

D65 Draper Header for Self-Propelled Windrowers

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

Operator's Manual

147725 Revision A
2016 Model Year
Original Instruction

D65 Draper Header for Self-Propelled Windrowers



1003985

Published: June 2015

Declaration of Conformity

	<h2>EC Declaration of Conformity</h2>	
	<p>[1] MacDon MacDon Industries Ltd. 680 Moray Street, Winnipeg, Manitoba, Canada R3J 3S3</p>	<p>[4] As Per Shipping Document</p> <p>[5] July 31, 2014</p>
<p>[2] Windrower Draper Header</p>	<p>[6] _____ Natalia Pedersen Product Integrity</p>	
<p>[3] MacDon D65 Series</p>		

EN	BG	CZ	DA
<p>We, [1]</p> <p>Declare, that the product:</p> <p>Machine Type: [2]</p> <p>Name & Model: [3]</p> <p>Serial Number(s): [4]</p> <p>fulfils all the relevant provisions of the Directive 2006/42/EC.</p> <p>Harmonized standards used, as referred to in Article 7(2):</p> <p>EN ISO 4254-1:2013 EN ISO 4254-7:2009</p> <p>Place and date of declaration: [5]</p> <p>Identity and signature of the person empowered to draw up the declaration: [6]</p> <p>Name and address of the person authorized to compile the technical file:</p> <p>Hartmut Hartmann Wersener Holz 2a D-49504 Lotte (Germany) hartmut.hartmann@prodoku.com</p>	<p>Ние, [1]</p> <p>декларираме, че следният продукт:</p> <p>Тип машина: [2]</p> <p>Наименование и модел: [3]</p> <p>Сериен номер(а): [4]</p> <p>отговаря на всички приложими разпоредби на директива 2006/42/ЕО.</p> <p>Исползвани са следните хармонизирани стандарти според чл. 7(2):</p> <p>EN ISO 4254-1:2013 EN ISO 4254-7:2009</p> <p>Място и дата на декларацията: [5]</p> <p>Име и подпис на лицето, упълномощено да изготви декларацията: [6]</p> <p>Име и адрес на лицето, упълномощено да състави техническия файл:</p> <p>Хартмут Хартман Wersener Holz 2a D-49504 Lotte (Германия) hartmut.hartmann@prodoku.com</p>	<p>My, [1]</p> <p>Prohlašujeme, že produkt:</p> <p>Typ zařízení: [2]</p> <p>Název a model: [3]</p> <p>Sériové(á) číslo(ja): [4]</p> <p>splňuje všechna relevantní ustanovení směrnice 2006/42/EC.</p> <p>Byly použity harmonizované standardy, jak je uvedeno v článku 7(2):</p> <p>EN ISO 4254-1:2013 EN ISO 4254-7:2009</p> <p>Místo a datum prohlášení: [5]</p> <p>Identita a podpis osoby oprávněné k vydání prohlášení: [6]</p> <p>Jméno a adresa osoby oprávněné k vyplnění technického souboru:</p> <p>Hartmut Hartmann Wersener Holz 2a D-49504 Lotte (Německo) hartmut.hartmann@prodoku.com</p>	<p>Vi, [1]</p> <p>erklærer, at produktet:</p> <p>Maskintype [2]</p> <p>Navn og model: [3]</p> <p>Serienummer (-numre): [4]</p> <p>Opfylder alle bestemmelser i direktiv 2006/42/EF.</p> <p>Anvendte harmoniserede standarder, som henviser til i paragraf 7(2):</p> <p>EN ISO 4254-1:2013 EN ISO 4254-7:2009</p> <p>Sted og dato for erklæringen: [5]</p> <p>Identitet på og underskrift fra den person, som er bemyndiget til at udarbejde erklæringen: [6]</p> <p>Navn og adresse på den person, som er bemyndiget til at udarbejde den tekniske fil:</p> <p>Hartmut Hartmann Wersener Holz 2a D-49504 Lotte (Tyskland) hartmut.hartmann@prodoku.com</p>

DE	ES	ET	FR
<p>Wir, [1]</p> <p>Erklären hiermit, dass das Produkt:</p> <p>Maschinentyp: [2]</p> <p>Name & Modell: [3]</p> <p>Seriennummer (n): [4]</p> <p>alle relevanten Vorschriften der Richtlinie 2006/42/EG erfüllt.</p> <p>Harmonisierte Standards wurden, wie in folgenden Artikeln angegeben, verwendet 7(2):</p> <p>EN ISO 4254-1:2013 EN ISO 4254-7:2009</p> <p>Ort und Datum der Erklärung: [5]</p> <p>Name und Unterschrift der Person, die dazu befugt ist, die Erklärung auszustellen: [6]</p> <p>Name und Anschrift der Person, die dazu berechtigt ist, die technischen Unterlagen zu erstellen:</p> <p>Hartmut Hartmann Wersener Holz 2a D-49504 Lotte (Deutschland) hartmut.hartmann@prodoku.com</p>	<p>Nosotros [1]</p> <p>declaramos que el producto:</p> <p>Tipo de máquina: [2]</p> <p>Nombre y modelo: [3]</p> <p>Números de serie: [4]</p> <p>cumple con todas las disposiciones pertinentes de la directriz 2006/42/EC.</p> <p>Se utilizaron normas armonizadas, según lo dispuesto en el artículo 7(2):</p> <p>EN ISO 4254-1:2013 EN ISO 4254-7:2009</p> <p>Lugar y fecha de la declaración: [5]</p> <p>Identidad y firma de la persona facultada para draw redactar la declaración: [6]</p> <p>Nombre y dirección de la persona autorizada para elaborar el expediente técnico:</p> <p>Hartmut Hartmann Wersener Holz 2a D-49504 Lotte (Germany) hartmut.hartmann@prodoku.com</p>	<p>Meie, [1]</p> <p>deklareerime, et toode</p> <p>Seadme tüüp: [2]</p> <p>Nimi ja mudel: [3]</p> <p>Seerianumbrid: [4]</p> <p>vastab kõigile direktiivi 2006/42/EÜ asjakohastele sätetele.</p> <p>Kasutatud on järgnevald harmoniseeritud standardeid, millele on viidatud ka punktis 7(2):</p> <p>EN ISO 4254-1:2013 EN ISO 4254-7:2009</p> <p>Deklaratsiooni koht ja kuupäev: [5]</p> <p>Deklaratsiooni koostamiseks volitatud isiku nimi ja allkiri: [6]</p> <p>Tehnilise dokumendi koostamiseks volitatud isiku nimi ja aadress:</p> <p>Hartmut Hartmann Wersener Holz 2a D-49504 Lotte (Saksamaa) hartmut.hartmann@prodoku.com</p>	<p>Nous soussignés, [1]</p> <p>Déclarons que le produit :</p> <p>Type de machine : [2]</p> <p>Nom et modèle : [3]</p> <p>Numéro(s) de série : [4]</p> <p>Est conforme à toutes les dispositions pertinentes de la directive 2006/42/EC.</p> <p>Utilisation des normes harmonisées, comme indiqué dans l'Article 7(2):</p> <p>EN ISO 4254-1:2013 EN ISO 4254-7:2009</p> <p>Lieu et date de la déclaration : [5]</p> <p>Identité et signature de la personne ayant reçu le pouvoir de rédiger cette déclaration : [6]</p> <p>Nom et adresse de la personne autorisée à constituer le dossier technique :</p> <p>Hartmut Hartmann Wersener Holz 2a D-49504 Lotte (Allemagne) hartmut.hartmann@prodoku.com</p>

EC Declaration of Conformity

IT	HU	LT	LV
<p>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.</p> <p>Utilizzo degli standard armonizzati, come indicato nell'Articolo 7(2):</p> <p style="text-align: center;">EN ISO 4254-1:2013 EN ISO 4254-7:2009</p> <p>Luogo e data della dichiarazione: [5] Nome e firma della persona autorizzata a redigere la dichiarazione: [6] Nome e persona autorizzata a compilare il file tecnico: Hartmut Hartmann Wersener Holz Za D-49504 Lotte (Germania) hartmut.hartmann@prodoku.com</p>	<p>Mi, [1] Ezennel kijelentjük, hogy a következő termék: Gép típusa: [2] Név és modell: [3] Számszám(ok): [4] teljesíti a következők írányelv összes vonatkozó előírásait: 2006/42/EK.</p> <p>Az alábbi harmonizált szabványok kerültek alkalmazásra a 7(2) cikkely szerint:</p> <p style="text-align: center;">EN ISO 4254-1:2013 EN ISO 4254-7:2009</p> <p>A nyilatkozattétel ideje és helye: [5] Azon személy kiléte és aláírása, aki jogosult a nyilatkozat elkészítésére: [6] Azon személy neve és aláírása, adatai fathatalmazott a műszaki dokumentáció összeállítására: Hartmut Hartmann Wersener Holz Za D-49504 Lotte (Németország) hartmut.hartmann@prodoku.com</p>	<p>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.</p> <p>Naudojami harmonizuoti standartai, kai nurodoma straipsnyje 7(2):</p> <p style="text-align: center;">EN ISO 4254-1:2013 EN ISO 4254-7:2009</p> <p>Deklaracijos vieta ir data: [5] Asmens tapatybės duomenys ir parašas asmens, įgaliojoto sudaryti šią deklaraciją: [6] Vardas ir pavardė asmens, kuris įgaliojotas sudaryti šį techninį failą: Hartmut Hartmann Wersener Holz Za D-49504 Lotte (Vokietija) hartmut.hartmann@prodoku.com</p>	<p>Mēs, [1] Deklarējam, ka produkts: Mašīnas tips: [2] Nosaukums un modelis: [3] Sērijas numurs(-i): [4] atbilst visām būtiskajām Direktīvas 2006/42/EK prasībām.</p> <p>Piemēroti šādi saskaņotie standarti, kā minēts 7. panta 2. punktā:</p> <p style="text-align: center;">EN ISO 4254-1:2013 EN ISO 4254-7:2009</p> <p>Deklarācijas parakstīšanas vieta un datums: [5] Tās personas vārds, uzvārds un paraksts, kas ir pilnvarota sagatavot šo deklarāciju: [6] Tās personas vārds, uzvārds un adrese, kas ir pilnvarota sastādīt tehnisko dokumentāciju: Hartmut Hartmann Wersener Holz Za D-49504 Lotte (Vācija) hartmut.hartmann@prodoku.com</p>
<p>Wij, [1] Verklaren dat het product: Machinetype: [2] Naam en model: [3] Serienummer(s): [4] voldoet aan alle relevante bepalingen van de Richtlijn 2006/42/EC.</p> <p>Geharmoniseerde normen toegepast, zoals vermeld in Artikel 7(2):</p> <p style="text-align: center;">EN ISO 4254-1:2013 EN ISO 4254-7:2009</p> <p>Plaats en datum van verklaring: [5] Naam en handtekening van de bevoegde persoon om de verklaring op te stellen: [6] Naam en adres van de geautoriseerde persoon om het technisch dossier samen te stellen: Hartmut Hartmann Wersener Holz Za D-49504 Lotte (Duitsland) hartmut.hartmann@prodoku.com</p>	<p>My nižej 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.</p> <p>Zastosowali śmy następujące (zharmonizowane) normy zgodnie z artykułem 7(2):</p> <p style="text-align: center;">EN ISO 4254-1:2013 EN ISO 4254-7:2009</p> <p>Data i miejsce oświadczenia: [5] Imię i nazwisko oraz podpis osoby upoważnionej do przygotowania deklaracji: [6] Imię i nazwisko oraz adres osoby upoważnionej do przygotowania dokumentacji technicznej: Hartmut Hartmann Wersener Holz Za D-49504 Lotte (Niemcy) hartmut.hartmann@prodoku.com</p>	<p>Nós, [1] Declaramos, que o produto: Tipo de máquina: [2] Nome e Modelo: [3] Número(s) de Série: [4] cumpre todas as disposições relevantes da Directiva 2006/42/CE.</p> <p>Normas harmonizadas aplicadas, conforme referido no Artigo 7(2):</p> <p style="text-align: center;">EN ISO 4254-1:2013 EN ISO 4254-7:2009</p> <p>Local e data da declaração: [5] Identidade e assinatura da pessoa autorizada a elaborar a declaração: [6] Nome e endereço da pessoa autorizada a compilar o ficheiro técnico: Hartmut Hartmann Wersener Holz Za D-49504 Lotte (Alemanha) hartmut.hartmann@prodoku.com</p>	<p>Noi, [1] Declarām, cā urmātorul produs: Tipul maşinii: [2] Denumirea şi modelul: [3] Număr (numere) serie: [4] corespunde tuturor dispoziţiilor esenţiale ale directivei 2006/42/EC.</p> <p>Au fost aplicate următoarele standarde armonizate conform articolului 7(2):</p> <p style="text-align: center;">EN ISO 4254-1:2013 EN ISO 4254-7:2009</p> <p>Data şi locul declaraţiei: [5] Identitatea şi semnătura persoanei împuternicite pentru întocmirea declaraţiei: [6] Numele şi semnătura persoanei autorizate pentru întocmirea cărţii tehnice: Hartmut Hartmann Wersener Holz Za D-49504 Lotte (Germania) hartmut.hartmann@prodoku.com</p>
<p>Mi, [1] Izjavljujemo da proizvod: Tip mašine: [2] Naziv i model: [3] Serijski broj(ovi): [4] ispunjava sve relevantne odredbe direktive 2006/42/EC.</p> <p>Korišćenje su usklađenje standardi kao što je navedeno u članu 7(2):</p> <p style="text-align: center;">EN ISO 4254-1:2013 EN ISO 4254-7:2009</p> <p>Datum i mesto izdavanja deklaracije: [5] Identitet i potpis lica ovlašćenog za sastavljanje deklaracije: [6] Ime i adresa osobe ovlašćene za sastavljanje tehničke datoteke: Hartmut Hartmann Wersener Holz Za D-49504 Lotte (Nemačka) hartmut.hartmann@prodoku.com</p>	<p>Mi, [1] Intygat att produkten: Maskintyp: [2] Namn och modell: [3] Serienummer: [4] uppfyller alla relevanta villkor i direktivet 2006/42/EG.</p> <p>Harmoniserade standarder används, såsom anges i artikel 7(2):</p> <p style="text-align: center;">EN ISO 4254-1:2013 EN ISO 4254-7:2009</p> <p>Plats och datum för intyget: [5] Identitet och signatur för person med befogenhet att upprätta intyget: [6] Namn och adress för person behörig att upprätta den tekniska dokumentationen: Hartmut Hartmann Wersener Holz Za D-49504 Lotte (Tyskland) hartmut.hartmann@prodoku.com</p>	<p>Mi, [1] Izjavljamo, da izdelek: Vrsta stroja: [2] Ime in model: [3] Serijska/-e številka/-e: [4] ustreza vsem zadevnim določbam Direktive 2006/42/ES.</p> <p>Uporabljeni usklajeni standardi, kot je navedeno v členu 7(2):</p> <p style="text-align: center;">EN ISO 4254-1:2013 EN ISO 4254-7:2009</p> <p>Kraj in datum izjave: [5] Istovetnost in podpis osebe, opolnomočene za pripravo izjave: [6] Ime in naslov osebe, pooblaščenega za pripravo tehnične datoteke: Hartmut Hartmann Wersener Holz Za D-49504 Lotte (Nemčija) hartmut.hartmann@prodoku.com</p>	<p>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.</p> <p>Použitie harmonizované normy, ktorú sa uvádzajú v článku 7(2):</p> <p style="text-align: center;">EN ISO 4254-1:2013 EN ISO 4254-7:2009</p> <p>Miesto a dátum prehlásenia: [5] Meno a podpis osoby oprávnenej vypracovať toto prehlásenie: [6] Meno a adresa osoby oprávnenej zostaviť technický súbor: Hartmut Hartmann Wersener Holz Za D-49504 Lotte (Nemecko) hartmut.hartmann@prodoku.com</p>

1013714

Introduction

This instructional manual contains information on the D65 Draper Header for Self-Propelled Windrowers. It is designed to serve a dual function in your grain, hay, and specialty crop harvesting operation. Teamed with your self-propelled windrower power unit and optional hay conditioner, D65 Draper Headers will cut and lay crop into uniform, fluffy windrows.

Carefully read all the material provided before attempting to unload, assemble, or 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. If you require more detailed service information, a technical manual is available from your MacDon Dealer.

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).

This manual is also available in the Russian language. It can be ordered from MacDon, downloaded from the Dealer Portal (<https://portal.macdon.com>) or from our International website (<http://www.macdon.com/world>).

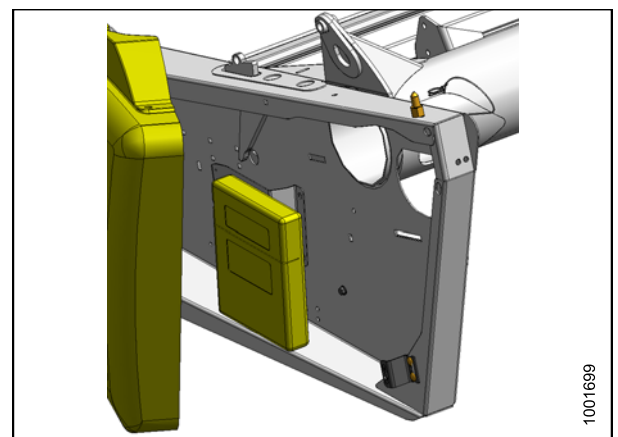


Figure 1: Manual Storage Location

List of Revisions

The following lists the changes from the previous version (169899 Revision A) of this document.

Summary of Change	Refer To
New book part number	<ul style="list-style-type: none">• D65 Draper Header for Self-Propelled Windrowers Operator's Manual from 169899 Rev A to 147725 Rev A• 8.3 Unloading and Assembly, page 266
New declaration of conformity	Declaration of Conformity, page i
Revised recommended settings	3.6.2 Header Settings, page 44
Re-organized sections	<ul style="list-style-type: none">• 2 Product Overview, page 23• 8 Reference, page 253• 5.9 Reel Drive, page 209
Added new kit	6.1.1 Multi-Crop Rapid Reel Conversion Kit, page 227

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-hand (RH) and left-hand (LH) designations are determined from the operator's position, facing forward.

Draper Header

Header Model: _____

Serial Number: _____

Year: _____

The serial number plate (A) is located beside the knife drive motor on the left-hand endsheet.

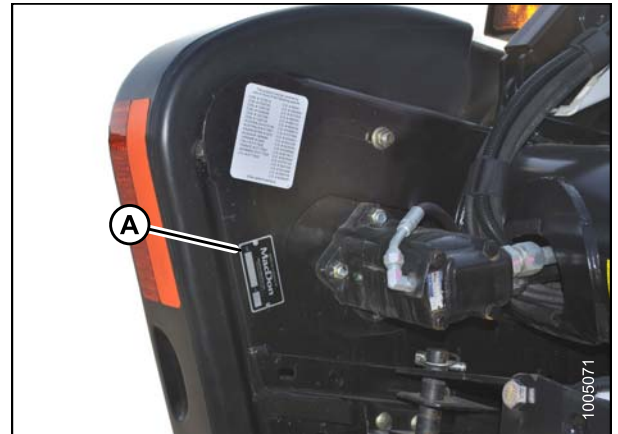


Figure 2: Header

Slow Speed Transport/Stabilizer Wheel Option

Serial Number: _____

Year: _____

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

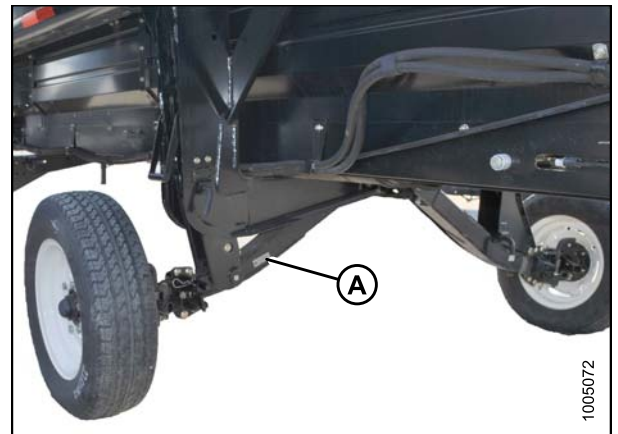


Figure 3: Transport/Stabilizer Option

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1 Safety

1.1 Safety Alert Symbols

This safety alert symbol indicates important safety messages in this manual and on safety signs on the header.

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. The appropriate signal word for each situation has been selected using the following guidelines:

DANGER

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

WARNING

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

CAUTION

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

1.3 General Safety

CAUTION

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

Protect yourself.

- When assembling, operating, and servicing machinery, wear all the protective clothing and personal safety devices that **could** be necessary for the job at hand. Don't 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
- Be aware that exposure to loud noises can cause hearing impairment or loss. Wear suitable hearing protection devices such as ear muffs or ear plugs to help protect against objectionable or loud noises.

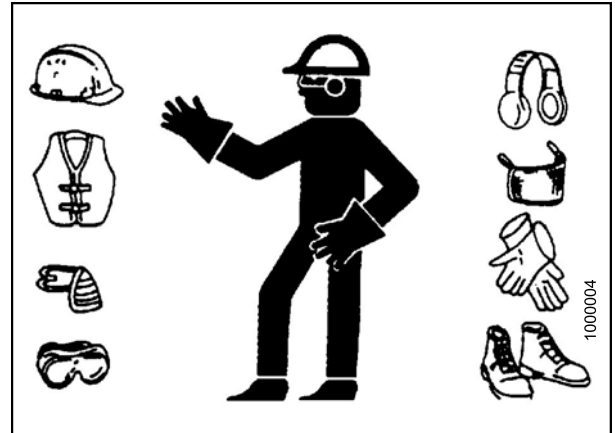


Figure 1.2: Safety Equipment



Figure 1.3: Safety Equipment

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

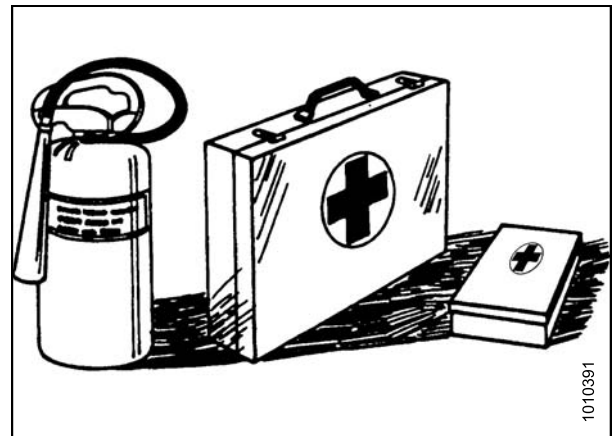


Figure 1.4: Safety Equipment

SAFETY

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



Figure 1.5: Safety Around Equipment

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

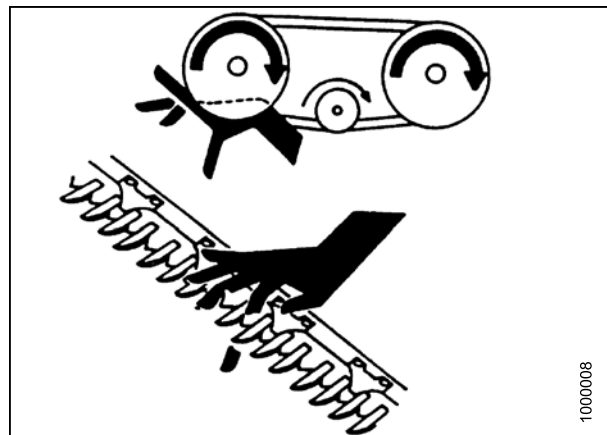


Figure 1.6: Safety Around Equipment

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



Figure 1.7: Safety Around Equipment

1.4 Maintenance Safety

To ensure your safety while maintaining the machine:

- Review the operator's manual and all safety items before operation and/or maintenance of the machine.
- Place all controls in Neutral, stop the engine, set the park brake, remove the ignition key, and wait for all moving parts to stop before servicing, adjusting, and/or repairing.
- Follow good shop practices:
 - Keep service areas clean and dry
 - Be sure electrical outlets and tools are properly grounded
 - Use adequate lighting for the job at hand
- Relieve pressure from hydraulic circuits before servicing and/or disconnecting the machine.
- Make sure all components are tight and that steel lines, hoses, and couplings are in good condition before applying pressure to hydraulic systems.
- Keep hands, feet, clothing, and hair away from all moving and/or rotating parts.
- Clear the area of bystanders, especially children, when carrying out any maintenance, repairs or, adjustments.
- Install transport lock or place safety stands under the frame before working under the header.
- If more than one person is servicing the machine at the same time, be aware that rotating a driveline or other mechanically-driven component by hand (for example, accessing a lube 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 1.8: Safety Around Equipment

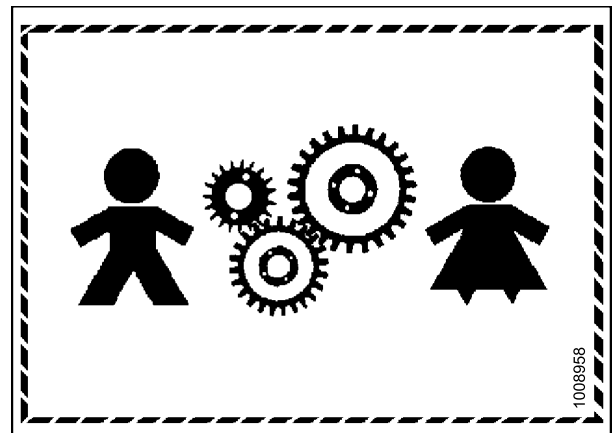


Figure 1.9: Equipment NOT Safe for Children

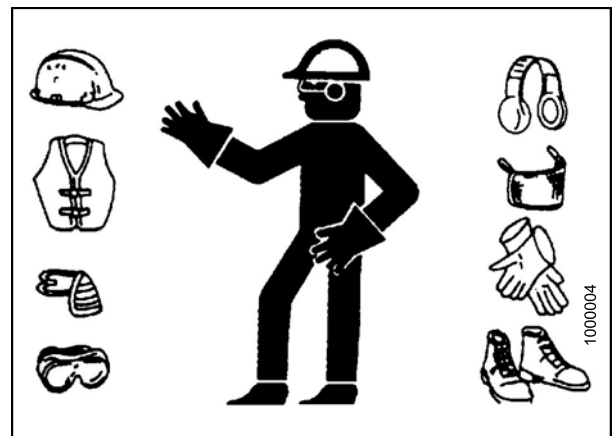


Figure 1.10: Safety Equipment

1.5 Hydraulic Safety

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

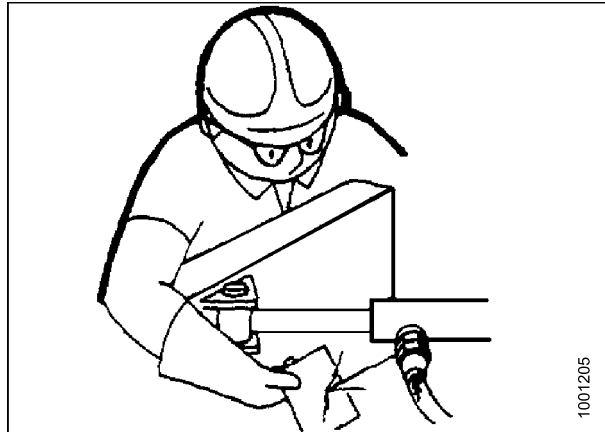


Figure 1.11: Testing for Hydraulic Leaks

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



Figure 1.12: Hydraulic Pressure Hazard

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

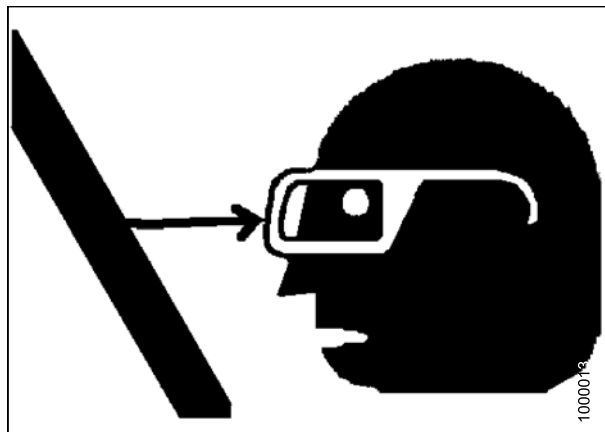


Figure 1.13: Safety Around Equipment

1.6 Safety Signs

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

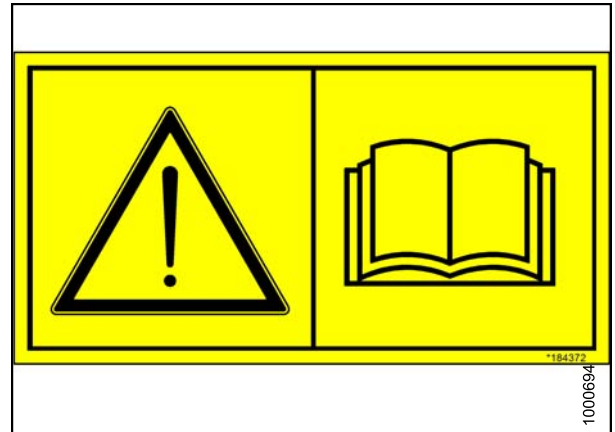
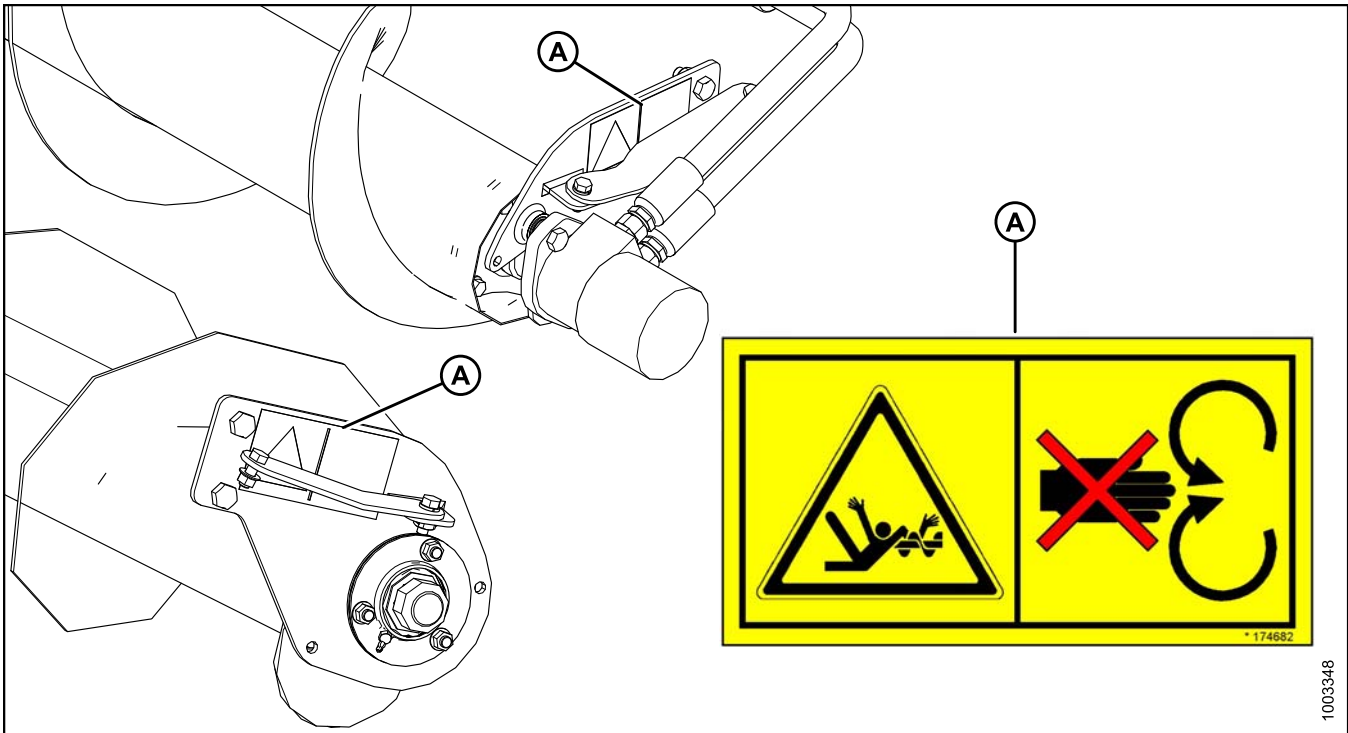


Figure 1.14: Operator's Manual Decal

1.6.1 Installing Safety Decals

1. Clean and dry the installation area.
2. Decide on the exact location before you remove the decal backing paper.
3. Remove the smaller portion of the split backing paper.
4. Place the sign in position and slowly peel back the remaining paper, smoothing the sign as it is applied.
5. Prick small air pockets with a pin and smooth out.

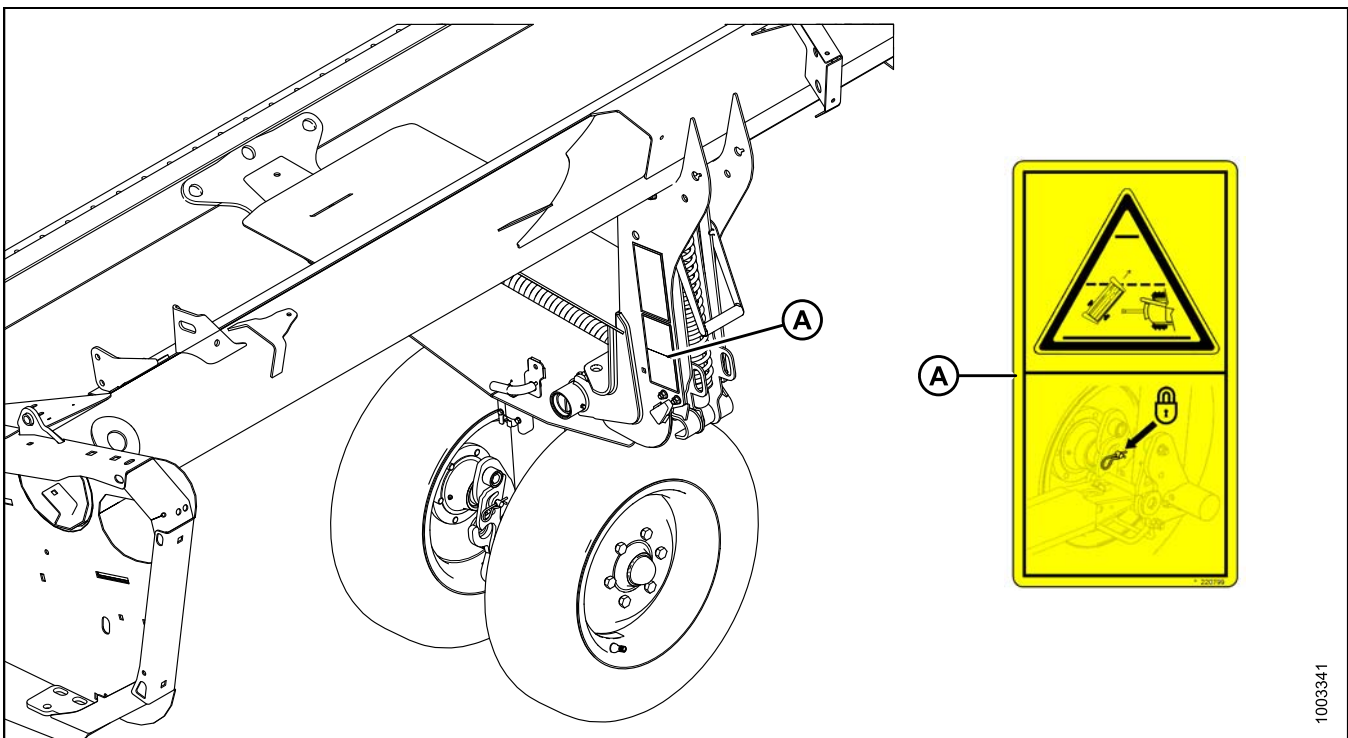
1.7 Safety Decal Locations



1003348

Figure 1.15: Upper Cross Auger

A - MD #174682

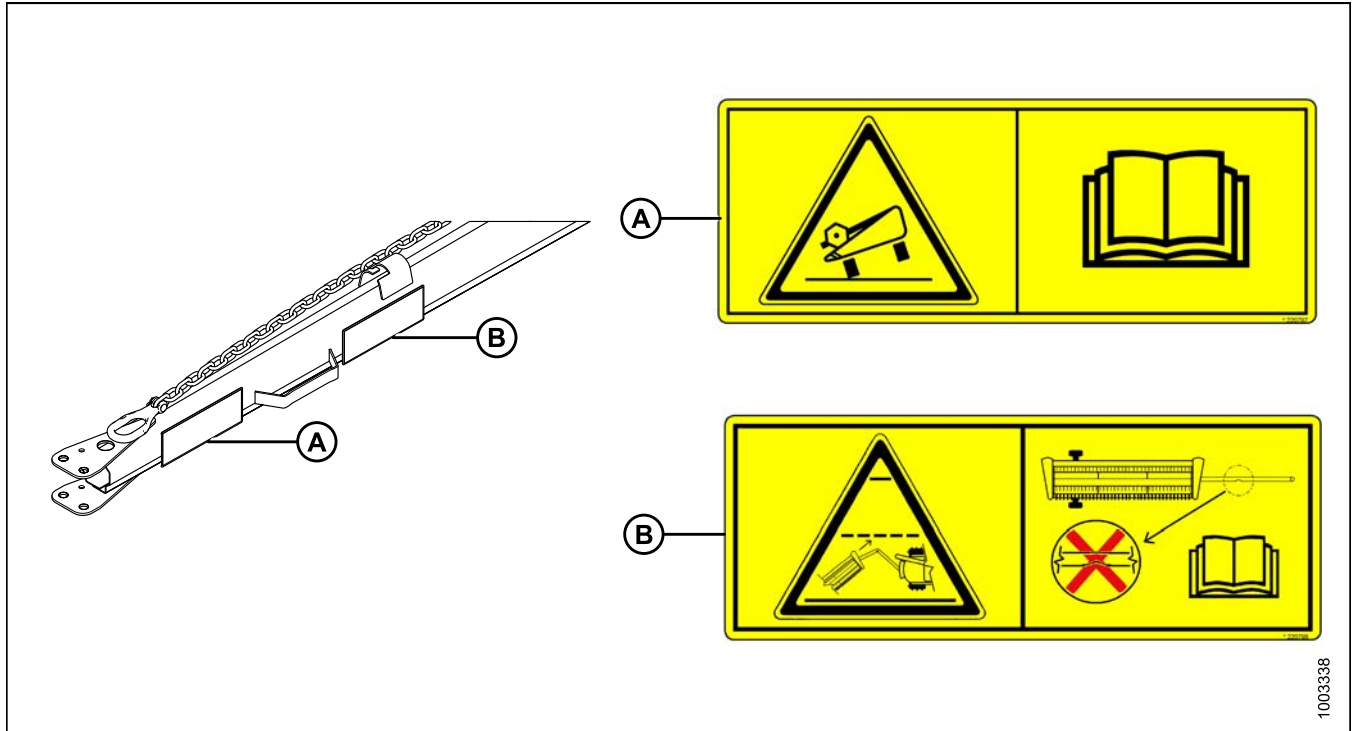


1003341

Figure 1.16: Slow Speed Transport

A - MD #220799

SAFETY

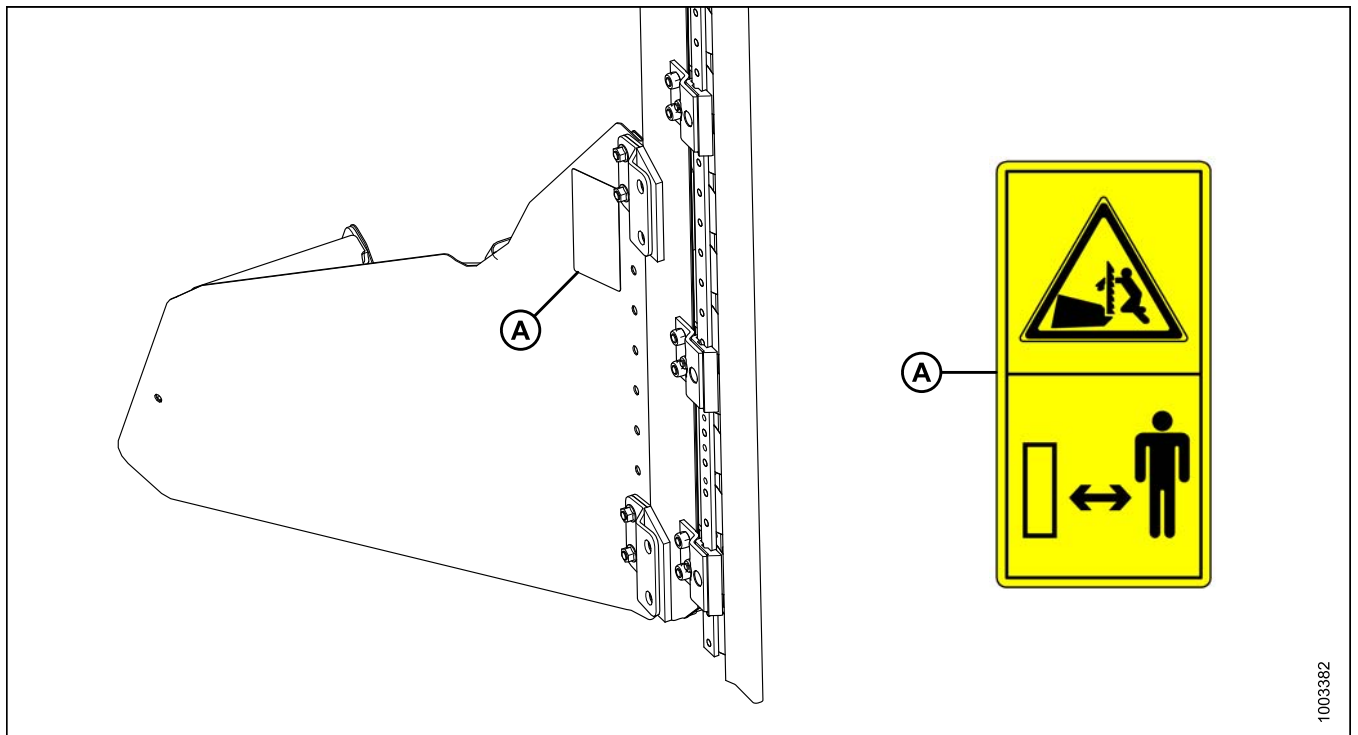


1003338

Figure 1.17: Slow Speed Transport Tow-Bar

A - MD #220797

B - MD #220798

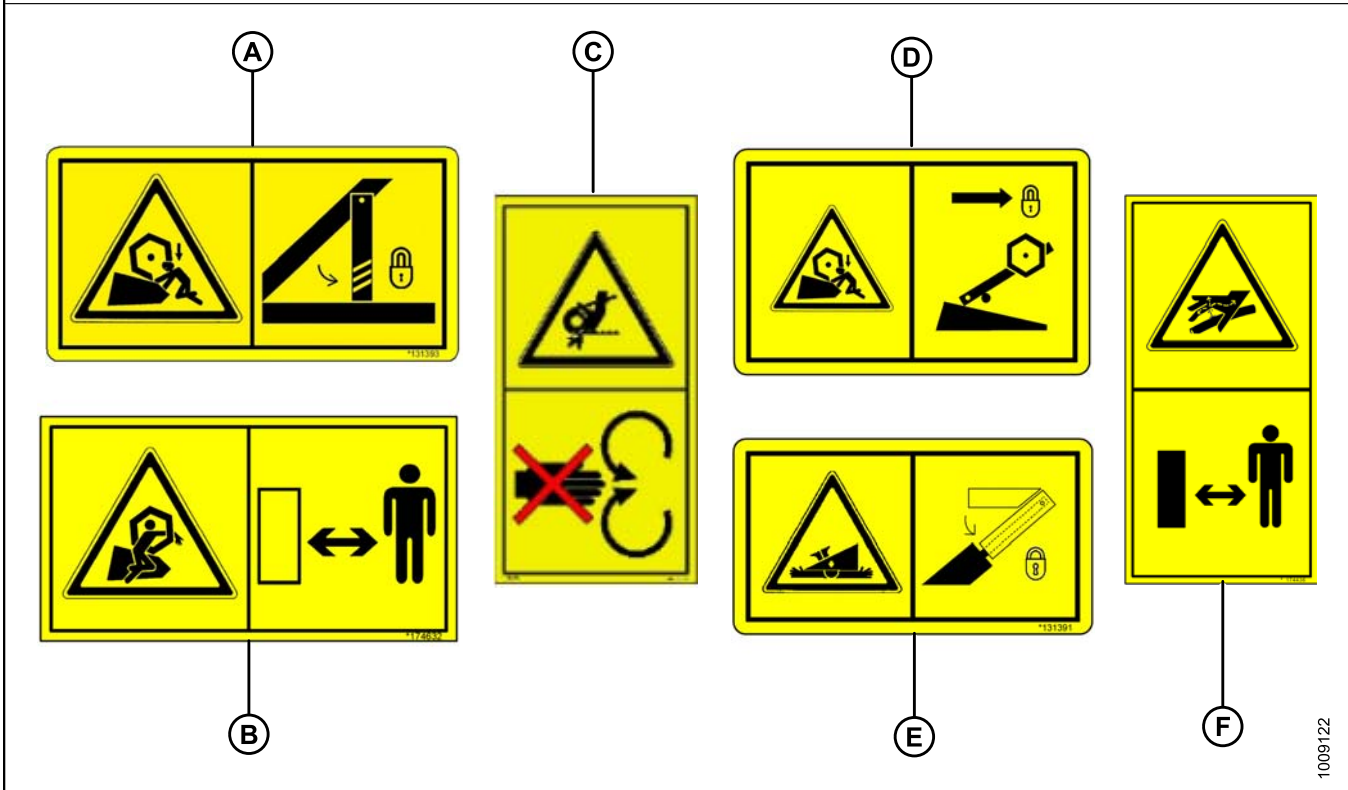
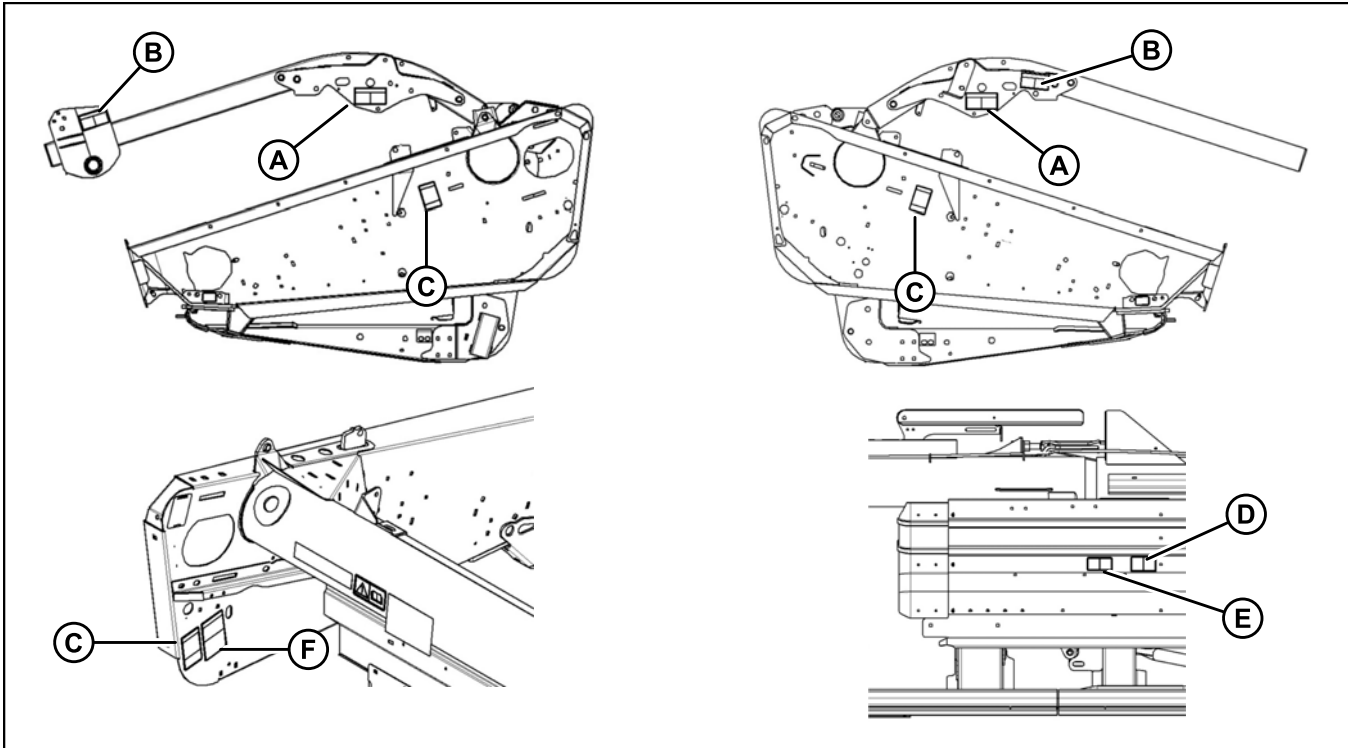


1003382

Figure 1.18: Vertical Knife

A - MD #174684

SAFETY



1009122

Figure 1.19: Endsheets, Reel Arms, Backsheet

A - MD #131393

B - MD #174632

C - MD #184371

D - MD #184371 (Double Knife Only)

E - MD #131392 (2 Places)

F - MD #131391 (2 Places)

G - MD #174436

H - MD #184371 (Double Knife
2 Places)

SAFETY

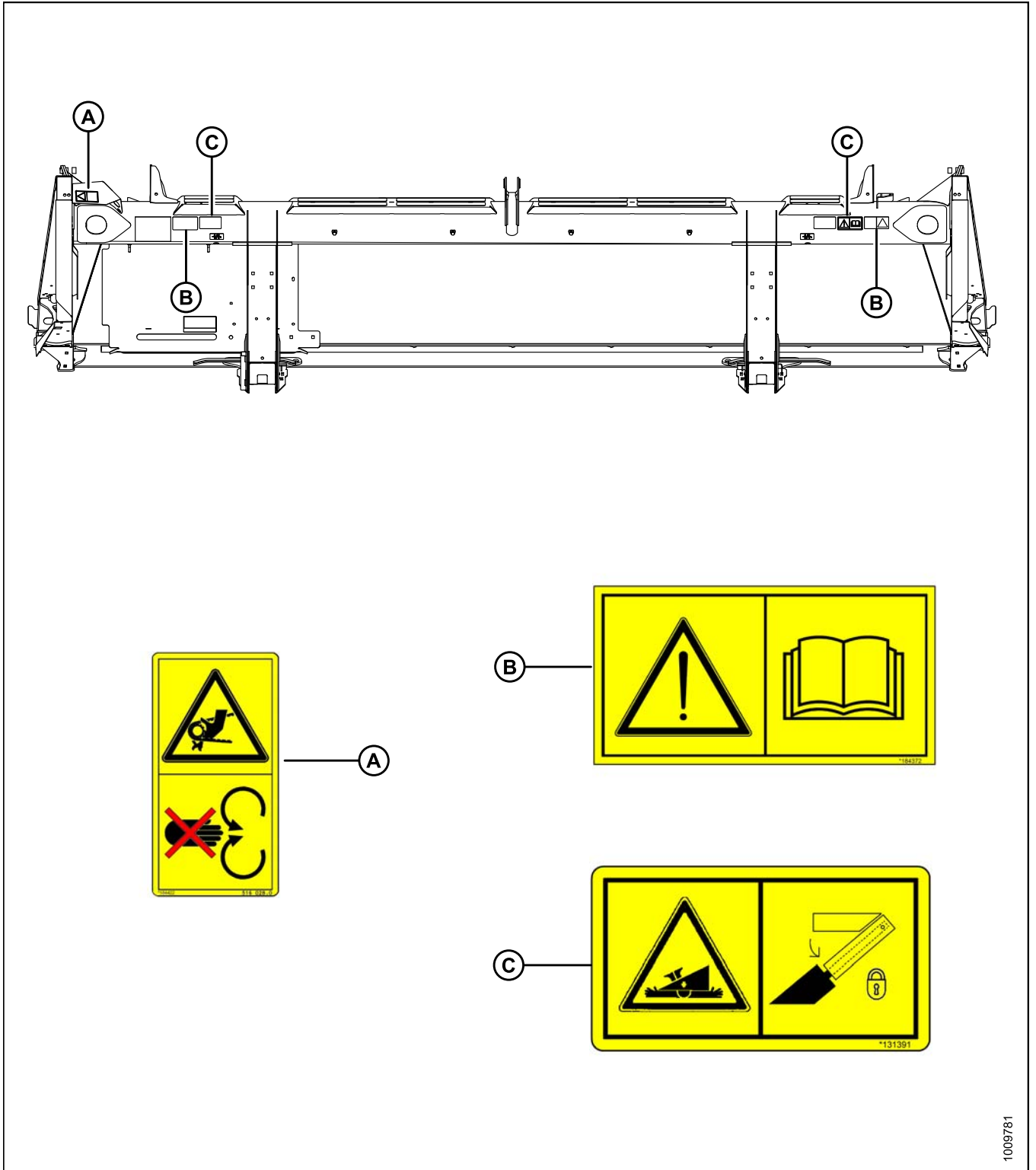


Figure 1.20: Backtube: 15-Footer Header

A - MD #184422

B - MD #184372

C - MD #131391

SAFETY

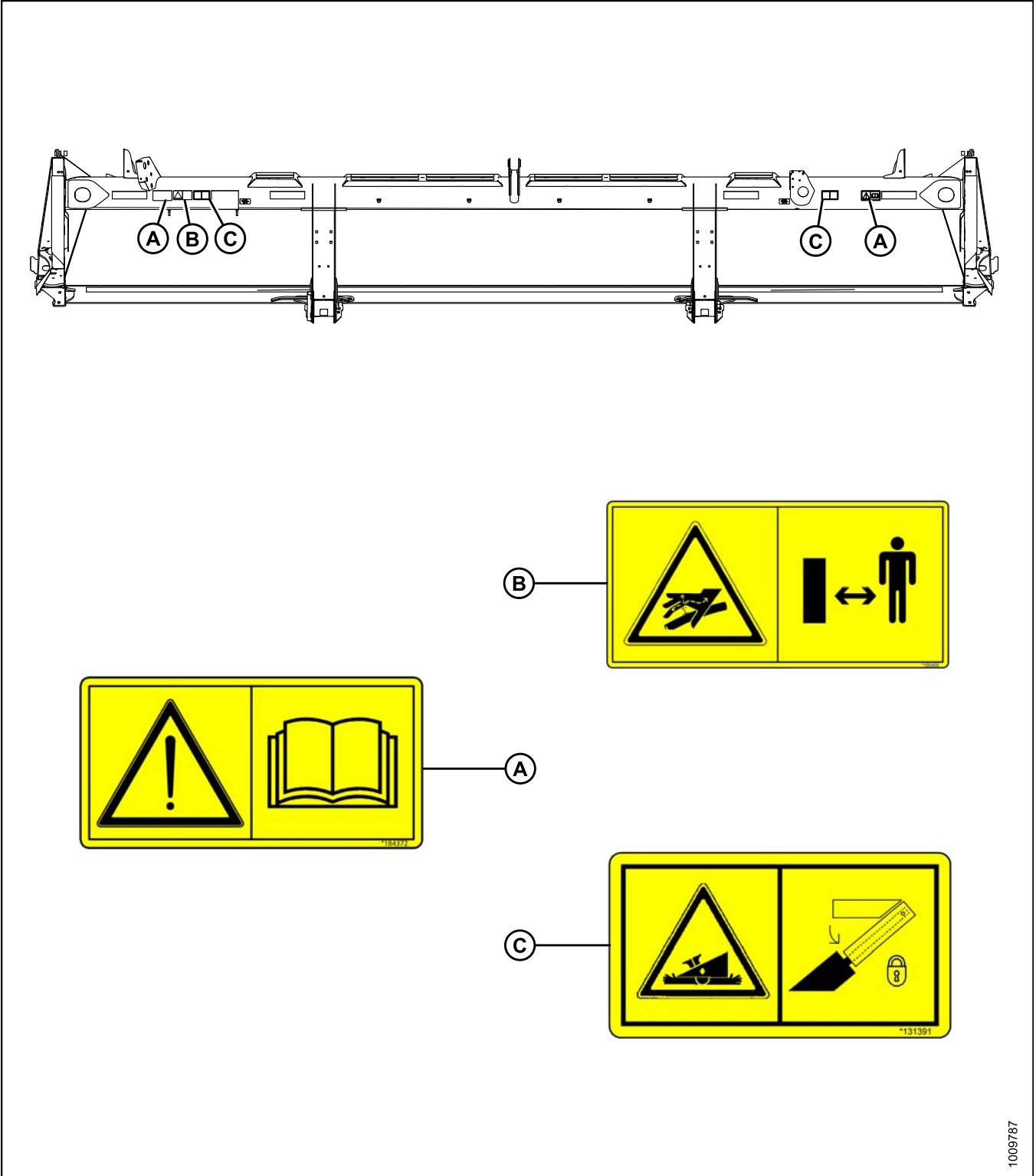


Figure 1.21: Backtube: 20-Foot Header

A - MD #184372

B - MD #166466

C - MD #131391

1009787

SAFETY

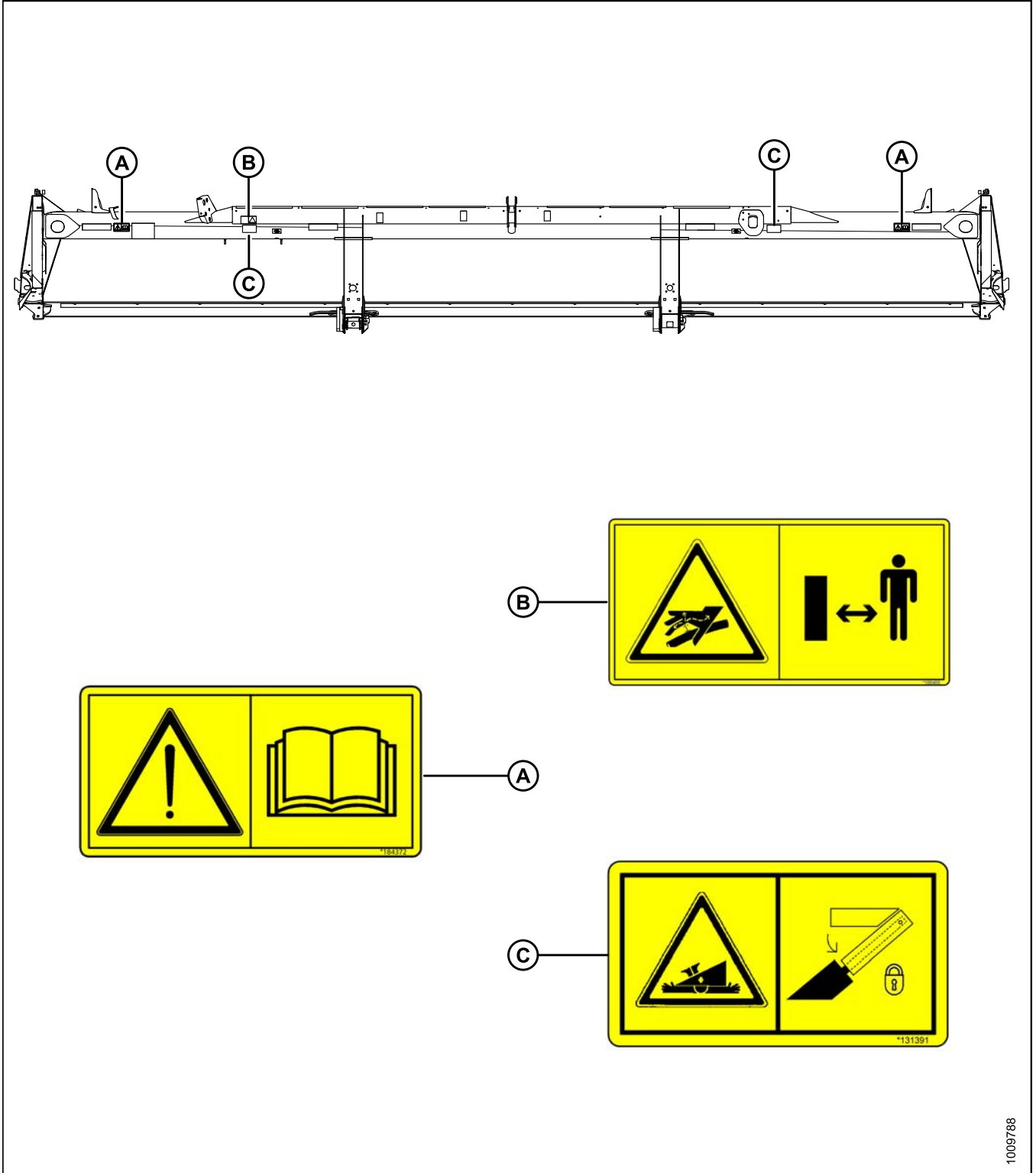


Figure 1.22: Backtube: 25-Footer Header

A - MD #184372

B - MD #166466

C - MD #131391

SAFETY

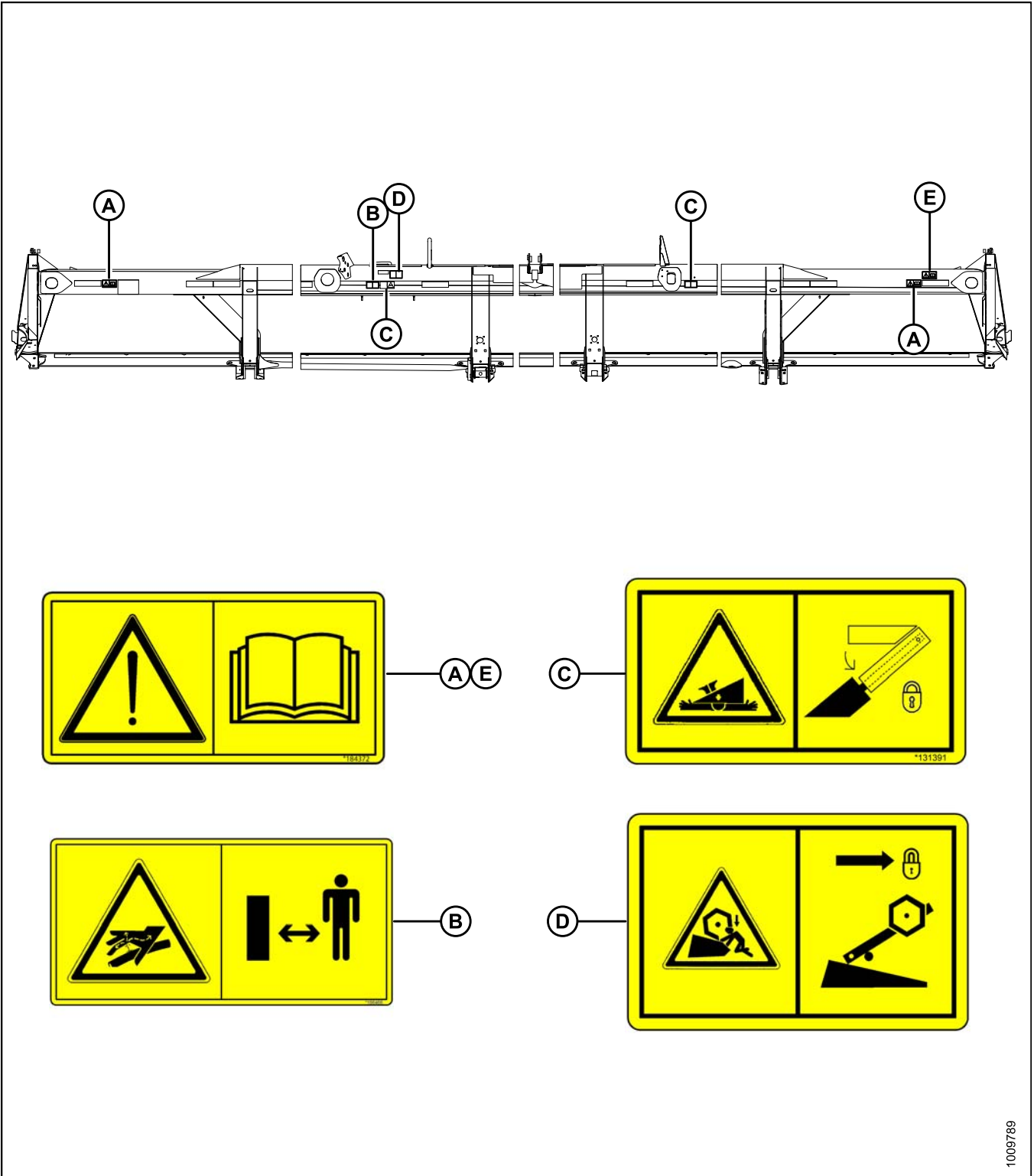


Figure 1.23: Backtube: 30-, 35-, 40-Footer Header

A - MD #184372

B - MD #166466

C - MD #131391

D - MD #131392 (30- & 35- Ft. Double Reel Only) E - MD #184372 (Split Frame)

1.8 Understanding Safety Signs

MD #113482

General hazard pertaining to machine operation and servicing

CAUTION

To avoid 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 safety instructions with all Operators every year.
- Ensure that all safety signs are installed and legible.
- Make certain everyone is clear of machine before starting engine and during operation.
- Keep riders off the machine.
- Keep all shields in place and stay clear of moving parts.
- Disengage header drive, put transmission in Neutral, and wait for all movement to stop before leaving operator's position.
- Shut down the engine and remove the key from ignition before servicing, adjusting, lubricating, cleaning, or unplugging machine.
- Engage safety props to prevent lowering of header or reel before servicing in the raised position (refer to the header operator's manual).
- Use slow moving vehicle emblem and flashing warning lights when operating on roadways unless prohibited by law.

MD #131391

Crushing hazard

DANGER

- Rest header on ground or engage safety props before going under unit.

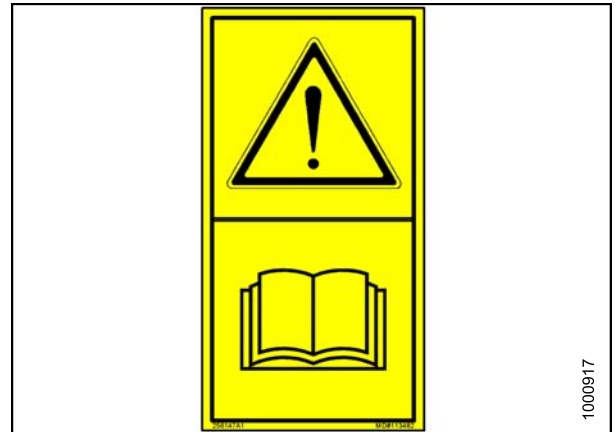


Figure 1.24: MD #113482

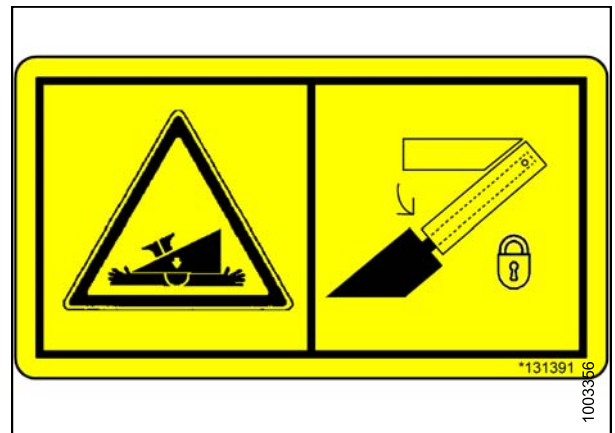


Figure 1.25: MD #131391

SAFETY

MD #131392

Crushing hazard

WARNING

- To avoid injury from fall of raised reel; fully raise reel, stop the engine, remove the key, and engage safety prop on each reel support arm before working on or under reel.
- Refer to header operator's manual.

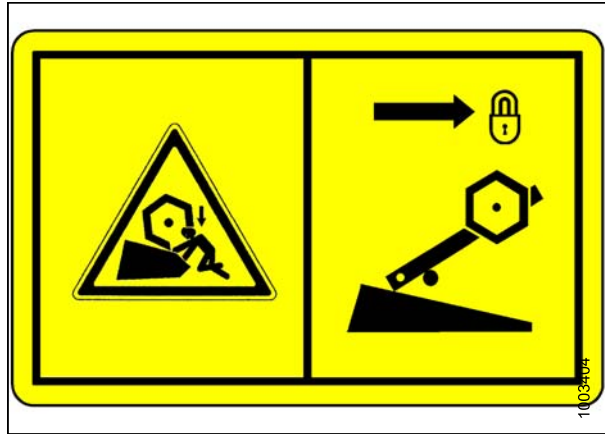


Figure 1.26: MD #131392

MD #131393

Reel hazard

WARNING

- To avoid injury from fall of raised reel; fully raise reel, stop the engine, remove the key, and engage safety prop on each reel support arm before working on or under reel.
- Refer to header operator's manual.



Figure 1.27: MD #131393

MD #166466

High pressure oil hazard

WARNING

- Do not go near leaks.
- High pressure oil easily punctures skin causing serious injury, gangrene, or death.
- If injured, seek emergency medical help. Immediate surgery is required to remove oil.
- Do not use finger or skin to check for leaks.
- Lower load or relieve hydraulic pressure before loosening fittings.



Figure 1.28: MD #166466

SAFETY

MD #166833

Run-over hazard

WARNING

- Remove key from ignition.
- Read tractor and mower manufacturer's manuals for inspection and maintenance instructions.
- Read the windrower and header manuals for inspection and maintenance instructions.

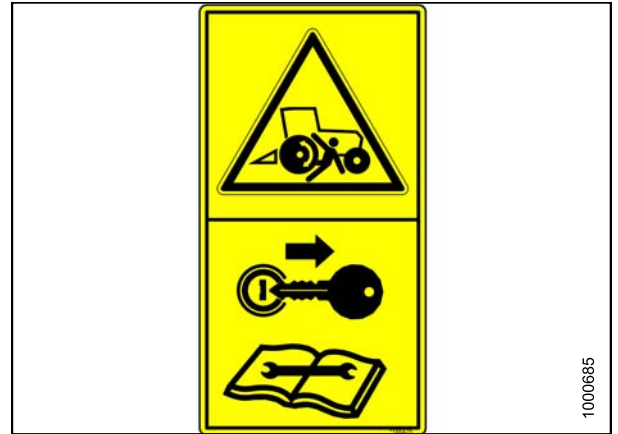


Figure 1.29: MD #166425

MD #174436

High pressure oil hazard

WARNING

- Do not go near leaks.
- High pressure oil easily punctures skin causing serious injury, gangrene, or death.
- If injured, seek emergency medical help. Immediate surgery is required to remove oil.
- Do not use finger or skin to check for leaks.
- Lower load or relieve hydraulic pressure before loosening fittings.



Figure 1.30: MD #174436

MD #174632

Reel entanglement hazard

CAUTION

- To avoid injury from entanglement with rotating reel, stand clear of header while machine is running.



Figure 1.31: MD #174632

SAFETY

MD #174682

Auger entanglement hazard

CAUTION

- To avoid injury from entanglement with rotating auger, stand clear of header while machine is running.

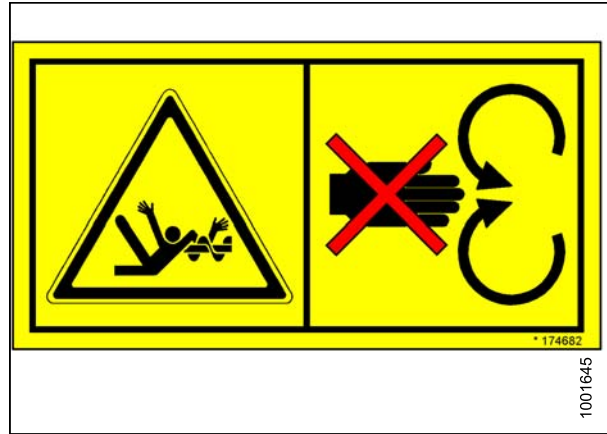


Figure 1.32: MD #174682

MD #174684

Sharp component hazard

CAUTION

- Wear heavy canvas or leather gloves when working with knife.
- Be sure no one is near the vertical knife when removing or rotating knife.



Figure 1.33: MD #174684

SAFETY

MD #184372

General hazard pertaining to machine operation and servicing

CAUTION

To avoid 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 safety instructions with all Operators annually.
- Ensure that all safety signs are installed and legible.
- Make certain everyone is clear of machine before starting engine and during operation.
- Keep riders off the machine.
- Keep all shields in place and stay clear of moving parts.
- Disengage header drive, put transmission in Neutral, and wait for all movement to stop before leaving operator's position.
- Shut off the engine and remove the key from ignition before servicing, adjusting, lubricating, cleaning, or unplugging machine.
- Engage safety props to prevent lowering of raised unit before servicing in the raised position.
- Use slow moving vehicle emblem and flashing warning lights when operating on roadways unless prohibited by law.

MD #184422

Keep shields in place hazard

WARNING

- Do not place hand.
- To avoid injury, stop the engine and remove the key before opening power drive system shield.
- Keep all shields in place.

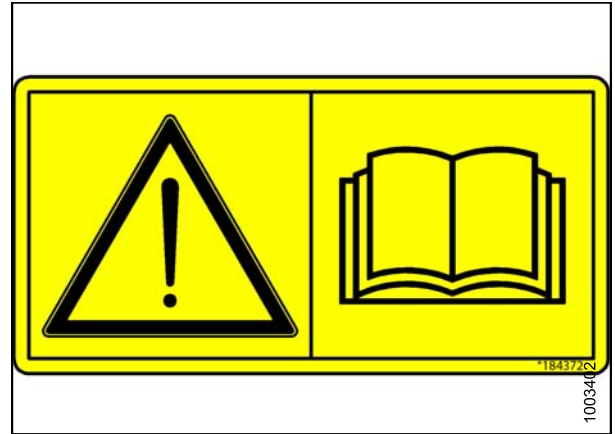


Figure 1.34: MD #184372



Figure 1.35: MD #184422

SAFETY

MD #193147

Transport/roading hazard

WARNING

- Ensure tow-bar lock mechanism is locked.

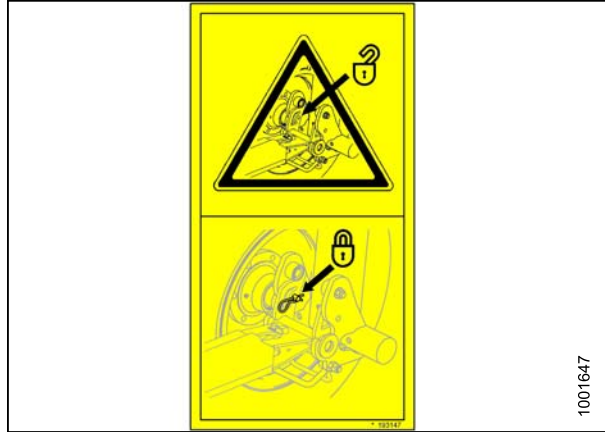


Figure 1.36: MD #193147

MD #220797

Tipping hazard in transport mode

WARNING

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

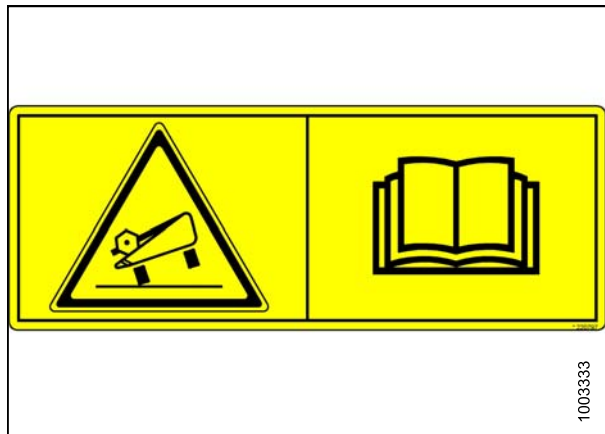


Figure 1.37: MD #220797

MD #220798

Loss of control hazard in transport

CAUTION

- Do not tow the header with a dented or otherwise damaged tow pole (the circle with the red X shows a dent in the pole).
- Consult the operator's manual for more information.

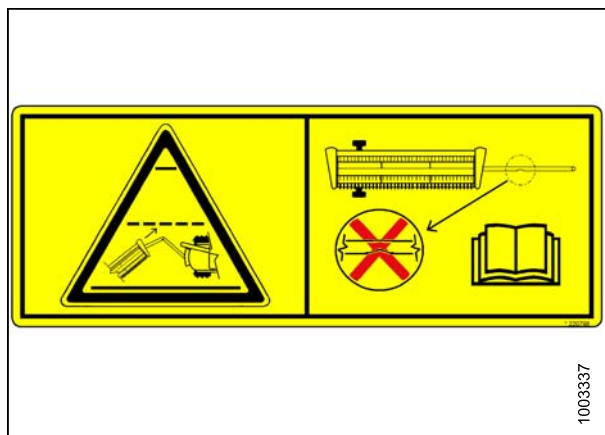


Figure 1.38: MD #220798

SAFETY

MD #220799

Transport/roading hazard

WARNING

- Ensure tow-bar lock mechanism is locked.



Figure 1.39: MD #220799

2 Product Overview

2.1 Definitions

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

Term	Definition
API	American Petroleum Institute
ASTM	American Society of Testing and Materials
Bolt	A headed and externally threaded fastener that is designed to be paired with a nut
Cab-forward	Windrower operation with the Operator and cab facing in the direction of travel
CDM	Cab display module on a self-propelled windrower
Center-link	A hydraulic cylinder link between the header and the machine to which it is attached: It is used to change header angle
CGVW	Combined vehicle gross weight
D-Series header	MacDon D50, D60, and D65 rigid draper headers
DK	Double knife
DKD	Double-knife drive
DDD	Double-draper drive
DR	Double reel
DWA	Double Windrow Attachment
Finger tight	Finger tight is a reference position where sealing surfaces or components are making contact with each other and the fitting has been tightened to a point where the fitting is no longer loose
FFFT	Flats from finger tight
GSL	Ground speed lever
GVW	Gross vehicle weight
Hard joint	A joint made with the use of a fastener where the joining materials are highly incompressible
Hex key	A hex key or Allen key (also known by various other synonyms) is a tool of hexagonal cross-section used to drive bolts and screws that have a hexagonal socket in the head (internal-wrenching hexagon drive)
HDS	Hydraulic deck shift
hp	Horsepower
ISC	Intermediate Speed Control
JIC	Joint Industrial Council: A standards body that developed the standard sizing and shape for original 37° flared fitting
Knife	A cutting device which uses a reciprocating cutter (also called a sickle)
n/a	Not applicable
Nut	An internally threaded fastener that is designed to be paired with a bolt

PRODUCT OVERVIEW

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

2.2 Component Identification

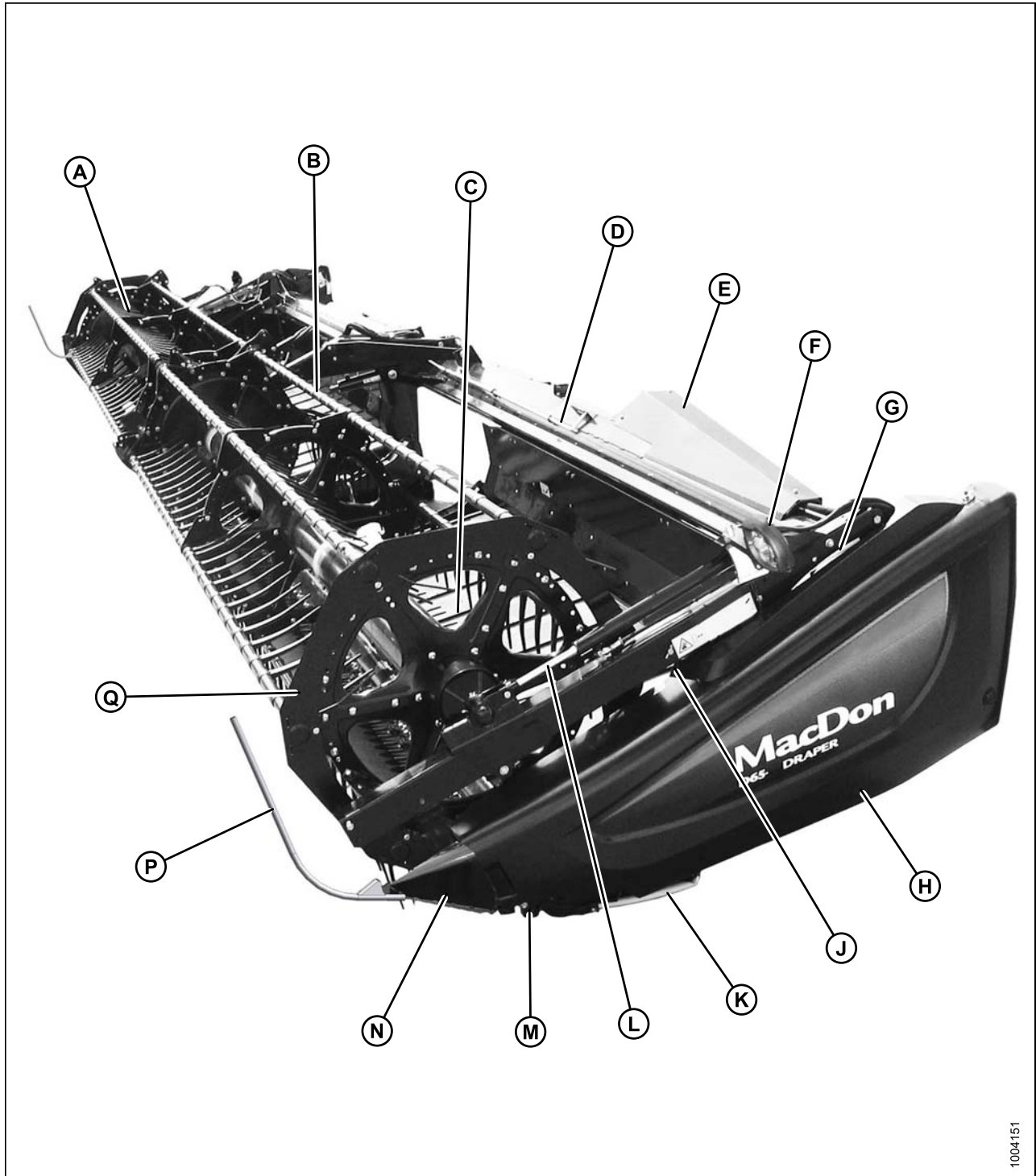


Figure 2.1: D65 Windrower Header Components

A - Reel Cam
D - Center Reel Arm Prop Handle
G - Reel Safety Prop
K - Skid Shoe
N - Crop Divider

B - Pick-Up Reel Tines
E - Hydraulic Connections
H - Endshield
L - Reel Fore-Aft Cylinder
P - Crop Divider Rod

C - Drapers
F - Transport Light
J - Reel Lift Cylinder
M - Knife Drive Box
Q - Reel Endshield

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PRODUCT OVERVIEW

2.3 Specifications

 D65 Attachments

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

Cutterbar			
Effective cutting width (distance between crop divider points)			
15-ft. header		15.00 ft. (180 in. [4572 mm])	S
20-ft. header		20.00 ft. (240 in. [6096 mm])	S
25-ft. header		25.00 ft. (300 in. [7620 mm])	S
30-ft. header		30.00 ft. (360 in. [9144 mm])	S
35-ft. header		35.00 ft. (420 in. [10,668 mm])	S
40-ft. header		40.00 ft. (480 in. [12192 mm])	S
Cutterbar lift range at guard tip (center-link fully retracted)		49-13/16 in. (1265 mm)	
Knife			
Single-knife drive: One hydraulic motor with V-belt to one heavy duty (MD) knife drive box			O _F
Double-knife drive 15–35 ft. (timed): One hydraulic motor with two cogged belts to two heavy duty MD knife drive boxes			O _F
Double-knife drive 40 ft. (untimed): Two hydraulic motors with banded-belts to two heavy duty (MD) knife drive boxes			O _F
Knife stroke		3 in. (76 mm)	S
Single-knife speed (strokes per minute) ¹	20, 25 ft.	1200–1400	S
	30 ft.	1200–1400	S
	35 ft.	1100–1300	S
	40 ft.	1050–1200	S
Double-knife speed (strokes per minute) ¹	15 ft.	1500–1900	S
	20, 25 ft.	1400–1700	S
	30 ft.	1200–1600	S
	35 ft.	1200–1400	S
	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
Knife overlap at center (double-knife headers)		1/8 in. (3 mm)	S

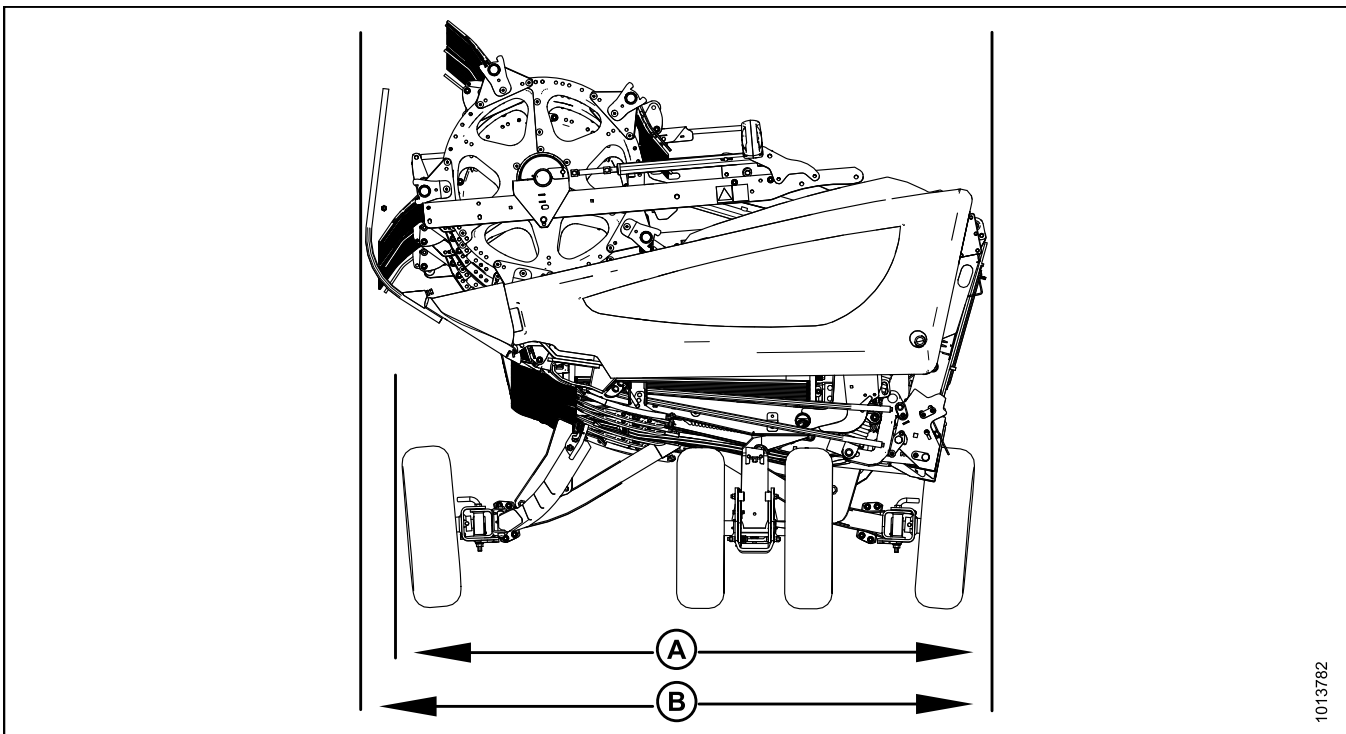
1. Under normal cutting conditions, knife speed taken at the knife drive pulley should be set between 600 and 640 rpm (1200 and 1280 spm). If set to low side of chart, you could experience knife stalling.

PRODUCT OVERVIEW

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	15–25 ft.	7.5 Degrees	S
Center-link retracted	30–40 ft.	2.5 Degrees	S
Center-link extended	15–25 ft.	17.0 Degrees	S
Center-link extended	30–40 ft.	12.0 Degrees	S
Conveyor (Draper) and Decks			
Draper width		41-5/8 in. (1057 mm)	S
Draper drive		Hydraulic	S
Draper speed		0–742 fpm (225 m/min.)	S
Delivery opening width (center delivery) / variable by shifting decks	15 ft.	60-5/8 – 69-11/16 in. (1540–1770 mm)	S
	20, 25, 30, 35, 40 ft.	67-1/8 – 76-11/16 in. (1720–1950 mm)	S
Delivery opening height (under frame tube at 8 in. cutting height)	Center-link fully retracted	37-5/8 in. (955 mm)	S
	Center-link fully extended	43-1/2 in. (1105 mm)	S
PR15 Pick-Up Reel			
Quantity of tine tubes		5, 6, or 9	
Center tube diameter	15 to 30 ft.	8 in. (203 mm)	
	35 ft.	10 in. (254 mm)	
Finger tip radius	Factory set	31-1/2 in. (800 mm)	
	Adjustment range	30-3/16 – 31-1/2 in. (766–800 mm)	
Effective reel diameter (via cam profile)		65 in. (1650 mm)	
Finger length		11 in. (290 mm)	
Finger spacing (staggered on alternate bats)		6 in. (150 mm)	
Reel drive		Hydraulic	S
Reel speed (auto-adjust from cab using ground speed index)		0–85 rpm	S

PRODUCT OVERVIEW

Frame and Structure				
Header width (field mode)			Cut width + 15-1/8 in. (384 mm)	S
Header width (transport mode—reel fore-aft fully retracted)	Header only	(B) ² (long dividers installed)	104 in. (2636 mm)	-
		(A) ² (long dividers removed)	97 in. (2452 mm)	-
	With HC10 Hay Conditioner installed	(B) ² (long dividers installed)	112 in. (2834 mm)	-
		(A) ² (long dividers removed)	104 in. (2650 mm)	-



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Figure 2.2: Header Width

2. Refer to Figure 2.2: [Header Width](#), page 28.

PRODUCT OVERVIEW

Attachments		
HC10 Hay Conditioner		O _D
Roll length		72 in. (1830 mm)
Outside diameter		9-1/8 in. (232 mm)
Roll tube diameter		6-5/8 in. (168 mm)
Roll speed		847–915 rpm
Upper Cross Auger		O _D
Outside diameter		12 in. (305 mm)
Tube diameter	All sizes except 25 ft.	6 in. (152 mm)
	25 ft.	7 in. (178 mm)
Stabilizer Wheel / Slow Speed Transport		O _D
Wheels		15 in.
Tires		P205/75 R-15

Weight		
Estimated weight range with base header (variances are due to different package configurations)		
15-ft. header		2937–3302 lb (1329–1497 kg)
20-ft. header		3146–3600 lb (1430–1633 kg)
25-ft. header		3547–3872 lb (1605–1753 kg)
30-ft. header		4370–4812 lb (1981–2178 kg)
35-ft. header		4808–5337 lb (2181–2480 kg)
40-ft. header	North America frame	5197–5704 lb (235 –2593 kg)
	Export frame	5437 lb (2461 kg)

3 Operation

3.1 Owner/Operator Responsibilities

CAUTION

- It is your responsibility to read and understand this manual completely before operating the header. Contact your MacDon Dealer if an instruction is not clear to you.
- Follow all safety messages in the manual and on safety decals on the machine.
- Remember that YOU are the key to safety. Good safety practices protect you and the people around you.
- Before allowing 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

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.

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.
- Check for excessive vibration and unusual noises. If there is any indication of trouble, shut down and inspect the machine. Follow proper shutdown procedure. Refer to [3.4 Shutting Down the Machine, page 42](#).
- Operate only in daylight or good artificial light.

3.2.1 Header Safety Props

The header safety props are located on the header lift cylinders. The safety props prevent the lift cylinders from inadvertently retracting and lowering the header.

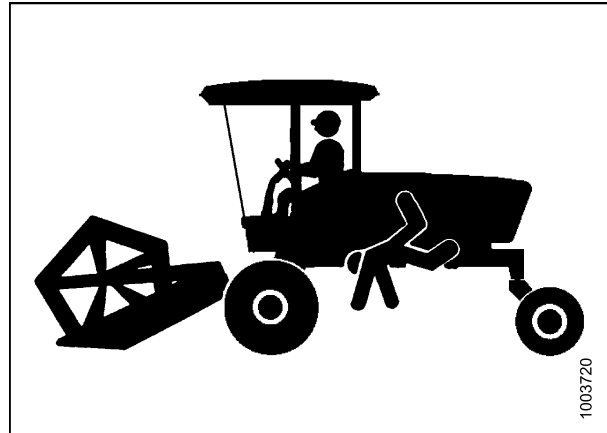


Figure 3.1: No Riders

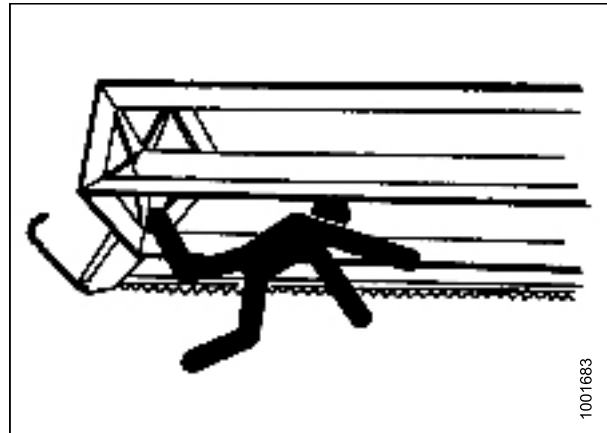


Figure 3.2: Bystander Safety

⚠ DANGER

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

3.2.2 Reel Safety Props

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

⚠ WARNING

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

IMPORTANT:

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

Engaging Reel Safety Props

⚠ DANGER

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

⚠ WARNING

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

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

NOTE:

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

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

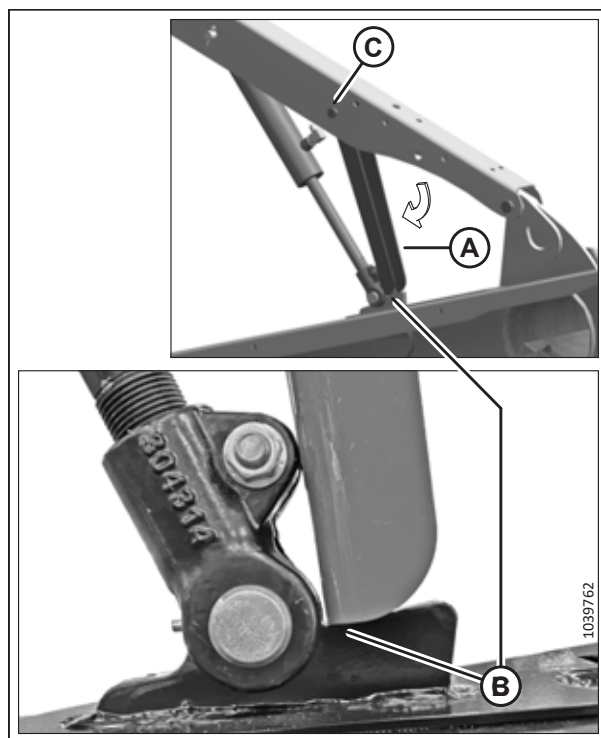


Figure 3.3: Engaged Reel Safety Prop – Left Shown

THE CONTENT ON THIS PAGE HAS CHANGED SINCE THIS MANUAL (147725 REVISION A) WAS PUBLISHED.

OPERATION

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

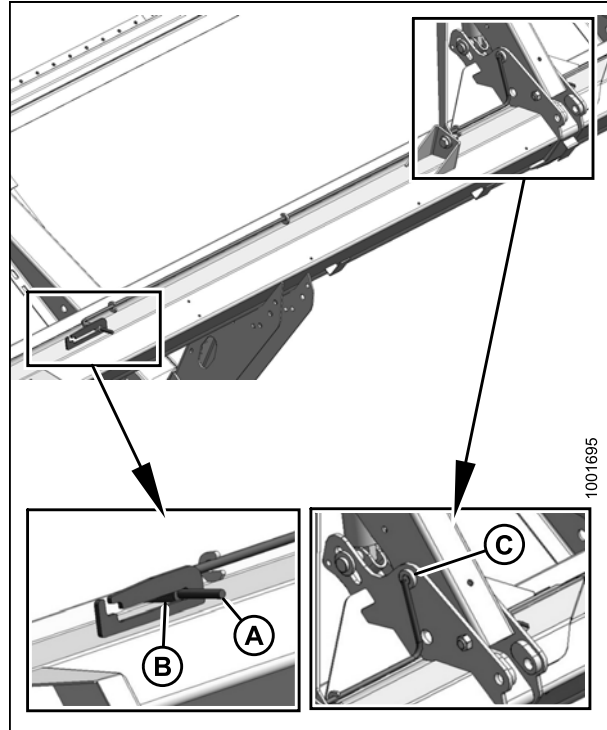


Figure 3.4: Reel Safety Prop – Center Arm

Disengaging Reel Safety Props

1. Raise the reel to maximum height.
2. Move the reel safety props (A) back inside the reel arms.

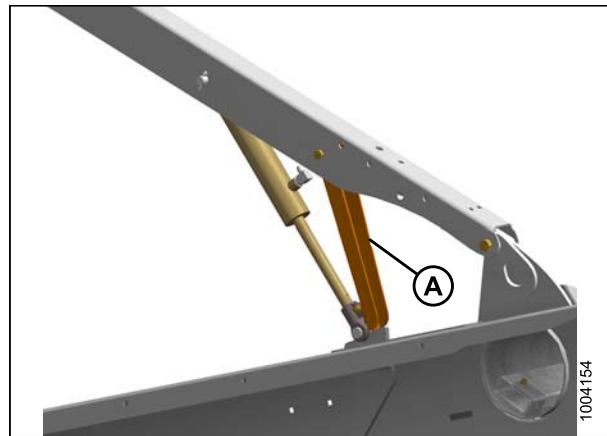


Figure 3.5: Reel Safety Prop – Left Side Outer Arm

OPERATION

3. Use the handle (B) to move the lock rod (A) to the outboard position.

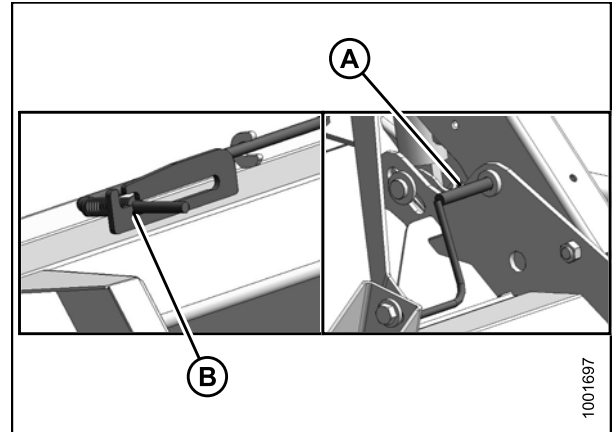


Figure 3.6: Reel Safety Prop – Center Arm

3.2.3 Endshields

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

Opening Endshields

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

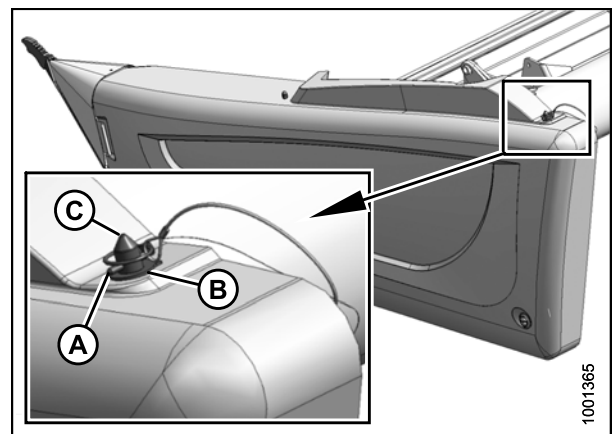


Figure 3.7: Left-Hand Endshield

OPERATION

2. Use tool (B) to unlock latch (A) at lower rear corner of endshield.
3. Lift endshield at the aft end to clear the pin at the top rear of the endshield.
4. Swing 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.

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:

If additional access is required to the front of the drives area, carefully disengage the front of the endshield from the tab (C) at the front of the endsheet and swing the front of the endshield away from the header.

NOTE:

If complete access to the endsheet area is required, remove the endshield. Refer to [Removing Endshields, page 37](#).

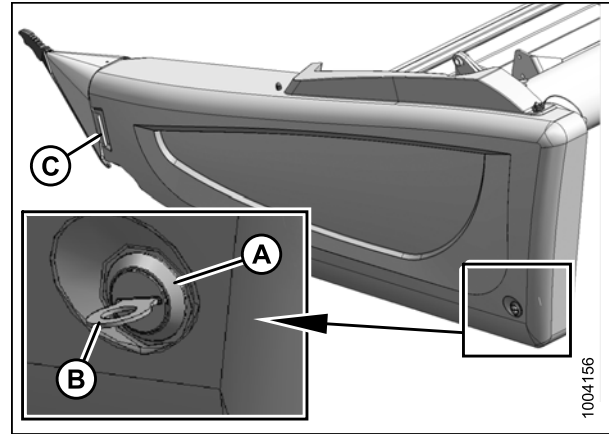


Figure 3.8: Left-Hand Endshield

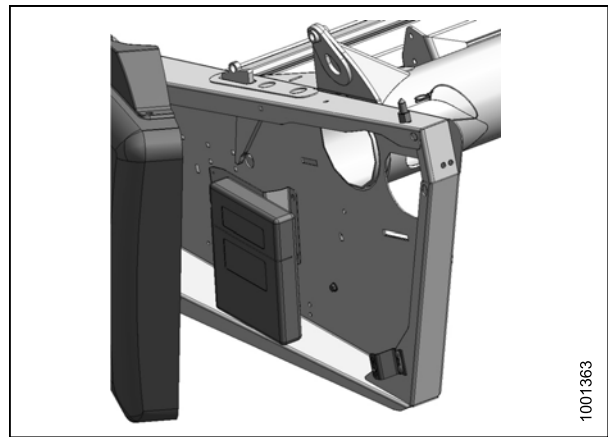


Figure 3.9: Left-Hand Endshield Open

Closing Endshields

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).

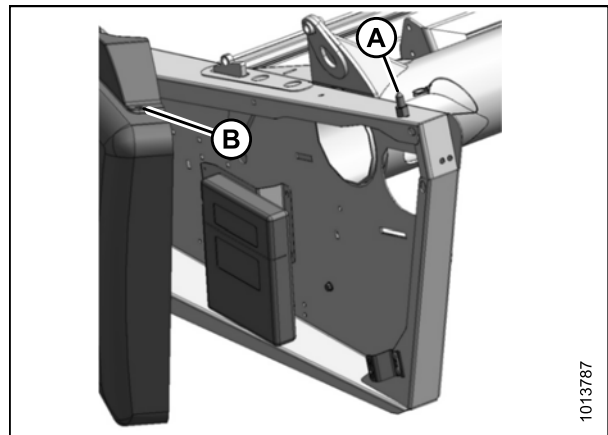


Figure 3.10: Left-Hand Endshield

OPERATION

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

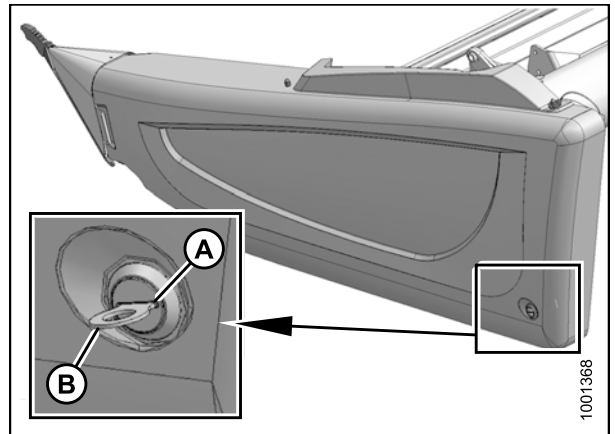


Figure 3.11: Left-Hand Endshield

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

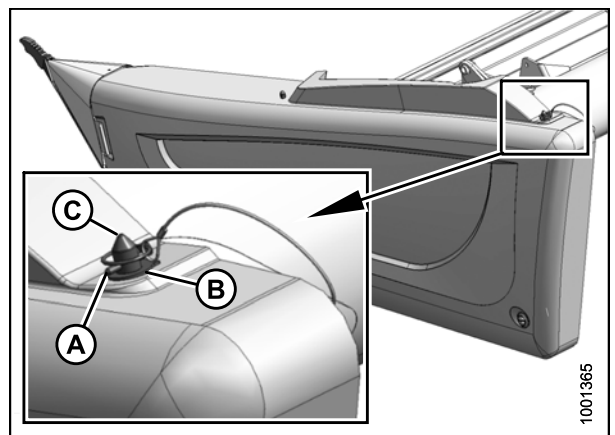


Figure 3.12: Left-Hand Endshield Pin

Removing Endshields

1. Open the endshield. Refer to [Opening Endshields, page 35](#).
2. Remove the acorn nut (A) securing the endshield to support (B).
3. Lift the endshield off support (B).

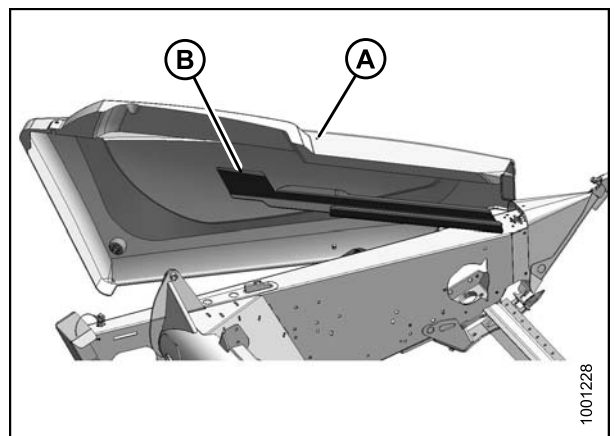


Figure 3.13: Left-Hand Endshield

OPERATION

Installing Endshields

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

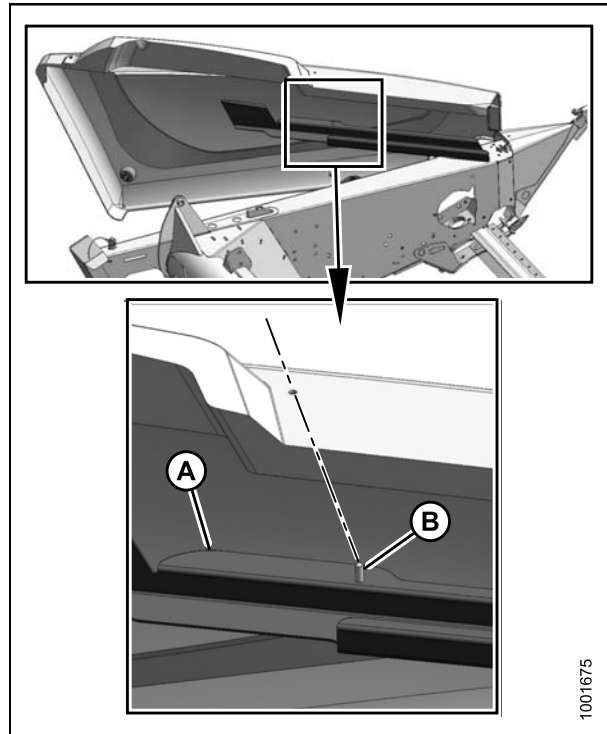


Figure 3.14: Left-Hand Endshield

2. Secure the endshield to the support with acorn nut (A).
3. Close the endshield. Refer to [Closing Endshields, page 36](#).

NOTE:

Plastic 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 Endshields, page 39](#).

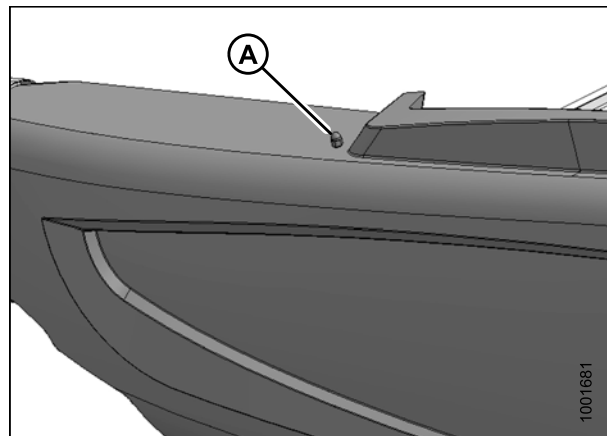


Figure 3.15: Left-Hand Endshield

OPERATION

Adjusting Endshields

Plastic endshields may 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 Gap "X" Chart, page 39.

Table 3.1 Gap "X" Chart

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

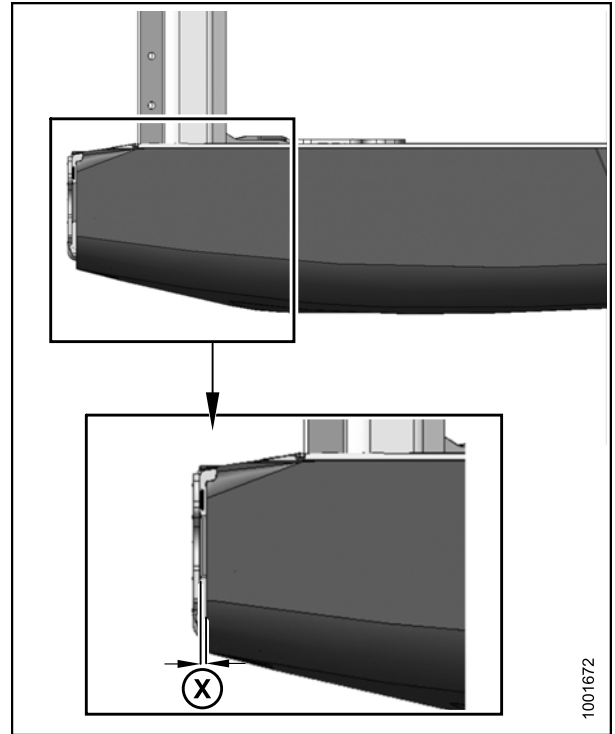


Figure 3.16: Left-Hand Endshield

If adjustments are required, proceed as follows:

2. Open the endshield. Refer to [Opening Endshields, page 35](#).
3. Loosen nut (A) on pin (B) from inside the endsheet using a 3/4 in. (19 mm) socket.
4. Close the endshield and adjust its position to achieve the gap 'X' 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 Endshields, page 36](#).

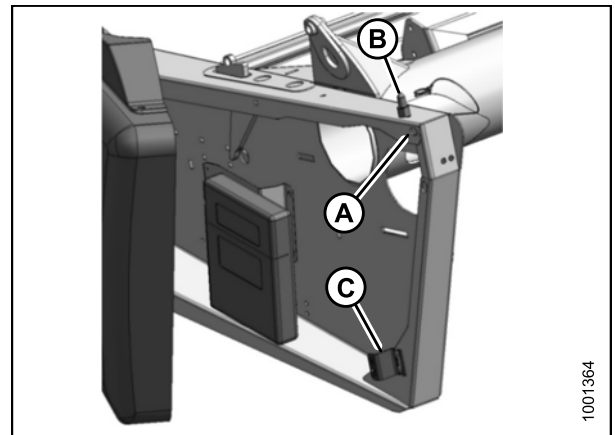


Figure 3.17: Left-Hand Endshield

3.2.4 Daily Start-Up Check

CAUTION

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

Complete the following tasks each day before start-up:

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

NOTE:

Use proper procedure when searching for pressurized fluid leaks. Refer to [5.3.5 Checking Hydraulic Hoses and Lines, page 118](#).

2. Clean all lights and reflective surfaces on the machine.
3. Perform all daily maintenance. Refer to [5.3.1 Maintenance Schedule/Record, page 115](#).

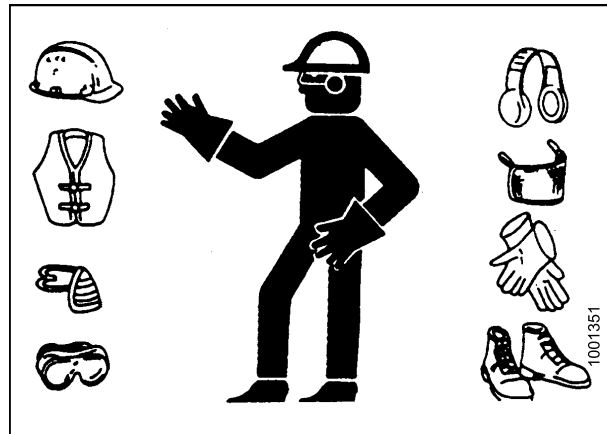


Figure 3.18: Safety Devices

3.3 Break-in Period

NOTE:

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

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

1. Operate the machine with reel drapers and knife running slowly for five minutes, watching and listening FROM THE OPERATOR'S SEAT for binding or interfering parts.

NOTE:

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

2. Perform the items specified. Refer to [5.3.2 Break-In Inspection, page 116](#).



CAUTION

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

3.4 Shutting Down the Machine

DANGER

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

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

- Park on level ground whenever possible.
- Lower the header fully.
- Place all controls in NEUTRAL or PARK.
- Disengage the header drive.
- Lower and fully retract the reel.
- Stop the engine and remove the key from the ignition.
- Wait for all movement to stop.

3.5 Cab Controls

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 in-cab controls for:

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

3.6 Header Setup

3.6.1 Header Attachments

Several attachments to improve performance of your D65 header are available as options that can be installed by your MacDon Dealer. Refer to [6 Options and Attachments, page 227](#) in this manual for a description of each item.

3.6.2 Header Settings

This table is a guideline for setting up the D65 Draper Header. Settings other than those suggested can be made to suit various crops and conditions not covered here.

Table 3.2 Recommended Header Settings

Crop Type	Stubble Height in. (mm)	Crop Condition	Divider Rods	Header Angle ³	Knife Speed ⁴	Reel Tine Pitch ⁵	Reel Speed % ⁶	Reel Fore-Aft ⁷	Skid Shoe Position ⁸	Stabilizer Wheels ⁹	Upper Cross Auger	Float lbf (N) ¹⁰
Cereals	<4 (<102)	Light	On	0-3	High	2	10-15	6 or 7	Up or center	Storage	Not required	70 (311)
		Normal		4-7	Medium		10					
		Heavy				3		5-10	4 or 5			
		Lodged		10-15								
	4-8 (102-203)	Light	On	0-3	High	2	10-15	6 or 7	Center or down	Variable	Not required	70 (311)
		Normal		4-7	Medium		10					
		Heavy				3		5-10	4 or 5			
		Lodged		10-15								
	>8 (>203)	Light	On	0-3	High	2	10-15	6 or 7	Not applicable	Variable	Not required	150 (667)
		Normal		4-7	Medium		10					
		Heavy				3		5-10	4 or 5			
		Lodged		10-15								

3. Set header angle as shallow as possible (setting A) with center-link and skid shoes while maintaining cutting height. Refer to [Controlling Header Angle, page 55](#).
4. Refer to [3.7.7 Knife Speed, page 57](#).
5. Refer to [Reel Cam Settings, page 65](#).
6. Percentage above ground speed. Refer to [3.7.4 Reel Speed, page 56](#).
7. Refer to [3.7.9 Reel Fore-Aft Position, page 58](#).
8. 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 49](#).
9. Stabilizer wheels are used to limit the side-to-side movement when cutting off the ground in rolling terrain, and to minimize bouncing. Refer to [Adjusting Stabilizer/Slow Speed Transport Wheels, page 50](#).
10. Force required to lift header at ends. Refer to your windrower operator's manual for adjustment procedures.

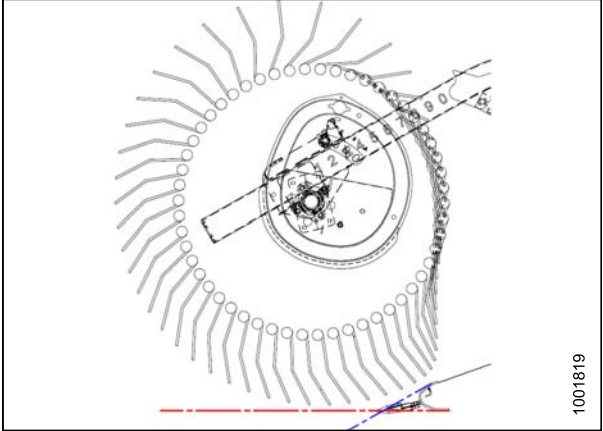
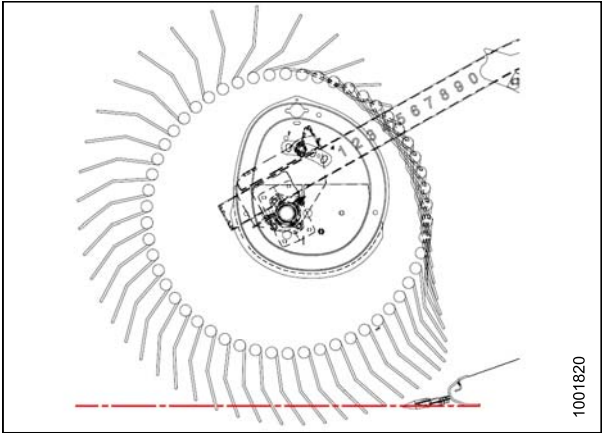
OPERATION

Crop Type	Stubble Height in. (mm)	Crop Condition	Divider Rods	Header Angle ³	Knife Speed ⁴	Reel Time Pitch ⁵	Reel Speed % ⁶	Reel Fore-Aft ⁷	Skid Shoe Position ⁸	Stabilizer Wheels ⁹	Upper Cross Auger	Float lbf (N) ¹⁰	
Canola	4-8 (102-203)	Light	On	8-10	Medium	2	5-10	6 or 7	Variable	Variable	Not required	70-100 (311-445)	
		Normal			1	10	3 or 4	Center or down	Recommended				
		Heavy			2	5-10		Variable					
		Lodged			3	10	Center or down						
Flax	>8 (>203)	Light	On	8-10	Medium	4	5-10	6 or 7	Not applicable	Variable	Not required	150 (667)	
		Normal			2	10	3 or 4	Recommended					
		Heavy			3	5-10							
		Lodged											
Edible beans	2-6 (51-153)	Light	On	4-7	High	2	5-10	6 or 7	Center or down	Variable	Not required	70-100 (311-445)	
		Normal		0-3			10						
		Heavy		4-7									
		Lodged		8-10									
Grass	On ground	Light	Off	8-10	Medium	2	5-10	3 or 4	Up or center	Storage	Not required	100 (445)	
		Normal					3						
		Heavy											
		Lodged											
Alfalfa	On ground	Light	On	Variable	High	2	10	6 or 7	Up or center	Storage	Not required	70-100 (311-445)	
		Normal					3						10-15
		Heavy					2						10
		Lodged					3						10-15

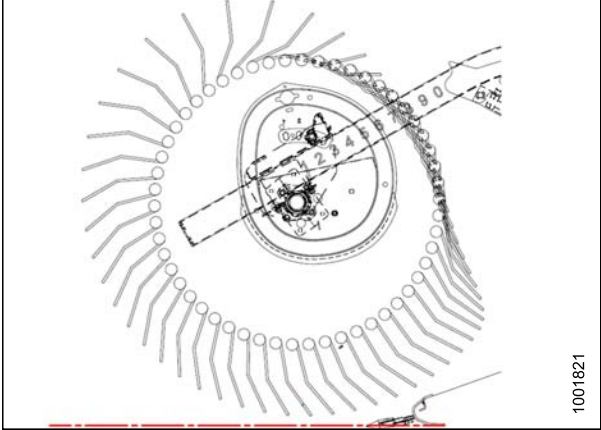
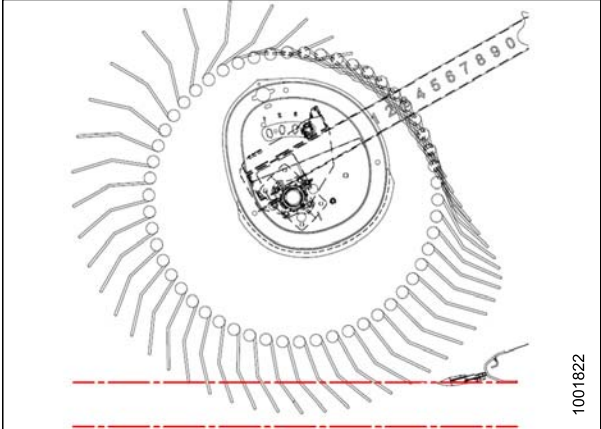
3.6.3 Reel Settings

The following chart illustrates the profile of the reel at each cam or finger pitch setting as well as the reel position 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	

OPERATION

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

NOTE:

- Adjust the reel forward to get closer to the ground while tilting the header back. Fingers/tines will dig into the ground at extreme reel-forward positions, so adjust skid shoes or header angle to compensate. Adjust the reel rearwards to position the reel further away from the ground when tilting the header forward.
- Header tilt can be increased to position the reel closer to the ground, or decreased to position the reel further from the ground, while keeping material flowing onto drapers.
- To leave the maximum amount of stubble behind in lodged crop, raise the header and increase the header tilt to keep the reel close to the ground. Position the reel fully forward.
- The reel may have to be moved back to prevent lumps or plugging on the cutterbar in thinner crops.
- Minimum crop carrying capacity (minimum area of exposed draper between the reel and the header backsheet) occurs with the reel in the furthest aft position.
- Maximum crop carrying capacity (maximum area of exposed draper between the reel and the header backsheet) occurs with the reel in the furthest forward position.
- The tip speed of the fingers/tines at the cutterbar becomes higher than the reel speed at higher cam settings due to the nature of the cam action. Refer to [Table 3.3 D65 Recommended Reel Settings, page 47](#).

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. As well, proper adjustments and timely maintenance will increase the length of service you receive from your machine.

The variables listed in Table [3.4 Operating Variables, page 49](#) and detailed on the following pages will affect the performance of your header.

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

Table 3.4 Operating Variables

Variable	Section
Cutting Height	3.7.1 Cutting Height, page 49
Header Float	3.7.2 Header Float, page 55
Header Angle	3.7.3 Header Angle, page 55
Reel Speed	3.7.4 Reel Speed, page 56
Ground Speed	3.7.5 Ground Speed, page 56
Draper Speed	3.7.6 Draper Speed, page 57
Knife Speed	3.7.7 Knife Speed, page 57
Reel Height	3.7.8 Reel Height, page 58
Reel Fore-Aft Position	3.7.9 Reel Fore-Aft Position, page 58
Reel Tine Pitch	3.7.10 Reel Tine Pitch, page 65
Crop Divider Rods	3.7.12 Crop Divider Rods, page 72

3.7.1 Cutting Height

The header design allows Operators to cut the crop above the ground in relation to the desired stubble height or to cut the crop at ground level with the header on the ground. Cutting height will vary depending on type of crop, crop conditions, etc.

Cutting Off the Ground

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

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 (or stabilizer/slow speed transport wheel system) is available only for 30-, 35-, 40-, and 45-foot headers.

OPERATION

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

1. Raise the header so the stabilizer wheels are off the ground. Shut down engine and remove the key.
2. Check that the float is working properly. Refer to your windrower operator's manual for instructions.
3. Remove the hairpin (A) from the latch on the right wheel assembly.
4. Disengage the latch (B), lift the wheel out of the hook, and place on the ground as shown. (This reduces weight of assembly and makes adjusting the wheel position easier.)
5. Lift the left wheel slightly to support the weight, and the pull handle (C) upwards to release the lock.
6. Lift the left wheel to the desired height and engage the support channel into the slot (D) in the upper support.
7. Push down on the handle (C) to lock.
8. Lift the right wheel back into the field position and ensure the latch (B) is engaged.
9. Secure the latch with hairpin (A).
10. Support the wheel weight by lifting slightly with one hand, and pull up on handle (A) to release the lock.
11. Lift the wheels to the desired height, and engage the support channel into the slot (B) in the upper support.
12. Push down on the handle (A) to lock.

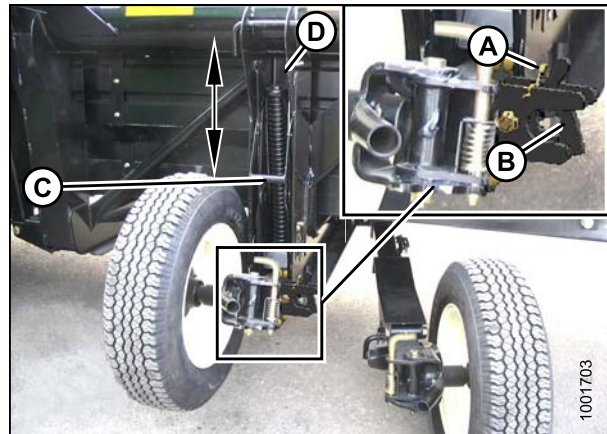


Figure 3.19: Right Wheel

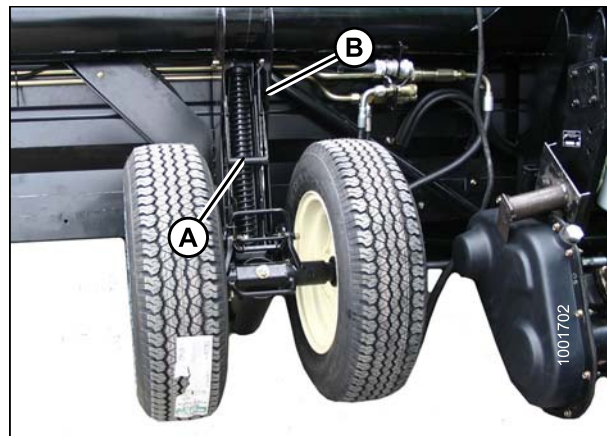


Figure 3.20: Left Wheel

OPERATION

13. Lower the header to the desired cutting height using the windrower controls and check the load indicator.

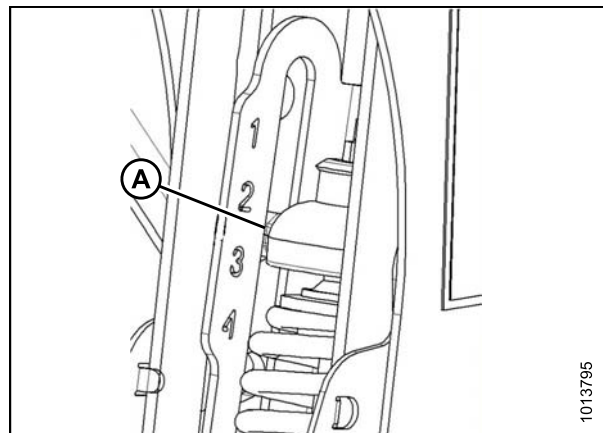


Figure 3.21: Load Indicator

IMPORTANT:

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

14. 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.
15. Use the windrower cab display module (CDM) controls to automatically maintain cutting height. Refer to your windrower operator's manual for details.

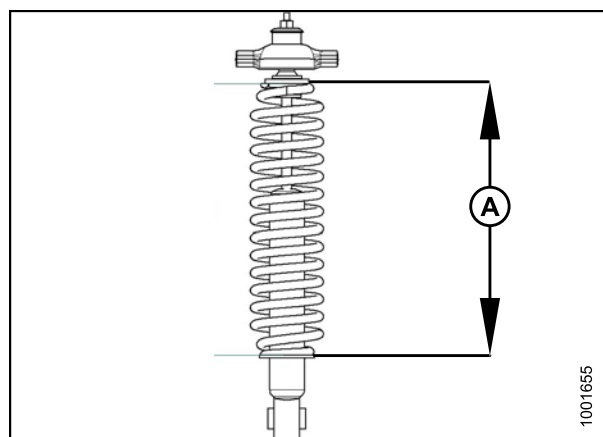


Figure 3.22: Spring Compression

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

1. Raise the header until the stabilizer wheels are off the ground. Shut down engine and remove the key.
2. Check that the float is working properly. Refer to your windrower operator's manual for instructions.

CAUTION

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.

OPERATION

3. Support the wheel weight by lifting slightly with one hand on handle (B), and pull up on the handle (A) to release the lock.
4. Lift the wheel using handle (B), and engage the support channel into the center slot (C) in the upper support.
5. Push down on the handle (A) to lock.

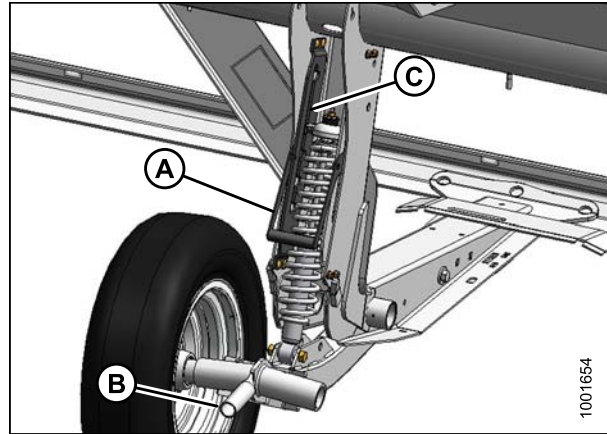


Figure 3.23: Stabilizer Wheel

6. Lower the header to the desired cutting height using the windrower controls and check the load indicator.

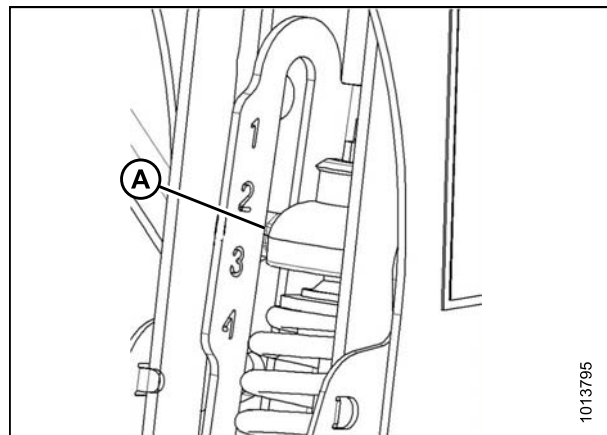


Figure 3.24: Load Indicator

IMPORTANT:

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

7. 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.
8. Use the windrower cab display module (CDM) controls to automatically maintain cutting height. Refer to your windrower operator's manual for details.

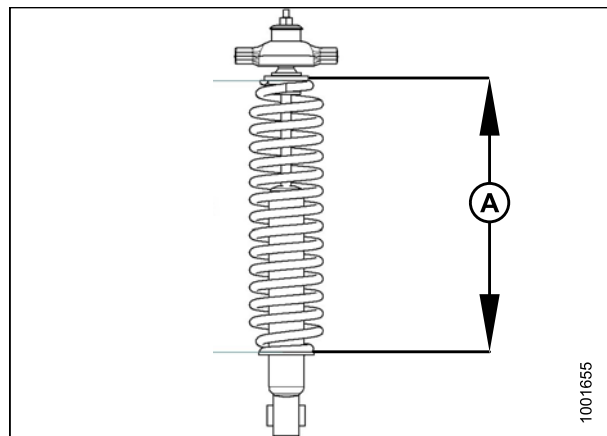


Figure 3.25: Spring Compression

OPERATION

Cutting On the Ground

Cutting on the ground is performed with the header fully lowered and the cutterbar on the ground. The orientation of the knife and knife guards relative to the ground (header angle) is controlled by the skid shoes and the center-link—it is **NOT** controlled by the header lift cylinders. The skid shoes and center-link allow the Operator 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 Shoe, page 54*](#)
- [*Adjusting Outer Skid Shoe, page 54*](#)
- [*3.7.3 Header Angle, page 55*](#)
- [*3.7.2 Header Float, page 55*](#)

OPERATION

Adjusting Inner Skid Shoe

DANGER

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

1. Raise header to full height, engage safety props, shut off engine, and remove key.
2. Raise the stabilizer wheels or slow speed transport wheels fully (if installed). Refer to the following:
 - [Adjusting Stabilizer Wheels, page 51](#)
 - [Adjusting Stabilizer/Slow Speed Transport Wheels, page 50](#)

3. Remove the lynch pin (A) from each skid shoe.
4. Hold the shoe (B) and remove the pin (C) by disengaging from the frame and pulling away from the shoe.
5. Raise or lower the skid shoe (B) to achieve the desired position using the holes in the support (D) as a guide.
6. Install the pin (C), engage in frame, and secure with lynch pin (A).
7. Check that all of the skid shoes are adjusted to the same position.
8. 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.
9. Check the header float as described in your windrower operator's manual.

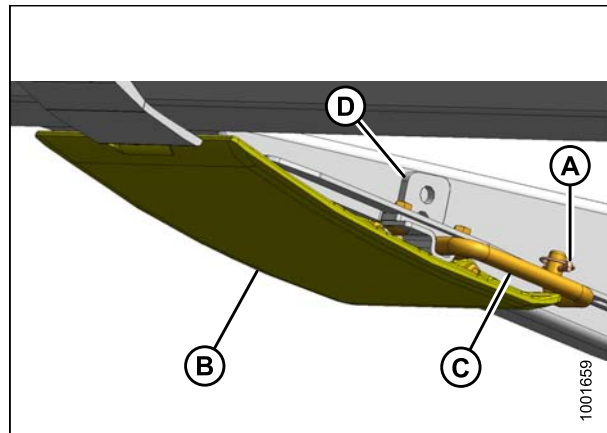


Figure 3.26: Inner Skid Shoe

Adjusting Outer Skid Shoe

DANGER

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

1. Raise the header to its full height, engage the safety props, shut off the engine, and remove the key from the ignition.
2. Raise the stabilizer wheels or slow speed transport wheels fully (if installed). Refer to the following:
 - [Adjusting Stabilizer Wheels, page 51](#)
 - [Adjusting Stabilizer/Slow Speed Transport Wheels, page 50](#)

OPERATION

3. Remove the lynch pin (A) from each skid shoe (B).
4. Hold the shoe (B) and remove the pin (C) by disengaging from the frame and pulling away from the shoe.
5. Raise or lower the skid shoe (B) to achieve the desired position using the holes in the support (D) as a guide.
6. Reinstall pin (C), engage in frame, and secure with lynch pin (A).
7. Check that all of the skid shoes are adjusted to the same position.
8. Check the header float as described in your windrower operator's manual.

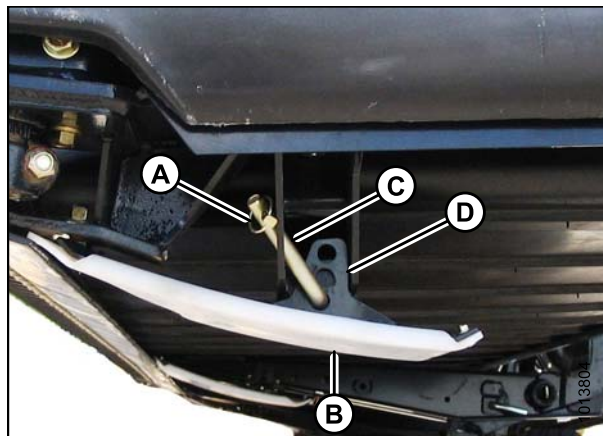


Figure 3.27: Outer Skid Shoe

3.7.2 Header Float

D65 windrower 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.

3.7.3 Header Angle

Header angle is the angle between the drapers and the ground and is adjustable to accommodate crop conditions and/or soil types.

Header angle (A) is a critical factor for effectively cutting on the ground because it determines the actual distance (B) between the knives and the ground. The header rotates at the point of skid shoe/ground contact (C) by adjusting the length of the center-link thereby adjusting the position of the guards and knives.

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

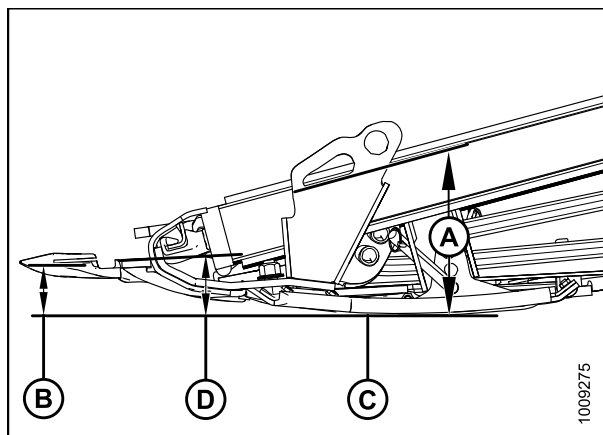


Figure 3.28: Header Angle

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.

3.7.4 Reel Speed

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

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

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

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

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

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

NOTE:

Nine-bat reels are available on 15-, 20-, and 25-foot 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.

The 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 sprocket that drives the reel and it is suitable for most crops. Other sprockets are available that provide more torque to the reel in heavy cutting conditions or allow for higher reel speeds in light crops when operating at increased ground speeds.

For installation details, refer to [5.9.3 Replacing Reel Drive Sprocket, page 213](#).

3.7.5 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 79](#) 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 3.0–3.5 mph (4.8–5.8 km/h) and adjust as required.

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

Figure [3.29: Ground Speed vs Acres, page 57](#) illustrates the relationship between ground speed and area cut for the various sized headers.

OPERATION

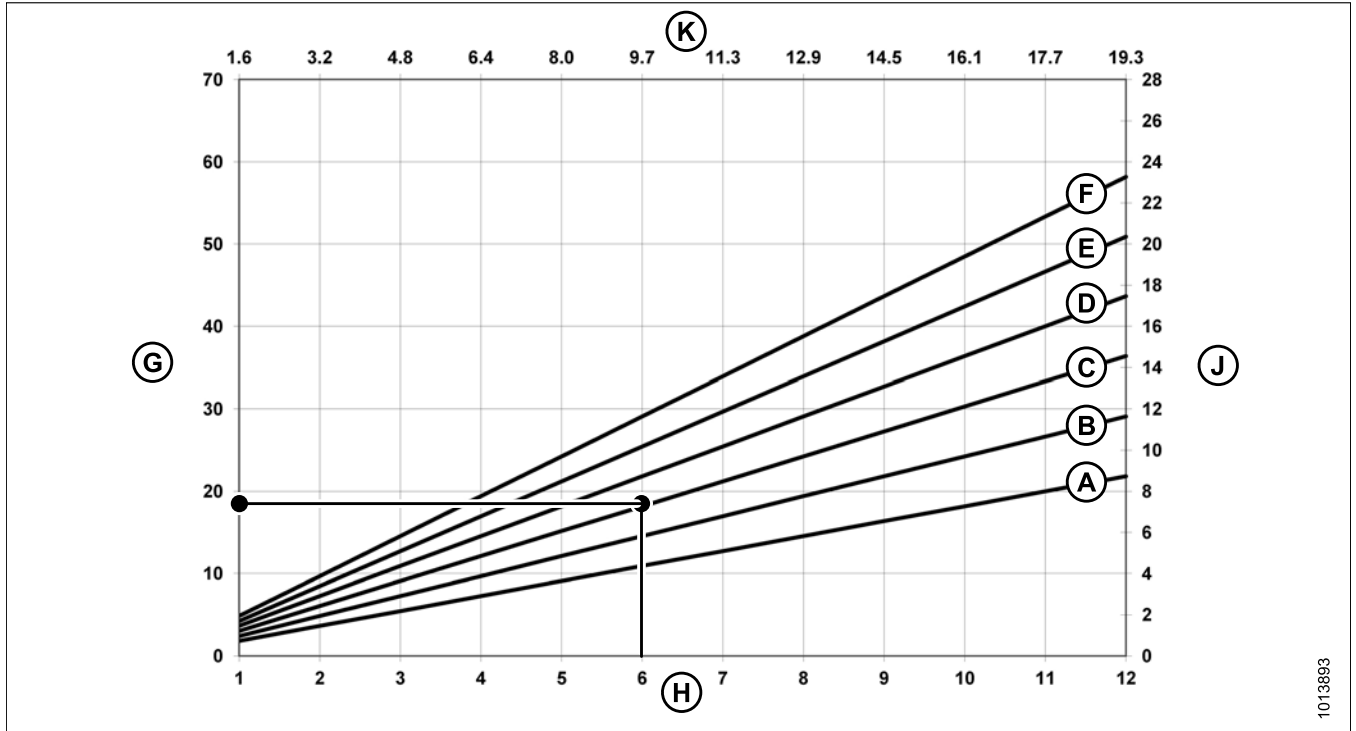


Figure 3.29: Ground Speed vs Acres

- A - 15 Foot
- B - 20 Foot
- C - 25 Foot
- D - 30 Foot
- E - 35 Foot
- F - 40 Foot
- G - acres/hour
- H - miles/hour
- J - hectares per hour
- K - kilometers/hour

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

3.7.6 Draper Speed

Correct draper speed is an important factor for achieving good flow of the 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 the draper speed to achieve good feeding of crop for a good windrow. Excessive draper speed will reduce draper life.

3.7.7 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.

Table 3.5 Knife Speed Guidelines

Header Size (ft.)	Recommended Knife Speed Range (spm)	
	Single Knife	Double Knife
15 ft.	—	1500–1900
20, 25 ft.	1200–1400	1400–1700

OPERATION

Header Size (ft.)	Recommended Knife Speed Range (spm)	
	Single Knife	Double Knife
30 ft.	1200–1400	1200–1600
35 ft.	1100–1300	1200–1400
40 ft.	1050–1200	1100–1400

3.7.8 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. Also, refer to [3.7.9 Reel Fore-Aft Position, page 58](#).

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 adequate clearance to prevent fingers contacting the knife or the ground. Refer to [5.8.1 Reel Clearance to Cutterbar, page 186](#).

3.7.9 Reel Fore-Aft Position

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

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

For double-reel headers, refer to [Repositioning Fore-Aft Cylinders on Double Reel, page 62](#).

For single-reel headers, refer to [Repositioning Fore-Aft Cylinders on Single Reel, page 60](#).

OPERATION

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

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

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

IMPORTANT:

Adjust to a steeper header angle if experiencing difficulty picking up flattened crop. Refer to [Controlling Header Angle, page 55](#) for adjustment instructions. Adjust reel position only if header angle adjustments are not satisfactory.

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 [3.7.10 Reel Tine Pitch, page 65](#) for adjustment details.

Adjusting Reel Fore-Aft Position

1. Select FORE-AFT mode on the selector switch in the cab.
2. Operate the hydraulics to move the reel to the desired position while using the decal (A) as a reference.
3. Check the reel clearance to cutterbar after making changes to the cam setting. Refer to the following for measurement and adjustment procedures:
 - [5.8.1 Reel Clearance to Cutterbar, page 186](#)
 - [5.8.2 Reel Frown, page 189](#)

IMPORTANT:

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

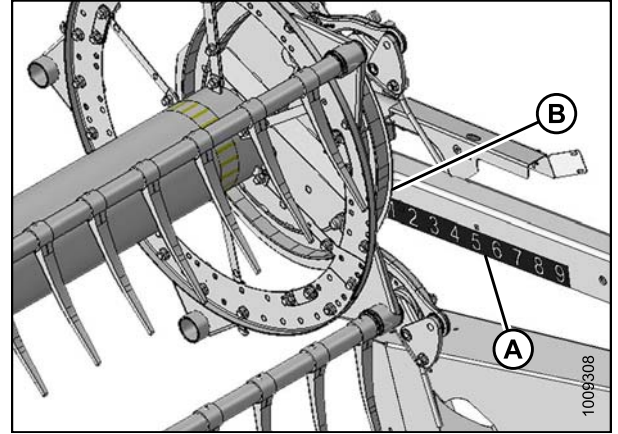


Figure 3.30: Fore-Aft Decal

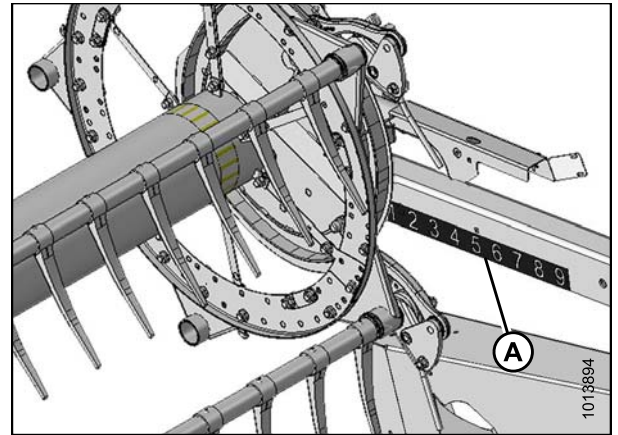


Figure 3.31: Fore-Aft Decal

OPERATION

Repositioning Fore-Aft Cylinders on Single Reel

The reel can be moved approximately 9 in. (227 mm) further aft by repositioning the fore-aft cylinders on the reel arms.

⚠ DANGER

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

Reposition the right reel arm cylinder as follows:

NOTE:

Reel components not shown in illustration for improved clarity.

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

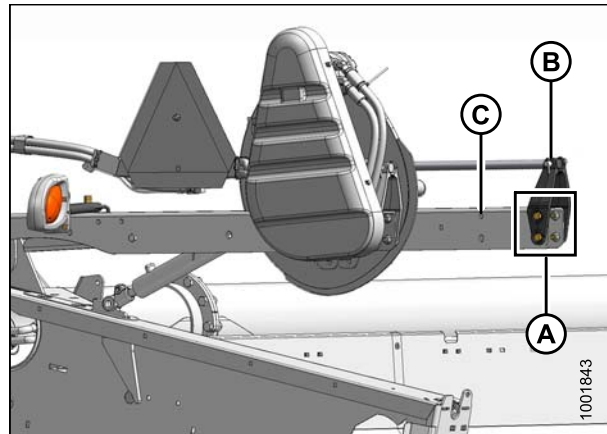


Figure 3.32: Right Arm Cylinder – Forward Position

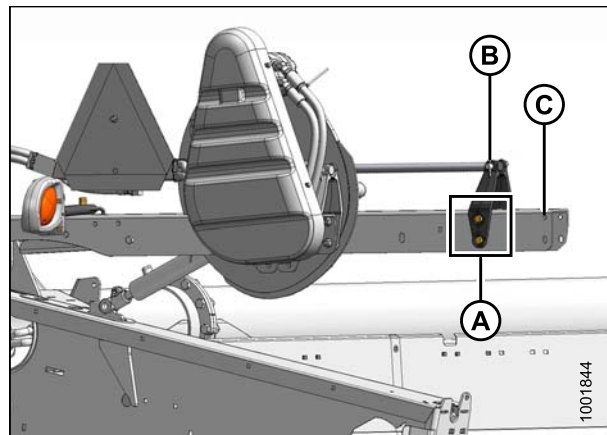


Figure 3.33: Right Arm Cylinder – Rearward Position

OPERATION

Reposition the left reel arm cylinder as follows:

NOTE:

Reel components not shown in illustration for improved clarity.

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

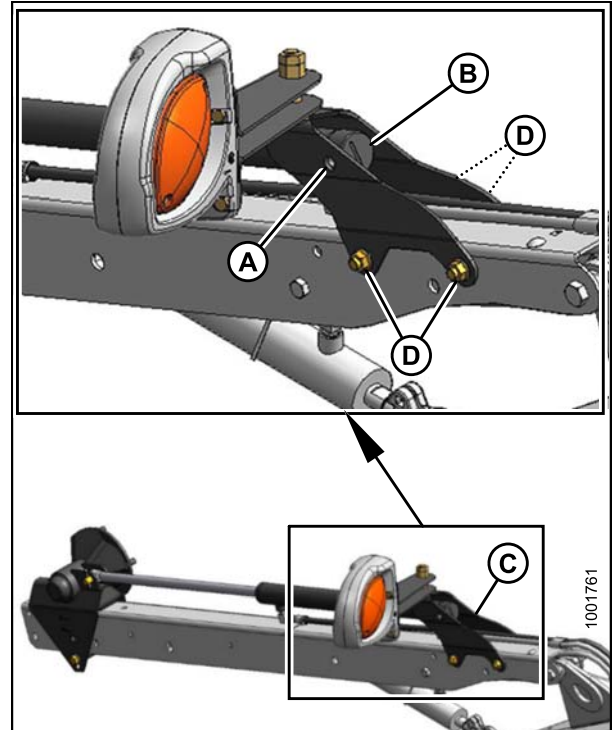


Figure 3.34: Forward Position

5. Reposition the bracket/light assembly (C) on the reel arm as shown, and secure with four bolts (D) Tighten bolts.
6. Push the reel back and attach cylinder (B) to the bracket/light assembly (C) with pin (A). Secure pin with cotter pin.
7. Secure the light harness to the bracket/light assembly (C) using a cable tie.
8. Check the reel clearance to the backsheet, upper cross auger (if installed), and reel braces.
9. Adjust the reel tine pitch if necessary. Refer to [3.7.10 Reel Tine Pitch, page 65](#).

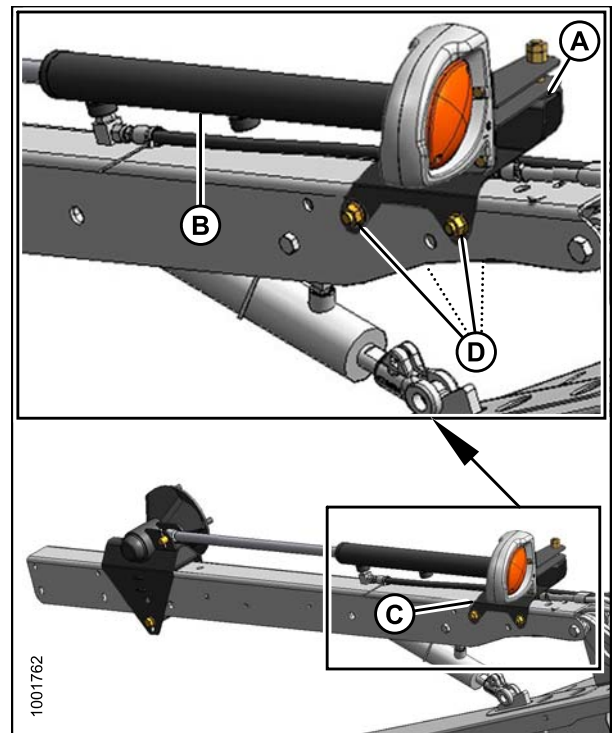


Figure 3.35: Rearward Position

OPERATION

Repositioning Fore-Aft Cylinders on Double Reel

The reel can be moved approximately 9 in. (227 mm) further aft by repositioning the fore-aft cylinders on the reel arms.

DANGER

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

Reposition the center arm cylinder as follows:

NOTE:

Reel components not shown in illustration for improved clarity.

1. Position reel fully aft with support arms horizontal.
2. Stop engine and remove key.
3. Remove four bolts (A) securing cylinder bracket (B) to reel arm.
4. Push/pull reel until bracket (B) lines up with the fore/aft set of holes (C).
5. Reinstall four bolts (A) to secure bracket (B) to reel arm at new position.

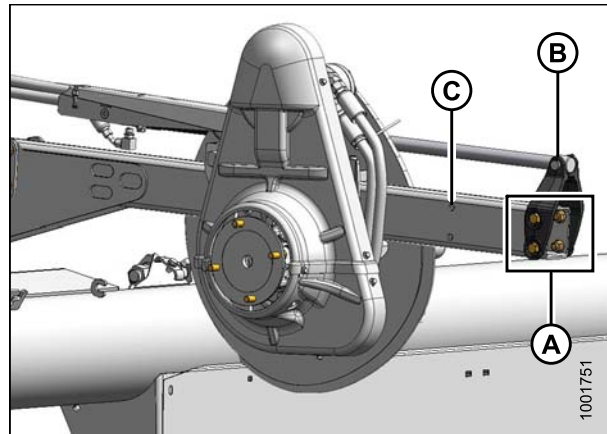


Figure 3.36: Forward Position

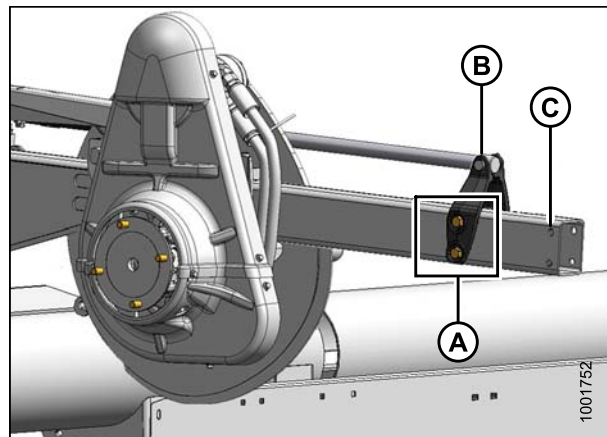


Figure 3.37: Rearward Position

OPERATION

Reposition right arm cylinder as follows:

NOTE:

Reel components not shown in illustration for improved clarity.

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

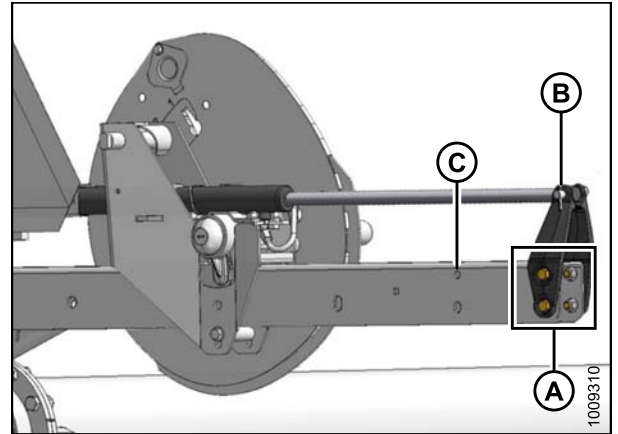


Figure 3.38: Forward Position

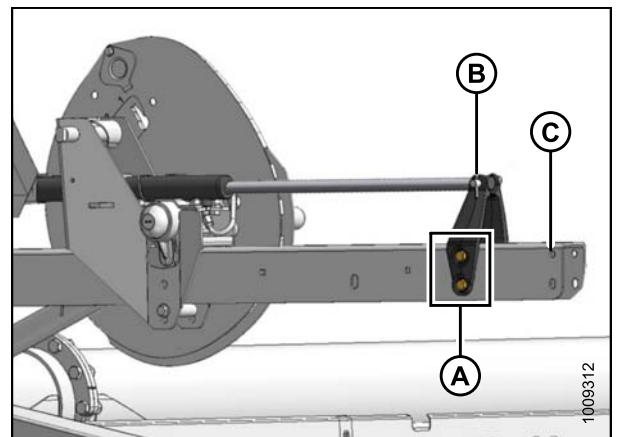


Figure 3.39: Rearward Position

OPERATION

Reposition the left reel arm cylinder as follows:

NOTE:

Reel components not shown in illustration for improved clarity.

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

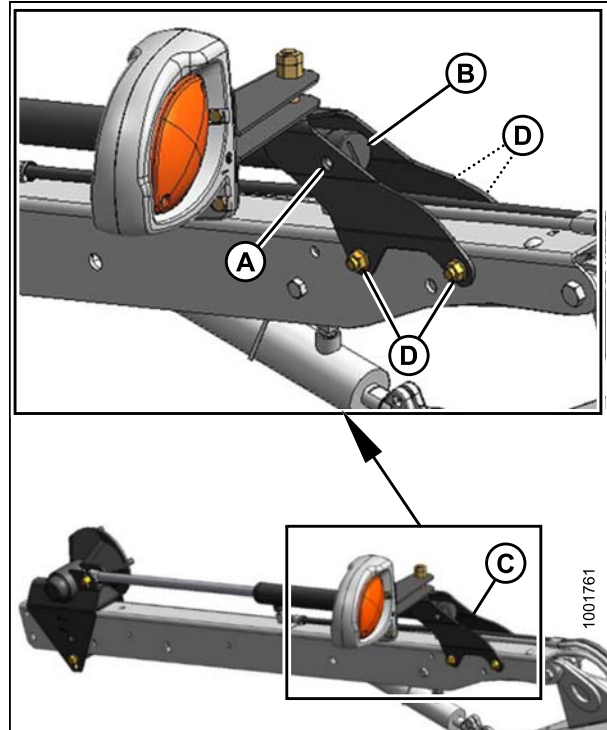


Figure 3.40: Forward Position

5. Reposition the bracket/light assembly (C) on the reel arm as shown, and secure with four bolts (D). Tighten bolts.
6. Push the reel back and attach cylinder (B) to the bracket/light assembly (C) with pin (A). Secure pin with cotter pin.
7. Secure the light harness to the bracket/light assembly (C) using a cable tie.
8. Check the reel clearance to the backsheet, upper cross auger (if installed), and reel braces.
9. Adjust the reel tine pitch if necessary. Refer to [3.7.10 Reel Tine Pitch, page 65](#).

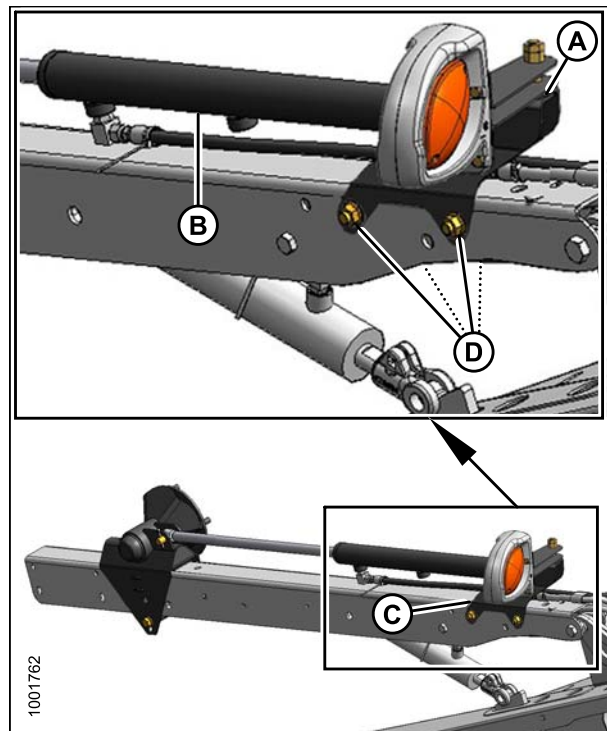


Figure 3.41: Rearward Position

3.7.10 Reel Tine Pitch

IMPORTANT:

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

The pick-up 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, however, because the cam setting is mainly used to determine how the crop gets delivered onto the drapers.

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

For the best results, use the minimum cam setting that delivers the crop past the rear edge of the cutterbar and onto the drapers. Refer to [3.6.2 Header Settings, page 44](#).

Reel Cam Settings

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

The setting numbers are visible above the slots on the cam disc. Refer to [Adjusting Reel Cam, page 67](#).

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.

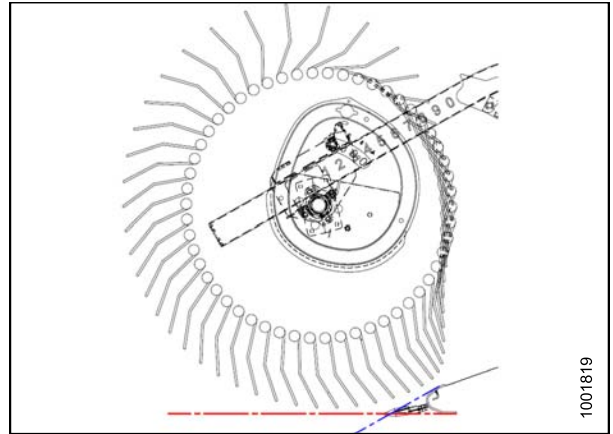


Figure 3.42: Finger Profile – Position 1

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

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

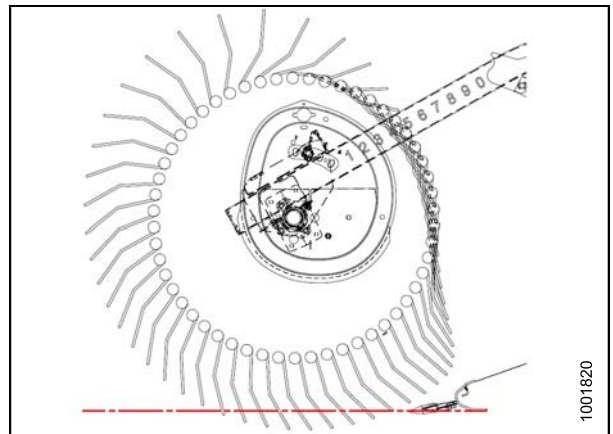


Figure 3.43: Finger Profile – Position 2

OPERATION

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.

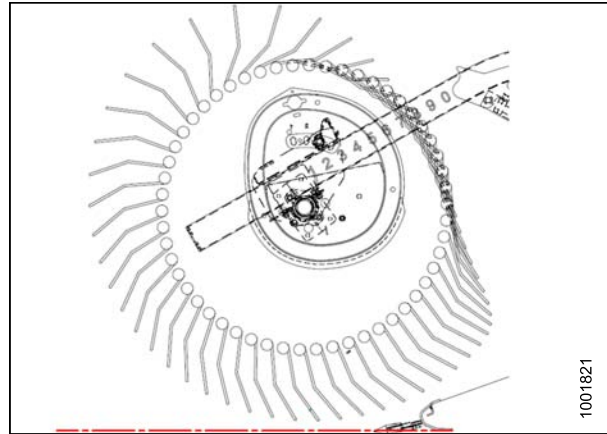


Figure 3.44: Finger Profile – Position 3

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.

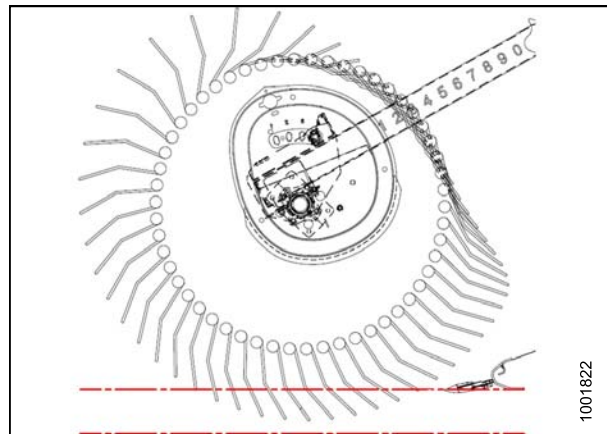


Figure 3.45: Finger Profile – Position 4

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

- Leaves a significant amount of stubble when cutting height is set to approximately 8 in. (203 mm). 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.

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, refer to [5.8.1 Reel Clearance to Cutterbar, page 186](#).

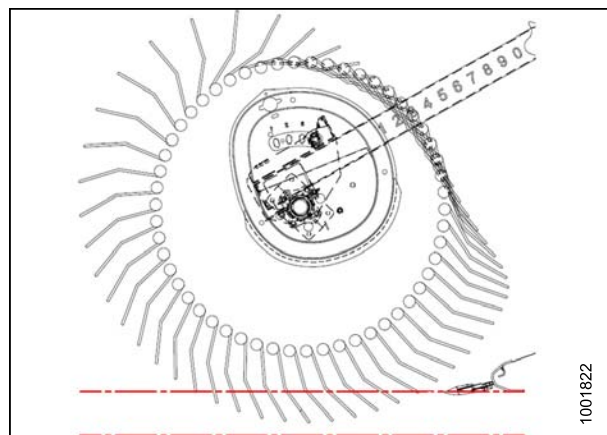


Figure 3.46: Finger Profile – Position 4

OPERATION

Refer to [3.6.2 Header Settings, page 44](#) for recommended reel tine pitch in specific crops and crop conditions.

Adjusting Reel Cam

DANGER

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

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

NOTE:

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

3. Turn the latch pin (A) clockwise to engage and lock the cam disc.
4. Repeat the above procedure for the opposite reel.

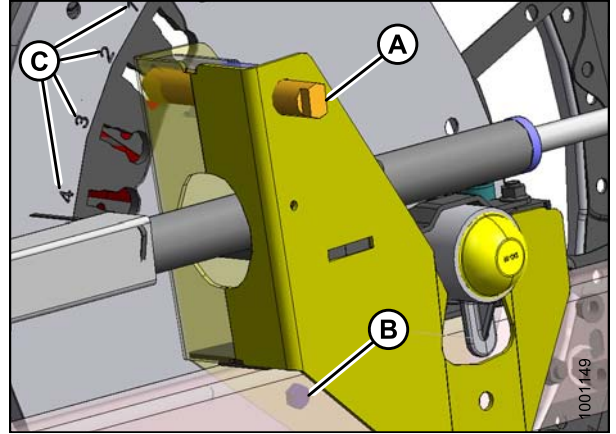


Figure 3.47: Reel Cam Positioner

IMPORTANT:

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

3.7.11 Crop Dividers

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

Removing Crop Dividers with Latch Option from Header

DANGER

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

1. Lower reel, raise header, stop engine, remove key, and engage header safety props. For instructions, refer to your windrower operator's manual.
2. Open or remove endshields. Refer to [3.2.3 Endshields, page 35](#).

OPERATION

3. Lift safety lever (A).
4. Hold onto crop divider (B), push lever (C) to open latch, and lower crop divider.

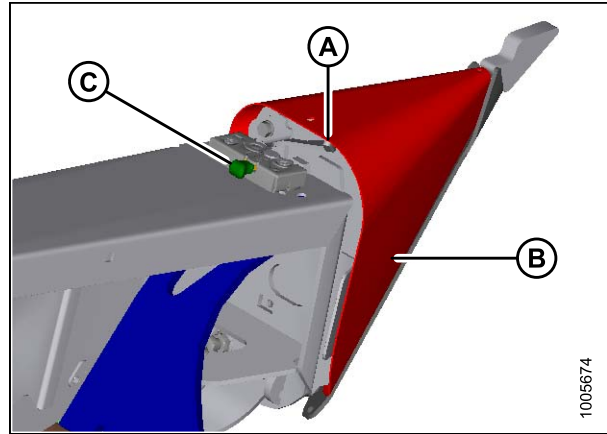


Figure 3.48: Crop Divider

5. Lift crop divider off endsheet and store as follows:
 - a. Insert pin (A) on crop divider into hole in endsheet at location shown.
 - b. Lift crop divider and position lugs (B) on crop divider into bracket on endsheet. Ensure lugs engage bracket.
6. Close or install endshields. Refer to [3.2.3 Endshields, page 35](#).

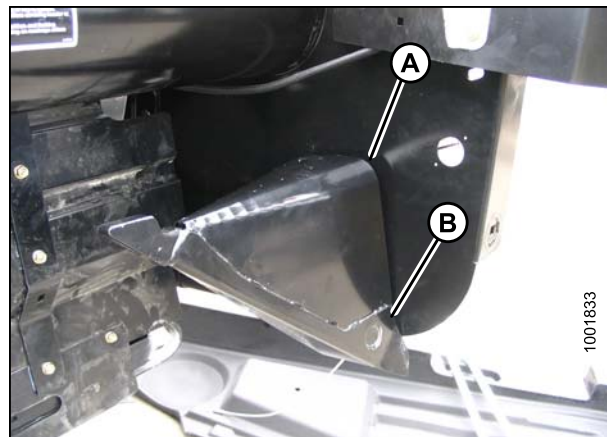


Figure 3.49: Stored Crop Divider

Removing Crop Dividers without Latch Option from Header

⚠ DANGER

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

1. Lower reel, raise header, stop engine, remove key, and engage safety props. For instructions, refer to your windrower operator's manual.
2. Open or remove endshields. Refer to [3.2.3 Endshields, page 35](#).

OPERATION

3. Remove bolt (A), lock washer, and flat washer.
4. Lower crop divider (B) and then lift to remove from endsheet.
5. Close or install endshields. Refer to [3.2.3 Endshields, page 35](#).

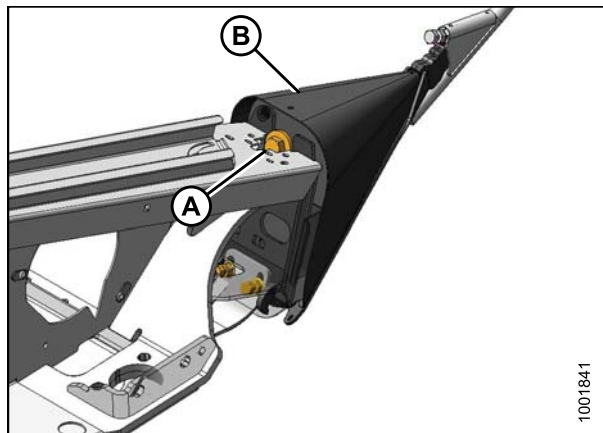


Figure 3.50: Crop Divider

Installing Crop Dividers with Latch Option onto Header

⚠ DANGER

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

1. Lower reel, raise header, stop engine, remove key, and engage safety props. For instructions, refer to your windrower operator's manual.
2. Open or remove endshields. Refer to [3.2.3 Endshields, page 35](#).
3. Remove crop divider from storage location by lifting crop divider to disengage lugs (A) at lower end and then lowering it slightly to disengage pin (B) from endsheet.

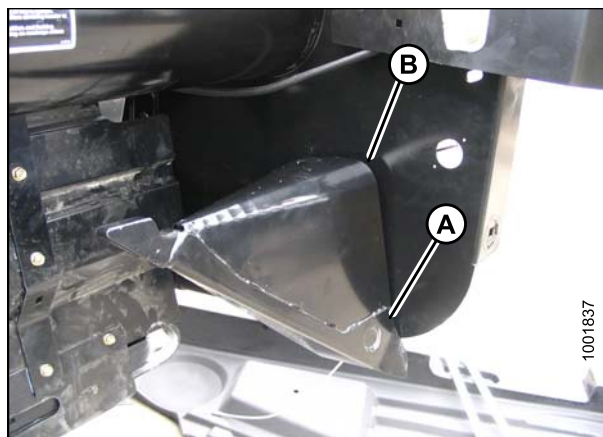


Figure 3.51: Stored Crop Divider

OPERATION

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

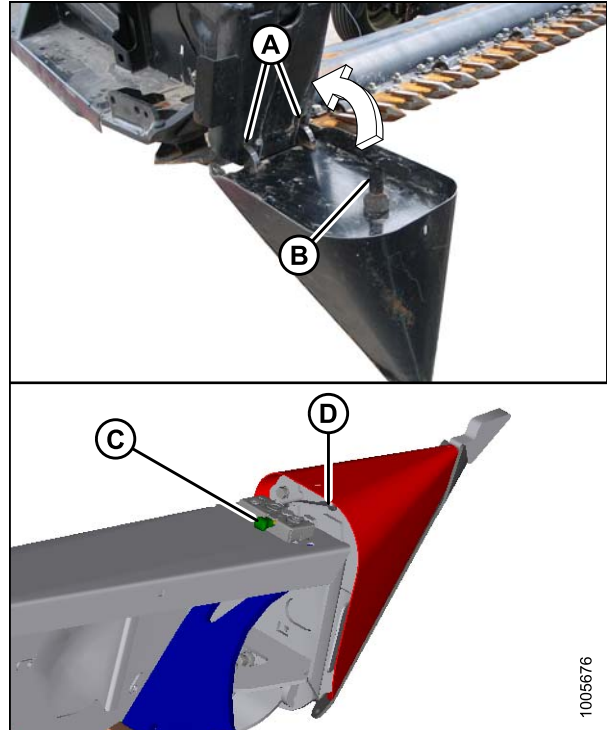


Figure 3.52: Crop Divider

7. Pull at the tip of the crop divider and ensure there is no lateral movement. If necessary, adjust bolts (A) to tighten crop divider and eliminate lateral movement.
8. Close or install endshields. Refer to [3.2.3 Endshields, page 35](#).



Figure 3.53: Crop Divider

Installing Crop Dividers without Latch Option onto Header

⚠ DANGER

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

1. Lower reel, raise header, stop engine, remove key, and engage safety props. For instructions, refer to your windrower operator's manual.
2. Open or remove endshields. Refer to [3.2.3 Endshields, page 35](#).

OPERATION

3. Remove crop divider from storage location by lifting crop divider to disengage lugs (A) at lower end and then lowering it slightly to disengage pin (B) from endsheet.

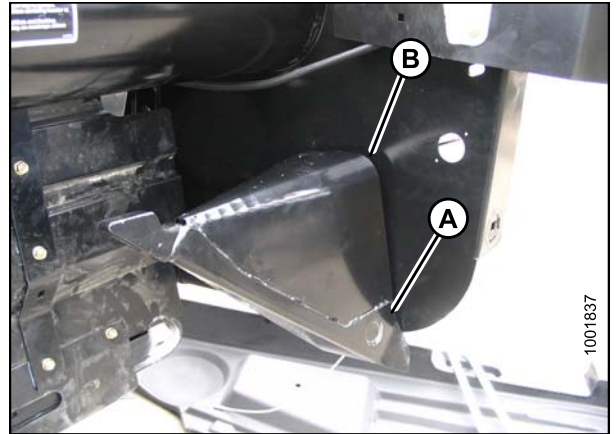


Figure 3.54: Stored Crop Divider

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

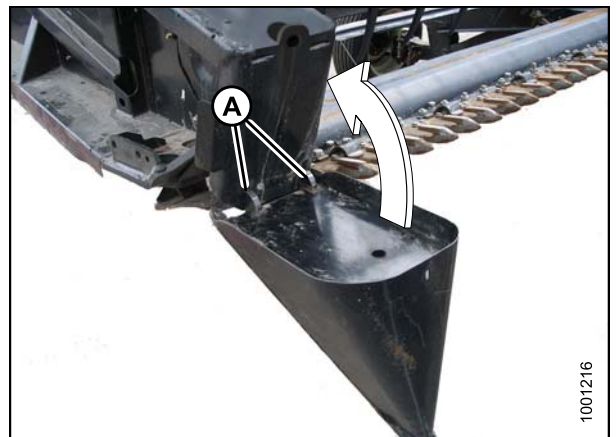


Figure 3.55: Crop Divider

5. Lift forward end of crop divider and install bolt (A) and special stepped washer (B) (step towards divider). Tighten bolt.
6. Pull at the tip of the crop divider and ensure there is no lateral movement. If necessary, adjust bolts (A) to tighten crop divider and eliminate lateral movement.
7. Close or install endshields. Refer to [3.2.3 Endshields, page 35](#).

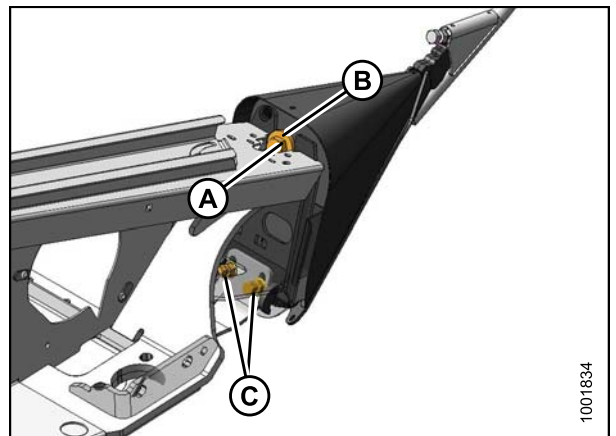


Figure 3.56: Crop Divider

OPERATION

3.7.12 Crop Divider Rods

Crop divider rods are used in conjunction with crop dividers. The removable crop divider rods are most useful when crop is down, but 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

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

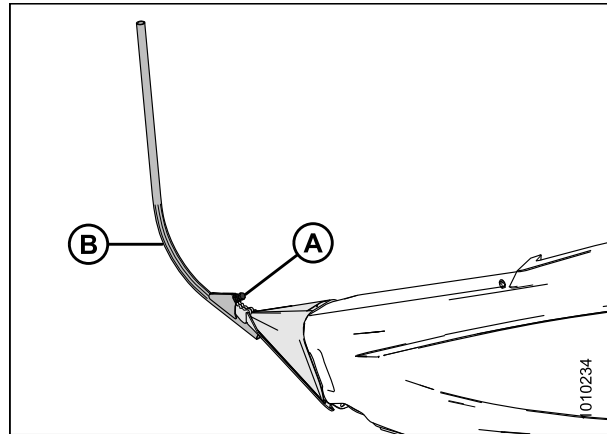


Figure 3.57: Crop Divider Rod

2. Store both crop divider rods inboard on the right side endsheet.

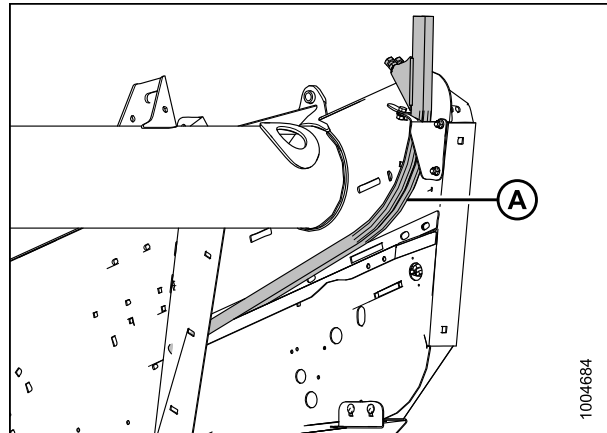


Figure 3.58: Right Side Endsheet

OPERATION

Rice Divider Rods

Optional rice divider rods provide improved performance in tall and tangled rice crops. Refer to [6.4.13 Rice Divider Rods, page 238](#).

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

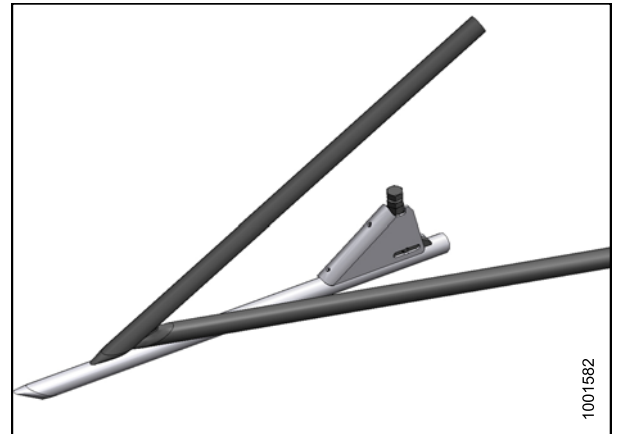


Figure 3.59: Divider Rod for Rice

3.8 Delivery Opening

The width and location of the delivery opening 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:

- Windrower pick-up capability
- Type and yield of crop
- Weather conditions (rain, humidity, wind)
- Drying time available

Refer to [3.10 Windrow Types, page 79](#) for the strengths and weaknesses of the various windrow configurations with respect to these factors.

Also refer to [3.9 Double Windrowing, page 76](#).

3.8.1 Adjusting Delivery Opening on Header with Manual Deck Shift

Both decks can be positioned to vary the delivery opening from 60-5/8 to 69-11/16 in. (1540–1770 mm) for the 15-ft. header and from 67-1/8 to 76-11/16 in. (1720–1950 mm) for 20- to 40-ft. models.

1. Loosen bolts (A) on both decks.
2. Slide decks desired amount. Retighten bolts (A).

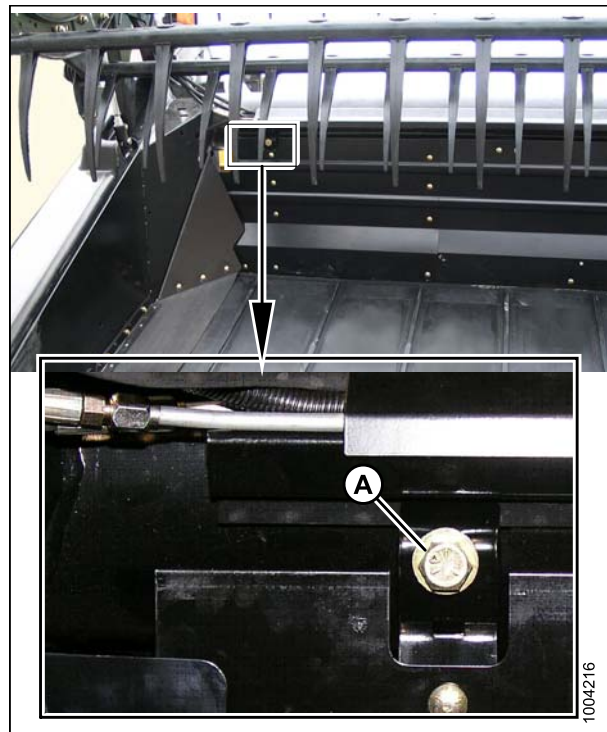


Figure 3.60: Manual Deck Shift

OPERATION

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.

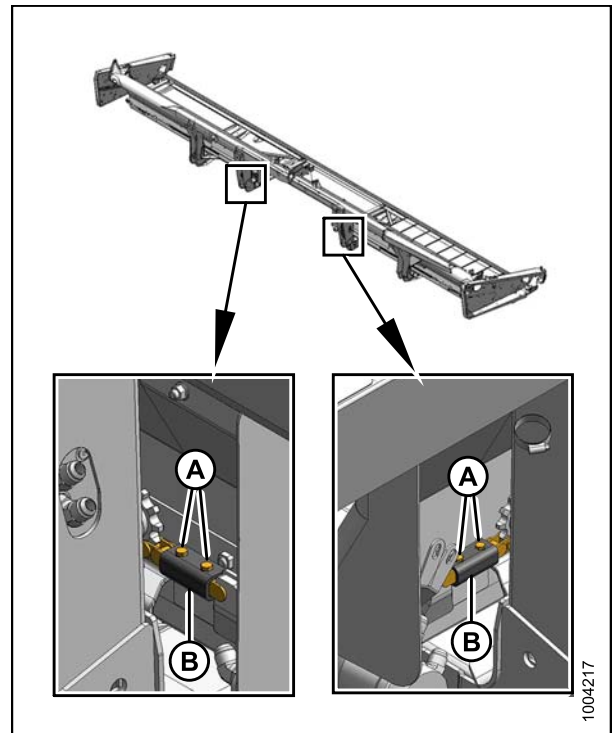


Figure 3.61: Hydraulic Deck Shift

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 is performed with the D65 Draper Headers by 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 example. Refer to

- [3.9.1 Shifting Decks Hydraulically, page 76](#)
- [3.9.2 Shifting Decks Manually, page 77](#)

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 30 ft. Refer to [3.9.3 Using Double Windrow Attachment \(DWA\), page 78](#).

3.9.1 Shifting Decks Hydraulically

The hydraulic deck shift feature allows you to select center, left, or right delivery from the windrower cab. It is only available on the 25-, 30-, and 35-ft. headers.

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

To lay a double-windrow, do the following:

NOTE:

30-ft. headers equipped with transport or stabilizer system require that the wheels be in the raised position to avoid interfering with the windrow.

1. Position the decks at the left end of header to deliver crop from right end (A) for the first round.
2. 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.
3. Complete the second round to lay a double windrow.
4. 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.

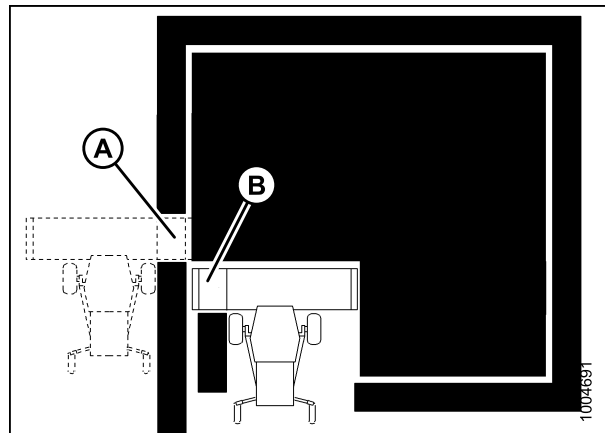


Figure 3.62: Double Windrowing

3.9.2 Shifting Decks Manually

Both decks can be moved manually to deliver the crop from the center or right/left end on 25- to 40-ft. headers.

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

⚠ DANGER

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

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

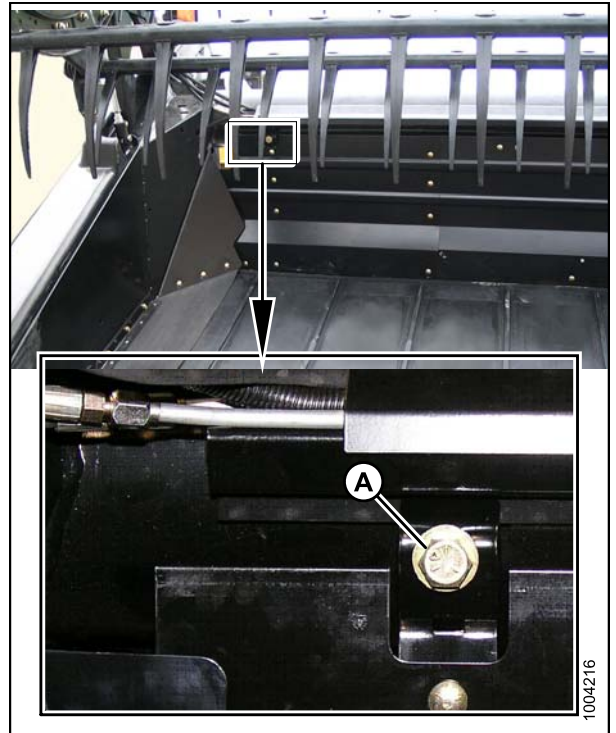


Figure 3.63: Right Deck Shown

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

NOTE:

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

NOTE:

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

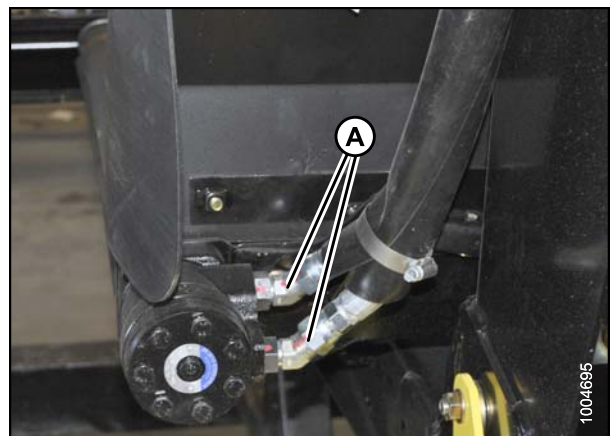


Figure 3.64: Right Deck Motor

OPERATION

To lay a double-windrow, do the following:

NOTE:

30-ft. headers equipped with transport or stabilizer system, require that the wheels be in the raised position to avoid interfering with the windrow.

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

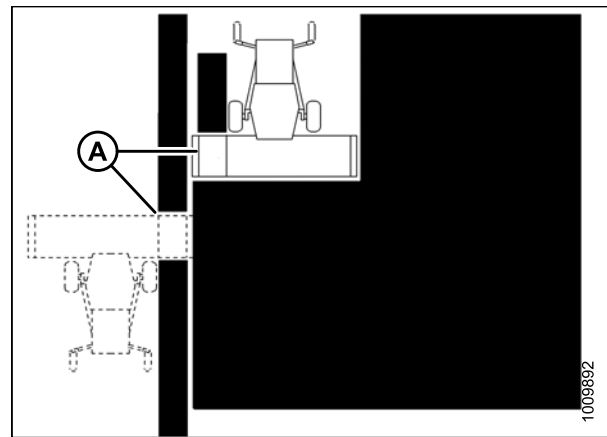
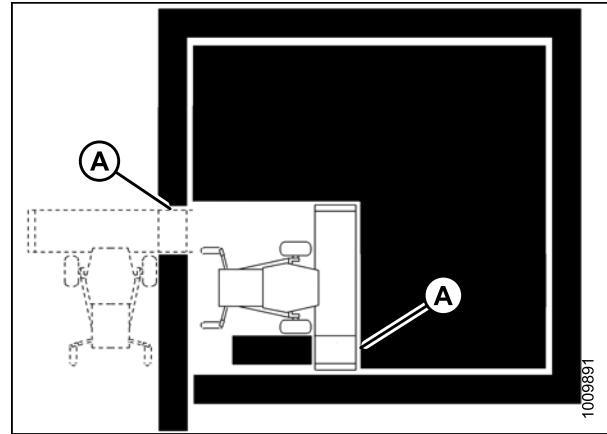


Figure 3.65: Double Windrowing

3.9.3 Using 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.

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.

NOTE:

The 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.

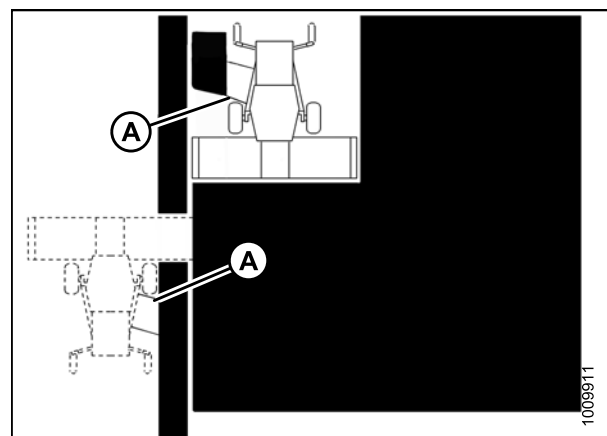
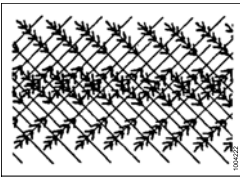
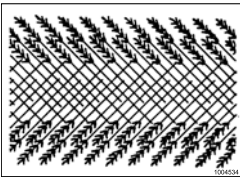
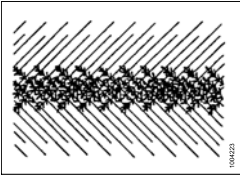
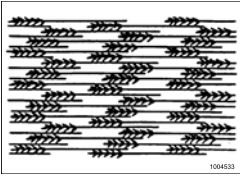


Figure 3.66: Double Windrowing

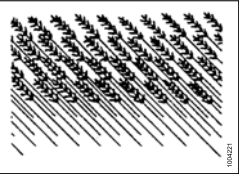
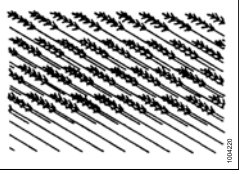
3.10 Windrow Types

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

Windrow Type	Description	Weight Distribution	Curing	Weatherability	Machine Setting Guidelines
Herringbone 	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.	Good	Good	Excellent	<ul style="list-style-type: none"> • Reel and ground speed approximately equal • Medium draper speed • Center delivery
Fantail 	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.	Fair	Fair	Fair	<ul style="list-style-type: none"> • Low draper speed • Low header angle • Center delivery
Dovetail 	The stalks are lined along outside edges of windrow and heads are crossed in center. This windrow can be formed by center delivery only.	Poor	Fair	Poor	<ul style="list-style-type: none"> • High draper speed • High header angle • Center delivery
Parallel 	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.	Good	Good	Good	<ul style="list-style-type: none"> • Medium draper speed • Medium header angle • Center or end delivery

OPERATION

Windrow Type	Description	Weight Distribution	Curing	Weatherability	Machine Setting Guidelines
<p>45° Diagonal</p> 	<p>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.</p>	<p>Poor</p>	<p>Fair</p>	<p>Poor</p>	<ul style="list-style-type: none"> • Low reel speed • Less aggressive tine pitch • End delivery or center delivery if crop is leaning
<p>75° Diagonal</p> 	<p>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.</p>	<p>Fair</p>	<p>Good</p>	<p>Fair</p>	<ul style="list-style-type: none"> • Low reel speed • Less aggressive tine pitch • End delivery or center delivery if crop is leaning

3.11 Haying Tips

The following information may be useful when using the D65 Draper Header in hay crops.

3.11.1 Curing

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

If ground is wet due to frequent rains, cut when weather allows and let the forage lie on 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 mid day, 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 winds is also recommended.

3.11.4 Windrow Configuration

The following windrow characteristics are desirable:

OPERATION

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 bunched	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 49](#) for instructions on adjusting the header.

3.11.5 Driving on Windrow

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 the windrow 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 losses which will be the result.

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.

Hay should not be raked or tilled at less than 25% moisture, or excessive yield losses will result.

3.11.7 Chemical Drying Agents

Hay drying agents work by removing wax from legume surfaces, enabling water to escape and evaporate faster. However, treated hay lying on wet ground will also absorb ground moisture faster. Before deciding to use a drying agent, costs and benefits relative to your area should be carefully evaluated.

3.12 Levelling the 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.

If the header is not level, check the pressure of the windrower's tires to ensure they are properly inflated (refer to your windrower's operator's manual).

If the header is still not level, adjust the windrower linkages as required (refer to the appropriate section in the windrower's operator's manual).

3.13 Unplugging Cutterbar

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

1. Stop forward movement of machine and disengage header drives.
2. Raise header to prevent it from filling with dirt, and engage header drive clutch.
3. If plug does **NOT** clear, disengage header drive clutch and raise header fully.

 **CAUTION**

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

 **WARNING**

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

4. Shut off engine and remove key.
5. Engage header safety props.

 **CAUTION**

Wear heavy gloves when working around or handling knives.

6. Clean off cutterbar by hand.

NOTE:

If cutterbar plugging persists, refer to [7 Troubleshooting, page 239](#).

3.14 Upper Cross Auger (UCA)

The UCA 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.

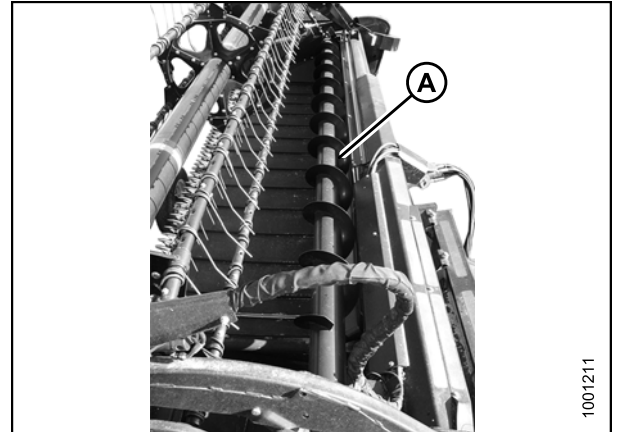


Figure 3.67: Upper Cross Auger

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3.14.1 Removing Beater Bars

⚠ DANGER

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

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

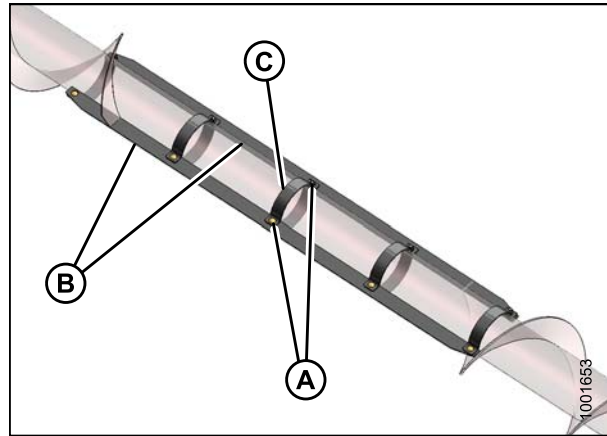


Figure 3.68: Single-Reel Headers

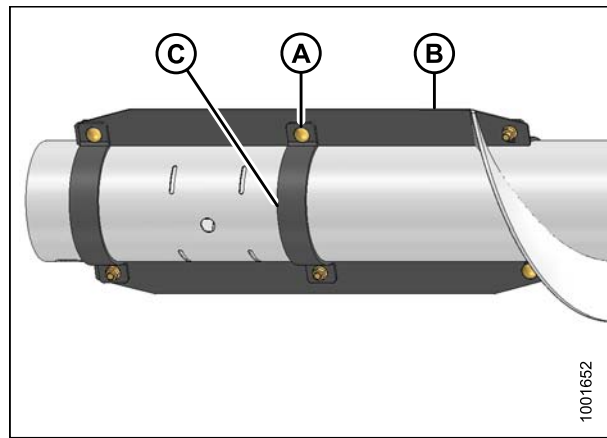


Figure 3.69: Beater Bars

3.14.2 Installing Beater Bars

WARNING

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

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

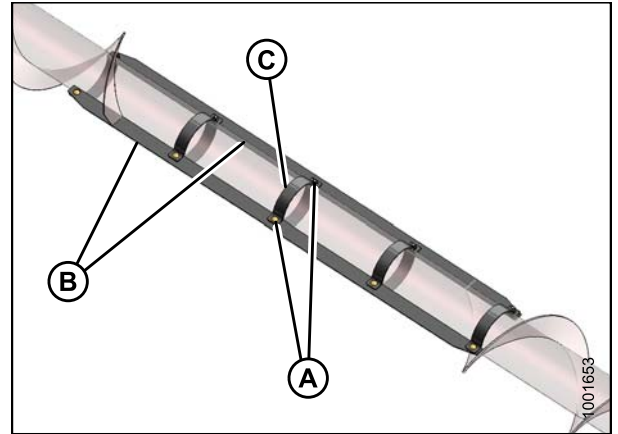


Figure 3.70: Single-Reel Headers

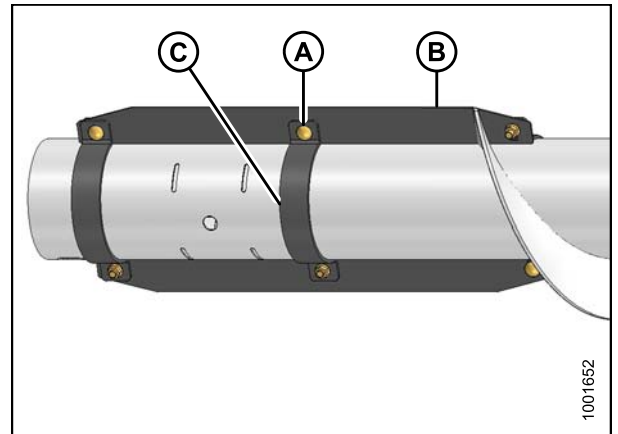


Figure 3.71: Beater Bars

3.15 Transporting Header

WARNING

Do NOT drive windrower with header attached on a road or highway at night, or in conditions which reduce visibility, such as fog or rain. The width of the header may not be apparent under these conditions.

3.15.1 Transporting Header on Windrower

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 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 slow moving vehicle emblem and reflectors. Adjust rear view mirror and clean windows.
- Lower the reel fully and raise 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 header at a minimum height. This provides maximum stability if forward motion is stopped for any reason. Raise header completely at bottom of grade to avoid contacting ground.
- Travel speed should be such that complete control and machine stability are maintained at all times.

3.15.2 Towing

Headers with the Slow Speed Transport/Stabilizer Wheel option can be towed behind a properly configured MacDon windrower or an agricultural tractor. Refer to the windrower operator's manual for instructions.

OPERATION

Attaching Header to Towing Vehicle

CAUTION

Adhere to the following slow speed transport instructions to prevent loss of control leading to bodily injury and/or machine damage:

- Weight of towing vehicle must exceed 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 reel is fully lowered and back on 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 wheel supports, cutterbar support, and hitch.
- Check tire condition and pressure prior to transporting.
- Connect hitch to towing vehicle using a proper hitch pin with a spring locking pin or other suitable fastener.
- Attach hitch safety chain to towing vehicle. Adjust safety chain length to provide only enough slack to permit turning.
- Connect header 7-pole plug wiring harness to mating receptacle on towing vehicle. (The 7-pole receptacle is available from your MacDon Dealer parts department).
- Ensure lights are functioning properly and clean the slow moving vehicle sign and other reflectors. Use flashing warning lights unless prohibited by law.

Towing the Header

CAUTION

Adhere to the following slow speed transport instructions to prevent loss of control leading to bodily injury and/or machine damage:

- Do NOT exceed 25 mph (40 km/h). Reduce transport speed to less than 5 mph (8 km/h) for corners and slippery or rough conditions.
- Turn corners at only very low speeds (5 mph [8km/h] or less). Header stability is reduced while cornering because front wheel moves to the left.
- 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.

OPERATION

3.15.3 Converting from Transport to Field Position

Removing Tow-Bar

1. Block the tires to prevent the header from rolling, and unhook the header from the towing vehicle.
2. Disconnect the electrical connector (A) on the tow-bar.
3. Remove pin (B) from the tow-bar, and disassemble the outer section (C) from the inner section (D).

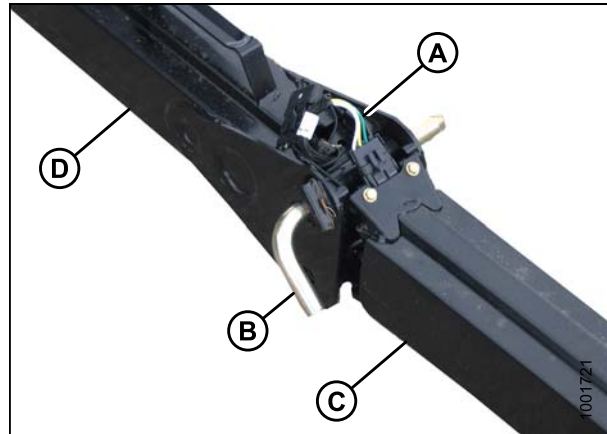


Figure 3.72: Tow-Bar Assembly

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



Figure 3.73: Wiring Connector

5. Remove clevis pin (A) and set aside for reinstallation.
6. Push latch (B) and lift the tow-bar (C) from the hook. Release latch.
7. Install clevis pin (A).

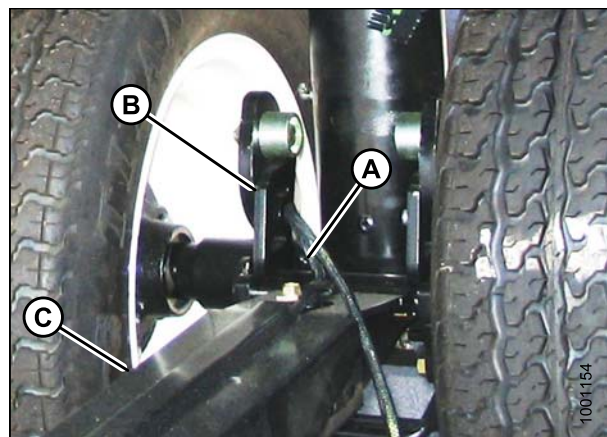


Figure 3.74: Tow-Bar Latch

OPERATION

Storing the Tow-Bar

1. Place the inner end of the outer half of the tow-bar into the cradle (A) on the left side of the header backtube.
2. Secure clevis/pintle end of the tow-bar in support (B) on the endsheet using hitch pin (C). Secure with lynch pin.
3. Install the rubber strap (D) on the cradle (A).

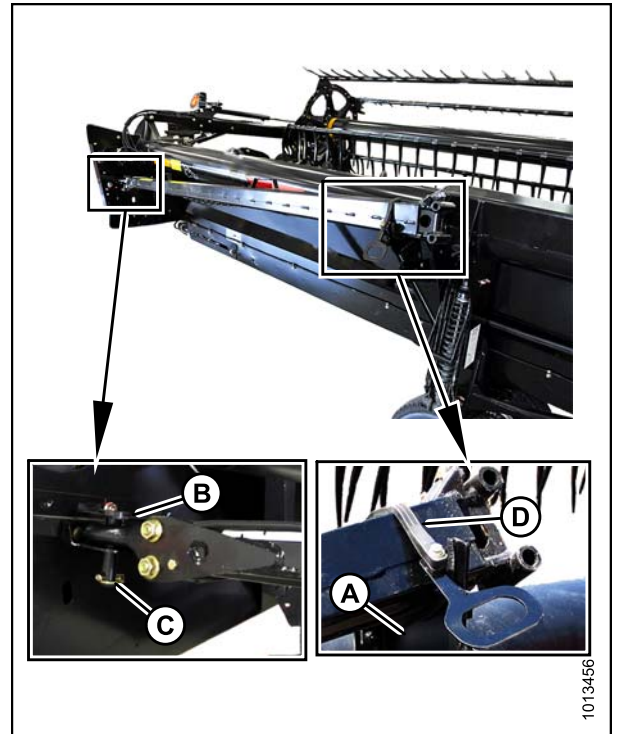


Figure 3.75: Tow-Bar Storage – Left Side

4. Place the inner end of the outer half of the tow-bar into the cradle (A) on the right side of the header backtube.
5. Secure the tube end of the tow-bar in support (B) on the endsheet using hitch pin (C). Secure with hairpin.
6. Install the rubber strap (D) on the cradle (A).

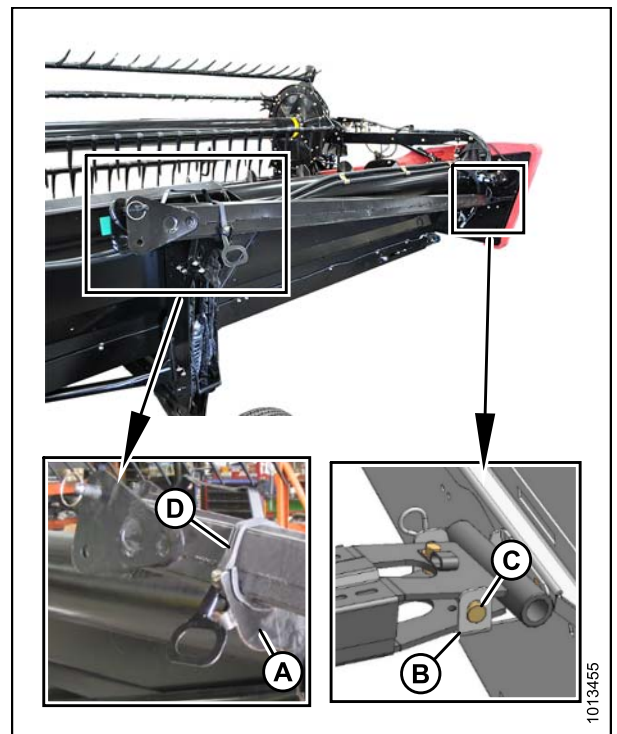


Figure 3.76: Tow-Bar Storage – Right Side

OPERATION

7. Attach the header to the windrower. Refer to the 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 92](#)
 - [Moving Rear \(Right\) Wheels into Field Position, page 93](#)

Moving Front (Left) Wheels into Field Position

DANGER

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

1. Raise the header fully and engage the header safety props.
2. Swivel the front wheel assembly (A) so the wheels are aligned with the lower frame.
3. Remove pin (B) and pull the wheel assembly towards the rear of header. Store the pin in hole (C) at the top of the leg.
4. Pull handle (D) upwards to release and lower the linkage into the vertical support.

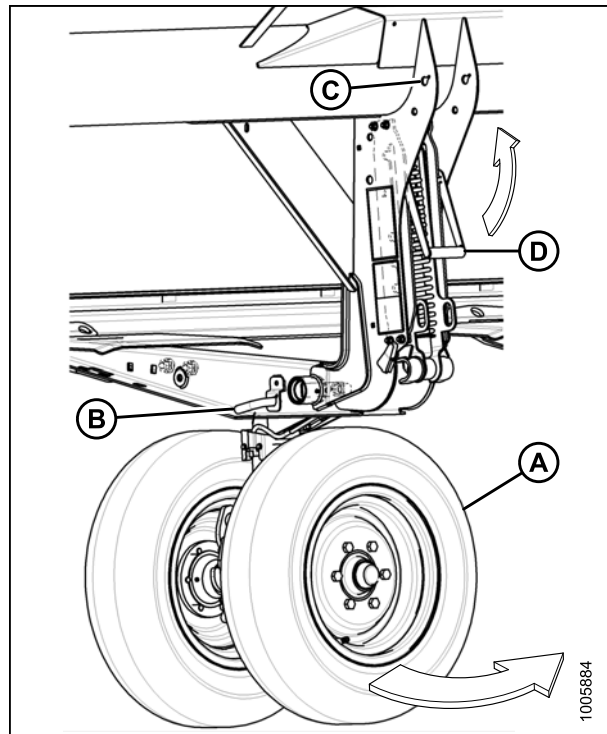


Figure 3.77: Front (Left) Wheels

OPERATION

5. 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.
6. Install clevis pin (D) and secure to the center of the axle with hairpin.

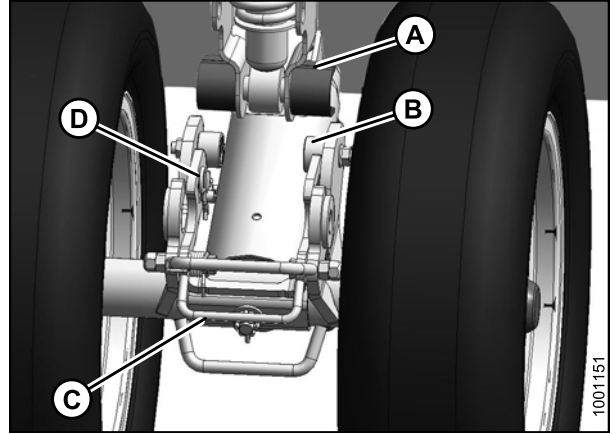


Figure 3.78: Front (Left) Wheels

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

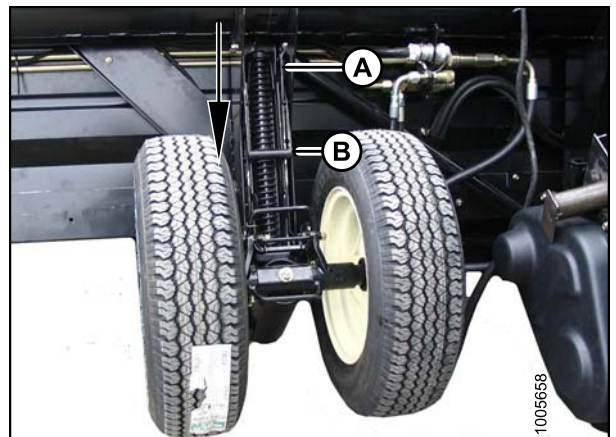


Figure 3.79: Front (Left) Wheels

Moving Rear (Right) Wheels into Field Position

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

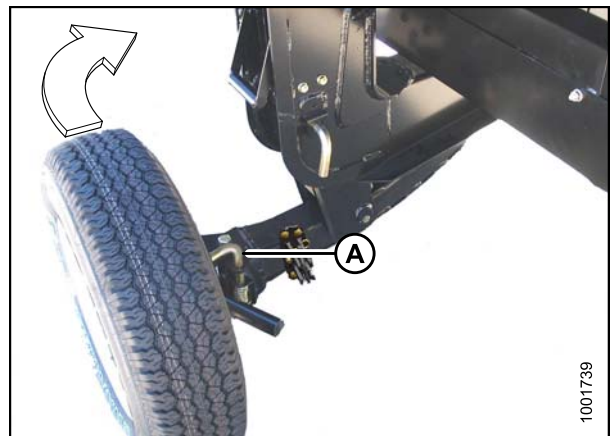


Figure 3.80: Rear Wheel – Left Side

OPERATION

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

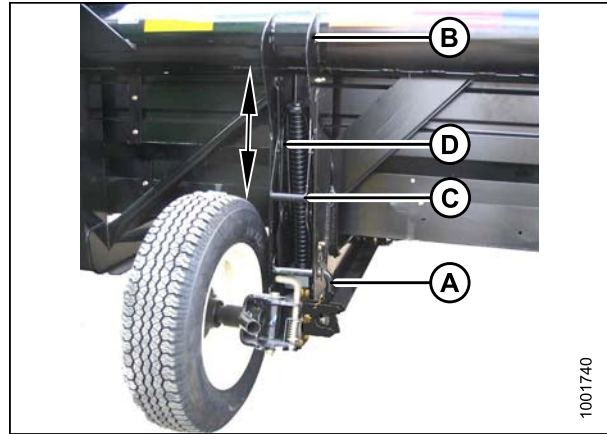


Figure 3.81: Rear Wheel – Left Side

6. Pull the pin (A) on brace (B) on the left-hand wheel in front of the cutterbar. Disengage the brace from the cutterbar and lower the brace against the axle (C).
7. Remove pin (D), lower support (E) onto axle, and reinsert pin into support.
8. Swing the axle (C) clockwise towards the rear of the header.

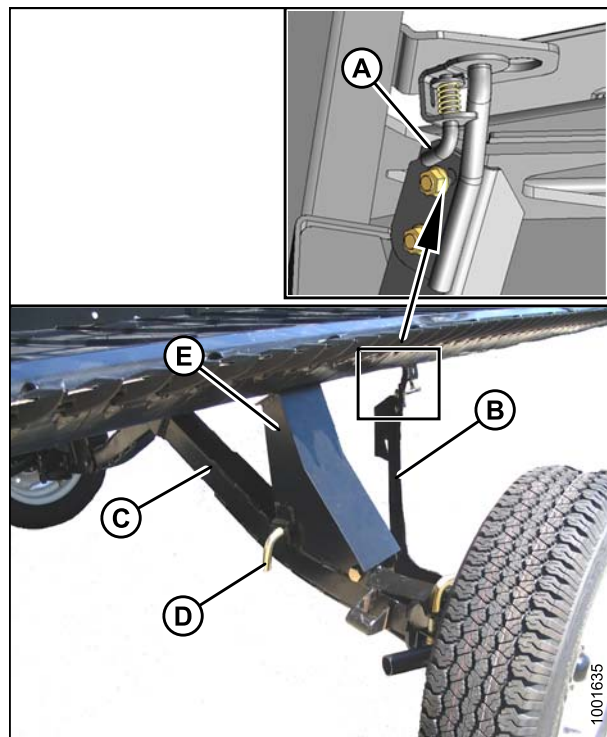


Figure 3.82: Right Rear Axle

OPERATION

9. Pull pin (A) on right-hand wheel, swivel the wheel counterclockwise to position shown, and lock with pin (A).
10. Remove the hairpin (B) from the 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.

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

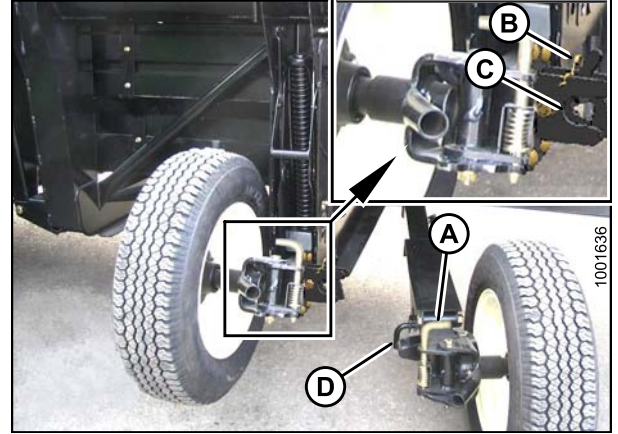


Figure 3.83: Rear Axles

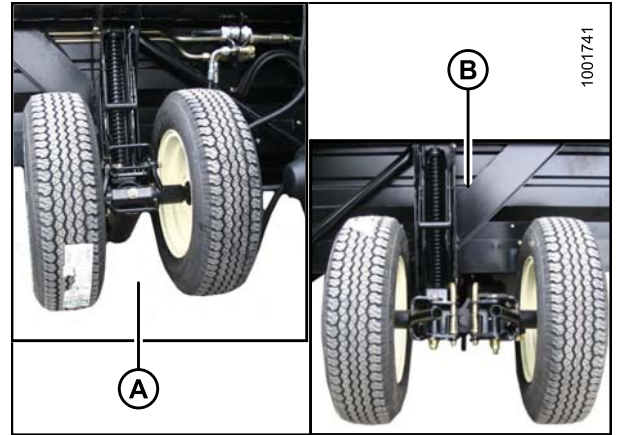


Figure 3.84: Field Position

3.15.4 Converting from Field to Transport Position

⚠ DANGER

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

Moving Front (Left) Wheels into Transport Position

⚠ DANGER

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

OPERATION

CAUTION

Stand clear of wheels and release linkage carefully as wheels will drop once the mechanism is released.

1. Pull the handle (B) upwards to release and raise the linkage (A) fully upwards into the vertical support.
2. Raise the header fully, stop the engine, and remove the key from ignition. Engage the header safety props.

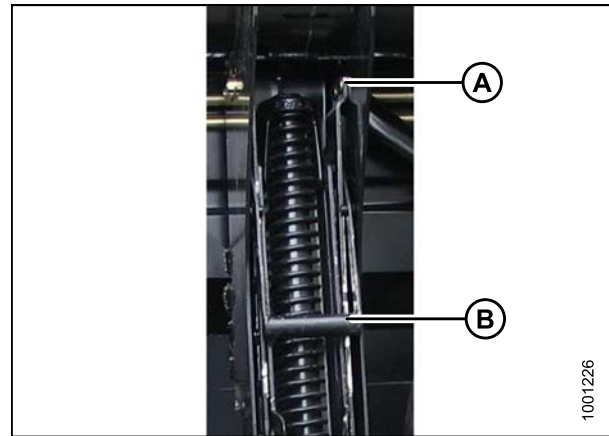


Figure 3.85: Raising Linkage

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

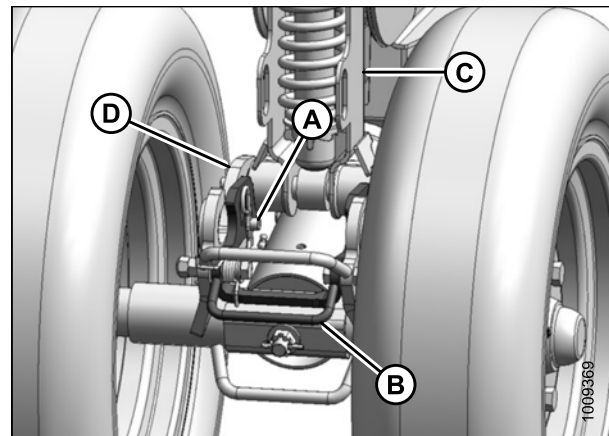


Figure 3.86: Left Front Wheels

6. Lower the handle (B) to lock.

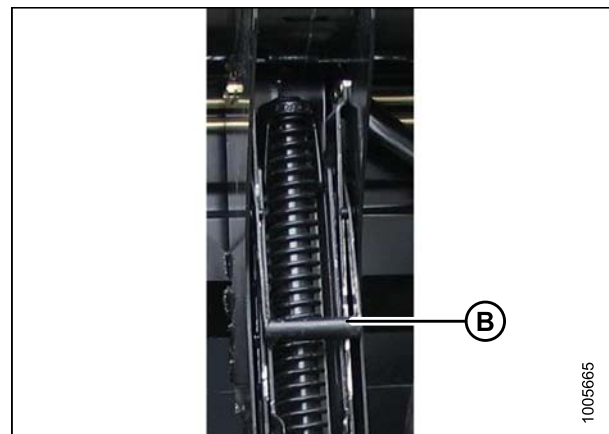


Figure 3.87: Locking Linkage

OPERATION

7. Remove the pin (A) from storage at the top of the leg (B).
8. Move and swivel the wheels clockwise until the connector (C) is turned towards the front end of the header.
9. Insert pin (A) and turn to lock.
10. Lower the header until the left wheels are just touching the ground.

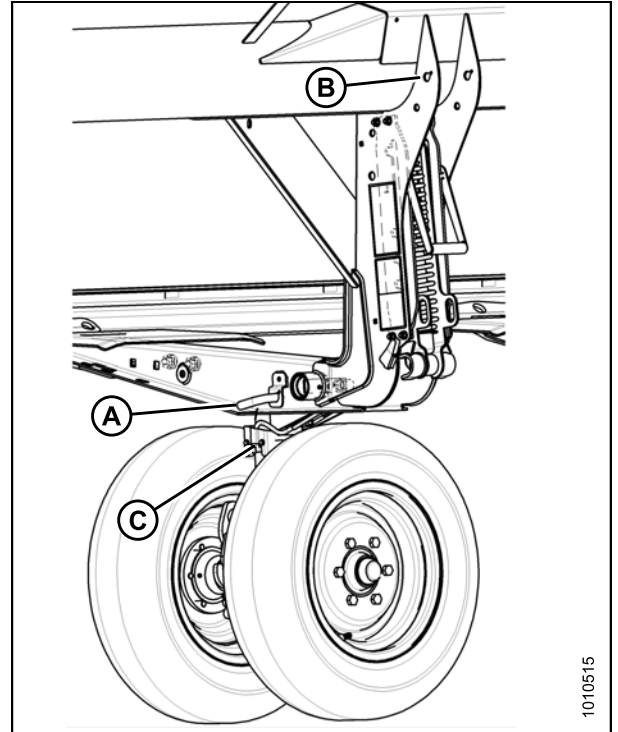


Figure 3.88: Left Front Wheels

Moving Rear (Right) Wheels into Transport Position

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

CAUTION

Stand clear of wheels and release linkage carefully as wheels will drop once the mechanism is released.

3. Pull handle (D) carefully to release the spring and lower the wheel to the ground.
4. Lift the wheel and linkage with handle (E) and position the linkage in the second slot from the bottom.
5. Lower the handle (C) to lock.

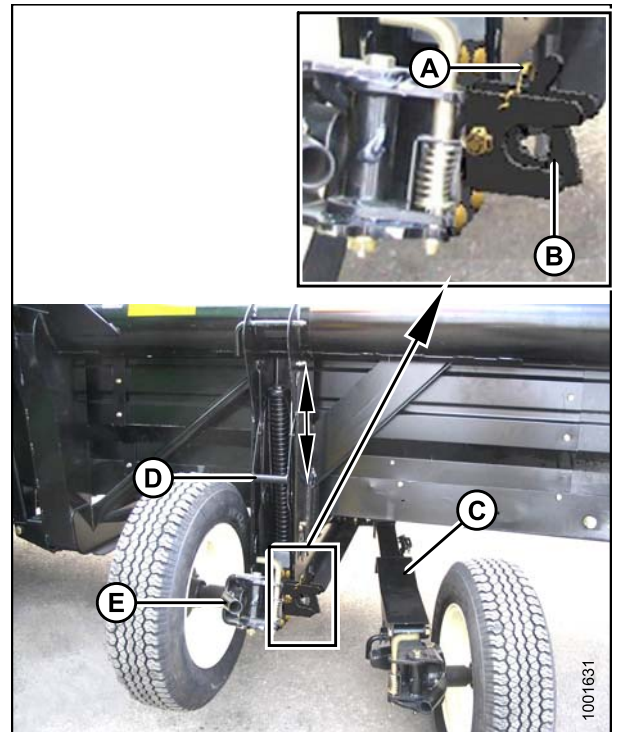


Figure 3.89: Separating Axles

OPERATION

6. Remove the pin (A) and install at location (B) to secure the linkage. Turn the pin to lock.
7. Pull the pin (D), swivel the wheel (C) counterclockwise 90°, and release the pin to lock.

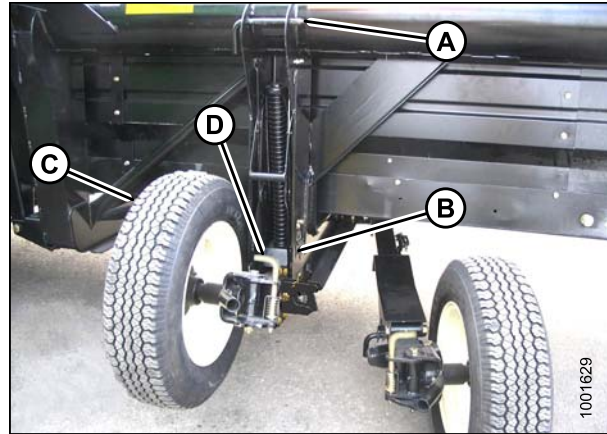


Figure 3.90: Wheel Position

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



Figure 3.91: Left Wheel in Transport Position

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

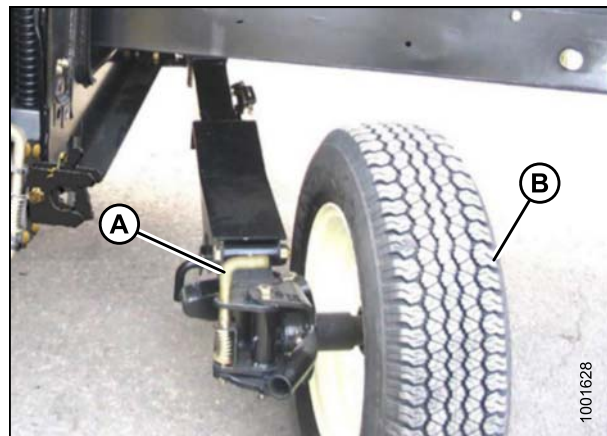


Figure 3.92: Right Rear Wheel

OPERATION

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

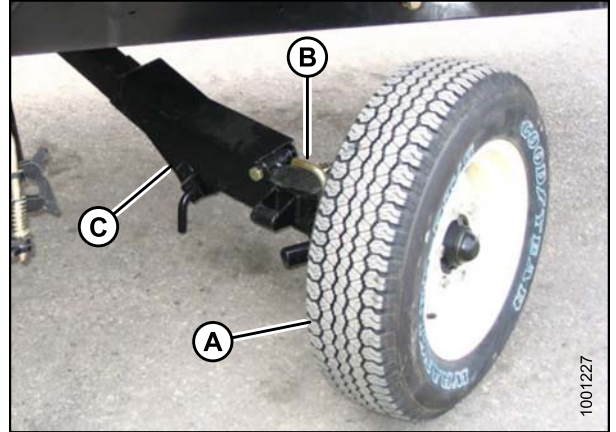


Figure 3.93: Right Rear Wheel

11. Remove the pin (A), raise support (B) to the position shown, and reinsert pin.

IMPORTANT:

Ensure the pin (A) engages the tube on the axle.

12. Swing the brace (C) into the position shown and insert the brace into the slot (D) behind the cutterbar. Position the brace so that pin (E) engages the hole in the bracket (F). The right hand wheel is now in transport position.
13. Disengage the header cylinder lift stops.
14. Detach the header's hydraulic and electrical connections from the windrower. Refer to [4 Header Attachment/Detachment, page 105](#).
15. Start the windrower and lower the header to the ground.

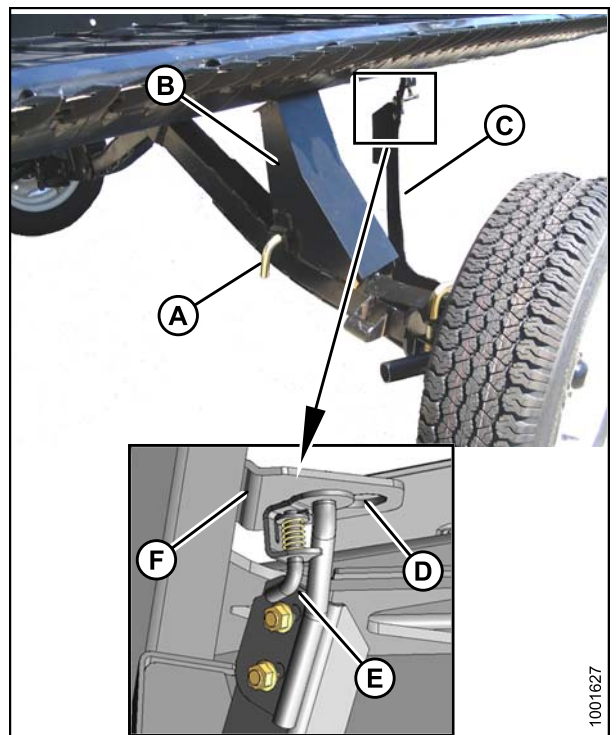


Figure 3.94: Right Rear Wheel Position

OPERATION

Attaching Tow-Bar

The tow-bar consists of two sections which make storage and handling easier.

1. Unhook the rubber strap (D) from the cradle (A) on the right side of the header.
2. Remove the clevis pin (C) and detach the tube end from the support (B).
3. Replace the 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.

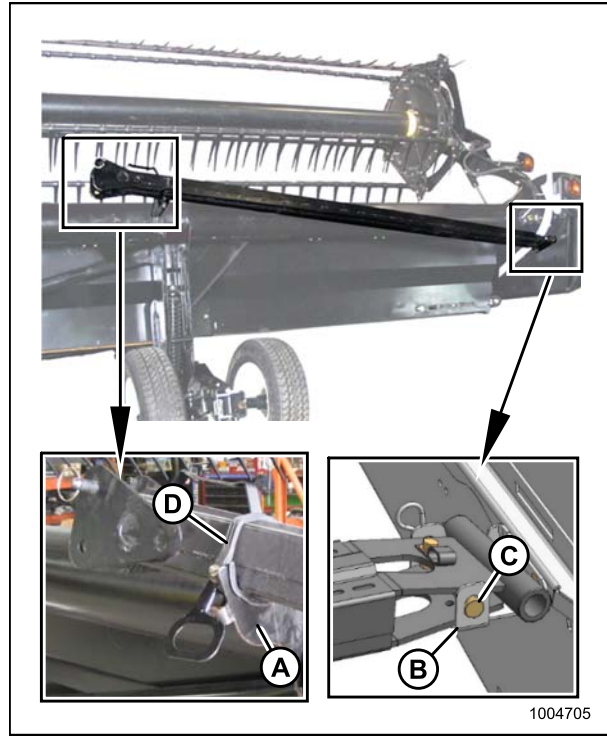


Figure 3.95: Tow-Bar Removal – Right Side

5. Unhook the rubber strap (D) from the cradle (A) on the left side of the header.
6. Remove the hitch pin (C) from the support (B), and remove the tow-bar.
7. Install the rubber strap (D) on the cradle (A).

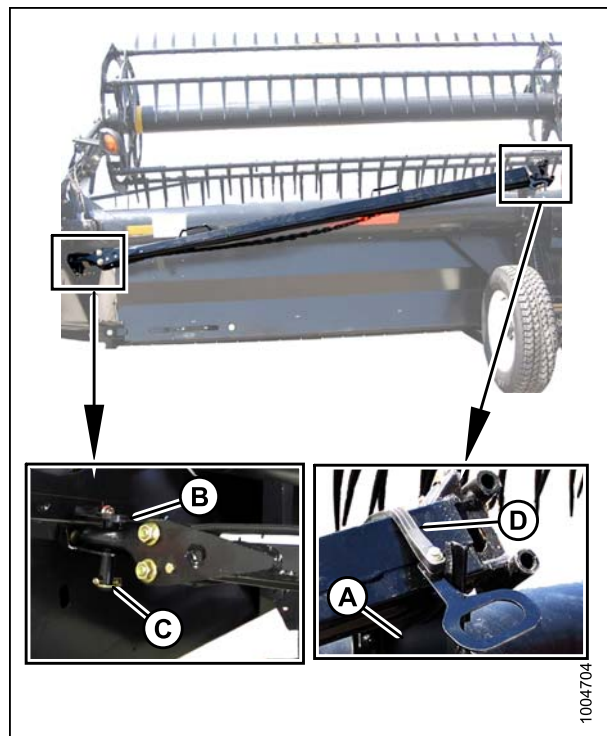


Figure 3.96: Tow-Bar Removal – Left Side

OPERATION

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

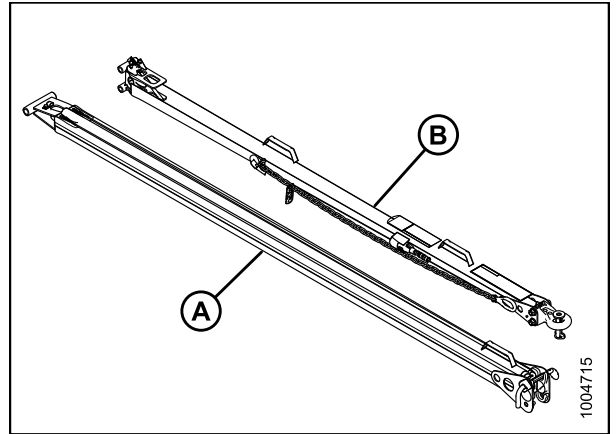


Figure 3.97: Tow-Bar Assembly

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

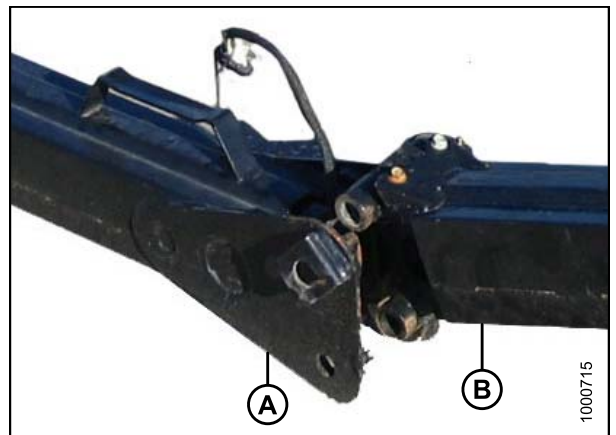


Figure 3.98: Tow-Bar Assembly

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

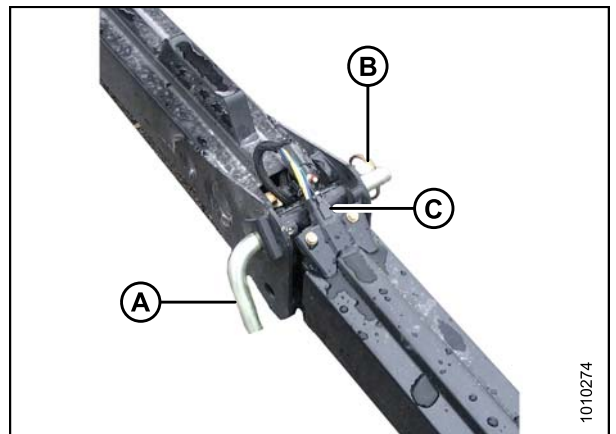


Figure 3.99: Tow-Bar Assembly

OPERATION

12. Position the tow-bar (A) onto the axle, and push against the latch (B) until the tow-bar pins drop into the hooks (C).
13. Check that latch (B) has engaged the tow-bar.
14. Install the clevis pin (D) and secure with hairpin.

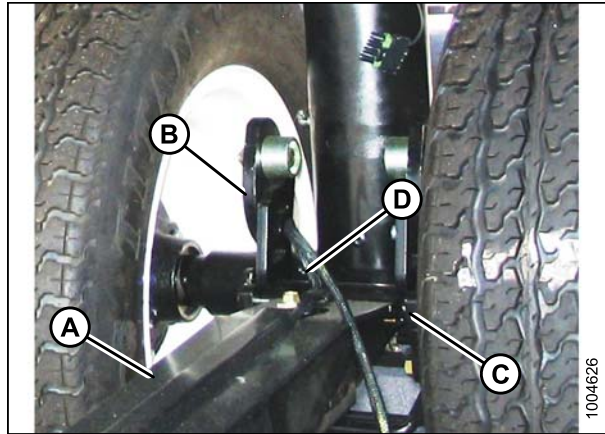


Figure 3.100: Attaching Tow-Bar

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



Figure 3.101: Harness Connection

3.16 Storing the Header

Perform the following procedures at the end of each operating season:

 **CAUTION**

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

 **CAUTION**

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

1. Clean the header thoroughly.
2. Store the machine in a dry, protected place if possible. If storing outside, always cover with a waterproof canvas or other protective material.

NOTE:

If storing the machine outside, remove the drapers and store them in a dark, dry place. If not removing the drapers, store the header with the cutterbar lowered so water and snow will not accumulate on the drapers. The weight of water and snow accumulation puts excessive stress on the drapers and header.

3. Lower the header onto blocks to keep the cutterbar off the ground.
4. Lower the reel completely. If stored outside, tie the reel to the frame to prevent rotation caused by the wind.
5. Repaint all worn or chipped painted surfaces to prevent rust.
6. Loosen the drive belts.
7. Lubricate the header thoroughly leaving excess grease on the fittings to keep moisture out of the bearings.
8. Apply grease to exposed threads, cylinder rods, and sliding surfaces of components.
9. Check for worn components and repair as necessary.
10. Check for broken components and order replacements from your Dealer. Immediate repair of these items will save time and effort at the beginning of next season.
11. Replace or tighten any missing or loose hardware.

4 Header Attachment/Detachment

This chapter includes instructions for setting up, attaching, and detaching the header.

4.1 Attaching Header to Windrower

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

To attach the header to a windrower, follow these steps:

1. Before connecting header drive hydraulics (A) and electrical harness (B) to header, check connectors and clean if required.
2. Disengage and rotate lever (A) counterclockwise to fully up position.
3. Remove cap (B) securing electrical connector to frame.
4. Move hose bundle (C) from windrower around hose support on header.



Figure 4.1: Header Drive Hoses

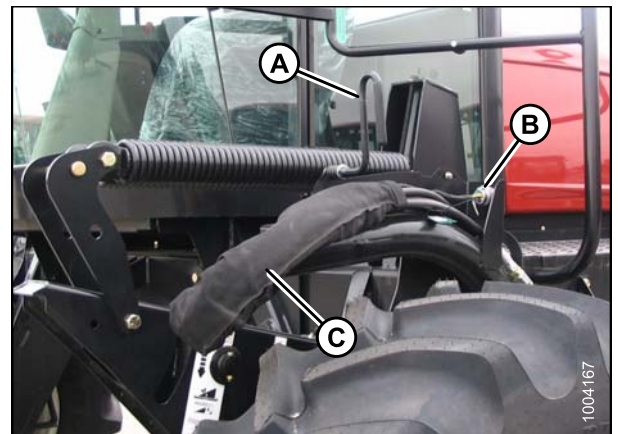


Figure 4.2: Header Drive Hoses

HEADER ATTACHMENT/DETACHMENT

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

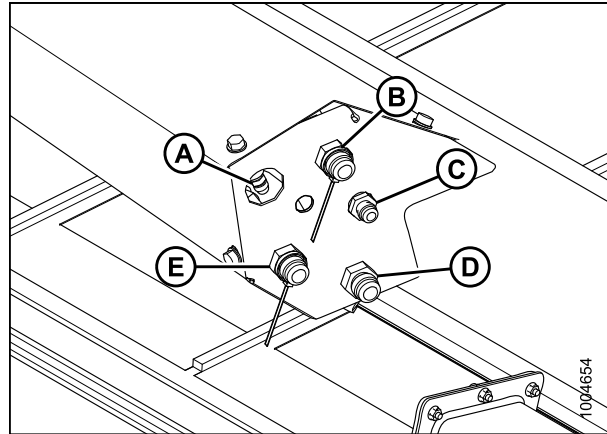


Figure 4.3: Header Receptacles

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

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



Figure 4.4: Hose Storage

10. Before connecting reel hydraulics, check connectors and clean if required.

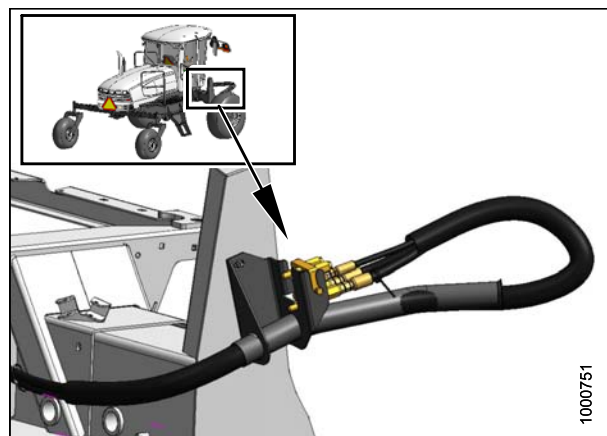


Figure 4.5: Reel Hose Storage

HEADER ATTACHMENT/DETACHMENT

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

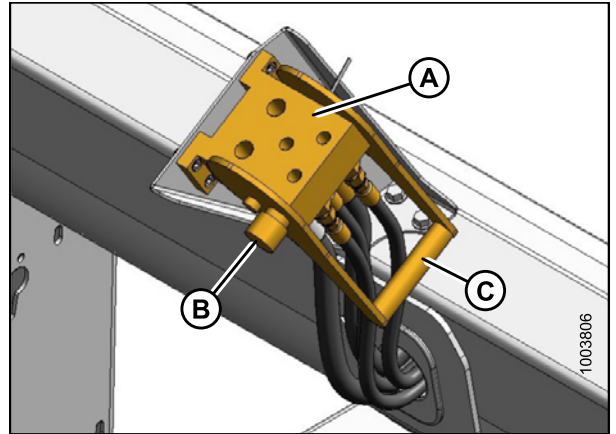


Figure 4.6: Reel Hydraulics Receptacle

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

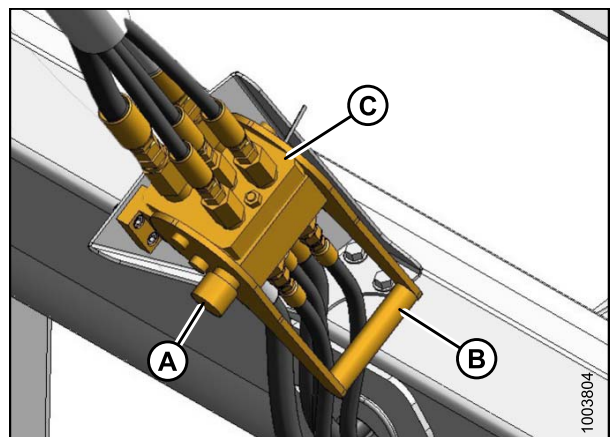


Figure 4.7: Reel Hose Connection

4.2 Detaching Header from Windrower

To detach the header from the windrower, follow these steps:

1. Fully lower the reel.
2. To disconnect the reel hydraulics, push in lock button (A) and pull handle (B) to disengage multicoupler (C) from header receptacle.
3. Route hose bundle back onto windrower and store multicoupler (C) on hose support.

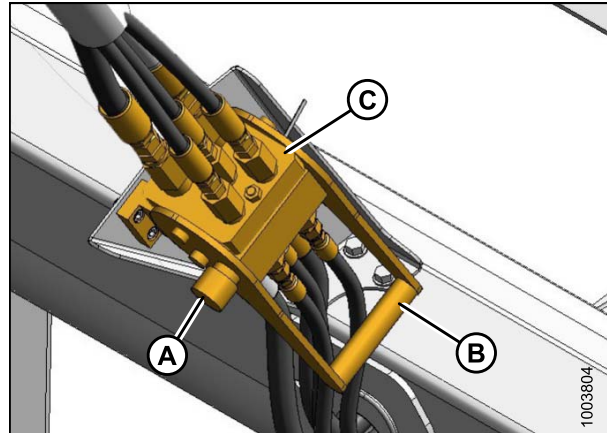


Figure 4.8: Reel Hydraulics

4. Close cover on header receptacle (A).

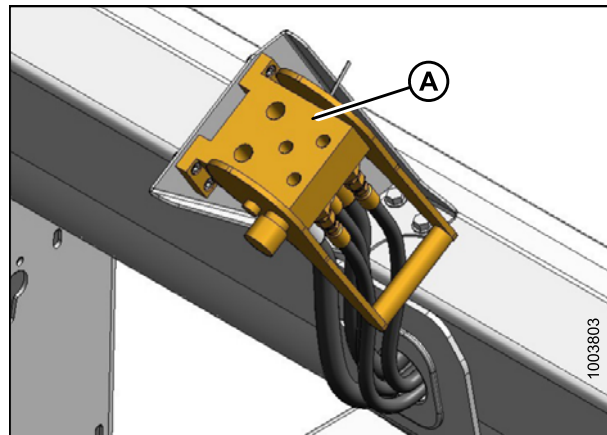


Figure 4.9: Close Cover

5. To disconnect header drive hydraulics, disengage and rotate lever (A) counterclockwise to fully up position.
6. Disconnect electrical connector from header.

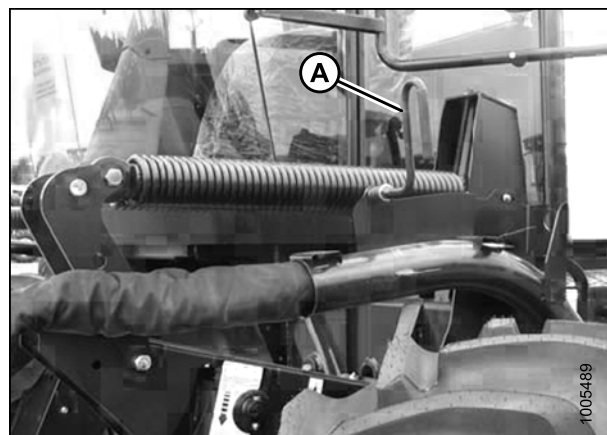


Figure 4.10: Header Drive Hydraulics

HEADER ATTACHMENT/DETACHMENT

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

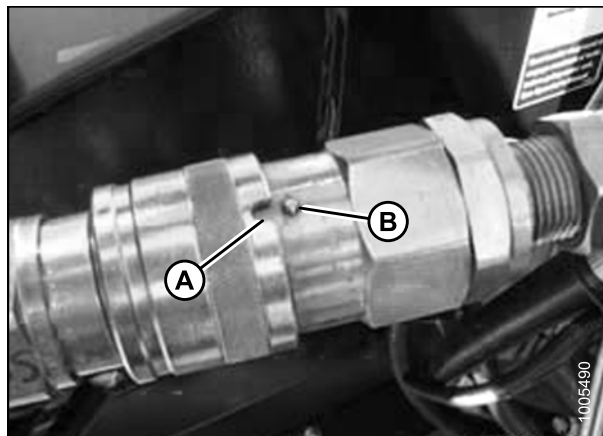


Figure 4.11: Quick Disconnect

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

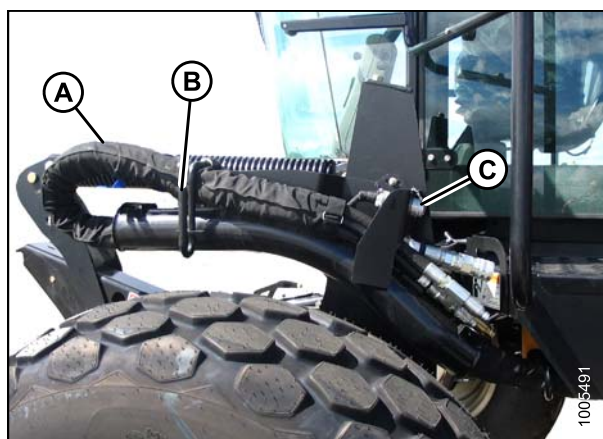


Figure 4.12: Hose Storage

5 Maintenance and Servicing

The following instructions provide information about routine header service. Detailed maintenance and service information is contained in the technical service manual that is available from your Dealer. A parts catalog is provided in the plastic manuals case inside the left endshield.

Log hours of operation and use the maintenance record provided (refer to [5.3.1 Maintenance Schedule/Record, page 115](#)) to keep track of your scheduled maintenance.

5.1 Preparing Machine for Servicing

DANGER

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

CAUTION

To avoid personal injury, perform the following procedures 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 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	2.3 quarts (2.2 liters)
			Main drive gearbox	2.6 quarts (2.5 liters)

5.2.2 Installing a Roller Chain

To install a roller chain, follow these steps:

DANGER

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

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

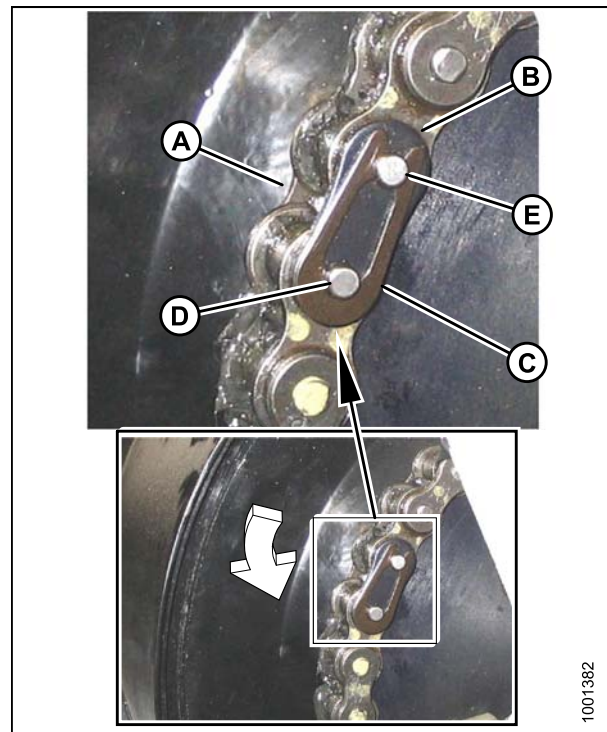


Figure 5.1: Arrow Shows Direction of Rotation

5.2.3 Installing a Sealed Bearing

To install a sealed bearing, follow these steps:

1. Clean shaft and coat with rust preventative.
2. Install flangette (A), bearing (B), second flangette (C), and lock collar (D).

NOTE:

The locking cam is only on one side of the bearing.

3. Install (but do **NOT** tighten) flangette bolts (E).
4. When the shaft is correctly located, lock the lock collar with a punch. The collar should be locked in the same direction the shaft rotates. Tighten the setscrew in the collar.
5. Tighten flangette bolts.
6. Loosen flangette bolts on mating bearing one turn and retighten. This will allow the bearing to line up.

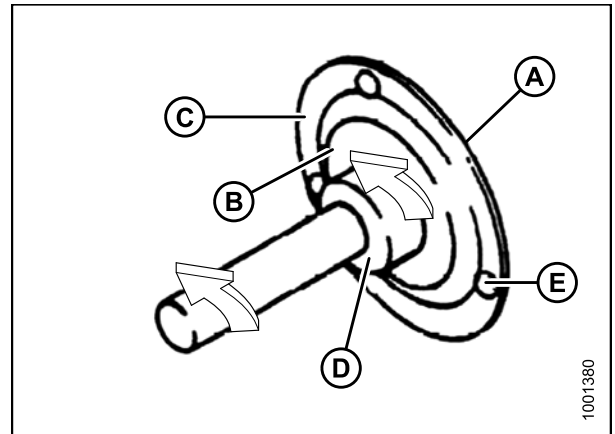


Figure 5.2: Sealed Bearing

5.3 Maintenance Requirements

Periodic maintenance requirements are organized according to service intervals.

Regular maintenance is the best insurance against early wear and untimely breakdowns. Following the maintenance schedule will increase your machine's life.

When servicing the machine, refer to the specific headings in this section and use only fluids and lubricants specified in [5.2.1 Recommended Fluids and Lubricants, page 112](#).

Log hours of operation, use the maintenance record, and keep copies of your maintenance records (refer to [5.3.1 Maintenance Schedule/Record, page 115](#)).

If a service interval specifies more than one timeframe, e.g., "100 hours or Annually", service the machine at whichever interval is reached first.

IMPORTANT:

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

 **CAUTION**

Carefully follow safety messages. Refer to [5.1 Preparing Machine for Servicing, page 111](#) and [1 Safety, page 1](#).

MAINTENANCE AND SERVICING

5.3.1 Maintenance Schedule/Record

Copy this page to continue record.

Maintenance Record	Action:	✓ - Check	⬇ - Lubricate	▲ - Change															
Hour Meter Reading																			
Date																			
Serviced by																			
First Use, Refer to 5.3.2 Break-In Inspection, page 116																			
End of Season, Refer to 5.3.4 End-of-Season Service, page 117																			
10 Hours or Daily¹¹																			
✓	Hydraulic hoses and lines ¹²																		
✓	Knife sections, guards, and hold-downs ¹²																		
✓	Tire pressure ¹²																		
⬇	Knife (except in sandy conditions) ¹²																		
25 Hours																			
⬇	Knifehead(s) ¹²																		
50 Hours																			
✱	Draper roller bearings																		
▲	Knife drive box oil - first 50 hours only																		
100 Hours or Annually¹¹																			
✓	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																		
⬇	Upper cross auger right-hand bearing																		

11. Whichever occurs first.
 12. A record of daily maintenance is not required, but is at the Owner's/Operator's discretion.

MAINTENANCE AND SERVICING

Maintenance Record	Action:	✓ - Check	⬇ - Lubricate	▲ - Change															
250 Hours or Annually¹¹																			
✓	Draper seal																		
⬇	Upper cross auger center support and U-joint																		
⬇	Reel drive U-joint																		
⬇	Transport axle pivot bushings																		
500 Hours or Annually¹¹																			
✓	Draper seal																		
⬇	Reel shaft bearings																		
⬇	Stabilizer/slow speed transport wheel bearings																		
1000 Hours or 3 Years¹¹																			
▲	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.

Timing	Item	Refer To
At 5 hours	Check for loose hardware. Tighten to required torque.	8.2 Torque Specifications, page 254
	Check knife drive belts tension. Periodically check for first 50 hours.	Tensioning Timed Knife Drive Belts, page 155 Tensioning Non-Timed Knife Drive Belts, page 150
At 10 hours	Check knife drive box mounting bolts.	Checking Mounting Bolts, page 140
At 50 hours	Change knife drive box lubricant.	Changing Oil in Knife Drive Box, page 148

5.3.3 Preseason/Annual Service

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. Refer to [Service Intervals, page 119](#).
 2. Adjust the tension on the drive belts. Depending on your equipment. Refer to [Tensioning Non-Timed Knife Drive Belts, page 150](#).
 3. Perform all the annual maintenance. Refer to [5.3.1 Maintenance Schedule/Record, page 115](#).

5.3.4 End-of-Season Service

Perform the following procedures at the end of each operating season:

CAUTION

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

CAUTION

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

1. Clean the header thoroughly.
2. Store the machine in a dry, protected place if possible. If storing outside, always cover with a waterproof canvas or other protective material.

NOTE:

If storing the machine outside, remove the drapers and store them in a dark, dry place. If not removing the drapers, store the header with the cutterbar lowered so water and snow will not accumulate on the drapers. The weight of water and snow accumulation puts excessive stress on the drapers and header.

3. Lower the header onto blocks to keep the cutterbar off the ground.
4. Lower the reel completely. If stored outside, tie the reel to the frame to prevent rotation caused by the wind.
5. Repaint all worn or chipped painted surfaces to prevent rust.
6. Loosen the drive belts.
7. Lubricate the header thoroughly leaving excess grease on the fittings to keep moisture out of the bearings.
8. Apply grease to exposed threads, cylinder rods, and sliding surfaces of components.
9. Check for worn components and repair as necessary.

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10. Check for broken components and order replacements from your Dealer. Immediate repair of these items will save time and effort at the beginning of next season.
11. Replace or tighten any missing or loose hardware. Refer to [5.2 Maintenance Specifications, page 112](#).

5.3.5 Checking Hydraulic Hoses and Lines

Check hydraulic hoses and lines daily for signs of leaks.

WARNING

- Avoid high-pressure fluids. Escaping fluid can penetrate the skin causing serious injury. Relieve pressure before disconnecting hydraulic lines. Tighten all connections before applying pressure. Keep hands and body away from pin holes and nozzles which eject fluids under high pressure.
- If ANY fluid is injected into the skin, it must be surgically removed within a few hours by a doctor familiar with this type of injury or gangrene may result.
- Use a piece of cardboard or paper to search for leaks.

IMPORTANT:

Keep hydraulic coupler tips and connectors clean. Dust, dirt, water, and foreign material are the major causes of hydraulic system damage. Do NOT attempt to service hydraulic system in the field as it requires WHITE ROOM CARE during overhaul.



Figure 5.3: High Pressure Warning

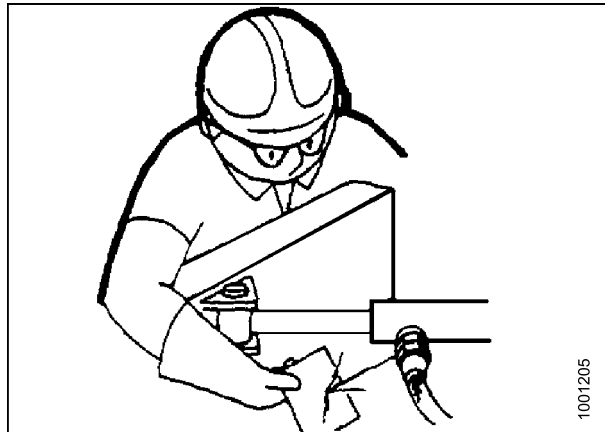


Figure 5.4: Checking Leak

5.3.6 Lubrication and Servicing

CAUTION

To avoid personal injury, before servicing header or opening drive covers, follow procedures in [5.1 Preparing Machine for Servicing, page 111](#).

Refer to [5.2.1 Recommended Fluids and Lubricants, page 112](#) 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 115](#).

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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 that is required.

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.

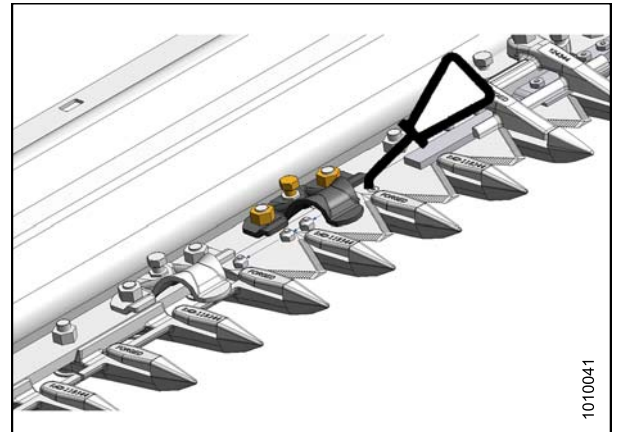


Figure 5.5: Every 10 Hours or Daily

Knifehead:

NOTE:

To prevent binding and/or excessive wear caused by knife pressure on the guards, do **NOT** over grease the 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. Refer to [5.5.3 Removing Knifehead Bearing](#), page 129.

NOTE:

Check for signs of excessive heating on first few guards after greasing. If required, relieve pressure by pressing check-ball in grease fitting.

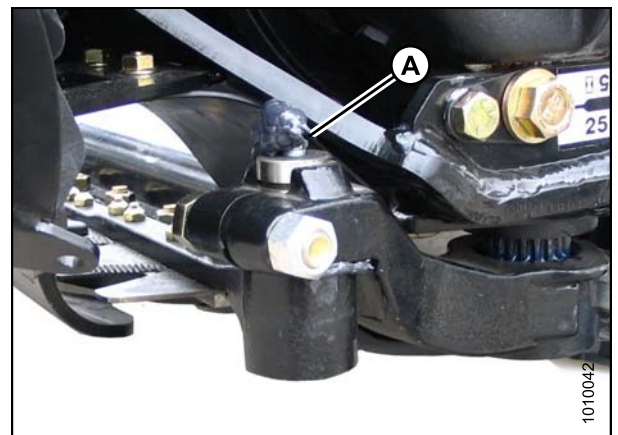


Figure 5.6: Every 25 Hours

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

MAINTENANCE AND SERVICING

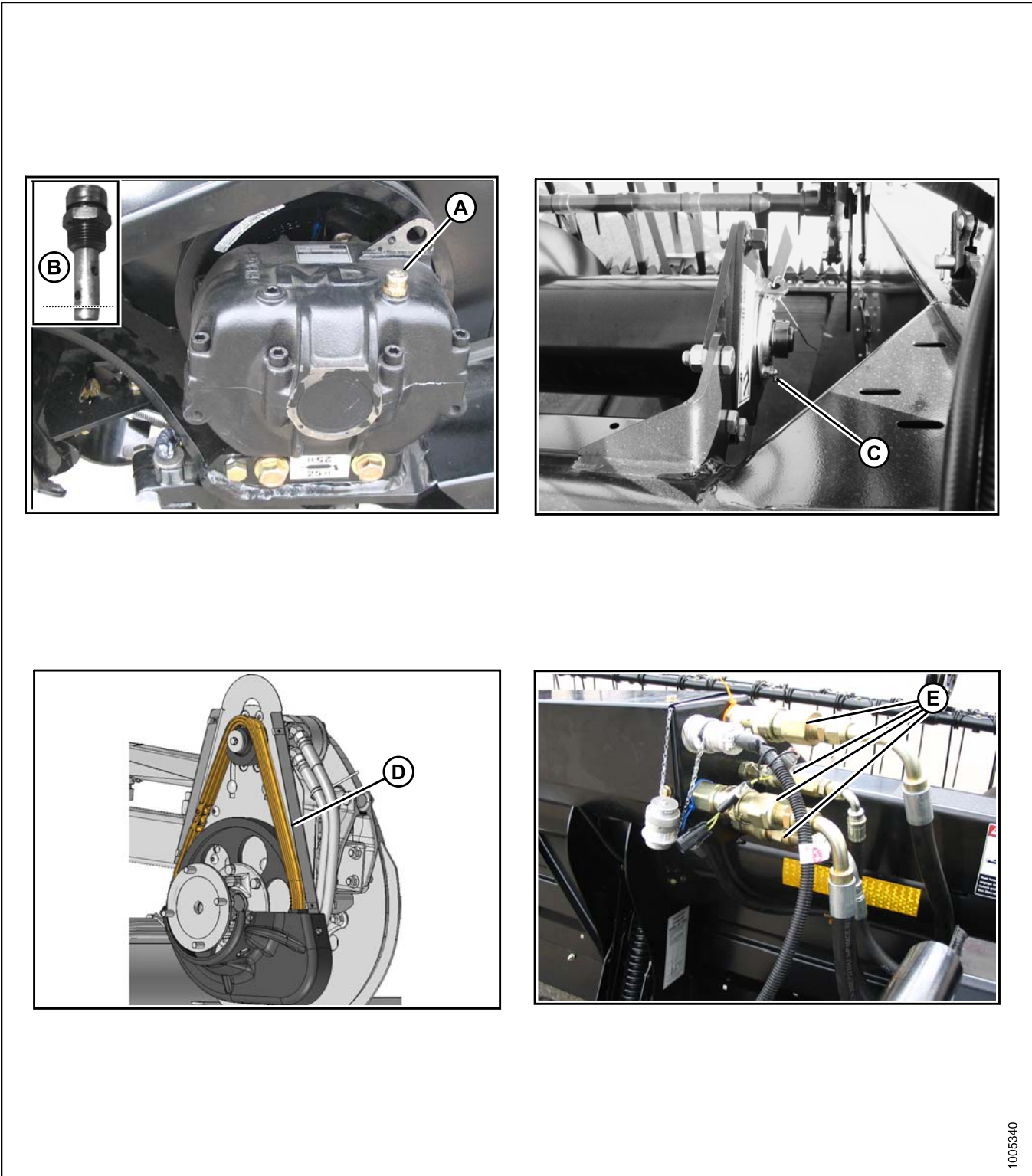


Figure 5.7: Every 100 Hours

A - Knife Drive Box (Check Oil Level Between Lower Hole and End of Dipstick [B])

D - Reel Drive Chain (1 Place) (Double Reel Shown – Single Reel Similar)

C - Upper Cross Auger Bearing (1 Place)

E - Hydraulic Couplers (Use WD40® or Equivalent)

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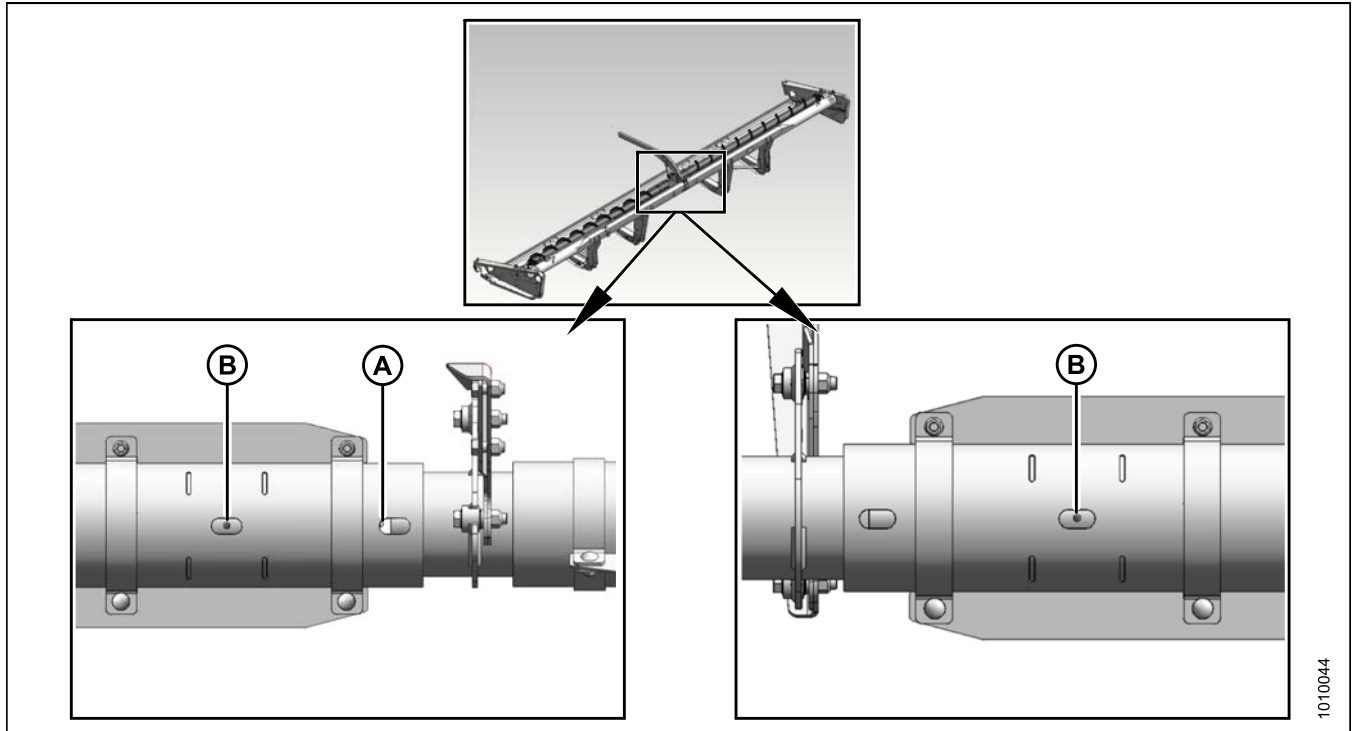
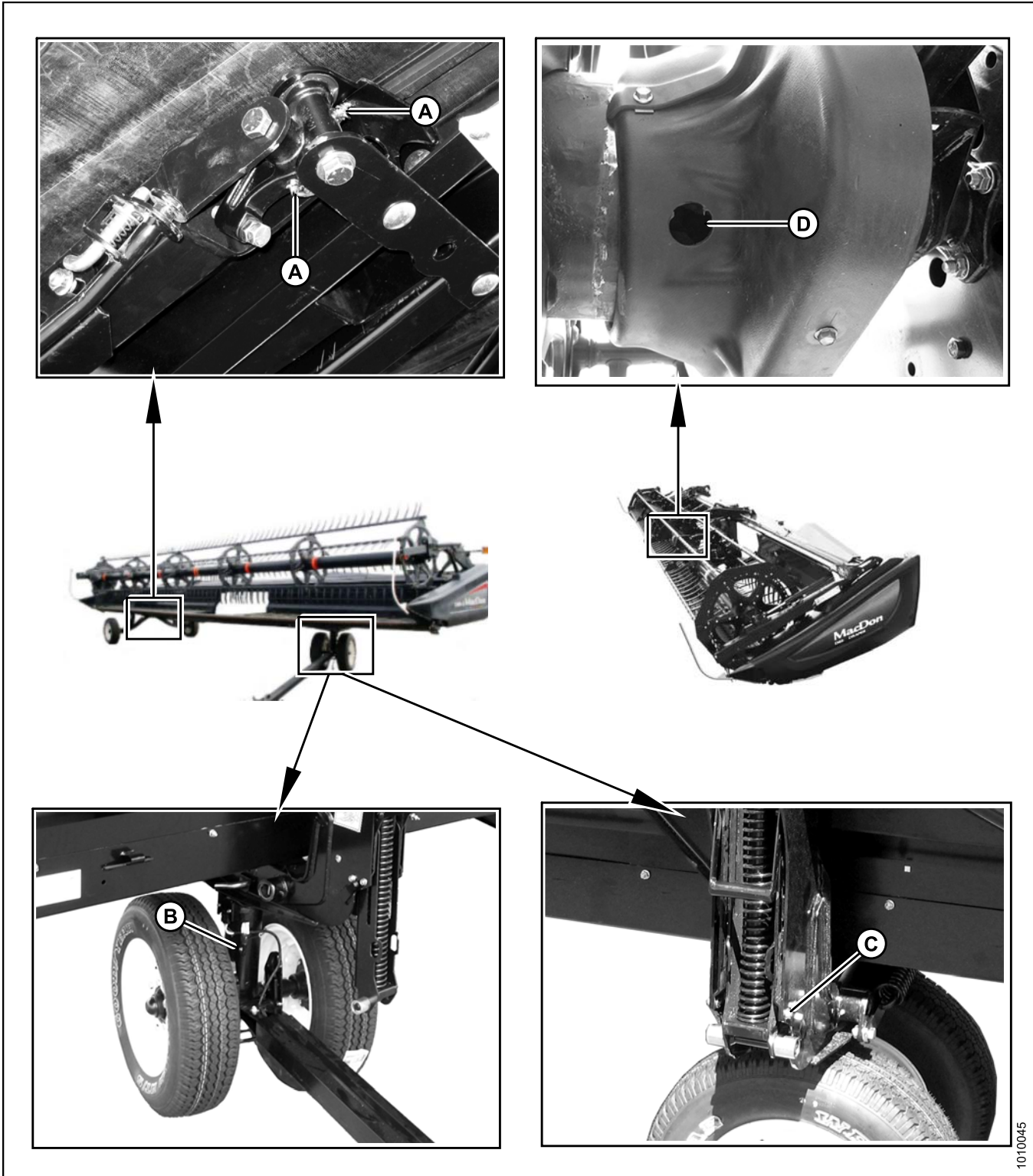


Figure 5.8: Every 250 Hours

A - Upper Cross Auger U-joint¹³

B - Upper Cross Auger Bearing (2 Places)

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



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Figure 5.9: Every 250 Hours (Continued)

A - Rear Axle Pivots

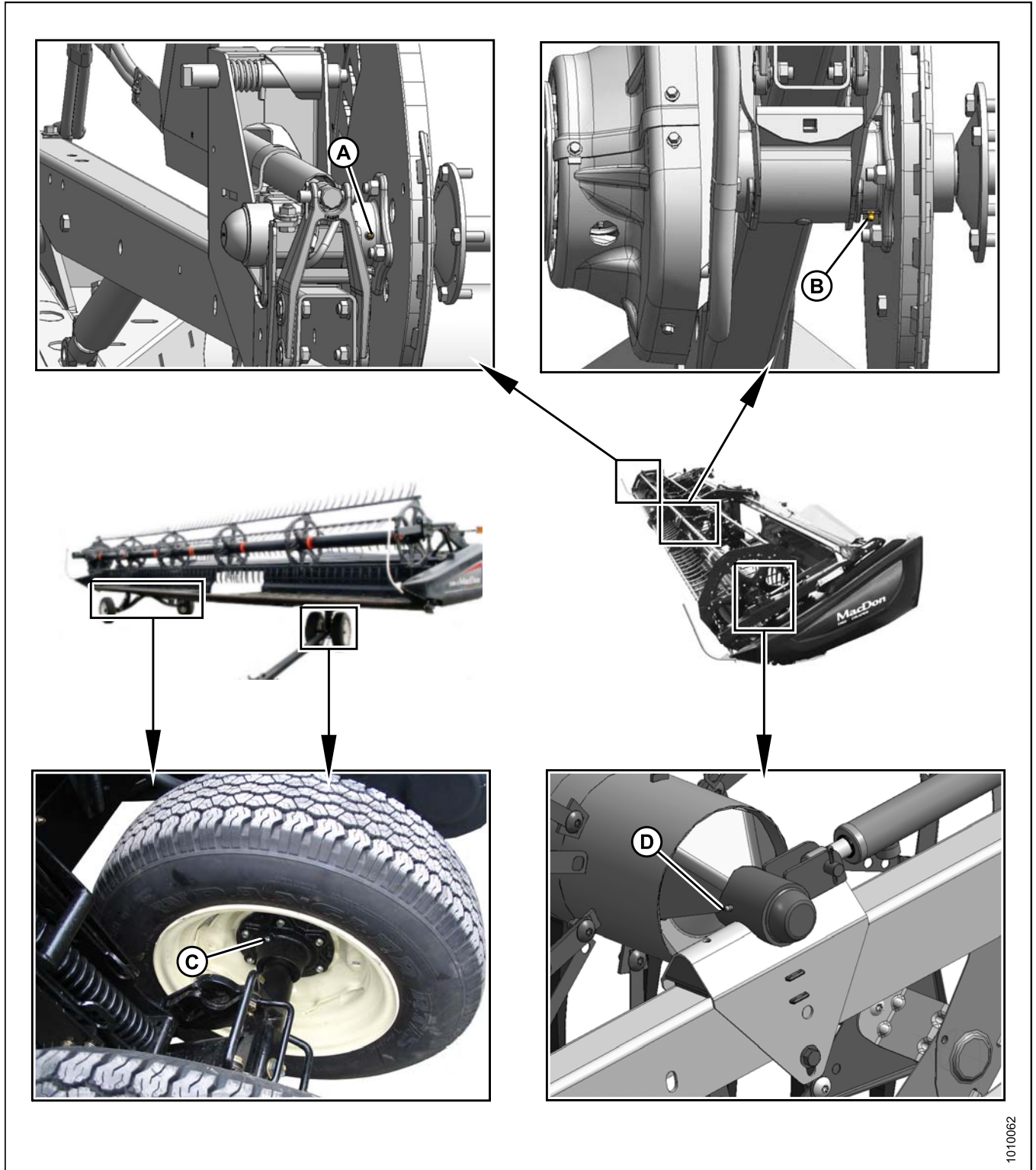
C - Frame/Wheel Pivot (1 Place) - Both Sides

B - Front Wheel Pivot (1 Place)

D - Double Reel U-Joint (1 Place)¹⁴

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

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Figure 5.10: 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)

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Greasing Procedure

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

DANGER

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

Refer to [5.2.1 Recommended Fluids and Lubricants, page 112](#) 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 115](#).

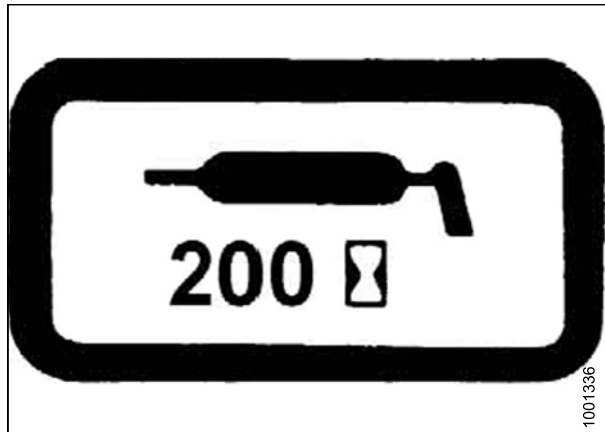


Figure 5.11: Greasing Interval Decal

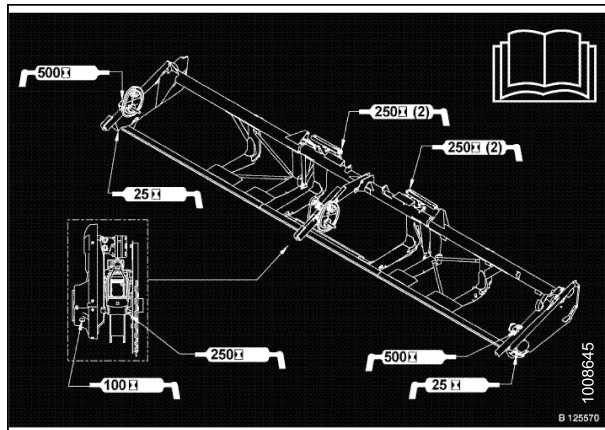


Figure 5.12: FD75 Master Grease Point Decal

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1. Wipe grease fitting with a clean cloth before greasing to avoid injecting dirt and grit.
2. Inject grease through fitting with grease gun until grease overflows fitting (except where noted).
3. Leave excess grease on 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 lubricant passageway. Replace fitting if necessary.
6. Use clean, high temperature extreme pressure grease only.

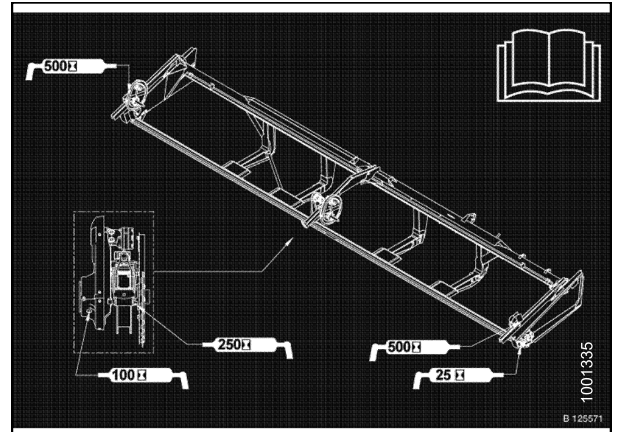


Figure 5.13: Single-Knife Header Master Grease Point Decal

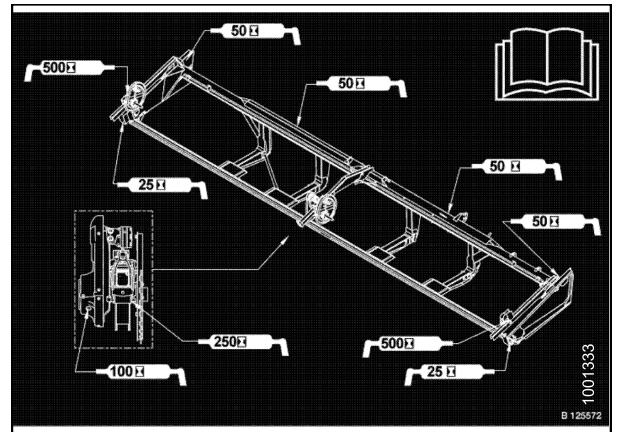


Figure 5.14: Double-Knife Header Master Grease Point Decal

5.4 Electrical

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

To replace a light bulb, follow these steps:

1. Using a Phillips screwdriver, remove screws (A) from fixture and remove plastic lens.
2. Replace bulb and reinstall plastic lens and screws.

NOTE:

Use bulb trade #1156 for amber clearance lights and #1157 for red tail light (Slow Speed Transport option).

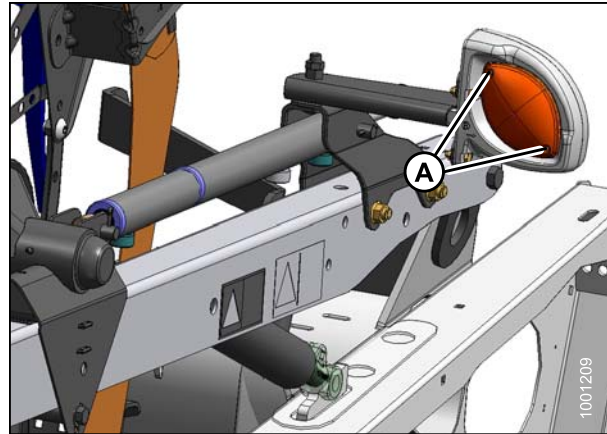


Figure 5.15: Clearance Light

5.5 Knife

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 111](#).

CAUTION

Wear heavy gloves when working around or handling knives.

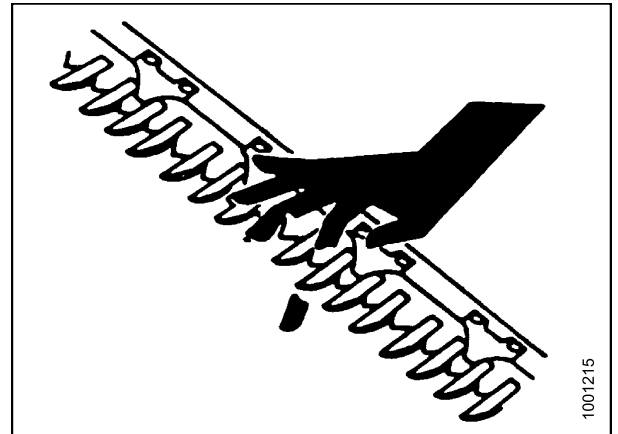


Figure 5.16: Cutterbar Hazard

5.5.1 Replacing Knife Section

Check daily that knife sections are firmly bolted to the knife back and are not worn or broken. Damaged or worn sections leave behind uncut plants. A worn or broken section can be replaced without removing knife from cutterbar.

Coarse serrated sections last longer than fine serrated sections in dirty or sandy conditions.

Fine serrated sections perform better in fine stemmed grasses and plants that contain more fibrous stems.

MAINTENANCE AND SERVICING

To replace a section, follow these steps:

1. Stroke knife as required, to center the section (A) between guards.
2. Remove nuts (B).
3. Remove bars (C) and lift section off the knife bar.
4. If section is under a splice bar (D), remove the bar.
5. Clean any dirt off of knife back and position new section on knife.

IMPORTANT:

Do NOT mix fine and coarse sections on same knife.

6. Reposition bars (C) and/or (D) and install lock nuts (B).

NOTE:

If replacing a screw, make sure to fully insert it. Do not use the nut to draw the screw into the knife bar.

7. Torque nuts to 7 ft-lbf (9.5 N·m).

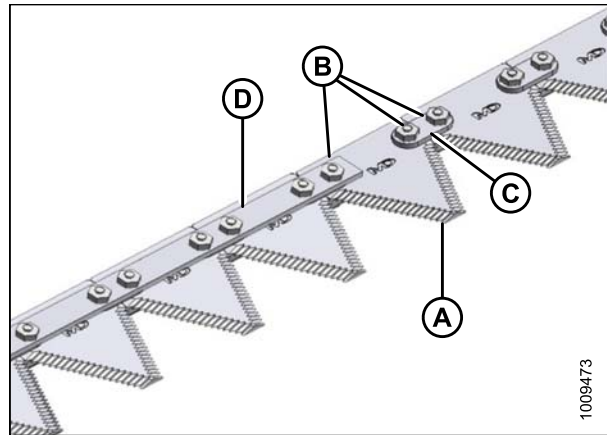
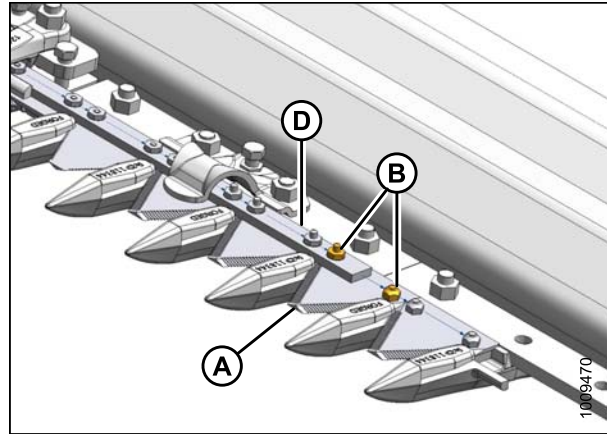


Figure 5.17: Cutterbar

5.5.2 Removing Knife

WARNING

Stand to rear of knife during removal to reduce risk of injury from cutting edges. Wear heavy gloves when handling knife.

Manually stroke knife to its outer limit and clean area around the knifehead.

1. Wrap a chain around knifehead and pull knife out.
2. For **SINGLE-KNIFE DRIVE** with splice plate, remove bolts from splice plate and pull knife out from both ends.

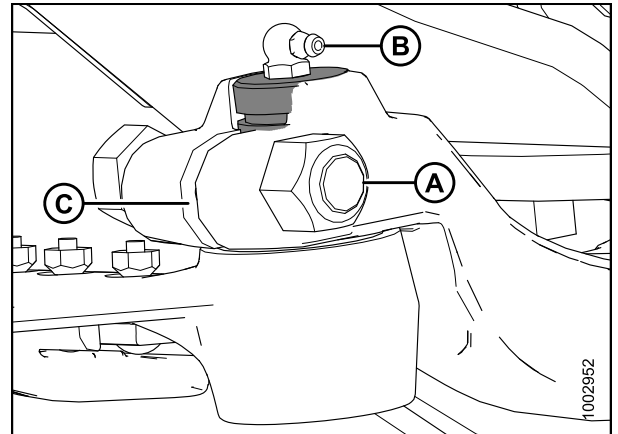


Figure 5.18: Knifehead

5.5.3 Removing Knifehead Bearing

WARNING

Stand to rear of knife during removal to reduce risk of injury from cutting edges. Wear heavy gloves when handling knife.

IMPORTANT:

The following procedure applies to single-knife headers. Repeat this procedure for each knife on double-knife headers.

1. Remove the knife. Refer to [5.5.2 Removing Knife, page 129](#).

NOTE:

It is not necessary to wrap the knifehead to protect the bearing if it is being replaced.

2. Using a flat-ended tool with approximately the same diameter as pin (A). Tap the 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 seal, check pin and needle bearing for wear. Replace if necessary.

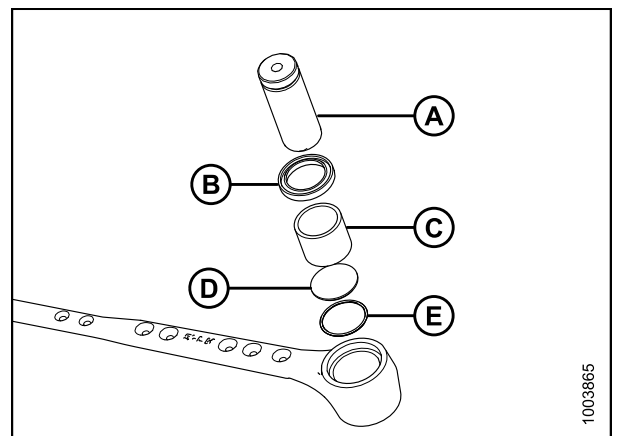


Figure 5.19: Knifehead Bearing Assembly

5.5.4 Installing Knifehead Bearing

To install the knifehead bearing, follow these steps:

1. Place O-ring (E) and plug (D) in knifehead.

IMPORTANT:

Install the bearing with the stamped end (the end with identification markings) facing up.

2. Using a flat-ended tool (A) with approximately the same diameter as the bearing (C), push the bearing into the knifehead until the top of the bearing is flush with the step in knifehead.

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

IMPORTANT:

To avoid premature knifehead or knife drive box failure, be sure there is no looseness in the fit of the knifehead pin and the needle bearing, and the fit of the knifehead pin and output arm.

4. Install knife. Refer to [5.5.5 Installing Knife, page 130](#).

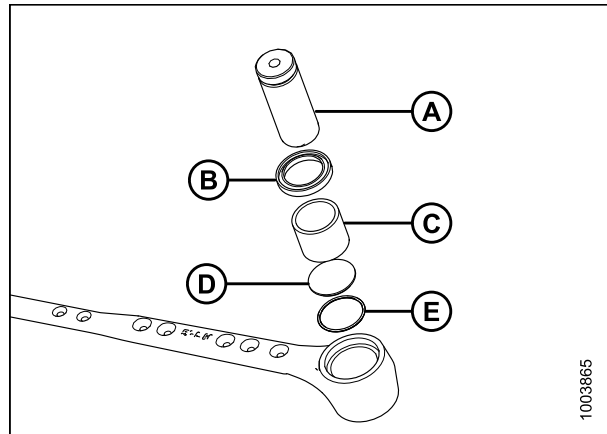


Figure 5.20: Knifehead Bearing Assembly

5.5.5 Installing Knife

⚠ WARNING

Stand to rear of knife during installation to reduce risk of injury from cutting edges. Wear heavy gloves when handling knife.

To install a knife, follow these steps:

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

NOTE:

For ease of removing or installing knifehead pin, remove grease zerk from pin.

2. Install knifehead pin (A) through the output arm and into the knifehead.
3. Set groove (B) in knifehead pin 1/16 in. (1.5 mm) above (C). Install the 5/8 in. x 3 hex head bolt (D) and nut and torque to 160 ft·lbf (217 N·m).

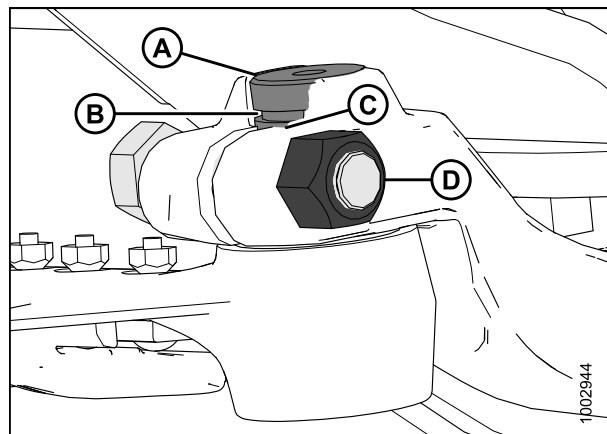


Figure 5.21: Knifehead

MAINTENANCE AND SERVICING

4. Install grease zerk (A) into the knifehead pin, turn the grease zerk for easy access.

IMPORTANT:

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

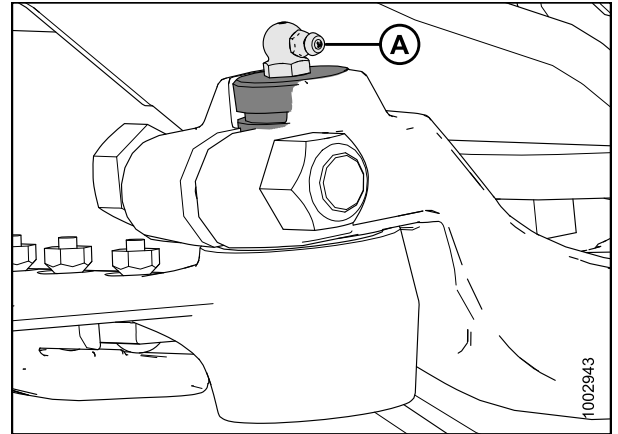


Figure 5.22: Knifehead

5.5.6 Spare Knife

A spare knife may be stored in the header frame tube (A) at the left end. Ensure knife is secured in place.

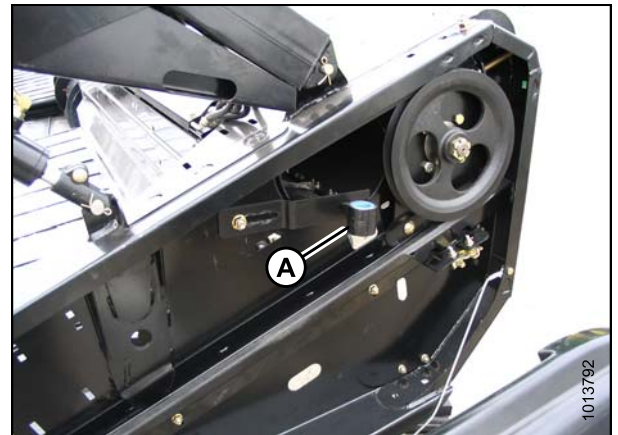


Figure 5.23: Spare Knife

5.5.7 Knife Guards

Check **DAILY** that guards are aligned and that knife sections are contacting shear surface of each guard.

Adjusting Knife Guards

To adjust knife guards, follow these steps:

NOTE:

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

MAINTENANCE AND SERVICING

1. To adjust guard tips upward, position tool as shown, and pull up.



Figure 5.24: Upward Adjustment

2. To adjust tips downward, position tool as shown and push down.

TIP:

If trouble is encountered cutting tangled or fine-stemmed material, install a knife hold-down on every guard and then replace lower guards with stub guards.

3. If material is tough to cut, install stub guards with top guard and adjuster plate. A kit is available from your MacDon Dealer. Refer to [6.2.3 Stub Guard Conversion Kit, page 231](#).



Figure 5.25: Downward Adjustment

Replacing Pointed Guards on a Single-Knife Header

To replace pointed knife guards on a single-knife header, follow these steps:

⚠ WARNING

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

1. Stroke knife so that knife sections are spaced midway between the guards.
2. Remove two nuts (B) and bolts that attach guard (A) and hold-down (C) (if applicable) to cutterbar.
3. Remove guard, hold-down, and plastic wear plate (if installed).
4. Position new guard (A) and plastic wear plate (if applicable) on cutterbar, and install bolts.

IMPORTANT:

The first four outboard guards on drive side(s) of header do not have a ledger plate. Ensure that proper replacement is installed.

5. Install hold-down, and secure with nuts. Tighten nuts to 50 ft-lbf (68 N-m).
6. Check and adjust clearance between hold-down and knife. Refer to [Checking Knife Hold-Downs, page 136](#).

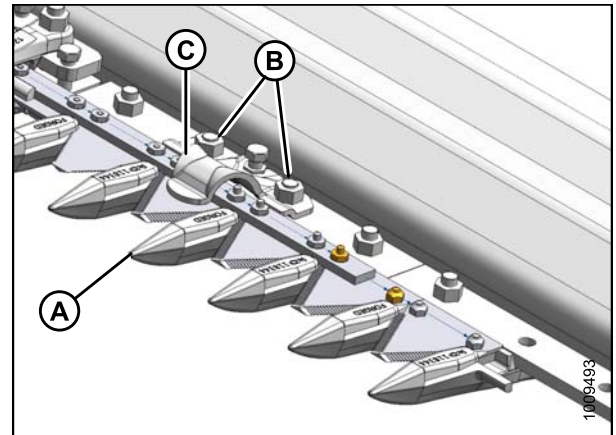


Figure 5.26: Cutterbar

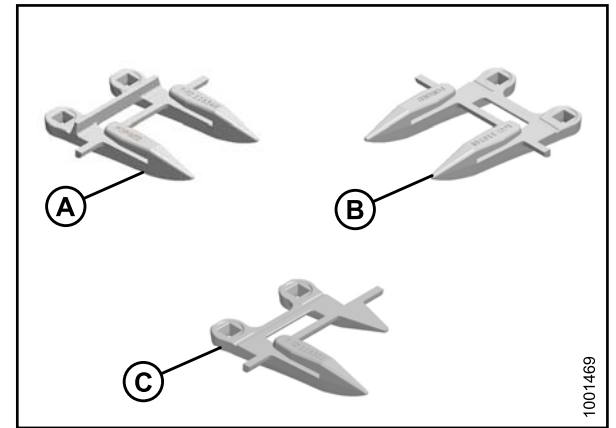


Figure 5.27: Guards

A - Normal

B - Drive Side

C - Half Guard (End)

Replacing Pointed Guards on a Double-Knife Header

⚠ WARNING

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

Refer to [Replacing Pointed Guards on a Single-Knife Header, page 133](#) for typical guard replacement.

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

To replace the pointed center guard or center top guide on a double-knife header, follow these steps:

MAINTENANCE AND SERVICING

1. Remove two bolts and nuts (B) that attach knife guard (A) and top guide (C) to cutterbar.
2. Remove knife guard, plastic wear plate (if installed), top guide (C), and adjuster bar (D).

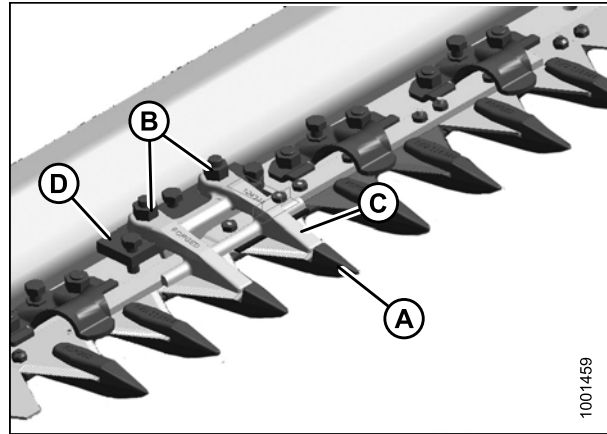


Figure 5.28: Double-Knife Guard

3. Position plastic wear plate (if applicable), replacement guard (A), adjuster bar, and top guide (B). Install bolts, but do **NOT** tighten.

IMPORTANT:

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

NOTE:

Top guide (B) must accommodate the two overlapping knives at center guard location on double-knife header. Ensure replacement is the correct part.

4. Check and adjust clearance between hold-down and knife. Refer to [Checking Knife Hold-Downs, page 136](#).

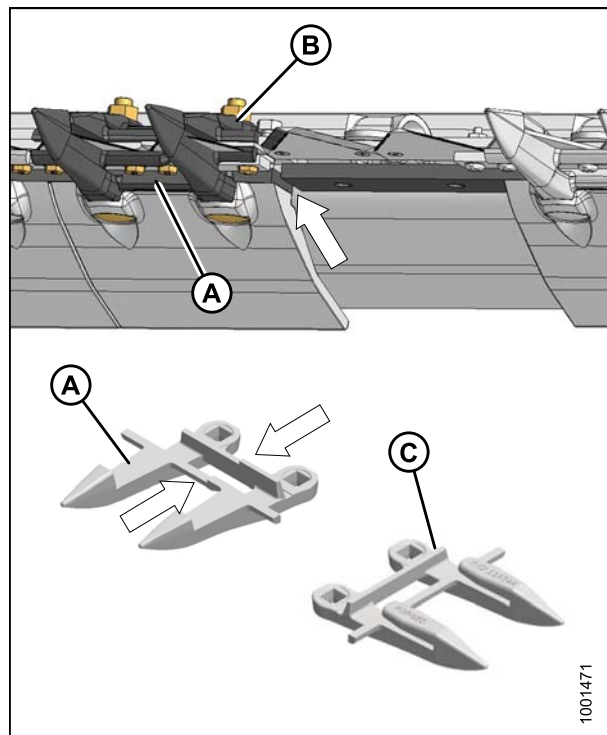


Figure 5.29: Double-Knife Guard

Replacing Stub Guards on a Single-Knife Header

⚠ WARNING

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

Stub guards complete with top guides and adjuster plates, are designed to cut tough crops. Only 15-, 20-, 25-, 30-, and 35-ft. headers can be equipped with stub guards.

MAINTENANCE AND SERVICING

To replace stub guards, follow these steps:

1. Remove the two nuts (A) and bolts that attach stub guard (B) and top guide (C) to cutterbar.
2. Remove guard, plastic wear plate (if installed), top guide, and adjuster bar (D).
3. Position plastic wear plate (if applicable), replacement stub guard (B), adjuster bar (D), top guide (C), and install bolts and nuts (A). Do **NOT** tighten.

IMPORTANT:

Note position of mitre on adjuster bar (D). Bar should be reinstalled in same position. Mitres should not be adjacent to each other.

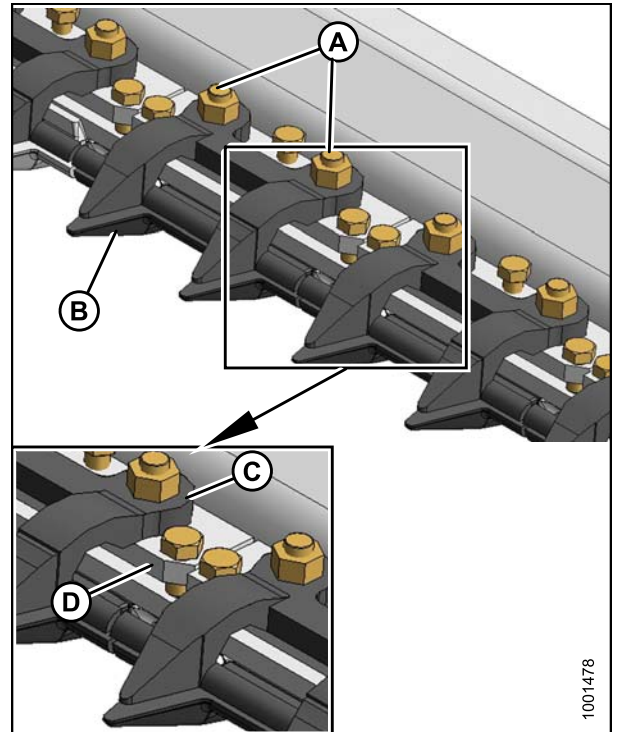


Figure 5.30: Stub Guards

IMPORTANT:

The first four outboard guards (B) on the drive side(s) of the header do **NOT** have a ledger plate like the normal guards (A). Ensure that the proper replacement is installed.

4. Check and adjust clearance between hold-down and knife. Refer to [Checking Knife Hold-Downs, page 136](#).

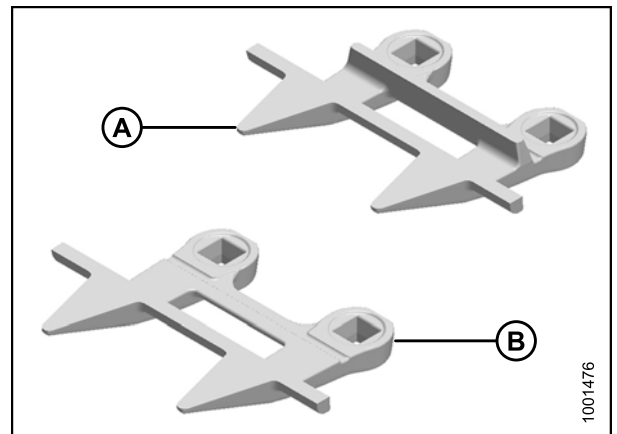


Figure 5.31: Stub Guards

Replacing Stub Guards on a Double-Knife Header

Refer to [Replacing Stub Guards on a Single-Knife Header, page 134](#) for typical guard replacement.

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

To replace the center guard or center top guide, follow these steps:

MAINTENANCE AND SERVICING

1. Remove the two nuts (A) and bolts that attach guard (B) and top guide (C) and adjuster bar (D) to cutterbar.
2. Remove guard, plastic wear plate (if installed), top guide (C), and adjuster bar (D).
3. Locate plastic wear plate (if applicable), replacement guard (B), adjuster bar (D), top guide (C), and install bolts, but do **NOT** tighten.

IMPORTANT:

Ensure center guard (B) has offset cutting surfaces. The top guide (C), which is an inverted normal stub guard, must accommodate the two overlapping knives at center guard location on double-knife header. Ensure replacements are correct part.

4. Check and adjust clearance between hold-down and knife. Refer to [Checking Knife Hold-Downs, page 136](#).

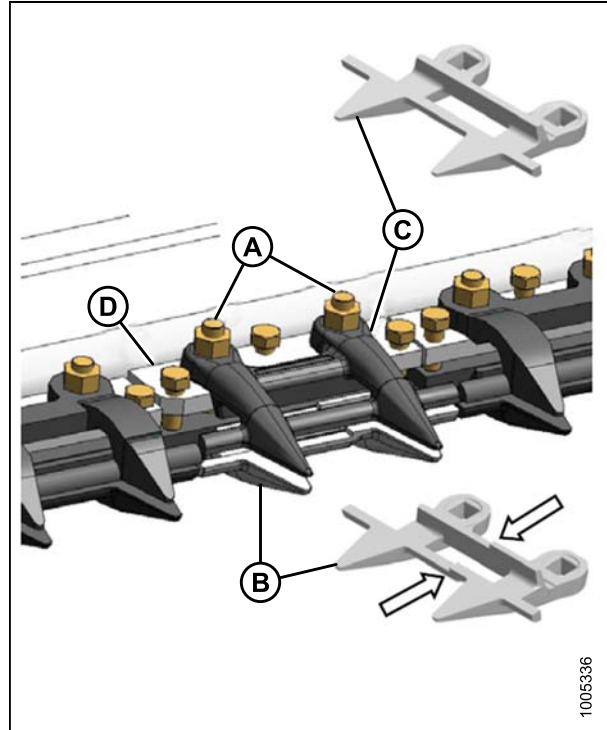


Figure 5.32: Stub Guards

Checking Knife Hold-Downs

Check daily that knife hold-downs are set to prevent knife sections from lifting off guards, but still permit knife to slide without binding. If there is evidence that the hold-downs are not properly adjusted, check the clearance between the hold-down and knife section with a feeler gauge.

Refer to:

- [Adjusting Hold-Downs with Pointed Guards, page 137](#)
- [Adjusting Hold-Downs with Stub Guards, page 138](#)

NOTE:

Guards should be aligned prior to adjusting hold-downs. Refer to [Adjusting Knife Guards, page 131](#).

Adjusting Hold-Downs with Pointed Guards

To adjust the clearance between hold-downs and knife on header with pointed guards, follow these steps:

1. Check the clearance (A) between the normal hold-down and knife section with a feeler gauge. The clearance should be 0.004–0.024 in. (0.1–0.6 mm).
2. Adjust as required by turning bolt (B).

NOTE:

For larger adjustments, it may be necessary to loosen nuts (C), turn adjuster bolt (B), then retighten nuts (C).

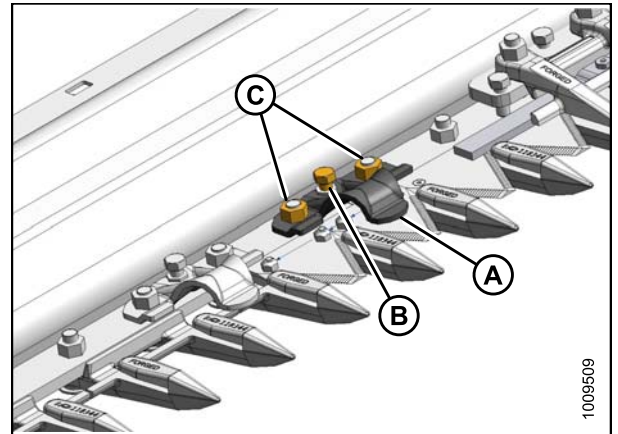


Figure 5.33: Hold-Down Clearance

3. Check the clearances between the center guard hold-down (A) and knife section with a feeler gauge. The clearances should be:
 - 0.004–0.016 in. (0.1–0.4 mm) at guide tip (B)
 - 0.004–0.040 in. (0.1–1.0 mm) at rear of guide (C)
4. If required, adjust clearances as follows:
 - a. Torque nuts (D) to 35 ft·lbf (46 N·m).
 - b. Turn the three adjuster bolts (E) as required.
 - c. Torque nuts (D) to 53 ft·lbf (72 N·m).
5. After adjusting all hold-downs, run header at a low engine speed and listen for noise due to insufficient clearance. Insufficient clearance will also result in overheating of the knife and guards. Readjust as necessary.

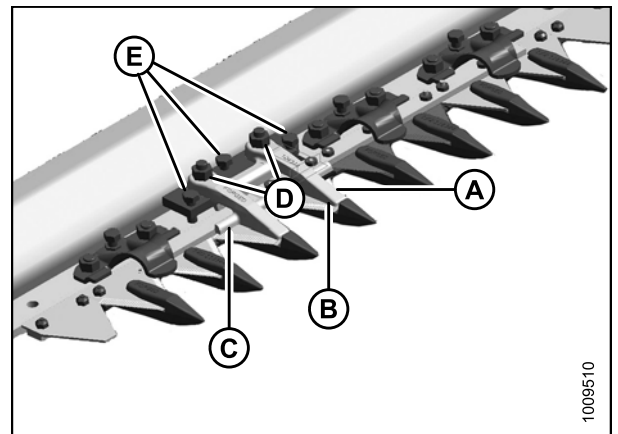


Figure 5.34: Hold-Down Clearance

Adjusting Hold-Downs with Stub Guards

To adjust the clearance between hold-downs and knife for all stub guards, follow these steps:

1. Check the clearances between the center guard hold-down (A) and knife section with a feeler gauge. The clearances should be:
 - 0.004–0.016 in. (0.1–0.4 mm) at guide tip (B)
 - 0.004–0.040 in. (0.1–1.0 mm) at rear of guide (C)
2. If required, adjust clearances as follows:
 - a. Torque nuts (D) to 35 ft·lbf (46 N·m).
 - b. Turn the three adjuster bolts (E) as required.
 - c. Torque nuts (D) to 53 ft·lbf (72 N·m).
3. After adjusting all hold-downs, run header at a low engine speed and listen for noise due to insufficient clearance. Insufficient clearance will also result in overheating of the knife and guards. Readjust as necessary.

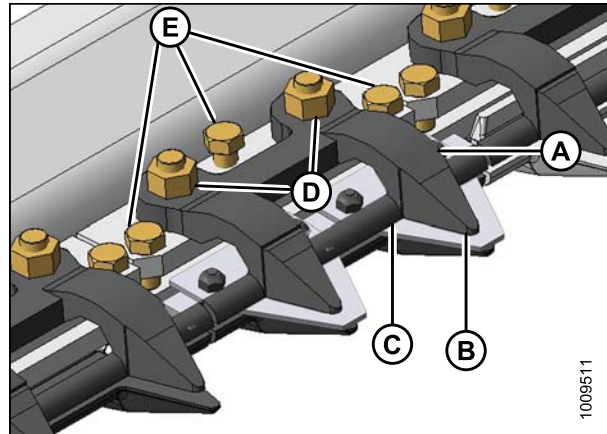


Figure 5.35: Stub Guards

5.5.8 Knifehead Shield

The shield attaches to the endsheet and reduces the knifehead opening to prevent cut crop from accumulating in the knifehead cut-out, especially in severely lodged crops.

The shield(s) and mounting hardware are available from your MacDon Dealer.

IMPORTANT:

Shields should be removed when cutting with the cutterbar on the ground in muddy conditions. Mud may pack into the cavity behind the shield and cause knife drive box failures.

Installing Knifehead Shield

The knifehead shield is supplied in flattened form and can be bent to suit installation on pointed or stub guard cutterbars and on double-knife headers. Shields are slightly different depending on header size and guard configuration. Ensure proper shield is used. Refer to the header parts catalog for proper replacement parts.

⚠ DANGER

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

1. Raise reel fully, lower header to ground, shut down windrower, and remove key.
2. Engage reel arm locks.

⚠ CAUTION

Wear heavy gloves when working around or handling knives.

MAINTENANCE AND SERVICING

3. Place knifehead shield (A) against endsheet as shown. Orient the shield so that cutout matches profile of knifehead and/or hold-downs.
4. Bend shield along slit to conform to endsheet.
5. Align mounting holes and then install two 3/8 in. x 1/2 Torx® head bolts (B).
6. Snug up bolts just enough so that shield can be adjusted as close as possible to the knifehead.
7. Manually rotate knife drive box pulley to move knife and check for areas of contact between the knifehead and shield.
8. If required, adjust shield to avoid interference with the knife.
9. Tighten bolts.

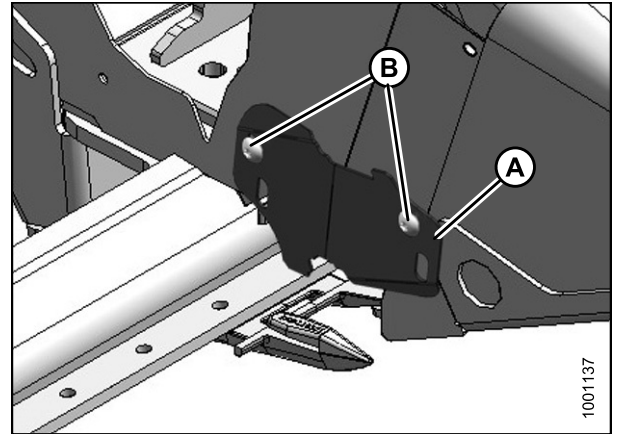


Figure 5.36: Knifehead Shield

5.6 Knife and Knife Drive

5.6.1 Knife Drive Box

Knife drive boxes are belt driven by a hydraulic motor that is powered by the adapter hydraulic pump, and convert rotational motion into the reciprocating motion of the knife.

CAUTION

To avoid personal injury, before servicing machine or opening drive covers, refer to [5.1 Preparing Machine for Servicing, page 111](#).

Checking Mounting Bolts

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

1. Torque side bolts (A) first, then the bottom bolts (B). Torque to 200 ft-lbf (271 N m).

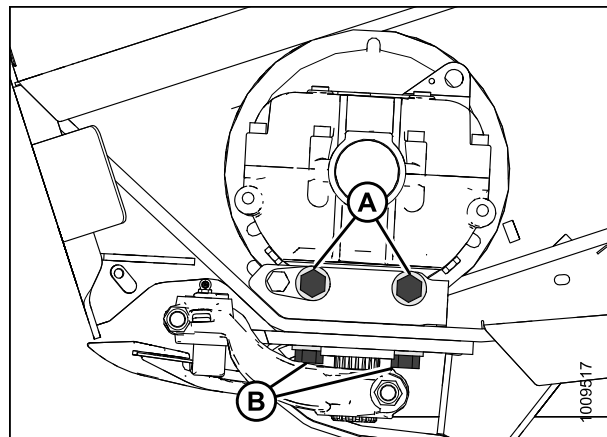


Figure 5.37: Knife Drive Box

Removing Knife Drive Box

Single and Untimed Double Knife

This procedure applies to single and untimed double-knife drive boxes.

1. Open endshield. Refer to [Opening Endshields, page 35](#).
2. Loosen the two bolts (A) that secure the motor assembly to header endsheet.
3. Loosen the tension on the belt by turning the tensioning bolt (B) counterclockwise.

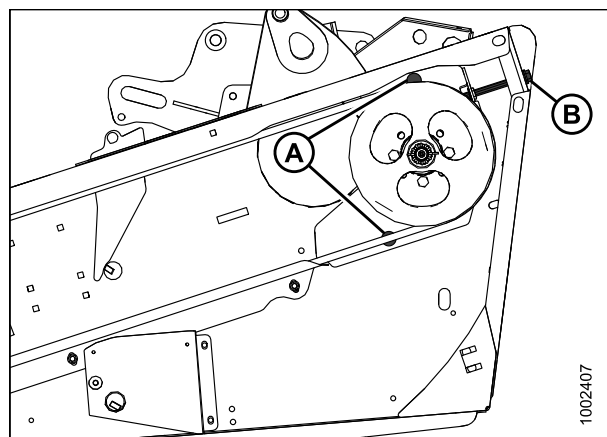


Figure 5.38: Knife Drive

MAINTENANCE AND SERVICING

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

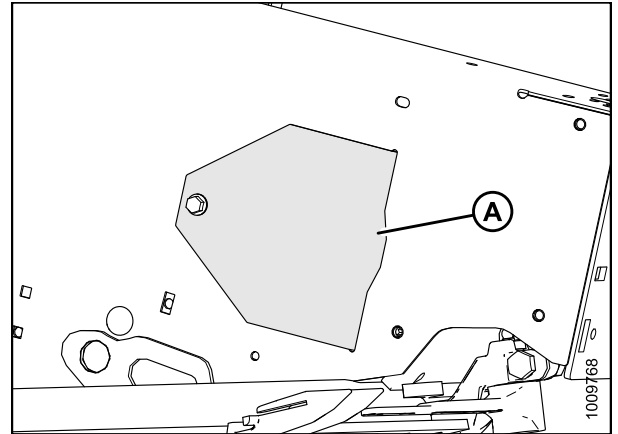


Figure 5.39: Access Cover

5. Remove belt (A) from drive pulley (B).
6. Slip belt (A) over and behind the knife drive box pulley (C). Use notch in pulley to assist in removing belt.

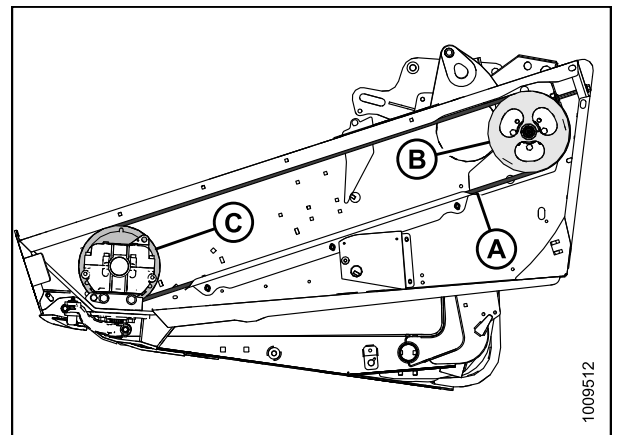


Figure 5.40: Knife Drive

7. Manually stroke knife to its outer limit and clean area around the knifehead.
8. Remove bolt (A).
9. Remove the grease zerk (B) from the pin.
10. Use a screwdriver or a chisel in slot (C) to release load on knifehead pin.
11. Pry pin upward with a screwdriver in pin groove until pin is clear of knifehead.
12. Push the knife assembly inboard until it is clear of the output arm.
13. Seal bearing in knifehead with plastic or tape, unless it is being replaced.

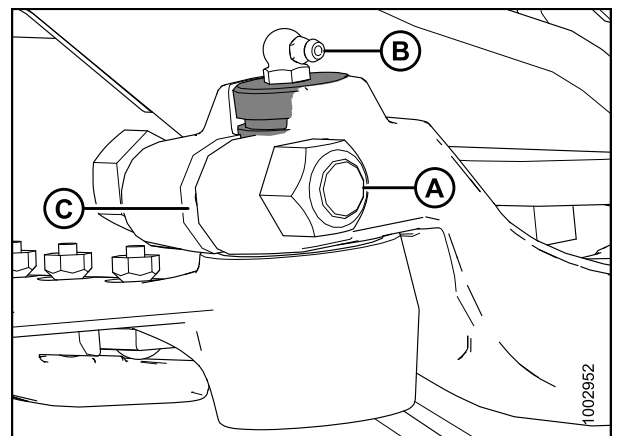


Figure 5.41: Knifehead

MAINTENANCE AND SERVICING

14. Remove bolt (A) that clamps the knife drive arm to the knife drive box output shaft.
15. Remove the knife drive arm (B) from the knife drive box output shaft.
16. Remove the four knife drive box mounting bolts (C, D).

NOTE:

Do **NOT** remove bolt (E), this is factory set. It is used to position the knife drive box in the proper fore-aft position.

17. Remove knife drive box and place on a bench for disassembly.

CAUTION

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

18. For double-knife headers, repeat procedure for opposite end.

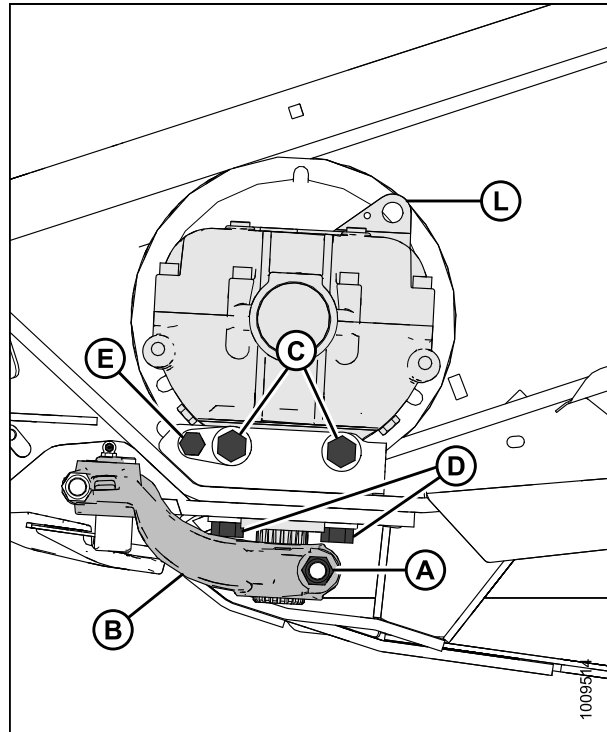


Figure 5.42: Knife Drive Box

Timed Double Knife

NOTE:

Procedure is the same for both ends of the timed double-knife header. Images shown are for the left end, right end is opposite.

1. Open endshield. Refer to [Opening Endshields, page 35](#).
2. Loosen two nuts (A) on belt idler bracket to relieve tension on belt.
3. Loosen nut (B) on idler pulley and slide idler down to loosen belt.

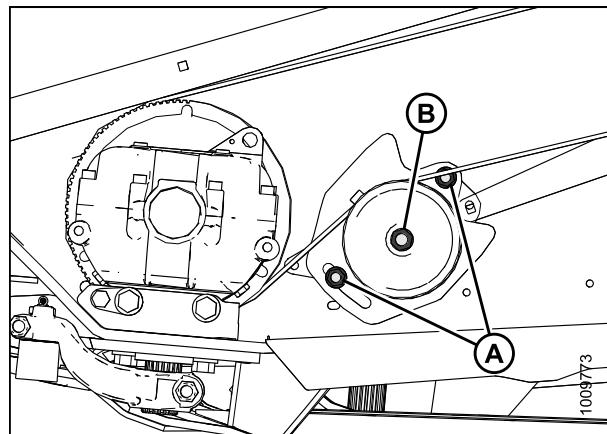


Figure 5.43: Knife Drive

MAINTENANCE AND SERVICING

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

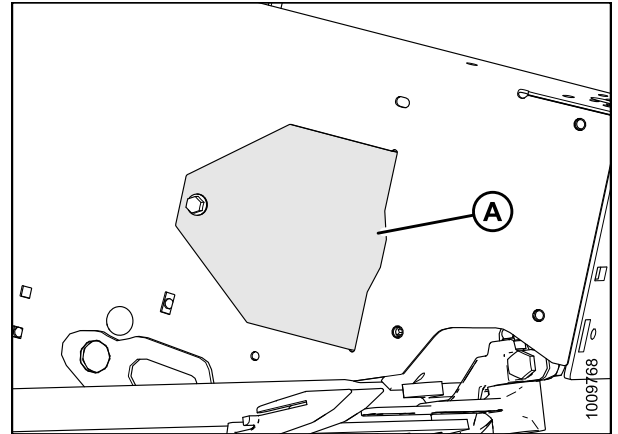


Figure 5.44: Access Cover

5. Manually stroke knife to its outer limit and clean area around the knifehead.
6. Remove bolt (A).
7. Remove the grease zerk (B) from the pin.
8. Use a screwdriver or a chisel in slot (C) to release load on knifehead pin.
9. Pry pin upward with a screwdriver in pin groove until pin is clear of knifehead.
10. Push the knife assembly inboard until it is clear of the output arm.
11. Seal bearing in knifehead with plastic or tape, unless it is being replaced.

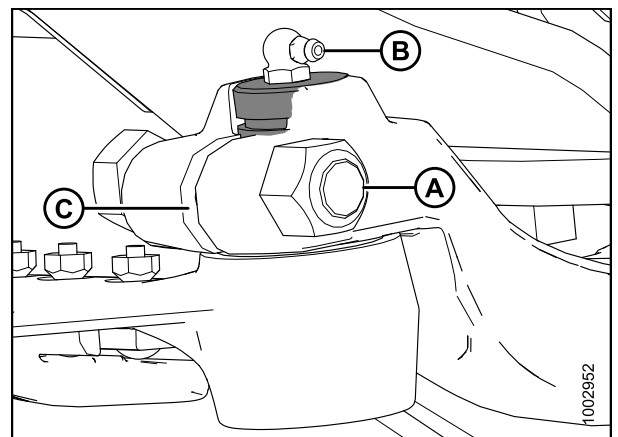


Figure 5.45: Knifehead

MAINTENANCE AND SERVICING

12. Remove bolt (A) that clamps the knife drive arm to the knife drive box output shaft.
13. Remove the knife drive arm (B) from the knife drive box output shaft.
14. Remove the four knife drive box mounting bolts (C, D).

NOTE:

Do **NOT** remove bolt (E), this is factory set. It is used to position the knife drive box in the proper fore-aft position.

15. Remove knife drive box and place on a bench for disassembly.

CAUTION

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

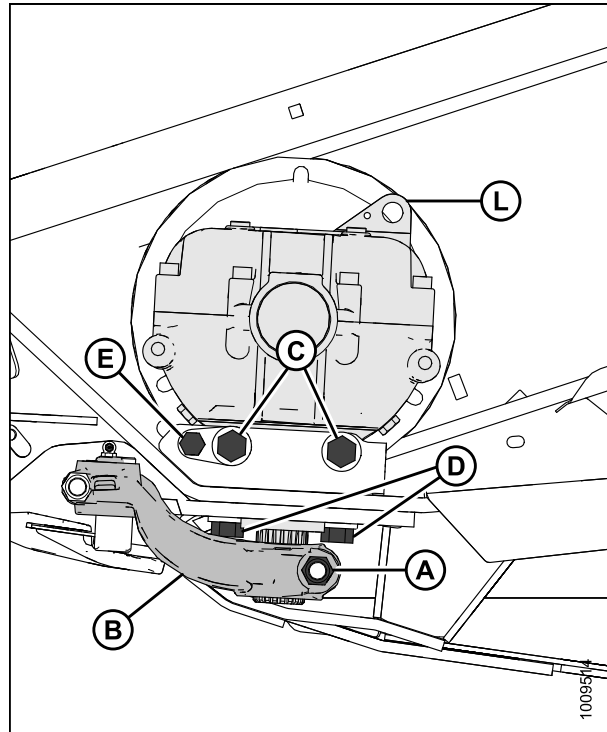


Figure 5.46: Knife Drive Box

Removing Knife Drive Box Pulley

To remove knife drive box pulley, follow these steps:

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

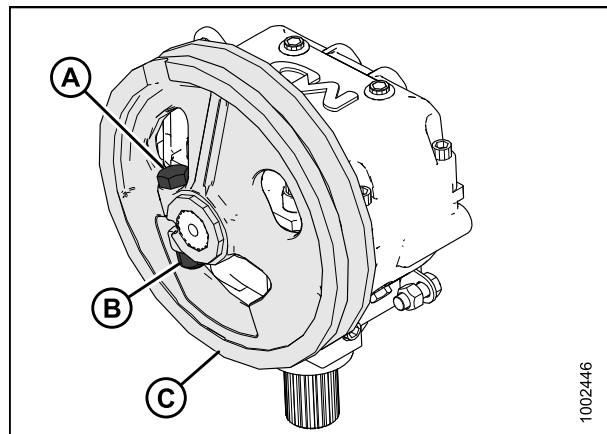


Figure 5.47: Knife Drive Box and Pulley

Installing Knife Drive Box Pulley

To install the knife drive box pulley, follow these steps:

1. Ensure splines and bores in pulley or drive arm are free of paint oil and solvents.
2. Apply Loctite® #243 adhesive (or equivalent) to spline. Apply in two bands (A) around shaft, with one band at end of spline and one band approximately mid-way.
3. Install pulley (B) until flush with end of shaft.
4. Secure pulley with 5/8 in. x 3 hex head bolt with distorted thread NC lock nut and torque to 160 ft-lbf (217 N-m).

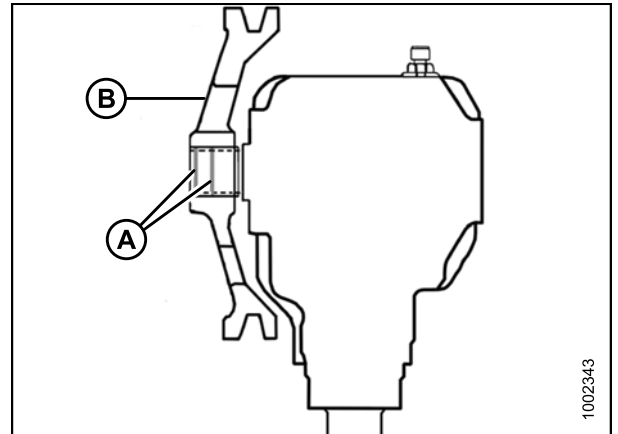


Figure 5.48: Knife Drive Box

Installing Knife Drive Box

This procedure can be used 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 145](#). If the pulley was not removed, then proceed to Step 1., [page 145](#).

CAUTION

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

1. Place knife drive box into position on header mount and locate belt on pulley.
2. Install two 5/8 in. x 1.75 grade 8 hex head bolts (A) at the side and two 5/8 in. x 2.25 grade 8 hex head bolts (B) underneath to mount knife drive box to frame.
3. Slightly tighten knife drive box side bolts (A) first, then the bottom bolts (B), to ensure proper contact with vertical and horizontal mounting surfaces. Do **NOT** torque bolts at this time.

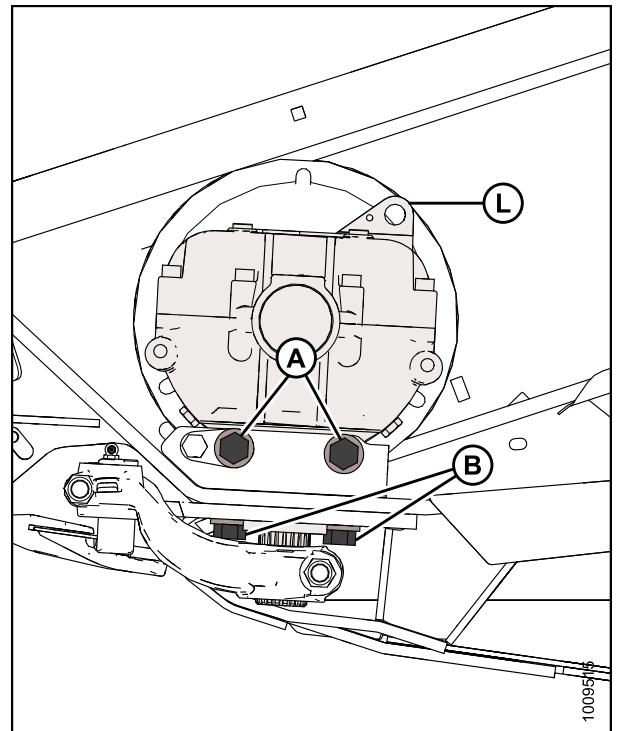


Figure 5.49: Knife Drive Box

MAINTENANCE AND SERVICING

4. Apply Loctite® #243 to the output shaft in two bands (A).
5. Slide output arm (B) onto output shaft. Rotate pulley to ensure drive arm just clears frame on inboard stroke to ensure proper placement on splines.

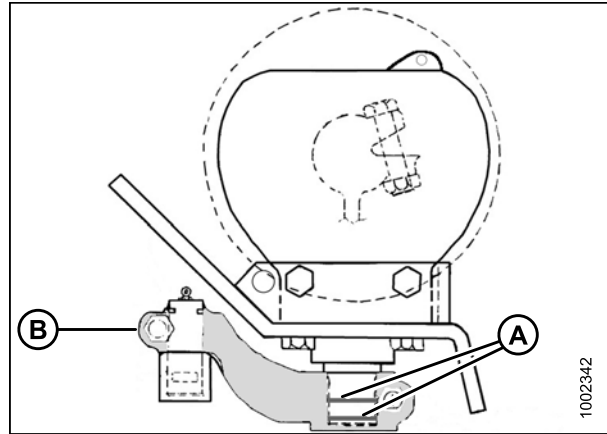


Figure 5.50: Knife Drive Box

6. Position output arm (A) to farthest outboard position. Move output arm (A) up or down on splined shaft until it almost contacts knifehead (B). Exact clearance (C) will be set when installing knifehead pin.

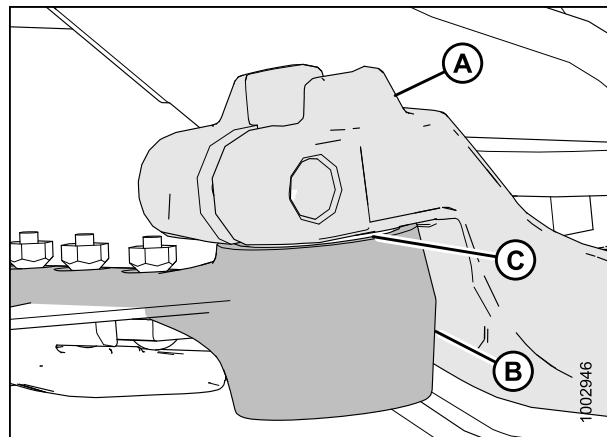


Figure 5.51: Knifehead

7. To secure arm to knife drive output shaft, torque output arm bolt (A) to 160 ft·lbf (217 N·m).

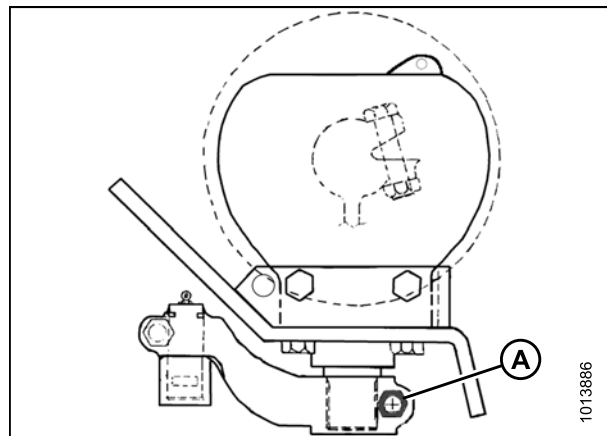


Figure 5.52: Knife Drive Box

MAINTENANCE AND SERVICING

NOTE:

For ease of removing or installing knifehead pin, remove grease zerk from pin.

8. Install knifehead pin (A) through the output arm and into the knifehead.
9. Set groove (B) in knifehead pin 1/16 in. (1.5 mm) above (C). Install the 5/8 in. x 3 hex head bolt (D) and nut and torque to 160 ft-lbf (217 N-m).

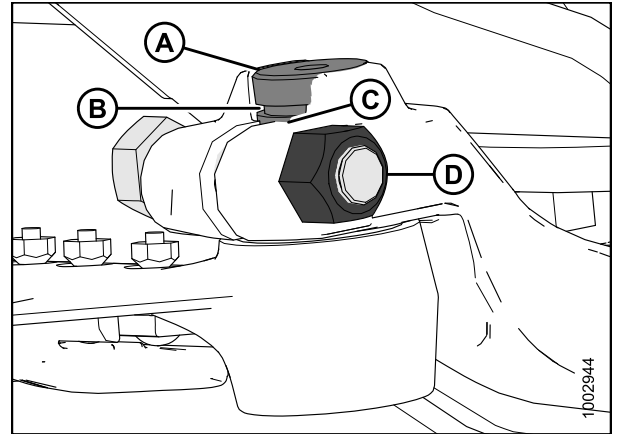


Figure 5.53: Knifehead

10. Install grease zerk (A) into the knifehead pin, turn the grease zerk for easy access.

IMPORTANT:

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

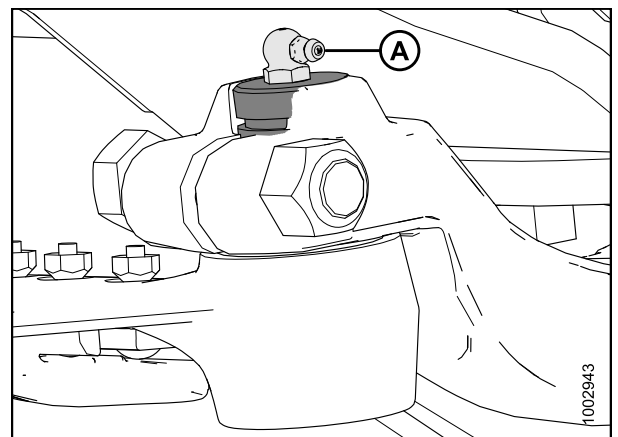


Figure 5.54: Knifehead

11. Check the knife drive box pulley and drive pulley alignment. If adjustment is required, contact your MacDon Dealer.
12. Tighten knife drive box side bolts (A) first, then the bottom bolts (B). Torque to 200 ft-lbf (271 N-m).
13. Stroke the output arm to mid stroke, check and ensure that the knife bar does not contact the front of the first guard. If adjustment is required, contact your MacDon Dealer.
14. Install and tension the knife drive belt(s). Refer to [5.6.2 Knife Drive Belts, page 148](#). For timed double-knife headers, also check the knife timing. Refer to [Adjusting Double-Knife Timing, page 156](#) for timing instructions.
15. Close endshield. Refer to [Closing Endshields, page 36](#).

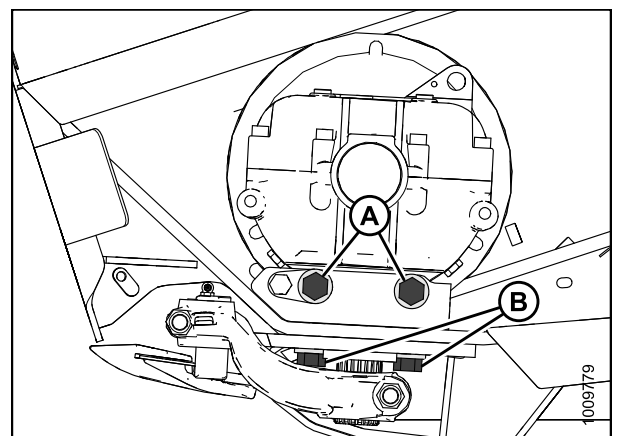


Figure 5.55: Knife Drive Box

Changing Oil in Knife Drive Box

Change knife drive box lubricant after the first 50 hours of operation and every 1000 hours (or 3 years) thereafter.

To change the oil in the knife drive box, follow these steps:

1. Raise header to allow a suitable container to be placed under the knife box drain to collect oil.
2. Open endshield(s). Refer to [Opening Endshields, page 35](#).
3. Remove breather/dipstick (A) and drain plug (B).
4. Allow oil to drain.
5. Reinstall drain plug (B).
6. Add oil to knife drive box. Refer to [5.2.1 Recommended Fluids and Lubricants, page 112](#) for quantity.
7. Close endshield(s). Refer to [Closing Endshields, page 36](#).

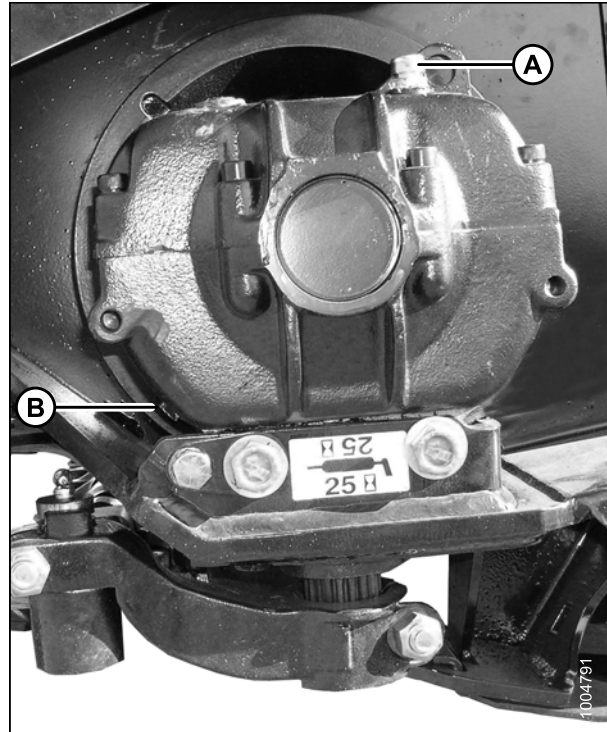


Figure 5.56: Knife Drive Box

5.6.2 Knife Drive Belts

Non-Timed Knife Drive Belts

The knife drive box is driven by a V-belt that is powered by a hydraulic motor on the header left endsheet. There is an identical drive system at the opposite end of 40-foot double-knife headers.

Removing Non-Timed Knife Drive Belt

This procedure describes the removal of the knife drive belt on single-knife headers and double-knife headers with non-timed drives.

NOTE:

Procedure is the same for both ends of a double-knife header.

MAINTENANCE AND SERVICING

1. Open endshield. Refer to [Opening Endshields, page 35](#).
2. Loosen the two bolts (A) that secure the motor assembly to header endsheet.
3. Loosen the belt by turning the tensioning bolt (B) counterclockwise.

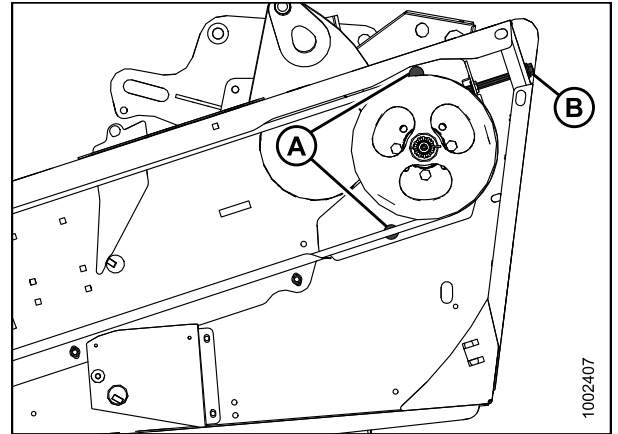


Figure 5.57: Knife Drive

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

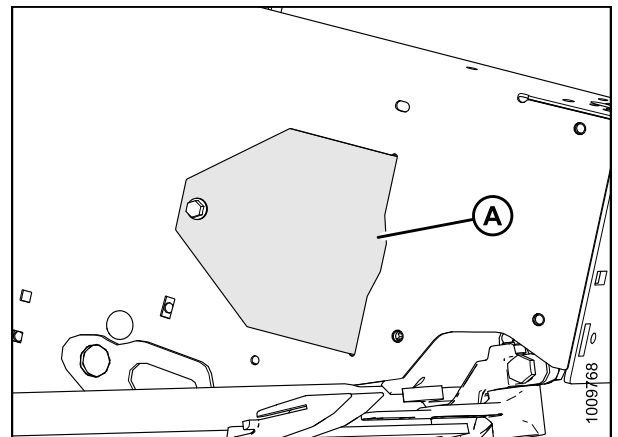


Figure 5.58: Access Cover

5. Remove belt (A) from drive pulley (B).
6. Slip belt (A) over and behind the knife drive box pulley (C). Use notch in pulley to assist in removing belt.

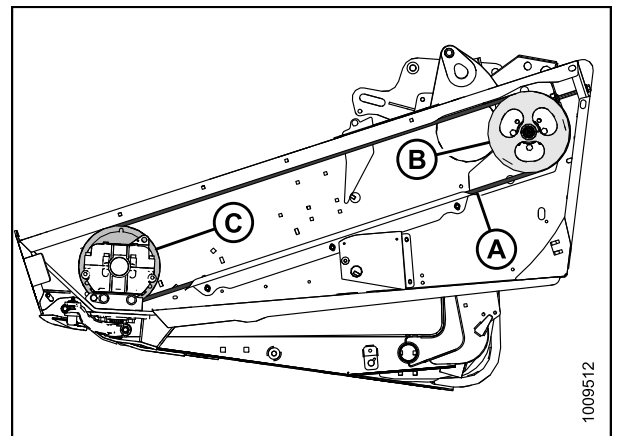


Figure 5.59: Knife Drive

Installing Non-Timed Knife Drive Belts

NOTE:

Procedure is the same for both ends of the double-knife header.

MAINTENANCE AND SERVICING

1. Route knife drive belt (A) around knife drive box pulley (C) and knife drive pulley (B). Use notch in pulley (C) to assist in installing belt.

NOTE:

When installing new belt, never pry belt over pulley. Be sure drive motor is fully forward.

2. Tension knife drive belt. Refer to [Tensioning Non-Timed Knife Drive Belts, page 150](#).

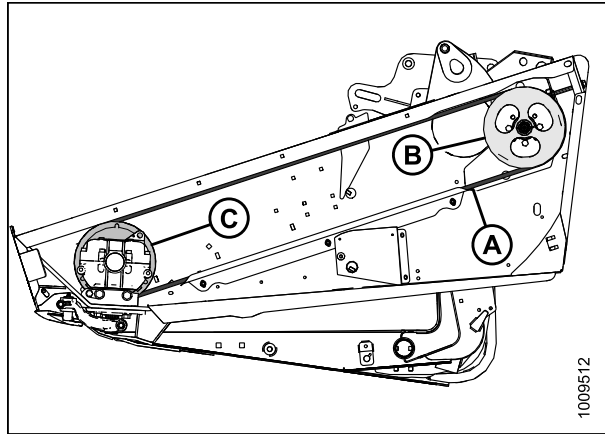


Figure 5.60: Knife Drive

3. Reinstall the access cover (A) and secure it with bolt.
4. Close endshield. Refer to [Closing Endshields, page 36](#).

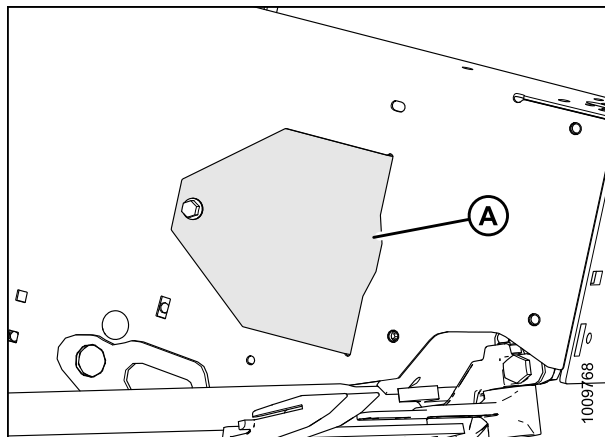


Figure 5.61: Access Cover

Tensioning Non-Timed Knife Drive Belts

This procedure applies to single- and double-knife headers with non-timed drives.

IMPORTANT:

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

1. Open the left endshield. Refer to [Opening Endshields, page 35](#).
2. Loosen the two bolts (A) that secure the motor assembly to the header endsheet.
3. Turn adjuster bolt (B) clockwise to move the drive motor until a force of 20 lbf (89 N) deflects the belt (C) 3/4–1 in. (20–25 mm) at the mid-span.

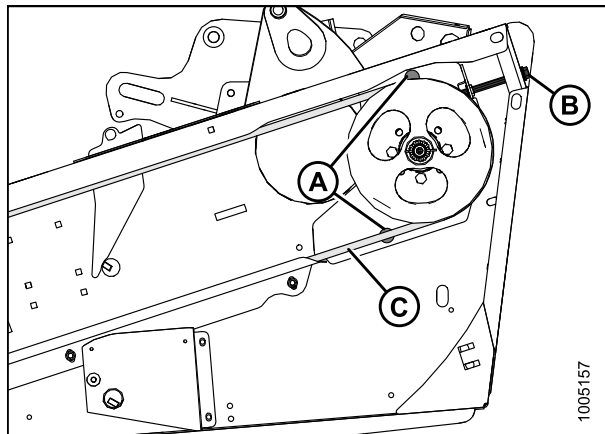


Figure 5.62: Left-Hand Shown – Right-Hand Opposite for Double-Knife Headers

MAINTENANCE AND SERVICING

4. Ensure the clearance between the belt (A) and belt guide (B) is 1/32 in. (1 mm).
5. Loosen three bolts (C), and adjust the position of the guide (B) as required.
6. Tighten bolts (C).
7. Close the endshield. Refer to [Closing Endshields, page 36](#).

NOTE:

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

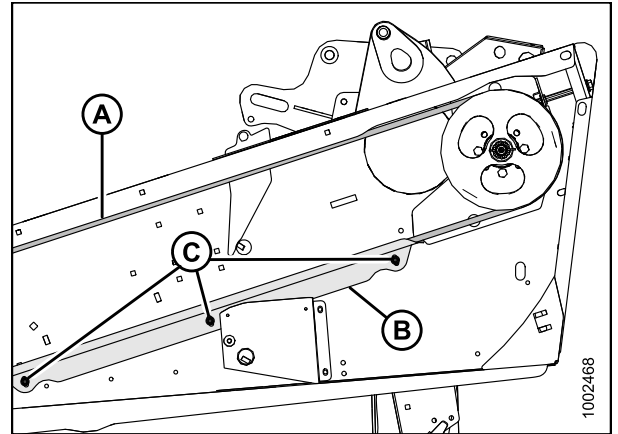


Figure 5.63: Knife Drive

Timed Double-Knife Drive Belts

This section applies to 35-foot and smaller double-knife model D65 Draper Headers with timed drives.

Removing Timed Drive V-Belts

1. Open left endshield. Refer to [Opening Endshields, page 35](#).
2. Loosen two bolts (A) on endsheet.
3. Turn adjuster bolt (B) to loosen the two V-belts (C) and remove them.

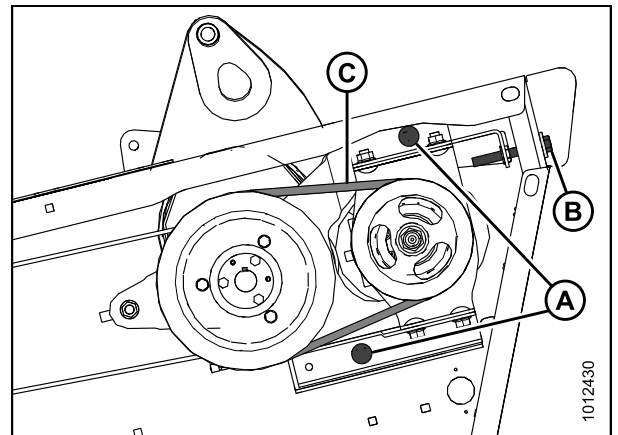


Figure 5.64: Knife Drive V-Belts

Installing Timed Drive V-Belts

NOTE:

New belts must be installed as a matched pair.

MAINTENANCE AND SERVICING

NOTE:

Never pry belt over pulley. Be sure drive motor is fully forward.

1. Install V-belts (C) onto pulleys.

IMPORTANT:

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

2. Turn adjuster bolt (B) to tighten belts. The belts should deflect 5/32 in. (4 mm) with 12–17 lbf (52–77 N) of force applied to each belt at mid-span when properly tensioned.
3. Tighten the two bolts (A).
4. Close endshield. Refer to [Closing Endshields, page 36](#).
5. Check tension of new belts after a short run-in period (about 5 hours).

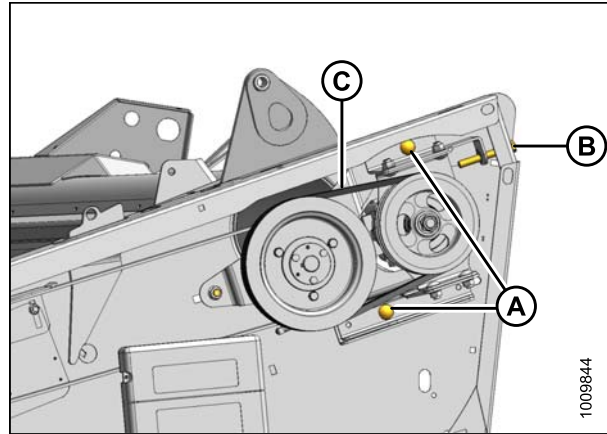


Figure 5.65: Knife Drive V-Belts

Removing Timed Knife Drive Belt

This procedure is applicable to the knife drive on both left and right sides.

1. Open endshield. Refer to [Opening Endshields, page 35](#).
2. Loosen two nuts (A) on belt idler bracket to relieve tension on belt.
3. Loosen nut (B) on idler pulley and slide idler down to loosen belt.

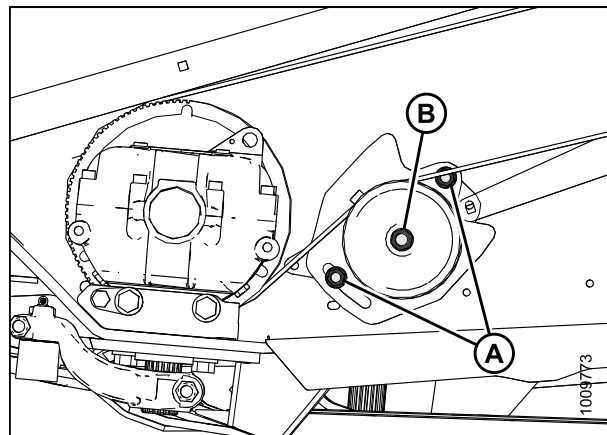


Figure 5.66: Knife Drive

MAINTENANCE AND SERVICING

NOTE:

The following two steps are not applicable to the right side drive.

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

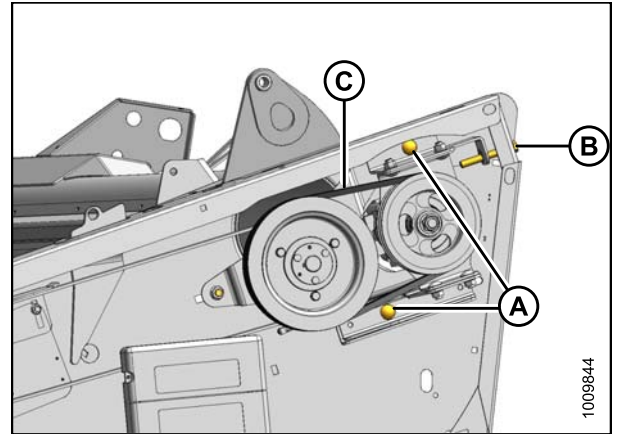


Figure 5.67: Knife Drive V-Belts

6. Open the access panel (A) inside the draper opening, just behind cutterbar. This will give you access to the knife drive pulley.
7. Remove the knife drive belt.

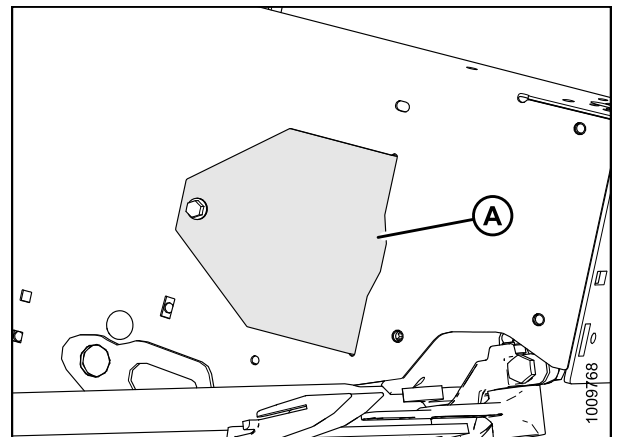


Figure 5.68: Access Cover

Installing Timed Knife Drive Belt

This procedure is applicable to the knife drive on both left and right sides.

If there are problems with belt alignment. Refer to [Adjusting Belt Tracking, page 159](#).

1. Route knife drive belt (A) around knife drive pulley (B) and knife drive box pulley (C).

NOTE:

When installing belt, never pry belt over pulley.

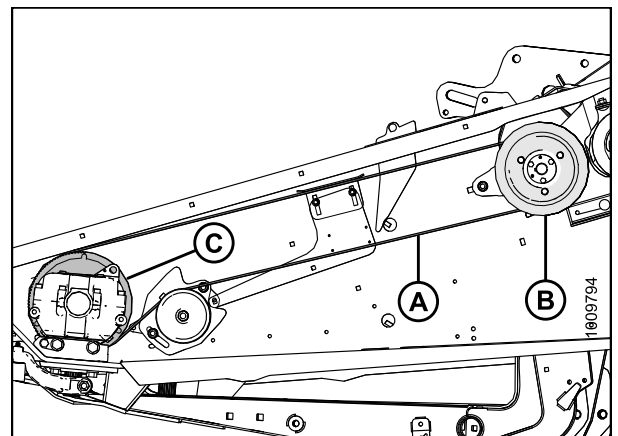


Figure 5.69: Left-Hand – Right-Hand Similar

MAINTENANCE AND SERVICING

NOTE:

The following two steps do not apply to the right side drive.

2. Install the two V-belts (C) and turn adjuster bolt (B) to tension them. Tension is checked at mid-span of the belts. The belts should deflect 5/32 in. (4 mm) with 12–17 lbf (52–77 N) of force applied to each belt.

NOTE:

Ensure drive motor is fully forward to allow V-belt's installation.

3. Tighten the two bolts (A) on endsheet.
4. Ensure that knives are timed before tightening belt. Refer to [Adjusting Double-Knife Timing, page 156](#).
5. Slide the idler pulley (A) in the slot on the support bracket (B) to take up the slack in the timing belt.

NOTE:

Ensure that the lower nut (C) is as high in the slot as possible.

6. Tighten the nut (D) to 157–173 ft·lbf (212–234 N·m).

7. Tension knife drive belt. Refer to [Tensioning Timed Knife Drive Belts, page 155](#).
8. Close endshield. Refer to [Closing Endshields, page 36](#).
9. Reinstall the access panel (A) and secure it with a bolt.

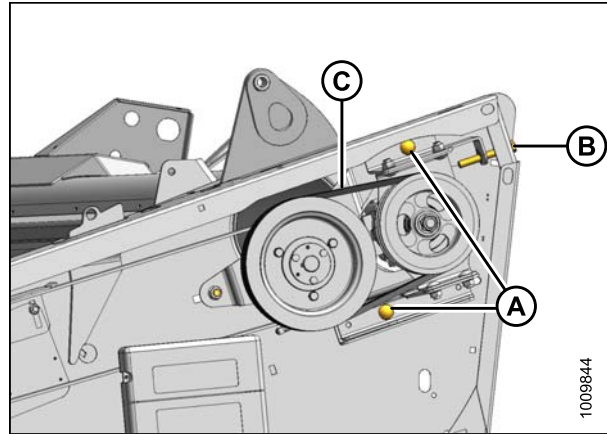


Figure 5.70: Knife Drive V-Belts

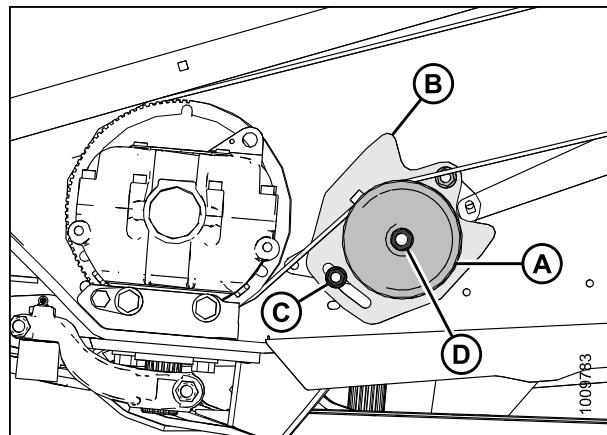


Figure 5.71: Knife Drive

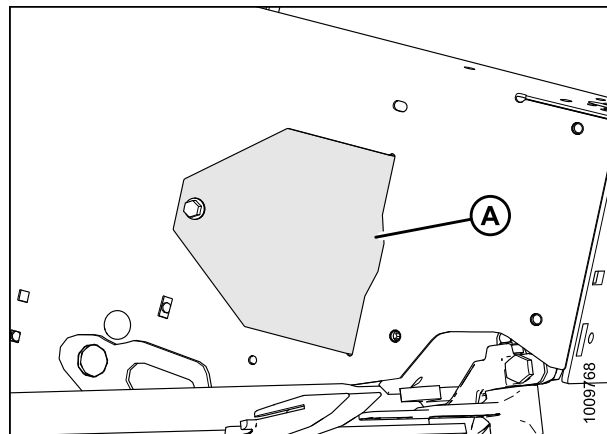


Figure 5.72: Access Cover

MAINTENANCE AND SERVICING

Tensioning Timed Knife Drive Belts

This describes the tensioning procedure for the timed left and right knife drive belts. The illustrations for the right side are opposite to what is shown.

IMPORTANT:

To prolong belt and drive life, do **NOT** over-tighten belt.

IMPORTANT:

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

1. Open left endshield. Refer to [Opening Endshields](#), page 35.
2. Loosen two nuts (A) on knife drive belt idler bracket.

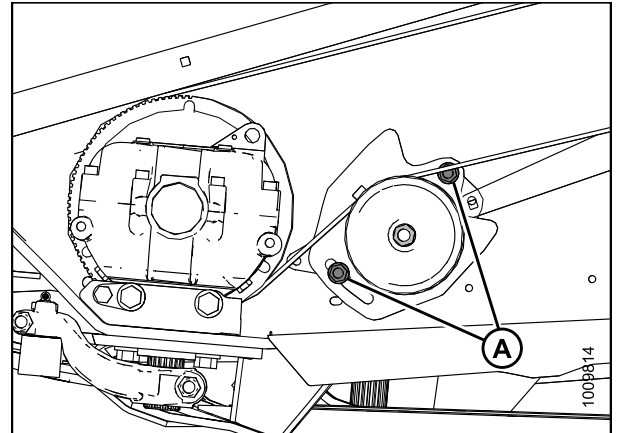


Figure 5.73: Knife Drive

3. Position pry bar (A) under the idler bracket (C), and push the bracket up until a force of 6 lb (27 N) deflects the belt 1/2 in. (13 mm) at mid-point of the upper span.

NOTE:

Placing a piece of wood (B) under pry bar (A) will protect the paint of the machine.

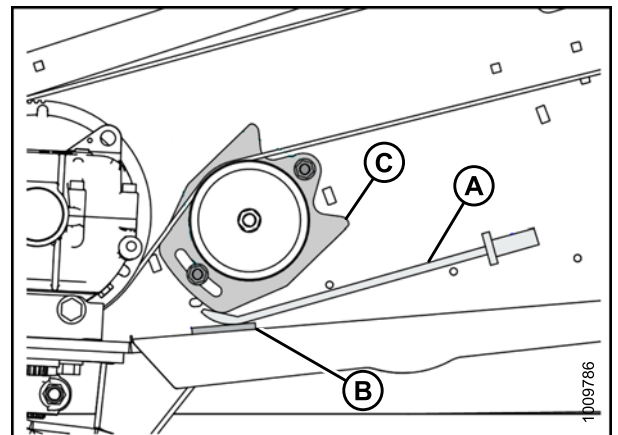


Figure 5.74: Knife Drive

MAINTENANCE AND SERVICING

4. Tighten nuts (C) to 54–59 ft·lbf (73–80 N·m) when proper belt tension is achieved.
5. Remove pry bar (A) and wood (B).

NOTE:

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

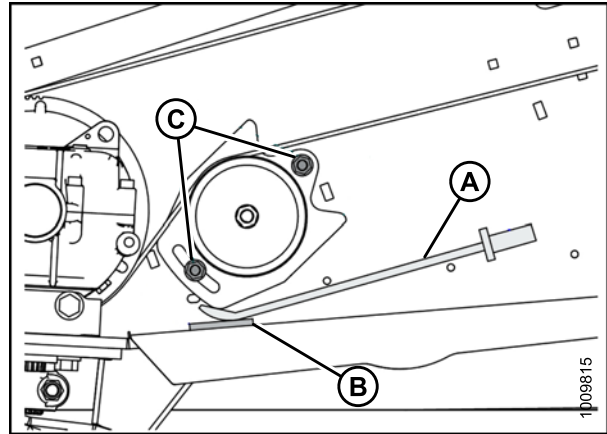


Figure 5.75: Knife Drive

6. Check that clearance (A) between belt (B) and guide (C) is 1/32–1/16 in. (0.5–1.5 mm).
7. If necessary, loosen bolts (D) and adjust guide as required. Tighten bolts.
8. Repeat procedure for opposite side of header.
9. Close endshields.

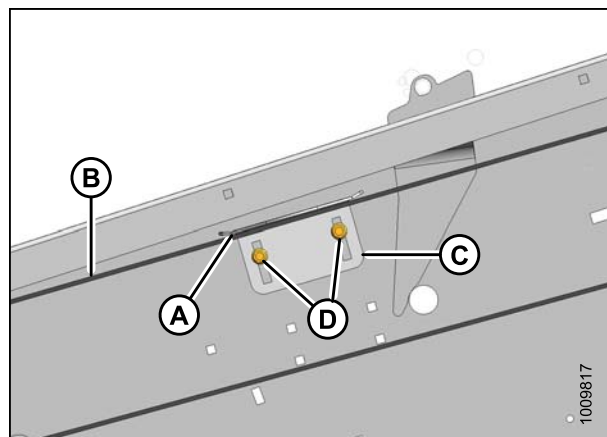


Figure 5.76: Belt Guide

Adjusting Double-Knife Timing

Timed double-knife D65 Draper Headers, 35-foot and smaller, require that knives are properly timed to move in opposite directions.

1. Open both endshields. Refer to [Opening Endshields, page 35](#).
2. Remove the belt on the right-hand side. Refer to [Removing Timed Knife Drive Belt, page 152](#).
3. Rotate the left knife drive box driven pulley clockwise until the left knife (A) is at the center of the inboard stroke (B) (moving towards center of header).

NOTE:

Center stroke is when the knife sections (C) are centered between guard points.

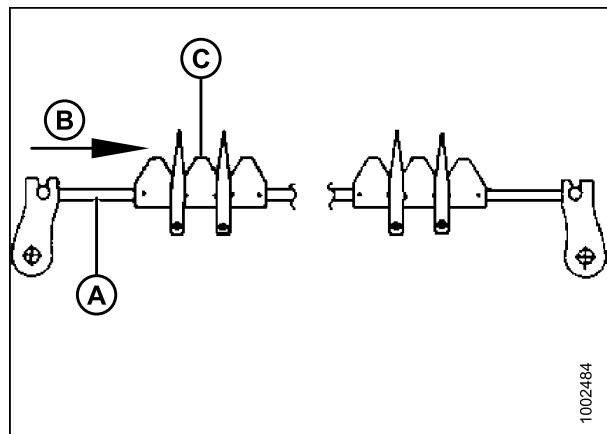


Figure 5.77: Timing: Left Side

MAINTENANCE AND SERVICING

4. Rotate the right knife drive box pulley counterclockwise until the right knife (A) is at the center of the inboard stroke (B) (moving towards center of header).

NOTE:

Center stroke is when the knife sections (C) are centered between guard points.

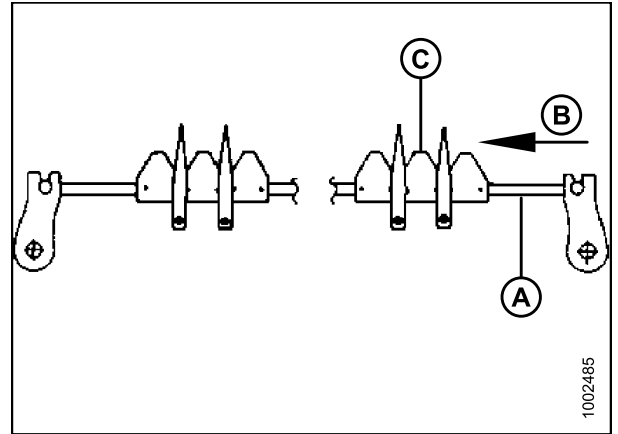


Figure 5.78: Timing: Right Side

5. Install right-hand belt (A).

NOTE:

To maintain timing, knife drive box driver and driven pulleys must not rotate as the belt is tightened.

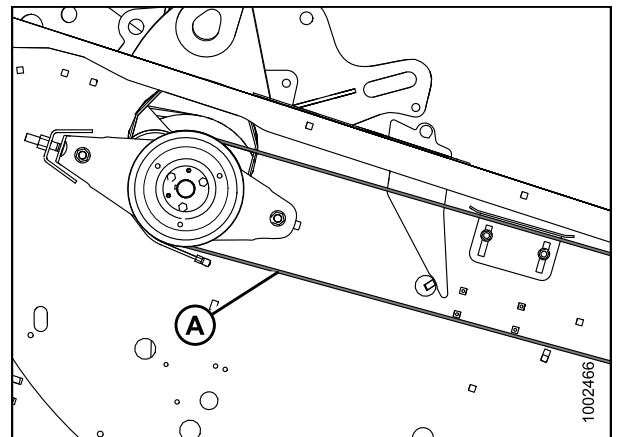


Figure 5.79: Knife Drive: Right Side

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

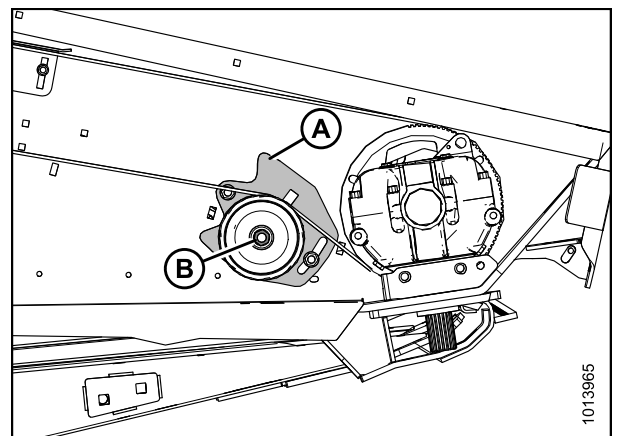


Figure 5.80

MAINTENANCE AND SERVICING

7. Position pry bar (A) under the idler bracket (C), and push the bracket up until a force of 6 lb (27 N) deflects the belt 1/2 in. (13 mm) at mid-point of the upper span.

NOTE:

Placing a piece of wood (B) under pry bar (A) will protect the paint of the machine.

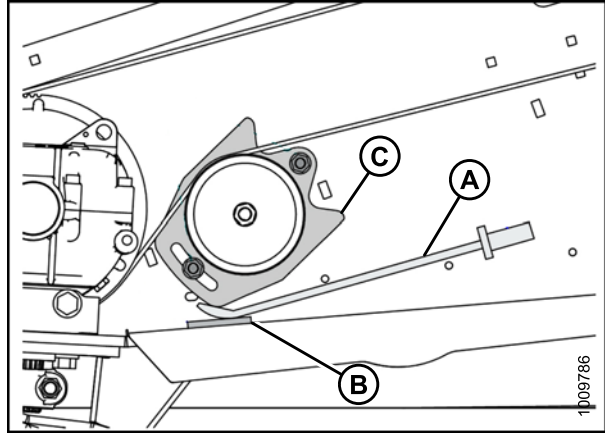


Figure 5.81: Left Side Shown-Right Side Opposite

8. Tighten nuts (C) to 54–59 ft·lbf (73–80 N·m) when proper belt tension is achieved.
9. Check that the timing belts are properly seated in the grooves on both driver and driven pulleys.
10. Check for correct knife timing by rotating the drive slowly by hand and observe knives where they overlap at the centre of the header.

IMPORTANT:

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

11. If the knives do not begin moving at the same time, loosen the right side drive belt (B) just enough to allow the belt to be repositioned to the next cog(s) and proceed as follows:
 - a. If right knife 'leads' left knife, rotate RIGHT SIDE driven pulley (A) clockwise.
 - b. If right knife 'lags' left knife, rotate RIGHT SIDE driven pulley (A) counterclockwise.
12. Retension the right side drive belt as per above, ensuring that the drive pulleys do not rotate.

IMPORTANT:

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

13. Recheck the timing.
14. Close both endshields. Refer to [Closing Endshields, page 36](#).

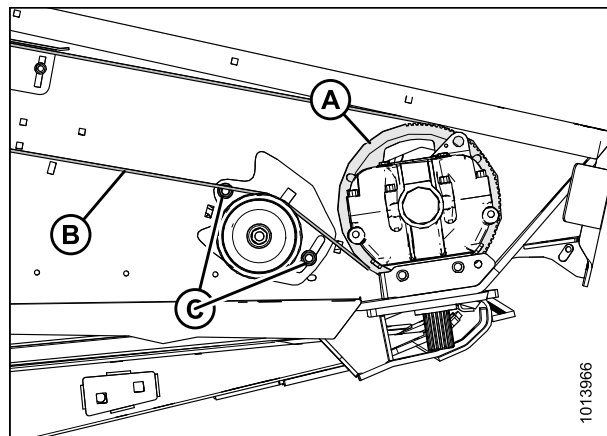


Figure 5.82

Adjusting Belt Tracking

The following procedure is applicable to the left side knife drive and the right side 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 0.08 in. (2 mm) 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.

To correct tracking problems, proceed as follows:

1. Open the endshields.

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.

WARNING

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

3. Shut down the windrower and remove key from ignition before making any adjustments.
4. If the belt is tracking toward the inboard side of the drive pulley, the likely cause is a toe-out problem (belt tends to move toward the low tension side of the pulley [inboard]). Proceed to Step 7., page 160 to correct the problem.
5. If the belt is tracking toward the outboard side of the drive pulley, the likely cause is a toe-in problem (belt tends to move toward the low tension side of the pulley [outboard]). Proceed to Step 7., page 160 to correct the problem.

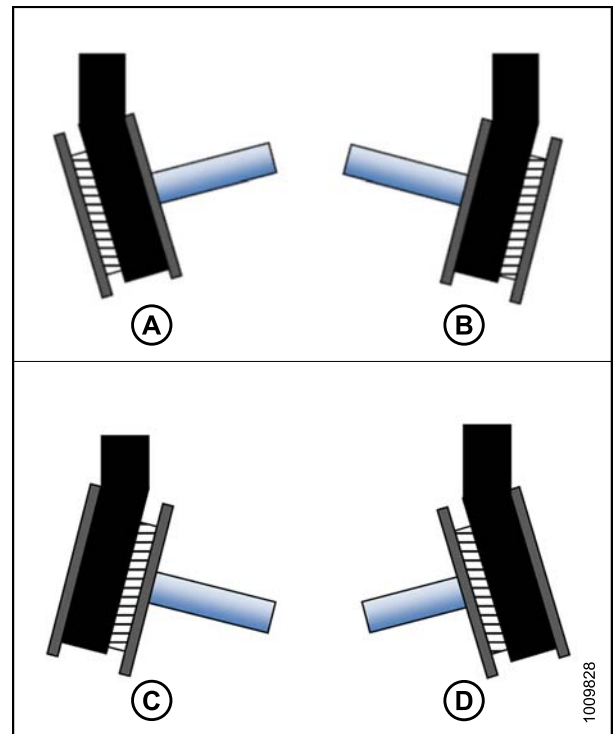


Figure 5.83: Knife Drive Pulley

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

MAINTENANCE AND SERVICING

6. If the belt (A) is tracking to one side of the knife drive box pulley (B), the likely cause is an out of position idler pulley (C). Proceed to Step 8., page 161 to correct the problem.

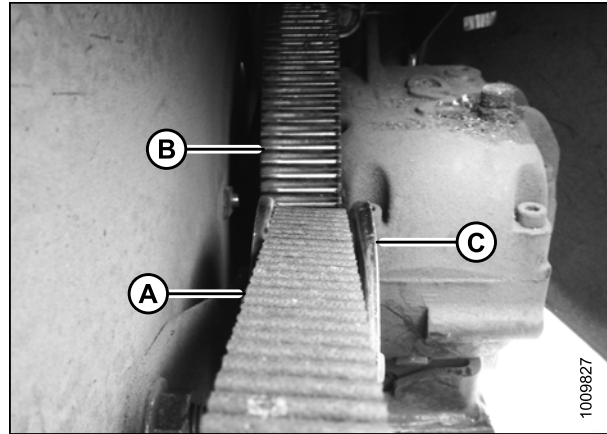


Figure 5.84: Knife Drive Belt

7. To correct the tracking problem on the drive pulley, adjust the position of the cross shaft support tube as follows:
 - a. Loosen nut (A) on support assembly (B).
 - b. Slide the support (B) rearward in slot (C) to correct toe-out condition, or forward to correct toe-in condition.
 - c. Retighten nut (A).
 - d. Operate the header and check the tracking. Adjust the support assembly as required.
 - e. If the belt tracking problem continues, proceed to Step 9., page 162.

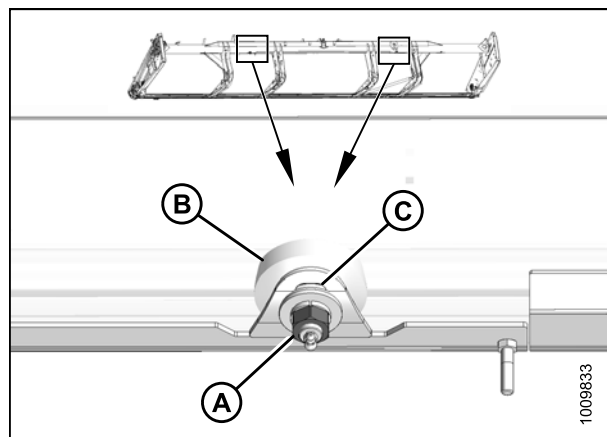


Figure 5.85: Cross-Shaft Support

MAINTENANCE AND SERVICING

8. To correct the tracking problem on the knife drive box pulley, adjust the position of the idler as follows:
 - a. Loosen nuts (A) and (B) and move bracket and idler until belt is loose.
 - b. Remove nut (B) securing idler to bracket, and remove lock washer, idler pulley, and flat washer.
 - c. Install the idler pulley (C), ensuring it lines up with the knife drive box pulley, using flat washer(s) (D) as required.
 - d. Reinstall lock washer (E) and nut (B).
 - e. Tension the belt. Refer to [Tensioning Timed Knife Drive Belts, page 155](#).
 - f. Operate the header and check the tracking.

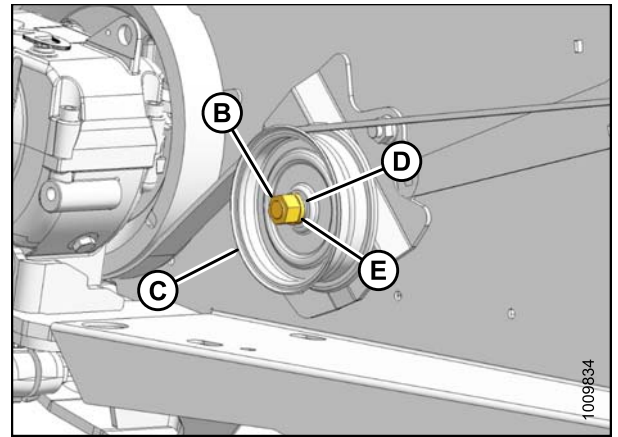
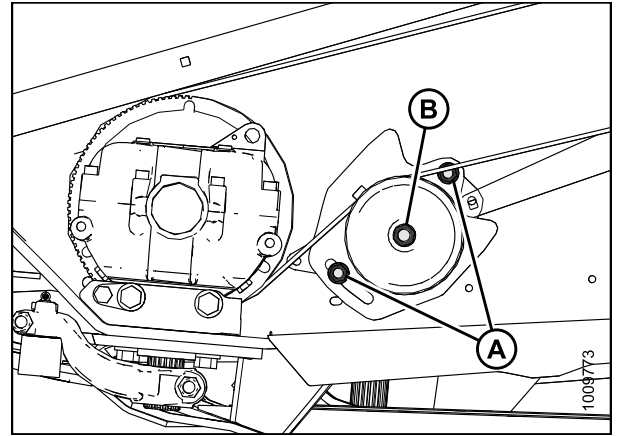


Figure 5.86: Knife Drive

MAINTENANCE AND SERVICING

9. If further adjustment to correct the drive pulley tracking is required, proceed as follows:
 - a. Loosen nut (A) on idler and nuts (B) on idler bracket.
 - b. Loosen nuts (C) at drive pulley location.
 - c. Turn adjuster bolt (D) clockwise to correct a toe-in problem, which will allow the belt to track inboard.
 - d. Turn adjuster bolt (D) counterclockwise to correct a toe-out problem, which will allow the belt to track outboard.
 - e. Tighten nuts (C) at drive pulley location.
 - f. Tension the belt. Refer to [Tensioning Timed Knife Drive Belts, page 155](#).
 - g. Operate the header and check the tracking. Adjust the drive pulley if required, as per the above steps.

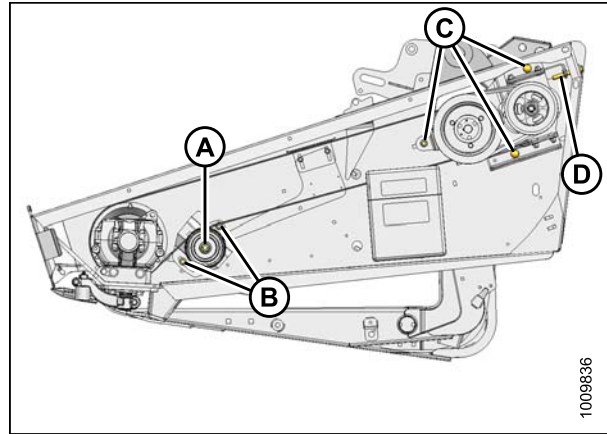


Figure 5.87: Knife Drive: Left Side

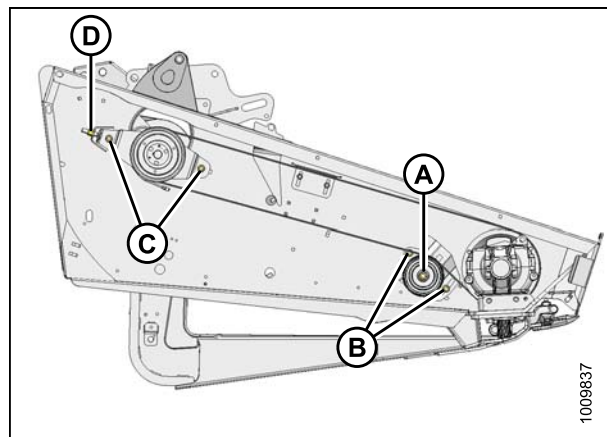


Figure 5.88: Knife Drive: Right Side

5.7 Drapers

Replace drapers if torn, cracked, or missing slats.

5.7.1 Removing Drapers

To remove a draper, follow these steps:

WARNING

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

1. Raise reel and engage reel safety props.
2. Raise header and engage safety props.
3. Move draper until draper joint is in work area.

NOTE:

Deck can also be shifted towards center to provide opening at endsheet.

4. Release tension on the draper. Refer to [5.7.3 Adjusting Draper Tension, page 165](#).
5. Remove fasteners (A) and tube connectors (B) at the draper joint.
6. Pull draper from deck.

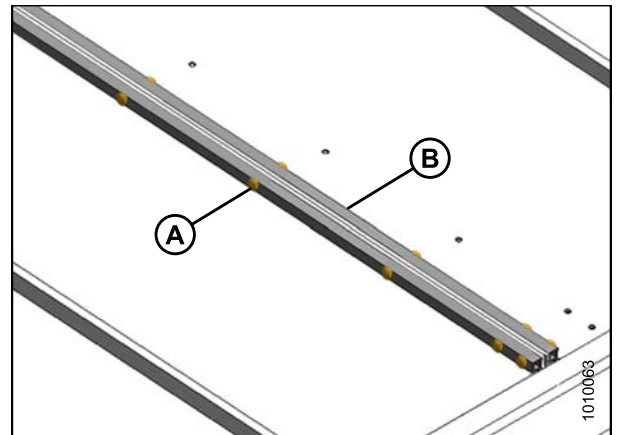


Figure 5.89: Draper Connector

5.7.2 Installing Drapers

WARNING

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

NOTE:

Check the deck height before installing the drapers. Refer to [5.7.7 Adjusting Deck Height, page 172](#).

MAINTENANCE AND SERVICING

1. 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.
2. 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.
3. Feed in the draper until it can be wrapped around the drive roller.
4. Insert the opposite end of the draper into the deck over the rollers. Pull the draper fully into the deck.



Figure 5.90: Installing Draper

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

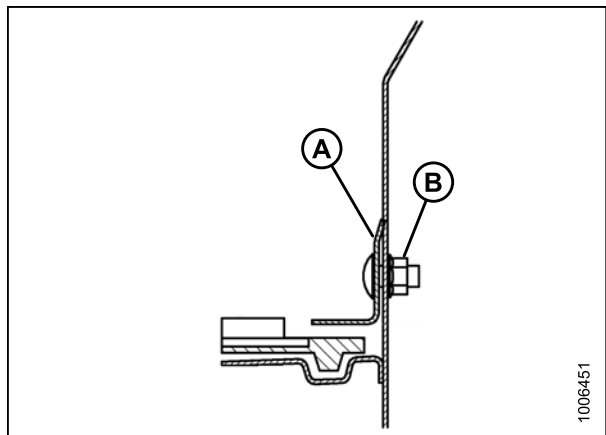


Figure 5.91: Draper Seal

6. Attach the ends of the draper with tube connectors (B), screws (A) (with the heads facing the center opening), and nuts.
7. Adjust the draper tension. Refer to [5.7.3 Adjusting Draper Tension, page 165](#).

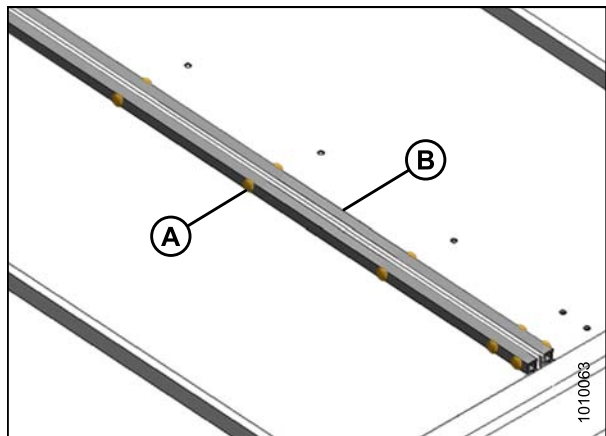


Figure 5.92: Draper Connector

MAINTENANCE AND SERVICING

8. Check the draper seal between the drapers and the cutterbar. Ensure there is a 0.04–0.08 in. (1–2 mm) gap (A) between the cutterbar (C) and the draper (B).
9. Refer to [5.7.7 Adjusting Deck Height, page 172](#) to achieve the proper gap.

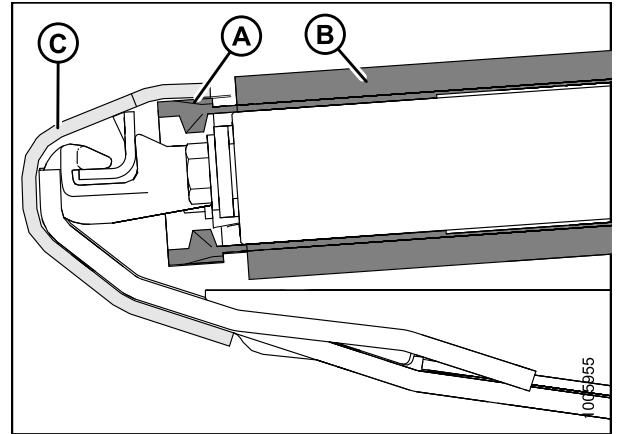


Figure 5.93: Draper Seal

10. Adjust the backsheet deflector (A) (if required) by loosening nut (D) and moving the deflector until there is a 1/32–5/16 in. (1–7 mm) gap (C) between the draper (B) and the deflector.
11. Operate the drapers with the engine at idle so the talc or talc/graphite lubricant makes contact and adheres to the draper seal surfaces.

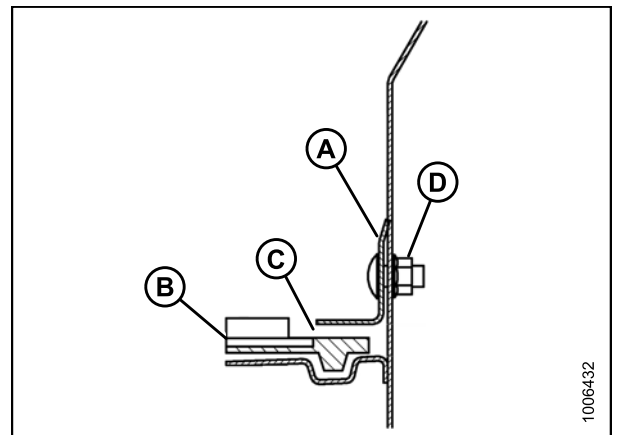


Figure 5.94: Draper Seal

5.7.3 Adjusting Draper Tension

WARNING

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

NOTE:

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

MAINTENANCE AND SERVICING

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

WARNING

Check to be sure all bystanders have cleared the area.

2. Start the engine and raise the header.
3. Stop the engine, remove the key from the ignition, and engage the header safety props.

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

5. Ensure the idler roller is between the guides.

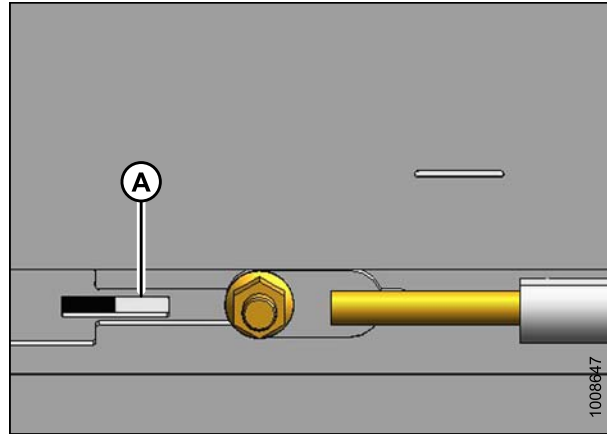


Figure 5.95: Left-Hand Tension Adjuster Shown – Right-Hand Opposite

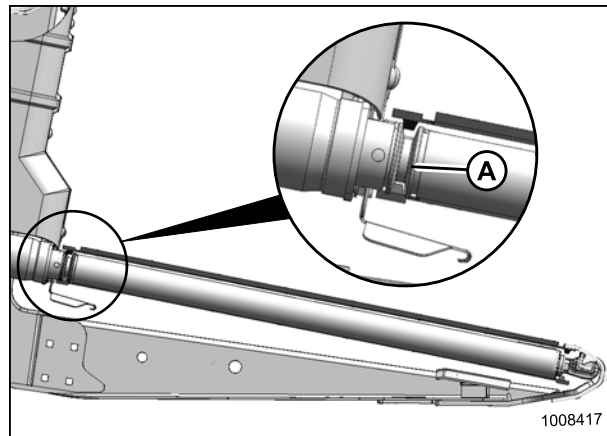


Figure 5.96: Drive Roller

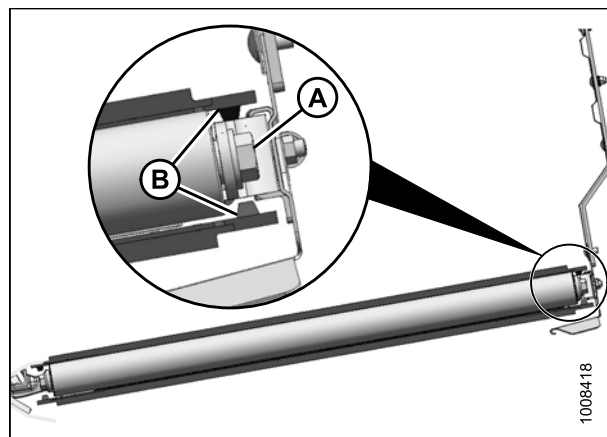


Figure 5.97: Idler Roller

IMPORTANT:

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

6. Turn the adjuster bolt (A) counterclockwise to loosen, and the white indicator bar (B) will move outboard in the direction of arrow (D) to indicate that the draper is loosening. Loosen until the white indicator bar is at the halfway point in the window.
7. Turn the adjuster bolt (A) clockwise to tighten, and the white indicator bar (B) will move inboard in the direction of arrow (E) to indicate that the draper is tightening. Tighten until the white indicator bar is at the halfway point in the window.

IMPORTANT:

- To avoid premature failure of the draper, draper rollers, and/or tightener components, do not operate 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.

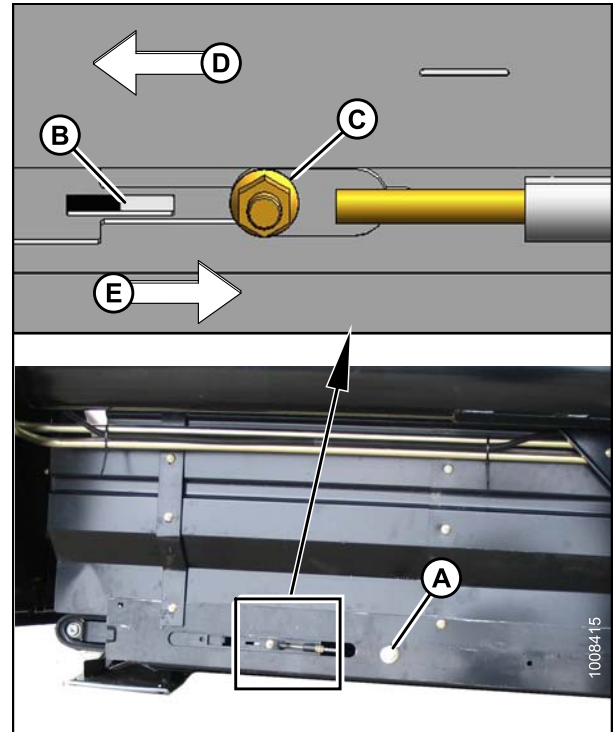


Figure 5.98: Left-Hand Tension Adjuster Shown – Right-Hand Opposite

5.7.4 Removing Endless Draper

⚠ DANGER

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

1. Raise reel and engage reel props.
2. Raise header and install safety props.

MAINTENANCE AND SERVICING

- Turn bolt (A) counterclockwise to fully loosen draper. White indicator bar (B) will move outboard in direction of arrow to indicate that draper is loosening.

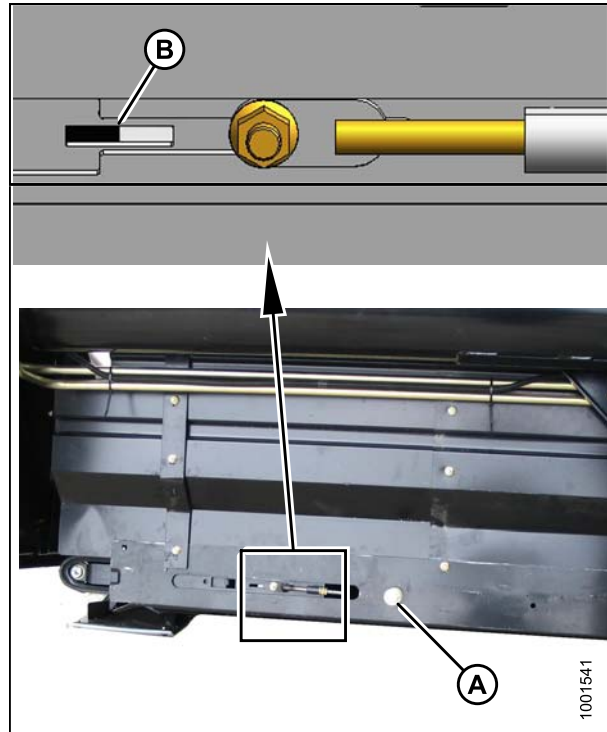


Figure 5.99: Draper Tensioner

- Push draper away from cutterbar (as shown) to expose deck support (A).

NOTE:

There are two or three supports depending on header size.

- Remove two center nuts (B) at each support.
- Move deck away from cutterbar to disengage deck supports.

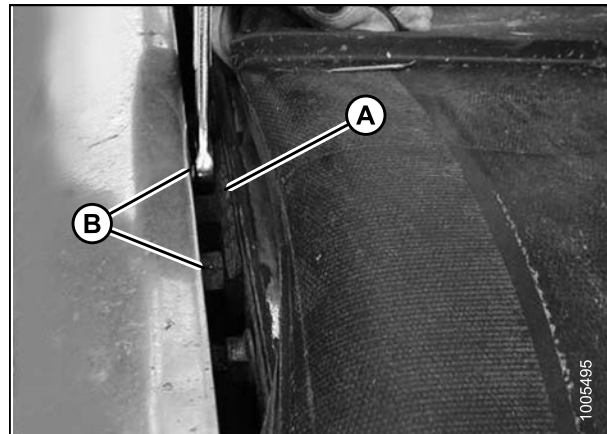


Figure 5.100: Deck Support

MAINTENANCE AND SERVICING

7. Insert a pry bar (A) into the hole located in the deck at the approximate deck mid-point location, and lift the deck clear of the cutterbar.

NOTE:

Ensure pry bar is long enough to accommodate the width of the draper.

8. Support pry bar (A) on a suitably sized stand (B).

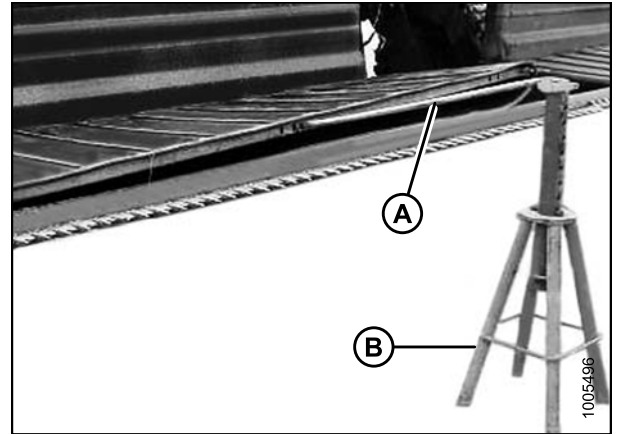


Figure 5.101: Lifting the Deck

9. Pull draper off deck and onto pry bar.
10. Remove stand (B), draper, and pry bar (A).

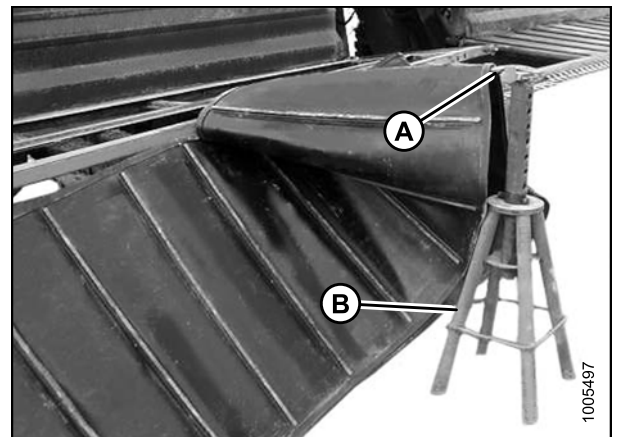


Figure 5.102: Removing Draper

5.7.5 Installing Endless Draper

⚠ DANGER

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

1. Insert a pry bar (A) through draper and locate bar in hole in deck located at approximately the deck mid-point.

NOTE:

Pry bar should be sufficient length to accommodate width of draper.

2. Lift deck clear of cutterbar and support bar on a suitably sized stand (B).
3. Slide draper onto deck.

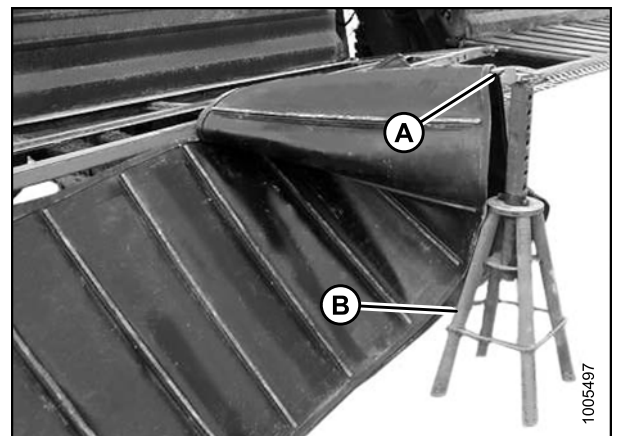


Figure 5.103: Supporting the Draper

MAINTENANCE AND SERVICING

4. Lift deck, remove stand (B), and lower deck into position. Remove pry bar (A).

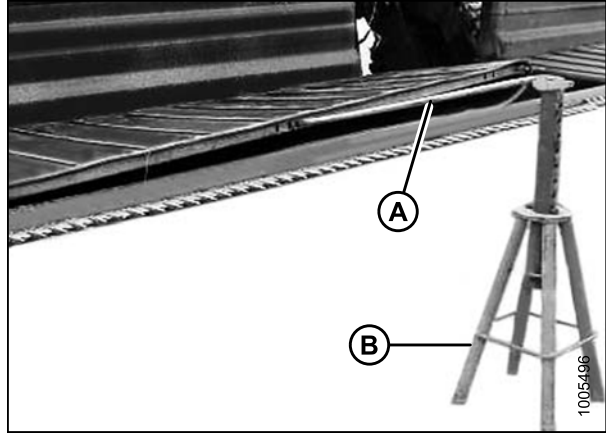


Figure 5.104: Lifting the Deck

5. Line-up deck supports (A) with bolts in deck.
6. Move deck towards cutterbar to engage deck supports.
7. Install nuts (B) and tighten.
8. Adjust draper tension. Refer to [5.7.3 Adjusting Draper Tension, page 165](#).

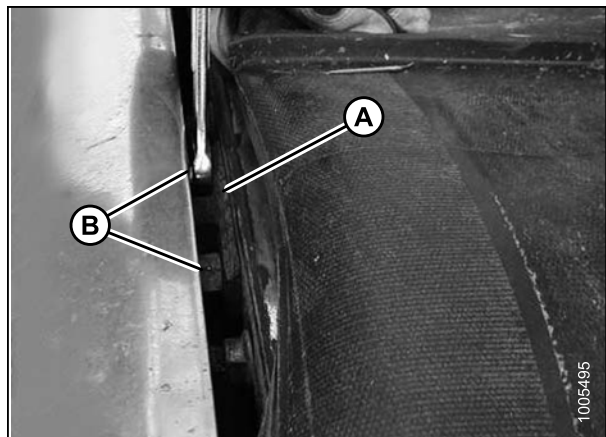


Figure 5.105: Deck Support

5.7.6 Adjusting Header Draper Tracking

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.

CAUTION

To avoid personal injury, before servicing machine or opening drive covers, refer to [5.1 Preparing Machine for Servicing, page 111](#).

MAINTENANCE AND SERVICING

Table 5.1 Header Draper Tracking

Tracking	At Location	Adjustment	Method
Backward	Drive Roller	Increase 'X'	Tighten nut (C)
Forward		Decrease 'X'	Loosen nut (C)
Backward	Idler Roller	Increase 'Y'	Tighten nut (C)
Forward		Decrease 'Y'	Loosen nut (C)

1. Refer to Table 5.1 Header Draper Tracking, page 171 to determine which roller requires adjustment and which adjustments are necessary.

NOTE:

To change 'X', adjust the back end of the roller using the adjuster mechanism at the inboard end of the deck.

2. Adjust the **drive** roller at 'X' as follows:
 - a. Loosen nuts (A) and jam nut (B).
 - b. Turn the adjuster nut (C).

3. Adjust the **idler** roller 'Y' as follows:
 - a. Loosen nut (A) and jam nut (B).
 - b. Turn the 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.

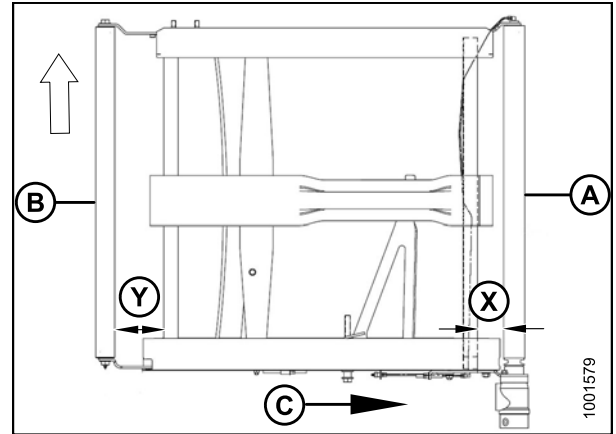


Figure 5.106: Draper Tracking Adjustments

A - Drive Roller B - Idler Roller C - Draper Direction
X - Drive Roller Adjust Y - Idler Roller Adjust

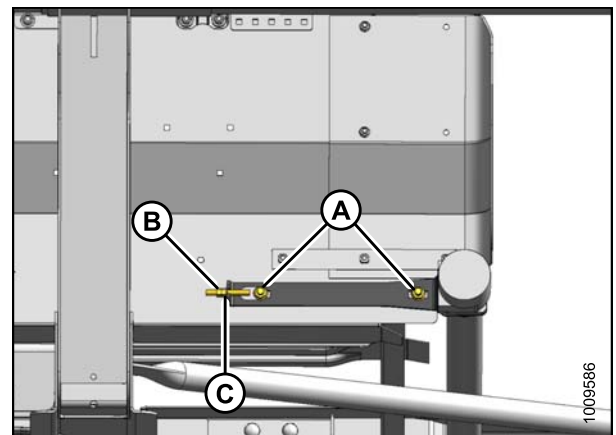


Figure 5.107: Left Side Drive Roller

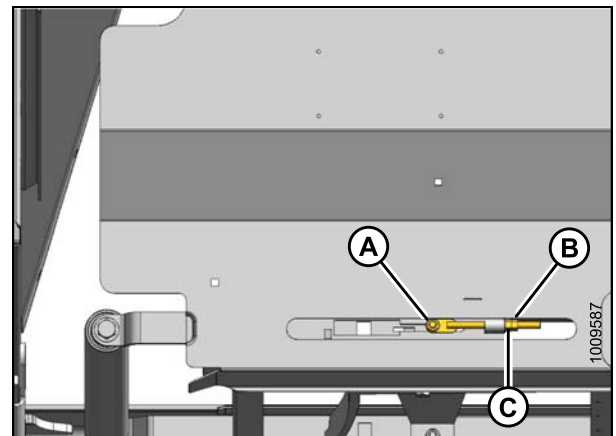


Figure 5.108: Left Side Idler Roller

5.7.7 Adjusting Deck Height

Maintain deck height so the draper runs just below the cutterbar. With a new header or newly installed draper, set the initial gap to 1/8 in. (3 mm). To prevent material from entering the drapers and cutterbar, you may need to decrease the deck clearance to 0–1/32 in. (0–1 mm) after the initial break-in period of approximately 50 hours.

DANGER

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

1. Check the deck height and ensure the draper (B) runs just below the cutterbar (C) with a gap (A) of 1/8 in. (3 mm) between the top of the deck front track and the cutterbar.

NOTE:

Measurement is at the supports with the header in working position and the decks fully forward.

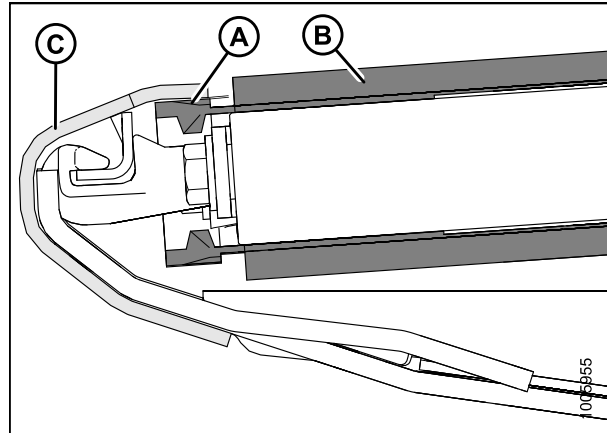


Figure 5.109: Draper Seal

2. Loosen the draper tension. Refer to [5.7.3 Adjusting Draper Tension, page 165](#).
3. Lift the front edge of the draper (A) past the cutterbar (B) to expose the deck support.

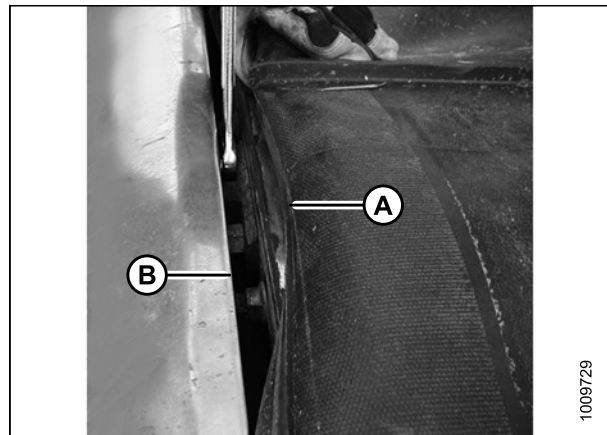


Figure 5.110: Draper Adjustment

MAINTENANCE AND SERVICING

- Loosen the two lock nuts (A) on the deck support (B) **one-half turn only**.

NOTE:

The number of deck supports (B) is determined by the header size: four on single reels, and eight on double reels.

- Tap the deck (C) to lower the deck relative to the deck supports. Tap the deck support (B) using a punch to raise the deck relative to the deck supports.

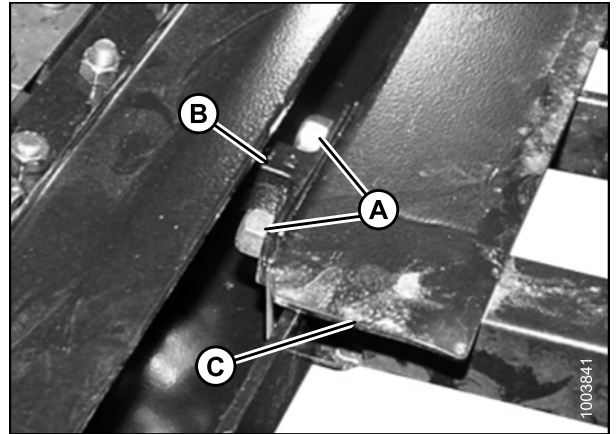


Figure 5.111: Deck Support

- Set the deck (A) to a gap (B) of 5/16–3/8 in. (8–9 mm) below the cutterbar (C) to create a seal.
- Tighten the deck support hardware (D).
- Recheck the gap (B) to ensure it is properly set to 5/16–3/8 in. (8–9 mm).
- Tension the draper. Refer to [5.7.3 Adjusting Draper Tension](#), page 165.

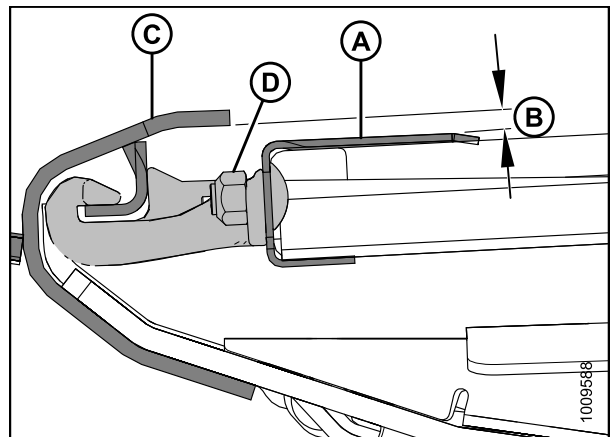


Figure 5.112: Deck Support

- Adjust the backsheet deflector (A) (if required) by loosening nut (D) and moving the deflector until there is a 1/32–5/16 in. (1–7 mm) gap (C) between the draper (B) and the deflector.

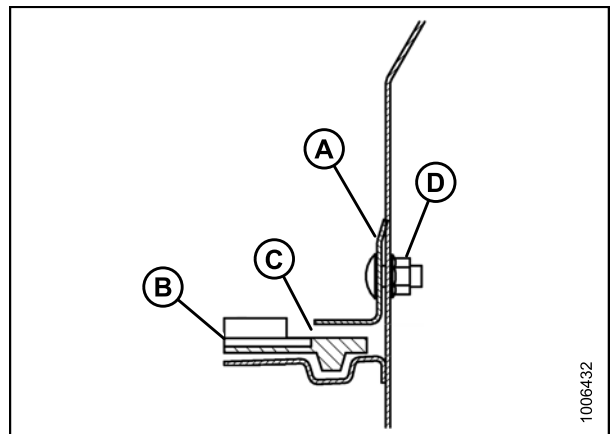


Figure 5.113: Backsheet Deflector

5.7.8 Draper Roller Maintenance

The draper rollers have non-greaseable bearings. The external seal should be checked every 200 hours (more frequently in sandy conditions) to obtain the maximum bearing life.

Inspecting Draper Roller Bearing

If a bad bearing is suspected in one of the draper rollers, a quick way to check is by using an infrared thermometer.

1. Engage header and run for approximately three minutes.
2. Check the temperature of each of the roller arms (A), (B), and (C) on each deck. The temperature should not exceed 80°F (44°C) above ambient temperature.

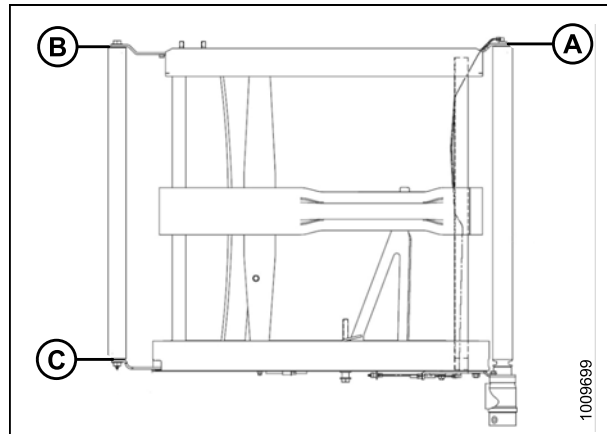


Figure 5.114: Roller Arms

Draper Deck Idler Roller

Removing Draper Idler Roller

DANGER

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

NOTE:

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

1. Start the engine, raise the header, and raise the reel.
2. Stop the engine, remove the key, engage the reel safety props, and engage the header safety props.
3. Loosen the draper by turning adjuster bolt (A) counterclockwise.

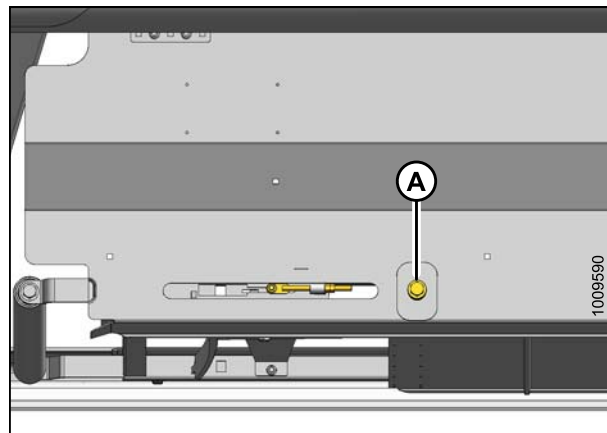


Figure 5.115: Tensioner

MAINTENANCE AND SERVICING

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

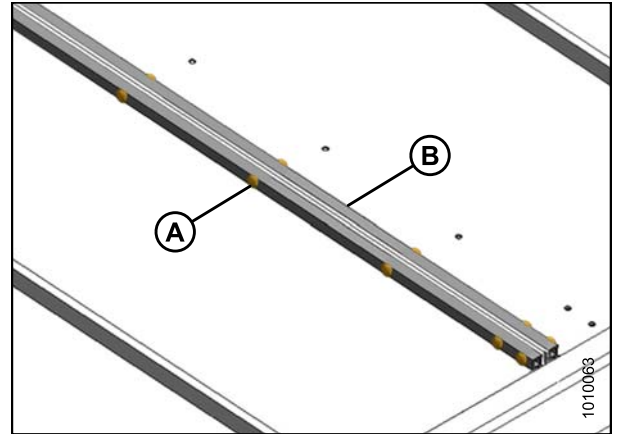


Figure 5.116: Draper Connector

6. Remove the bolts (A) and washer at the ends of the idler roller.
7. Spread the roller arms (B) and (C) and remove the idler roller.

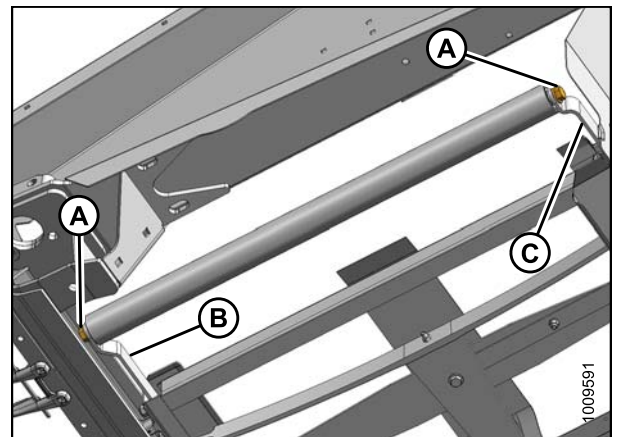


Figure 5.117: Idler Roller

Replacing Draper Idler Roller Bearing

1. Remove the draper idler roller assembly. Refer to [Removing Draper Idler Roller, page 174](#).

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2. Remove the bearing assembly (A) and seal (B) from the roller tube (C) as follows:
 - a. Attach a slide hammer (D) to the threaded shaft (E) in the bearing assembly.
 - b. Tap out the bearing assembly (A) and seal (B).
3. Clean the inside of the roller tube (C), check the tube for signs of wear or damage, and replace if necessary.

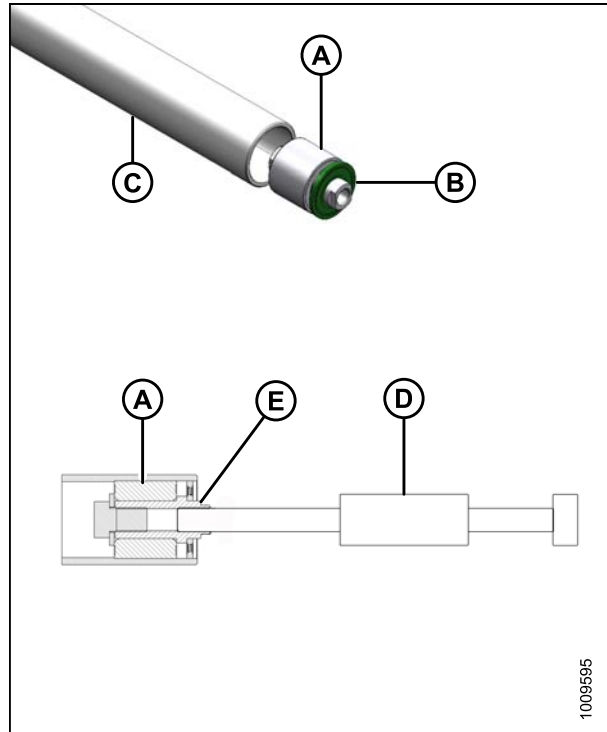


Figure 5.118: Idler Roller Bearing

4. Install the new bearing assembly (A) by pressing the outer race of the bearing into the tube until it is 9/16–19/32 in. (14–15 mm) (B) from the outside edge of the tube.
5. Apply the recommended grease in front of the bearing assembly (A). Refer to [5.2.1 Recommended Fluids and Lubricants, page 112](#).
6. Install a new seal (C) at the roller opening, and install a flat washer (1.0 in. I.D. x 2.0 in. O.D.) on the seal.
7. Tap the seal (C) into the roller opening with a suitably sized socket. Tap the washer and the bearing assembly (A) until the seal is 1/8–3/16 in. (3–4 mm) (D) from the outside edge of the tube.

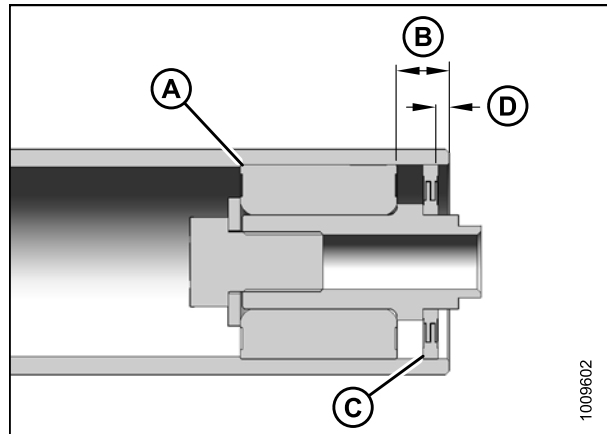


Figure 5.119: Idler Roller Bearing

Installing Draper Idler Roller

1. Position the stub shaft into the idler roller in the 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 the rear arm (C).
3. Install bolts (A) with washers, and torque to 70 ft-lbf (93 N-m).
4. Wrap the draper over the idler roller, close the draper, and set the tension. Refer to [5.7.2 Installing Drapers, page 163](#).
5. Run the machine and verify the draper tracks correctly. Adjust the draper tracking if required. Refer to [5.7.6 Adjusting Header Draper Tracking, page 170](#).

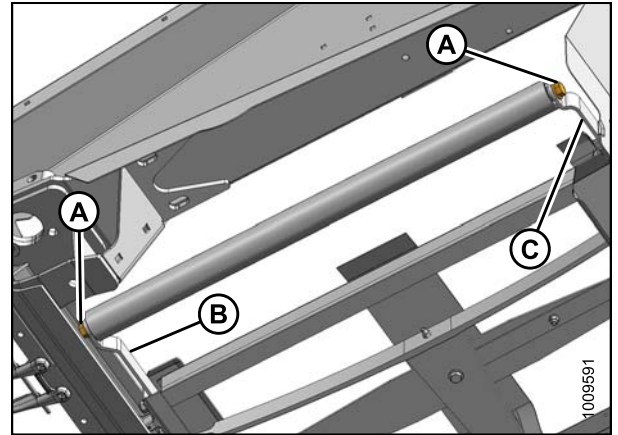


Figure 5.120: Idler Roller

Draper Deck Drive Roller

Removing Draper Drive Roller

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

WARNING

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

2. Raise header and reel, and then shutdown the engine.
3. Engage header lift cylinder safety props and reel lift cylinder safety props.
4. Loosen draper by turning adjuster bolt (A) counterclockwise.

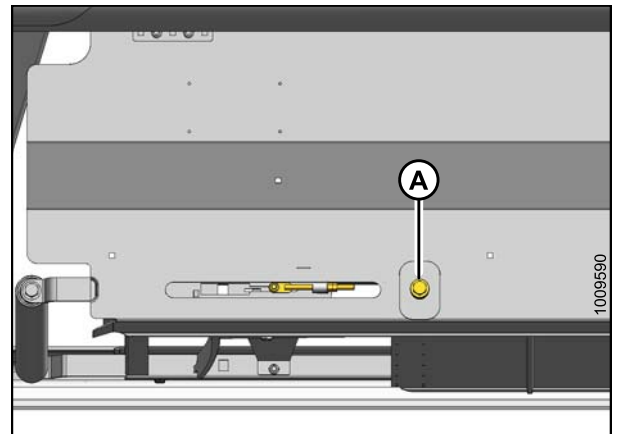


Figure 5.121: Tensioner

MAINTENANCE AND SERVICING

5. Remove fasteners (A) and tube connectors (B) at the draper joint to uncouple the draper.
6. Pull the draper off the drive roller.

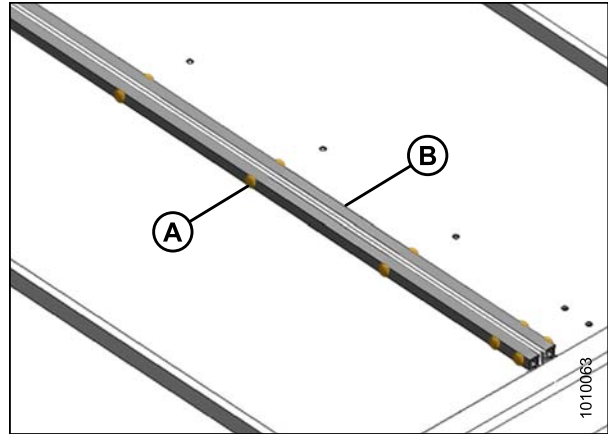


Figure 5.122: Draper Connector

7. Line up the setscrews with the hole (A) in the guard. Remove the two setscrews that hold the motor onto the drive roller.

NOTE:

The setscrews are a 1/4 turn apart.

8. Remove the four bolts (B) that hold motor to the drive roller arm.

NOTE:

Plastic shield (C) may require removal to gain access to the top bolt.

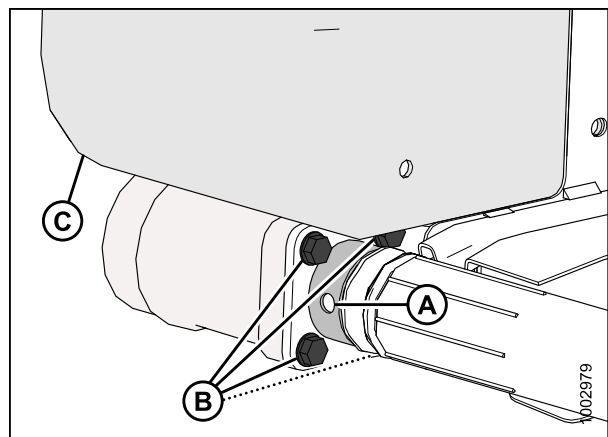


Figure 5.123: Drive Roller

9. Remove bolt (A) that secures the other end of the drive roller (B) to the support arm.
10. Remove the drive roller (B).

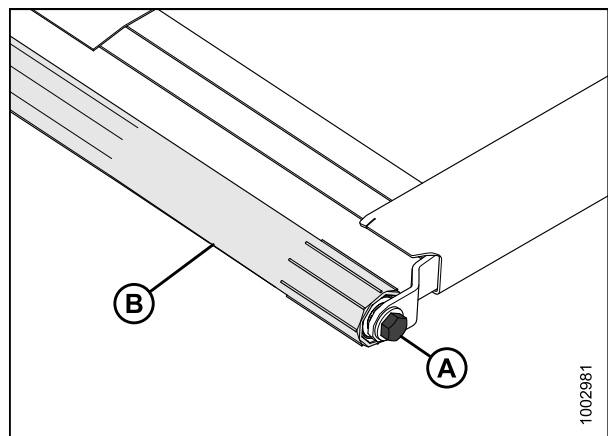


Figure 5.124: Drive Roller

Replacing Draper Drive Roller Bearing

1. Remove the draper idler roller assembly. Refer to [Removing Draper Drive Roller, page 177](#).

MAINTENANCE AND SERVICING

2. Remove the bearing assembly (A) and seal (B) from the roller tube (C) as follows:
 - a. Attach a slide hammer (D) to the threaded shaft (E) in the bearing assembly.
 - b. Tap out the bearing assembly (A) and seal (B).
3. Clean the inside of the roller tube (C), check the tube for signs of wear or damage, and replace if necessary.

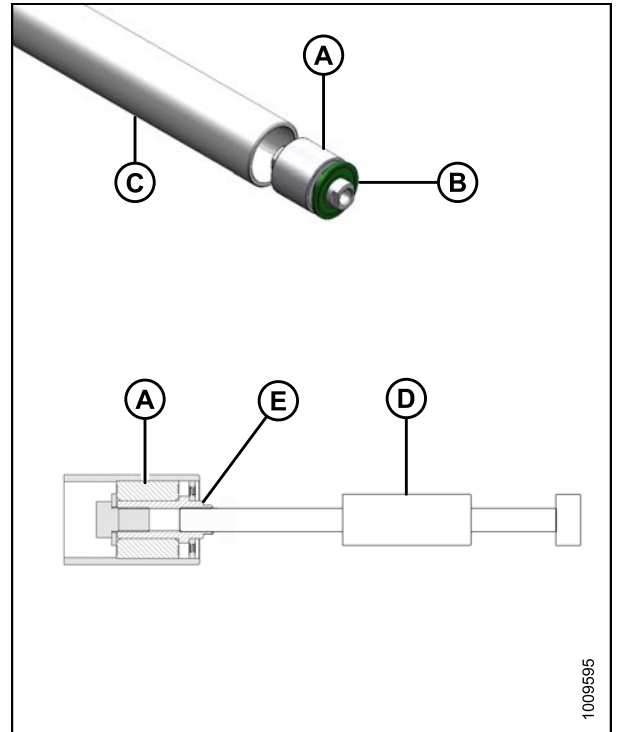


Figure 5.125: Drive Roller Bearing

4. Install the new bearing assembly (A) by pressing the outer race of the bearing into the tube until it is 9/16–19/32 in. (14–15 mm) (B) from the outside edge of the tube.
5. Apply the recommended grease in front of the bearing assembly (A). Refer to [5.2.1 Recommended Fluids and Lubricants, page 112](#).
6. Install a new seal (C) at the roller opening, and install a flat washer (1.0 in. I.D. x 2.0 in. O.D.) on the seal.
7. Tap the seal (C) into the roller opening with a suitably sized socket. Tap the washer and the bearing assembly (A) until the seal is 1/8–3/16 in. (3–4 mm) (D) from the outside edge of the tube.

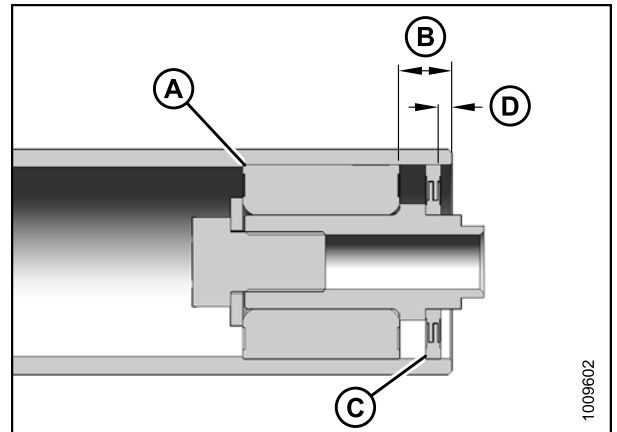


Figure 5.126: Drive Roller Bearing

MAINTENANCE AND SERVICING

Installing Draper Drive Roller

1. Position the drive roller (B) between the roller support arms.
2. Install bolt (A) that holds the drive roller to the arm closest to the cutterbar. Torque bolt to 70 ft·lbf (95 N·m).
3. Grease motor shaft and insert into the end of the drive roller.

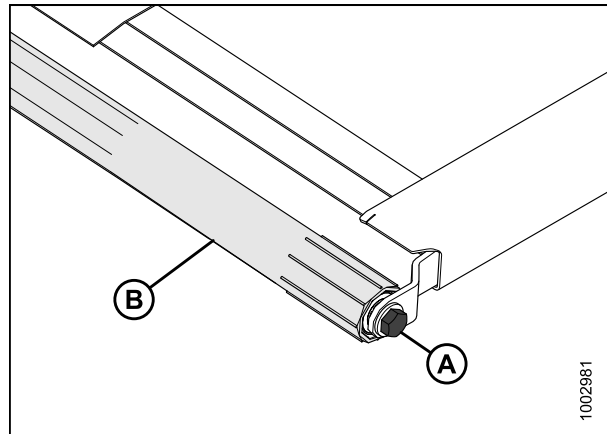


Figure 5.127: Drive Roller

4. Secure motor to the roller support with four bolts (A). Torque to 20 ft·lbf (27 N·m).

NOTE:

Tighten any loosened bolts and reinstall plastic shield (B), if removed.

5. Tighten the two setscrews through access hole (C).

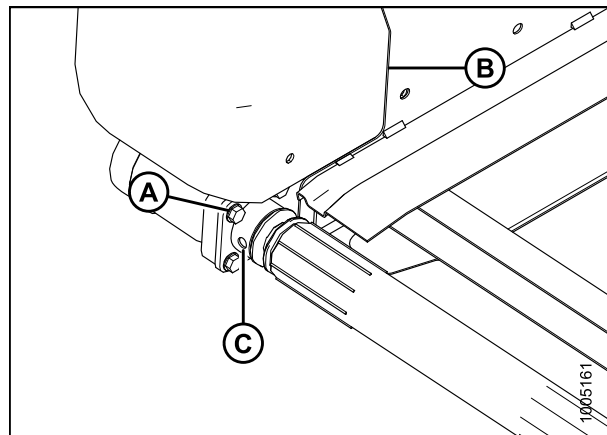


Figure 5.128: Drive Roller

6. Wrap the draper over the drive roller and attach ends of draper with tube connectors (B), screws (A), and nuts.

NOTE:

Head of screws must face the center opening.

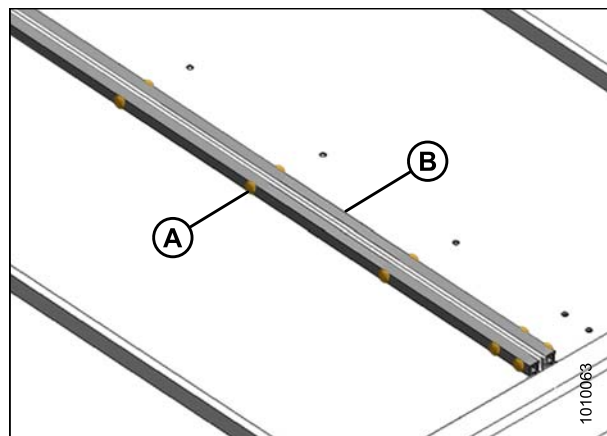


Figure 5.129: Draper Connector

MAINTENANCE AND SERVICING

7. Tension the draper with tensioner bolt (A) and follow the directions on the decal for proper draper tensioning.
8. Disengage the reel and header safety props.
9. Start the engine and lower header and reel.
10. Run machine to verify that draper tracks correctly.
11. If adjustment is required, refer to [5.7.6 Adjusting Header Draper Tracking, page 170](#).

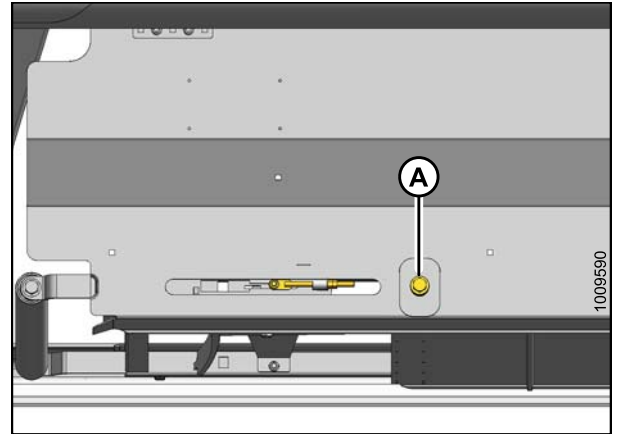


Figure 5.130: Draper Tensioner

5.7.9 Replacing Draper Deflectors

Removing Wide Draper Deflectors

To remove draper deflector, follow these steps:

NOTE:

Left end removal is illustrated.

1. Raise reel fully and lower header to ground.
2. Shift decks to allow work space at one end of header if hydraulic deck shift installed, otherwise move decks manually after shutting down windrower.

⚠ WARNING

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

3. Stop engine, remove key, and engage reel safety props.
4. Open endshield.
5. Loosen nuts (A) on cutterbar until retainer (B) is loose.

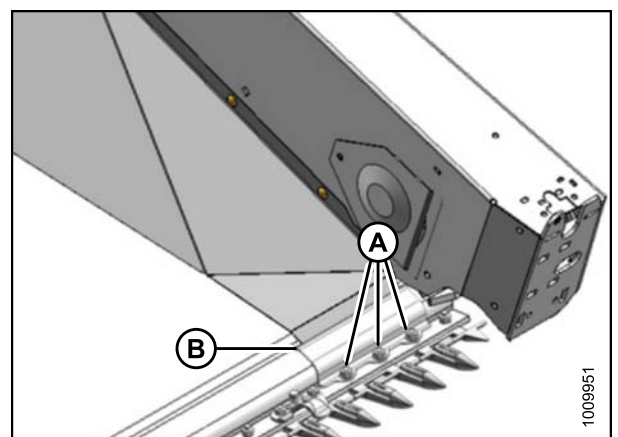


Figure 5.131: Deflector Retainer

MAINTENANCE AND SERVICING

6. Remove fasteners securing deflector to endsheet. Nuts (A) are accessible from endshield side. Nuts (B) on uppermost fasteners are accessible from behind the deflector (C).
7. Remove the deflector (C).

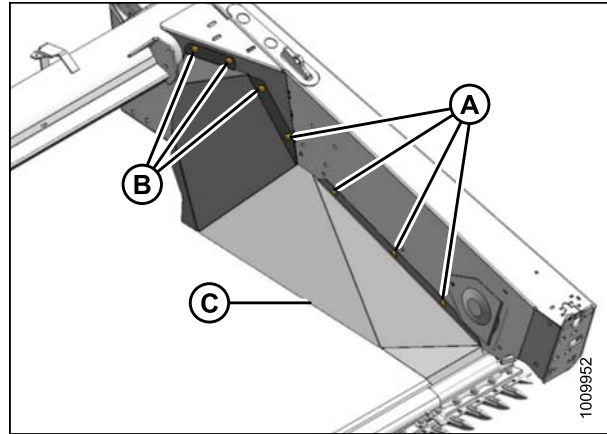


Figure 5.132: Wide Deflector

8. Remove bolts (A) and remove deflector support (B).
9. If support (B) will not be reinstalled, replace lower bolt (B) that holds belt guide (C) on opposite side of endsheet.
10. Repeat above steps for opposite end.

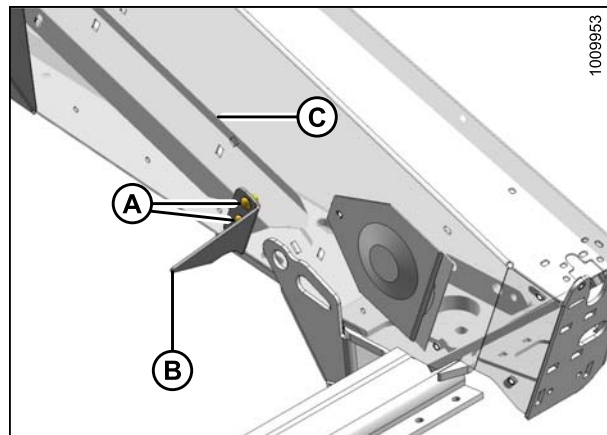


Figure 5.133: Deflector Support

Installing Wide Draper Deflectors

To install draper deflector, follow these steps:

NOTE:

Left installation is illustrated.

1. Raise reel fully and lower header to ground.
2. Shift decks to allow work space at one end of header, if hydraulic deck shift is installed. Otherwise, move decks manually after shutting down windrower.

⚠ WARNING

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

3. Stop engine, remove key, and engage reel safety props.
4. Open endshield.

MAINTENANCE AND SERVICING

5. Loosen bolts (A) on cutterbar until retainer (B) is loose.
6. Remove existing bolt that secures belt guide (C) on opposite side of endsheet.
7. Locate support (D) and reinstall bolt (E), with nut on far side.
8. Install a second 3/8 in. x 3/4 carriage bolt (F) and lock nut. Do NOT tighten bolts.

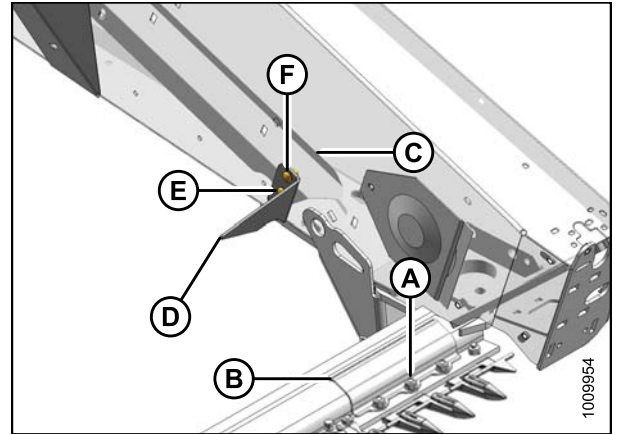


Figure 5.134: Deflector Support

9. Position deflector (A) as shown and adjust forward edge for best fit on cutterbar. Slide deflector under retainer (B).
10. Loosely install seven 3/8 in. x 3/4 carriage bolts (C) with lock nuts to attach deflector to endsheet. Bolt heads face inboard.
11. Adjust position of deflector to obtain best fit at cutterbar and aft edge. Tighten bolts (C) as required to maintain best fit.
12. Tighten bolts (D) on retainer (B). Torque to 65 ft-lbf (88 N·m).

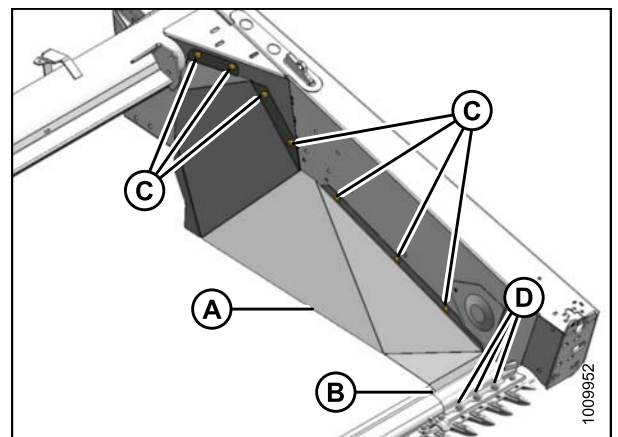


Figure 5.135: Wide Deflector

13. Adjust position of support (A) so that tip contacts the deflector (B). Tighten bolts (C).
14. Repeat above steps for opposite end.

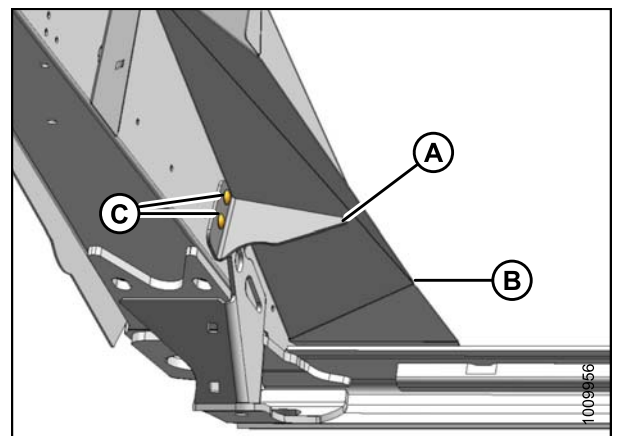


Figure 5.136: Deflector Support

Removing Narrow Draper Deflectors

To remove narrow draper deflectors, follow these steps:

NOTE:

Left-end removal is illustrated.

1. Raise reel fully and lower header to ground.
2. Shift decks to allow work space at one end of header, if hydraulic deck shift installed. Otherwise, move decks manually after shutting down windrower.

! WARNING

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

3. Stop engine, remove key, and engage reel safety props.
4. Open endshield.
5. Remove the two Torx® head screws (A) and lock nuts.
6. Remove the three carriage bolts (B) and lock nuts, and remove aft deflector (C).

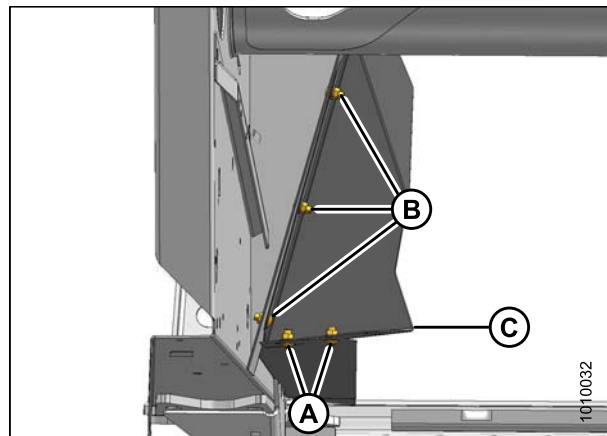


Figure 5.137: Aft Deflector

7. Remove the four screws (A) and remove deflector (B).
8. Repeat above steps for opposite end.

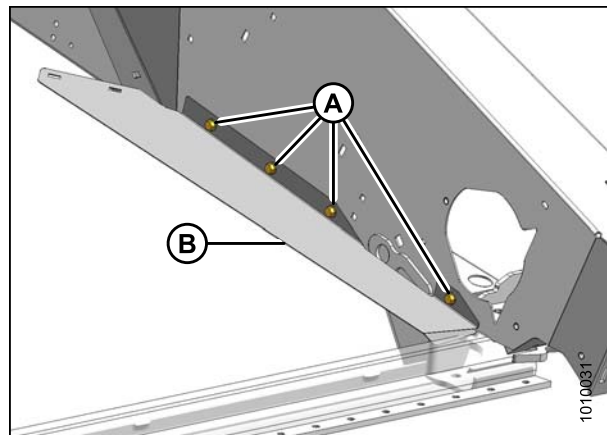


Figure 5.138: Forward Deflector

Installing Narrow Draper Deflectors

Narrow deflectors can replace wide deflectors if bunching occurs at the ends of the header when decks are set for center delivery.

To install narrow draper deflectors, follow these steps:

NOTE:

Left-end installation is illustrated.

1. Raise reel fully and lower header to ground.
2. Shift decks to allow work space at one end of header, if hydraulic deck shift installed. Otherwise, move decks manually after shutting down windrower.



WARNING

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

3. Stop engine, remove key, and engage reel safety props.
4. Open endshield.
5. Position forward deflector (B) onto endsheet and temporarily install forward and aft 3/8 in. x 5/8 self tapping screws (A).
6. Check fit of forward end of deflector onto cutterbar. There should be no gap between deflector and cutterbar. Remove and bend deflector as required, to obtain best fit.
7. Install the four 3/8 in. x 5/8 self-tapping screws (A) and tighten.

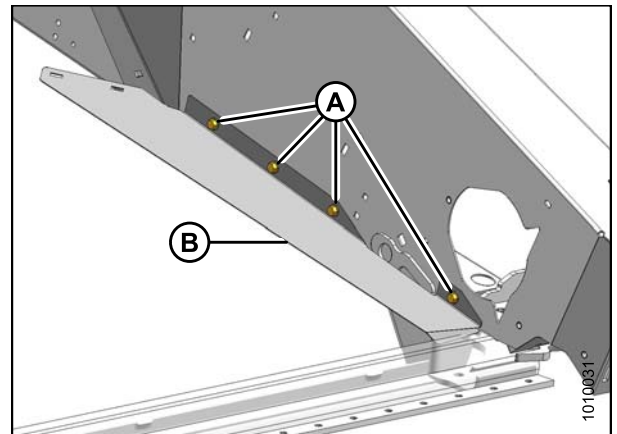


Figure 5.139: Forward Deflector

8. Position aft deflector (C) as shown and install three 3/8 in. x 3/4 carriage bolts (B) and lock nuts. Orientation of bolts not important.
9. Install two Torx® head screws (A) and lock nuts with heads facing down.
10. Tighten all fasteners.
11. Repeat above steps for opposite end.

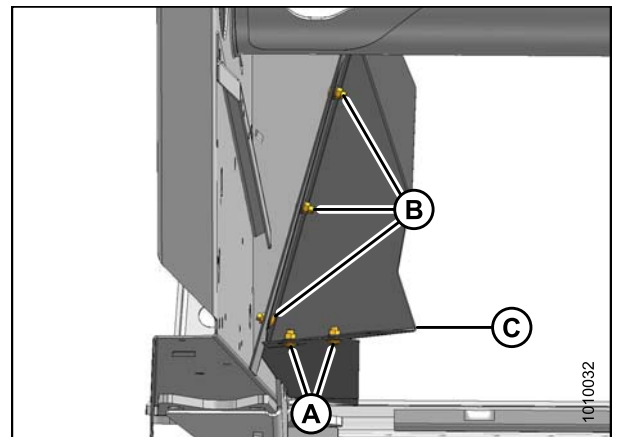


Figure 5.140: Aft Deflector

5.8 Reel

CAUTION

To avoid personal injury, before servicing machine or opening drive covers, refer to [5.1 Preparing Machine for Servicing, page 111](#).

5.8.1 Reel Clearance to Cutterbar

The minimum clearance between the reel fingers and the cutterbar ensures that the reel fingers do not contact the cutterbar during operation. The clearance is adjusted at the factory, but adjustments may be necessary before the header is put into operation.

The finger to guard/cutterbar clearances with reels fully lowered are shown in [Table 5.2 Finger to Guard/Cutterbar Clearance, page 186](#).

Table 5.2 Finger to Guard/Cutterbar Clearance

Header Width	'X' +/- 1/8 in. (3 mm) at Reel Ends	
	Single Reel	Double Reel
15 ft.	3/4 in. (20 mm)	—
20 ft.		
25 ft.	1 in. (25 mm)	3/4 in. (20 mm)
30 ft.	1-3/4 in. (45 mm)	
35 ft.	2-3/8 in. (60 mm)	
40 ft.	—	

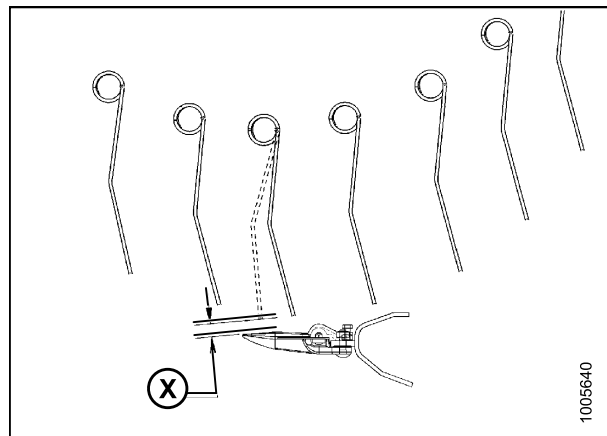


Figure 5.141: Finger Clearance

Measuring Reel Clearance

To measure the finger-to-guard/cutterbar clearance, follow these steps:

DANGER

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

1. Park header on level ground.

MAINTENANCE AND SERVICING

2. Set the fore-aft position to the middle position on the reel arm indicator decal (A).
3. Fully lower the reel.
4. Shut down engine. Remove key from ignition.

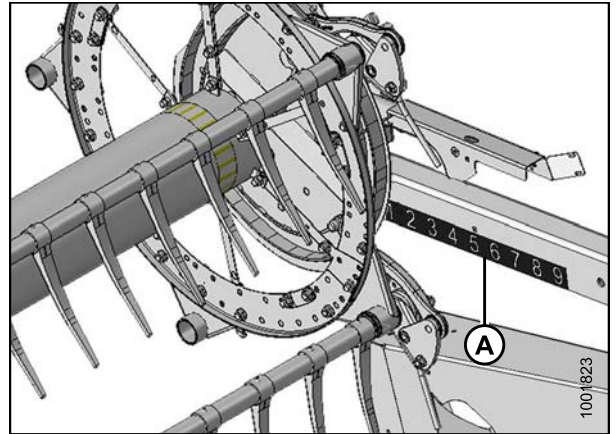


Figure 5.142: Fore-Aft Position

5. Measure clearance (X) between points (Y) and (Z) at ends of each reel (A).

NOTE:

The reel is factory-set to provide more clearance at the center of the reel than at the ends ('frown') to compensate for reel flexing.

6. Check all possible points of contact between points (Y) and (Z). Depending on reel fore-aft position, minimum clearance can occur at guard tine, hold-down, or cutterbar.

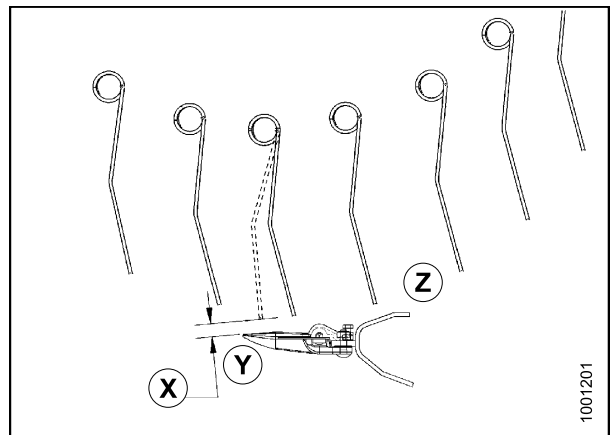


Figure 5.143: Clearance

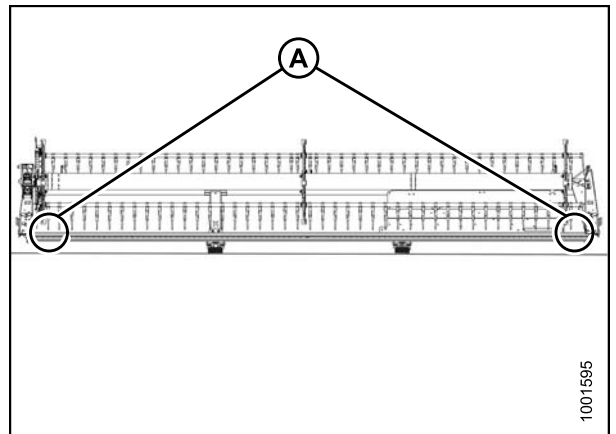


Figure 5.144: Single Reel Measurement Locations (Two Places)

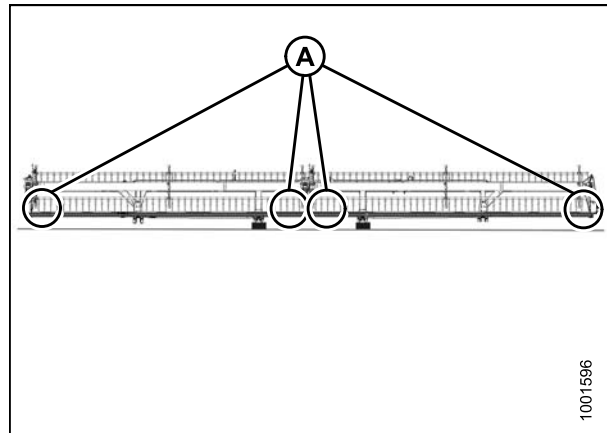


Figure 5.145: Double Reel Measurement Locations (Four Places)

7. If necessary, refer to [Adjusting Reel Clearance, page 188](#) for adjustment procedure.

Adjusting Reel Clearance

DANGER

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

1. Adjust outboard reel arm lift cylinders to set clearance at outboard ends of reel as follows:
 - a. Loosen bolt (A).
 - b. Turn cylinder rod (B) out of clevis to raise reel and increase clearance to cutterbar, or turn cylinder rod into clevis to lower reel and decrease clearance.
 - c. Tighten bolt (A).
 - d. Repeat at opposite side.

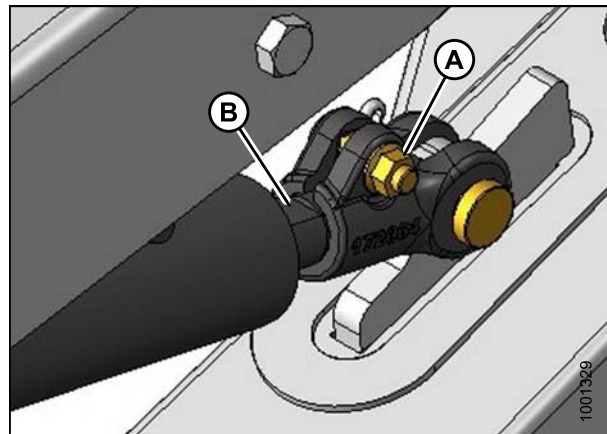


Figure 5.146: Outside Reel Arm

MAINTENANCE AND SERVICING

2. **For Double Reel Only:** Adjust center arm lift cylinder stop (A) to change clearance at inboard ends of reels as follows:

NOTE:

Instructions apply to double-reel headers only and are performed from the underside of the arm.

- a. Loosen nut (B).
- b. Turn nut (C) counterclockwise to raise reel and increase clearance to cutterbar, or clockwise to lower reel and decrease clearance.
- c. Tighten nut (B).

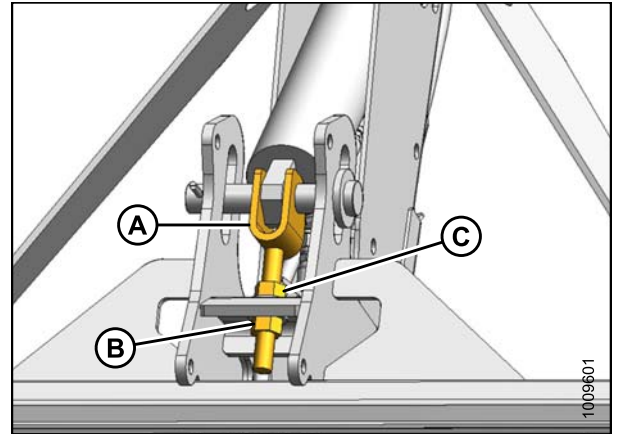


Figure 5.147: Looking Up at Arm Underside

5.8.2 Reel Frown

The reel is factory-set to provide more clearance at the center of the reel than at the ends ('frown') to compensate for reel flexing.

Adjusting Reel Frown

The frown is adjusted by repositioning the hardware connecting the reel tube arms 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 over the cutterbar (between '4' and '5' on the fore-aft position decal). This position provides adequate clearance at all reel fore-aft positions.
2. Record the measurement at each reel disc location for each reel tube.

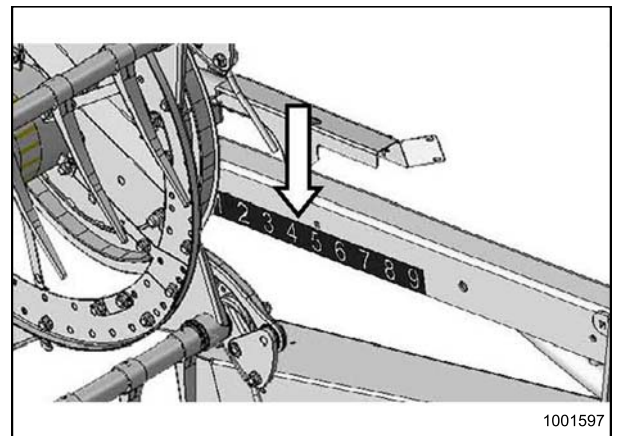


Figure 5.148: Fore-Aft Position Decal

MAINTENANCE AND SERVICING

3. Starting with the reel disc closest to the center of the header and proceeding outward towards the ends, adjust the header profile as follows:
 - a. Remove bolts (A).
 - b. Loosen bolt (B) and adjust arm (C) until desired measurement is obtained between the reel tube and the cutterbar.

NOTE:

Allow the reel tubes to curve naturally and position the hardware accordingly.

- c. Reinstall bolts (A) in aligned holes and tighten.

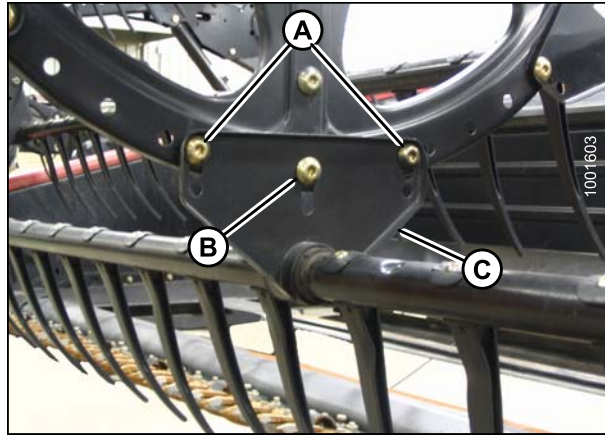


Figure 5.149: Reel Arm

5.8.3 Centering the Reel

The reel(s) should be centered between the endsheets.

Centering Double Reels

To center the reels, follow these steps:

1. Loosen bolt (A) on each brace (B).
2. Move forward end of reel center support arm (C) laterally as required, to center both reels.
3. Tighten bolts (A) and torque to 265 ft·lbf (359 N·m).

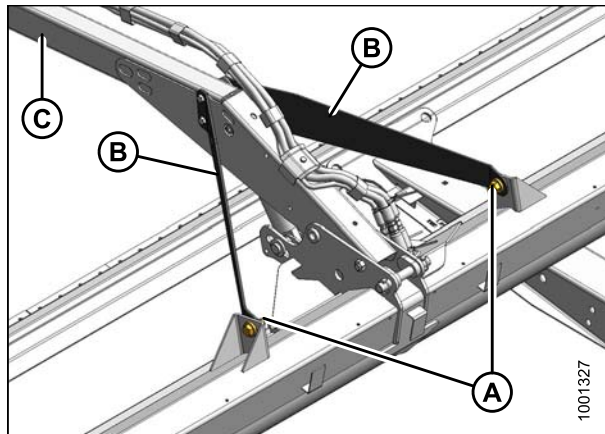


Figure 5.150: Reel Center Support Arm

Centering Single Reel

To center the reel, follow these steps:

1. Loosen bolt (A) on brace (B) at both ends of reel.
2. Move forward end of reel support arm (C).
3. Tighten bolts (A) and torque to 265 ft·lbf (359 N·m).

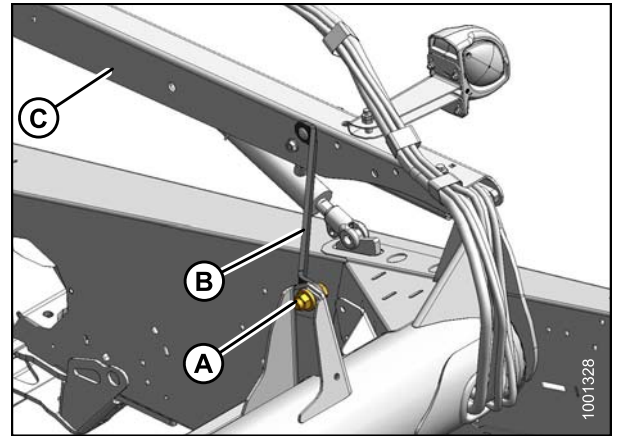


Figure 5.151: Reel Support Arm

5.8.4 Reel Tines

IMPORTANT:

Keep reel tines in good condition. Straighten or replace as required.

Removing Steel Tines

WARNING

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

1. Lower header and raise reel. Engage reel safety props.

WARNING

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

2. Shut down engine and remove key from ignition.
3. Remove tine tube bushings from the applicable tine tube at center and left discs. Refer to [Removing Bushings from Five-, Six- or Nine-Bat Reels, page 194](#).

MAINTENANCE AND SERVICING

4. Temporarily attach reel arms (B) to reel disc, using original attachment locations (A).
5. Cut damaged tine(s) so that it can be removed from tube.
6. Remove bolts on existing tines and slide tines over to replace tine that was cut off in previous step. Remove reel arms (B) from tube as required.

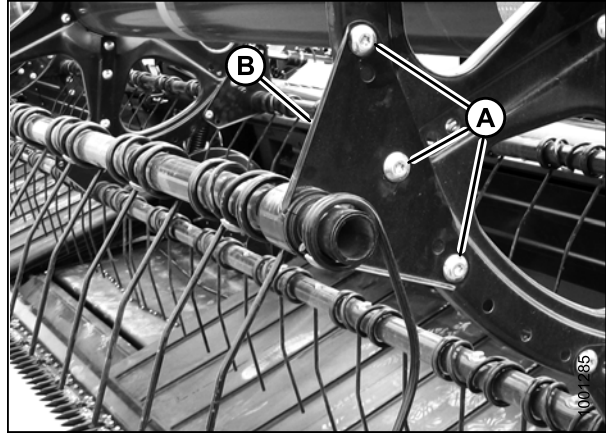


Figure 5.152: Reel Arm

Installing Steel Tines

WARNING

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

IMPORTANT:

Ensure tine tube is supported at all times to prevent damage to the tube or other components.

1. Slide new tines and reel arm (A) onto end of tube.
2. Install tine tube bushings. Refer to [5.8.5 Tine Tube Bushings](#), page 194.
3. Attach tines to tine bar with bolts and nuts (B).

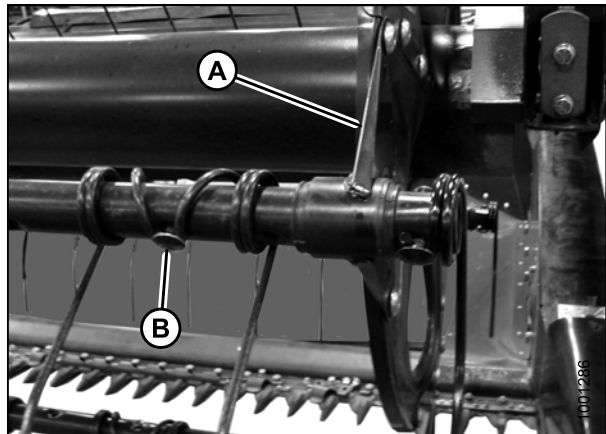


Figure 5.153: Tine Tube

Removing Plastic Fingers

WARNING

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

MAINTENANCE AND SERVICING

1. Remove screw (A) with a Torx® Plus 27 IP socket wrench.

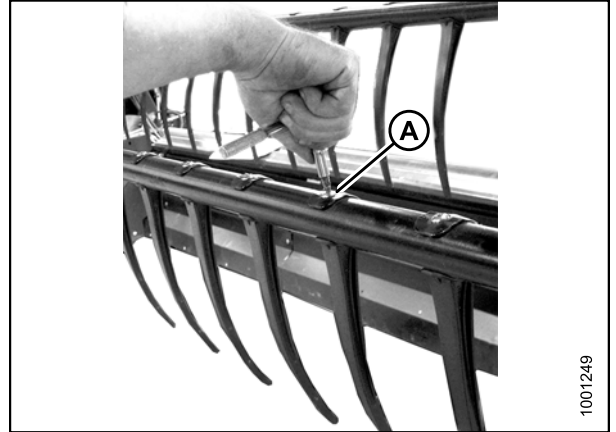


Figure 5.154: Plastic Fingers

2. Push finger top clip back toward reel tube and remove from finger tube.

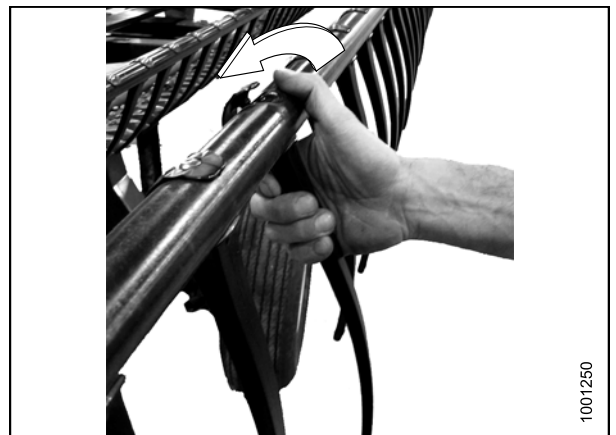


Figure 5.155: Plastic Fingers

Installing Plastic Fingers

WARNING

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

1. Position finger on rear of finger tube and engage lug at bottom of finger in lower hole in finger tube.
2. Gently lift top flange and rotate finger until lug in top flange engages upper hole in finger tube.



Figure 5.156: Plastic Fingers

IMPORTANT:

Do **NOT** apply force to finger prior to tightening mounting screw. Applying force to finger without screw tightened will break finger or shear off locating pins.

3. Install screw (A) and torque to 75–80 in-lbf (8.5–9.0 N·m) with a Torx®-Plus 27 IP socket wrench.

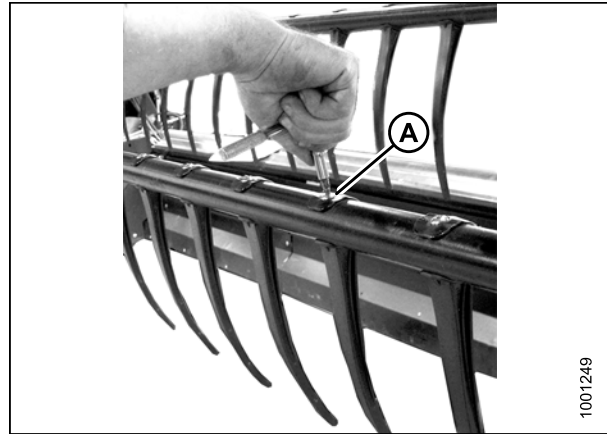


Figure 5.157: Plastic Fingers

5.8.5 Tine Tube Bushings

Removing Bushings from Five-, Six- or Nine-Bat Reels

⚠ WARNING

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

NOTE:

If only replacing the cam end bushing, refer to **Cam End Bushings**.

Center Disc and Tail-End Bushings

1. Lower header, raise reel fully, and engage reel safety props.

IMPORTANT:

Ensure tine tube is supported at all times to prevent damage to the tube or other components.

2. Remove reel endshields and endshield support (C) from the tail end of the reel at applicable tine tube location.

NOTE:

There are no endshields on the center disc.

3. Remove bolts (A) securing arm (B) to disc.

IMPORTANT:

Note the hole locations in arm and disc and ensure bolts are reinstalled at original locations.

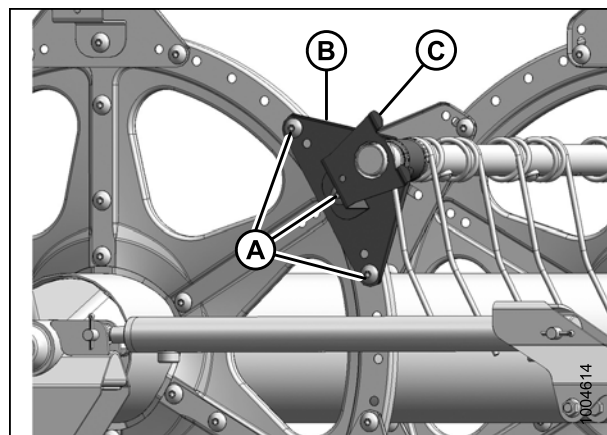


Figure 5.158: Tail End

MAINTENANCE AND SERVICING

4. Release bushing clamps (A) using a small screwdriver to separate the serrations. Pull clamp off tine tube.

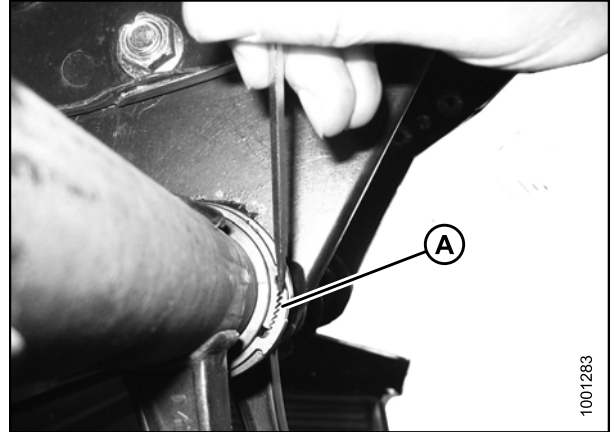


Figure 5.159: Bushing Clamp

5. Rotate arm (A) clear of disc and slide arm inboard off bushing and remove bushing halves (B). If required, remove the next tine or plastic finger, so the arm can slide off the bushing. Refer to:

- [Removing Plastic Fingers, page 192](#)
- [Removing Steel Tines, page 191](#)

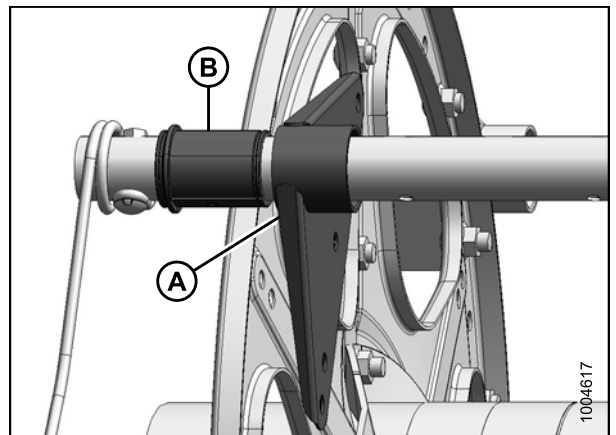


Figure 5.160: Bushing

Cam End Bushings

NOTE:

Removing cam end bushings requires that the tine tube be moved through the disc arms to expose the bushing.

6. At the cam end, remove endshields and endshield support (A) at applicable tine tube location on the cam end.

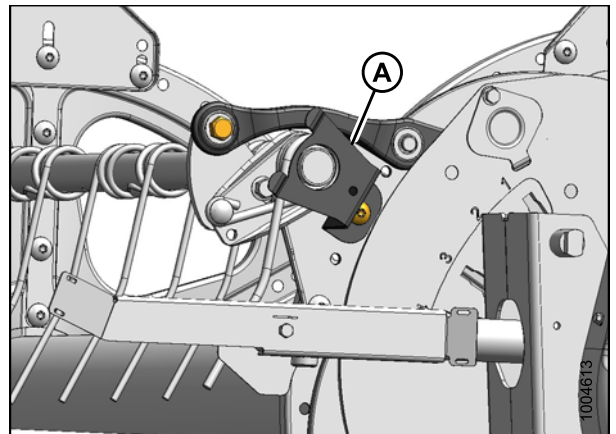


Figure 5.161: Cam End

MAINTENANCE AND SERVICING

- At the tail end, remove reel endshields and endshield support (C) at applicable tine tube location.

NOTE:

There are no endshields on the center discs.

- At the tail and center discs, remove bolts (A) securing arm (B) to disc.

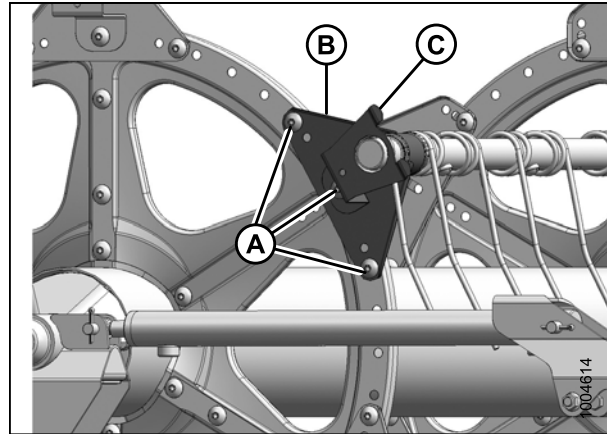


Figure 5.162: Tail End

- At the tine tube support (if installed) locations, either release the bushing clamps or disconnect the support channels from the tube support, depending on which tine tube is being moved. Three tine tubes (B) require that the channels be disconnected and two (C) require only to remove the bushing clamp.

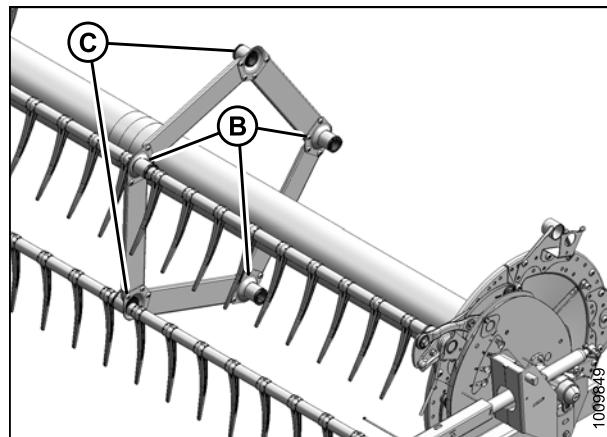


Figure 5.163: Tine Tube Supports

- Remove bolt (A) at cam linkage so that tine tube (B) is free to rotate.

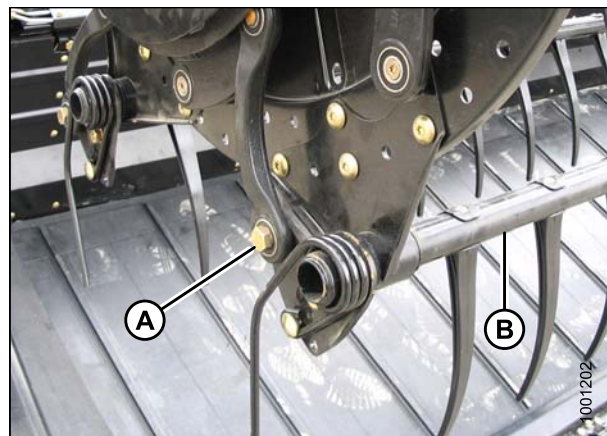


Figure 5.164: Cam End

MAINTENANCE AND SERVICING

11. Release bushing clamps (A) at the cam disc with a small screwdriver to separate the serrations. Move clamps off bushings.

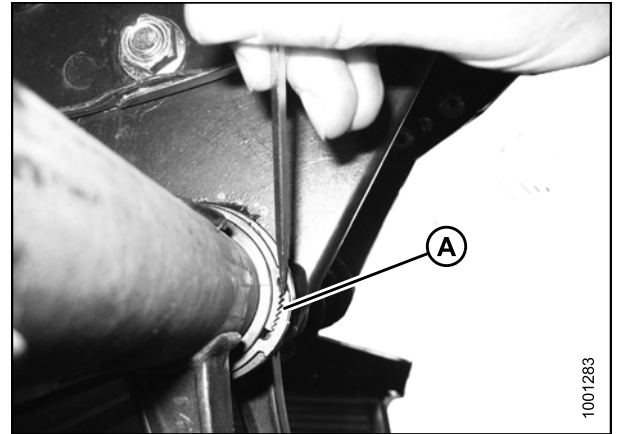


Figure 5.165: Bushing Clamp

12. Slide tine tube (A) outboard to expose the bushing. Remove the bushing halves (B). If required, remove the next tine or plastic finger, so the arm can slide off the bushing. Refer to:

- [Removing Plastic Fingers, page 192](#)
- [Removing Steel Tines, page 191](#)

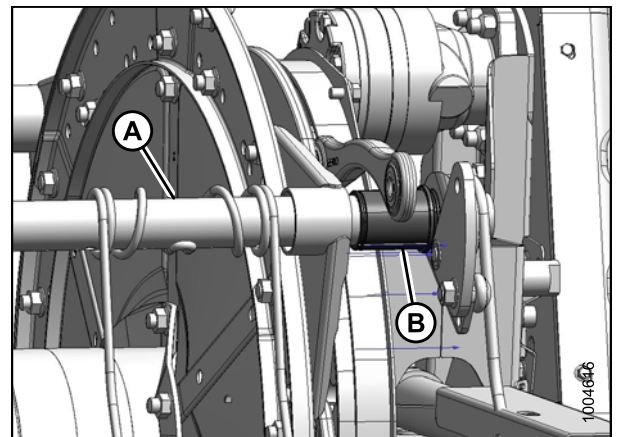


Figure 5.166: Cam End

Tine Tube Bushings (If Installed)

If the tine tube reinforcing kit is installed:

13. Locate the support (A) that requires a new bushing.
14. Remove four bolts (B) securing channels (C) to support (A).
15. If finger (D) is too close to support (A), to allow access to bushing, remove screw (E) and finger (D). For instructions, refer to [Removing Plastic Fingers, page 192](#).

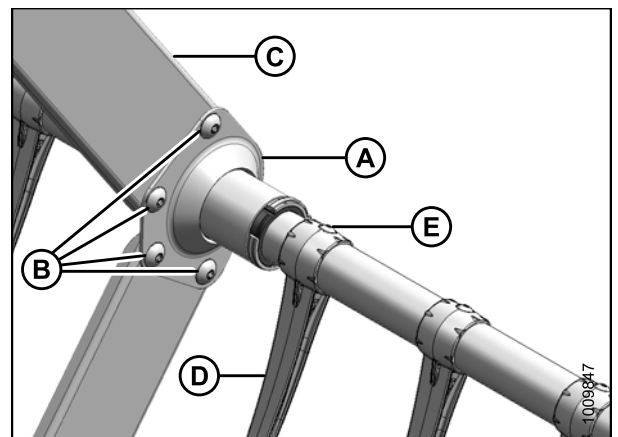


Figure 5.167: Tine Tube Support

MAINTENANCE AND SERVICING

16. Release bushing clamp (A) using a small screwdriver to separate the serrations. Move clamp clear of bushing.

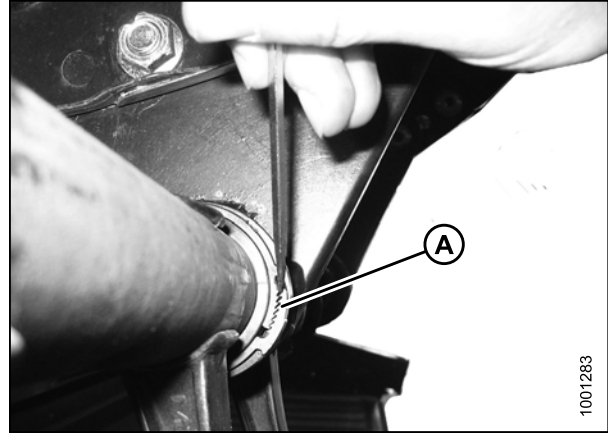


Figure 5.168: Bushing Clamp

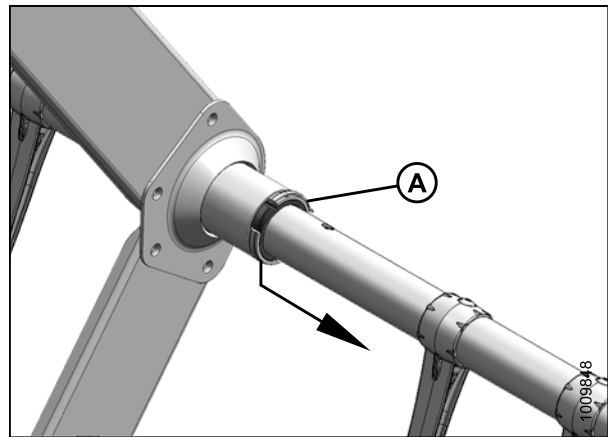


Figure 5.169: Bushing Clamp

MAINTENANCE AND SERVICING

- Slide support (A) off of the bushing halves (B).

NOTE:

Two tine tubes have supports that are assembled opposite to what is shown. Those supports (A) can be rotated for the flange to clear the channels before they can be moved off the bushing. The tine tube can also be moved outward slightly.

- Remove the bushing halves (B).

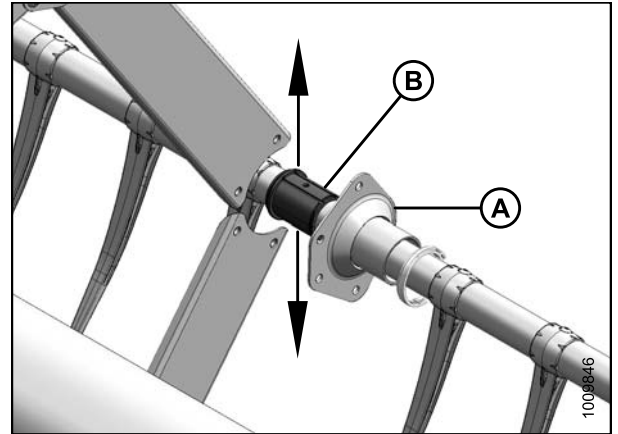


Figure 5.170: Support

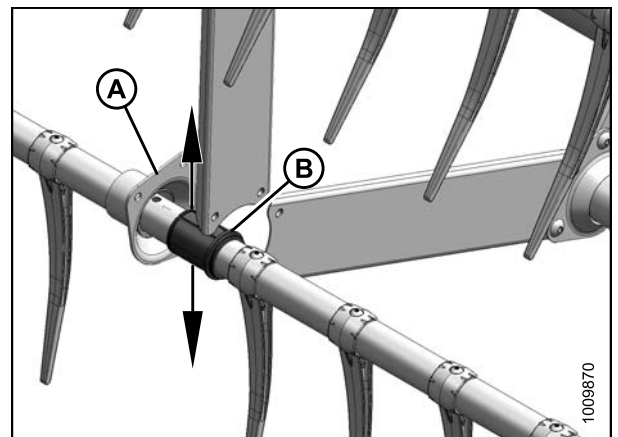


Figure 5.171: Opposite Support

Installing Bushings on Five-, Six- or Nine-Bat Reels

⚠ WARNING

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

IMPORTANT:

Ensure tine tube is supported at all times to prevent damage to the tube or other components.

MAINTENANCE AND SERVICING

NOTE:

A pair of modified channel lock pliers is recommended to install the bushing clamps. Secure pliers (A) in vice and grind in a notch (B) at the end of each arm that fits the clamp (C).

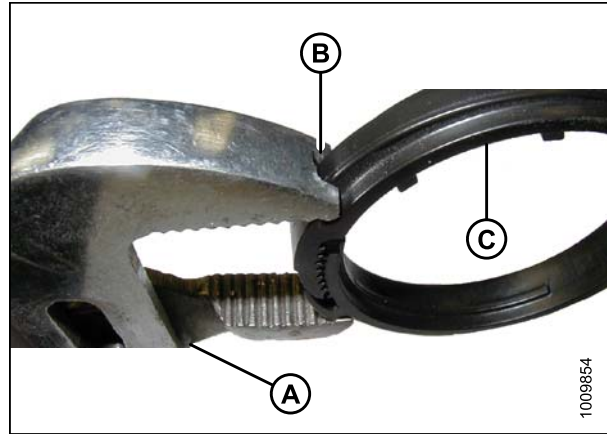


Figure 5.172: Modified Pliers

Cam End Bushings

1. Position bushing halves (B) on tine tube with flangeless end adjacent to reel arm, and locate lug in each bushing half in hole in tine tube.
2. Slide tine tube (A) toward tail end of reel to insert the bushing (B) into the reel arm. If tine tube supports are installed, ensure that the bushings at those locations slide into the support.
3. Reinstall fingers or tines if removed. Refer to:
 - [Installing Steel Tines, page 192](#)
 - [Installing Plastic Fingers, page 193](#)
4. Install bushing clamp (A) onto tine tube, adjacent to flangeless end of bushing (B).
5. Position clamp (A) on bushings (B) so that edges of clamp and bushing are flush when clamp fits into groove on bushing and lock tabs are engaged.

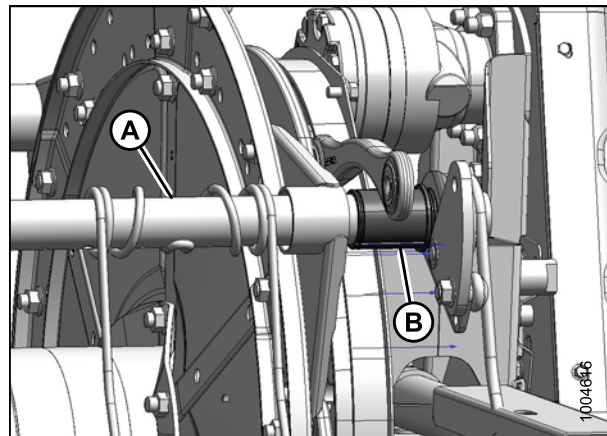


Figure 5.173: Cam End

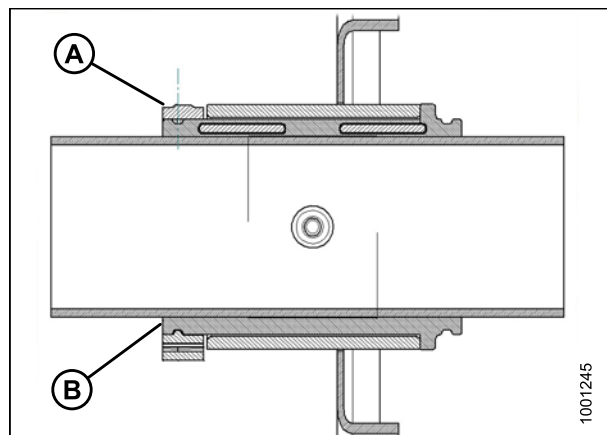


Figure 5.174: Bushing

MAINTENANCE AND SERVICING

6. Tighten clamp (A) with modified channel lock pliers (B) so that finger pressure will **NOT** move clamp.

IMPORTANT:

Overtightening clamp may result in breakage.

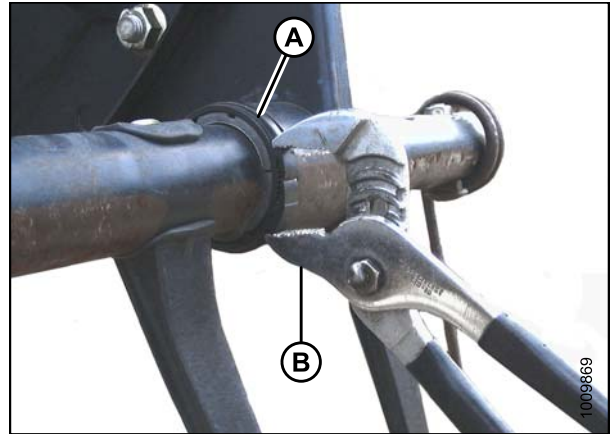


Figure 5.175: Installing Clamp

7. Line up tine bar (B) with cam arm and install bolt (A). Torque bolt to 120 ft·lbf (165 N·m).

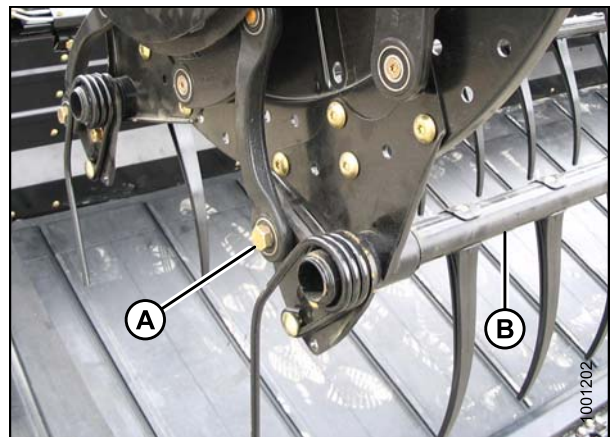


Figure 5.176: Cam End

8. At the center disc, install the bolts (A) securing arm (B) to disc.
9. At the tail end, install reel arm (B) and endshield support (C) from the tail end of the reel at applicable tine tube location with bolts (A).

NOTE:

There are no endshields on the center discs.

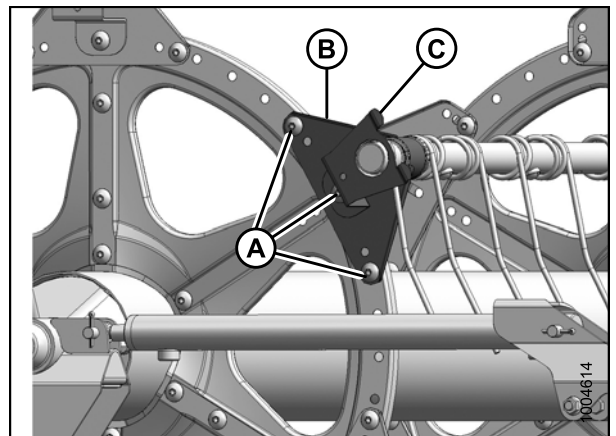


Figure 5.177: Tail End

MAINTENANCE AND SERVICING

10. At the cam end, install endshield support (A) at applicable tine tube location on the cam end.
11. Reinstall reel endshields. Refer to [5.8.6 Reel Endshields, page 206](#).

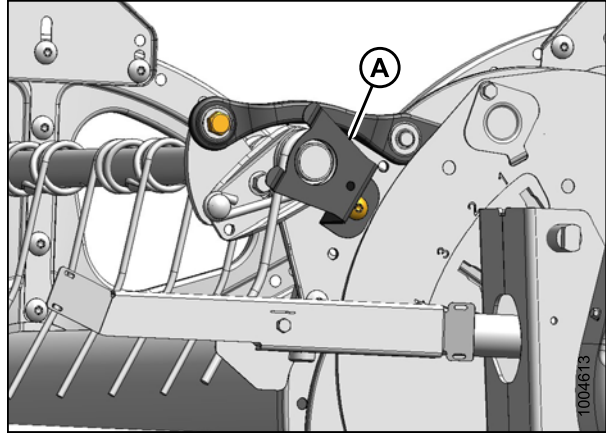


Figure 5.178: Cam End

Center Disc and Tail End Bushings

12. Position bushing halves (B) on tine tube with flangeless end adjacent to reel arm, and locate lug in each bushing half in hole in tine tube.
13. Slide reel arm (A) onto bushing (B) and position against disc at original location.
14. Reinstall any fingers or tines that were removed. Refer to:
 - [Installing Steel Tines, page 192](#)
 - [Installing Plastic Fingers, page 193](#)

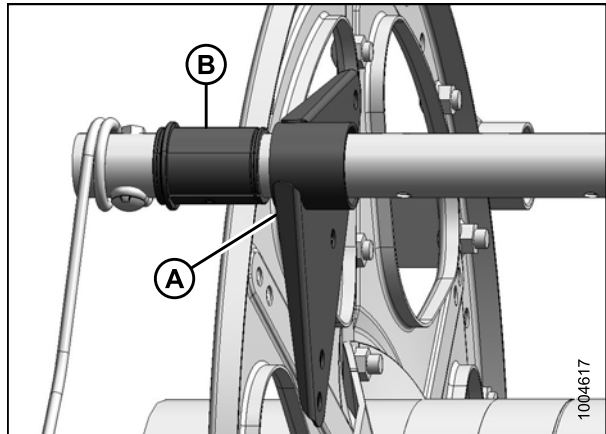


Figure 5.179: Tail End

15. Install bushing clamp (A) onto tine tube, adjacent to flangeless end of bushing (B).
16. Position clamp (A) on bushings (B) so that edges of clamp and bushing are flush when clamp fits into groove on bushing and lock tabs are engaged.

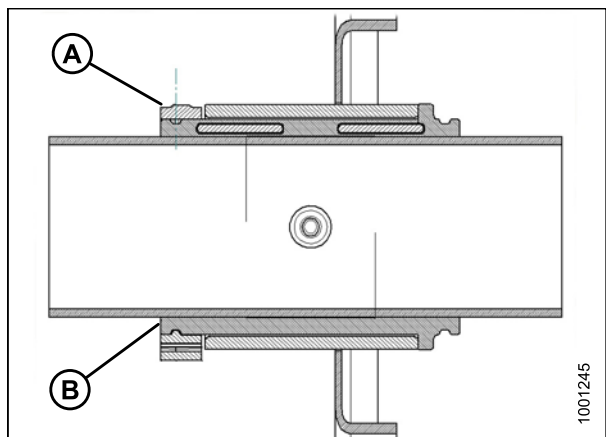


Figure 5.180: Bushing

MAINTENANCE AND SERVICING

17. Tighten clamp (A) with modified channel lock pliers (B) so that finger pressure will **NOT** move clamp.

IMPORTANT:

Over-tightening clamp may result in breakage.

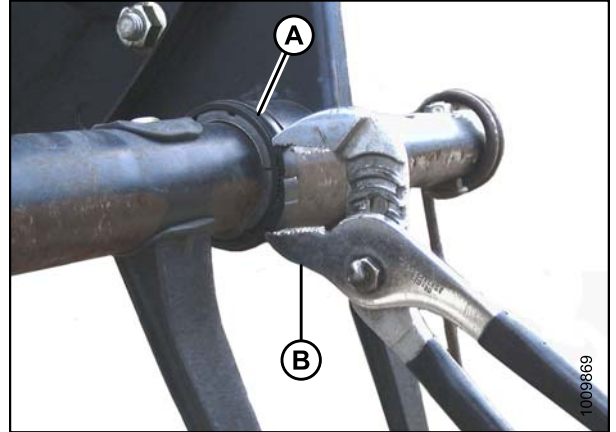


Figure 5.181: Clamp

18. At the center disc, install the bolts (A) securing arm (B) to disc.
19. At the tail end, install reel arm (B) and endshield support (C) at applicable tine tube location with bolts (A). Reinstall endshields.

NOTE:

There are no endshields on the center discs.

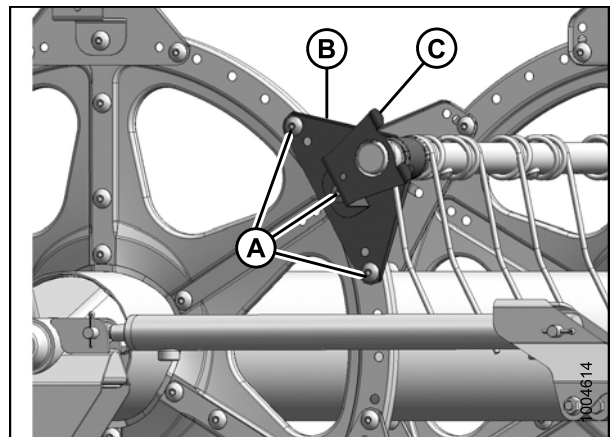


Figure 5.182: Tail End

MAINTENANCE AND SERVICING

Tine Tube Support (If installed) Bushings

20. Position bushing halves (B) on tine tube with flangeless end adjacent to reel arm, and locate lug in each bushing half in hole in tine tube.
21. Slide support (C) onto bushing (B). For the opposite tine tube, rotate support (C) or slightly move tine tube so that it clears channels (D).

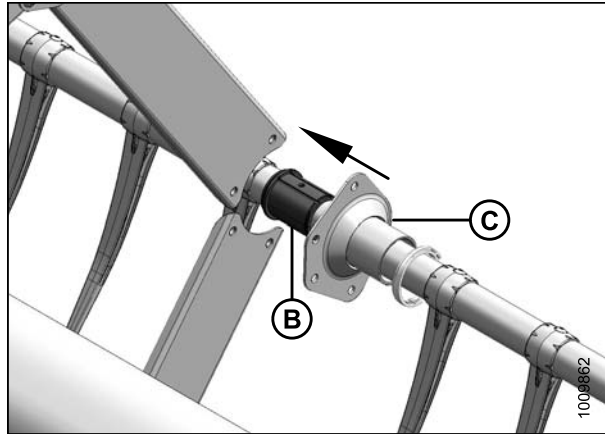


Figure 5.183: Support

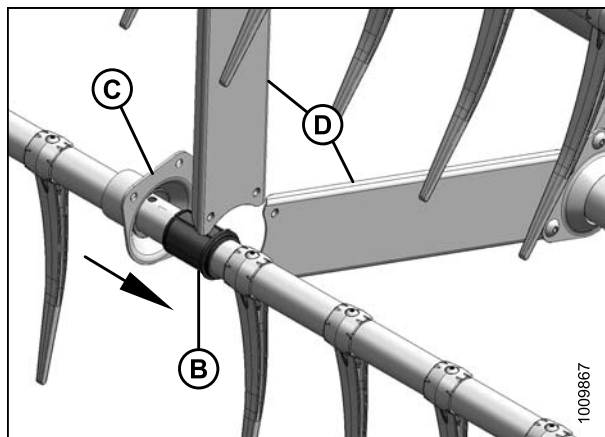


Figure 5.184: Opposite Support

22. Install bushing clamp (A) onto tine tube, adjacent to flangeless end of bushing (B).
23. Position clamp (A) on bushings (B) so that edges of clamp and bushing are flush when clamp fits into groove on bushing and lock tabs are engaged.

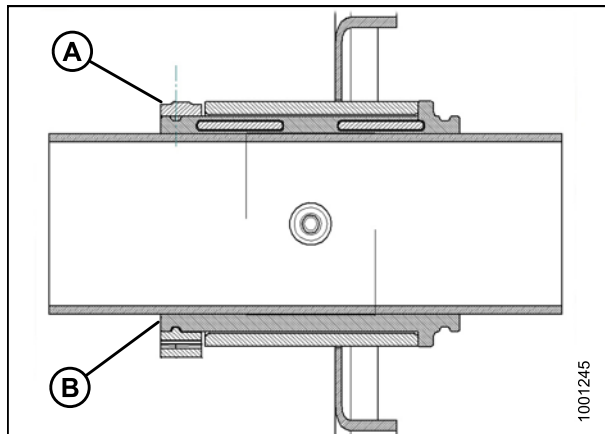


Figure 5.185: Bushing Clamp

MAINTENANCE AND SERVICING

24. Tighten clamp (A) with modified channel lock pliers (B) so that finger pressure will not move clamp.

IMPORTANT:

Over-tightening clamp may result in breakage.

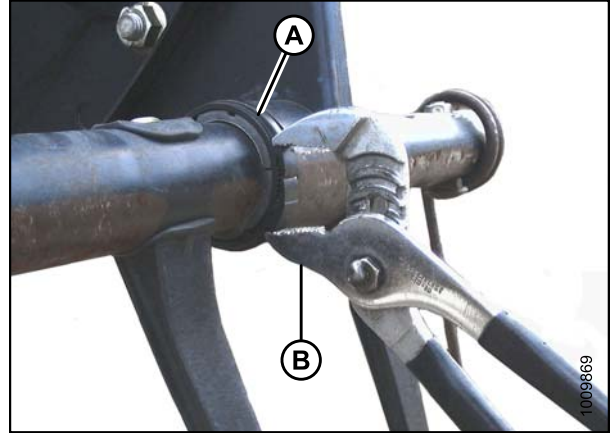


Figure 5.186: Clamp

25. Reattach channels (C) to support (A) with screws (B) and nuts. Torque screws to 32 ft·lbf (43 N·m).
26. Reinstall any fingers (D) that were removed with screws (E). Refer to [Installing Plastic Fingers, page 193](#).

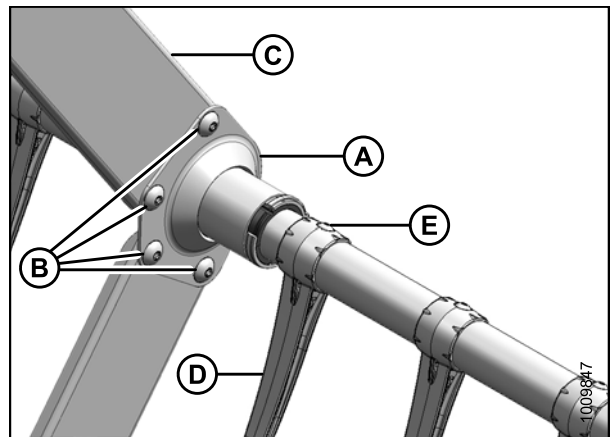


Figure 5.187: Support

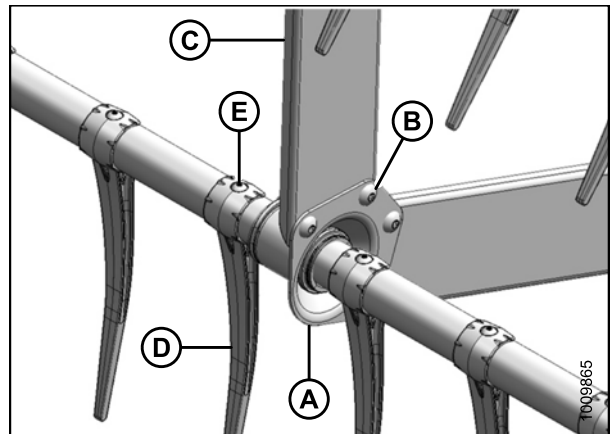


Figure 5.188: Opposite Support

5.8.6 Reel Endshields

The reel endshields and supports do not require regular maintenance, but should be checked periodically for damage and for loose or missing fasteners. Endshields or supports that are slightly dented or deformed may be repaired. Severely damaged components should be replaced.

Reel endshields can be attached to either end of the reel.

Replacing Endshield

WARNING

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

1. Lower header and reel, and shutdown engine. Remove key from ignition.
2. Manually rotate reel for access to endshield (A) to be replaced.
3. Remove three bolts (B).

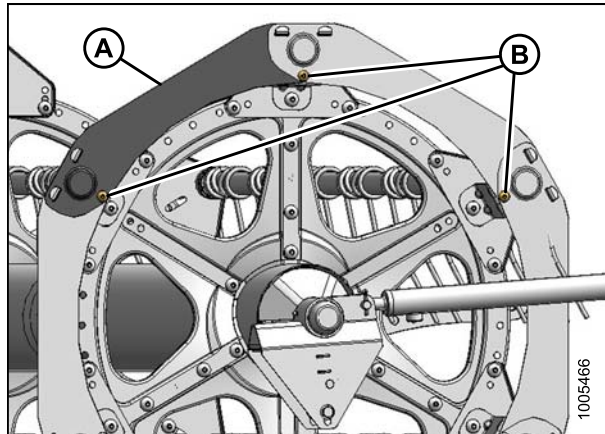


Figure 5.189: Reel Endshields

4. Lift end of endshield (A) off support (B).

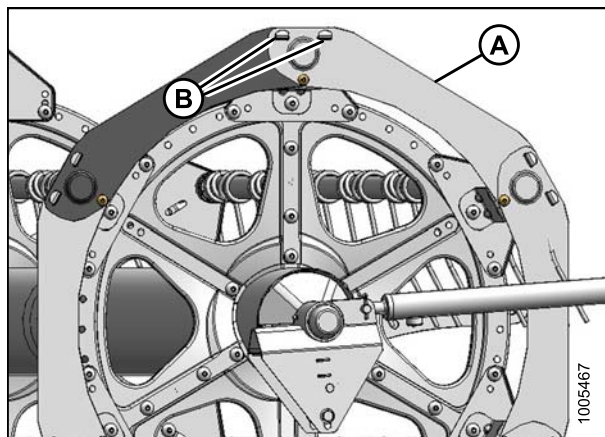


Figure 5.190: Reel Endshields

MAINTENANCE AND SERVICING

5. Lift endshield off supports.

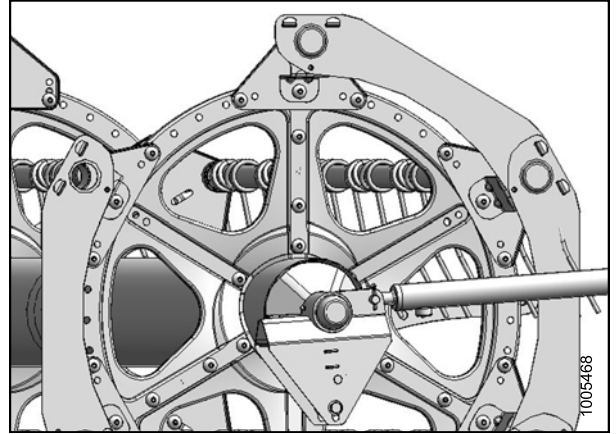


Figure 5.191: Reel Endshields

6. Move endshield (A) away from support (B), and place new endshield (C) onto supports.
7. Reattach end of endshield (A) to support (B).
8. Reinstall bolts (D).
9. Tighten all hardware.

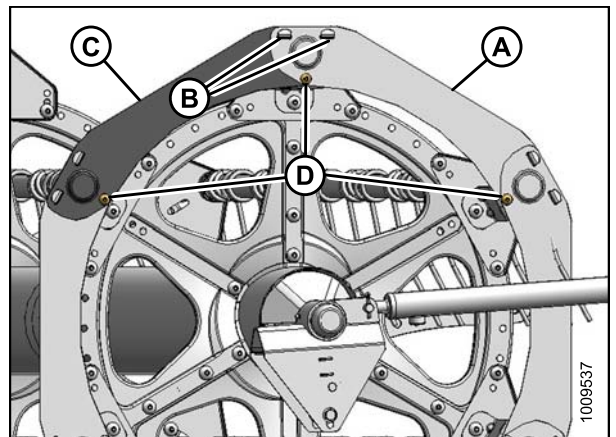


Figure 5.192: Reel Endshields

Replacing Support

DANGER

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

1. Lower header and reel, and shut down engine. Remove key from ignition.
2. Manually rotate reel for access to endshield support (A) to be replaced.
3. Remove bolt (B) from support (A).
4. Remove bolts (C) from support (A) and two adjacent supports.

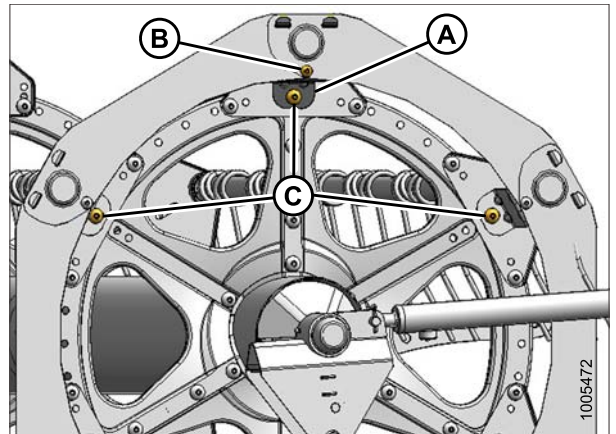


Figure 5.193: Endshield Supports

MAINTENANCE AND SERVICING

5. Move endshields (A) away from tine tube and rotate support (B) towards reel to remove it.
6. Insert tabs of new support (B) into slots in endshields and rotate into endshields. Ensure tabs engage both endshields.
7. Secure support (B) to disc with bolt (C) and nut. Do not tighten.
8. Secure endshields (A) to support (B) with bolt (C) and nut. Do not tighten.
9. Reattach supports with bolts (C) and nuts.
10. Check clearance between tine tube and endshield support, and adjust if necessary.
11. Torque nuts to 20 ft·lbf (27 N·m).

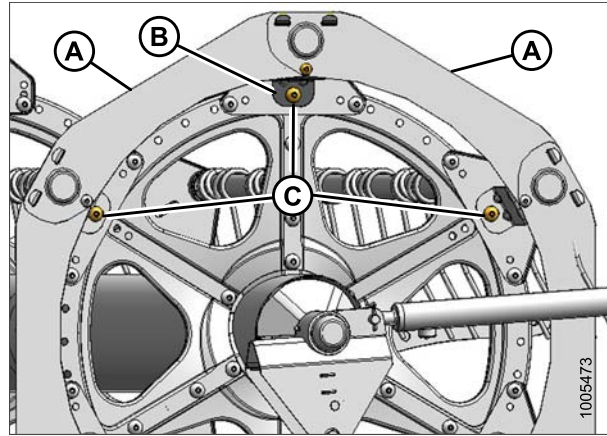


Figure 5.194: Endshield Supports

5.9 Reel Drive

The reel is hydraulically driven through a chain case that is attached to the right end of the reel on a single-reel header, and between the reels on a double-reel header.

5.9.1 Replacing Reel Drive Cover

Removing Drive Cover

DANGER

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

Single Reel Drive:

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

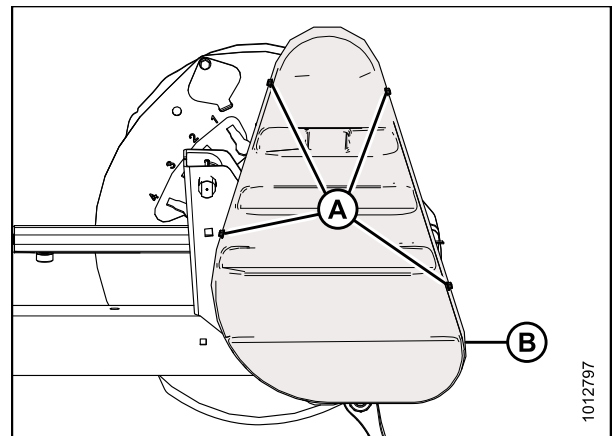


Figure 5.195: Drive Cover – Single Reel

Double Reel Drive:

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

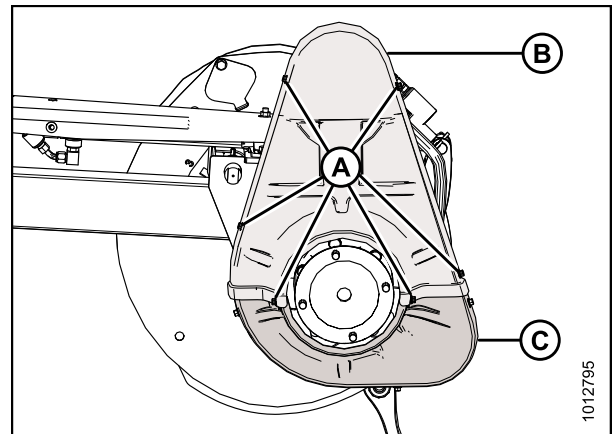


Figure 5.196: Drive Cover – Double Reel

MAINTENANCE AND SERVICING

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

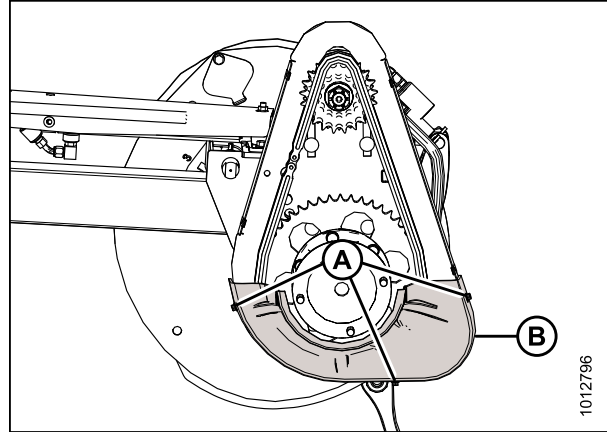


Figure 5.197: Drive Cover – Double Reel

Installing Drive Cover

Single Reel Drive:

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

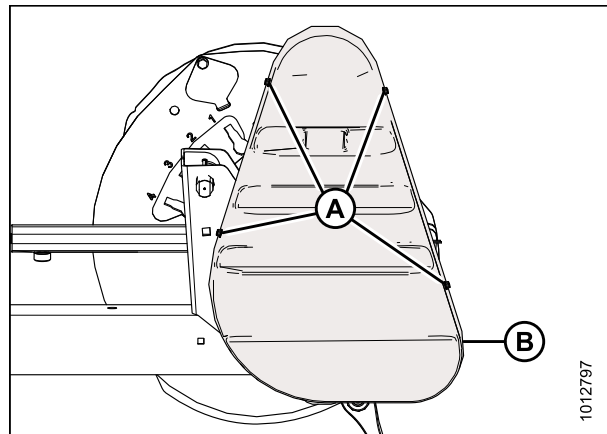


Figure 5.198: Drive Cover – Single Reel

Double Reel Drive:

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

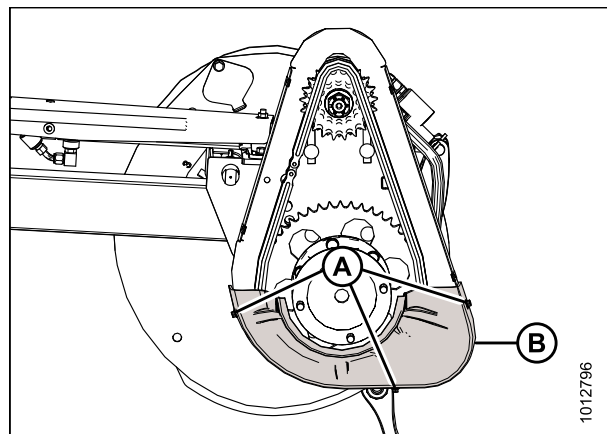


Figure 5.199: Drive Cover – Double Reel

MAINTENANCE AND SERVICING

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

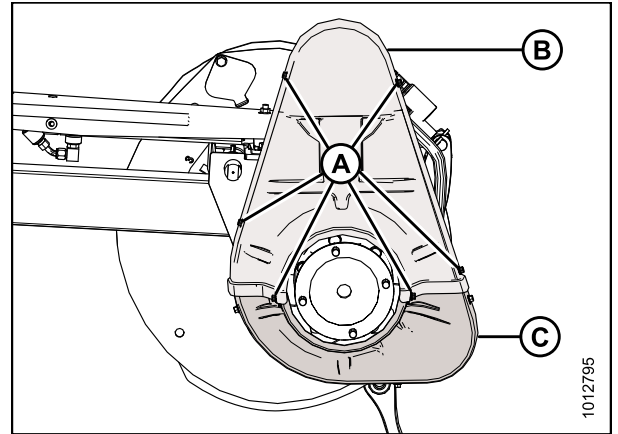


Figure 5.200: Drive Cover – Double Reel

5.9.2 Adjusting Reel Drive Chain Tension

Loosening Drive Chain

1. Remove the drive cover, refer to [Removing Drive Cover, page 209](#).
2. Loosen six nuts (A). Slide the motor (B) and motor mount (C) down towards the reel shaft.

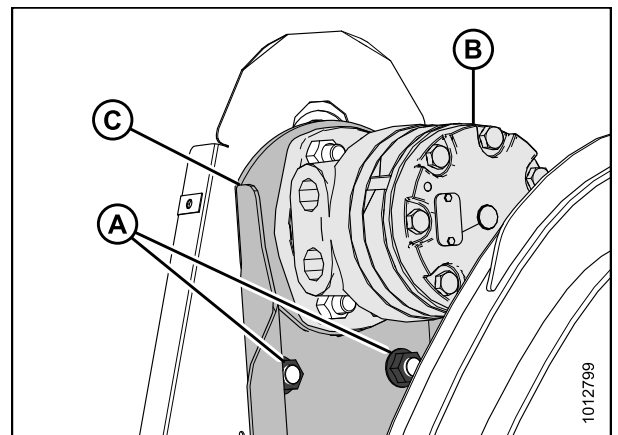


Figure 5.201: Single-Reel Drive Shown – Double-Reel Drive Similar

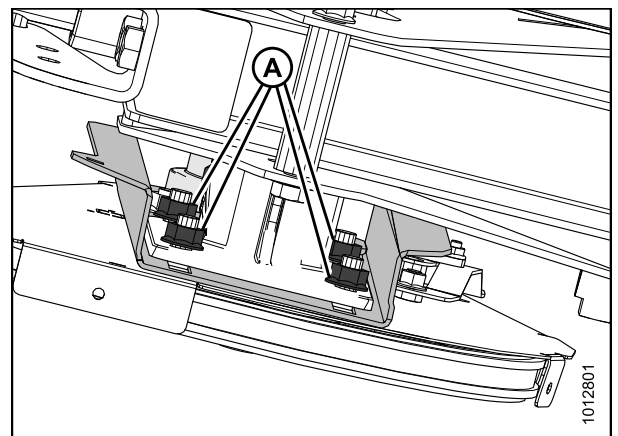


Figure 5.202: Single-Reel Drive – Viewed from Underside of Reel

MAINTENANCE AND SERVICING

Tightening Drive Chain

1. Ensure the six bolts (A) securing the motor mount to the chain case are loose.

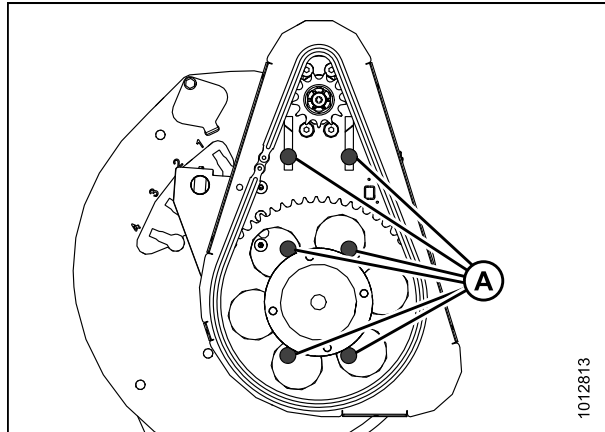


Figure 5.203: Single Reel Drive Shown – Double Reel Similar

2. Slide the motor (A) and motor mount (B) upwards until the chain (C) is tight.

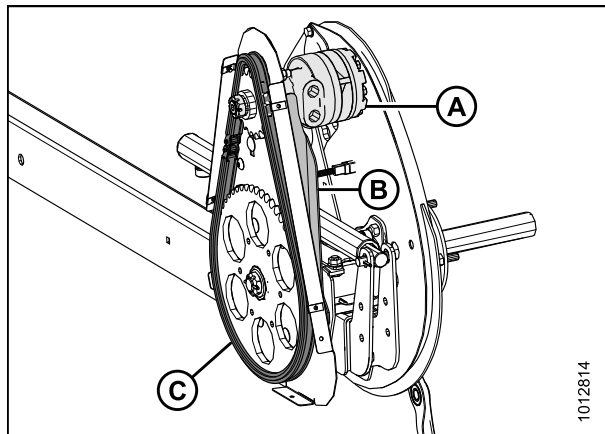


Figure 5.204: Single Reel Drive Shown – Double Reel Similar

MAINTENANCE AND SERVICING

3. Tighten six nuts (A).
4. Ensure there is 1/8 in. (3 mm) of slack at the chain midspan. Adjust if necessary.
5. Torque nuts (A) to 54 lbf-ft (73 N·m).
6. Install the drive cover, refer to [Installing Drive Cover, page 210](#).

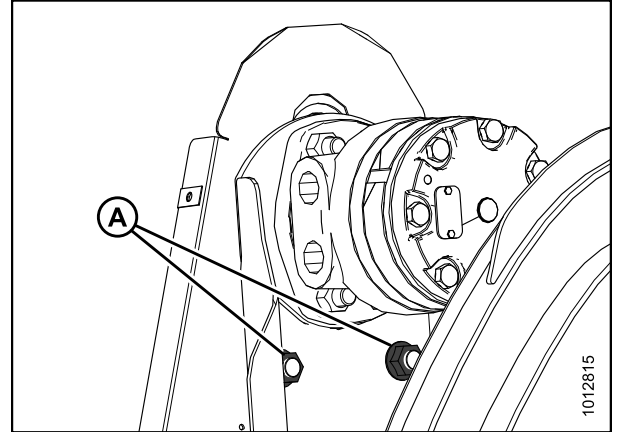


Figure 5.205: Single Reel Drive Shown – Double Reel Similar

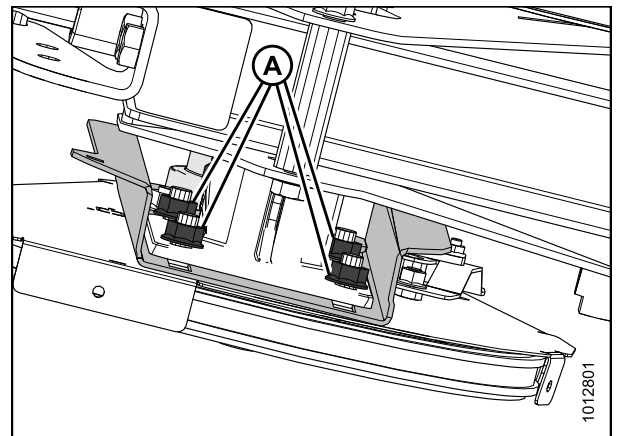


Figure 5.206: Single Reel Drive – Viewed from Underside of Reel

5.9.3 Replacing Reel Drive Sprocket

Removing Drive Sprocket

1. Loosen the drive chain, refer to [Loosening Drive Chain, page 211](#).

MAINTENANCE AND SERVICING

2. Remove the drive chain (A) from the drive sprocket (B).

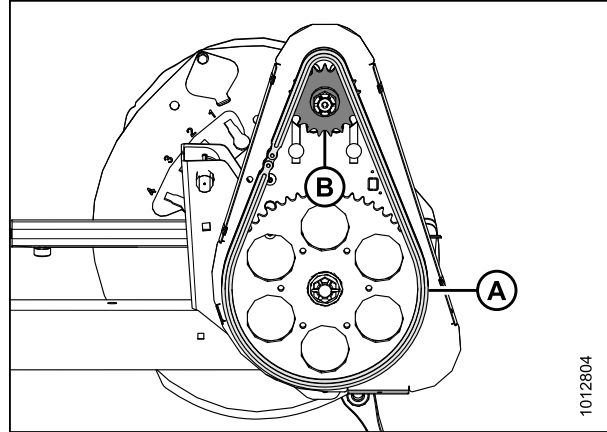


Figure 5.207: Reel Drive

3. Remove the cotter pin (A), slotted nut (B), and flat washer (C) from the motor shaft.
4. Remove the drive sprocket (D). Ensure the key remains in the shaft.

IMPORTANT:

To prevent 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 the drive sprocket (D).

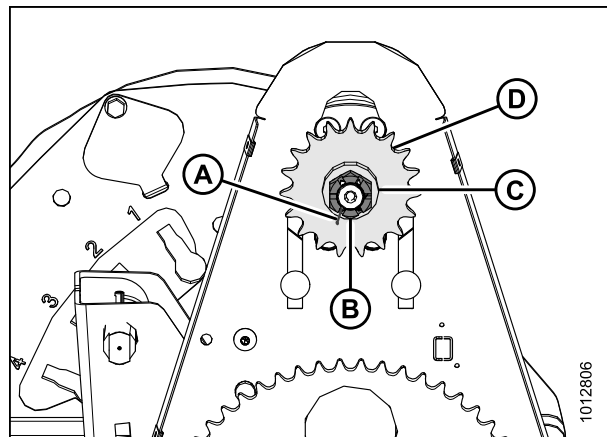


Figure 5.208: Reel Drive

Installing Drive Sprocket

1. Align the keyway in sprocket (D) with the key on the motor shaft, and slide the sprocket onto the shaft. Secure with flat washer (C) and slotted nut (B).
2. Torque slotted nut (B) to 40 lbf-ft (54 N-m).
3. Install cotter pin (A). If necessary, tighten the slotted nut (B) to the next slot to install the cotter pin.

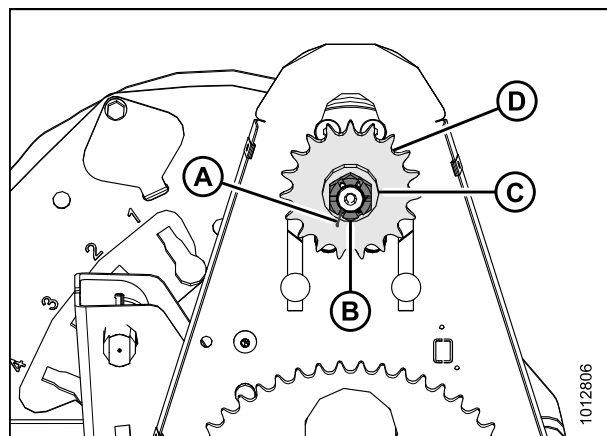


Figure 5.209: Reel Drive

MAINTENANCE AND SERVICING

4. Install the drive chain (A) onto the drive sprocket (B).

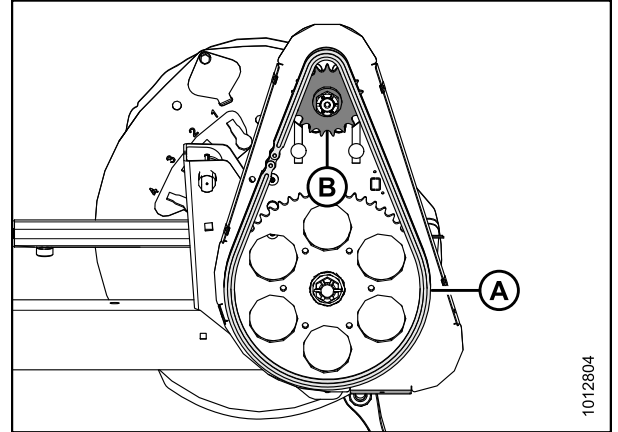


Figure 5.210: Reel Drive

5. Tighten the drive chain, refer to [Tightening Drive Chain, page 212](#).

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 the specifications. Refer to [5.3.6 Lubrication and Servicing, page 118](#).

Replace the U-joint if severely worn or damaged. Refer to [Removing Double Reel U-Joint, page 215](#).

Removing Double Reel U-Joint

1. Remove the drive cover, refer to [Removing Drive Cover, page 209](#).
2. 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 end disc as possible.

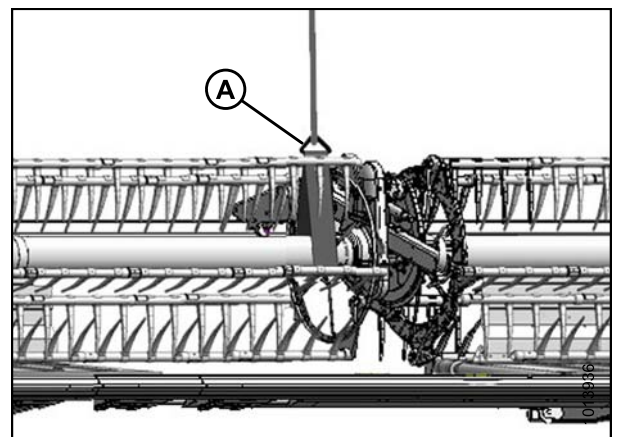


Figure 5.211: Reel and Reel Support

MAINTENANCE AND SERVICING

3. Remove the six bolts (A) attaching the U-joint flange (B) to the driven sprocket (C).
4. Remove the U-joint.

NOTE:

It may be necessary to move the right-hand reel sideways for the U-joint to clear the tube.

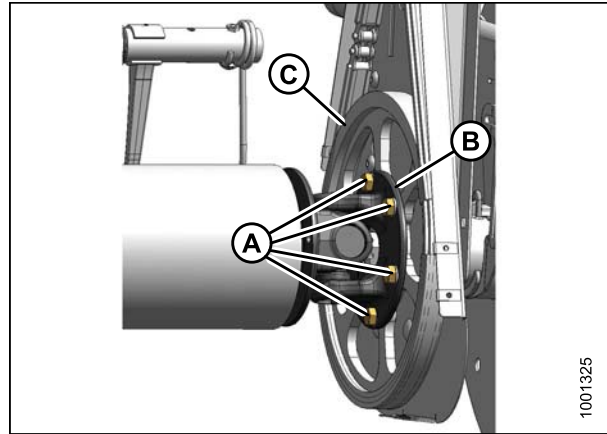


Figure 5.212: U-Joint

Installing Double Reel U-Joint

NOTE:

It may be necessary to move the right-hand reel sideways for the U-joint to clear the reel tube.

1. Position the U-joint flange (B) onto the driven sprocket (C) as shown. Install six bolts (A) and hand-tighten. Do **NOT** torque the bolts.

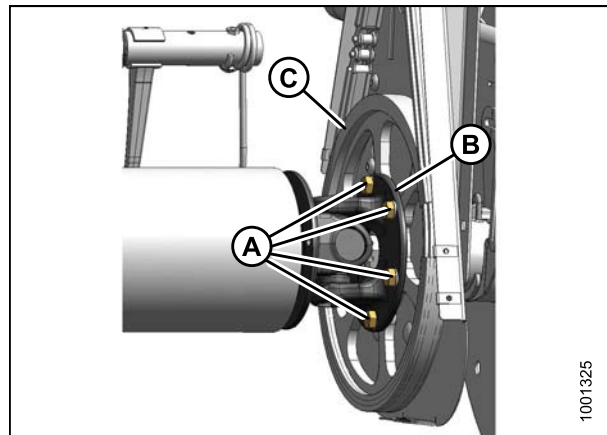


Figure 5.213: U-Joint

2. Position the right-hand 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 Loctite® #243 (or equivalent) to four 1/2 in. bolts (A) and secure with lock washers.
5. Torque to 75–85 ft-lbf (102–115 N·m).

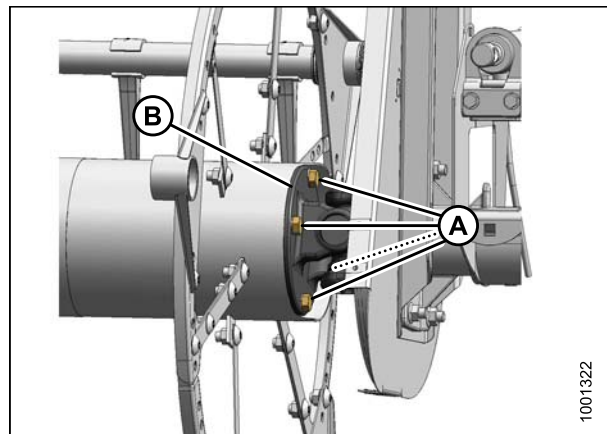


Figure 5.214: U-Joint

6. Remove the temporary reel support (A).

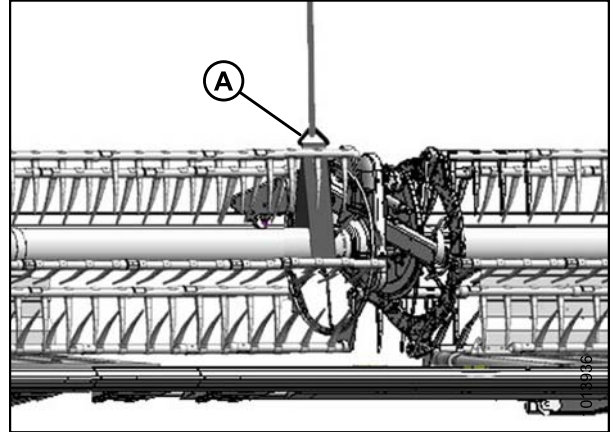


Figure 5.215: Supporting Reel

7. Install the drive cover, refer to [Installing Drive Cover, page 210](#).

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

1. Loosen the drive chain, refer to [Loosening Drive Chain, page 211](#).
2. Remove the drive sprocket, refer to [Removing Drive Sprocket, page 213](#).
3. Disconnect the hydraulic lines (A) at the motor (B). Cap or plug open ports and lines.

NOTE:

Mark the hydraulic lines (A) and their locations in the motor (B) to ensure correct reinstallation.

4. Remove four nuts and bolts (C) and remove the motor (A). Retrieve the spacer (not shown) from between the motor (B) and the motor mount (if installed).

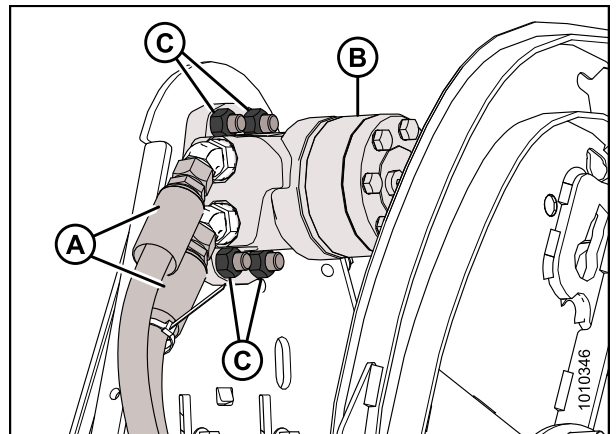


Figure 5.216: Reel Motor and Hoses

Installing Reel Drive Motor

1. Slide the motor mount (A) up or down so the motor mounting holes (B) are accessible through the openings in the chain case.

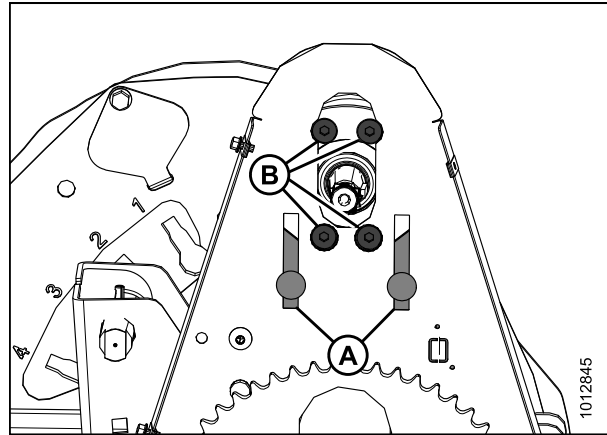


Figure 5.217: Reel Drive Motor Mounting Holes

2. Attach the motor (A) (and spacer if previously removed) to the motor mount (B) with four 1/2 in. x 1-3/4 in. countersunk bolts and nuts (C).
3. Torque nuts (C) to 54 lbf-ft (73 N·m).
4. Install the hydraulic fittings (not shown) if installing new motor, and torque to 81–89 ft·lbf (110–120 N·m).

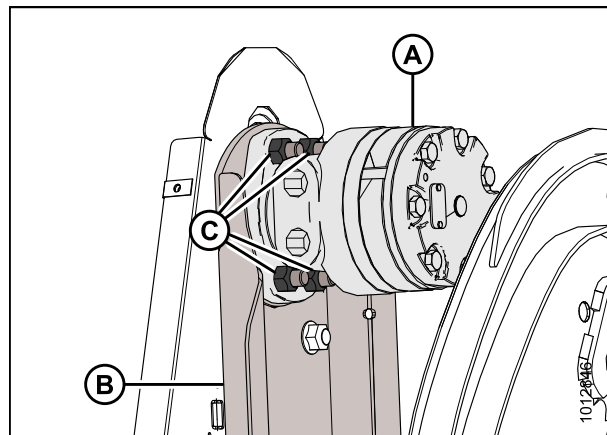


Figure 5.218: Reel Drive Motor

5. Remove the caps or plugs from the ports and lines and connect the hydraulic lines (A) to the hydraulic fittings (B) on the motor (C).

NOTE:

Ensure the hydraulic lines (A) are installed at their original locations.

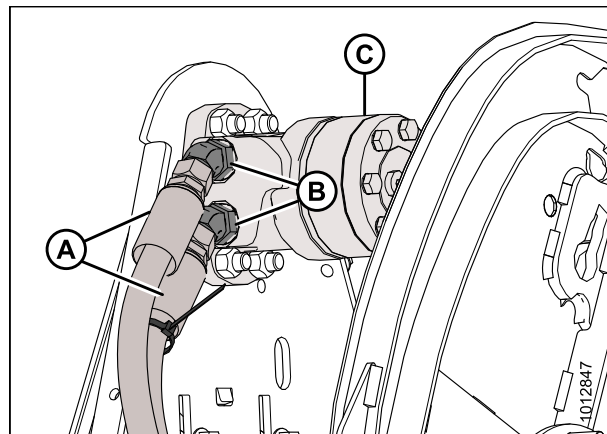


Figure 5.219: Reel Motor and Hoses

6. Install the drive sprocket, refer to [Installing Drive Sprocket, page 214](#).
7. Tighten the drive chain, refer to [Tightening Drive Chain, page 212](#).

5.9.6 Replacing Drive Chain on Double Reel

Refer to the following two methods for replacing the drive chain on a high torque double-reel drive:

- [Replacing Chain Using the Reel Drive Method, page 219](#)
- [Replacing Chain Using Breaking the Chain Method, page 221](#)

NOTE:

Both procedures are acceptable, but disconnecting the reel drive method is preferable because it doesn't affect the chain's integrity.

Replacing Chain Using the Reel Drive Method

1. Loosen the drive chain, refer to [Loosening Drive Chain, page 211](#).
2. 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 end disc as possible.

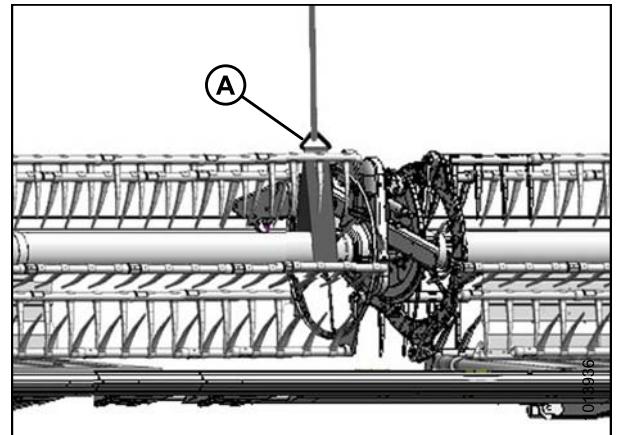


Figure 5.220: Supporting Reel

3. Remove the four bolts (A) securing the reel tube to the U-joint flange (B).

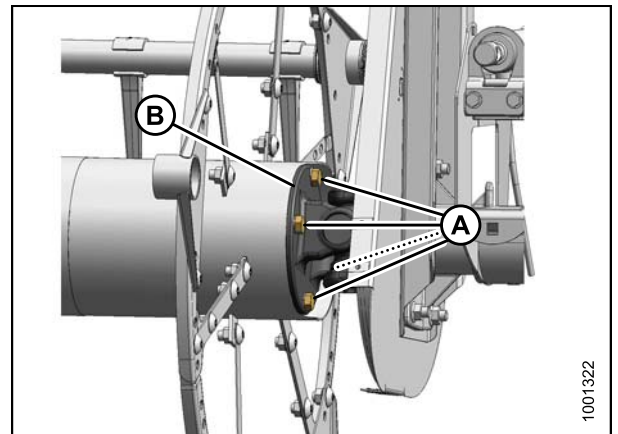


Figure 5.221: U-Joint

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4. Move the right-hand reel sideways to separate the reel tube (A) from the U-joint (B).
5. Remove the drive chain (C).
6. Route the new chain (C) over the U-joint (B) and position onto the sprockets.

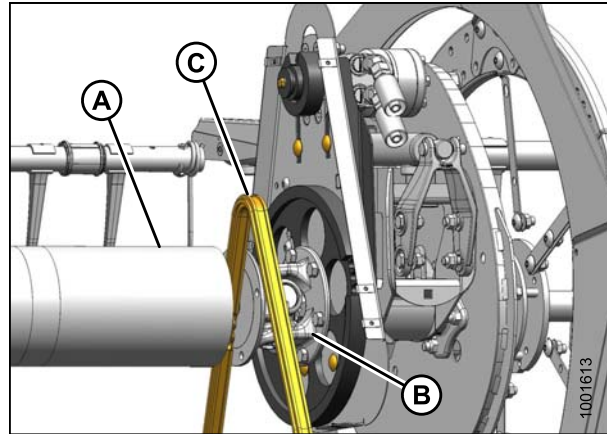


Figure 5.222: Replacing Chain

7. Position the right-hand reel tube (A) against the reel drive and engage the stub shaft into the U-joint pilot hole.
8. Rotate the reel until the holes in end of the reel tube and U-joint flange (B) line up.
9. Apply Loctite® #243 (or equivalent) to four 1/2 in. bolts (A) and secure with lock washers.
10. Torque to 75–85 ft·lbf (102–115 N·m).

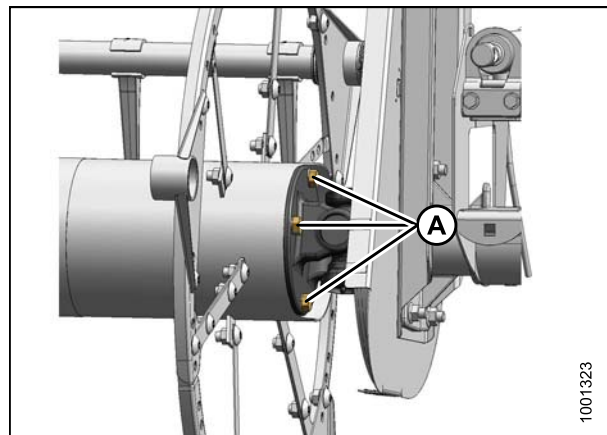


Figure 5.223: U-Joint

11. Remove the temporary reel support (A).

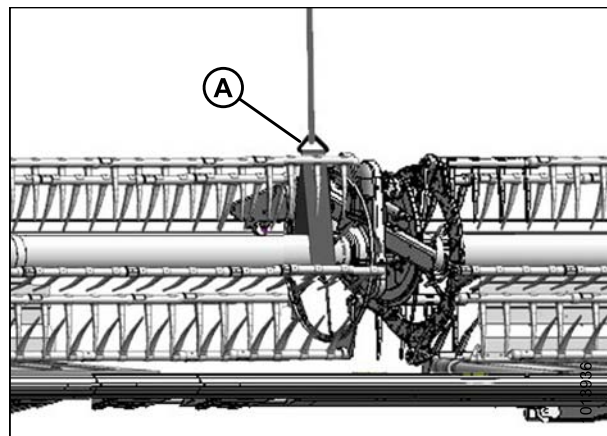


Figure 5.224: Supporting Reel

Replacing Chain Using Breaking the Chain Method

1. Grind off the head of a link rivet on the chain (A), punch out the rivet, and remove the chain.
2. Grind off the head of a link rivet on the new chain, punch out the rivet, and separate the chain.
3. Position the ends of the new chain onto the sprocket (B).

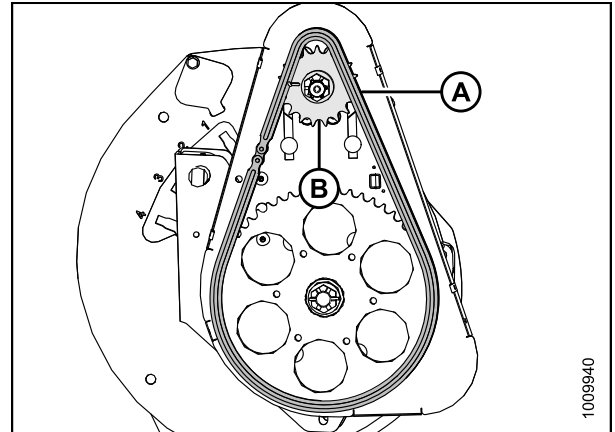


Figure 5.225: Reel Drive

4. Install the pin connector (A) (not available as a MacDon part) into the chain (preferably from the backside of the sprocket).
5. Install connector (B) onto pins.
6. Install the spring clip (C) onto the front pin (D) with the closed end of the spring clip facing the direction of the sprocket rotation.
7. Position one leg of the spring clip (C) into the groove of the aft pin (E).
8. Press the other leg of the spring clip (C) over the face of the aft pin (E) until it slips into the groove. Do **NOT** press the spring clip lengthwise from the closed end.
9. Ensure the spring clip (C) is seated into the grooves of the front pin (D) and aft pin (E).
10. Tighten the drive chain, refer to [Tightening Drive Chain, page 212](#).

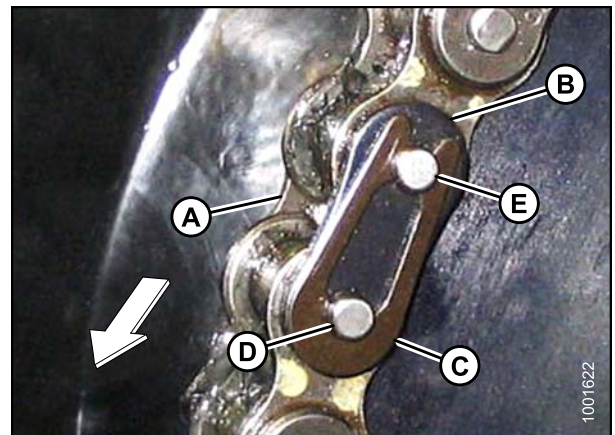


Figure 5.226: Chain

5.9.7 Replacing Drive Chain on Single Reel

1. Loosen the drive chain, refer to [Loosening Drive Chain, page 211](#).

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2. Lift the chain (A) off the drive sprocket (B).
3. Lower the chain until free of the lower sprocket (C) and remove the chain from the drive.
4. Position the new chain (A) around the bottom teeth on the lower sprocket (C).
5. Lift the chain onto the drive sprocket (B) ensuring all the links are properly engaged in the teeth.

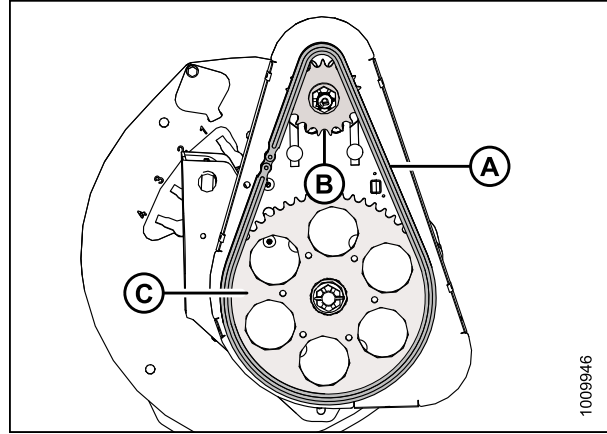


Figure 5.227: Reel Drive

6. Tighten the drive chain, refer to [Tightening Drive Chain, page 212](#).

5.10 Transport System (Optional)

Refer to [6.3.3 Stabilizer/Slow Speed Transport Wheels, page 233](#) for more information.

5.10.1 Checking Wheel Bolt Torque

If a transport system is installed, follow procedure for torquing the wheel bolts.

IMPORTANT:

Whenever a wheel is removed and reinstalled, check torque after one hour of operation and every 100 hours thereafter. Maintain 80–90 ft-lbf (110–120 N·m) torque. Follow bolt tightening sequence as shown.

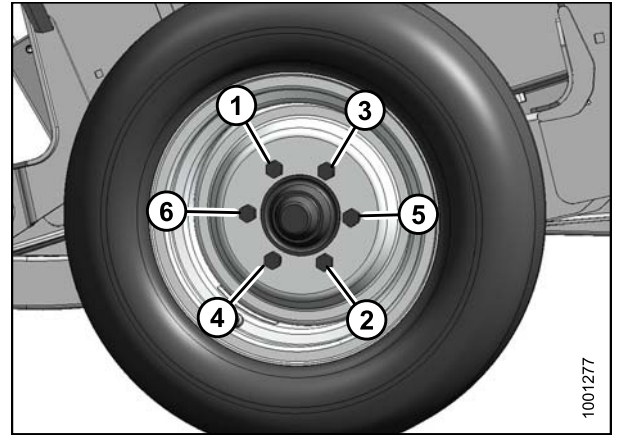


Figure 5.228: Bolt Tightening Sequence

5.10.2 Checking Axle Bolt Torque

If a transport system is installed, follow this procedure for torquing the axle bolts.

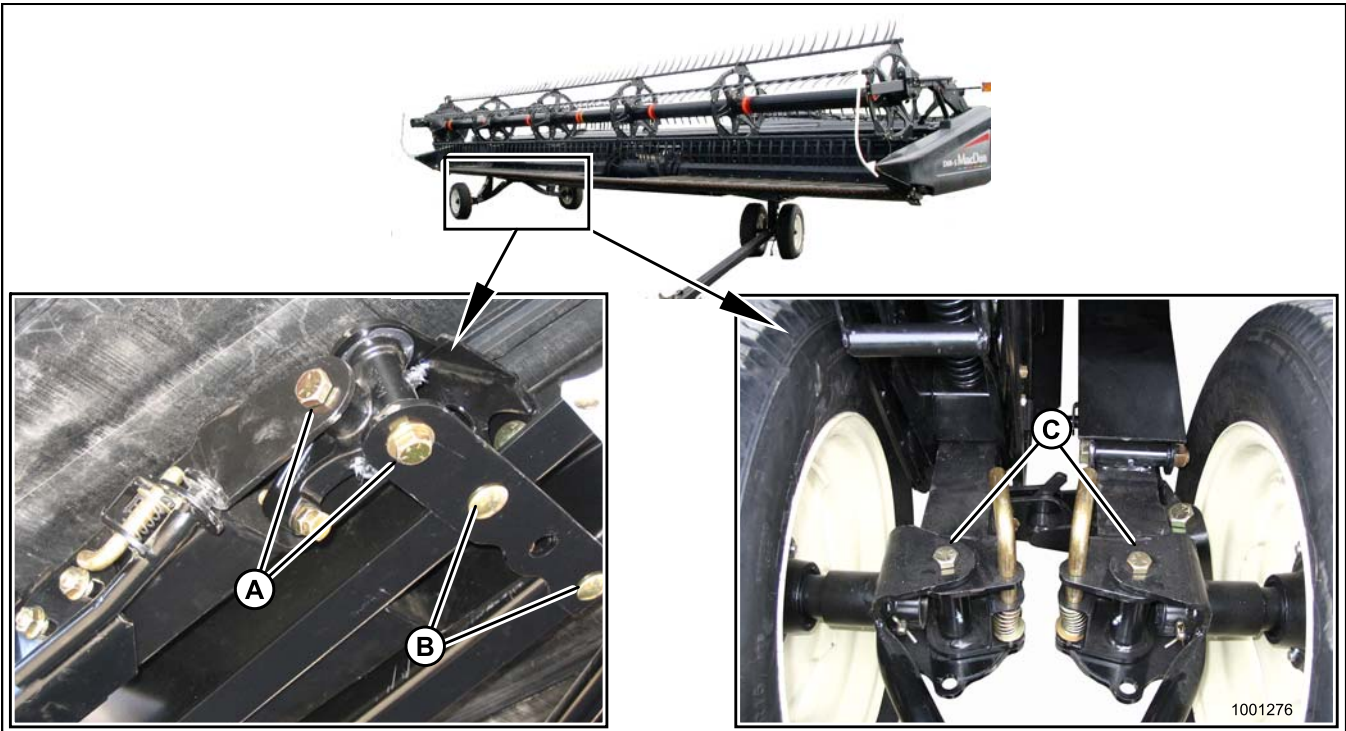


Figure 5.229: Axle Bolts

1. Check and tighten axle bolts **DAILY** until torque is maintained as follows:
 - (A): 180 ft-lbf (244 N·m)
 - (B): 150 ft-lbf (203 N·m)
 - (C): 180 ft-lbf (244 N·m)

5.10.3 Checking Tire Pressure

Check tire pressure daily. Maintain pressure recommended in following table:

Size	Load Range	Pressure
ST205/75 R15	D	65 psi (448 kPa)
	E	80 psi (552 kPa)

WARNING

- Service tires safely.
- A tire can explode during inflation and cause serious injury or death.
- Do NOT stand over tire. Use a clip-on chuck and extension hose.
- NEVER increase air pressure beyond pressure specified on tire sidewall to seat the bead on the rim.
- Replace the tire if it has a defect.
- Replace a wheel rim, which has cracks, wear or severe rust.
- NEVER weld a wheel rim.
- NEVER use force on an inflated or partially inflated tire.
- Make sure the tire is correctly seated before inflating to operating pressure.
- If the tire is not in correct position on the rim, or is too full of air, the tire bead can loosen on one side, causing air to leak 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 a tire before removing the tire from a rim.
- Do NOT remove, install or make repairs to 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.

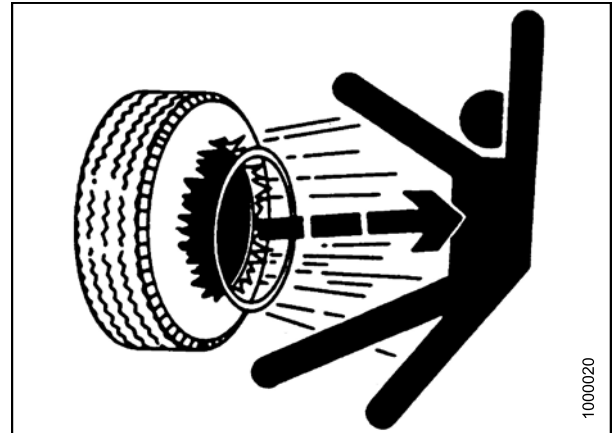


Figure 5.230: Inflation Warning

6 Options and Attachments

The following options and attachments are available for use with your header. Most come with installation instructions. See your MacDon Dealer for availability and ordering information.

6.1 Reel

6.1.1 Multi-Crop Rapid Reel Conversion Kit

This kit decreases the time required to change the fore-aft cylinder position on the reel support arm from the normal operating location to a farther aft location that minimizes disturbance of the crop. The reel fore-aft cylinders can also be quickly relocated back to the normal operating position.

For use on double-reel units only.

MD #B5943

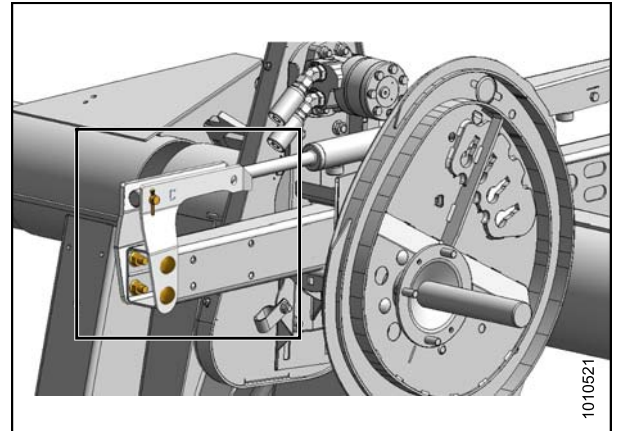


Figure 6.1: Center Arm – Left and Right Similar

6.1.2 Lodged Crop Reel Finger Kit

The steel fingers attach to ends of every other tine bar and help in clearing material in heavy, hard-to-cut crops such as lodged rice.

Each kit contains three fingers for the cam end and three fingers for the tail end of the reel. Hardware, installation and adjustment instructions are included with the kit.

MD #B4831



Figure 6.2: Lodged Crop Finger

6.1.3 PR15 Tine Tube Reel Conversion Kit

This kit allows conversion of a six-bat reel to a nine-bat reel.

Order bundles by header size and type:

- 15 ft. – Steel Fingers MD #B5654
- 20 ft. – Steel Fingers MD #B5655
- 25 ft. – Plastic Fingers MD #B5277
- 30 ft. – Plastic Fingers MD #B5278¹⁵
- 30 ft. – Steel Fingers MD #B5657¹⁵
- 35 ft. – Plastic Fingers MD #B5674

NOTE:

Must order additional endshields when converting reel.

6.1.4 Reel Endshield Kit

The steel shields attach to ends of the reel(s) and help in clearing material in heavy, hard-to-cut crops. They are standard equipment on all, except nine-bat headers. See your MacDon Dealer for more information. Installation and adjustment instructions are included with the kit.

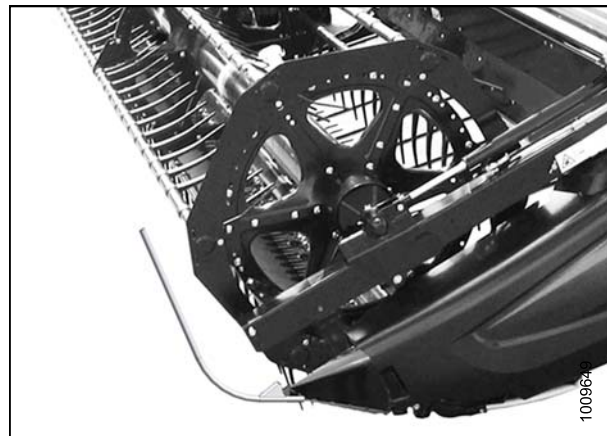


Figure 6.3: Reel Endshields

15. Double-reel units only

6.1.5 Reel Tine Tube Reinforcing Kit

The reel tine tube reinforcing kit is available for five-bat and six-bat reels when cutting extremely heavy crops where high reel loads are experienced.

- Five-Bat – MD #B5825
- Six-Bat – MD #B5826

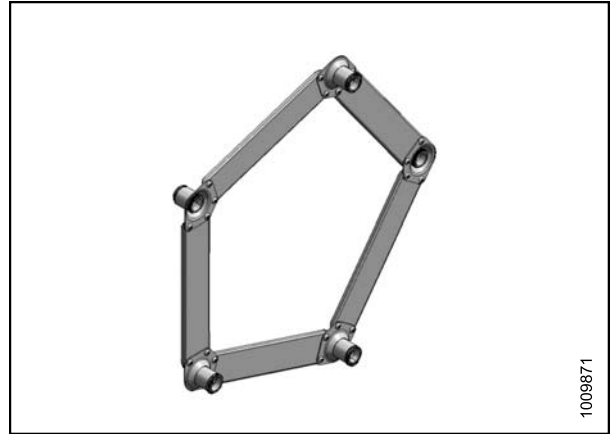


Figure 6.4: Five-Bat Shown – Six-Bat Similar

6.2 Cutterbar

6.2.1 Cutterbar Wearplate

Available as an attachment, they are recommended for cutting on the ground where soil adheres to steel.

Bundles by header size:

- 15 ft. – MD #B4864
- 20 ft. – MD #B4865
- 25 ft. – MD #B4838
- 30 ft. – MD #B4839
- 35 ft. – MD #B4840
- 40 ft. – MD #B4841



Figure 6.5: Cutterbar Wearplate

6.2.2 Knifehead Shield

The shields attach to the endsheets and reduce the knifehead opening to prevent cut crop, particularly severely lodged crop, from accumulating over the knifehead, which could damage the knife drive box and the endsheet.

Order kit according to header size and guard type.

Regular Guards:

- 30 ft. and larger – MD #220101

Stub Guards:

- 30 ft. and larger – MD #220103

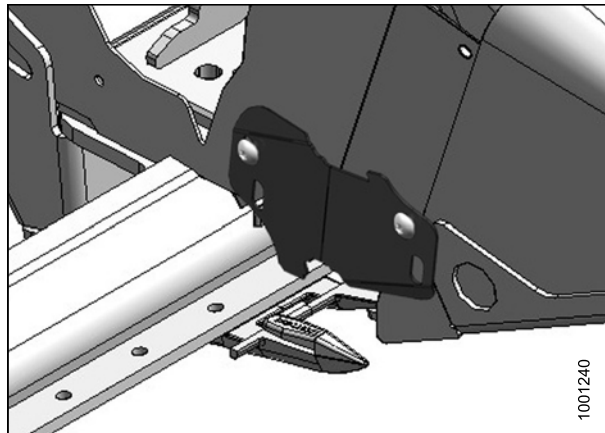


Figure 6.6: Knifehead Shield

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 bundle according to the length of your header:

- 15 ft. – MD #B5009
- 20 ft. – MD #B5010
- 25 ft. – MD #B5011
- 30 ft. – MD #B5012
- 35 ft. – MD #B5013

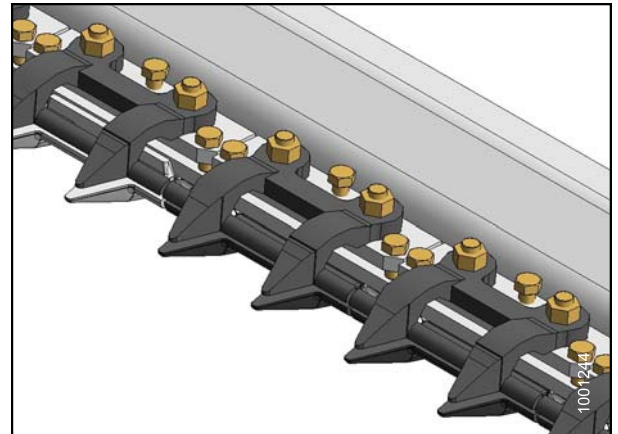


Figure 6.7: Stub Guards

6.2.4 Vertical Knife Mounts

The vertical knife¹⁶ mounts allow installation of vertically oriented knives onto both ends of the header.

Installation and adjustment instructions are included with the bundle.

Order bundles based on left or right side:

- Left-hand – MD #B5757
- Right-hand – MD #B5758

NOTE:

If mounting on multiple headers, you will also require the auxiliary vertical knife plumbing kit MD #B5406.

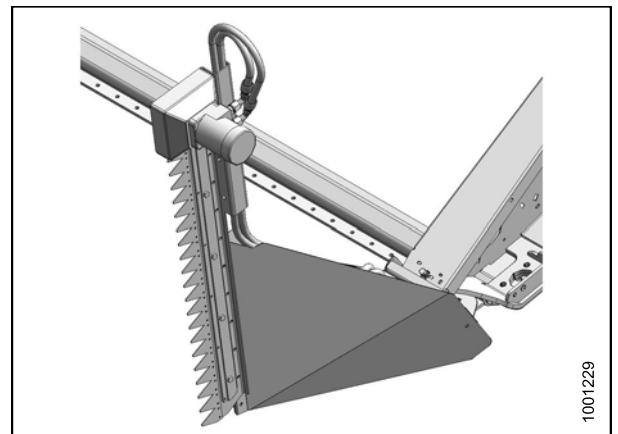


Figure 6.8: Vertical Knife Mount

16. Must be purchased from a separate supplier.

6.3 Header

6.3.1 Divider Latch Kit

The latches attach to the endsheets. They allow for quick removal of endsheet divider cones to accommodate storage and if required, to reduce the transport width of the header. Installation instructions are included with the kit.

MD #B5607

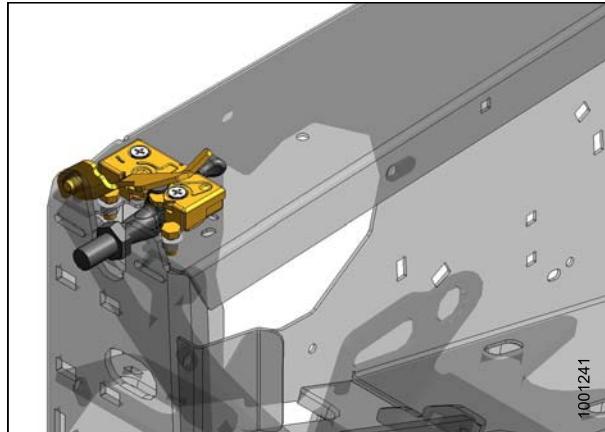


Figure 6.9: Divider Latch

6.3.2 Stabilizer Wheels

The stabilizer wheels help stabilize the header in field conditions that would otherwise cause the header to bounce and result in uneven cutting height. Installation and adjustment instructions are included with the kit.

Available as an attachment for use with 30-, 35-, and 40-ft. headers.

MD #C1986

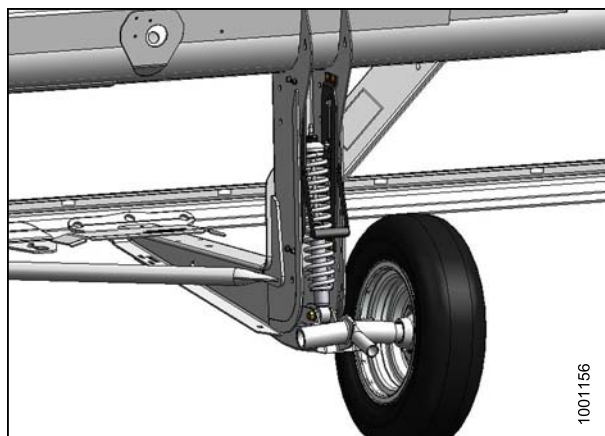


Figure 6.10: Stabilizer Wheel

6.3.3 Stabilizer/Slow Speed Transport Wheels

The Stabilizer/Slow Speed Transport Wheels help stabilize the header in field conditions that would otherwise cause the header to bounce, and result in uneven cutting height. This system is similar to the Stabilizer Wheel option.

The Stabilizer/Slow Speed Transport Wheels convert to transport mode to allow the header to be towed behind a properly configured MacDon windrower (or agricultural tractor) at slow speed. A tow pole is included in the kit.

For use on 30-, 35-, and 40-ft. headers.

MD #C1997



Figure 6.11: Stabilizer/Transport Wheels

6.4 Crop Delivery

6.4.1 Double Draper Drive (DDD) Kit

This option minimizes draper slipping in heavy forage crops when using the side delivery feature, by having four draper rollers powered instead of the normal two.

Installation instructions are included with the kit.

Available for 30- to 40-ft. headers.

MD #B5653¹⁷

6.4.2 Double Windrow Attachment (DWA)

The DWA¹⁸ lays up to 48 ft. (14.6 m) of crop in a single windrow which is ideal for today's large forage harvesters. It is only intended for mounting on SP windrowers equipped with an HC10 Conditioner¹⁹.

MD #C1987

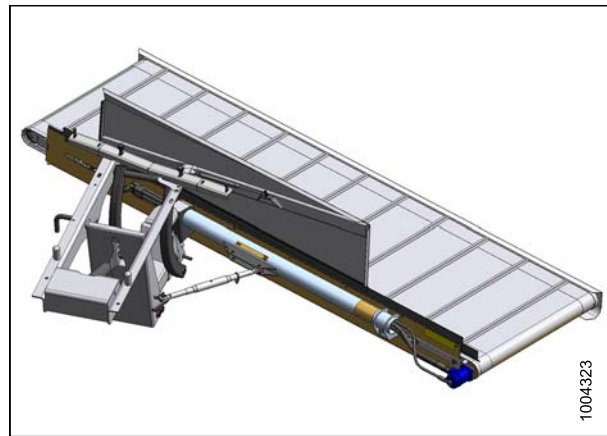


Figure 6.12: Double Windrow Attachment

6.4.3 Draper Deflector (Narrow)

Narrow metal deflectors attach to the inboard side of the endsheets and prevent material from falling through the gap between the endsheet and draper while minimizing reel carryover in bushy type crops. They are not recommended for double windrowing, wide deflectors are available for this purpose.

Refer to the D65 Draper Header for Combines and Self-Propelled Windrowers Parts Catalog for required parts.

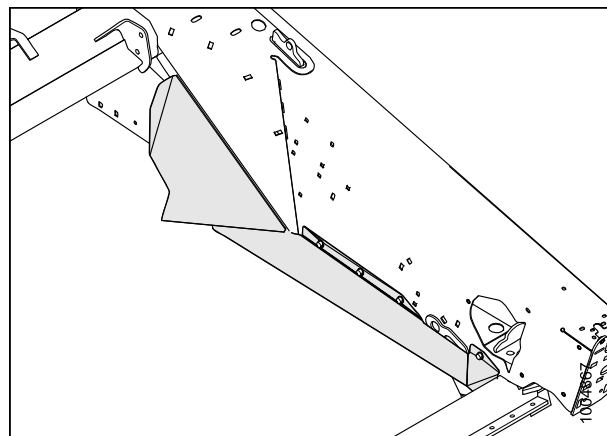


Figure 6.13: Draper Deflector

17. MD #B5606 is required to operate both upper cross auger (UCA) and double draper drive (DDD) on an SP Windrower.

18. This option is not compatible with the M105 SP Windrower.

19. This option is not for use with the M205 or M105 SP Windrower.

6.4.4 Draper Deflector (Wide)

Wide metal deflectors attach to the inboard side of the endsheets, to prevent material from falling through the gap between the endsheet and draper.

Refer to the D65 Draper Header for Combines and Self-Propelled Windrowers for required parts.

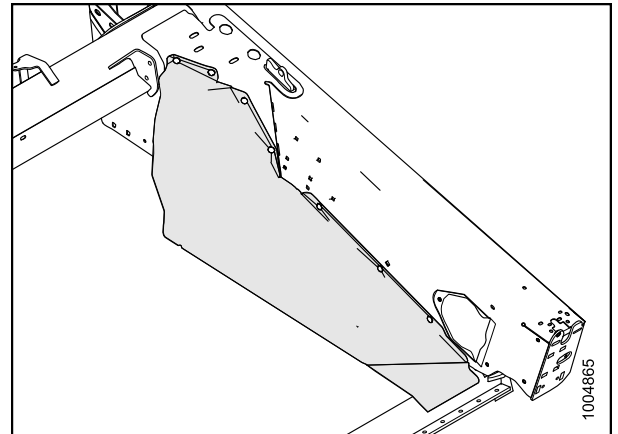


Figure 6.14: Draper Deflector

6.4.5 Draper Extension Kit

This kit increases the length of each deck up to 10 in. (250 mm) into the header opening which decreases the swath width when cutting light/thin crops.

It includes roller support extensions, a draper repair kit and necessary hardware. Installation instructions are also included.

MD #B5407²⁰

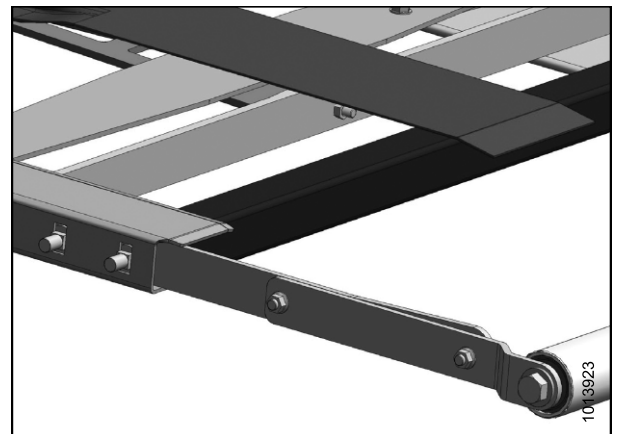


Figure 6.15: Draper Extension

20. Not for use with Double Draper Drive (DDD).

6.4.6 End Swath Deflector Rods (End Delivery)

End deflector rods are used for double swathing with end delivery only, but can be kept on for center delivery.

The rods help prevent the delivered crop at the opening from interfering with standing crop.

Installation and adjustment instructions are included with the kit.

Order bundles based on left or right end.

- Left – MD #B5088
- Right – MD #B5089

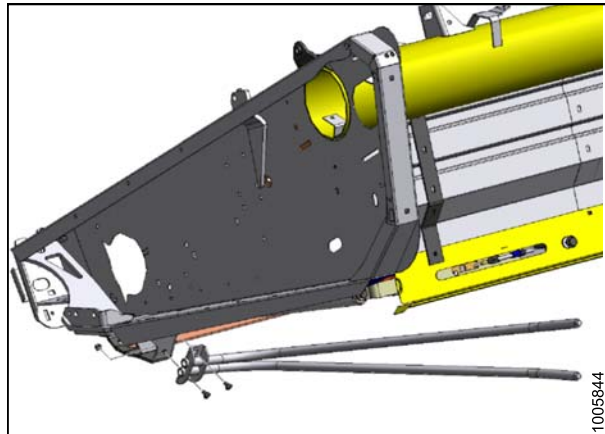


Figure 6.16: Swath Deflector

6.4.7 HC10 Hay Conditioner

The hay conditioner will lay uniform, fluffy windrows. Conditioning or crimping the cut hay allows moisture release for quicker drying and earlier processing.

Installation instructions, operating instructions, and parts list are included.

MD #C1982

NOTE:

Not for use on M205 Windrower.

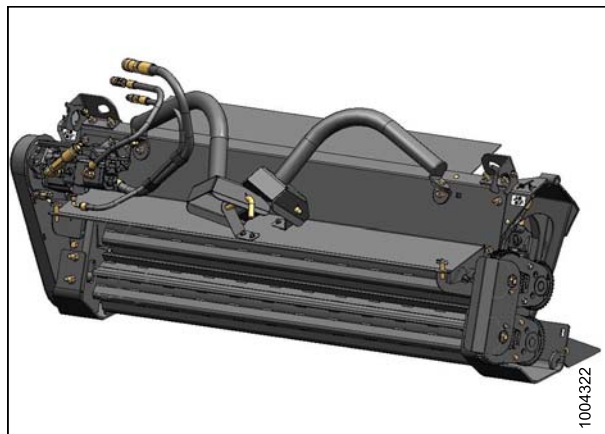


Figure 6.17: Hay Conditioner

6.4.8 Hydraulic Deck Shift Package

This system allows shifting of the decks from the operator's console when double-swathing.

Installation and adjustment instructions are included with the kit.

Available on 25-, 30-, 35-, and 40-ft. headers.

MD #B5664

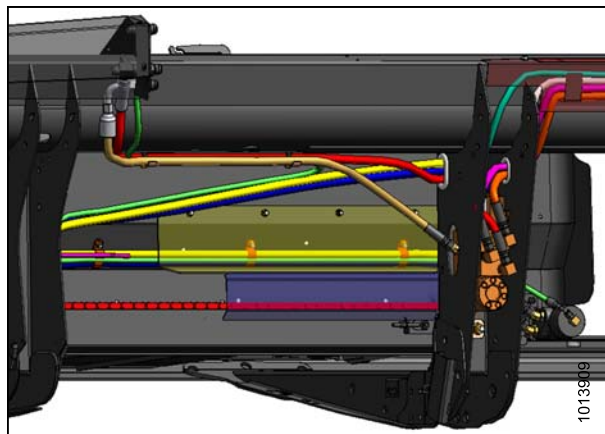


Figure 6.18: Hydraulic Deck Shift

6.4.9 Swath Forming Rods (Center Delivery)

The rods form the windrow such that the heads are in the center and thus are protected from shatter. The rods are mainly used for grass seed cutting applications.

Installation and adjustment instructions are included with the kit.

MD #4803

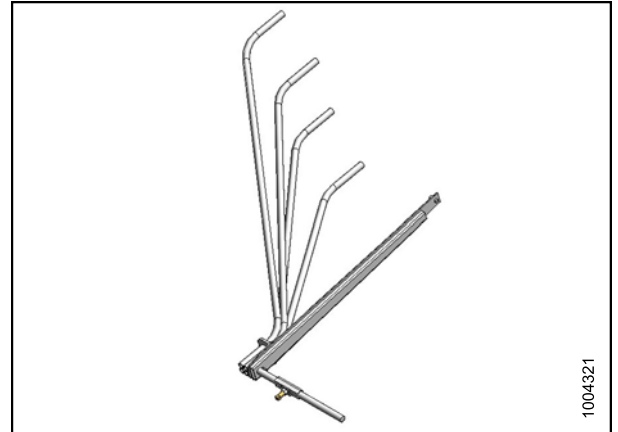


Figure 6.19: Swath Forming Rods

6.4.10 Upper Cross Auger (UCA)

Attaches in front of the backtube, the UCA improves feeding of crop to the center of the header in heavy crop conditions. Ideal for high volume harvesting of forages, oats, canola, mustard and other tall, bushy, hard to feed crops.

Order bundle²¹ according to the length of your header:

- 15 ft. – MD #B4844
- 25 ft. – MD #B4846
- 30 ft. – MD #B4847
- 35 ft. – MD #B4848
- 40 ft. – MD #B4849

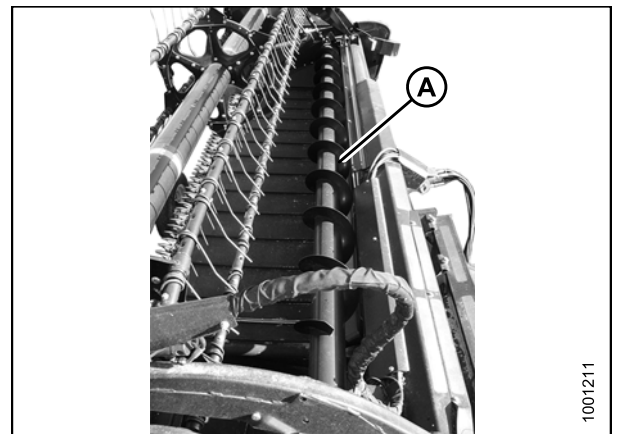


Figure 6.20: Upper Cross Auger

6.4.11 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 Windrowers.

MD #B5606

21. MD #B5606 is required to operate both upper cross auger (UCA) and double draper drive (DDD) on an SP Windrower.

6.4.12 Upper Cross Auger (UCA) Case Drain Kit for Single Draper Drive (SDD)

This kit is intended for SDD headers equipped with an UCA and is applicable to all M-Series windrowers, except the M205.

MD #5842

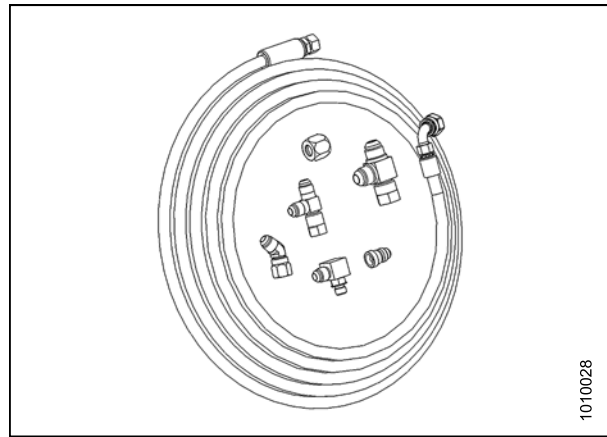


Figure 6.21: Case Drain

6.4.13 Rice Divider Rods

The rice divider rods attach to the left-hand and right-hand endsheet cones and perform the same function in tall and tangled rice crops as standard equipment crop dividers. Installation instructions are included with the kit.

MD #B5609



Figure 6.22: Rice Divider Rod

7 Troubleshooting

7.1 Crop Loss at Cutterbar

Symptom	Problem	Solution	Section
Does not pick up down crop	Cutterbar too high	Lower cutterbar	3.7.1 Cutting Height, page 49
	Header angle too low	Increase header angle	Controlling Header Angle, page 55
	Reel too high	Lower reel	3.7.8 Reel Height, page 58
	Reel too far back	Move reel forward	3.7.9 Reel Fore-Aft Position, page 58
	Ground speed too fast for reel speed	Reduce ground speed or increase reel speed	<ul style="list-style-type: none"> 3.7.4 Reel Speed, page 56 3.7.5 Ground Speed, page 56
	Reel fingers not lifting crop sufficiently	Increase finger pitch aggressiveness	3.7.10 Reel Tine Pitch, page 65
Install lifter guards		See your MacDon Dealer	
Heads shattering or breaking off	Reel speed too fast	Reduce reel speed	3.7.4 Reel Speed, page 56
	Reel too low	Raise reel	3.7.8 Reel Height, page 58
	Ground speed too fast	Reduce ground speed	3.7.5 Ground Speed, page 56
	Crop too ripe	Operate at night when humidity is higher	—
Cut grain falling ahead of cutterbar	Ground speed too slow	Increase ground speed	3.7.5 Ground Speed, page 56
	Reel speed too slow	Increase reel speed	3.7.4 Reel Speed, page 56
	Reel too high	Lower reel	3.7.8 Reel Height, page 58
	Cutterbar too high	Lower cutterbar	3.7.1 Cutting Height, page 49
	Reel too far forward	Move reel back on arms	3.7.9 Reel Fore-Aft Position, page 58
	Cutting at speeds over 6 mph (10 km/h) with high torque (10-tooth) reel drive sprocket	Replace with standard torque (19-tooth) reel drive sprocket	<ul style="list-style-type: none"> See your MacDon Dealer 5.9.3 Replacing Reel Drive Sprocket, page 213
	Worn or broken knife components	Replace components	5.5 Knife, page 127

TROUBLESHOOTING

Symptom	Problem	Solution	Section
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 127
Excessive bouncing at normal field speed	Float set too light	Adjust header float	3.7.2 Header Float, page 55
Divider rod running down standing crop	Divider rods too long	Remove divider rod	3.7.12 Crop Divider Rods, page 72
Bushy or tangled crop flows over divider rod, builds up on endsheets	Divider rods providing insufficient separation	Install long divider rods	3.7.12 Crop Divider Rods, page 72
Crop not being cut at ends	Reel not frowning or not centered in header	Adjust reel frown or reel horizontal position	<ul style="list-style-type: none"> • 3.7.9 Reel Fore-Aft Position, page 58 • 5.8.2 Reel Frown, page 189
	Knife hold-downs not adjusted properly	Adjust hold-downs so knife works freely, but still keep sections from lifting off guards	Checking Knife Hold-Downs, page 136
	Knife sections or guards are worn or broken	Replace all worn and broken cutting parts	5.5 Knife, page 127
	Header is not level	Level header	3.12 Levelling the Header, page 83
	Reel fingers not lifting crop properly ahead of knife	Adjust reel position/finger pitch	<ul style="list-style-type: none"> • 3.7.9 Reel Fore-Aft Position, page 58 • 3.7.10 Reel Tine Pitch, page 65
	Divider runs down thick crop at ends, preventing proper feeding due to material bridging the cutter guards	Replace three or four end guards with stub guards	<ul style="list-style-type: none"> • See your MacDon Dealer • 5.5.7 Knife Guards, page 131 • 6.2.3 Stub Guard Conversion Kit, page 231
Material accumulating in gap between cut-out in endsheet and knifehead	Crop heads leaning away from knifehead hole in endsheet	Add knifehead shield(s), except in damp/sticky soils	6.2.2 Knifehead Shield, page 230

TROUBLESHOOTING

7.2 Cutting Action and Knife Components

Symptom	Problem	Solution	Section
Ragged or uneven cutting of crop	Knife hold-downs not adjusted properly	Adjust hold-downs	Checking Knife Hold-Downs, page 136
	Knife sections or guards are worn or broken	Replace all worn and broken cutting parts	5.5 Knife, page 127
	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	<ul style="list-style-type: none"> • 3.7.5 Ground Speed, page 56 • 3.7.4 Reel Speed, page 56
	Reel fingers not lifting crop properly ahead of knife	Adjust reel position / finger pitch	<ul style="list-style-type: none"> • 3.7.9 Reel Fore-Aft Position, page 58 • 3.7.10 Reel Tine Pitch, page 65
	Cutterbar too high	Lower cutting height	3.7.1 Cutting Height, page 49
	Header angle too flat	Steepen header angle	Controlling Header Angle, page 55
	Bent knife, causing binding of cutting parts	Straighten a bent knife. Align guards	5.5.7 Knife Guards, page 131
	Cutting edge of guards not close enough, or parallel to knife sections	Align guards	
	Tangled / tough to cut crop	Install stub guards	<ul style="list-style-type: none"> • 5.5.7 Knife Guards, page 131 • 6.2.3 Stub Guard Conversion Kit, page 231 • See your MacDon Dealer
	Reel too far back	Move reel forward	3.7.9 Reel Fore-Aft Position, page 58
	Loose knife drive belt	Adjust drive belt tension	<ul style="list-style-type: none"> • Tensioning Non-Timed Knife Drive Belts, page 150 • Tensioning Timed Knife Drive Belts, page 155

TROUBLESHOOTING

Symptom	Problem	Solution	Section
Knife plugging	Reel too high or too far forward	Lower reel or move reel rearward	<ul style="list-style-type: none"> • 3.7.8 Reel Height, page 58 • 3.7.9 Reel Fore-Aft Position, page 58
	Ground speed too slow	Increase ground speed	3.7.5 Ground Speed, page 56
	Loose knife drive belt	Adjust drive belt tension	<ul style="list-style-type: none"> • Tensioning Non-Timed Knife Drive Belts, page 150 • Tensioning Timed Knife Drive Belts, page 155
	Improper knife hold-down adjustment	Adjust hold-down	Checking Knife Hold-Downs, page 136
	Dull or broken knife sections	Replace knife section	5.5.1 Replacing Knife Section, page 127
	Bent or broken guards	Align or replace guards	5.5.7 Knife Guards, page 131
	Reel fingers not lifting crop properly ahead of knife	Adjust reel position / finger pitch	<ul style="list-style-type: none"> • 3.7.9 Reel Fore-Aft Position, page 58 • 3.7.10 Reel Tine Pitch, page 65
	Steel pick-up fingers contacting knife	Increase reel clearance to cutterbar, or adjust frown	<ul style="list-style-type: none"> • 5.8.1 Reel Clearance to Cutterbar, page 186 • 5.8.2 Reel Frown, page 189
	Float too heavy	Adjust springs for lighter float	3.7.2 Header Float, page 55
	Mud or dirt build-up on cutterbar	Raise cutterbar by lowering skid shoes	Cutting On the Ground, page 53
		Install cut-out sections	See your MacDon Dealer
		Flatten header angle	Controlling Header Angle, page 55
	Knife is not operating at recommended speed	Check engine speed of windrower	Refer to your windrower's operator's manual

TROUBLESHOOTING

Symptom	Problem	Solution	Section
Excessive header vibration	Knife hold-downs not adjusted properly	Adjust hold-downs	Checking Knife Hold-Downs, page 136
	Knives on double-knife drive not timed	Adjust knife timing	Adjusting Double-Knife Timing, page 156
	Knife not operating at recommended speed	Check engine speed of windrower	Refer to your windrower's operator's manual
	Excessive knife wear	Replace knife	<ul style="list-style-type: none"> • 5.5.2 Removing Knife, page 129 • 5.5.5 Installing Knife, page 130
	Loose or worn knifehead pin or drive arm	Tighten or replace parts	<ul style="list-style-type: none"> • 5.5.3 Removing Knifehead Bearing, page 129 • 5.6.1 Knife Drive Box, page 140
	Bent cutterbar	Straighten cutterbar	See your MacDon Dealer
Knife back breakage	Bent or broken guard	Straighten or replace	5.5.7 Knife Guards, page 131
	Worn knifehead pin	Replace	5.5.3 Removing Knifehead Bearing, page 129
	Dull knife	Replace	<ul style="list-style-type: none"> • 5.5.2 Removing Knife, page 129 • 5.5.5 Installing Knife, page 130
Excessive breakage of knife sections or guards.	Knife hold-downs not adjusted properly	Adjust hold-downs	Checking Knife Hold-Downs, page 136
	Cutterbar operating too low in stony conditions	Raise cutterbar, using skid shoes	Cutting On the Ground, page 53
	Float is set too heavy	Adjust for lighter float	3.7.2 Header Float, page 55
	Bent or broken guard	Straighten or replace	5.5.7 Knife Guards, page 131
	Header angle too steep	Flatten header angle	Controlling Header Angle, page 55

TROUBLESHOOTING

7.3 Reel Delivery

Symptom	Problem	Solution	Section
Reel not releasing material in normal standing crop	Reel speed too fast	Reduce reel speed	3.7.4 Reel Speed, page 56
	Reel too low	Raise reel	3.7.8 Reel Height, page 58
	Reel tines too aggressive	Reduce cam setting	3.7.10 Reel Tine Pitch, page 65
	Reel too far back	Move reel forward	3.7.9 Reel Fore-Aft Position, page 58
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)	3.7.10 Reel Tine Pitch, page 65
Wrapping on reel end	Reel tines too aggressive	Reduce cam setting	3.7.10 Reel Tine Pitch, page 65
	Reel too low	Raise reel	3.7.8 Reel Height, page 58
	Reel speed too fast	Reduce reel speed	3.7.4 Reel Speed, page 56
	Crop conditions	Install optional endshields	See your MacDon Dealer
	Reel not centered in header	Center reel in header	5.8.3 Centering the Reel, page 190
Reel releases crop too quickly	Reel tines not aggressive enough	Increase cam setting	3.7.10 Reel Tine Pitch, page 65
	Reel too far forward	Move reel back	3.7.9 Reel Fore-Aft Position, page 58
Reel will not lift	Reel lift couplers are incompatible or defective	Change quick coupler	—
Reel will not turn	Control set at 0	Activate reel speed control	3.7.4 Reel Speed, page 56
	Quick couplers not properly connected	Connect couplers	4.1 Attaching Header to Windrower, page 105
	Reel drive chain disconnected	Connect chain	5.9.7 Replacing Drive Chain on Single Reel, page 221
Reel motion uneven under no load	Excessive slack in reel drive chain	Tighten chain	5.9.2 Adjusting Reel Drive Chain Tension, page 211

TROUBLESHOOTING

Symptom	Problem	Solution	Section
Reel motion is uneven or stalls in heavy crops	Reel speed too fast	Reduce reel speed	3.7.4 Reel Speed, page 56
	Reel fingers not aggressive enough	Move to a more aggressive finger pitch notch	3.7.10 Reel Tine Pitch, page 65
	Reel too low	Raise reel	3.7.8 Reel Height, page 58
	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	
	Relief valve malfunction	Replace relief valve	
	Cutting tough crops with standard torque (19-tooth) reel drive sprocket	Replace with high torque (10-tooth) or 14-tooth reel drive sprocket	5.9.3 Replacing Reel Drive Sprocket, page 213
Plastic fingers cut at tip	Insufficient reel to cutterbar clearance	Increase clearance	5.8.1 Reel Clearance to Cutterbar, page 186
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 49
		Decrease header tilt	Controlling Header Angle, page 55
		Move reel aft	3.7.9 Reel Fore-Aft Position, page 58
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 49
		Decrease header tilt	Controlling Header Angle, page 55
		Move reel aft	3.7.9 Reel Fore-Aft Position, page 58
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 84
		Stop reel before plugging becomes excessive	—

TROUBLESHOOTING

7.4 Header and Drapers

Symptom	Problem	Solution	Section
Header lift insufficient	Low relief pressure	Increase relief pressure	See your MacDon Dealer
Insufficient draper speed	Speed control set too low	Increase control setting	3.7.6 Draper Speed, page 57
	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 the windrower operator's manual
	Worn out gear pump	Replace pump	See your MacDon Dealer
	Pressure compensator (V7) set too low	Adjust to increase setting	Refer to your windrower operator's manual
Draper will not move	Drapers are loose	Tighten drapers	5.7.3 Adjusting Draper Tension, page 165
	Drive or idler roller wrapped with material	Loosen draper and clean rollers	
	Slat or connector bar jammed by frame or material	Loosen draper and clear obstruction	
	Roller bearing seized	Replace	5.7.8 Draper Roller Maintenance, page 174
	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
Draper stalling	Material not feeding evenly off knife	Lower reel	3.7.8 Reel Height, page 58
		Install stub guards	<ul style="list-style-type: none"> • 6.2.3 Stub Guard Conversion Kit, page 231 • 5.5.7 Knife Guards, page 131 • See your MacDon Dealer
Hesitation in flow of bulky crop	Header angle too low	Increase header angle	Controlling Header Angle, page 55
	Material overload on drapers	Increase side draper speed	3.7.6 Draper Speed, page 57
		Install upper cross auger	6.4.10 Upper Cross Auger (UCA), page 237
		Add flighting extensions	See your MacDon Dealer

TROUBLESHOOTING

Symptom	Problem	Solution	Section
Drapers back-feed	Drapers running too slow in heavy crop	Increase draper speed	<i>3.7.6 Draper Speed, page 57</i>
Crop is thrown across opening and under opposite side draper	Drapers running too fast in light crop	Reduce draper speed	
Material accumulates inside or under front edge of draper	Deck height improperly adjusted	Adjust deck height	<i>5.7.7 Adjusting Deck Height, page 172</i>
Material wrapping at upper cross auger beater bars	Crop conditions do not require beater bars	Remove beater bars	<i>3.14.1 Removing Beater Bars, page 86</i>
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)	<i>3.13 Unplugging Cutterbar, page 84</i>

TROUBLESHOOTING

7.5 Cutting Edible Beans

Symptom	Problem	Solution	Section	
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	Cutting On the Ground, page 53	
	Float set too light—rides on high spots and does not lower soon enough	Set float for: - Dry ground: 100–150 lbf - Wet ground: 50–100 lbf	3.7.2 Header Float, page 55	
	Reel too high	Fully retract reel cylinders	3.7.8 Reel Height, page 58	
	Reel too high with cylinders fully retracted	Adjust reel height	3.7.8 Reel Height, page 58	
	Finger pitch not aggressive enough	Adjust finger pitch	3.7.10 Reel Tine Pitch, page 65	
	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	3.7.9 Reel Fore-Aft Position, page 58	
	Header angle too shallow	Lengthen center-link	If cutting on ground, header angle can be increased by fully retracting lift cylinders	Controlling Header Angle, page 55
	Reel too slow	Adjust reel speed to be marginally faster than ground speed	3.7.4 Reel Speed, page 56	
	Ground speed too fast	Lower ground speed	3.7.5 Ground Speed, page 56	
	Skid shoes too low	Raise skid shoes to highest setting	Cutting On the Ground, page 53	
	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	Manually clean the bottom of cutterbar when accumulation gets unacceptable	—	

TROUBLESHOOTING

Symptom	Problem	Solution	Section
Plants being stripped and complete or partial plants left behind (cont'd)	Plastic wear strip for cutterbar has been installed over top of steel wear plates	Remove steel cutterbar wear plates when installing the plastic wear strips for cutterbar	—
	Header not level	Level header	3.12 Levelling the Header, page 83
	Worn/damaged knife sections	Replace sections or complete knife	5.5 Knife, page 127
	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 231
Excessive losses at dividers	Divider rod running down crop and shattering pods	Remove divider rod	3.7.12 Crop Divider Rods, page 72
	Vines and plants build up on endsheet	Install divider rod	
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	
Crop accumulating at guards and not moving rearward onto drapers	Reel finger pitch not aggressive enough	Increase finger aggressiveness (cam position)	3.7.10 Reel Tine Pitch, page 65
	Reel too high	Lower reel	3.7.8 Reel Height, page 58
	Minimum reel clearance to cutterbar setting too high	Readjust reel minimum height with cylinders fully retracted	Adjusting Reel Clearance, page 188
	Reel too far forward	Reposition reel	3.7.9 Reel Fore-Aft Position, page 58
Reel too far forward			
Reel shattering pods	Reel speed too high	Reduce reel speed	3.7.4 Reel Speed, page 56
	Bean pods are too dry	Cut at night with heavy dew once pods have softened	—
	Reel finger pitch too retarded	Increase finger aggressiveness (cam position)	3.7.10 Reel Tine Pitch, page 65

TROUBLESHOOTING

Symptom	Problem	Solution	Section
Cutterbar guards breaking	Float insufficient	Increase float	3.7.2 Header Float, page 55
	Excessive number of rocks in field	Consider installing optional stub guards	<ul style="list-style-type: none"> • 5.5.7 Knife Guards, page 131 • 6.2.3 Stub Guard Conversion Kit, page 231
Tip: Experiment with a few guards on a section of cutterbar to compare the performance of the two different styles of guards			
Cutterbar pushing too much trash and dirt	Header too heavy	Readjust float to make header lighter	3.7.2 Header Float, page 55
	Header angle too steep	Decrease header angle with lift cylinders	3.7.3 Header Angle, page 55
		Shorten the center-link	
	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 231
Insufficient support for header	Install center skid shoes on header	Cutting On the Ground, page 53	
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	5.7.7 Adjusting Deck Height, page 172
		Raise header fully at each end of field or as required and shift decks back and forth to help clean out cutterbar	—
Reel carries over odd plants in same location	Reel fingers (steel) bent and hook plants from crop flow on drapers	Straighten fingers (steel)	
	Dirt accumulation on end of fingers prevent plants dropping off fingers onto drapers	Raise reel	3.7.8 Reel Height, page 58
		Adjust reel fore and aft location to move fingers out of the ground	3.7.9 Reel Fore-Aft Position, page 58
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° to undulations, provided knife floats across without digging in	

TROUBLESHOOTING

Symptom	Problem	Solution	Section
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	3.7.6 Draper Speed, page 57
	Finger pitch too retarded	Increase finger pitch	3.7.10 Reel Tine Pitch, page 65
Reel wraps up with crop	Reel too low	Raise reel	3.7.8 Reel Height, page 58
Reel ends wrap up with crop	Uncut crop interfering on reel ends	Add reel endshields	Refer to the header parts catalog

TROUBLESHOOTING

7.6 Windrow Formation

Symptom	Problem	Solution	Section
Heads on ground and scattered	Draper speed too slow	Increase draper speed	3.7.6 Draper Speed, page 57
	Draper angle too flat	Increase header angle	Controlling Header Angle, page 55
	Ground speed too slow	Increase ground speed	3.7.5 Ground Speed, page 56
	Crop too ripe	Cut material before too mature	—
Hollow in center	Draper speed too slow	Increase draper speed	3.7.6 Draper Speed, page 57
	Delivery opening too wide	Decrease delivery opening width	3.8 Delivery Opening, page 74
All heads in center	Draper speed too fast or header angle too steep	Reduce draper speed and/or decrease header angle	3.7.6 Draper Speed, page 57 3.7.3 Header Angle, page 55
	Ground speed too fast	Reduce ground speed	3.7.5 Ground Speed, page 56
	Crop too green	Allow to mature	—
All heads to one side	Crop leaning to one side and reel too slow	Increase reel speed to re-orient crop parallel to draper slats and/or increase finger pitch aggressiveness	<ul style="list-style-type: none"> • 3.7.4 Reel Speed, page 56 • 3.7.10 Reel Tine Pitch, page 65
Uneven windrow (any crop condition)	Ground speed too fast for drapers, causing heads to fan out and crop to leave drapers unevenly	Reduce ground speed or increase draper speed	<ul style="list-style-type: none"> • 3.7.5 Ground Speed, page 56 • 3.7.6 Draper Speed, page 57
	Reel too low	Raise reel	3.7.8 Reel Height, page 58
	Reel speed too fast	Reduce reel speed	3.7.4 Reel Speed, page 56

8 Reference

8.1 Conversion Chart

Table 8.1 Conversion Chart

Quantity	Inch-Pound Units		Factor	SI Units (Metric)	
	Unit Name	Abbreviation		Unit Name	Abbreviation
Area	Acres	acres	$\times 0.4047 =$	Hectares	ha
Flow	US gallons per minute	gpm	$\times 3.7854 =$	Liters per minute	L/min
Force	Pounds force	lbf	$\times 4.4482 =$	Newtons	N
Length	Inch	in.	$\times 25.4 =$	Millimeters	mm
	Foot	ft.	$\times 0.305 =$	Meters	m
Power	Horsepower	hp	$\times 0.7457 =$	Kilowatts	kW
Pressure	Pounds per square inch	psi	$\times 6.8948 =$	Kilopascals	kPa
			$\times .00689 =$	Megapascals	MPa
			$\div 14.5038 =$	Bar (Non-SI)	bar
Torque	Pound feet or foot pounds	ft·lbf	$\times 1.3558 =$	Newton meters	N·m
	Pound inches or inch pounds	in·lbf	$\times 0.1129 =$	Newton meters	N·m
Temperature	Degrees Fahrenheit	°F	$(^{\circ}\text{F}-32) \times 0.56 =$	Celsius	°C
Velocity	Feet per minute	ft/min	$\times 0.3048 =$	Meters per minute	m/min
	Feet per second	ft/s	$\times 0.3048 =$	Meters per second	m/s
	Miles per hour	mph	$\times 1.6063 =$	Kilometres per hour	km/h
Volume	US gallons	US gal	$\times 3.7854 =$	Liters	L
	Ounces	oz.	$\times 29.5735 =$	Milliliters	ml
	Cubic inches	in. ³	$\times 16.3871 =$	Cubic centimeters	cm ³ or cc
Weight	Pounds	lbs	$\times 0.4536 =$	Kilograms	kg

REFERENCE

8.2 Torque Specifications

The following tables provide the correct torque values for various bolts, cap screws, and hydraulic fittings.

- Tighten all bolts to the torque values specified in the charts (unless otherwise noted throughout this manual).
- Replace hardware with the same strength and grade of bolt.
- Use the torque value tables as a guide and periodically check tightness of bolts.
- Understand torque categories for bolts and cap screws by using their identifying head markings.

8.2.1 SAE Bolt Torque Specifications

Torque values shown in the following tables are valid for non-greased, or non-oiled threads and heads; therefore, do **NOT** grease or oil bolts or cap screws unless otherwise specified in this manual.

Table 8.2 SAE Grade 5 Bolt and Grade 5 Free Spinning Nut

Nominal Size (A)	Torque (ft-lbf) (*in-lbf)		Torque (N-m)	
	Min.	Max.	Min.	Max.
1/4-20	*106	*117	11.9	13.2
5/16-18	*218	*241	24.6	27.1
3/8-16	32	36	44	48
7/16-14	52	57	70	77
1/2-13	79	87	106	118
9/16-12	114	126	153	170
5/8-11	157	173	212	234
3/4-10	281	311	380	420
7/8-9	449	496	606	669
1-8	611	676	825	912

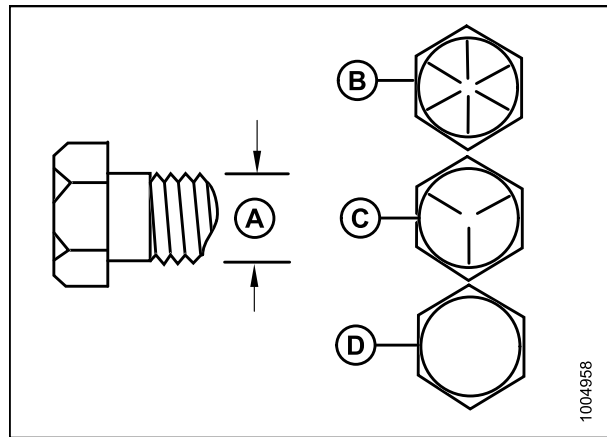


Figure 8.1: Bolt Grades

A - Nominal Size
C - SAE-5

B - SAE-8
D - SAE-2

REFERENCE

Table 8.3 SAE Grade 5 Bolt and Grade F Distorted Thread Nut

Nominal Size (A)	Torque (ft-lbf) (*in-lbf)		Torque (N-m)	
	Min.	Max.	Min.	Max.
1/4-20	*72	*80	8.1	9
5/16-18	*149	*164	16.7	18.5
3/8-16	22	24	30	33
7/16-14	35	39	48	53
1/2-13	54	59	73	80
9/16-12	77	86	105	116
5/8-11	107	118	144	160
3/4-10	192	212	259	286
7/8-9	306	338	413	456
1-8	459	507	619	684

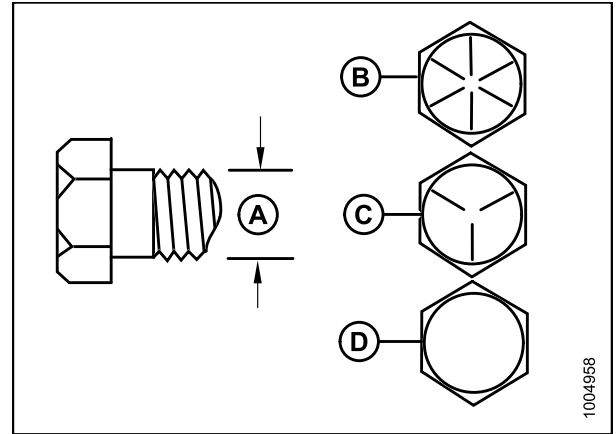


Figure 8.2: Bolt Grades

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 (ft-lbf) (*in-lbf)		Torque (N-m)	
	Min.	Max.	Min.	Max.
1/4-20	*150	*165	16.8	18.6
5/16-18	18	19	24	26
3/8-16	31	34	42	46
7/16-14	50	55	67	74
1/2-13	76	84	102	113
9/16-12	109	121	148	163
5/8-11	151	167	204	225
3/4-10	268	296	362	400
7/8-9	432	477	583	644
1-8	647	716	874	966

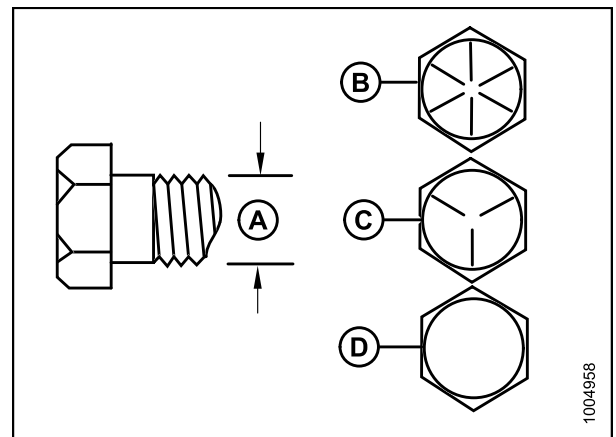


Figure 8.3: Bolt Grades

A - Nominal Size
 B - SAE-8
 C - SAE-5
 D - SAE-2

REFERENCE

Table 8.5 SAE Grade 8 Bolt and Grade 8 Free Spinning Nut

Nominal Size (A)	Torque (ft-lbf) (*in-lbf)		Torque (N-m)	
	Min.	Max.	Min.	Max.
1/4-20	*150	*165	16.8	18.6
5/16-18	26	28	35	38
3/8-16	46	50	61	68
7/16-14	73	81	98	109
1/2-13	111	123	150	166
9/16-12	160	177	217	239
5/8-11	221	345	299	330
3/4-10	393	435	531	587
7/8-9	633	700	855	945
1-8	863	954	1165	1288

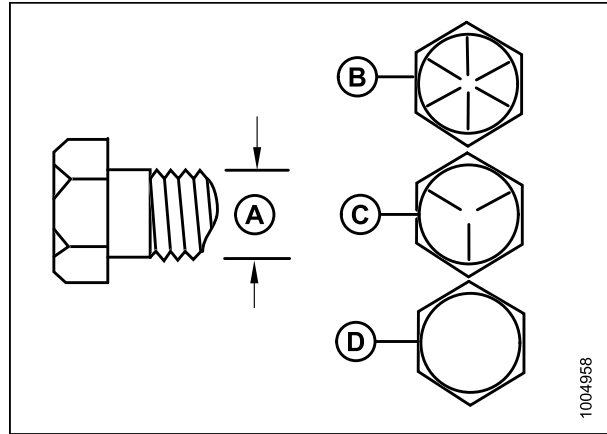


Figure 8.4: Bolt Grades

A - Nominal Size
C - SAE-5

B - SAE-8
D - SAE-2

1004958

8.2.2 Metric Bolt Specifications

Table 8.6 Metric Class 8.8 Bolts and Class 9 Free Spinning Nut

Nominal Size (A)	Torque (ft-lbf) (*in-lbf)		Torque (N-m)	
	Min.	Max.	Min.	Max.
3-0.5	*13	*14	1.4	1.6
3.5-0.6	*20	*22	2.2	2.5
4-0.7	*29	*32	3.3	3.7
5-0.8	*59	*66	6.7	7.4
6-1.0	*101	*112	11.4	12.6
8-1.25	20	23	28	30
10-1.5	40	45	55	60
12-1.75	70	78	95	105
14-2.0	113	124	152	168
16-2.0	175	193	236	261
20-2.5	341	377	460	509
24-3.0	589	651	796	879

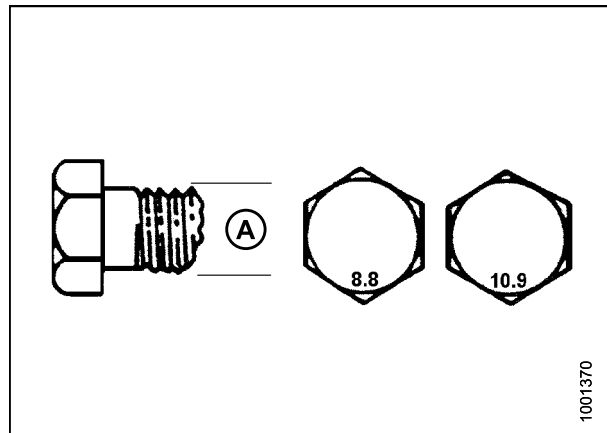


Figure 8.5: Bolt Grades

1001370

REFERENCE

Table 8.7 Metric Class 8.8 Bolts and Class 9 Distorted Thread Nut

Nominal Size (A)	Torque (ft-lbf) (*in-lbf)		Torque (N-m)	
	Min.	Max.	Min.	Max.
3-0.5	*9	*10	1	1.1
3.5-0.6	*14	*15	1.5	1.7
4-0.7	*20	*22	2.3	2.5
5-0.8	*40	*45	4.5	5
6-1.0	*69	*76	7.7	8.6
8-1.25	*167	*185	18.8	20.8
10-1.5	28	30	37	41
12-1.75	48	53	65	72
14-2.0	77	85	104	115
16-2.0	119	132	161	178
20-2.5	233	257	314	347
24-3.0	402	444	543	600

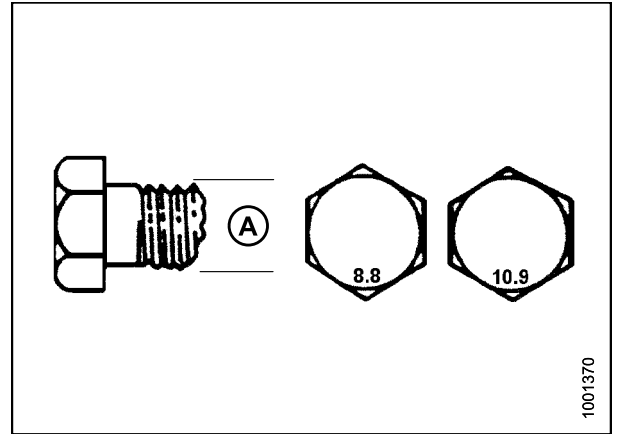


Figure 8.6: Bolt Grades

Table 8.8 Metric Class 10.9 Bolts and Class 10 Free Spinning Nut

Nominal Size (A)	Torque (ft-lbf) (*in-lbf)		Torque (N-m)	
	Min.	Max.	Min.	Max.
3-0.5	*18	*19	1.8	2
3.5-0.6	*27	*30	2.8	3.1
4-0.7	*41	*45	4.2	4.6
5-0.8	*82	*91	8.4	9.3
6-1.0	*140	*154	14.3	15.8
8-1.25	28	31	38	42
10-1.5	56	62	75	83
12-1.75	97	108	132	145
14-2.0	156	172	210	232
16-2.0	242	267	326	360
20-2.5	472	521	637	704
24-3.0	815	901	1101	1217

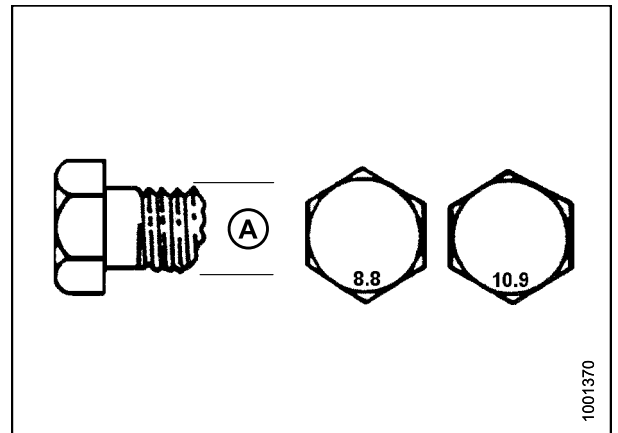


Figure 8.7: Bolt Grades

REFERENCE

Table 8.9 Metric Class 10.9 Bolts and Class 10 Distorted Thread Nut

Nominal Size (A)	Torque (ft-lbf) (*in-lbf)		Torque (N-m)	
	Min.	Max.	Min.	Max.
3-0.5	*12	*13	1.3	1.5
3.5-0.6	*19	*21	2.1	2.3
4-0.7	*28	*31	3.1	3.4
5-0.8	*56	*62	6.3	7
6-1.0	*95	*105	10.7	11.8
8-1.25	19	21	26	29
10-1.5	38	42	51	57
12-1.75	66	73	90	99
14-2.0	106	117	143	158
16-2.0	165	182	222	246
20-2.5	322	356	434	480
24-3.0	556	614	750	829

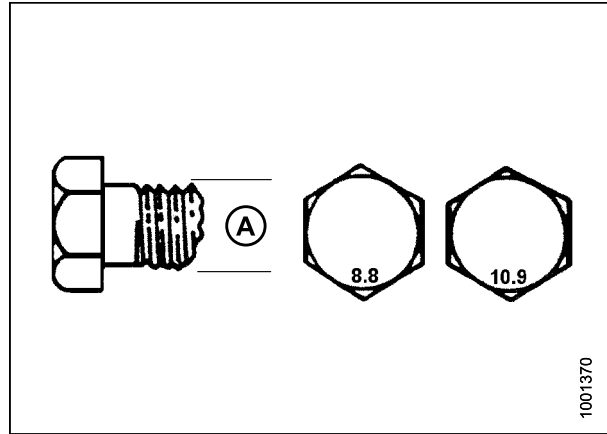


Figure 8.8: Bolt Grades

8.2.3 Metric Bolt Specifications Bolting into Cast Aluminum

Table 8.10 Metric Bolt Bolting into Cast Aluminum

Nominal Size (A)	Bolt Torque			
	8.8 (Cast Aluminum)		10.9 (Cast Aluminum)	
	ft·lbf	N·m	ft·lbf	N·m
M3	–	–	1	–
M4	–	–	2.6	4
M5	–	–	5.5	8
M6	6	9	9	12
M8	14	20	20	28
M10	28	40	40	55
M12	52	70	73	100
M14	–	–	–	–
M16	–	–	–	–

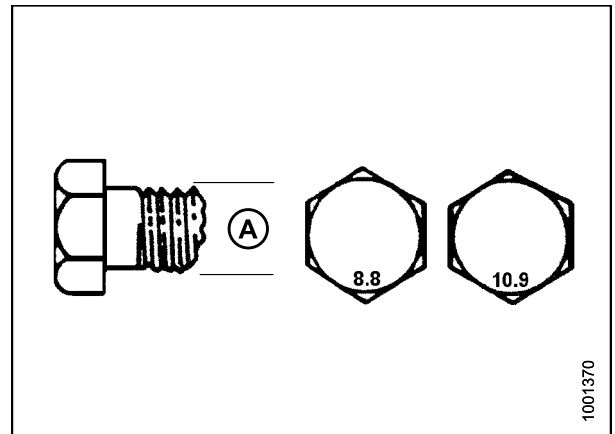


Figure 8.9: Bolt Grades

8.2.4 Flare-Type Hydraulic Fittings

1. Check flare (A) and flare seat (B) for defects that might cause leakage.
2. Align tube (C) with fitting (D) and thread nut (E) onto fitting without lubrication until contact has been made between the flared surfaces.
3. Torque the fitting nut (E) to the specified number of flats from finger tight (FFFT) or to a given torque value in [Table 8.11 Flare-Type Hydraulic Tube Fittings, page 260](#).
4. Use two wrenches to prevent fitting (D) from rotating. Place one wrench on the fitting body (D) and tighten nut (E) with the other wrench to the torque shown.
5. Assess the final condition of the connection.

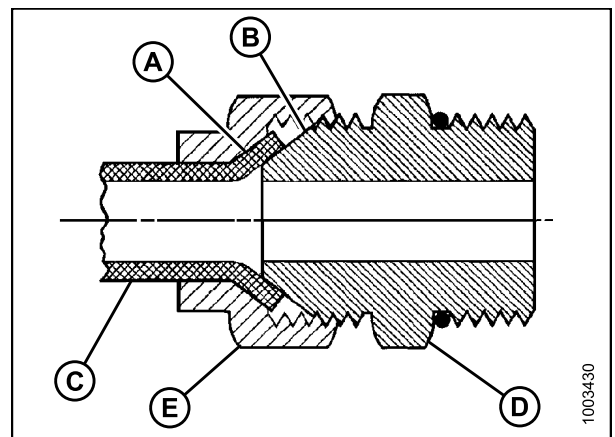


Figure 8.10: Hydraulic Fitting

REFERENCE

Table 8.11 Flare-Type Hydraulic Tube Fittings

SAE Dash Size	Thread Size (in.)	Torque Value ²²		Flats from Finger Tight (FFFT)	
		ft·lbf	N·m	Tube	Swivel Nut or Hose
-2	5/16–24	3–4	4–5	—	—
-3	3/8–24	5–6	7–8	—	—
-4	7/16–20	13–14	18–19	2-1/2	2
-5	1/2–20	14–15	19–21	2	2
-6	9/16–18	22–24	30–33	2	1-1/2
-8	3/4–16	42–46	57–63	2	1-1/2
-10	7/8–14	60–66	81–89	1-1/2	1-1/2
-12	1-1/16–12	83–91	113–124	1-1/2	1-1/4
-14	1-3/16–12	100–110	136–149	1-1/2	1-1/4
-16	1-5/16–12	118–130	160–176	1-1/2	1
-20	1-5/8–12	168–184	228–250	1	1
-24	1-7/8–12	195–215	264–291	1	1
-32	2-1/2–12	265–291	359–395	1	1
-40	3–12	—	—	1	1

22. Torque values shown are based on lubricated connections as in reassembly.

REFERENCE

8.2.5 O-Ring Boss (ORB) Hydraulic Fittings (Adjustable)

1. Inspect O-ring (A) and seat (B) for dirt or obvious defects.
2. Back off the lock nut (C) as far as possible. Ensure that washer (D) is loose and is pushed toward the lock nut (C) as far as possible.
3. Check that O-ring (A) is **NOT** on the threads and adjust if necessary.
4. Apply hydraulic system oil to the O-ring (A).

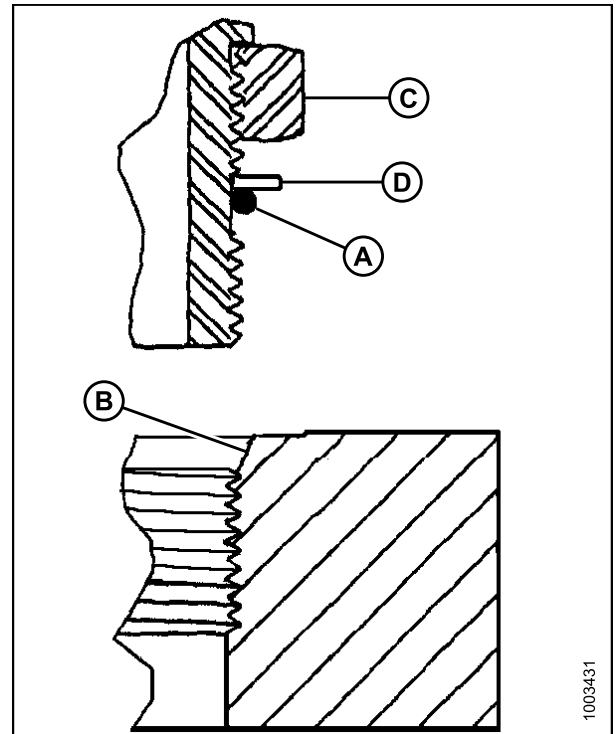


Figure 8.11: Hydraulic Fitting

5. Install fitting (B) into port until back up washer (D) and O-ring (A) contact the part face (E).
6. Position angle fittings by unscrewing no more than one turn.
7. Turn lock nut (C) down to washer (D) and tighten to torque shown. Use two wrenches, one on fitting (B) and the other on lock nut (C).
8. Check the final condition of the fitting.

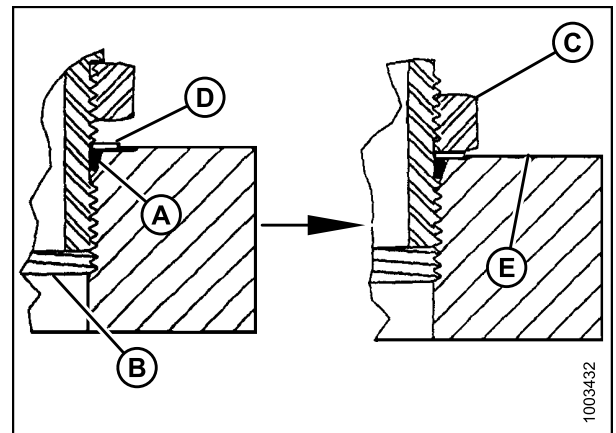


Figure 8.12: Hydraulic Fitting

REFERENCE

Table 8.12 O-Ring Boss (ORB) Hydraulic Fittings (Adjustable)

SAE Dash Size	Thread Size (in.)	Torque Value ²³	
		ft·lbf (*in·lbf)	N·m
-2	5/16-24	*53-62	6-7
-3	3/8-24	*106-115	12-13
-4	7/16-20	14-15	19-21
-5	1/2-20	15-24	21-33
-6	9/16-18	19-21	26-29
-8	3/4-16	34-37	46-50
-10	7/8-14	55-60	75-82
-12	1-1/16-12	88-97	120-132
-14	1-3/8-12	113-124	153-168
-16	1-5/16-12	130-142	176-193
-20	1-5/8-12	163-179	221-243
-24	1-7/8-12	199-220	270-298
-32	2-1/2-12	245-269	332-365

23. Torque values shown are based on lubricated connections as in reassembly.

REFERENCE

8.2.6 O-Ring Boss (ORB) Hydraulic Fittings (Non-Adjustable)

1. Inspect O-ring (A) and seat (B) for dirt or obvious defects.
2. Check that O-ring (A) is **NOT** on the threads and adjust if necessary.
3. Apply hydraulic system oil to the O-ring.
4. Install fitting (C) into port until fitting is hand tight.
5. Torque fitting (C) according to the values in Table 8.13 *O-Ring Boss (ORB) Hydraulic Fittings (Non-Adjustable)*, page 263.
6. Check the final condition of the fitting.

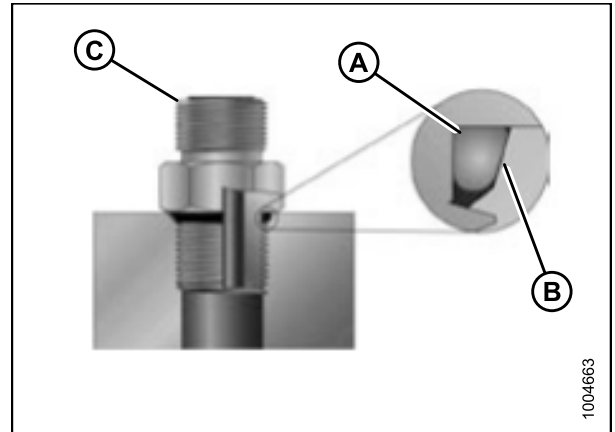


Figure 8.13: Hydraulic Fitting

Table 8.13 O-Ring Boss (ORB) Hydraulic Fittings (Non-Adjustable)

SAE Dash Size	Thread Size (in.)	Torque Value ²⁴	
		ft·lbf (*in·lbf)	N·m
-2	5/16–24	*53–62	6–7
-3	3/8–24	*106–115	12–13
-4	7/16–20	14–15	19–21
-5	1/2–20	15–24	21–33
-6	9/16–18	19–21	26–29
-8	3/4–16	34–37	46–50
-10	7/8–14	55–60	75–82
-12	1-1/16–12	88–97	120–132
-14	1-3/8–12	113–124	153–168
-16	1-5/16–12	130–142	176–193
-20	1-5/8–12	163–179	221–243
-24	1-7/8–12	199–220	270–298
-32	2-1/2–12	245–269	332–365

24. Torque values shown are based on lubricated connections as in reassembly.

REFERENCE

8.2.7 O-Ring Face Seal (ORFS) Hydraulic Fittings

1. Check components to ensure that the sealing surfaces and fitting threads are free of burrs, nicks, scratches, or any foreign material.



Figure 8.14: Hydraulic Fitting

2. Apply hydraulic system oil to the O-ring (B).
3. Align the tube or hose assembly so that the flat face of the sleeve (A) or (C) comes in full contact with O-ring (B).
4. Thread tube or hose nut (D) until hand-tight. The nut should turn freely until it is bottomed out.
5. Torque fittings according to the values in Table [8.14 O-Ring Face Seal \(ORFS\) Hydraulic Fittings, page 265](#).

NOTE:

If applicable, hold the hex on the fitting body (E) to prevent rotation of fitting body and hose when tightening the fitting nut (D).

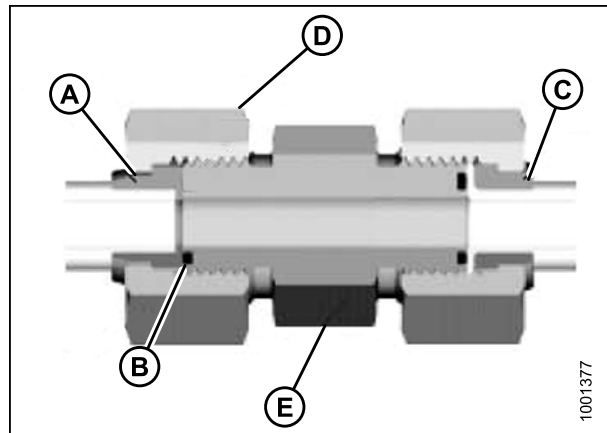


Figure 8.15: Hydraulic Fitting

6. Use three wrenches when assembling unions or joining two hoses together.
7. Check the final condition of the fitting.

REFERENCE

Table 8.14 O-Ring Face Seal (ORFS) Hydraulic Fittings

SAE Dash Size	Thread Size (in.)	Tube O.D. (in.)	Torque Value ²⁵	
			ft-lbf	N·m
-3	Note ²⁶	3/16	–	–
-4	9/16	1/4	18–21	25–28
-5	Note ²⁶	5/16	–	–
-6	11/16	3/8	29–32	40–44
-8	13/16	1/2	41–45	55–61
-10	1	5/8	59–65	80–88
-12	1-3/16	3/4	85–94	115–127
-14	Note ²⁶	7/8	–	–
-16	1-7/16	1	111–122	150–165
-20	1-11/16	1-1/4	151–167	205–226
-24	1–2	1-1/2	232–256	315–347
-32	2-1/2	2	376–414	510–561

25. Torque values and angles shown are based on lubricated connection as in reassembly.

26. O-ring face seal type end not defined for this tube size.

REFERENCE

8.3 Unloading and Assembly

Refer to the header-specific instructions 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 #147739
Export (anywhere other than North America)	D65 Draper Header for Self-Propelled Windrowers	MD #147740

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