into windrows for later harvest
SK	Single knife
SKD	Single-knife drive
Soft joint	A flexible joint made by use of a fastener in which the joining materials compress or relax over a period of time
Tension	An axial load placed on a bolt or screw, usually measured in Newtons (N) or pounds (lb.). This term can also be used to describe the force a belt exerts on a pulley or sprocket
TFFT	Turns from finger tight
Torque	The product of a force * the length of a lever arm, usually measured in Newton-meters (Nm) or foot-pounds (lbf·ft)
Torque angle	A tightening procedure in which a fitting is assembled to a specified tightness (usually finger tight) and then the nut is turned farther by a specified number of degrees until it achieves its final position
Torque-tension	The relationship between the assembly torque applied to a piece of hardware and the axial load it induces in a bolt or screw
Truck	A four-wheel highway/road vehicle weighing no less than 3400 kg (7500 lb.)
Washer	A thin cylinder with a hole or a slot located in the center, used as a spacer, a load distribution element, or a locking mechanism
WCM	Windrower control module
Windrower	The power unit for a header

2.2 Specifications

The following symbol and letters are used in Table *2.1, page 25* and Table *2.2, page 28*:

| D65 | Attachments

S: standard / O_F: optional (factory installed) / O_D: optional (dealer installed) / —: not available

Table 2.1 Header Specifications

Cutterbar			
Effective cutting width (distance between crop divider points)			
4.6 m (15 ft.) header		4572 mm (180 in.)	S
6.1 m (20 ft.) header		6096 mm (240 in.)	S
7.6 m (25 ft.) header		7620 mm (300 in.)	S
9.1 m (30 ft.) header		9144 mm (360 in.)	S
10.7 m (35 ft.) header		10,668 mm (420 in.)	S
12.2 m (40 ft.) header		12,192 mm (480 in.)	S
Cutterbar lift range at guard tip (center-link fully retracted)		1265 mm (49.8 in.)	—
Knife			
Single-knife drive: one hydraulic motor with V-belt to one heavy duty knife drive box			O_F
Double-knife drive 4.6–10.7 m (15–35 ft.) (timed): one hydraulic motor with two cogged belts to two heavy duty knife drive boxes			O_F
Double-knife drive 12.2 m (40 ft.) (untimed): two hydraulic motors with V-belts to two heavy duty knife drive boxes			O_F
Knife stroke		76 mm (3 in.)	S
Single-knife speed (strokes per minute)[2]	6.1–7.6 m (20–25 ft.)	1200–1400	S
Single-knife speed (strokes per minute) [2]	9.1 m (30 ft.)	1200–1400	S
Single-knife speed (strokes per minute) [2]	10.7 m (35 ft.)	1100–1300	S
Single-knife speed (strokes per minute) [2]	12.2 m (40 ft.)	1050–1200	S
Double-knife speed (strokes per minute) [2]	4.6 m (15 ft.)	1500–1900	S
Double-knife speed (strokes per minute) [2]	6.1–7.6 m (20–25 ft.)	1400–1700	S
Double-knife speed (strokes per minute) [2]	9.1 m (30 ft.)	1200–1600	S
Double-knife speed (strokes per minute) [2]	10.7 m (35 ft.)	1200–1400	S
Double-knife speed (strokes per minute) [2]	12.2 m (40 ft.)	1100–1400	S
Knife Sections			
Over-serrated / solid / bolted / 9 serrations per inch			O_F
Over-serrated / solid / bolted / 14 serrations per inch			O_F

2. 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 low side of range, knife stalling could occur.

Table 2.1 Header Specifications (continued)

Knife overlap at center (double-knife headers)		3 mm (0.12 in.)	S
Guards and Hold-Downs			
Guard: pointed / forged / double heat treated (DHT) Hold-down: sheet metal / adjustment bolt			O_F
Guard: pointed / forged / case hardened (CH) Hold-down: sheet metal / adjustment bolt			O_F
Guard: stub / forged bottom / forged top / adjustment plate			O_F
Guard: stub / forged bottom / sheet metal top / adjustment bolt			O_F
Guard: four point / no-choke design (two long points with tangs / two short points without tangs)			O_F
Guard Angle (Cutterbar on Ground)			
Center-link retracted	4.6–7.6 m (15–25 ft.)	7.5 Degrees	S
Center-link retracted	9.1–12.2 m (30–40 ft.)	2.5 Degrees	S
Center-link extended	4.6–7.6 m (15–25 ft.)	17.0 Degrees	S
Center-link extended	9.1–12.2 m (30–40 ft.)	12.0 Degrees	S
Conveyor (Draper) and Decks			
Draper width		1057 mm (41.6 in.)	S
Draper drive		Hydraulic	S
Draper speed		0–225 m/min. (0–742 fpm)	S
Delivery opening width (center delivery) / variable by shifting decks	4.6 m (15 ft.)	1540–1770 mm (60.6–69.7 in.)	S
Delivery opening width (center delivery) / variable by shifting decks	6.1–12.2 m (20–40 ft.)	1720–1950 mm (67.1– 76.7 in.)	S

Table 2.1 Header Specifications (continued)

PR15 Pick-Up Reel				
Delivery opening height (under frame tube at 203 mm [8 in.] cutting height)	Center-link fully retracted		955 mm (37.6 in.)	S
Delivery opening height (under frame tube at 203 mm [8 in.] cutting height)	Center-link fully extended		1105 mm (43.5 in.)	S
Quantity of tine tubes			5, 6, or 9	—
Center tube diameter: all reel sizes except 10.7 m (35 ft.) single reel			203 mm (8 in.)	—
10.7 m (35 ft.) single header reel only			254 mm (10 in.)	—
Finger tip radius	Factory-set		800 mm (31.5 in.)	—
Finger tip radius	Adjustment range		766–800 mm (30.2– 31.5 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 (auto-adjust from cab using ground speed index)			0–85 rpm	S
Frame and Structure				
Header width (field mode)			Cut width + 384 mm (15.12 in.)	S
Header width (transport mode—reel fore-aft fully retracted)	Header only	(B)[3],[4]	2636 mm (104 in.)	—
Header width (transport mode—reel fore-aft fully retracted)	Header only	(A)[3],[5]	2452 mm (97 in.)	—
Header width (transport mode—reel fore-aft fully retracted)	With HC10 Hay Conditioner installed	(B)[3],[4]	2834 mm (112 in.)	—
Header width (transport mode—reel fore-aft fully retracted)	With HC10 Hay Conditioner installed	(A)[3],[5]	2650 mm (104 in.)	—

3. Refer to Figure *2.1, page 28*
4. Long dividers installed
5. Long dividers removed

Figure 2.1: Header Width

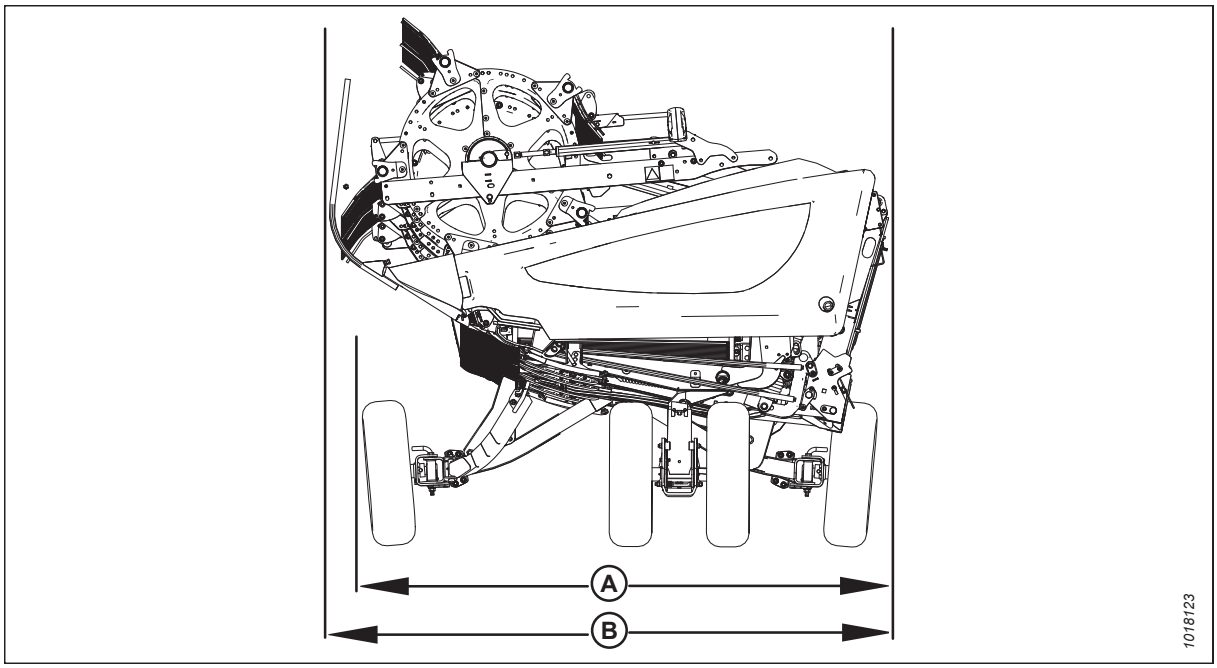


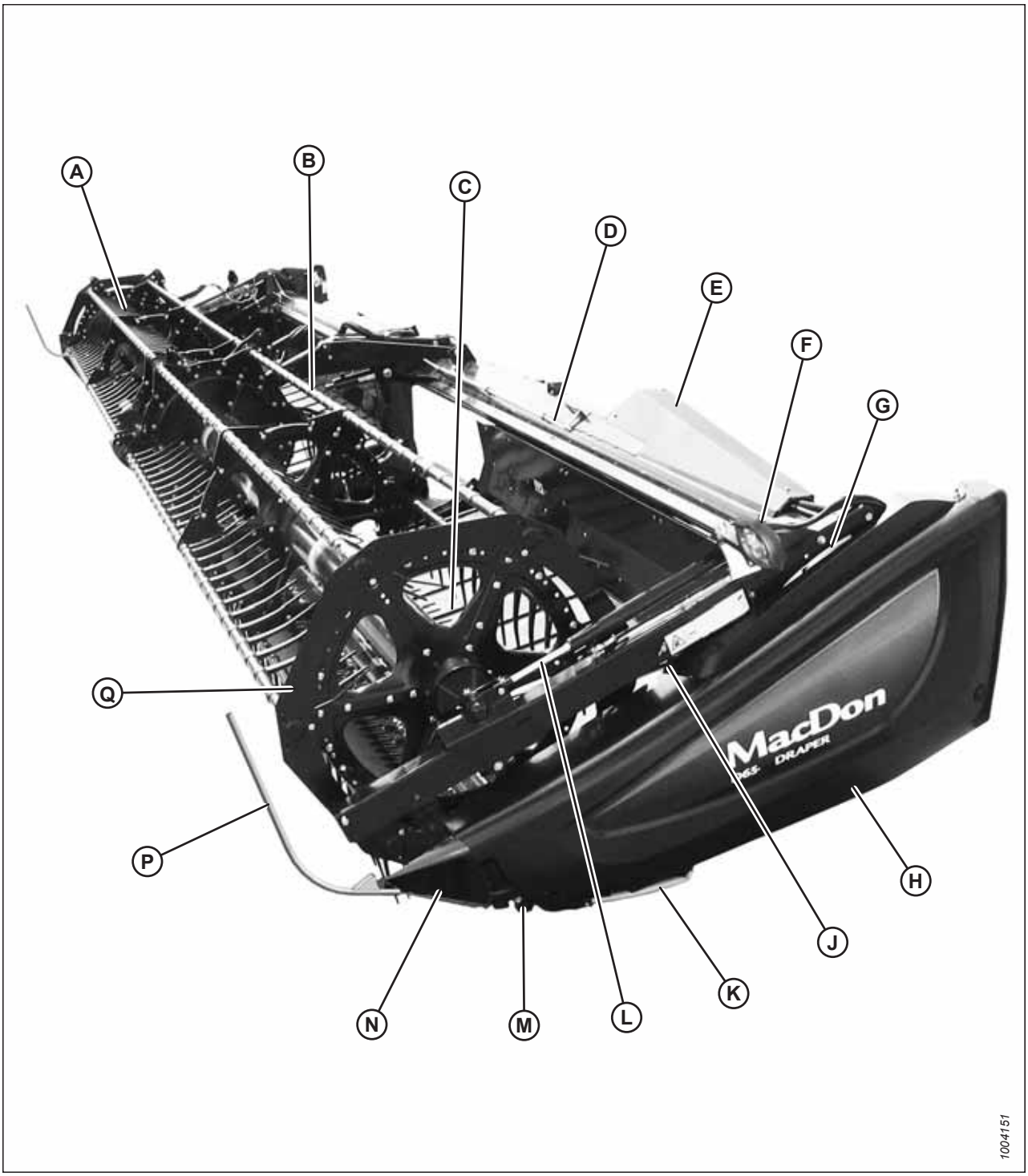
Table 2.2 Header Attachments

HC10 Hay Conditioner		O_D
Roll length		1830 mm (72 in.)
Outside diameter		232 mm (9.1 in.)
Roll tube diameter		168 mm (6.6 in.)
Roll speed		847–915 rpm
Upper Cross Auger		**O_D**
Flighting (Outside diameter [O.D])		305 mm (12 in.)
Tube diameter (O.D)	All except 7.6 m (25 ft.)	152 mm (6 in.)
Tube diameter (O.D)	7.6 m (25 ft.)	178 mm (7 in.)
Stabilizer Wheel / Slow Speed Transport		**O_D**
Wheels		381 mm (15 in.)
Tires		P205/75 R-15

Weight		
Estimated weight range with base header only (variances are due to different package configurations)		
4.6 m (15 ft.) header		1329–1497 kg (2937–3302 lb.)
6.1 m (20 ft.) header		1430–1633 kg (3146–3600 lb.)
7.6 m (25 ft.) header		1605–1753 kg (3547–3872 lb.)
9.1 m (30 ft.) header		1981–2178 kg (4370–4812 lb.)
10.7 m (35 ft.) header		2181–2480 kg (4808–5337 lb.)
12.2 m (40 ft.) header	North America frame	2352–2593 kg (5197–5704 lb.)
	Export frame	2461 kg (5437 lb.)

2.3 Component Identification

Figure 2.2: D65 Windrower Header Components



A - Reel Cam
B - Pick-Up Reel Tines
C - Drapers
D - Center Reel Arm Prop Handle
E - Hydraulic Connections
F - Transport Light
G - Reel Safety Prop
H - Endshield
J - Reel Lift Cylinder
K - Skid Shoe
L - Reel Fore-Aft Cylinder
M - Knife Drive Box
N - Crop Divider
P - Crop Divider Rod
Q - Reel Endshield

Chapter 3: Operation

Safely operating the machine requires familiarizing yourself with its capabilities.

3.1 Owner/Operator Responsibilities

Familiarize yourself with the responsibilities of operating this machine.

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 anyone 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 also 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

Follow all the safety and operational instructions given in this manual.

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 windrower manual, get one from your Dealer and read it thoroughly.**
- **Never attempt to start the engine or operate the machine except from the windrower seat.**
- **Check the operation of all controls in a safe, clear area before starting work.**
- **Do NOT allow riders on the windrower.**

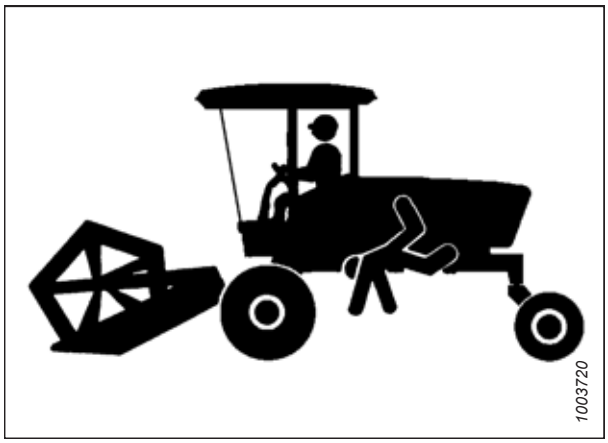


Figure 3.1: No Riders

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 operator's station while the engine is running.**
- **To avoid bodily injury or death from unexpected startup of a machine, always stop the engine and remove the key before adjusting or removing plugged material from the machine.**

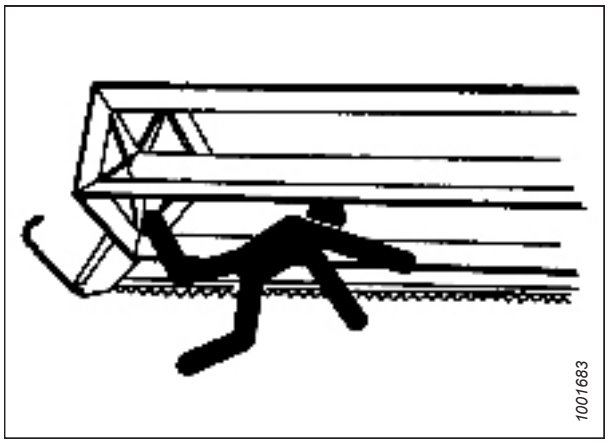


Figure 3.2: Bystander Hazard

- **Check for excessive vibration and unusual noises. If there is any indication of trouble, shut down and inspect the machine. Follow proper shutdown procedure. For instructions, refer to *3.4 Shutting down the Machine, page 42*.**
- **Operate only in daylight or good artificial light.**

3.2.1 Header Safety Props

When engaged, the header safety props located on the header lift cylinders prevent header from falling unexpectedly. For instructions on operating the safety props, refer to your windrower operator's manual.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a 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 arms. When engaged, the reel safety props prevent the reel from falling unexpectedly.

IMPORTANT:

To prevent damage to the reel support arms, do **NOT** transport the header with the reel safety props 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 Step *3, page 33* on the opposite side of the header.

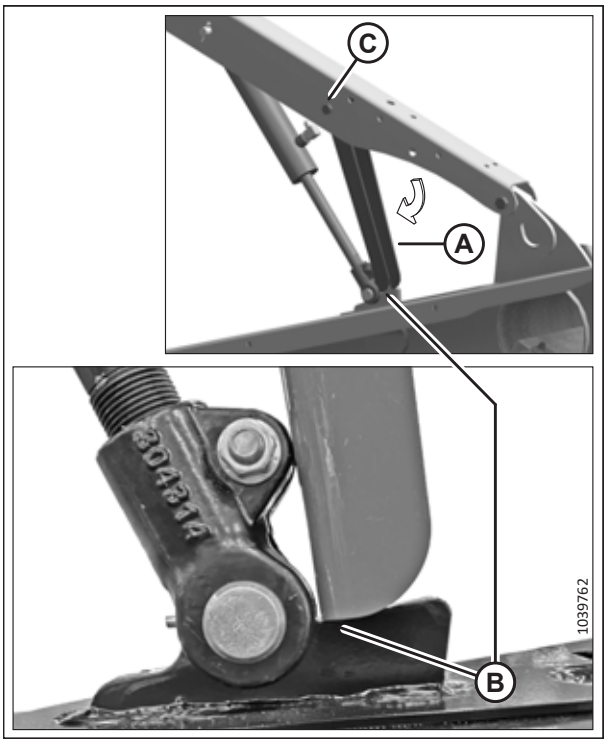


Figure 3.3: Reel Safety Prop – Left Arm Shown

5. **Double-reel header, center arm:** Use handle (A) to move the lock rod to inboard position (B) which engages pin (C) under the prop.

6. Lower the reel until the safety props contact the outer arm cylinder mounts and the center arm pin (the center arm only applies to double-reel headers).

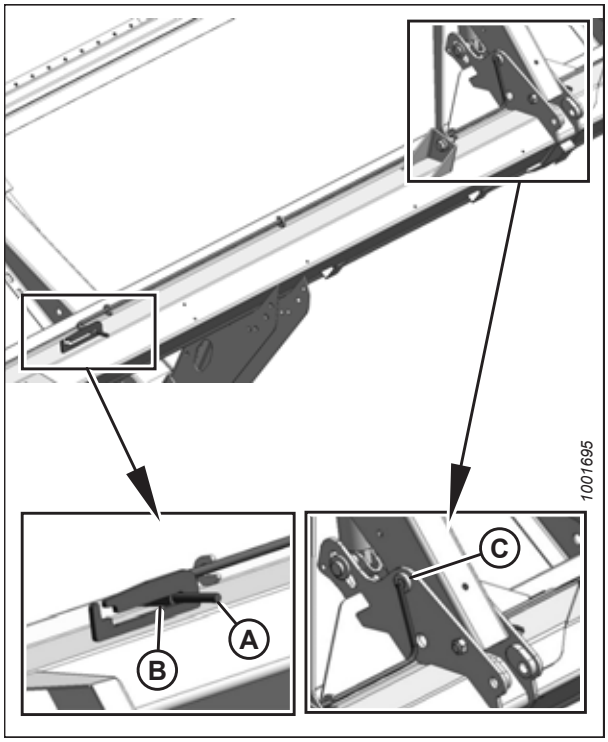


Figure 3.4: Reel Safety Prop – Center Arm

Disengaging Reel Safety Props

Disengage the reel safety props once you have completed working on or around a raised reel.

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.

1. Raise the reel fully.

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

3. Move reel safety prop (A) inside the reel arm.

4. Repeat Step *3, page 34* on the opposite end of the reel.

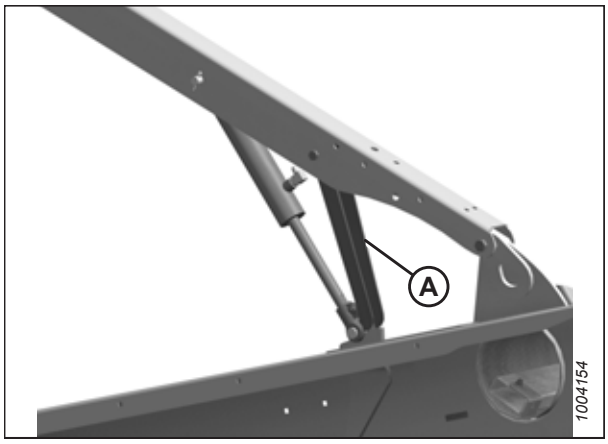


Figure 3.5: Reel Safety Prop – Left Arm Shown

5. **Double-reel headers, center reel arm:** Use handle (B) to move lock rod (A) to the outboard position.

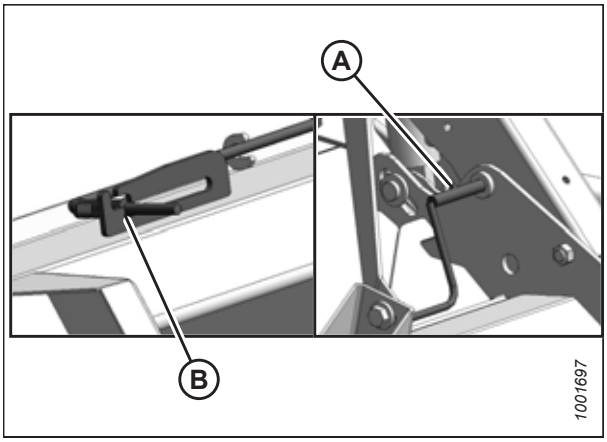


Figure 3.6: Reel Safety Prop – Center Arm

3.2.3 Endshields

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

Opening Endshield

The header endshields cover components. To access the components you will need to open the endshield.

1. Remove lynch pin (A) and tool (B) from pin (C) at the top rear of the endshield.

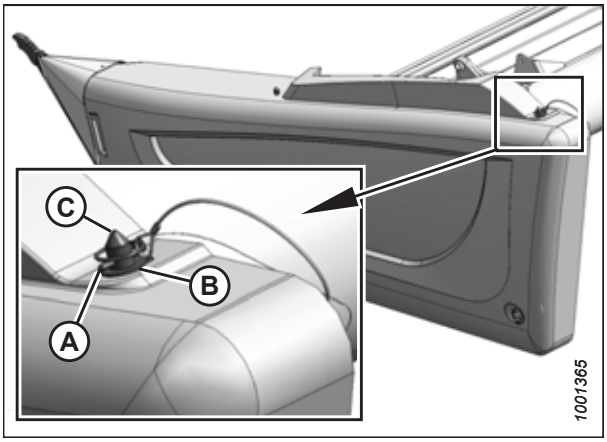


Figure 3.7: Left Endshield

2. Use tool (B) to unlock latch (A) at the lower rear corner of the endshield.
3. Lift the endshield at the aft end to clear the pin at the top rear of the endshield.
4. Swing the endshield out and away from the header while maintaining forward pressure to prevent the endshield from slipping out of tab (C) at the front of the endsheet.

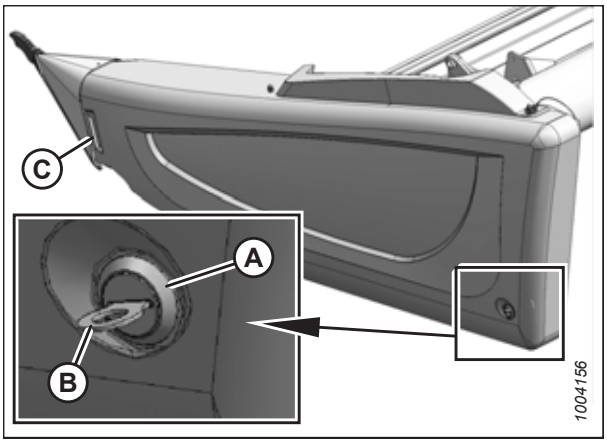


Figure 3.8: Left Endshield

IMPORTANT:

Do **NOT** force the endshield once it has reached its end of travel or damage to the endshield structure may result. The endshield is designed to open sufficiently to allow access to the drive system and manual case.

NOTE:

To access the knife drive box, carefully disengage the front of endshield from the tab at the front of the endsheet and swing the front of the endshield away from the header.

NOTE:

If complete access to endsheet area is required, remove endshield. For instructions, refer to *Removing Endshield, page 37*.

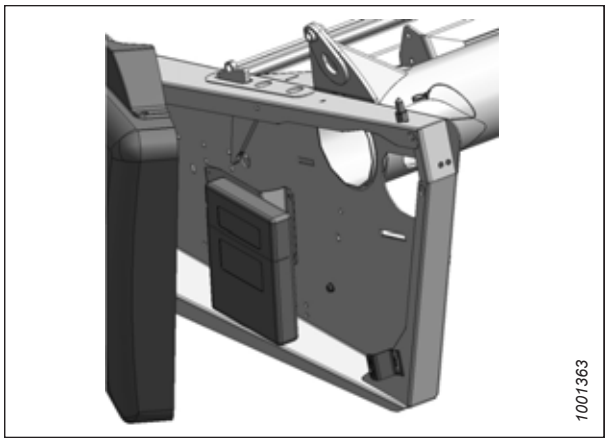


Figure 3.9: Left Endshield Open

Closing Endshield

The header endshields cover components. After accessing the components you will need to close the endshield.

1. Maintain forward pressure and swing the rear of the endshield towards the header.
2. Lift the endshield and engage pin (A) located on the top of the endsheet frame with the hole in endshield (B).

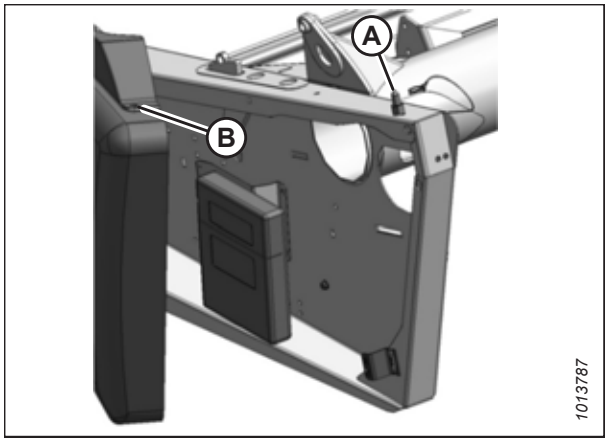


Figure 3.10: Left Endshield

3. Push in the endshield to engage lower latch (A).
4. Use tool (B) to lock lower latch (A).

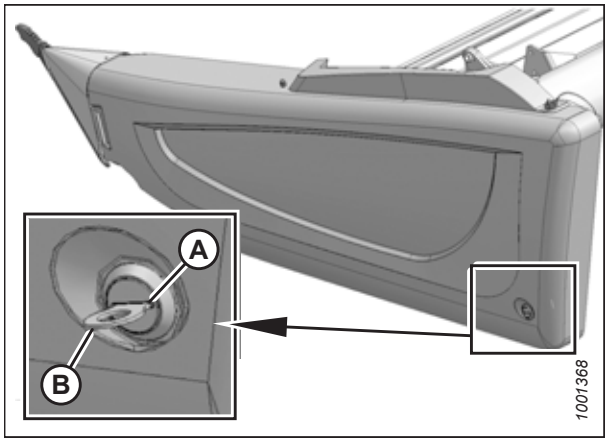


Figure 3.11: Left Endshield

5. Replace tool (B) and lynch pin (A) on top pin (C).

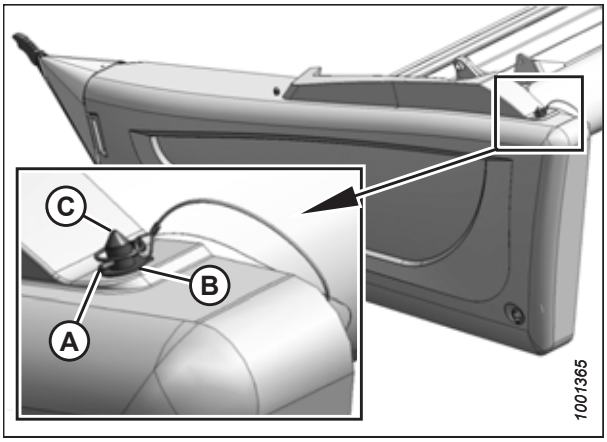


Figure 3.12: Left Endshield Pin

Removing Endshield

1. Open the endshield. For instructions, refer to *Opening Endshield, page 35*.
2. Remove acorn nut (A) securing the endshield to support (B).
3. Lift the endshield off support (B).

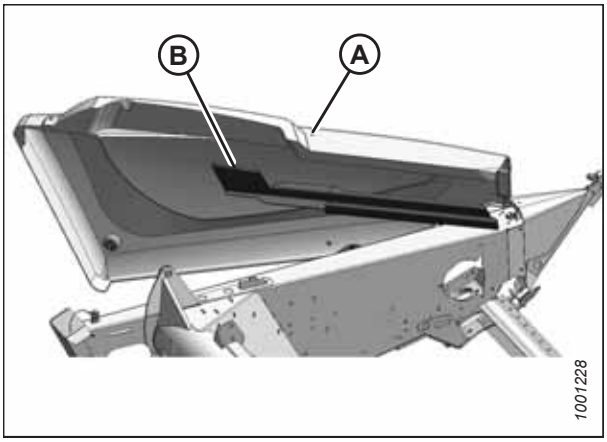


Figure 3.13: Left Endshield

Installing Endshield

1. Position the endshield onto support (A), and align the hole in the endshield with stud (B) on the support.

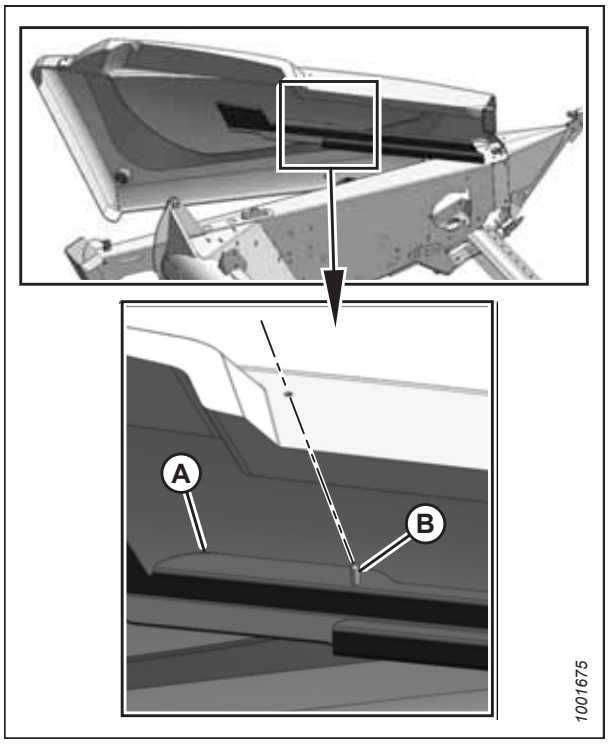


Figure 3.14: Left Endshield

2. Secure the endshield to the support with acorn nut (A).
3. Close the endshield. Refer to *Closing Endshield, page 36*.

   NOTE:

   Polyethylene endshields may expand or contract when subjected to large temperature changes. Top pin and lower catch bracket positions can be adjusted to compensate for dimensional changes. Refer to *Adjusting Endshield, page 39*.

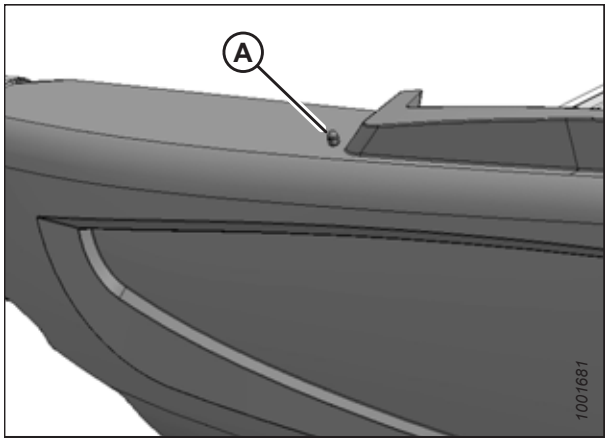


Figure 3.15: Left Endshield

Adjusting Endshield

Polyethylene endshields expand or contract when subjected to large temperature changes. The position of the top pin and lower catch can be adjusted to compensate for dimensional changes.

1. Measure gap (X) between the front end of the endshield and the header frame and compare the measurement to the values provided in Table *3.1, page 39*.

Table 3.1 Gap (X) Chart

Temperature °C (°F)	Gap (X) between Endshield and Frame mm (in.)
-4 (25)	28 (1-1/8)
7 (45)	24 (1)
18 (65)	20 (13/16)
29 (85)	16 (5/8)
41 (105)	12 (1/2)
52 (125)	8 (5/16)
63 (145)	4 (3/16)
89 (165)	0

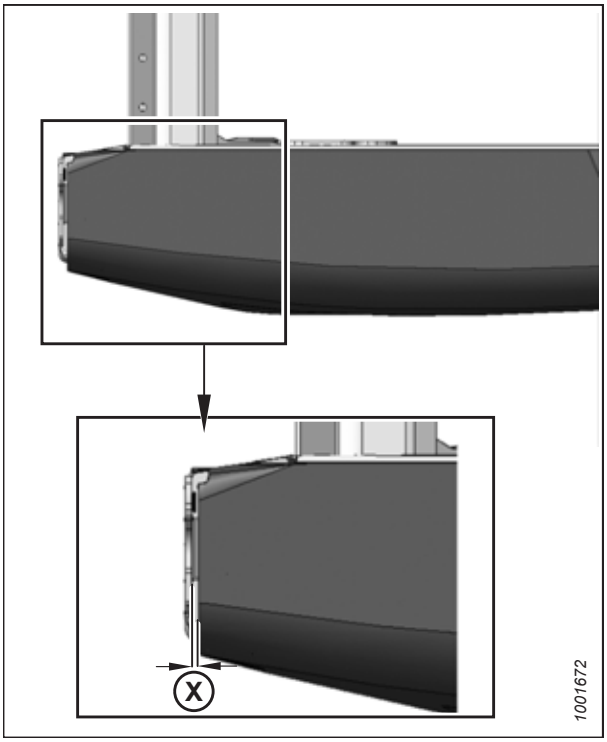


Figure 3.16: Left Endshield

If adjustments are required, proceed as follows:

2. Open the endshield. Refer to *Opening Endshield, page 35*.
3. Loosen nut (A) on pin (B) from inside the endsheet using a 19 mm (3/4 in.) socket.
4. Close the endshield and adjust its position to achieve the gap (X) (shown in Figure *3.16, page 39*) between the front end of the endshield and the header frame.
5. Open the endshield and tighten nut (A).
6. Loosen the bolts on catch (C), and adjust the catch as required to reposition the endshield. Ensure there is a snug fit between the top of the endshield and the header frame and that the endshield is fully engaged on pin (B).
7. Tighten the bolts on catch (C).
8. Close the endshield. Refer to *Closing Endshield, page 36*.

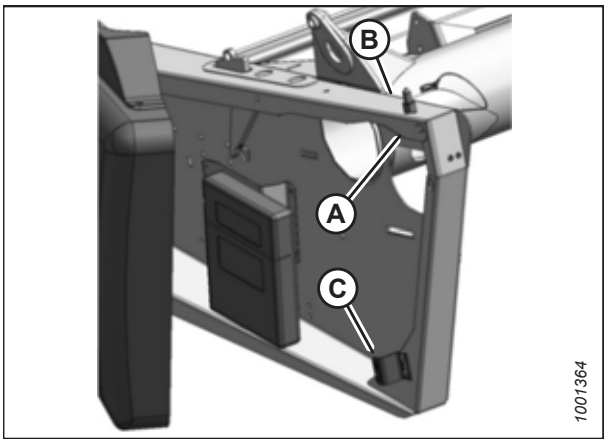


Figure 3.17: Left Endshield

3.2.4 Daily Start-Up Check

Complete the following tasks each day before starting the machine.

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.**

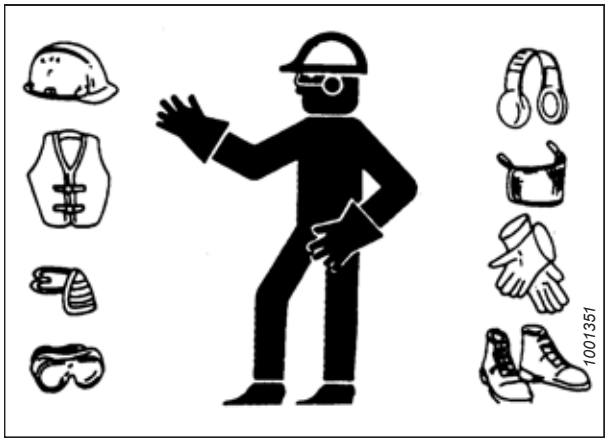


Figure 3.18: Safety Devices

- **Protect against noise. Wear a suitable hearing protective device such as ear muffs or ear plugs to protect against objectionable or uncomfortably loud noises.**

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 125*.

2. Clean all lights and reflective surfaces on the machine.

3. Perform all daily maintenance. For instructions, refer to *5.3.1 Maintenance Schedule/Record, page 122*.

3.3 Break-In Period

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

CAUTION

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

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

1. Operate the machine with the reels, drapers, and knives running slowly for five 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 123* and perform all the specified tasks.

3.4 Shutting down the Machine

To prevent injuries and equipment damage, always perform the procedures for shutting down the machine.

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 leaving the operator's seat for any reason.

To shut down, and before leaving the windrower seat for any reason, follow these steps:

1. Disengage the header drive.
2. Park on level ground whenever possible.
3. Lower the header fully.
4. Place all controls in NEUTRAL or PARK.
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 before exiting the vehicle.

3.5 Cab Controls

The primary header functions are controlled inside the windrower cab.

CAUTION

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

Refer to your windrower operator's manual for identification of the following in-cab controls:

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

3.6 Header Setup

The setup section provides information about adjustments, optional attachments, and optimizing the header for various conditions.

3.6.1 Header Attachments

Several attachments to optimize the performance of your D65 Draper Header are available as options from your MacDon Dealer.

Refer to *6 Options and Attachments, page 243* for descriptions of available items.

3.6.2 Header Settings

The following table is a guideline for setting up the D65 Draper Header. Adjustments can be made to suit various crops and conditions not covered here.

Table 3.2 Recommended Header Settings

Crop Condition	Divider Rods	Header Angle[6]	Knife Speed[7]	Reel Tine Pitch[8]	Reel Speed %[9]	Reel Fore-Aft[10]	Skid Shoe Position[11]	Stabilizer Wheels[12]	Upper Cross Auger	Float N (lbf)[13]
Crop Type: Cereals										
Stubble Height: <102 mm (<4 in.)										
Light	On	0–3	Medium	2	10–15	6 or 7	Up or center	Variable	Not required	311 (70)
Normal	On	0–3	High	2	10	6 or 7	Up or center	Variable	Not required	311 (70)
Heavy	On	4–7	High	2	10	6 or 7	Up or center	Variable	Not required	311 (70)
Lodged	On	4–7	High	3	5–10	4 or 5	Up or center	Variable	Not required	311 (70)
Crop Type: Cereals										
Stubble Height: 102–203 mm (4–8 in.)										
Light	On	0–3	Medium	2	10–15	6 or 7	Center or down	Variable	Not required	311 (70)
Normal	On	0–3	High	2	10	6 or 7	Center or down	Variable	Not required	311 (70)
Heavy	On	4–7	High	2	10	6 or 7	Down	Variable	Not required	311 (70)
Lodged	On	4–7	High	3	5–10	4 or 5	Down	Variable	Not required	311 (70)

6. Set header angle as shallow as possible with center-link and skid shoes while maintaining cutting height. For instructions, refer to *Controlling Header Angle, page 57*.
7. Refer to *3.7.9 Knife Speed, page 59*.
8. Refer to *Reel Cam Settings, page 68*.
9. Percentage above ground speed. Refer to *3.7.6 Reel Speed, page 58*.
10. Refer to *3.7.11 Reel Fore-Aft Position, page 61*.
11. Skid shoe position is used in combination with header angle to determine the cutting height when cutting on or very close to the ground. Refer to *3.7.1 Cutting Height, page 52*.
12. Stabilizer wheels are used to limit the side-to-side movement when cutting off the ground in rolling terrain, and to minimize bouncing.
13. Force required to lift header at ends. Refer to your windrower operator's manual for adjustment procedures.

Table 3.2 Recommended Header Settings (continued)

Crop Condition	Divider Rods	Header Angle[14]	Knife Speed[15]	Reel Tine Pitch[16]	Reel Speed %[17]	Reel Fore-Aft[18]	Skid Shoe Position[19]	Stabilizer Wheels[20]	Upper Cross Auger	Float N (lbf)[21]
Crop Type: Cereals										
Stubble Height: >203 mm (>8 in.)										
Light	On	0–3	Medium	2	10–15	6 or 7	Not applicable	Storage	Not required	667 (150)
Normal	On	0–3	High	2	10	6 or 7	Not applicable	Storage	Not required	667 (150)
Heavy	On	4–7	High	2	10	6 or 7	Not applicable	Storage	Not required	667 (150)
Lodged	On	4–7	High	3	5–10	4 or 5	Not applicable	Storage	Not required	667 (150)
Crop Type: Canola										
Stubble Height: 102–203 mm (4–8 in.)										
Light	On	8–10	Low	2	5–10	6 or 7	Variable	Variable	Not required	311–445 (70–100)
Normal	On	8–10	Medium	1	10	6 or 7	Center or down	Variable	Not required	311–445 (70–100)
Heavy	On	8–10	Medium	1	10	3 or 4	Variable	Variable	Recommended	311–445 (70–100)
Lodged	On	8–10	Medium	2	5–10	3 or 4	Center or down	Variable	Recommended	311–445 (70–100)

14. Set header angle as shallow as possible with center-link and skid shoes while maintaining cutting height. For instructions, refer to *Controlling Header Angle, page 57*.
15. Refer to *3.7.9 Knife Speed, page 59*.
16. Refer to *Reel Cam Settings, page 68*.
17. Percentage above ground speed. Refer to *3.7.6 Reel Speed, page 58*.
18. Refer to *3.7.11 Reel Fore-Aft Position, page 61*.
19. Skid shoe position is used in combination with header angle to determine the cutting height when cutting on or very close to the ground. Refer to *3.7.1 Cutting Height, page 52*.
20. Stabilizer wheels are used to limit the side-to-side movement when cutting off the ground in rolling terrain, and to minimize bouncing.
21. Force required to lift header at ends. Refer to your windrower operator's manual for adjustment procedures.

Table 3.2 Recommended Header Settings (continued)

Crop Condition	Divider Rods	Header Angle[22]	Knife Speed[23]	Reel Tine Pitch[24]	Reel Speed %[25]	Reel Fore-Aft[26]	Skid Shoe Position[27]	Stabilizer Wheels[28]	Upper Cross Auger	Float N (lbf)[29]
Crop Type: Canola										
Stubble Height: >203 mm (>8 in.)										
Light	On	8–10	Low	4	5–10	6 or 7	Not applicable	Storage	Recommended	667 (150)
Normal	On	8–10	Medium	2	10	6 or 7	Not applicable	Storage	Recommended	667 (150)
Heavy	On	8–10	Medium	3	10	3 or 4	Not applicable	Storage	Recommended	667 (150)
Lodged	On	8–10	Medium	3	5–10	3 or 4	Not applicable	Storage	Recommended	667 (150)
Crop Type: Flax										
Stubble Height: 51–153 mm (2–6 in.)										
Light	On	4–7	High	2	5–10	6 or 7	Center or down	Variable	Not required	311–445 (70–100)
Normal	On	0–3	High	2	10	6 or 7	Center or down	Variable	Not required	311–445 (70–100)
Heavy	On	4–7	High	2	10	6 or 7	Center or down	Variable	Not required	311–445 (70–100)
Lodged	On	8–10	High	2	10	6 or 7	Center or down	Variable	Not required	311–445 (70–100)

22. Set header angle as shallow as possible with center-link and skid shoes while maintaining cutting height. For instructions, refer to *Controlling Header Angle, page 57*.
23. Refer to *3.7.9 Knife Speed, page 59*.
24. Refer to *Reel Cam Settings, page 68*.
25. Percentage above ground speed. Refer to *3.7.6 Reel Speed, page 58*.
26. Refer to *3.7.11 Reel Fore-Aft Position, page 61*.
27. Skid shoe position is used in combination with header angle to determine the cutting height when cutting on or very close to the ground. Refer to *3.7.1 Cutting Height, page 52*.
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. Force required to lift header at ends. Refer to your windrower operator's manual for adjustment procedures.

Table 3.2 Recommended Header Settings (continued)

Crop Condition	Divider Rods	Header Angle[30]	Knife Speed[31]	Reel Tine Pitch[32]	Reel Speed %[33]	Reel Fore-Aft[34]	Skid Shoe Position[35]	Stabilizer Wheels[36]	Upper Cross Auger	Float N (lbf)[37]
Crop Type: Edible beans										
Stubble Height: On ground										
Light	Off	8–10	Medium	2	5–10	3 or 4	Up or center	Storage	Not required	445 (100)
Normal	Off	8–10	Medium	2	5–10	3 or 4	Up or center	Storage	Not required	445 (100)
Heavy	Off	8–10	Medium	2	5–10	3 or 4	Up or center	Storage	Not required	445 (100)
Lodged	Off	8–10	Medium	3	5–10	3 or 4	Up or center	Storage	Not required	445 (100)
Crop Type: Grass										
Stubble Height: On ground										
Light	On	Variable	High	2	10	6 or 7	Up or center	Storage	Not required	311–445 (70–100)
Normal	On	Variable	High	2	10	6 or 7	Up or center	Storage	Not required	311–445 (70–100)
Heavy	On	Variable	High	2	10	6 or 7	Up or center	Storage	Not required	311–445 (70–100)
Lodged	On	Variable	High	2	10–15	6 or 7	Up or center	Storage	Not required	311–445 (70–100)

30. Set header angle as shallow as possible with center-link and skid shoes while maintaining cutting height. For instructions, refer to *Controlling Header Angle, page 57*.
31. Refer to *3.7.9 Knife Speed, page 59*.
32. Refer to *Reel Cam Settings, page 68*.
33. Percentage above ground speed. Refer to *3.7.6 Reel Speed, page 58*.
34. Refer to *3.7.11 Reel Fore-Aft Position, page 61*.
35. Skid shoe position is used in combination with header angle to determine the cutting height when cutting on or very close to the ground. Refer to *3.7.1 Cutting Height, page 52*.
36. Stabilizer wheels are used to limit the side-to-side movement when cutting off the ground in rolling terrain, and to minimize bouncing.
37. Force required to lift header at ends. Refer to your windrower operator's manual for adjustment procedures.

Table 3.2 Recommended Header Settings (continued)

Crop Condition	Divider Rods	Header Angle[38]	Knife Speed[39]	Reel Tine Pitch[40]	Reel Speed %[41]	Reel Fore-Aft[42]	Skid Shoe Position[43]	Stabilizer Wheels[44]	Upper Cross Auger	Float N (lbf)[45]
Crop Type: Alfalfa										
Stubble Height: On ground										
Light	On	Variable	High	3	10	6 or 7	Up or center	Storage	Not required	311–445 (70–100)
Normal	On	Variable	High	2	10	6 or 7	Up or center	Storage	Not required	311–445 (70–100)
Heavy	On	Variable	High	2	10	6 or 7	Up or center	Storage	Not required	311–445 (70–100)
Lodged	On	Variable	High	3	10–15	6 or 7	Up or center	Storage	Not required	311–445 (70–100)

38. Set header angle as shallow as possible with center-link and skid shoes while maintaining cutting height. For instructions, refer to *Controlling Header Angle, page 57*.
39. Refer to *3.7.9 Knife Speed, page 59*.
40. Refer to *Reel Cam Settings, page 68*.
41. Percentage above ground speed. Refer to *3.7.6 Reel Speed, page 58*.
42. Refer to *3.7.11 Reel Fore-Aft Position, page 61*.
43. Skid shoe position is used in combination with header angle to determine the cutting height when cutting on or very close to the ground. Refer to *3.7.1 Cutting Height, page 52*.
44. Stabilizer wheels are used to limit the side-to-side movement when cutting off the ground in rolling terrain, and to minimize bouncing.
45. Force required to lift header at ends. Refer to your windrower operator's manual for adjustment procedures.

3.6.3 Reel Settings

The combination of reel positions and reel cam settings allow the operator to adjust to various crops and conditions.

The following chart illustrates the reel profile at each cam setting and the reel location relative to the ground at different positions on the reel arm. Refer to *3.6.2 Header Settings, page 44* for applicability of each finger pattern and reel position.

Table 3.3 D65 Recommended Reel Settings

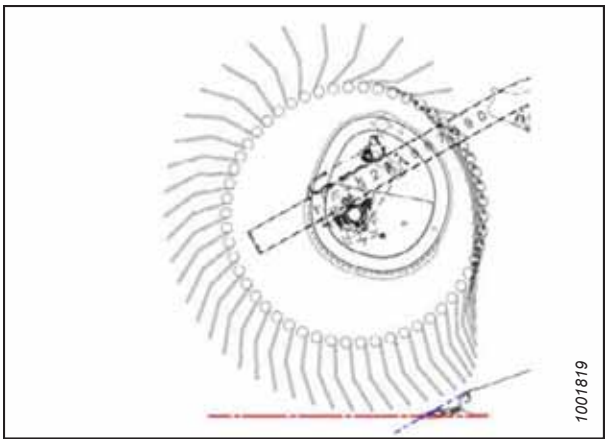
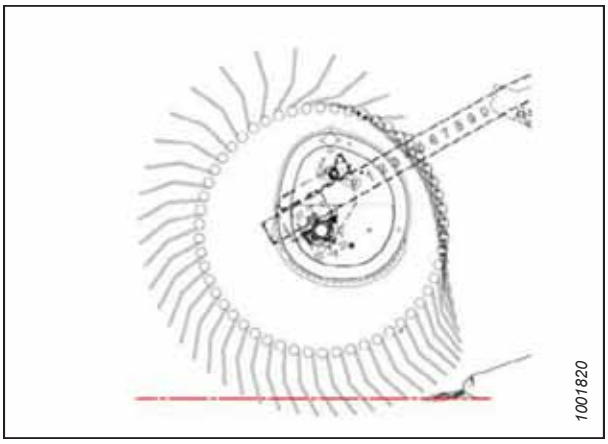
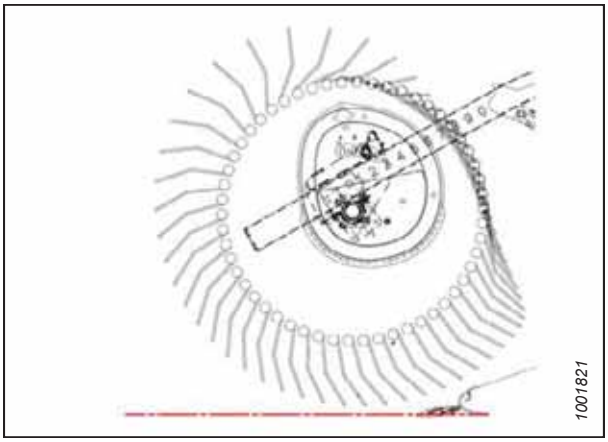
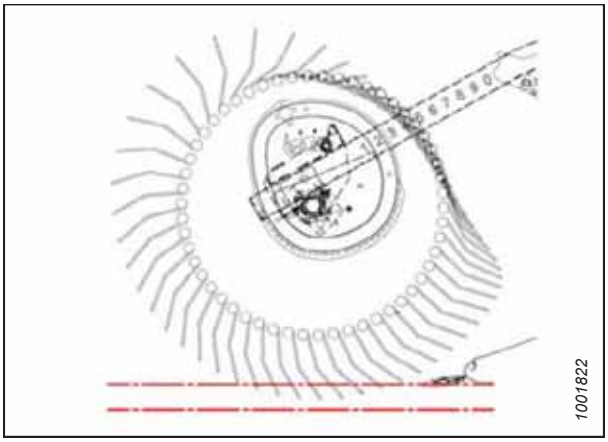
Cam Setting Number (Finger Speed Gain)	Reel Position Number	Reel Finger Pattern
1 (0)	6 or 7	
2 (20%)	3 or 4	

Table 3.3 D65 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 position the fingers closer to the ground, while tilting the header back. Fingers/tines will dig into the ground at extreme reel-forward positions, so adjust skid shoes or header angle to compensate.
- Adjust the reel aft in thinner crops to prevent plugging on the cutterbar.
- Increase the header angle to position the reel closer to the ground, or decrease the angle to position the reel farther from the ground.
- Raise header, increase header angle, and position reel fully forward in lodged crop for maximum stubble height.
- Minimum crop carrying capacity (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 (maximum area of exposed draper between the reel and the header backsheet) occurs with the reel in the farthest forward position.
- The finger tip speed at the cutterbar is higher than the reel speed at higher cam settings due to the nature of the cam action. For instructions, refer to Table *3.3, page 50*.

3.7 Header Operating Variables

Satisfactory function of the header in all situations requires making proper adjustments to suit various crops and conditions. Correct operation reduces crop loss and increases productivity. Proper adjustments and timely maintenance will increase the length of service you receive from your machine.

The variables listed in Table *3.4, page 52* (and detailed on the following pages) will affect the header performance.

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 3.4 Operating Variables

Variable	Refer to
Cutting height	*3.7.1 Cutting Height, page 52*
Header float	*3.7.4 Header Float, page 57*
Header angle	*3.7.5 Header Angle, page 57*
Reel speed	*3.7.6 Reel Speed, page 58*
Ground speed	*3.7.7 Ground Speed, page 58*
Draper speed	*3.7.8 Draper Speed, page 59*
Knife speed	*3.7.9 Knife Speed, page 59*
Reel height	*3.7.10 Reel Height, page 60*
Reel fore-aft position	*3.7.11 Reel Fore-Aft Position, page 61*
Reel tine pitch	*3.7.12 Reel Tine Pitch, page 68*
Crop divider rods	*3.7.14 Crop Divider Rods, page 76*

3.7.1 Cutting Height

The D65 Draper Header is capable of cutting the crop to a desired stubble height or cutting as close as possible to the ground. Cutting height will vary depending on the type of crop, crop conditions, etc.

3.7.2 Cutting off the Ground

Cutting height is controlled using a combination of the windrower header height control and a stabilizer wheel system (or stabilizer/slow speed transport wheel system).

The stabilizer wheel system in both options is designed to minimize bouncing at the header ends and float the header to achieve an even cutting height when cutting above ground level in cereal crops. The system produces even stubble height and greatly reduces operator fatigue.

The stabilizer wheel system (or stabilizer/slow speed transport wheel system) is available only for 9.1–12.2 m (30–40 ft.) headers.

Adjusting Stabilizer/Slow Speed 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/slow speed transport wheels.

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 leaving the operator's seat for any reason.

1. Raise the header so 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. Refer to your windrower operator's manual for instructions.

4. Remove hairpin (A) from the latch on the right wheel assembly.

5. Disengage latch (B), lift the wheel out of the hook, and place the wheel on the ground as shown. (This reduces the weight of the assembly and makes adjusting the wheel position easier.)

6. Lift the left wheel slightly to support the weight, and pull handle (C) upwards to release the lock.

7. Lift the left wheel to the desired height and engage the support channel in slot (D) in the upper support.

8. Push down on handle (C) to lock it.

9. Lift the right wheel back into field position and ensure latch (B) is engaged.

10. Secure the latch with hairpin (A).

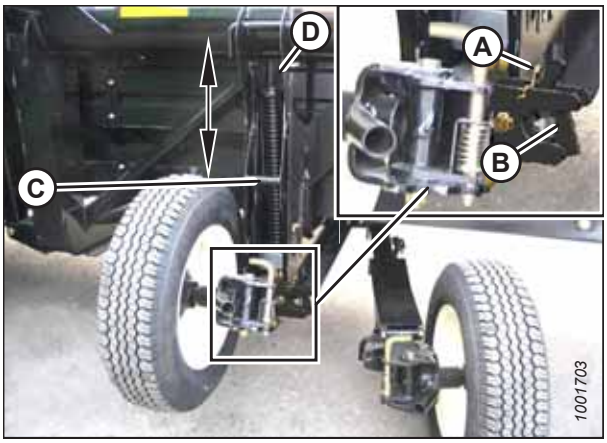


Figure 3.19: Right Wheel

11. Support the wheel weight by lifting it 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 it.

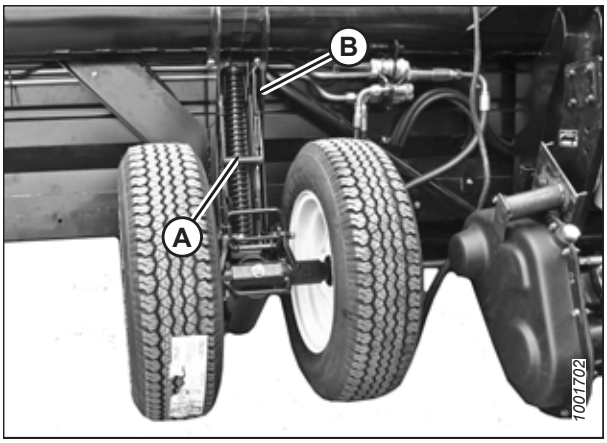


Figure 3.20: Left Wheel

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

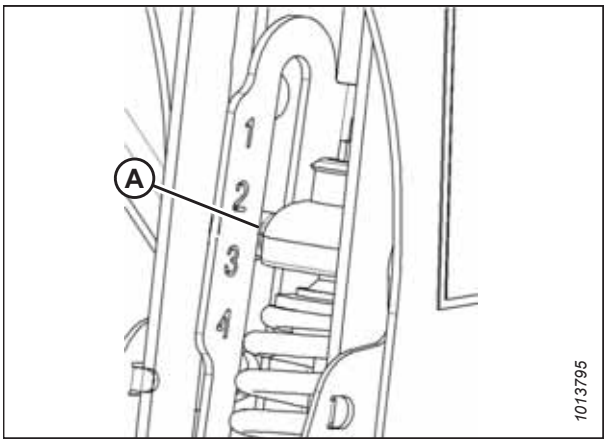


Figure 3.21: Load Indicator

IMPORTANT:

Continuous operation with excessive spring compression (that is, 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.

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.

16. Use the windrower cab display module (CDM) controls to automatically maintain cutting height. Refer to your windrower operator's manual for details.

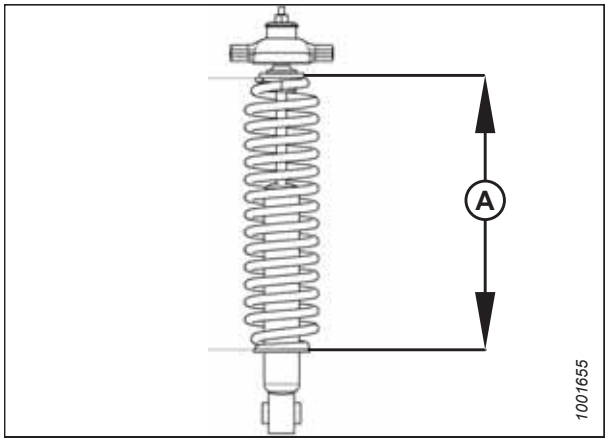


Figure 3.22: Spring Compression

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.

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 leaving the operator's seat for any reason.

CAUTION

The handle may be under tension—especially when the wheels are on the ground. Raise the header until the wheels are off the ground before making adjustments.

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. Refer to your windrower operator's manual for instructions.

4. Support the wheel weight by lifting slightly with one hand on handle (B), and pull up on handle (A) to release the lock.

5. Lift the wheel using handle (B), and engage the support channel into center slot (C) in the upper support.

6. Push handle (A) down to lock.

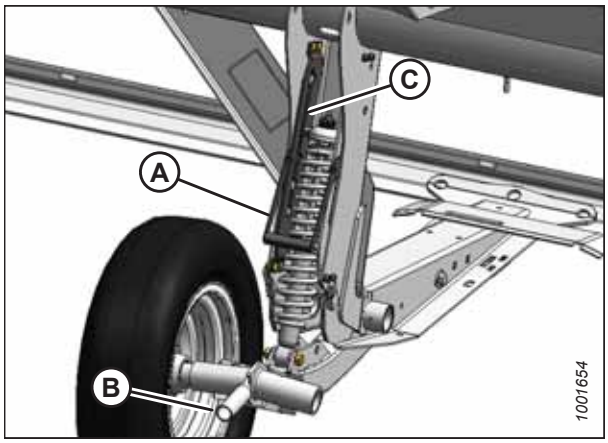


Figure 3.23: Stabilizer Wheel

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

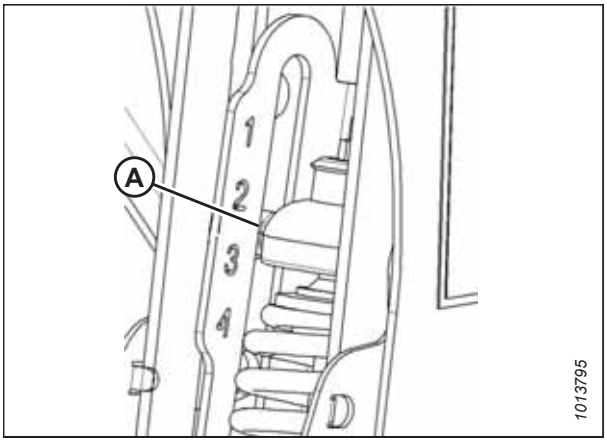


Figure 3.24: Load Indicator

IMPORTANT:

Continuous operation with excessive spring compression (that is, 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.

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

9. Use the windrower cab display module (CDM) controls to automatically maintain cutting height. Refer to your windrower operator's manual for details.

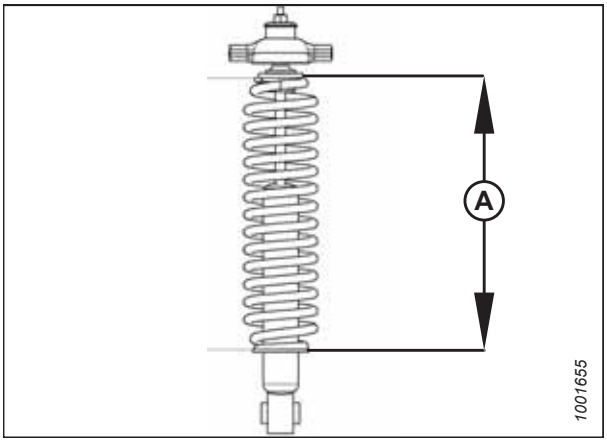


Figure 3.25: Spring Compression

3.7.3 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.

Refer to the following for additional information:

- *Adjusting Inner Skid Shoes, page 56*
- *Adjusting Outer Skid Shoes, page 56*
- *3.7.5 Header Angle, page 57*
- *3.7.4 Header Float, page 57*

Adjusting Inner Skid Shoes

Adjust the inner skid shoes to affect stubble height when cutting on the ground. Ensure both inner and outer skid shoes should be set to the same height.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a 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. For instructions, refer to the windrower operator's manual.
4. Raise the stabilizer wheels or slow speed transport wheels fully (if installed). For instructions, refer to the following:
   - *Adjusting Stabilizer Wheels, page 54*
   - *Adjusting Stabilizer/Slow Speed Transport Wheels, page 52*
5. Remove lynch pin (A) from each skid shoe.
6. Hold shoe (B) and remove pin (C) by disengaging it from the frame and pulling it away from the shoe.
7. Raise or lower skid shoe (B) to achieve the desired position using the holes in support (D) as a guide.
8. Install pin (C), engage the pin in the frame, and secure it with lynch pin (A).
9. Check that all skid shoes are equally adjusted.
10. 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.
11. Check the header float as described in your windrower operator's manual.

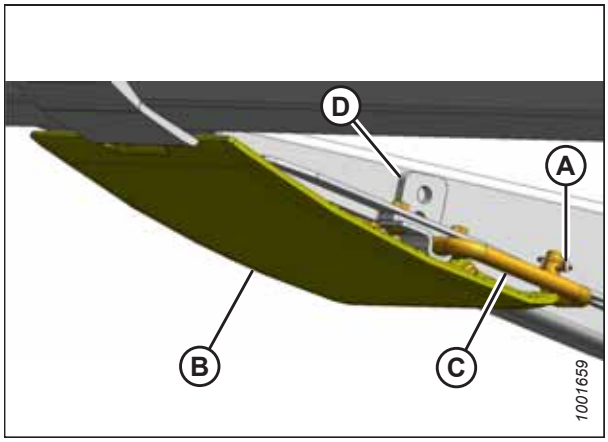


Figure 3.26: Inner Skid Shoe

Adjusting Outer Skid Shoes

Adjust the outer skid shoes to affect stubble height when cutting on the ground. Ensure both inner and outer skid shoes are set to the same height.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a 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. For instructions, refer to the windrower operator's manual.

4. Raise the stabilizer wheels or slow speed transport wheels fully (if installed). For instructions, refer to the following:
   - *Adjusting Stabilizer Wheels, page 54*
   - *Adjusting Stabilizer/Slow Speed Transport Wheels, page 52*
5. Remove lynch pin (A) from each skid shoe (B).
6. Hold shoe (B) and remove adjustment pin (C) by disengaging it from the frame and pulling it away from the shoe.
7. Raise or lower skid shoe (B) to achieve the desired position using the holes in the support as a guide.
8. Reinstall pin (C), engage it in the frame, and secure it with lynch pin (A).
9. Check that all skid shoes are equally adjusted.
10. Check the header float as described in your windrower operator's manual.

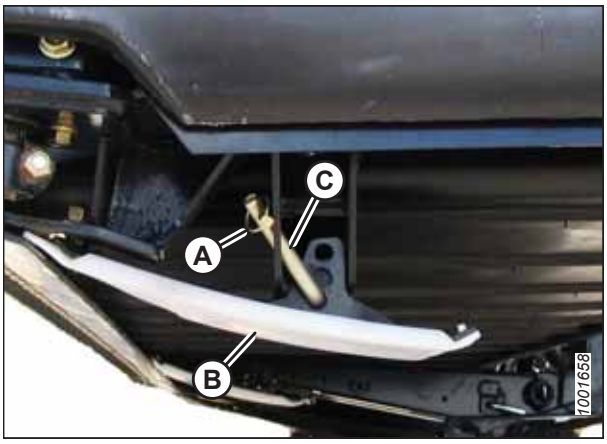


Figure 3.27: Outer Skid Shoe

3.7.4 Header Float

D65 Draper Headers are designed to ride on the skid shoes when cutting on the ground. The windrower float system reduces the ground pressure so that the header floats over obstacles and follows ground contours instead of being supported by the windrower lift cylinders.

Refer to your windrower operator's manual for details about header float adjustments.

3.7.5 Header Angle

Header angle can be adjusted to accommodate different crop conditions and/or soil types.

Header angle (A) controls the distance (B) between the knife and the ground and is a critical component for effective cutting on the ground. Adjusting the center-link determines the position of the knife and guards and pivots the header at the point of skid shoe/ground contact (C).

Header angle (A) is equal to guard angle (D) which is the angle between the upper surface of the guards and the ground.

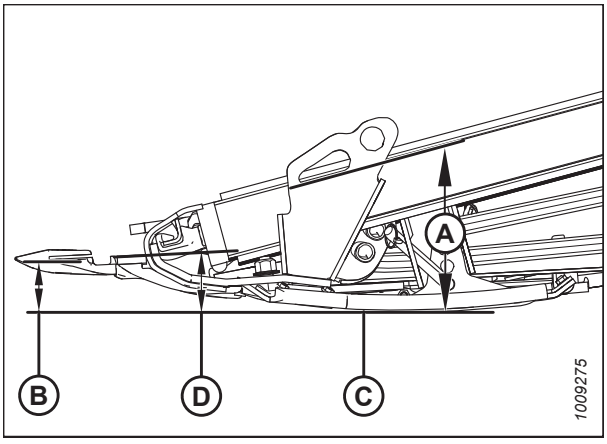


Figure 3.28: Header Angle

Controlling Header Angle

Header angle varies by adjusting the length of the top center-link (mechanical or hydraulic) between the windrower and the header.

Refer to your windrower operator's manual for adjustment details.

3.7.6 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 beneficial in shatter-prone crops.

NOTE:

Nine-bat reels are available on 4.6–7.6 m (15–25 ft.) headers from the factory. A conversion kit to change from a six-bat reel to a nine-bat reel is available for these headers.

Refer to *3.6.2 Header Settings, page 44* for recommended reel speeds in specific crops and crop conditions.

Reel speed is adjustable using the controls in the windrower cab. Refer to your windrower 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 that is suitable for most crops. Other sprockets are available that provide more torque to the reel in heavy cutting conditions, or higher reel speeds in light crops when operating at increased ground speeds.

For installation details, refer to *5.9.3 Replacing Reel Drive Sprocket, page 232*.

3.7.7 Ground Speed

Operating at the proper ground speed will result in cleanly cut crops and evenly distributed material in uniform windrows.

Refer to *3.10 Windrow Types, page 86* for effects of ground speed on windrow formation.

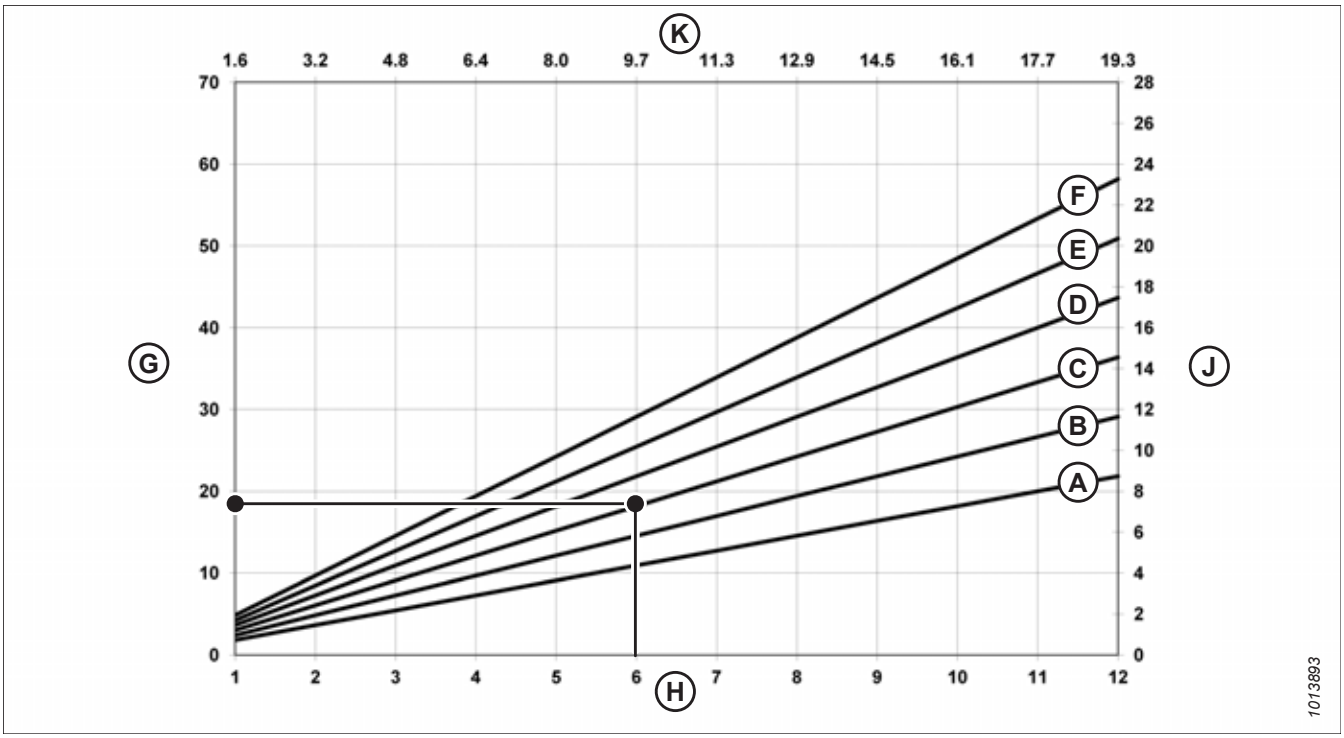
Reduce ground speed in difficult cutting conditions to reduce loads on cutting components and drives.

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 which causes uneven cutting and possible damage to cutting components. If ground speed is increased, draper and reel speeds should be increased to handle the extra material.

Figure *3.29, page 59* illustrates the relationship between ground speed and area cut for the various sized headers.

Figure 3.29: Ground Speed vs Acres



A - 4.6 m (15 ft.)
B - 6.1 m (20 ft.)
C - 7.6 m (25 ft.)
D - 9.1 m (30 ft.)
E - 10.7 m (35 ft.)
F - 12.2 m (40 ft.)
G - acres/hour
H - miles/hour
J - hectares/hour
K - kilometers/hour

Example: A 7.6 m (25 ft.) header operating at a ground speed of 9.7 km/h (6 mph) would produce a cut area of approximately 7.3 hectares (18 acres) in one hour.

3.7.8 Draper Speed

Correct draper speed is important for achieving a good flow of cut crop away from the cutterbar.

The draper speed is controlled with the windrower cab display module (CDM). Refer to your windrower operator's manual for instructions.

Adjust draper speed to optimize crop feeding for a well formed windrow. Excessive draper speed will reduce draper life.

3.7.9 Knife Speed

The header knife drive is driven by the windrower hydraulic pump and is controlled with the windrower cab display module (CDM). The default speed is 1200 strokes per minute (spm).

Refer to your windrower operator's manual for more information.

Table 3.5 Knife Speed Guidelines

	Recommended Knife Speed Range (spm)	
Header Size	**Single Knife**	**Double Knife**
4.6 m (15 ft.)	—	1500–1900
6.1 – 7.6 m (20–25 ft.)	1200–1400	1400–1700
9.1 m (30 ft.)	1200–1400	1200–1600

Table 3.5 Knife Speed Guidelines (continued)

	Recommended Knife Speed Range (spm)	
Header Size	**Single Knife**	**Double Knife**
10.7 m (35 ft.)	1100–1300	1200–1400
12.2 m (40 ft.)	1050–1200	1100–1400

Checking Knife Speed

Compare pulley rpm measurement with the values listed in the knife speed chart in this manual.

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 leaving the operator's seat for any reason.

1. Shut down the engine, and remove the key from the ignition.
2. Open left endshield (A).

DANGER

Check to be sure all bystanders have cleared the area.

3. Start the windrower engine, engage the header drive, and run the windrower at operating rpm.

Figure 3.30: Left Endshield

4. Measure rpm of knife drive box pulley (A) with a hand-held tachometer.
5. Shut down the windrower.
6. Compare pulley rpm measurement with the rpm values in the knife speed chart. For instructions, refer to *3.7.9 Knife Speed, page 59*.
7. Contact your MacDon Dealer if the pulley rpm measurement exceeds the specified rpm range for your header.

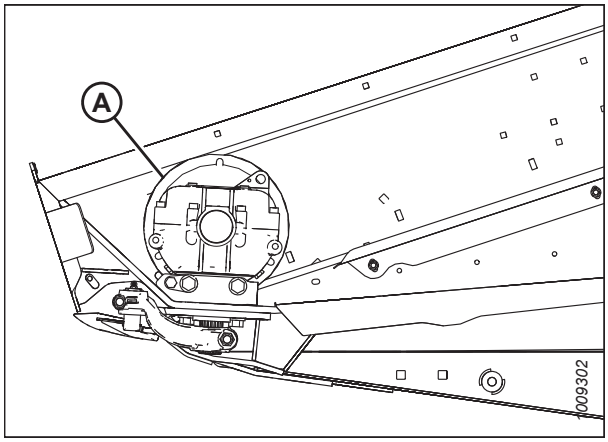


Figure 3.31: Knife Drive Pulley

3.7.10 Reel Height

The crop type and condition determines the operating height of the reel.

Set the reel height to carry material past the knife and onto the drapers with minimal disturbance and damage to the cut crop. For instructions, refer to *3.7.11 Reel Fore-Aft Position, page 61*.

The reel height is controlled using switches in the windrower cab.

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 being pushed down by the tine tubes

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

Refer to *3.6.2 Header Settings, page 44* for recommended reel height in specific crops and crop conditions.

IMPORTANT:

Maintain reel clearance to prevent fingers contacting the knife or the ground. For instructions, refer to *5.8.1 Reel Clearance to Cutterbar, page 202*.

3.7.11 Reel Fore-Aft Position

Reel fore-aft position is a critical factor for achieving the best results in adverse conditions. The reel position can be adjusted forward or backward as required using the controls inside the cab.

The reel can be moved approximately 227 mm (9 in.) farther aft by repositioning the fore-aft cylinders on the reel arms to accommodate certain crop conditions.

For single-reel header instructions, refer to *Repositioning Fore-Aft Cylinders on Single Reel, page 62*.

For double-reel header instructions, refer to *Repositioning Fore-Aft Cylinders on Double Reel, page 64*.

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 the 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).

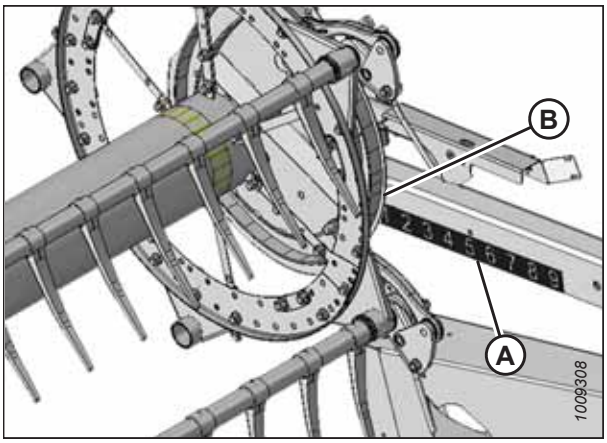


Figure 3.32: Fore-Aft Decal

IMPORTANT:

Adjust to a steeper header angle if experiencing difficulty picking up flattened crop. Refer to *Controlling Header Angle, page 57* for adjustment instructions. Adjust reel position only if header angle adjustments are insufficient.

Refer to *3.6.2 Header Settings, page 44* for recommended reel positions in specific crops and crop conditions.

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 *3.7.12 Reel Tine Pitch, page 68* for adjustment details.

Adjusting Reel Fore-Aft Position

The factory-set reel position suits normal conditions, but the fore-aft position can be adjusted as required using the controls inside the cab.

1. Select FORE-AFT mode on the selector switch in the cab.
2. Operate the hydraulics to move the reel to the desired position, using decal (A) as a reference.
3. Check the reel clearance to the cutterbar after making changes to the cam setting. Refer to the following for measurement and adjustment procedures:
   - *5.8.1 Reel Clearance to Cutterbar, page 202*
   - *5.8.2 Reel Frown, page 205*

   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 angle as required to prevent damaging the fingers.

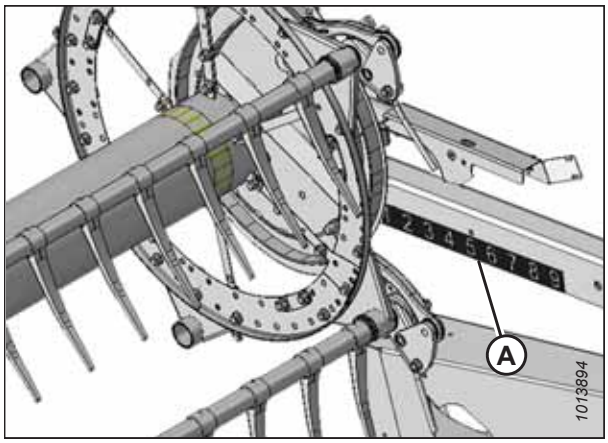


Figure 3.33: Fore-Aft Decal

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.

DANGER

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

NOTE:

The reel components are not shown in the illustrations in this procedure for the sake of clarity.

1. Position reel fully aft with support arms horizontal.
2. Shut down the engine, and remove the key from the ignition.

To reposition the right reel arm cylinder:

3. Remove the four bolts (A) securing the cylinder bracket (B) to the reel arm.

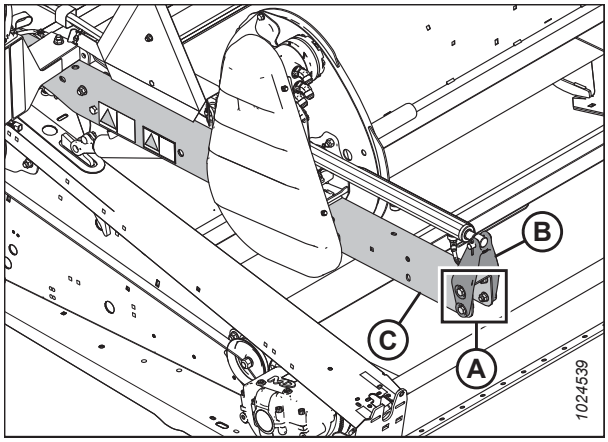


Figure 3.34: Right Reel Arm Cylinder in Forward Position

4. Push/pull the reel until bracket (B) lines up with the fore/aft set of holes (C).

5. Reinstall the four bolts (A) securing the cylinder bracket (B) to the reel arm at the new position.

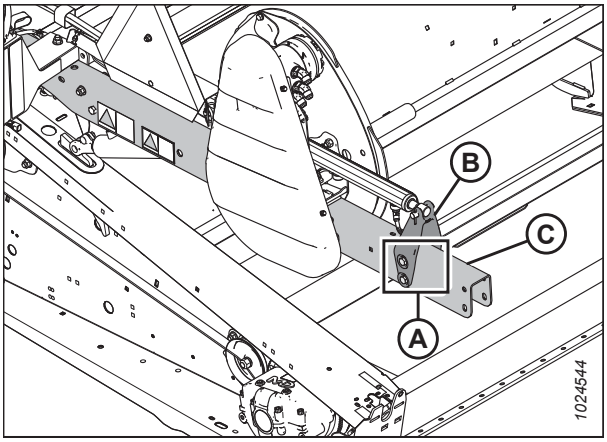


Figure 3.35: Right Reel Arm Cylinder in Aft Position

To reposition the left reel arm cylinder:

6. Remove pin (A) securing cylinder (B) to bracket/light assembly (C).

7. Remove bolts (D) securing bracket/light assembly (C) to the reel arm, and remove the bracket/light assembly.

8. Remove the cable tie securing the harness to the bracket/light assembly (C) or reel arm if necessary.

9. Swivel the light to the working position as shown.

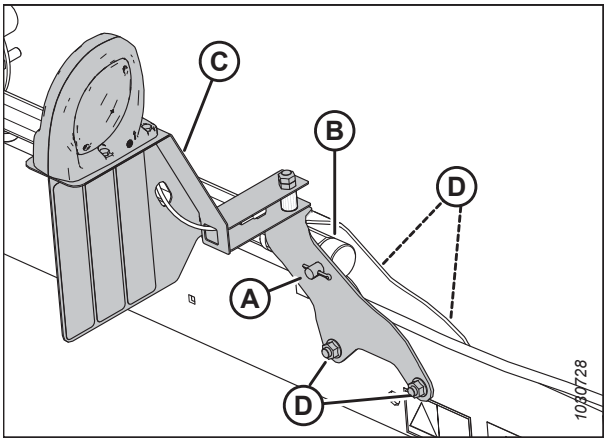


Figure 3.36: Left Reel Arm Cylinder in Forward Position

10. Reposition the bracket/light assembly (C) on the reel arm as shown, and secure with four bolts (D). Tighten bolts.

11. Push the reel back and attach cylinder (B) to the bracket/light assembly (C) with pin (A). Secure pin with cotter pin.

12. Secure the light harness to the bracket/light assembly (C) using a cable tie.

13. Check the reel clearance to the backsheet, upper cross auger (if installed), and reel braces.

14. Adjust the reel tine pitch if necessary. Refer to *3.7.12 Reel Tine Pitch, page 68*.

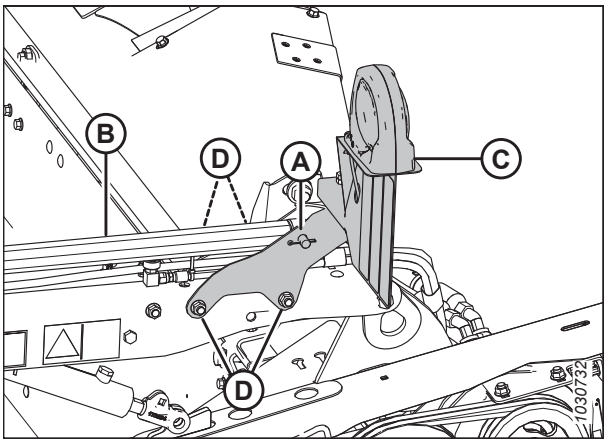


Figure 3.37: Left Reel Arm Cylinder in Aft Position

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.

DANGER

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

NOTE:

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

If the Multi-Crop Rapid Reel Conversion option is installed, refer to *Repositioning Fore-Aft Cylinders with Multi-Crop Rapid Reel Conversion Option, page 66*.

Reposition the center arm cylinder as follows:

NOTE:

Reel components not shown in illustration for improved clarity.

NOTE:

To move a split reel into canola position, the Short Brace Kit for Center Reel Arm (B5605) is required.

1. Position reel fully aft with support arms horizontal.
2. Shut down the engine, and remove the key from the ignition.
3. Remove four bolts (A) securing cylinder bracket (B) to the reel arm.
4. Position reel until bracket (B) lines up with desired position holes (C):
   - Forward position, refer to Figure *3.38, page 64*
   - Rearward position, refer to Figure *3.39, page 64*
5. Reinstall four bolts (A) to secure bracket (B) to reel arm at new position.

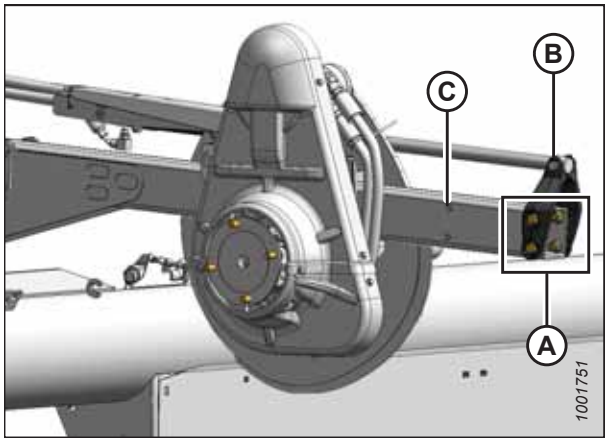


Figure 3.38: Forward Position

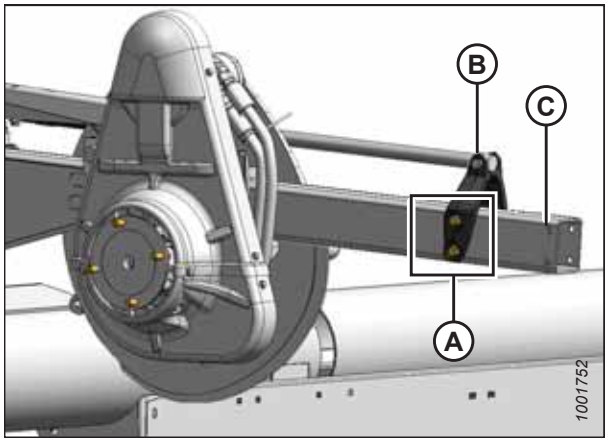


Figure 3.39: Rearward Position

Reposition right arm cylinder as follows:

NOTE:

Reel components not shown in illustration for clarity.

6. Remove four bolts (A) securing cylinder bracket (B) to the reel arm.
7. Position reel until bracket (B) lines up with desired position holes (C):
   - Forward position, refer to Figure *3.40, page 65*
   - Rearward position, refer to Figure *3.41, page 65*
8. Reinstall the four bolts (A) to secure bracket to reel arm at new position.

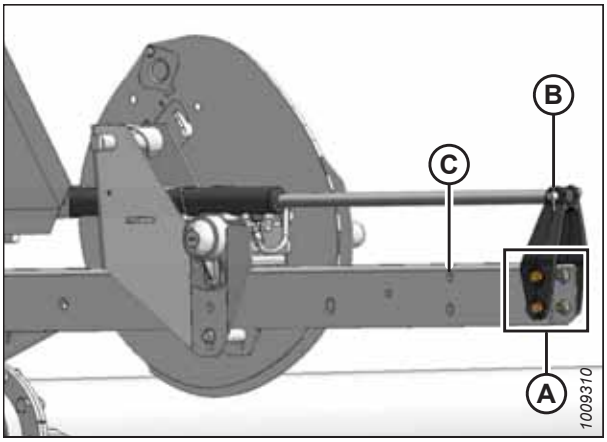


Figure 3.40: Forward Position

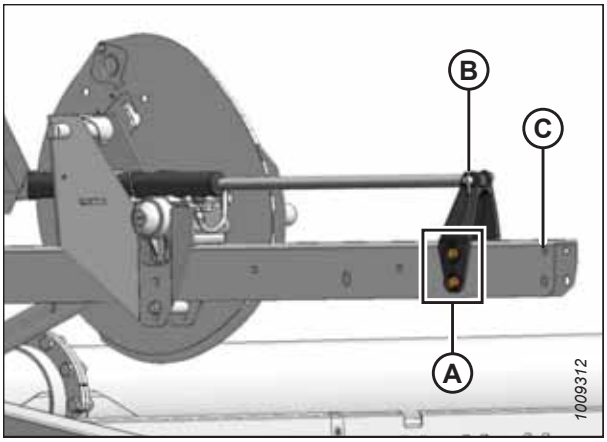


Figure 3.41: Rearward Position

Reposition the left reel arm cylinder as follows:

NOTE:

Reel components not shown in illustration for clarity.

9. Remove pin (A) securing cylinder (B) to bracket/light assembly (C).
10. Remove bolts (D) securing bracket/light assembly (C) to the reel arm, and remove the bracket/light assembly.
11. If necessary, remove the cable tie securing the harness to the bracket/light assembly (C) or reel arm.
12. Swivel the light to the working position as shown.

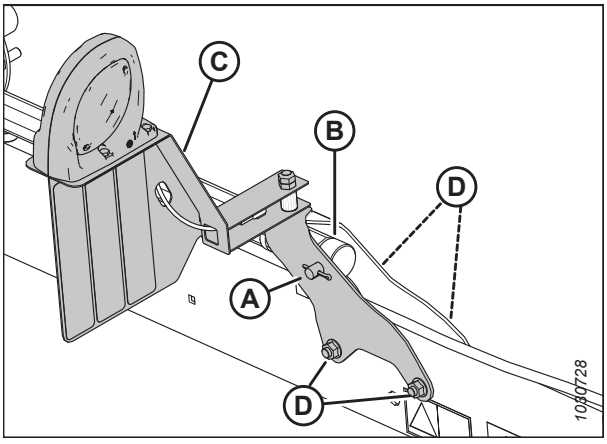


Figure 3.42: Left Reel Arm Cylinder in Forward Position

13. Reposition bracket/light assembly (C) on the reel arm as shown, and secure with four bolts (D). Tighten bolts.
14. Push the reel back and attach cylinder (B) to bracket/light assembly (C) with pin (A). Secure pin with cotter pin.
15. Secure the light harness to bracket/light assembly (C) using a cable tie.
16. Check the reel clearance to the backsheet, upper cross auger (if installed), and reel braces.
17. Adjust the reel tine pitch if necessary. Refer to *3.7.12 Reel Tine Pitch, page 68*.

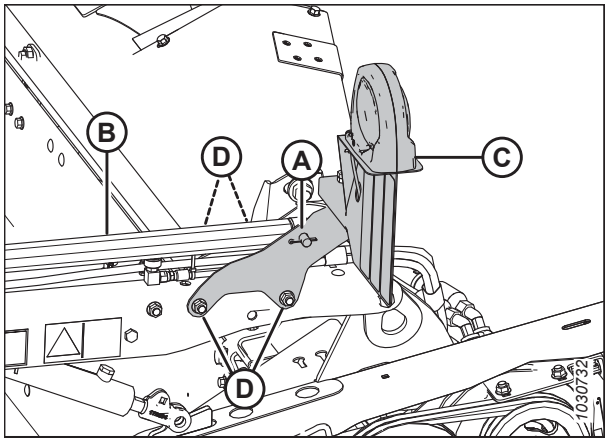


Figure 3.43: Left Reel Arm Cylinder in Aft Position

Repositioning Fore-Aft Cylinders with Multi-Crop Rapid Reel Conversion Option

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 Conversion option is applicable to double-reel headers only.

DANGER

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

NOTE:

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

To reposition the left reel arm cylinder:

NOTE:

The reel components are not shown in the illustrations in this procedure for the sake of clarity.

1. Position reel fully aft with 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 the clevis pin.
4. Push the reel back until cylinder barrel (C) lines up with the aft holes in bracket (D).

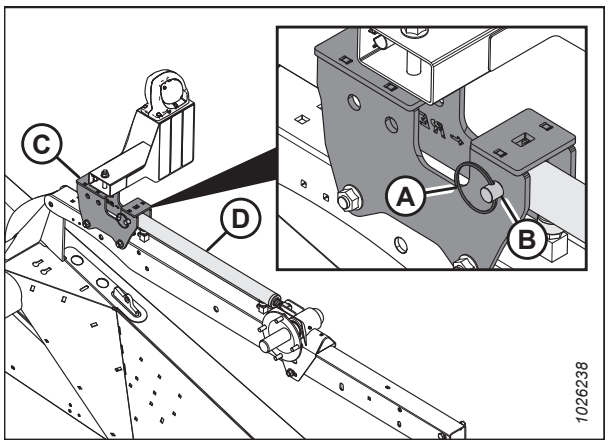


Figure 3.44: Left Reel Arm in Forward Position

5. Reinstall clevis pin (B) at the new position in bracket (C), and secure end of cylinder (D) with ring (A).

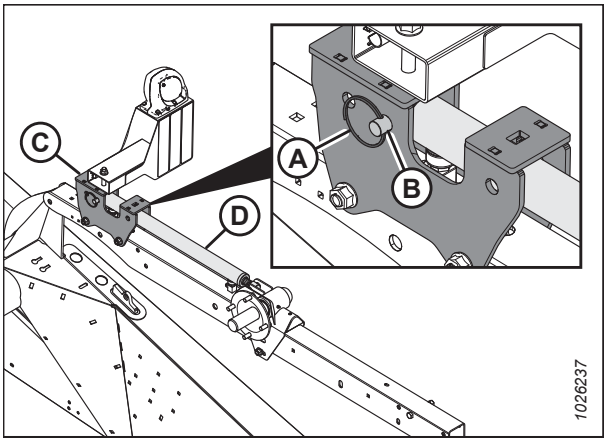


Figure 3.45: Left Reel Arm in Aft Position

To reposition the right reel arm cylinder:

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

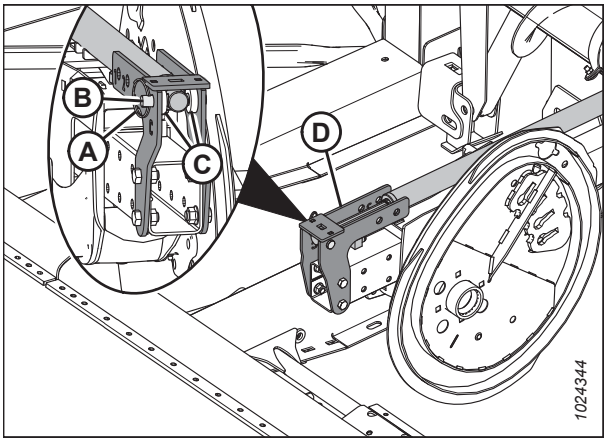


Figure 3.46: Forward Position – Center Arm

7. Push the reel back until the end of cylinder (E) lines up with the 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. Secure it with ring (A).

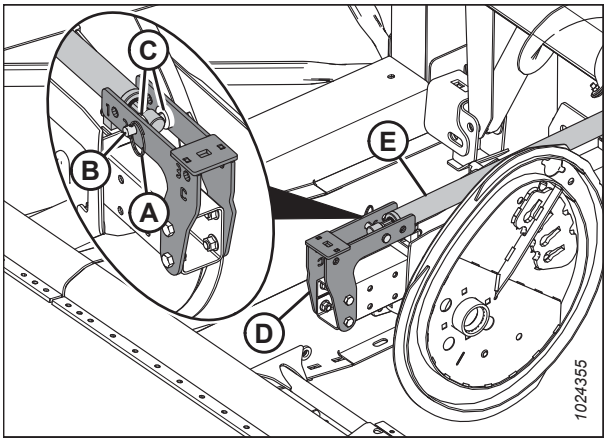


Figure 3.47: Center Reel Arm in Aft Position

To reposition the right reel arm cylinder:

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.
11. Reinstall clevis pin (B) at the new position. Secure it with ring (A).

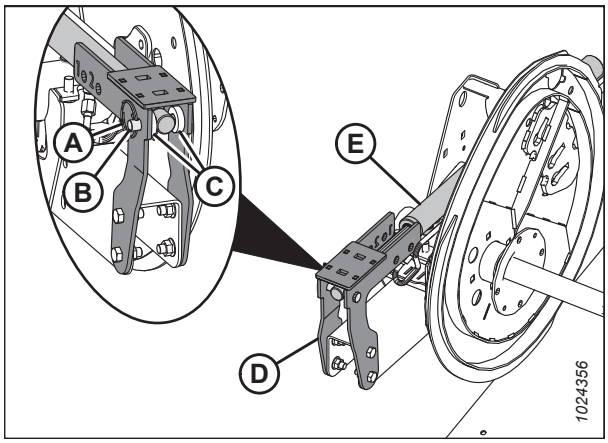


Figure 3.48: Right Reel Arm in Forward Position

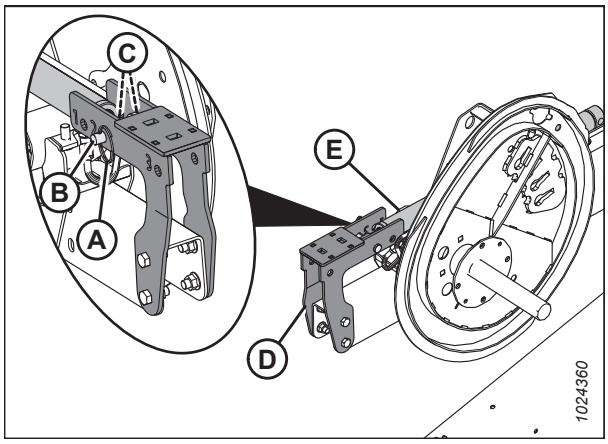


Figure 3.49: Right Reel Arm in Aft Position

3.7.12 Reel Tine Pitch

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

Finger positioning, 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 instructions, refer to *3.6.2 Header Settings, page 44*.

Reel Cam Settings

The following outlines the function of each cam setting and provides setup guidelines for various crop conditions. The setting numbers are visible above the slots on the cam disc.

If adjustments are necessary, refer to *Adjusting Reel Cam, page 70*.

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

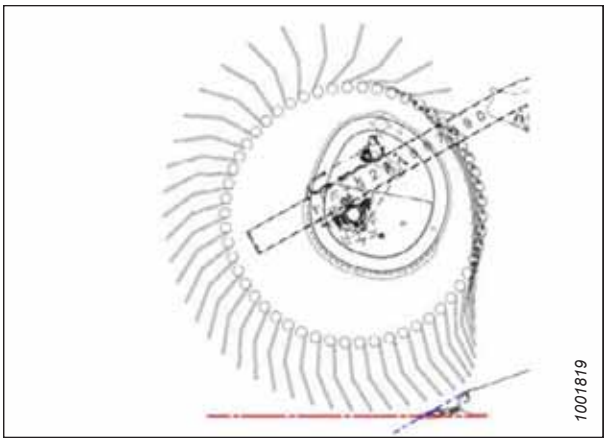


Figure 3.50: Finger Profile – Cam Position 1

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.

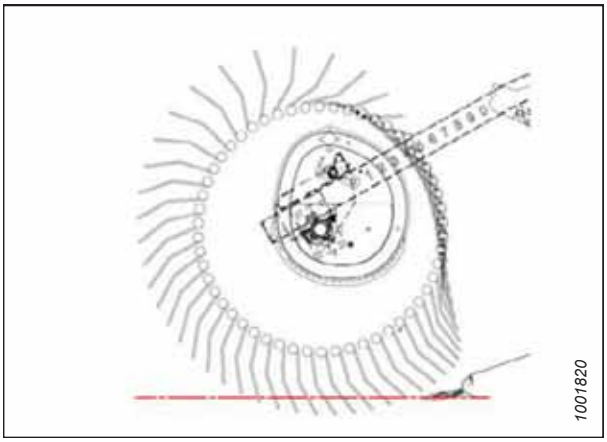


Figure 3.51: Finger Profile – Cam Position 2

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.

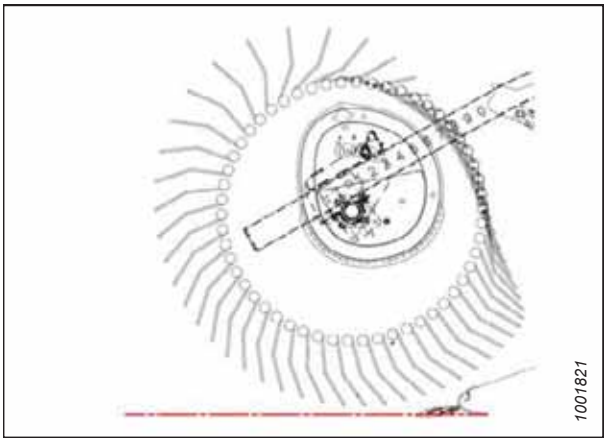


Figure 3.52: Finger Profile – Cam Position 3

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.

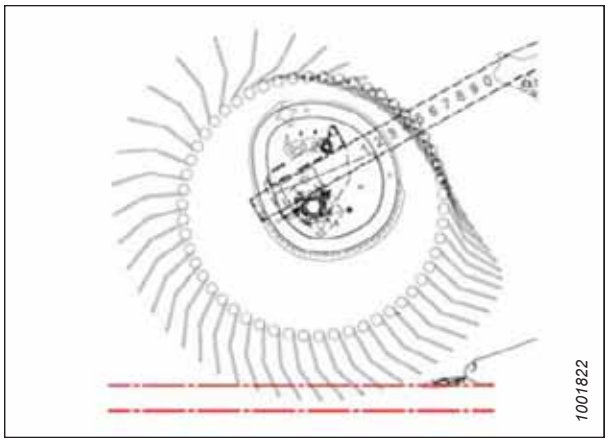


Figure 3.53: Finger Profile – Cam Position 4

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.

- This position leaves a significant amount of stubble when cutting height is set to approximately 203 mm (8 in.). In damp materials such as rice, it's 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.

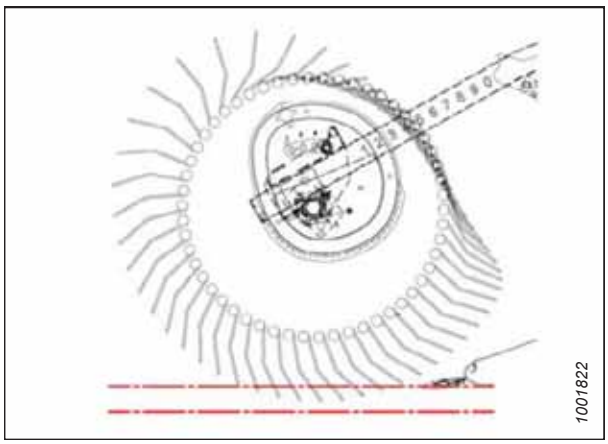


Figure 3.54: Finger Profile – Cam Position 4

NOTE:

Higher cam settings with the reel fore-aft position set between 4–5 sharply decreases 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.

IMPORTANT:

The reel to cutterbar clearance should always be checked following adjustments to reel tine pitch and reel fore-aft position. For instructions, refer to *5.8.1 Reel Clearance to Cutterbar, page 202*.

Refer to *3.6.2 Header Settings, page 44* for recommended reel tine pitch in specific crops and crop conditions.

Adjusting Reel Cam

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

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 leaving the operator's seat for any reason.

1. Lower the reel fully.
2. Lower the header fully.
3. Shut down the engine, and remove the key from the ignition.

4. Turn latch pin (A) counterclockwise using a 3/4 in. wrench to release the cam disc.
5. 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).
6. Turn latch pin (A) clockwise to engage and lock the cam disc.
7. Repeat Steps *4, page 71* to *6, page 71* for the opposite reel.

   IMPORTANT:

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

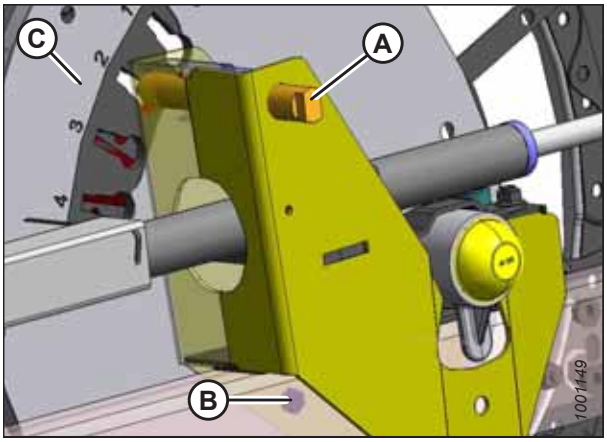


Figure 3.55: Cam Disc Positions

3.7.13 Crop Dividers

Crop dividers are used to help divide the crop when harvesting. They are removable to decrease transport width.

Crop dividers are bolted to the header by default, but a latch option is also available.

Removing Crop Dividers with Latch Option from Header

To correctly remove crop dividers with the latch option, follow the recommended removal procedure provided here.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a 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.
2. Raise the header fully.
3. Shut down the engine, and remove the key from the ignition.
4. Engage the header safety props. For instructions, refer to your windrower operator's manual.
5. Open or remove the endshields. For instructions, refer to *3.2.3 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.

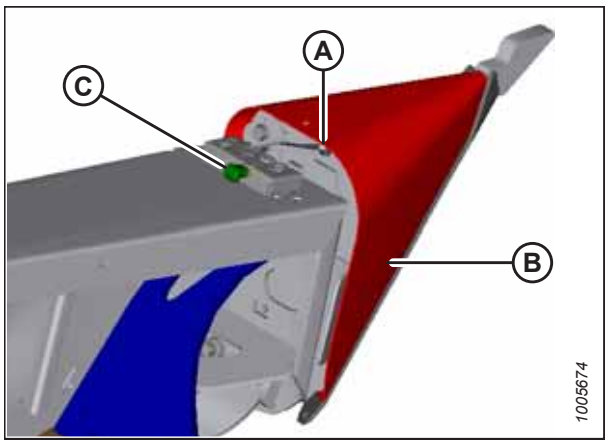


Figure 3.56: Crop Divider

8. Lift the crop divider off the endsheet and store as follows:
   a. Insert the pin on the crop divider into the hole in the endsheet at location (A) as shown.
   b. Lift the crop divider and position lugs (B) on the crop divider into the bracket on the endsheet. Ensure the lugs engage the bracket.
9. Close or install the endshields. For instructions, refer to *3.2.3 Endshields, page 35*.

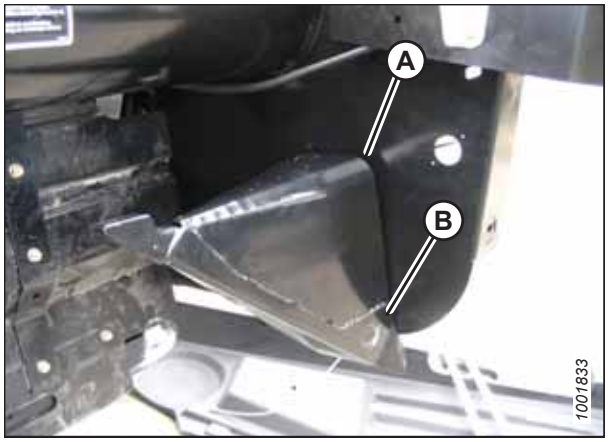


Figure 3.57: Stored Crop Divider

Removing Crop Dividers without Latch Option from Header

To correctly remove crop dividers without the latch option, follow the recommended removal procedure provided here.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a 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.
2. Raise the header fully.
3. Shut down the engine, and remove the key from the ignition.
4. Engage the header safety props. For instructions, refer to your windrower operator's manual.
5. Open or remove the endshields. For instructions, refer to *3.2.3 Endshields, page 35*.

6. Remove bolt (A), lock washer, and flat washer.
7. Lower crop divider (B) and then lift the crop divider to remove it from the endsheet.
8. Close or install the endshields. For instructions, refer to *3.2.3 Endshields, page 35*.

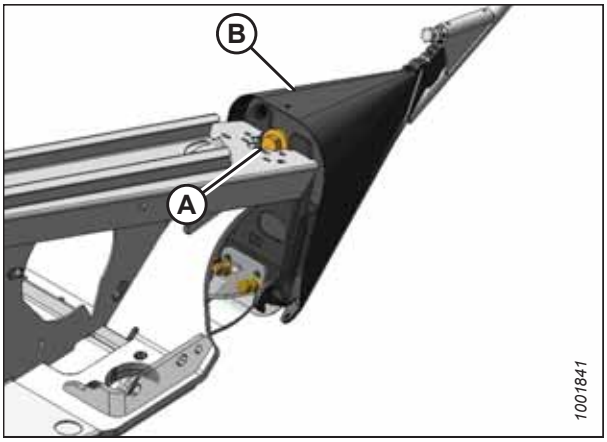


Figure 3.58: Crop Divider

Installing Crop Dividers with Latch Option onto Header

To correctly install crop dividers with the latch option, follow the recommended installation procedure provided here.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a 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.
2. Raise the header fully.
3. Shut down the engine, and remove the key from the ignition.
4. Engage the safety props. For instructions, refer to your windrower operator's manual.
5. Open or remove the endshields. For instructions, refer to *3.2.3 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.

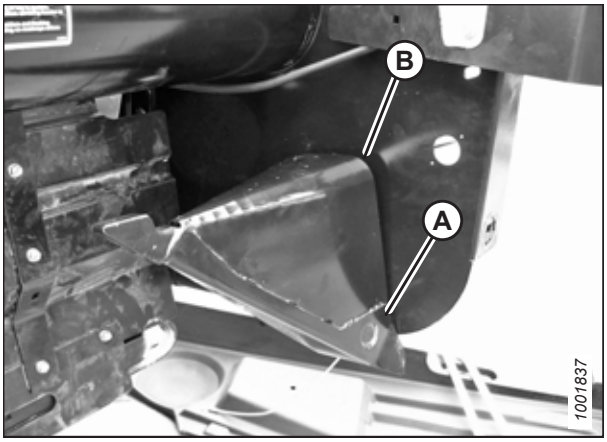


Figure 3.59: Stored Crop Divider

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 the top of the crop divider engages and closes latch (C).
9. Push safety lever (D) downward to lock the pin into latch (C).

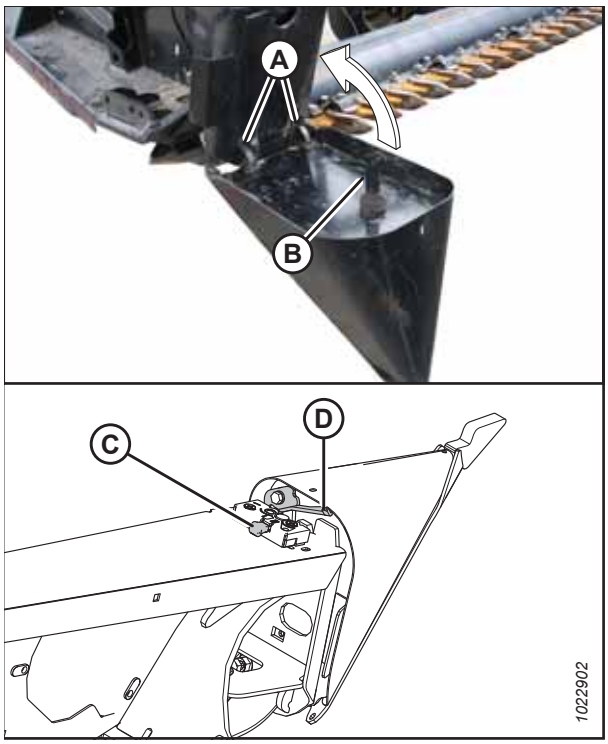


Figure 3.60: Crop Divider

10. Pull at the tip of the crop divider and ensure there is no lateral movement. If necessary, adjust bolts (A) to tighten the crop divider and eliminate lateral movement.
11. Close or install the endshields. For instructions, refer to *3.2.3 Endshields, page 35*.

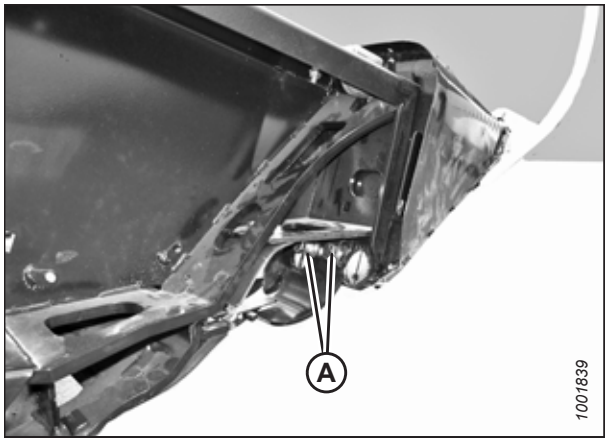


Figure 3.61: Crop Divider

Installing Crop Dividers without Latch Option onto Header

To correctly install crop dividers without the latch option, follow the recommended installation procedure provided here.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a 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.
2. Raise the header fully.
3. Shut down the engine, and remove the key from the ignition.

4. Engage the header safety props. For instructions, refer to your windrower operator's manual.

5. Open or remove the endshields. For instructions, refer to *3.2.3 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.

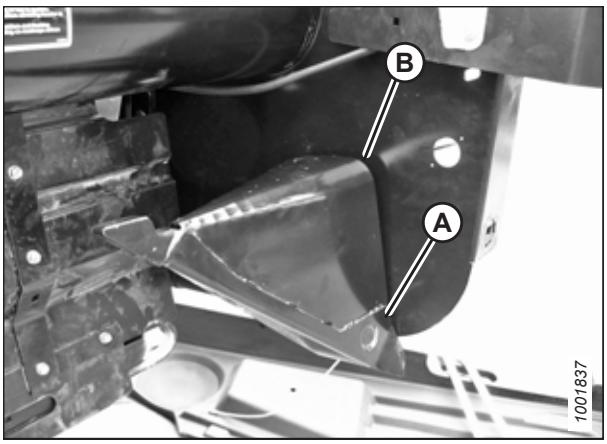


Figure 3.62: Stored Crop Divider

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

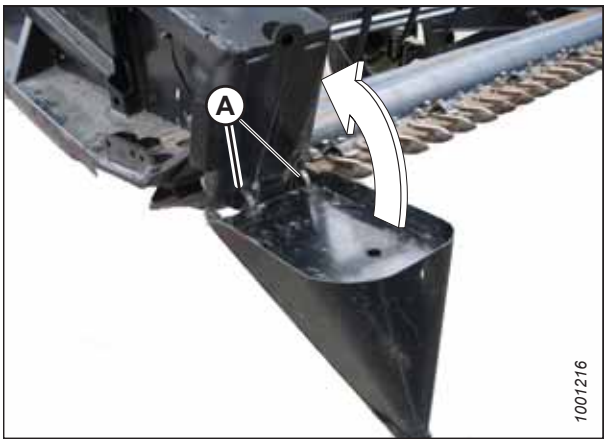


Figure 3.63: Crop Divider

8. Lift the forward end of the crop divider and install bolt (A) and special stepped washer (B) (step towards the divider). Tighten the bolt.

9. Pull at the tip of the crop divider and ensure there is no lateral movement. If necessary, adjust bolts (C) to tighten the crop divider and eliminate lateral movement.

10. Close or install the endshields. For instructions, refer to *3.2.3 Endshields, page 35*.

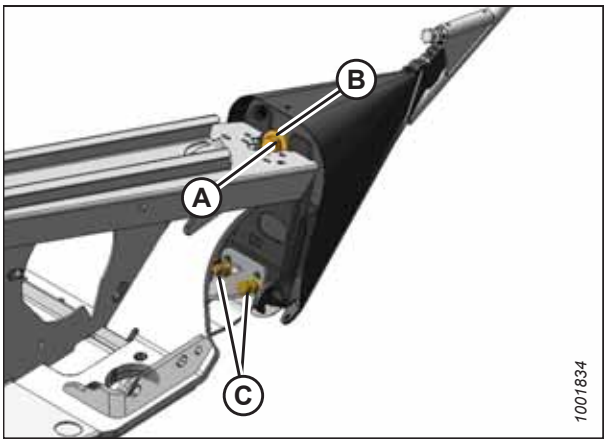


Figure 3.64: Crop Divider

3.7.14 Crop Divider Rods

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

Table 3.6 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

Removing Crop Divider Rods

To remove the crop divider rods and place them in their storage position, perform the removal procedure provided here.

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

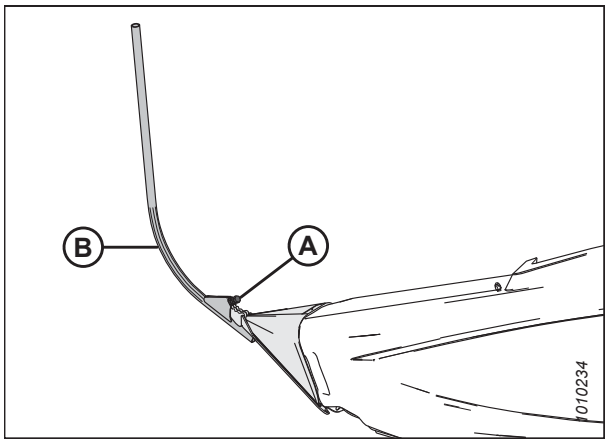


Figure 3.65: Crop Divider Rod

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

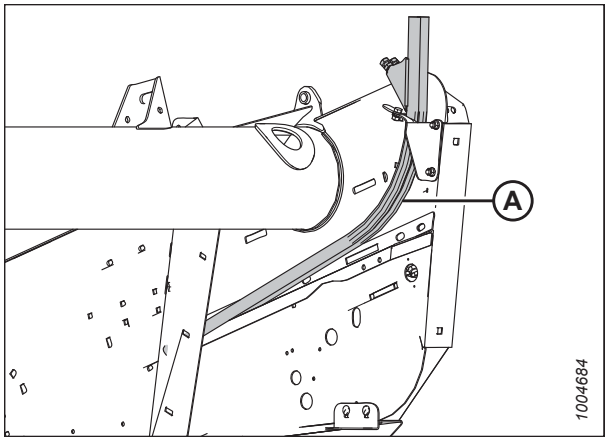


Figure 3.66: Right Endsheet

Rice Divider Rods

Rice divider rods attach to the left and right crop dividers.

Optional rice divider rods provide improved performance in tall and tangled rice crops. For instructions, refer to *6.4.4 Rice Divider Rods, page 251*.

The installation and removal procedures are the same as for standard crop divider rods.

Figure 3.67: Divider Rod for Rice

3.8 Delivery Opening

The width and location of the delivery opening can be changed. This affects the width and configuration of the windrow.

The decision to widen or narrow the center delivery opening, or to double windrow, should be based on the following factors:

- Capability to pick-up a windrow
- Type and yield of crop
- Weather conditions (rain, humidity, wind)
- Drying time available

Refer to *3.10 Windrow Types, page 86* for the strengths and weaknesses of the various windrow configurations with respect to these factors.

The procedure for adjusting the delivery opening varies depending on whether the optional hydraulic deck shift has been installed.

Also refer to *3.9 Double Windrowing, page 82*.

3.8.1 Adjusting Size of Delivery Opening on Header with Manual Deck Shift

Both draper decks can be moved manually to adjust the delivery opening.

1. Loosen bolts (A) on both decks.
2. Slide the decks to the desired opening width. Retighten bolts (A).

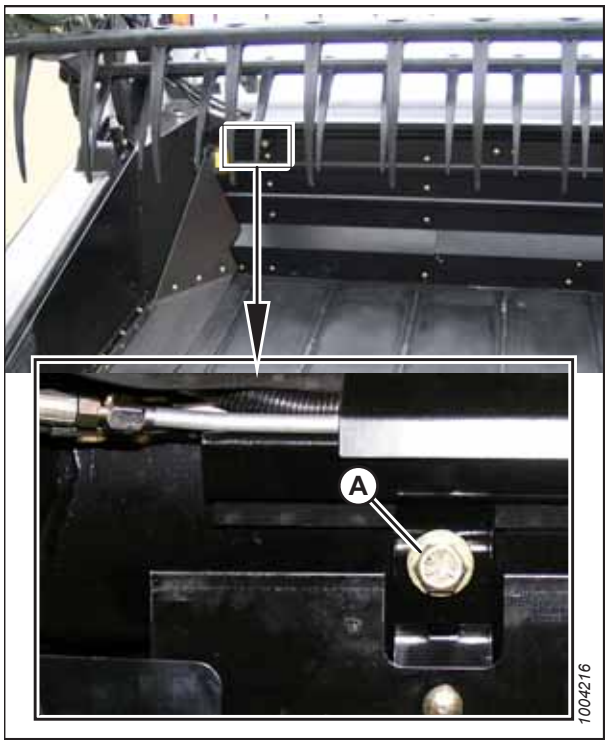


Figure 3.68: Manual Deck Shift

3.8.2 Adjusting Delivery Opening on Header with Hydraulic Deck Shift

The delivery opening can be changed by moving the inboard deck shift stops.

1. Remove bolts (A).
2. Slide stop (B) outboard to decrease the maximum opening size, or inboard to increase the maximum opening.

CAUTION

Adjust the outboard stops to prevent the decks from contacting each other.

3. Reinstall bolts (A) and tighten.

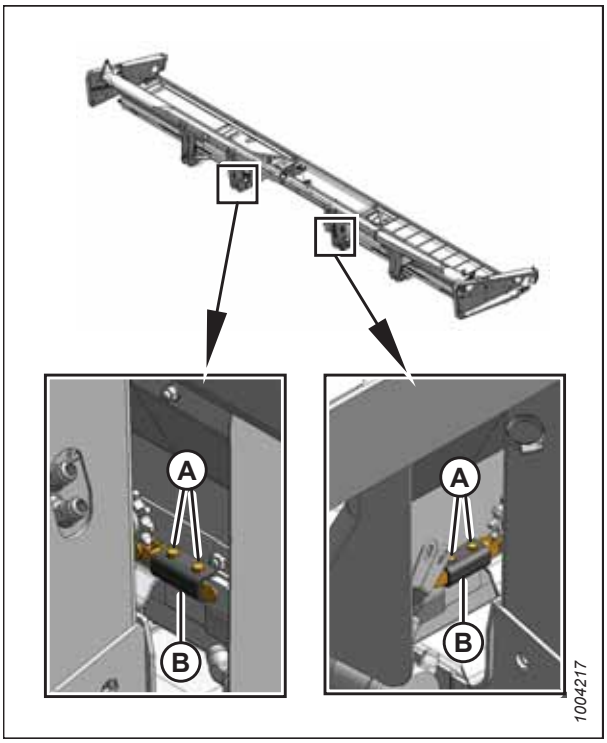


Figure 3.69: Hydraulic Deck Shift

3.8.3 Adjusting Hydraulic Deck Shift Chain Tension

The hydraulic deck shift (HDS) chain's midpoint should be 25–50 mm (1–2 in.) lower than either end of the chain.

1. Locate chain adjustment bolt (A).

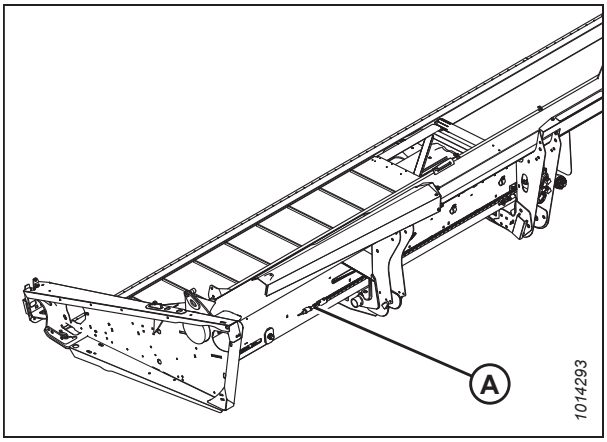


Figure 3.70: Chain Adjustment Bolt – Left Shown, Right Similar

2. Loosen jam nuts (B) and (C).

3. Turn nut (A) to adjust chain tension.

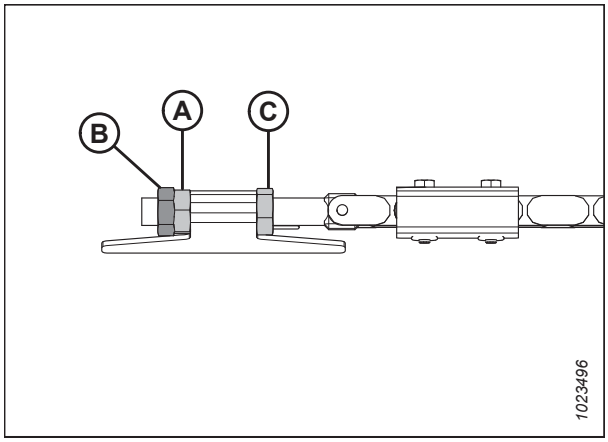
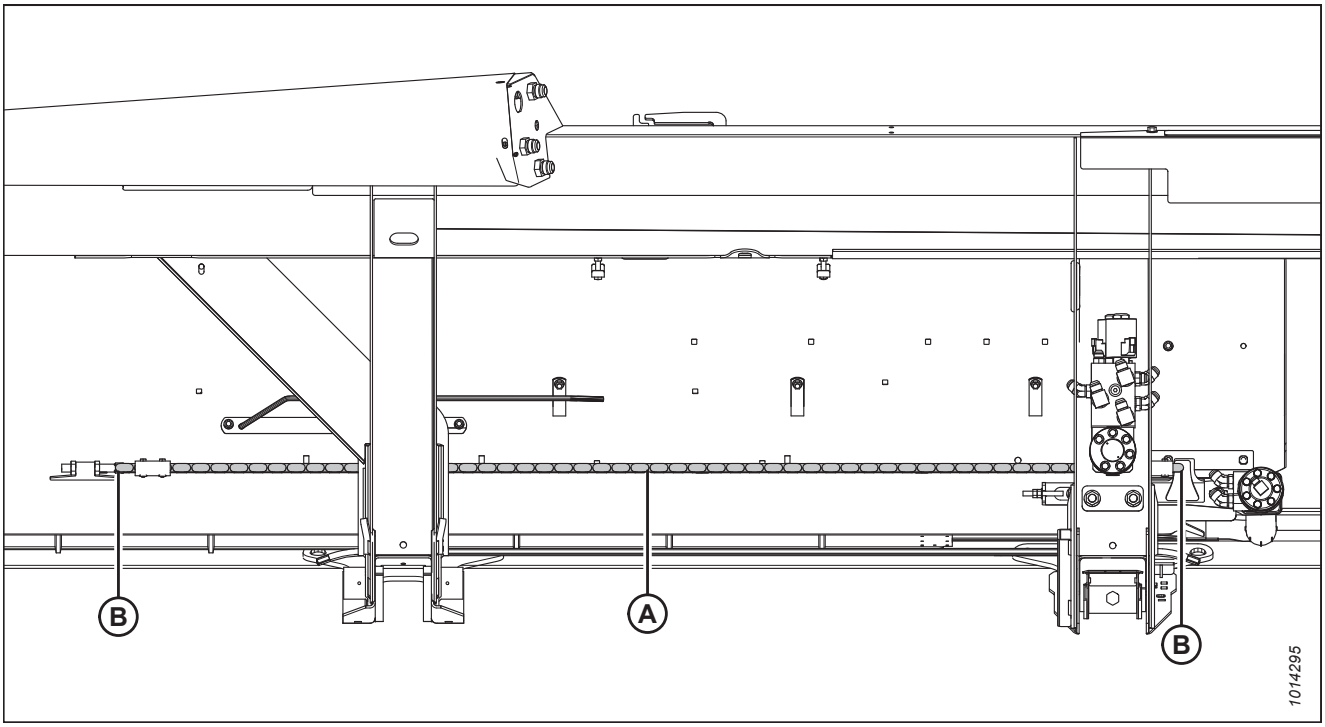


Figure 3.71: Chain Adjustment Bolt – Left Shown, Right Similar

Figure 3.72: HDS Chain – Left Shown, Right Similar



4. Measure to ensure chain midpoint (A) is 25–50 mm (1–2 in.) lower than the chain ends (B).

5. Tighten jam nut (C).

6. Lock nut (B) against nut (A).

   NOTE:

   If there is less than 5 mm (3/16 in.) of thread visible beside jam nut (C), then remove nut (C).

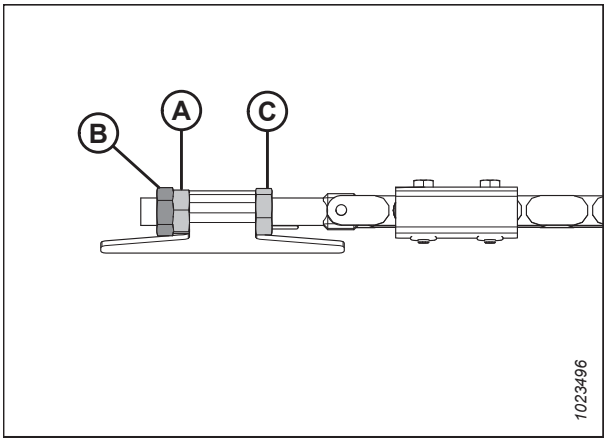


Figure 3.73: Chain Adjustment Bolt – Left Shown, Right Similar

3.9 Double Windrowing

Double windrowing is laying two swaths side-by-side. Larger capacity combines or forage harvesters can then pick up twice as much material in a single pass, saving time and fuel.

Double windrowing can be performed using two methods: deck shifting or using the Double Windrow Attachment (DWA).

Deck shifting is used for crops that don't require conditioning, such as grains, canola, and beans. For instructions, refer to:

- *3.9.1 Shifting Decks Hydraulically, page 82*
- *3.9.2 Shifting Decks Manually, page 82*

Forage crops such as alfalfa, hay, and some grasses are cut and then fed into the HC10 Hay Conditioner. The DWA system allows double windrowing with conditioner-equipped windrowers up to 9.1 m (30 ft.). For instructions, refer to *3.9.3 Using Double Windrow Attachment, page 84*.

3.9.1 Shifting Decks Hydraulically

The hydraulic deck shift feature allows you to select center, left, or right delivery from the windrower cab.

Refer to your windrower operator's manual for identification and operation of the deck shift control.

To lay a double windrow, do the following:

1. Raise and lock the transport/stabilizer wheels (if installed) at the highest wheel height position to prevent the wheels from interfering with the windrow. For instructions, refer to *Moving Front (Left) Wheels into Field Position, page 100* and *Moving Front (Left) Wheels into Transport Position, page 104*.
2. Position the decks at the left end of header to deliver crop from right end (A) for the first round.
3. To deliver crop from the left end (B) of the header, use the deck shift control in the windrower to shift the decks to the right end of the header.
4. Complete the second round to lay a double windrow.
5. Repeat above steps to lay additional double windrow.

   NOTE:

   The end delivery opening is designed to give adequate clearance between the first windrow and the standing crop, and optimum space between the two windrows.

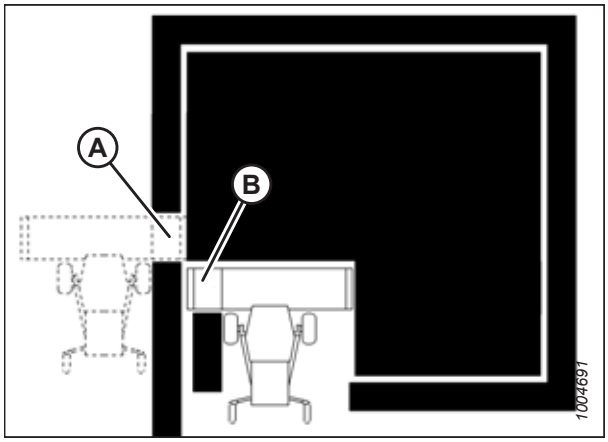


Figure 3.74: Double Windrowing

3.9.2 Shifting Decks Manually

Both decks can be shifted manually, and can be positioned to deliver the crop from the right or left end and from the center.

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.

1. Raise and lock the transport/stabilizer wheels (if installed) at the highest wheel height position to prevent the wheels from interfering with the windrow. For instructions, refer to *Moving Front (Left) Wheels into Field Position, page 100* and *Moving Front (Left) Wheels into Transport Position, page 104*.

To deliver crop from the right end, move the decks to the left end of the header as follows:

2. Loosen bolt (A) on the right deck.
3. Slide the deck to close off the center opening. Tighten bolt (A).

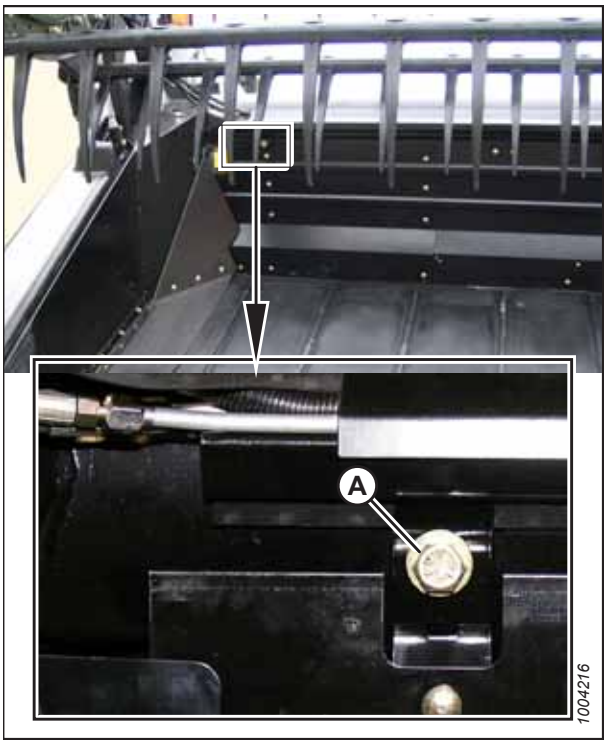


Figure 3.75: Right Deck Shown

4. Reverse draper drive motor hoses (A) on the moved deck so that the draper turns the same direction as the unmoved deck.

   NOTE:

   Loosen the clamp on the plastic sleeve at the drive motor so that hoses (A) can be reversed. Tighten the clamp.

   NOTE:

   To deliver crop from the left end, move the decks to the right end of the header following the steps above.

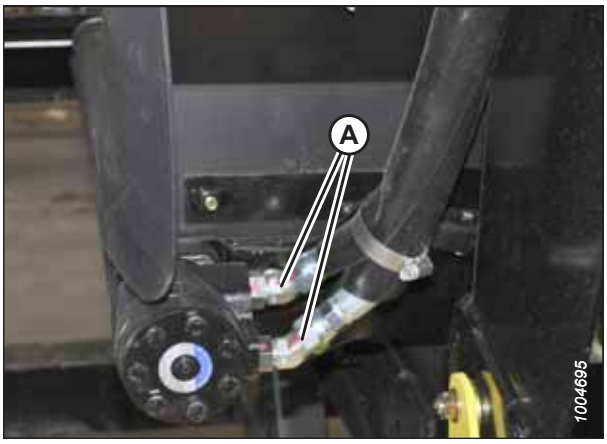


Figure 3.76: Right Deck Motor

To lay a double windrow, do the following:

5. Position decks at the left end of header to deliver crop from right end (A).
6. Complete one round or one length of the field.
7. Complete the second round or length in the opposite direction to lay a double windrow.
8. Repeat the above steps to lay additional double windrows.

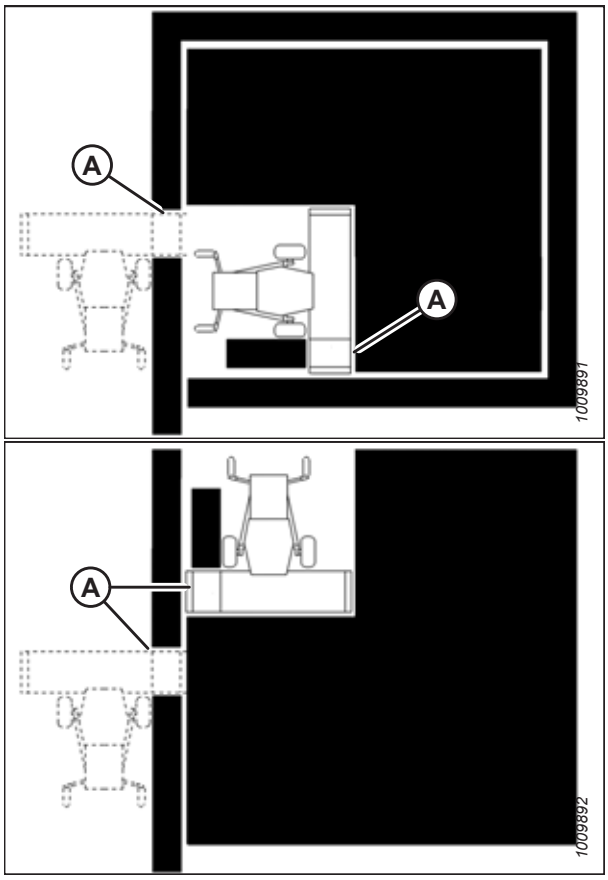


Figure 3.77: Double Windrowing

3.9.3 Using Double Windrow Attachment

The double windrow attachment (DWA) allows double windrowing of cut and conditioned forage type crops. The conditioned crop is deposited onto the side delivery system draper (A) and delivered to the side of the windrower when required. Draper speed and deck position are controlled with switches in the windrower cab.

NOTE:

The double windrow attachment (DWA) system shuts off the draper automatically when it is raised and allows the crop to be deposited between the tractor wheels as it would be without the side delivery system.

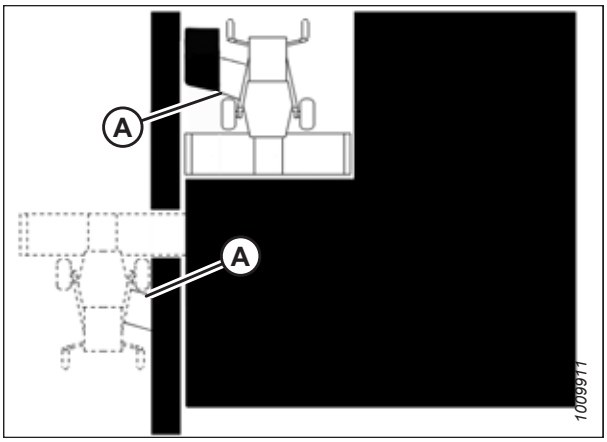


Figure 3.78: Double Windrowing

To lay a double windrow, do the following:

1. Complete one round or one length of the field.
2. Complete the second round or length in the opposite direction to lay a double windrow.
3. Repeat above steps to lay additional double windrow.

3.10 Windrow Types

Review the qualities that make up a good windrow to better understand how the crop delivery method affects your windrow.

There are three basic criteria by which the quality of a windrow is measured:

- **Weight Distribution:** Heads and stalks distributed evenly across full width of windrow
- **Good Curing:** A loose, open windrow for better drying
- **Good Weatherability:** A well-formed windrow that supports heads off the ground and holds together in extreme weather conditions

Table 3.7 Windrow Descriptions

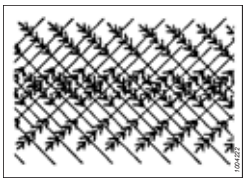
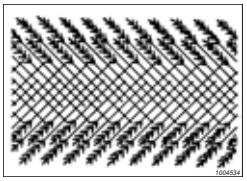
Windrow Type	Windrow Descriptions
Herringbone 	**Description:** The most desirable form of windrow, stalks are crossed and interwoven. Heads are distributed across full width of windrow. This windrow can be formed by center delivery only. **Weight Distribution:** Good **Curing:** Good **Weatherability:** Excellent **Machine Setting Guidelines:** • Reel and ground speed approximately equal • Medium draper speed • Center delivery
Fantail 	**Description:** The stalks are crossed in the center and the heads are in line along outside edges. This windrow can be formed by center delivery only. **Weight Distribution:** Fair **Curing:** Fair **Weatherability:** Fair **Machine Setting Guidelines:** • Low draper speed • Low header angle • Center delivery

Table 3.7 Windrow Descriptions (continued)

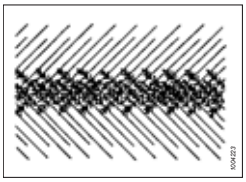
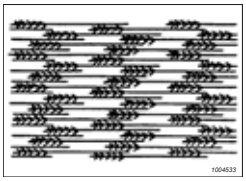
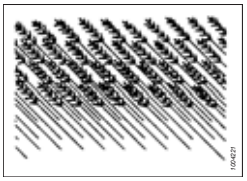
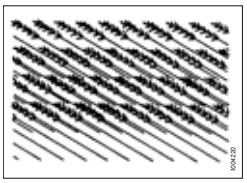
Windrow Type	Windrow Descriptions
Dovetail 	**Description:** The stalks are lined along outside edges of windrow and heads are crossed in center. This windrow can be formed by center delivery only. **Weight Distribution:** Poor **Curing:** Fair **Weatherability:** Poor **Machine Setting Guidelines:** • High draper speed • High header angle • Center delivery
Parallel 	**Description:** The stalks are parallel to windrow and heads evenly distributed across width of windrow. This windrow can be formed by center delivery or end delivery. **Weight Distribution:** Good **Curing:** Good **Weatherability:** Good **Machine Setting Guidelines:** • Medium draper speed • Medium header angle • Center or end delivery

Table 3.7 Windrow Descriptions (continued)

Windrow Type	Windrow Descriptions
45° Diagonal 	**Description:** The stalks are lined along one edge and heads are along opposite edge, 45° to windrow perpendicular. This windrow can be formed by end delivery or by center delivery, if the crop is leaning to one side. **Weight Distribution:** Poor **Curing:** Fair **Weatherability:** Poor **Machine Setting Guidelines:** • Low reel speed • Less aggressive tine pitch • End delivery or center delivery if crop is leaning
75° Diagonal 	**Description:** The stalks are closer to parallel than the 45° windrow. Stalk tips are lined along one edge with heads opposite, 75° to windrow perpendicular. This windrow can be formed by end delivery or by center delivery, if the crop is leaning to one side. **Weight Distribution:** Fair **Curing:** Good **Weatherability:** Fair **Machine Setting Guidelines:** • Low reel speed • Less aggressive tine pitch • End delivery or center delivery if crop is leaning

NOTE:

If combining, follow the same path as the header did for windrowing for optimal combine feeding performance.

3.11 Haying Tips

These tips may be useful when using the header in hay crops

3.11.1 Curing

Curing crops quickly helps maintain the highest quality because for each day that hay lies on the ground, 5% of the protein is lost.

A quick cure will maintain top quality because:

- 5% of the protein is lost for each day hay lies on the ground.
- The sooner the cut hay is off the ground, the earlier the start for new growth.

Leaving the windrow as wide and thin as possible makes for the quickest curing. The cured hay should be baled as soon as possible.

3.11.2 Topsoil Moisture

On wet soil, the general rule of wide and thin does **NOT** apply. A narrower windrow will dry faster than hay left flat on wet ground.

When the ground is wetter than the hay, moisture from the soil is absorbed by the hay above it. Determine topsoil moisture level before cutting. Use a moisture tester or estimate level using the table below.

Level	% Moisture	Condition
Wet	Over 45%	Soil is muddy
Damp	25–45%	Shows footprints
Dry	Under 25%	Surface is dusty

If the ground is wet due to irrigation, wait until soil moisture drops below 45%.

If the ground is wet due to frequent rains, cut when the weather allows and let the forage lie on the wet ground until it dries to the moisture level of the ground. The cut hay will dry no more until the ground under it dries, so consider moving the windrow to drier ground.

3.11.3 Weather and Topography

Cut as much hay as possible by midday, when drying conditions are best.

Fields sloping south get up to 100% more exposure to the sun's heat than the north sloping fields. If hay is baled and chopped, consider baling the south-facing fields and chopping fields facing north.

When relative humidity is high, the evaporation rate is low and hay dries slower.

If there is no wind, saturated air becomes trapped around the windrow. Raking or tedding will expose the hay to fresher, less saturated air.

Cutting hay perpendicular to the direction of the prevailing wind is also recommended.

3.11.4 Windrow Characteristics

Adjust speed and header variables to achieve the ideal windrow characteristics.

Table 3.8 Windrow Characteristics

Configuration	Advantage
High and fluffy	Movement of air through the windrow is more important to the curing process than is direct sunlight.
Consistent formation, not bunchy	Permits an even flow of material into the baler, chopper, etc. and allows for more even drying.
Even distribution of material across windrow	Results in even and consistent bales to minimize handling and stacking problems.
Properly conditioned	Prevents excessive leaf damage.

Refer to *3.7 Header Operating Variables, page 52* for instructions on adjusting the header.

3.11.5 Driving on Windrows

Driving on previously cut windrows can lengthen drying time by a full day in hay that will not be raked. If practical, set forming shields for a narrower windrow that can be straddled.

NOTE:

Driving on windrows in high-yielding crops may be unavoidable if a full width windrow is necessary.

3.11.6 Raking and Tedding

Raking or tedding speeds up drying; however, benefits must be evaluated against additional leaf loss.

There is little or no advantage to raking or tedding if the ground beneath the windrow is dry. Large windrows on damp or wet ground should be turned over when they reach 40–50% moisture.

To avoid excessive yield losses, hay should not be raked or tedded when moisture is less than 25%.

3.11.7 Chemical Drying Agents

Hay drying agents work by removing wax from legume surfaces, so that water can escape and evaporate faster.

However, treated hay lying on wet ground will also absorb moisture faster. Costs and benefits relative to your area should be carefully considered before using a drying agent.

3.12 Leveling Header

The windrower linkages are factory-set to provide the proper level for the header and should not normally require adjustment.

NOTE:

The float springs are **NOT** used to level the header.

1. If the header is not level, check the pressure of the windrower's tires to ensure they are properly inflated. For instructions, refer to the windrower operator's manual.
2. If the header is still not level, adjust the windrower linkages as required. For instructions, refer to the windrower operator's manual.

3.13 Unplugging Cutterbar

Follow safety procedures when clearing a plugged cutterbar, and refer to troubleshooting recommendations of plugging persists.

DANGER

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

CAUTION

Wear heavy gloves when working around or handling knives.

IMPORTANT:

Lowering the rotating reel on a plugged cutterbar will damage the reel components.

To remove plugged material from the cutterbar, follow these steps:

1. Stop 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 raise the header fully.
4. Shut down the engine, and remove the key from the ignition.
5. Engage the header safety props. For instructions, refer to the windrower operator's manual.
6. Clean off the cutterbar by hand.

   NOTE:

   If cutterbar plugging persists, refer to *7 Troubleshooting, page 257*.

3.14 Upper Cross Auger (Option)

The upper cross auger (UCA) (A) improves delivery of very bulky crops across the header and onto the windrow.

Beater bars assist in delivering material through the header opening, but the beater bars are removable if wrapping occurs.

IMPORTANT:

The UCA drive motor must be equipped with a case drain kit when used on single draper drive headers. See your MacDon Dealer for details.

NOTE:

Newer UCA kits do not include or use beater bars.

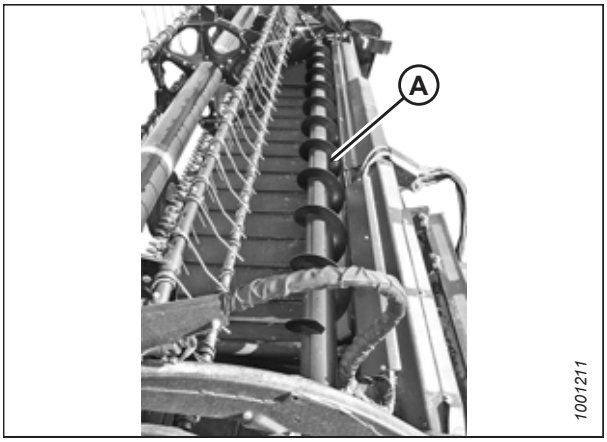


Figure 3.79: Upper Cross Auger

3.14.1 Removing Beater Bars

Beater bars assist in delivering material through the header opening, but the beater bars are removable if wrapping occurs.

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.

NOTE:

Some newer upper cross augers do not have beater bars.

1. Lower the header to the ground.
2. Shut down the engine, and remove the key from the ignition.
3. Remove bolts (A) securing beater bars (B) and clamps (C) to the auger tubes, and remove the beater bars and clamps.

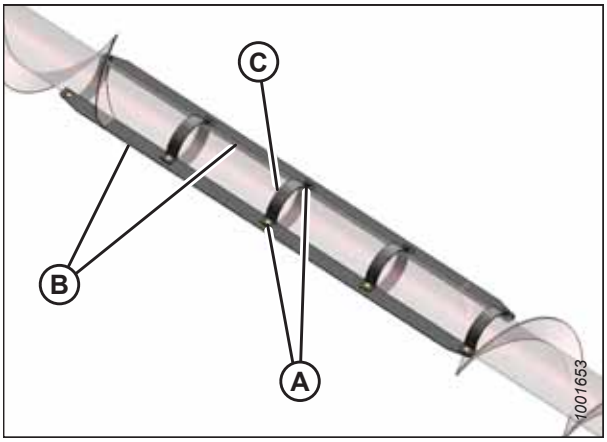


Figure 3.80: Beater Bars

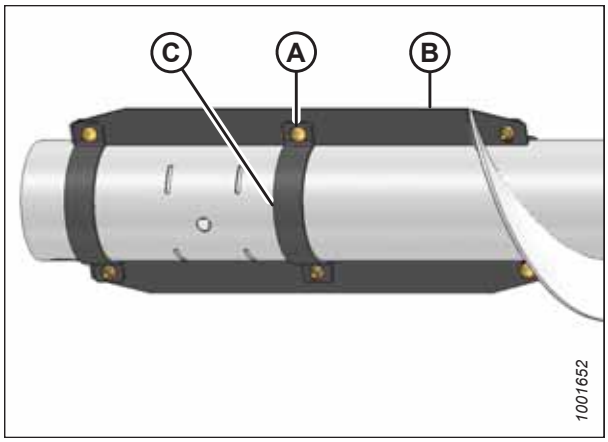


Figure 3.81: Beater Bars

3.14.2 Installing Beater Bars

Beater bars can improve the delivery of material through the header opening.

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.

NOTE:

Some newer upper cross augers do not have beater bars.

1. Lower the header to the ground.
2. Shut down the engine, and remove the key from the ignition.
3. Position one beater bar (B) and one clamp set (C) onto the auger tube and loosely secure with carriage bolt (A) and nut. Bolt head **MUST** face the direction of auger rotation.
4. Position the remaining clamp sets (C) onto the auger tube and loosely attach to beater bar (B) with carriage bolts (A) and nuts. Bolt heads **MUST** face the direction of auger rotation.
5. Position second beater bar (B) in clamp sets (C) and secure with carriage bolts (A) and nuts.

   NOTE:

   To reduce the chance of wrapping, offset the beater bars by 90°.
6. Tighten the bolts.

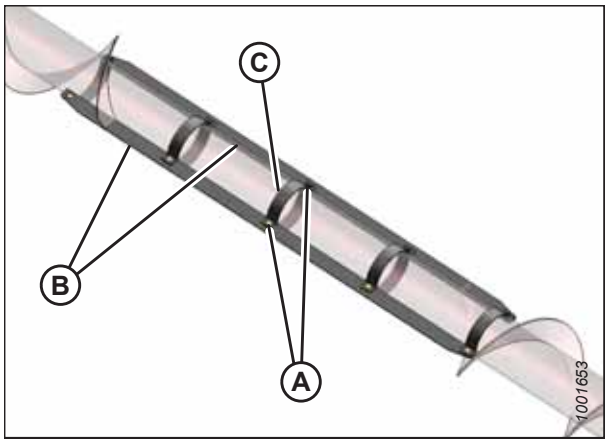


Figure 3.82: Beater Bars

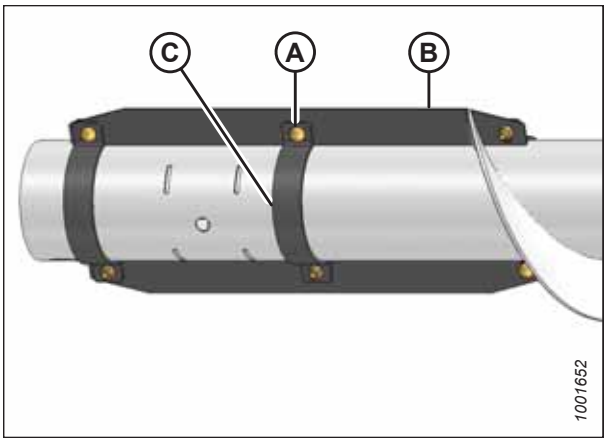


Figure 3.83: Beater Bars

3.15 Transporting Header

There are two ways to transport the header: attached to the front of the windrower, and towed behind a combine, windrower, or agricultural tractor.

The towing option is only available for headers with the Slow Speed Transport option installed. For more information, refer to *6.3.3 Stabilizer / Slow Speed Transport Wheels, page 249*.

3.15.1 Precautions for Transporting Header on a Windrower

Take the following precautions when transporting the header on a windrower.

WARNING

Do NOT drive the windrower 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.

CAUTION

- **Check local laws for width regulations and lighting or marking requirements before transporting on roads.**
- **Follow all recommended procedures in your windrower operator's manual for transporting, towing, etc.**
- **Disengage the header drive clutch when travelling to and from the field.**
- **Before driving windrower on a roadway, be sure flashing amber lamps, red tail lamps, and head lamps are clean and working properly. Pivot amber lamps for best visibility by approaching traffic. Always use these lamps on roads to provide adequate warning to other vehicles.**
- **Do NOT use field lamps on roads; they may confuse other drivers.**
- **Before driving on a roadway, clean the slow moving vehicle emblem and reflectors. Adjust the rear view mirror 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. This provides maximum stability if forward motion is stopped for any reason. Raise the header completely at the bottom of grade to avoid contacting the ground.**
- **Travel speed should be such that complete control and machine stability are maintained at all times.**

3.15.2 Towing Header

Headers with the optional Slow Speed Transport can be towed behind a properly configured MacDon windrower, a properly configured combine, or an agricultural tractor.

Refer to the towing vehicle's operator's manual for instructions.

Attaching Header to Towing Vehicle

Review this list of cautions before attaching a header behind a MacDon windrower, a properly configured combine, or an agricultural tractor.

CAUTION

Adhere to the following slow speed 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.**
- **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 pins are properly secured in transport position at the wheel supports, cutterbar support, and hitch.**
- **Check tire condition and pressure prior to transporting.**
- **Connect the hitch to the 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 the lights are functioning properly and clean the slow moving vehicle sign and other reflectors. Use flashing warning lights unless prohibited by law.**

Precautions for Towing a Header

Review this list of cautions before towing a header behind a MacDon windrower, a properly configured combine, or an agricultural tractor.

CAUTION

Adhere to the following slow speed 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.**
- **Do NOT tow with any highway-capable vehicle. Use only an agricultural tractor, agricultural combine, or a properly configured MacDon windrower.**
- **Use flashing warning lights unless prohibited by law.**
- **Do NOT exceed 32 km/h (20 mph) when towing a header using the Slow Speed Transport option. Reduce speed to less than 8 km/h (5 mph) for corners and slippery or rough conditions.**
- **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.**

3.15.3 Converting from Transport to Field Position

The header needs to be converted back to field position if it was towed to a new location.

Removing Tow-Bar

The transport tow-bar can easily be disassembled and stored on the header.

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 detach outer section (C) from inner section (D).

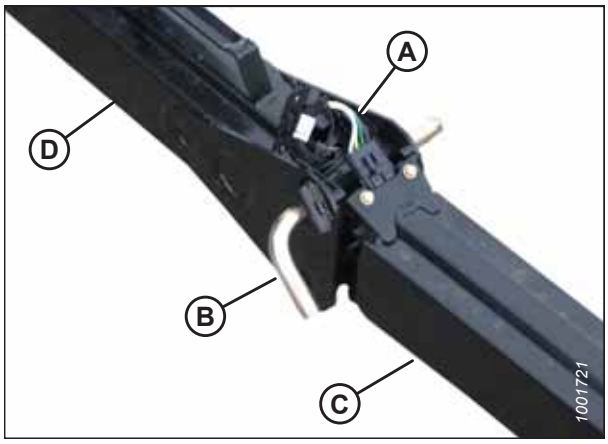


Figure 3.84: Tow-Bar Assembly

4. Disconnect electrical connector (A) at the front wheel.

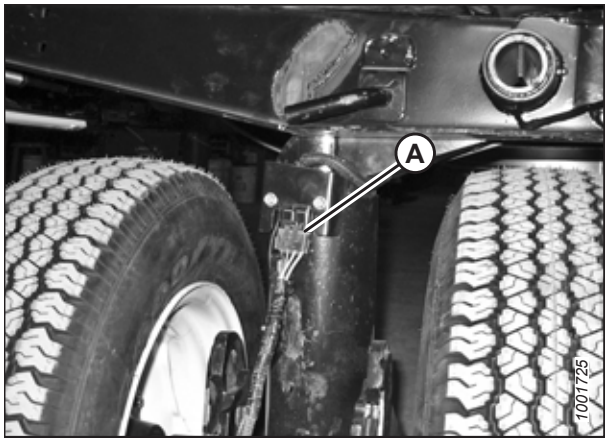


Figure 3.85: Wiring Connector

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).

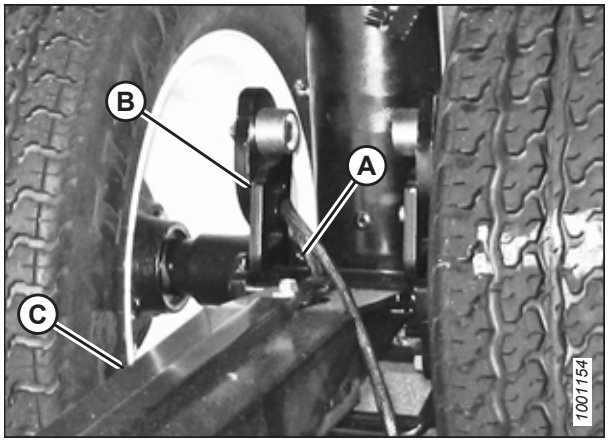


Figure 3.86: Tow-Bar Latch

Storing the Tow-Bar

The tow-bar consists of two sections: inner half (A) and outer half (B).

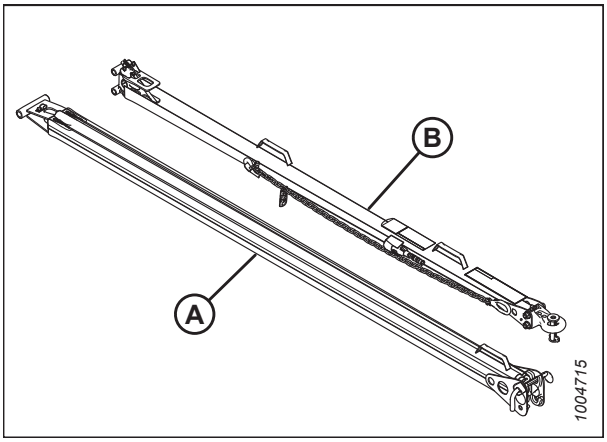


Figure 3.87: Tow-Bar Assembly

1. On the left side of the header's backtube, place the inner end of the outer half of the tow-bar into cradle (A).

   NOTE:

   The exact appearance of the tow-bar storage cradle varies according to the model of header.

2. Secure the clevis/pintle end of the tow-bar in support (B) on the endsheet using hitch pin (C). Secure the pin with a lynch pin.

3. Install rubber strap (D) on cradle (A).

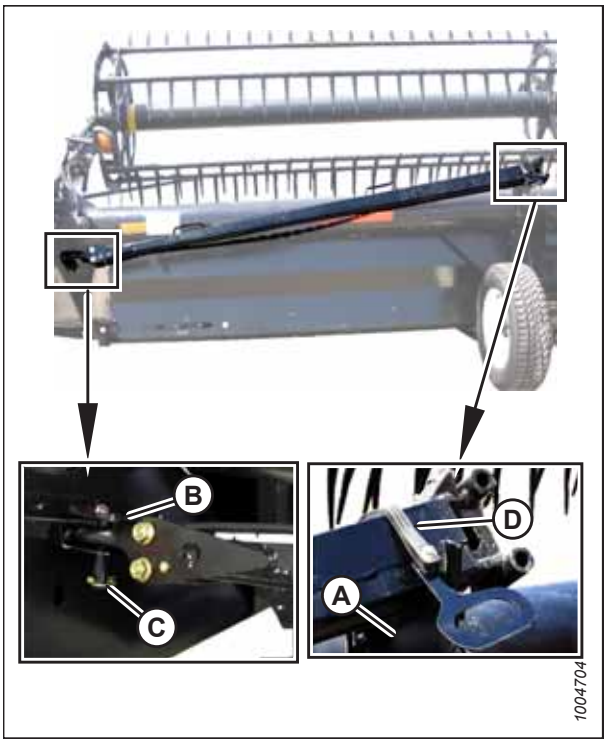


Figure 3.88: Tow-Bar Storage

4. On the right side of the header's backtube, place the inner end of the inner half of the tow-bar into cradle (A).

   NOTE:

   The exact appearance of the tow-bar storage cradle varies according to the model of header.

5. Secure the tube end of the tow-bar in support (B) on the endsheet using L-pin (C) from the tow-pole connection. Secure the L-pin with ring (E).

6. Install rubber strap (D) on cradle (A).

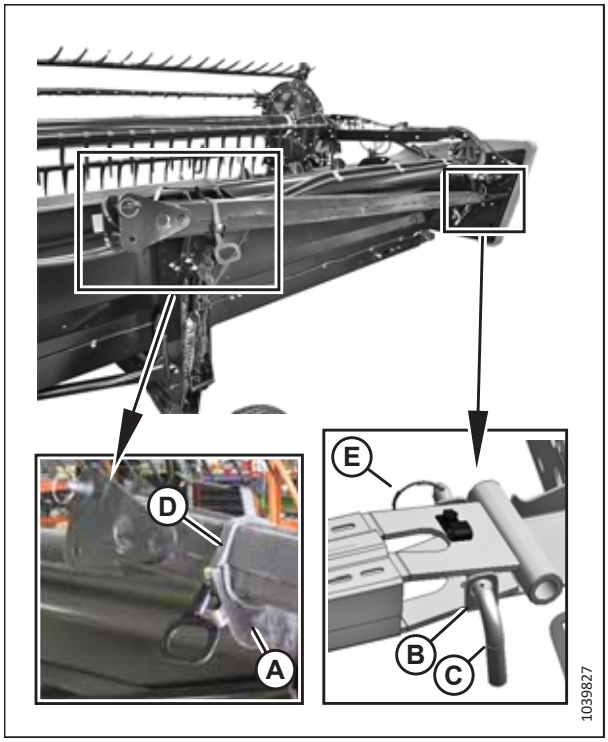


Figure 3.89: Tow-Bar Storage

7. Attach the header to the windrower. Refer to windrower operator's manual for instructions.

IMPORTANT:

Carrying the tow-bar on the header will affect the main header float. Refer to your windrower operator's manual for adjustment procedures.

8. Place the transport wheels into field position. Refer to the following:
   - *Moving Front (Left) Wheels into Field Position, page 100*
   - *Moving Rear (Right) Wheels into Field Position, page 102*

Moving Front (Left) Wheels into Field Position

The front wheels are located closest to the towing vehicle. To prepare for operation in the field, the wheel assembly must be rotated to face the cutterbar and lifted to the desired height.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a 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's safety props.

4. Swivel front wheel assembly (A) so the wheels are aligned with the lower frame.
5. Remove pin (B) and pull the wheel assembly toward the rear of the header. Store the pin in hole (C) at the top of the leg.
6. Pull handle (D) upward to release and lower the linkage into the vertical support.

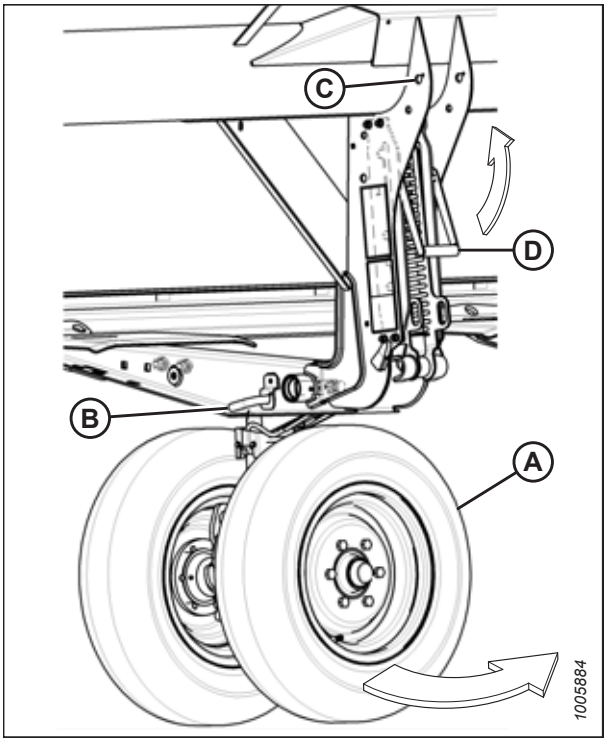


Figure 3.90: Front Wheels – Left

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 the hairpin.

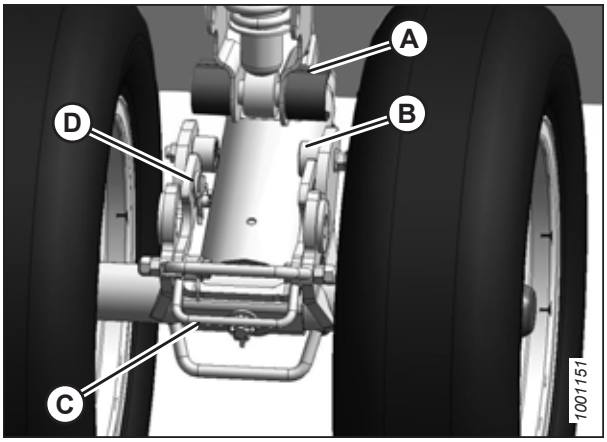


Figure 3.91: Front Wheels – Left

9. Lift the wheel assembly to the desired height and slide linkage (A) into the appropriate slot in the vertical support.
10. Push handle (B) down to lock it.

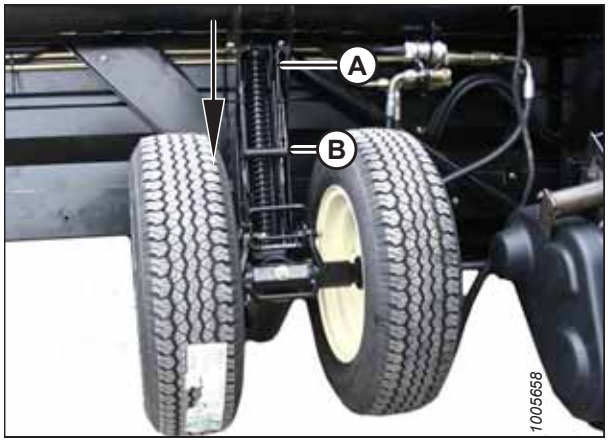


Figure 3.92: Front Wheels – Left

Moving Rear (Right) Wheels into Field Position

The rear wheels are located farthest from the towing vehicle. To prepare for operation in the field, the rear wheel assembly must be rotated to face the cutterbar and lifted to the desired height.

1. Pull pin (A) on the left rear wheel. Swivel the wheel clockwise and lock with the pin.

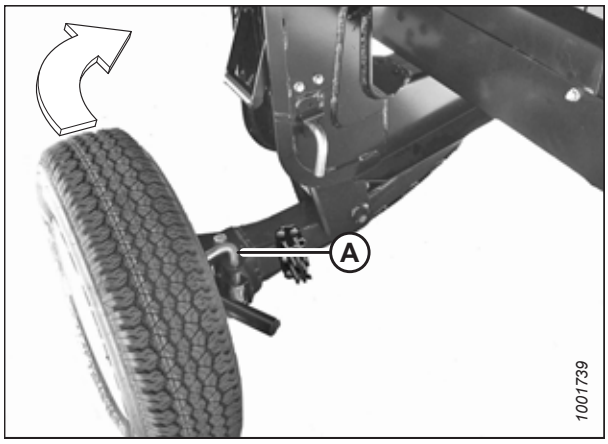


Figure 3.93: Rear Wheel – Right Side

2. Remove pin (A) and store at location (B).
3. Pull handle (C) upward to release.
4. Lift the wheel to the desired height, and engage the support channel into slot (D) in the vertical support.
5. Push handle (C) down to lock.

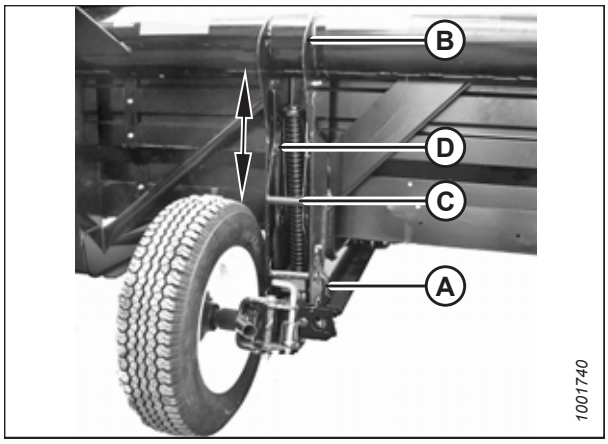


Figure 3.94: Rear Wheel – Right Side

6. Pull pin (A) on brace (B) on the left 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 the axle, and reinsert the pin into the support.
8. Swing axle (C) clockwise towards the rear of the header.

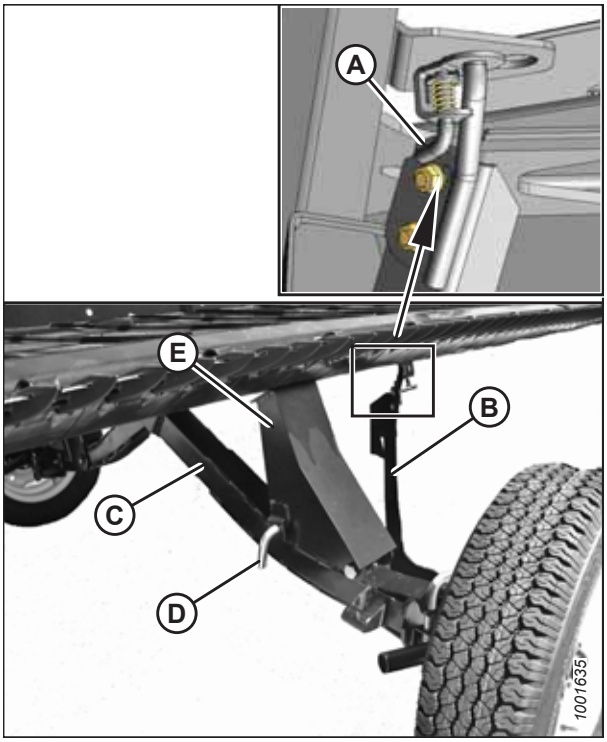


Figure 3.95: Right Rear Axle

9. Pull pin (A) on the right wheel, 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 windrower.

    NOTE:

    The hairpin can become dislodged by crop if installed with the open end facing the cutterbar.

    IMPORTANT:

    Check that wheels are locked and that handle is in locked position.

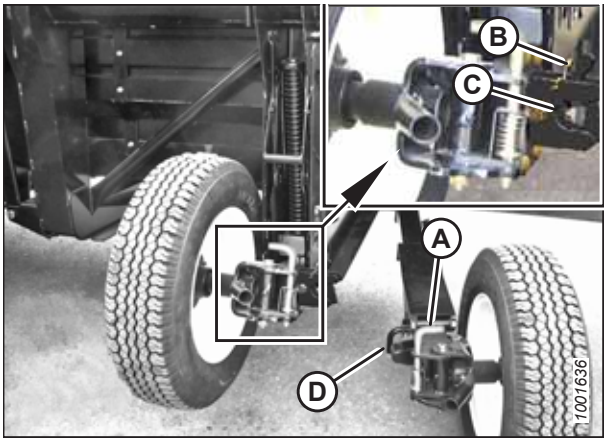


Figure 3.96: Rear Axles

13. Complete the conversion by ensuring left (A) and right (B) wheels are in the positions shown.

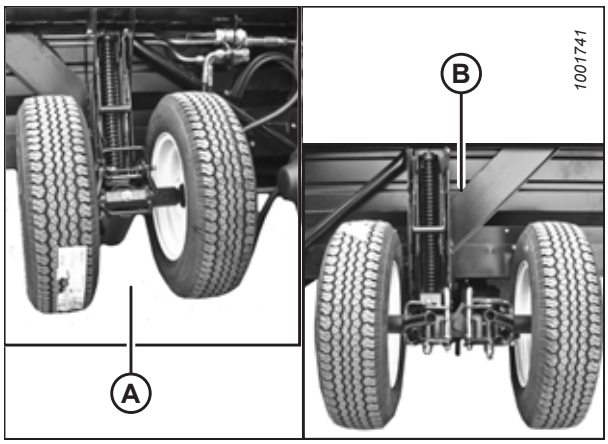


Figure 3.97: Field Position

3.15.4 Converting from Field to Transport Position

The header needs to be converted to the transport when being towed to a new location.

Moving Front (Left) Wheels into Transport Position

The front wheels are located closest to the towing vehicle. To prepare for transport, the wheels must be lowered to the ground and rotated to face the direction of travel.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a 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 the wheels and release the linkage carefully; the wheels will drop once the mechanism is released.

1. Pull handle (B) upward to release and raise linkage (A) fully upward 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. For instructions, refer to the windrower operator's manual.

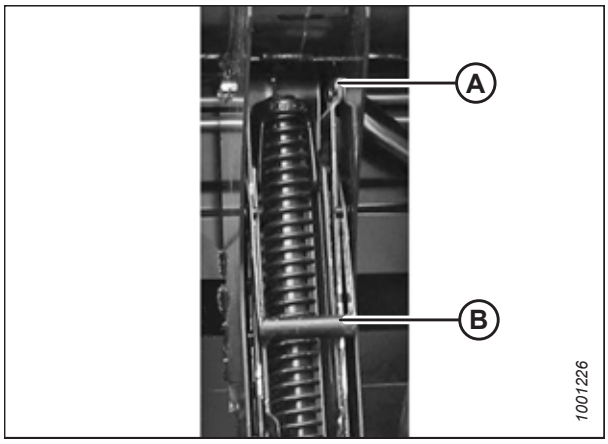


Figure 3.98: Raising Linkage

5. Remove the hairpin and clevis pin (A).
6. Pull latch handle (B) to release suspension linkage (C), and pull the suspension linkage away from spindle (D).
7. Lower the wheels slowly.

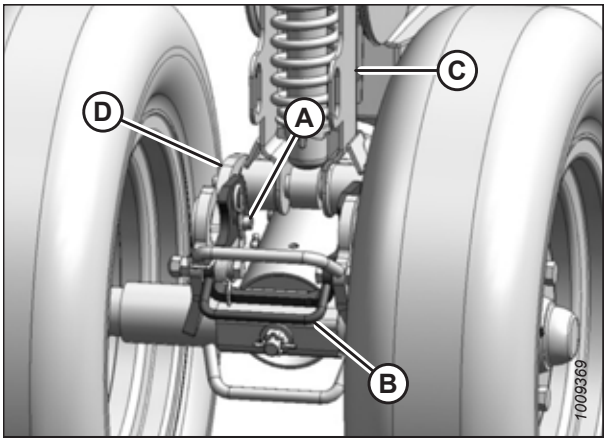


Figure 3.99: Left Front Wheels

8. Lower handle (B) to lock.

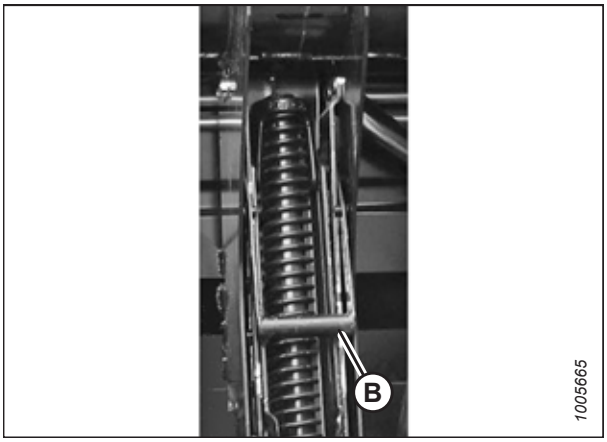


Figure 3.100: Locking Linkage

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.

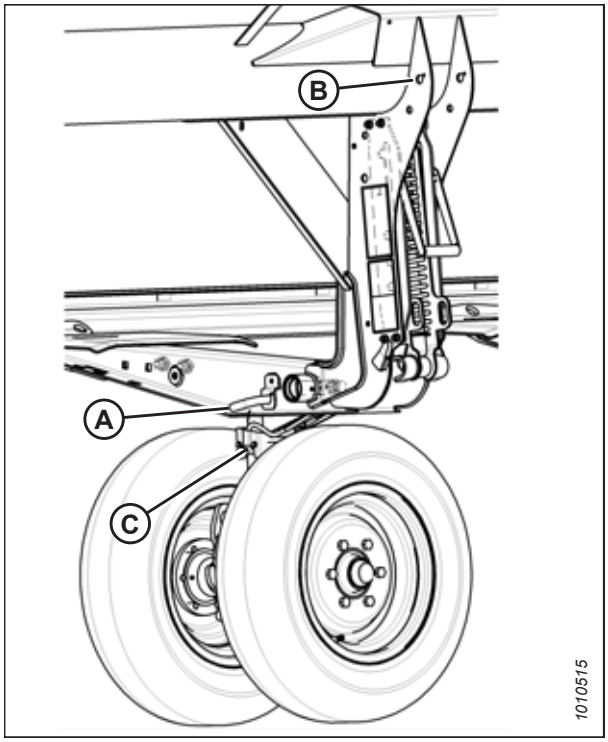


Figure 3.101: Left Front Wheels

Moving Rear (Right) Wheels into Transport Position

The rear wheels are located farthest the towing vehicle. To prepare for transport, the wheels must be lowered to the ground, expanded to transport width, and rotated to face the direction of travel.

1. Remove hairpin (A) from latch (B).
2. Lift latch (B), disengage right axle (C), and lower to the ground.

CAUTION

Stand clear of the wheels and release the linkage carefully; the 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.

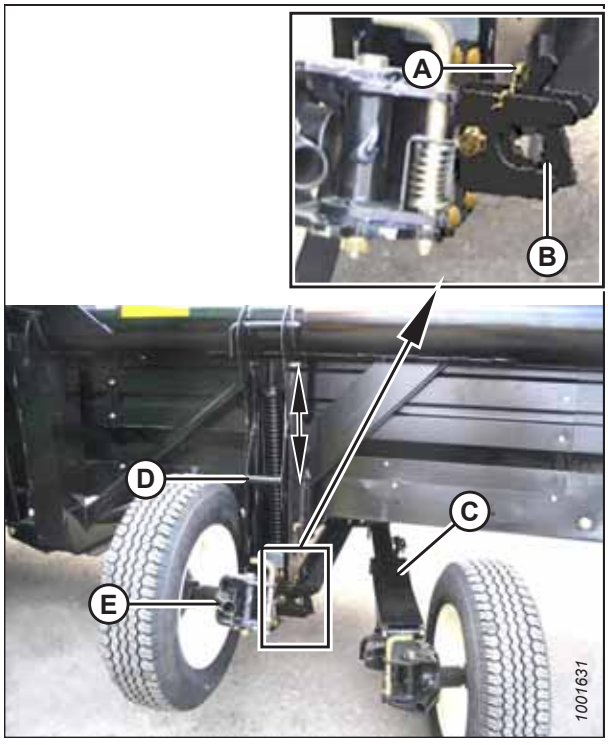


Figure 3.102: Separating Axles

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.

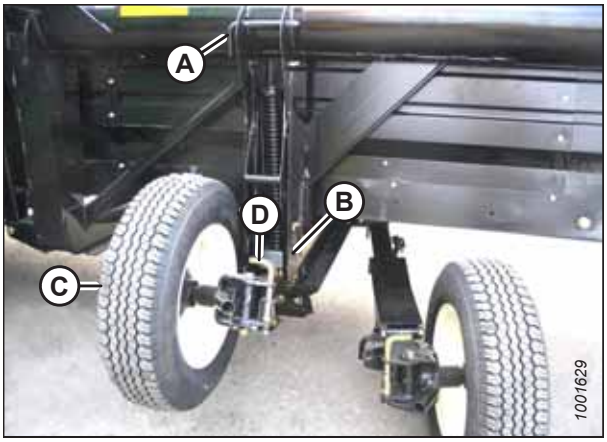


Figure 3.103: Wheel Position

8. Ensure the left wheel is in the transport position as shown.

Figure 3.104: Left Wheel in Transport Position

9. Pull pin (A) and swivel right rear wheel (B) clockwise 90°.

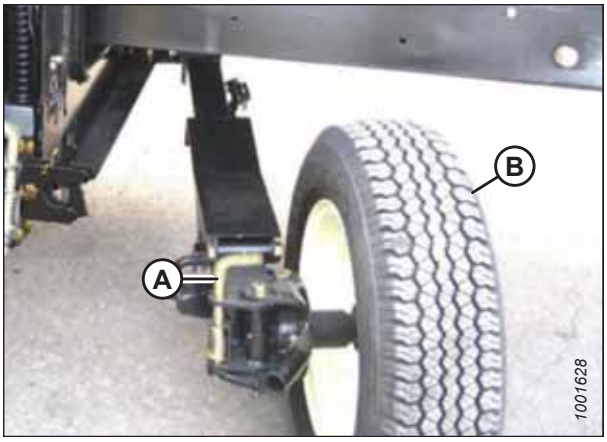


Figure 3.105: Right Rear Wheel

10. Lock wheel (A) with pin (B). Move right axle (C) to the front of the header.

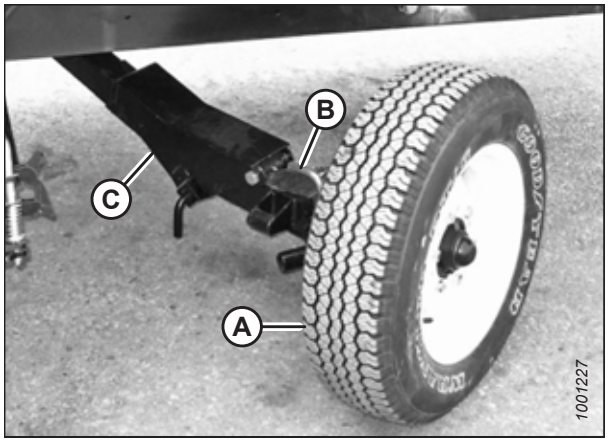


Figure 3.106: Right Rear Wheel

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 safety props. For instructions, refer to the the windrower operator's manual.

14. Detach the header's hydraulic and electrical connections from the windrower. For instructions, refer to *4 Header Attachment/Detachment, page 113*.

15. Start the windrower and lower the header to the ground.

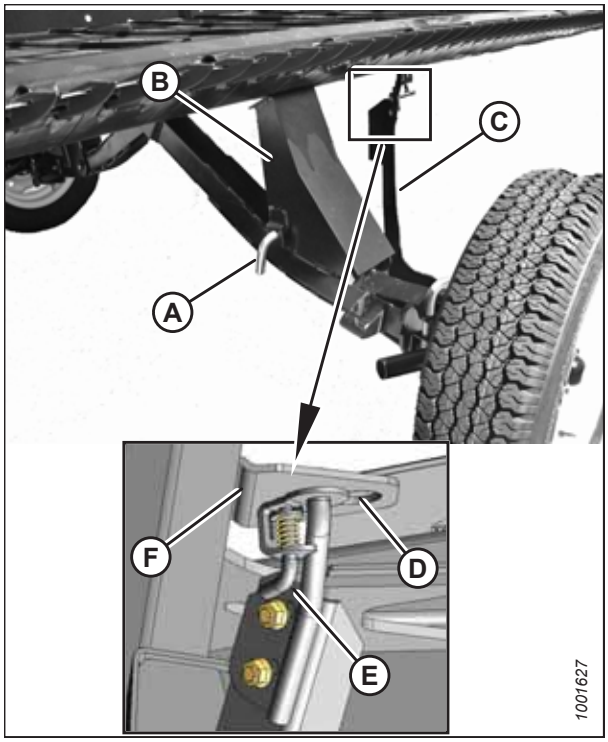


Figure 3.107: Right Rear Wheel Position

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.

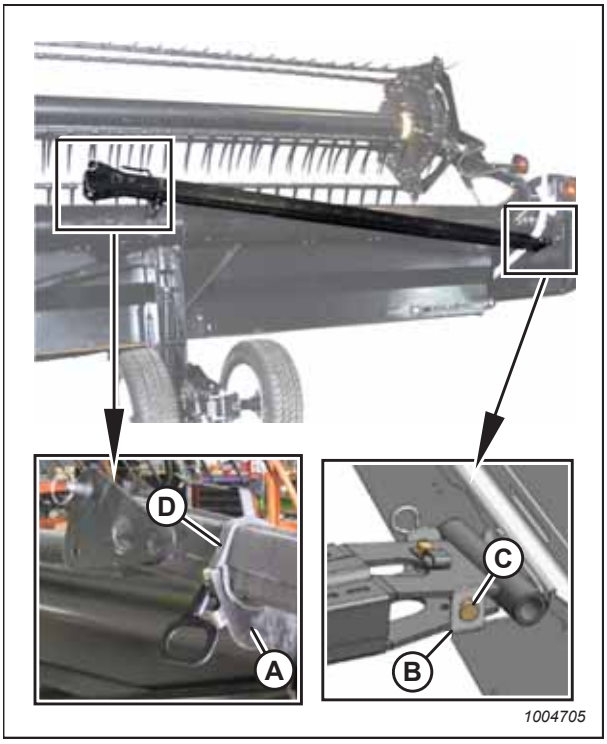


Figure 3.108: Tow-Bar Removal – Right Side

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).

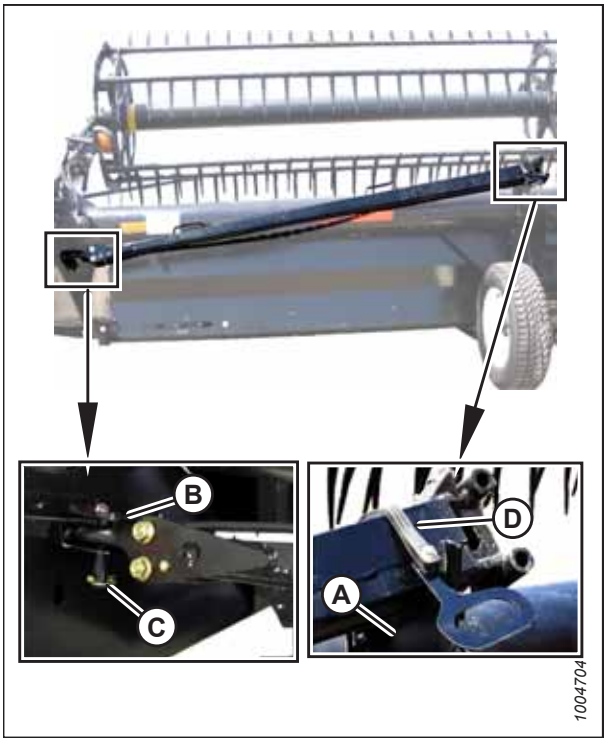


Figure 3.109: Tow-Bar Removal – Left Side

8. Connect outer half (B) of the tow-bar to inner half (A).

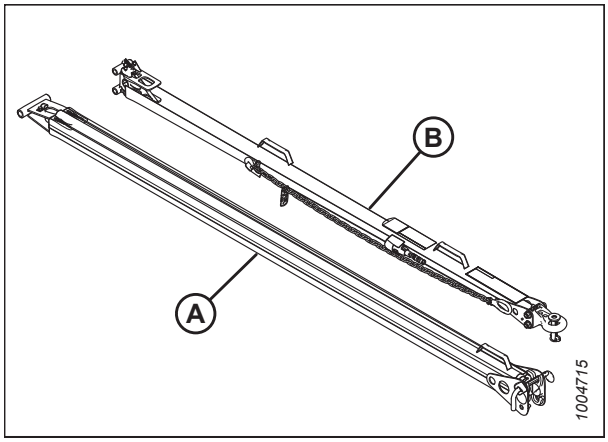


Figure 3.110: Tow-Bar Assembly

9. Lift outer half (B) and insert it into inner half (A).

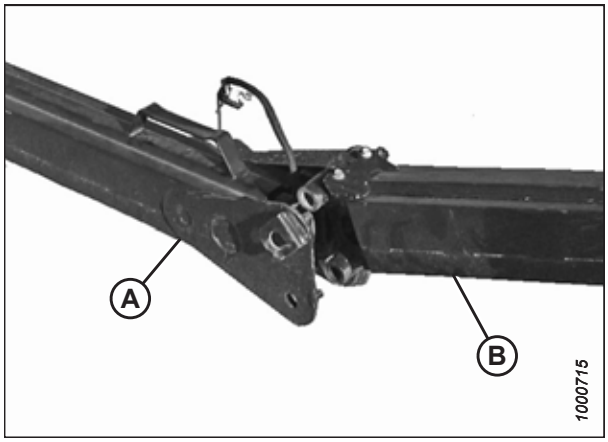


Figure 3.111: Tow-Bar Assembly

10. Secure the two halves together with L-pin (A) and then turn to lock. Secure the L-pin with ring (B).
11. Connect the electrical harness to connector (C).

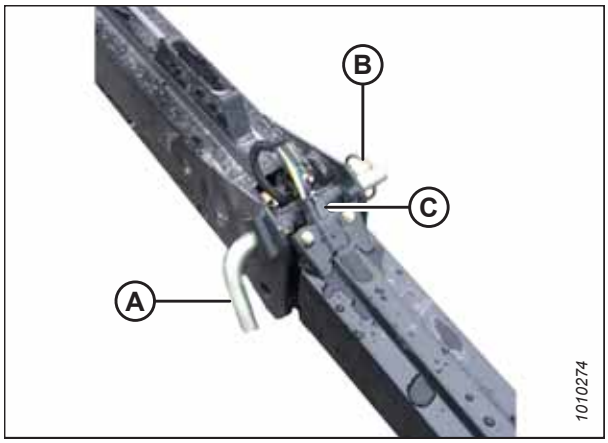


Figure 3.112: Tow-Bar Assembly

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.

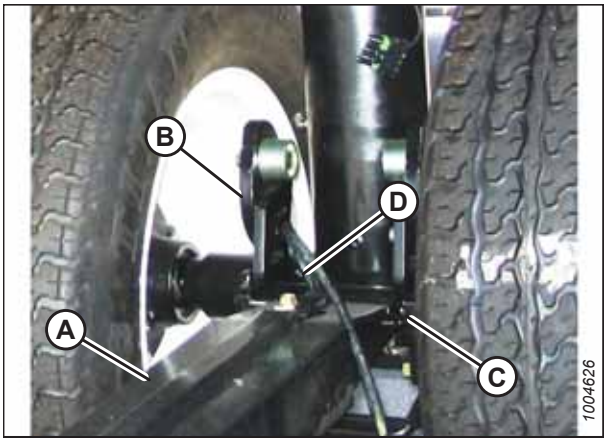


Figure 3.113: Attaching Tow-Bar

15. Connect electrical harness (A) at the front wheel.

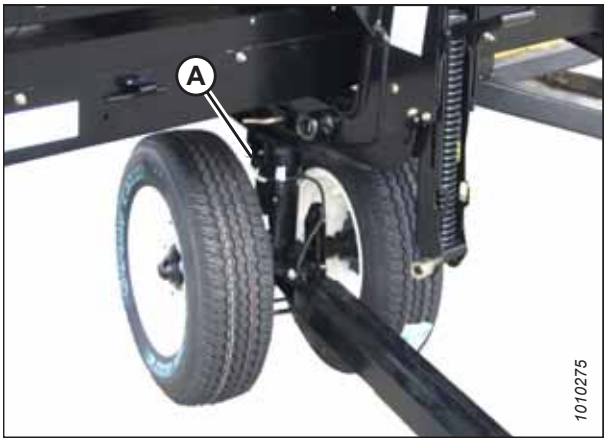


Figure 3.114: Harness Connection

3.16 Storing the Header

Ensure the header is ready for the next harvest by taking steps to prevent corrosion, reduce unnecessary wear, and replace worn components.

CAUTION

Never use gasoline, naphtha, or any volatile material for cleaning purposes. These materials may be toxic and/or flammable.

CAUTION

Cover the cutterbar and knife guards to prevent injury from accidental contact.

- Lower the reel completely. If the header is stored outside, tie the reel to the frame to prevent rotation caused by the wind.
- Lower the header onto blocks to keep the cutterbar off the ground.
- Clean the header thoroughly.
- Check for worn or broken components and order replacements from your Dealer. Immediate repair of these items will save time and effort at the beginning of next season.
- Loosen the drive belts.
- Lubricate the header thoroughly leaving excess grease on the fittings to keep moisture out of the bearings.
- Apply grease to exposed threads, cylinder rods, and sliding surfaces of components.
- Store the machine in a dry, protected place if possible. If storing outside, always cover with a waterproof canvas or other protective material.
- 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.
- Replace or tighten any missing or loose hardware. For instructions, refer to *8.2 Torque Specifications, page 270*.
- Repaint all worn or chipped painted surfaces to prevent rust.

Chapter 4: Header Attachment/Detachment

This chapter includes instructions for attaching a header to, and detaching a header from a windrower.

4.1 Attaching Header to Windrower

Refer to your windrower operator's manual for instructions for mechanically attaching the header to the windrower.

Refer to the following procedures for electrical and hydraulic connections.

Header drive hydraulic hoses and electrical harness are located on the left cab-forward side of the windrower. The reel drive and control hoses are located on the right cab-forward side.

1. Before connecting header drive hydraulics (A) and electrical harness (B) to header, check fittings and connectors. Clean them if required.

Figure 4.1: Header Drive Hoses

2. Disengage and rotate lever (A) counterclockwise to fully up position.
3. Remove cap (B) securing the electrical connector to the frame.
4. Move hose bundle (C) from the windrower hose support and route it along the header hose guide.

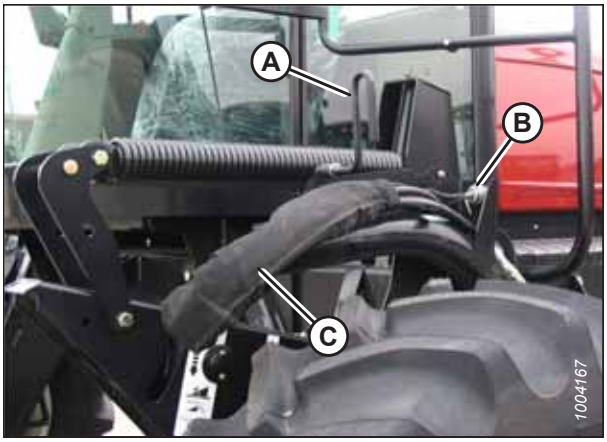


Figure 4.2: Header Drive Hoses

5. Push the hose connectors onto the mating receptacle until the collar on the receptacle snaps into locked position.
6. Remove the cover from electrical receptacle (A).
7. Push the electrical connector onto the receptacle and turn the collar on the connector to lock it in.
8. Attach the cover to the mating cover on the windrower's wiring harness.

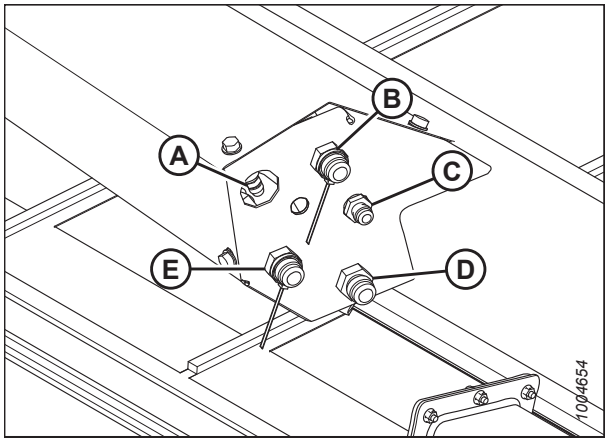


Figure 4.3: Header Receptacles

A - Electrical Receptacle
B - Knife Drive
C - Case Drain (Double Knife)
D - Draper Drive
E - Return

9. Lower lever (A) and engage it in down position.

Figure 4.4: Hose Storage

10. Before connecting the reel hydraulics, check the fittings. If the fittings are dirty, clean them.

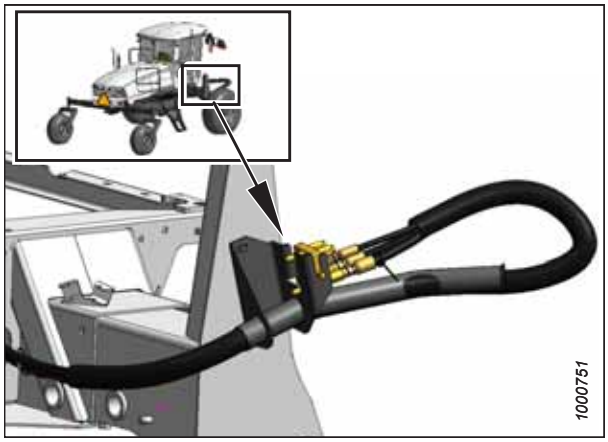


Figure 4.5: Reel Hose Storage

11. Open the cover on header receptacle (A).
12. Push in lock button (B) and pull handle (C) to the half-open position.

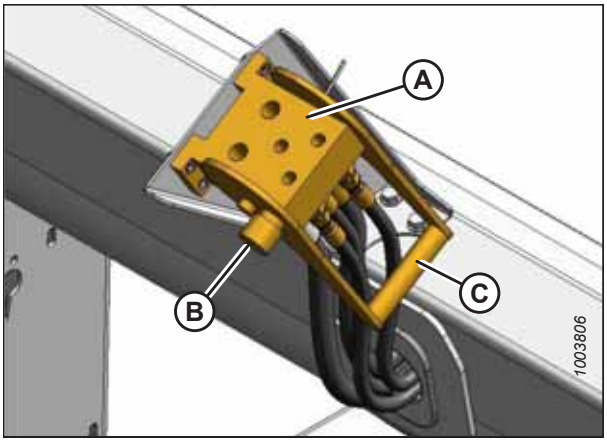


Figure 4.6: Reel Hydraulics Receptacle

13. Remove the hose bundle with multicoupler (C) from the windrower, place the multicoupler onto the header receptacle, and push handle (B) to engage the connector pins.
14. Push the handle away from the hoses until lock button (A) snaps out.
15. Raise and lower the header and the reel a few times to allow trapped air to pass back to the reservoir.

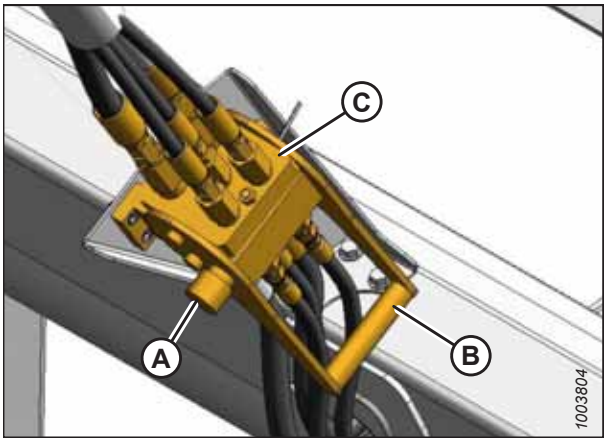


Figure 4.7: Reel Hose Connection

4.2 Detaching Header from Windrower

To detach the header from an M Series Windrower, follow the procedure provided here.

1. Lower the header fully.
2. Lower the reel fully.
3. Shut down the engine, and remove the key from the ignition.

Disconnecting reel hydraulics:

4. Push in lock button (A) and pull handle (B) to disengage multicoupler (C) from the header receptacle.
5. Route the hose bundle back onto the windrower and store multicoupler (C) on the hose support.

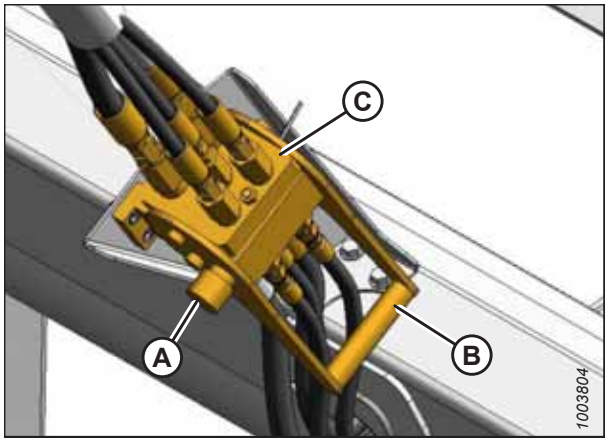


Figure 4.8: Reel Hydraulics

6. Close the cover on header receptacle (A).

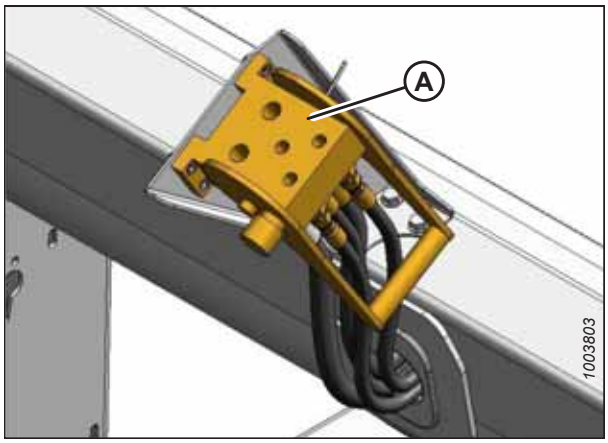


Figure 4.9: Closed Receptacle Cover

Disconnecting header drive hydraulics:

7. Disengage and rotate lever (A) counterclockwise to the fully up position.
8. Disconnect the electrical connector from the header.

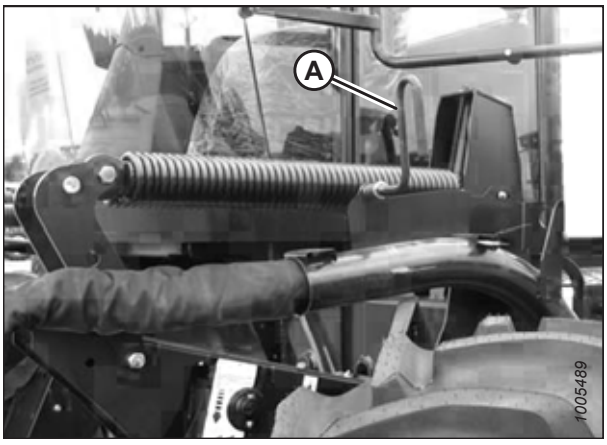


Figure 4.10: Header Drive Hydraulics

9. To disconnect the hoses from the header, line up slot (A) in collar with pin (B) on the connector.
10. Push the collar toward the pin and pull the connector to disengage.
11. Install caps on the connectors and the hose ends (if equipped).

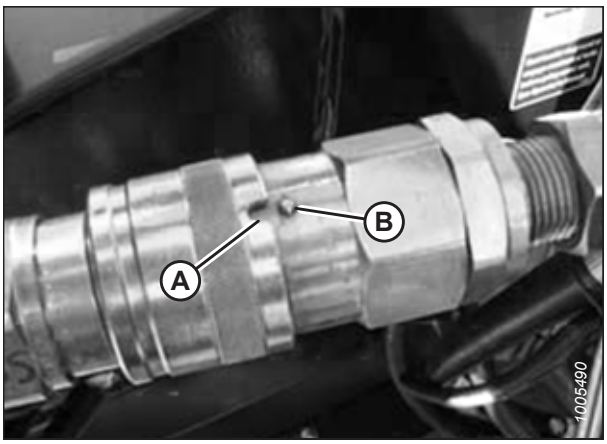


Figure 4.11: Quick Disconnect

Storing hose bundle on windrower support:

12. Route hose bundle (A) back onto the hose support on the windrower.
13. Rotate lever (B) and lock in the down position.
14. Install cap (C) on the electrical connector.
15. Detach the header from the windrower. For instructions, refer to the windrower operator's manual.

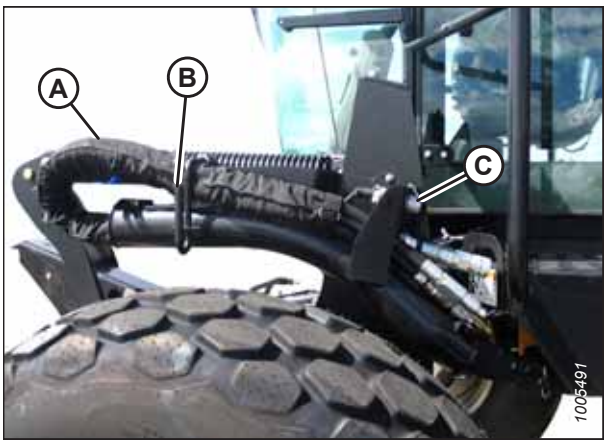


Figure 4.12: Hose Storage

Chapter 5: Maintenance and Servicing

This chapter contains the information necessary to perform routine maintenance and occasional servicing tasks on your machine. The word “maintenance” refers to scheduled tasks that help your machine operate safely and effectively; “service” refers to tasks that must be performed when a part needs to be repaired or replaced. For advanced service procedures, contact your Dealer.

5.1 Preparing Machine for Servicing

Observe all safety precautions before beginning service on the machine.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key before leaving the operator’s seat, and always engage the 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. Stop 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 Roller Chain

When working on chain driven systems, you may need to install a new roller chain. This topic explains how to install a chain with a clip and pin connector link.

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 leaving the operator's seat for any reason.

1. Locate the ends of the chain on the sprocket.
2. Install pin connector (A) into chain, preferably from the sprocket backside.
3. Install connector (B) onto the pins.
4. Install spring clip (C) onto front pin (D) with the closed end of the clip in the direction of sprocket rotation.
5. Locate one leg of clip in groove of aft pin (E).
6. Press the other leg of the spring clip over the face of aft pin (E) until it slips into the groove. Do **NOT** press the clip lengthwise from the closed end.
7. Ensure the clip is seated in the grooves of the pins.

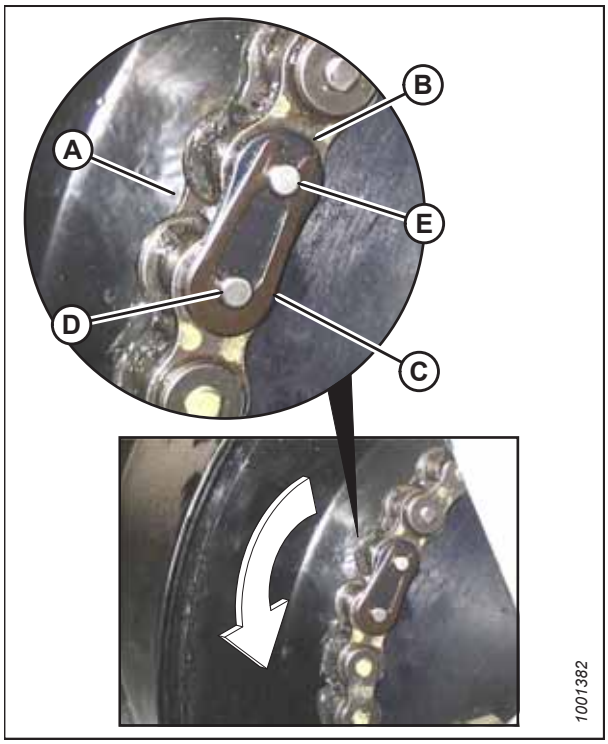


Figure 5.1: Chain Link Connector

5.2.2 Installing a Sealed Bearing

This installation procedure applies to all typical sealed bearings.

1. Clean the shaft and apply a rust preventive coating.
2. Install flangette (A), bearing (B), second flangette (C), and lock collar (D).

   NOTE:

   The locking cam is on only one side of the bearing.
3. Install and tighten flangette bolts (E).
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. Loosen the flangette bolts on the mating bearing one turn and then retighten. This will allow the bearing to properly line up.

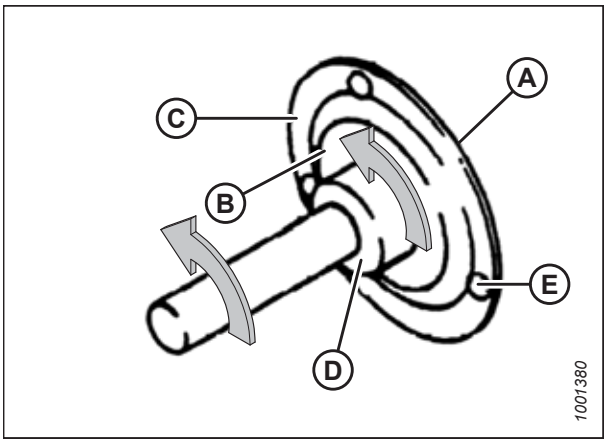


Figure 5.2: Sealed Bearing

5.3 Maintenance Requirements

Regular maintenance is the best insurance against early wear and untimely breakdowns.

Periodic maintenance requirements are organized according to service intervals.

When servicing the machine, refer to the appropriate section in this chapter and use only the fluids and lubricants specified in Recommended Fluids and Lubricants on the inside back cover.

Log hours of operation, use the maintenance record, and keep copies of your maintenance records (refer to *5.3.1 Maintenance Schedule/Record, page 122*).

CAUTION

Carefully follow safety messages. Refer to *5.1 Preparing Machine for Servicing, page 119* and *1 Safety, page 1*.

5.3.1 Maintenance Schedule/Record

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:

Service the machine more often if operating under adverse conditions (severe dust, extra heavy loads, etc.).

Maintenance Record	Action:	✓ - Check							♦ - Lubricate							▲ - Change						
Hour Meter Reading																						
Date																						
Serviced by																						
First Use, refer to *5.3.2 Break-In Inspection, page 123*																						
End of Season, refer to *5.3.4 Maintaining the Header – End-of-Season, page 124*																						
10 Hours or Daily[46]																						
✓	Hydraulic hoses and lines[47]																					
✓	Knife sections, guards, and hold-downs[47]																					
✓	Tire pressure[47]																					
♦	Knife (except in sandy conditions)[47]																					
25 Hours																						
♦	Knifehead(s)[47]																					
50 Hours																						
✓	Draper roller bearings																					
▲	Knife drive box oil - first 50 hours only																					
♦	All upper cross auger (UCA) grease points																					
100 Hours or Annually[46]																						

46. Whichever occurs first.
47. A record of daily maintenance is not required, but can be kept at the Owner's/Operator's discretion.

✓	Draper seal																					
✓	Reel drive chain tension																					
✓	Reel tine/cutterbar clearance																					
✓	Knife drive belt tension																					
✓	Wheel bolt torque																					
✓	Knife drive box lubricant level																					
✓	Knife drive box mounting bolts																					
🩸	Reel drive chain																					
Maintenance Record	**Action:**	**✓ - Check**							**🩸 - Lubricate**							**▲ - Change**						
250 Hours or Annually[46]																						
✓	Draper seal																					
🩸	Reel drive U-joint																					
🩸	Transport axle pivot bushings																					
500 Hours or Annually[46]																						
✓	Draper seal																					
🩸	Reel shaft bearings																					
🩸	Stabilizer/slow speed transport wheel bearings																					
1000 Hours or 3 Years[46]																						
▲	Knife drive box lubricant																					

5.3.2 Break-In Inspection

Break-in inspections involve 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.

Inspection Interval	Item	Refer to
5 hours	Check for loose hardware. Tighten to required torque.	*8.2 Torque Specifications, page 270*
5 hours	Check knife drive belts tension. Periodically check for first 50 hours.	• *Tensioning Timed Knife Drive Belts, page 170* • *Tensioning Untimed Knife Drive Belts, page 165*
10 hours	Check knife drive box mounting bolts.	*Checking Mounting Bolts, page 155*
50 hours	Change knife drive box lubricant.	*Changing Oil in Knife Drive Box, page 162*

5.3.3 Maintaining the Header – Preseason

Equipment should be inspected and serviced at the beginning of each operating season.

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.**
- **Check the 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, page 125*.
2. Adjust the tension on the drive belts depending on your equipment. For instructions, refer to *Tensioning Untimed Knife Drive Belts, page 165*.
3. Perform all the annual maintenance. For instructions, refer to *5.3.1 Maintenance Schedule/Record, page 122*.

5.3.4 Maintaining the Header – End-of-Season

Ensure the header is ready for the next harvest by taking steps to prevent corrosion, reduce unnecessary wear, and replace worn components.

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.

- Lower the reel completely. If the header is stored outside, tie the reel to the frame to prevent rotation caused by the wind.
- Lower the header onto blocks to keep the cutterbar off the ground.
- Clean the header thoroughly.
- Check for worn or broken components and order replacements from your Dealer. Immediate repair of these items will save time and effort at the beginning of next season.
- Loosen the drive belts.
- Lubricate the header thoroughly leaving excess grease on the fittings to keep moisture out of the bearings.
- Apply grease to exposed threads, cylinder rods, and sliding surfaces of components.
- Store the machine in a dry, protected place if possible. If storing outside, always cover with a waterproof canvas or other protective material.
- 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.
- Replace or tighten any missing or loose hardware. For instructions, refer to *8.2 Torque Specifications, page 270*.
- Repaint all worn or chipped painted surfaces to prevent rust.

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.**
- **Keep your hands and body away from pinholes and nozzles which can eject fluids under high pressure.**
- **Relieve pressure before disconnecting hydraulic lines, and tighten all connections before applying 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 5.3: Hydraulic Pressure Hazard

- **Use a piece of cardboard or paper to search for leaks.**

IMPORTANT:

Keep hydraulic coupler tips and connectors clean. The introduction of dust, dirt, water, or foreign material into a hydraulic system is the major cause of damage. Do **NOT** attempt to service hydraulic systems in the field.

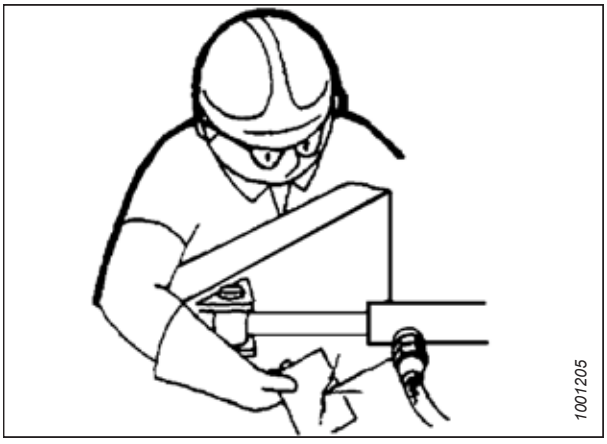


Figure 5.4: Testing for Hydraulic Leaks

5.3.6 Lubrication

Some header components need to be lubricated periodically.

CAUTION

To avoid personal injury, before servicing header or opening drive covers, follow the procedures in *5.1 Preparing Machine for Servicing, page 119*.

Refer to the inside back cover for recommended lubricants.

Log hours of operation and use the Maintenance Record provided to keep a record of scheduled maintenance. For the maintenance schedule, refer to *5.3.1 Maintenance Schedule/Record, page 122*.

Service Intervals

Refer to the illustrations on the following pages to identify the various locations that require lubrication and servicing. Illustrations are organized by the frequency of service.

IMPORTANT:

Unless otherwise specified, use high temperature extreme pressure (EP2) performance with 1% maximum molybdenum disulphide (NLGI grade 2) lithium base.

Knife (except in sandy conditions):

Lubricate every 10 hours or daily.

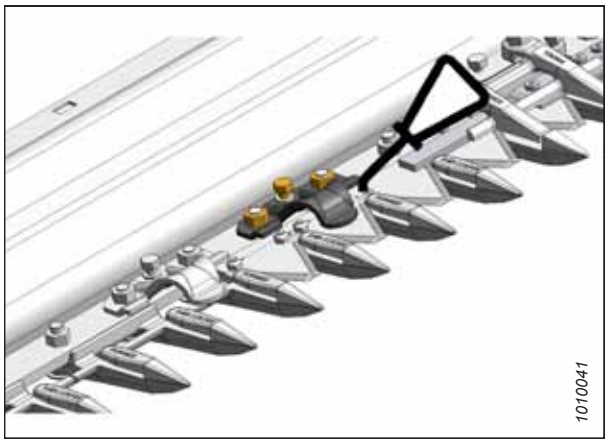


Figure 5.5: Every 10 Hours or Daily

Knifehead:

Lubricate every 25 hours.

IMPORTANT:

To prevent binding and/or excessive wear caused by knife pressure on the guards, do **NOT** overgrease knifehead (A). 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 *5.5.3 Removing Knifehead Bearing, page 140*.

NOTE:

After greasing, run the header and check if the first few knife guards feel excessively hot. If the knife guards are too hot, relieve knife pressure on the guards by pressing the check-ball in the grease fitting.

Figure 5.6: Every 25 Hours

A - Knifehead (Single Knife [1 Place]; Double Knife [2 Places])

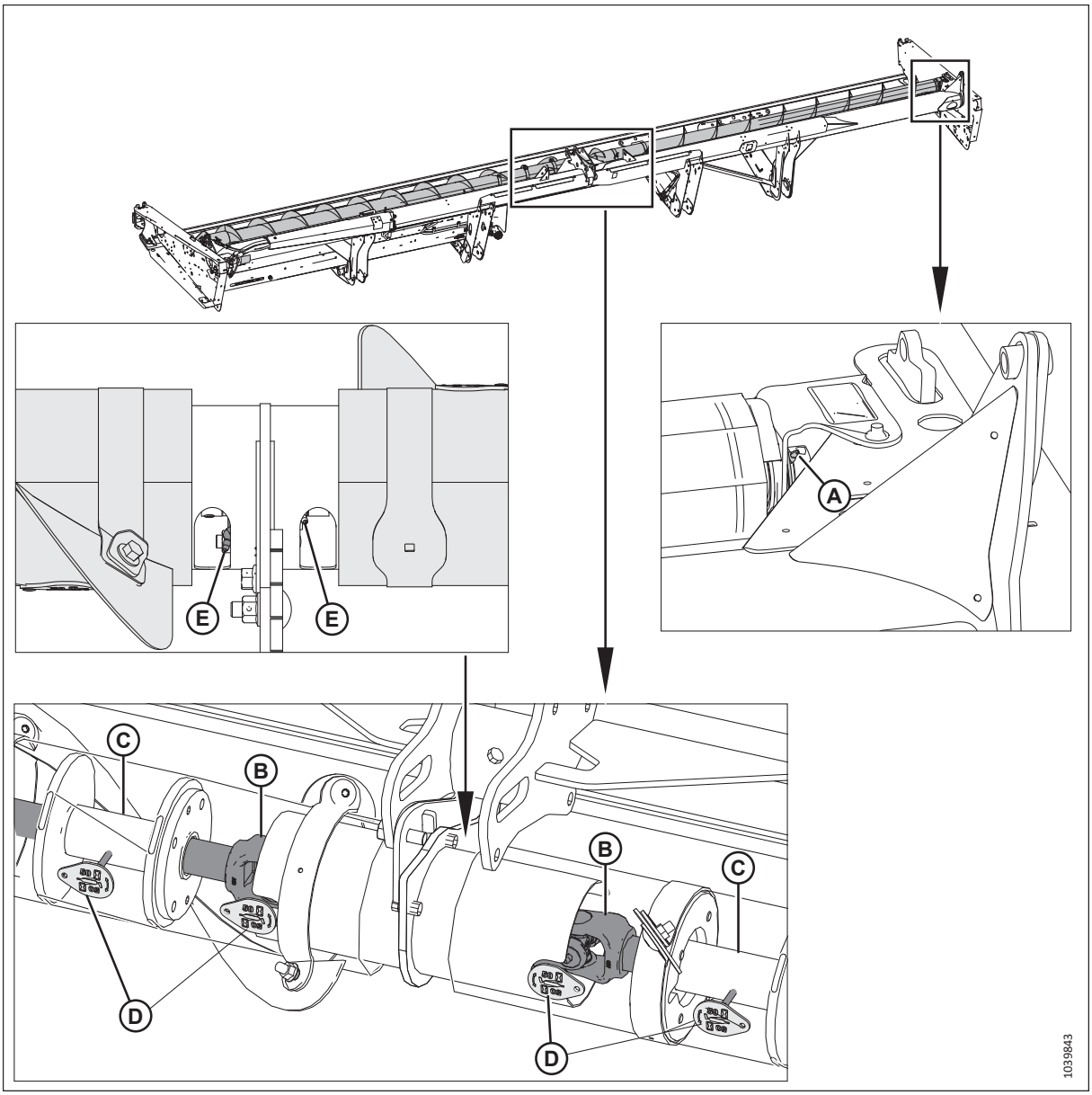


Figure 5.7: Every 50 Hours – Upper Cross Auger, New Assembly

A- Right End Bearing
B - Two-Piece Auger Only: Upper Cross Auger U-joints [Two places, accessible by opening cover (D)]
C - Two-Piece Auger Only: Upper Cross Auger Sliding Hubs [Two places, accessible by opening cover (D)]
E - Two-Piece Auger Only: Upper Cross Auger Center Bearings (Two Places)

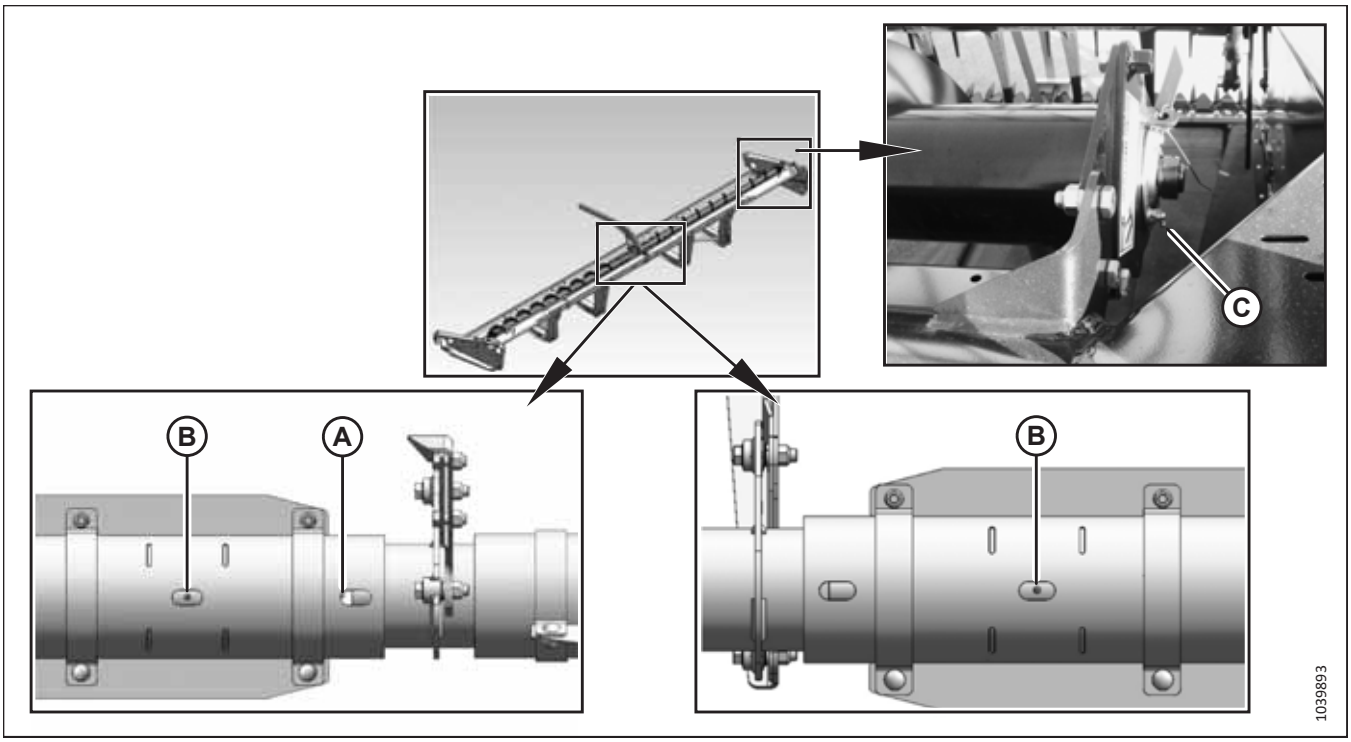
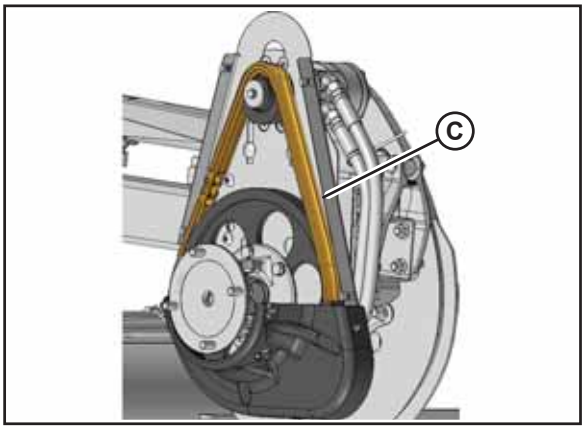


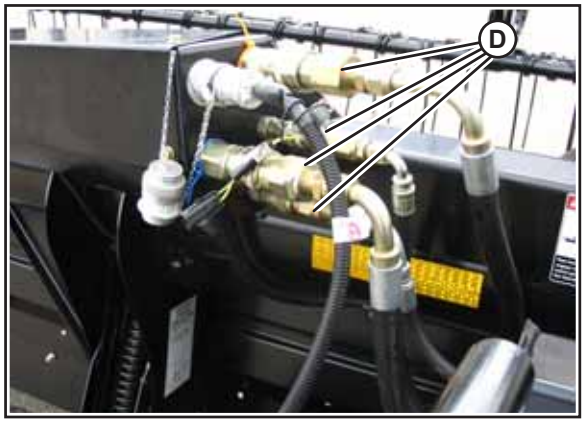
Figure 5.8: Every 50 Hours – Upper Cross Auger, Old Assembly

A - Upper Cross Auger U-joint[48]
B - Upper Cross Auger Bearing (2 Places)
C - Right End Bearing

48. The U-joint has a cross and bearing kit with an extended lubrication interval. Stop greasing when greasing becomes difficult or if the U-joint stops taking grease. Overgreasing will damage the U-joint. Six to eight pumps are sufficient at first grease (factory). Decrease the grease interval (i.e., grease more often) as the U-joint wears and requires more than six pumps.

Figure 5.9: Every 100 Hours





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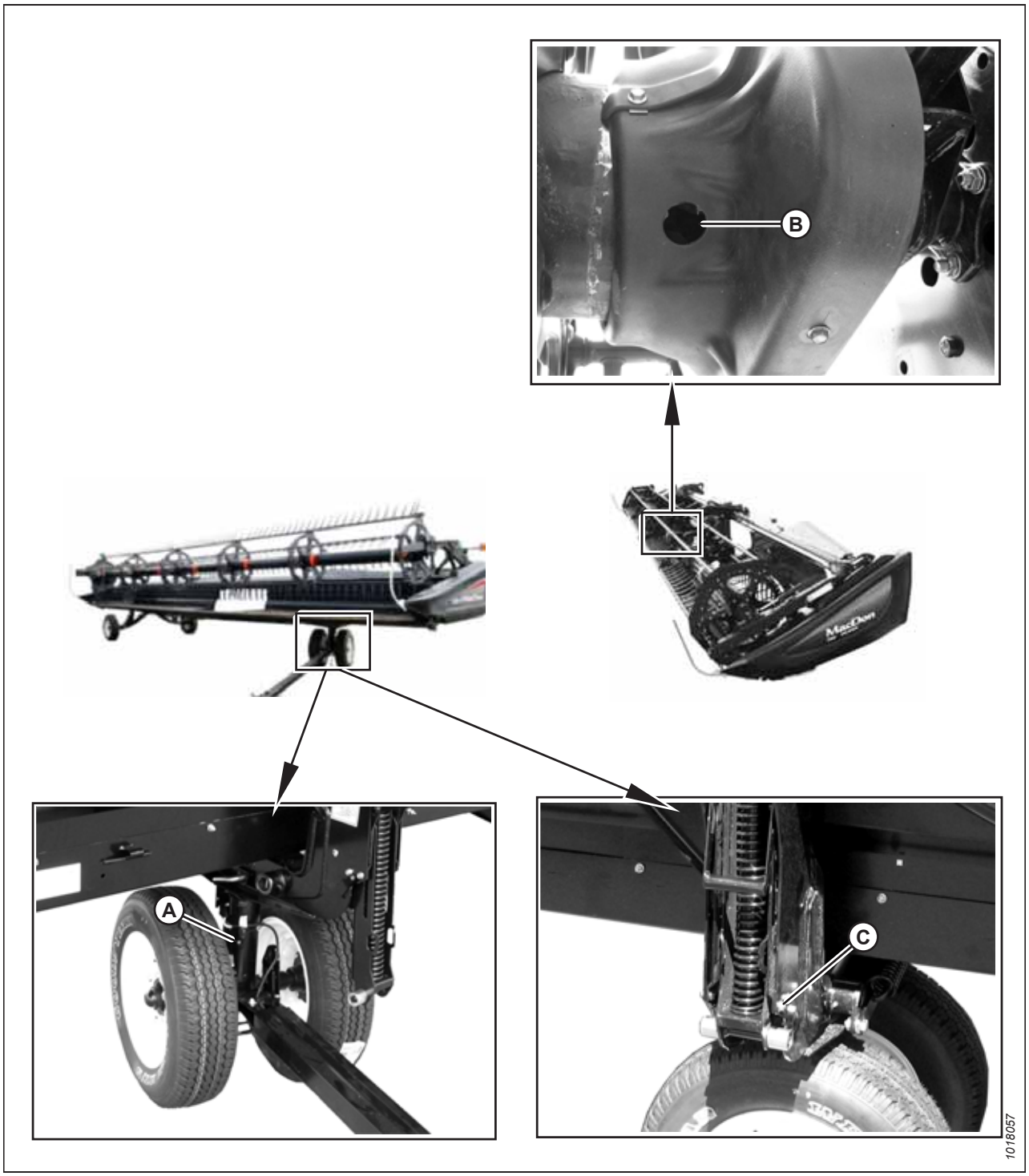
A - Knife Drive Box (Check Oil Level Between Lower Hole and End of Dipstick [B])
C - Reel Drive Chain (1 Place) (Double Reel Shown – Single Reel Similar)
D - Hydraulic Couplers (Use WD40® or Equivalent)

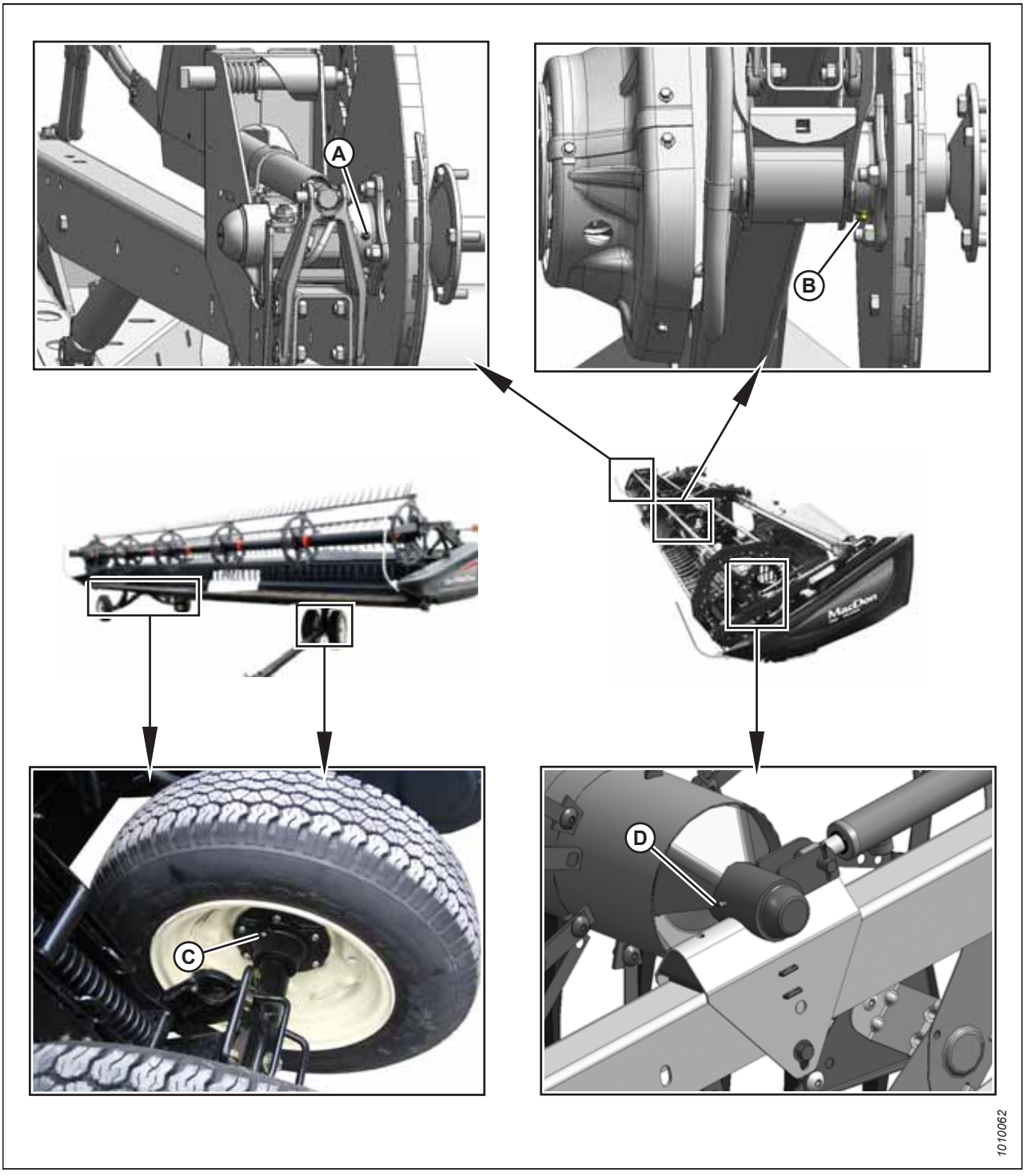
Figure 5.10: Every 250 Hours (Continued)



A - Front Wheel Pivot (1 Place)
B - Double Reel U-Joint (1 Place)[49]
C - Frame/Wheel Pivot (1 Place) - Both Sides

49. The U-joint has a cross and bearing kit with an extended lubrication interval. Stop greasing when greasing becomes difficult or if the U-joint stops taking grease. Overgreasing will damage the U-joint. Six to eight pumps are sufficient at first grease (factory). Decrease the grease interval (i.e., grease more often) as the U-joint wears and requires more than six pumps.

Figure 5.11: Every 500 Hours



A - Reel Right Bearing (1 Place)
B - Reel Center Bearing (1 Place)
C - Wheel Bearings (4 Places)
D - Reel Left Bearing (1 Place)

Lubricating the Header

Greasing points are marked on machine by decals showing a grease gun and grease interval in hours of operation. Master grease point location decals are provided on header.

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 leaving the operator's seat for any reason.

Refer to the inside back cover for recommended lubricants.

Log hours of operation and use the Maintenance Record provided to keep a record of scheduled maintenance. Refer to *5.3.1 Maintenance Schedule/Record, page 122*.

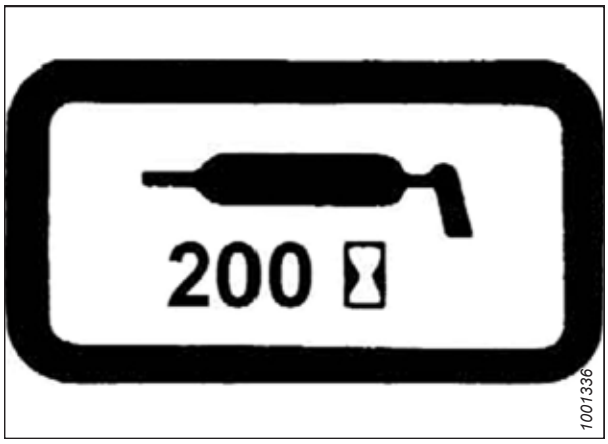


Figure 5.12: Greasing Interval Decal

1. Wipe the grease fitting with a clean cloth before greasing to avoid injecting dirt and grit.
2. Inject grease through the fitting with grease gun until grease overflows the fitting (except where noted).
3. Leave excess grease on the fitting to keep out dirt.
4. Replace any loose or broken fittings immediately.
5. Remove and thoroughly clean any fitting that will not take grease. Also clean the lubricant passageway. Replace fitting if necessary.
6. Use high temperature, extreme pressure (EP2) performance with 1% max molybdenum disulphide (NLGI Grade 2) lithium base unless otherwise specified.

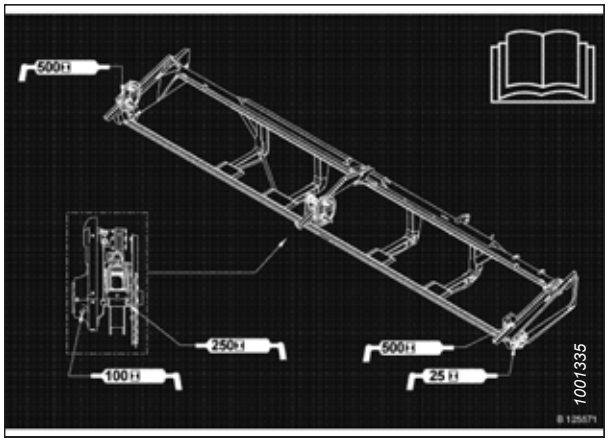


Figure 5.13: Single-Knife Header Master Grease Point Decal

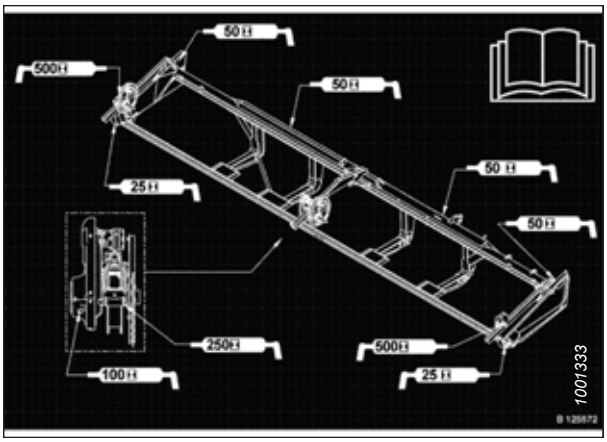


Figure 5.14: Double-Knife Header Master Grease Point Decal

Lubricating Reel Drive Chain – Single Reel

The reel drive chain should be lubricated every 100 hours.

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 leaving the operator's seat for any reason.

1. Stop the engine, and remove the key from the ignition.
2. Remove four bolts (A) securing cover (B) to the reel drive.

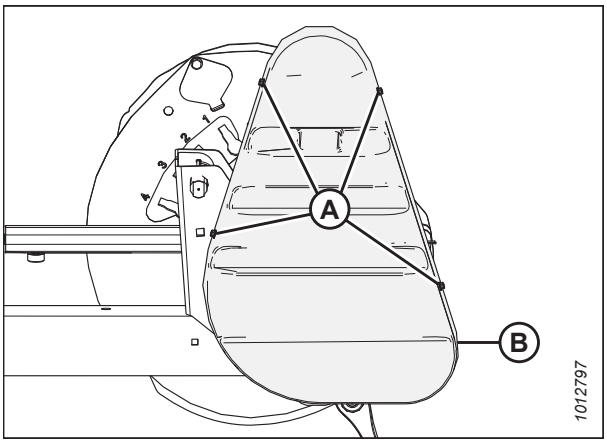


Figure 5.15: Drive Cover – Single Reel

3. Apply a liberal amount of grease to chain (A).

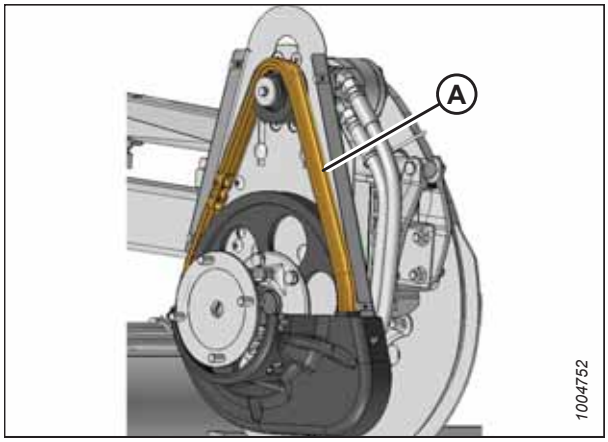


Figure 5.16: Drive Chain

4. Position drive cover (B) onto the reel drive and secure it with four bolts (A).

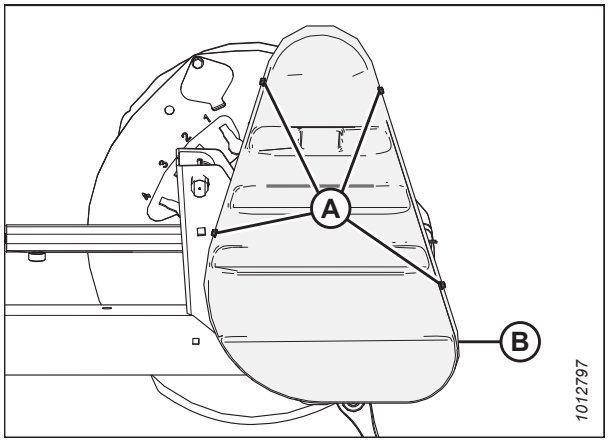


Figure 5.17: Drive Cover – Single Reel

Lubricating Reel Drive Chain – Double Reel

The reel drive chain should be lubricated every 100 hours.

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 leaving the operator's seat for any reason.

1. Stop the engine, and remove the key from the ignition.
2. Remove six bolts (A) securing upper cover (B) to the reel drive and lower cover (C).

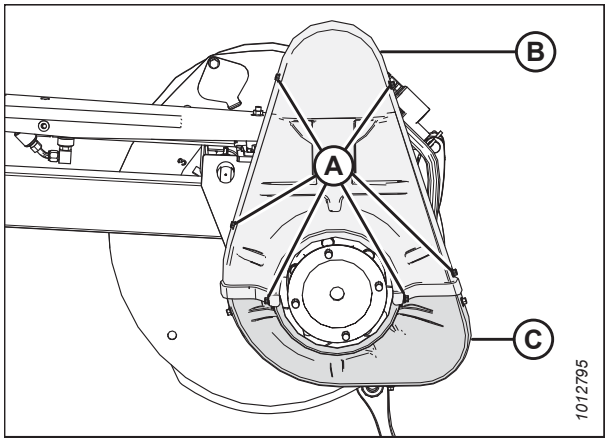


Figure 5.18: Drive Cover – Double Reel

3. Remove three bolts (A) and remove lower cover (B) if necessary.

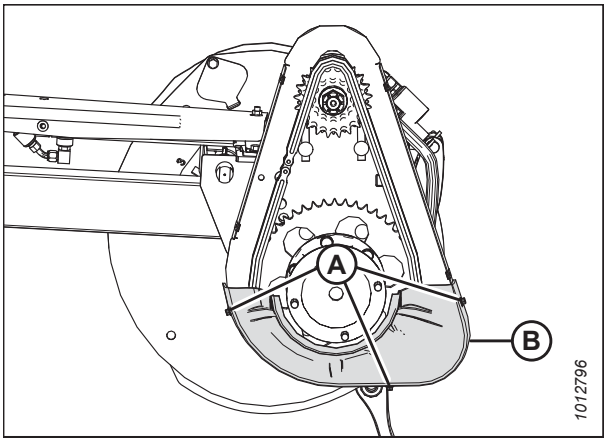


Figure 5.19: Drive Cover – Double Reel

4. Apply a liberal amount of grease to chain (A).

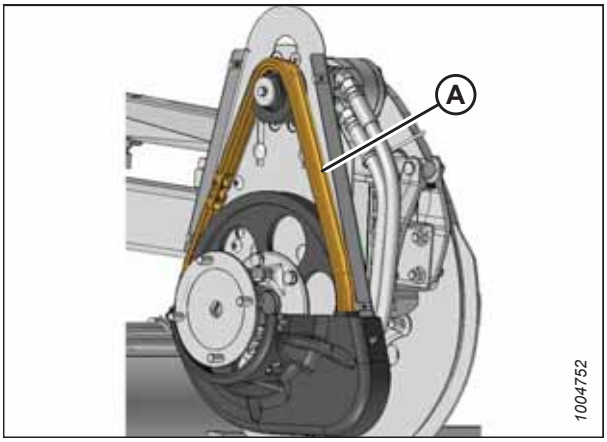


Figure 5.20: Drive Chain

5. Position lower drive cover (B) onto the reel drive (if previously removed) and secure with three bolts (A).

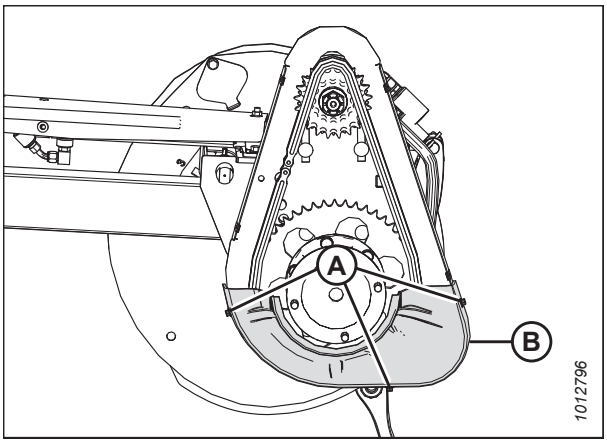


Figure 5.21: Drive Cover – Double Reel

6. Position upper drive cover (B) onto the reel drive and lower cover (C), and secure with six bolts (A).

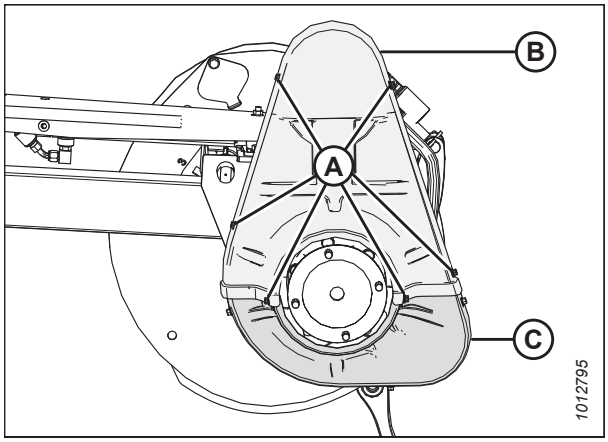


Figure 5.22: Drive Cover – Double Reel

5.4 Electrical System

The electrical wires and connectors that connect the header lights should be secured to avoid damage.

Use electrical tape and wire clips as required to prevent wires from dragging or rubbing. Keep lights clean and replace defective bulbs.

5.4.1 Replacing Light Bulbs

If a light bulb on the header is burnt out or damaged, it will need to be replaced.

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.

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.
3. Remove two screws (A) from lens and remove lens.
4. Push and twist light bulb to remove from socket.
5. Install new bulb in socket ensuring that bulb base is properly engaged in socket.
   - Use Bulb Trade #1157 for red tail lights (Slow Speed Transport option).
   - Use Bulb Trade #1156 for amber lights
6. Reinstall lens with screws (A).

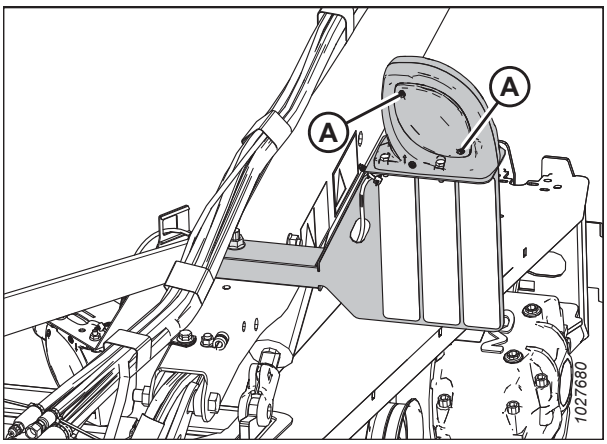


Figure 5.23: Left Transport Light

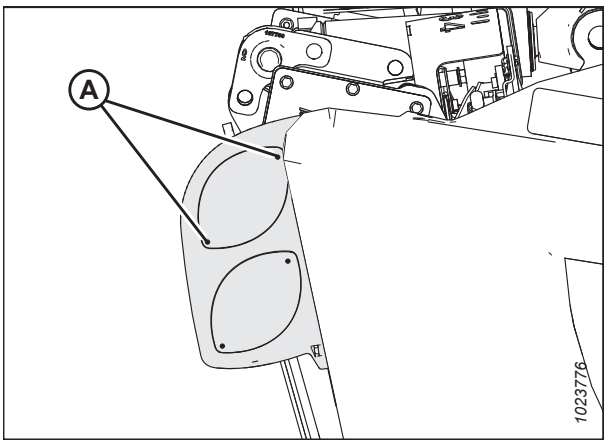


Figure 5.24: Optional Slow Speed Transport Red and Amber Lights

5.5 Cutterbar

The cutterbar is located on the front of the header. It supports the knife and guards which are used to cut the crop.

WARNING

Keep hands clear of the area between guards and knife at all times.

CAUTION

To avoid personal injury, before servicing machine or opening drive covers, refer to *5.1 Preparing Machine for Servicing, page 119*.

CAUTION

Wear heavy gloves when working around or handling knives.

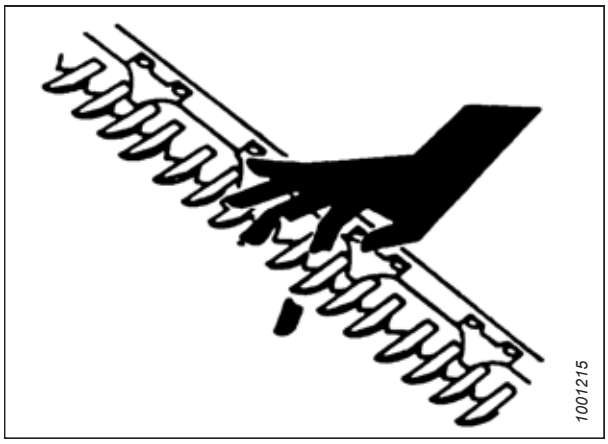


Figure 5.25: Cutterbar Hazard

5.5.1 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 or damaged sections leave behind uncut plants). Worn or damaged sections can be replaced without removing the knife from the cutterbar.

NOTE:

Coarse serrated knife sections last longer than fine serrated sections in dirty or sandy conditions. Fine serrated knife sections perform better in fine-stemmed grasses and plants that contain more fibrous stems.

1. Shut down the windrower, and remove the key from the ignition.
2. Stroke the knife as required to center knife section (A) between the guards.
3. Remove nuts (B).
4. Remove the bars and lift the knife section off the knife bar.
5. Remove splice bar (C) if the knife section is under the bar.
6. Clean any dirt off the knife back and position the new knife section onto the knife bar.

   IMPORTANT:

   Do **NOT** mix fine and coarse sections on the same knife.

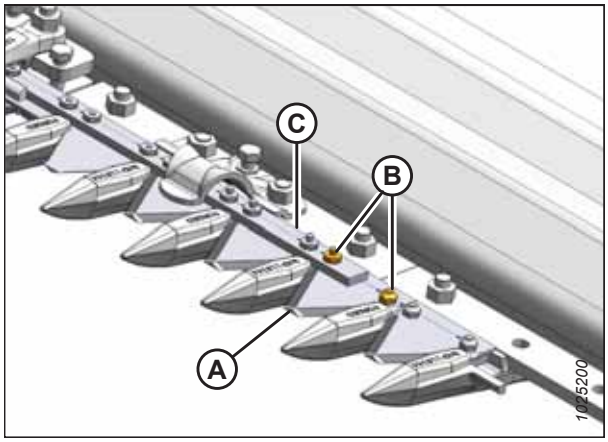


Figure 5.26: Knife Bar

7. Reposition bars (C) and/or (D) on knife (A) and install lock nuts (B).

   NOTE:

   If replacing screws, ensure they are fully inserted. Do **NOT** use nuts to draw screws into the knife bar.

8. Torque the nuts to 9.5 Nm (7 lbf·ft).

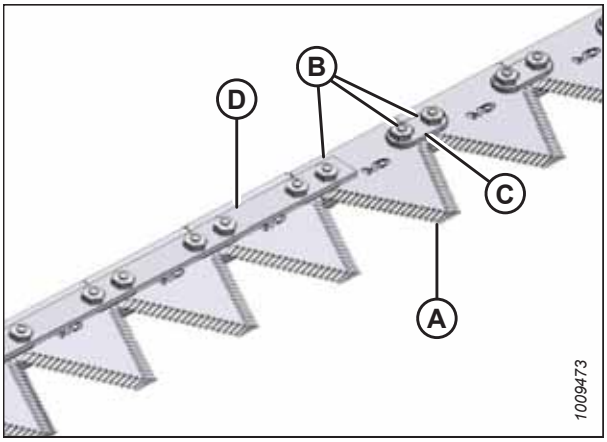


Figure 5.27: Knife Bar

5.5.2 Removing Knife

The cutterbar knife is designed to easily be replaced if worn or damaged. A spare knife can be stored in the header frame tube.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key before leaving the operator's seat, and always engage the 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 the cutting edges. Wear heavy gloves when handling a knife.

1. Raise the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Engage the header safety props. For instructions, refer to the windrower operator's manual.
4. Stroke the knife manually to its outer limit.
5. Clean the area around the knifehead.
6. Remove bolt (A).
7. Remove grease fitting (B) from the pin.
8. Use a screwdriver or chisel in slot (C) to release the load on the knifehead pin.
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 unless it is being replaced.

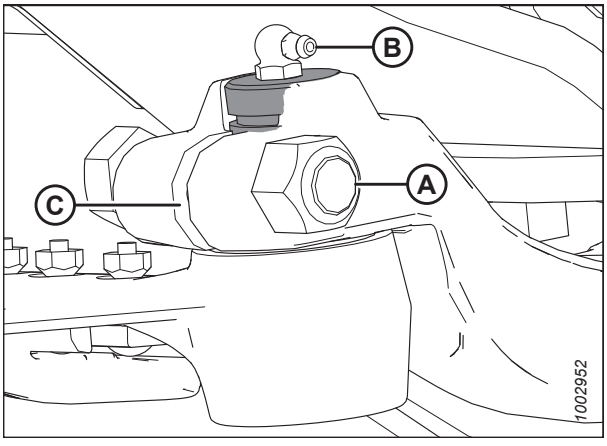


Figure 5.28: Knifehead

12. Wrap a chain around the knifehead and pull out the knife.

5.5.3 Removing Knifehead Bearing

The knifehead bearing, seals, and greasing interval protect the knifehead from the forces of the knife drive output arm. The seals and bearing require inspection and, when worn—replacement to prevent damage.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key before leaving the operator's seat, and always engage the 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 the cutting edges. Wear heavy gloves when handling a knife.

IMPORTANT:

Repeat this procedure for each knife.

1. Shut down the engine, and remove the key from the ignition.
2. Remove the knife. For instructions, refer to *5.5.2 Removing Knife, page 139*.

   NOTE:

   Because the bearing is being replaced, it is not necessary to wrap the knifehead to protect the bearing.

3. Use a flat-ended tool with the same approximate diameter as pin (A), and 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.

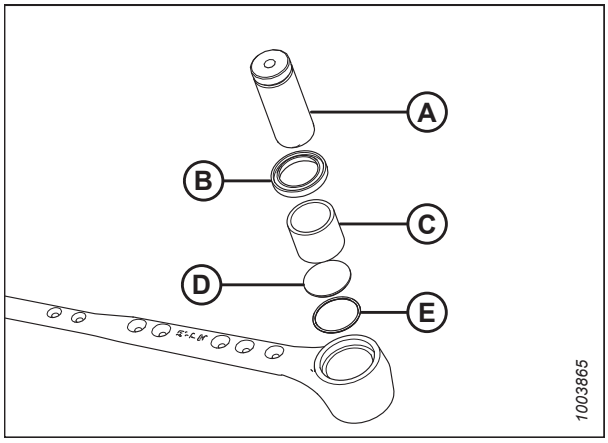


Figure 5.29: Knifehead Bearing Assembly

5.5.4 Installing Knifehead Bearing

The knifehead bearing, seals, and greasing interval protect the knifehead from the forces of the knife drive output arm. The seals and bearing require inspection and, when worn—replacement to prevent damage.

1. 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.

   NOTE:

   It may be necessary to temporarily remove the grease fitting from the knifehead during installation of the knifehead pin. This will allow any trapped air to escape and the knifehead pin will seat correctly.

2. Use a flat-ended tool 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.

3. Install seal (B) into the knifehead with the lip facing outwards.

   IMPORTANT:

   To prevent premature knifehead or knife drive box failure, ensure there's a tight fit between knifehead pin (A) and the needle bearing, and also between the knifehead pin and the output arm.

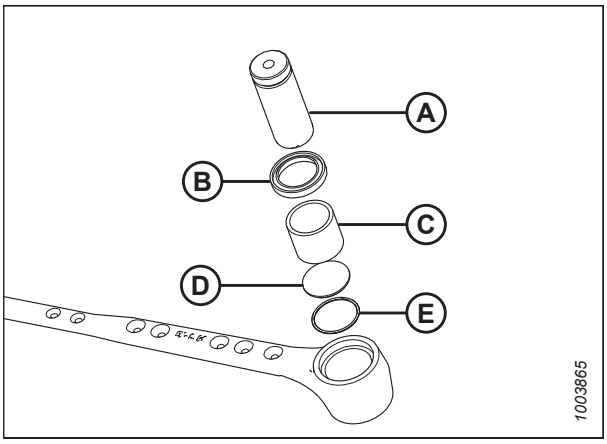


Figure 5.30: Knifehead Bearing Assembly

4. Install the knife. For instructions, refer to *5.5.5 Installing Knife, page 141*.

5.5.5 Installing Knife

The cutterbar knife is designed to easily be replaced if worn or damaged. A spare knife can be stored in the header frame tube.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key before leaving the operator's seat, and always engage the 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 header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Engage the header safety props. For instructions, refer to the windrower operator's manual.
4. Slide the knife into place and align the knifehead with the output arm.
5. For ease of removing or installing the knifehead pin, remove the grease fitting from the pin.

6. Install knifehead pin (A) through the output arm and into the knifehead. Tap knifehead pin (A) down, and make sure the pin is seated at the bottom of the knifehead.
7. Set groove (B) in the knifehead pin 1.5 mm (1/16 in.) above output arm (C). Secure it with 5/8 in. x 3 in. hex head bolt and nut (D), and torque the hardware to 217 Nm (160 lbf·ft).
8. Using a feeler gauge, check that the gap at location (E) is 0.25 mm (0.01 in.).

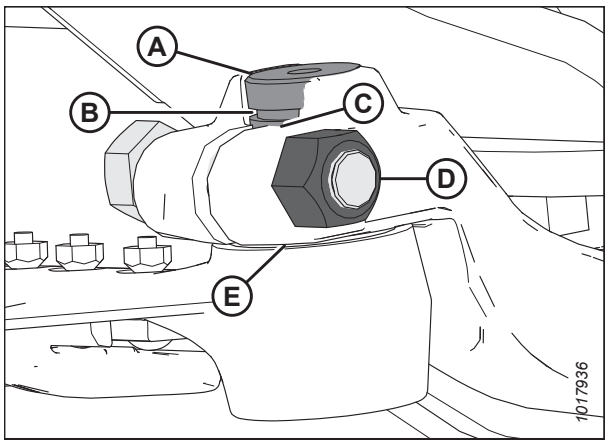


Figure 5.31: Knifehead

9. Install grease fitting (A) into the knifehead pin, and turn the grease fitting for easy access.

   IMPORTANT:

   Grease the knifehead just enough to start a slight downward movement. Overgreasing will lead to knife misalignment which causes the guards to overheat and the drive systems to overload.

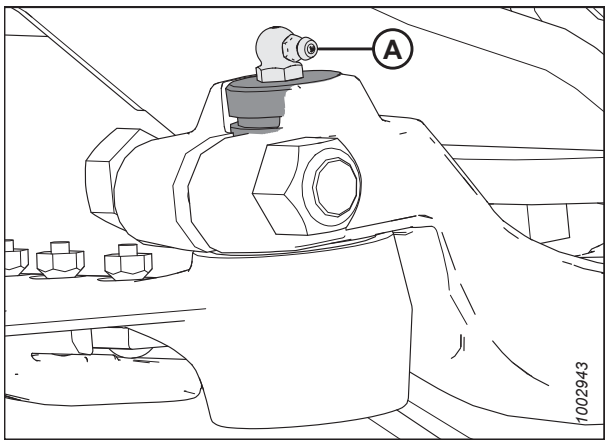


Figure 5.32: Knifehead

5.5.6 Spare Knife

A spare knife can be stored in the header frame tube at the left end of the header.

Ensure spare knife (A) is secured in place.

Figure 5.33: Spare Knife

5.5.7 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.

Adjusting Knife Guards

Bent knife guards may be able to be straightened with the optional guard straightening tool.

DANGER

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

NOTE:

Use guard straightening tool (MD #140135) available from your MacDon Dealer.

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

2. Position the tool as shown, and pull up to adjust the guard tips upwards.

Figure 5.34: Upward Adjustment

3. Position the tool as shown, and push down to adjust the guard tips downwards.

   NOTE:

   If the crop is difficult to cut, install stub guards with top guards and adjuster plates. A kit is available from your MacDon Dealer. For information, refer to *6.2.3 Stub Guard Conversion Kit, page 247*.

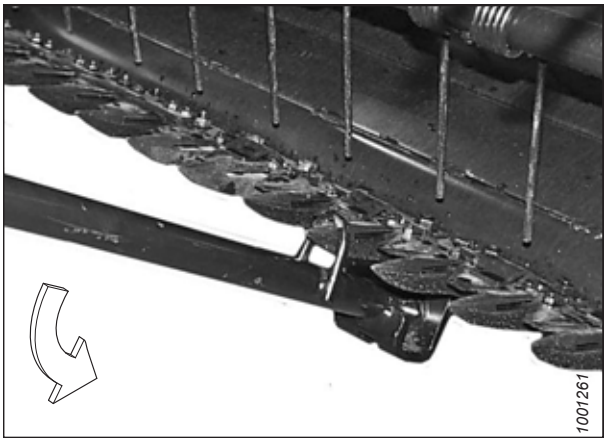


Figure 5.35: Downward Adjustment

Replacing Pointed Guards

To replaced pointed guards, perform the recommended replacement procedure provided here.

Replacing normal, drive side, and end guards

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.

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 (B) and bolts attaching guard (A) and hold-down (C) (if applicable) to the cutterbar.

4. Remove guard (A), hold-down (C) (if applicable), and plastic wearplate (if installed).

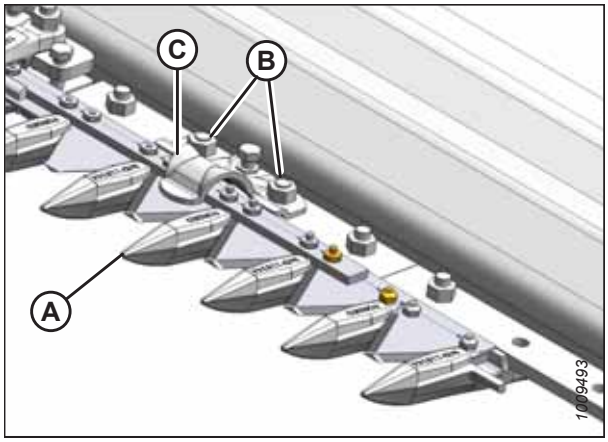


Figure 5.36: Pointed Guards

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.

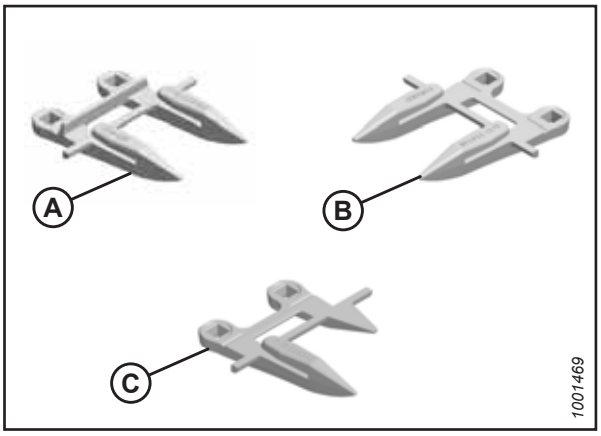


Figure 5.37: Pointed Guards

A - Normal **B - Drive Side** **C - Half Guard (End)**

5. Position new guard (A), hold-down (C) (if applicable), and 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 .

NOTE:

The guard at the center of a double-knife header (where the two knives overlap) requires a different replacement procedure. For instructions, refer to Steps *8, page 145* through *12, page 145*.

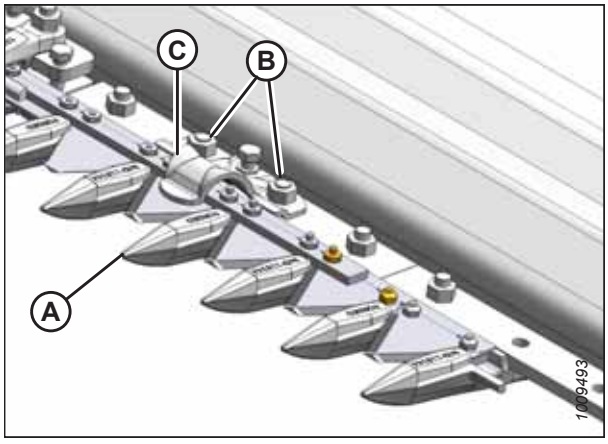


Figure 5.38: Pointed Guards

Replacing center guards

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

8. Remove two nuts (B) and bolts attaching guard (A) and hold-down (C) to the cutterbar.
9. Remove guard (A), plastic wearplate (if installed), hold-down (C), and adjuster bar (D).

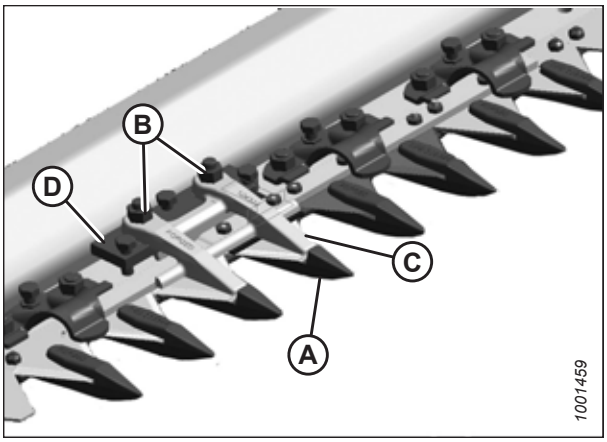


Figure 5.39: Center Guards

10. Position the plastic wearplate (if applicable), replacement center guard (A), adjuster bar, and hold-down (B) onto the cutterbar. Install bolts, but do **NOT** tighten.

    IMPORTANT:

    Ensure center guard (A) (right of the cutterbar split) has offset cutting surfaces.

    IMPORTANT:

    Hold-down (B) must accommodate the two overlapping knives at the center guard location. Ensure the proper replacement guard is installed at this location.

11. Check and adjust the clearance between the hold-down and knife. For instructions, refer to .

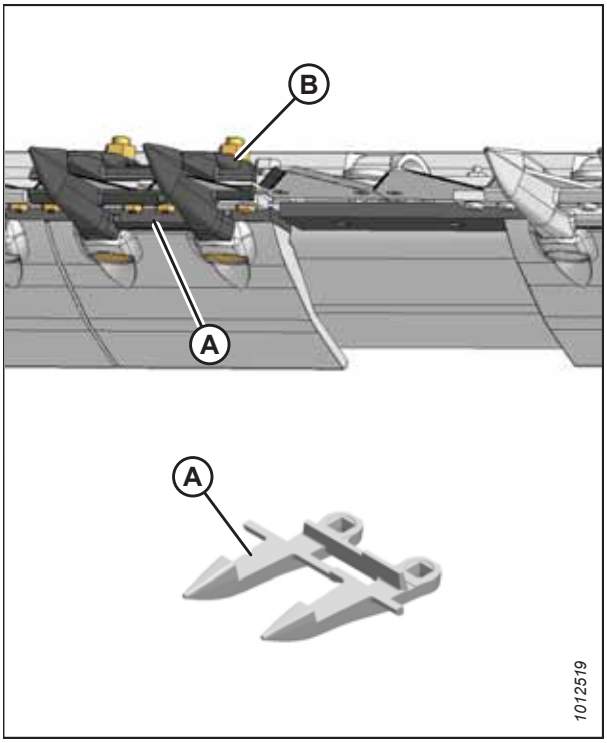


Figure 5.40: Center Guards

Replacing Stub Guards

Stub guards, complete with hold-downs and adjuster plates, are designed to cut tough crops.Stub guards are available for 4.6–10.7 m (15–35 ft.) headers only.

Replacing normal, drive side, and end guards

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.

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 hold-down (C) to the cutterbar.
4. Remove guard (B), plastic wearplate (if installed), hold-down (C), and adjuster bar (D).

IMPORTANT:

Note the position of the miter on adjuster bar (D), and reinstall the adjuster bar in the same position. Miters should **NOT** be adjacent to each other.

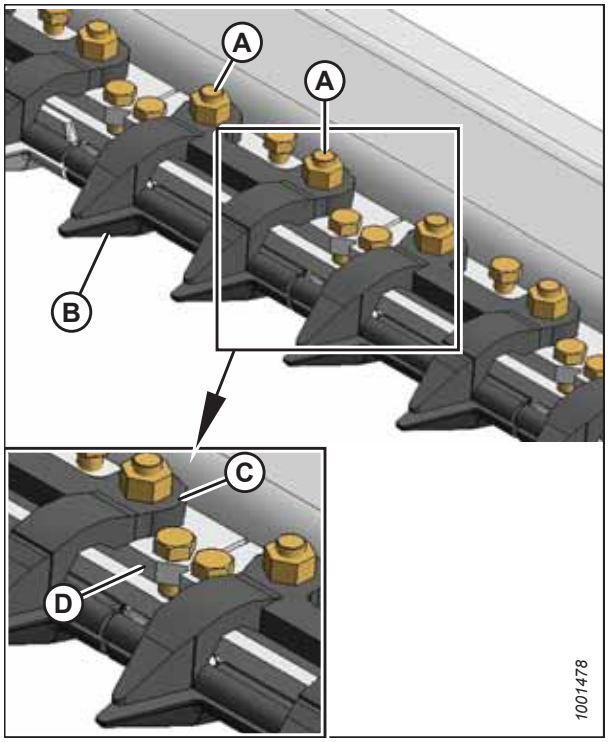


Figure 5.41: Stub Guards

IMPORTANT:

The first four outboard guards (B) on the drive sides of the header do **NOT** have ledger plates. Ensure the proper replacement guards are installed at these locations.

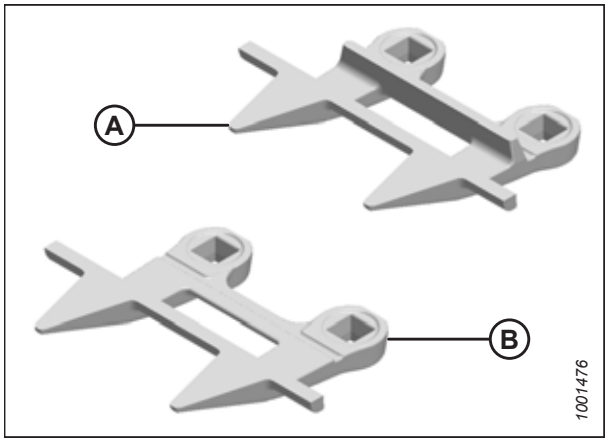


Figure 5.42: Stub Guards

A - Normal Guard **B - Drive Side Guard**

5. Position the plastic wearplate (if applicable), replacement guard (B), adjuster bar (D), hold-down (C), and 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 *Checking and Adjusting Knife Hold-Downs, page 148*.

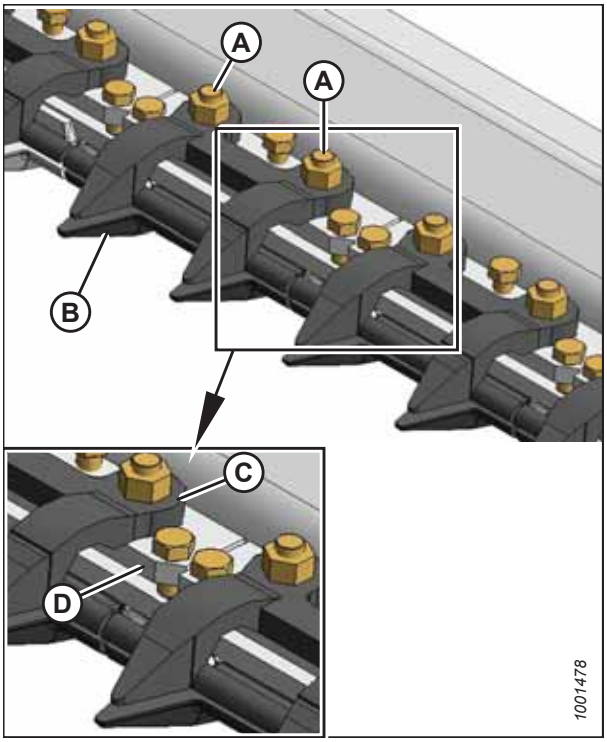


Figure 5.43: Stub Guards

Replacing center guards

NOTE:

The guard at the center of a double-knife header (where the two knives overlap) requires a slightly different replacement procedure.

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

8. Remove two nuts (A) and bolts attaching guard (B), hold-down (C), and adjuster bar (D) to the cutterbar.
9. Remove guard (B), plastic wearplate (if installed), hold-down (C), and adjuster bar (D).
10. Position the plastic wearplate (if applicable), replacement guard (B), adjuster bar (D), and hold-down (C) onto the cutterbar. Install bolts, but do **NOT** tighten.

    IMPORTANT:

    Ensure center guard (B) (right of the cutterbar split) has offset cutting surfaces.

    IMPORTANT:

    Hold-down (C) must accommodate the two overlapping knives at the center guard location. Ensure the proper replacement guard is installed at this location.
11. Check and adjust the clearance between the hold-down and the knife. For instructions, refer to *Checking and Adjusting Knife Hold-Downs, page 148*.

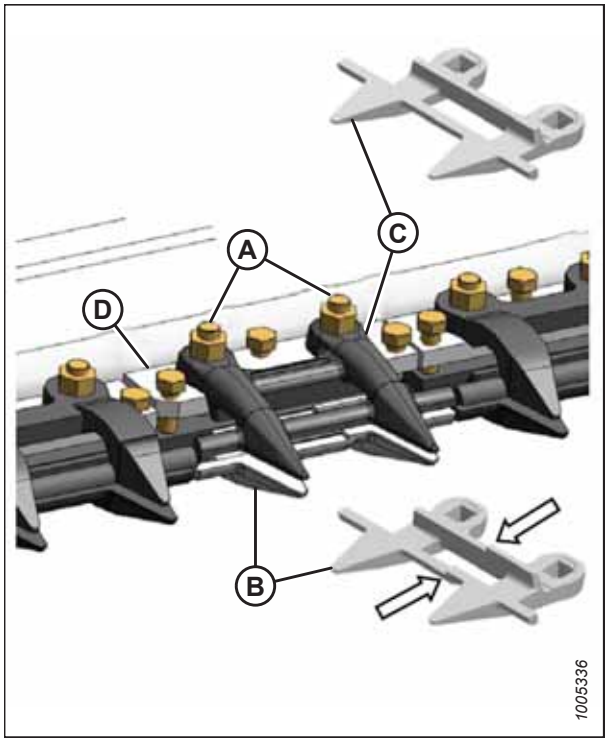


Figure 5.44: Center Guards

Checking and Adjusting Knife Hold-Downs

NOTE:

Align guards prior to checking and adjusting hold-downs. Refer to *Adjusting Knife Guards, page 142*.

Perform daily inspections to ensure knife hold-downs are preventing knife sections from lifting off guards while permitting knife to slide without binding.

Proceed to the applicable topic:

- *Checking Pointed Guard Hold-Downs, page 148*
- *Checking Stub Guard Hold-Downs, page 151*

Checking Pointed Guard Hold-Downs

This procedure is applicable to headers with pointed guards.

DANGER

To prevent bodily injury or death from the unexpected startup of the machine, always stop the engine and remove the key before adjusting the machine.

Measure the clearance between the hold-downs and knife sections as follows:

1. Shut down the engine, and remove the key from the ignition.
2. Check the guard alignment and adjust it as required. Refer to *Adjusting Knife Guards, page 142*.

3. Manually stroke the knife to align section (A) under hold-down (B).
4. At standard guard locations, push knife section (A) down against guard (C) and measure the clearance between hold-down (B) and knife section (A) with a feeler gauge. The clearance should be 0.1–0.6 mm (0.004–0.024 in.).
5. If necessary, refer to *Adjusting Pointed Guard Hold-Downs, page 149*.

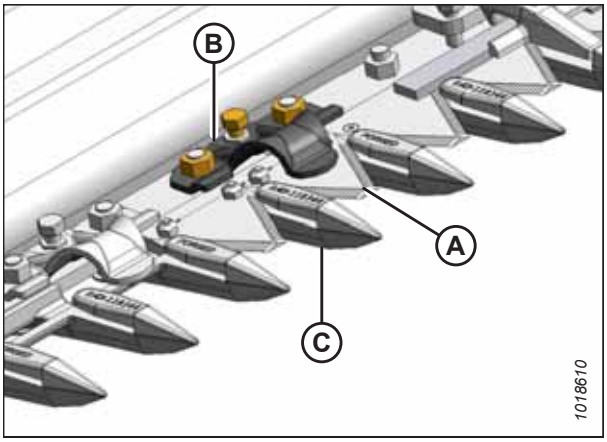


Figure 5.45: Normal Guard Hold-Down

Double knife:

6. Manually stroke the knife to align sections (A) and (C) under center hold-down (B).
7. Measure between knife sections (A) and (C) with a feeler gauge. The clearances should be as follows:
   - At tip of hold-down: 0.1–0.4 mm (0.004–0.016 in.)
   - At rear of hold-down: 0.1–1.0 mm (0.004–0.040 in.)
8. If necessary, refer to *Adjusting Hold-Down Clips at Double-Knife Center Pointed Guard, page 150*.

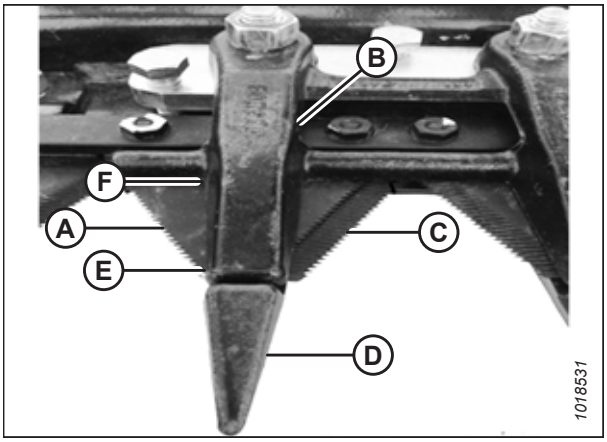


Figure 5.46: Double-Knife Center Guard Hold-Down

Adjusting Pointed Guard Hold-Downs

This procedure is applicable to formed sheet metal hold-downs. Do **NOT** use this procedure for the hold-down at the center guard position where knives overlap on double-knife headers. For center guard, refer to .

DANGER

To prevent bodily injury or death from the unexpected startup of the machine, always stop the engine and remove the key before adjusting the machine.

1. Shut down the windrower, and remove the key from the ignition.
2. Decrease the clearance by turning bolt (B) clockwise to lower the front of hold-down (A).
3. Increase the clearance by turning bolt (B) counterclockwise to raise the front of the hold-down.

   NOTE:

   For larger adjustments, it may be necessary to loosen nuts (C), turn adjuster bolt (B), and then retighten the nuts.
4. Check the clearance again and adjust it as required.

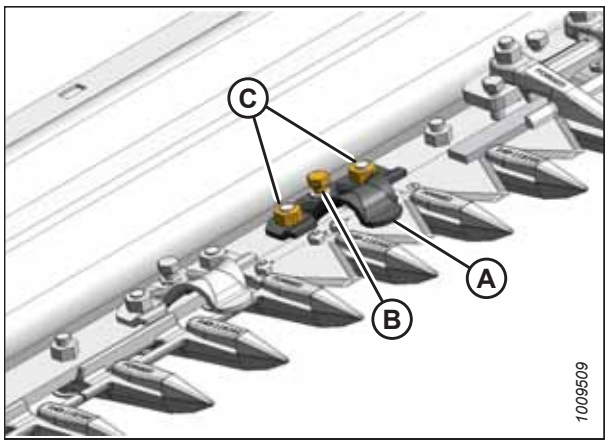


Figure 5.47: Cutterbar

WARNING

Check to be sure all bystanders have cleared the area.

5. Complete the hold-down adjustments, run the header at low engine speed, and listen for noise caused by insufficient clearance.

   NOTE:

   Insufficient hold-down clearance will result in overheating of the knife and the guards—adjust clearance as necessary.

Adjusting Hold-Down Clips at Double-Knife Center Pointed Guard

DANGER

To prevent bodily injury or death from the unexpected startup of the machine, always stop the engine and remove the key before adjusting the machine.

1. Shut down the windrower, and remove the key from the ignition.
2. Manually stroke the knives so that sections (A) are under hold-down (B) as shown.
3. Loosen nuts (C) and back off bolts (D) until they don't contact the cutterbar.
4. Lightly clamp hold-down (B) to guard (E) with a C-clamp or equivalent. Position the clamp on the trash bar at location (F) as shown.
5. Turn bolts (D) until they contact the cutterbar, then tighten them **ONE** turn.
6. Remove the clamp.
7. Tighten nuts (C) and torque the nuts to 88 Nm (65 lbf·ft).
8. Check clearances. For instructions, refer to *Checking Pointed Guard Hold-Downs, page 148*.

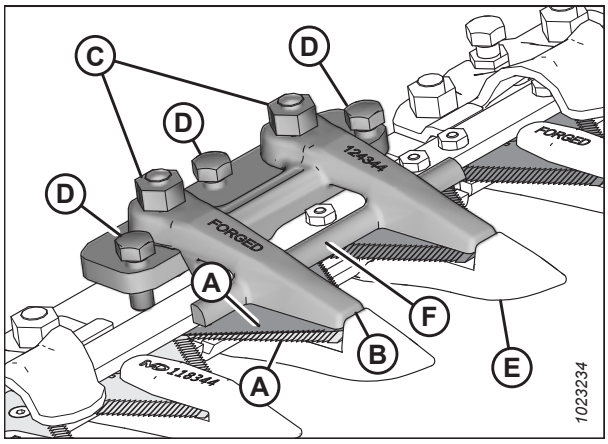


Figure 5.48: Center Guard

Checking Stub Guard Hold-Downs

This procedure is to measure clearance between hold-downs and knife sections on single- and double-knife headers with stub guards.

DANGER

To prevent bodily injury or death from the unexpected startup of the machine, always stop the engine and remove the key before adjusting the machine.

1. Shut down the engine, and remove the key from the ignition.
2. Manually stroke knife to locate section under hold-down (A).
3. **Standard guard:** At standard guard locations, push knife section (B) down against guard (C) and measure clearance between hold-down clip (A) and knife section (B) with a feeler gauge. The clearance should be as follows:
   - **At hold-down tip (D):** 0.1–0.4 mm (0.004–0.016 in.)
   - **At rear of hold-down (E):** 0.1–1.0 mm (0.004–0.040 in.)
   - **At sheet metal hold-down (F):** 0.1–0.6 mm (0.004–0.024 in.)
4. If necessary, refer to *Adjusting Stub Guard Hold-Downs, page 152*.

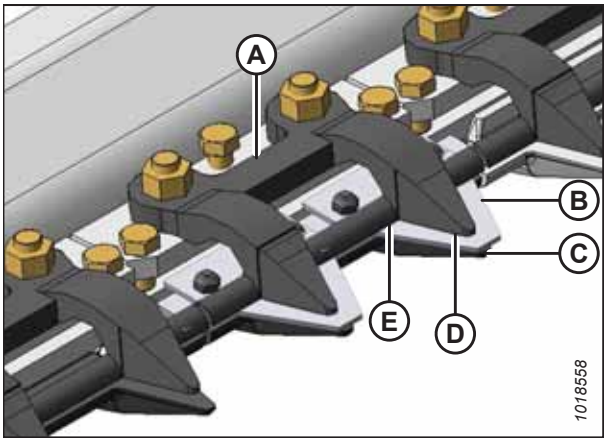


Figure 5.49: Short Knife Forged Hold-Down

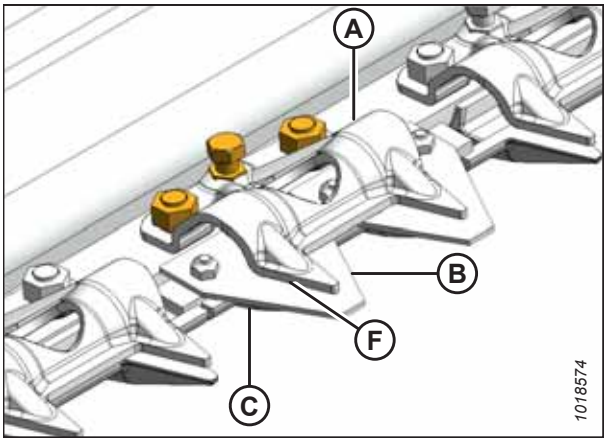


Figure 5.50: Short Knife Sheet Metal Hold-Down

5. **Double-knife center stub guard:** Manually stroke knife to locate sections under hold-down (B). Measure clearance between knife sections (A) and (C) with a feeler gauge. The clearance should be as follows:
   - **At hold-down tip (D):** 0.1–0.4 mm (0.004–0.016 in.)
   - **At rear of hold-down (E):** 0.1–1.0 mm (0.004–0.040 in.)
6. If necessary, refer to *Adjusting Stub Guard Hold-Downs, page 152*.

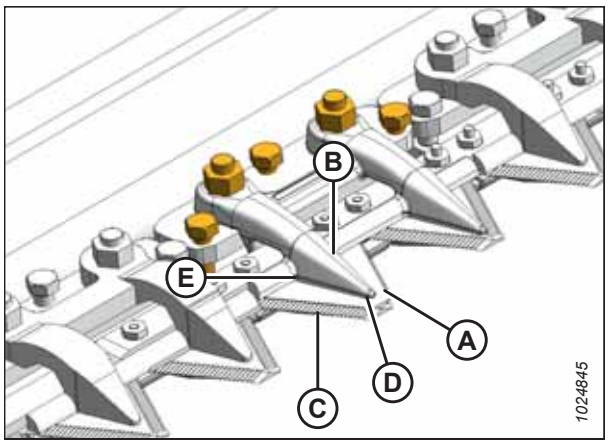


Figure 5.51: Double-Knife Center Short Knife Guard Hold-Down

Adjusting Stub Guard Hold-Downs

DANGER

To prevent bodily injury or death from the unexpected startup of the machine, always stop the engine and remove the key before adjusting the machine.

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

Forged hold-down:

2. Manually stroke knife to center section(s) (A) under hold-down (B) as shown.
3. Loosen nuts (C) and back off bolts (D) clear of cutterbar.
4. Position a C-clamp or equivalent on trash bar at location (F), and lightly clamp hold-down (B) to guard (E).
5. Turn bolts (D) until they contact cutterbar, then tighten **ONE** turn.
6. Remove clamp.
7. Tighten nuts (C) and torque to 45 Nm (35 lbf·ft).
8. Check that specified clearances are achieved. For instructions, refer to *Checking Stub Guard Hold-Downs, page 151*.

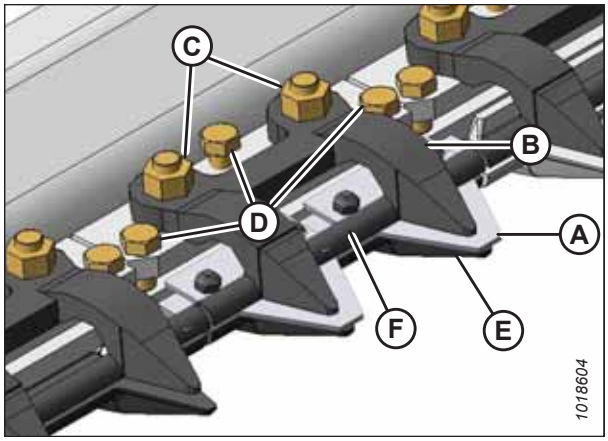


Figure 5.52: Normal Stub Guard Forged Hold-Down

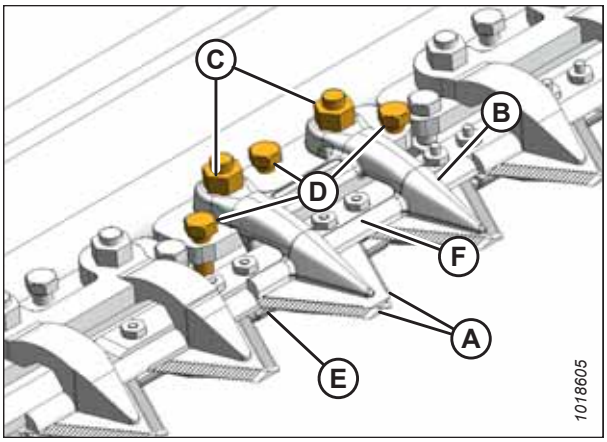


Figure 5.53: Double-Knife Center Stub Guard

Sheet metal hold-down:

9. Manually stroke knife to center section (A) under hold-down (B) as shown.
10. Decrease clearance by turning bolt (C) clockwise to lower front of hold-down. Clearance should be 0.1–0.6 mm (0.004–0.024 in.).
11. Increase clearance by turning bolt (C) counterclockwise to raise front of hold-down.

    NOTE:

    For larger adjustments, it may be necessary to loosen nuts (D), turn adjuster bolt (C), and then retighten nuts.
12. Torque nuts (D) to 88 Nm (65 lbf·ft) after all adjustments are complete and specified clearances are achieved. For instructions, refer to *Checking Stub Guard Hold-Downs, page 151*.

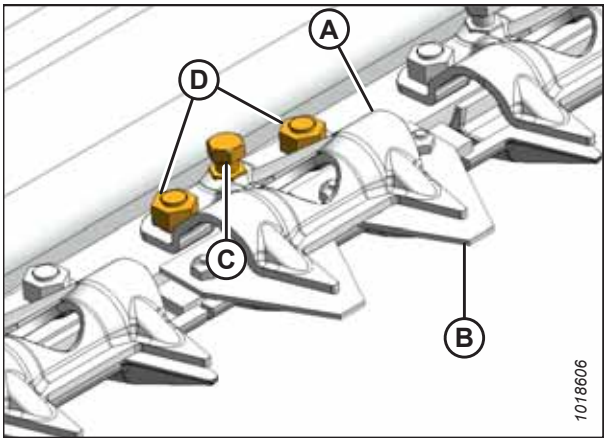


Figure 5.54: Stub Guard Sheet Metal Hold-Down

DANGER

Check to be sure all bystanders have cleared the area.

13. Complete hold-down adjustments, run header at low engine speed, and listen for noise caused by insufficient clearance.

    IMPORTANT:

    Insufficient hold-down clearance will result in overheating of knife and guards—readjust as necessary.

5.5.8 Knifehead Shield

The knifehead shield attaches to the endsheet and reduces the knifehead opening to prevent cut crop from accumulating in the knifehead cutout.

IMPORTANT:

Remove the shields when cutting with 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.

The shields and mounting hardware are available from your MacDon Dealer.

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 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.

CAUTION

Wear heavy gloves when working around or handling knives.

1. Raise the reel fully.
2. Lower the header 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. 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.
6. Bend knifehead shield (A) along the slit to conform to the endsheet.
7. Align the mounting holes and secure with two 3/8 in. x 1/2 in. Torx® head bolts (B).
8. 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.
9. 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.
10. Tighten bolts (B).

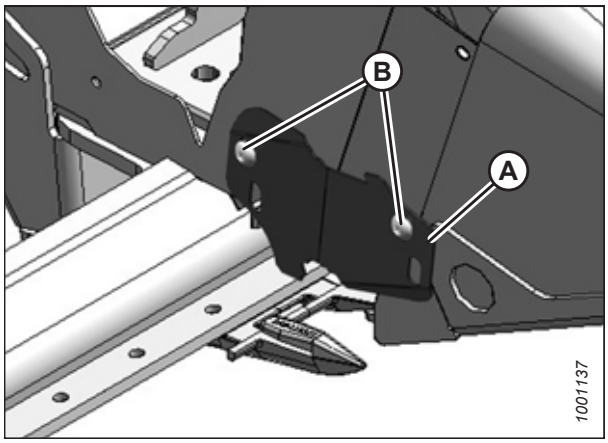


Figure 5.55: Knifehead Shield

5.6 Knife Drive

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.

5.6.1 Knife Drive Box

Knife drive boxes convert rotational motion into the reciprocating motion of the knife, and are belt driven by a hydraulic motor. There is one knife drive box on single-knife headers and two knife drive boxes on double-knife headers.

CAUTION

To avoid personal injury, before servicing machine or opening drive covers, refer to *5.1 Preparing Machine for Servicing, page 119*.

Checking Mounting Bolts

Check the torque on the four knife drive box mounting bolts after the first 10 hours of operation and every 100 hours thereafter.

DANGER

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

1. Torque side bolts (A) first, then torque bottom bolts (B). Torque all bolts to 271 Nm (200 lbf·ft).

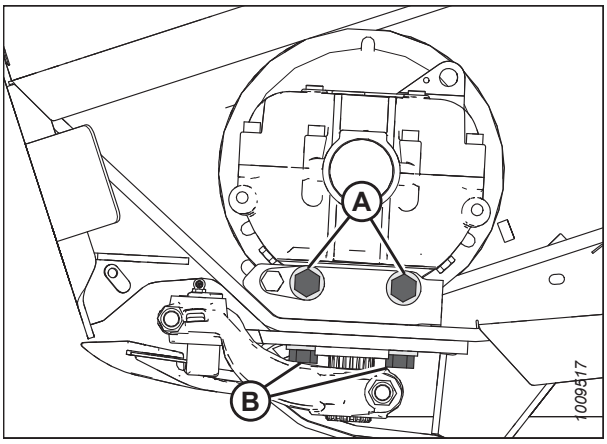


Figure 5.56: Knife Drive Box

Removing Knife Drive Box

The knife drive box may need to be removed for repair at the Dealership. Follow the recommended removal procedure provided here.

DANGER

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

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 Endshield, 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 down to loosen the belt.
5. Proceed to Step *10, page 156*.

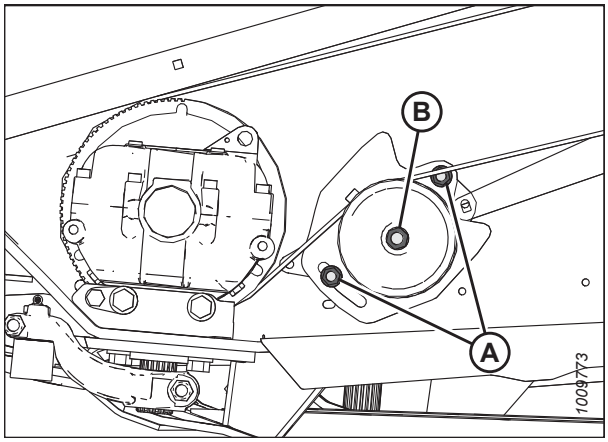


Figure 5.57: Timed Double-Knife Drive

Single 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 Endshield, page 35*.
8. Loosen two bolts (A) securing the motor assembly to the header endsheet.
9. Loosen the belt tension by turning tensioning bolt (B) counterclockwise.

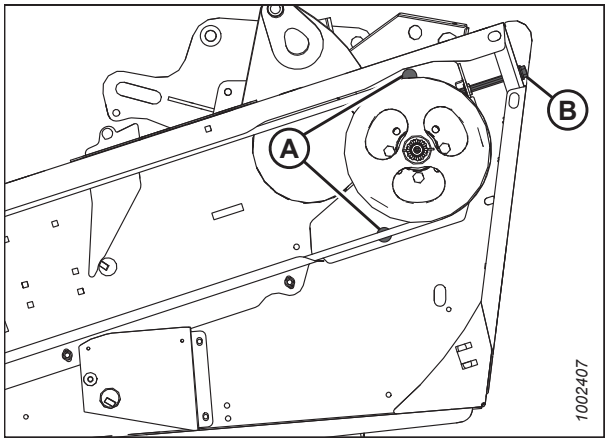


Figure 5.58: Single and Untimed Double-Knife Drive

10. Open access cover (A) on the endsheet behind the cutterbar to provide clearance between the knife drive box pulley and the endsheet.

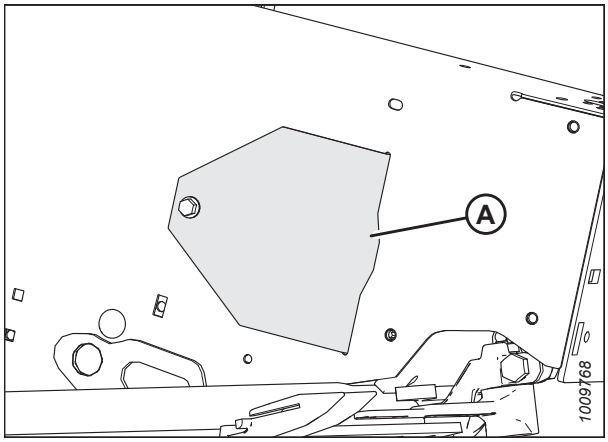


Figure 5.59: Access Cover

11. Remove belt (A) from drive pulley (B).
12. Slip belt (A) over and behind knife drive box pulley (C). Use the notch in the pulley to assist with the belt removal.
13. Stroke the knife manually to its outer limit.

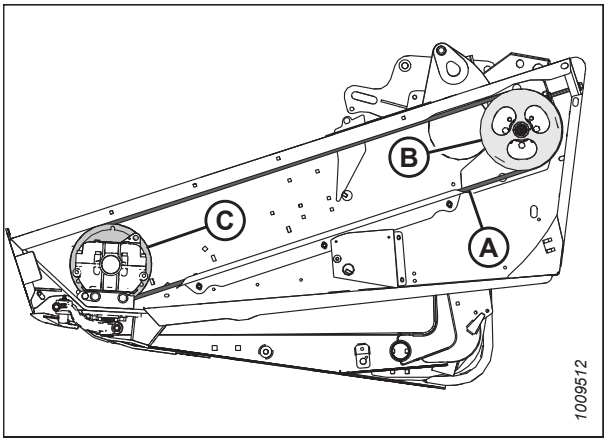


Figure 5.60: Knife Drive

14. Remove bolt (A).
15. Remove grease fitting (B) from the pin.
16. Use a screwdriver or chisel in slot (C) to release the load on the knifehead pin.
17. Use a screwdriver or chisel to pry the pin upwards in the pin groove until the pin is clear of the knifehead.
18. Push the knife assembly inboard until it is clear of the output arm.
19. Seal the knifehead bearing with plastic or tape unless it is being replaced.

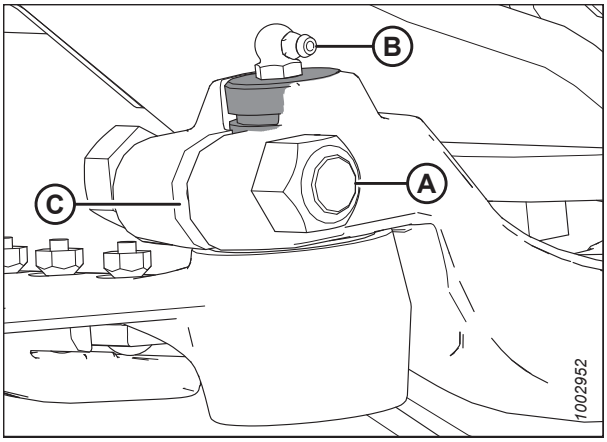


Figure 5.61: Knifehead

20. Remove bolt (A) that clamps knife drive arm (B) to the knife drive box output shaft.
21. Remove knife drive arm (B) from the knife drive box output shaft.
22. Remove four knife drive box mounting bolts (C) and (D).

    NOTE:

    Bolt (E) is factory set; do **NOT** remove it. It is used to secure the knife drive box in the proper fore-aft position.

CAUTION

The knife drive box and pulley weigh over 35 kg (65 lb.) Use care when removing or installing it. Lug (L) can be used for lifting. If the speed sensor is installed at this location, you will need to remove it before using it for lifting.

23. Remove the knife drive box and place it on a bench for disassembly.
24. **Double-knife headers:** Repeat this procedure for the opposite end of the header.

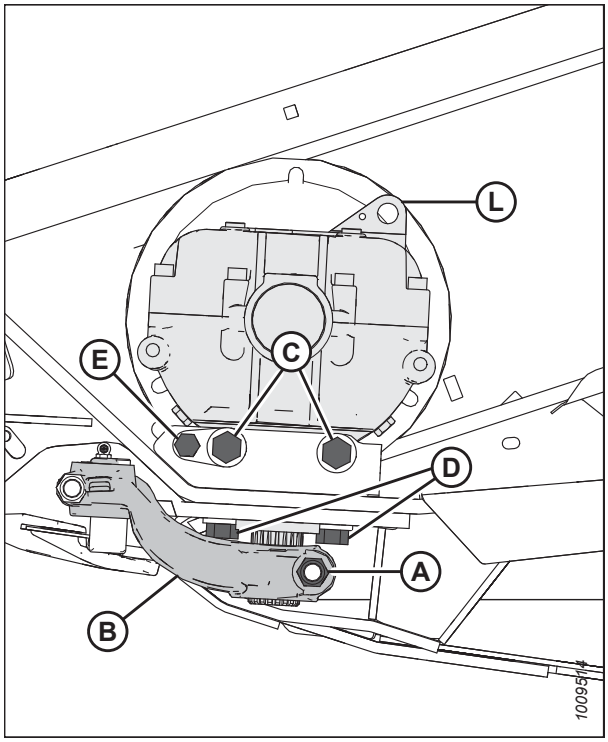


Figure 5.62: Knife Drive Box

Removing Knife Drive Box Pulley

To remove the knife drive box pulley, follow the recommended removal procedure provided here.

1. Loosen and remove knife drive box pulley clamping bolt (A) and nut (B).
2. Remove knife drive box pulley (C) using a three-jaw puller.

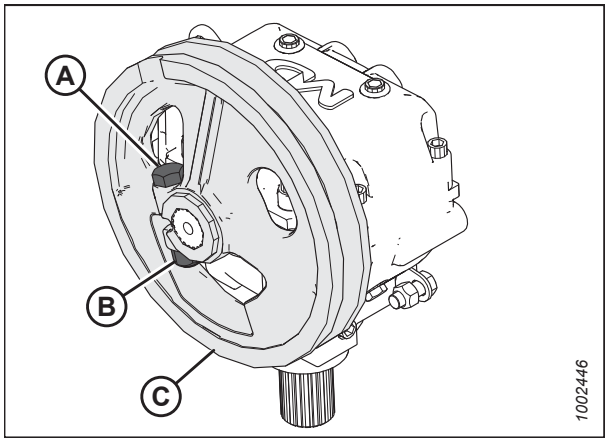


Figure 5.63: Knife Drive Box and Pulley

Installing Knife Drive Box Pulley

The knife drive box pulley is driven by the knife drive motor and the knife drive belt. To install the knife drive box pulley, follow the recommended installation procedure provided here.

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. Apply one band at the end of the spline and the second band at the approximate midpoint location.
3. Install pulley (B) so that it is flush with the end of the shaft.
4. Secure the pulley with 5/8 in. x 3 in. hex head bolt with distorted thread NC lock nut and torque it to 217 Nm (160 lbf·ft).

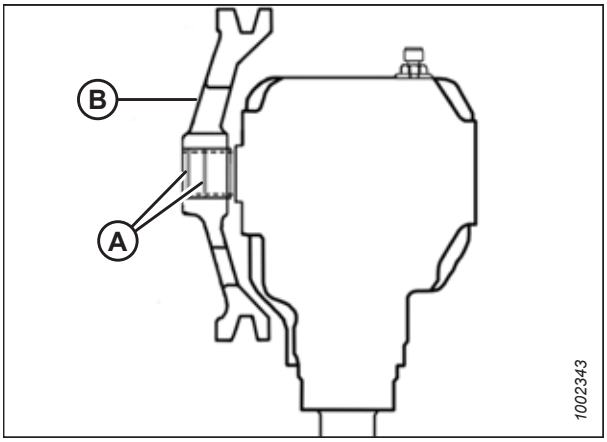


Figure 5.64: Knife Drive Box

Installing Knife Drive Box

The procedure for installing knife drive boxes is the same for single- and double-knife headers.

NOTE:

If the pulley was removed from the knife drive box, refer to *Installing Knife Drive Box Pulley, page 159*. If the pulley was not removed, proceed to Step *1, page 159*.

CAUTION

The knife drive box and pulley weigh over 35 kg (65 lb.) Use care when removing or installing it. Lug (L) can be used for lifting. If the speed sensor is installed at this location, you will need to remove it before using it 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 in. x 1-3/4 in. grade 8 hex head bolts (A) on the side and two 5/8 in. x 2-1/4 in. grade 8 hex head bolts (B) on the bottom.
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.

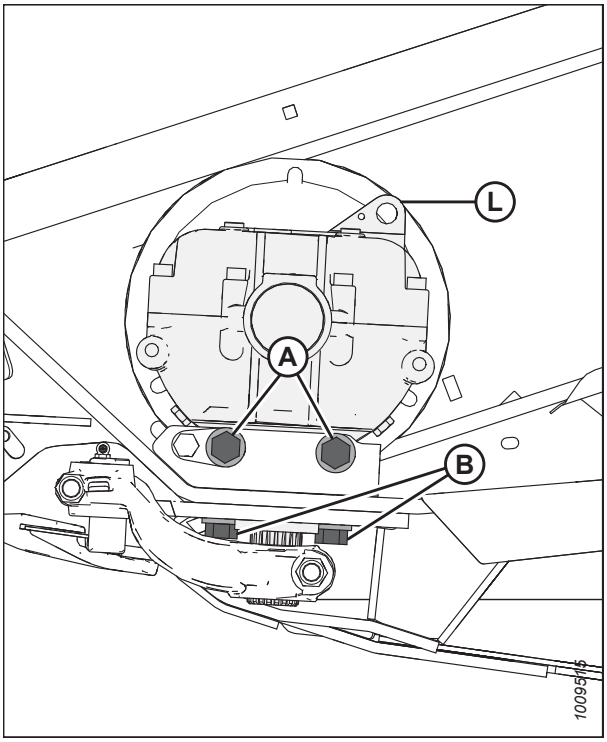


Figure 5.65: Knife Drive Box

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 at the approximate midpoint location.

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.

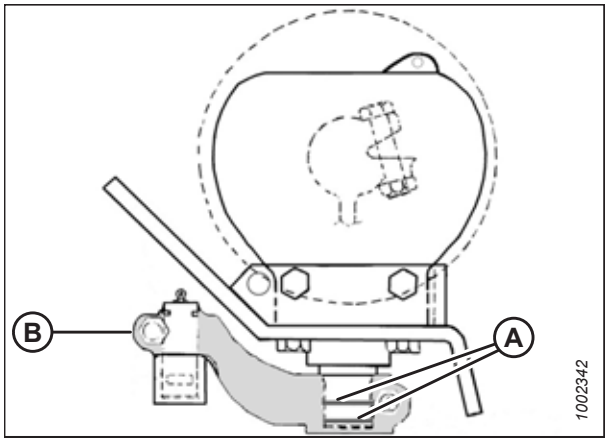


Figure 5.66: Knife Drive Box

6. Position output arm (A) to the farthest outboard position. 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).

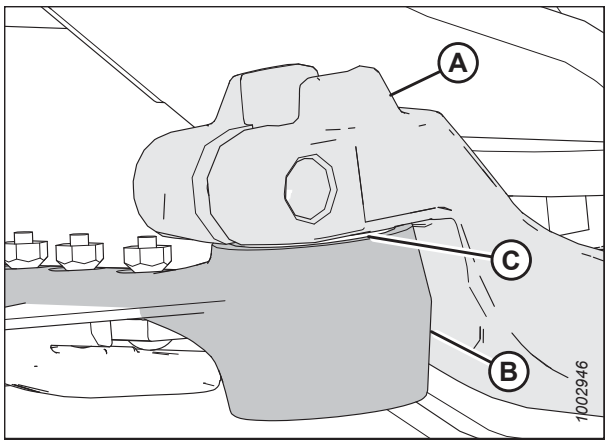


Figure 5.67: Knifehead

7. Torque output arm bolt (A) to 217 Nm (160 lbf·ft).

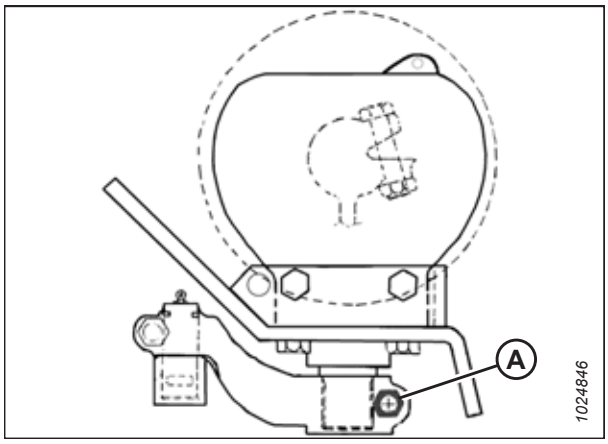


Figure 5.68: Knife Drive Box

8. Slide the knife into place and align the knifehead with the output arm.

9. For ease of removing or installing the knifehead pin, remove the grease fitting from the pin.

10. Install knifehead pin (A) through the output arm and into the knifehead. Tap knifehead pin (A) down, and make sure the pin is seated at the bottom of the knifehead.

11. Using a feeler gauge, check that the gap at location (E) is 0.25 mm (0.01 in.).

12. Set groove (B) in the knifehead pin 1.5 mm (1/16 in.) above output arm (C). Secure it with 5/8 in. x 3 in. hex head bolt and nut (D), and torque the hardware to 217 Nm (160 lbf·ft).

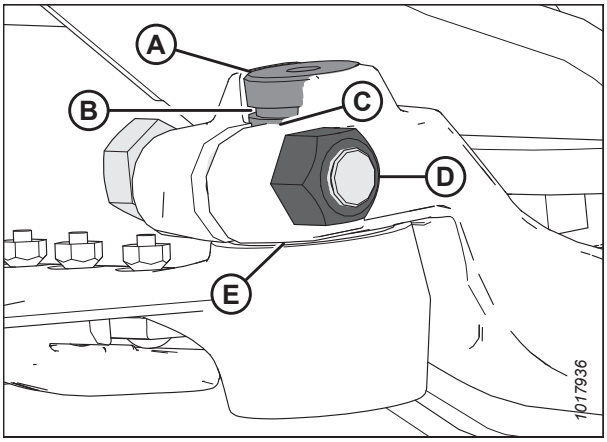


Figure 5.69: Knifehead

13. Install grease fitting (A) into the knifehead pin, and turn the grease fitting for easy access.

    IMPORTANT:

    Grease the knifehead just enough to start a slight downward movement. Overgreasing will lead to knife misalignment which causes the guards to overheat and the drive systems to overload.

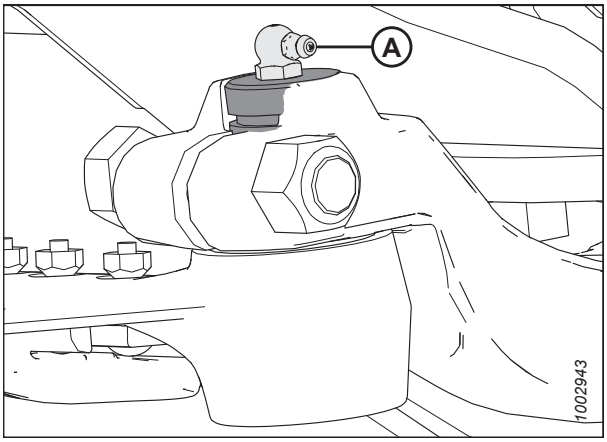


Figure 5.70: Knifehead

14. Tighten the knife drive box side bolts (A) first, then tighten bottom bolts (B). Torque to 271 Nm (200 lbf·ft).

15. Move the output arm to the midstroke 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.

16. Install and tension the knife drive belts. Refer to the following topics depending on your header:

    - For untimed belts, refer to *Tensioning Untimed Knife Drive Belts, page 165*
    - For timed belts, refer to *Tensioning Timed Knife Drive Belts, page 170*
    - For timed double-knife headers, also check the knife timing. For instructions, refer to *Adjusting Double-Knife Timing, page 172*

17. Close the endshield. For instructions, refer to *Closing Endshield, page 36*.

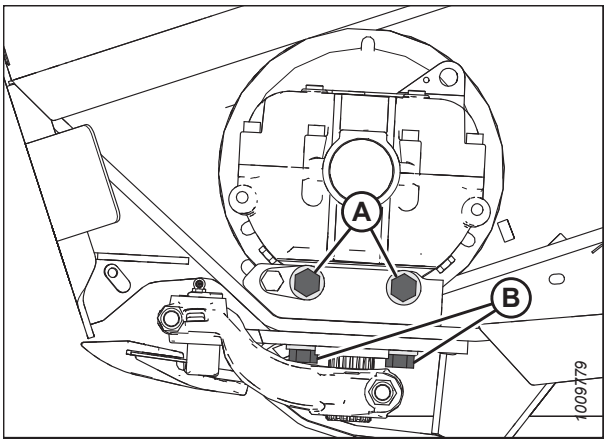


Figure 5.71: Knife Drive Box

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 prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key from the ignition before making adjustments to the machine. NEVER climb onto or go underneath an unsupported header.

1. Raise the header to allow a suitably sized container to fit under the knife box drain and collect the oil.
2. Shut down the engine, and remove the key from the ignition.
3. Open the endshield. For instructions, refer to *Opening Endshield, page 35*.
4. Remove breather/dipstick (A) and drain plug (B).
5. Allow the oil to drain.
6. Reinstall drain plug (B).
7. Add oil to the knife drive box. Refer to the inside back cover for specifications.
8. Reinstall breather/dipstick (A).
9. Close the endshield. For instructions, refer to *Closing Endshield, page 36*.

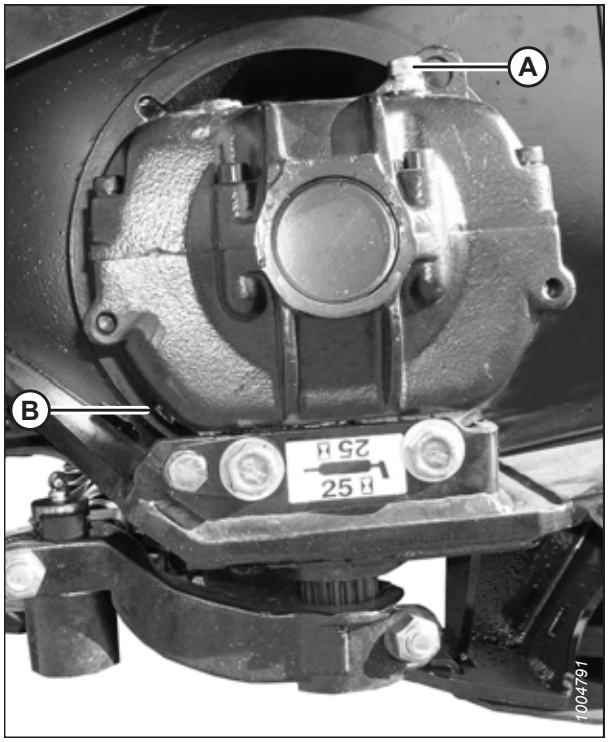


Figure 5.72: Knife Drive Box

5.6.2 Knife Drive Belts

The knife drive box is driven by a V-belt that is powered by a hydraulic motor on the header endsheets.

Untimed Knife Drive Belts

The knife drive box is driven by a V-belt that is powered by a hydraulic motor on the header endsheets.

Removing Untimed Knife Drive Belts

The untimed knife drive belt removal procedure is the same for both sides of a double-knife header.

DANGER

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

1. Shut down the engine, and remove the key from the ignition.
2. Open the endshield. For instructions, refer to *Opening Endshield, page 35*.
3. Loosen two bolts (A) securing the motor assembly to the header endsheet.
4. Loosen the belt tension by turning tensioning bolt (B) counterclockwise.

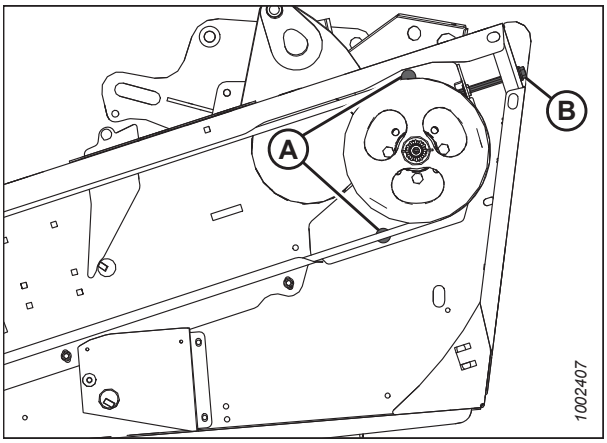


Figure 5.73: Single and Untimed Double-Knife Drive

5. Open access cover (A) on the endsheet behind the cutterbar to provide clearance between the knife drive box pulley and the endsheet.

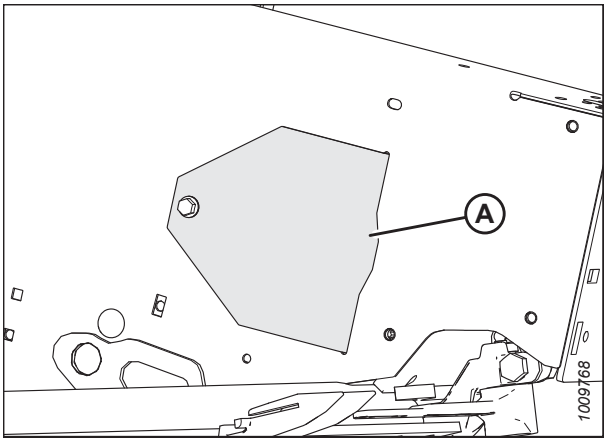


Figure 5.74: Access Cover

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 the belt removal.

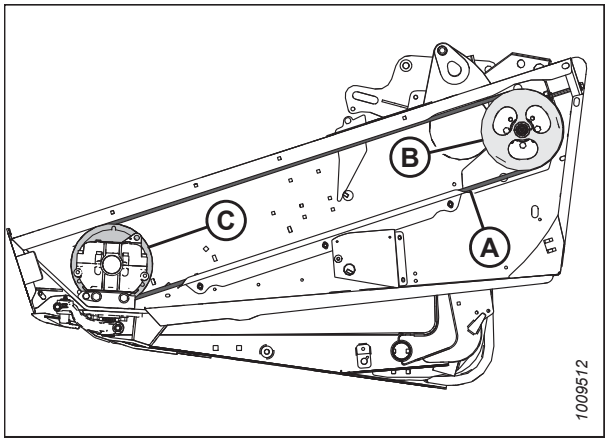


Figure 5.75: Knife Drive

Installing Untimed Knife Drive Belts

The procedure for installing untimed knife drive belts is the same for both sides of the header.

DANGER

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

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

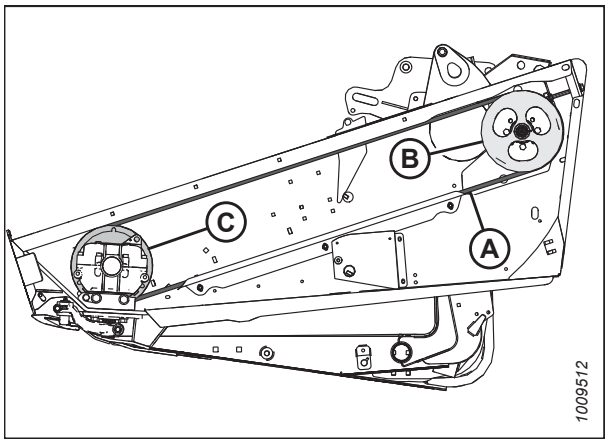


Figure 5.76: Knife Drive

3. Tension the knife drive belt. For instructions, refer to *Tensioning Untimed Knife Drive Belts, page 165*.
4. Install access cover (A) and secure it with a bolt.
5. Close the endshield. For instructions, refer to *Closing Endshield, page 36*.

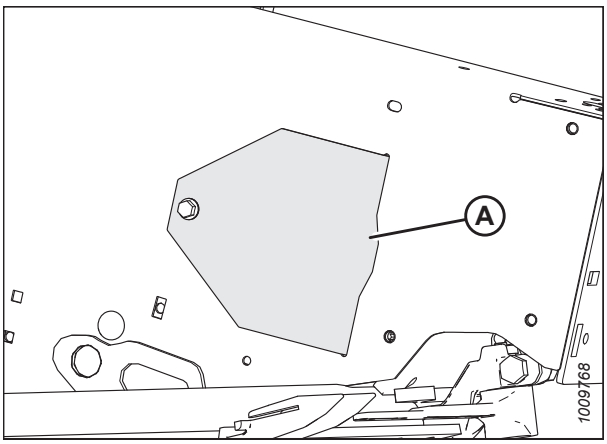


Figure 5.77: Access Cover

Tensioning Untimed Knife Drive Belts

The procedure for tensioning untimed knife drive belts is the same for single- and double-knife headers.

DANGER

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

IMPORTANT:

To prolong belt and drive life, do **NOT** overtighten the belt.

1. Shut down the engine, and remove the key from the ignition.
2. Open the endshield. For instructions, refer to *Opening Endshield, page 35*.
3. Loosen two bolts (A) securing the motor assembly to the header endsheet.
4. Turn adjuster bolt (B) clockwise to move drive the motor until a force of 89 N (20 lbf) deflects belt (C) 20–25 mm (3/4–1 in.) at the midspan.

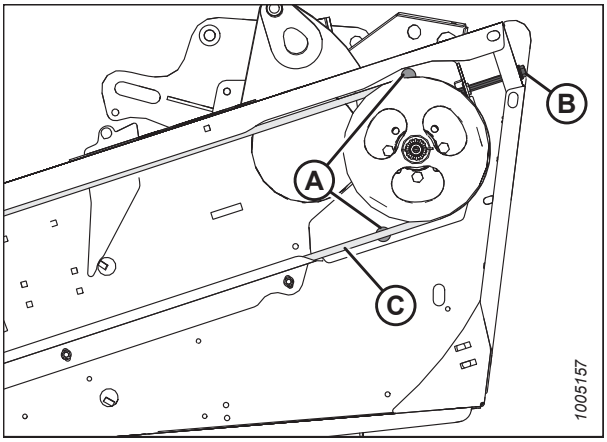


Figure 5.78: Untimed Knife Drive

5. Ensure the clearance between belt (A) and belt guide (B) is 1 mm (1/32 in.).
6. Loosen three bolts (C), and adjust the position of guide (B) as required.
7. Tighten three bolts (C).
8. Close the endshield. For instructions, refer to *Closing Endshield, page 36*.

   NOTE:

   Readjust the tension of a new belt after a short run-in period (about five hours).
9. Repeat the above steps for the opposite end on double-knife headers.

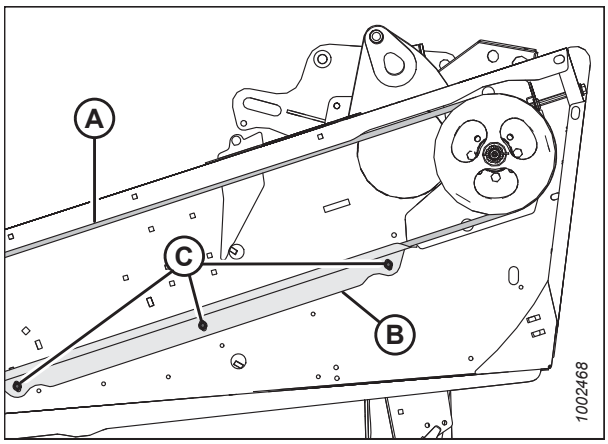


Figure 5.79: Untimed Knife Drive

Timed Double-Knife Drive Belts

Removing Timed Drive V-Belts

DANGER

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

1. Shut down the engine, and remove the key from the ignition.
2. Open the endshield. For instructions, refer to *Opening Endshield, page 35*.
3. Loosen two bolts (A) securing the motor assembly to the header endsheet.
4. Turn the adjuster bolt (B) counterclockwise to loosen it and remove two V-belts (C).

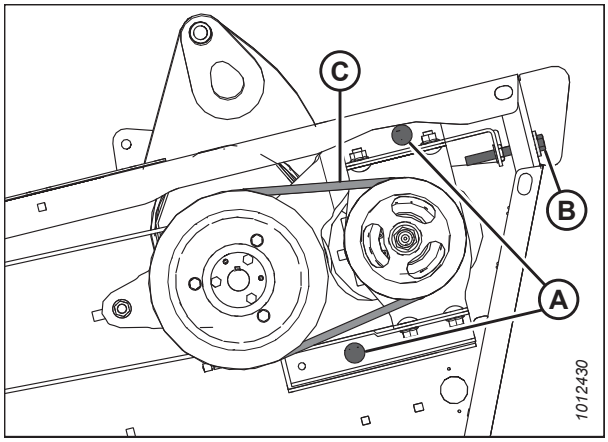


Figure 5.80: Knife Drive V-Belts

Installing Timed Drive V-Belts

DANGER

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

NOTE:

Install new V-belts in matching pairs.

1. Shut down the windrower, and remove the key from the ignition.
2. Install 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 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.
4. Tighten two bolts (A) on the endsheet.

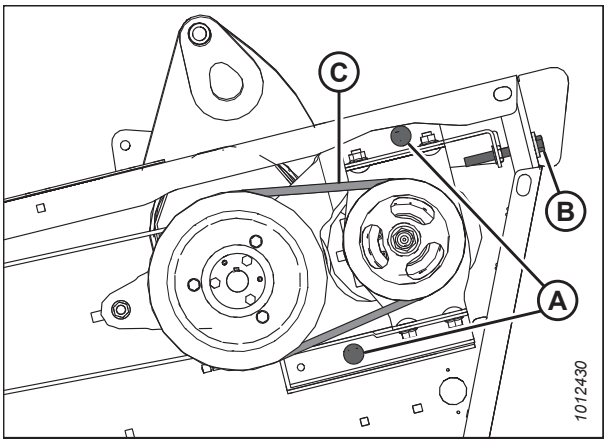


Figure 5.81: Knife Drive V-Belts

5. Close the endshield. For instructions, refer to *Closing Endshield, page 36*.
6. Check the tension of the new V-belts after a short run-in period (about five hours).

Removing Timed Knife Drive Belt

The timed knife drive belt removal procedure is the same for both sides of the header.

DANGER

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

1. Shut down the engine, and remove the key from the ignition.
2. Open the endshield. For instructions, refer to *Opening Endshield, 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 downward to loosen the belt.

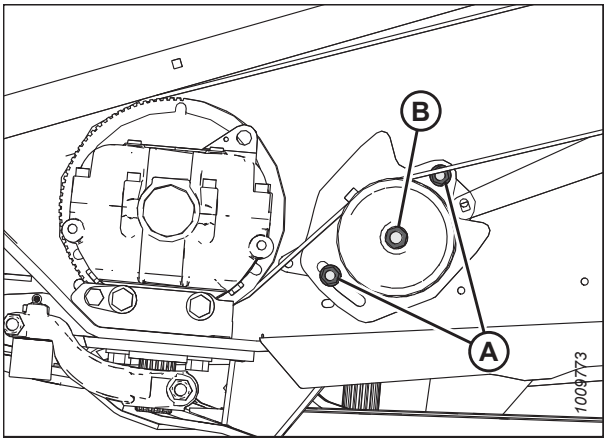


Figure 5.82: Knife Drive

NOTE:

The following two steps apply only to the left drive.

5. Loosen two bolts (A) on the endsheet.
6. Turn adjuster bolt (B) counterclockwise to loosen it and remove two V-belts (C).

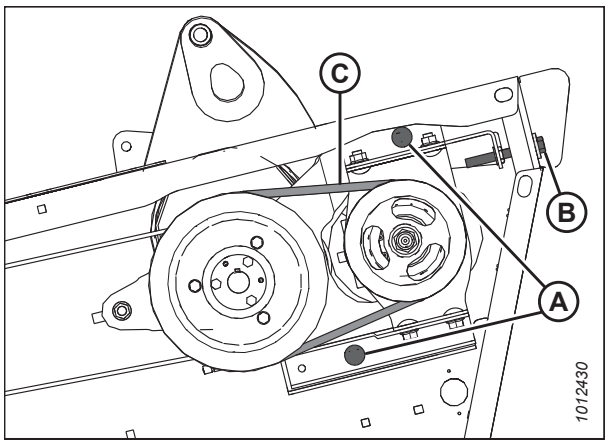


Figure 5.83: Knife Drive V-Belts

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.

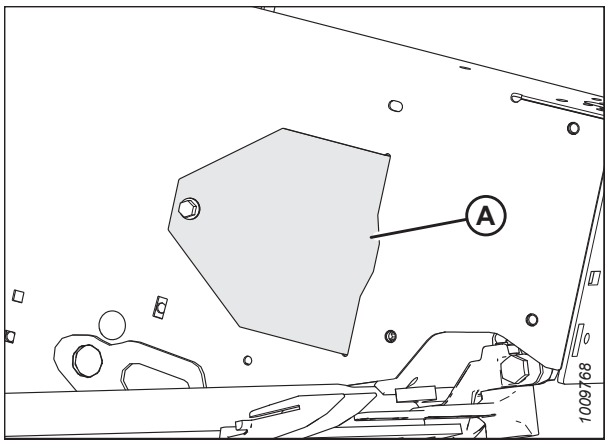


Figure 5.84: Access Cover

Installing Timed Knife Drive Belts

The procedure for installing timed knife drive belts is the same for both sides of the header.

DANGER

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

If the belt is out of alignment, refer to *Checking Knife Drive Belt Tracking, page 174*.

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.

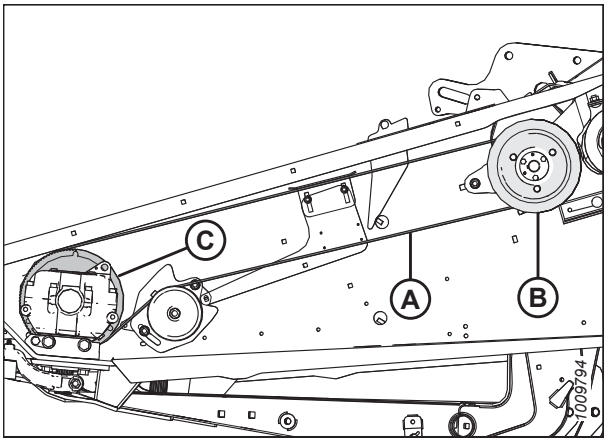


Figure 5.85: Left Side Shown – Right Side Similar

3. Install V-belt (C) onto the pulleys.
4. Turn adjuster bolt (B) clockwise to tighten the V-belts. A properly tensioned V-belt should deflect 4 mm (5/32 in.) when 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.
5. Tighten two bolts (A) on the endsheet.

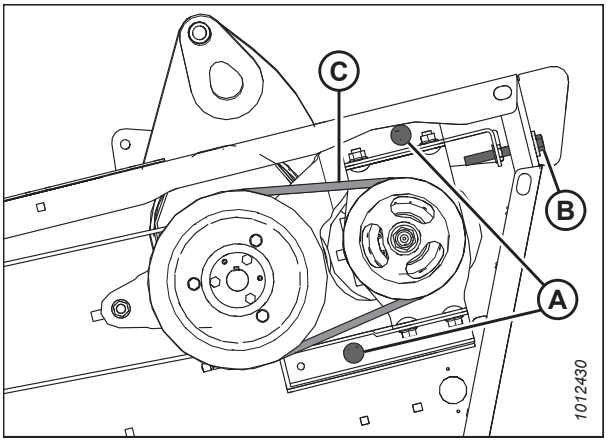


Figure 5.86: Knife Drive V-Belts

6. Ensure the knives are timed before tightening the belt. For instructions, refer to *Adjusting Double-Knife Timing, page 172*.
7. Slide idler pulley (A) into the slot on support bracket (B) to take-up the slack in the timing belt.

   NOTE:

   Ensure lower nut (C) is as high as possible in the support bracket (B) slot.
8. Tighten nut (D) to 212–234 Nm (157–173 lbf·ft).

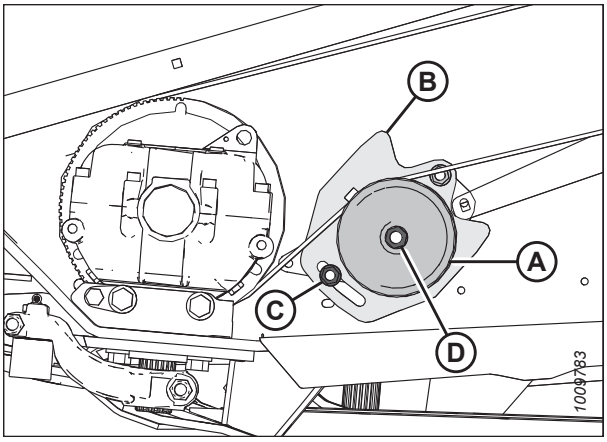


Figure 5.87: Knife Drive

9. Tension the knife drive belt. For instructions, refer to *Tensioning Timed Knife Drive Belts, page 170*.
10. Install access cover (A) and secure it with a bolt.
11. Close the endshield. For instructions, refer to *Closing Endshield, page 36*.

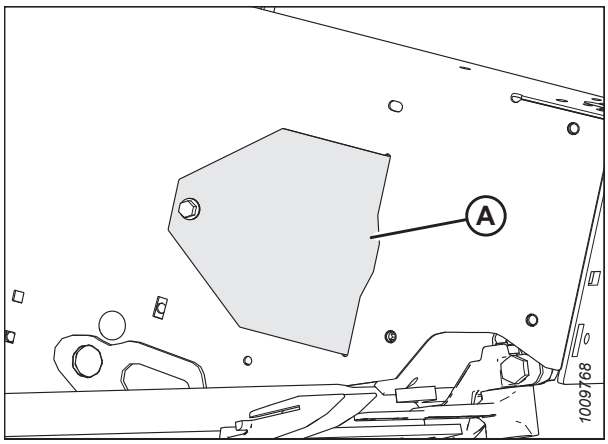


Figure 5.88: Access Cover

Tensioning Timed Knife Drive Belts

The procedure for tensioning timed knife drive belts is the same for both sides of the header. The illustrations shown are for the left side—the right side is opposite.

DANGER

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

IMPORTANT:

To prolong belt and drive life, do **NOT** overtighten belt.

IMPORTANT:

Do **NOT** use adjuster bolt at 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 Endshield, page 35*.
3. Loosen two nuts (A) on the knife drive belt idler bracket.

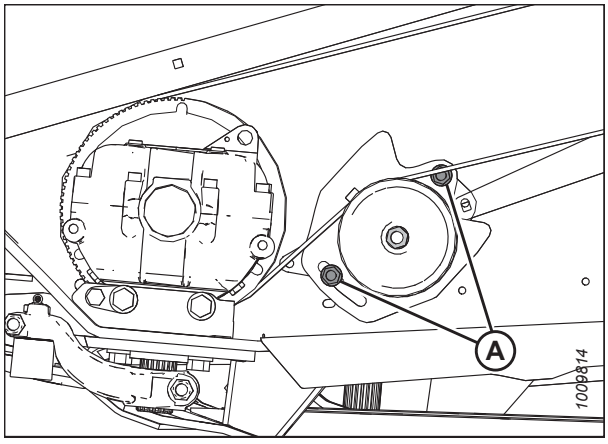


Figure 5.89: Left Knife Drive

4. Position pry bar (A) under idler bracket (C), and push the bracket upward until a force of 27 N (6 lbf) deflects the belt 13 mm (1/2 in.) at the midpoint of the upper span.

   NOTE:

   Protect the paint by placing a piece of wood (B) under pry bar (A).

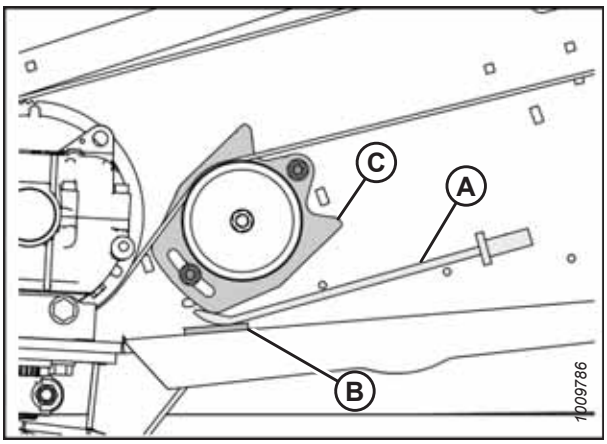


Figure 5.90: Left Knife Drive

5. After achieving the proper belt tension, tighten nuts (C) to 73–80 Nm (54–59 lbf·ft).

6. Remove pry bar (A) and wood (B).

   NOTE:

   Readjust the tension of a new belt after a short run-in period (about five hours).

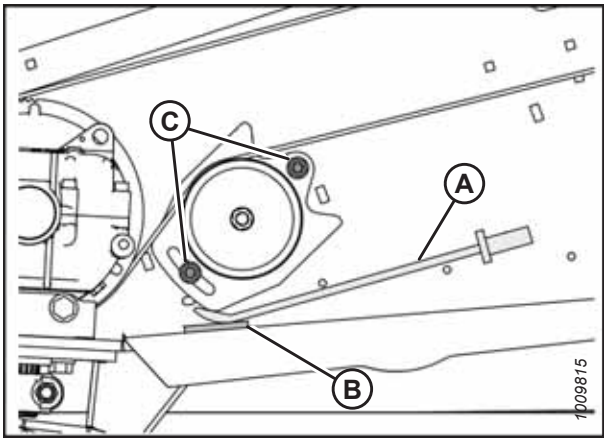


Figure 5.91: Left Knife Drive

7. Ensure clearance (A) between belt (B) and guide (C) is 0.5–1.5 mm (1/32–1/16 in.).

8. Loosen bolts (D) and adjust the guide if necessary. Tighten the bolts.

9. Repeat this procedure for the opposite side of the header.

10. Close the endshield. For instructions, refer to *Closing Endshield, page 36*.

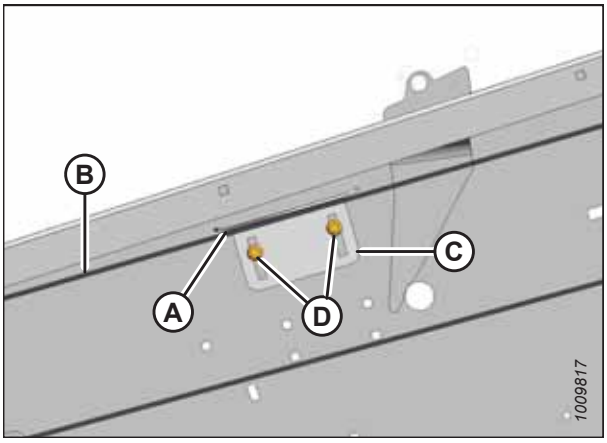


Figure 5.92: Left Belt Guide

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

1. Shut down the engine, and remove the key from the ignition.
2. Open both endshields. For instructions, refer to *Opening Endshield, page 35*.
3. Remove the right knife drive belt. For instructions, refer to *Removing Timed Knife Drive Belt, page 167*.
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.

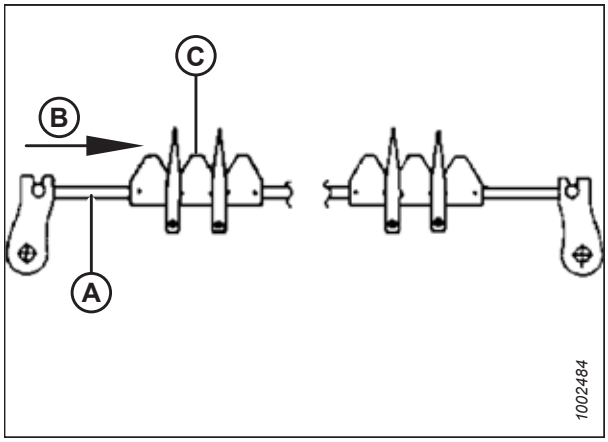


Figure 5.93: Adjusting Timing – Left Side

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.

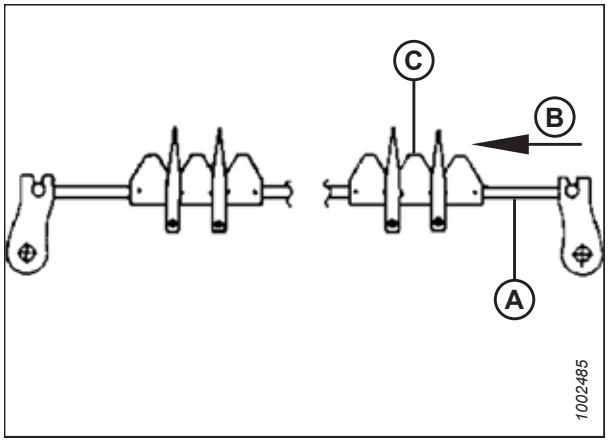


Figure 5.94: Adjusting Timing – Right Side

6. Install right knife drive belt (A).

   NOTE:

   Ensure the knife drive box driver and driven pulleys do **NOT** rotate during belt installation.

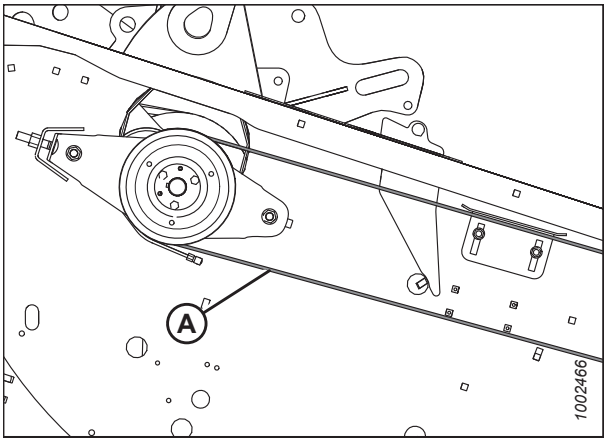


Figure 5.95: Right Knife Drive

7. Rotate idler pulley bracket (A) downward, and slide the idler pulley up by hand to remove most of the belt slack. Tighten nut (B).

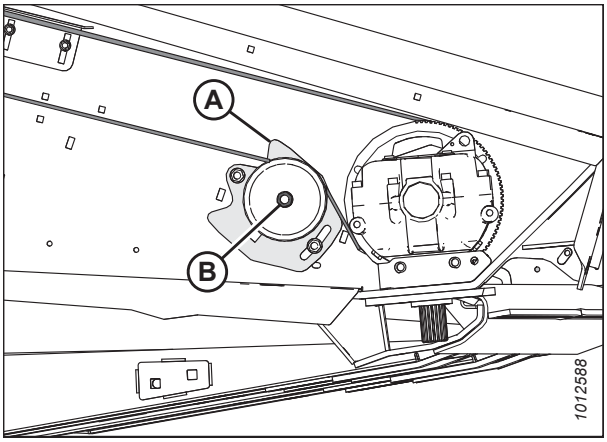


Figure 5.96: Right Knife Drive

8. Position pry bar (A) under idler bracket (C), and push the bracket upward until a force of 27 N (6 lbf) deflects the belt 13 mm (1/2 in.) at the midpoint of the upper span.

   NOTE:

   Protect the paint by placing a piece of wood (B) under pry bar (A).

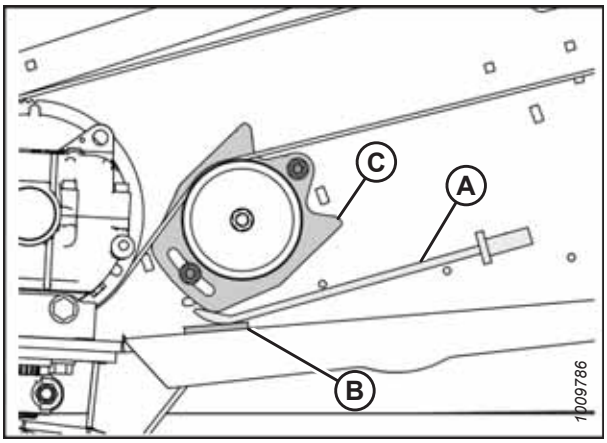


Figure 5.97: Left Shown – Right Opposite

9. When the belt has the proper belt tension, tighten nuts (C) to 73–80 Nm (54–59 lbf·ft).

10. Ensure the timing belts are properly seated in the grooves on both driver and driven pulleys.

11. Rotate the drive slowly by hand and observe where the knives overlap at the center of the header to check for the correct knife timing.

    IMPORTANT:

    The knives must begin moving at the exact same time and must move in opposite directions.

12. Adjust the knife timing, if necessary, by loosening the right drive belt (B) just enough to reposition it to the next cog(s) and proceed as follows:

    a. If the right knife leads the left knife, rotate the right driven pulley (A) clockwise.

    b. If the right knife lags the left knife, rotate the right driven pulley (A) counterclockwise.

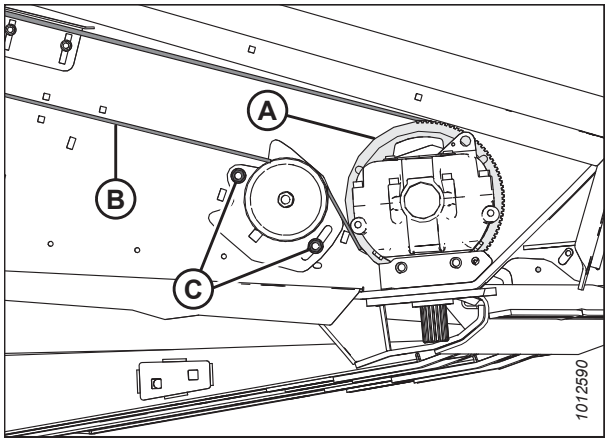


Figure 5.98: Right Knife Drive

13. Ensure the drive pulleys don't rotate, and tension the right drive belts (refer to Step *7, page 173* to Step *9, page 174*).

    IMPORTANT:

    Do **NOT** use the adjuster bolt at the drive pulley to adjust the timing belt tension.

14. Recheck the timing (refer to Step *11, page 174*) and readjust it if necessary (refer to Step *12, page 174*).

15. Close both endshields. For instructions, refer to *Closing Endshield, page 36*.

Checking Knife Drive Belt Tracking

The following procedure is applicable to the left knife drive and the right knife drive on timed drive headers.

IMPORTANT:

A belt that is not tracking properly is subject to premature failure. Ensure the pulleys are aligned and parallel. Follow the belt tensioning procedures in this manual to avoid misalignment.

The cogged timing belt should be centered on the knife drive box pulley and at least 2 mm (0.08 in.) from either edge when the header is running. The belt should avoid continual contact with the drive pulley flanges. Occasional contact is acceptable. A gap should be visible between the belt and the pulley flanges.

1. Open the endshields. For instructions, refer to *Opening Endshield, page 35*.

CAUTION

Exercise extreme care when operating the header with the endshields open.

2. Operate the header and observe how the belt is tracking on both the drive pulley and the knife drive box pulley on both sides of the header. Shut down the engine, and remove the key from the ignition before making any adjustments.

3. If the belt is tracking toward the inboard side of the drive pulley, the likely cause is a toe-out problem (the belt tends to move toward the low tension side of the pulley [inboard]). For instructions, refer to *Adjusting Drive Belt Tracking – Drive Pulley, page 175*.

4. If the belt is tracking toward the outboard side of the drive pulley, the likely cause is a toe-in problem (the belt tends to move toward the low tension side of the pulley [outboard]). For instructions, refer to *Adjusting Drive Belt Tracking – Drive Pulley, page 175*.

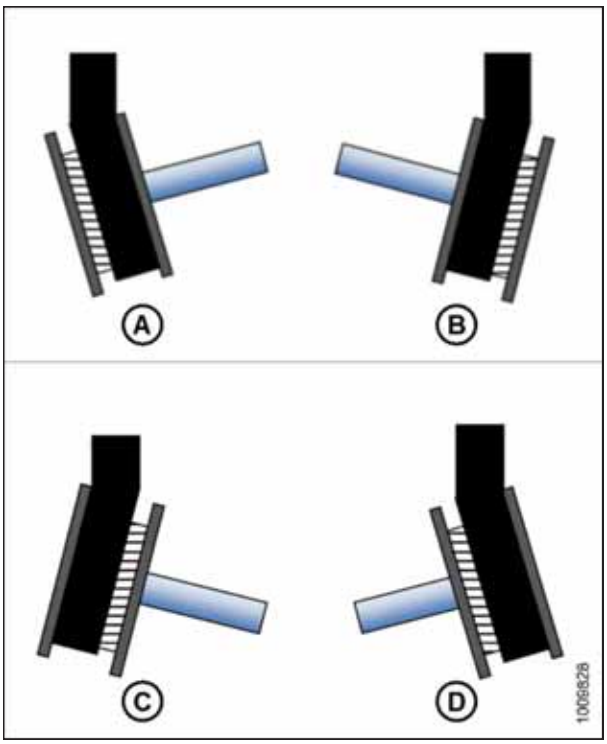


Figure 5.99: Knife Drive Pulley

A - Toe-Out: Left Side
B - Toe-Out: Right Side
C - Toe-In: Left Side
D - Toe-In: Right Side

5. If belt (A) is tracking to one side of knife drive box pulley (B), the likely cause is an out of position idler pulley (C). For instructions, refer to *Adjusting Drive Belt Tracking – Knife Drive Box Pulley, page 177*.

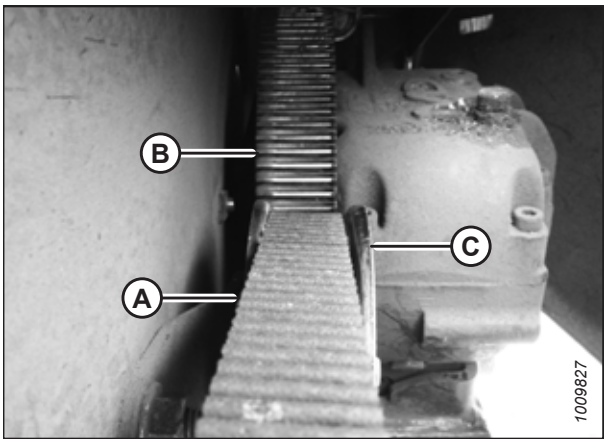


Figure 5.100: Knife Drive Belt

Adjusting Drive Belt Tracking – Drive Pulley

The following procedure is applicable to the left knife drive and the right knife drive on timed drive headers.

Before adjusting the drive belt tracking, verify the pulley that needs to be adjusted. For instructions, refer to *Checking Knife Drive Belt Tracking, page 174*.

IMPORTANT:

A belt that is not tracking properly is subject to premature failure. Ensure the pulleys are aligned and parallel. Follow the belt tensioning procedures in this manual to avoid misalignment.

The cogged timing belt should be centered on the knife drive box pulley and at least 2 mm (0.08 in.) from either edge when the header is running. The belt should also avoid constant contact with the flanges on the drive pulley, but occasional contact is acceptable. A gap should be visible between the belt and pulley flanges.

CAUTION

Exercise extreme care when operating the header with the endshields open.

1. Open both endshields. For instructions, refer to *Opening Endshield, page 35*.
2. Loosen nut (A) on support assembly (B).
3. Slide support (B) rearward in slot (C) to correct toe-out condition, or forward to correct toe-in condition.
4. Tighten nut (A).
5. Operate the header and check the tracking. For instructions, refer to *Checking Knife Drive Belt Tracking, page 174*. Adjust the support assembly as required.
6. If the belt tracking problem continues, proceed to Step *7, page 176*.

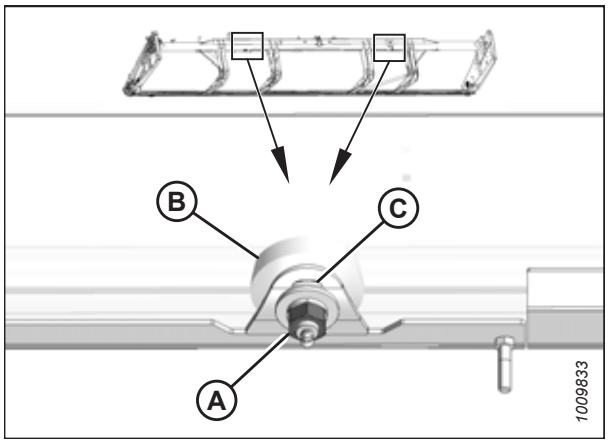


Figure 5.101: Cross-Shaft Support

7. Loosen nut (A) on the idler and nuts (B) on the idler bracket.
8. Loosen nuts (C) at the drive pulley location.
9. To correct a toe-in problem, turn adjuster bolt (D) clockwise to allow the belt to track inboard.
10. To correct a toe-out problem, turn adjuster bolt (D) counterclockwise to allow the belt to track outboard.
11. Tighten nuts (C) at the drive pulley location.
12. Tension the belt. For instructions, refer to *Tensioning Timed Knife Drive Belts, page 170*.
13. Operate the header and check the tracking. For instructions, refer to *Checking Knife Drive Belt Tracking, page 174*. Adjust the drive pulley if required as per the above steps.

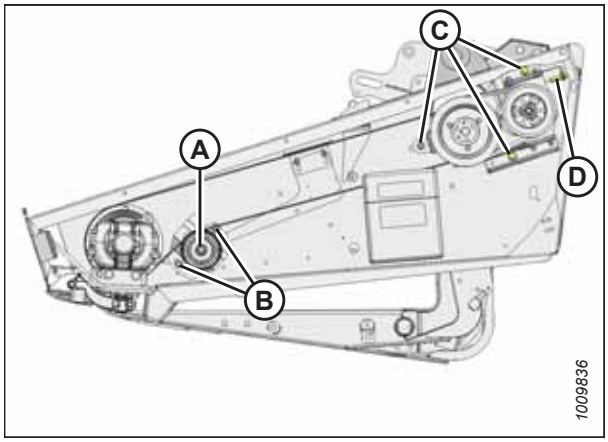


Figure 5.102: Knife Drive – Left Side

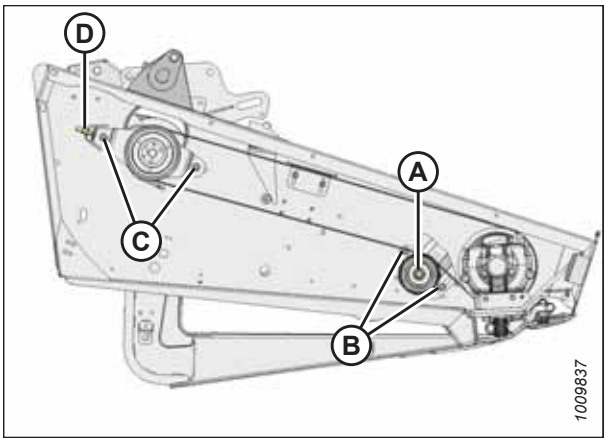


Figure 5.103: Knife Drive – Right Side

Adjusting Drive Belt Tracking – Knife Drive Box Pulley

The following procedure is applicable to the left knife drive and the right knife drive on timed drive headers.

The cogged timing belt should be centered on the knife drive box pulley and at least 2 mm (0.08 in.) from either edge when the header is running. The belt should also avoid constant contact with the flanges on the drive pulley but occasional contact is acceptable. A gap should be visible between the belt and the pulley flanges. Before adjusting the drive belt tracking, verify the pulley that needs to be adjusted. For instructions, refer to *Checking Knife Drive Belt Tracking, page 174*.

IMPORTANT:

A belt that is not tracking properly is subject to premature failure. Ensure the pulleys are aligned and parallel. Follow the belt tensioning procedures in this manual to avoid misalignment.

1. Open both endshields. For instructions, refer to *Opening Endshield, page 35*.

CAUTION

Exercise extreme care when operating the header with the endshields open.

2. Loosen nuts (A) and (B) and move the bracket and idler until the belt is loose.

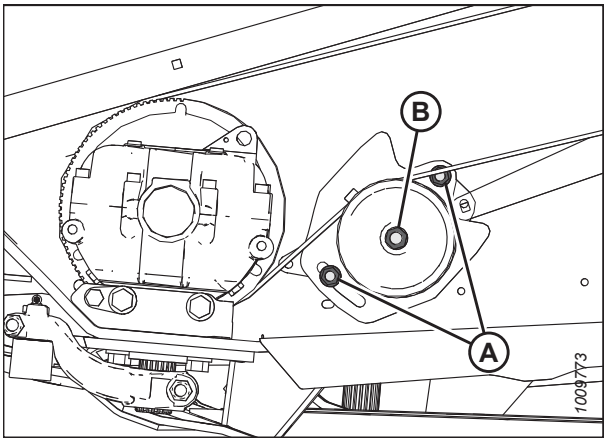


Figure 5.104: Knife Drive

3. Remove nut (A) securing the idler to the bracket, and remove lock washer (D), the idler pulley, and flat washer (C).
4. Install idler pulley (B), ensuring it lines up with the knife drive box pulley, using flat washer(s) (C) as required.
5. Reinstall lock washer (D) and nut (A).
6. Tension the belt. For instructions, refer to *Tensioning Timed Knife Drive Belts, page 170*.
7. Operate the header and check the tracking. For instructions, refer to *Checking Knife Drive Belt Tracking, page 174*.

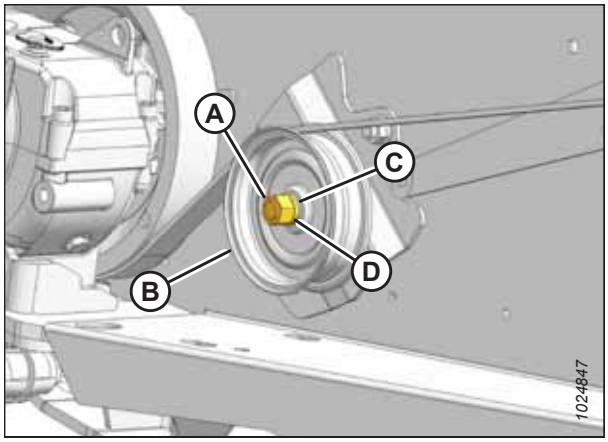


Figure 5.105: Knife Drive

5.7 Drapers

Two side drapers convey cut crop to the center opening. Replace the side drapers if they are torn, cracked, or missing slats.

5.7.1 Removing Side Drapers

Replace the drapers if they are torn, cracked, or missing slats.

DANGER

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

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. Raise the header fully.
3. Move the draper until the draper joint is in the work area.

   NOTE:

   The deck can also be shifted towards the center to provide an opening at the endsheet.
4. Shut down the engine, and remove the key from the ignition.
5. Engage the header safety props. For instructions, refer to the windrower operator's manual.
6. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 33*.
7. Release the tension on the draper. For instructions, refer to *5.7.3 Adjusting Draper Tension, page 182*.
8. Remove screws (A) and tube connectors (B) at the draper joint.
9. Pull the draper from the deck.

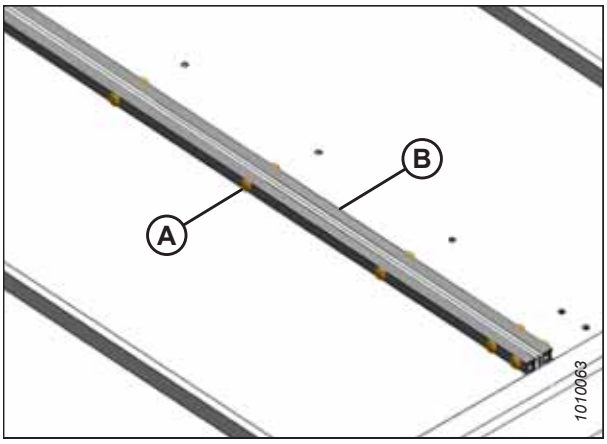


Figure 5.106: Draper Joint

5.7.2 Installing Side Drapers

Side drapers are used to bring cut crop to the center of the header. To ensure they are installed correctly, follow the recommended installation procedure provided here.

DANGER

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

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. Raise the header fully.
3. Shut down the engine, and remove the key from the ignition.
4. Engage the header safety props. For instructions, refer to the windrower operator's manual.
5. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 33*.
6. Check the deck height before installing the drapers. For instructions, refer to *5.7.5 Adjusting Deck Height, page 186*.
7. Apply talc, baby powder, or talc/graphite lubricant mix to the draper surface that forms the seal with the cutterbar and to the underside of the draper guides.
8. 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.
9. Feed in the draper until it can be wrapped around the drive roller.
10. Insert the opposite end of the draper into the deck over the rollers. Pull the draper fully into the deck.

Figure 5.107: Installing Draper

11. Loosen mounting bolts (B) on rear deck deflector (A) (this may help with draper installation).

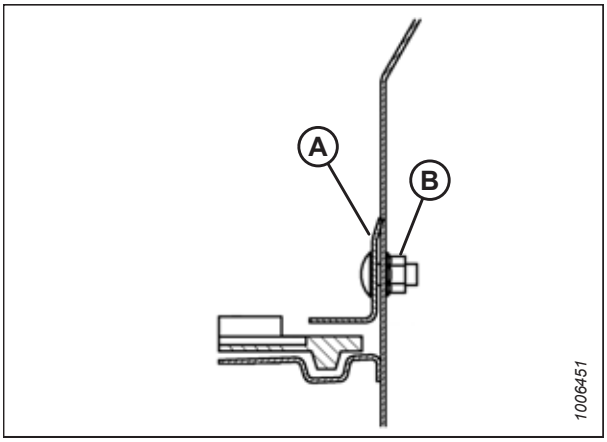


Figure 5.108: Draper Seal

12. Attach the ends of the draper with tube connectors (B), screws (A) (with the heads facing the center opening), and nuts.
13. Adjust the draper tension. For instructions, refer to *5.7.3 Adjusting Draper Tension, page 182*.

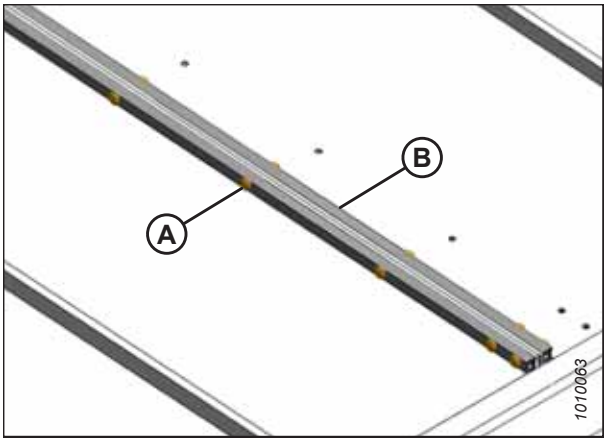


Figure 5.109: Draper Joint

14. Check the draper seal between the drapers and the cutterbar. Ensure there is a 1–2 mm (0.04–0.08 in.) gap (A) between cutterbar (C) and draper (B).
15. Refer to *5.7.5 Adjusting Deck Height, page 186* to achieve the proper gap.

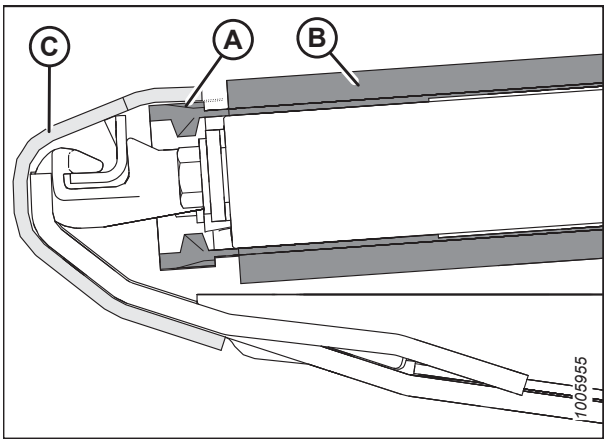


Figure 5.110: Draper Seal

16. Adjust backsheet deflector (A) (if required) by loosening nut (D) and moving the deflector until there is a 1–7 mm (3/64–9/32) gap (C) between draper (B) and the deflector.

17. Operate the drapers with the engine at idle so the talc or talc/graphite lubricant makes contact and adheres to the draper seal surfaces.

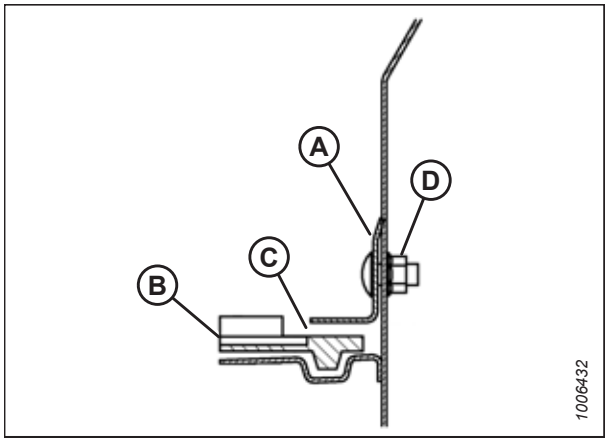


Figure 5.111: Draper Seal

5.7.3 Adjusting Draper Tension

The drapers are tensioned at the factory and should NOT require adjustment. If adjustment is required, draper tension should be just enough to prevent slipping and to keep the draper from sagging below the cutterbar.

DANGER

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

1. Ensure white indicator bar (A) is at the halfway point in the window.

DANGER

Check to be sure all bystanders have cleared the area.

2. Start the engine.

3. Raise the header fully.

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

5. Engage the header safety props. For instructions, refer to the windrower operator's manual.

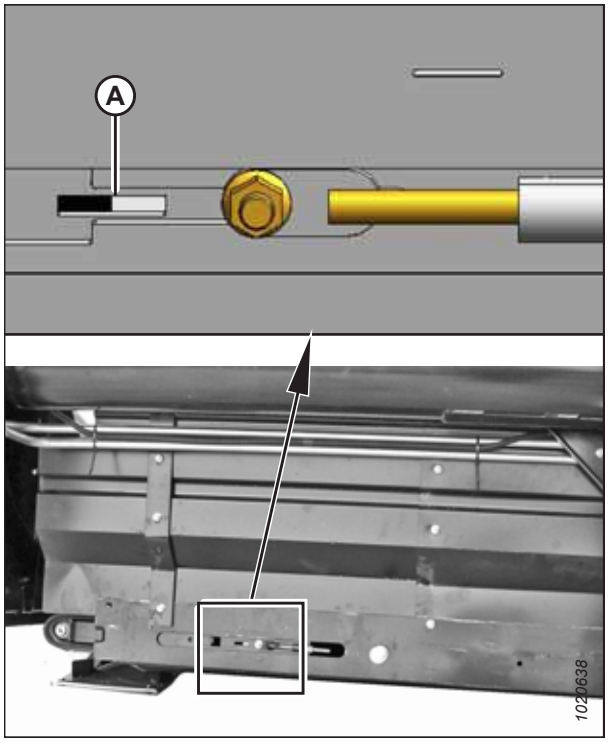


Figure 5.112: Left Adjuster Shown – Right Opposite

6. Ensure the draper guide (the rubber track on the underside of the draper) is properly engaged in groove (A) on the drive roller.

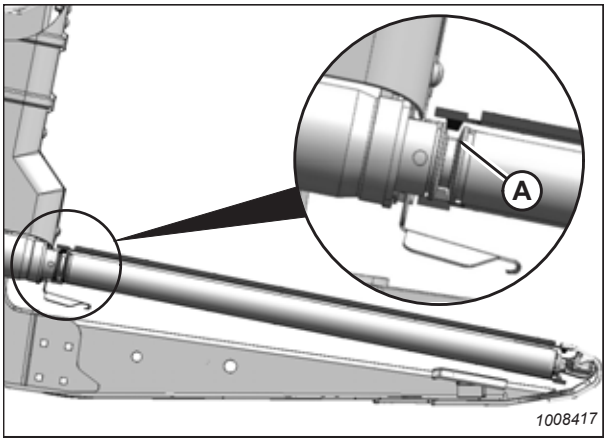


Figure 5.113: Drive Roller

7. Ensure idler roller (A) is between draper guides (B).

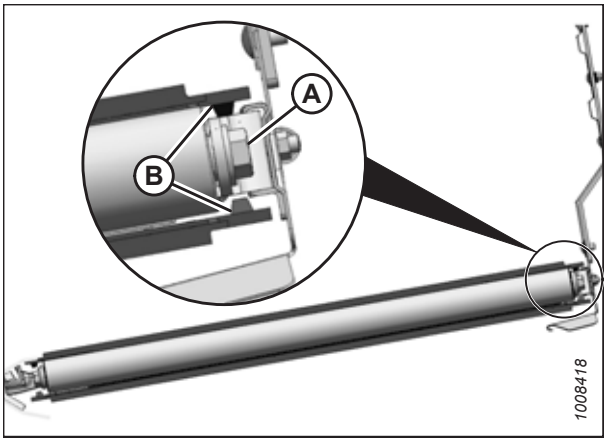


Figure 5.114: Idler Roller

IMPORTANT:

Do **NOT** adjust nut (C). This nut is used for draper alignment only.

8. Turn adjuster bolt (A) counterclockwise to loosen the draper. White indicator bar (B) will move outboard in the direction of arrow (D) to indicate that the draper is loosening. Loosen the draper until the white indicator bar is at the halfway point in the window.

9. Turn adjuster bolt (A) clockwise to tighten the draper. White indicator bar (B) will move inboard in the direction of arrow (E) to indicate that the draper is tightening. Tighten the draper until the white indicator bar is at the halfway point, on the right side of the window.

   IMPORTANT:

   - To avoid premature failure of the draper, draper rollers, and/or tightener components, do **NOT** operate with the tension set so the white bar is not visible.
   - To prevent scooping dirt, ensure the draper is tight enough that it does not sag below the point where the cutterbar contacts the ground.

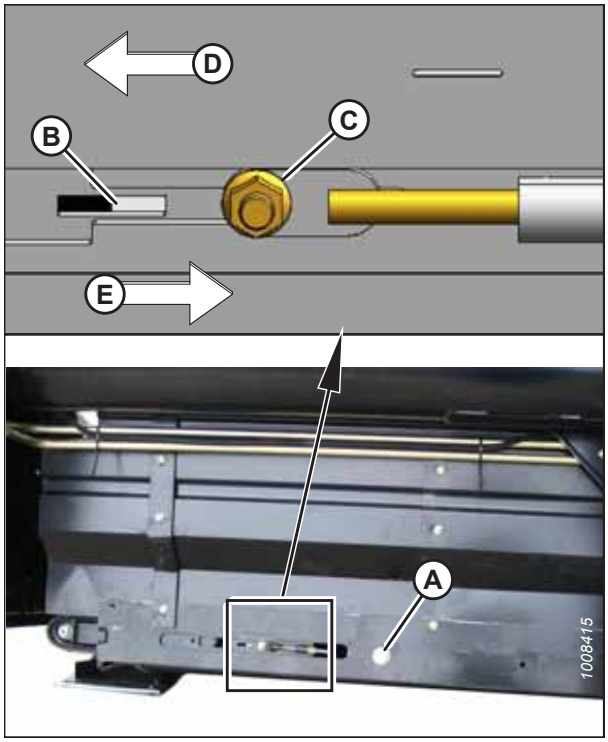


Figure 5.115: Draper Tensioner

5.7.4 Adjusting Side Draper Tracking

The side draper tracking is adjusted by aligning the drive and idler draper rollers.

CAUTION

To avoid personal injury, before servicing machine or opening drive covers, refer to *5.1 Preparing Machine for Servicing, page 119*.

Each draper deck has a fixed drive roller (A) and a spring-loaded idler roller (B) that can be aligned using the adjuster rods so the draper tracks properly on the rollers.

Table 5.1 Side Draper Tracking

Tracking	Location	Adjustment	Method
Backward	Drive roller	Increase **(X)**	Tighten nut
Forward	Drive roller	Decrease **(X)**	Loosen nut
Backward	Idler roller	Increase **(Y)**	Tighten nut
Forward	Idler roller	Decrease **(Y)**	Loosen nut

1. Refer to Table *5.1, page 184* to determine which roller requires adjustment and which adjustments are necessary.

   NOTE:

   To change the distance **(X)**, adjust the back end of the roller using the adjuster mechanism at the inboard end of the deck.

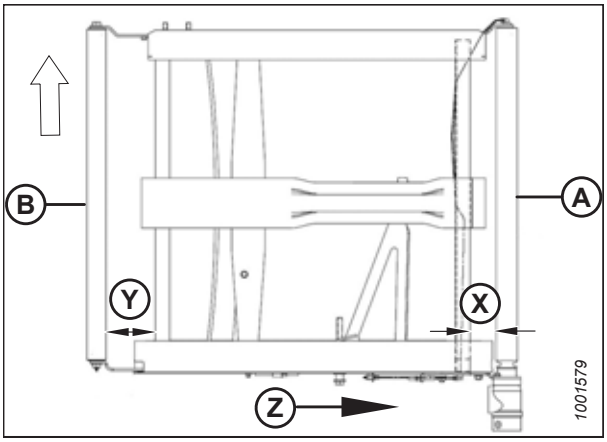


Figure 5.116: Draper Tracking Adjustments

A - Drive Roller
B - Idler Roller
X - Drive Roller Adjust
Y - Idler Roller Adjust
Z - Draper Rotation Direction

2. Adjust the drive roller distance **(X)** as follows:

   a. Loosen nuts (A) and jam nut (B).

   b. Turn adjuster nut (C).

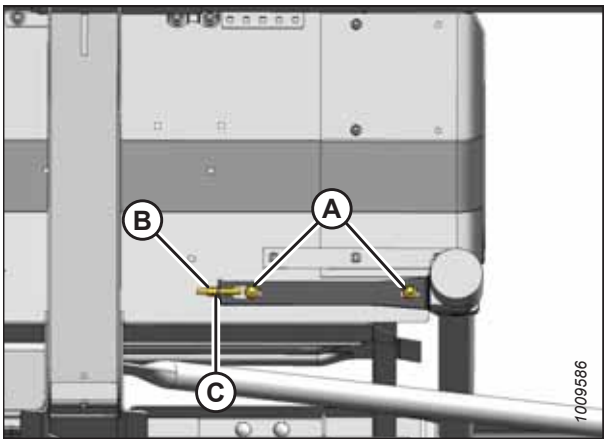


Figure 5.117: Left Drive Roller

3. Adjust the idler roller distance **(Y)** 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.

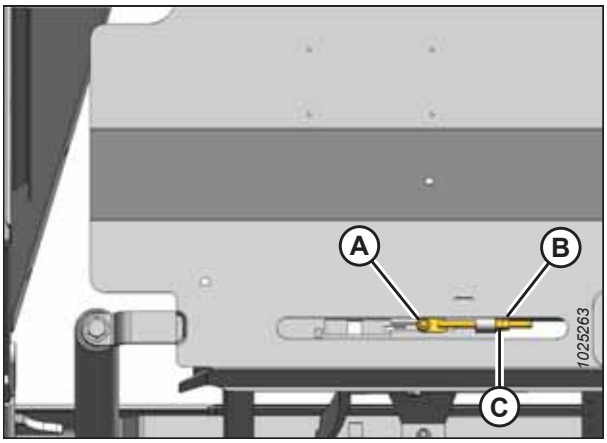


Figure 5.118: Left Idler Roller

5.7.5 Adjusting Deck Height

The draper seal is the gap between the draper and the cutterbar. It should be inspected before the draper is operated to prevent potential damage to the draper system.

DANGER

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

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:

The draper seal is set to 0–3 mm (0–1/8 in.) at the factory to prevent material from entering into the side drapers and stalling them. Whenever you are installing new drapers, the draper seal **MUST** be set to at least 1 mm (1/16 in.). This is because new drapers are very tacky and can cause material to accumulate on the underside of the cutterbar, which can cause the draper to rub against the cutterbar and thereby cause the hydraulic pressure in the draper circuit to increase to dangerous levels. A gap of 1–3 mm (1/16–1/8 in.) is acceptable. Follow this procedure to check the gap; adjust the gap if necessary.

1. Lower the header onto blocks.
2. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 33*.
3. Shut down the engine, and remove the key from the ignition.
4. Ensure that clearance (A) between draper (B) and cutterbar (C) is 1–3 mm (1/16–1/8 in.).

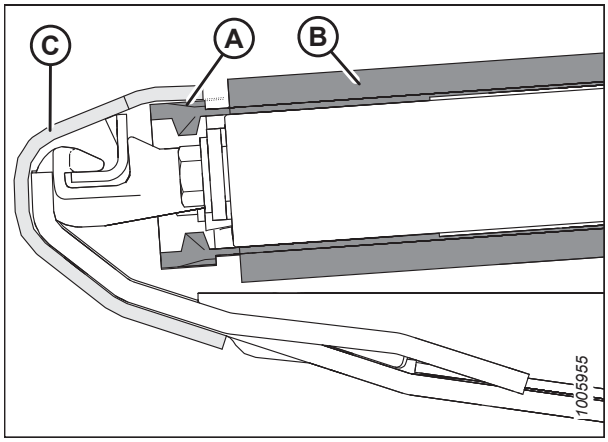


Figure 5.119: Draper Seal

5. Measure the clearance between the draper and the cutterbar at deck supports (A). For instructions, refer to Step *4, page 186*.

6. Reduce the tension on the draper. For instructions, refer to *5.7.3 Adjusting Draper Tension, page 182*.

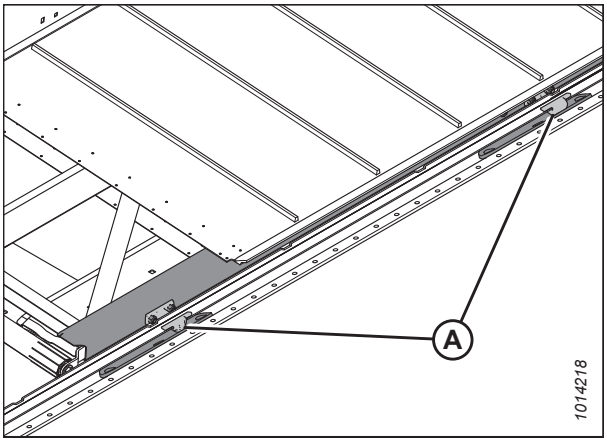


Figure 5.120: Draper Deck Supports

7. Lift the front edge of draper (A) past cutterbar (B) to expose the deck support.

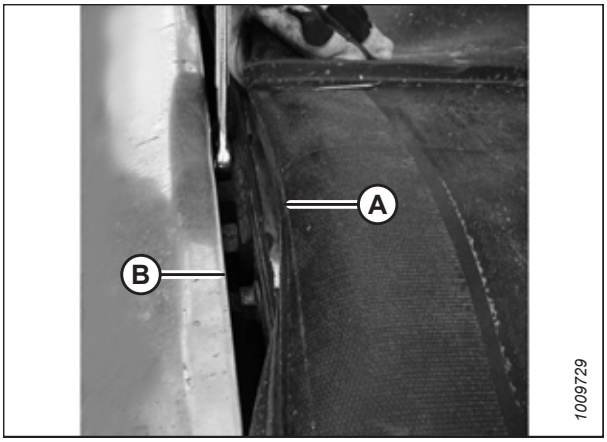


Figure 5.121: Deck Adjustment

8. Loosen two lock nuts (A) on deck support (B) by one half-turn **ONLY**.

   NOTE:

   The deck is shown with the draper removed in the illustration at right. The number of deck supports depends on the width of the header.

9. To lower the deck relative to the deck supports, tap deck (C) with a hammer. To raise the deck relative to the deck supports, tap deck support (B) using a hammer and punch.

10. Measure the thickness of the draper belt.

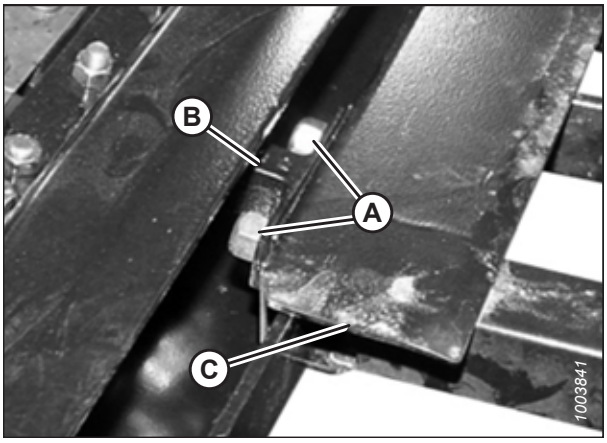


Figure 5.122: Deck Support

11. Locate a feeler gauge of the same thickness as the draper belt plus 1 mm (1/16 in.).
12. Slide the feeler gauge along deck (A) under the cutterbar in order to properly set the gap.
13. To create a seal, adjust deck (A) so that clearance (B) between cutterbar (C) and the deck is the same thickness as the draper belt plus 1 mm (1/16 in.).

    NOTE:

    When checking the clearance at either roller, measure the gap beginning at the roller tube, **NOT** the deck.
14. Tighten deck support hardware (D).
15. Recheck gap (B) with a feeler gauge. For instructions, refer to Step *11, page 188*.
16. Repeat Step *8, page 187* to Step *15, page 188* for each draper deck support requiring adjustment.
17. Tension the draper. For instructions, refer to *5.7.3 Adjusting Draper Tension, page 182*.
18. If necessary, adjust backsheet deflector (A) by loosening nut (D) and moving the deflector until there is a 1–7 mm (1/16–1/4 in.) gap (indicated by callout [C]) between draper (B) and the deflector.

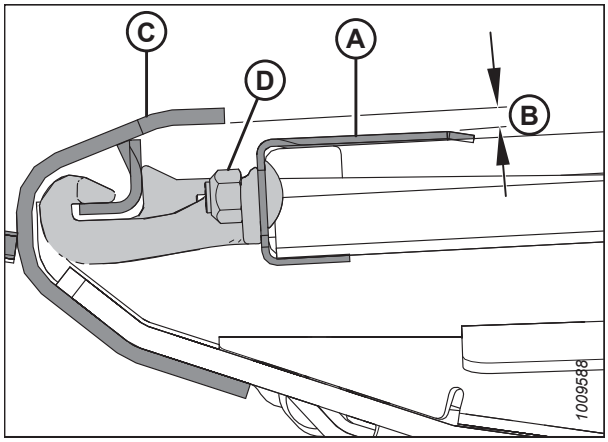


Figure 5.123: Deck Support

DANGER

Ensure that all bystanders have cleared the area.

19. Disengage the reel safety props. For instructions, refer to *Disengaging Reel Safety Props, page 34*.
20. Lower the reel fully.
21. Shut down the engine, and remove the key from the ignition.

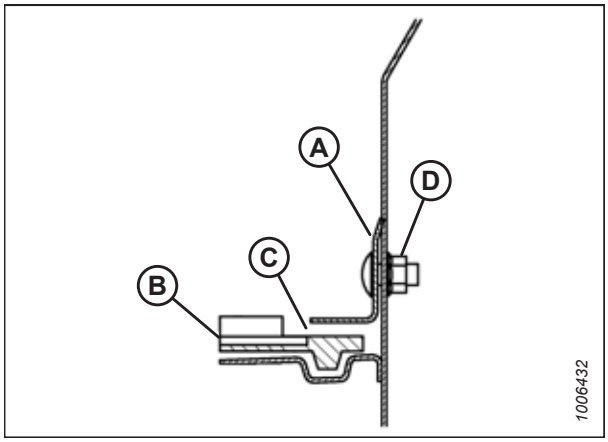


Figure 5.124: Backsheet Deflector

5.7.6 Side 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

Check for damaged draper roller bearings using an infrared thermometer 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.

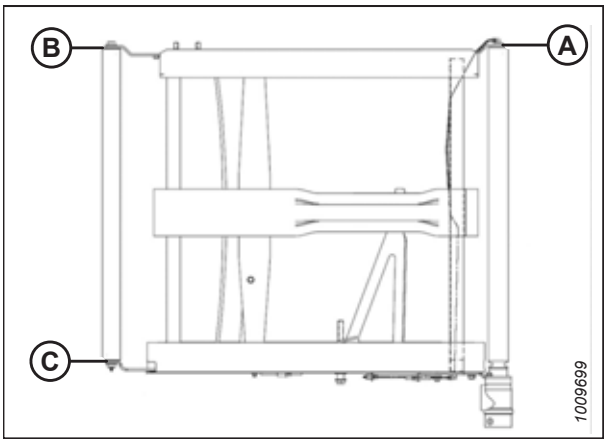


Figure 5.125: Roller Arms

Removing Draper Idler Roller

The feed draper idler roller needs to be removed when repairing or replacing it.

DANGER

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

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.

NOTE:

If the draper joint is not visible, engage the header until the connector is accessible (preferably close to the outboard end of the deck).

1. Start the engine.
2. Raise the header fully.
3. Raise the reel fully.
4. Shut down the engine, and remove the key from the ignition.
5. Engage the header safety props. For instructions, refer to the windrower operator's manual.
6. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 33*.

7. Loosen the draper by turning adjuster bolt (A) counterclockwise.

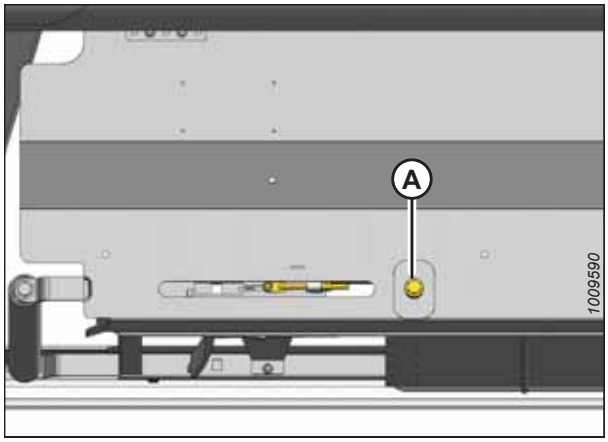


Figure 5.126: Tensioner

8. Remove screws (A), tube connectors (B), and nuts from the draper joint to uncouple the draper.
9. Pull the draper off the idler roller.

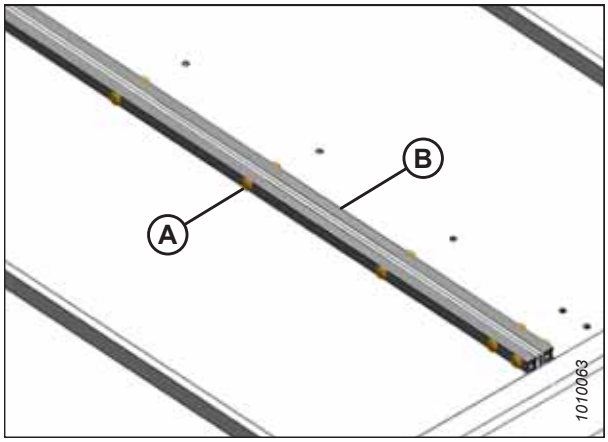


Figure 5.127: Draper Joint

10. Remove bolts (A) and washers at the ends of the idler roller.
11. Spread roller arms (B) and (C) and remove the idler roller.

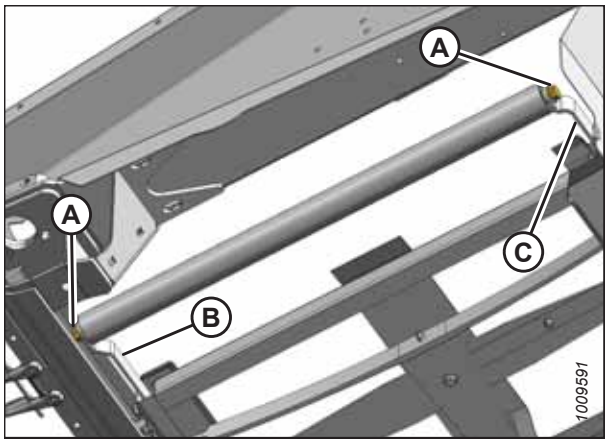


Figure 5.128: Idler Roller

Replacing Draper Idler Roller Bearing

The bearing helps the roller turn. The bearing needs to be removed when replacing it.

1. Remove the draper idler roller assembly. For instructions, refer to *Removing Draper Idler Roller, page 189*.

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 it if necessary.

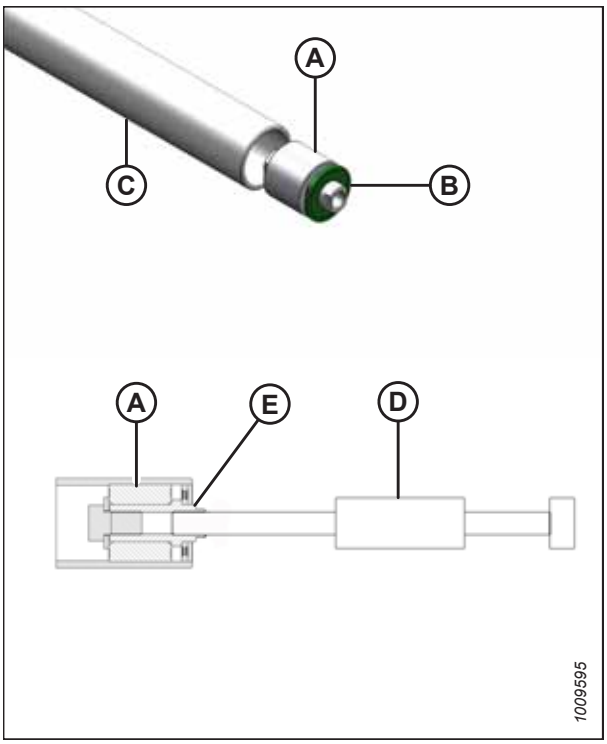


Figure 5.129: Idler Roller Bearing

4. Install new bearing assembly (A) by pressing the outer race of the bearing into the tube until it is 14–15 mm (0.55–0.2 in.) (B) from the outside edge of the tube.

5. Add approximately 8 cc or two pumps of grease in front of bearing assembly (A). Refer to the inside back cover for specifications.

6. Install new seal (C) at the roller opening.

7. Tap seal (C) into the roller opening with a suitably sized socket until gap (D) between the seal and the outside edge of the tube is 3–4 mm (0.12–0.16 in.).

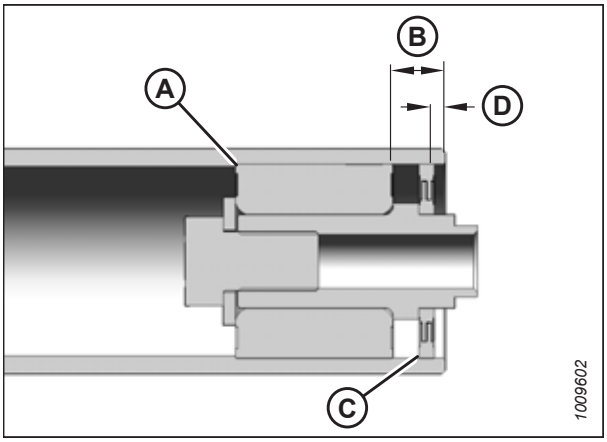


Figure 5.130: Idler Roller Bearing

Installing Draper Idler Roller

The roller needs to be installed after it has been repaired or replaced

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 them 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 *5.7.2 Installing Side Drapers, page 180*.
5. Run the machine and verify the draper tracks correctly. Adjust the draper tracking if required. For instructions, refer to *5.7.4 Adjusting Side Draper Tracking, page 184*.

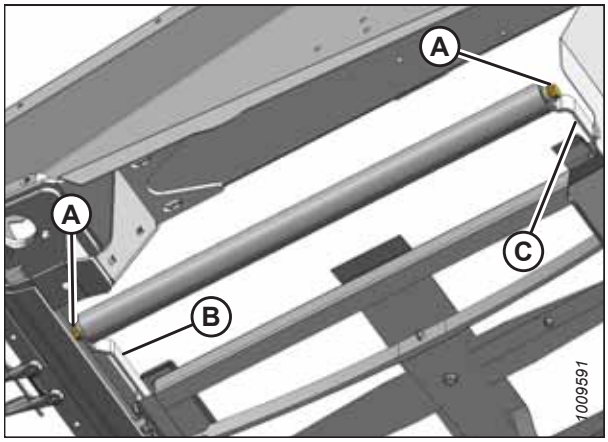


Figure 5.131: Idler Roller

Removing Draper Deck Drive Roller

The roller needs to be removed when repairing or replacing it.

DANGER

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

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.

NOTE:

If the draper joint is not visible, engage the header until the connector is accessible (preferably close to the outboard end of the deck).

1. Raise the reel fully.
2. Raise the header fully.
3. Shut down the engine, and remove the key from the ignition.
4. Engage the header safety props. For instructions, refer to the windrower operator's manual.
5. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 33*.

6. Loosen the draper by turning adjuster bolt (A) counterclockwise.

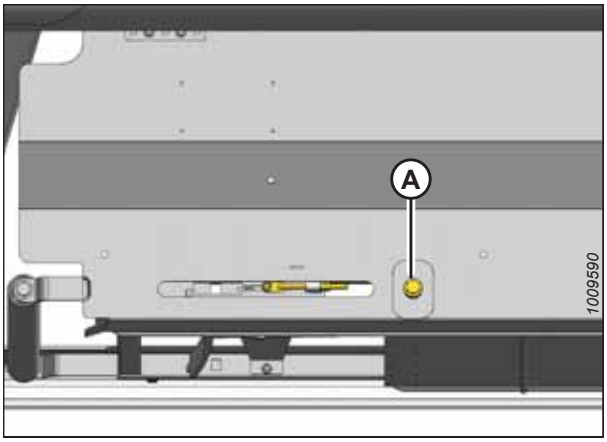


Figure 5.132: Tensioner

7. Remove connectors (B), screws (A), and nuts from the draper joint to uncouple the draper.
8. Pull the draper off the drive roller.

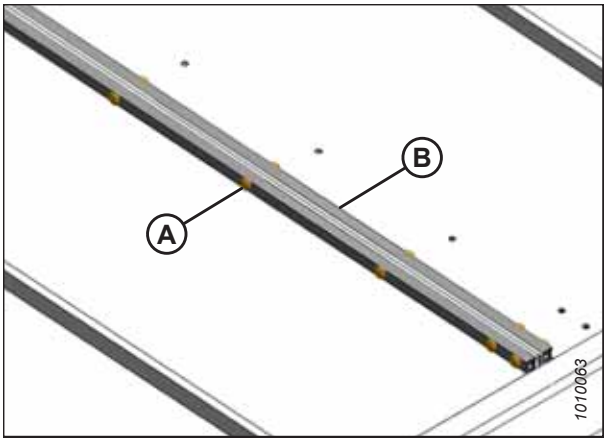


Figure 5.133: Draper Joint

9. 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.

10. 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.

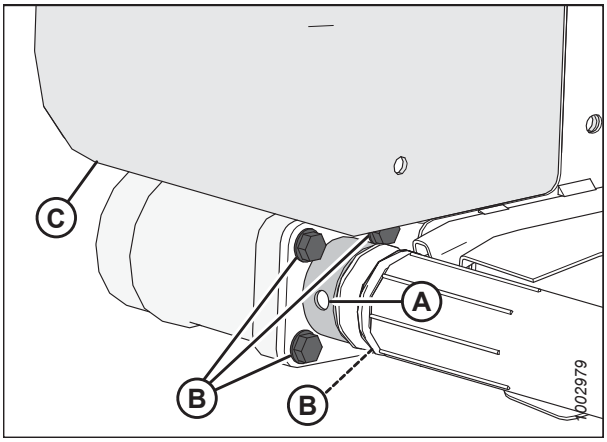


Figure 5.134: Drive Roller

11. Remove bolt (A) securing the opposite end of drive roller (B) to the support arm.
12. Remove drive roller (B).

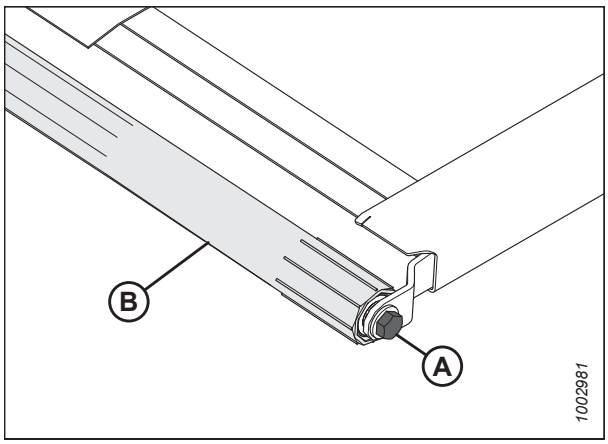


Figure 5.135: Drive Roller

Replacing Draper Drive Roller Bearing

You will need a slide hammer to remove and replace the bearing on a drive roller.

1. Remove the draper drive roller assembly. For instructions, refer to *Removing Draper Deck Drive Roller, page 192*.
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 it if necessary.

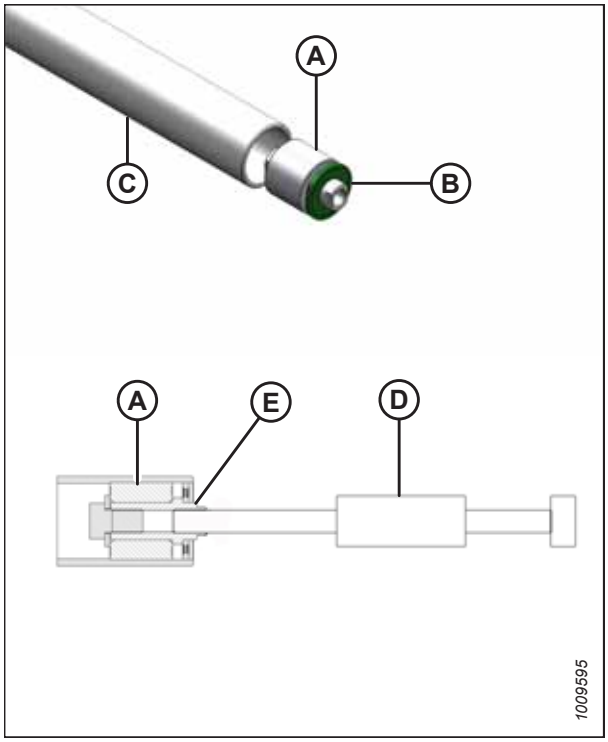


Figure 5.136: Drive Roller Bearing

4. Install new bearing assembly (A) by pressing the outer race of the bearing into the tube until it is 14–15 mm (0.55–0.2 in.) (B) from the outside edge of the tube.
5. Add approximately 8 cc or two pumps of grease in front of bearing assembly (A). Refer to the inside back cover for specifications.
6. Install new seal (C) at the roller opening.
7. Tap seal (C) into the roller opening with a suitably sized socket until gap (D) between the seal and the outside edge of the tube is 3–4 mm (0.12–0.16 in.).

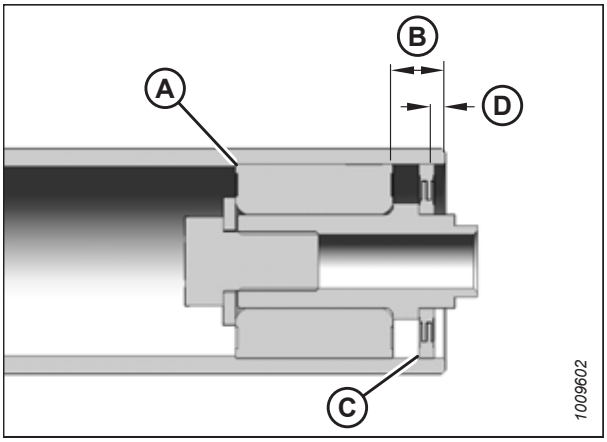


Figure 5.137: Drive Roller Bearing

Installing Draper Deck Drive Roller

The draper deck has a roller on either end of the deck. One is the idler roller and one is the drive roller.

1. Position drive roller (B) between the roller support arms.
2. Attach roller (B) to the arm at the forward end of the deck with bolt (A). Support the other end of the roller and torque bolt (A) to 95 Nm (70 lbf·ft).
3. Grease the motor shaft and insert it into the end of drive roller (B).

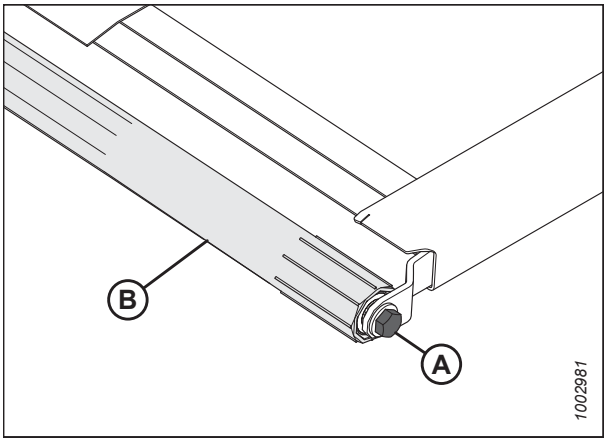


Figure 5.138: Drive Roller

4. Secure the motor to the roller support with four bolts (B). Torque the bolts to 27 Nm (20 lbf·ft).
5. Tighten any loosened bolts and reinstall plastic shield (C) if previously removed.
6. 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.

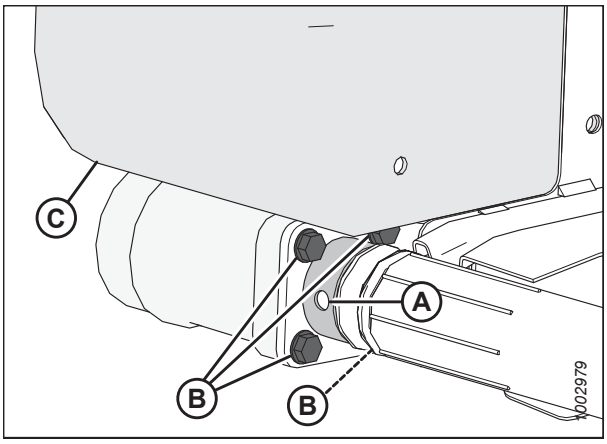


Figure 5.139: Drive Roller

7. Wrap the draper over the drive roller and attach the ends of the draper together using tube connectors (B), screws (A), and nuts.

   NOTE:

   The heads of the screws must face the center opening.

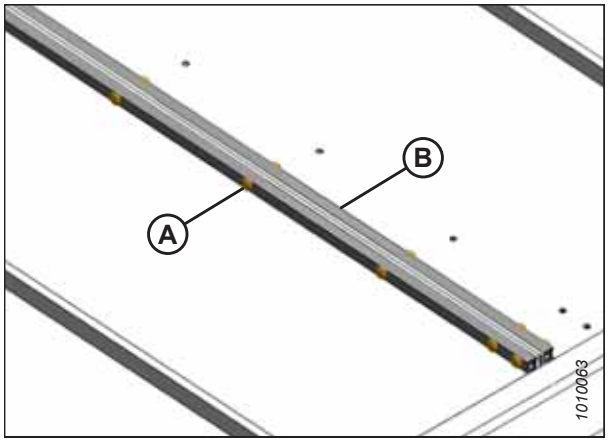


Figure 5.140: Draper Joint

8. Tension the draper. Locate adjuster bolt (A) and follow the directions on the decal for the proper draper tensioning or refer to *5.7.3 Adjusting Draper Tension, page 182*.
9. Disengage the reel and header safety props.
10. Start the engine, and lower the header and reel.
11. Run the machine to verify the draper tracks correctly. If adjustment is necessary, refer to *5.7.4 Adjusting Side Draper Tracking, page 184*.

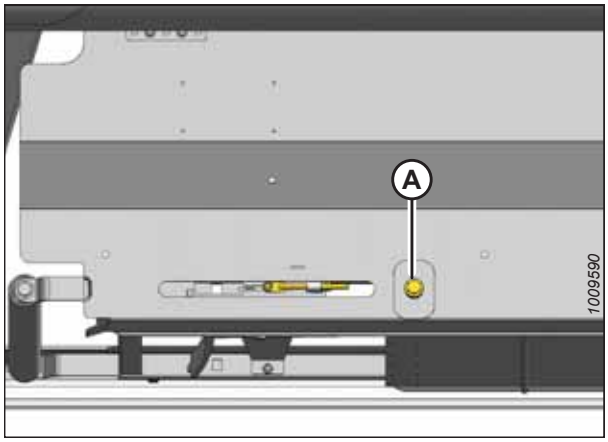


Figure 5.141: Draper Tensioner

5.7.7 Replacing Draper Deflectors

Removing Wide Draper Deflectors

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. Lower the header fully.
3. **If hydraulic deck shift is installed:** Shift the decks to create work space at one end of the header.
4. Shut down the engine, and remove the key from the ignition.
5. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 33*.
6. **If hydraulic deck shift is NOT installed:** Move the decks manually to create work space at one end of the header.

7. Open the endshield. For instructions, refer to *Opening Endshield, page 35*.

8. Loosen nuts (A) on the cutterbar until retainer (B) is loose.

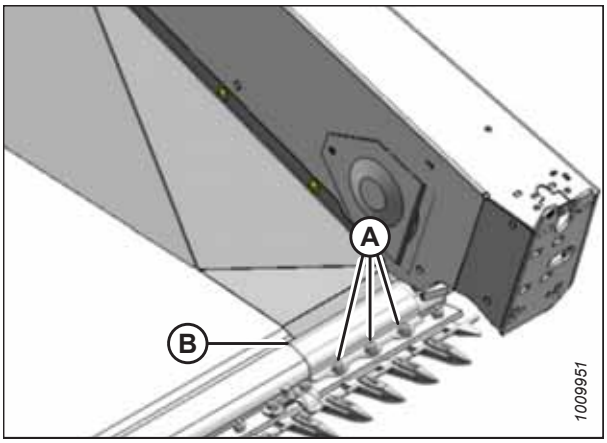


Figure 5.142: Deflector Retainer

9. Remove fasteners securing the deflector to the endsheet. Nuts (A) are accessible from the side of the endshield, and nuts (B) on the uppermost fasteners are accessible from behind deflector (C).

10. Remove deflector (C).

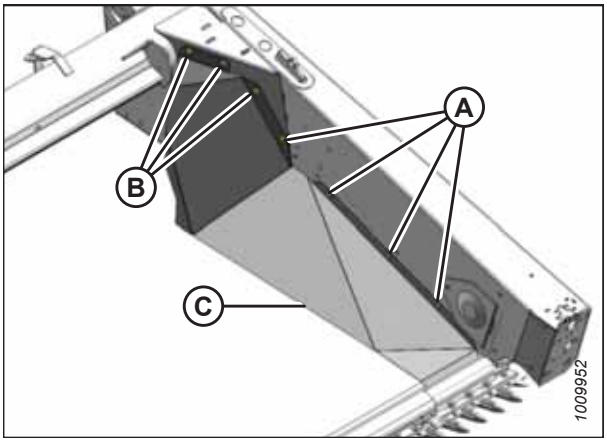


Figure 5.143: Wide Deflector

11. Remove bolts (A) and (D), and remove deflector support (B).

12. Reinstall bolt (D) (if not reinstalling support [B]) to secure belt guide (C) to the opposite side of the endsheet. Otherwise, position support (B) as shown, and secure it with bolt (D).

13. Repeat this procedure at the opposite end of the header.

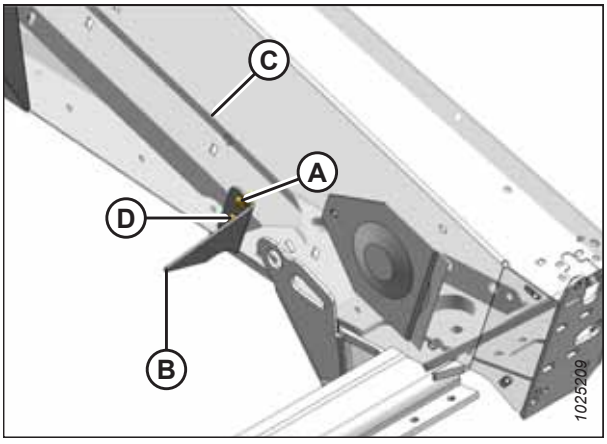


Figure 5.144: Deflector Support

Installing Wide Draper Deflectors

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. Lower the header fully.
3. **If hydraulic deck shift is installed:** Shift the decks to create work space at one end of the header.
4. Shift the decks to allow work space at one end of the header if hydraulic deck shift is installed. Otherwise, move the decks manually after shutting down the windrower.
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. **If hydraulic deck shift is NOT installed:** Move the decks manually to create work space at one end of the header.
8. Open the endshield. For instructions, refer to *Opening Endshield, page 35*.
9. Loosen bolts (A) on the cutterbar until retainer (B) is loose.
10. Remove the existing bolt that secures belt guide (C) on the opposite side of the endsheet.
11. Position support (D) as shown, and reinstall bolt (E) with the nut on the far side.
12. Install a second 3/8 in. x 3/4 carriage bolt (F) and lock nut. Do **NOT** tighten the bolts.

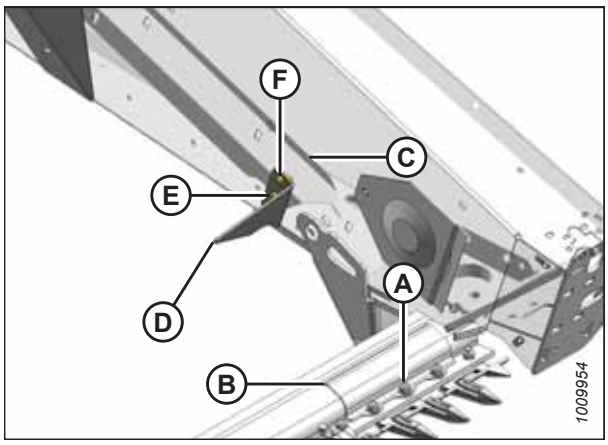


Figure 5.145: Deflector Support

13. Position deflector (A) as shown and adjust the forward edge for best fit on the cutterbar. Slide the deflector under retainer (B).
14. Loosely install seven 3/8 in. x 3/4 carriage bolts (C) with lock nuts to attach the deflector to the endsheet. Bolt heads must face inboard.
15. Adjust the position of the deflector to obtain the best fit at the cutterbar and the aft edge. Tighten bolts (C) as required to maintain the best fit.
16. Tighten bolts (D) on retainer (B). Torque the bolts to 88 Nm (65 lbf·ft).

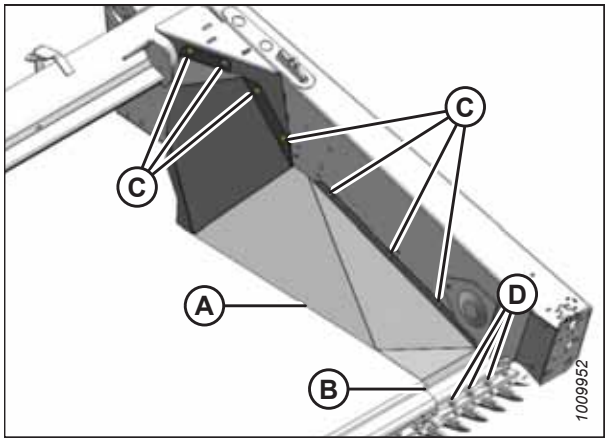


Figure 5.146: Wide Deflector

17. Adjust the position of support (A) so that the tip contacts deflector (B). Tighten bolts (C).
18. Repeat the above steps for the opposite end.
19. Close the endshield. For instructions, refer to *Closing Endshield, page 36*.
20. After setting the recommended reel clearance to the cutterbar and while the reel is still fully lowered, move the reel back to ensure the steel end fingers do **NOT** contact the deflector shields.

    NOTE:

    If contact is detected, adjust the reel upward until contact with the deflector shields is avoided at all reel fore/aft positions. Alternatively, with the reel fully lowered, trim the steel end fingers until contact with the deflector shields is avoided at all reel fore/aft positions. Periodically monitor them to ensure contact is avoided and repeat the adjustment procedure if necessary.

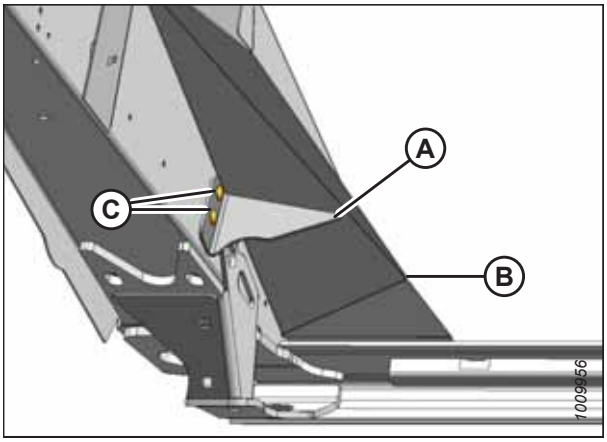


Figure 5.147: Deflector Support

Removing Narrow Draper Deflectors

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. Lower the header fully.
3. **If hydraulic deck shift is installed:** Shift the decks to create work space at one end of the header.
4. Shut down the engine, and remove the key from the ignition.
5. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 33*.
6. **If hydraulic deck shift is NOT installed:** Move the decks manually to create work space at one end of the header.

7. Open the endshield. For instructions, refer to *Opening Endshield, page 35*.
8. Remove two Torx® head screws (A) and lock nuts.
9. Remove three carriage bolts (B) and lock nuts, and remove aft deflector (C).

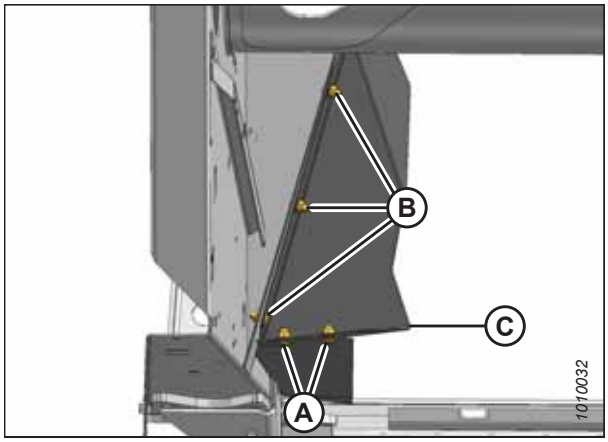


Figure 5.148: Aft Deflector

10. Remove four screws (A) and remove deflector (B).
11. Repeat this procedure for the opposite end of the header.

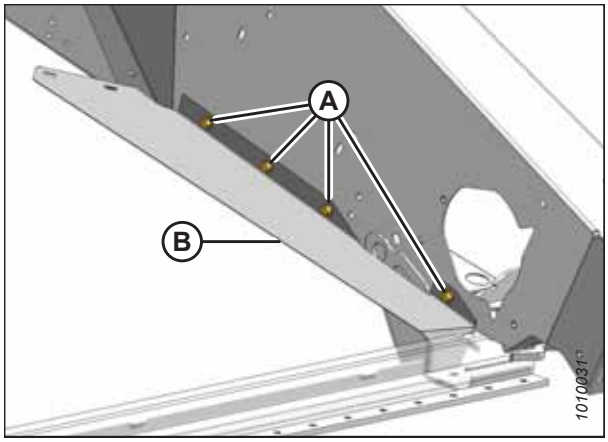


Figure 5.149: Forward Deflector

Installing Narrow Draper Deflectors

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. Lower the header fully.
3. **If hydraulic deck shift is installed:** Shift the decks to create work space at one end of the header.
4. Shut down the engine, and remove the key from the ignition.
5. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 33*.
6. **If hydraulic deck shift is NOT installed:** Move the decks manually to create work space at one end of the header.
7. Open the endshield. For instructions, refer to *Opening Endshield, page 35*.

8. Position forward deflector (B) onto the endsheet and temporarily install forward and aft 3/8 in. x 5/8 in. self-tapping screws (A).
9. Check the fit of the forward end of deflector (B) on the cutterbar and ensure there is no gap between the deflector and cutterbar. Remove and bend the deflector as required to obtain the best fit.
10. Install two 3/8 in. x 5/8 in. self-tapping screws (C), then tighten all four screws (A) and (C).

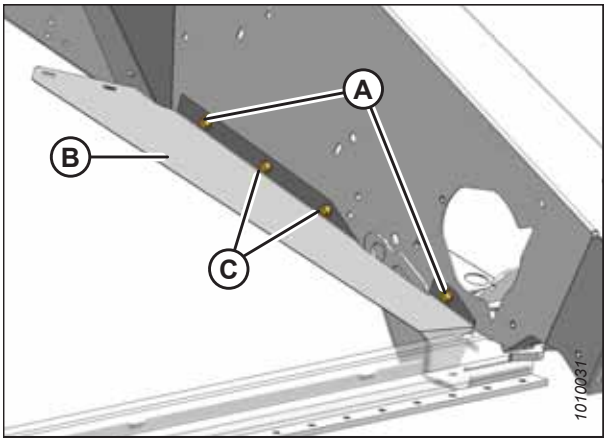


Figure 5.150: Forward Deflector

11. Position aft deflector (C) as shown and install three 3/8 in. x 3/4 in. carriage bolts (B) and lock nuts.
12. Install two Torx® head screws (A) and lock nuts with the heads facing down.
13. Tighten all fasteners.
14. Repeat this procedure for the opposite end of the header.

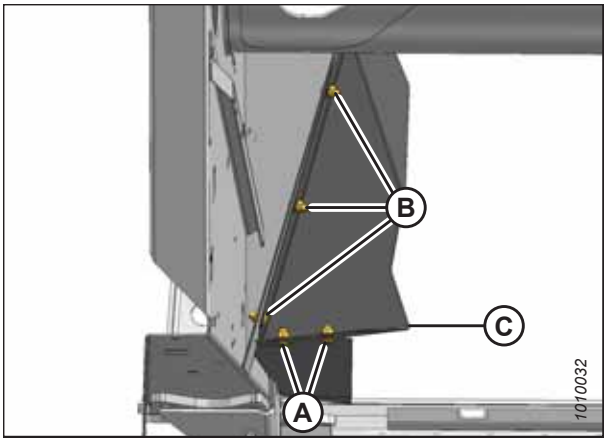


Figure 5.151: Aft Deflector

5.8 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 119*.

5.8.1 Reel Clearance to Cutterbar

The minimum clearance between the reel fingers and the cutterbar ensures that reel fingers do not contact cutterbar during operation. The clearance is set at the factory, but some adjustment may be necessary before operation or if there is evidence of contact during operation.

The finger to guard/cutterbar clearances with the reel fully lowered are shown in Table *5.2, page 202*.

Table 5.2 Finger to Guard/Cutterbar Clearance

	(X) +/- 3 mm (1/8 in.) at Reel Ends	
Header Width	**Single Reel**	**Double Reel**
4.6 m (15 ft.)	20 mm (3/4 in.)	–
6.1 m (20 ft.)	20 mm (3/4 in.)	–
7.6 m (25 ft.)	25 mm (1 in.)	–
9.1 m (30 ft.)	45 mm (1-3/4 in.)	20 mm (3/4 in.)
10.7 m (35 ft.)	60 mm (2-3/8 in.)	20 mm (3/4 in.)
12.2 m (40 ft.)	–	20 mm (3/4 in.)

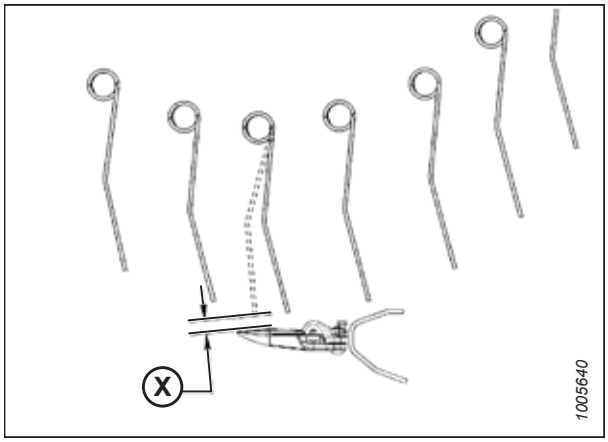


Figure 5.152: Finger Clearance

Measuring Reel Clearance

Make sure there is sufficient clearance between the reel and the cutterbar to prevent the knife from cutting the reel finger tips off during operation.

DANGER

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

1. Park machine on level ground.

2. Set the fore-aft position to middle position 5 on fore-aft position indicator decal (A).
3. Lower the reel fully.
4. Shut down the engine, and remove the key from the ignition.

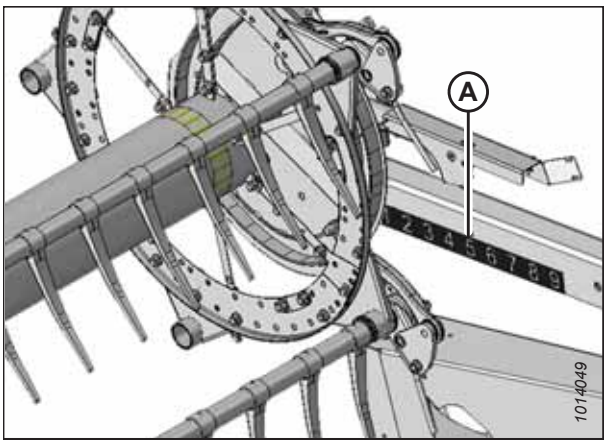


Figure 5.153: Fore-Aft Position

5. Measure the clearance at the ends of each reel at locations (A).

   NOTE:

   The reel is factory-set to provide more clearance at the center of the reel than at the ends to compensate for reel flexing.

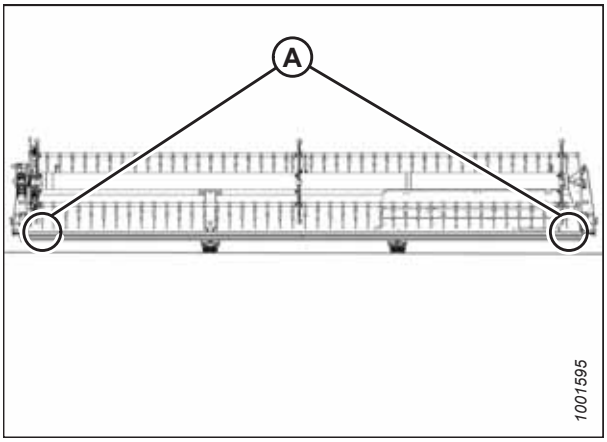


Figure 5.154: Single-Reel Header

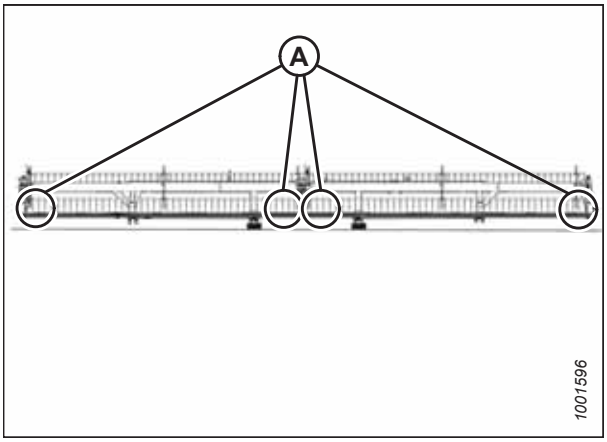


Figure 5.155: Double-Reel Header

6. Check finger clearance (X) when positioned between locations (A) and (B). Depending on the reel fore-aft position, the minimum clearance can result at the guard tine, hold-down, or cutterbar. For finger clearance measurements, refer to Table *5.2, page 202*.

7. Adjust the reel if necessary. For instructions, refer to *Adjusting Reel Clearance, page 204*.

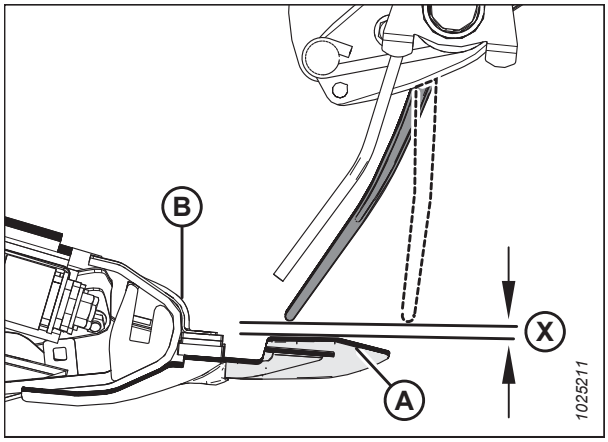


Figure 5.156: Reel Clearance

Adjusting Reel Clearance

Perform this procedure with the reel at the midpoint of the fore-aft range and fully lowered.

DANGER

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

1. Adjust the outboard reel arm lift cylinders to set the clearance as follows:

   a. Loosen bolt (A).

   b. Turn cylinder rod (B) out of the clevis to raise the reel and increase the clearance to the cutterbar, or turn the cylinder rod into the clevis to lower the reel and decrease the clearance.

   c. Tighten bolt (A).

   d. Repeat these steps at the opposite side.

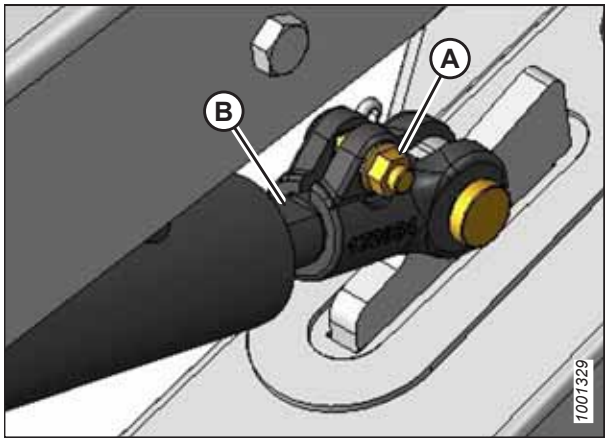


Figure 5.157: Reel Outboard Arm

2. **Double Reel:** Adjust center arm lift cylinder link (A) to set the clearance at the center of the reel as follows:

   NOTE:

   This adjustment is most easily performed from the underside of the arm.

   a. Loosen nut (B).

   b. Turn nut (C) counterclockwise to raise the reel and increase the clearance to the cutterbar, or clockwise to lower the reel and decrease the clearance.

   c. Tighten nut (B).

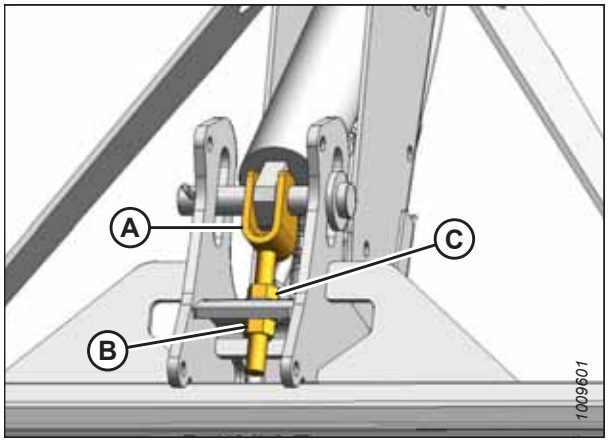


Figure 5.158: Double Reel Center Arm

3. Move the reel back to ensure the steel end fingers do not contact the deflector shields.
4. If contact is evident, adjust the reel upward to maintain the clearance at all reel fore/aft positions. Alternatively, trim the steel end fingers to obtain the proper clearance.
5. Periodically check for evidence of contact, and adjust the clearance as required.

5.8.2 Reel Frown

The reel is factory-set in a frown shape (more clearance at the center of the reel than at the ends) to compensate for reel flexing.

Adjusting Reel Frown

Adjust the reel frown by repositioning the reel tine tubes attached to the reel discs.

NOTE:

Measure the frown profile before disassembling the reel for servicing so the profile can be maintained during reassembly.

1. Position the reel all the way down and over the cutterbar (between position 4 and 5 on fore-aft decal [A]).
2. Record the measurement at each reel disc location for each reel tine tube.

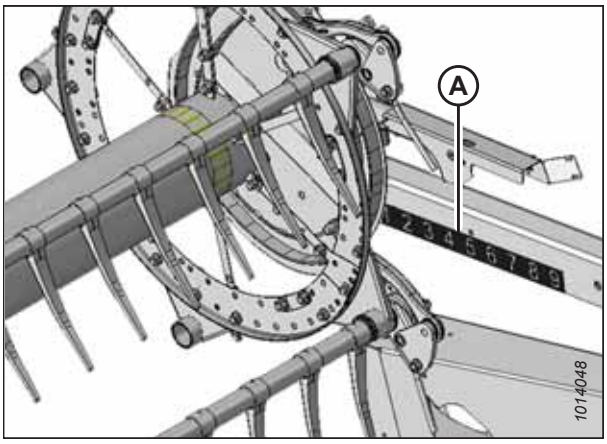


Figure 5.159: Fore-Aft Position Decal

3. Start with the reel disc closest to the center of the header and proceed outward toward 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 tine tube and the cutterbar.

   NOTE:

   Allow the reel tine tubes to curve naturally and position the hardware accordingly.

   c. Reinstall bolts (A) in the aligned holes and tighten them.

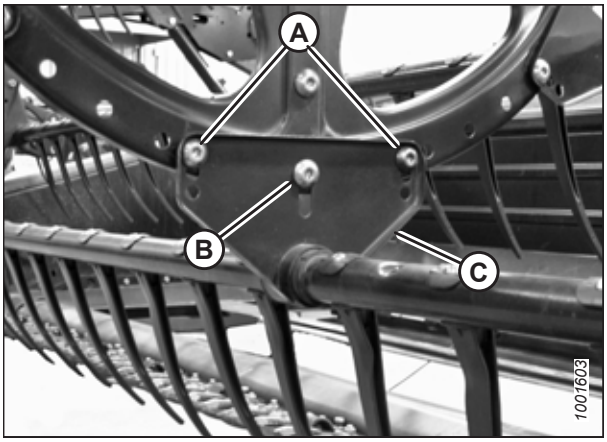


Figure 5.160: Center Reel Arm

5.8.3 Centering Reel

The reel needs to be centered on the header to avoid any contact with the endsheets.

To center the reel, refer to the procedure that applies to your reel configuration:

Centering Double Reel

The reel needs to be centered on the header to avoid any contact with the endsheets.

DANGER

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

1. Start the engine and set the cutterbar height at approximately 150 mm (6 in.) above the ground.
2. Shut down the engine, and remove the key from the ignition.
3. Measure clearances (A) at locations (B) between the reels and the endsheets at both ends of the header. The clearances will be the same if the reels are centered.

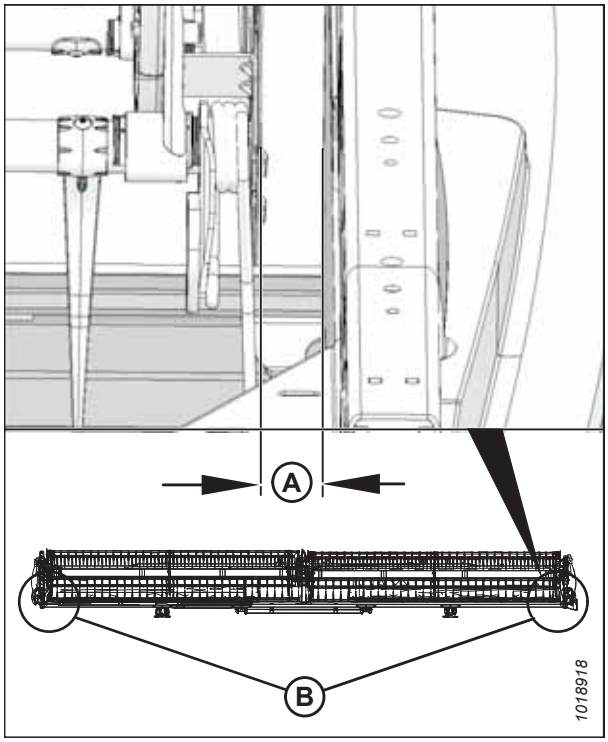


Figure 5.161: Double-Reel Measurement Locations

If adjustment is required:

4. Loosen bolt (A) on each brace (B).
5. Move the forward end of reel center support arm (C) laterally as required to center both reels.
6. Tighten bolts (A) and torque them to 359 Nm (265 lbf·ft).

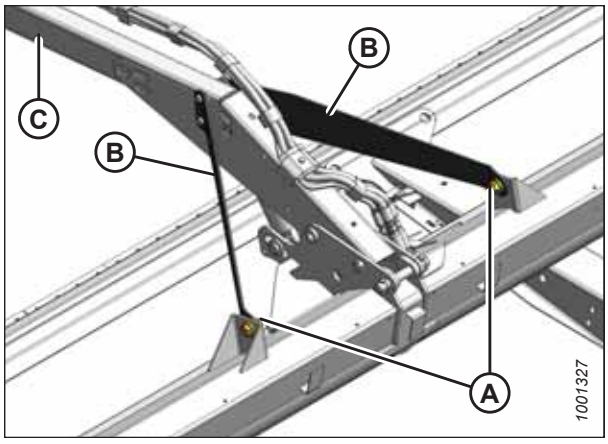


Figure 5.162: Reel Center Support Arm

Centering Single Reel

The reel needs to be centered on the header to avoid any contact with the endsheets.

1. Start the engine and set the cutterbar height at approximately 150 mm (6 in.) above the ground.
2. Lower the reel and adjust the fore-aft position to 5 on the reel arm decal.
3. Shut down the engine, and remove the key from the ignition.
4. Measure clearance (A) at locations (B) between the reel and the endsheet at both ends of the header. The clearances should be the same if the reel is centered.

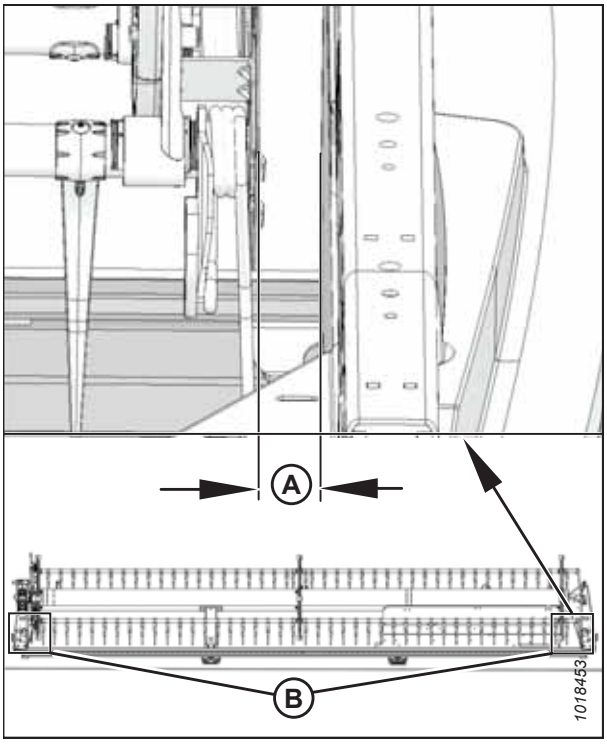


Figure 5.163: Centering the Reel

5. Loosen bolt (A) on brace (B) at both ends of the reel.
6. Move the forward end of reel support arm (C) laterally as required to center the reel.
7. Tighten bolts (A) and torque them to 359 Nm (265 lbf·ft).

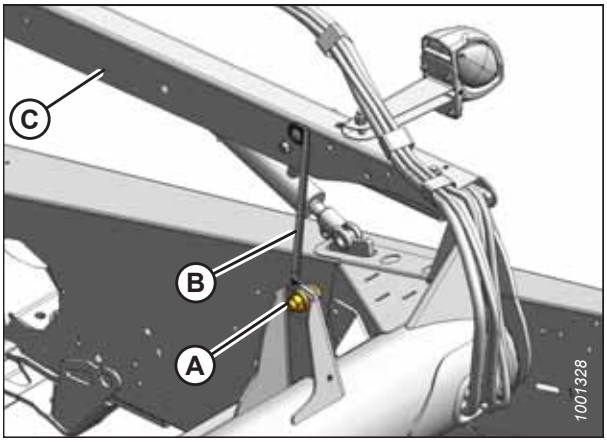


Figure 5.164: Reel Support Arm

5.8.4 Reel Tines and Fingers

If a steel tine or plastic finger is damaged or worn, it will need to be removed so it can be replaced.

IMPORTANT:

Keep the reel tines and fingers in good condition. Straighten or replace them as required.

Removing Steel Tines

Damaged steel fingers will need to be cut off of the reel tine tube.

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.

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.
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 Five-, Six-, or Nine-Bat Reels, page 211*.
6. Attach reel arms (B) (temporarily) to the reel disc at the original attachment locations (A).
7. Cut the damaged tine so it can be removed from the tine tube.
8. Remove the bolts from the existing tines and slide the tines over to replace the tine that was cut off in Step *7, page 208* (remove reel arms [B] from the tine tubes as necessary).

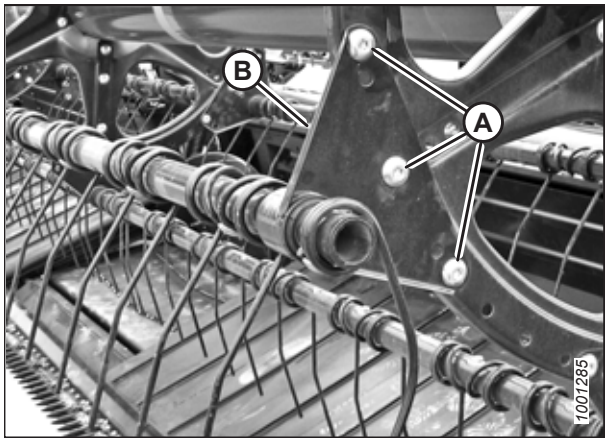


Figure 5.165: Reel Arm

Installing Steel Tines

Once the old steel tine has been removed, a new tine can be pushed onto the tine tube.

DANGER

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

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:

Ensure the tine tube is supported at all times to prevent damage to the tube and other components.

1. Remove the applicable tine. For instructions, refer to *Removing Steel Tines, page 208*.
2. Slide the new tines and reel arm (A) onto the end of the tube.
3. Install the tine tube bushings. For instructions, refer to *Installing Bushings on Five-, Six-, or Nine-Bat Reels, page 216*.
4. Attach the tines to the reel tine tube with bolts and nuts (B).

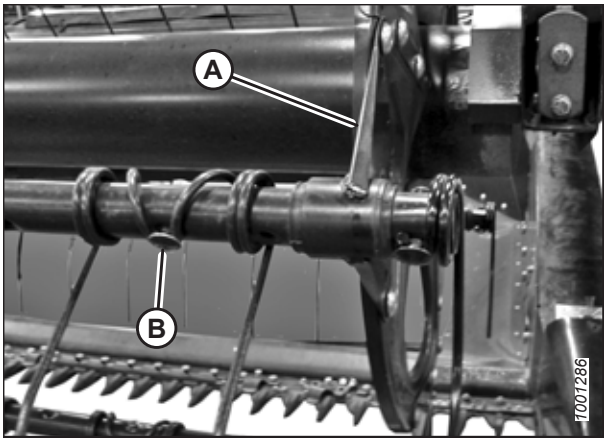


Figure 5.166: Reel Tine Tube

Removing Plastic Fingers

Plastic reel fingers are secured to the tine tube with a single Torx® screw.

DANGER

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

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. Remove screw (A) using a Torx® Plus 27 IP socket wrench.

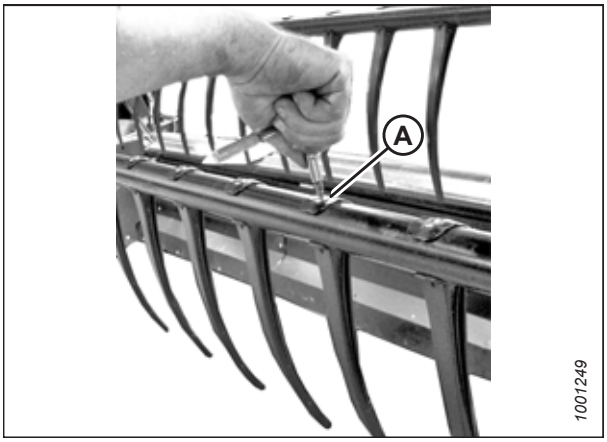


Figure 5.167: Removing Plastic Fingers

2. Push the top of the finger off the reel tine tube while slightly pulling on the tine under the tube. The finger can then be removed.

Figure 5.168: Removing Plastic Fingers

Installing Plastic Fingers

Once the old plastic reel finger has been removed, a new one can be installed.

DANGER

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

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. Position the finger on the rear of the tine tube and 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 until the lug in the top of the finger engages the upper hole in the tine tube.

Figure 5.169: Installing 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 it to 8.5–9.0 Nm (75–80 lbf·in).

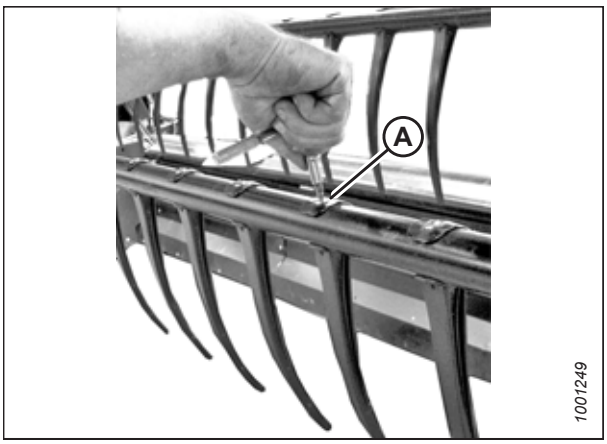


Figure 5.170: Installing Finger

5.8.5 Tine Tube Bushings

The reel tine tube rests in a tine tube bushing, which is secured to the reel disc. If a tine tube bushing is damaged or worn, it will need to be replaced.

Removing Bushings from Five-, Six-, or Nine-Bat Reels

The bushing clamps securing the tine tube to the bushing will need to be released so that the bushing halves can be removed.

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.

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.
4. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 33*.

NOTE:

If replacing only the cam end bushing, refer to Step *10, page 213*.

Removing center disc and tail-end bushings:

5. 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.

6. Remove bolts (A) securing 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.

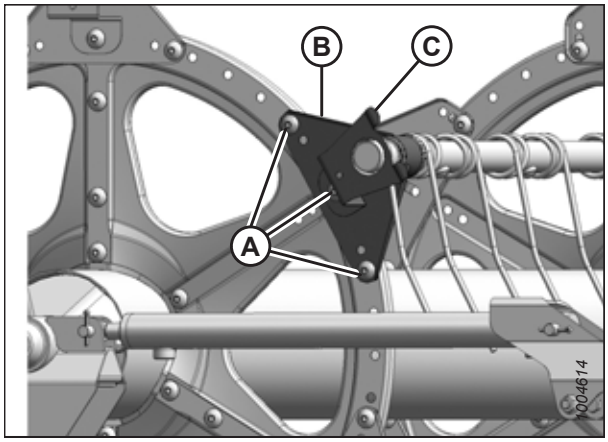


Figure 5.171: Tail End

7. Release bushing clamps (A) using a small screwdriver to separate the serrations. Pull the clamp off the tine tube.

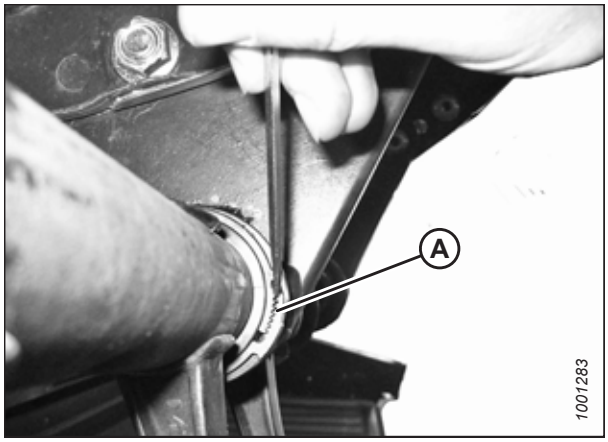


Figure 5.172: Bushing Clamp

8. Rotate arm (A) until it is clear of the disc and slide the arm inboard off of bushing (B).

9. Remove bushing halves (B). If required, remove the next tine or plastic finger so the arm can slide off the bushing. Refer to the following procedures as necessary:

   - *Removing Plastic Fingers, page 209*
   - *Removing Steel Tines, page 208*

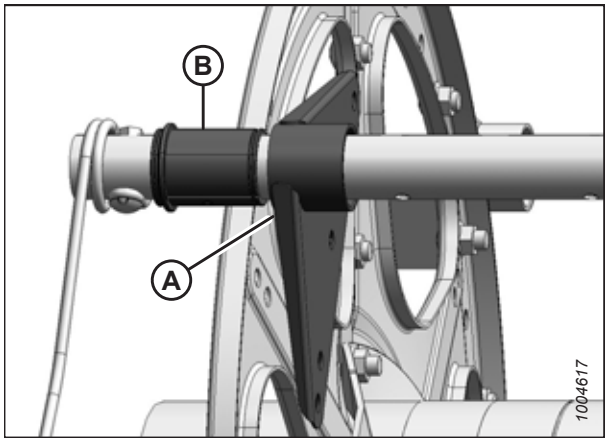


Figure 5.173: Bushing

Removing cam end bushings:

10. Remove the endshields and endshield support (A) at the applicable tine tube location on the cam end.

    NOTE:

    Removing the cam end bushings requires the tine tube be moved through the disc arms to expose the bushing.

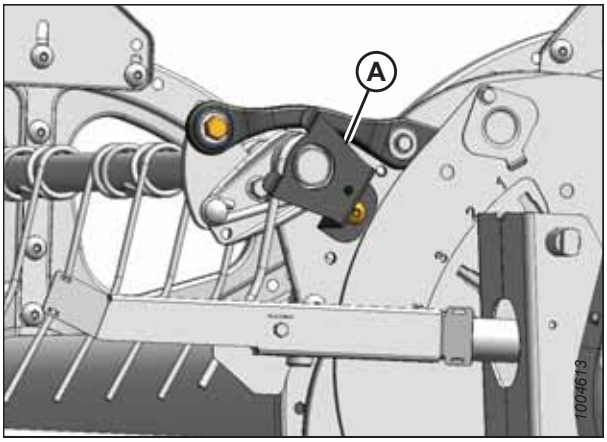


Figure 5.174: Cam End

11. Remove the reel endshields and endshield support (C) from the tail end of the reel at the applicable tine tube location.

12. Remove bolts (A) securing arms (B) to the tail and center discs.

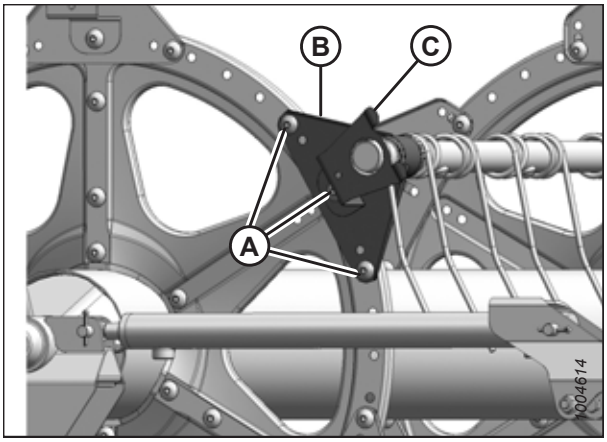


Figure 5.175: Tail End

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.

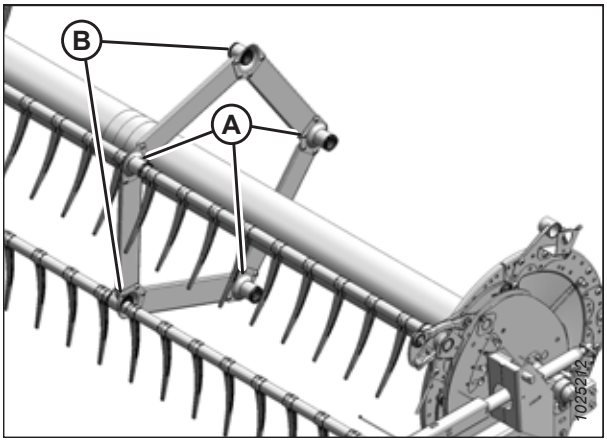


Figure 5.176: Tine Tube Supports

14. Remove bolt (A) from the cam linkage so the tine tube (B) is free to rotate.

    NOTE:

    Be sure to not lose the shim, and mark the shim location for reassembly.

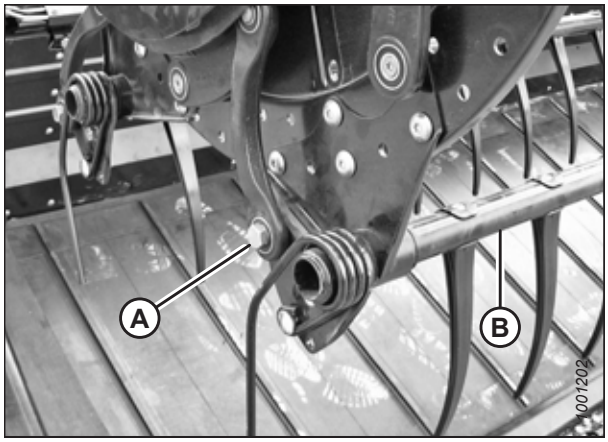


Figure 5.177: Cam End

15. Release bushing clamps (A) at the cam disc using a small screwdriver to separate the serrations. Move the clamps off the bushings.

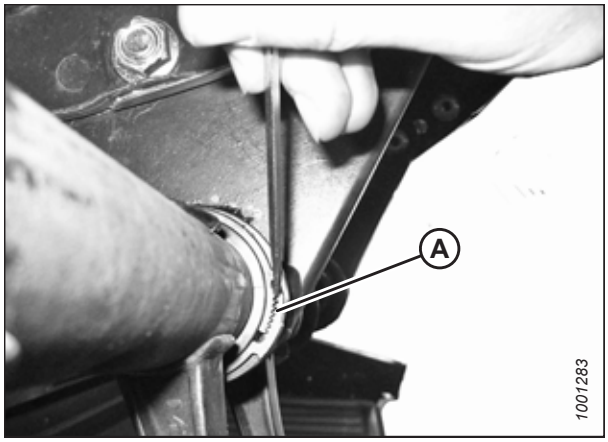


Figure 5.178: Bushing Clamp

16. Slide tine tube (A) outboard to expose bushing (B).

17. Remove bushing halves (B). If required, remove the next tine or plastic finger so the arm can slide off the bushing. Refer to the following procedures if necessary:

    - *Removing Plastic Fingers, page 209*
    - *Removing Steel Tines, page 208*

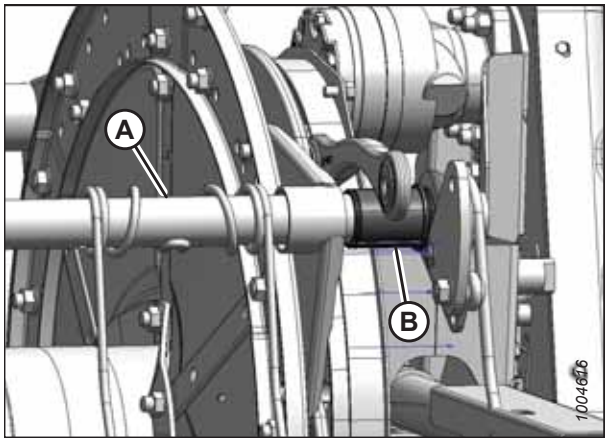


Figure 5.179: Cam End

Removing tine tube support bushings (if installed):

18. Locate support (A) that requires a new bushing.
19. Remove four bolts (B) securing channels (C) to support (A).
20. If finger (D) is too close to the support to allow access to the bushing, remove screw (E) and remove finger (D). For instructions, refer to *Removing Plastic Fingers, page 209*.

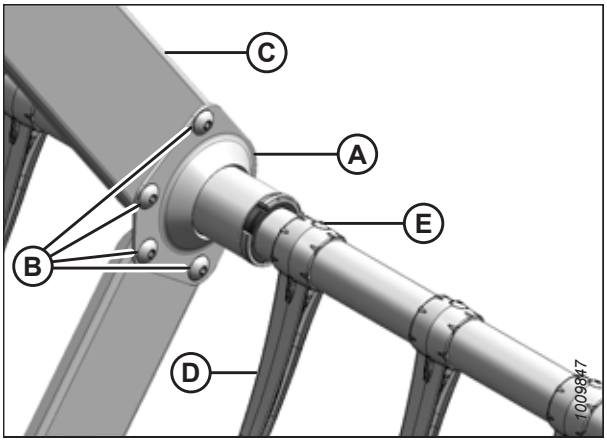


Figure 5.180: Tine Tube Support

21. Release bushing clamps (A) using a small screwdriver to separate the serrations.

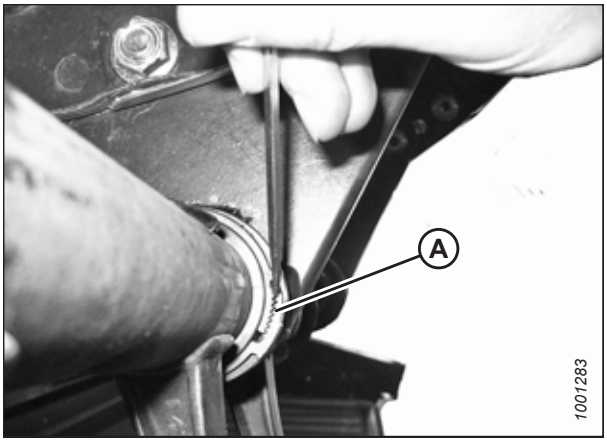


Figure 5.181: Bushing Clamp

22. Move clamps (A) off the bushings.

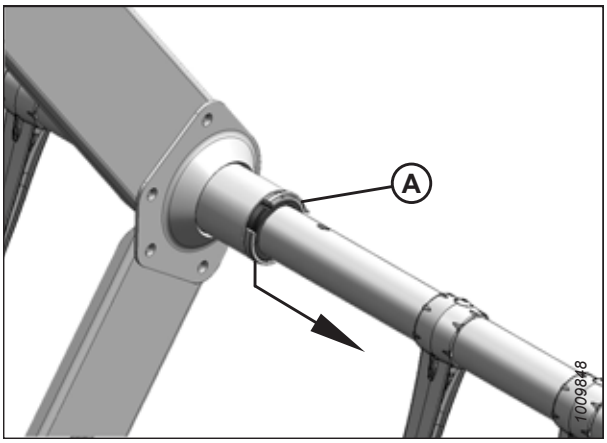


Figure 5.182: Bushing Clamp

23. Slide support (A) off bushing halves (B).

    NOTE:

    Two tine tubes have opposite-facing supports. Rotate the supports until the flanges clear the channels before moving them off bushing (B). Move the tine tube outward slightly if necessary.

24. Remove bushing halves (B).

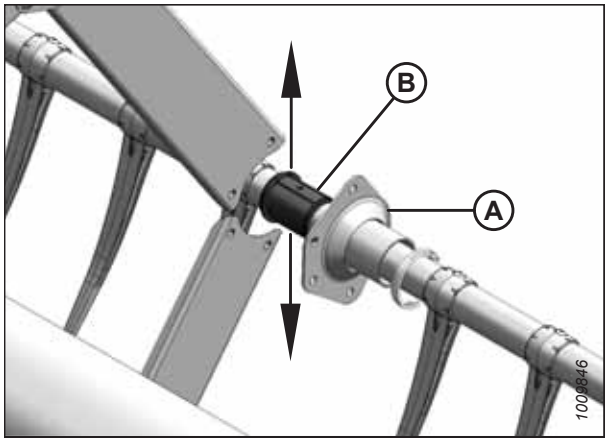


Figure 5.183: Support

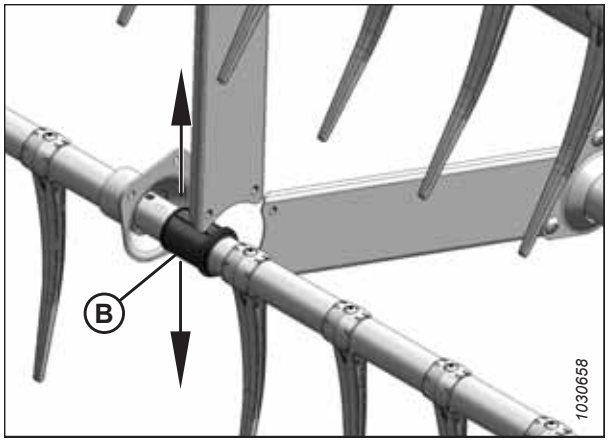


Figure 5.184: Opposite Support

Installing Bushings on Five-, Six-, or Nine-Bat Reels

Once the old tine tube bushing halves have been removed, the new ones can be installed.

DANGER

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

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:

Ensure tine tube is supported at all times to prevent damage to the tube or other components.

NOTE:

Use a pair of modified channel lock pliers (A) to install bushing clamps (C). Secure the pliers in a vise and grind a notch (B) into the end of each arm to fit the clamp as shown.

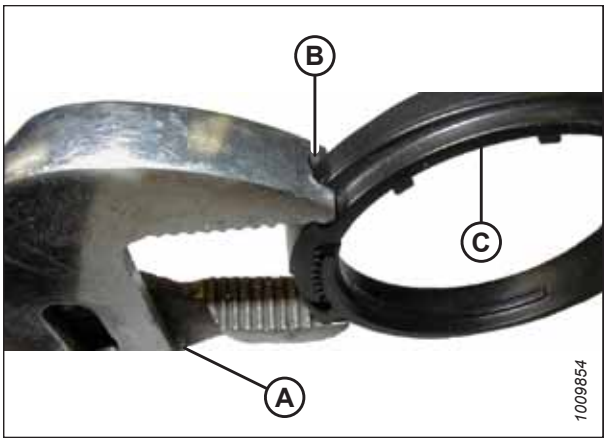


Figure 5.185: Modified Pliers

Installing cam end bushings:

1. Position bushing halves (B) on the tine tube with the flangeless end adjacent to the reel arm, and position the lug in each bushing half into the hole in tine tube (A).
2. Slide tine tube (A) toward the tail end of the reel to insert bushing (B) into the reel arm.

   NOTE:

   If the tine tube supports are installed, ensure the bushings at those locations slide into the support.
3. Reinstall the previously removed fingers or tines. Refer to the following procedures as necessary:
   - *Removing Plastic Fingers, page 209*
   - *Removing Steel Tines, page 208*
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.

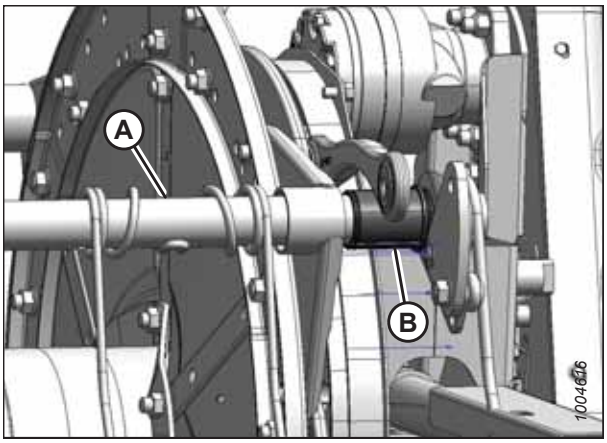


Figure 5.186: Cam End

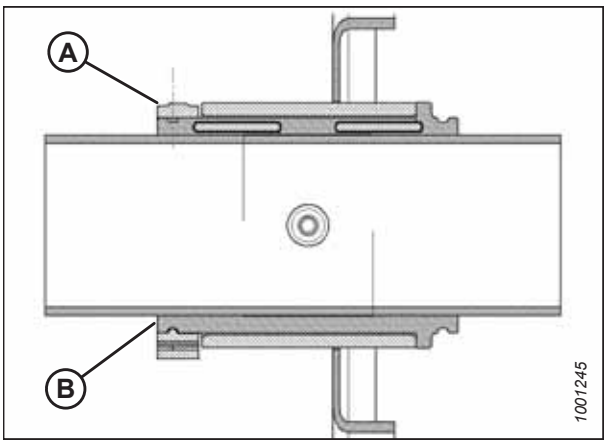


Figure 5.187: Bushing

6. Tighten clamp (A) using modified channel lock pliers (B) until finger pressure will **NOT** move the clamp.

   IMPORTANT:

   Overtightening the clamp might break the clamp.

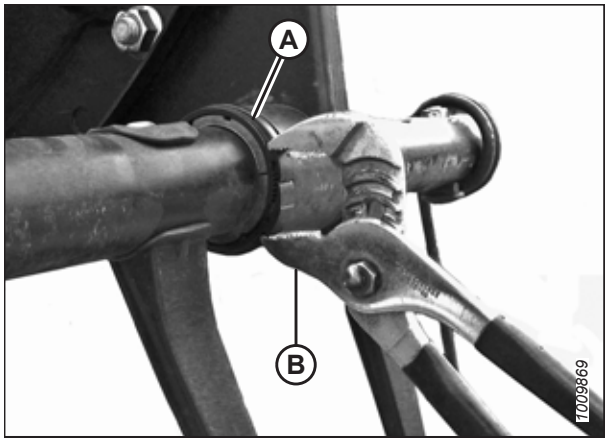


Figure 5.188: Clamp on Bushing

7. Line up tine tube (B) with the cam arm and install bolt (A). Apply medium-strength threadlocker (Loctite® 243 or equivalent) to the bolt, and torque the bolt to 165 Nm (120 lbf·ft).

   NOTE:

   Make sure the shim is between the cam arm and the reel bat.

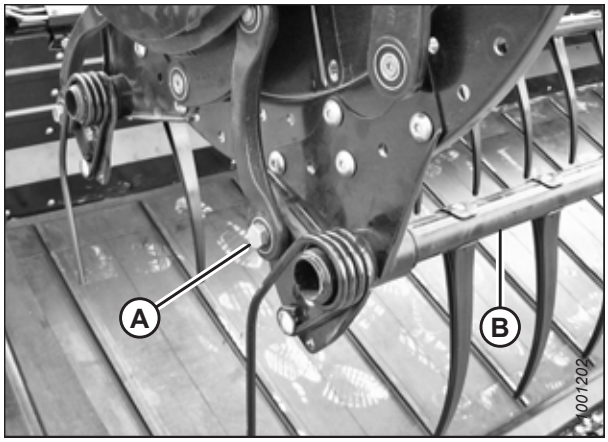


Figure 5.189: Cam End

8. Install bolts (A) securing arm (B) to the center disc.

9. Install reel arm (B) and endshield support (C) to the tail end of the reel at the applicable tine tube location, and secure them with bolts (A).

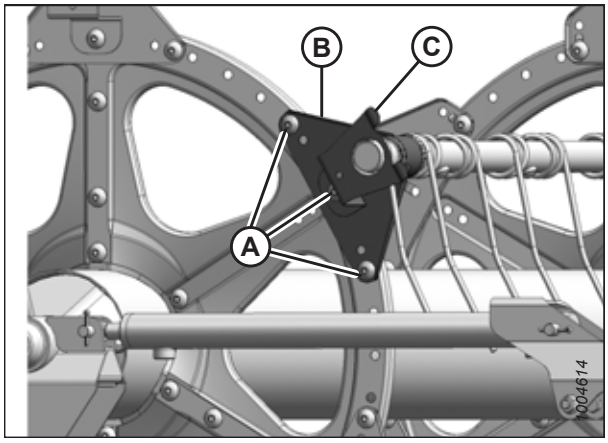


Figure 5.190: Tail End

10. Install endshield support (A) at the applicable tine tube location at the cam end.

11. Reinstall the reel endshields. For instructions, refer to *5.8.6 Reel Endshields, page 223*.

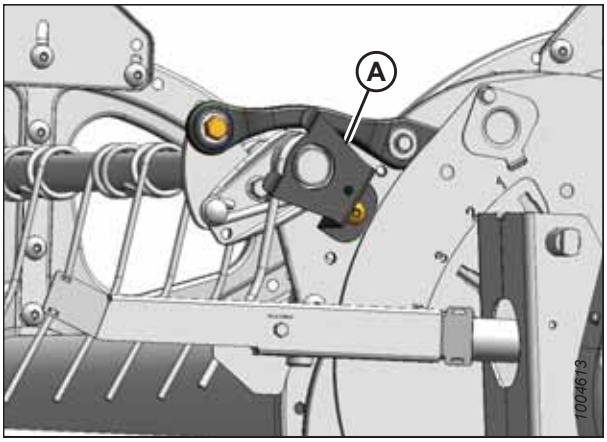


Figure 5.191: Cam End

Installing center disc and tail-end bushings:

12. Position bushing halves (B) on the tine tube with the flangeless end adjacent to the reel arm, and position the lug in each bushing half into the hole in tine tube (A).
13. Slide the reel arm onto bushing (B) and position them against the disc at the original location.
14. Reinstall the previously removed fingers or tines. Refer to the following procedures as necessary:
    - *Removing Plastic Fingers, page 209*
    - *Removing Steel Tines, page 208*

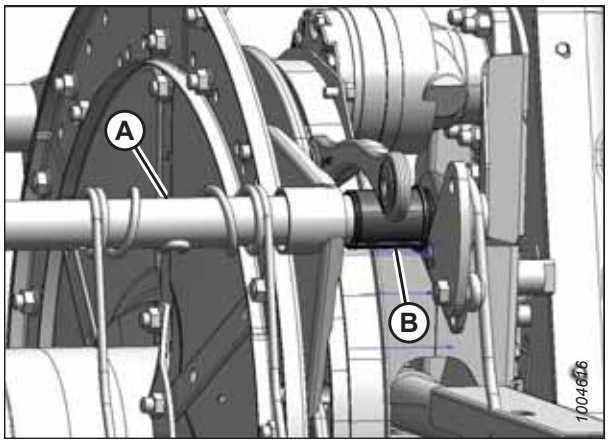


Figure 5.192: Cam End

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.

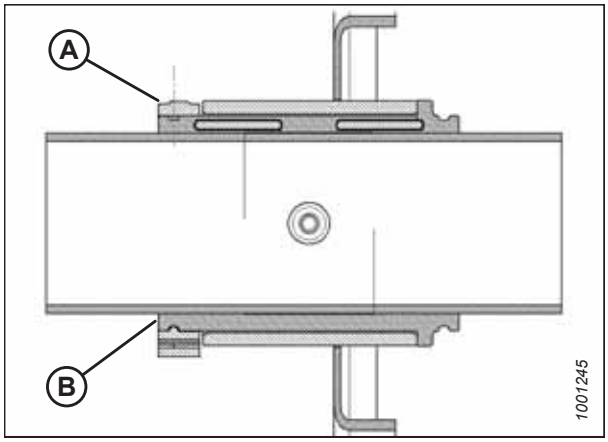


Figure 5.193: Bushing

17. Tighten clamp (A) using modified channel lock pliers (B) until finger pressure will **NOT** move the clamp.

    IMPORTANT:

    Overtightening the clamp might break the clamp.

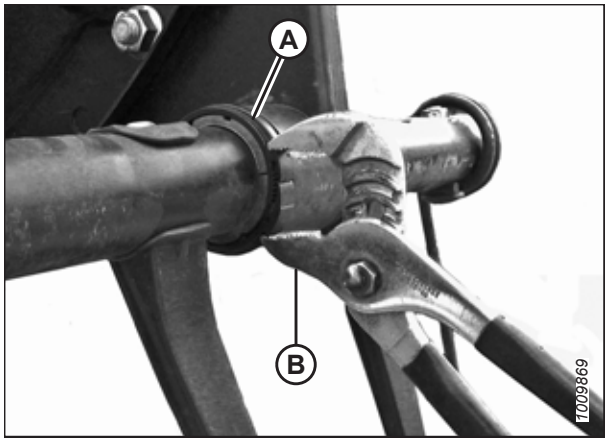


Figure 5.194: Clamp on Bushing

18. Install bolts (A) securing arm (B) to the center disc.

19. Install reel arm (B) and endshield support (C) to the tail end of the reel at the applicable tine tube location, and secure them with bolts (A).

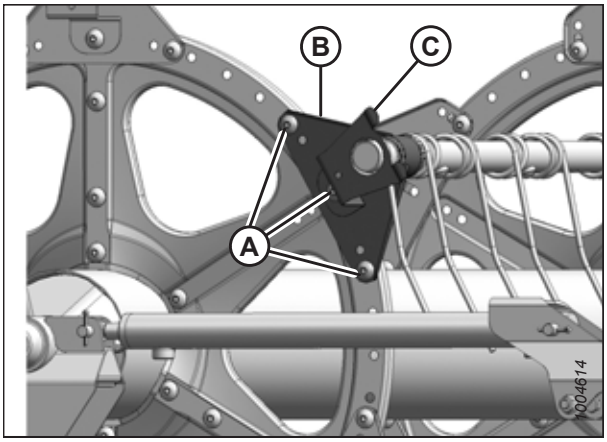


Figure 5.195: Tail End

Installing tine tube support (if installed) bushings:

20. Position bushing halves (B) on the tine tube with the flangeless end adjacent to the reel arm, and position the lug in each bushing half into the hole in tine tube (A).

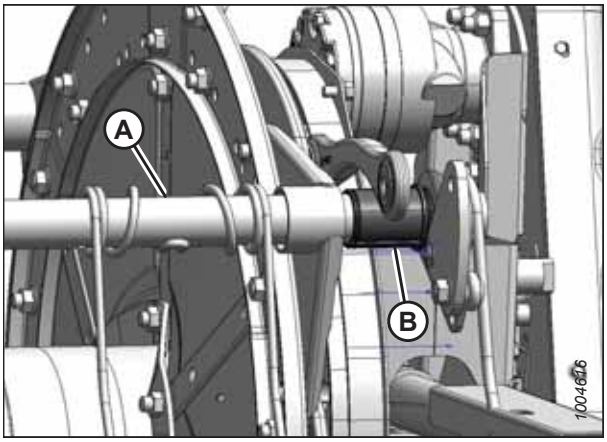


Figure 5.196: Cam End

21. Slide support (A) onto bushing (B).

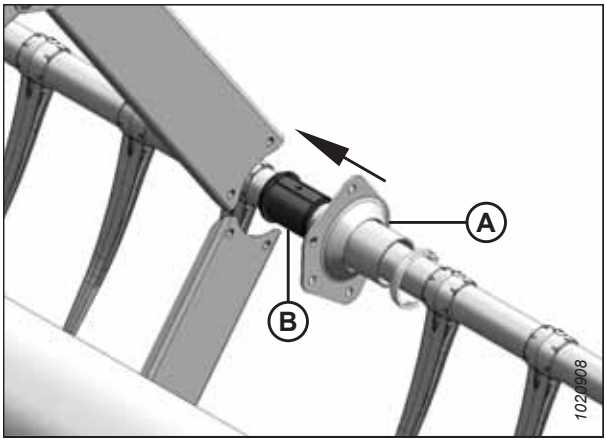


Figure 5.197: Support

22. For the opposite tine tube, rotate support (A) or slightly move the tine tube until it clears channels (C).

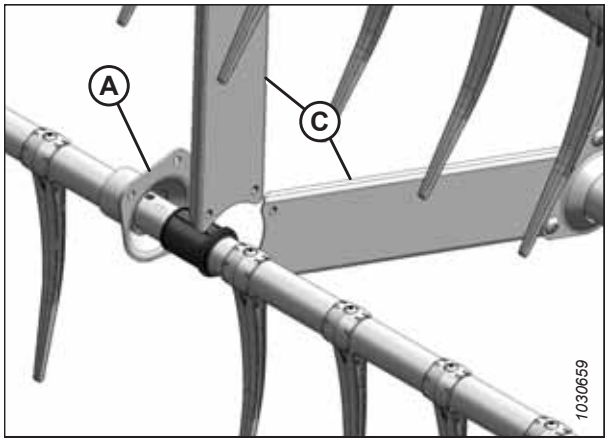


Figure 5.198: Opposite Support

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.

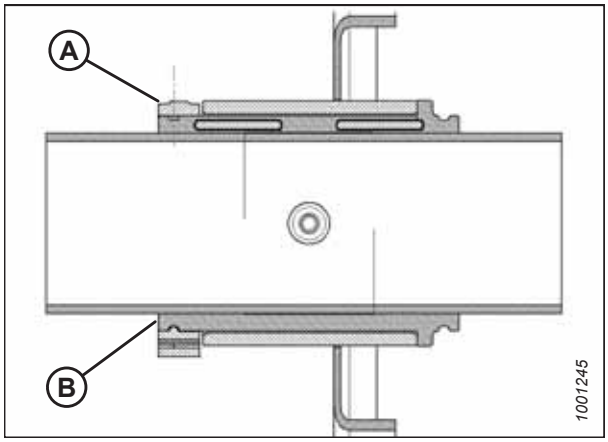


Figure 5.199: Bushing

25. Tighten clamp (A) using modified channel lock pliers (B) until finger pressure will **NOT** move the clamp.

    IMPORTANT:

    Overtightening the clamp might break the clamp.

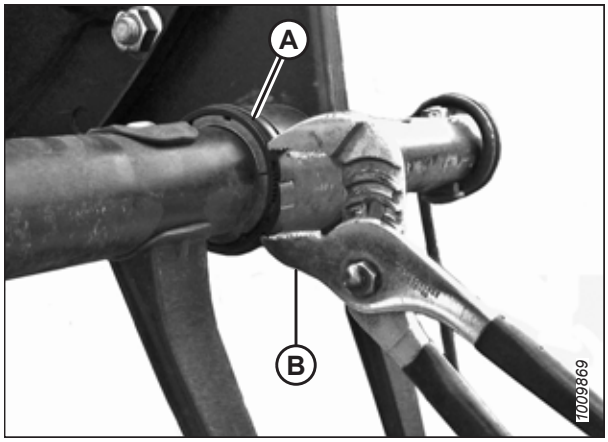


Figure 5.200: Clamp on Bushing

26. Reattach channels (C) to support (A) with screws (B) and nuts. Torque the screws to 43 Nm (32 lbf·ft).

27. Reinstall any fingers (D) that were previously removed using screws (E). For instructions, refer to *Installing Plastic Fingers, page 210*.

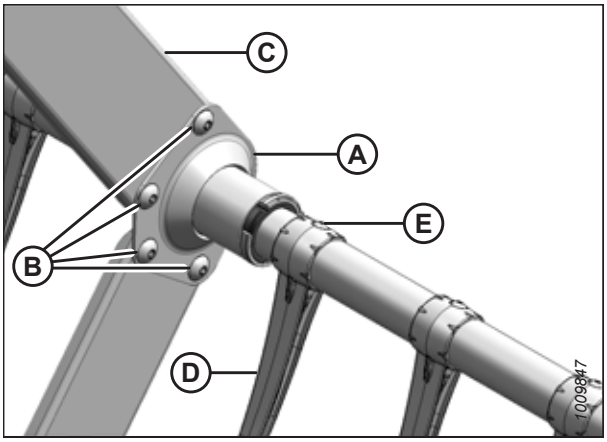


Figure 5.201: Tine Tube Support

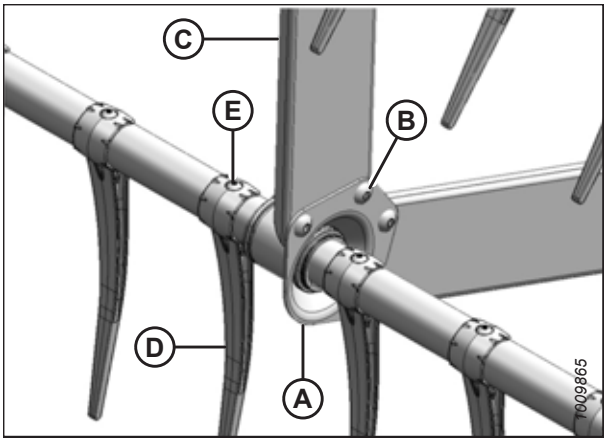


Figure 5.202: Opposite Support

5.8.6 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 severely damaged components must be replaced.

You can attach reel endshields to either end of the reel.

Replacing 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.

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 leaving the operator's seat for any reason.

1. Lower the header and reel, shut down the engine, and remove the key from the ignition.
2. Rotate the reel manually until reel endshield support (A) requiring replacement is accessible.
3. Remove three bolts (B).

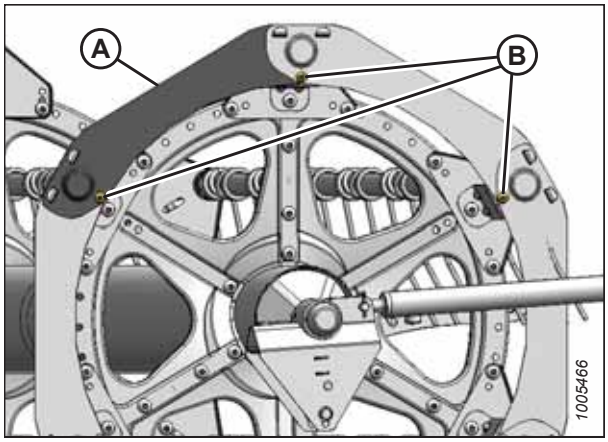


Figure 5.203: Reel Endshields

4. Lift the end of reel endshield (A) off support (B).

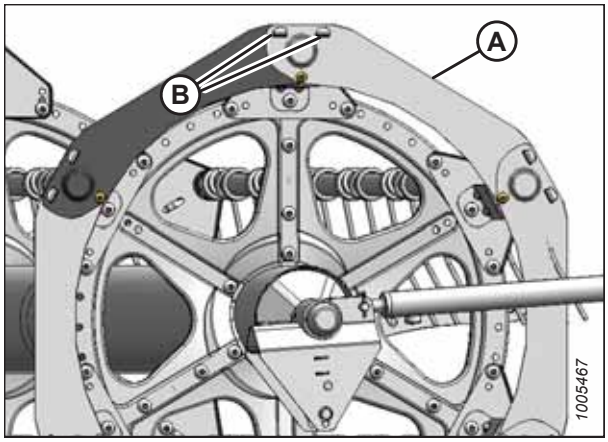


Figure 5.204: Reel Endshields

5. Remove the reel endshield from the supports.

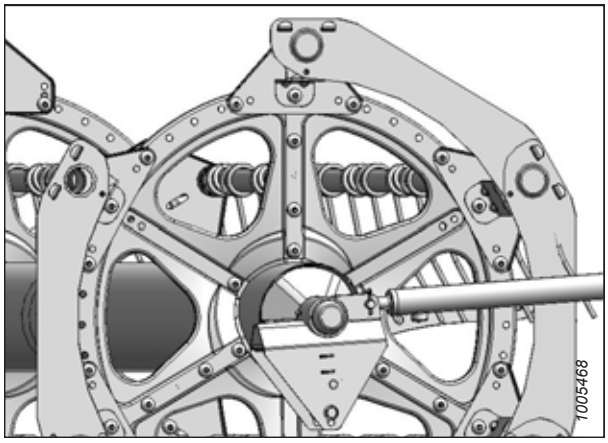


Figure 5.205: Reel Endshields

6. Remove reel endshield (A) from support (B).
7. Install new reel endshield (C) onto support (B).
8. Reattach reel endshield (A) onto support (B), ensuring it is installed on top of reel endshield (C).
9. Reinstall bolts (D).
10. Tighten all hardware.

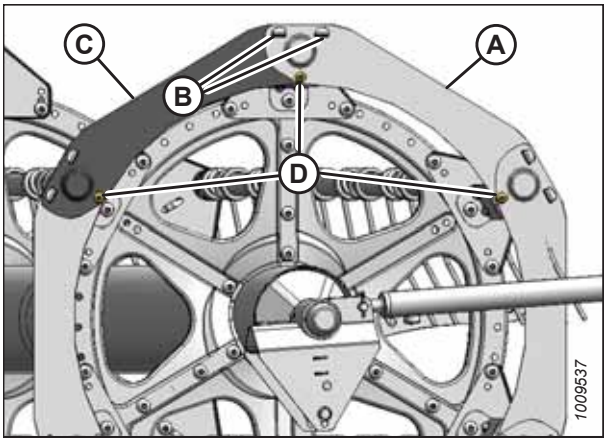


Figure 5.206: Reel Endshields

Replacing Reel Endshield Supports

The reel endshield supports need to be replaced if they are damaged.

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 leaving the operator's seat for any reason.

1. Lower the header and reel, shut down the engine, and remove the key from the ignition.
2. Rotate the reel manually until reel endshield (A) requiring replacement is accessible.
3. Remove bolt (B) from support (A).
4. Remove bolts (C) from support (A) and two adjacent supports.

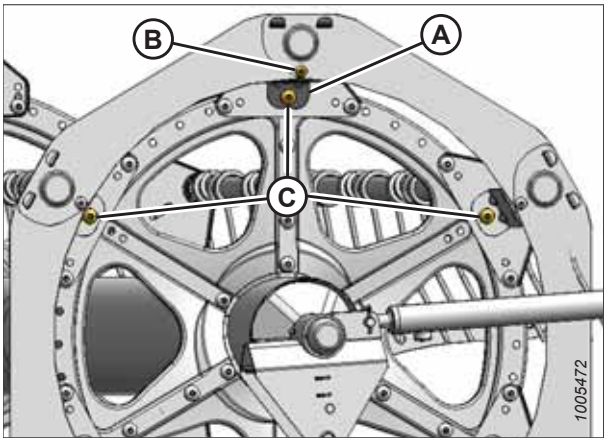


Figure 5.207: Reel Endshield Supports

5. Move reel endshields (A) away from the tine tube and rotate support (B) toward the reel to remove it.
6. Insert the tabs of new support (B) into the slots in reel endshields (A). Ensure the tabs engage both reel endshields.
7. Secure support (B) to the disc with bolt (C) and nut. Do **NOT** tighten.
8. Secure reel endshields (A) to support (B) with bolts (C) and nut. Do **NOT** tighten them.
9. Reattach the supports with bolts (C) and nuts.

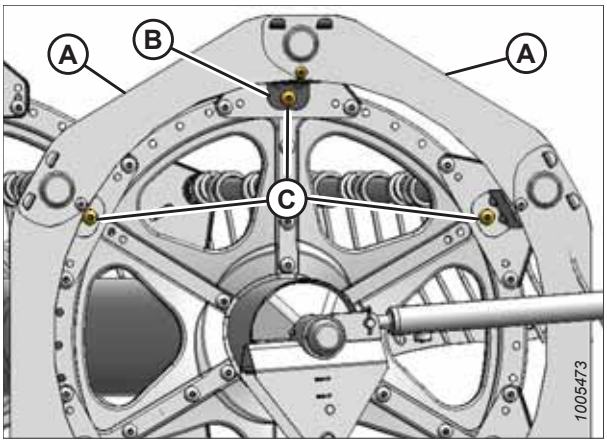


Figure 5.208: Reel Endshield Supports

10. Check the clearance between the tine tube and the reel endshield support, and adjust it if necessary.

11. Torque the nuts to 27 Nm (20 lbf·ft).

5.9 Reel

All 7.6 m (25 ft.) and smaller headers have single reels, 9.1–10.7 m (30–35 ft.) headers are available in single-reel and double-reel versions, and all headers larger than 10.7 m (35 ft.) are only available in double-reel configurations. Single reels are driven from the right arm and double reels are driven from the center arm.

5.9.1 Replacing Reel Drive Cover

The reel drive cover protects the reel drive components from dirt and debris.

Removing Reel Drive Cover

The reel drive cover protects the reel drive components from dirt and debris.

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 leaving the operator's seat for any reason.

Single-reel drive:

1. Stop the engine, and remove the key from the ignition.
2. Remove four bolts (A) securing cover (B) to the reel drive.

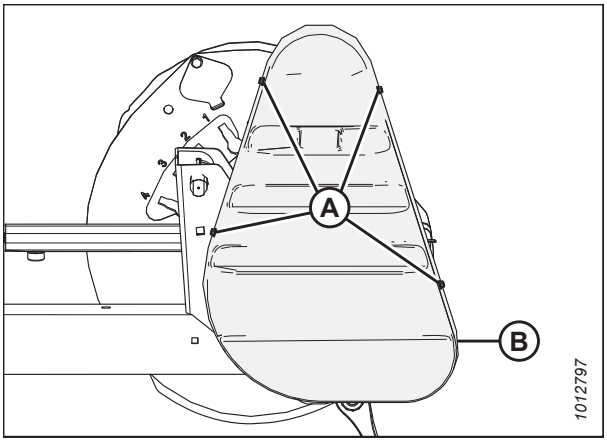


Figure 5.209: Drive Cover – Single Reel

Double-Reel Drive:

3. Stop the engine, and remove the key from the ignition.
4. Remove six bolts (A) securing upper cover (B) to the reel drive and lower cover (C).

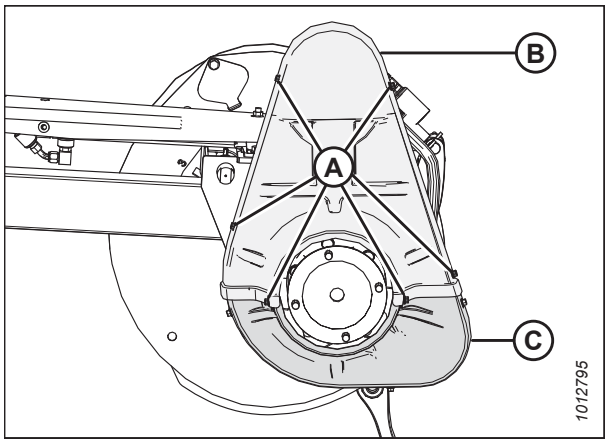


Figure 5.210: Drive Cover – Double Reel

5. Remove three bolts (A) and remove lower cover (B) if necessary.

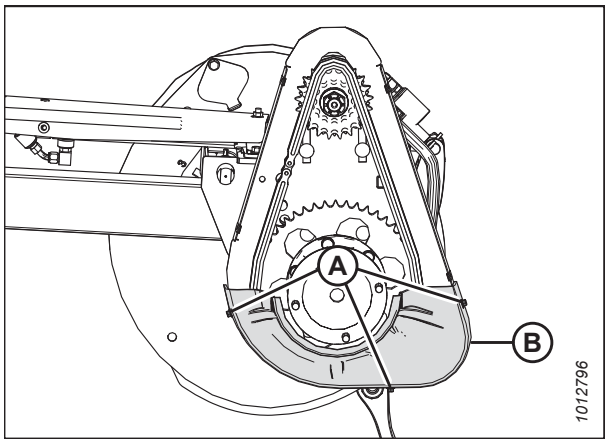


Figure 5.211: Drive Cover – Double Reel

Installing Reel Drive Cover

The reel drive cover protects the drive components from weather and debris.

Single-Reel Drive:

1. Position drive cover (B) onto the reel drive and secure it with four bolts (A).

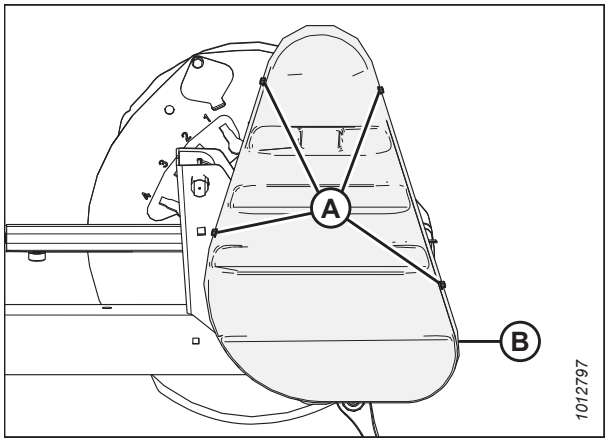


Figure 5.212: Drive Cover – Single Reel

Double-Reel Drive:

2. Position lower drive cover (B) onto the reel drive (if previously removed) and secure it with three bolts (A).

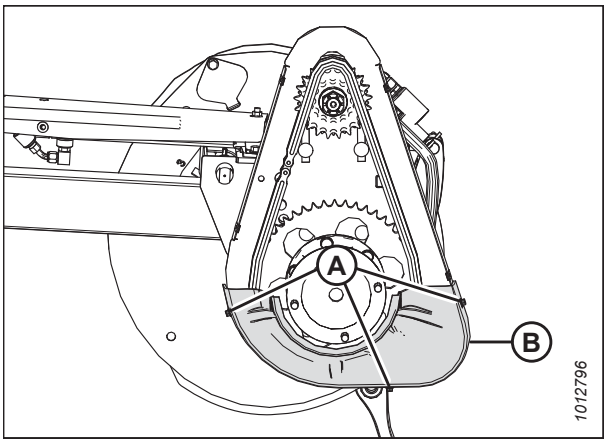


Figure 5.213: Drive Cover – Double Reel

3. Position upper drive cover (B) onto the reel drive and lower cover (C), and secure it with six bolts (A).

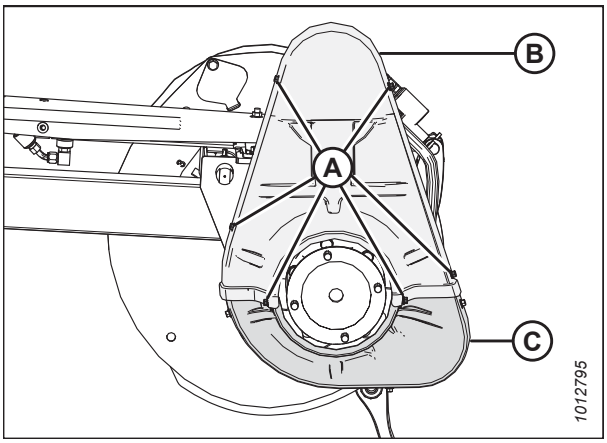


Figure 5.214: Drive Cover – Double Reel

5.9.2 Adjusting Reel Drive Chain Tension

The reel drive chain transfers power from the hydraulically driven reel motor to the sprockets that rotate the reels.

Loosening Reel Drive Chain

The tension on the reel drive chain can be loosened to allow access to reel drive components.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine, remove the key, and engage the safety props before going under the header 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 227*.

3. Loosen six nuts (A). Slide motor (B) and motor mount (C) down toward the reel shaft.

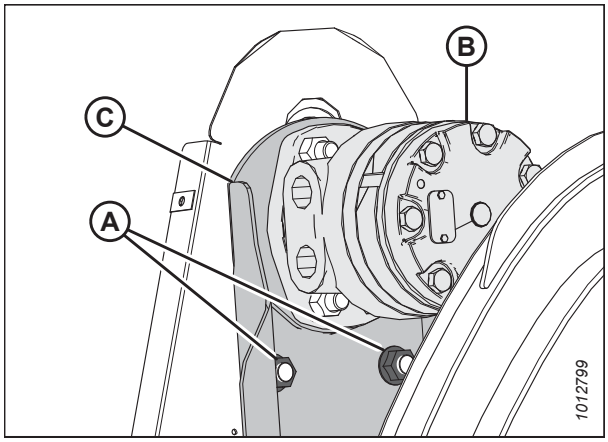


Figure 5.215: Single-Reel Drive Shown – Double-Reel Drive Similar

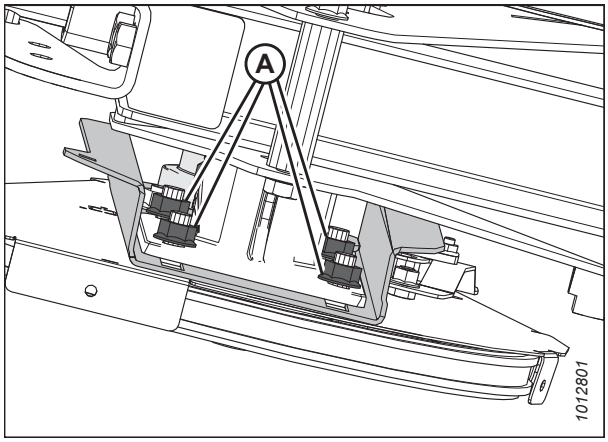


Figure 5.216: Single-Reel Drive – Viewed from Underside of Reel

Tightening Reel Drive Chain

A correctly tensioned drive chain ensures optimum power transfer while minimizing component wear.

DANGER

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

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

2. Ensure six bolts (A) securing the motor mount to the chain case are loose.

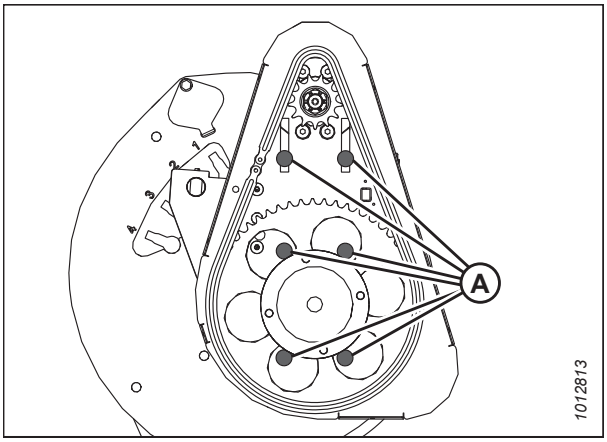


Figure 5.217: Single-Reel Drive Shown – Double Reel Similar

3. Slide motor (A) and motor mount (B) upward until chain (C) is tight.

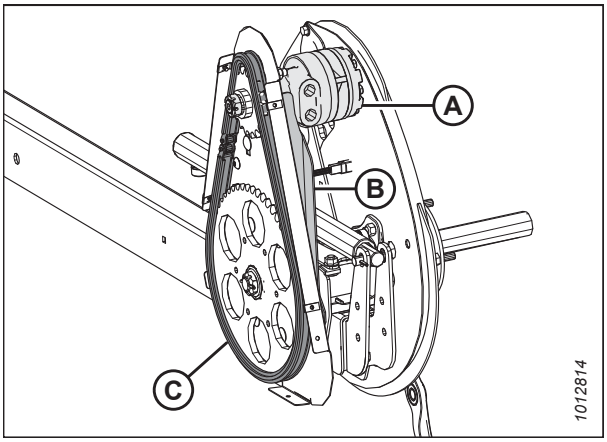


Figure 5.218: Single-Reel Drive Shown – Double Reel Similar

4. Ensure there is 3 mm (0.12 in.) of slack at the chain midspan. Adjust it if necessary.
5. Torque nuts (A) to 73 Nm (54 lbf·ft).
6. Install the drive cover. For instructions, refer to *Installing Reel Drive Cover, page 228*.

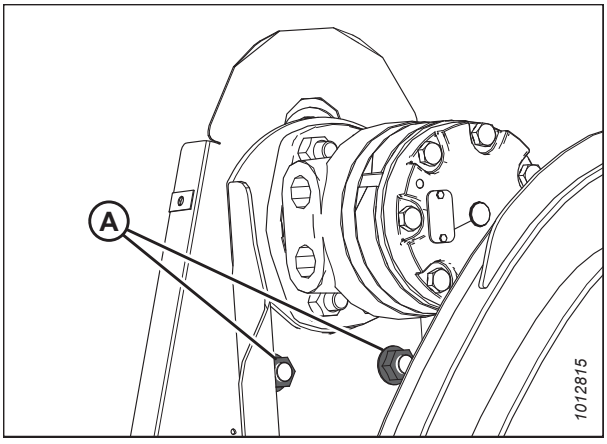


Figure 5.219: Single-Reel Drive Shown – Double Reel Similar

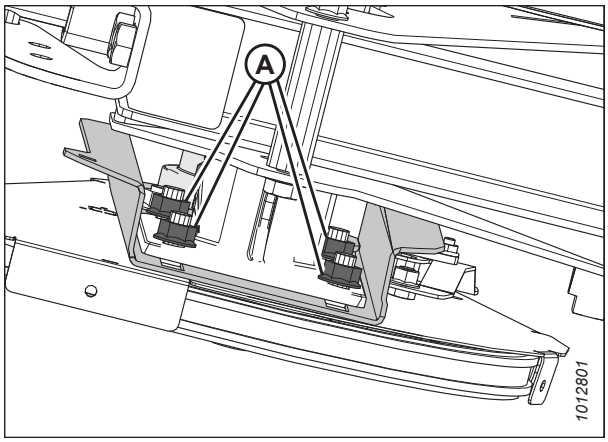


Figure 5.220: Single-Reel Drive – Viewed from Underside of Reel

5.9.3 Replacing Reel Drive Sprocket

The reel drive sprocket is attached to the reel drive motor.

Removing Reel Drive Sprocket

The reel drive sprocket is attached to the reel drive motor.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine, remove the key, and engage the safety props before going under the header 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 229*.
3. Remove drive chain (A) from drive sprocket (B).

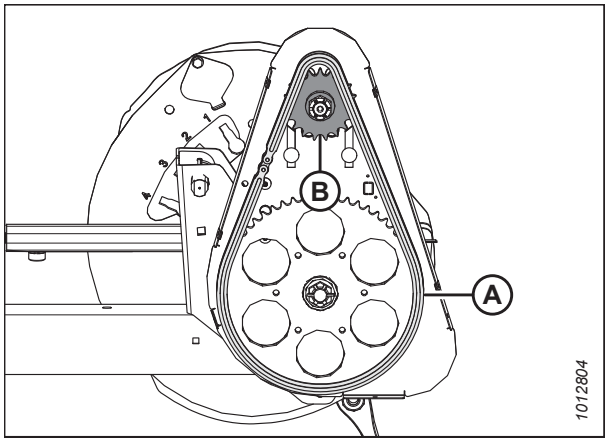


Figure 5.221: Reel Drive

4. Remove cotter pin (A), slotted nut (B), and flat washer (C) from the motor shaft.
5. Remove drive sprocket (D). Ensure the key remains in the shaft.

   IMPORTANT:

   To avoid damaging the motor, use a puller if the drive sprocket does not come off by hand. Do **NOT** use a pry bar and/or hammer to remove drive sprocket (D).

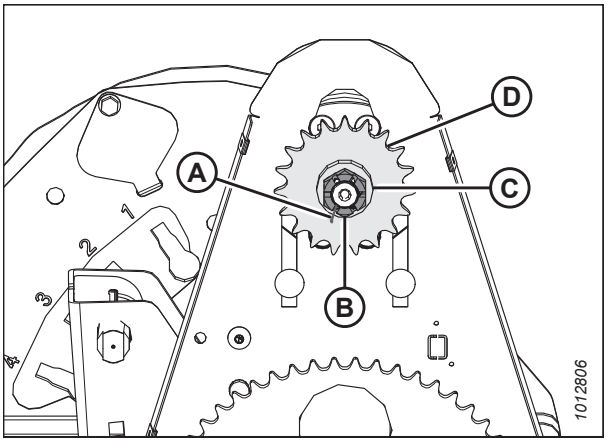


Figure 5.222: Reel Drive

Installing Reel Drive Sprocket

The reel drive sprocket is attached to the reel drive motor.

1. Align the keyway in sprocket (D) with the key on the motor shaft, and slide the sprocket onto the shaft. Secure it 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.

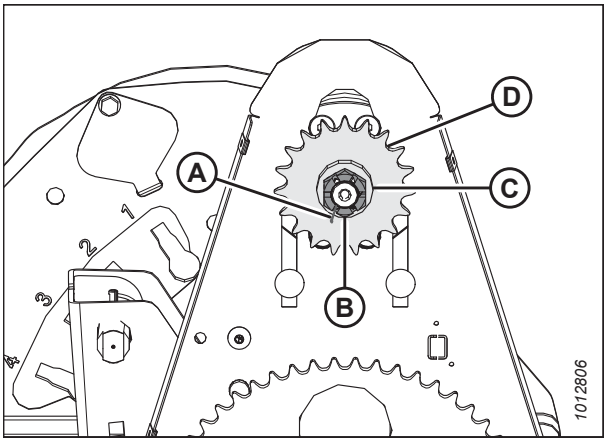


Figure 5.223: Reel Drive

4. Install drive chain (A) onto drive sprocket (B).
5. Tighten the drive chain. For instructions, refer to *Tightening Reel Drive Chain, page 230*.

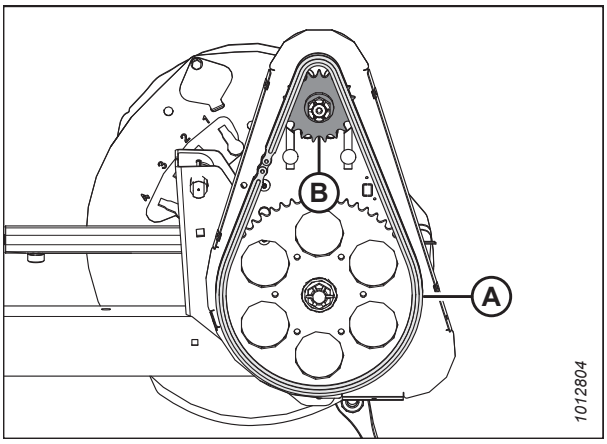


Figure 5.224: Reel Drive

5.9.4 Replacing Double-Reel U-Joint

The double-reel drive U-joint allows each reel to move independently from the other.

Lubricate the U-joint according to specifications. For instructions, refer to *5.3.6 Lubrication, page 125*.

Replace the U-joint if it is severely worn or damaged. For instructions, refer to *Removing Double-Reel U-Joint, page 234*.

Removing Double-Reel U-Joint

If the double-reel U-joint is worn or damaged, it will need to be replaced.

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 227*.
3. Support the inboard end of the right reel with a front end loader and nylon slings (A) (or equivalent lifting device).

   IMPORTANT:

   Avoid damaging or denting the center tube by supporting the reel as close to the cam end disc as possible.

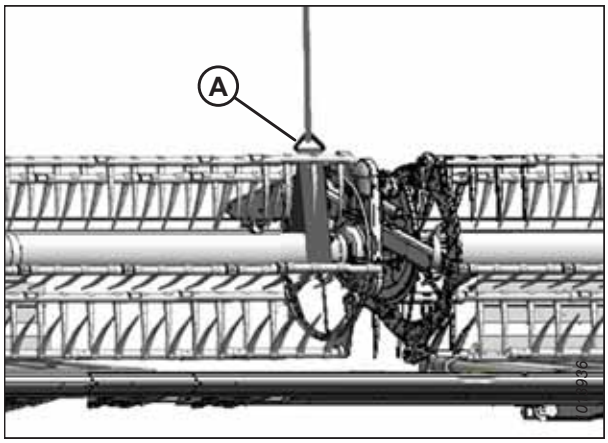


Figure 5.225: Supporting Reel

4. Remove six bolts (A) attaching U-joint flange (B) to driven sprocket (C).
5. Remove the U-joint.

   NOTE:

   It may be necessary to move the right reel sideways for the U-joint to clear the tube.

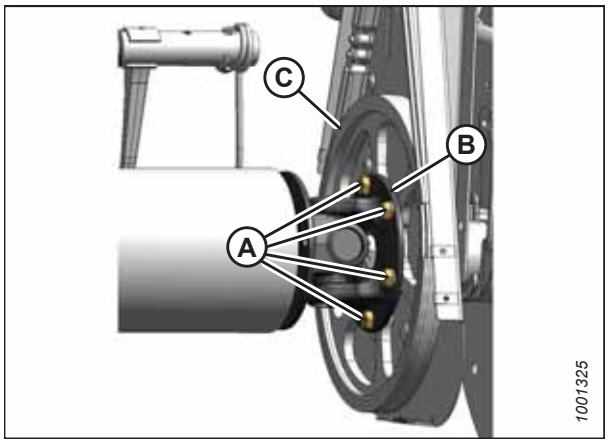


Figure 5.226: U-Joint

Installing Double-Reel U-Joint

Once the old U-joint has been removed, a new one can be installed.

NOTE:

It may be necessary to move the right reel sideways for the U-joint to clear the reel tube.

1. Position U-joint flange (B) onto driven sprocket (C) as shown. Install six bolts (A) and hand-tighten them. Do **NOT** torque the bolts.

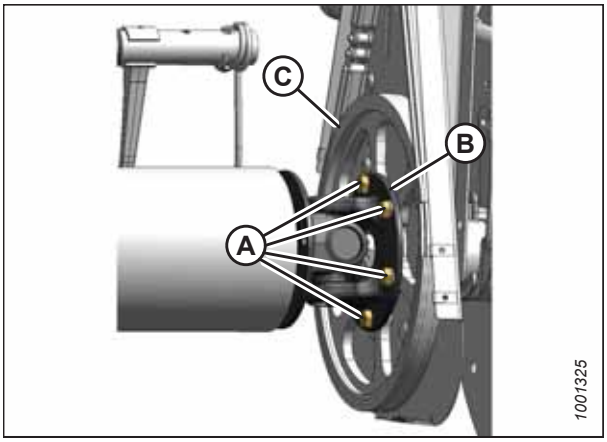


Figure 5.227: U-Joint

2. Position the right reel tube against the reel drive and engage the stub shaft into the U-joint pilot hole.
3. Rotate the reel until the holes in the end of the reel tube and U-joint flange (B) line up.
4. Apply medium-strength threadlocker (Loctite® 243 or equivalent) to four 1/2 in. bolts (A) and secure them with lock washers.
5. Torque the bolts to 102–115 Nm (75–85 lbf·ft).

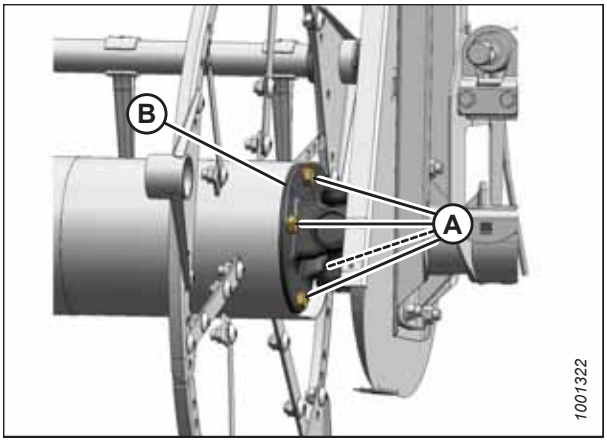


Figure 5.228: U-Joint

6. Remove temporary reel support (A).
7. Install the drive cover. For instructions, refer to *Installing Reel Drive Cover, page 228*.

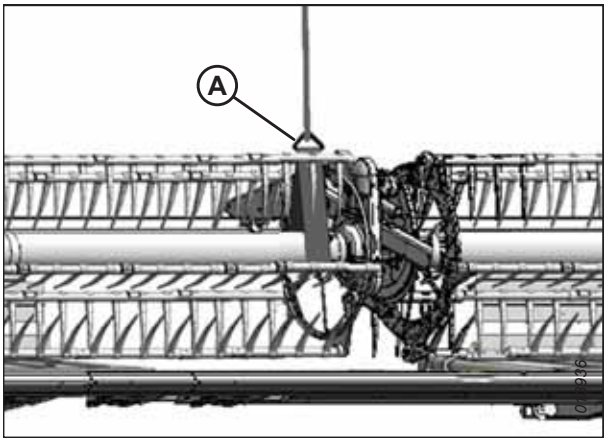


Figure 5.229: Supporting Reel

5.9.5 Replacing Reel Drive Motor

The reel drive motor does not require regular maintenance or servicing. If problems occur with the motor, remove it and have it serviced at your MacDon Dealer.

Removing Reel Drive Motor

The reel drive motor does not require regular maintenance or servicing. If problems occur with the motor, remove it and have it serviced at your MacDon Dealer.

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 229*.
3. Remove the drive sprocket. For instructions, refer to *Removing Reel Drive Sprocket, page 232*.
4. Disconnect hydraulic lines (A) at motor (B). Cap or plug open ports and lines.

   NOTE:

   Mark hydraulic lines (A) and their locations in motor (B) to ensure correct reinstallation.
5. Remove four nuts and bolts (C) and remove motor (B). Retrieve the spacer (not shown) from between motor (B) and the motor mount (if installed).

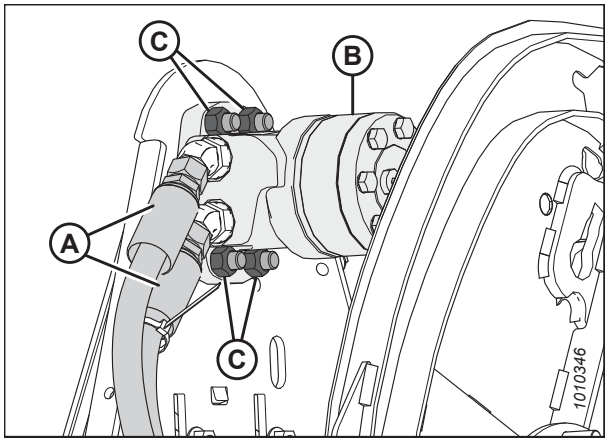


Figure 5.230: Reel Motor and Hoses

Installing Reel Drive Motor

The reel drive motor does not require regular maintenance or servicing. If problems occur with the motor, remove it and have it serviced at your MacDon Dealer.

1. Slide motor mount (A) up or down so motor mounting holes (B) are accessible through the openings in the chain case.

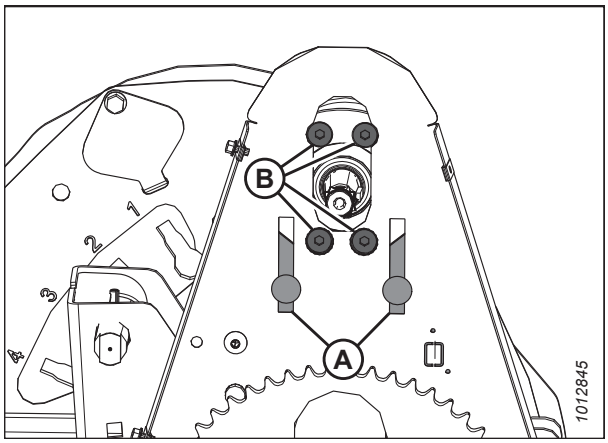


Figure 5.231: Reel Drive Motor Mounting Holes

2. Attach motor (A) (and spacer if previously removed) to motor mount (B) with four 1/2 in. x 1 3/4 in. countersunk bolts and nuts (C).
3. Torque nuts (C) to 73 Nm (54 lbf·ft).
4. If installing a new motor, install the hydraulic fittings (not shown) and torque them to 110–120 Nm (81–89 lbf·ft).

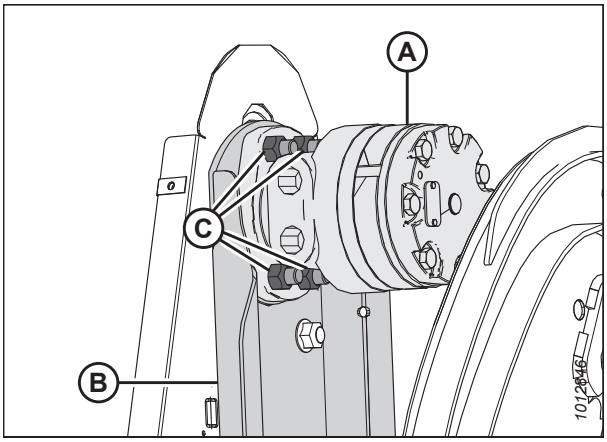


Figure 5.232: Reel Drive Motor

5. 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 at their original locations.
6. Install the drive sprocket. For instructions, refer to *Installing Reel Drive Sprocket, page 233*.
7. Tighten the drive chain. For instructions, refer to *Tightening Reel Drive Chain, page 230*.

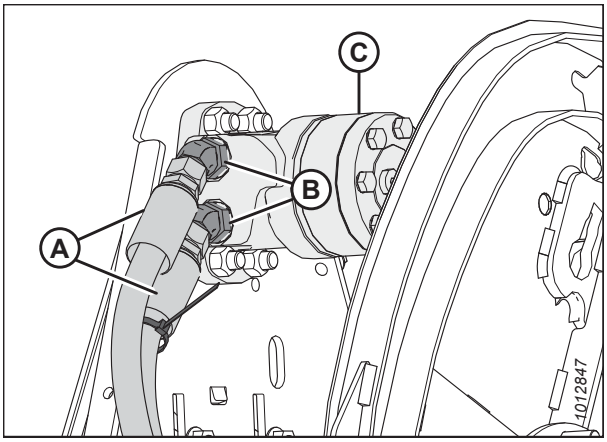


Figure 5.233: Reel Motor and Hoses

5.9.6 Replacing Drive Chain on Double Reel

The drive chain allows the hydraulic reel drive motor to turn the reel. It can be replaced if damaged or worn.

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 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 229*.

3. Support the inboard end of the right reel with a front end loader and nylon slings (A) (or equivalent lifting device).

   IMPORTANT:

   Support the reel as close to the end disc as possible to avoid damaging or denting the center tube.

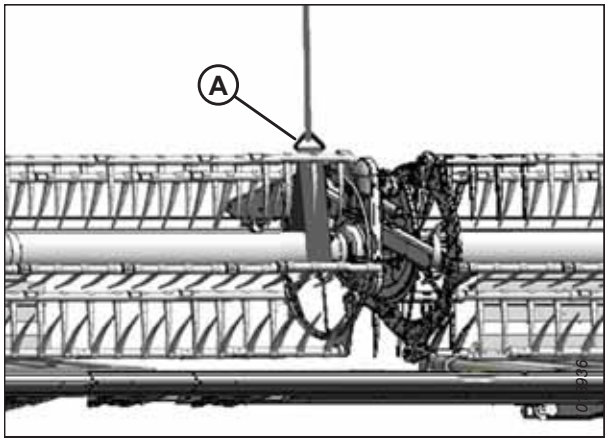


Figure 5.234: Supporting Reel

4. Remove four bolts (A) securing the reel tube to U-joint flange (B).

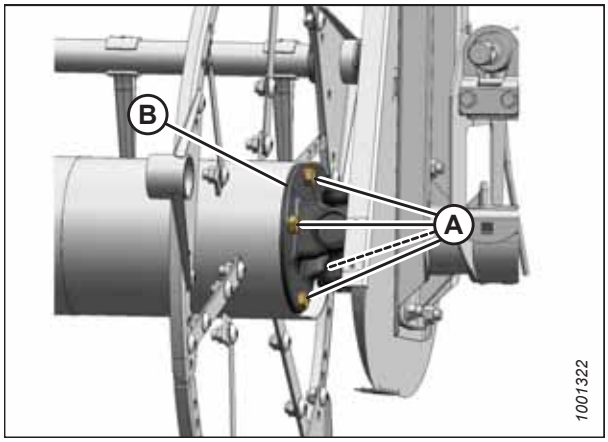


Figure 5.235: U-Joint

5. Move the right reel sideways to separate reel tube (A) from U-joint (B).
6. Remove drive chain (C).
7. Route new chain (C) over U-joint (B) and position it onto the sprockets.

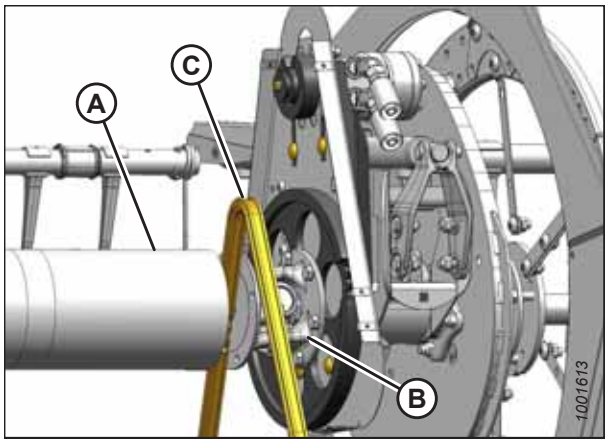


Figure 5.236: Replacing Chain

8. Position right reel tube (A) against the reel drive and engage the stub shaft into the U-joint pilot hole.
9. Rotate the reel until the holes in end of the reel tube and U-joint flange line up.
10. Apply medium-strength threadlocker (Loctite® 243 or equivalent) to four 1/2 in. bolts (A) and secure it with lock washers.
11. Torque the bolts to 102–115 Nm (75–85 lbf·ft).

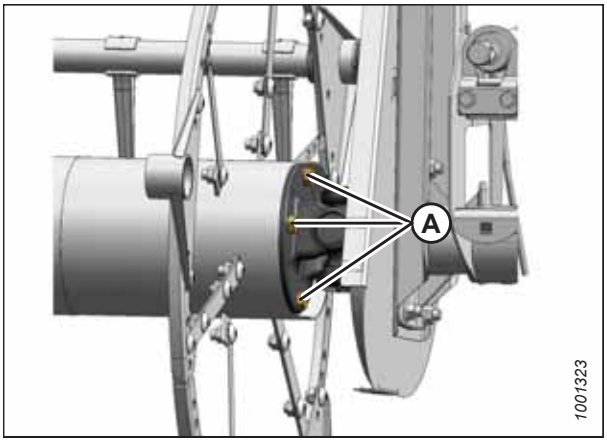


Figure 5.237: U-Joint

12. Remove temporary reel support (A).

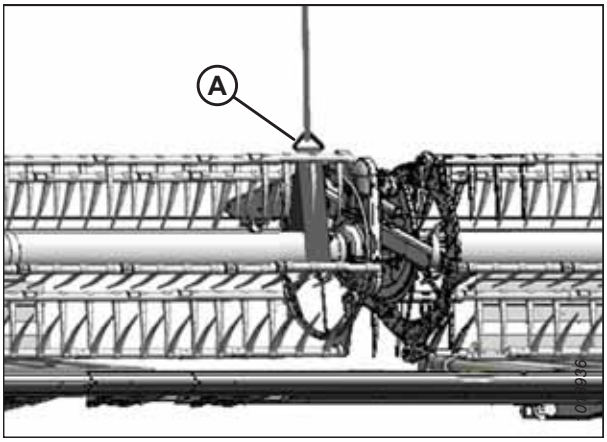


Figure 5.238: Supporting Reel

5.9.7 Replacing Drive Chain on Single Reel

The drive chain allows the hydraulic reel drive motor to turn the reel. It can be replaced if damaged or worn.

1. Loosen the drive chain. For instructions, refer to *Loosening Reel Drive Chain, page 229*.
2. Lift chain (A) off drive sprocket (B).
3. Lower the chain until free of lower sprocket (C) and remove the chain from the drive.
4. Position new chain (A) around the bottom teeth on lower sprocket (C).
5. Lift the chain onto drive sprocket (B) ensuring all the links are properly engaged in the teeth.
6. Tighten the drive chain. For instructions, refer to *Tightening Reel Drive Chain, page 230*.

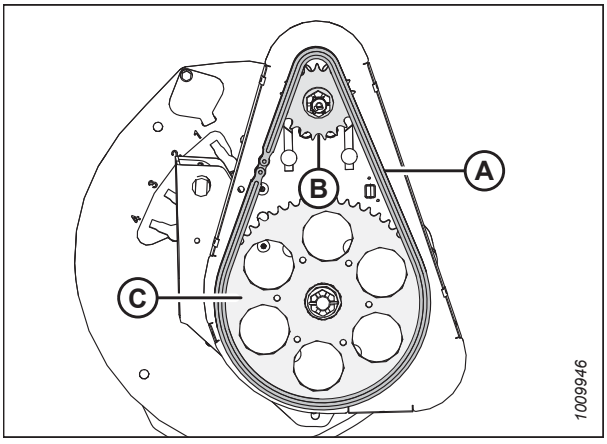


Figure 5.239: Reel Drive

5.10 Transport System (Optional)

The header can be equipped with a set of transport wheels so that the header can be towed by a windrower, combine, or tractor.

Refer to *6.3.3 Stabilizer / Slow Speed Transport Wheels, page 249* for more information.

5.10.1 Checking Wheel Bolt Torque

The transport wheel bolt torque should be checked after one operating hour following the installation of the wheels, and every 100 operating hours thereafter.

1. Torque wheel bolts to 120 Nm (90 lbf·ft) using the sequence shown at right.

   IMPORTANT:

   Whenever a wheel is removed and reinstalled, check the wheel bolt torque after one hour of operation and every 100 hours thereafter.

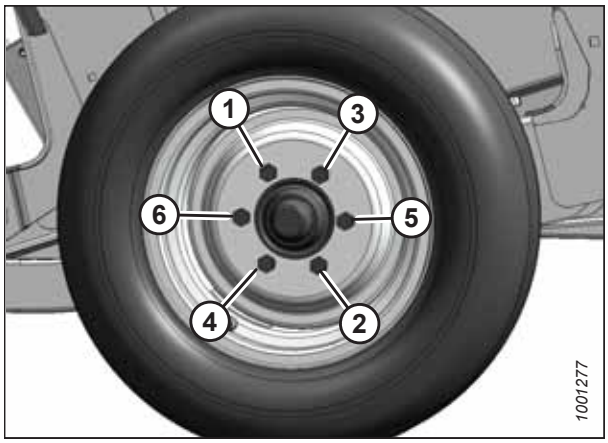


Figure 5.240: Bolt Tightening Sequence

5.10.2 Checking Axle Bolt Torque

The hardware that secures the optional transport system components to the header must be checked daily to ensure safe operation.

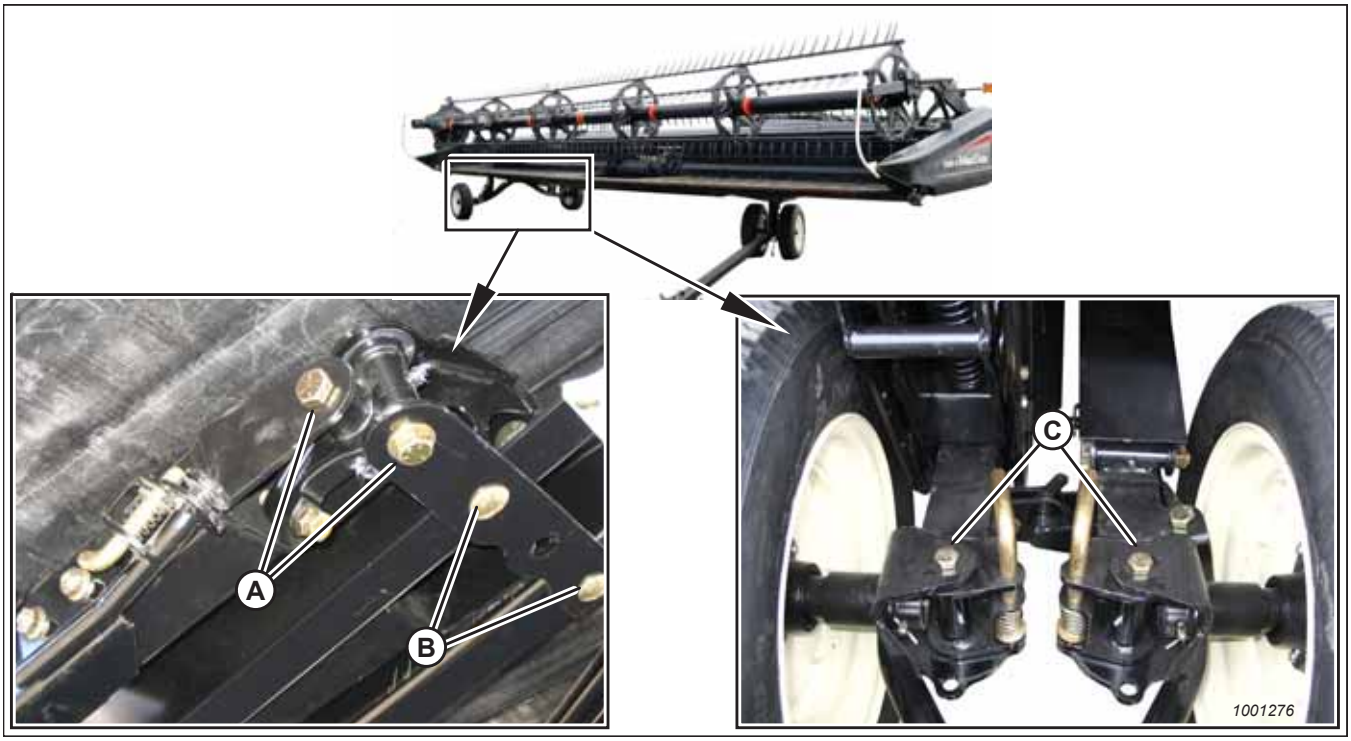


Figure 5.241: Axle Bolts

1. Check and tighten axle bolts **DAILY** until the torque is maintained as follows:
   - (A): 244 Nm (180 lbf·ft)
   - (B): 203 Nm (150 lbf·ft)
   - (C): 244 Nm (180 lbf·ft)

5.10.3 Checking Tire Pressure

Proper tire pressure ensures tires perform properly and wear evenly.

WARNING

- **Service tires safely.**
- **A tire can explode during inflation which could cause serious injury or death.**
- **Do NOT stand over the tire. Use a clip-on chuck and extension hose.**
- **Do NOT exceed the maximum inflation pressure indicated on the 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 it to operating pressure.**
- **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.**

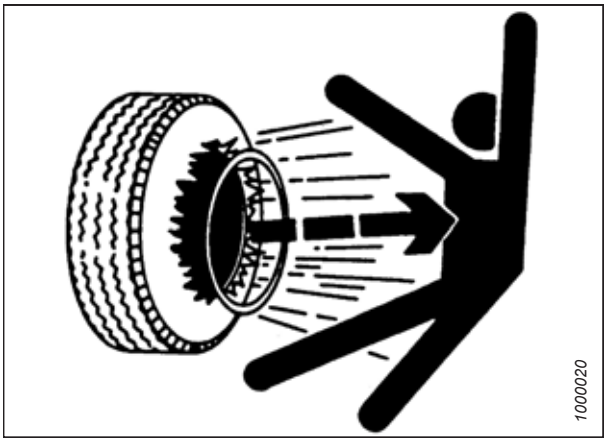


Figure 5.242: Inflation Warning

1. Check the tire inflation pressure and inflate it according to the information provided in Table *5.3, page* .
2. Make sure the tire is correctly seated on the rim before inflating.
   a. If the tire is not correctly positioned on the rim, take the tire to a qualified tire repair shop.
3. If inflation is required, use a clip-on chuck and an extension hose to inflate the tire to the desired pressure.

   IMPORTANT:

   Do **NOT** exceed the maximum inflation pressure indicated on the tire label or sidewall.

Table 5.3 Tire Pressure for ST205/75 R15 Tires

Load Range	Pressure
D	448 kPa (65 psi)
E	552 kPa (80 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 Reel

6.1.1 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 an aft location that minimizes crop disturbance. The kit also enables the reel fore-aft cylinders to be quickly relocated to the normal operating location.

Installation instructions are included in the kit.

MD #B6590

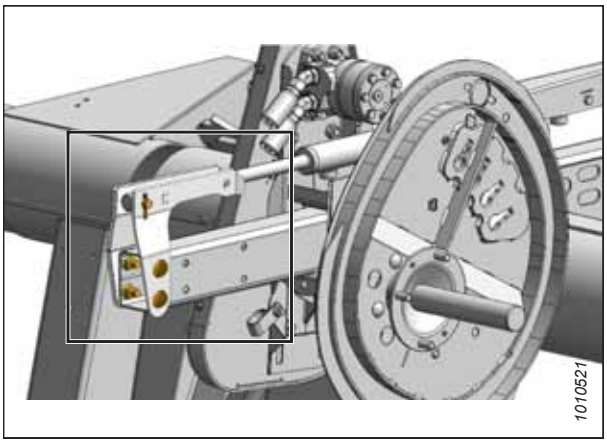


Figure 6.1: Center Arm – Left and Right Similar

6.1.2 Lodged Crop Reel Finger Kit

The steel fingers provided in the Lodged Crop Reel Finger kit attach to the ends of every other tine tube 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 6.2: Lodged Crop Finger

6.1.3 PR15 Tine Tube Reel Conversion Kit

This kit allows conversion from a six-bat reel to a nine-bat reel.

Installation instructions are included in the kit.

Order the following bundles according to your header size and type:

- 4.6 m (15 ft.) – Steel Fingers MD #B5654

- 6.1 m (20 ft.) – Steel Fingers MD #B5655
- 7.6 m (25 ft.) – Plastic Fingers MD #B5277
- 9.1 m (30 ft.) – Plastic Fingers MD #B5278[50]
- 9.1 m (30 ft.) – Steel Fingers MD #B5657[50]
- 10.7 m (35 ft.) – Plastic Fingers MD #B5674

NOTE:

You must also order additional endshields when converting the reel.

6.1.4 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 nine-bat reels).

Hardware and installation instructions are included in the kit.

See your MacDon Dealer for more information.

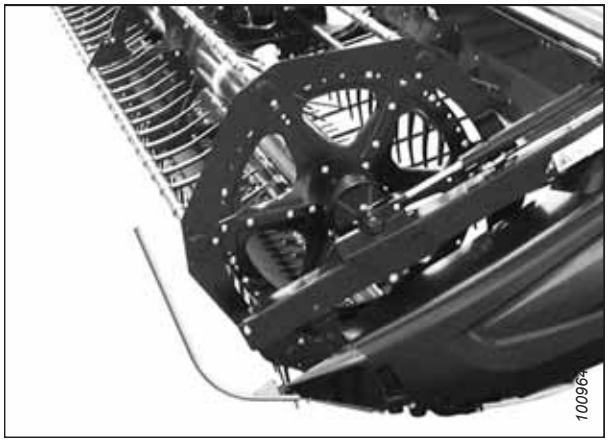


Figure 6.3: Reel Endshields

6.1.5 Short Brace Kit For Center Reel Arm

The Short Brace kit for Center Reel Arm consists of a set of shorter braces and necessary hardware for the center reel support arm. This kit allows you to move the reel farther back for applications such as straight cutting canola and cutting shatter prone crops.

Installation and adjustment instructions are included.

MD #B5605

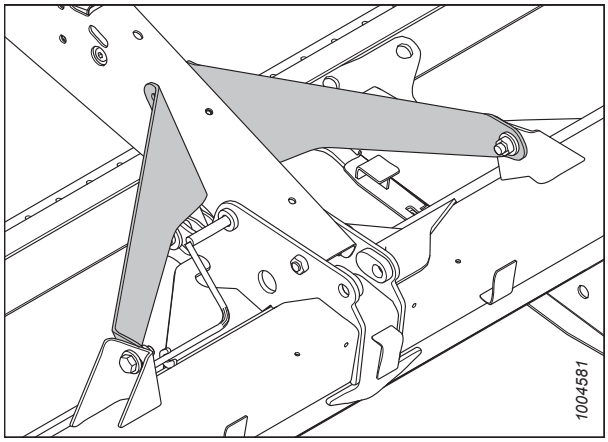


Figure 6.4: Short Brace kit (MD #B5605)

50. Double-reel units only.

6.1.6 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 included in the kit.

- Five-Bat Reels – MD #B5825
- Six-Bat Reels – MD #B5826

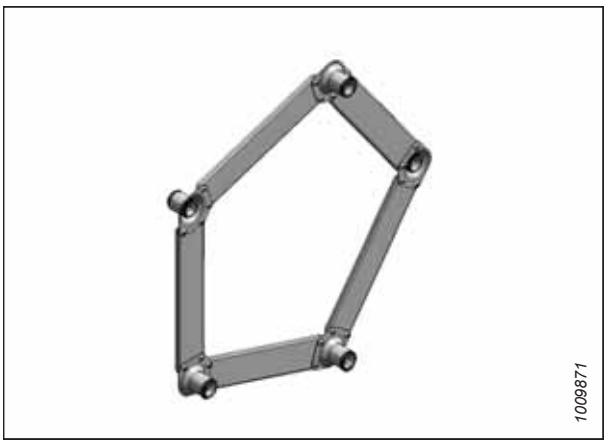


Figure 6.5: Five-Bat Reinforcing Kit Shown – Six-Bat Reinforcing Kit Similar

6.2 Cutterbar

6.2.1 Cutterbar Wearplate

Cutterbar wearplates are recommended for cutting on the ground when the soil is adhering to the steel.

Installation instructions are included in the kit.

Order one of the following bundles according to your 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
- 10.7 m (35 ft.) – MD #B4840
- 12.2 m (40 ft.) – MD #B4841

Figure 6.6: Cutterbar Wearplates

6.2.2 Knifehead Shield

Knifehead shields attach to the endsheets and reduce the knifehead opening to prevent cut crop (particularly severely lodged crop) from accumulating over the knifehead and damaging the knife drive box and endsheet.

Installation instructions are included in the kit.

Order the following bundles according to your header size and guard type:

Regular Guards
- 9.1 m (30 ft.) and larger – MD #220101

Stub Guards
- 9.1 m (30 ft.) and larger – MD #220103

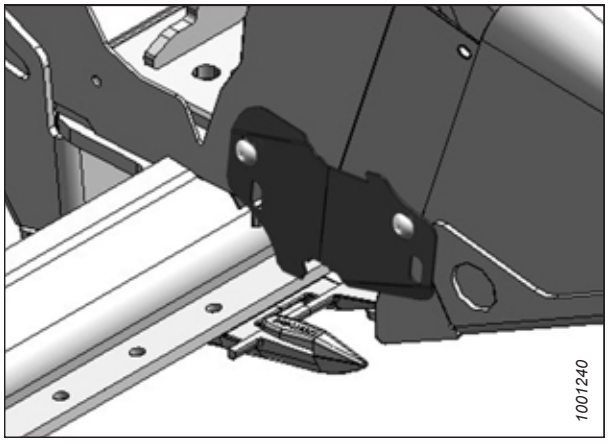


Figure 6.7: Knifehead Shield

6.2.3 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 kit.

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

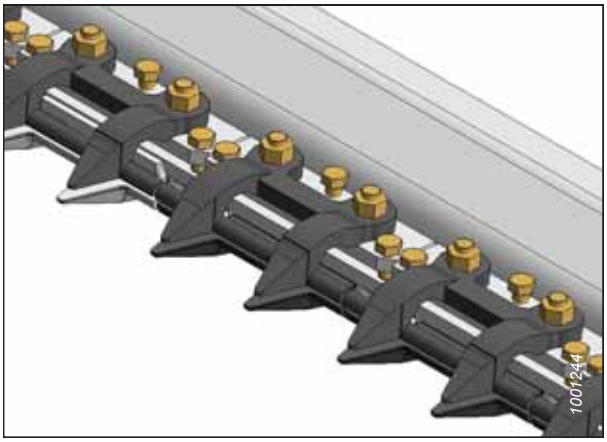


Figure 6.8: Stub Guards

6.3 Header

6.3.1 Divider Latch Kit

Divider 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 #B5607

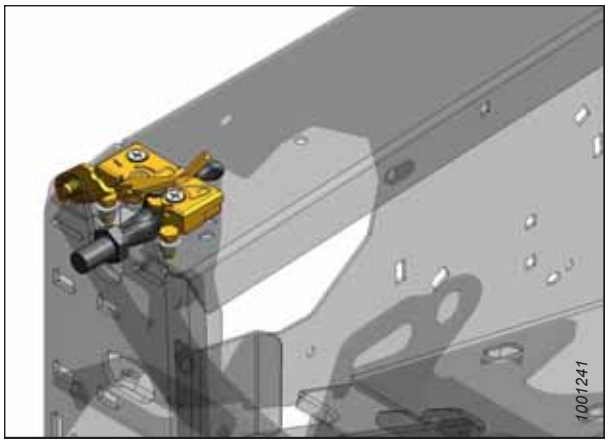


Figure 6.9: Divider Latch

6.3.2 Stabilizer Wheels

Stabilizer wheels help to 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.

This kit is available as an attachment for use with 9.1, 10.7, and 12.2 m (30, 35, and 40 ft.) headers.

MD #C1986

Second Stabilizer Wheel kit:

The Second Stabilizer Wheel kit is available to upgrade the header to two stabilizer wheels. Each kit consists of one wheel assembly; two kits are required to upgrade both sides of the header.

Installation instructions are included with the kit.

MD #B6179

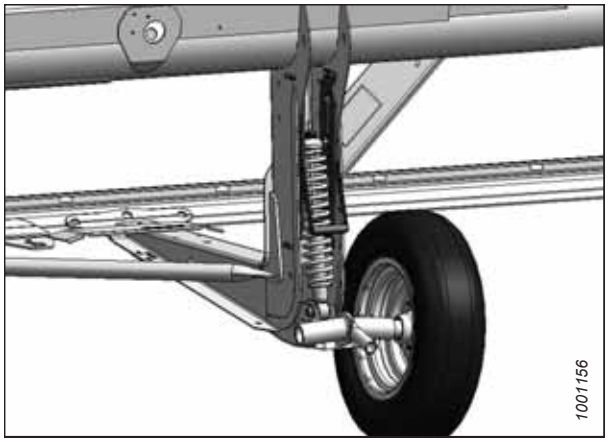


Figure 6.10: Stabilizer Wheel

6.3.3 Stabilizer / Slow Speed Transport Wheels

Stabilizer/slow speed transport wheels 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 option. For more information about that option, refer to *6.3.2 Stabilizer Wheels, page 248*.

Stabilizer/slow speed transport wheels are used to convert the header into transport mode for slow-speed towing behind a properly configured windrower (or agricultural tractor). A tow pole and installation instructions are included in the kit.

This option is available for use with 9.1, 10.7, and 12.2 m (30, 35, and 40 ft.) headers.

MD #C1997

Figure 6.11: Stabilizer/Transport Wheels

6.4 Crop Delivery

6.4.1 Draper Deflector (Narrow)

Narrow 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 while minimizing reel carryover in bushy crops.

NOTE:

Narrow draper deflectors are not recommended for double windrowing – wide draper deflectors are available for this purpose.

Refer to your parts catalog for the necessary parts.

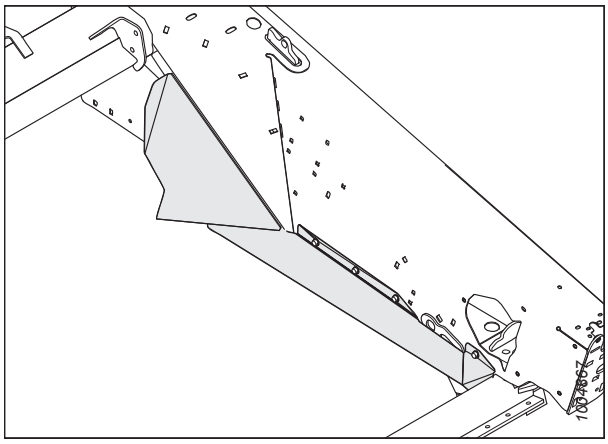


Figure 6.12: Draper Deflector (Narrow)

6.4.2 Draper Deflector (Wide)

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.

NOTE:

Required for double windrowing only (leaves a gap between the standing crop and the windrow for the divider to run through).

Refer to your parts catalog for the necessary parts.

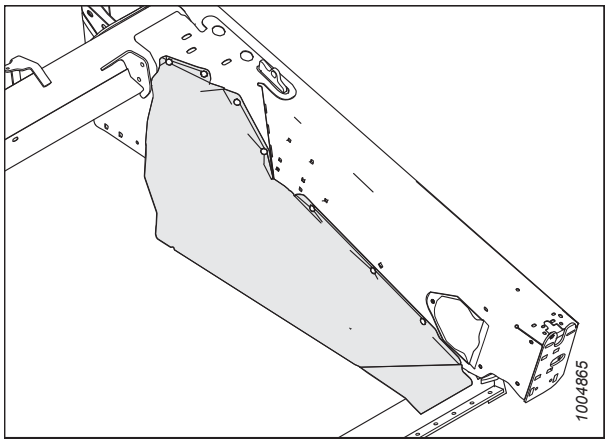


Figure 6.13: Draper Deflector (Wide)

6.4.3 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.

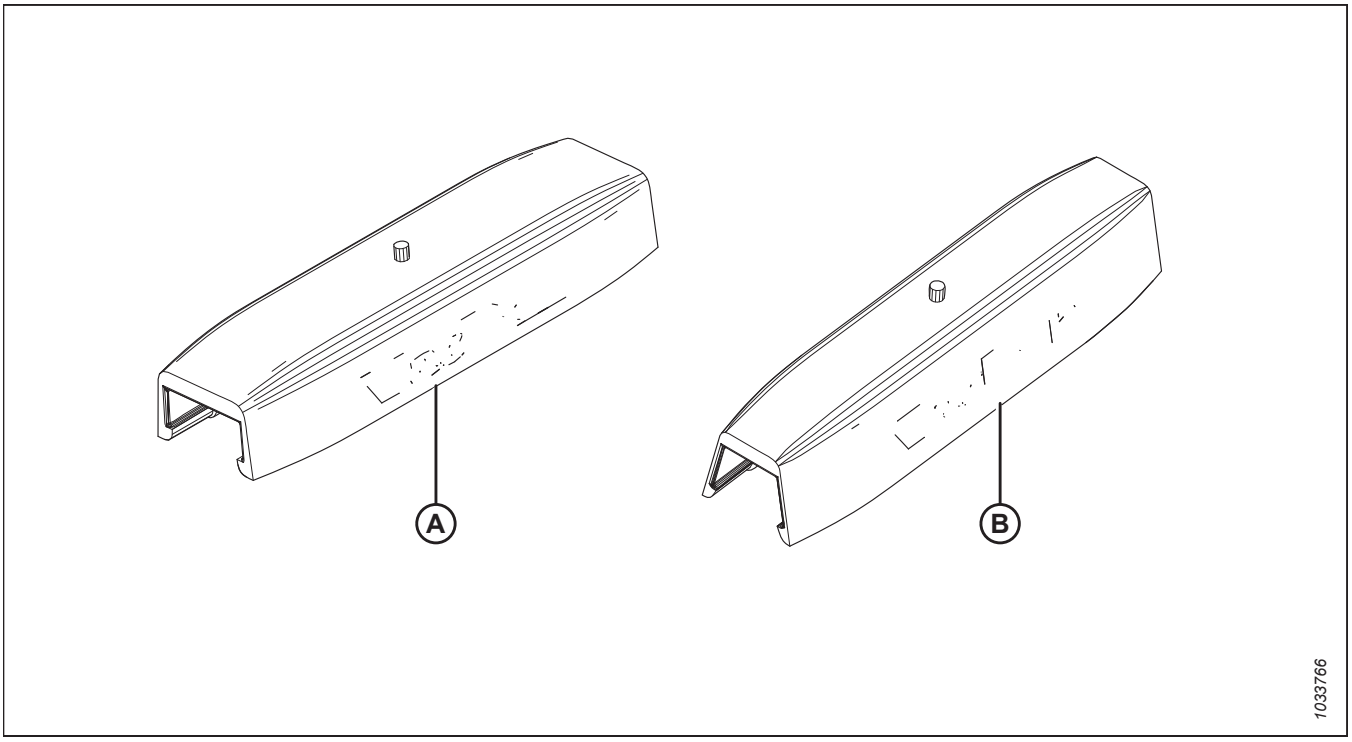


Figure 6.14: Draper Clips

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)

6.4.4 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 6.15: Rice Divider Rod

6.4.5 Double Draper Drive Kit

The Double Draper Drive (DDD) kit provides power to four draper rollers instead of the usual two in order to minimize draper slipping when using the side delivery feature in heavy forage crops.

Installation instructions are included with the kit.

This kit is available for 9.1–12.2 m (30–40 ft.) headers.

MD #B5653[51]

6.4.6 Double Windrow Attachment

The Double Windrow Attachment (DWA) can be attached to an M Series Self-Propelled Windrower to enable double-windrowing with a hay conditioner.

The DWA[52] lays up to 18.3 m (60 ft.) of crop in a single windrow which is ideal for large forage harvesters. It is designed to mount only on SP windrowers equipped with an HC10 Conditioner[53].

MD #C1987

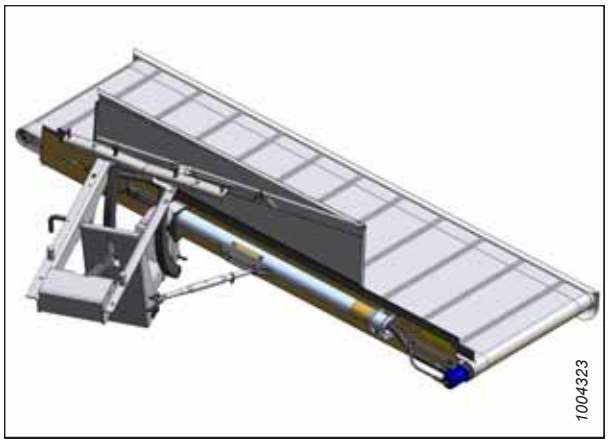


Figure 6.16: Double Windrow Attachment (DWA)

6.4.7 Draper Extension Kit

The draper extension kit increases the inboard length of each deck up to 250 mm (10 in.), which narrows the header opening and decreases windrow width when cutting light/thin crops.

The kit includes roller support extensions, a draper repair kit, all necessary hardware, and installation instructions.

MD #B5407[54]

51. MD #B5606 is required to operate both upper cross auger and double draper drive on an SP Windrower.
52. This option is not compatible with the M105 SP Windrower.
53. This option is not for use with the M205 or M105 SP Windrower.
54. Not for use with Double Draper Drive (DDD).

6.4.8 Swath Forming Rods (Center Delivery)

Swath forming rods form windrows so the heads are in the center and protected from shatter. Swath forming rods are mainly used for grass seed cutting applications.

Installation and adjustment instructions are included with the kit.

MD #B4803

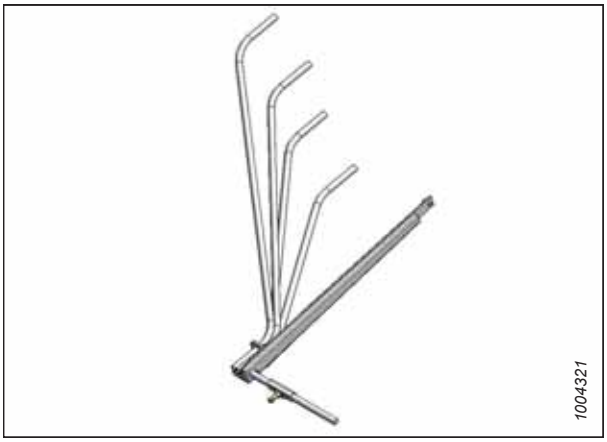


Figure 6.17: Swath Forming Rods

6.4.9 Swath Deflector Rods (End Delivery)

End delivery deflector rods are used for double windrowing with end delivery only, but can be left in place for center delivery.

The deflector rods help prevent delivered crop at the opening from interfering with the standing crop.

Installation and adjustment instructions are included with the bundle.

Order bundles according to left or right side:

- Left Side – MD #B5088
- Right Side – MD #B5089

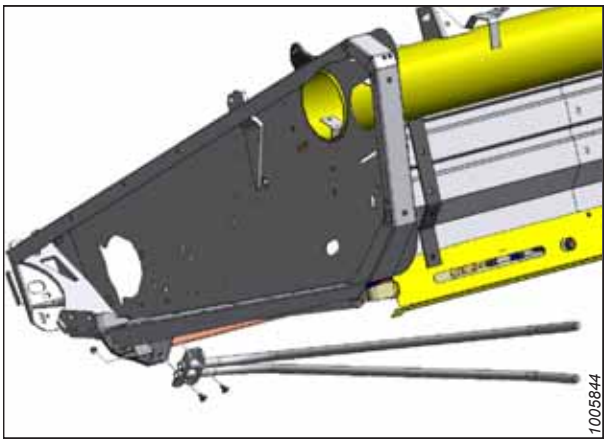


Figure 6.18: Swath Deflector

6.4.10 HC10 Hay Conditioner

When paired with a windrower and a draper header, the HC10 hay conditioner lays uniform, fluffy windrows. Conditioning or crimping the cut hay allows the release of moisture resulting in faster drying times and earlier processing.

A parts list and installation and operating instructions are included with the kit.

MD #C1982

NOTE:

Not for use on M205 SP Windrowers.

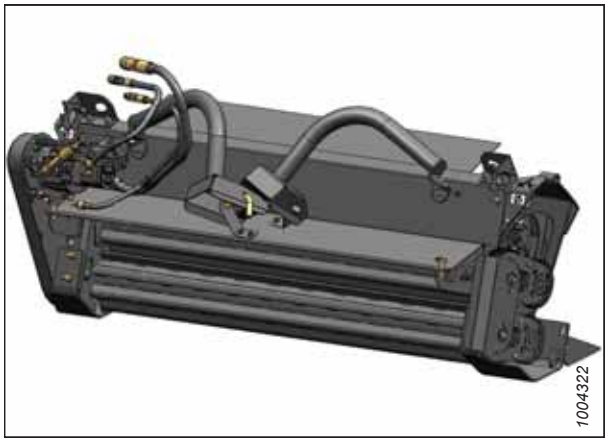


Figure 6.19: Hay Conditioner

6.4.11 Hydraulic Deck Shift Package

This system allows shifting of the decks from the operator's console when double-windrowing.

Installation and adjustment instructions are included with the kit.

Available on 7.6–12.2 m (25–40 ft.) headers.

MD #B5664

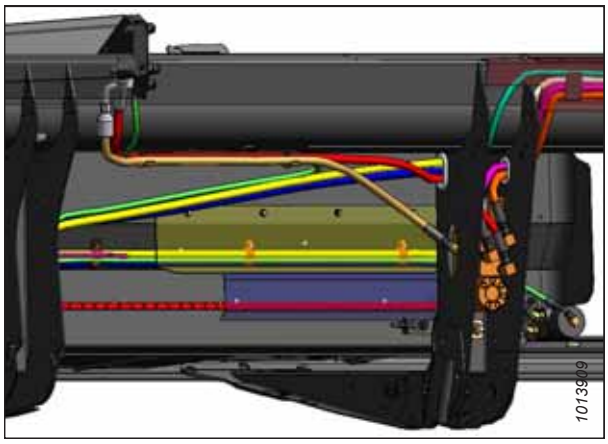


Figure 6.20: Hydraulic Deck Shift

6.4.12 Upper Cross Auger

The upper cross auger (UCA) 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.

NOTE:

Newer UCA kits do not include or use beater bars.

Installation instructions are included with the kit.

Order from the following bundles[55] according to your header size:

- 4.6 m (15 ft.) – MD #B6280
- 6.1 m (20 ft.) – MD #B6281
- 7.6 m (25 ft.) – MD #B6461
- 9.1 m (30 ft.) – MD #B9045
- 10.7 m (35 ft.) – MD #B9046
- 12.2 m (40 ft.) – MD #B9047

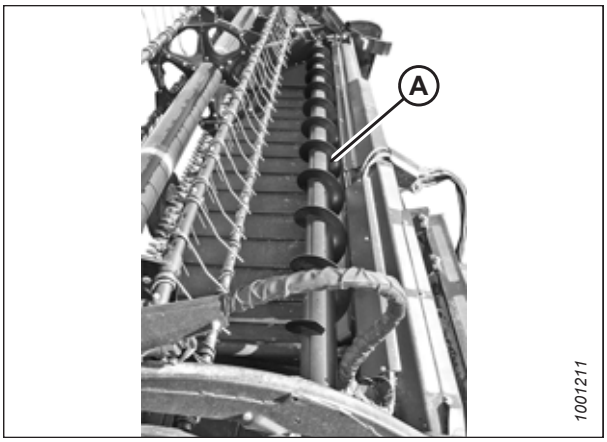


Figure 6.21: Upper Cross Auger

6.4.13 Upper Cross Auger (UCA) Hydraulic Kit for Double Draper Drive (DDD)

This kit is required to provide hydraulic power to the UCA on headers with both UCA and DDD kits installed. Operating both options without this kit can result in damage to the UCA motor and inadequate power to the draper drive system. This kit is not applicable to M100 and M105 SP Windrowers.

MD #B5606

6.4.14 Upper Cross Auger (UCA) Case Drain Kit for Single Draper Drive (SDD)

This kit is intended for SDD headers equipped with a UCA and is applicable to all M Series windrowers, except the M205.

MD #5842

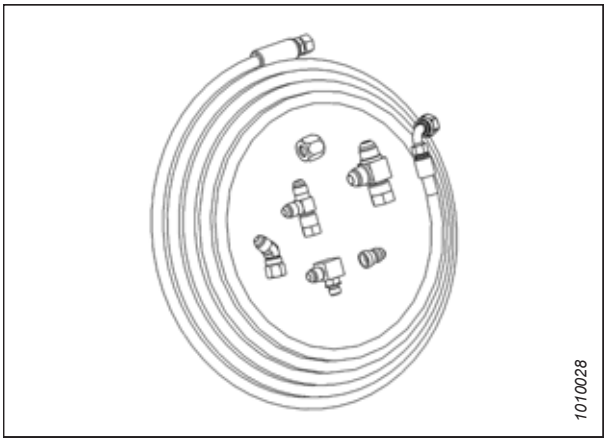


Figure 6.22: Case Drain

55. MD #B5606 is required to operate both the upper cross auger and the double draper drive on an SP Windrower.

Chapter 7: Troubleshooting

Troubleshooting tables are provided to help you diagnose and solve any problems you may have with the header.

7.1 Crop Loss at Cutterbar

Use the following tables to determine the cause of crop loss at the cutterbar and the recommended solution.

Problem	Solution	Refer to
Symptom: Does Not Pick Up Down Crop		
Cutterbar too high	Lower cutterbar	*3.7.1 Cutting Height, page 52*
Header angle too low	Increase header angle	*Controlling Header Angle, page 57*
Reel too high	Lower reel	*3.7.10 Reel Height, page 60*
Reel too far back	Move reel forward	*3.7.11 Reel Fore-Aft Position, page 61*
Ground speed too fast for reel speed	Reduce ground speed or increase reel speed	• *3.7.6 Reel Speed, page 58* • *3.7.7 Ground Speed, page 58*
Reel fingers not lifting crop sufficiently	Increase finger pitch aggressiveness	*3.7.12 Reel Tine Pitch, page 68*
Reel fingers not lifting crop sufficiently	Install lifter guards	See your MacDon Dealer
Symptom: Heads Shattering or Breaking Off		
Reel speed too fast	Reduce reel speed	*3.7.6 Reel Speed, page 58*
Reel too low	Raise reel	*3.7.10 Reel Height, page 60*
Ground speed too fast	Reduce ground speed	*3.7.7 Ground Speed, page 58*
Crop too ripe	Operate at night when humidity is higher	—
Symptom: Cut Grain Falling Ahead of Cutterbar		
Ground speed too slow	Increase ground speed	*3.7.7 Ground Speed, page 58*
Reel speed too slow	Increase reel speed	*3.7.6 Reel Speed, page 58*
Reel too high	Lower reel	*3.7.10 Reel Height, page 60*
Cutterbar too high	Lower cutterbar	*3.7.1 Cutting Height, page 52*
Reel too far forward	Move reel back	*3.7.11 Reel Fore-Aft Position, page 61*
Cutting at speeds over 10 km/h (6 mph) with high torque (10-tooth) reel drive sprocket	Replace with standard torque (19-tooth) reel drive sprocket	• *5.9.3 Replacing Reel Drive Sprocket, page 232* • See your MacDon Dealer
Worn or broken knife components	Replace knife components	*5.5 Cutterbar, page 138*
Symptom: Strips of Uncut Material		
Crowding uncut crop	Allow enough room for crop to be fed to cutterbar	—
Broken knife sections	Replace broken sections	*5.5.1 Replacing Knife Section, page 138*
Symptom: Excessive Bouncing at Normal Field Speed		
Float set too light	Adjust header float	*3.7.4 Header Float, page 57*
Symptom: Divider Rod Running Down Standing Crop		
Divider rods too long	Remove divider rods	*3.7.14 Crop Divider Rods, page 76*
Symptom: Bushy or Tangled Crop Flows over Divider Rod, Builds Up on Endsheets		

Problem	Solution	Refer to
Divider rods providing insufficient separation	Install long divider rods	*3.7.14 Crop Divider Rods, page 76*
Symptom: Crop Not Being Cut at Ends		
Reel not frowning or not centered in header	Adjust reel frown or reel horizontal position	• *3.7.11 Reel Fore-Aft Position, page 61* • *5.8.2 Reel Frown, page 205*
Knife hold-downs not adjusted properly	Adjust hold-downs so knife works freely, but still keeps sections from lifting off guards	*Checking and Adjusting Knife Hold-Downs, page 148*
Knife sections or guards are worn or broken	Replace all worn and broken cutting parts	*5.5 Cutterbar, page 138*
Header is not level	Level header	*3.12 Leveling Header, page 91*
Reel fingers not lifting crop properly ahead of knife	Adjust reel position / finger pitch	• *3.7.11 Reel Fore-Aft Position, page 61* • *3.7.12 Reel Tine Pitch, page 68*
Divider runs down thick crop at ends, preventing proper feeding due to material bridging the knife guards	Replace three or four end guards with stub guards	• *5.5.7 Knife Guards, page 142* • *6.2.3 Stub Guard Conversion Kit, page 247* • See your MacDon Dealer
Symptom: Material Accumulating in Gap between Cutout in Endsheet and Knifehead		
Crop heads leaning away from knifehead opening in endsheet	Add knifehead shield(s), except in damp/sticky soils	*5.5.8 Knifehead Shield, page 153*

7.2 Cutting Action and Knife Components

Use the following tables to determine the cause of the cutting action and knife component problems and the recommended repair procedure.

Problem	Solution	Refer to
Symptom: Ragged or Uneven Cutting of Crop		
Knife hold-downs not adjusted properly	Adjust hold-downs	*Checking and Adjusting Knife Hold-Downs, page 148*
Knife sections or guards are worn or broken	Replace all worn and broken cutting parts	*5.5 Cutterbar, page 138*
Knife is not operating at recommended speed	Check engine speed of windrower	Refer to your windrower operator's manual
Ground speed too fast for reel speed	Reduce ground speed or increase reel speed	• *3.7.7 Ground Speed, page 58* • *3.7.6 Reel Speed, page 58*
Reel fingers not lifting crop properly ahead of knife	Adjust reel position / finger pitch	• *3.7.11 Reel Fore-Aft Position, page 61* • *3.7.12 Reel Tine Pitch, page 68*
Cutterbar too high	Lower cutting height	*3.7.1 Cutting Height, page 52*
Header angle too flat	Steepen header angle	*Controlling Header Angle, page 57*
Bent knife, causing binding of cutting parts	Straighten a bent knife and align guards	*5.5.7 Knife Guards, page 142*
Cutting edge of guards not close enough, or parallel to knife sections	Align guards	*5.5.7 Knife Guards, page 142*
Tangled / tough to cut crop	Install stub guards	• *5.5.7 Knife Guards, page 142* • *6.2.3 Stub Guard Conversion Kit, page 247* • See your MacDon Dealer
Reel too far back	Move reel forward	*3.7.11 Reel Fore-Aft Position, page 61*
Loose knife drive belt	Adjust knife drive belt tension	• *Tensioning Untimed Knife Drive Belts, page 165* • *Tensioning Timed Knife Drive Belts, page 170*
Symptom: Knife Plugging		
Reel too high or too far forward	Lower reel or move reel rearward	• *3.7.10 Reel Height, page 60* • *3.7.11 Reel Fore-Aft Position, page 61*
Ground speed too slow	Increase ground speed	*3.7.6 Reel Speed, page 58*
Loose knife drive belt	Adjust drive belt tension	• *Tensioning Untimed Knife Drive Belts, page 165* • *Tensioning Timed Knife Drive Belts, page 170*
Improper knife hold-down adjustment	Adjust hold-down	*Checking and Adjusting Knife Hold-Downs, page 148*

Problem	Solution	Refer to
Dull or broken knife sections	Replace knife section	*5.5.1 Replacing Knife Section, page 138*
Bent or broken guards	Align or replace guards	*5.5.7 Knife Guards, page 142*
Reel fingers not lifting crop properly ahead of knife	Adjust reel position / finger pitch	• *3.7.11 Reel Fore-Aft Position, page 61* • *3.7.12 Reel Tine Pitch, page 68*
Steel pick-up fingers contacting knife	Increase reel clearance to cutterbar, or adjust frown	• *5.8.1 Reel Clearance to Cutterbar, page 202* • *5.8.2 Reel Frown, page 205*
Float too heavy	Adjust springs for lighter float	*3.7.4 Header Float, page 57*
Mud or dirt build up on cutterbar	Raise cutterbar by lowering skid shoes	*3.7.3 Cutting on the Ground, page 55*
Mud or dirt build up on cutterbar	Install cut-out sections	See your MacDon Dealer
Mud or dirt build up on cutterbar	Flatten header angle	*Controlling Header Angle, page 57*
Knife is not operating at recommended speed	Check engine speed of windrower	Refer to your windrower's operator's manual
Symptom: Excessive Header Vibration		
Knife hold-downs not adjusted properly	Adjust hold-downs	*Checking and Adjusting Knife Hold-Downs, page 148*
Knives on double-knife drive not timed	Adjust knife timing	*Adjusting Double-Knife Timing, page 172*
Knife not operating at recommended speed	Check engine speed of windrower	Refer to your windrower's operator's manual
Excessive knife wear	Replace knife	• *5.5.2 Removing Knife, page 139* • *5.5.5 Installing Knife, page 141*
Loose or worn knifehead pin or drive arm	Tighten or replace parts	• *5.5.3 Removing Knifehead Bearing, page 140* • *5.6.1 Knife Drive Box, page 155*
Bent cutterbar	Straighten cutterbar	See your MacDon Dealer
Symptom: Knife Back Breakage		
Bent or broken guard	Straighten or replace guard	*5.5.7 Knife Guards, page 142*
Worn knifehead pin	Replace knifehead pin	*5.5.3 Removing Knifehead Bearing, page 140*
Dull knife	Replace knife	• *5.5.2 Removing Knife, page 139* • *5.5.5 Installing Knife, page 141*
Symptom: Excessive Breakage of Knife Sections or Guards		
Knife hold-downs not adjusted properly	Adjust hold-downs	*Checking and Adjusting Knife Hold-Downs, page 148*
Cutterbar operating too low in stony conditions	Raise cutterbar using skid shoes	*3.7.3 Cutting on the Ground, page 55*
Float is set too heavy	Adjust for lighter float	*3.7.4 Header Float, page 57*
Bent or broken guard	Straighten or replace guard	*5.5.7 Knife Guards, page 142*
Header angle too steep	Flatten header angle	*Controlling Header Angle, page 57*

7.3 Reel Delivery

Use the following tables to determine the cause of reel delivery problems and the recommended repair procedure.

Problem	Solution	Refer to
Symptom: Reel Not Releasing Material in Normal Standing Crop		
Reel speed too fast	Reduce reel speed	*3.7.6 Reel Speed, page 58*
Reel too low	Raise reel	*3.7.10 Reel Height, page 60*
Reel tines too aggressive	Reduce cam setting	*3.7.12 Reel Tine Pitch, page 68*
Reel too far back	Move reel forward	*3.7.11 Reel Fore-Aft Position, page 61*
Symptom: Reel Not Releasing Material in Lodged and Standing Crop (Reel Fully Lowered)		
Reel tines too aggressive for standing crop	Reduce cam setting (1 or 2)	*3.7.12 Reel Tine Pitch, page 68*
Symptom: Wrapping on Reel End		
Reel tines too aggressive	Reduce cam setting	*3.7.12 Reel Tine Pitch, page 68*
Reel too low	Raise reel	*3.7.10 Reel Height, page 60*
Reel speed too fast	Reduce reel speed	*3.7.6 Reel Speed, page 58*
Crop conditions	Install optional endshields	See your MacDon Dealer
Reel not centered in header	Center reel in header	*5.8.3 Centering Reel, page 205*
Symptom: Reel Releases Crop too Quickly		
Reel tines not aggressive enough	Increase cam setting	*3.7.12 Reel Tine Pitch, page 68*
Reel too far forward	Move reel back	*3.7.11 Reel Fore-Aft Position, page 61*
Symptom: Reel Will Not Lift		
Reel lift couplers are incompatible or defective	Change quick coupler	—
Symptom: Reel Will Not Turn		
Control set at 0	Activate reel speed control	*3.7.6 Reel Speed, page 58*
Quick couplers not properly connected	Connect couplers	*4.1 Attaching Header to Windrower, page 113*
Reel drive chain disconnected	Connect reel drive chain	*5.9.7 Replacing Drive Chain on Single Reel, page 239*
Symptom: Reel Motion Uneven under no Load		
Excessive slack in reel drive chain	Tighten reel drive chain	*5.9.2 Adjusting Reel Drive Chain Tension, page 229*

Problem	Solution	Refer to
Symptom: Reel Motion is Uneven or Stalls in Heavy Crops		
Reel speed too fast	Reduce reel speed	*3.7.6 Reel Speed, page 58*
Reel fingers not aggressive enough	Move to a more aggressive finger pitch notch	*3.7.12 Reel Tine Pitch, page 68*
Reel too low	Raise reel	*3.7.10 Reel Height, page 60*
Relief valve on windrower has low relief pressure setting	Increase relief pressure to manufacturer's recommendations	Refer to the windrower operator's manual
Low oil reservoir level on windrower (sometimes more than one reservoir)	Fill to proper level	Refer to the windrower operator's manual
Relief valve malfunction	Replace relief valve	Refer to the windrower 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	*Optional Reel Drive Sprockets, page 58*
Symptom: Plastic Fingers Cut at Tip		
Insufficient reel to cutterbar clearance	Increase clearance	*5.8.1 Reel Clearance to Cutterbar, page 202*
Symptom: Plastic Fingers Bent Rearward at Tip		
Reel digging into ground with reel speed slower than ground speed	Raise header	*3.7.1 Cutting Height, page 52*
Reel digging into ground with reel speed slower than ground speed	Decrease header tilt	*Controlling Header Angle, page 57*
Reel digging into ground with reel speed slower than ground speed	Move reel aft	*3.7.11 Reel Fore-Aft Position, page 61*
Symptom: Plastic Fingers Bent Forward at Tip (Opposite of Above)		
Reel digging into ground with reel speed faster than ground speed	Raise header	*3.7.1 Cutting Height, page 52*
Reel digging into ground with reel speed faster than ground speed	Decrease header tilt	*Controlling Header Angle, page 57*
Reel digging into ground with reel speed faster than ground speed	Move reel aft	*3.7.11 Reel Fore-Aft Position, page 61*
Symptom: Plastic Fingers Bent Close to Tine Tube		
Excessive plugging at cutterbar with wads of crop accumulating at cutterbar while maintaining reel operation	Correct plugging/cutting issues	*3.13 Unplugging Cutterbar, page 92*
Excessive plugging at cutterbar with wads of crop accumulating at cutterbar while maintaining reel operation	Stop reel before plugging becomes excessive	—

7.4 Header and Drapers

Use the following tables to determine the header and draper problems and the recommended repair procedure.

Problem	Solution	Refer to
Symptom: Insufficient Header Lift		
Low relief pressure	Increase relief pressure	See your MacDon Dealer
Symptom: Insufficient Draper Speed		
Speed control set too low	Increase control setting	*3.7.8 Draper Speed, page 59*
Relief pressure too low	Increase relief pressure to recommended setting	See your MacDon Dealer
Windrower header drive too slow	Adjust to correct speed for windrower model	Refer to windrower operator's manual
Worn out gear pump	Replace gear pump	See your MacDon Dealer
Pressure compensator (V7) set too low	Adjust to increase setting	Refer to windrower operator's manual
Symptom: Draper Will Not Move		
Drapers are loose	Tighten drapers	*5.7.3 Adjusting Draper Tension, page 182*
Drive or idler roller wrapped with material	Loosen draper and clean rollers	*5.7.3 Adjusting Draper Tension, page 182*
Slat or connector bar jammed by frame or material	Loosen draper and clear obstruction	*5.7.3 Adjusting Draper Tension, page 182*
Roller bearing seized	Replace roller bearing	*5.7.6 Side Draper Roller Maintenance, page 189*
Low hydraulic oil	Fill windrower reservoir to full level	See your MacDon Dealer
Incorrect relief setting at flow control valve	Adjust relief setting	See your MacDon Dealer
Symptom: Draper Stalling		
Material not feeding evenly off knife	Lower reel	*3.7.10 Reel Height, page 60*
Material not feeding evenly off knife	Install stub guards	• *6.2.3 Stub Guard Conversion Kit, page 247* • *5.5.7 Knife Guards, page 142* • See your MacDon Dealer
Symptom: Hesitation in Flow of Bulky Crop		
Header angle too low	Increase header angle	*Controlling Header Angle, page 57*
Material overload on drapers	Increase side draper speed	*3.7.8 Draper Speed, page 59*
Material overload on drapers	Install upper cross auger	*6.4.12 Upper Cross Auger, page 254*
Material overload on drapers	Add flighting extensions	See your MacDon Dealer
Symptom: Drapers Back Feed		
Drapers running too slow in heavy crop	Increase draper speed	*3.7.8 Draper Speed, page 59*

Problem	Solution	Refer to
Symptom: Crop is Thrown Across Opening and under Opposite Side Draper		
Drapers running too fast in light crop	Reduce draper speed	*3.7.8 Draper Speed, page 59*
Symptom: Material Accumulates inside or under Front Edge of Draper		
Deck height improperly adjusted	Adjust deck height	*5.7.5 Adjusting Deck Height, page 186*
Symptom: Material Wrapping at Upper Cross Auger Beater Bars **NOTE:** Some newer upper cross augers do not have beater bars.		
Crop conditions do not require beater bars	Remove beater bars	*3.14.1 Removing Beater Bars, page 93*
Symptom: Material Accumulating on End Deflectors and Releasing in Bunches		
End deflectors too wide	For headers with manual deck shift only, trim deflector or replace with narrow deflector (MD #172381)	*3.13 Unplugging Cutterbar, page 92*

7.5 Cutting Edible Beans

Use the following tables to determine the cause of any cutting edible bean problems and the recommended solutions.

Problem	Solution	Refer to
Symptom: Plants Being Stripped and Complete or Partial Plants Left Behind		
Header off ground	Lower header to ground and run on skid shoes and/or cutterbar	*3.7.3 Cutting on the Ground, page 55*
Float set too light—rides on high spots and does not lower soon enough	Set float as follows: • Dry ground: 445-667 N (100–150 lbf) • Wet ground: 222–445 N (50–100 lbf)	*3.7.4 Header Float, page 57*
Reel too high	Fully retract reel cylinders	*3.7.10 Reel Height, page 60*
Reel too high with cylinders fully retracted	Adjust reel height	*3.7.10 Reel Height, page 60*
Finger pitch not aggressive enough	Adjust finger pitch	*3.7.12 Reel Tine Pitch, page 68*
Reel too far aft	Move reel forward until the fingertips skim the soil surface with header on the ground and the center-link properly adjusted	*3.7.11 Reel Fore-Aft Position, page 61*
Header angle too shallow	Lengthen center-link	*Controlling Header Angle, page 57*
Header angle too shallow	If cutting on ground, header angle can be increased by fully retracting lift cylinders	*Controlling Header Angle, page 57*
Reel too slow	Adjust reel speed to be marginally faster than ground speed	*3.7.6 Reel Speed, page 58*
Ground speed too fast	Lower ground speed	*3.7.6 Reel Speed, page 58*
Skid shoes too low	Raise skid shoes to highest setting	*3.7.3 Cutting on the Ground, page 55*
Dirt packs on bottom of cutterbar and raises cutterbar off the ground	Install plastic wear strips on bottom of cutterbar and skid shoes	See your MacDon Dealer
Dirt packing on bottom of cutterbar with plastic wear strips on cutterbar and raises cutterbar off the ground	Ground too wet. Allow soil to dry	—
Dirt packing on bottom of cutterbar with plastic wear strips on cutterbar and raises cutterbar off the ground	Manually clean the bottom of cutterbar when accumulation gets unacceptable	—
Plastic wear strip for cutterbar has been installed over top of steel wearplates	Remove steel cutterbar wearplates when installing the plastic wear strips for cutterbar	—
Header not level	Level header	*3.12 Leveling Header, page 91*
Worn/damaged knife sections	Replace sections or complete knife	*5.5 Cutterbar, page 138*
Parts of vines get caught in pointed guard tip. (Occurs more in row-cropped beans that are hilled from cultivating)	Install stub guard kit	*6.2.3 Stub Guard Conversion Kit, page 247*
Symptom: Excessive Losses at Dividers		

Problem	Solution	Refer to
Divider rod running down crop and shattering pods	Remove divider rods	*3.7.14 Crop Divider Rods, page 76*
Vines and plants build up on endsheet	Install divider rods	*3.7.14 Crop Divider Rods, page 76*
Plant Vines Pinched between Top of Draper and Cutterbar		
Cutterbar has filled up with trash with draper to cutterbar gap properly adjusted	Raise header fully at each end of field, or as required and shift decks back and forth to help clean out cutterbar	—
Shifting of decks with header raised does not clean out cutterbar debris	Manually remove debris from cutterbar cavity to prevent damage to drapers	—
Symptom: Crop Accumulating at Guards and Not Moving Rearward onto Drapers		
Reel finger pitch not aggressive enough	Increase finger aggressiveness (cam position)	*3.7.12 Reel Tine Pitch, page 68*
Reel too high	Lower reel	*3.7.10 Reel Height, page 60*
Minimum reel clearance to cutterbar setting too high	Readjust reel minimum height with cylinders fully retracted	*Adjusting Reel Clearance, page 204*
Reel too far forward	Reposition reel	*3.7.11 Reel Fore-Aft Position, page 61*
Symptom: Reel Shattering Pods		
Reel too far forward	Reposition reel	*3.7.11 Reel Fore-Aft Position, page 61*
Reel speed too high	Reduce reel speed	*3.7.6 Reel Speed, page 58*
Bean pods are too dry	Cut at night with heavy dew once pods have softened	—
Finger pitch not aggressive enough	Increase finger aggressiveness (cam position)	*3.7.12 Reel Tine Pitch, page 68*
Symptom: Cutterbar Guards Breaking		
Float insufficient	Increase float	*3.7.4 Header Float, page 57*
Excessive number of rocks in field	Consider installing optional stub guards **Note:** Experiment with a few guards on a section of cutterbar to compare the performance of the two different styles of guards	• *5.5.7 Knife Guards, page 142* • *6.2.3 Stub Guard Conversion Kit, page 247*
Symptom: Cutterbar Pushing Too Much Trash and Dirt		
Header too heavy	Readjust float to make header lighter	*3.7.4 Header Float, page 57*
Header angle too steep	Decrease header angle with lift cylinders	*3.7.5 Header Angle, page 57*
Header angle too steep	Shorten the center-link	*3.7.5 Header Angle, page 57*
Regular guards push dirt and plug up with trash or plug up with trash and then push dirt	Install stub guard kit	*6.2.3 Stub Guard Conversion Kit, page 247*
Insufficient support for header	Install center skid shoes on header	*3.7.3 Cutting on the Ground, page 55*
Symptom: Cutterbar Fills Up with Dirt		
Excessive gap between top of front of draper and cutterbar	Adjust front deck supports to obtain proper clearance between cutterbar and draper	*5.7.5 Adjusting Deck Height, page 186*

Problem	Solution	Refer to
Excessive gap between top of front of draper and cutterbar	Raise header fully at each end of field or as required and shift decks back and forth to help clean out cutterbar	—
Symptom: Reel Carries Over Odd Plants in Same Location		
Reel steel fingers bent and hook plants from crop flow on drapers	Straighten steel fingers	—
Dirt accumulation on end of fingers prevent plants dropping off fingers onto drapers	Raise reel	*3.7.10 Reel Height, page 60*
Dirt accumulation on end of fingers prevent plants dropping off fingers onto drapers	Adjust reel fore and aft location to move fingers out of the ground	*3.7.11 Reel Fore-Aft Position, page 61*
Dirt accumulation on end of fingers prevent plants dropping off fingers onto drapers	Adjust reel fore and aft location to move fingers out of the ground	*3.7.11 Reel Fore-Aft Position, page 61*
Symptom: Cutterbar Pushing Too Much Dirt in Certain Locations for Length of Field		
Tire tracks or row crop ridges	Cut at angle to ridges or crop rows to allow knife and guards to clean out better	—
Rolling land along length of field	Cut at 90° angle to undulations, provided knife floats across without digging in	—
Symptom: Reel Carries Over Excessive Amounts of Plants or Wads		
Excessive accumulation of crop on drapers (up to height of reel center tube)	Increase draper speed	*3.7.8 Draper Speed, page 59*
Finger pitch not aggressive enough	Increase finger aggressiveness (cam position)	*3.7.12 Reel Tine Pitch, page 68*
Symptom: Reel Wraps Up with Crop		
Reel too low	Raise reel	*3.7.10 Reel Height, page 60*
Symptom: Reel Ends Wrap Up with Crop		
Uncut crop interfering on reel ends	Add reel endshields	Refer to the header parts catalog

7.6 Windrow Formation

Use the following tables to determine the cause of any windrow formation problems and the recommended solutions.

Problem	Solution	Refer to
Symptom: Heads on Ground and Scattered		
Draper speed too slow	Increase draper speed	*3.7.8 Draper Speed, page 59*
Draper angle too flat	Increase header angle	*Controlling Header Angle, page 57*
Ground speed too slow	Increase ground speed	*3.7.7 Ground Speed, page 58*
Crop too ripe	Cut material before too mature	—
Symptom: Hollow in Center		
Draper speed too slow	Increase draper speed	*3.7.8 Draper Speed, page 59*
Delivery opening too wide	Decrease delivery opening width	*3.8 Delivery Opening, page 78*
Symptom: All Heads in Center		
Draper speed too fast or header angle too steep	Reduce draper speed and/or decrease header angle	• *3.7.8 Draper Speed, page 59* • *3.7.5 Header Angle, page 57*
Ground speed too fast	Reduce ground speed	
Crop too green	Allow time to mature	—
Symptom: All Heads To One Side		
Crop leaning to one side and reel too slow	Increase reel speed to orient crop parallel to draper slats and/or increase finger pitch aggressiveness	• *3.7.6 Reel Speed, page 58* • *3.7.12 Reel Tine Pitch, page 68*
Symptom: Uneven Windrow (Any Crop Condition)		
Reel too low	Raise reel	*3.7.10 Reel Height, page 60*
Ground speed too fast for drapers, causing heads to fan out and crop to leave drapers unevenly	Reduce ground speed or increase draper speed	• *3.7.8 Draper Speed, page 59*
Reel speed too fast	Reduce reel speed	*3.7.6 Reel Speed, page 58*

Chapter 8: Reference

This chapter provides quick access to frequently needed information or numbers (for example, units of measurement or torque values).

8.1 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 8.1 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^3 or cc	x 0.061 =	cubic inch	$in.^3$
Weight	kilogram	kg	x 2.2046 =	pound	lb.

8.2 Torque Specifications

The following tables provide torque values for various bolts, cap screws, and hydraulic fittings. Refer to these values only when no other torque value has been specified in a given procedure.

- Tighten all bolts to the torque values specified in the charts below, unless you are directed otherwise in this manual.
- Replace removed hardware with hardware of the same strength and grade.
- Refer to the torque value tables as a guide when periodically checking the tightness of bolts.
- Understand the torque categories for bolts and cap screws by reading the markings on their heads.

Jam nuts

Jam nuts require less torque than nuts used for other purposes. When applying torque to finished jam nuts, multiply the torque applied to regular nuts by 0.65 to obtain the modified torque value.

Self-tapping screws

Refer to the standard torque values when installing the self-tapping screws. Do **NOT** install the self-tapping screws on structural or otherwise critical joints.

8.2.1 SAE Bolt Torque Specifications

The torque values provided in the following SAE bolt torque tables apply to hardware installed dry; that is, hardware with no grease, oil, or threadlocker on the threads or heads. Do **NOT** grease or oil bolts or cap screws unless directed to do so in this manual.

Table 8.2 SAE Grade 5 Bolt and Grade 5 Free Spinning Nut

Nominal Size (A)	Torque (Nm)		Torque (lbf·ft) (*lbf·in)	
	Min.	Max.	Min.	Max.
1/4-20	11.9	13.2	*106	*117
5/16-18	24.6	27.1	*218	*241
3/8-16	44	48	32	36
7/16-14	70	77	52	57
1/2-13	106	118	79	87
9/16-12	153	170	114	126
5/8-11	212	234	157	173
3/4-10	380	420	281	311
7/8-9	606	669	449	496
1-8	825	912	611	676

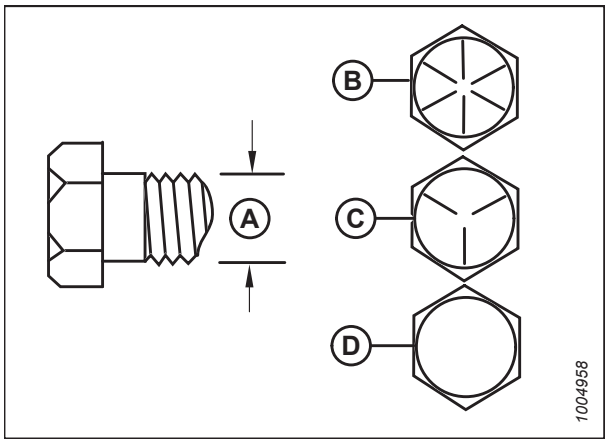


Figure 8.1: Bolt Grades

A - Nominal Size **B - SAE-8**
C - SAE-5 **D - SAE-2**

Table 8.3 SAE Grade 5 Bolt and Grade F Distorted Thread Nut

Nominal Size (A)	Torque (Nm)		Torque (lbf·ft) (*lbf·in)	
	Min.	Max.	Min.	Max.
1/4-20	8.1	9	*72	*80
5/16-18	16.7	18.5	*149	*164
3/8-16	30	33	22	24
7/16-14	48	53	35	39
1/2-13	73	80	54	59
9/16-12	105	116	77	86
5/8-11	144	160	107	118
3/4-10	259	286	192	212
7/8-9	413	456	306	338
1-8	619	684	459	507

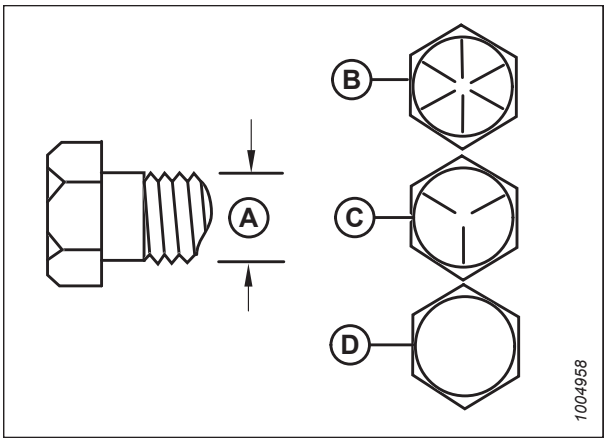


Figure 8.2: Bolt Grades

A - Nominal Size **B - SAE-8**
C - SAE-5 **D - SAE-2**

Table 8.4 SAE Grade 8 Bolt and Grade G Distorted Thread Nut

Nominal Size (A)	Torque (Nm)		Torque (lbf·ft) (*lbf·in)	
	Min.	Max.	Min.	Max.
1/4-20	16.8	18.6	*150	*165
5/16-18	24	26	18	19
3/8-16	42	46	31	34
7/16-14	67	74	50	55
1/2-13	102	113	76	84
9/16-12	148	163	109	121
5/8-11	204	225	151	167
3/4-10	362	400	268	296
7/8-9	583	644	432	477
1-8	874	966	647	716

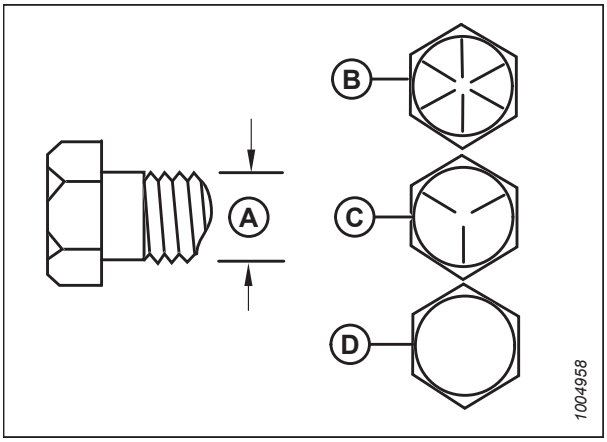


Figure 8.3: Bolt Grades

A - Nominal Size **B - SAE-8**
C - SAE-5 **D - SAE-2**

Table 8.5 SAE Grade 8 Bolt and Grade 8 Free Spinning Nut

Nominal Size (A)	Torque (Nm)		Torque (lbf·ft) (*lbf·in)	
	Min.	Max.	Min.	Max.
1/4-20	16.8	18.6	*150	*165
5/16-18	35	38	26	28
3/8-16	61	68	46	50
7/16-14	98	109	73	81
1/2-13	150	166	111	123
9/16-12	217	239	160	177
5/8-11	299	330	221	345
3/4-10	531	587	393	435
7/8-9	855	945	633	700
1-8	1165	1288	863	954

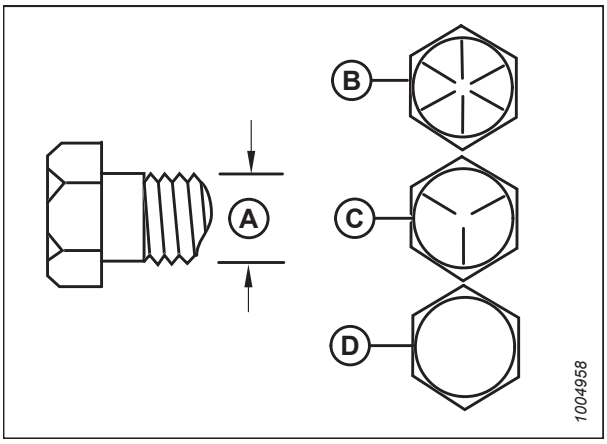


Figure 8.4: Bolt Grades

A - Nominal Size **B - SAE-8**
C - SAE-5 **D - SAE-2**

8.2.2 Metric Bolt Specifications

Specifications are provided for the appropriate final torque values to secure various sizes of metric bolts.

NOTE:

The torque values provided in the following metric bolt torque tables apply to hardware installed dry; that is, hardware with no grease, oil, or threadlocker on the threads or heads. Do **NOT** add grease, oil, or threadlocker to bolts or cap screws unless you are directed to do so in this manual.

Table 8.6 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

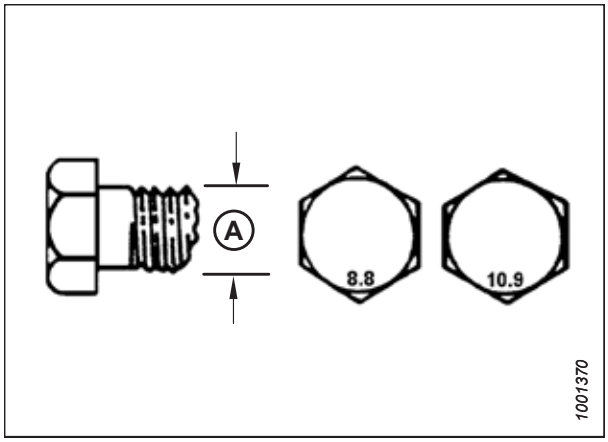


Figure 8.5: Bolt Grades

Table 8.7 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

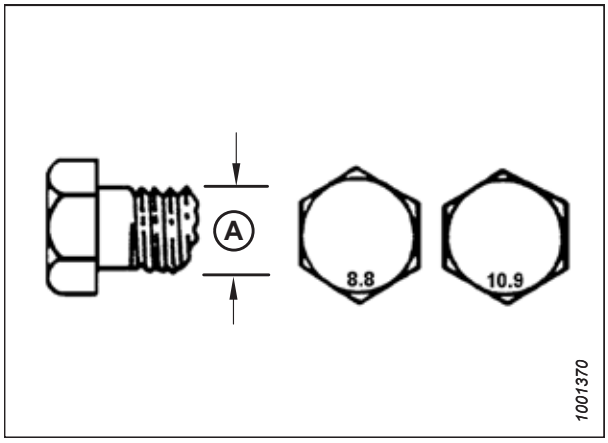


Figure 8.6: Bolt Grades

Table 8.8 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

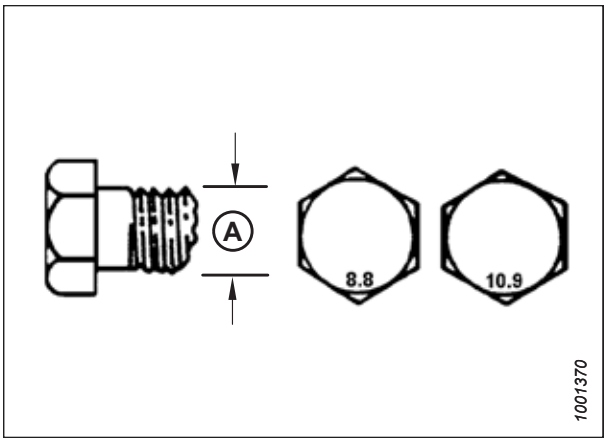


Figure 8.7: Bolt Grades

Table 8.9 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

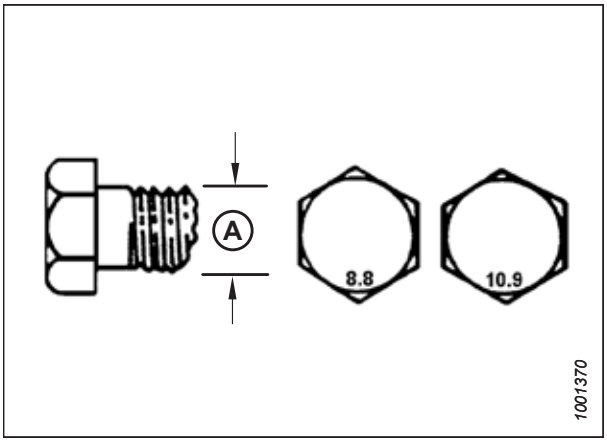


Figure 8.8: Bolt Grades

8.2.3 Metric Bolt Specifications – Cast Aluminum

Specifications are provided for the appropriate final torque values for various sizes of metric bolts in cast aluminum.

NOTE:

The torque values provided in the following metric bolt torque tables apply to hardware installed dry; that is, hardware with no grease, oil, or threadlocker on the threads or heads. Do **NOT** add grease, oil, or threadlocker to bolts or cap screws unless you are directed to do so in this manual.

Table 8.10 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	–	–	–	–

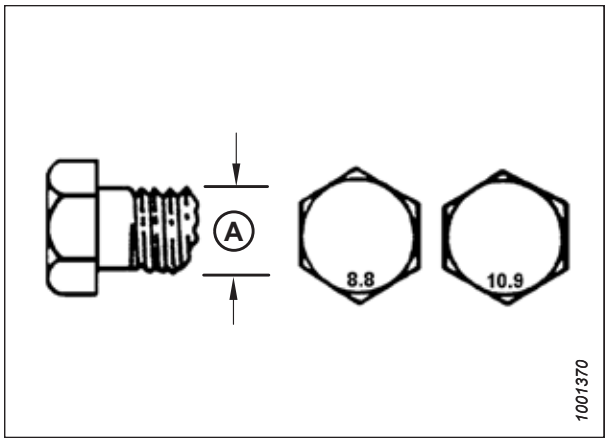


Figure 8.9: Bolt Grades

8.2.4 Flare-Type Hydraulic Fittings

The standard torque values are provided for flare-type hydraulic fittings. If a procedure specifies a different torque value for the same type and size of fitting found in this topic, refer to the value specified in the procedure instead.

1. Inspect flare (A) and flare seat (B) for defects that might cause leakage.
2. Align tube (C) with fitting (D) and thread nut (E) onto the fitting without lubrication until contact is made between the flared surfaces.
3. Torque fitting nut (E) to the specified number of flats from finger tight (FFFT) or to a given torque value in Table *8.11, page 274*.
4. Secure fitting (D) with two wrenches. Place one wrench on fitting body (D), and tighten nut (E) with the other wrench to the torque value shown in Table *8.11, page 274*.
5. Verify the final condition of connection.

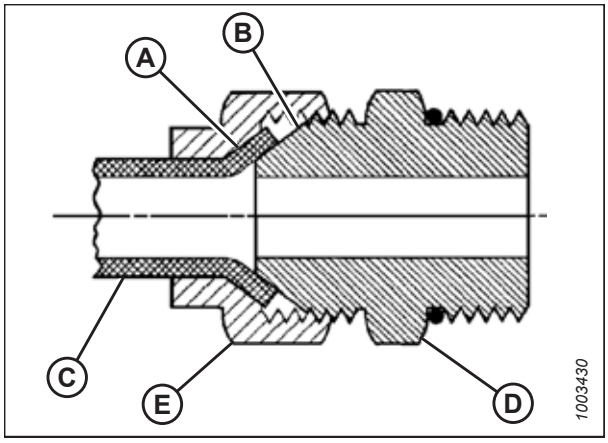


Figure 8.10: Hydraulic Fitting

Table 8.11 Flare-Type Hydraulic Tube Fittings

SAE Dash Size	Thread Size (in.)	Torque Value[56]		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

56. Torque values shown are based on lubricated connections as in reassembly.

Table 8.11 Flare-Type Hydraulic Tube Fittings (continued)

SAE Dash Size	Thread Size (in.)	Torque Value[57]		Flats from Finger Tight (FFFT)	
		Nm	lbf·ft	Tube	Swivel Nut or Hose
-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

8.2.5 O-Ring Boss Hydraulic Fittings – Adjustable

The standard torque values are provided for adjustable hydraulic fittings. If a procedure specifies a different torque value for the same type and size of fitting found in this topic, refer to the value specified in the procedure instead.

1. Inspect O-ring (A) and seat (B) for dirt or 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. Ensure that O-ring (A) is **NOT** on the threads. Adjust O-ring (A) if necessary.
4. Apply hydraulic system oil to O-ring (A).

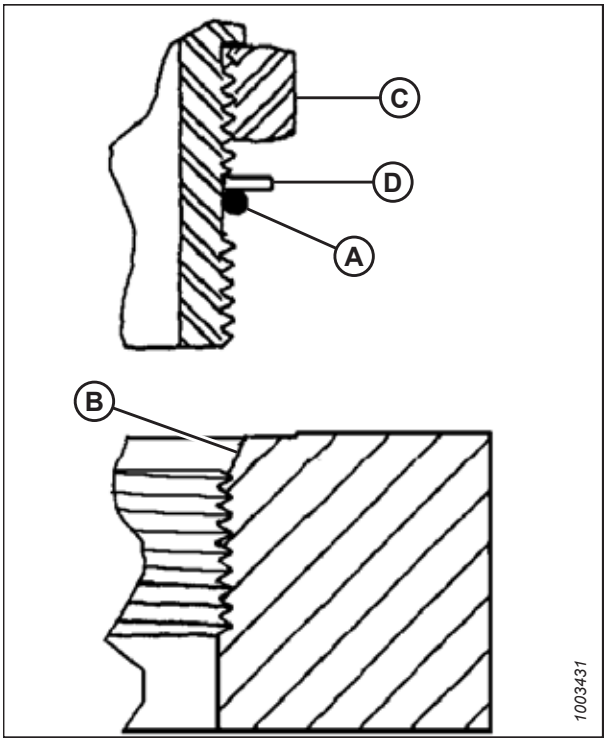


Figure 8.11: Hydraulic Fitting

57. Torque values shown are based on lubricated connections as in reassembly.

5. Install fitting (B) into the 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 it to the torque value indicated in the table. Use two wrenches, one on fitting (B) and the other on lock nut (C).
8. Verify the final condition of the fitting.

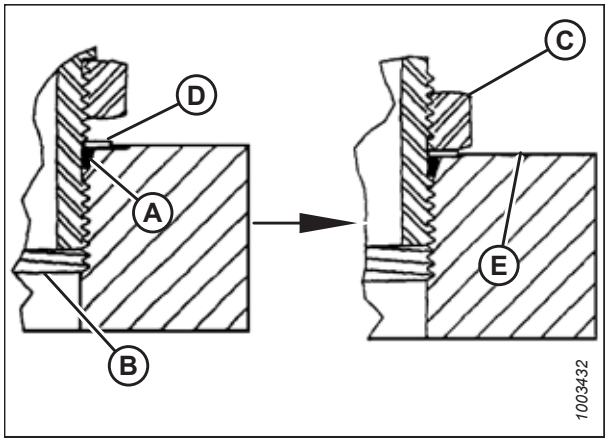


Figure 8.12: Hydraulic Fitting

Table 8.12 O-Ring Boss (ORB) Hydraulic Fittings – Adjustable

SAE Dash Size	Thread Size (in.)	Torque Value[58]	
		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

58. Torque values shown are based on lubricated connections as in reassembly.

8.2.6 O-Ring Boss Hydraulic Fittings – Non-Adjustable

The standard torque values for non-adjustable hydraulic fittings are provided. If a procedure specifies a different torque value for the same type and size of fitting found in this topic, use the value specified in the procedure instead.

1. Inspect O-ring (A) and seat (B) for dirt or defects.
2. Ensure that O-ring (A) is **NOT** on the threads. Adjust O-ring (A) if necessary.
3. Apply hydraulic system oil to the O-ring.
4. Install fitting (C) into the port until the fitting is hand-tight.
5. Torque fitting (C) according to values in Table *8.13, page 277*.
6. Verify the final condition of the fitting.

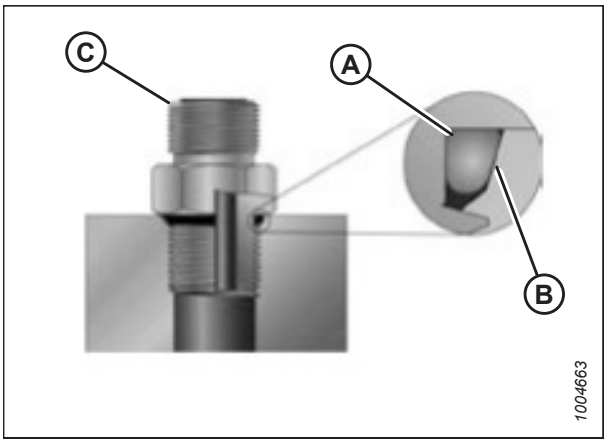


Figure 8.13: Hydraulic Fitting

Table 8.13 O-Ring Boss (ORB) Hydraulic Fittings – Non-Adjustable

SAE Dash Size	Thread Size (in.)	Torque Value[59]	
		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

8.2.7 O-Ring Face Seal Hydraulic Fittings

The standard torque values are provided for O-ring face seal hydraulic fittings. If a procedure specifies a different torque value for the same type and size of fitting found in this topic, refer to the value specified in the procedure instead.

Torque values are shown in the Table *8.14, page 278*.

59. Torque values shown are based on lubricated connections as in reassembly.

1. Ensure that the sealing surfaces and the fitting threads are free of burrs, nicks, scratches, and any foreign material.

Figure 8.14: 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 into 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 bottoms out.
5. Torque the fittings according to values in Table *8.14, page 278*.

   NOTE:

   If applicable, hold the hex flange on fitting body (E) to prevent the rotation of the fitting body and the hose when tightening fitting nut (D).
6. Use three wrenches when assembling unions or joining two hoses together.
7. Verify the final condition of the fitting.

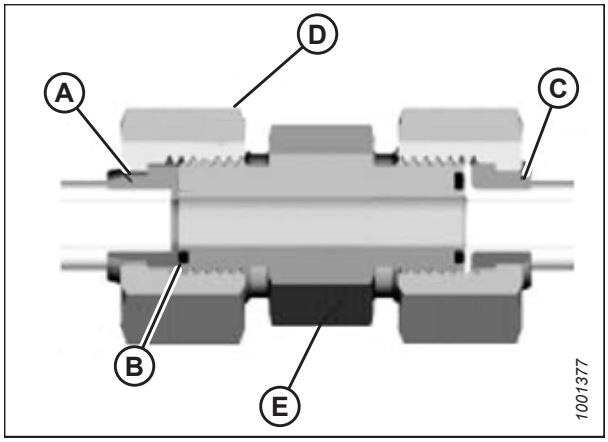


Figure 8.15: Hydraulic Fitting

Table 8.14 O-Ring Face Seal (ORFS) Hydraulic Fittings

SAE Dash Size	Thread Size (in.)	Tube O.D. (in.)	Torque Value[60]	
			Nm	lbf·ft
-3	Note[61]	3/16	–	–
-4	9/16	1/4	25–28	18–21
-5	Note[61]	5/16	–	–
-6	11/16	3/8	40–44	29–32
-8	13/16	1/2	55–61	41–45
-10	1	5/8	80–88	59–65
-12	1 3/16	3/4	115–127	85–94
-14	Note[61]	7/8	–	–
-16	1 7/16	1	150–165	111–122

60. Torque values and angles shown are based on lubricated connection as in reassembly.
61. O-ring face seal type end not defined for this tube size.

Table 8.14 O-Ring Face Seal (ORFS) Hydraulic Fittings (continued)

SAE Dash Size	Thread Size (in.)	Tube O.D. (in.)	Torque Value[62]	
			Nm	lbf·ft
-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

8.2.8 Tapered Pipe Thread Fittings

The standard torque values are provided for tapered pipe thread fittings. If a procedure specifies a different torque value for the same type and size of fitting found in this topic, refer to the value specified in the procedure instead.

Assemble pipe fittings as follows:

1. Ensure that the fitting and the port threads are free of burrs, nicks, scratches, and any other form of contamination.
2. Apply paste-type pipe thread sealant 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 *8.15, page 279*. Ensure that the tube end of a shaped connector (typically a 45° or 90° elbow) is aligned to receive the incoming tube or hose assembly. Always finish the alignment of the fitting in the direction of tightening. Never loosen the threaded connectors to achieve alignment.
5. Clean all residue and any excess thread conditioner with an appropriate cleaner.
6. Inspect the final condition of the fitting. Pay special attention to the possibility of cracks in the port opening.
7. Mark the final position of the fitting. If a fitting leaks, disassemble the fitting and check it for damage.

   NOTE:

   The failure of fittings due to over-torquing may not be evident until the fittings are disassembled and inspected.

Table 8.15 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
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

62. Torque values and angles shown are based on lubricated connection as in reassembly.

8.3 Unloading and Assembly

Refer to the instructions for your specific header for unloading, assembly, and setup procedures that are included with your shipment. The instruction part numbers are shown in the following table:

Shipping Destination	Header Description	MacDon Instruction Part Number
North America	D65 Draper Header for Self-Propelled Windrowers	MD #214328
Export (anywhere other than North America)	D65 Draper Header for Self-Propelled Windrowers	MD #214580

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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
Grease	SAE multi-purpose	High temperature extreme pressure (EP2) performance with 1% max. molybdenum disulphide (NLGI grade 2) Lithium base	As required unless otherwise specified	—
Gear lubricant	SAE 85W-140	API service class GL-5	Knife drive box	2.2 liters (2.3 quarts)

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