

# **R85**

## **Rotary Disc 16-Foot Header for Self-Propelled Windrower**

Operator's Manual

214366 Revision A

2018 Model Year

Original Instruction

## R85 Rotary Disc 4.9-Meter (16-Foot) Self-Propelled Windrower Header



1005291

Published: August 2017

# Recommended Fluids and Lubricants

Your machine can operate at top efficiency only if clean lubricants are used.


- Use clean containers to handle all lubricants.
- Store in an area protected from dust, moisture, and other contaminants.

**Table .16 Fluids and Capacities**

Lubricant	Location	Description	Capacities
Grease	As required unless otherwise specified	SAE Multi-Purpose, High temperature extreme pressure (EP) performance with 0–1% max. Molybdenum Disulphide (NLGI Grade 2) Lithium complex base	—
	Driveline slip-joints	High temperature extreme pressure (EP) performance with 10% max. Molybdenum Disulphide (NLGI Grade 2) Lithium base	—
Gear Lubricant	Cutterbar	80W-90 gear lubricant with high thermal and oxidation stability conforming to API gear lubricant service GL-5 minimum (SAE J2360 preferred) specifications such as Traxon 80W-90 gear oil	4.25 L (4.4 US quarts)
	Conditioner gearbox	75W-90 synthetic gear lubricant with high thermal and oxidation stability conforming to API GL-5 minimum (SAE J2360 preferred) specifications such as Traxon E Synthetic 75W-90 gear oil	750 ml (0.79 US quarts)
	Bevel gearbox		2.1 L (2.2 quarts)

# Declaration of Conformity

Figure 1. EC Declaration of Conformity, Page 1

EC Declaration of Conformity			
			
<b>[1] MacDon</b> MacDon Industries Ltd. 680 Mora y Street, Winnipeg, Manitoba, Canada R3J 3S3		<b>[4] As Per Shipping Document</b>	
<b>[2] Rotary Disc Windrower Header</b>		<b>[5] July 31, 2017</b>	
<b>[3] MacDon R85</b>		<b>[6] Christoph Martens Product Integrity</b>	
<b>EN</b> We, [1] Declare, that the product: Machine Type: [2] Name & Model: [3] Serial Number(s): [4] fulfils all the relevant provisions of the Directive 2006/42/EC. Harmonized standards used, as referred to in Article 7(2): EN ISO 4254-1:2013 EN ISO 4254-7:2009 Place and date of declaration: [5] Identity and signature of the person empowered to draw up the declaration: [6] Name and address of the person authorized to compile the technical file: Benedikt von Riedesel General Manager, MacDon Europe GmbH Hagenauer Straße 59 65203 Wiesbaden (Germany) bvonriedesel@macdon.com	<b>BG</b> Ние, [1] декларираме, че следният продукт: Тип машина: [2] Наименование и модел: [3] Сериен номер(а): [4] отговаря на всички приложими разпоредби на директива 2006/42/ЕО. Използвани са следните хармонизирани стандарти според чл. 7(2): EN ISO 4254-1:2013 EN ISO 4254-7:2009 Място и дата на декларацията: [5] Име и подпис на лицето, упълномощено да изготви декларацията: [6] Име и адрес на лицето, упълномощено да състави техническия файл: Бенедикт фон Рийдесел Управител, MacDon Europe GmbH Hagenauer Straße 59 65203 Wiesbaden (Германия) bvonriedesel@macdon.com	<b>CZ</b> My, [1] Prohlašujeme, že produkt: Typ zařízení: [2] Název a model: [3] Sériové(á) číslo(a): [4] splňuje všechna relevantní ustanovení směrnice 2006/42/EC. Byly použity harmonizované standardy, jak je uvedeno v článku 7(2): EN ISO 4254-1:2013 EN ISO 4254-7:2009 Místo a datum prohlášení: [5] Identita a podpis osoby oprávněné k vydání prohlášení: [6] Jméno a adresa osoby oprávněné k vyplnění technického souboru: Benedikt von Riedesel generální ředitel, MacDon Europe GmbH Hagenauer Straße 59 65203 Wiesbaden (Německo) bvonriedesel@macdon.com	<b>DA</b> Vi, [1] erklærer, at produktet: Maskintype [2] Navn og model: [3] Serienummer (-numre): [4] Opfylder alle bestemmelser i direktiv 2006/42/EF. Anvendte harmoniserede standarder, som henviser til i paragraf 7(2): EN ISO 4254-1:2013 EN ISO 4254-7:2009 Sted og dato for erklæringen: [5] Identitet på og underskrift fra den person, som er bemyndiget til at udarbejde erklæringen: [6] Navn og adresse på den person, som er bemyndiget til at udarbejde den tekniske fil: Benedikt von Riedesel Direktør, MacDon Europe GmbH Hagenauer Straße 59 D-65203 Wiesbaden (Tyskland) bvonriedesel@macdon.com
<b>DE</b> Wir, [1] Erklären hiermit, dass das Produkt: Maschinentyp: [2] Name & Modell: [3] Seriennummer (n): [4] alle relevanten Vorschriften der Richtlinie 2006/42/EG erfüllt. Harmonisierte Standards wurden, wie in folgenden Artikeln angegeben, verwendet 7(2): EN ISO 4254-1:2013 EN ISO 4254-7:2009 Ort und Datum der Erklärung: [5] Name und Unterschrift der Person, die dazu befugt ist, die Erklärung auszustellen: [6] Name und Anschrift der Person, die dazu berechtigt ist, die technischen Unterlagen zu erstellen: Benedikt von Riedesel General Manager, MacDon Europe GmbH Hagenauer Straße 59 65203 Wiesbaden bvonriedesel@macdon.com	<b>ES</b> Nosotros [1] declaramos que el producto: Tipo de máquina: [2] Nombre y modelo: [3] Números de serie: [4] cumple con todas las disposiciones pertinentes de la directriz 2006/42/EC. Se utilizaron normas armonizadas, según lo dispuesto en el artículo 7(2): EN ISO 4254-1:2013 EN ISO 4254-7:2009 Lugar y fecha de la declaración: [5] Identidad y firma de la persona facultada para dar redactar la declaración: [6] Nombre y dirección de la persona autorizada para elaborar el expediente técnico: Benedikt von Riedesel Gerente general - MacDon Europe GmbH Hagenauer Straße 59 65203 Wiesbaden (Alemania) bvonriedesel@macdon.com	<b>ET</b> Meie, [1] deklareerime, et toode Seadme tüüp: [2] Nimi ja mudel: [3] Seerianumbrid: [4] vastab kõigile direktiivi 2006/42/EÜ asjakohastele sätetele. Kasutatud on järgnevald harmoniseeritud standardeid, millele on viidatud ka punktis 7(2): EN ISO 4254-1:2013 EN ISO 4254-7:2009 Deklaratsiooni koht ja kuupäev: [5] Deklaratsiooni koostamiseks volitatud isiku nimi ja allkiri: [6] Tehnilise dokumendi koostamiseks volitatud isiku nimi ja aadress: Benedikt von Riedesel Peadirektor, MacDon Europe GmbH Hagenauer Straße 59 65203 Wiesbaden (Saksamaa) bvonriedesel@macdon.com	<b>FR</b> Nous soussignés, [1] Déclarons que le produit : Type de machine : [2] Nom et modèle : [3] Numéro(s) de série : [4] Est conforme à toutes les dispositions pertinentes de la directive 2006/42/EC. Utilisation des normes harmonisées, comme indiqué dans l'Article 7(2): EN ISO 4254-1:2013 EN ISO 4254-7:2009 Lieu et date de la déclaration : [5] Identité et signature de la personne ayant reçu le pouvoir de rédiger cette déclaration : [6] Nom et adresse de la personne autorisée à constituer le dossier technique : Benedikt von Riedesel Directeur général, MacDon Europe GmbH Hagenauer Straße 59 65203 Wiesbaden (Allemagne) bvonriedesel@macdon.com
<b>The Harvesting Specialists</b>		<b>MacDon</b>	

1022972



Figure 2. EC Declaration of Conformity, Page 2

EC Declaration of Conformity

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

1022873

## Noise Levels

The A-weighted sound pressure level inside the operator's station of a typical self-propelled vehicle (e.g., M205), when operated in conjunction with this R85 rotary disc header, **is 79 dBA**. This measurement was taken in accordance with ISO 5131. The sound pressure level depends upon the rotary disc speed, crop conditions, as well the exact type of self-propelled vehicle used to power the R85.

## List of Revisions

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

Summary of Change	Location
Updated Declaration of Conformity.	<a href="#">Declaration of Conformity, page i</a>
Added conventions used in this document.	<a href="#">Introduction, page v</a>
Updated illustrations to show new transport lighting brackets.	<ul style="list-style-type: none"><li>• <a href="#">Serial Number(s), page vii</a></li><li>• <a href="#">2.2 Component Identification, page 21</a></li></ul>
Corrected safety decal descriptions for MD #184371, 194465, 194466, and 184386.	<a href="#">1.8 Understanding Safety Signs, page 11</a>
Updated transport light replacement instructions.	<ul style="list-style-type: none"><li>• <a href="#">Replacing Amber Hazard/Signal Bulb, page 173</a></li><li>• <a href="#">Replacing Amber Hazard/Signal Light Fixture, page 173</a></li></ul>
Added topic.	<ul style="list-style-type: none"><li>• <a href="#">4.1.3 Checking Float – M1240 Windrower, page 83</a></li><li>• <a href="#">4.1.4 Setting the Float – M1240 Windrower, page 83</a></li><li>• <a href="#">6.1.8 Solid Drums and Shields Kit, page 178</a></li></ul>
Removed transport light adjustment procedure; it is not applicable to the new transport lights.	—
Moved Recommended Fluids and Lubricants to inside back cover.	Inside back cover

# Introduction

This manual describes operating and maintenance procedures for the MacDon R85 Rotary Disc 16-Foot Self-Propelled Windrower Header.

Your new 16-foot rotary disc header can be attached to MacDon M200, M205, and M1240 Self-Propelled Windrowers and is designed to cut, condition, and lay in windrows a wide variety of grasses and hay crops.

**Carefully read all the material provided before attempting to use or service the machine.**

Use this manual as your first source of information for the machine.

A parts catalog is also supplied with your new header. If you require more detailed service information, contact your MacDon Dealer.

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

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

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

Use the Table of Contents and the Index to guide you to specific areas. Study the Table of Contents to familiarize yourself with how the material is organized. Keep this manual handy for frequent reference and to pass on to new Operators or Owners. Call your Dealer if you need assistance, information, or additional copies of this manual.

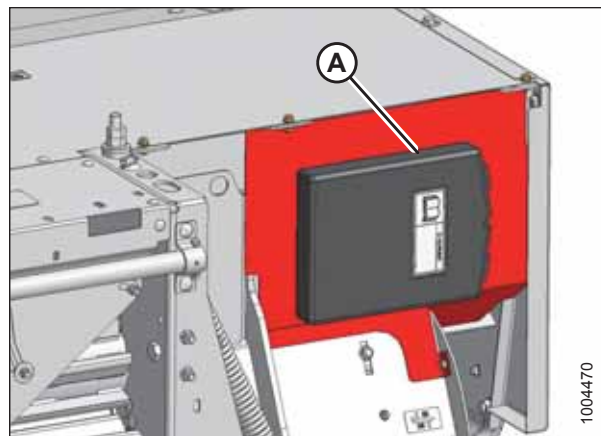
## Conventions

The following conventions are used in this document:

- Right and left are determined from the operator's position, facing forward with the windrower in cab-forward position.
- Unless otherwise noted, use the standard torque values provided in Chapter 8 *Reference*, page 185 of this document.

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

Store the operator's manual and the parts catalog in the plastic manual case (A) located at the right side of the header.



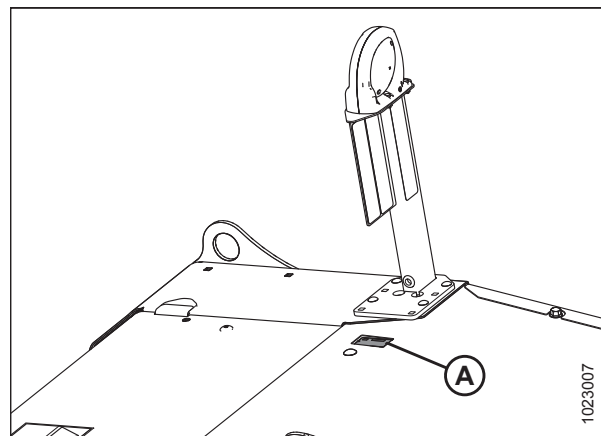
**Figure 3. Manual Storage Case**

## Serial Number(s)

Record the serial number of the header in the space provided.

**Header Serial No:** \_\_\_\_\_

The serial number plate (A) is located on the top cover at the right side of the header.



**Figure 4. Serial Number Location – Self-Propelled**



## TABLE OF CONTENTS

Declaration of Conformity .....	i
Noise Levels .....	iii
List of Revisions .....	iv
Introduction.....	v
Serial Number(s) .....	vii
<b>Chapter 1: Safety .....</b>	<b>1</b>
1.1 Safety Alert Symbols .....	1
1.2 Signal Words .....	2
1.3 General Safety.....	3
1.4 Maintenance Safety .....	5
1.5 Hydraulic Safety.....	6
1.6 Safety Signs .....	7
1.6.1 Installing Safety Decals .....	7
1.7 Safety Decal Locations.....	8
1.8 Understanding Safety Signs.....	11
<b>Chapter 2: Product Overview .....</b>	<b>19</b>
2.1 Definitions .....	19
2.2 Component Identification .....	21
2.3 Specifications .....	22
<b>Chapter 3: Operation .....</b>	<b>25</b>
3.1 Owner/Operator Responsibilities.....	25
3.2 Operational Safety .....	26
3.3 Engaging and Disengaging Header Safety Props .....	28
3.4 Driveshields.....	30
3.4.1 Opening the Driveshield: North American Headers .....	30
3.4.2 Closing the Driveshield: North American Headers.....	30
3.4.3 Opening the Driveshield: Export Headers.....	31
3.4.4 Closing the Driveshield: Export Headers .....	31
3.4.5 Removing Right Endshield.....	32
3.4.6 Installing Right Endshield.....	32
3.5 Cutterbar Doors .....	33
3.5.1 Opening the Cutterbar Doors: North America .....	34
3.5.2 Closing the Cutterbar Doors: North American Header .....	35
3.5.3 Opening the Cutterbar Doors: Export Header .....	36
3.5.4 Closing the Cutterbar Doors: Export Header.....	37
3.6 Daily Start-Up Check.....	39
3.7 Attaching the Header.....	41
3.7.1 Attaching the Forming Shield .....	41



## TABLE OF CONTENTS

3.7.2 Attaching Header to an M200 and M205 Self-Propelled Windrower .....	44
3.7.3 Attaching Hydraulic and Electrical Components: M205 Windrowers .....	45
3.7.4 Attaching Hydraulic and Electrical Components: M200 Windrowers .....	51
3.7.5 Attaching Hydraulic Center-Link with Optional Self-Alignment: M1240 Windrowers .....	57
3.7.6 Attaching Hydraulic and Electrical Components: M1240 Windrowers .....	62
Routing Hydraulic Hoses and Electrical Components to M1240 Windrowers .....	63
Connecting Header Hydraulics Using Quick Couplers: M1240 Windrowers .....	64
Connecting Header Hydraulics Using Hard Plumbing: M1240 Windrowers .....	65
3.8 Detaching the Header .....	68
3.8.1 Detaching the Header: M1240 Windrowers .....	68
3.8.2 Detaching the Header: M205 Windrowers .....	71
3.8.3 Detaching the Header: M200 Windrowers .....	75
3.9 Break-In Period .....	78
3.10 Shutting down the Windrower .....	79
3.11 Transporting the Header .....	80
<b>Chapter 4: Operating the Header .....</b>	<b>81</b>
4.1 Header Float .....	81
4.1.1 Checking Float – M200 and M205 Windrowers .....	81
4.1.2 Adjusting Float – M200 and M205 Windrowers .....	82
4.1.3 Checking Float – M1240 Windrower .....	83
4.1.4 Setting the Float – M1240 Windrower .....	83
4.1.5 Removing and Restoring Float – M1240 Windrowers .....	84
4.2 Roll Gap .....	86
4.2.1 Checking Roll Gap .....	86
4.2.2 Adjusting Roll Gap .....	87
4.3 Roll Tension .....	89
4.3.1 Adjusting Roll Tension .....	89
4.4 Roll Timing .....	90
4.4.1 Checking Roll Timing .....	90
4.4.2 Adjusting Roll Timing .....	91
4.5 Forming Shields .....	93
4.5.1 Adjusting the Side Deflectors .....	93
4.5.2 Adjusting the Rear Deflector (Fluffer Shield) .....	95
4.5.3 Adjusting the Swath Baffle .....	95
4.6 Header Angle .....	97
4.7 Cutting Height .....	98
4.7.1 Adjusting Gauge Roller Height .....	98
4.7.2 Adjusting the Skid Shoe Height .....	99
4.8 Disc Speed .....	100
4.9 Ground Speed .....	101
4.10 Double Windrowing .....	102

## TABLE OF CONTENTS

<b>4.11 Tall Crop Feed Plates .....</b>	<b>103</b>
4.11.1 Removing the Tall Crop Feed Plates from Storage .....	103
Installing Tall Crop Feed Plates under Driven Deflector.....	104
Installing Tall Crop Feed Plates under Driveline Deflector .....	105
4.11.2 Removing Tall Crop Feed Plates.....	106
Removing Tall Crop Feed Plates from under Driven Deflector .....	106
Removing Tall Crop Feed Plates from under Driveline Deflector .....	107
4.11.3 Returning Tall Crop Feed Plates to Storage .....	107
<b>4.12 Tall Crop Divider Option .....</b>	<b>108</b>
4.12.1 Installing Tall Crop Divider.....	108
4.12.2 Removing Tall Crop Divider .....	109
<b>4.13 Overshot Auger.....</b>	<b>111</b>
4.13.1 Adjusting the Overshot Auger.....	111
<b>4.14 Stripper Bars .....</b>	<b>114</b>
4.14.1 Adjusting the Stripper Bar .....	114
<b>4.15 Haying .....</b>	<b>117</b>
4.15.1 Curing .....	117
4.15.2 Topsoil Moisture .....	117
4.15.3 Weather and Topography.....	117
4.15.4 Windrow Characteristics .....	118
4.15.5 Driving on Windrow .....	118
4.15.6 Raking and Tedding.....	118
4.15.7 Using Chemical Drying Agents .....	118
<b>4.16 Unplugging the Header.....</b>	<b>119</b>
<b>Chapter 5: Maintenance and Servicing .....</b>	<b>121</b>
<b>5.1 Preparation for Servicing .....</b>	<b>121</b>
<b>5.2 Maintenance Requirements .....</b>	<b>122</b>
5.2.1 Maintenance Schedule/Record .....	122
5.2.2 Preseason/Annual Service.....	125
5.2.3 End-of-Season Service.....	125
5.2.4 Lubrication and Servicing.....	126
5.2.5 Greasing Procedure .....	127
5.2.6 Lubrication and Servicing Intervals .....	127
5.2.7 Lubricating the Cutterbar .....	132
Draining the Cutterbar Lubricant .....	132
Filling the Cutterbar Lubricant.....	134
5.2.8 Rock Guards.....	136
Inspecting the Rock Guards .....	136
<b>5.3 Cutterbar Discs .....</b>	<b>137</b>
5.3.1 Direction of Spindle Rotation .....	137
5.3.2 Inspecting the Cutterbar Discs.....	138
5.3.3 Removing a Cutterbar Disc .....	138
5.3.4 Installing a Cutterbar Disc .....	139

## TABLE OF CONTENTS

---

5.3.5 Cutterblades .....	140
Inspecting Discblades .....	141
Inspecting Cutterblade Hardware .....	142
Replacing the Cutterblades .....	144
5.3.6 Accelerators .....	145
Inspecting Accelerators .....	146
Replacing Accelerators .....	147
5.3.7 Nut Shield .....	148
Inspecting Nut Shield .....	148
Replacing Nut Shield .....	149
5.3.8 Rotary Deflectors .....	149
Inspecting Rotary Deflectors .....	149
Removing the Driven Deflector .....	150
Installing the Driven Deflector .....	151
Removing the Driveline Deflector .....	151
Installing the Driveline Deflector .....	152
5.3.9 Disc Spindles .....	153
Replacing a Spindle Key .....	153
5.3.10 Cutterbar Doors .....	156
Inspecting Curtains .....	156
Inspecting Door Latches: North American Header .....	156
Inspecting Door Latches: Export Header .....	156
Adjusting Door Latches: Export Header .....	156
Replacing Door Latches: Export Header .....	157
Replacing Door Latch Brackets: Export Header .....	157
<b>5.4 Drive Systems .....</b>	<b>158</b>
5.4.1 Bevel Gearbox .....	158
Changing the Bevel Gearbox Lubricant .....	158
5.4.2 Conditioner Drive Belt .....	159
Inspecting the Conditioner Drive Belt .....	159
Replacing the Conditioner Drive Belt .....	160
5.4.3 Conditioner Gearbox .....	162
Changing the Conditioner Gearbox Lubricant .....	162
5.4.4 Header Drive Speed Sensor .....	164
Adjusting the Header Drive Speed Sensor .....	164
Replacing the Header Drive Speed Sensor .....	165
5.4.5 Auger Drive Belt .....	166
Inspecting and Adjusting the Auger Drive Belts .....	166
Replacing the Auger Drive Belts .....	167
5.4.6 Installing Sealed Bearings .....	169
<b>5.5 Hydraulics .....</b>	<b>170</b>
5.5.1 Hydraulic Motor .....	170
Removing the Hydraulic Motor .....	170
Installing the Hydraulic Motor .....	171
5.5.2 Hydraulic Hoses and Lines .....	172
<b>5.6 Electrical System .....</b>	<b>173</b>
5.6.1 Hazard Lights .....	173
Replacing Amber Hazard/Signal Bulb .....	173
Replacing Amber Hazard/Signal Light Fixture .....	173

## TABLE OF CONTENTS

---

<b>Chapter 6: Options and Attachments .....</b>	<b>175</b>
6.1 Options and Attachments: Kits .....	175
6.1.1 Adjustable Skid Shoe Kit.....	175
6.1.2 Cutterbar Repair Tool Kit.....	175
6.1.3 Double Windrow Attachment (DWA) .....	176
6.1.4 Gauge Roller .....	176
6.1.5 Hydraulic Drive: 16-Foot for M200 Self-Propelled .....	176
6.1.6 Tall Crop Divider Kit .....	177
6.1.7 Tall Crop Feed Plate Kit .....	177
6.1.8 Solid Drums and Shields Kit .....	178
<b>Chapter 7: Troubleshooting .....</b>	<b>179</b>
7.1 Header Performance .....	179
7.2 Mechanical Problems .....	182
<b>Chapter 8: Reference .....</b>	<b>185</b>
8.1 Torque Specifications .....	185
8.1.1 SAE Bolt Torque Specifications .....	185
8.1.2 Metric Bolt Specifications .....	187
8.1.3 Metric Bolt Specifications Bolting into Cast Aluminum .....	189
8.1.4 Flare-Type Hydraulic Fittings.....	190
8.1.5 O-Ring Boss (ORB) Hydraulic Fittings (Adjustable).....	191
8.1.6 O-Ring Boss (ORB) Hydraulic Fittings (Non-Adjustable).....	193
8.1.7 O-Ring Face Seal (ORFS) Hydraulic Fittings .....	194
8.1.8 Tapered Pipe Thread Fittings .....	195
8.2 Conversion Chart .....	196
<b>Index.....</b>	<b>197</b>
<b>Recommended Fluids and Lubricants .....</b>	<b>Inside Back Cover</b>



# 1 Safety

## 1.1 Safety Alert Symbols

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

This symbol means:

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

Carefully read and follow the safety message accompanying this symbol.

### Why is safety important to you?

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



Figure 1.1: Safety Symbol

## 1.2 Signal Words

Three signal words, **DANGER**, **WARNING**, and **CAUTION**, are used to alert you to hazardous situations. 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 protective clothing and personal safety devices that could be necessary for job at hand. Do **NOT** take chances. You may need the following:
  - Hard hat
  - Protective footwear with slip resistant soles
  - Protective glasses or goggles
  - Heavy gloves
  - Wet weather gear
  - Respirator or filter mask
- Be aware that exposure to loud noises can cause hearing impairment or loss. Wear suitable hearing protection devices such as earmuffs or earplugs to help protect against loud noises.

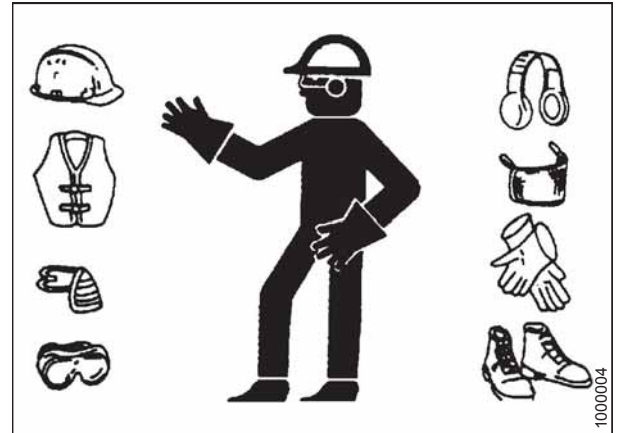


Figure 1.2: Safety Equipment



Figure 1.3: Safety Equipment

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

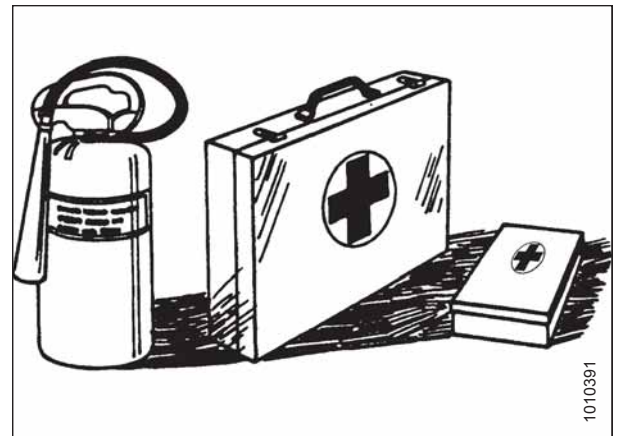


Figure 1.4: Safety Equipment



## SAFETY

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



Figure 1.5: Safety around Equipment

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

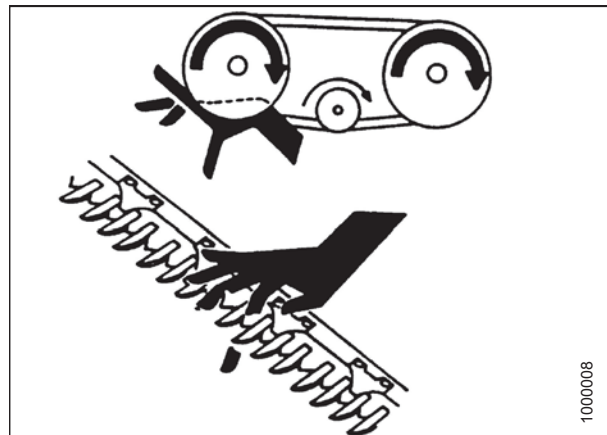


Figure 1.6: Safety around Equipment

- Keep 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

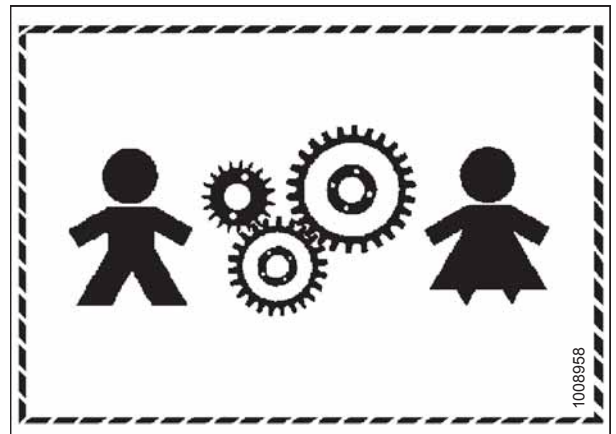
## 1.4 Maintenance Safety

To ensure your safety while maintaining machine:

- Review operator's manual and all safety items before operation and/or maintenance of machine.
- Place all controls in Neutral, stop the engine, set the park brake, remove the ignition key, and wait for all moving parts to stop before servicing, adjusting, and/or repairing.
- Follow good shop practices:
  - Keep service areas clean and dry
  - Be sure electrical outlets and tools are properly grounded
  - Keep work area well lit
- Relieve pressure from hydraulic circuits before servicing and/or disconnecting 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 area of bystanders, especially children, when carrying out any maintenance, repairs, or adjustments.
- Install transport lock or place safety stands under frame before working under machine.
- If more than one person is servicing machine at 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 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 hydraulic system are kept clean and in good condition.
- Replace any worn, cut, abraded, flattened, or crimped hoses and steel lines.
- Do **NOT** attempt any makeshift repairs to hydraulic lines, fittings, or hoses by using tapes, clamps, cements, or welding. The hydraulic system operates under extremely high pressure. Makeshift repairs will fail suddenly and create hazardous and unsafe conditions.

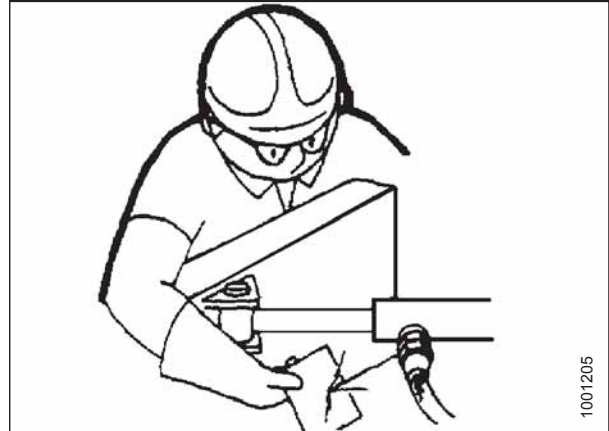


Figure 1.11: Testing for Hydraulic Leaks

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



Figure 1.12: Hydraulic Pressure Hazard

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

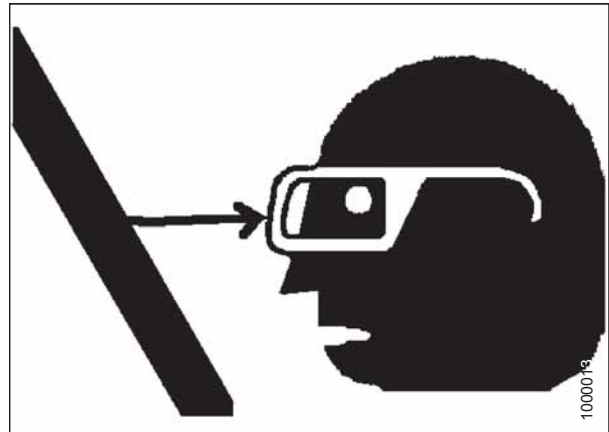
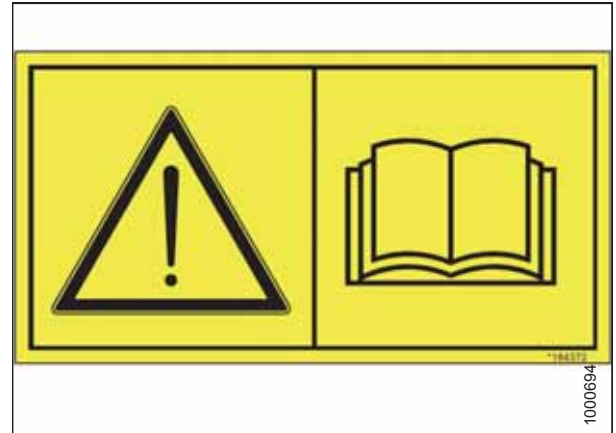


Figure 1.13: Safety around Equipment

## **1.6 Safety Signs**

- 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 repair part also bears current safety sign.
- Replacement safety signs are available from your Dealer Parts Department.



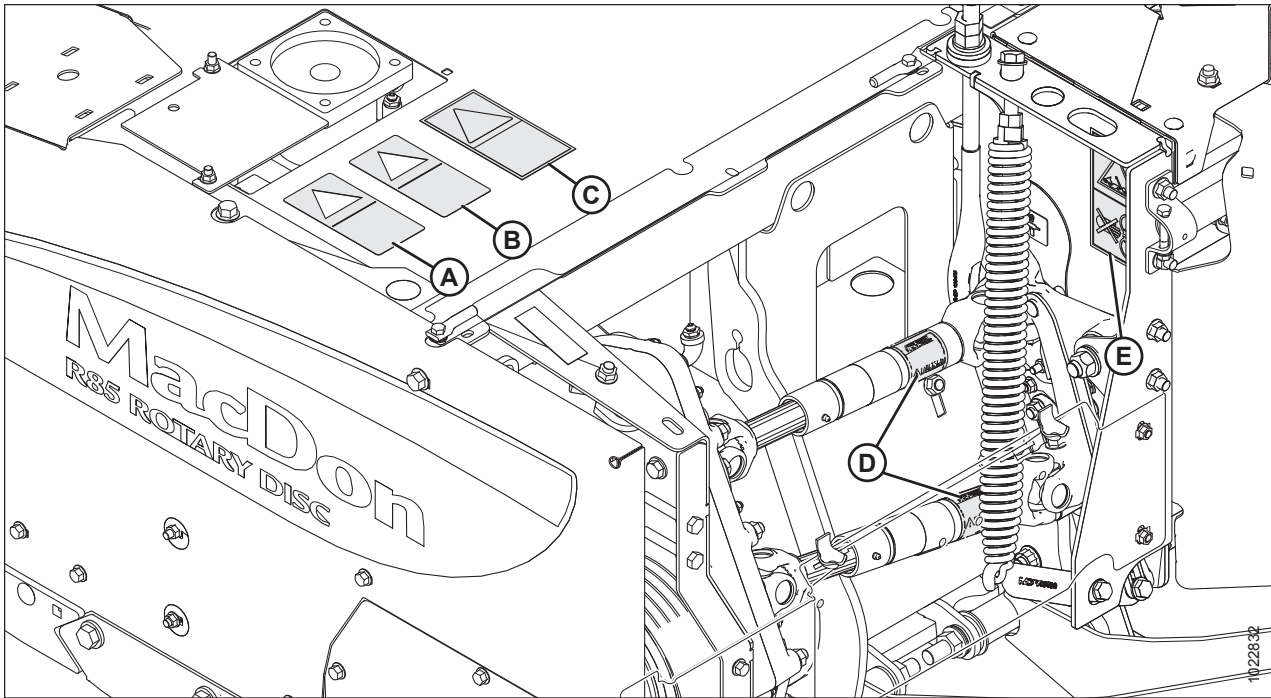
**Figure 1.14: Operator's Manual Decal**

### **1.6.1 Installing Safety Decals**

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

## 1.7 Safety Decal Locations

Figure 1.15: Safety Decal Locations

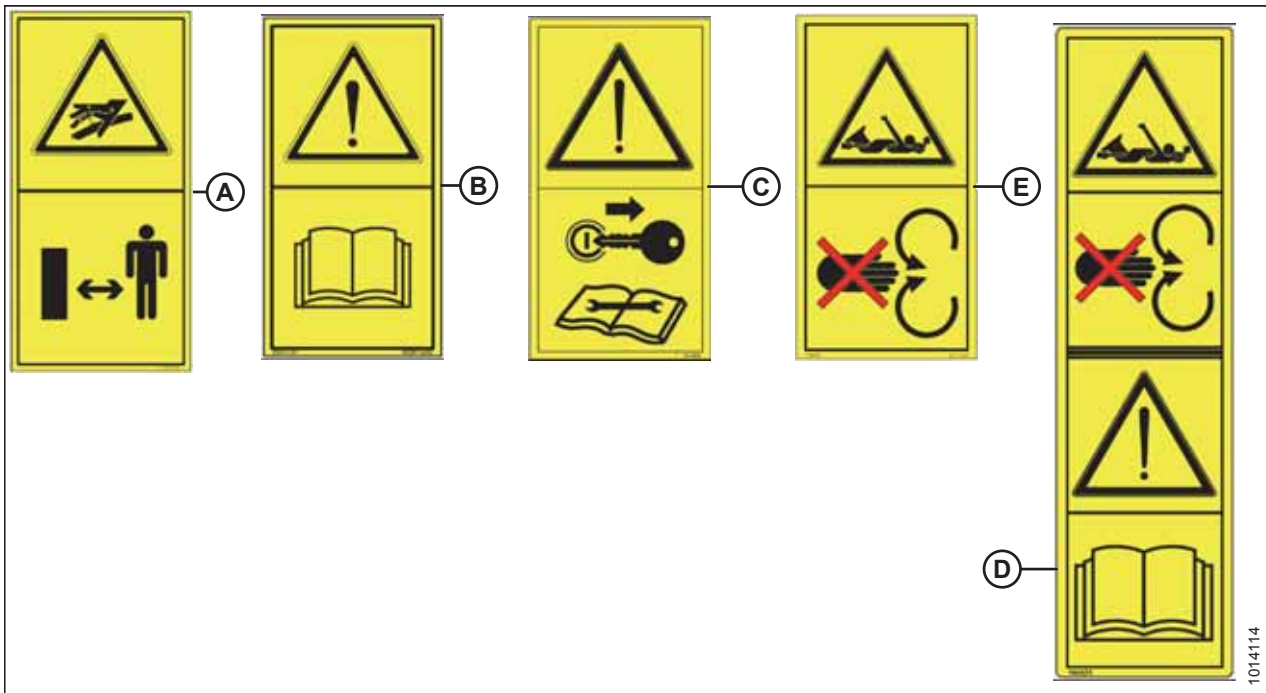


A - MD #174436  
D - MD #194521

B - MD #113482  
E - MD #184385

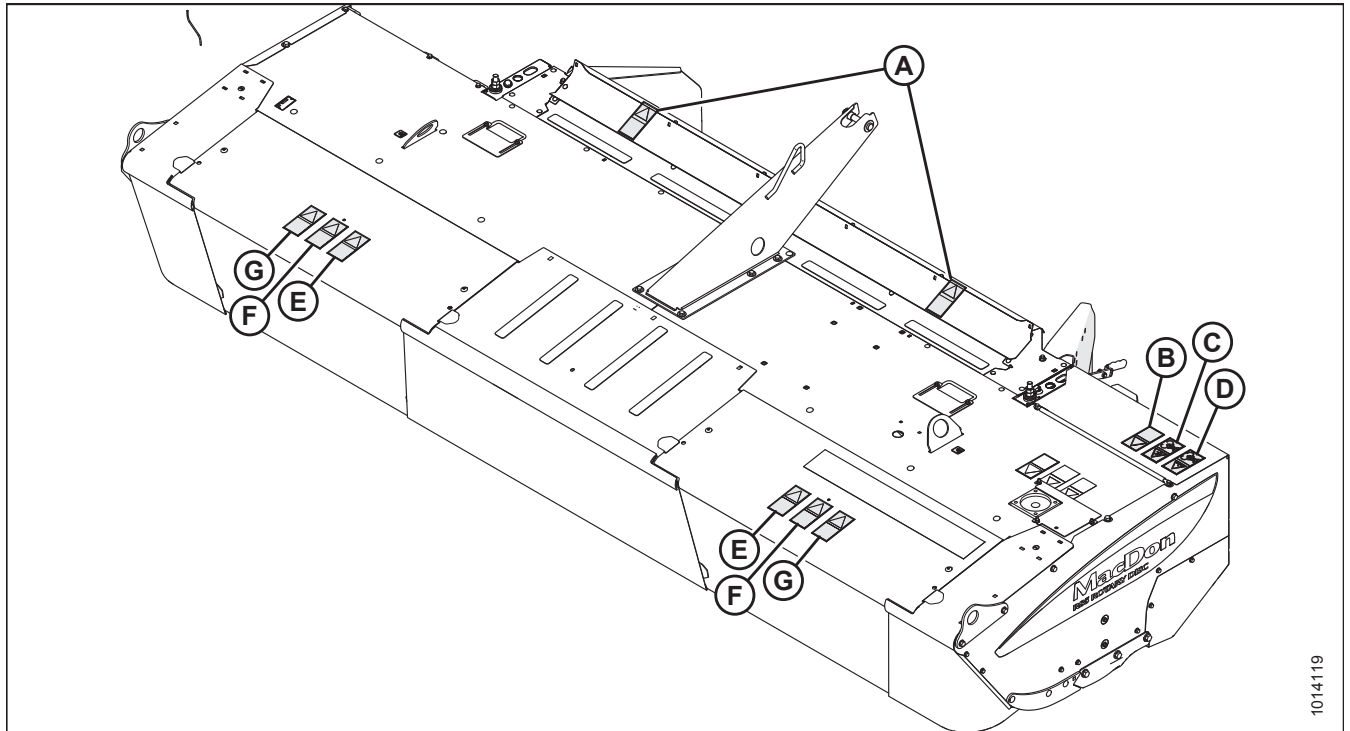
C - MD #194464

Figure 1.16: Safety Decals



## SAFETY

Figure 1.17: Safety Decal Locations

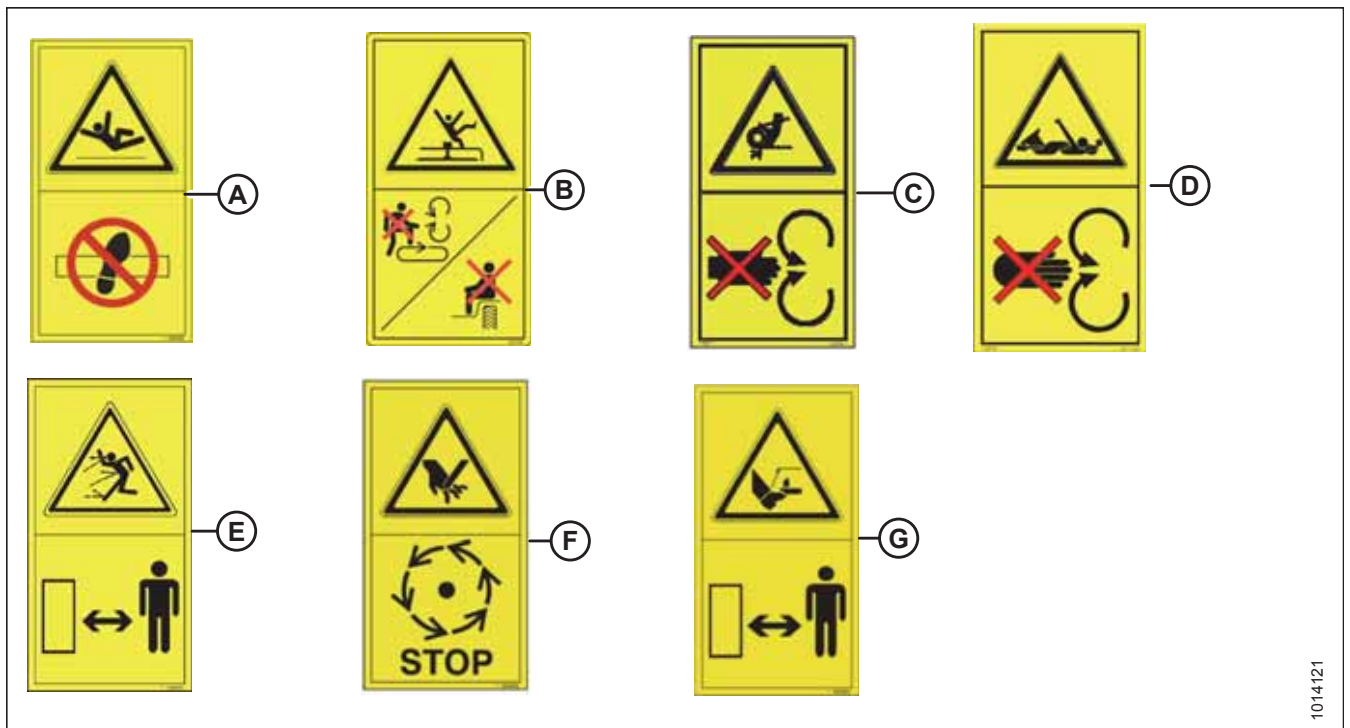


A - MD #190546  
D - MD #184385  
G - MD #194465

B - MD #247166  
E - MD #194466

C - MD #184371  
F - MD #194463

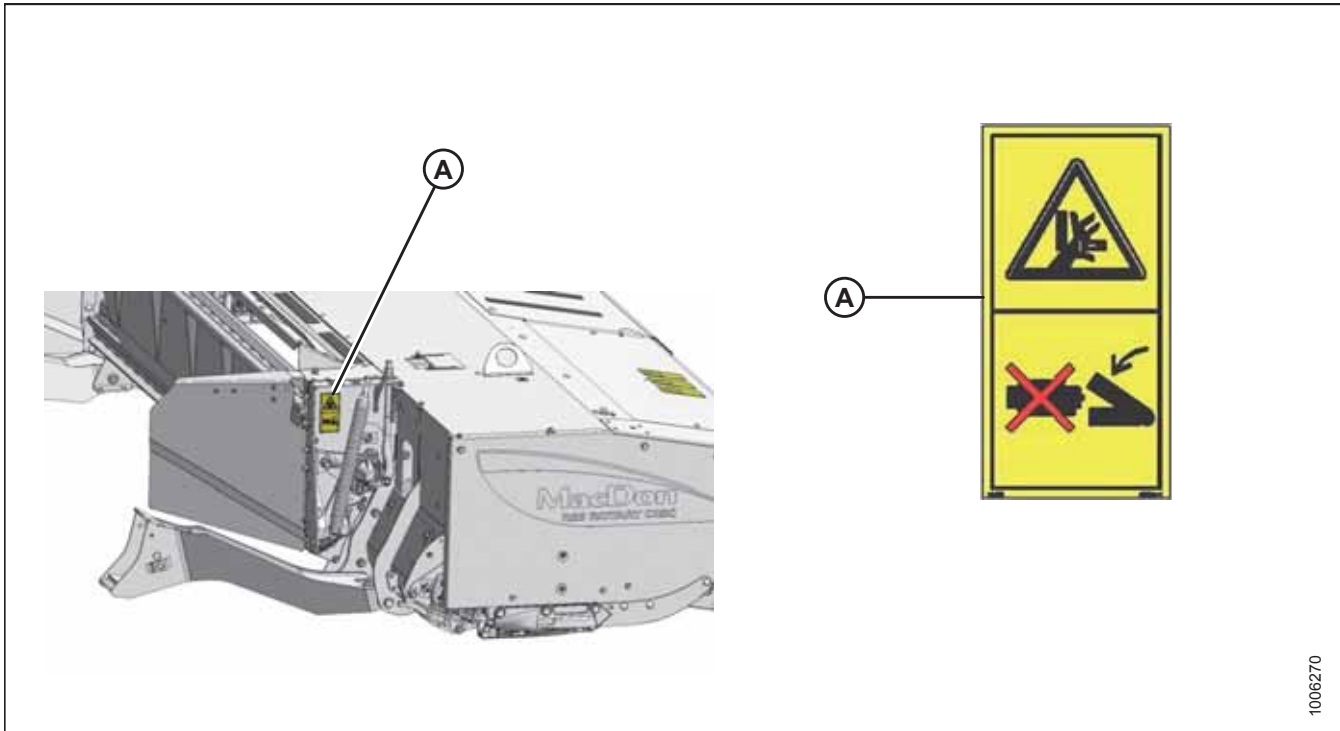
Figure 1.18: Safety Decals





## SAFETY

Figure 1.19: Safety Decal Locations



A - MD #184386

## 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.
- 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.
- Stop the engine and remove the key before servicing, adjusting, lubricating, cleaning, or unplugging machine.
- Engage safety props to prevent lowering of header or reel before servicing in the raised position.
- Use slow moving vehicle emblem and flashing warning lights when operating on roadways unless prohibited by law.



Figure 1.20: MD #113482

### 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 1.21: MD #166466



## SAFETY

### MD #174434

Header hazard

#### DANGER

- Rest header on ground or engage mechanical locks before going under unit.



Figure 1.22: MD #174434

### MD #184371

Hand entanglement hazard

#### WARNING

- Do not operate without shields in place.
- To avoid injury, stop engine and remove key before opening shield.



Figure 1.23: MD #184371

### MD #184385

Entanglement hazard

#### WARNING

- Do not operate without shields in place.
- To avoid injury, stop engine and remove key before opening shield.



Figure 1.24: MD #184385

## SAFETY

### MD #184386

Pinch hazard

#### WARNING

- Keep away.
- Never reach into pinch area.
- Failure to comply could result in death or serious injury.



Figure 1.25: MD #184386

### 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 1.26: MD #184422

### MD #190546

Slippery surface

#### WARNING

- Do not use this area as a step or platform.
- Failure to comply could result in serious injury or death.



Figure 1.27: MD #190546

## SAFETY

### MD #194462

Header crushing hazard

#### WARNING

- Install lock before going under unit.



Figure 1.28: MD #194462

### MD #194463

Rotating blades

#### WARNING

- Stop the engine and remove the key before opening the header covers.
- Listen and look for evidence of rotation before lifting cover.
- Rotating cutters may continue to rotate after power is shut off.



Figure 1.29: MD #194463

### MD #194464

Shut down for service

#### WARNING

- Stop the engine and remove the key.
- Read the windrower and header manuals for inspection and maintenance instructions.



Figure 1.30: MD #194464

## SAFETY

### MD #194465

Rotating blades

#### WARNING

- Stand clear.
- Stop the engine and remove the key.
- Listen and look for evidence of rotation before lifting cover.
- Rotating cutters may continue to rotate after power is shut off.
- Failure to comply could result in serious injury or death.



Figure 1.31: MD #194465

### MD #194466

Thrown objects hazard

#### WARNING

- Stand clear.
- Crop materials exiting at high speed.
- Stop machine, look, listen, and wait for all movement to stop before approaching.
- Failure to comply could result in death or serious injury.



Figure 1.32: MD #194466

## SAFETY

### MD #194521

Auger entanglement hazard

#### CAUTION

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

General hazard pertaining to machine operation and servicing.

#### CAUTION

- Read the operator's manual and follow safety instructions.
- 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.
- Stop the engine and remove the key from ignition before servicing, adjusting, lubricating, cleaning, or unplugging machine.
- Engage locks to prevent lowering of header or reel before servicing in the raised position.
- Use slow moving vehicle emblem and flashing warning lights when operating on roadways unless prohibited by law.

### MD #247166

Moving implement hazard

#### WARNING

- To avoid injury, do not mount or ride machine while the machine is in motion.

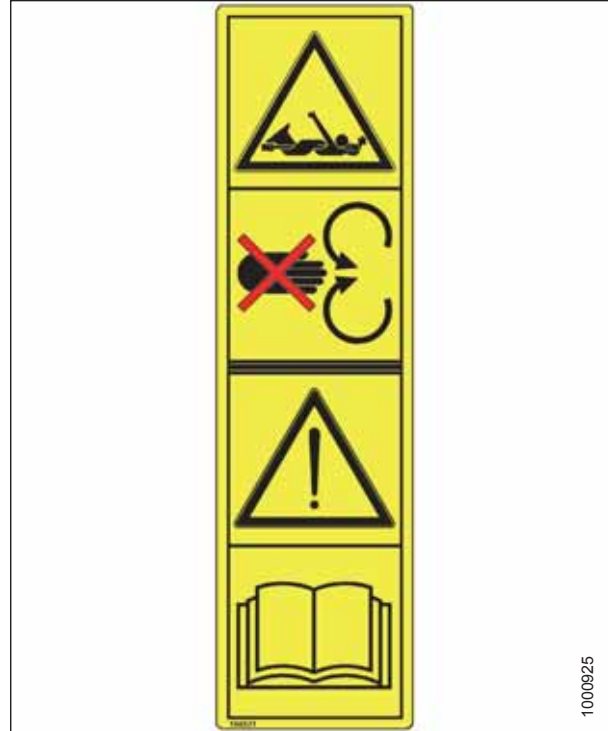


Figure 1.33: MD #194521



Figure 1.34: MD #247166

## SAFETY

### MD #247167

Rotating blades

#### WARNING

- Stop the engine and remove the key.
- Listen and look for evidence of rotation before lifting cover.
- Rotating blades may continue to rotate after power is shut off due to inertia.



Figure 1.35: MD #247167



## 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 Operator and cab facing in direction of travel
CDM	Cab display module on a self-propelled windrower
Center-link	A hydraulic cylinder link between header and machine used to change header angle
CGVW	Combined gross vehicle weight
DWA	Double Windrow Attachment
ECM	Engine control module
ECU	Electronic control unit
Engine-forward	Windrower operation with Operator and engine facing in direction of travel
Export header	Header configuration typical outside North America
Finger tight	Finger tight is a reference position where sealing surfaces or components are making contact with each other, and fitting has been tightened to a point where fitting is no longer loose
FFFT	Flats from finger tight
GSS	Grass Seed Special
GVW	Gross vehicle weight
Hard joint	A joint made with use of a fastener where joining materials are highly incompressible
Header	A machine that cuts and lays crop into a windrow and is attached to a self-propelled windrower
Hex key	A tool of hexagonal cross-section used to drive bolts and screws that have a hexagonal socket in head (internal-wrenching hexagon drive); also known as an Allen key and various other synonyms
hp	Horsepower
ISC	Intermediate Speed Control
JIC	Joint Industrial Council: A standards body that developed standard sizing and shape for original 37° flared fitting
M Series windrower	MacDon M100, M105, M150, M155, M155E4, M200, and M205 windrowers
M1 Series windrower	MacDon M1170 and M1240 windrowers
n/a	Not applicable

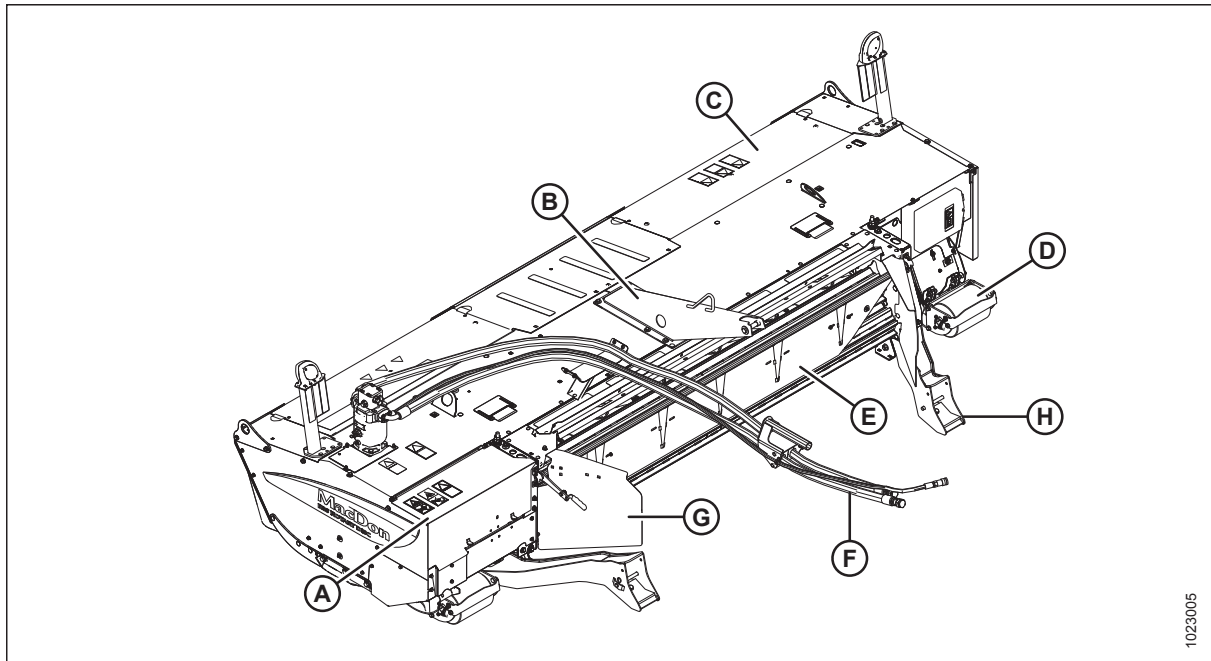


## PRODUCT OVERVIEW

Term	Definition
Nut	An internally threaded fastener that is designed to be paired with a bolt
N-DETENT	The slot opposite the NEUTRAL position on operator's console of M Series windrowers.
North American header	Header configuration typical in North America
NPT	National Pipe Thread: A style of fitting used for low pressure port openings. Threads on NPT fittings are uniquely tapered for an interference fit
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
rpm	Revolutions per minute
R Series header	MacDon R80 and R85 disc headers
RoHS (Reduction of Hazardous Substances)	A directive by the European Union to restrict use of certain hazardous substances (such as hexavalent chromium used in some yellow zinc platings)
SAE	Society of Automotive Engineers
Screw	A headed and externally threaded fastener that threads into preformed threads or forms its own thread into a mating part
Self-Propelled (SP) Windrower	Self-propelled machine consisting of a power unit with a header
Soft joint	A joint made with use of a fastener where joining materials are compressible or experience relaxation over a period of time
Truck	A four-wheel highway/road vehicle weighing no less than 3400 kg (7500 lb.)
Tension	Axial load placed on a bolt or screw, usually measured in Newtons (N) or pounds (lb.)
TFFT	Turns from finger tight
Torque	The product of a force X lever arm length, usually measured in Newton-meters (Nm) or foot-pounds (lbf-ft)
Torque angle	A tightening procedure where fitting is assembled to a precondition (finger tight) and then nut is turned farther a number of degrees to achieve its final position
Torque-tension	The relationship between assembly torque applied to a piece of hardware and axial load it induces in bolt or screw
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
WCM	Windrower control module

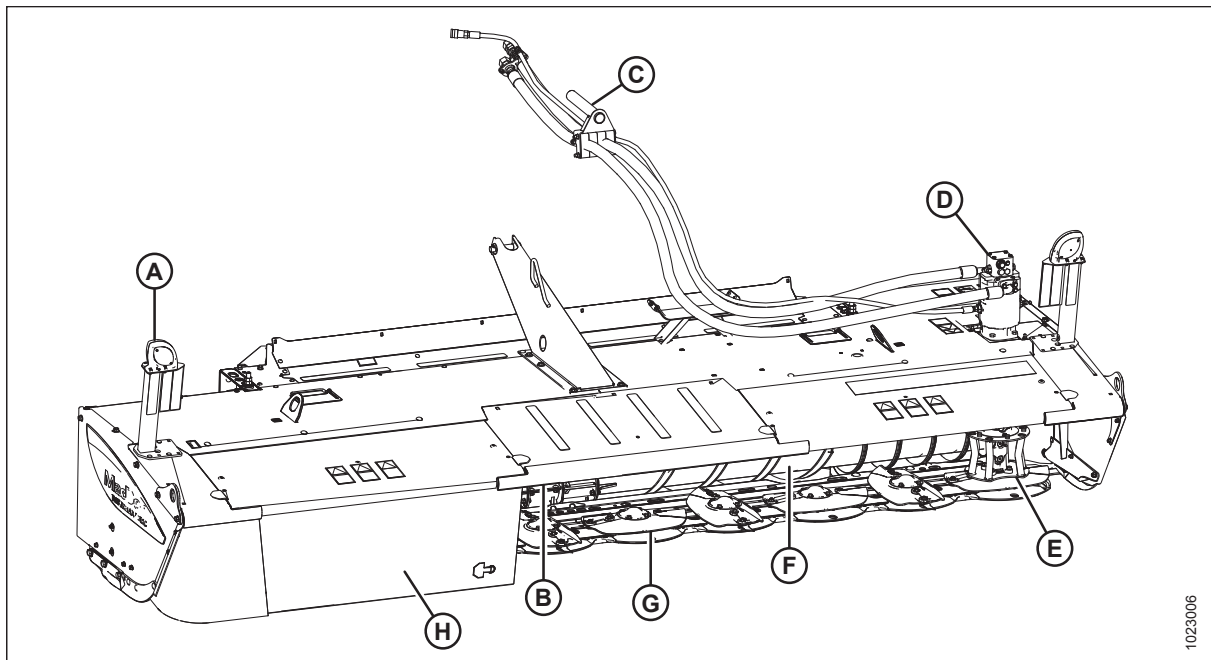
## 2.2 Component Identification

Figure 2.1: Component Identification



- |                 |                                  |                    |                              |
|-----------------|----------------------------------|--------------------|------------------------------|
| A - Driveshield | B - Tower                        | C - Door           | D - Gauge Rollers (Optional) |
| E - Baffle      | F - Hydraulic Hoses to Windrower | G - Baffle Control | H - Header Boot              |

Figure 2.2: Component Identification



- |                      |                       |                       |                 |
|----------------------|-----------------------|-----------------------|-----------------|
| A - Transport Light  | B - Conditioner Rolls | C - Hose Support      | D - Drive Motor |
| E - Rotary Deflector | F - Overshot Auger    | G - 10-Disc Cutterbar | H - Curtains    |

## 2.3 Specifications

**NOTE:**

Specifications and design are subject to change without notice or obligation to revise previously sold units.

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

	4.9-Meter (16-Foot) R85
<b>Cutterbar</b>	
Effective cutting width	4827 mm (15.83 ft.)
Number of cutting discs	10
Number of blades per disc	2
11 degree bevel up knives	S
Inline spur gear cutterbar design	S
Geartrain protection - shearable key in spindle (all discs)	S
Tall crop feed plates (stored on header)	2
Austempered cutting discs	S
Knife tip speed	82.9 mps (184 mph)
Range of cutting disc rpm	1800–2600 rpm
Knife tip speed range	59.2–85.5 mps (131–189 mph)
Cutterbar spindle anti-wrap ring	S
Austempered rock guards	S
Hourglass converging impellers	S
Heat treated crop lifters	S
Cutting angle range	0-8° below horizontal
Cutting angle range - minimum cut height	19 mm (3/4 in.)
Adjustable gauge rollers	O
Adjustable shoes	O
<b>Overshot Auger</b>	
Peripheral diameter	229 mm (9.0 in.)
Center tube diameter	152 mm (6.0 in.)
Rpm range	720–1040
Three HB belt drive (with spring loaded idler)	S
Universal joint in auger center	S

## PRODUCT OVERVIEW

	4.9-Meter (16-Foot) R85
<b>Hay Conditioner</b>	
Drive: Bevel gearbox to 5 HA banded belt drive to enclosed timing gearbox and driveline	S
Roll type: Intermeshing steel bars	S
Roll length: 300 mm (118 in.)	S
Roll diameter 229 mm (9.0 in.) outside diameter on (179 mm) 7.0 in. O.D. tube	S
Roll diameter 233 mm (9.17 in.) outside diameter on 168.4 mm (6.63 in.) O.D. tube (SP)	S
Roll speed	730–1040 rpm
<b>Forming Shield</b> for 915 mm. (36 in.) windrow to 2540 mm (102 in.) wide swath	S
Header mounted adjustable baffle	S
Tractor mounted side deflector and rear baffle	S
<b>Frame and Structure</b>	
Two amber transport lights	S
Mounts to self-propelled windrower	S
Easy access doors to access cutterbar components	2
Transport width	4879 mm (192 in.)
Total weight complete with lift arms (estimated)	1955 kg (4300 lb.)
<b>Drives</b>	
M205 Windrower tractor to 106 cc (6.4 cu in.) Eaton heavy duty hydraulic motor	S
M205 maximum hydraulic power developed	174 kW (231 Hp)
<b>Hydraulic Header Connection</b>	
Hydraulic couplers for quick attachment	O <sub>D</sub>
<b>Attachments and Accessories</b>	
Double windrow attachment	O <sub>D</sub>
Tall crop divider kit	O
Cutterbar repair tool kit	O



## 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 and affect machine life.
- 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.
- Ensure that the windrower is properly equipped to safely operate the header. This may include adding ballast according to windrower operator's manual requirements for attachments of this size and mass.

## 3.2 Operational Safety

### CAUTION

Follow these safety precautions:

- Follow all safety and operational instructions given in your windrower operator's manuals. If you do not have an operator's manual, get one from your Dealer and read it thoroughly.
- Never attempt to start the windrower's 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 or header.

### 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.
- If cutting ditch banks, use extreme caution. If the header hits an obstruction, the front of the windrower will usually swerve toward the ditch.
- When working on inclines, travel uphill or downhill when possible. Be sure to keep the windrower transmission in gear when travelling downhill.
- Never attempt to get on or off a moving machine.
- Do NOT get off the windrower while the header is in operation.
- To avoid bodily injury or death from unexpected startup of machine, always stop the windrower 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.

### CAUTION

Follow proper shut down procedure:

- Engage the windrower brake.
- Stop the engine and remove the key.
- Wait for all movement to stop.
- Engage the header safety props before inspecting a raised machine.

**⚠ CAUTION**

- Operate only in daylight or good artificial light.
- Keep everyone several hundred feet away from your operation.
- Ensure bystanders are never in line with the front or rear of the machine. Stones or other foreign objects can be ejected with force from either end.
- Extreme care must be exercised to avoid injury from thrown objects. Do NOT, under any circumstances, operate the header when other people are in the vicinity. Stones and other objects can be thrown great distances by the rotating cutting blades.
- The cutterbar curtains are very important to reduce the potential for thrown objects. Always keep the cutterbar curtains down when operating the header. Replace the curtains if they become worn or damaged.



Figure 3.1: Ejected Objects Warning



### 3.3 Engaging and Disengaging Header Safety Props

Safety props are located on both header lift cylinders on the windrower. Follow these steps to engage or disengage the header safety props:

#### **DANGER**

To avoid bodily injury from fall of raised header, always engage safety props when working on or around raised header, and before going under header for any reason.

*Engage safety props as follows:*

1. Start engine and press header up (A) switch to raise header to maximum height.
2. Rephase cylinders if one end of the header does not raise fully. If rephasing is required, proceed as follows:
  - a. Press and hold the header up (A) switch until both cylinders stop moving.
  - b. Continue to hold the switch for 3–4 seconds. Cylinders are now phased.
3. Pull lever (A) and rotate toward header to lower safety prop (B) onto cylinder. Repeat for opposite cylinder.



Figure 3.2: Ground Speed Lever (GSL)

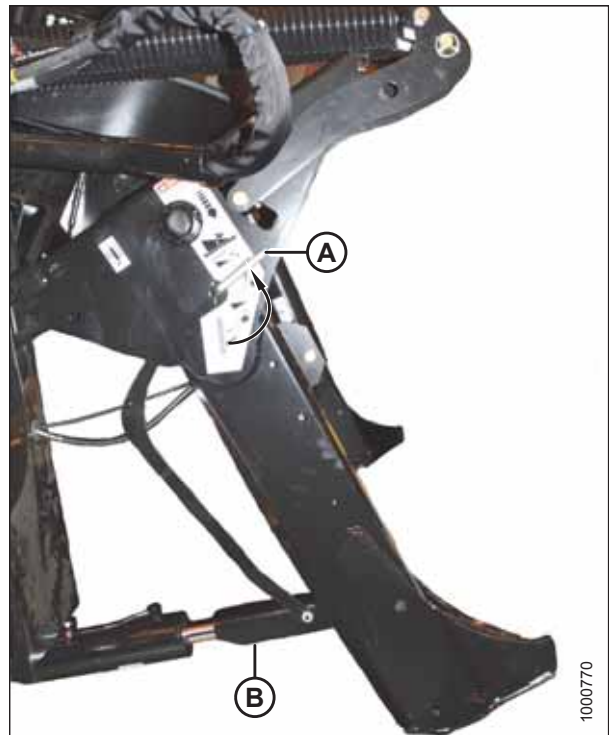


Figure 3.3: Safety Prop

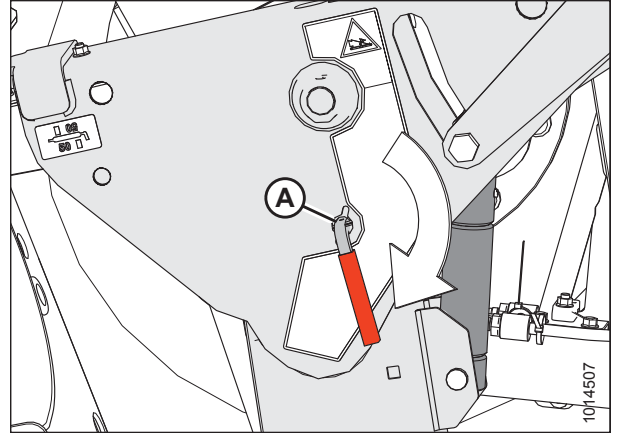
## OPERATION

*Disengage safety props as follows:*

### **DANGER**

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

1. Turn lever (A) away from header to raise safety prop until lever locks into vertical position. Repeat for opposite cylinder.
2. Start engine, choose a level area, and lower header to the ground.
3. Stop the engine, and remove the key.



**Figure 3.4: Safety Prop**

## 3.4 Driveshields

### WARNING

Do NOT operate the machine with the driveshields open. High-speed rotating components may throw debris and could result in death or serious injury.

The Rotary Disc 4.9-Meter (16-Footer) Header for Self-Propelled Windrowers comes in two configurations: one for use in North America and one for use outside of North America. Headers configured for use outside of North America are referred to as export headers. The configuration is specified in the title when necessary.

### 3.4.1 Opening the Driveshield: North American Headers

Follow these steps to open the driveshield on North American headers:

1. Release rubber latches (A).
2. Lift shield (B).

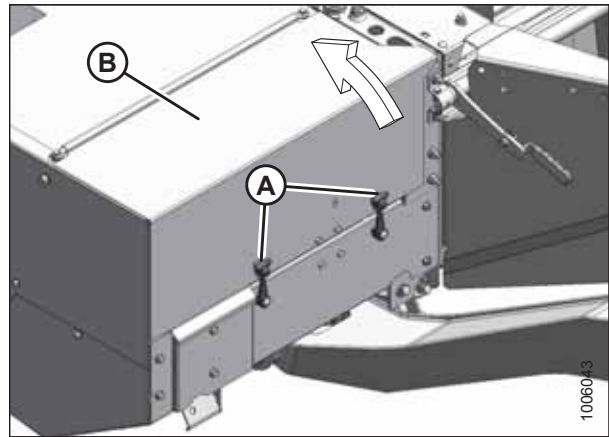


Figure 3.5: Driveshield

### 3.4.2 Closing the Driveshield: North American Headers

Follow these steps to close the driveshield on North American headers:

1. Lower shield (B) so that pins at lower end of shield engage holes in lower panel.
2. Engage rubber latches (A).

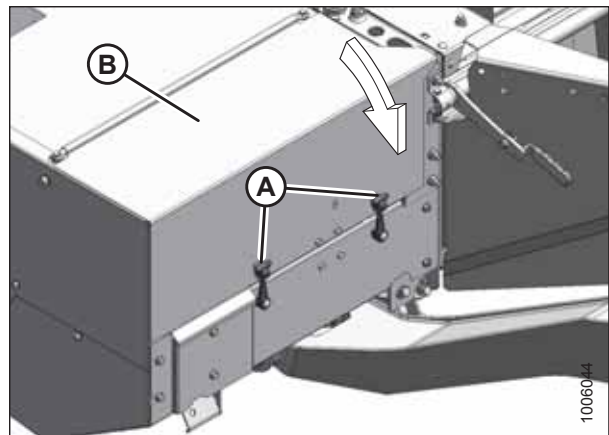


Figure 3.6: Driveshield

### 3.4.3 Opening the Driveshield: Export Headers

Follow these steps to open the driveshield on export headers:

1. Release rubber latches (A).
2. Insert a screwdriver (or equivalent) through hole in shield (B) and into the notch in latch (C) and disengage latch.
3. Open driveshield (D).

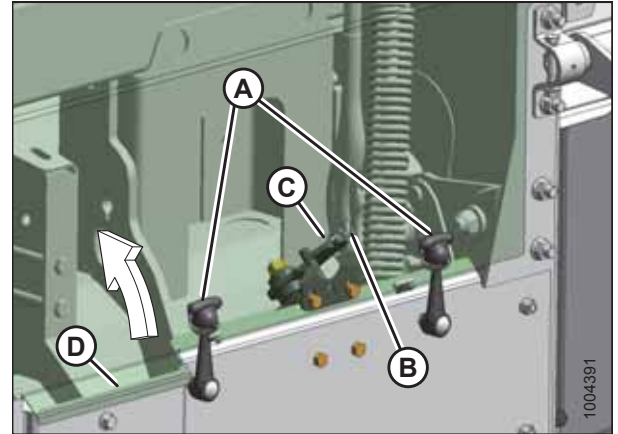


Figure 3.7: Driveshield

### 3.4.4 Closing the Driveshield: Export Headers

Follow these steps to close the driveshield on export headers:

1. Lower shield (C) so that pins at lower end of shield engage holes in the lower panel, and latch (B) re-engages the driveshield.
2. Engage rubber latches (A).

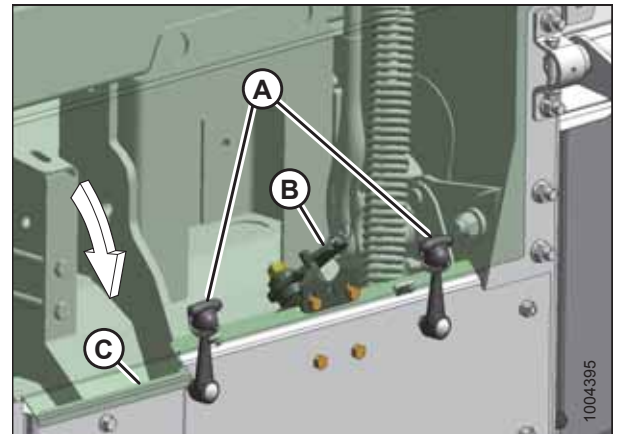


Figure 3.8: Driveshield

### 3.4.5 Removing Right Endshield

1. Remove three bolts (A) and remove right endshield (B).

**NOTE:**

Tall crop feed plates are supplied from the factory and stored behind the right endshield.

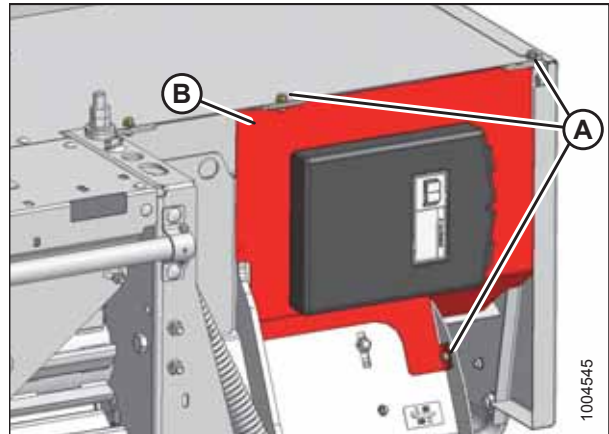


Figure 3.9: Right Endshield

### 3.4.6 Installing Right Endshield

1. Install right endshield (B) using three bolts (A).

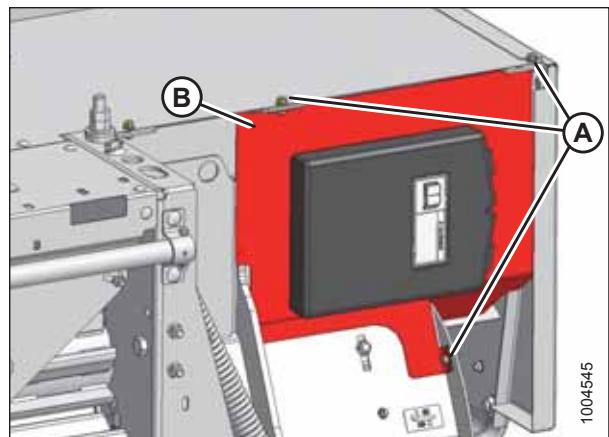


Figure 3.10: Right Endshield

### 3.5 Cutterbar Doors

The Rotary Disc 4.9-Meter (16-Footer) Header for Self-Propelled Windrowers comes in two configurations: one for use in North America and one for use outside of North America. Headers configured for use outside of North America are referred to as export headers. The configuration is specified in the title when necessary.

#### CAUTION

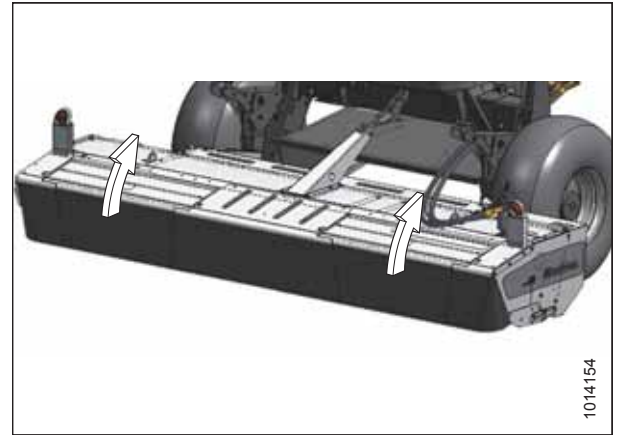
**Do NOT operate the machine without all the cutterbar doors down. The curtains should be installed and in good condition.**

Two doors provide access to the cutterbar area.

Rubber curtains are attached to each door at the front corners and center fixed cover. Latches at the lower corners of each curtain keep the curtains together to minimize the risk of thrown objects.

The cutterbar curtains reduce the potential for thrown objects. Always keep curtains down when operating the header.

Replace worn or damaged curtains. Refer to your Dealer for replacement instructions.



**Figure 3.11: Cutterbar Doors**

### 3.5.1 Opening the Cutterbar Doors: North America

Follow these steps to open the cutterbar doors on a North American header:

#### **DANGER**

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

1. Unhook curtain latches (A).

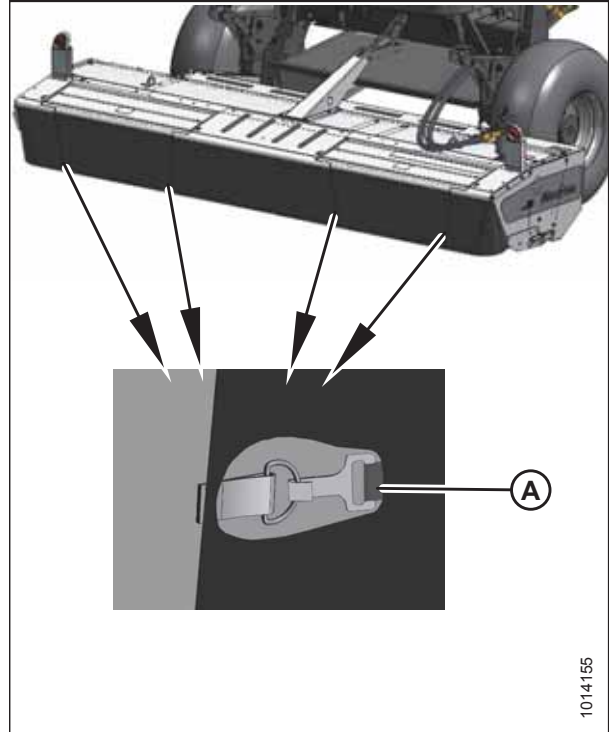


Figure 3.12: Curtain Latches

2. Lift front of door to the open position. The front cover safety latch (A) will automatically drop into position and keep the cover from falling closed again during maintenance.

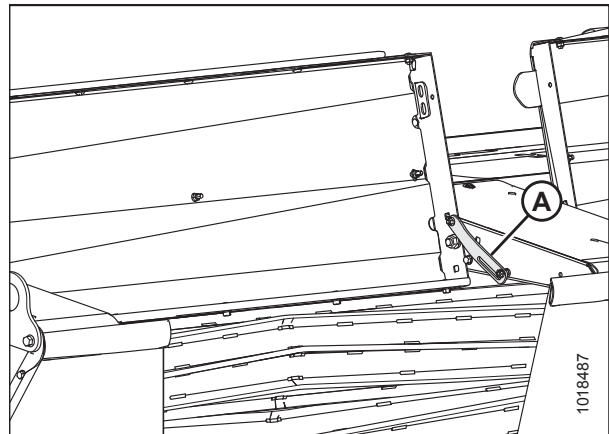


Figure 3.13: Cutterbar Doors

### 3.5.2 Closing the Cutterbar Doors: North American Header

Follow these steps to close the cutterbar doors on a North American header:

#### CAUTION

To avoid injury, keep hands and fingers away from corners of doors when closing.

1. Holding the door open, lift safety door latch (A) to disengage its lock, then move the door down to its closed position over the cutterbar.

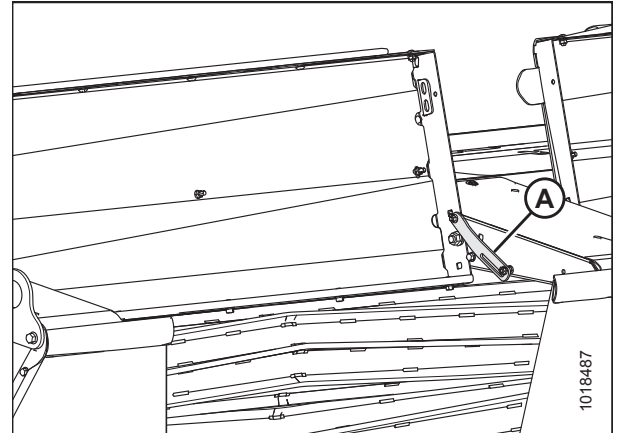


Figure 3.14: Cutterbar Doors

2. Hook curtain latches (A).

#### NOTE:

Ensure that curtains hang properly and completely enclose cutterbar area.

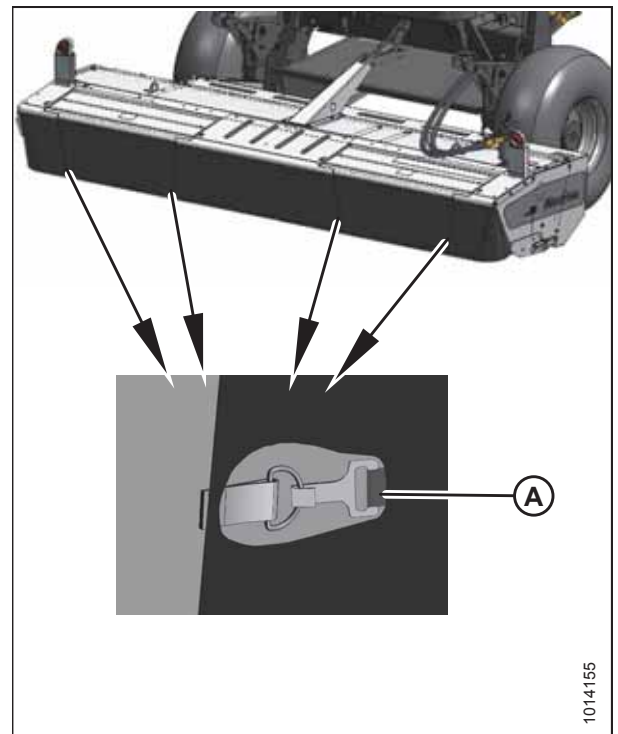


Figure 3.15: Curtain Latches



### 3.5.3 Opening the Cutterbar Doors: Export Header

Follow these steps to open the cutterbar doors on an export header:

#### **DANGER**

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

1. Unhook curtain latches (A).

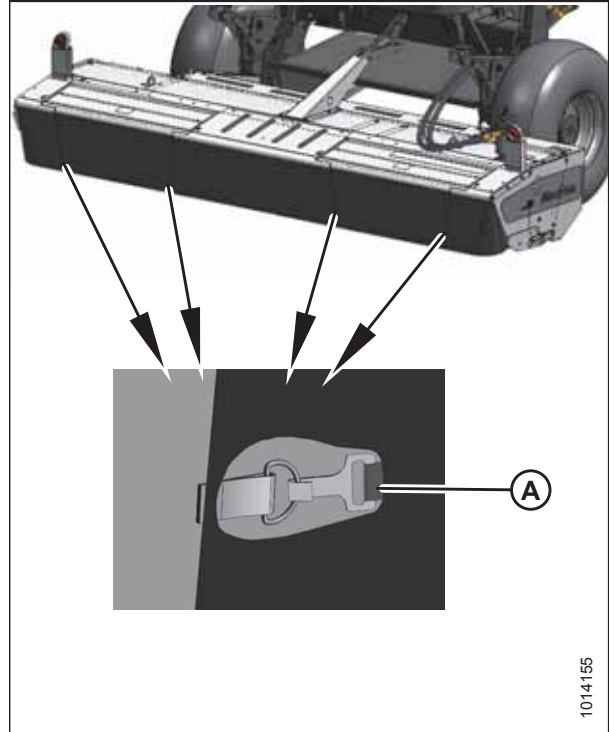


Figure 3.16: Curtain Latches

## OPERATION

2. Insert a screwdriver (or equivalent) through hole (A) in door into notch in latch (B) and push latch to disengage.
3. Lift at front of door to open.

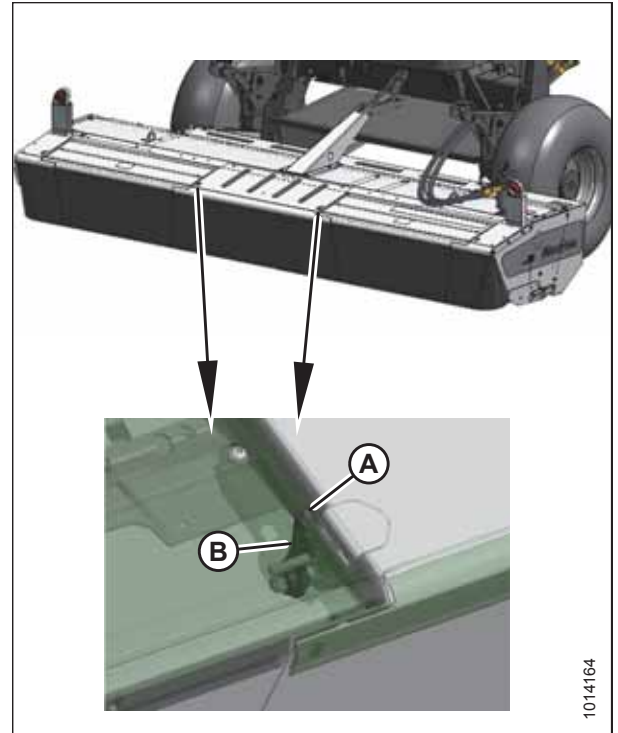


Figure 3.17: Cutterbar Door Latch

### 3.5.4 Closing the Cutterbar Doors: Export Header

To close the cutterbar doors on an export header follow these steps:

#### CAUTION

To avoid injury, keep hands and fingers away from corners of doors when closing.

## OPERATION

1. Pull at top and move to closed position. Ensure latch (A) has engaged the door.

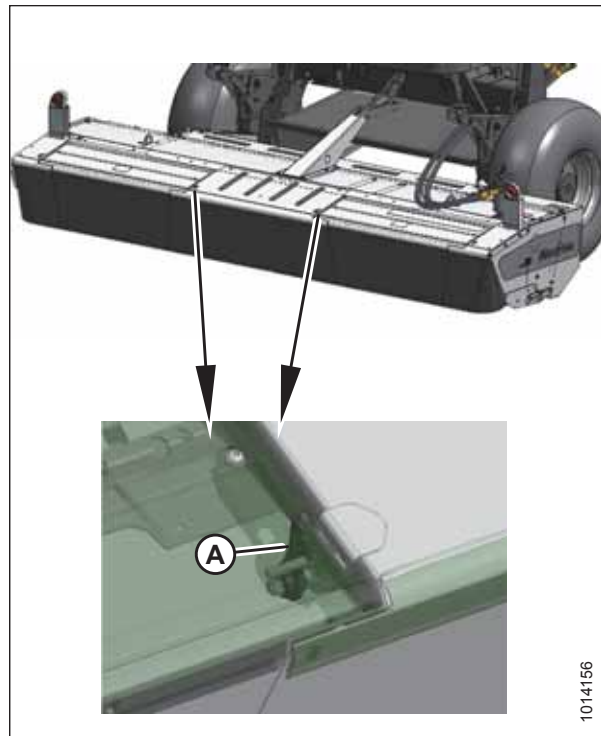


Figure 3.18: Cutterbar Door Latch

2. Hook curtain latches (A).

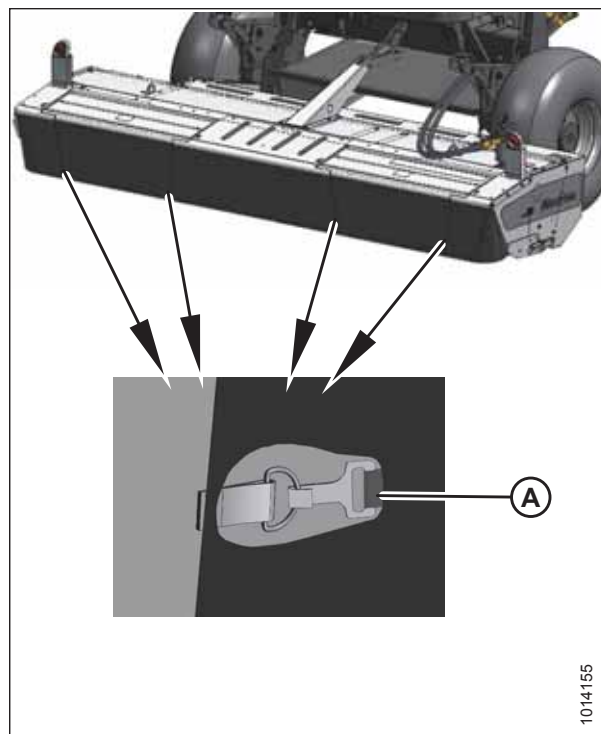


Figure 3.19: Curtain Latches

## 3.6 Daily Start-Up Check

### CAUTION

- Be sure windrower and header are properly attached, all controls are in NEUTRAL, and windrower brake is engaged.
- Clear the area of other persons, pets etc. Keep children away from machinery. Walk around the header to be sure no one is under, on or close to it.
- Wear close fitting clothing and protective shoes with slip resistant soles. As well, carry with you any protective clothing and personal safety devices that COULD be necessary through the day. Don't take chances.
- Remove foreign objects from the machine and surrounding area.

You may need the following:

- A hard hat
- Protective footwear with slip resistant soles
- Protective glasses or goggles
- Heavy gloves
- A respirator or filter mask
- Wet weather gear

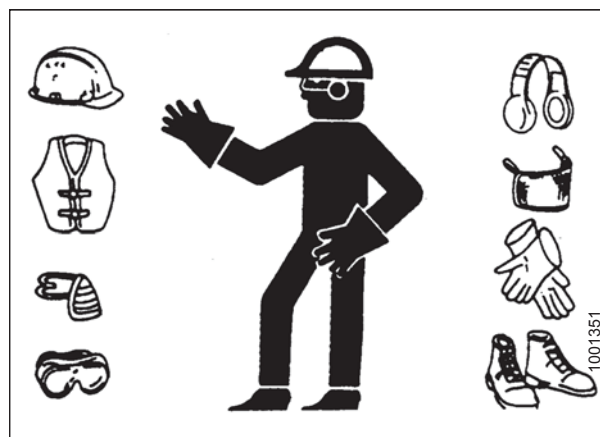


Figure 3.20: Safety Equipment

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



Figure 3.21: Safety Equipment

## OPERATION

Do the following 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 [5.5.2 Hydraulic Hoses and Lines, page 172](#).

2. Clean all lights and reflective surfaces on the machine. Check lights for proper operation.
3. Perform all daily maintenance. Refer to [5.2.1 Maintenance Schedule/Record, page 122](#).

## 3.7 Attaching the Header

### 3.7.1 Attaching the Forming Shield

#### DANGER

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

1. Stop the engine and remove the key.
2. Remove the two clevis pins (A) from the forming shield forward end.

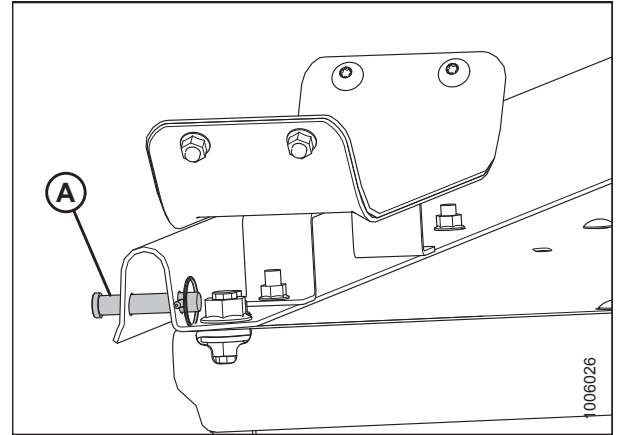


Figure 3.22: Forming Shield

3. Position forming shield (A) under the windrower frame.

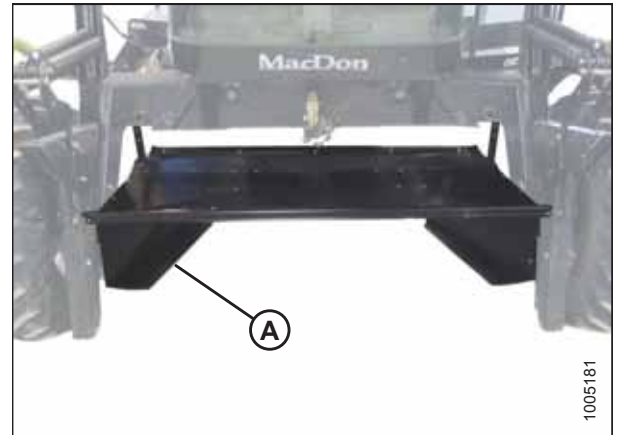
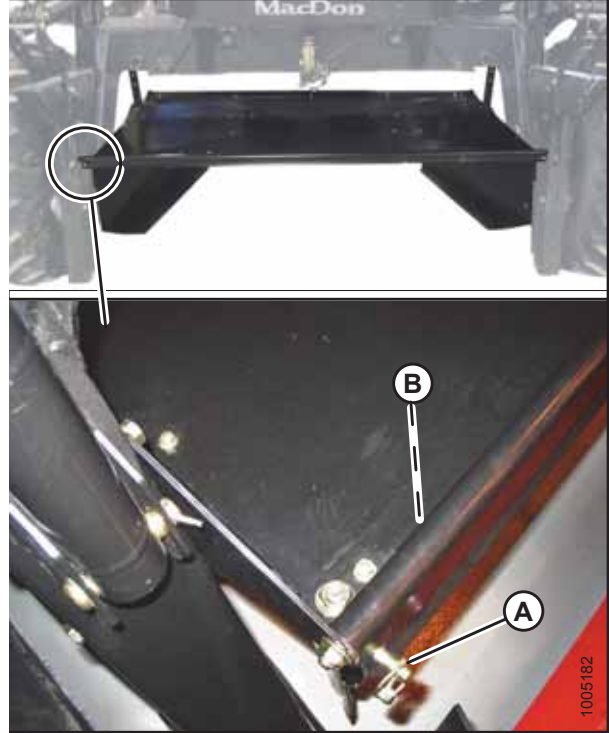


Figure 3.23: Forming Shield under Windrower Frame

## OPERATION

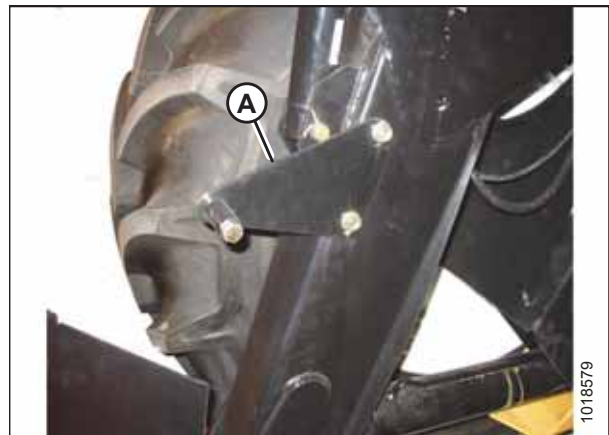
4. Position the forming shield onto spacers (B) on windrower legs. Secure with clevis pins (A) and lynch pin.



**Figure 3.24: Attaching Forming Shield to Windrower Legs**

### **IMPORTANT:**

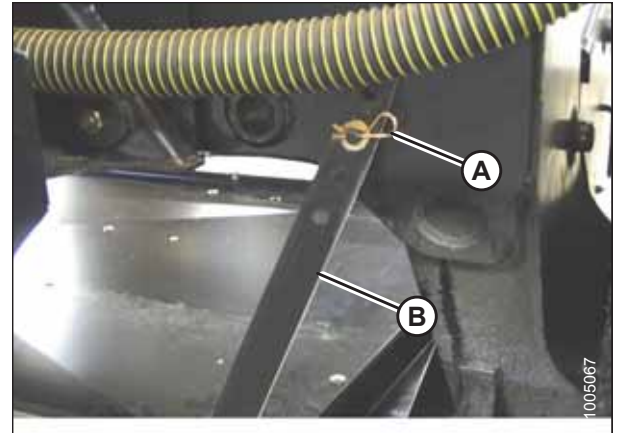
Forming shield plate (A) is shown in standard position. If installing double windrow attachment (DWA), install plate in inverted position.



**Figure 3.25: Forming Shield under Windrower Frame**

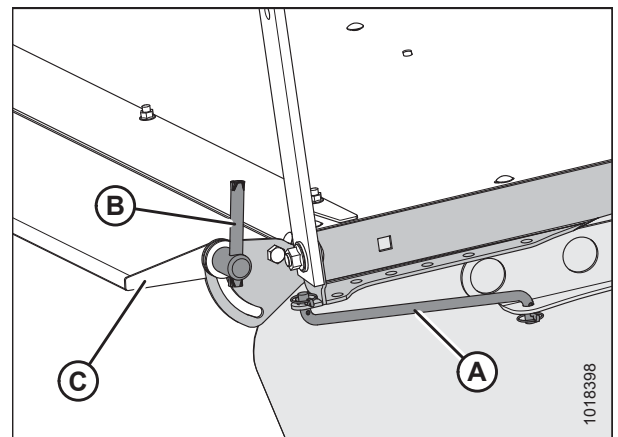
## OPERATION

6. Lift the aft end of the forming shield and attach straps (B) to pins (A) on the windrower frame.
7. Install washer and hairpin to secure strap. Use the middle hole and adjust height to suit the crop.



**Figure 3.26: Forming Shield Strap**

8. Set the forming shield side deflectors to the desired width by repositioning adjuster bars (A). Use the same hole location on both sides.
9. Adjust rear fluffer deflector (C) to the middle position. Loosen handles (B) if required.
10. Attach the R85 header to the windrower. Refer to the windrower operator's manual for instructions, and then return to this manual to complete the attachment.
11. Connect the hydraulics and electrical harness.
  - For M1240, refer to [3.7.6 Attaching Hydraulic and Electrical Components: M1240 Windrowers](#), page 62.
  - For M205, refer to [3.7.3 Attaching Hydraulic and Electrical Components: M205 Windrowers](#), page 45.
  - For M200, refer to [3.7.4 Attaching Hydraulic and Electrical Components: M200 Windrowers](#), page 51.



**Figure 3.27: Forming Shield Adjuster Bar**



### 3.7.2 Attaching Header to an M200 and M205 Self-Propelled Windrower

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

1. Remove hairpin from pin (A) and remove pin from left and right header boots (B).

#### **CAUTION**

Ensure all bystanders have cleared the area.

2. Start engine and activate HEADER down button on the ground speed lever (GSL) to fully retract header lift cylinders.

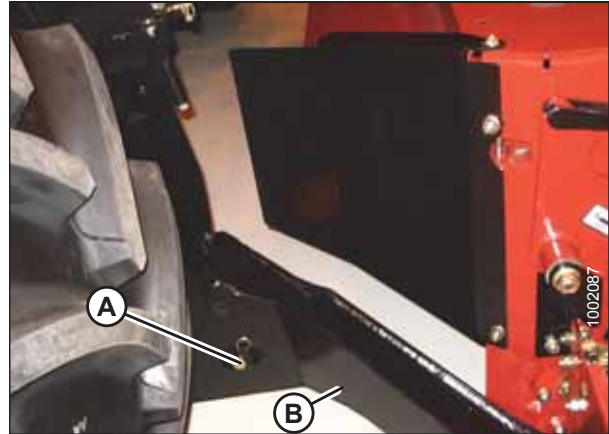


Figure 3.28: Header Boots

3. Slowly drive the windrower forward so that the feet (A) enter the header boots (B). Continue to drive slowly forward until feet engage the boots and header nudges forward.
4. If a manual center-link is installed, raise it up by hand and extend it until it reaches the header. Install the pin to secure the center-link to the header.
5. Adjust the manual center-link until a dimension of 737 mm (29 in) (pin to pin) is achieved.

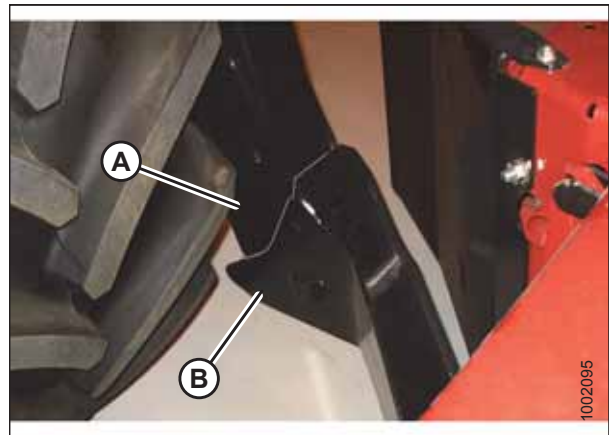


Figure 3.29: Header Boots

6. If the hydraulic center-link is installed, use the HEADER TILT cylinder switches on the GSL to position center-link cylinder (A) so it can connect to the header.
7. Push down on the rod end of the link cylinder until the hook engages pin (B) on header. Then, retract it until it is locked.

#### **NOTE:**

If the optional center-link assist cylinder is installed, activate the cylinder from the cab using the reel lift switches to lower the center-link onto header. Then retract the center-link to secure it to the header.

8. Raise the header fully with the HEADER UP switch on the GSL. Stop engine and remove key.

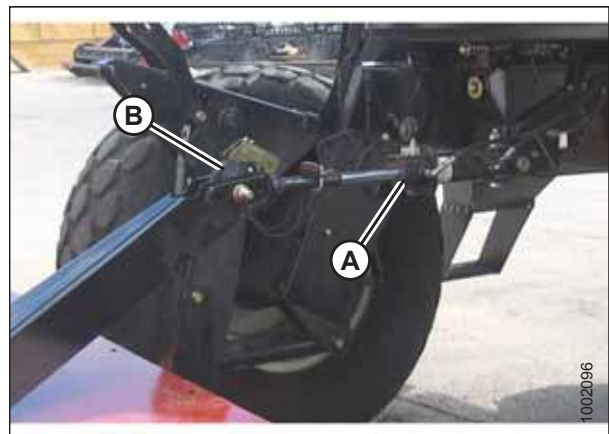


Figure 3.30: Center-Link

#### **DANGER**

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

## OPERATION

9. Engage safety props on both lift cylinders.
10. Install pin (A) through each boot and foot and secure with hairpin.

### IMPORTANT:

Ensure pin (A) is fully inserted and hairpin is installed behind the bracket.

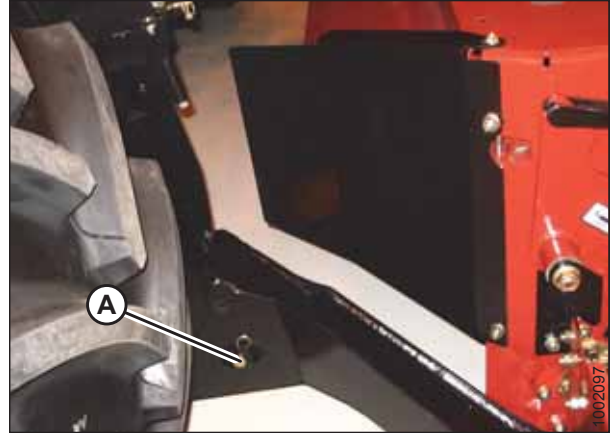


Figure 3.31: Header Boots

11. Remove pin (A) from its storage position in linkage and insert it into hole (B) to engage float springs. Secure with hairpin.
12. Disengage safety props.
13. Start engine and activate the HEADER LIFT cylinder switch on the GSL to lower header fully. Stop engine and remove key.
14. Connect header drive hydraulics and electrical harness to header.

### NOTE:

Refer to the header operator's manual for instructions on attaching the hydraulics and electrical to the rotary header.

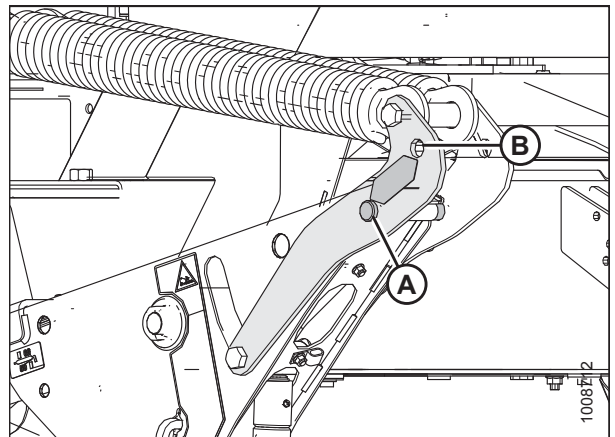


Figure 3.32: Float Pins

### 3.7.3 Attaching Hydraulic and Electrical Components: M205 Windrowers



### DANGER

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

### NOTE:

Factory-installed hard plumb connections are ideal for attaching an R85 disc header's hydraulics on an M205 windrower. If an auger header or draper header will also be used on a disc header-ready M205 windrower, quick couplers can be ordered and installed to make switching between these headers easier<sup>1</sup>.

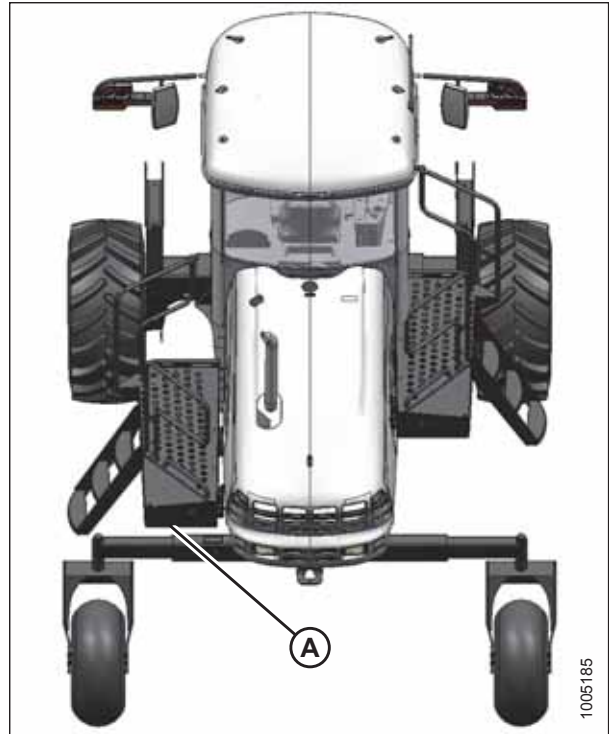
Refer to your windrower operator's manual for procedures to mechanically attach the header to the windrower. Refer to the following procedures for electrical and hydraulic connections:

1. Order two kits (MD #B5497) for use on an M205 windrower factory-configured for a disc header only. Order one kit (MD #B5497) for use on an M205 windrower factory-configured for auger and draper headers.

## OPERATION

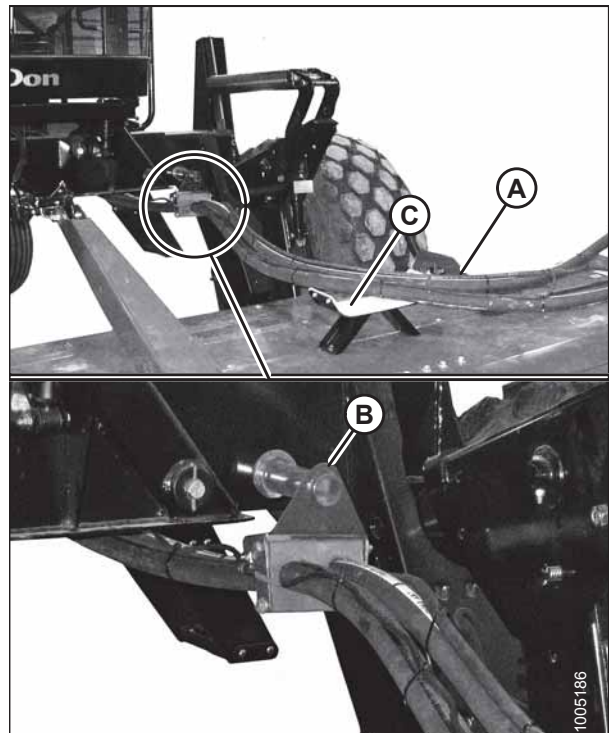
### ***Routing hydraulic hose bundle from header to windrower:***

1. Move windrower left (cab-forward) platform (A) to OPEN position. For instructions, refer to the windrower operator's manual.



**Figure 3.33: Windrower with Left Platform in Open Position**

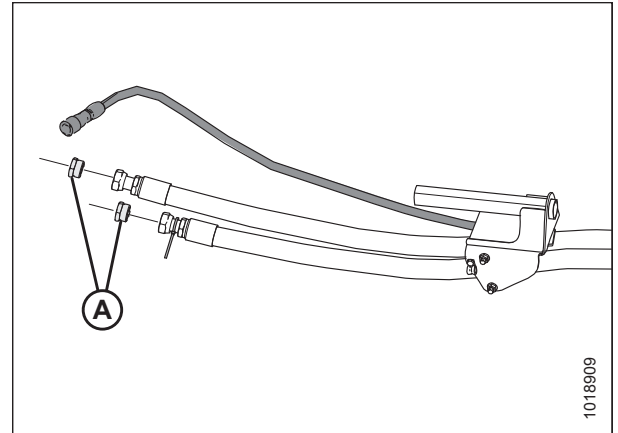
2. Route hose bundle (A) from the header under the windrower frame, and insert pin (B) into hole in windrower frame.
3. Place hoses on support (C) and on the hose support on the forming shield (not shown).



**Figure 3.34: Hydraulic Hoses**

## OPERATION

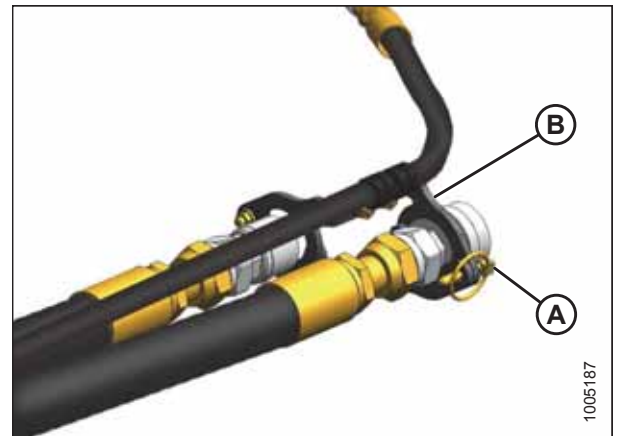
4. Remove protective plugs (A) from ends of hydraulic hoses.



**Figure 3.35: Protective Shipping Plugs on R85 Hydraulic Hoses**

### ***Attaching hydraulics using quick coupler connections:***

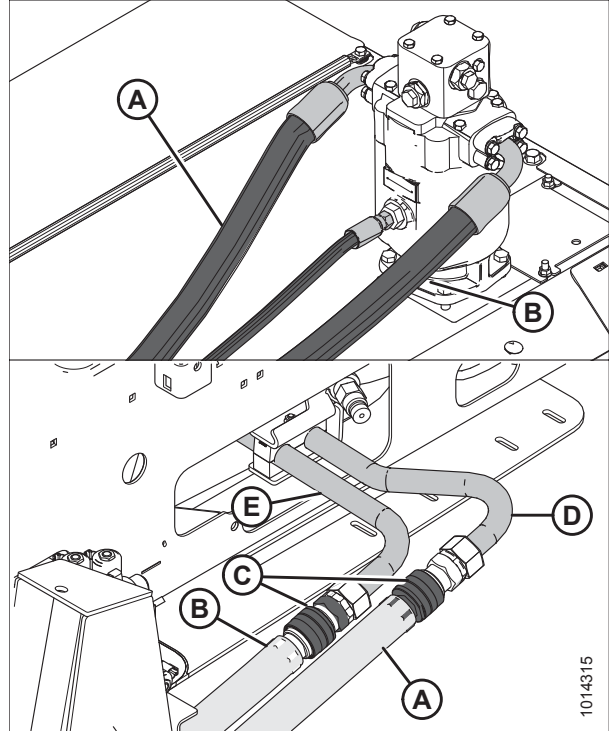
1. Remove coupler lock as follows:
  - a. Remove lynch pin (A) and open up coupler lock (B).
  - b. Remove lock from coupler.



**Figure 3.36: Hydraulic Couplers with Coupler Lock**

## OPERATION

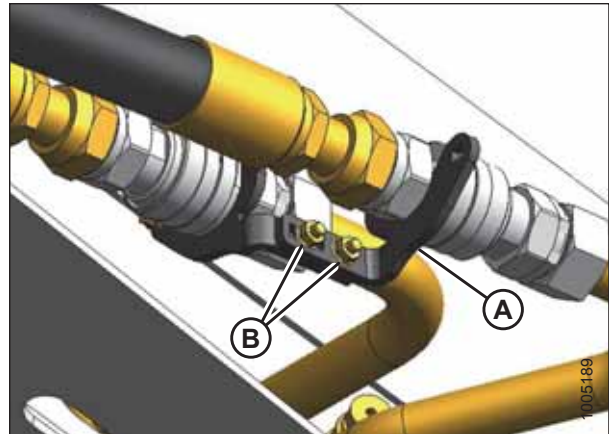
2. Connect rear pump hose (A) to outboard line (D) on windrower using coupler (C).
3. Connect front pump hose (B) to inboard line (E) on windrower using coupler (C).



4. Position the lock onto the couplers so that retainer (A) rests under the fitting next to the sleeve on each coupler.

**NOTE:**

The retainer can be adjusted by loosening bolts (B). Tighten bolts after adjusting.

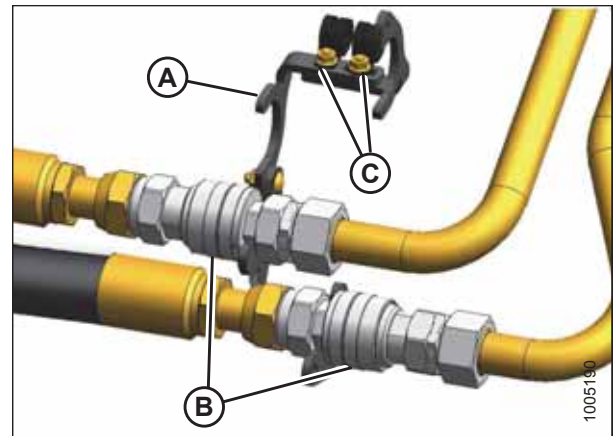


## OPERATION

5. Lower holder (A) onto sleeves (B) so that the flats are positioned on the holder.

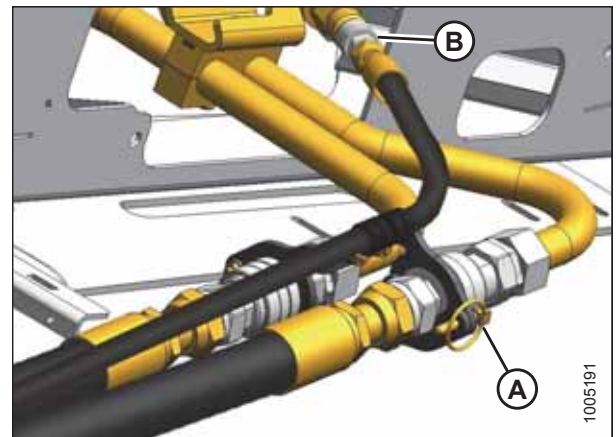
**NOTE:**

Holder can be adjusted by loosening bolts (C). Tighten bolts after adjusting.



**Figure 3.39: Hydraulic Couplers with Coupler Lock**

6. Insert lynch pin (A) to secure the lock.
7. Attach case drain hose coupler at (B).
8. Proceed to Step [5, page 50](#) and Step [6, page 51](#).



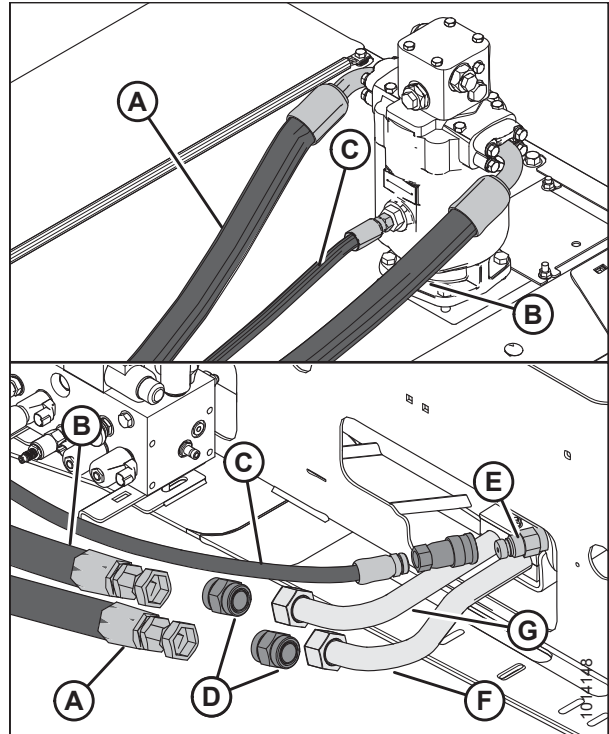
**Figure 3.40: Hydraulic Couplers with Case Drain Hose**



## OPERATION

### **Attaching hydraulics using hard plumbing connections:**

1. Connect rear pump hose (A) to outboard line (F) on windrower using fitting (D).
2. Connect front pump hose (B) to inboard line (G) on windrower using fitting (D).
3. Torque fittings to 183 Nm (135 lbf·ft).
4. Attach case drain hose and coupler (C) to (E).

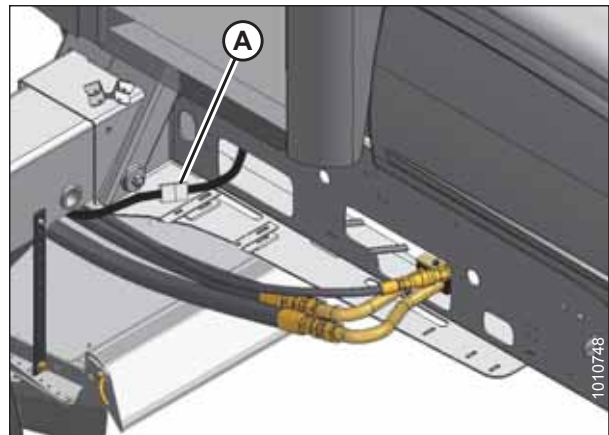


**Figure 3.41: Hose Routing and Connections**

5. Connect the electrical harness to connector HC-2A (A) (located beside the forward valve block on the windrower).

#### **NOTE:**

The R85 disc header ships with a factory-installed electrical harness extension for compatibility with M1240 windrowers. Remove the extension from the electrical harness before connecting to the M205 windrower.



**Figure 3.42: Electrical Connection (Valve Block Removed for Clarity)**

## OPERATION

6. Move windrower platform (A) to the CLOSED position. For instructions, refer to the windrower operator's manual.

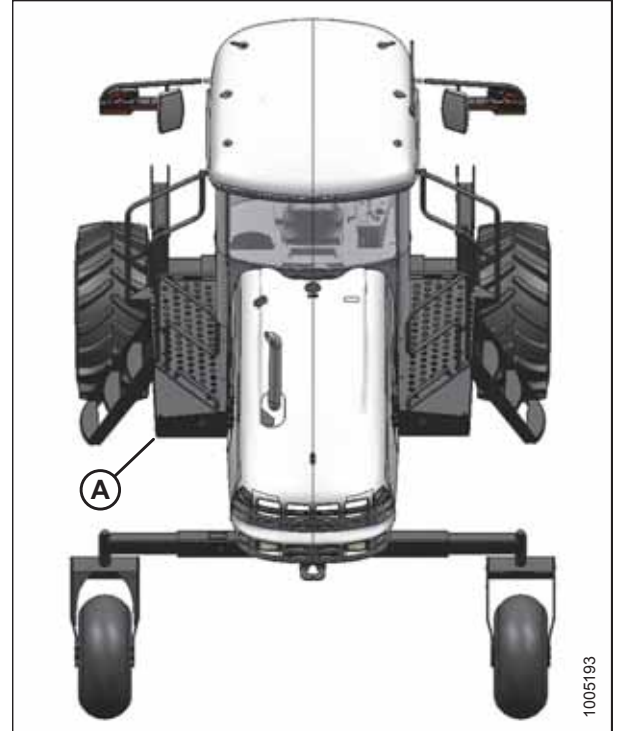


Figure 3.43: Windrower with Left Platform in Closed Position

### 3.7.4 Attaching Hydraulic and Electrical Components: M200 Windrowers

#### DANGER

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

Refer to [3.7 Attaching the Header, page 41](#) for procedure to mechanically attach the header to the windrower. Refer to the following procedures for electrical and hydraulic connections:

#### IMPORTANT:

To operate the 4.9-meter (16-foot) header on an M200 windrower, a hydraulic drive kit (MD #B5455) is required. Install kit in accordance with the supplied kit instructions.

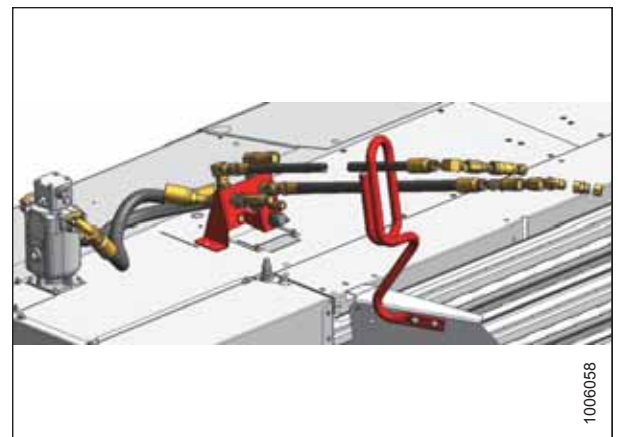
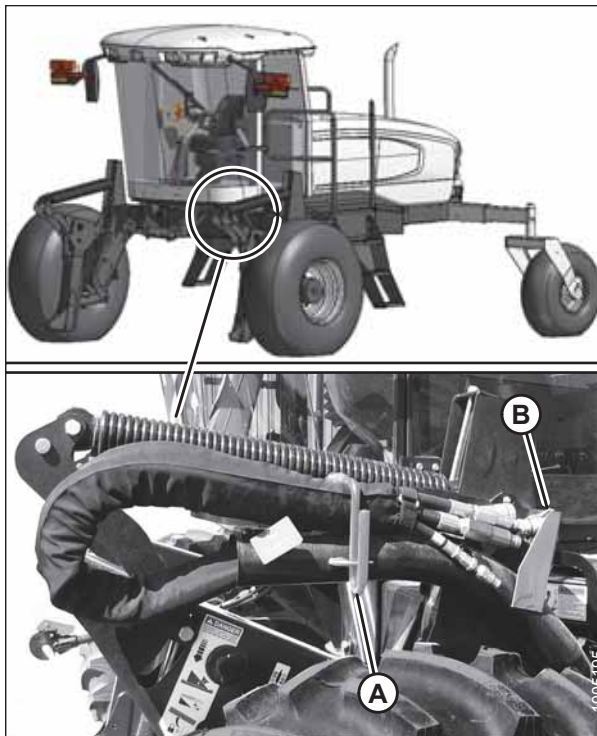


Figure 3.44: MD #B5455 Hydraulic Drive Kit



## OPERATION

1. Disengage and rotate lever (A) counterclockwise to the UP position.
2. Remove cap (B) securing the electrical connector to the frame.



**Figure 3.45: Hose Bundle**

3. Move hose bundle (A) from the windrower, and rest the bundle on the header.



**Figure 3.46: Hose Bundle**

## OPERATION

4. Position the hose support with lower bolt (A) in the forward hole, as shown. Loosen both bolts and adjust as required.

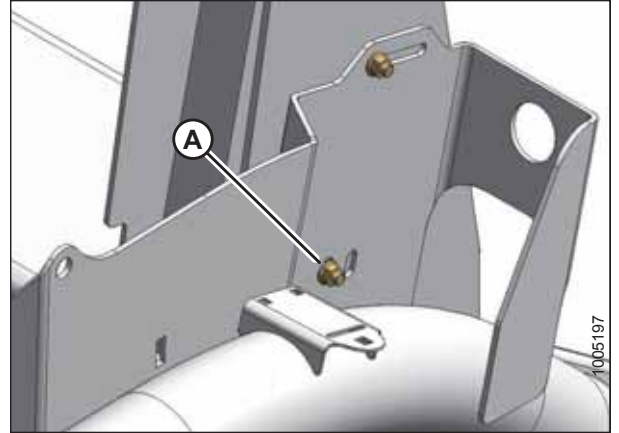


Figure 3.47: Hose Support

5. Route hose bundle (A) from the windrower through support (B) on header.
6. Route header return and pressure hose bundle (C) through support (B) on header to the windrower.

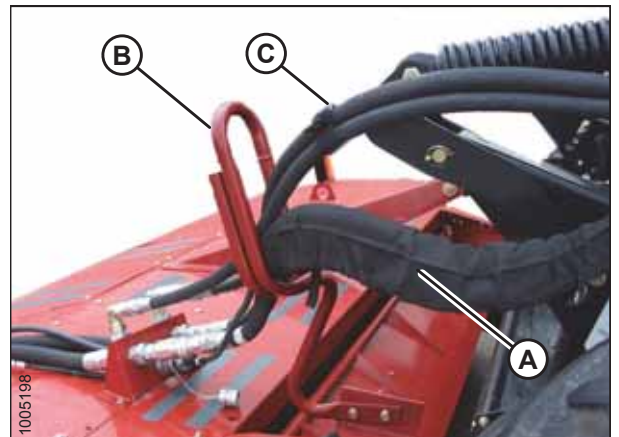


Figure 3.48: Hose Bundle

7. Secure hose bundles with three cinch straps (B).
8. Lower and lock lever (A).

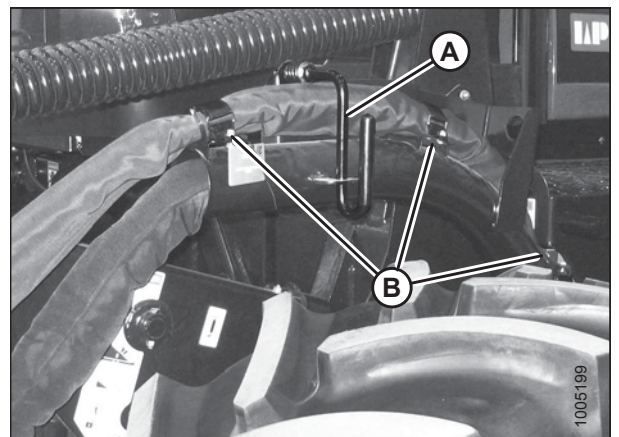


Figure 3.49: Hose Bundle

## OPERATION

9. Move the windrower's left side (cab-forward) platform (A) to the OPEN position to access the valve blocks.

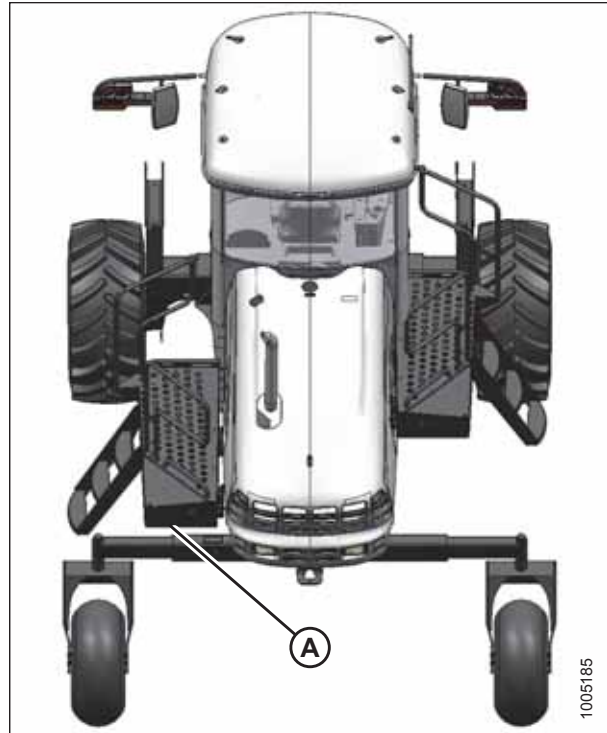


Figure 3.50: Windrower with Left Platform in Open Position

10. Remove caps from pressure (A) and return (B) ports on valve (C) and discard.

**IMPORTANT:**

Keep open lines and ports clean.

11. Remove fitting at pressure port (A) and discard.

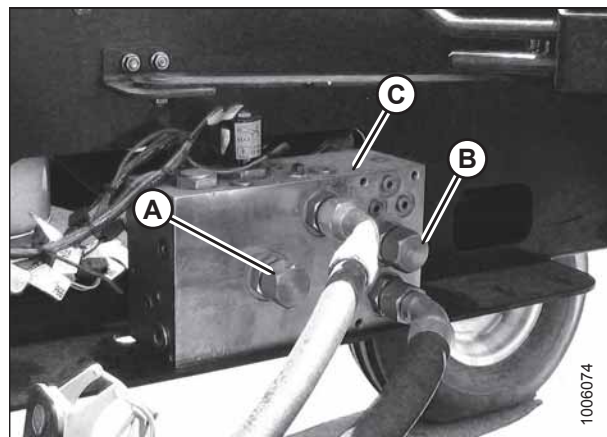


Figure 3.51: Hydraulic Connections

## OPERATION

12. Disconnect fittings at end of hose bundle (A).  
Discard caps.

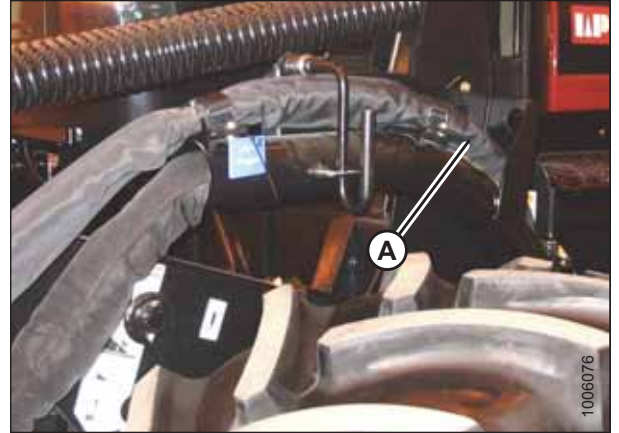


Figure 3.52: Hose Bundle

13. Remove O-ring (A) from cap and install over JIC threads on fitting at return port (B).
14. Install female coupler (C) from hose in return port (B).
15. Install male 45° fitting (D) and male coupler (E) from hose in pressure port (F).

**NOTE:**

Male fitting and coupler may need to be disassembled prior to installing on valve block.

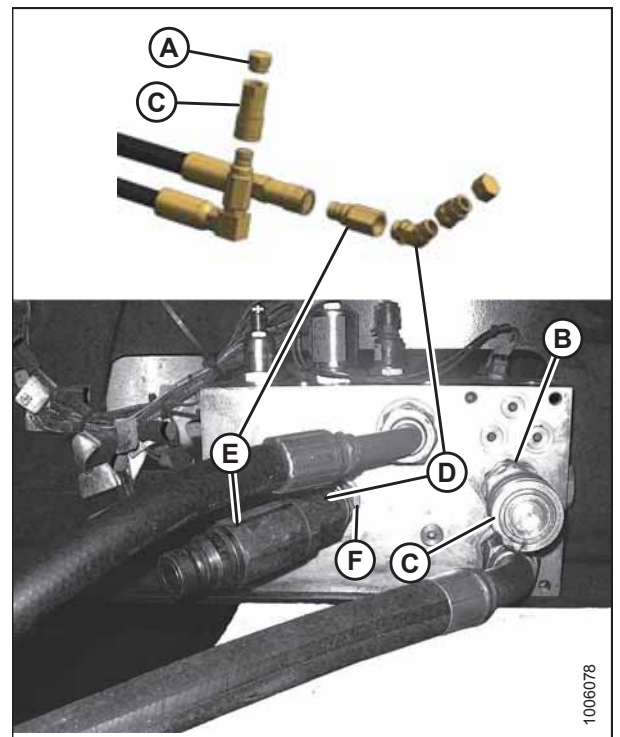


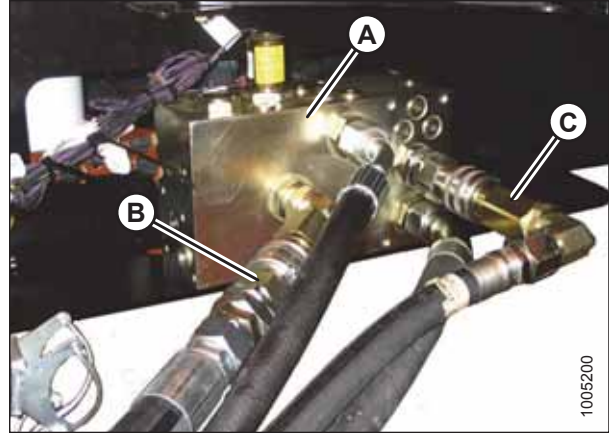
Figure 3.53: Hydraulic Connections

## OPERATION

16. Connect hoses from header to fittings as shown.

**NOTE:**

If the windrower is equipped with a reverser valve for an auger header, replace the 90° fitting on hose (C) with a 45° fitting.

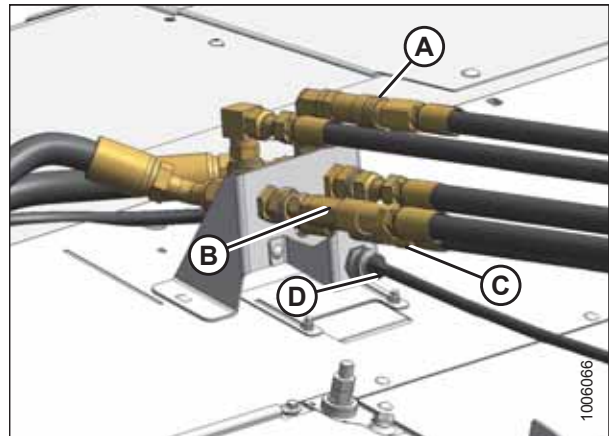


**Figure 3.54: Hydraulic Connections**

A - Middle Valve Block  
C - Return

B - Pressure

17. Remove caps and plugs from hoses and lines.
18. Connect the pressure (A), return (B), and case drain (C) hoses from windrower to fittings on header as shown.
19. Connect electrical harness (D) from windrower to connector on header.



**Figure 3.55: Header Connections**

## OPERATION

20. Move platform (A) to the CLOSED position. For instructions, refer to the windrower operator's manual.

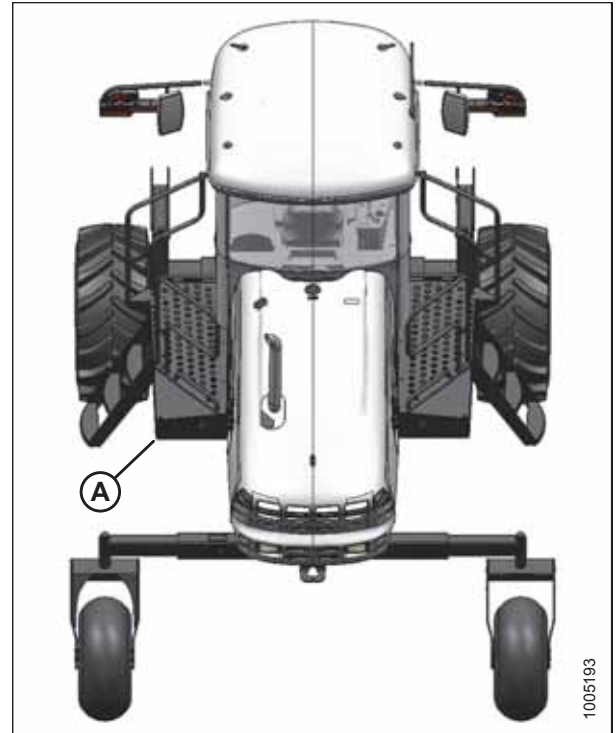


Figure 3.56: Top View of Windrower

### 3.7.5 Attaching Hydraulic Center-Link with Optional Self-Alignment: M1240 Windrowers

To attach an R85 header to a windrower, follow these steps:

#### DANGER

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

1. Remove hairpin (B) from clevis pin (A), and remove pin from header support (C) on both sides of header.

#### CAUTION

Check to be sure all bystanders have cleared the area.

2. Start engine.

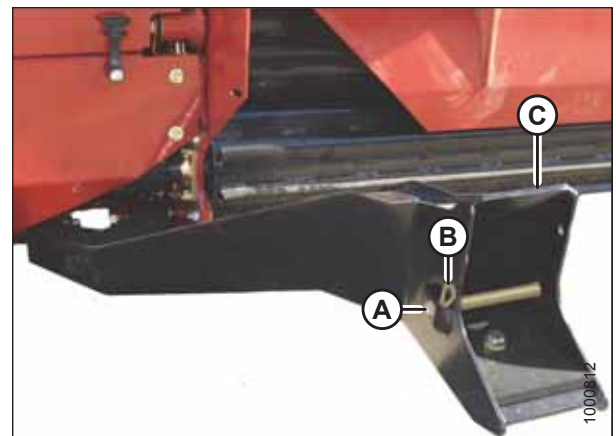


Figure 3.57: Header Support



## ⚠ CAUTION

To prevent damage to the header lift linkages when lowering header lift legs without a header or weight box attached to the windrower, ensure the float springs tension is fully released.

### NOTE:

If not prompted by the harvest performance tracker (HPT) display to remove float, remove float manually by doing the following:

### NOTE:

If not prompted by the HPT display to remove header float, remove header float manually by doing the following:

3. Press rotary scroll knob (A) on Harvest Performance Tracker (HPT) to highlight QuickMenu options.
4. Rotate scroll knob (A) to highlight HEADER FLOAT symbol (B), and press scroll knob to select.

5. On Float Adjust page, press soft key 3 (A) to remove the header float.

### NOTE:

If the header float is active, the icon at soft key 3 will say REMOVE FLOAT; if header float has been removed, the icon will say RESUME FLOAT.

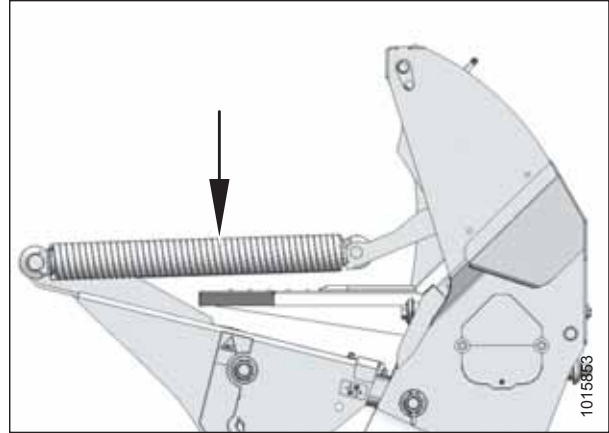


Figure 3.58: Header Float Spring



Figure 3.59: HPT Display



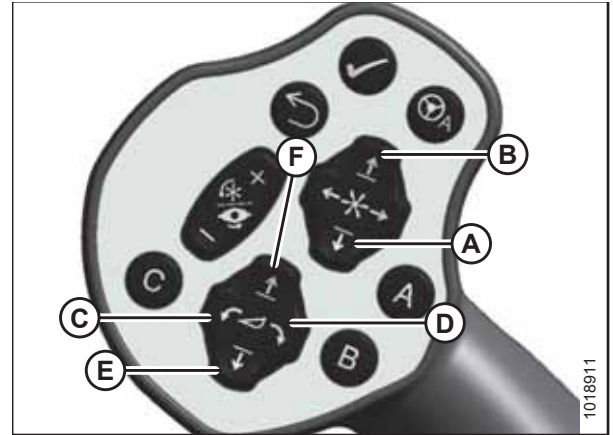
Figure 3.60: HPT Display

## OPERATION

6. Press HEADER DOWN switch (E) on the ground speed lever (GSL) to fully retract header lift cylinders.
7. Press REEL UP switch (B) on the GSL to raise the center-link until the hook is above the attachment pin on the header.

### IMPORTANT:

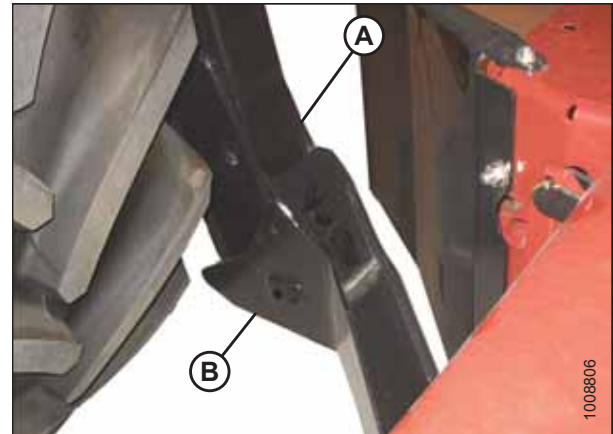
If the center-link is too low, it may contact the header as the windrower approaches the header for hookup.



**Figure 3.61: GSL**

A - Reel Down  
B - Reel Up  
C - Header Tilt Down  
D - Header Tilt Up  
E - Header Down  
F - Header Up

8. Drive the windrower slowly forward until the windrower feet (A) enter the header supports (B). Continue to drive slowly forward until feet engage the supports and header nudges forward.
9. Ensure that lift linkages are properly engaged in header legs.



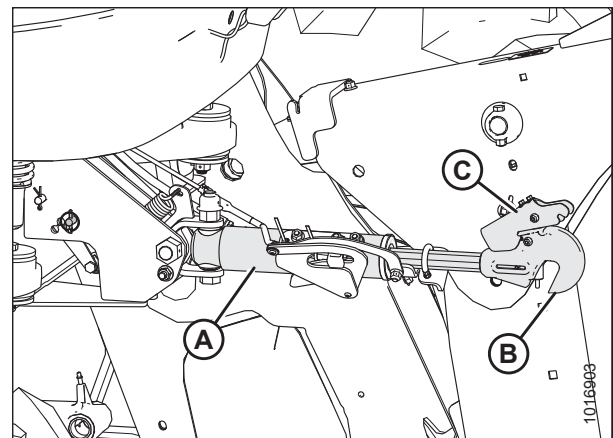
**Figure 3.62: Header Support**

10. Adjust position of the center-link cylinder (A) with the switches on the GSL until the hook (B) is above the header attachment pin.

### IMPORTANT:

Hook release (C) must be down to enable self-locking mechanism. If the release is open (up), manually push it down after the hook engages the header pin.

11. Lower center-link (A) onto the header with REEL DOWN switch on GSL until it locks into position (hook release [C] is down). Refer to Figure 3.61, page 59 for GSL controls.
12. Check that the center-link is locked onto header by pressing the REEL UP switch on the GSL. Refer to Figure 3.61, page 59 for GSL controls.



**Figure 3.63: Center-Link**



## CAUTION

Check to be sure all bystanders have cleared the area.



## OPERATION

13. Start engine.
14. Press HEADER UP switch (A) to raise header to maximum height.
15. If one end of the header does **NOT** fully raise, rephase the lift cylinders as follows:
  - a. Press and hold HEADER UP switch (A) until both cylinders stop moving.
  - b. Continue to hold the switch for 3–4 seconds. Cylinders are now phased.
16. Stop the engine, and remove the key.



Figure 3.64: GSL

17. Engage safety prop on lift cylinder as follows:
  - a. Pull lever (A) and rotate toward header to release, and lower safety prop onto cylinder.
  - b. Repeat for opposite lift cylinder.

**IMPORTANT:**

Ensure the safety props engage over the cylinder piston rods. If safety prop does not engage properly, raise header until prop fits over the rod.

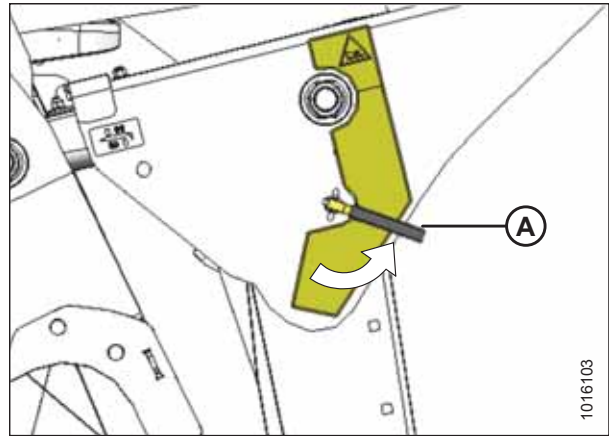


Figure 3.65: Cylinder Safety Prop

18. Install clevis pin (A) through support and foot, and secure with hairpin (B). Repeat for opposite side.

**IMPORTANT:**

Ensure clevis pin (A) is fully inserted and hairpin is installed behind bracket.

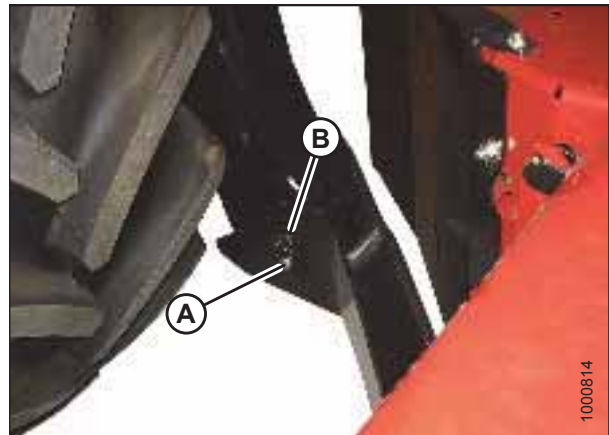


Figure 3.66: Header Support

## OPERATION

19. Disengage safety prop by turning lever (A) downward to raise safety prop until lever locks into vertical position.

**NOTE:**

If safety prop will not disengage, raise header slightly.

20. Repeat for opposite side.

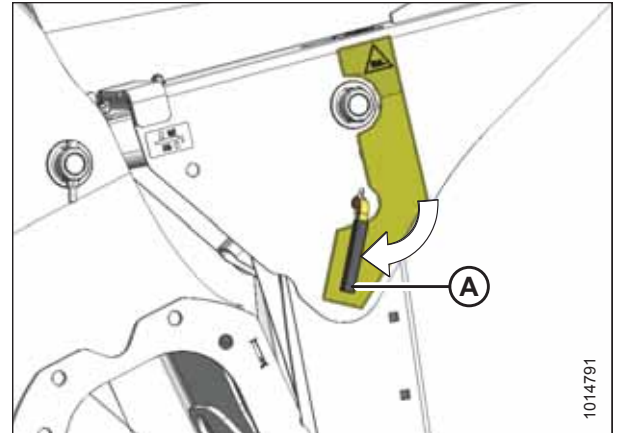


Figure 3.67: Cylinder Safety Prop

21. Start engine and press HEADER DOWN switch (A) on GSL to fully lower header.

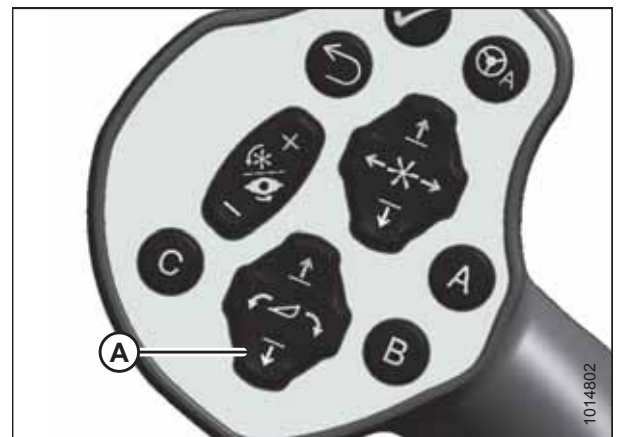


Figure 3.68: GSL

22. Press rotary scroll knob (A) on Harvest Performance Tracker (HPT) to highlight QuickMenu options.
23. Rotate scroll knob (A) to highlight HEADER FLOAT symbol (B), and press scroll knob to select.



Figure 3.69: HPT Display

## OPERATION

24. Turn scroll knob (A) to highlight left or right float setting and press knob (A) to activate selection.
25. Rotate scroll knob (A) to adjust float setting and press knob when finished.

### IMPORTANT:

Float adjustments of 1.0 (out of 10) change the header weight at the cutterbar by approximately 91 kg (200 lb.). Adjust float in increments of 0.05 to optimize field performance.



Figure 3.70: HPT Display

26. Stop the engine, and remove the key.
27. Grasp one end of the rotary header and lift. Lifting force should be 426–471 N (95–105 lbf) and should be the same at both ends.

### 3.7.6 Attaching Hydraulic and Electrical Components: M1240 Windrowers

Your M1240 Self-Propelled Windrower may be configured with either quick coupler or hard plumb connections for the R85 Header.

Refer to the following procedures for routing and connecting M1240 and R85 hydraulic and electrical components:

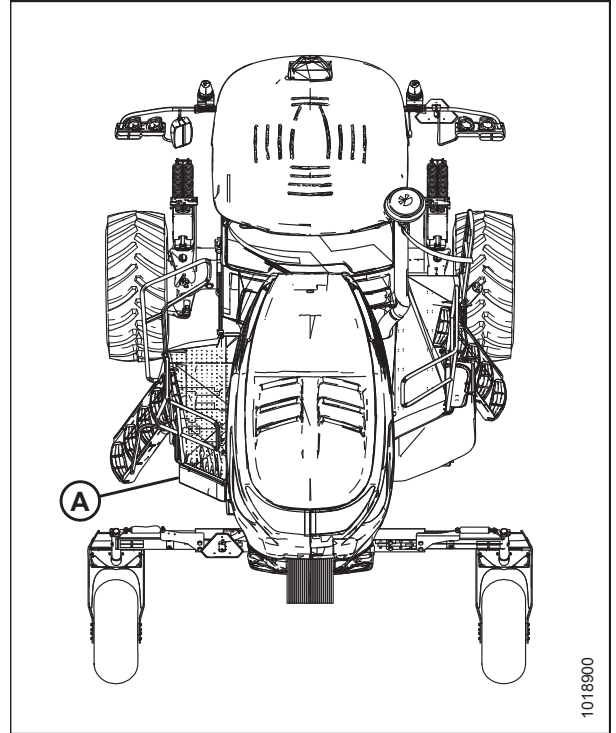
- [Routing Hydraulic Hoses and Electrical Components to M1240 Windrowers, page 63](#)
- [Connecting Header Hydraulics Using Quick Couplers: M1240 Windrowers, page 64](#)
- [Connecting Header Hydraulics Using Hard Plumbing: M1240 Windrowers, page 65](#)

## OPERATION

### *Routing Hydraulic Hoses and Electrical Components to M1240 Windrowers*

To route the R85 Header hydraulic hoses and electrical harness to the M1240 Windrower, follow these steps.

1. Move windrower left (cab-forward) platform (A) to the OPEN position. For instructions, refer to the windrower operator's manual.



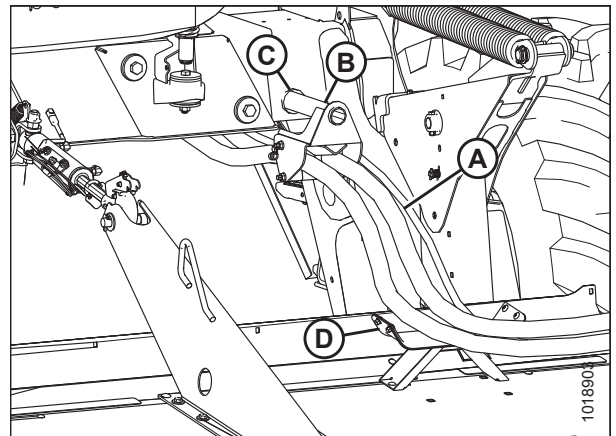
**Figure 3.71: Windrower with Left Platform in Open Position**

2. Route hose bundle (A) from the header, under the windrower frame, then insert pin (B) into hole (C) in the windrower frame.

**NOTE:**

Route hoses as straight as possible and avoid rub/wear points that could damage the hydraulic hoses.

3. Place hoses on support (D) and on the forming shield hose support (not shown).



**Figure 3.72: Hydraulic Hoses**

4. If your M1240 Windrower has factory-installed quick connect couplers, refer to [Connecting Header Hydraulics Using Quick Couplers: M1240 Windrowers, page 64](#) for connection instructions.

If your M1240 Windrower has factory-installed hard plumb connections, refer to [Connecting Header Hydraulics Using Hard Plumbing: M1240 Windrowers, page 65](#) for connection instructions.

## OPERATION

### Connecting Header Hydraulics Using Quick Couplers: M1240 Windrowers

To connect the R85 Header hydraulic hoses and electrical cords to the M1240 Self-Propelled Windrower, follow these steps.

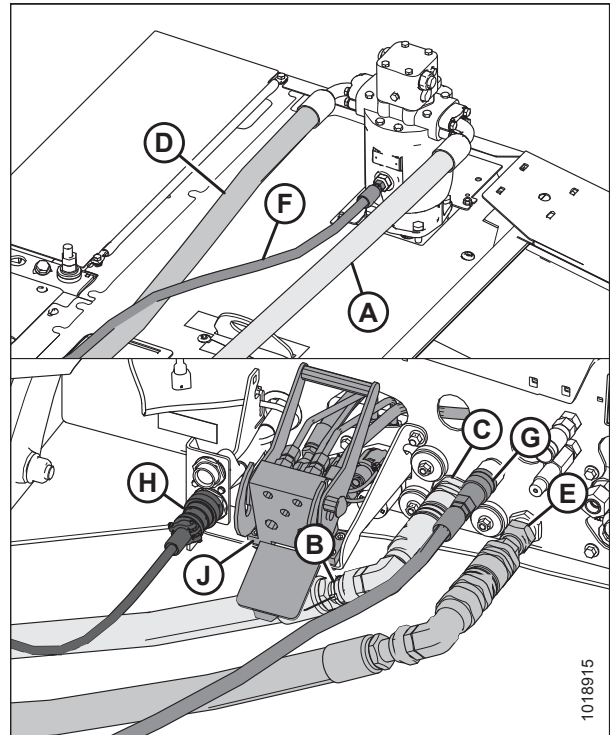
1. Use a clean rag to remove dirt and moisture from the couplers.
2. Make the following hydraulic and electrical connections to the windrower:
  - a. Connect disc pressure hose (A) marked with a red cable tie (B) with coupler (C) and torque to 205–226 Nm (151–167 lbf·ft)
  - b. Connect disc return hose (D) with coupler (E) and torque to 205–226 Nm (151–167 lbf·ft)
  - c. Connect case drain hose (F) to fitting (G)
  - d. Connect the electrical harness to plug (H)

**NOTE:**

Elbow fittings on quick couplers should be set at a 30° angle to allow hoses to pass by the multicoupler without coming into contact with it.

**NOTE:**

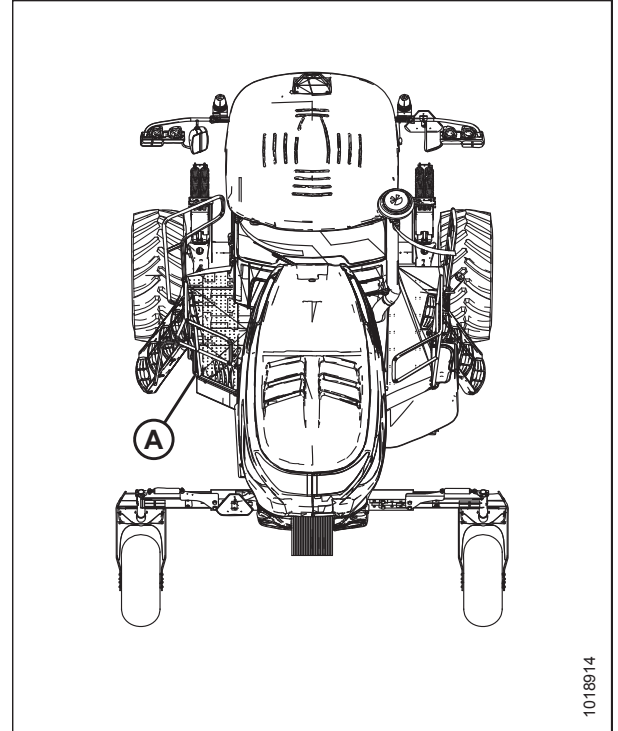
The hydraulic hoses should have enough slack in them to pass by multicoupler (J) without coming into contact with it. This will keep the hoses from rubbing against the multicoupler and protect them from becoming damaged or worn. You can increase slack in the hoses by loosening and adjusting the hose holder on the front windrower leg and pulling the hoses backwards toward the windrower.



**Figure 3.73: Hydraulic and Electrical Connections on M1240 Windrower (Parts Removed for Clarity)**

## OPERATION

3. Move left windrower platform (A) to the CLOSED position. For instructions, refer to the windrower operation's manual.

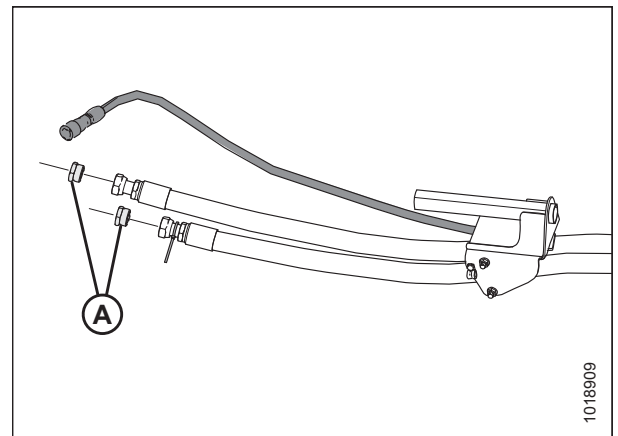


**Figure 3.74: Windrower with Left Platform in Closed Position**

### *Connecting Header Hydraulics Using Hard Plumbing: M1240 Windrowers*

Hard plumbing helps reduce the potential for leaks at the hydraulic connection sites and helps the header drive run more efficiently. To connect the R85 Header to the M1240 Windrower with hard plumbing, follow these steps.

1. Remove protective plugs (A) from ends of hydraulic hoses.



**Figure 3.75: Protective Shipping Plugs on R85 Hydraulic Hoses**

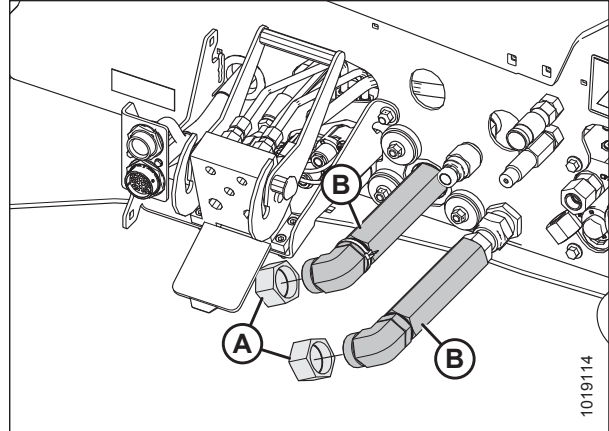


## OPERATION

2. Use a clean rag to remove dirt and moisture from the couplers on the windrower and remove protective plugs (A) from hard plumbing (B).

**NOTE:**

Hard plumbing should be factory-set to 30° to allow hoses to pass by the multicoupler.

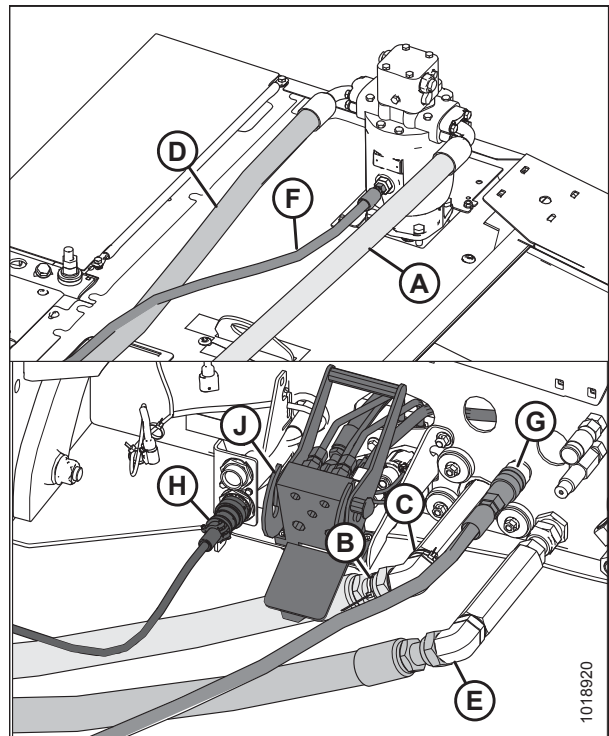


**Figure 3.76: Protective Shipping Plugs on M1240 Hard Plumbing Connections (Parts Removed for Clarity)**

3. Make the following hydraulic and electrical connections to the windrower:
  - a. Connect disc pressure hose (A) marked with a red cable tie (B) to hard plumb fitting marked with a red cable tie (C) and torque to 205–226 Nm (151–167 lbf·ft)
  - b. Connect disc return hose (D) to hard plumb fitting (E) and torque to 205–226 Nm (151–167 lbf·ft)
  - c. Connect case drain hose (F) to fitting (G)
  - d. Connect the electrical harness to plug (H)

**NOTE:**

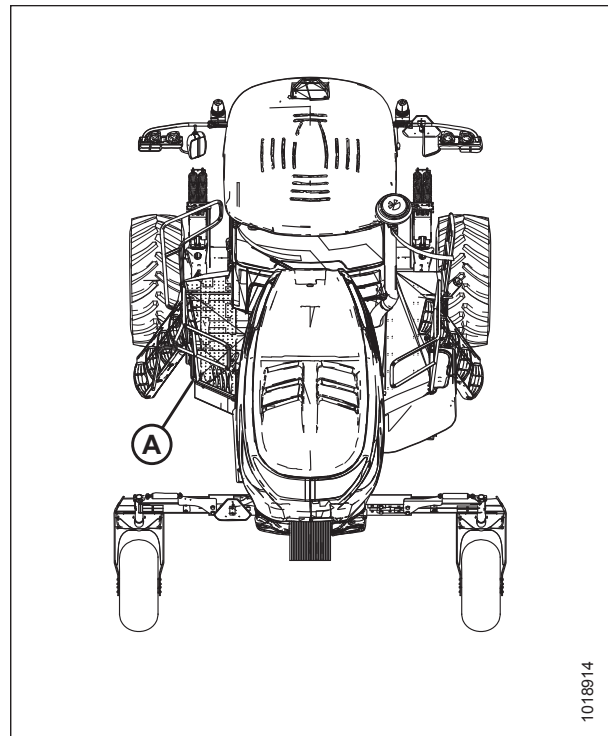
The hydraulic hoses should have enough slack in them to pass by multicoupler (J) without coming into contact with it. This will keep the hoses from rubbing against the multicoupler and protect them from becoming damaged or worn. You can increase slack in the hoses by loosening and adjusting the hose holder on the front windrower leg and pulling the hoses backwards toward the windrower.



**Figure 3.77: Hydraulic and Electrical Connections on Header and M1240 Windrower using Hard Plumbing (Parts Removed for Clarity)**

## OPERATION

4. Move windrower platform (A) to the CLOSED position. For instructions, refer to the windrower operator's manual.



**Figure 3.78: Windrower with Left Platform in Closed Position**



## 3.8 Detaching the Header

### 3.8.1 Detaching the Header: M1240 Windrowers

#### DANGER

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

#### CAUTION

Check to be sure all bystanders have cleared the area.

1. Start the engine, and press switch (A) to raise the header to the maximum height.
2. Stop the engine and remove key from ignition.



Figure 3.79: GSL

3. Open the left-side platform. For instructions, refer to the windrower operator's manual.
4. Disconnect the following electrical harness and hydraulic hoses from the windrower:
  - a. Disconnect the disc pressure hose from fitting (A).
  - b. Disconnect the disc return hose from fitting (B).
  - c. Disconnect the case drain hose from fitting (C).
  - d. Disconnect the electrical harness from receptacle (D).

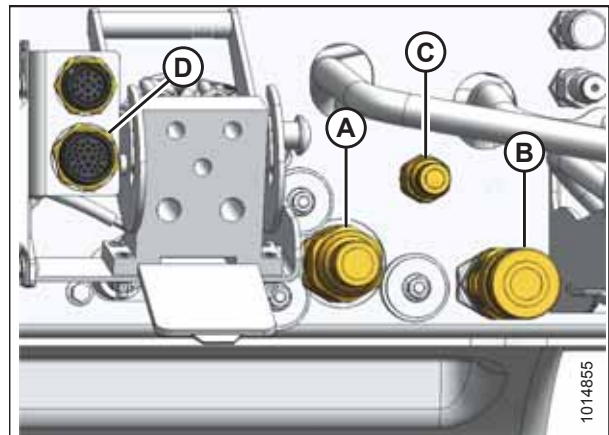


Figure 3.80: Header Drive Hydraulics

## OPERATION

5. Remove hairpin (B) from clevis pin (A) and remove clevis pin from header support (C) on both sides of header.

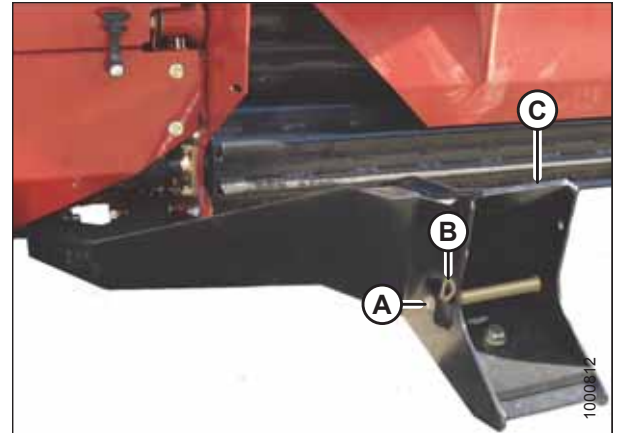


Figure 3.81: Header Supports

6. **For windrowers with self-aligning center-link:** Release center-link latch (A) before returning to the cab.

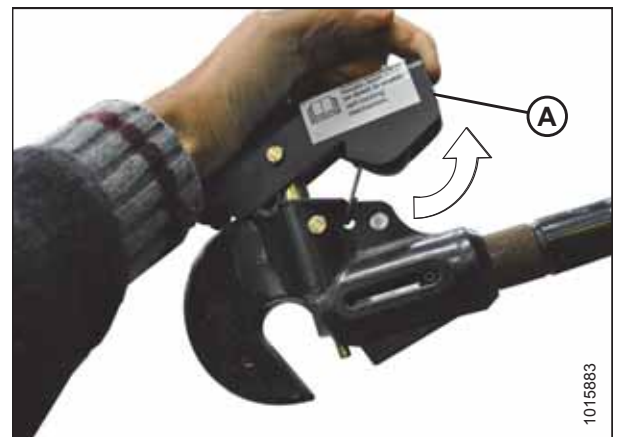


Figure 3.82: Center-Link

7. Disengage safety prop by turning lever (A) downwards until lever locks into the vertical position.
8. Repeat for the opposite side.

### CAUTION

Check to be sure all bystanders have cleared the area.

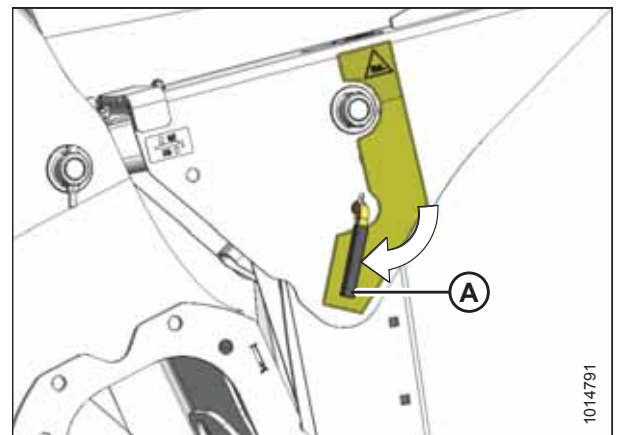


Figure 3.83: Safety Props

9. Start engine and remove header float when prompted by the Harvest Performance Tracker (HPT).

### NOTE:

If not prompted by the HPT to remove float, remove float manually.

10. Lower the header to the ground.

## OPERATION

11. **For windrowers with self-aligning center-link:** Use HEADER TILT cylinder switches (A) on GSL to release load on center-link cylinder.
12. Operate the link lift cylinder with the REEL UP switch (B) to disengage the center-link from the header.

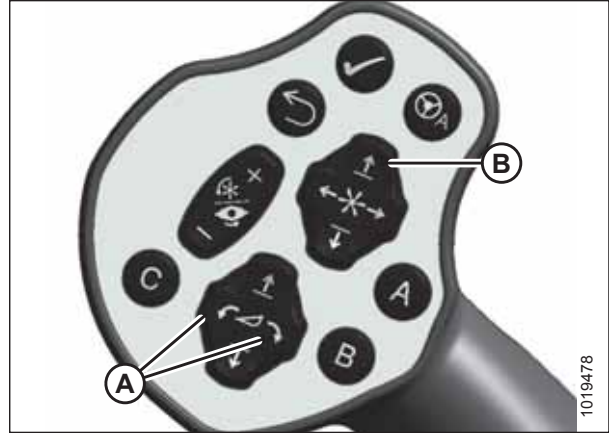


Figure 3.84: GSL

13. **For windrowers without self-aligning center-link:** Shut off the engine and remove the key.
14. Lift hook release (C) and lift hook (B) off header pin.

### CAUTION

Check to be sure all bystanders have cleared the area.

15. Start the engine.

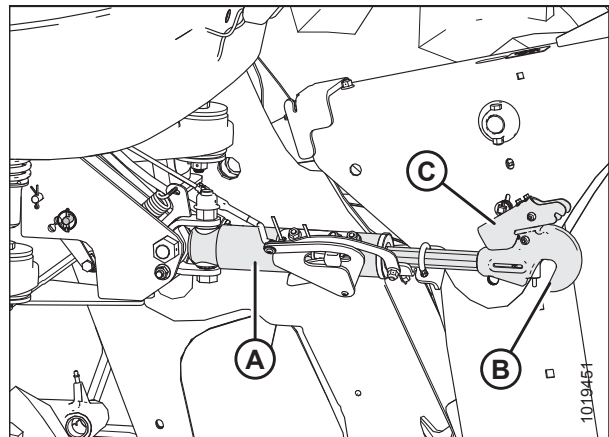


Figure 3.85: Hydraulic Center-Link

16. Back the windrower slowly away from header.
17. Reinstall clevis pin (A) through support (C) and secure with hairpin (B). Repeat for opposite side.

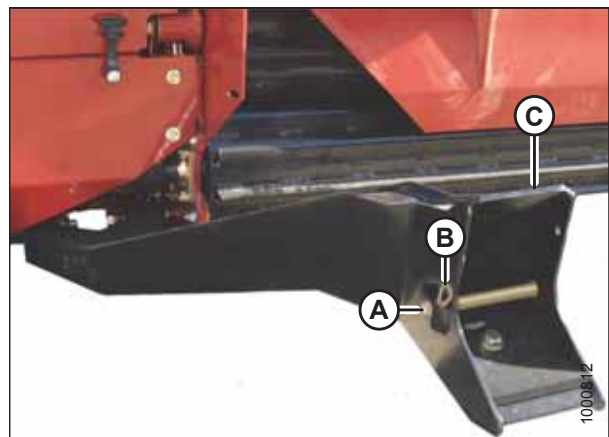


Figure 3.86: Header Support

### 3.8.2 Detaching the Header: M205 Windrowers

Refer to your windrower operator's manual for the procedure to mechanically detach the header from a windrower. Refer to the following procedure to disconnect electrical and hydraulic systems:

#### **DANGER**

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

1. Lower the header to the ground. If ground is soft, place blocks under header.
2. Stop the engine and remove the key.
3. Move the left side (cab-forward) platform (A) to the open position. For instructions, refer to the windrower operator's manual.

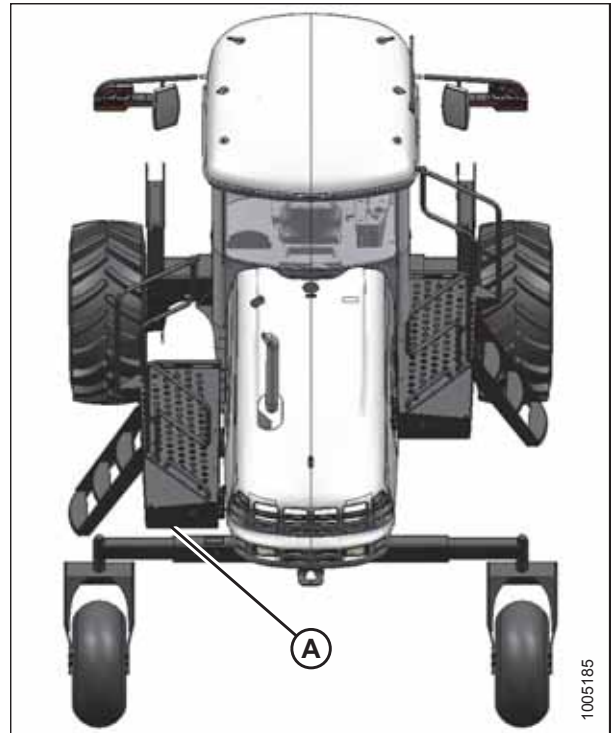


Figure 3.87: Windrower Left Platform

4. Disconnect the electrical harness at connector (A).

**NOTE:**

The valve block was removed from the illustration to show the electrical connector.

5. If couplers and coupler lock are installed on lines, proceed as follows. Otherwise, proceed to Step 13, [page 73](#).

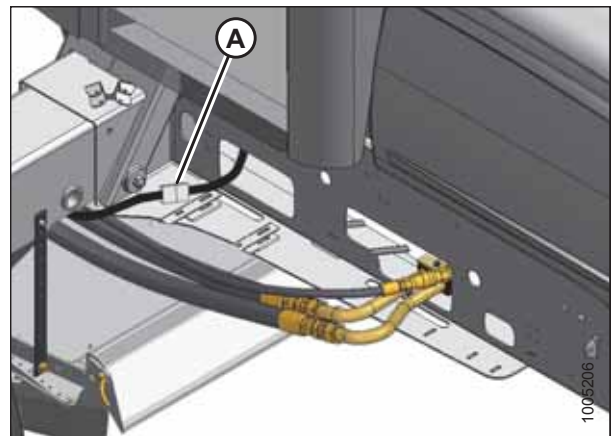


Figure 3.88: Hydraulic Connections

## OPERATION

6. Disconnect 12.7 mm (1/2 in.) hose (B) from windrower coupler and remove lynch pin (A).

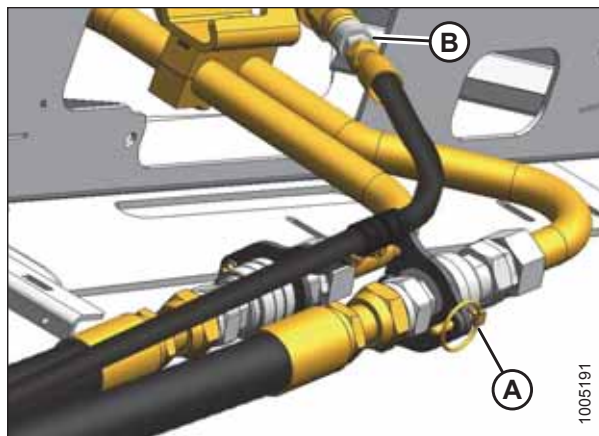


Figure 3.89: Hydraulic Connections

7. Open coupler lock (A).
8. Remove lock from couplers (B).

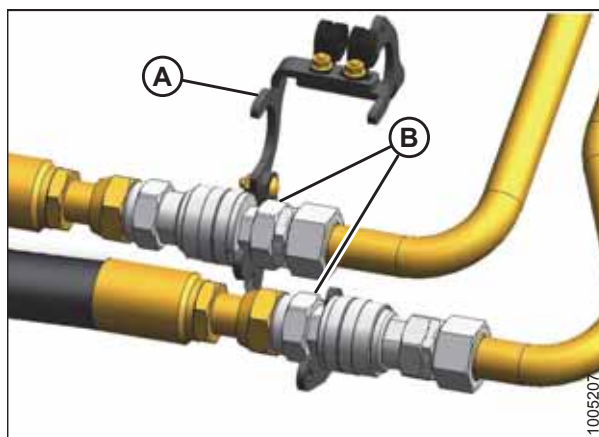


Figure 3.90: Hydraulic Connections

9. Unscrew sleeves (A) on couplers and separate couplers.
10. Install caps and plugs on open lines.

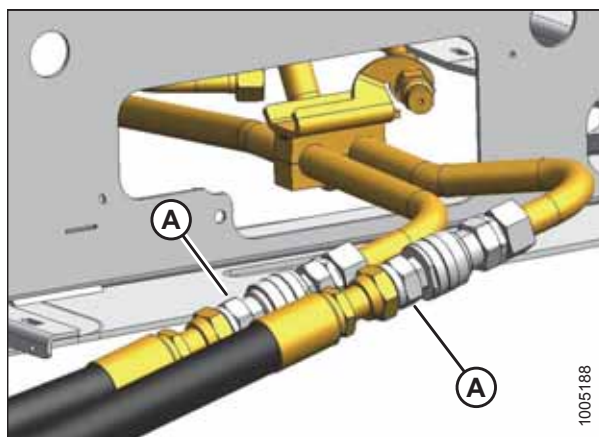
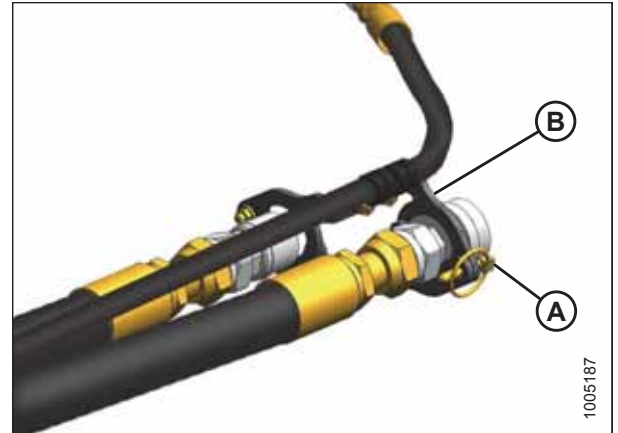


Figure 3.91: Hydraulic Connections

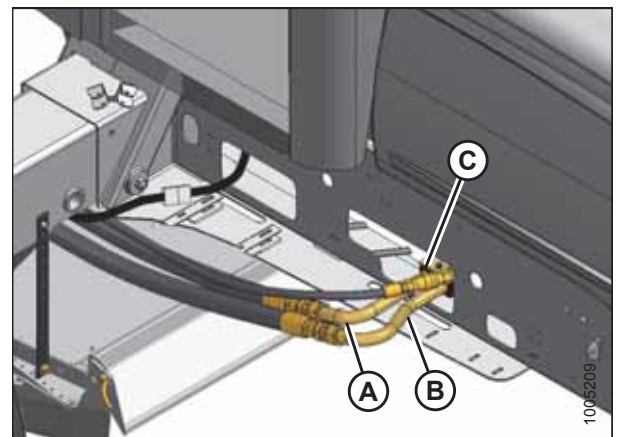
## OPERATION

11. Attach coupler lock (B) to hoses and secure with lynch pin (A).
12. Proceed to Step [14, page 74](#).



**Figure 3.92: Hydraulic Connections**

13. Disconnect hoses from lines (A), (B), and (C) on windrower. Install caps and plugs on open lines.

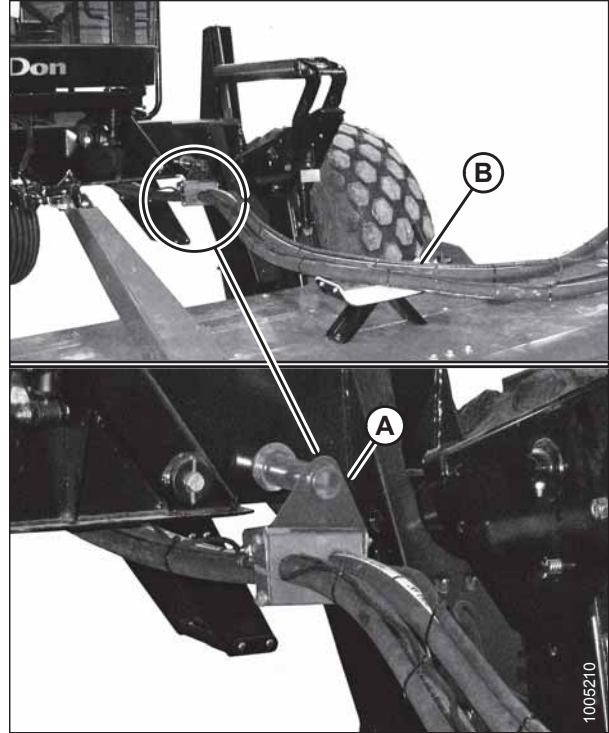


**Figure 3.93: Hydraulic Connections**



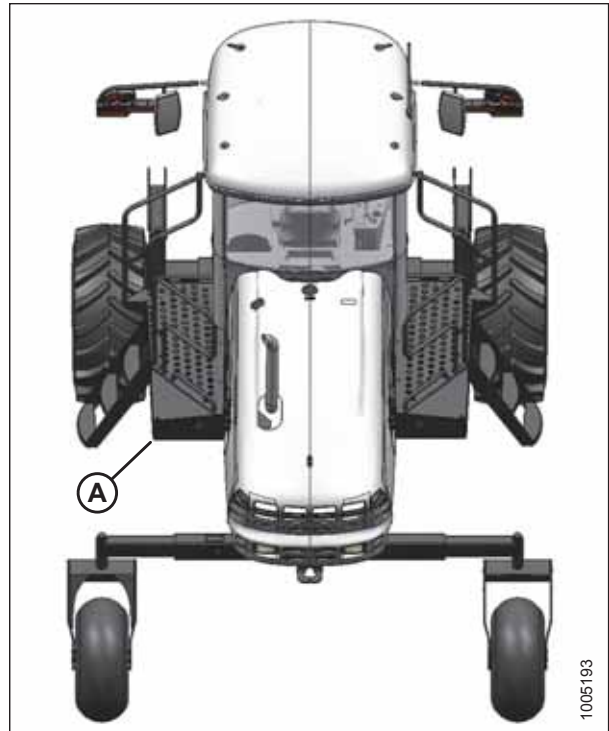
## OPERATION

14. Remove hose support (A) from the windrower frame.
15. Route hoses (B) and electrical harness onto the header.



**Figure 3.94: Hose Bundle**

16. Move maintenance platform (A) to the CLOSED position. For instructions, refer to the windrower operator's manual.
17. For instructions on mechanically detaching the header from the windrower, refer to the windrower operator's manual.



**Figure 3.95: Windrower Left Platform**

### 3.8.3 Detaching the Header: M200 Windrowers

Refer to your windrower operator's manual for procedure to mechanically detach the header from a windrower. Refer to the following procedure to disconnect electrical and hydraulic systems:

#### DANGER

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

1. Lower the header to the ground. If the ground is soft, place blocks under the header.
2. Stop the engine and remove the key.
3. Move left side (cab-forward) platform (A) to the open position. For instructions, refer to the windrower operator's manual.

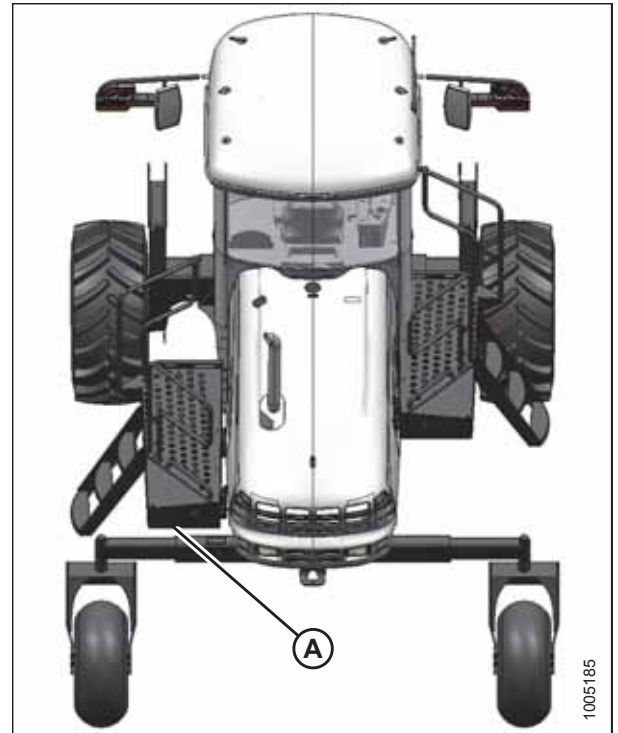


Figure 3.96: Windrower Left Platform

4. Disconnect pressure hose (A) from port (M2) on the header drive valve block.
5. Disconnect return hose (B) from port (R2) on the header drive valve block.
6. Install plugs and caps on open windrower lines and header hoses.

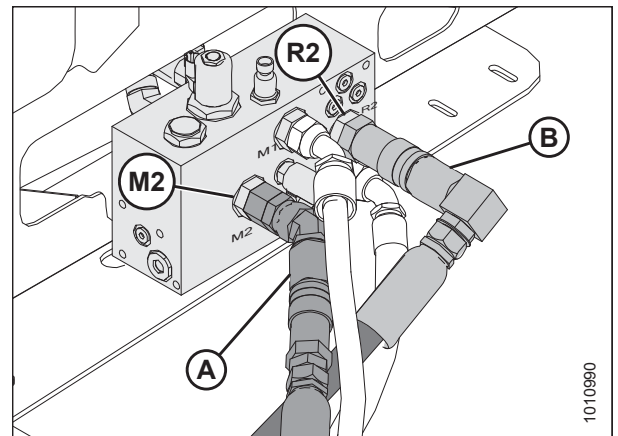
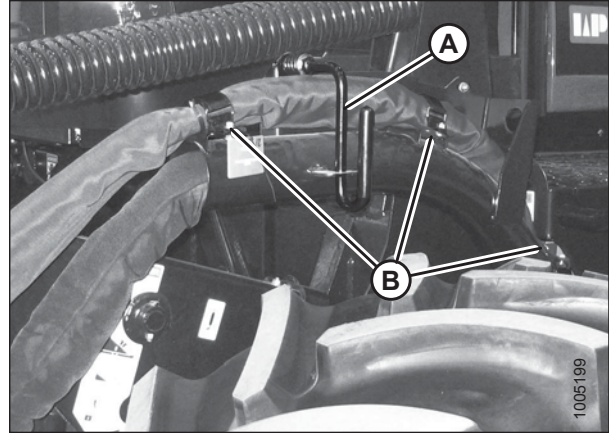


Figure 3.97: Hydraulic Connections



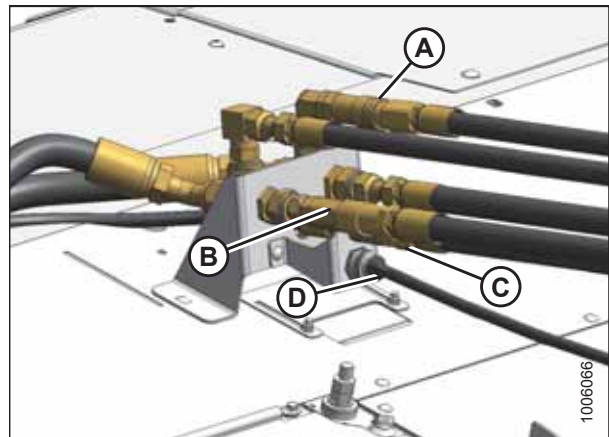
## OPERATION

7. Raise and unlock lever (A) and undo the three cinch straps (B).
8. Move hose bundle to store on header.



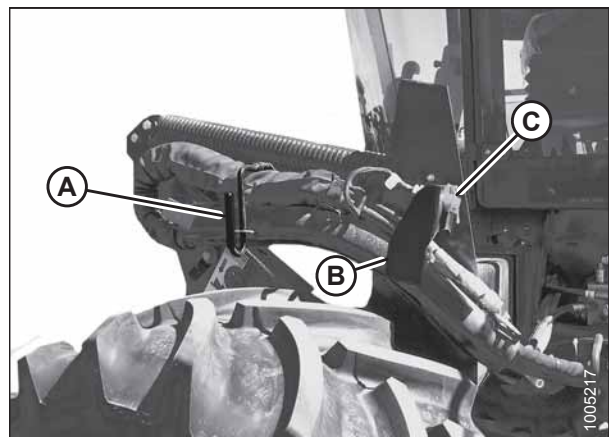
**Figure 3.98: Hose Bundle**

9. At the header, disconnect electrical connector (D) by turning the collar counterclockwise and pulling connector to disengage.
10. Disconnect the pressure (A), return (B), and case drain (C) hoses.



**Figure 3.99: Hydraulic Connections**

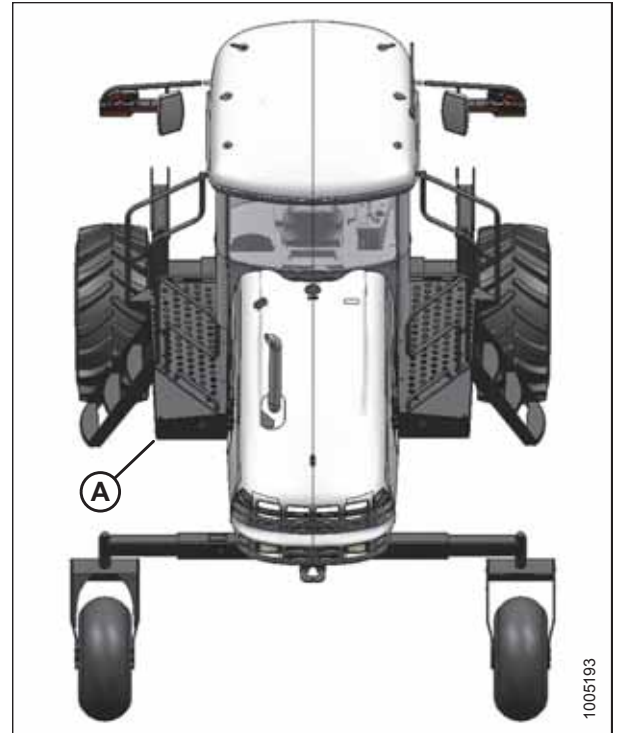
11. Move the hose bundle from header to the left-side (cab-forward) hose support (B).
12. Rotate lever (A) clockwise and push to engage bracket.
13. Route the electrical harness through hose support (B) and attach cap to electrical connector (C).



**Figure 3.100: Hose Bundle**

## OPERATION

14. Move windrower platform (A) back to the CLOSED position. For instructions, refer to the windrower operator's manual.
15. For instructions on mechanically detaching the header from the windrower, refer to the windrower operator's manual.



**Figure 3.101: Windrower Left Platform**

## 3.9 Break-In Period

After attaching the header to the windrower for the first time, operate the machine slowly for five minutes, watching and listening from the windrower seat for binding or interfering parts.

**NOTE:**

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



### **CAUTION**

**Before investigating an unusual sound or attempting to correct a problem, stop the engine, engage parking brake, and remove the key.**

**NOTE:**

Perform the items specified in [5.2.1 Maintenance Schedule/Record, page 122](#).

## 3.10 Shutting down the Windrower



### CAUTION

**Before leaving the windrower seat for any reason:**

1. Park on level ground (if possible).
2. Lower the header fully.
3. Place ground speed control in N-DETENT.
4. Stop the engine and remove the key.
5. Wait for all movement to stop.

## 3.11 Transporting the Header

For information on transporting the header when attached to the windrower, refer to your windrower operator's manual.

**IMPORTANT:**

For cab-forward road travel the windrower must have the lighting and marking bundle installed (MD #B5412).

## 4 Operating the Header

Your header will provide the best performance when it is properly adjusted to suit the crop 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 the machine.

The variables listed below and detailed on the following pages will affect the performance of the header. You will quickly become familiar with adjusting the machine to give you the desired results. Most of the adjustments have been set at the factory, but if desired, the settings can be changed to suit crop conditions.

**Table 4.1 Header Adjustment Procedures**

Variable	Refer to
Header float	<a href="#">4.1 Header Float, page 81</a>
Roll gap	<a href="#">4.2 Roll Gap, page 86</a>
Roll tension	<a href="#">4.3 Roll Tension, page 89</a>
Roll timing	<a href="#">4.4 Roll Timing, page 90</a>
Forming shields	<a href="#">4.5 Forming Shields, page 93</a>
Header angle	<a href="#">4.6 Header Angle, page 97</a>
Cutting height	<a href="#">4.7 Cutting Height, page 98</a>
Disc speed	<a href="#">4.8 Disc Speed, page 100</a>
Ground speed	<a href="#">4.9 Ground Speed, page 101</a>

### 4.1 Header Float

Header float springs are normally set so 426–471 N (95–105 lbf) is required to lift the header at either end.

In rough or stony conditions, it may be desirable to maintain a lighter setting to protect cutting components.

When float setting is light, it may be necessary to use a slower ground speed to avoid excessive bouncing resulting in a ragged cut. Faster ground speeds may require additional ground pressure.

Up to three user-defined float positions can be stored in the windrower's control system. For information on setting float, refer to the Float Options topic in the windrower operator's manual.

#### 4.1.1 Checking Float – M200 and M205 Windrowers



#### **DANGER**

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

Set the float fine adjustment to **MID-RANGE** with the windrower float adjustment system in the cab (refer to your windrower operator's manual).

1. Lower the header until lift cylinders are fully retracted.
2. Stop the engine and remove the key.
3. Grasp the front corner of the header and lift. The force required to lift the header should be 426–471 N (95–105 lbf) and should be approximately the same at both ends. If adjustment is required, refer to [4.1.2 Adjusting Float](#)

## OPERATING THE HEADER

– *M200 and M205 Windrowers, page 82* or refer to *4.1.5 Removing and Restoring Float – M1240 Windrowers, page 84*.

### 4.1.2 Adjusting Float – M200 and M205 Windrowers

#### **DANGER**

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

Set the float fine adjustment to **MID-RANGE** with the windrower float adjustment system in the cab (refer to your windrower operator's manual).

Check the float by grasping the front corner of the header and lifting. The weight should feel like 426–471 N (95–105 lbf) and should be approximately the same at both ends.

If adjustment is required, follow these steps:

1. Raise the header fully.
2. Stop the engine and remove the key.
3. Turn drawbolt (A):
  - a. Clockwise to **INCREASE** float (makes header lighter).
  - b. Counterclockwise to **DECREASE** float (makes header heavier).
4. Recheck the float.



Figure 4.1: Windrower Lift Linkage

### 4.1.3 Checking Float – M1240 Windrower

#### DANGER

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

1. Start the engine
2. Use the HEADER TILT switches (A) on the ground speed lever (GSL) to set the center-link to the mid-range position (**5.0** on the Harvest Performance Tracker [HPT]).
3. Using the HEADER DOWN switch (B), lower header fully with lift cylinders fully retracted.
4. Turn engine off and remove the ignition key.
5. Grasp one end of the header and lift. Lifting force should be 426–471 N (95–105 lbf) and should be the same at both ends.

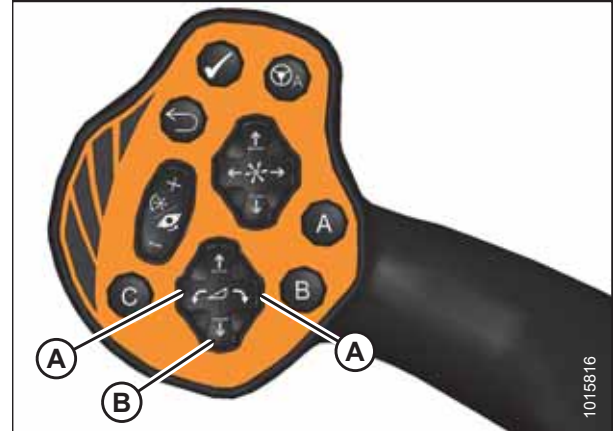


Figure 4.2: GSL

6. Restart the engine and adjust float as required. Refer to [4.1.4 Setting the Float – M1240 Windrower, page 83](#).

**NOTE:**

Increasing the float value on the HPT makes the header feel lighter.

### 4.1.4 Setting the Float – M1240 Windrower

The float can be set for windrowing with the cutterbar on the ground or with the cutterbar off the ground (normally used with the draper header).

#### **Cutterbar on Ground**

The optimum float setting lets the header follow the contour of the terrain. Proceed as follows:

1. Set center-link to mid-range position **5.0** on the Harvest Performance Tracker (HPT). Refer to windrower operator's manual.
2. Lower header until cutterbar is on the ground.

**NOTE:**

To minimize scooping rocks when operating at the flattest header angle, lower the header skid shoes. Refer to your header operator's manual.

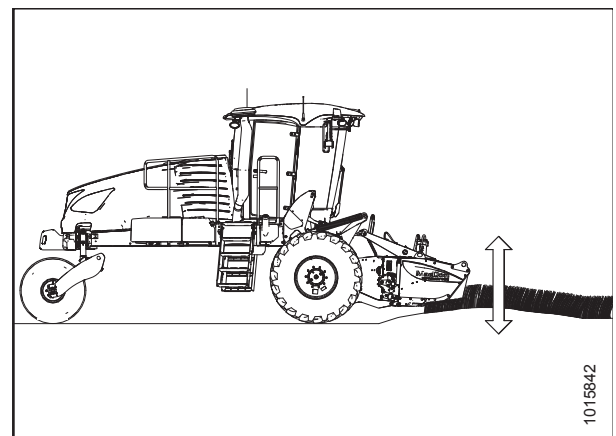


Figure 4.3: Header Float (Cutterbar on Ground)



## OPERATING THE HEADER

3. Press rotary scroll knob (A) on HPT to display the QuickMenu system.
4. Rotate scroll knob (A) to highlight header float icon (B) and press scroll knob to select.



Figure 4.4: HPT Run Screen

5. Turn scroll knob (A) to highlight left (B) or right (C) float and press knob (A) to activate selection.
6. Rotate scroll knob (A) to adjust float setting and press knob when finished. Float is now set.

### IMPORTANT:

Float adjustments of **1.0** (out of 10) change the header weight at the cutterbar by approximately **91 kg (200 lb.)**. Adjust float in increments **0.05** to optimize field performance.

7. Use soft key 3 (D) to remove/resume float and deck position to previous setting for the attached header.



Figure 4.5: HPT Left/Right Float Settings

### 4.1.5 Removing and Restoring Float – M1240 Windrowers

Follow these steps to remove and restore the header float settings:

1. Press rotary scroll knob (A) on Harvest Performance Tracker (HPT) to display the QuickMenu system or press F1 on the console.
2. Rotate scroll knob (A) to highlight header float adjust (B) and press scroll knob to select.



Figure 4.6: Run Screen – HPT Display

## OPERATING THE HEADER

3. Press soft key 3 (A) to remove or restore the header float.

**NOTE:**

If the header float is active, the icon at soft key 3 will say REMOVE FLOAT; if header float has been removed, the icon will say RESTORE FLOAT.



Figure 4.7: Adjusting Float – HPT Display

## 4.2 Roll Gap

Steel rolls condition the crop by crimping and crushing the stem in several places. This allows moisture to release for quicker drying. The degree to which the crop is conditioned as it passes through the rolls is controlled by roll gap. The roll gap is factory-set at 25.4 mm (1.0 in.), but it can be adjusted.

Correct conditioning of alfalfa, clover, and other legumes is usually indicated when 90% of the stems show cracking, but no more than 5% of the leaves are damaged. Set enough roll gap to achieve this result.

A larger gap may be desirable in thick stemmed cane-type crops. However, too large a gap may cause feeding problems. Grass-type crops may require a smaller gap for proper feeding and conditioning.

### IMPORTANT:

It's recommended that operators visually check the size of the gap if they are using settings below the factory setting.

### 4.2.1 Checking Roll Gap

#### DANGER

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

1. Lower the header fully.
2. Open the driveshield. Refer to [3.4 Driveshields, page 30](#).
3. Remove bolts (A) that secure conditioner shield (B).
4. Remove shield (B).

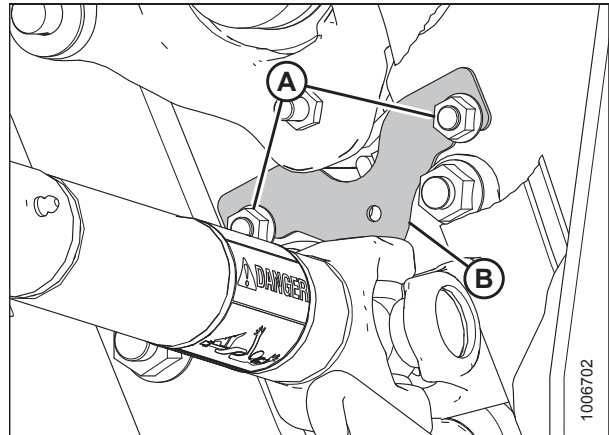


Figure 4.8: Conditioner Shield

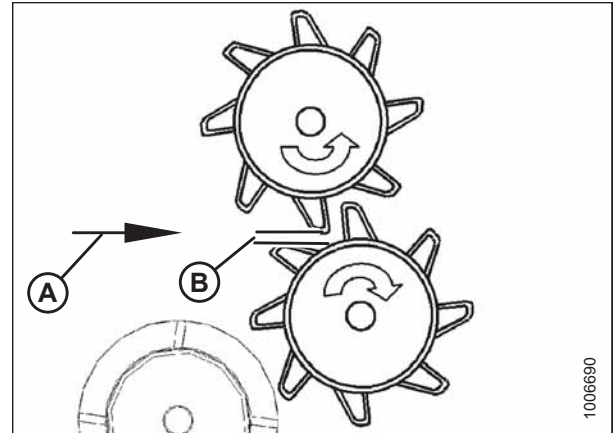
## OPERATING THE HEADER

5. Inspect roll gap at both ends of the rolls. At factory setting, roll gap (B) should be 25.4 mm (1 in.).

### IMPORTANT:

Roll timing is critical when the roll gap is decreased because the bars may contact each other if the timing is wrong.

6. Check roll timing. Refer to [4.4 Roll Timing, page 90](#).

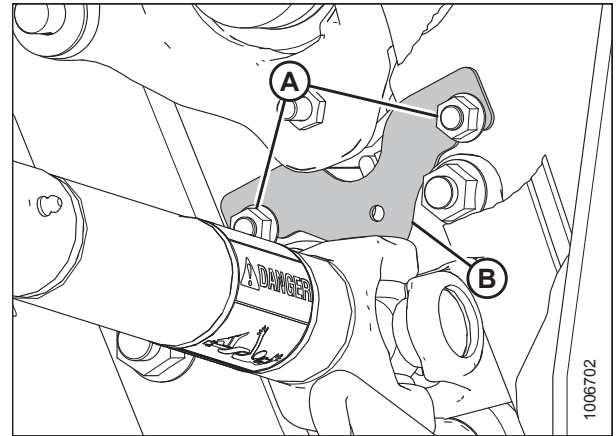


**Figure 4.9: Conditioner Roll Gap**

A - Crop Direction

B - Roll Gap

7. Reinstall conditioner shield (B) and secure it with nuts (A).
8. Close the driveshield. Refer to [3.4 Driveshields, page 30](#).



**Figure 4.10: Conditioner Shield**

### 4.2.2 Adjusting Roll Gap

#### DANGER

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

1. Lower the header fully.
2. Stop the engine and remove the key.
3. Open the driveshield. Refer to [3.4 Driveshields, page 30](#).

## OPERATING THE HEADER

4. Loosen upper jam nut (B) on both sides of conditioner adjustment bolts.
5. To increase roll gap, turn lower nut (A) clockwise.
6. To decrease roll gap, turn lower nut (A) counterclockwise.
7. Measurement at (C) should be 35 mm (1.4 in.). This equates to 25.4 mm (1 in.) of roll gap.
8. Once adjustment is complete, hold nut (A) and torque jam nut (B) to 102 Nm (75 lbf·ft).

**NOTE:**

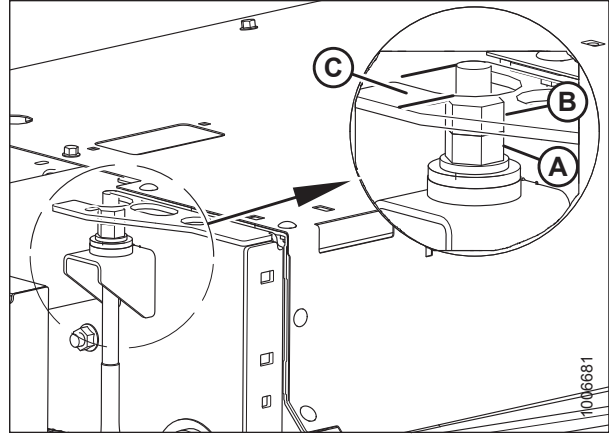
When adjusting roll gap, be sure that the thread protruding at the adjustment is the same on both ends of the conditioner rolls. This will achieve consistent intermesh across the rolls.

9. Check roll gap. Refer to [4.2.1 Checking Roll Gap, page 86](#).

**IMPORTANT:**

Roll timing is critical when the roll gap is decreased because the bars may contact each other if the timing is wrong.

10. Refer to [4.4 Roll Timing, page 90](#) for instructions on checking the timing.
11. Close the driveshield. Refer to [3.4 Driveshields, page 30](#).



**Figure 4.11: Roll Gap Adjustment Bolt**

## 4.3 Roll Tension

Roll tension (the force holding the rolls together) is factory set with a spring-type adjustable linkage.

The roll tension factory setting is the spring fully tensioned.

Heavy crops or tough forage tend to separate the rolls and require more tension to ensure material is sufficiently crimped. Light alfalfa and short grasses require less tension to minimize over-conditioning.

### 4.3.1 Adjusting Roll Tension

#### DANGER

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

Before changing the factory adjusted roll tension, refer to [4.2.2 Adjusting Roll Gap, page 87](#) to ensure the roll gap setting is ideal for your crop type.

1. Lower the header fully.
2. Stop the engine and then remove the key.
3. Open the driveshield. Refer to [3.4 Driveshields, page 30](#).
4. To decrease the roll tension, turn the spring drawbolts counterclockwise to loosen the springs. Set dimension (C) to 45–55 mm (1.77–2.16 in.).
5. To increase the roll tension, loosen jam nut (A) and turn spring drawbolt (B) clockwise to tighten the spring at each end of the roll. Set dimension (C) to 45–55 mm (1.77–2.16 in.).

#### IMPORTANT:

Turn each bolt equal amounts. Each turn of the bolt changes the roll tension by approximately 44.5 N (10 lbf).

6. Tighten jam nut (A) against casting after adjusting tension.
7. Close the driveshield. Refer to [3.4 Driveshields, page 30](#).

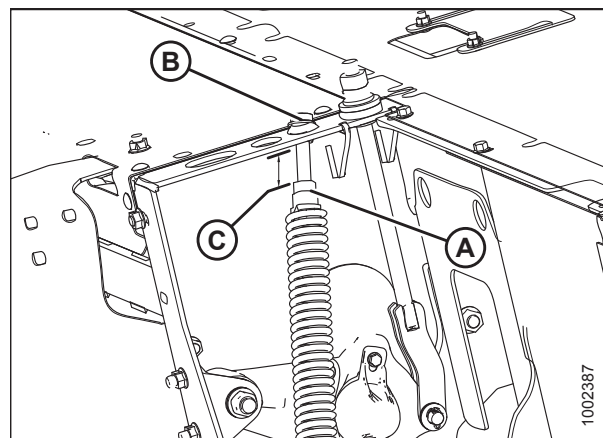


Figure 4.12: Roll Tension Spring (Right Side)

## 4.4 Roll Timing

For proper conditioning, the rolls must be properly timed. Each steel bar on one of the rolls should be centered between two bars of the other roll. The factory setting should be suitable for most crop conditions.

### IMPORTANT:

Roll timing is especially critical when roll gap is decreased because the bars can contact each other if the timing is wrong.

### 4.4.1 Checking Roll Timing

#### DANGER

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

1. Lower the header fully.
2. Stop engine and remove the key.
3. Open the driveshield. Refer to [3.4 Driveshields, page 30](#).
4. Loosen nuts (A) and slide conditioner shield (B) up to remove it.

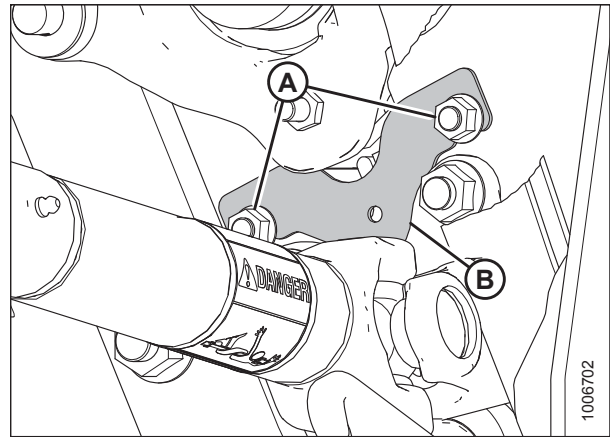


Figure 4.13: Conditioner Shield (Left Side)

5. Measure clearance (B) between the flats of the conditioner roll bars at both end of the conditioner rolls. Dimension (B) should be set to 9–13 mm (0.35–0.51 in.). If adjustment is required, refer to [4.4.2 Adjusting Roll Timing, page 91](#).

#### NOTE:

There should be less than 2 mm (0.08 in.) difference between the two ends of the conditioner roll.

#### NOTE:

Roll spacing not to scale in illustration.

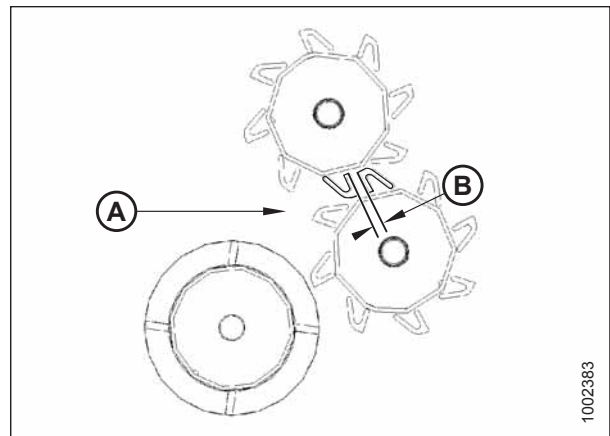


Figure 4.14: Roll Timing

A - Crop Flow

B - Roll Timing Distance 9–13 mm (0.35–0.51 in.)

6. Close the driveshield. Refer to [3.4 Driveshields, page 30](#).

### 4.4.2 Adjusting Roll Timing

Follow these steps to adjust the roll timing (if necessary):

#### DANGER

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

1. Lower the header fully.
2. Stop engine and remove the key.
3. Loosen four bolts (A) in slots of yoke plate (B) on upper roll universal shaft.

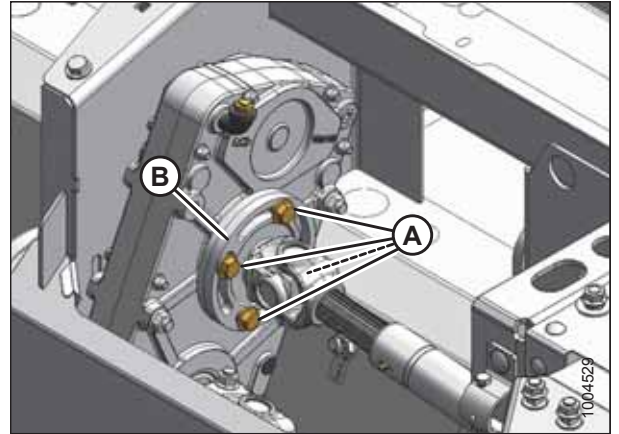


Figure 4.15: Conditioner Gearbox

4. Locate roll timing gauge (B) (MD #150572) on frame member under the flange. Remove nut (A) to remove gauge.

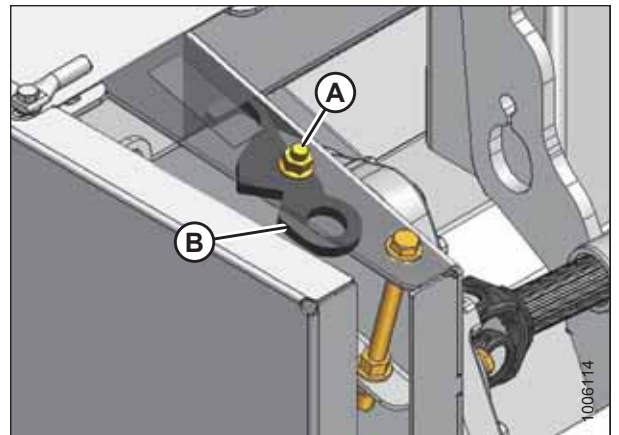


Figure 4.16: Roll Timing Gauge



## OPERATING THE HEADER

5. Position gauge (MD #150572) (A) at left end of rolls, and manually turn the rolls to engage. The rolls will automatically adjust to the correct timing.

This will provide for a roll gap of 11 mm (7/16 in.) and a roll timing setting of 4 mm (3/16 in.).

6. Using the roll gap adjustment bolt, reduce the roll gap until the roll sits lightly on the gauge.
7. Repeat procedure for right end of the conditioner.
8. Tighten bolts in slots of yoke plate to secure the upper conditioner roll position.
9. Turn the rolls manually to release gauge.

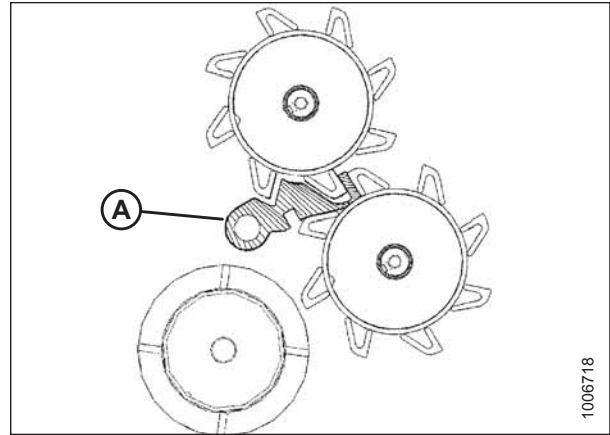


Figure 4.17: Roll Timing Gauge



### CAUTION

To ensure gauge is not forcibly ejected from rolls when machine is started, ensure gauge is securely reattached to frame.

## 4.5 Forming Shields

### WARNING

Keep hands and feet away from discharge opening. Keep everyone several hundred feet away from your operation. Never direct the discharge toward anyone. Stones or other foreign objects can be ejected with force.

The position of the forming shields controls the width and placement of the windrow. The decision on forming shield position should be based on the following factors:

- Weather conditions (rain, sun, humidity, wind)
- Type and yield of crop
- Drying time available
- Method of processing (green-feed, bales, silage)

A wider windrow will generally dry faster and more evenly resulting in less protein loss. Fast drying is especially important in areas where the weather allows only a few days to cut and bale. For more information, refer to [4.15 Haying, page 117](#).

A narrower windrow may be preferred for ease of pickup and when drying is not critical (for example, when cutting for silage or green-feed).

### 4.5.1 Adjusting the Side Deflectors

The position of the side deflectors controls the width and placement of the windrow.

### DANGER

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

1. Set forming shield side deflectors (A) to desired width by repositioning adjuster bars (B) in holes in forming shield cover. To ensure windrow placement is centered, adjust both side deflectors to the same position.

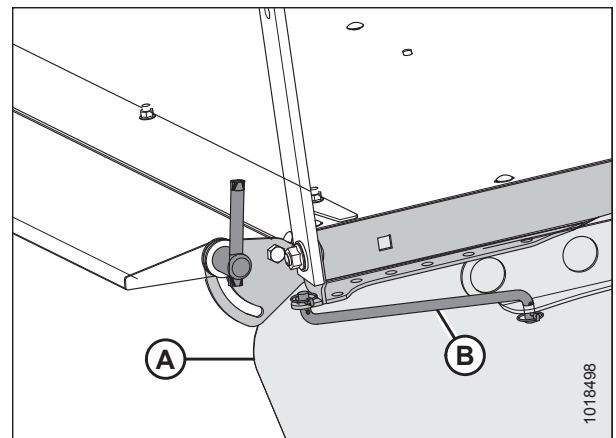


Figure 4.18: Forming Shield

## OPERATING THE HEADER

2. If side deflector attachment is too tight or too loose, tighten or loosen nut (A) as required.

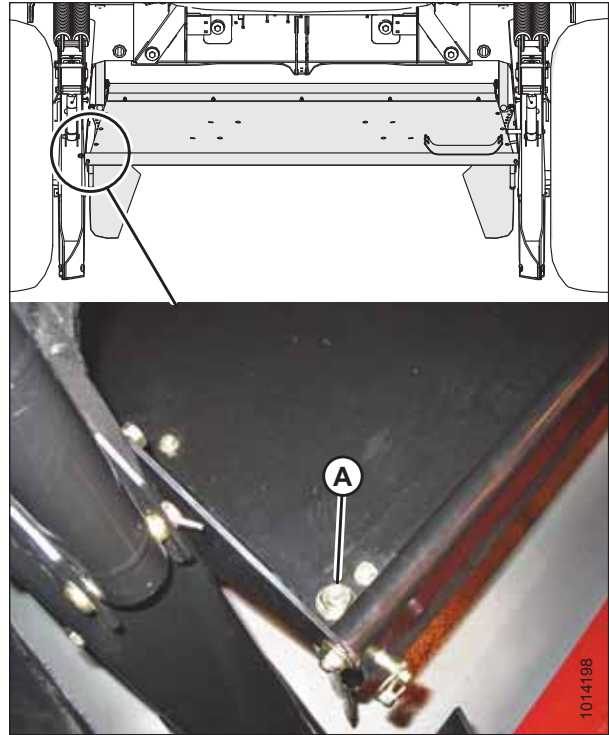


Figure 4.19: Forming Shield

## 4.5.2 Adjusting the Rear Deflector (Fluffer Shield)

### DANGER

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

The rear deflector (fluffer shield) slows the crop exiting the conditioner rolls, directs the flow downward, and fluffs the material.

1. For more crop control in light material, lower deflector (A) by pushing down on one side of the deflector and then on the other side.

#### NOTE:

Locking handles (B) are located at both ends of the deflector and may be loosened slightly.

2. For heavier crops, raise the deflector by pulling up on one side and then on the other side.

#### NOTE:

For even windrow formation, be sure deflector (A) is not twisted.

3. Tighten handles (B) to secure deflector position.

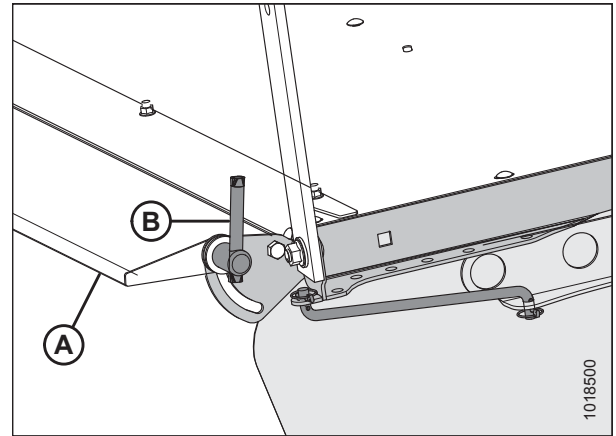


Figure 4.20: Forming Shield

## 4.5.3 Adjusting the Swath Baffle

The swath baffle determines the width and height of the windrow.

### DANGER

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

The swath baffle (A) is located immediately behind and above the conditioning rolls and can be positioned to:

- Direct the crop flow into the forming shield for narrow and moderate width windrows
- Direct crop downward to form a wide swath

## OPERATING THE HEADER

1. Remove lynch pin from pin (B) and remove pin from lever (C).
2. Move lever to middle hole in bracket and reinstall pin (B) through lever and bracket.
3. Secure with lynch pin.

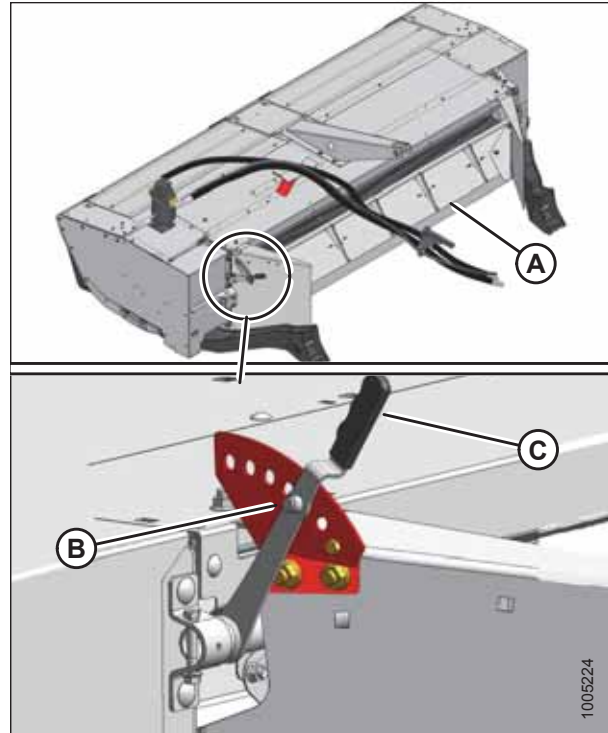


Figure 4.21: Swath Baffle Lever

### NOTE:

Swath baffle position may need to be adjusted for proper pin engagement. Loosen bolts (A) and adjust bracket (B) and baffle as required. Tighten bolts (A).

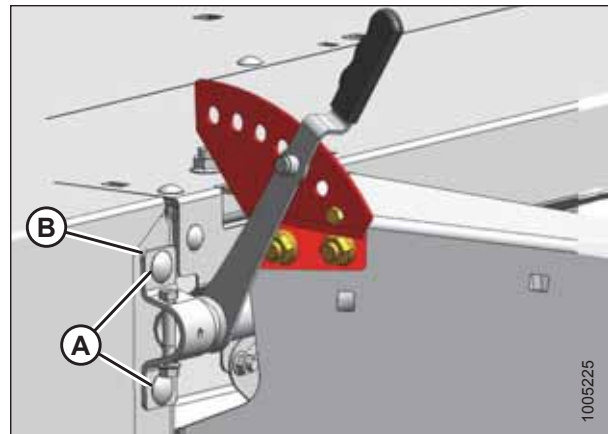


Figure 4.22: Swath Baffle Lever

## 4.6 Header Angle

Header (or cutterbar) angle can be varied from 0–8° below horizontal. Choose an angle that maximizes performance for your crop and field conditions. A flatter angle provides better clearance in stony conditions while a steeper angle provides better lifting action in down crops.

The header angle may be hydraulically adjusted from the windrower cab using hydraulic cylinder (A) without shutting down the windrower.

Refer to your windrower operator's manual for instructions.



Figure 4.23: Hydraulic Center-Link

## 4.7 Cutting Height

Cutting height is determined by a combination of the angle of the cutterbar/header and the optional gauge roller or skid shoe settings if installed. Cutting height should be adjusted for optimum cutting performance without excessive mud build-up inside the header that can lead to poor crop flow and increased wear on cutting components. Choose an angle that maximizes performance for your crop and field conditions. Refer to [4.6 Header Angle, page 97](#).

Optional adjustable gauge rollers or skid shoes are also available to provide different cutting heights. Refer to:

- [6.1 Options and Attachments: Kits, page 175](#)
- [4.7.1 Adjusting Gauge Roller Height, page 98](#)
- [4.7.2 Adjusting the Skid Shoe Height, page 99](#)

Lowering the skid shoes/gauge rollers or decreasing header angle increases the cutting height. This may reduce damage to cutting components in stony conditions. Also, a longer stubble length helps material dry faster.

Raising the skid shoes/gauge rollers and increasing header angle allows the crop to be cut lower.

To minimize damage to cutterbar components, scooping soil, or soil build-up at the cutterbar in damp conditions, set header float as light as possible without excessive bouncing.

A light float setting may require reduced ground speeds to avoid excess bouncing and a ragged cut.

### 4.7.1 Adjusting Gauge Roller Height

Optional adjustable gauge rollers are available to provide different cutting heights.



#### **DANGER**

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

To adjust gauge roller height, follow these steps:

1. Raise the header fully.
2. Stop the engine and remove the key.
3. Engage header safety props. Refer to [3.3 Engaging and Disengaging Header Safety Props, page 28](#).
4. Remove lynch pin and remove adjuster pin (A) from one side of the roller.
5. Hold roller and remove lynch pin and adjuster pin (A) from other side. Position roller at desired position and reinstall adjuster pins (A). Secure with lynch pins.
6. Repeat for roller at opposite end of header.
7. Adjust mud bar (B) by loosening nuts (C).
8. Retighten nuts (C) while maintaining a minimum clearance between mud bar and roller.

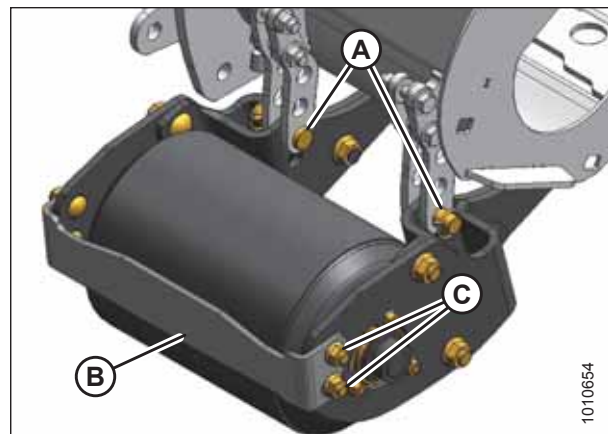


Figure 4.24: Gauge Roller

## 4.7.2 Adjusting the Skid Shoe Height

Optional adjustable skid shoes are available to provide different cutting heights.

### DANGER

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

To adjust skid shoe height, follow these steps:

1. Raise header fully.
2. Stop the engine and remove the key.
3. Engage header safety props. Refer to [3.3 Engaging and Disengaging Header Safety Props, page 28](#).
4. Remove lynch pin and remove adjuster pin (A) from one side of skid shoe (B).
5. Hold skid shoe and remove lynch pin and adjuster pin (A) from other side. Position shoe at desired position, and reinstall adjuster pins (A). Secure with lynch pins.
6. Repeat for skid shoe at opposite end of header.
7. Check header float as described in [4.1 Header Float, page 81](#).
8. Adjust header angle to desired working position using the machine's header angle controls. If angle is not critical, set it to mid-position. Refer to [4.6 Header Angle, page 97](#).

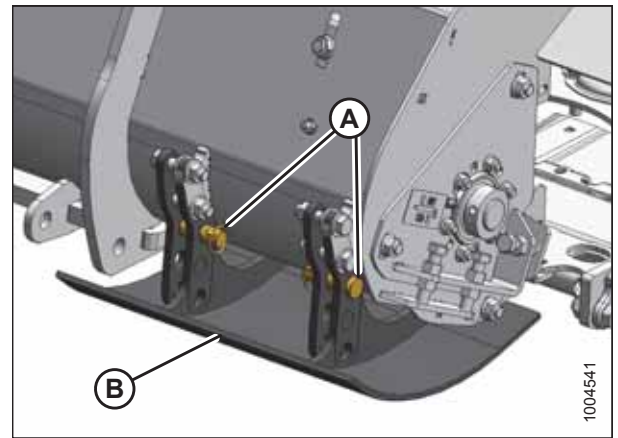


Figure 4.25: Skid Shoe



## 4.8 Disc Speed

The disc header can be used to cut a variety of crops.

For the best cutting results, a range of disc speeds is recommended for each type of crop and condition. Refer to table below.

**Table 4.2 Disc Speed Recommendations**

Crop	Condition	Disc rpm
Alfalfa	Heavy	2300–2500
Alfalfa	Light	1600–2000
Sudan, Sorghum, Haygrazer, Timothy	Tall and stemmy	2300–2500
Short grass	Dense	2500
Short grass	Thin	1800–2000

Disc speeds are set and adjusted from the cab using system controls, without shutting down the windrower. For instructions for setting and adjusting disc speeds, refer to your windrower operator's manual.

## 4.9 Ground Speed

### CAUTION

Reduce speed when turning, crossing slopes, or when travelling over rough ground.

Choose a ground speed that allows the cutterbar and conditioner to cut the crop smoothly and evenly. Try different combinations of header speed and ground speed to suit your specific crop.

In tough cutting conditions, such as native grasses, the disc speed will need to be increased.

In light crops, the header speed can be reduced while maintaining ground speed.

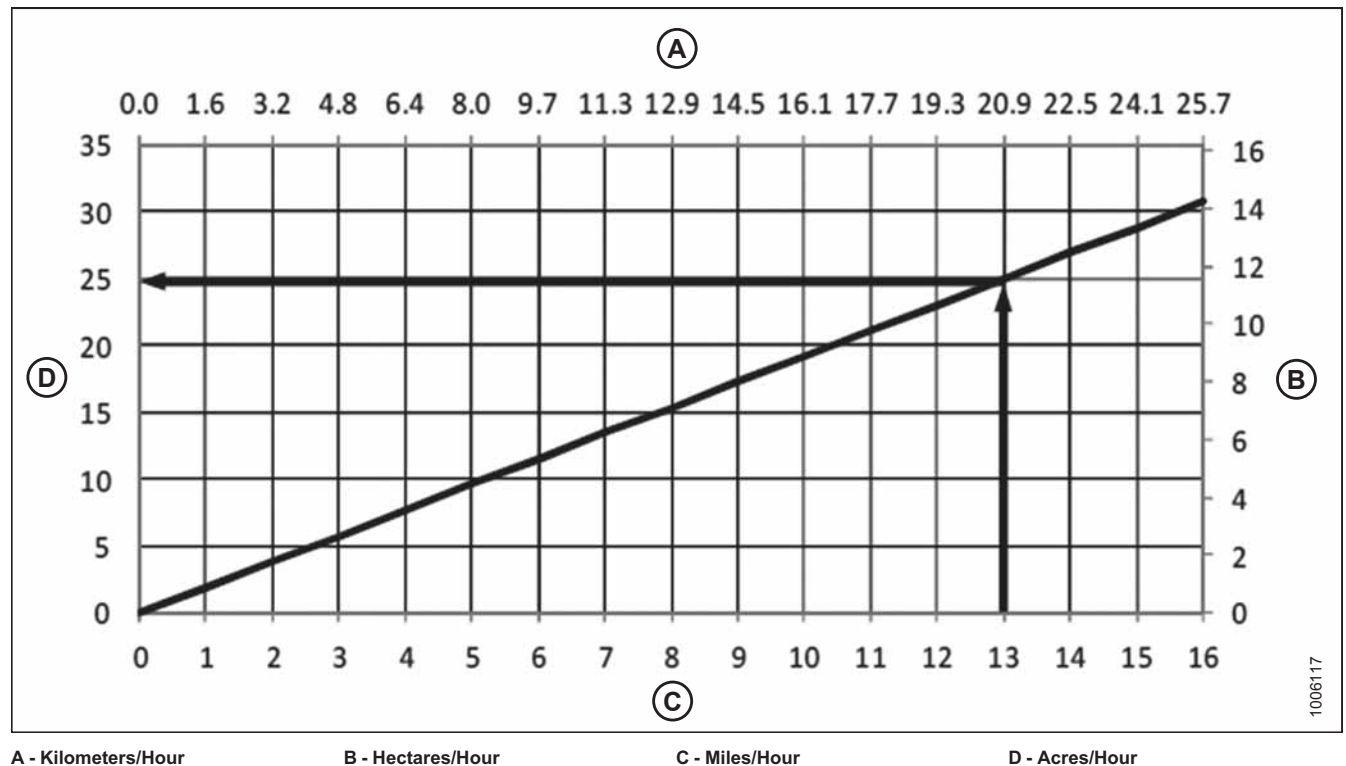
Refer to your windrower operator's manual for changing ground speed.

### NOTE:

Operating the header at the minimum disc speed will extend the wear life of cutting components.

The chart below indicates the relationship between ground speed and area cut.

Figure 4.26: Ground Speed Chart



**Example:** At ground speed of 21 km/h (13 mph) the area cut would be approximately 25 acres (12 hectares) per hour.

## 4.10 Double Windrowing

If your windrower is equipped with the Double Windrow Attachment (DWA [A]), refer to the MacDon DWA Manual for operating and maintenance instructions.

The manual is shipped with the DWA Kit.

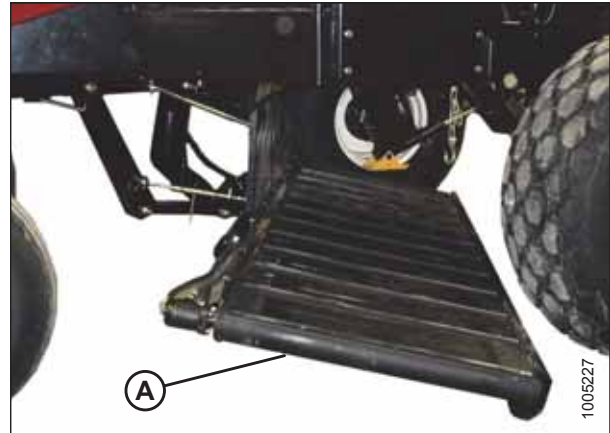


Figure 4.27: DWA

## 4.11 Tall Crop Feed Plates

The tall crop feed plates (A) assist in feeding tall crops into the conditioner by aiding material flow from behind cage deflectors (B).

The feed plates are designed for installation under the two cage deflectors. They are stored inside the compartment at the right end of the header.

Tall crop feed plates should only be installed when cutting tall, heavier crops; they can degrade cutterbar performance if used in medium to light alfalfa.

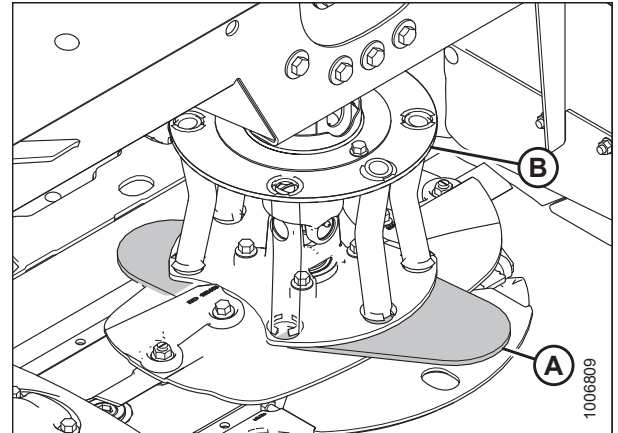


Figure 4.28: Cage Deflector

### 4.11.1 Removing the Tall Crop Feed Plates from Storage

#### DANGER

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

1. Lower the header fully.
2. Stop the engine and remove the key.
3. Open the right end drive cover. Refer to [3.4.5 Removing Right Endshield, page 32](#).
4. Remove four nuts (A), securing nut shields (B) and feed plates (C) to side of compartment, and remove deflectors and plates. Reinstall nuts (A).
5. Install right endshield. Refer to [3.4.6 Installing Right Endshield, page 32](#).

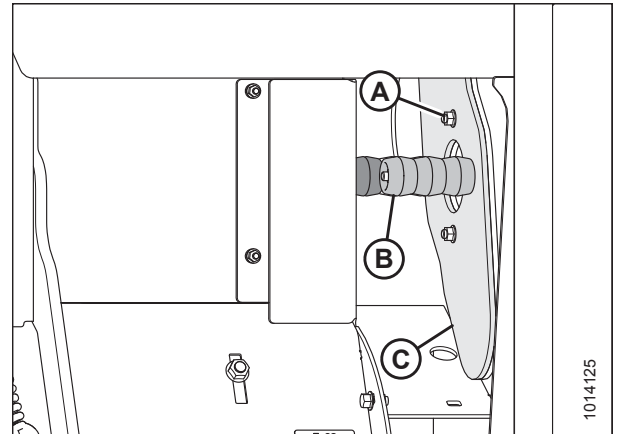


Figure 4.29: Nut Shield and Feed Plate Storage

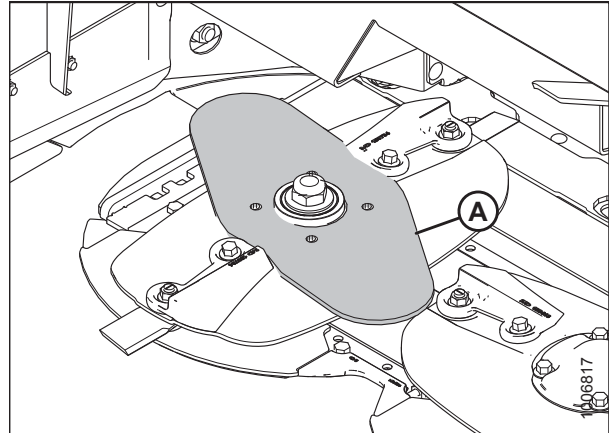
## OPERATING THE HEADER

### *Installing Tall Crop Feed Plates under Driven Deflector*

#### **DANGER**

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

1. Lower header fully.
2. Stop the engine and remove the key.
3. Open the cutterbar doors. Refer to [3.5 Cutterbar Doors, page 33](#).
4. Remove driven deflector. Refer to [Removing the Driven Deflector, page 150](#).
5. Remove the tall crop feed plates from storage. Refer to [4.11.1 Removing the Tall Crop Feed Plates from Storage, page 103](#).
6. Position feed plate (A) on the disc, ensuring that hole in feed plate registers on disc. Position plate approximately as shown and align holes.

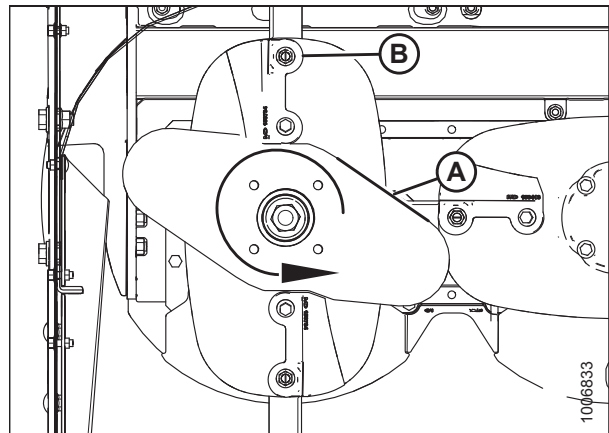


**Figure 4.30: Right End Shown**

#### **IMPORTANT:**

Depending on disc (B) rotation, feed plate (A) should be positioned so that when holes are aligned, the leading edge of the feed plate is farther from accelerator (B) than the trailing edge.

8. Install the deflector. Refer to [Installing the Driven Deflector, page 151](#).
9. Close the cutterbar doors. Refer to [3.5 Cutterbar Doors, page 33](#).



**Figure 4.31: Right End Top View**

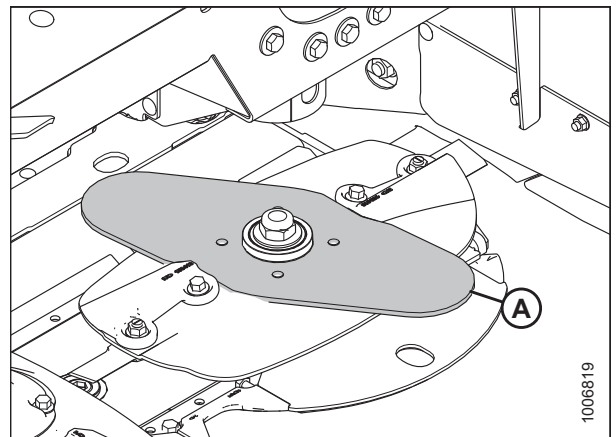
## OPERATING THE HEADER

### *Installing Tall Crop Feed Plates under Driveline Deflector*

#### **DANGER**

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

1. Locate the feed plates. Refer to [4.11.1 Removing the Tall Crop Feed Plates from Storage, page 103](#).
2. Lower the header fully.
3. Stop the engine and remove the key.
4. Open the cutterbar door(s). Refer to [3.5 Cutterbar Doors, page 33](#).
6. Install feed plate (A) on the disc.

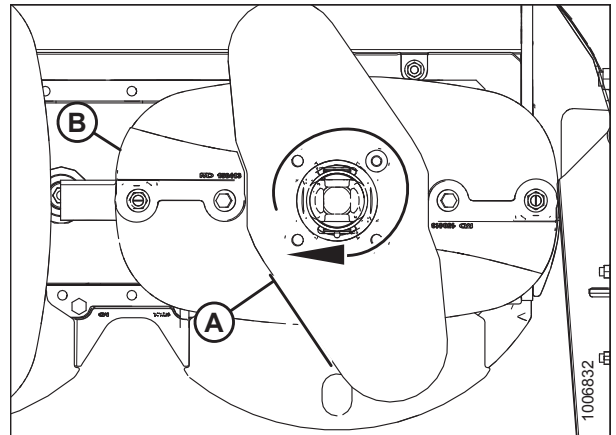


**Figure 4.32: Left End Shown**

#### **IMPORTANT:**

Depending on disc (B) rotation, feed plate (A) should be located so that when holes are aligned, the leading edge of the feed plate is farther from accelerator (B) than the trailing edge.

7. Install the deflector. Refer to [Installing the Driveline Deflector, page 152](#).



**Figure 4.33: Left End Top View Shown**

### 4.11.2 Removing Tall Crop Feed Plates

Follow these steps to remove the tall crop feed plates:

#### DANGER

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

1. Lower the header fully.
2. Stop the engine and remove the key.
3. Open cutterbar doors. Refer to [3.5 Cutterbar Doors, page 33](#).

#### CAUTION

Exercise caution when working around the blades. Blades are sharp and can cause serious injury. Wear gloves when handling blades.

4. Place a block of wood between discs to prevent deflector from turning.

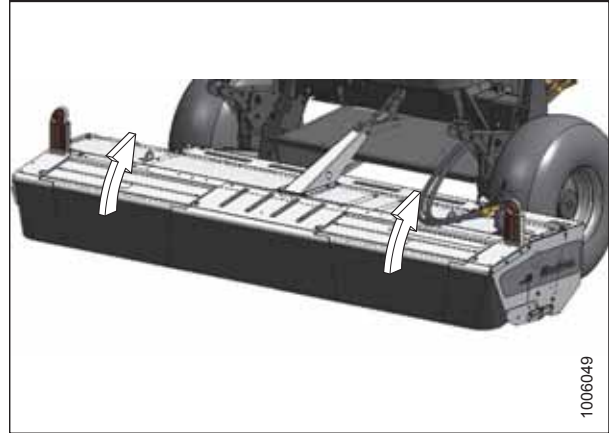


Figure 4.34: Cutterbar Doors

#### *Removing Tall Crop Feed Plates from under Driven Deflector*

1. Remove the deflector. Refer to [Removing the Driven Deflector, page 150](#).
2. Remove feed plate (A).

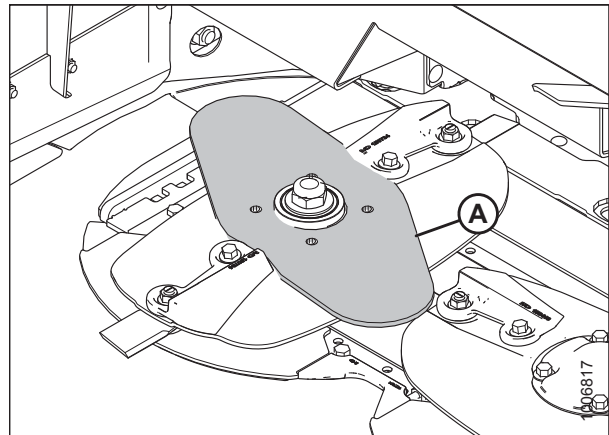


Figure 4.35: Right End Shown

3. Return the tall crop feed plates to the storage location. Refer to [4.11.3 Returning Tall Crop Feed Plates to Storage, page 107](#).
4. Install the deflector. Refer to [Installing the Driven Deflector, page 151](#).
5. Close the cutterbar doors. Refer to [3.5 Cutterbar Doors, page 33](#).

## OPERATING THE HEADER

### *Removing Tall Crop Feed Plates from under Driveline Deflector*

1. Open cutterbar doors. Refer to [3.5 Cutterbar Doors, page 33](#).
2. Remove the deflector. Refer to [Removing the Driveline Deflector, page 151](#).
3. Remove feed plate (A).
4. Return feed plates to storage. Refer to [4.11.3 Returning Tall Crop Feed Plates to Storage, page 107](#).
5. Install the deflector. Refer to [Installing the Driveline Deflector, page 152](#).
6. Close the cutterbar doors. Refer to [3.5 Cutterbar Doors, page 33](#).

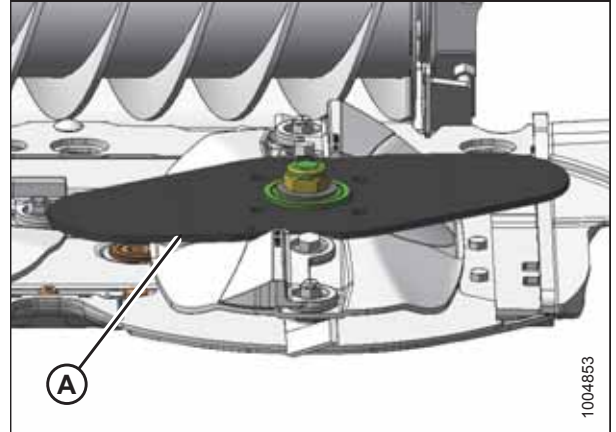


Figure 4.36: Tall Crop Feed Plate

### 4.11.3 Returning Tall Crop Feed Plates to Storage

#### DANGER

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

1. Lower the header fully.
2. Stop the engine and remove the key.
3. Open the right end driveshield. Refer to [3.4.5 Removing Right Endshield, page 32](#).
4. Remove four nuts (A) and secure nut shields (B) and feed plates (C) to side of compartment. Reinstall nuts (A).

#### NOTE:

Nut shields will not be in storage location if they are installed on the cutterbar.

5. Install right shield. Refer to [3.4.6 Installing Right Endshield, page 32](#).

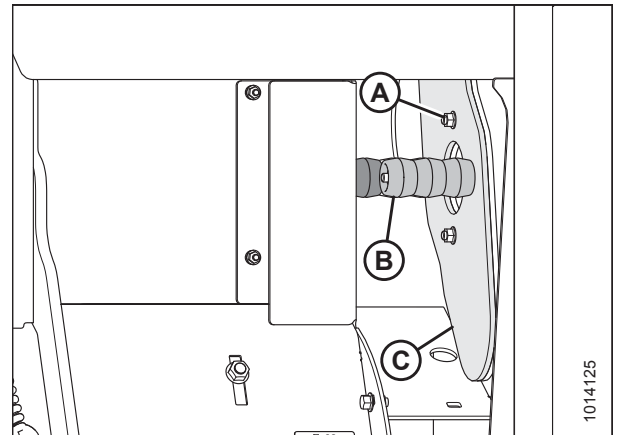


Figure 4.37: Nut Deflector and Feed Plate Storage



## 4.12 Tall Crop Divider Option

Tall crop dividers (one on each end of the header) assist in clean crop dividing and cutterbar entry in tall crops. Tall crop dividers are not adjustable, but they are removable.

### 4.12.1 Installing Tall Crop Divider

To install the tall crop divider kit (MD #B5509), follow these steps:

#### DANGER

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

1. Lower header fully.
2. Stop the engine, and remove the key.
3. Unpack kit.
4. Open cutterbar doors. Refer to [3.5 Cutterbar Doors](#), [page 33](#).

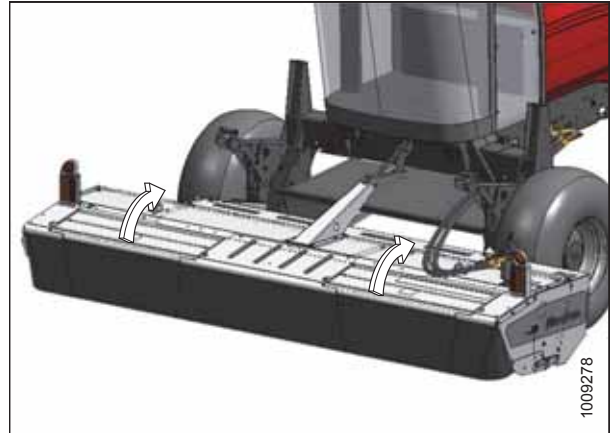


Figure 4.38: Cutterbar Doors

5. Remove four bolts (A) from divider (B).

#### NOTE:

Mounting holes in header should be vacant. Remove fasteners, if necessary.

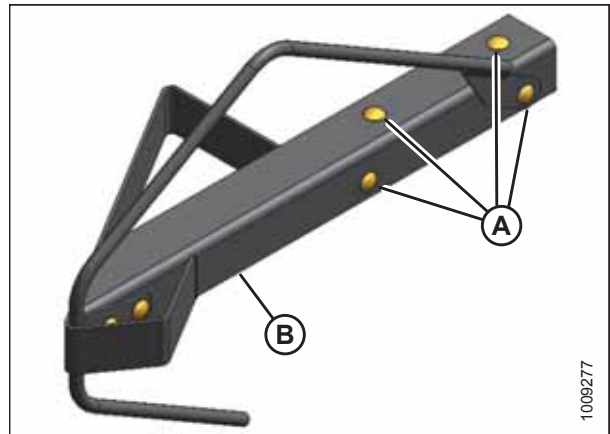


Figure 4.39: Tall Crop Divider Kit (Left Shown, Right Side Opposite)

## OPERATING THE HEADER

6. Position left divider (B) on header left front corner, and install with four bolts (A) and nuts in existing holes. Tighten hardware.
7. Repeat for right side.
8. Lower cutterbar doors.

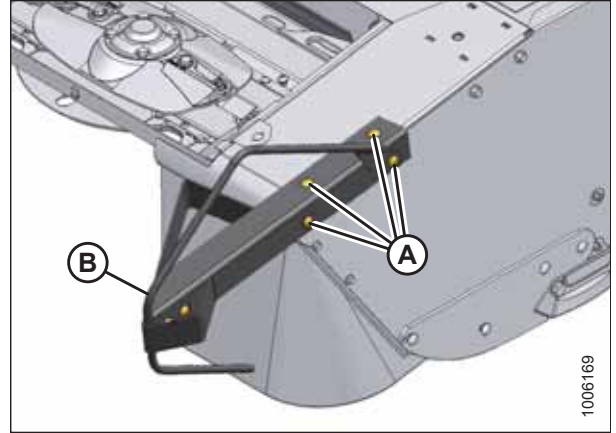


Figure 4.40: Tall Crop Divider Installed

### 4.12.2 Removing Tall Crop Divider

#### DANGER

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

1. Lower the header fully.
2. Stop the engine and remove the key.
3. Open the cutterbar doors. Refer to [3.5 Cutterbar Doors, page 33](#).
4. Remove four bolts (A) and nuts. Remove deflector (B).

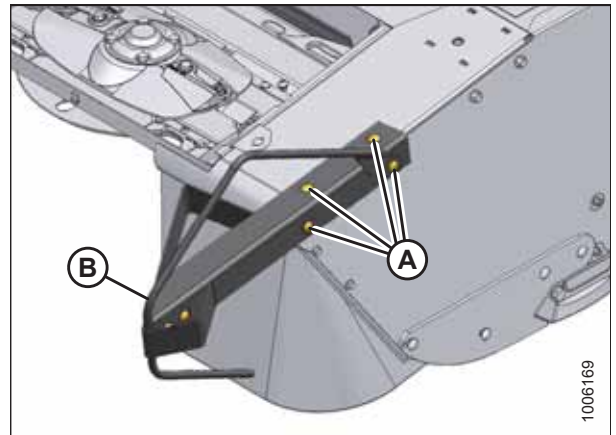
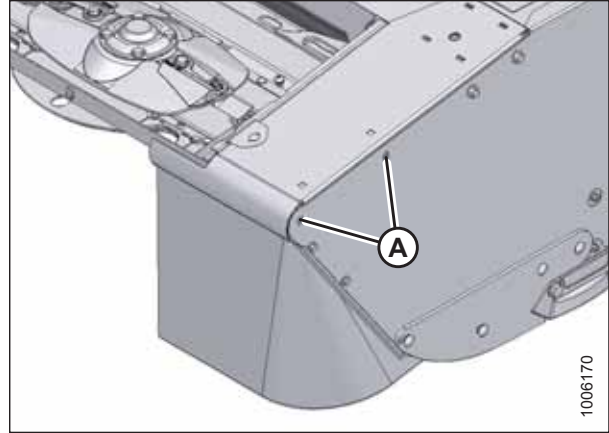


Figure 4.41: Left Crop Divider

## OPERATING THE HEADER

5. Reinstall two bolts and nuts at location shown (A).
6. Repeat Steps [4, page 109](#) and [5, page 110](#) at the other end of the header.
7. Close the cutterbar doors. Refer to [3.5 Cutterbar Doors, page 33](#).



**Figure 4.42: Crop Divider Mounting Holes**

## 4.13 Overshot Auger

The overshot auger is designed to feed the cut crop from the cutterbar into the conditioner rolls.

The auger position has been factory set and should not normally require adjustment. However, if adjustment is required the vertical and fore-aft positions of the auger can be adjusted for crop conditions. The ideal setting allows optimal movement of crop, minimizes wrapping, and keeps the cutterbar clear.

For fine stemmed crop, the auger performs best when set as close as possible to the pan and stripper bars without rubbing. This is especially important in grass and other crops which have a tendency to wrap.

### IMPORTANT:

The auger flighting should **NEVER** contact the pan or stripper bars.

Component wear may cause excessive clearances resulting in feeding problems and uneven windrows.

### 4.13.1 Adjusting the Overshot Auger

If necessary, adjust the auger position as follows:

#### DANGER

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

1. Raise the header fully.
2. Stop the engine and remove the key.
3. Engage header safety props. Refer to [3.3 Engaging and Disengaging Header Safety Props, page 28](#).
4. Remove/loosen four bolts (A) and remove cover (B).

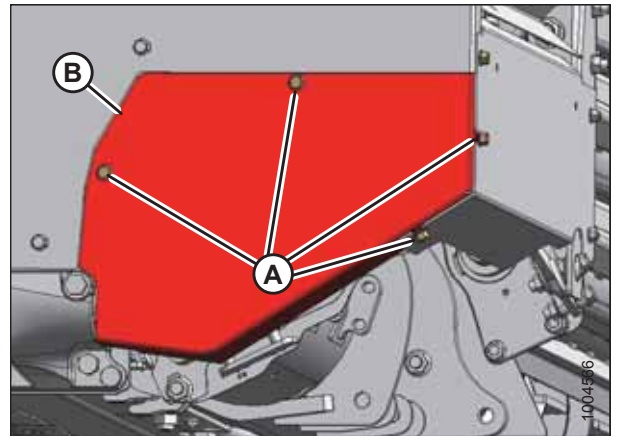


Figure 4.43: Drive Belt Cover

## OPERATING THE HEADER

5. Loosen jam nuts (A) to relieve tension on auger drive belts (B).
6. Loosen three jam nuts (C).
7. To adjust vertical position, loosen upper nuts on adjuster bolts (D). Hold lower nut and turn adjuster bolts (D) to set auger vertical position from bottom of pan.
8. To adjust fore-aft position, loosen aft nut on adjuster bolt (E). Hold forward nut and turn adjuster bolt (E) to set auger so that it clears the back of the pan.
9. Tighten three nuts (C) and then the jam nuts on adjuster bolts (D) and (E).
10. Replace cover (B) and tighten bolts (A).
11. Repeat Steps 6, page 112 to 9, page 112 at opposite end of auger.

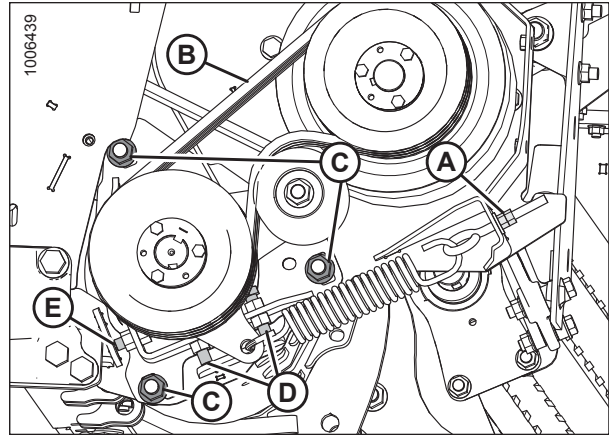


Figure 4.44: Drive Belts

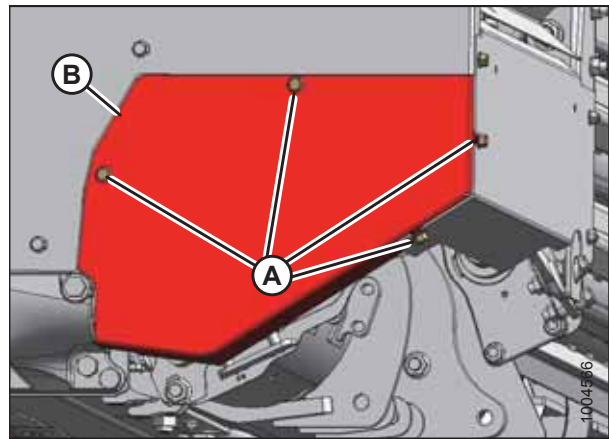


Figure 4.45: Drive Belt Cover

12. To adjust the center support, loosen bolts (A). Adjust auger support (B) fore or aft and vertical position as required. Tighten bolts (A).
13. Check clearance to stripper bars. Refer to [4.14 Stripper Bars, page 114](#).

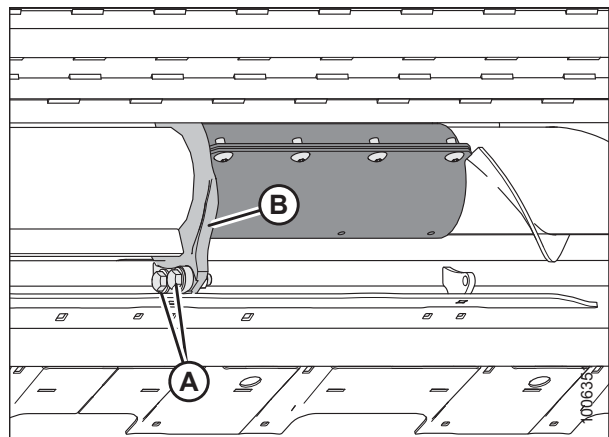
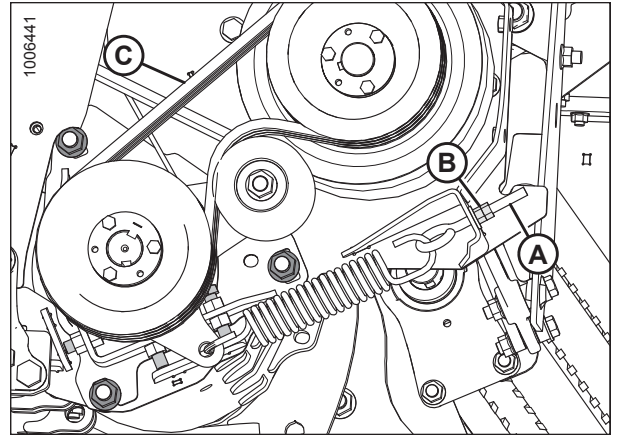


Figure 4.46: Auger Support

## OPERATING THE HEADER

14. To tighten auger drive belts (C), adjust eye bolt (A) and secure with jam nut (B). Refer to *Inspecting and Adjusting the Auger Drive Belts*, page 166.



**Figure 4.47: Drive Belts**

## 4.14 Stripper Bars

There are two adjustable stripper bars installed on the pan at both ends of the auger that minimize wrapping of material around the auger. The factory position should be satisfactory for most crops, but bars can be adjusted for specific conditions.

For fine stemmed crop, the auger performs best when the stripper bars are positioned as close as possible to the auger without rubbing.

Component wear and cutting in bumpy terrain where the auger can contact the stripper bar may cause clearances to become excessive resulting in feeding problems and uneven windrows.

If material starts to accumulate between the auger flighting and the strippers, the gap will need to be adjusted.

**NOTE:**

The stripper bars will likely require adjustment if the auger position is changed.

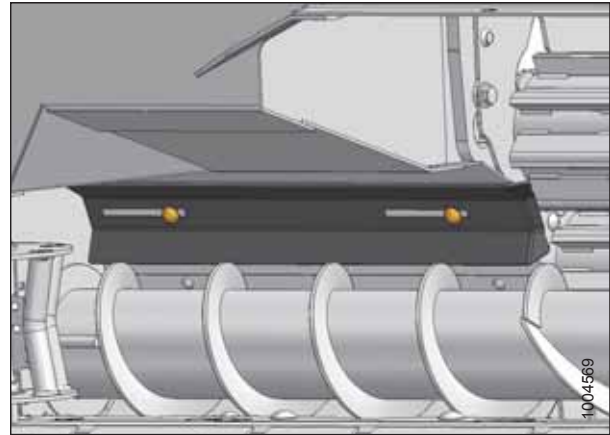


Figure 4.48: Right Stripper Bar

### 4.14.1 Adjusting the Stripper Bar

If necessary, adjust the stripper bar as follows:



**DANGER**

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

1. Lower the header fully.
2. Stop the engine and remove the key.
3. Open the cutterbar door(s). Refer to [3.5 Cutterbar Doors, page 33](#).
4. Open the driveshield. Refer to [3.4 Driveshields, page 30](#).
5. Loosen nuts (A) on the two bolts securing stripper bar to the pan sufficiently so that stripper bar can be moved.

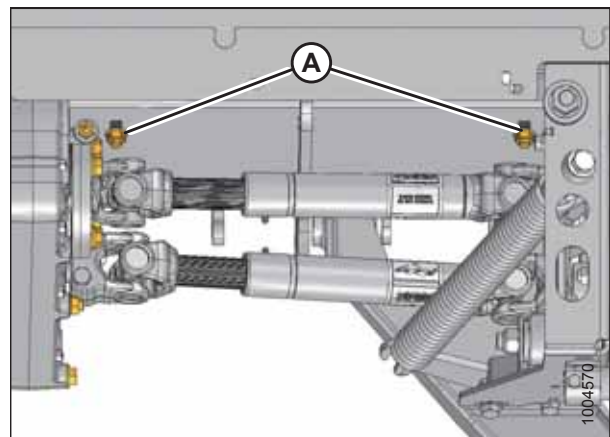


Figure 4.49: Left End Drives

## OPERATING THE HEADER

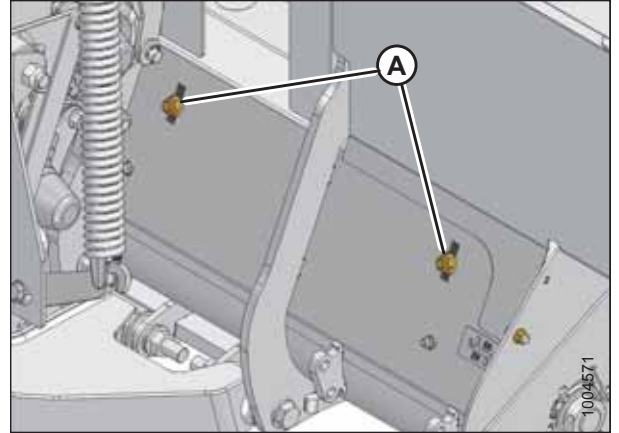


Figure 4.50: Right End

6. Position stripper bar (A) as close as possible to auger flighting without contacting it.
7. Repeat Steps 5, [page 114](#) and 6, [page 115](#) for opposite side.
8. Manually rotate auger to check that auger does **NOT** contact stripper bars. Readjust as required.

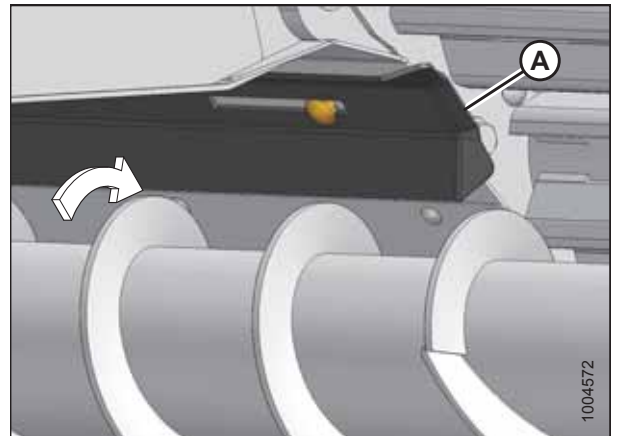


Figure 4.51: Stripper Bar

9. Tighten nuts (A).

**NOTE:**

Right side and left side stripper bars are interchangeable. Each stripper bar can be flipped when one bar wears out or becomes damaged.

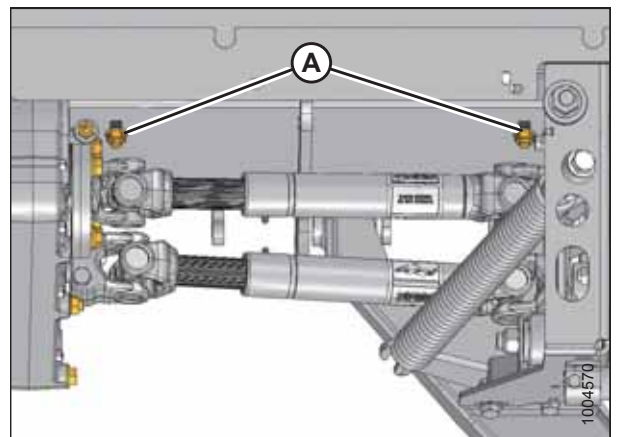
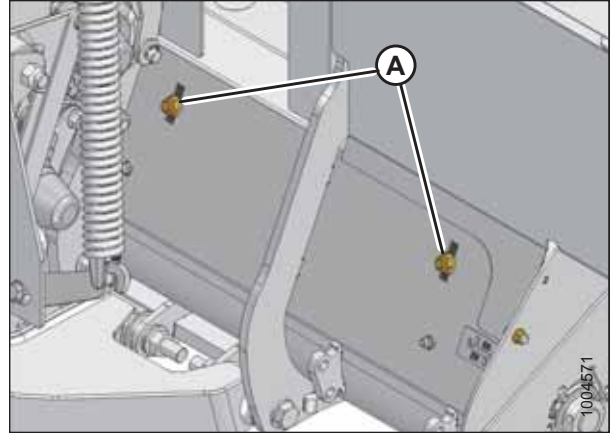


Figure 4.52: Left End



## OPERATING THE HEADER



**Figure 4.53: Right End**

## 4.15 Haying

### 4.15.1 Curing

Curing crops quickly helps maintain the highest quality of crop material as 5% of protein is lost from hay for each day that it lays on the ground after cutting.

Leaving the windrow as wide and fluffy as possible results in the quickest curing. Cured hay should be baled as soon as possible.

### 4.15.2 Topsoil Moisture

**Table 4.3 Topsoil Moisture Levels**

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

- 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.
- If ground is wet due to irrigation, wait until soil moisture drops below 45%.
- If ground is wet due to frequent rains, cut hay when weather allows and let the forage lie on wet ground until it dries to the moisture level of the ground.
- Cut hay will dry only to the moisture level of the ground beneath it, so consider moving the windrow to drier ground.

### 4.15.3 Weather and Topography

- Cut as much hay as possible by midday when drying conditions are best.
- Fields sloping south get up to 100% more exposure to the sun's heat than do north sloping fields. If hay is baled and chopped, consider baling the south facing fields and chopping those facing north.
- When relative humidity is high, the evaporation rate is low and hay dries slowly.
- If there is no wind, saturated air becomes trapped around the windrow. Raking or tedding will expose the hay to fresh, less saturated air.
- Cut hay perpendicular to the direction of the prevailing winds if possible.

#### 4.15.4 Windrow Characteristics

Producing windrows with the recommended characteristics will achieve the greatest results. Refer to [4 Operating the Header, page 81](#) for instructions on adjusting the header.

**Table 4.4 Recommended Windrow Characteristics**

Characteristic	Advantage
High and fluffy	Enables airflow through windrow, which is more important to the curing process than direct sunlight
Consistent formation (not bunching)	Permits an even flow of material into the baler, chopper, etc.
Even distribution of material across windrow	Results in even and consistent bales to minimize handling and stacking problems
Properly conditioned	Prevents excessive leaf damage

#### 4.15.5 Driving on Windrow

Driving on previously cut windrows that will not be raked can lengthen drying time by a full day. If practical, set forming shields to produce a narrower windrow that the machine can straddle.

**NOTE:**

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

#### 4.15.6 Raking and Tedding

Raking or tedding speeds up drying; however, the resulting leaf loss may outweigh the benefits. 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 moisture levels reach 40–50%. Hay should not be raked or tedded at moisture levels below 25%, however, or excessive yield loss will result.

#### 4.15.7 Using Chemical Drying Agents

Hay drying agents work by removing wax from legume surfaces and allowing moisture to escape cut crop and evaporate faster; however, treated hay lying on wet ground will absorb ground moisture faster.

Before deciding to use a drying agent, carefully compare the relative costs and benefits for your area.

## 4.16 Unplugging the Header

Follow these steps to remove plugged material from the header:

### DANGER

To avoid bodily injury or death from unexpected startup of machine, always stop the engine and remove the key before removing plugged material from header.

1. Stop forward movement of the windrower and disengage the header.
2. Run the header backwards with the header reverse controls in the windrower cab to clear the plug. If plug does not clear, proceed to the next steps.
3. Raise the header fully.
4. Stop the engine and remove the key.
5. Engage header safety props. Refer to [3.3 Engaging and Disengaging Header Safety Props, page 28](#).

### WARNING

Wear heavy gloves when working around cutterbar.

6. Open the cutterbar doors. Refer to [3.5 Cutterbar Doors, page 33](#).
7. Clean off the cutterbar or rolls by hand.

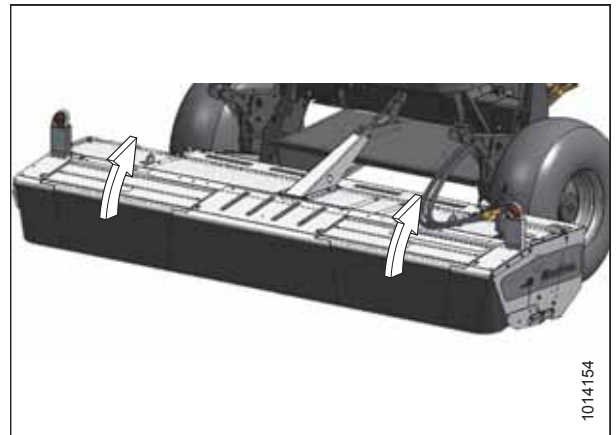


Figure 4.54: Cutterbar Doors



## 5 Maintenance and Servicing

Use the following instructions as your first source of information for servicing the header. A parts catalog is located in a plastic case at the right end of the header. If more detailed maintenance and service information is required, contact your Dealer.

Log the hours of operation and use the Maintenance Schedule/Record provided to keep a record of scheduled maintenance. Refer to [5.2.1 Maintenance Schedule/Record, page 122](#).

### 5.1 Preparation for Servicing

#### CAUTION

**To avoid personal injury, before servicing the header or opening drive covers, perform the following:**

1. Lower the header fully.
2. Stop the engine and remove the key.
3. Engage park brake.
4. Wait for all moving parts to stop.

## 5.2 Maintenance Requirements

In this manual, periodic maintenance requirements are organized by service intervals. For detailed instructions, refer to the specific headings in this section.

Regular maintenance is the best insurance against early wear and breakdowns. Use the following schedule and recommendations to increase machine life.

- Use fluids and lubricants specified on the inside back cover.
- Make copies of the [5.2.1 Maintenance Schedule/Record, page 122](#) and log the hours of operation.

Where a service interval is given with 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 operated under adverse conditions (severe dust, extra heavy loads, etc.).



### CAUTION

Carefully follow safety messages given in [1 Safety, page 1](#).

### 5.2.1 Maintenance Schedule/Record

Action		✓ Check					⬇ Lubricate					▲ Change				
	Hour meter reading															
	Service date															
	Serviced by															
Preseason or Annual. Refer to <a href="#">5.2.2 Preseason/Annual Service, page 125</a> .																
End of season. Refer to <a href="#">5.2.3 End-of-Season Service, page 125</a> .																
<b>First 5 hours</b>																
✓	Check for loose hardware. Refer to <a href="#">8.1 Torque Specifications, page 185</a> .															
✓	Check drive belt tension. Refer to <a href="#">Inspecting the Conditioner Drive Belt, page 159</a> and <a href="#">Inspecting and Adjusting the Auger Drive Belts, page 166</a> .															
<b>First 10 hours then daily</b>																
✓	Check hydraulic hoses and lines. Refer to <a href="#">5.5.2 Hydraulic Hoses and Lines, page 172</a> .															
✓	Check cutterblades, deflectors, and discs. Refer to <a href="#">5.3.2 Inspecting the Cutterbar Discs, page 138</a> .															

# MAINTENANCE AND SERVICING

Action		✓ Check		⬇ Lubricate				▲ Change					
First 25 hours													
✓	Check drive belt tension. Refer to <i>Inspecting the Conditioner Drive Belt, page 159</i> and <i>Inspecting and Adjusting the Auger Drive Belts, page 166</i> .												
Every 25 hours													
⬇	Lube roll universal joints. Refer to <i>5.2.4 Lubrication and Servicing, page 126</i> .												
⬇	Lube cutterbar driveline bearings. Refer to <i>5.2.4 Lubrication and Servicing, page 126</i> .												
First 50 hours													
✓	Check drive belt tension. Refer to <i>Inspecting the Conditioner Drive Belt, page 159</i> and <i>Inspecting and Adjusting the Auger Drive Belts, page 166</i> .												
▲	Change cutterbar lubricant. Refer to <i>5.2.7 Lubricating the Cutterbar, page 132</i> <sup>2</sup> .												
▲	Change bevel gearbox lubricant. Refer to <i>5.4.1 Bevel Gearbox, page 158</i> .												
▲	Change conditioner gearbox lubricant. Refer to <i>5.4.1 Bevel Gearbox, page 158</i> .												
Every 50 hours													
⬇	Lube drive belt tensioner. Refer to <i>5.2.4 Lubrication and Servicing, page 126</i> .												
⬇	Lube roll shaft bearings. Refer to <i>5.2.4 Lubrication and Servicing, page 126</i> .												
⬇	Lube gauge roller bearings. <sup>3</sup>												
Every 100 hours or annually													
✓	Check conditioner drive belt. Refer to <i>Inspecting the Conditioner Drive Belt, page 159</i> .												

2. Use only the specified amount. DO NOT overfill
3. Optional



## MAINTENANCE AND SERVICING

[illegible]

4. Begins after the first 150 hour service

### 5.2.2 Preseason/Annual Service

#### CAUTION

- Review the operator's manual to refresh your memory on safety and operating recommendations.
- Review all safety signs and other decals on the header and note hazard areas.
- Be sure all 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 the operating characteristics of the machine.
- Check the first aid kit and fire extinguisher. Know where they are and how to use them.

Perform the following at the beginning of each operating season:

- Lubricate machine completely. Refer to [5.2.4 Lubrication and Servicing, page 126](#).
- Perform all annual maintenance. Refer to [5.2.1 Maintenance Schedule/Record, page 122](#).

### 5.2.3 End-of-Season Service

#### CAUTION

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

Do the following at the end of each operating season:

- Clean the header thoroughly.
- Store in a dry, protected place if possible. If stored outside, always cover the header with a waterproof canvas or other protective material.
- Raise the header and engage header safety props.
- If possible, block up the header to take weight off tires.
- Repaint all worn or chipped painted surfaces to prevent rust.
- Loosen drive belt.
- Lubricate the header thoroughly, leaving excess grease on fittings to keep moisture out of bearings.
- Apply grease to exposed threads, cylinder rods, and sliding surfaces of components.
- Oil cutterbar components to prevent rust.
- Check for worn components and repair as necessary.
- Check for broken components and order replacements from your Dealer. Attention to these items right away will save time and effort at beginning of next season.
- Replace or tighten any missing or loose hardware. Refer to [8.1 Torque Specifications, page 185](#).
- Remove divider rods (if equipped) to reduce space required for inside storage.

## 5.2.4 Lubrication and Servicing

### **⚠ WARNING**

To avoid personal injury, before servicing the header or opening drive covers, follow procedures in [5.1 Preparation for Servicing, page 121](#).

Log hours of operation and use the Maintenance Checklist provided to keep a record of scheduled maintenance. Refer to [5.2.1 Maintenance Schedule/Record, page 122](#).

To access the drive systems, open the driveshield and cutterbar doors. Refer to:

- [3.4 Driveshields, page 30](#)
- [3.5 Cutterbar Doors, page 33](#)

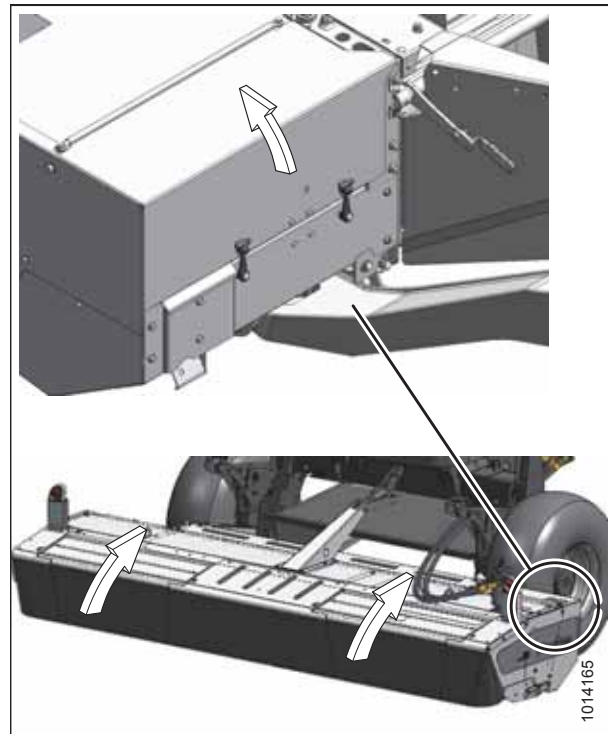


Figure 5.1: Driveshield

### 5.2.5 Greasing Procedure

#### DANGER

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

The greasing points are marked on the machine by decals showing a grease gun and grease interval in hours of operation.

Use the recommended lubricants specified in this manual. Refer to inside back cover.

1. Wipe grease fitting with a clean cloth 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. If fitting will not take grease, remove and clean thoroughly. Also, clean lubricant passageway. Replace fitting, if necessary.

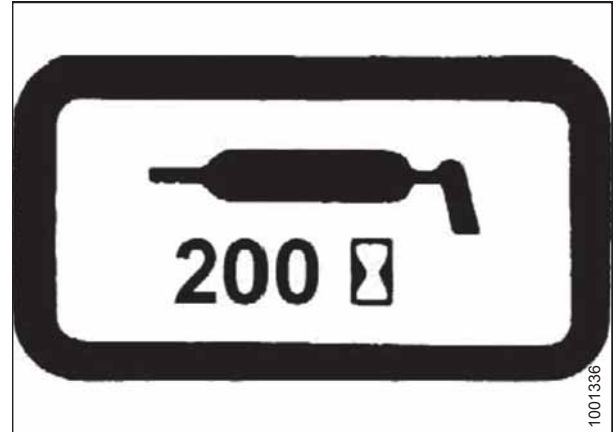


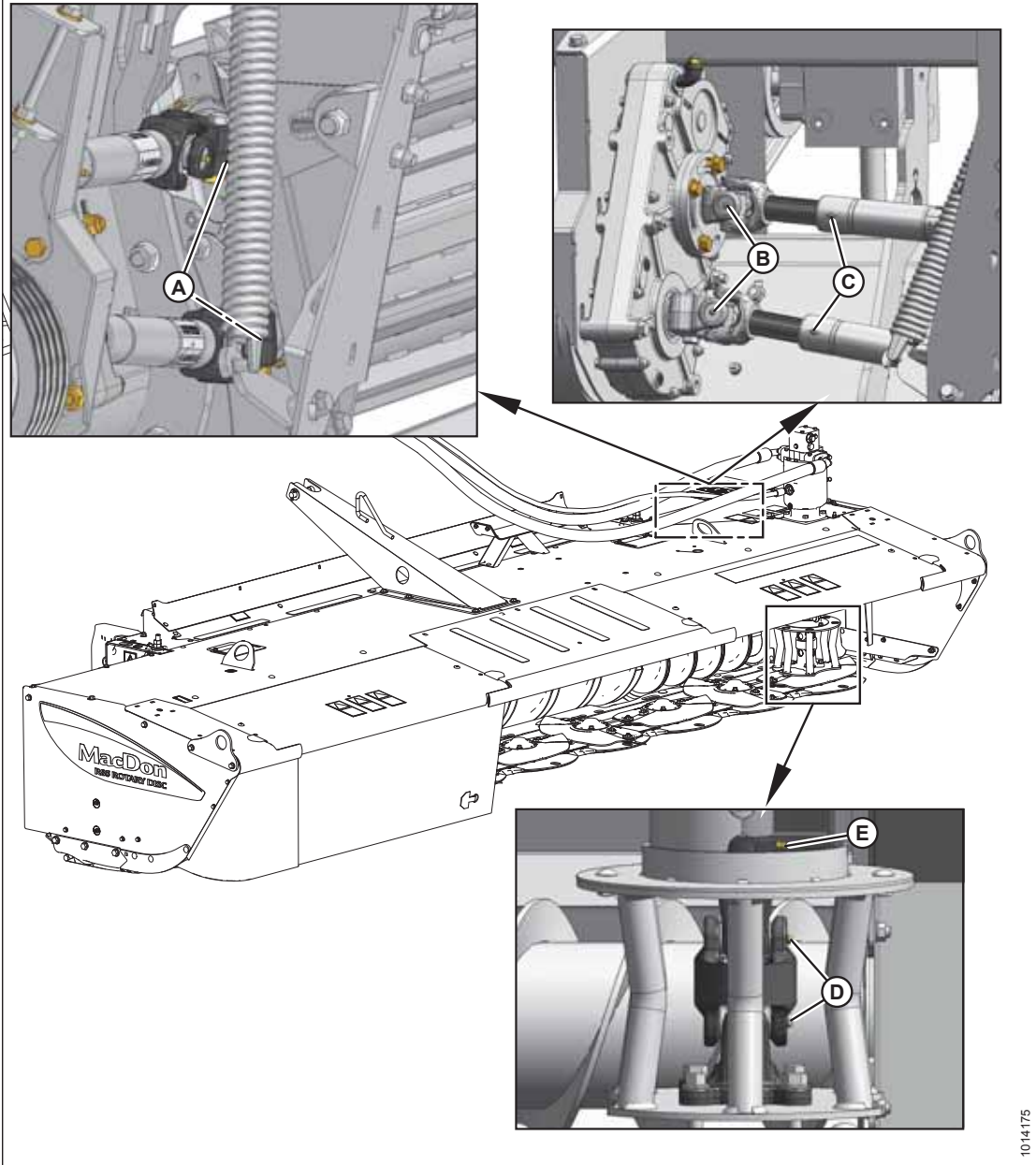
Figure 5.2: Grease Interval Decal

### 5.2.6 Lubrication and Servicing Intervals

To identify the various locations that require lubrication and servicing, refer to the following illustrations (organized by the frequency of service that is required).

## MAINTENANCE AND SERVICING

### Every 25 Hours



A - Driveline Universals (2 Places)

B - Driveline Universals (2 Places)

C - Driveline Shaft<sup>5</sup> (2 Places)

D - Driveline Universals (2 Places)

E - Driveline Shaft<sup>5</sup>

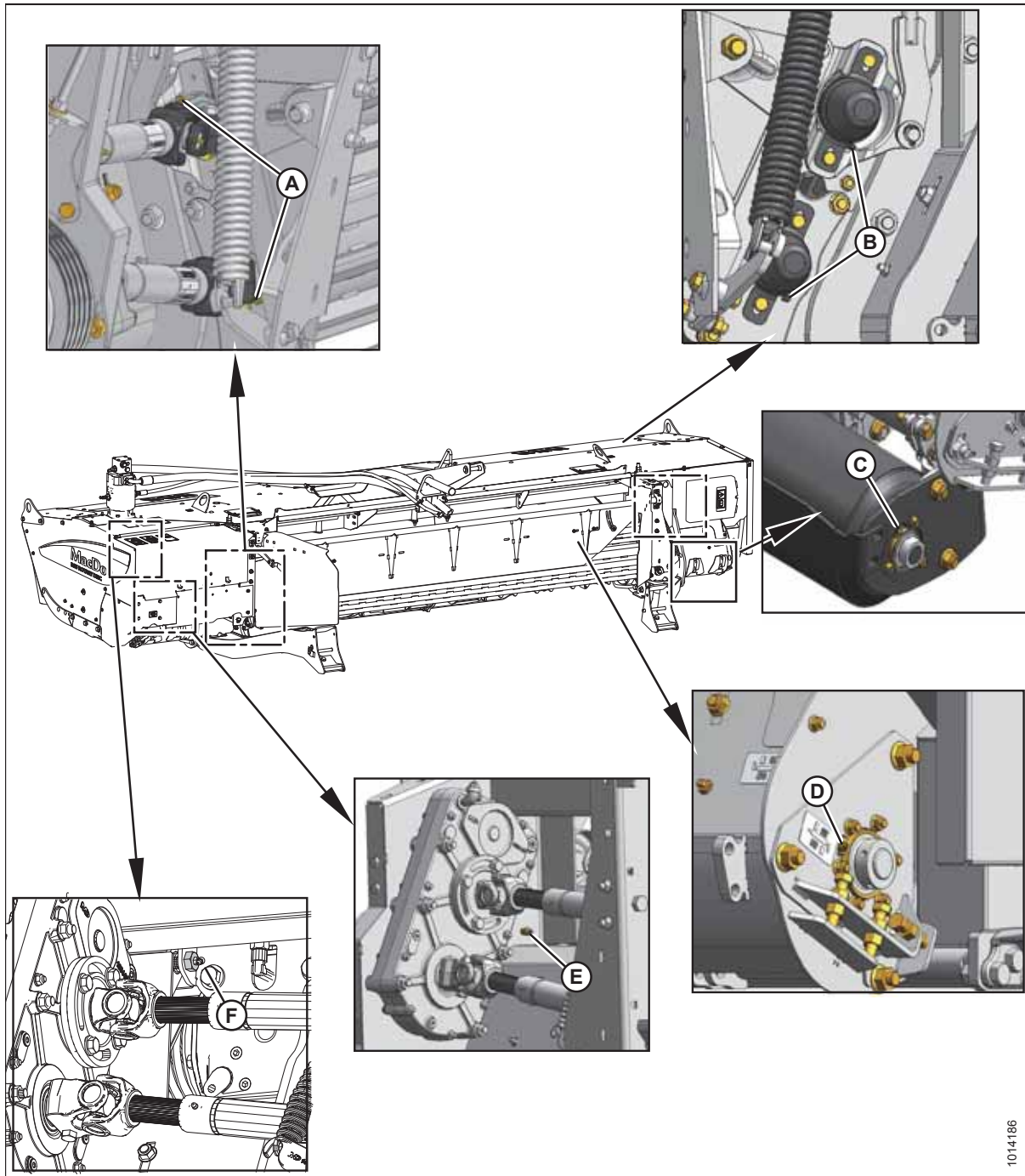
#### NOTE:

Use high temperature extreme pressure (EP2) performance with 1% max molybdenum disulphide (NLGI grade 2) lithium base except where noted.

5. 10% moly grease is recommended for driveline shaft slip joint only.

## MAINTENANCE AND SERVICING

### Every 50 Hours



A - Roll Shaft Bearings (2 Places)

B - Roll Shaft Bearings (2 Places)

C - Optional Gauge Roll Bearings  
(2 Places Each)

D - Auger Bearing (1 Place)

E - Auger Bearing (1 Place)

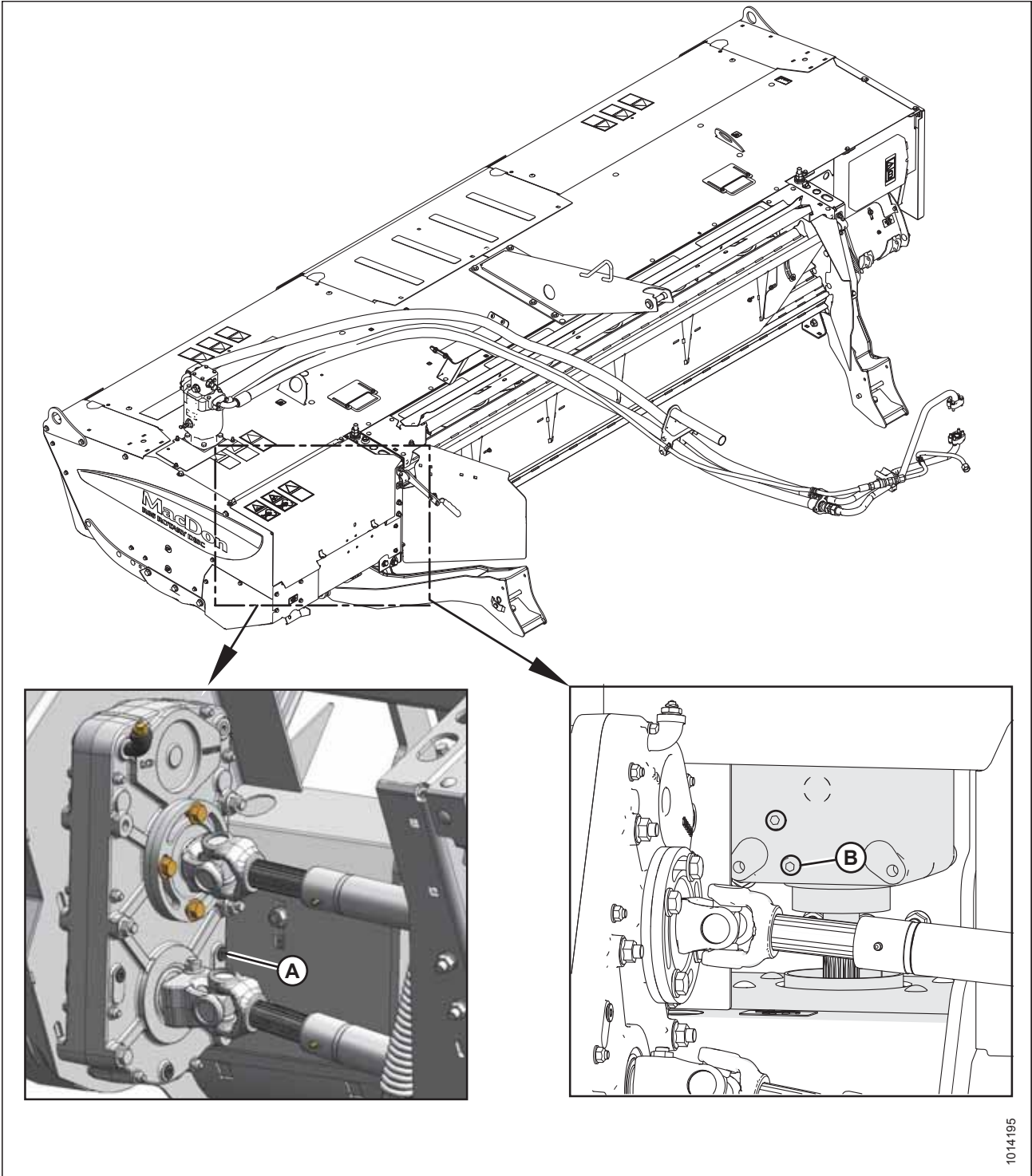
F - Belt Tensioner Pivot (1 Place)

#### NOTE:

Use high temperature extreme pressure (EP2) performance with 1% max molybdenum disulphide (NLGI grade 2) lithium base except where noted.

# MAINTENANCE AND SERVICING

Every 100 Hours or Annually



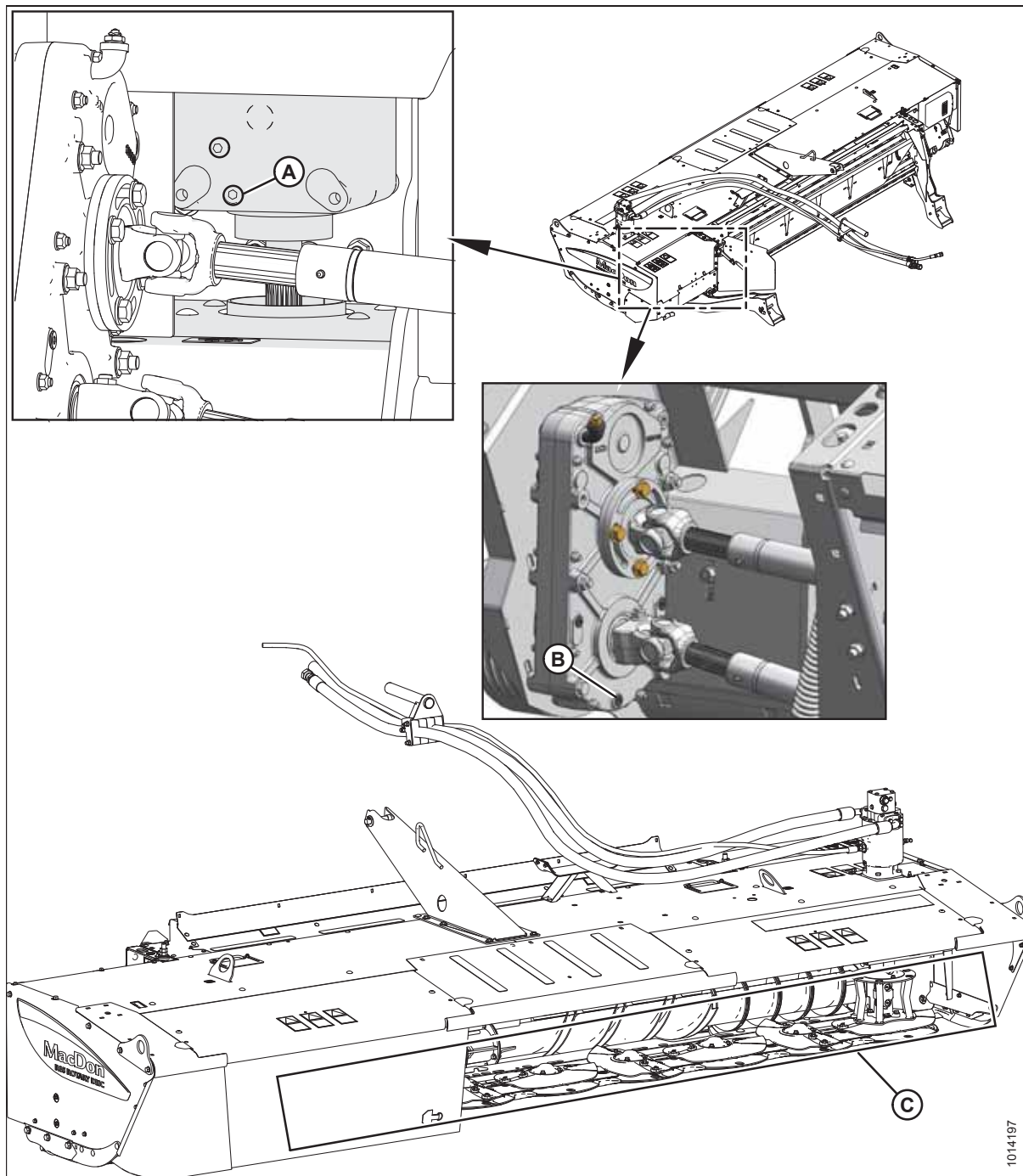
1014195

A - Conditioner Gearbox Oil Level (Check with Top of Header Horizontal)    B - Bevel Gearbox Oil Level (Check with Top of Header Horizontal)



## MAINTENANCE AND SERVICING

### Every 250 Hours



A - Drain and Refill Bevel Gearbox Lube<sup>6</sup>

B - Drain and Refill Conditioner Gearbox Lube<sup>6</sup>

C - Drain and Refill Cutterbar Lube<sup>7</sup>

6. Refer to [Changing the Bevel Gearbox Lubricant, page 158.](#)

7. Refer to [5.2.7 Lubricating the Cutterbar, page 132.](#)



## 5.2.7 Lubricating the Cutterbar

The lubricant level in the cutterbar **CANNOT** be checked. If the cutterbar lubricant quantity is in doubt, do **NOT** add lubricant. Drain the cutterbar and refill with new clean lubricant.

### *Draining the Cutterbar Lubricant*

#### **IMPORTANT:**

Drain the cutterbar when the lubricant is warm. If the lubricant is cold, idle the machine for about 10 minutes prior to draining.

#### **DANGER**

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

#### **CAUTION**

Be careful when working around the blades. Blades are sharp and can cause serious injury. Wear gloves when handling blades.

#### **DANGER**

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

1. Place blocks under each end of the header (A) making sure the left end is higher than the right end.
2. Disengage header safety props. Refer to [3.3 Engaging and Disengaging Header Safety Props, page 28](#).
3. Start the windrower and lower header onto blocks.
4. Stop the engine and remove the key.
5. Open cutterbar doors (B). Refer to [3.5 Cutterbar Doors, page 33](#).

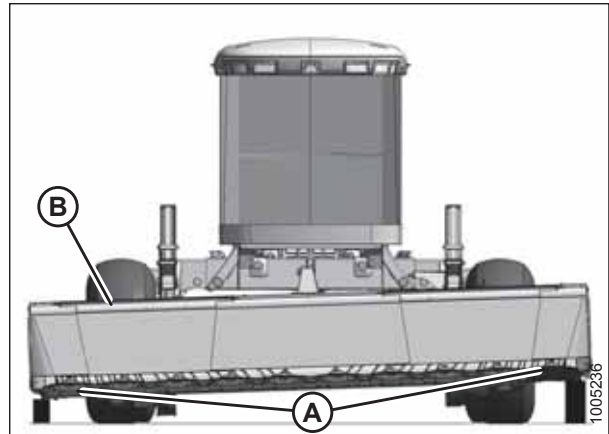
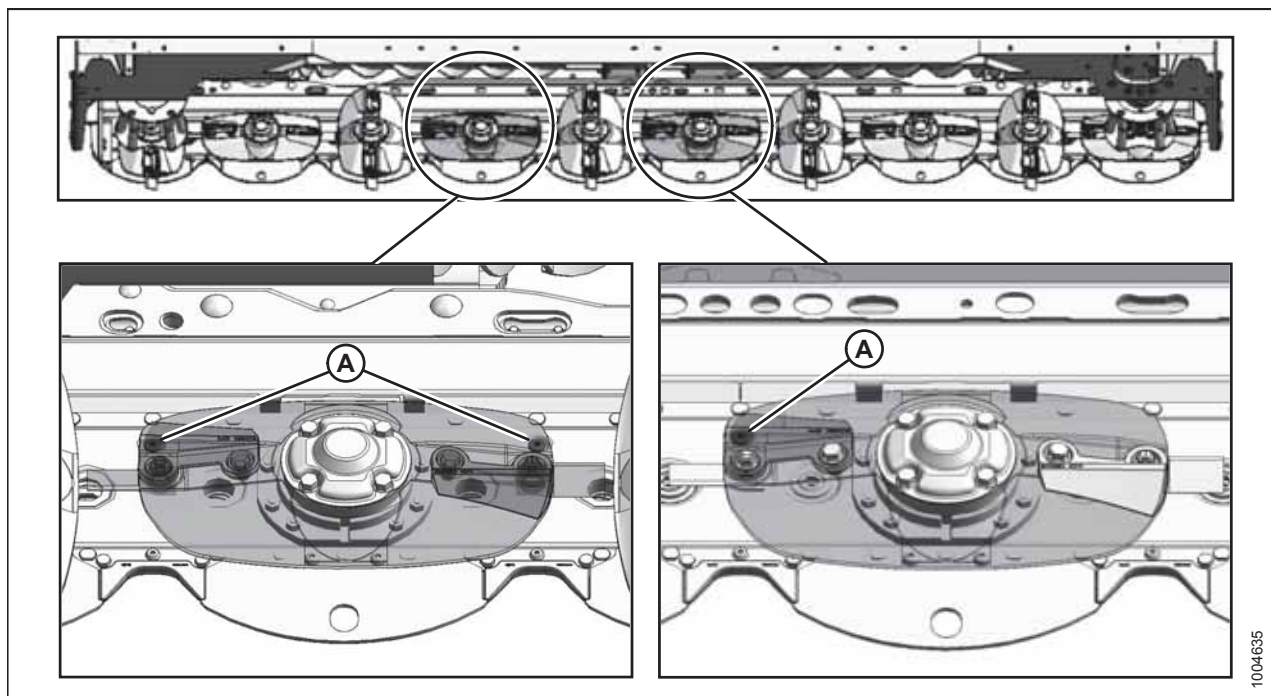


Figure 5.3: Header Raised Left Side

6. Locate one of the three filler plugs along the top of the cutterbar. Refer to [5.4, page 133](#).

Figure 5.4: Cutterbar Filler Plug Locations



7. Clean around either filler plug (A) and remove one plug with an 8 mm hex key.

**NOTE:**

Rotate disc to expose filler plug if necessary.

8. Place a suitably sized container under the cutterbar drain hole (A). Refer to for cutterbar lubricant capacity.
9. Remove plug (A) with an 8 mm hex key and allow sufficient time for lubricant to drain.

**IMPORTANT:**

Do NOT flush the cutterbar.

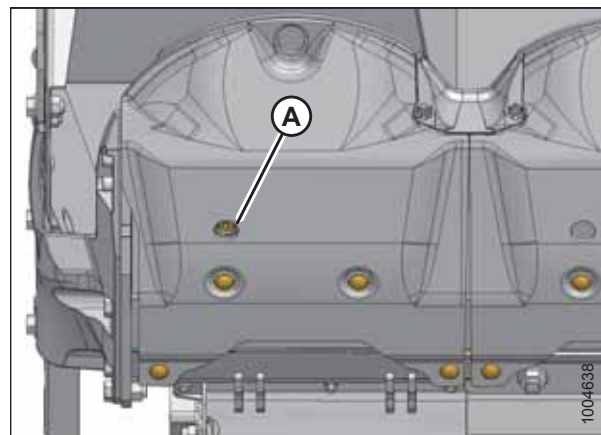


Figure 5.5: Cutterbar Lubricant Drain

10. Replace drain plug (A) and tighten.
11. Safely dispose of lubricant.
12. Add lubricant. Refer to [Filling the Cutterbar Lubricant, page 134](#).

## Filling the Cutterbar Lubricant

### DANGER

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

1. Park the machine on level ground.
2. Raise the header fully.
3. Stop the engine and remove the key.
4. Engage header safety props. Refer to [3.3 Engaging and Disengaging Header Safety Props, page 28](#).
5. Move higher block to right end of header.

#### NOTE:

Having the fill end higher allows for quicker filling of cutterbar.

6. Disengage header safety props. Refer to [3.3 Engaging and Disengaging Header Safety Props, page 28](#).
7. Start windrower and lower header onto blocks (A).

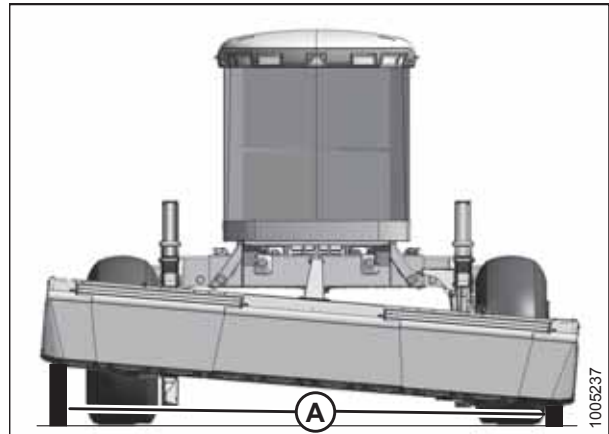


Figure 5.6: Header Raised Right Side

8. Stop the engine and remove the key.
9. Verify that drain plug (A) has been installed before adding new lubricant.

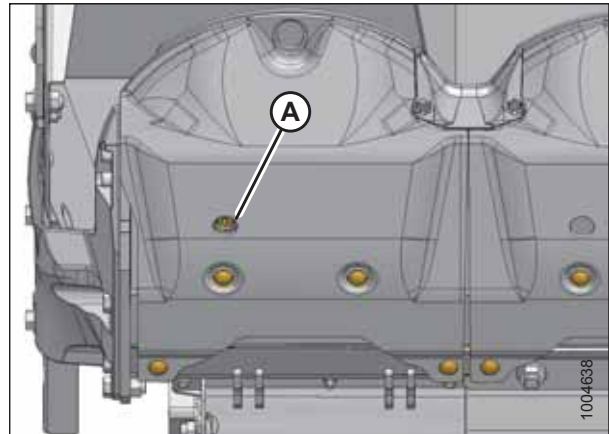
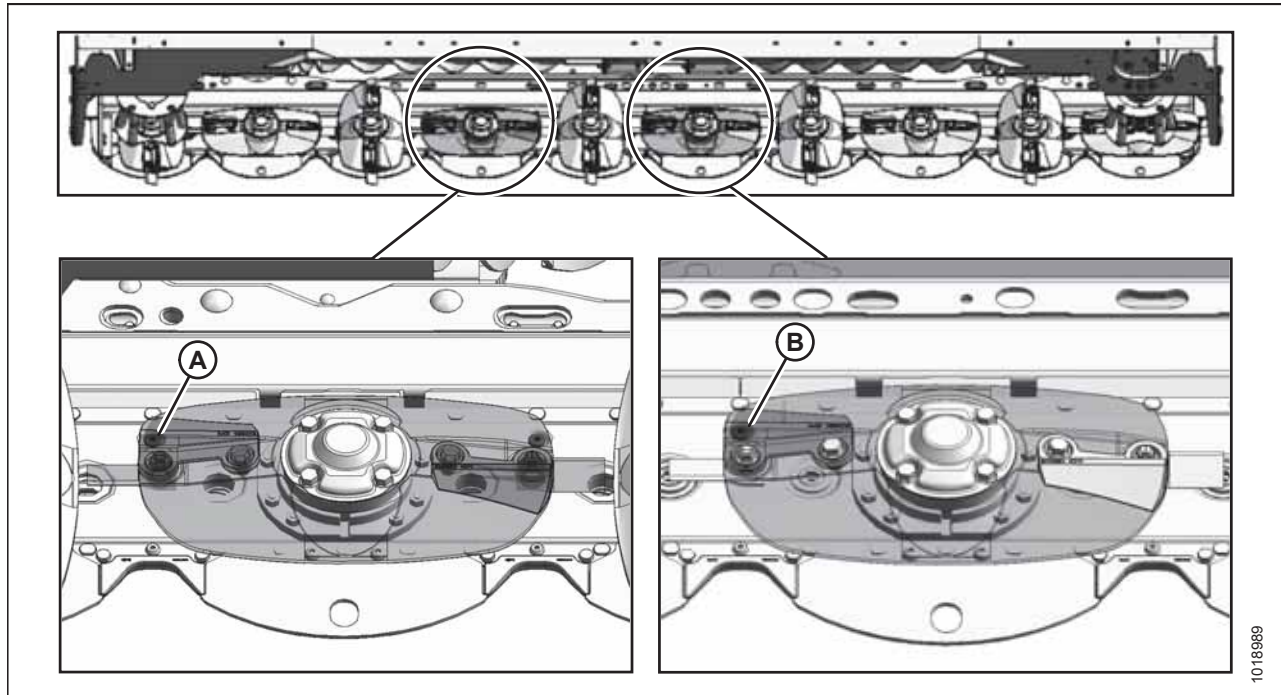


Figure 5.7: Cutterbar Drain Plug

10. Locate filler plugs (A) and (B) along the top of the cutterbar. Refer to [Figure 5.8, page 135](#).

Figure 5.8: Cutterbar Filler Plug Locations



11. Clean around and remove filler plugs (A) and (B) with an 8 mm hex key.

**NOTE:**

Opening two fill plugs allows air to escape while adding oil to the cutterbar and prevents oil from blowing back through the fill hole.

**NOTE:**

Rotate disc to expose filler plug if necessary.

12. Add lubricant to cutterbar through filler hole (A). Refer to for recommended lubricant type and volume.

**IMPORTANT:**

DO NOT overfill the cutterbar. Overfilling can cause overheating and damage to or failure of the cutterbar. To avoid overfilling, completely drain the oil from the cutterbar before adding the recommended volume of oil. Refer to *Draining the Cutterbar Lubricant, page 132*.

13. Install the filler plugs that were removed.
14. Close the cutterbar door(s). Refer to *3.5 Cutterbar Doors, page 33*.
15. Start engine and raise header off blocks.
16. Engage header safety props. Refer to *3.3 Engaging and Disengaging Header Safety Props, page 28*.
17. Remove blocks and lower the header fully.
18. Stop the engine and remove the key.
19. Disengage header safety props. Refer to *3.3 Engaging and Disengaging Header Safety Props, page 28*.
20. Start engine and lower the header fully.

## 5.2.8 Rock Guards

The machine is equipped with rock guards at each cutting disc location. Rock guards prevent the cutterbar from digging into the ground and protect the disc from coming in contact with stones and other debris.

### *Inspecting the Rock Guards*

Check rock guards periodically for severe damage or wear as follows:

#### **DANGER**

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

#### **DANGER**

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

#### **CAUTION**

Exercise caution when working around the blades. Blades are sharp and can cause serious injury. Wear gloves when handling blades.

1. Raise the header fully.
2. Stop the engine and remove the key.
3. Engage header safety props.
4. Engage header safety props. Refer to [3.3 Engaging and Disengaging Header Safety Props, page 28](#).
5. Inspect rock guards (A) for severe damage, wear, and distortion. The guards should be replaced if severely damaged or worn.
6. Check for loose or missing fasteners and tighten or replace fastener if missing.
7. Contact your MacDon Dealer for replacement procedures.

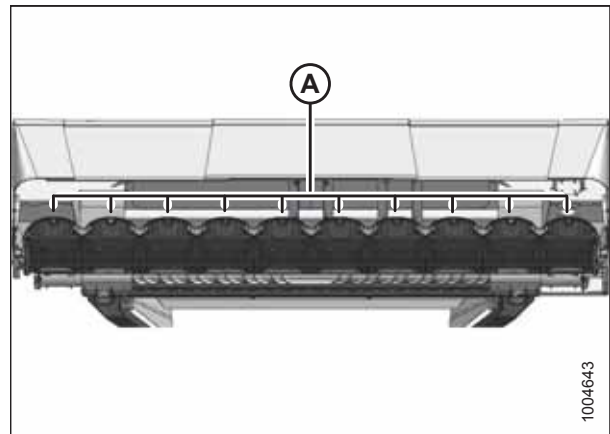


Figure 5.9: Rock Guards

## 5.3 Cutterbar Discs

Perform daily inspections to ensure that cutterbar discs have not suffered damage from rocks, or experienced excessive wear from abrasive working conditions.

Cutterbar discs are interchangeable and can be moved to a spindle that rotates in the opposite direction as long as it is in usable condition and the blades are oriented to cut in the correct direction.

The cutterbar discs are **NOT** repairable and must be replaced if severely damaged or worn.

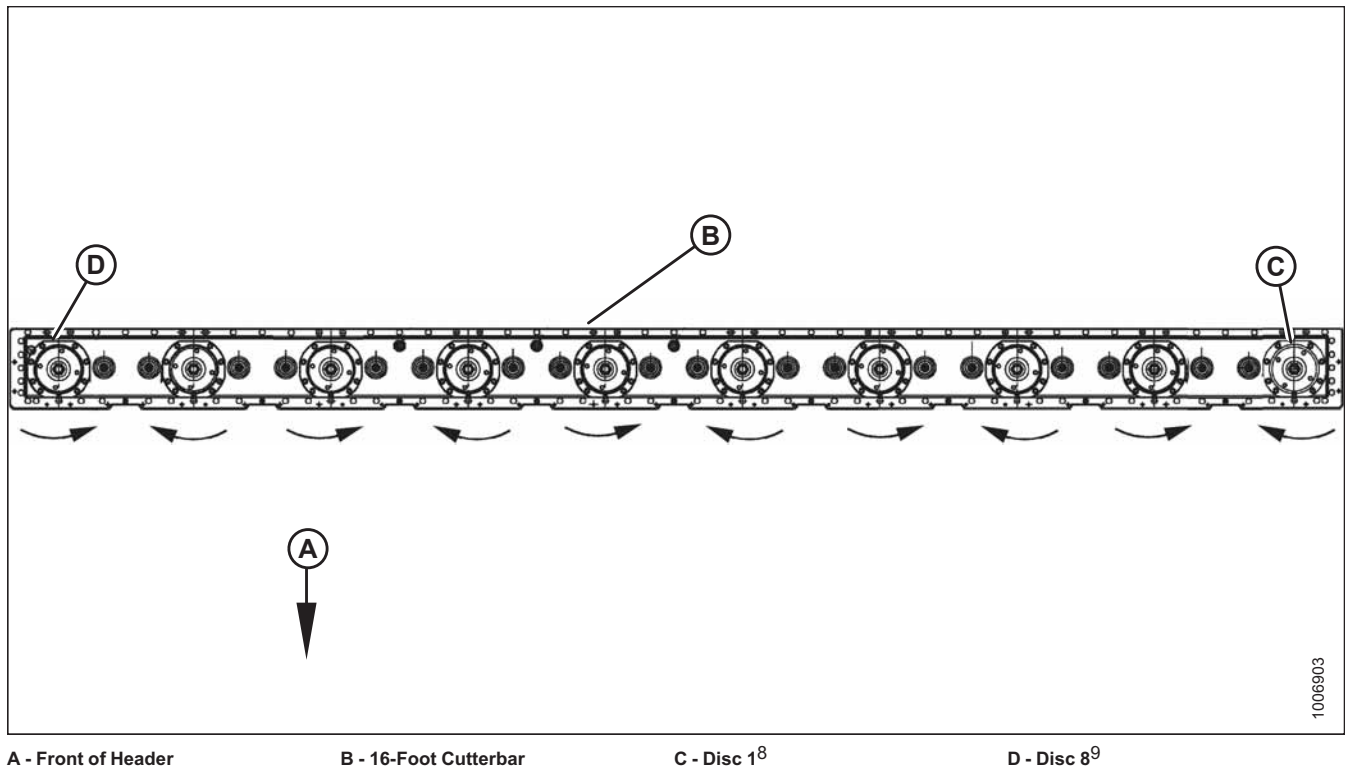
### IMPORTANT:

If holes appear in a cutterbar disc, replace the disc immediately. Do **NOT** attempt to repair the cutterbar discs. Always use factory replacement parts.

### 5.3.1 Direction of Spindle Rotation

When installing cutterblades or disc accelerators, the direction of rotation determines proper crop positioning. Refer to Figure 5.10, [page 137](#) to determine the direction of spindle rotation.

Figure 5.10: Spindle Rotation



8. Driveline deflector installed here.

9. Driven deflector installed here.

### 5.3.2 Inspecting the Cutterbar Discs

Perform the following cutterbar disc inspection daily:

#### DANGER

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

1. Lower the header fully.
2. Stop the engine and remove the key.
3. Open the cutterbar doors. Refer to [3.5 Cutterbar Doors, page 33](#).
4. Check discs (A) for damage or loose fasteners.
5. Replace damaged discs. Refer to:
  - [5.3.3 Removing a Cutterbar Disc, page 138](#)
  - [5.3.4 Installing a Cutterbar Disc, page 139](#)
6. Replace damaged fasteners. Tighten loose fasteners.
7. Close the cutterbar doors. Refer to [3.5 Cutterbar Doors, page 33](#).

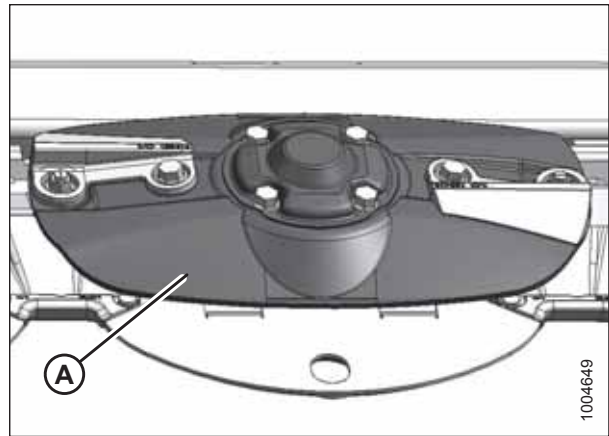


Figure 5.11: Cutterbar Disc

### 5.3.3 Removing a Cutterbar Disc

#### CAUTION

Exercise caution when working around the blades. Blades are sharp and can cause serious injury. Wear gloves when handling blades.

1. Open cutterbar door(s). Refer to [3.5 Cutterbar Doors, page 33](#).
2. Identify which disc needs to be replaced.
3. Place a block of wood between two discs to prevent disc rotation while loosening bolts.
4. If the disc has a deflector installed on it, remove the rotary deflector. Refer to:
  - [Removing the Driveline Deflector, page 151](#)
  - [Removing the Driven Deflector, page 150](#)



## MAINTENANCE AND SERVICING

5. Remove four bolts (A) on disc cover (B) and remove cover and disc (C).

**NOTE:**

If removing multiple discs, mark the position of each disc to assist in reinstallation. The blades on each disc are direction-specific. Refer to [5.3.1 Direction of Spindle Rotation](#), page 137.

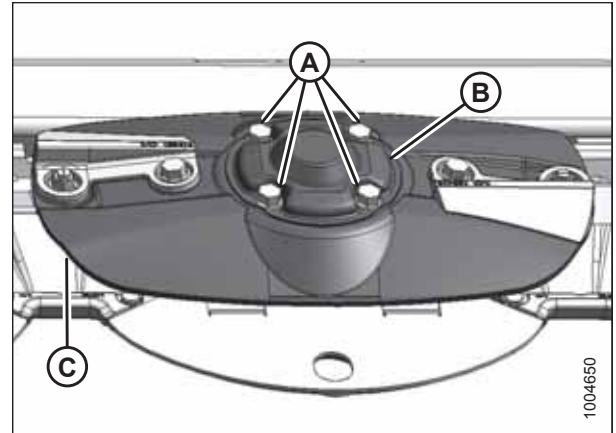


Figure 5.12: Cutterbar Disc

### 5.3.4 Installing a Cutterbar Disc

**⚠ CAUTION**

Exercise caution when working around the blades. Blades are sharp and can cause serious injury. Wear gloves when handling blades.

1. Install the new disc on spindle positioned at a 90° angle to the adjacent discs.

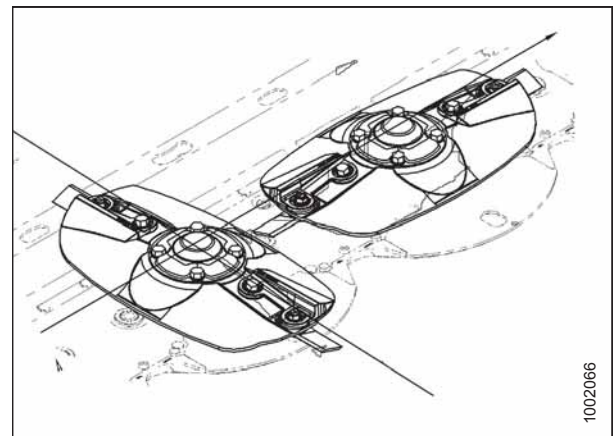


Figure 5.13: Cutterbar Discs



## MAINTENANCE AND SERVICING

2. Install cover (B) and secure with four bolts (A). Tighten bolts.
3. Reinstall previously removed rotary deflector (if applicable). Refer to:
  - *Installing the Driveline Deflector, page 152*
  - *Installing the Driven Deflector, page 151*
4. Close the cutterbar door(s). Refer to *3.5 Cutterbar Doors, page 33*.

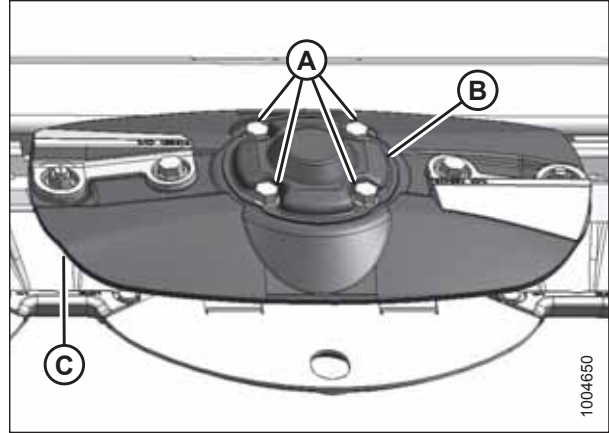


Figure 5.14: Cutterbar Disc

### 5.3.5 Cutterblades

Each disc has two cutterblades (A), one attached at each end, with a specially designed shoulder bolt that allows the blades to swivel horizontally.

Since each blade has two cutting edges, they can be flipped over to extend the life of the blades.

The blades are NOT repairable and must be replaced if damaged or worn.

**IMPORTANT:**

Always use MacDon factory replacement parts.

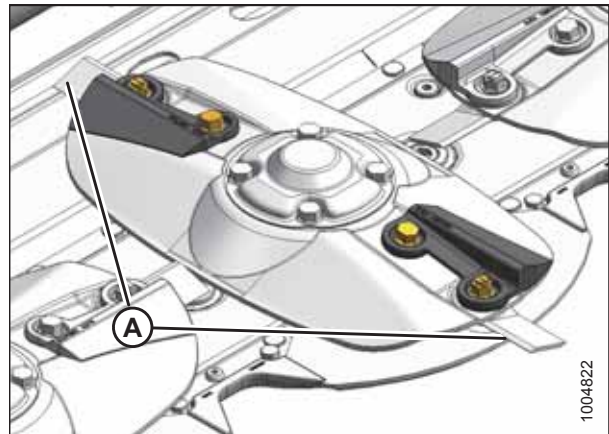


Figure 5.15: Cutterblades

## Inspecting Discblades

### **DANGER**

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.

### **CAUTION**

Discblades have two sharp cutting edges that can cause serious injury. Exercise caution and wear gloves when working with blades.

### **CAUTION**

Damaged blades may damage the cutterbar and result in poor cutting performance. Replace damaged blades immediately.

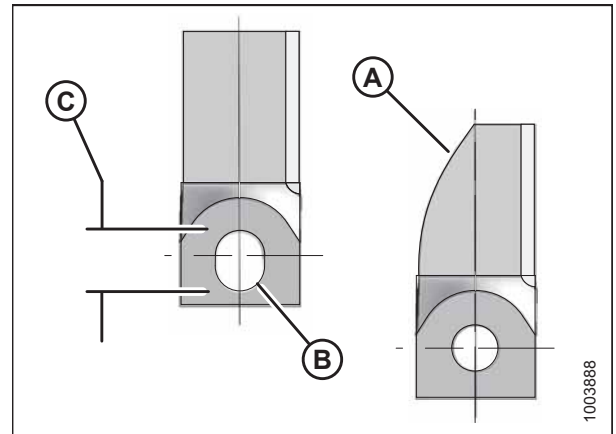
### **CAUTION**

Damaged or loose discblades or blade attachment hardware can be ejected during machine operation and may cause personal injury or machine damage.

1. Check daily that the discblades are securely attached to the disc.
2. Inspect blades for cracks, wear beyond safe operating limits (C), and distortion.
3. Replace blades immediately if any problems occur.

#### **IMPORTANT:**

Blades should be replaced in pairs, or the disc may become unbalanced and cause damage to the cutterbar.



**Figure 5.16: Discblades**

A - Blade Wear to Center Line

B - Elongated Hole

C - Maximum Elongation 21 mm (13/16 in.)

## MAINTENANCE AND SERVICING

### IMPORTANT:

The discblades have cutting edges on both sides so the blades can be turned over and reused. The twist in each blade determines the cutting direction. If you are unsure which direction the spindles rotate, refer to [5.3.1 Direction of Spindle Rotation](#), page 137.

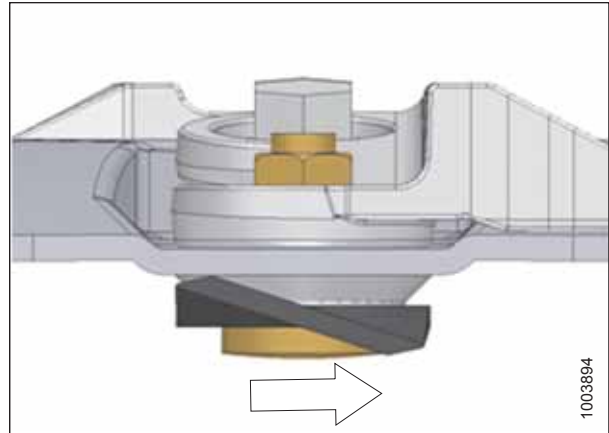


Figure 5.17: Counterclockwise Disc Rotation Direction

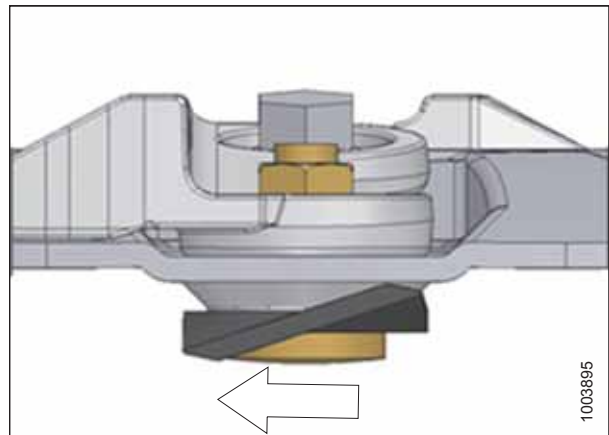


Figure 5.18: Clockwise Disc Rotation Direction

### *Inspecting Cutterblade Hardware*

#### **CAUTION**

Damaged or loose discblades or blade attachment hardware can be ejected during machine operation and may cause personal injury or machine damage.

## MAINTENANCE AND SERVICING

Check blade attachment hardware each time blades are changed. Refer to [Replacing the Cutterblades, page 144](#) for hardware replacement procedure.

Check bolts and replace bolt if:

- Bolt has been removed and installed five times
- Head (A) is worn flush with bearing surface of blade
- Diameter of bolt neck is worn (B) 3 mm (1/8 in.)
- Bolt is cracked (C)
- Bolt is visibly distorted (D)
- There is evidence of interference (E) with adjacent parts

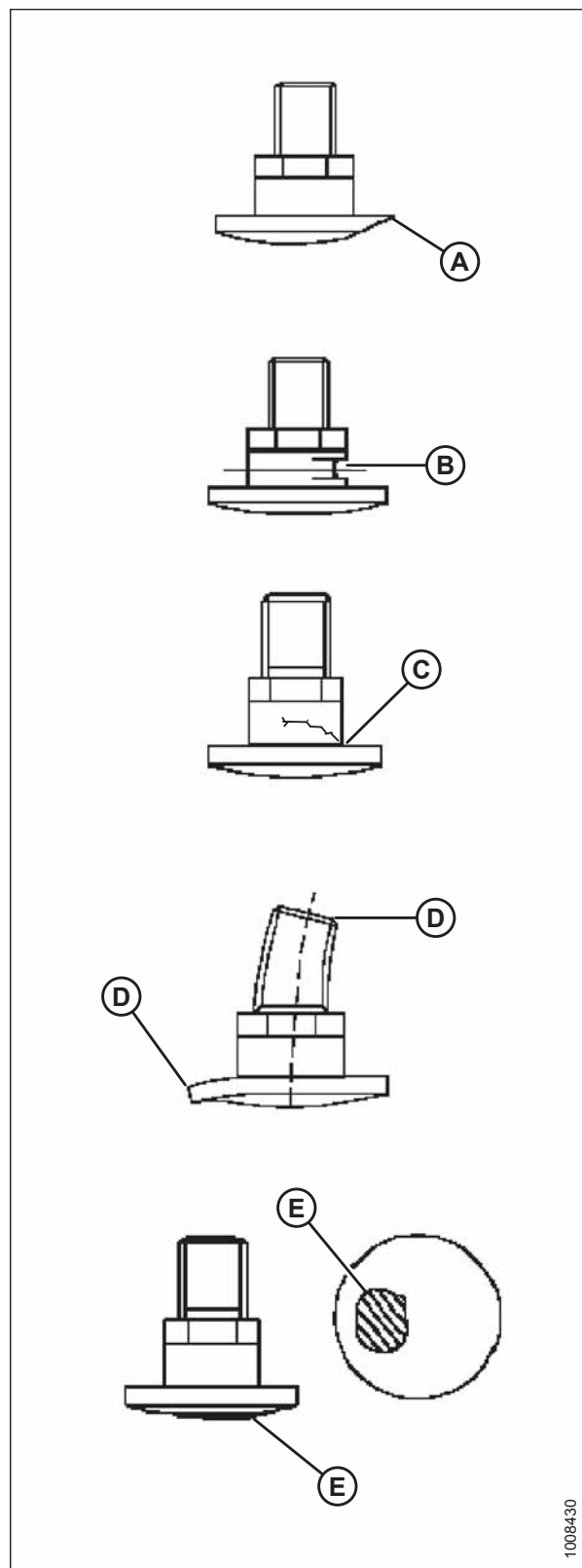


Figure 5.19: Cutterblade Bolt

## MAINTENANCE AND SERVICING

Check nuts and replace nut if:

- Nut has been removed and installed five times
- Worn height (A) is less than half original height (B)
- Nut is cracked

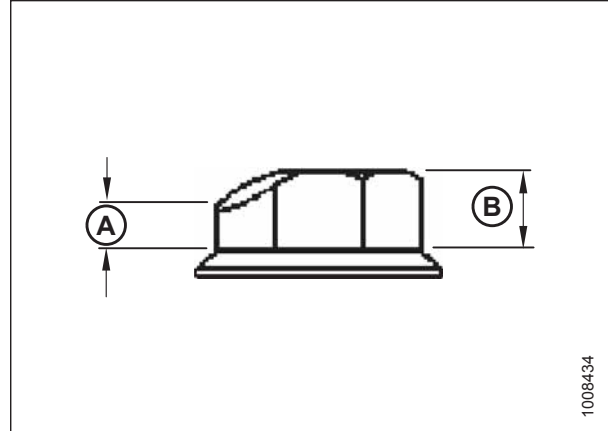


Figure 5.20: Cutterblade Nut

### *Replacing the Cutterblades*

Follow these steps to replace the cutterblades:

#### **! DANGER**

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

#### **! CAUTION**

Cutterblades have two cutting edges. Be careful when working around the blades. Blades are sharp and can cause serious injury. Wear gloves when handling blades.

1. Raise the header fully.
2. Stop the engine and remove the key.
3. Engage header safety props. Refer to [3.3 Engaging and Disengaging Header Safety Props, page 28](#).
4. Open the cutterbar door(s). Refer to [3.5 Cutterbar Doors, page 33](#).
5. Rotate disc (A) so that blade (B) faces forward and lines up with hole (C) in rock guard.
6. Place a block of wood between two discs to prevent disc rotation while loosening blade bolts.
7. Clean debris from blade attachment area.

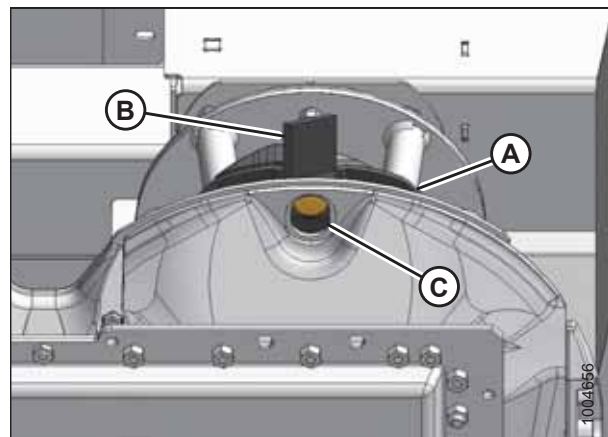


Figure 5.21: Cutterblades

## MAINTENANCE AND SERVICING

8. Remove nut (A).
9. Remove shoulder bolt (B) and blade (C).
10. Install new or reversed blade (C) with shoulder bolt (B) onto disc.

**NOTE:**

Ensure shoulder bolt is fully engaged into blade before tightening nut.

**NOTE:**

Ensure blade is installed correctly to suit rotation of disc. Refer to:

- Figure 5.17, page 142
- Figure 5.18, page 142

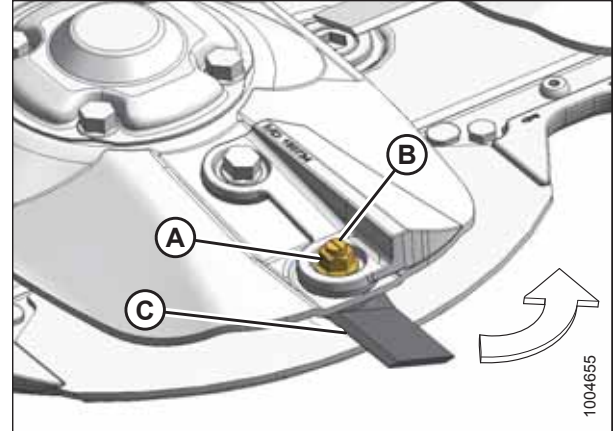


Figure 5.22: Cutterblades

**NOTE:**

If you are unsure which direction the spindle rotates, Refer to [5.3.1 Direction of Spindle Rotation, page 137](#).

11. Install nut (A). Tighten nut to 135 Nm (100 lbf-ft).
12. Remove block of wood (if used).

### WARNING

Ensure cutterbar is completely clear of foreign objects. These objects can be ejected with considerable force when the machine is started and may result in serious injury or machine damage.

13. Close the cutterbar doors. Refer to [3.5 Cutterbar Doors, page 33](#).

## 5.3.6 Accelerators

Two accelerators (A) are mounted on each outboard disc. They are designed to quickly move the cut material off the disc and into the auger and conditioner.

Accelerators are replaceable and should be inspected periodically for damage and loose or missing fasteners.

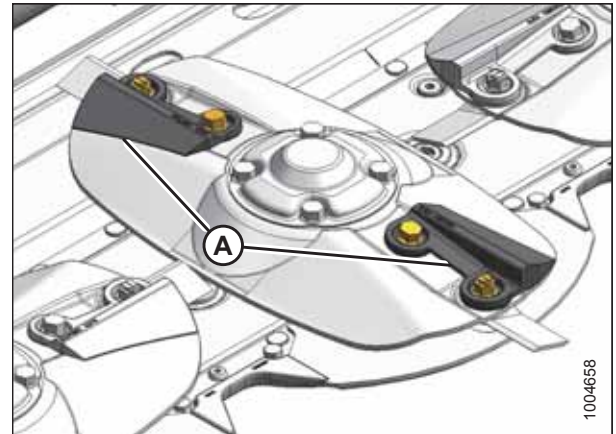


Figure 5.23: Outboard Disc

### Inspecting Accelerators

Follow these steps to inspect accelerators:

#### DANGER

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

1. Raise the header fully.
2. Stop the engine and remove the key.
3. Engage header safety props. Refer to [3.3 Engaging and Disengaging Header Safety Props](#), page 28.
4. Open the cutterbar doors. Refer to [3.5 Cutterbar Doors](#), page 33.

#### CAUTION

Cutterblades have two cutting edges. Exercise caution when working around the blades. Blades are sharp and can cause serious injury. Wear gloves when handling blades.

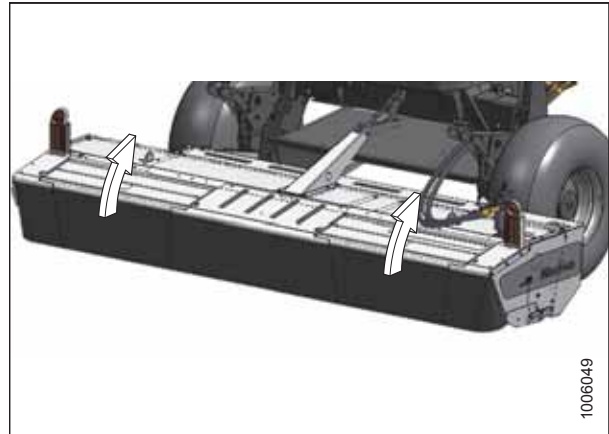


Figure 5.24: Cutterbar Doors

5. Inspect accelerators (A) and replace if severely damaged or worn.
6. Check for loose or missing fasteners and tighten or replace fastener if missing.

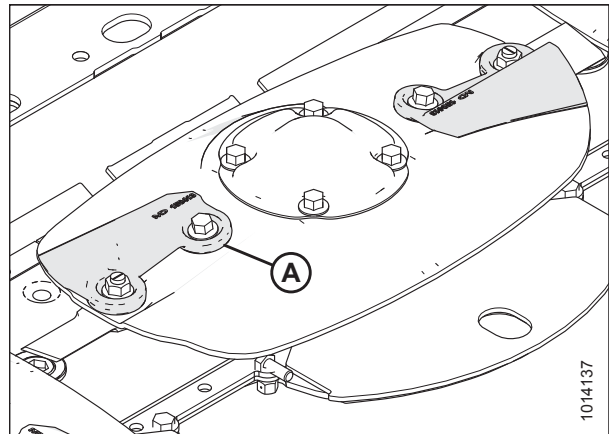


Figure 5.25: Inspecting Accelerators

## *Replacing Accelerators*

Follow these steps to replace the accelerators:

### **! DANGER**

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

1. Raise the header fully.
2. Stop the engine and remove the key.
3. Engage header safety props. Refer to [3.3 Engaging and Disengaging Header Safety Props, page 28](#).
4. Remove disc (D). Refer to [5.3.3 Removing a Cutterbar Disc, page 138](#).
5. Remove bolt and nut (A) and nut (B).
6. Remove accelerator (C) from disc (D).

#### **IMPORTANT:**

Do NOT remove cutterblade bolt unless it or the blade is being replaced. Repeat for other accelerator.

7. Install a new accelerator on disc onto existing cutterblade bolt. Install nut (B).

#### **NOTE:**

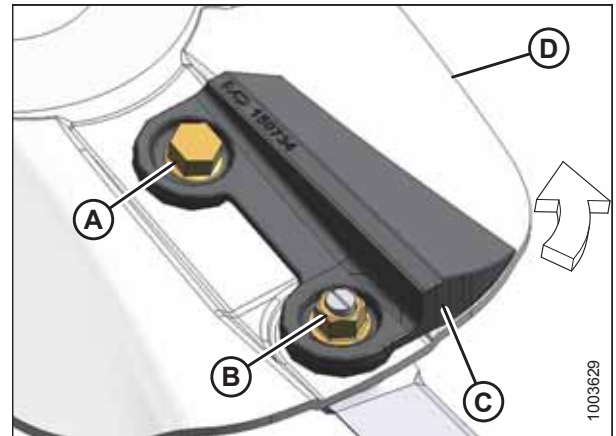
Accelerators are handed for clockwise or counterclockwise operation. Verify the direction of disc before installing accelerators.

8. Install hex bolt (A) and nut at inboard hole. Bolt head faces up.
9. Tighten both nuts to 135 Nm (100 lbf·ft).
10. Repeat for other accelerator.
11. Reinstall disc (D) on spindle. Refer to [5.3.4 Installing a Cutterbar Disc, page 139](#).
12. Remove block of wood (if used).

### **! WARNING**

**Ensure cutterbar is completely clear of foreign objects. These objects can be ejected with considerable force when the machine is started and may result in serious injury or machine damage.**

13. Close the cutterbar doors. Refer to [3.5 Cutterbar Doors, page 33](#).



**Figure 5.26: Disc Accelerator**



### 5.3.7 Nut Shield

If accelerators are not used, nut shields will be required to protect the cutterblade nuts.

Nut shields (A) are mounted on each outboard disc.

Nut shields are replaceable and should be inspected periodically for damage and loose or missing fasteners.

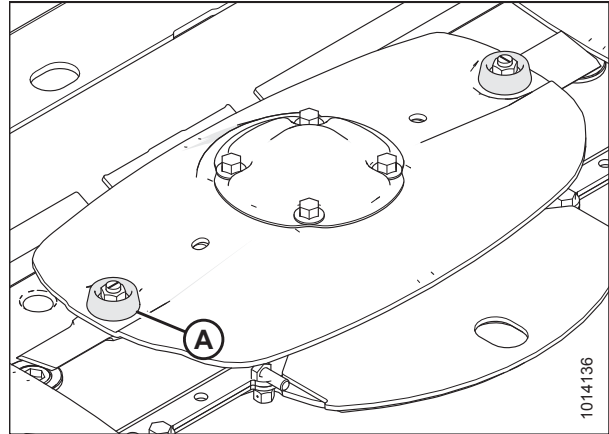


Figure 5.27: Inspecting Nut Shield

#### *Inspecting Nut Shield*

#### DANGER

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

1. Raise the header fully.
2. Stop the engine and remove the key.
3. Engage header safety props. Refer to [3.3 Engaging and Disengaging Header Safety Props, page 28](#).
4. Open the cutterbar doors. Refer to [3.5 Cutterbar Doors, page 33](#).
5. Inspect nut shields (A) and replace if severely damaged or worn.
6. Check for loose or missing fasteners and tighten or replace fastener if missing. If replacement is required, refer to [Replacing Nut Shield, page 149](#).
7. Close the cutterbar doors. Refer to [3.5 Cutterbar Doors, page 33](#).

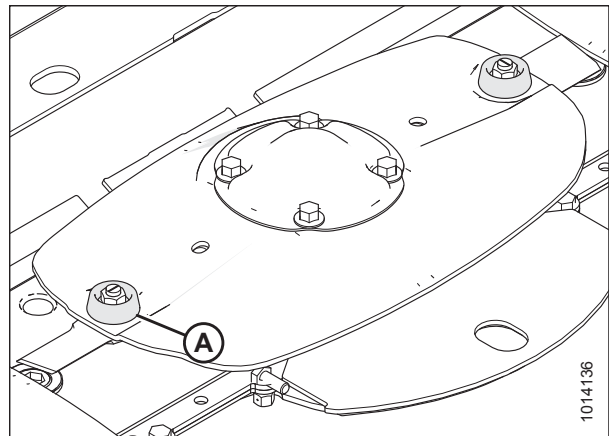


Figure 5.28: Inspecting Nut Shield

### Replacing Nut Shield

#### DANGER

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

1. Raise the header fully.
2. Stop the engine and remove the key.
3. Engage header safety props. Refer to [3.3 Engaging and Disengaging Header Safety Props, page 28](#).
4. Open the cutterbar doors. Refer to [3.5 Cutterbar Doors, page 33](#).
5. Remove disc (C). Refer to [5.3.3 Removing a Cutterbar Disc, page 138](#).
6. Remove nut shield by loosening nut (A) and removing nut shield (B) from disc (C).

#### IMPORTANT:

Do NOT remove cutterblade bolt unless it or the blade is being replaced.

7. Locate new nut shield (B) on disc (C) and align with existing cutterblade bolt. Install nut (A).
8. Tighten nut. Torque to 135 Nm (100 lbf-ft).
9. Reinstall disc (D) on spindle. Refer to [5.3.4 Installing a Cutterbar Disc, page 139](#).
10. Remove block of wood (if used).

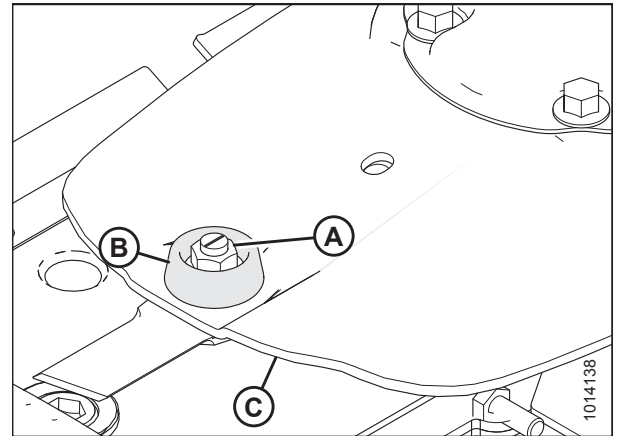


Figure 5.29: Nut Shield

#### WARNING

Ensure cutterbar is completely clear of foreign objects. These objects can be ejected with considerable force when the machine is started and may result in serious injury or machine damage.

11. Close the cutterbar doors. Refer to [3.5 Cutterbar Doors, page 33](#).

### 5.3.8 Rotary Deflectors

The rotary cage deflectors are designed to deliver the cut material from the ends of the cutterbar into the auger and to assist in maintaining an even flow of crop into the conditioner.

Rotary deflectors should be checked daily for damage or wear.

#### Inspecting Rotary Deflectors

#### DANGER

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

1. Lower the header fully.
2. Stop the engine and remove the key.

## MAINTENANCE AND SERVICING

3. Open the cutterbar doors. Refer to [3.5 Cutterbar Doors, page 33](#).
4. Check that deflectors (A) are not damaged or bent, also check for loose hardware.
5. Replace deflectors (A) if they are severely damaged or worn. Do **NOT** repair. Refer to:
  - [Removing the Driven Deflector, page 150](#)
  - [Installing the Driven Deflector, page 151](#)
  - [Removing the Driveline Deflector, page 151](#)
  - [Installing the Driveline Deflector, page 152](#)
6. Tighten loose fasteners.

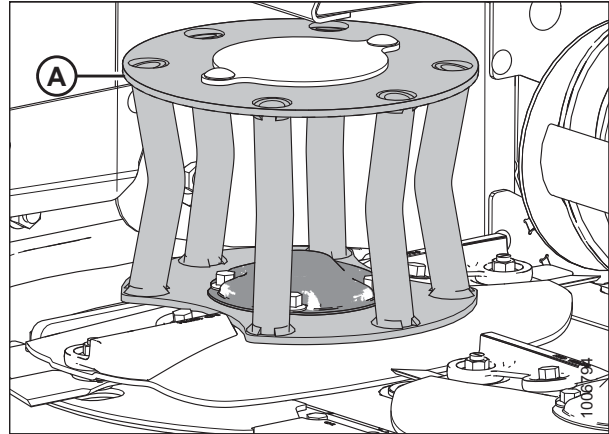


Figure 5.30: Rotary Deflector

### **WARNING**

Ensure cutterbar is completely clear of foreign objects. These objects can be ejected with considerable force when the machine is started and may result in serious injury or machine damage.

7. Close the cutterbar doors. Refer to [3.5 Cutterbar Doors, page 33](#).

### *Removing the Driven Deflector*

Follow these steps to replace the driven rotary deflector:

### **DANGER**

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

1. Lower the header fully.
2. Stop the engine and remove the key.
3. Open the cutterbar doors. Refer to [3.5 Cutterbar Doors, page 33](#).
4. Remove four bolts (A).
5. Remove cover (B) and deflector (C).

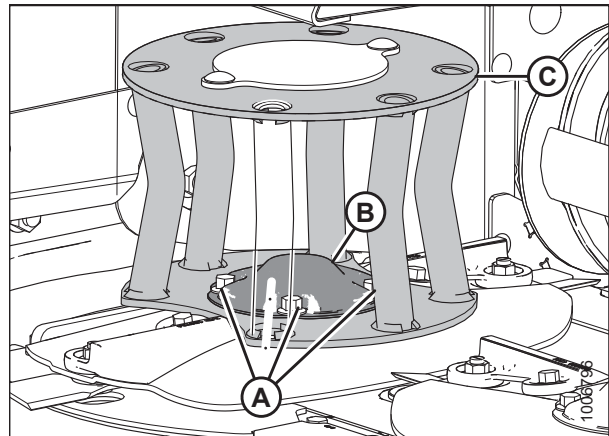


Figure 5.31: Driven Deflector

## *Installing the Driven Deflector*

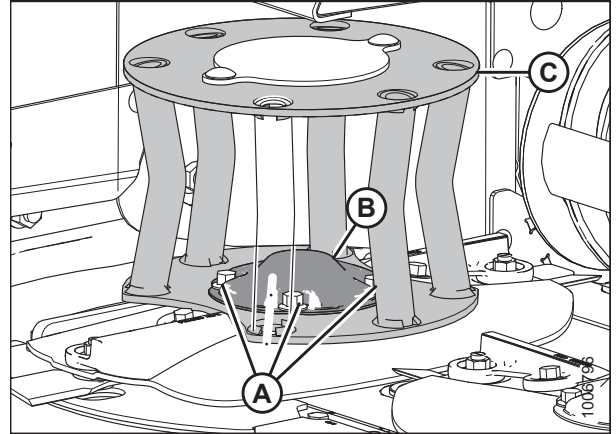
Follow these steps to replace the driven rotary deflector:

1. Position new deflector (C) on spindle so that it clears accelerators (D).
2. Install cover (B) and secure with four bolts (A).
3. Tighten bolts.
4. Remove block of wood (if used).



### **WARNING**

**Ensure cutterbar is completely clear of foreign objects. These objects can be ejected with considerable force when the machine is started and may result in serious injury or machine damage.**



**Figure 5.32: Driven Deflector**

## *Removing the Driveline Deflector*

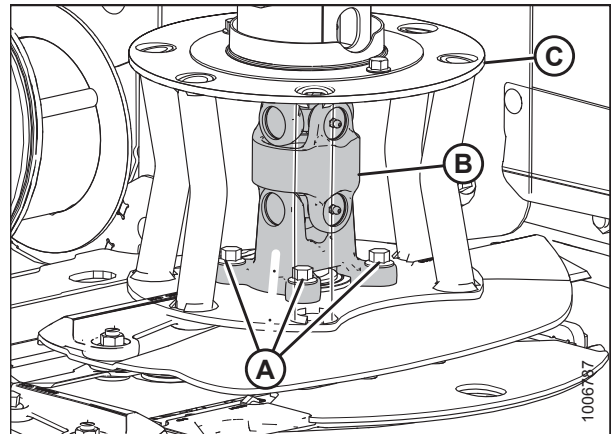
Follow these steps to remove the driveline deflector:



### **DANGER**

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

1. Lower the header fully.
2. Stop the engine and remove the key.
3. Open the cutterbar doors. Refer to [3.5 Cutterbar Doors, page 33](#).
4. On the left end of the cutterbar, locate deflector (C) with the driveline in the center of it.
5. Remove four bolts (A) and flat washers that secure driveline (B) and disc to the spindle.
6. Rotate deflector (C) as required so the large opening in deflector faces you.
7. Remove driveline (B) through the larger opening in the deflector.



**Figure 5.33: Driveline Deflector**

## MAINTENANCE AND SERVICING

8. Loosen four bolts (A) in the two plates (B) that hold upper driveline shield (C) in place.
9. Move plates (B) so that shield (C) can be lowered into deflector (D).
10. Remove deflector (D).

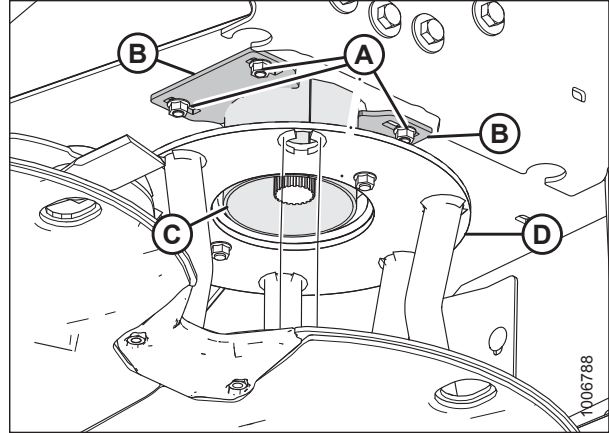


Figure 5.34: Driveline Deflector

### *Installing the Driveline Deflector*

Follow these steps to install the driveline deflector:

1. Position deflector (D) and upper driveline shield onto spindle.
2. Raise upper driveline shield (C) into position and slide plates (B) into slots in shield. Do not tighten bolts.

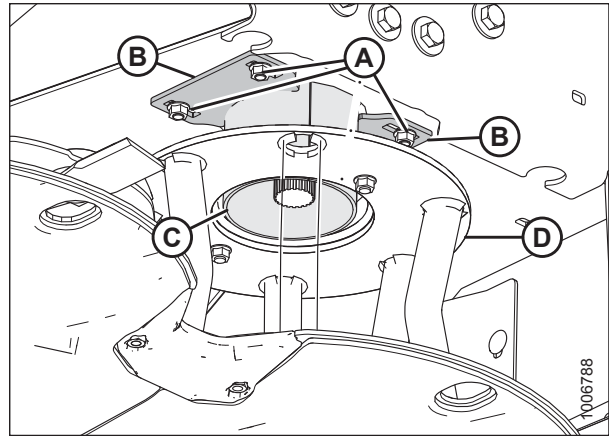


Figure 5.35: Driveline Deflector

3. Insert driveline (B) into deflector (C) and install onto shaft. Ensure that driveline (B) grease zerks will be accessible through large opening in deflector.
4. Align mounting holes in deflector (C), spindle, and driveline (B) and reinstall four bolts (A). Tighten bolts.
5. Adjust the upper driveline shield to achieve consistent gap around deflector shield (C).

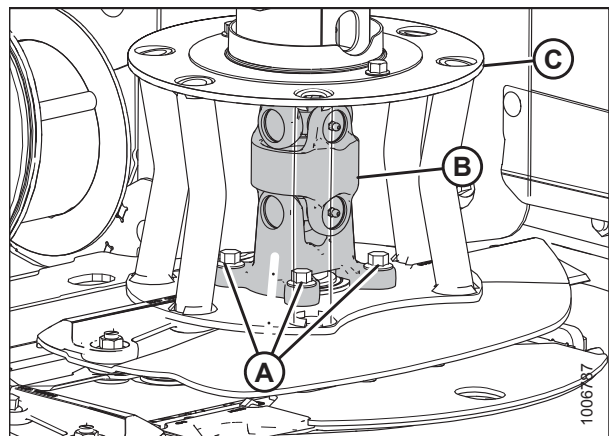


Figure 5.36: Driveline Deflector

6. Tighten bolts (A) on shield plates (B).
7. Remove block of wood (if used).
8. Manually rotate discs to check for interference of adjacent parts.
9. Close the cutterbar doors. Refer to [3.5 Cutterbar Doors, page 33](#).



## **WARNING**

Ensure cutterbar is completely clear of foreign objects. These objects can be ejected with considerable force when the machine is started and may result in serious injury or machine damage.

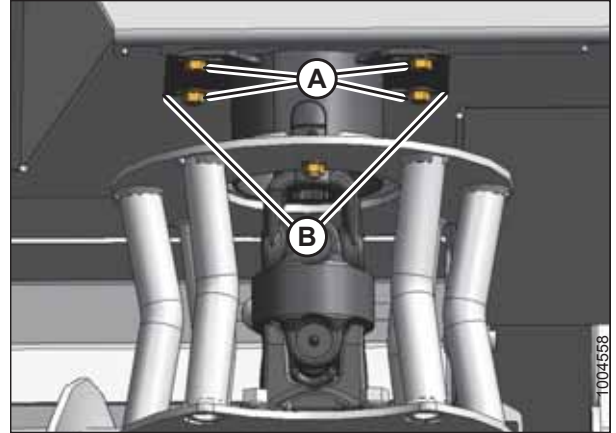


Figure 5.37: Driveline Deflector

## **5.3.9 Disc Spindles**

To avoid damaging the cutterbar and its drive systems, each disc is attached to a spindle which incorporates a key that shears if the disc contacts a large stone, a stump, or other large object. In the event of a sheared key, the disc stops rotating, but remains attached to the spindle.

### *Replacing a Spindle Key*

Follow these steps to replace a spindle key:



## **DANGER**

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

### **NOTE:**

Short spindle assembly shown in this procedure. The procedure for replacing a tall spindle is identical.

1. Lower the header fully.
2. Stop the engine and remove key.
3. Open cutterbar doors. Refer to [3.5 Cutterbar Doors, page 33](#).



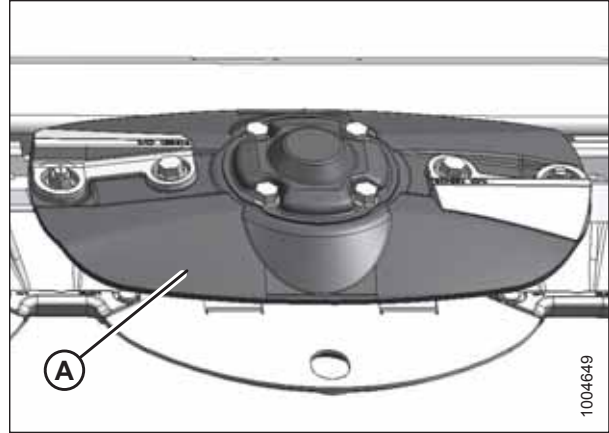
## **CAUTION**

Cutterblades have two cutting edges. Exercise caution when working around the blades. Blades are sharp and can cause serious injury. Wear gloves when handling blades.



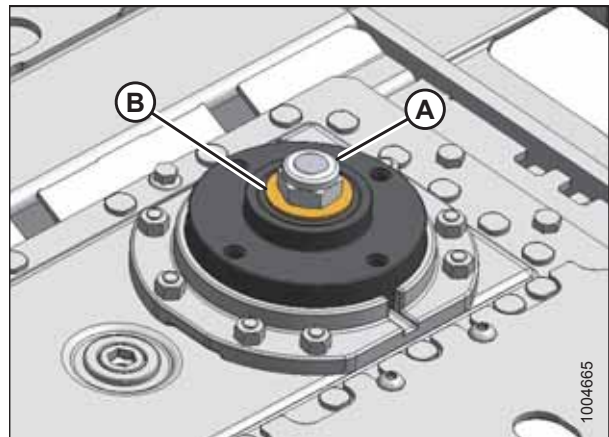
## MAINTENANCE AND SERVICING

4. Remove cutter disc (A) from failed spindle. Refer to [5.3.3 Removing a Cutterbar Disc, page 138](#).



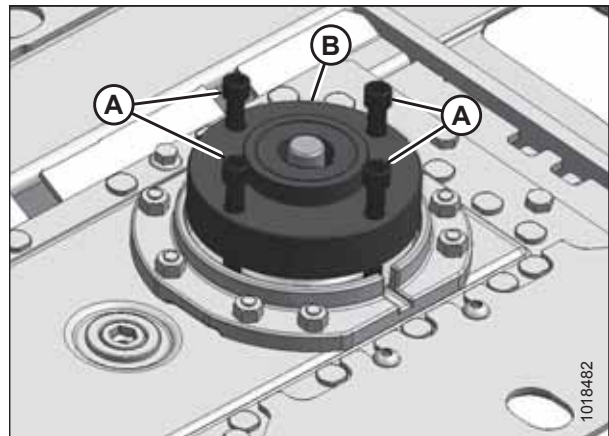
**Figure 5.38: Cutter Disc**

5. Using a 34 mm socket wrench, remove nut (A) and washer (B) from spindle.



**Figure 5.39: Cutterbar Spindle Assembly (Short Spindle Shown)**

6. Install four M12 mm x 60 mm long bolts (A) into holes in disc (B).
7. Use bolts (A) as jacking screws to remove flange (B) from gear. Remove bolts from flange.



**Figure 5.40: Cutterbar Spindle Flange and Securing Bolts**

## MAINTENANCE AND SERVICING

8. Pry out failed key (A) from spindle keyway (B).
9. Thoroughly clean metal debris from disassembled components and cutterbar.

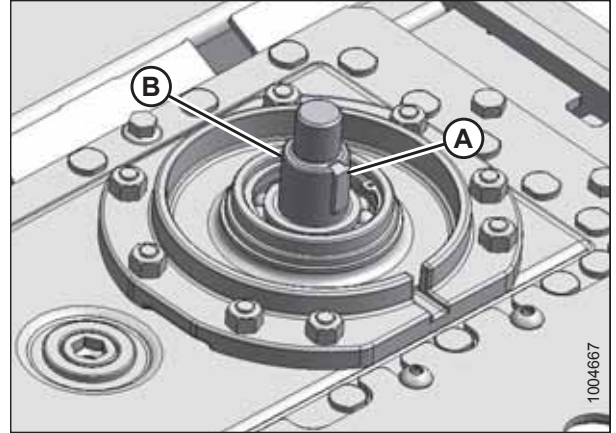


Figure 5.41: Cutterbar Spindle Keyway and Key

10. Inspect flange (C) and spindle shaft (E) for damage. If seriously damaged, replace entire spindle assembly. Contact your MacDon Dealer.
11. Install new key (D) into gear (E) keyway as shown.
12. Align keyway in disc (C) with key in gear (E) and install disc (C) onto gear until sufficient threads are exposed to install washer (B) and nut (A).

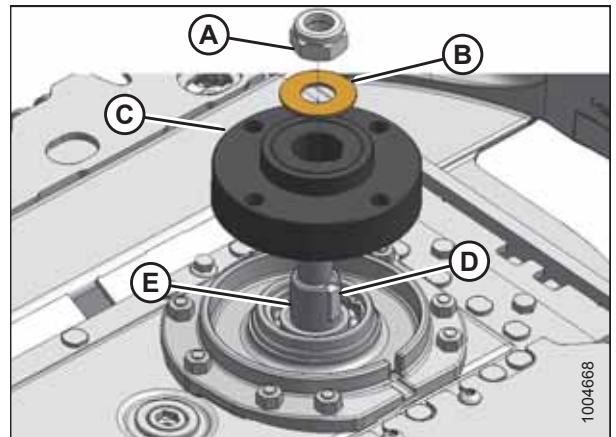


Figure 5.42: Cutterbar Spindle Assembly

13. Tighten nut (A) until flange is in final position. Torque nut to 440 Nm (325 lbf-ft).
14. Reinstall disc. Refer to [5.3.4 Installing a Cutterbar Disc, page 139](#).

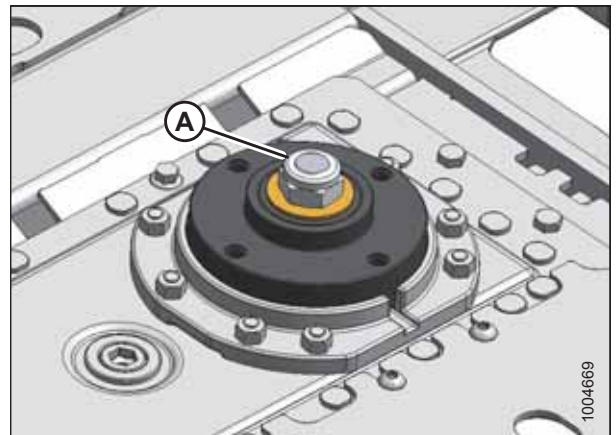


Figure 5.43: Cutterbar Spindle Assembly



## 5.3.10 Cutterbar Doors

### *Inspecting Curtains*

Replace the curtains if they should become worn or damaged. Contact your Dealer for replacement instructions.

### *Inspecting Door Latches: North American Header*

The cutterbar door latches should operate smoothly and remain engaged when the doors are open. The door latch should pivot on its hinge bolt and should engage the securing pin when the cutterbar doors are opened. Adjustment of these door latches is not usually required.

### *Inspecting Door Latches: Export Header*

The cutterbar door latches should operate smoothly and remain engaged when the doors are down. Tighten latch hardware if loose. If the rubber bushing is damaged or does not allow the latch to operate properly, the latch should be replaced.

### *Adjusting Door Latches: Export Header*

Follow these steps to adjust the door latches:

### **DANGER**

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

1. Turn off the windrower's engine and remove the key from the ignition.
2. Unlatch and lift the curtain.
3. Loosen bolts (A) and move latch assembly to position as shown so that latch (B) engages pin.
4. Tighten bolts (A).
5. If necessary, loosen nut (C) and rotate latch (B) to position as shown.
6. Tighten nut (C).

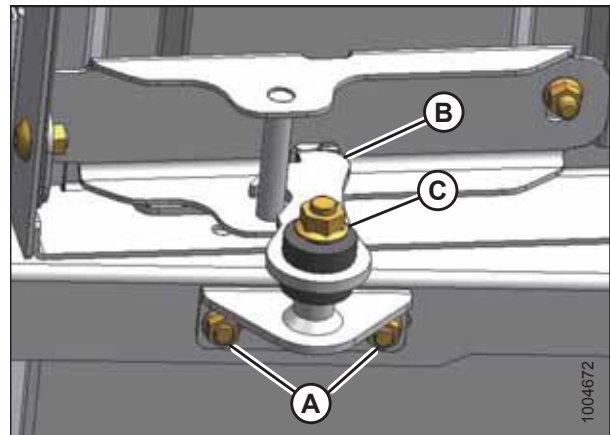


Figure 5.44: Cutterbar Door Latch

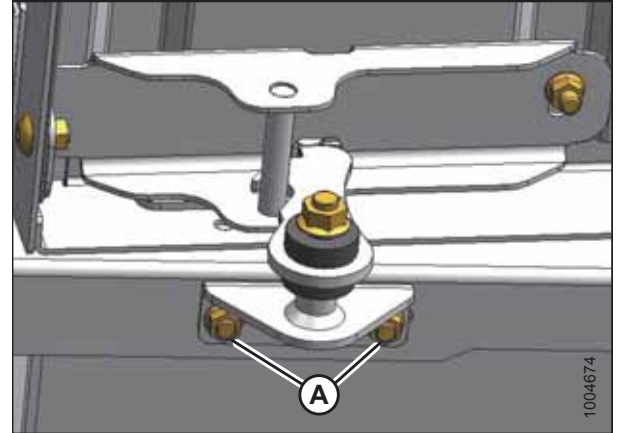
## *Replacing Door Latches: Export Header*

To replace cutterbar door latches, follow these steps:

### **! DANGER**

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

1. Turn off the windrower's engine and remove the key from ignition.
2. Unlatch and lift the curtain.
3. Remove bolts (A) and remove latch assembly from frame.
4. Locate new latch assembly on frame and reinstall bolts (A).
5. Adjust to position shown and tighten bolts (A).



**Figure 5.45: Cutterbar Door Latch**

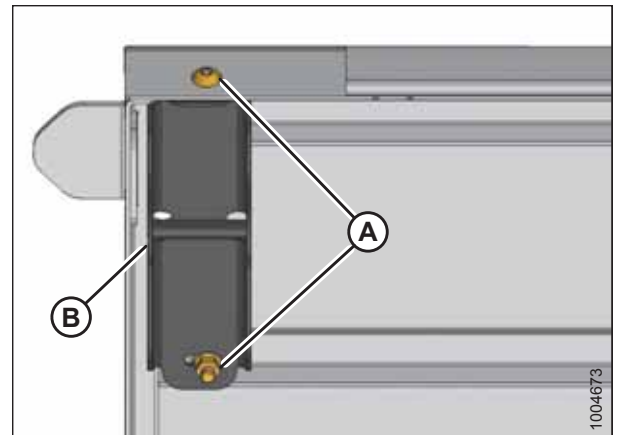
## *Replacing Door Latch Brackets: Export Header*

To replace the cutterbar door latch brackets, follow these steps:

### **! DANGER**

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

1. Turn off the windrower's engine and remove key from ignition.
2. Open cutterbar door.
3. Remove bolts (A), washers, and nuts, and remove latch bracket (B) from door.
4. Locate new latch bracket (B) on door and reinstall bolts (A), washers, and nuts. Use three washers on aft bolt as spacers between bracket (B) and door.
5. Close door and check alignment with latch. Adjust as necessary and tighten bolts (A).



**Figure 5.46: Latch Bracket**

## 5.4 Drive Systems

### 5.4.1 Bevel Gearbox

The bevel gearbox (A), which transfers power from the hydraulic motor to the header drives, is located inside the drive compartment at the left end of the header.

If repairs are required, the gearbox should be removed and serviced at your Dealer.

The only regular servicing required is maintaining the lubricant level and changing the lubricant according to the intervals specified in this manual. Refer to [5.2.1 Maintenance Schedule/Record, page 122](#).

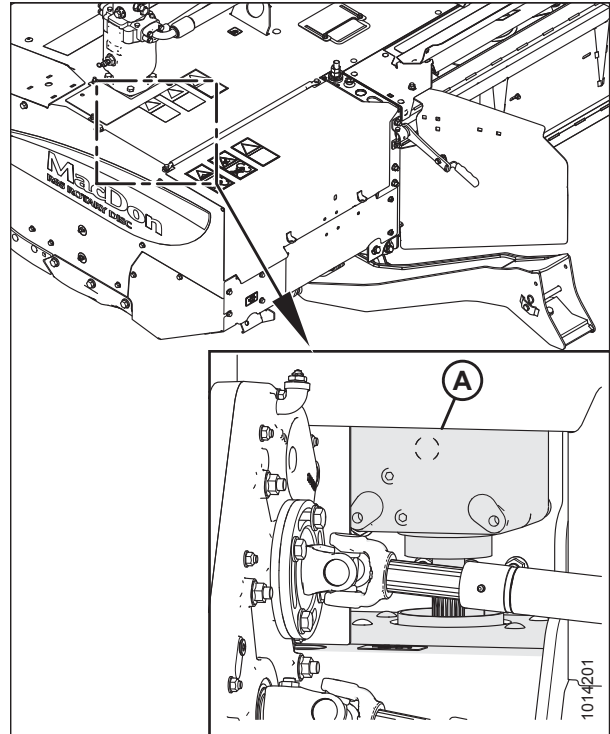


Figure 5.47: Bevel Gearbox

#### *Changing the Bevel Gearbox Lubricant*

Follow these steps to change the bevel gearbox lubricant:

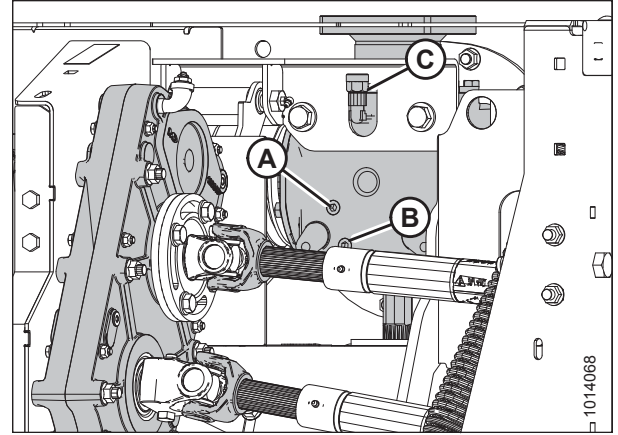


#### **DANGER**

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

1. If the lubricant is cold, idle the machine for about 10 minutes to warm the lubricant.
2. Raise the header fully.
3. Stop the engine and remove the key.
4. Engage header safety props. Refer to [3.3 Engaging and Disengaging Header Safety Props, page 28](#).
5. Open the driveshield. Refer to [3.4 Driveshields, page 30](#).

6. Place a suitably sized container under drain plug (B). Refer to the inside back cover for gearbox capacity.
7. Remove plugs (A) and (B).
8. Allow sufficient time for lubricant to drain.
9. Disengage header safety props. Refer to [3.3 Engaging and Disengaging Header Safety Props, page 28](#).
10. Start the engine, and lower the header until the gearbox is level with the ground.
11. Stop the engine and remove the key.
12. Install plug (B).
13. Remove breather from filler elbow (C).
14. Add gear lubricant to gearbox through port (A). Lubricant should slightly run out of port (A) when at the proper level. Refer to for quantity and specification.
15. Install plug (A) and breather (C), and tighten.
16. Properly dispose of used lubricant and clean up any spilled lubricant.
17. Close the driveshield. Refer to [3.4 Driveshields, page 30](#).



**Figure 5.48: Bevel Gearbox**

### 5.4.2 Conditioner Drive Belt

The conditioner drive belt is located inside the left driveshield. The tension is factory-set and should not require adjustment.

#### *Inspecting the Conditioner Drive Belt*

Check the belt tension and inspect for damage or wear every 100 hours or annually (preferably before the start of the cutting season).

#### **DANGER**

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

1. Lower the header fully.
2. Stop the engine and remove the key.
3. Open the driveshield. Refer to [3.4 Driveshields, page 30](#).

## MAINTENANCE AND SERVICING

4. Inspect condition of belt (A). Replace if damaged or showing signs of cracking or separation.
5. Check that adjuster nut (B) is tight.
6. Check that end of slots (C) are aligned with plate (D).
7. If necessary, adjust tension as follows:
  - a. Loosen jam nut (E).
  - b. Turn adjuster nut (B) until end of slots (C) are aligned with plate (D).
  - c. Tighten jam nut (E).
8. Close the driveshield. Refer to [3.4 Driveshields, page 30](#).

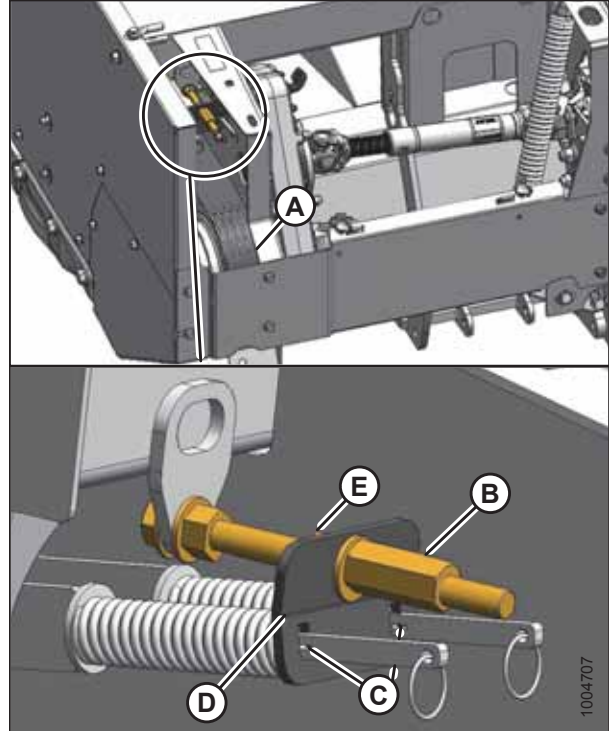


Figure 5.49: Conditioner Drive Belt Adjuster

### Replacing the Conditioner Drive Belt

#### DANGER

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

1. Lower the header fully.
2. Stop the engine and remove the key.
3. Open the driveshield. Refer to [3.4 Driveshields, page 30](#).
4. Remove auger drive belts (A). Refer to [Replacing the Auger Drive Belts, page 167](#).

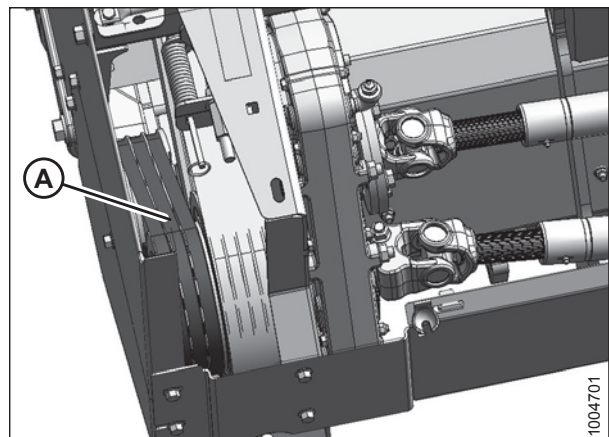


Figure 5.50: Drive Belts (Left Side)

## MAINTENANCE AND SERVICING

5. Turn adjuster nut (A) counterclockwise until springs are loose and there is no tension on belt (B).

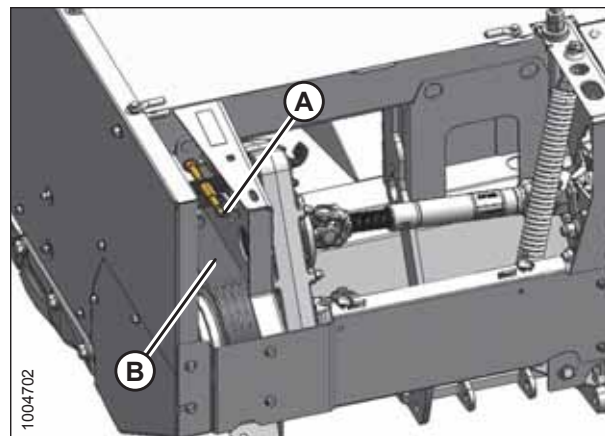


Figure 5.51: Drive Belts (Left Side)

6. Remove conditioner drive belt (A).
7. Install new conditioner drive belt (A) onto pulleys ensuring it is in the pulley grooves.
8. Tension conditioner drive belt (A). Refer to [Inspecting the Conditioner Drive Belt, page 159](#).
9. Install and tension auger drive belts. Refer to [Replacing the Auger Drive Belts, page 167](#).
10. Close the driveshield. Refer to [3.4 Driveshields, page 30](#).

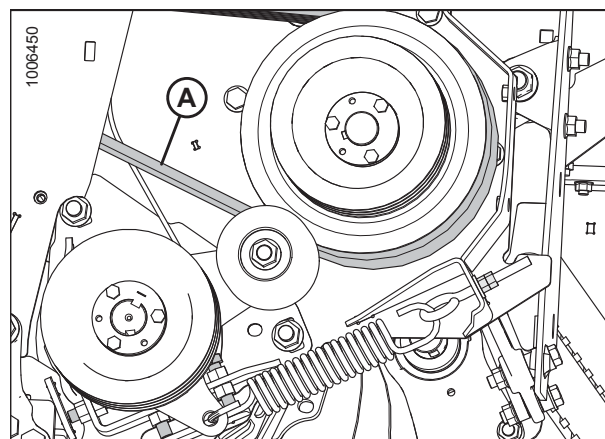


Figure 5.52: Drive Belts (Left Side)



### 5.4.3 Conditioner Gearbox

The conditioner gearbox (A), which transfers power from the bevel gearbox to the conditioner rolls and to the overshoot auger, is located inside the drive compartment at the left end of the header.

If repairs are required, the conditioner gearbox should be removed and serviced at your MacDon Dealer.

The only regular servicing required is maintaining the lubricant level and changing the lubricant according to the intervals specified in this manual. Refer to [5.2.1 Maintenance Schedule/Record, page 122](#).

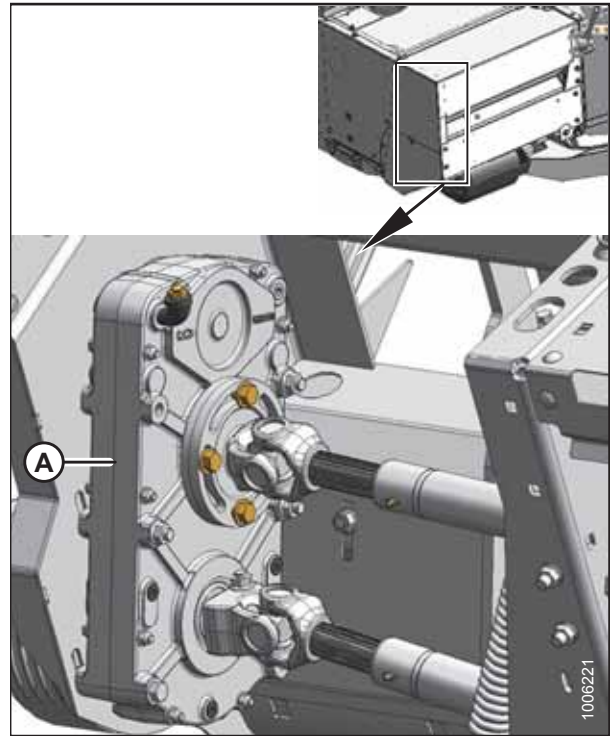


Figure 5.53: Conditioner Gearbox

#### *Changing the Conditioner Gearbox Lubricant*

Follow these steps to change the conditioner gearbox lubricant:

#### **⚠ DANGER**

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

1. If the lubricant is cold, idle the machine for about 10 minutes to warm the lubricant.
2. Angle the header until gearbox (A) is level to the ground (B). Refer to [4.6 Header Angle, page 97](#) for the adjustment procedure.
3. Stop the engine and remove the key.
4. Engage header safety props. Refer to [3.3 Engaging and Disengaging Header Safety Props, page 28](#).

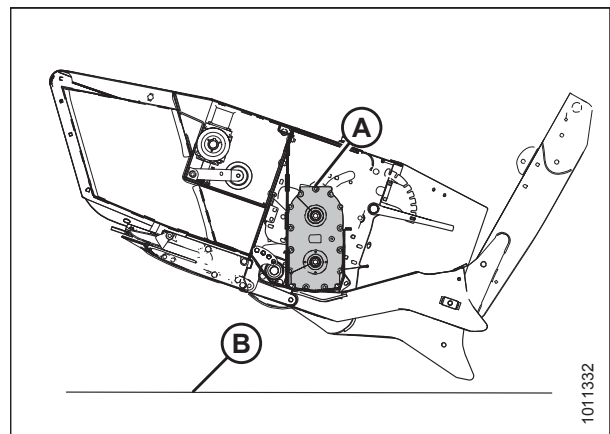


Figure 5.54: Conditioner Gearbox Orientation

## MAINTENANCE AND SERVICING

5. Open the driveshield. Refer to [3.4 Driveshields, page 30](#).

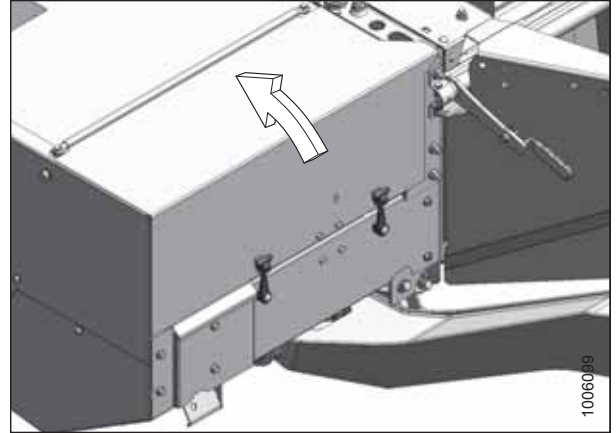


Figure 5.55: Driveshield

6. Place a suitable container under drain plug (A). Refer to the inside back cover for conditioner gearbox lubricant capacity.
7. Remove plugs (A) and (B).
8. Allow sufficient time for lubricant to drain.
9. Replace plug (A) and tighten.

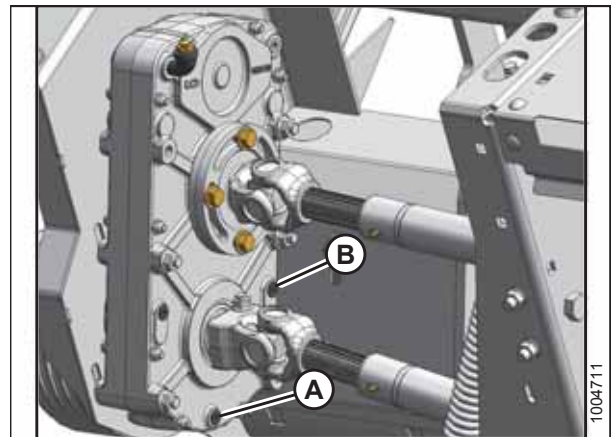


Figure 5.56: Conditioner Gearbox

10. Remove breather and bushing (A) at filler pipe (B).
11. Add gear lubricant to gearbox through filler pipe (B). Refer to for specification.

**NOTE:**

To check the lubricant level, tilt the header so the top of the gearbox is level with the ground. Lubricant should run out of port (C) slightly when at the proper level.

12. Reinstall plug (C) and tighten.
13. Reinstall bushing and breather (A) in filler pipe (B) and tighten.
14. Properly dispose of used lubricant and clean up any spilled lubricant.
15. Close the driveshield. Refer to [3.4 Driveshields, page 30](#).

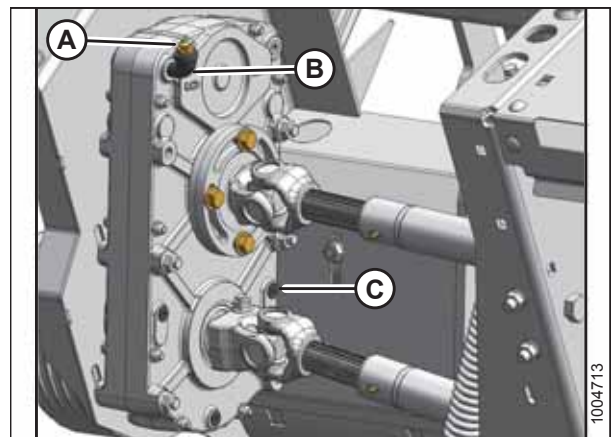


Figure 5.57: Conditioner Gearbox



## 5.4.4 Header Drive Speed Sensor

The header drive speed sensor monitors the rotational speed of the bevel gearbox pulley and sends a signal to the system monitor in the windrower cab to display disc speed.

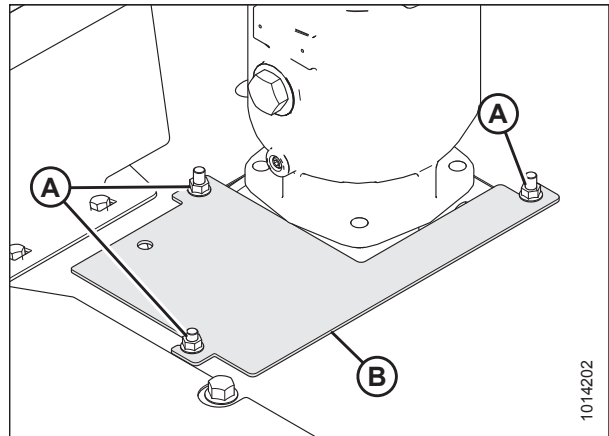
The sensor does not require regular maintenance; if it malfunctions or is damaged, it can be easily adjusted or replaced.

### *Adjusting the Header Drive Speed Sensor*

#### **! DANGER**

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

1. Lower header to ground, turn off engine, and remove key.
2. Loosen bolts (A) and slide cover (B) off opening.

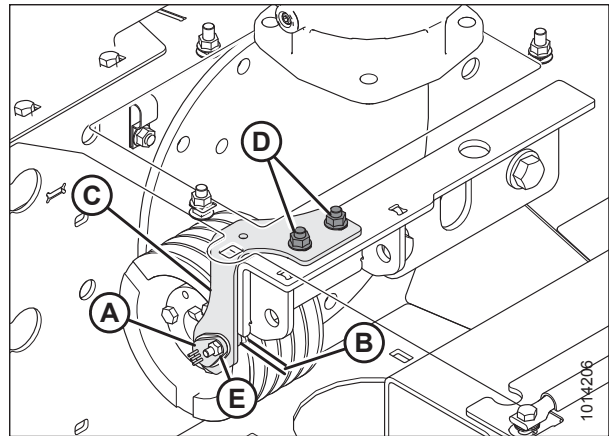


**Figure 5.58: Header Drive**

3. Check gap (B) between sensor (A) and pulley. If required, adjust gap by loosening bolts (D) and moving bracket (C) to achieve 2–3 mm (0.08–0.12 in.) gap (B). When correct gap is achieved, tighten bolts (D).
4. Check position of sensor (A). If required, adjust position by loosening bolt (E) and moving sensor to align it with rim of pulley.

**NOTE:**

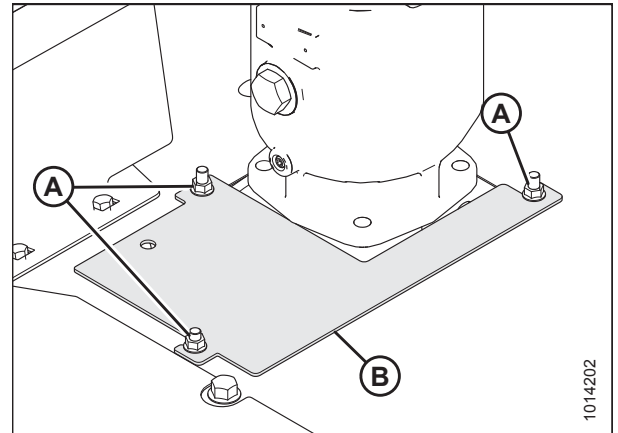
Top panel removed for clarity.



**Figure 5.59: Header Drive Speed Sensor**

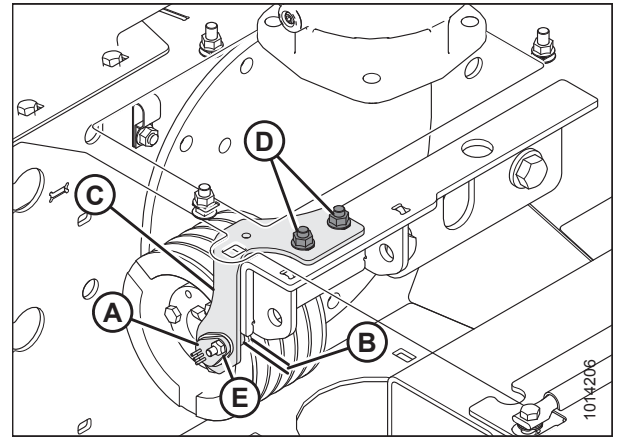
## *Replacing the Header Drive Speed Sensor*

1. Loosen bolts (A) and remove cover (B).



**Figure 5.60: Header Drive Cover**

2. Cut and remove cable tie securing harness to bracket (C).
3. Unplug sensor wire from connector (A).
4. Remove nut and bolt (E) securing sensor (A) to bracket (C) and remove sensor (A).
5. Install new sensor (A) onto bracket (C) with bolt and nut (E). Ensure sensor is aligned with the pulley rim.
6. Check that gap (B) between sensor and pulley is 0.08 in. (2 mm). Adjust as required.
7. Connect sensor wire to connector (A).
8. Secure harness to bracket with plastic tie.

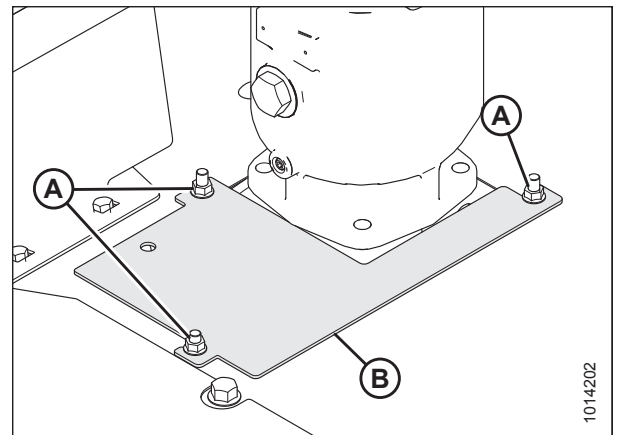


**Figure 5.61: Header Drive Speed Sensor**

**NOTE:**

Top panel removed for clarity.

9. Reinstall cover (B) and secure with bolts (A).



**Figure 5.62: Header Drive Cover**

### 5.4.5 Auger Drive Belt

The auger drive belts are located inside the drive compartment at the lower left end of the header.

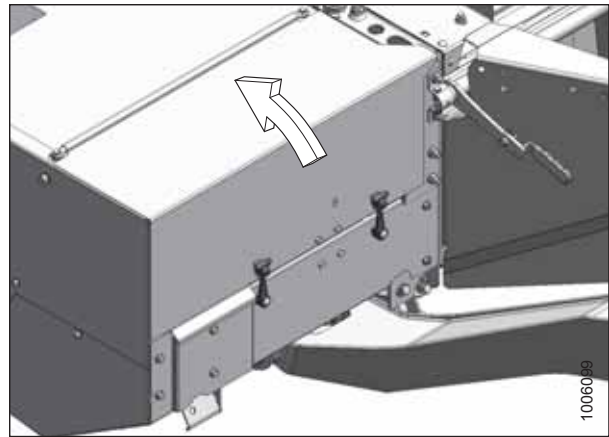
Check the belt tension and inspect for damage or wear every 100 hours or annually, preferably before the start of the cutting season.

#### *Inspecting and Adjusting the Auger Drive Belts*

#### **DANGER**

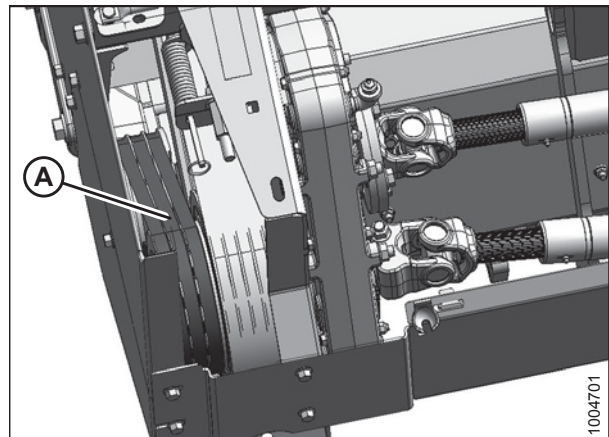
**To avoid bodily injury or death from unexpected startup of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.**

1. Lower the header to the ground, stop the engine and remove the key.
2. Open the driveshield. Refer to [3.4 Driveshields, page 30](#).



**Figure 5.63: Driveshield**

3. Check condition of auger drive belts (A). If severely worn or damaged, replace them. Refer to [Replacing the Auger Drive Belts, page 167](#).
4. Raise the header fully.
5. Stop the engine and remove the key.
6. Engage header safety props. Refer to [3.3 Engaging and Disengaging Header Safety Props, page 28](#).



**Figure 5.64: Auger Drive Belts**

## MAINTENANCE AND SERVICING

7. To check the belt tension, spring (A) length should measure 262 mm (10.3 in.) (B). If necessary, adjust belt tension as follows:
  - a. Loosen jam nut (C).
  - b. Adjust eye bolt with adjuster bolt (D) until spring length (B) is achieved.
  - c. Tighten jam nut (C).

**NOTE:**

Edge of eye bolt to jam nut (E) should measure 41 mm (1.6 in.).

8. Close the driveshield. Refer to [3.4 Driveshields, page 30](#).

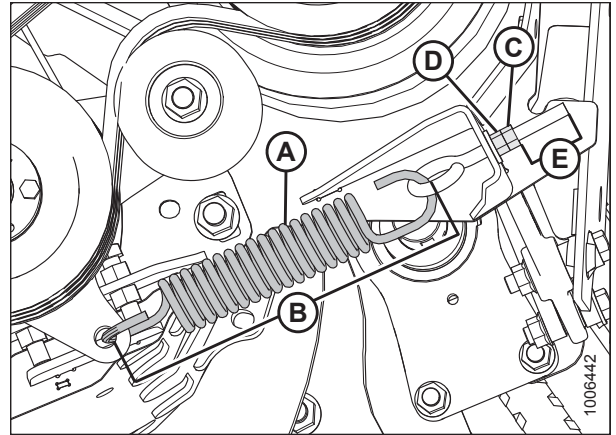


Figure 5.65: Belt Tension Spring

### Replacing the Auger Drive Belts

Follow these steps to replace the auger drive belts:



### **DANGER**

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

1. Raise the header fully.
2. Stop the engine and remove the key.
3. Engage header safety props. Refer to [3.3 Engaging and Disengaging Header Safety Props, page 28](#).
4. Open the driveshield. Refer to [3.4 Driveshields, page 30](#).
5. Remove/loosen four bolts (A) and remove cover (B).

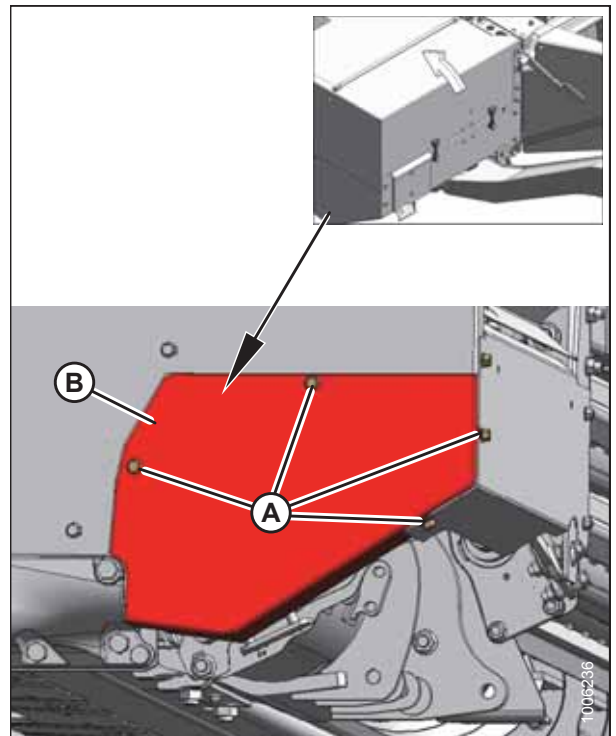


Figure 5.66: Drive Cover

## MAINTENANCE AND SERVICING

6. Loosen jam nut (A) to release tension on auger drive belts (B).
7. Remove all three belts.

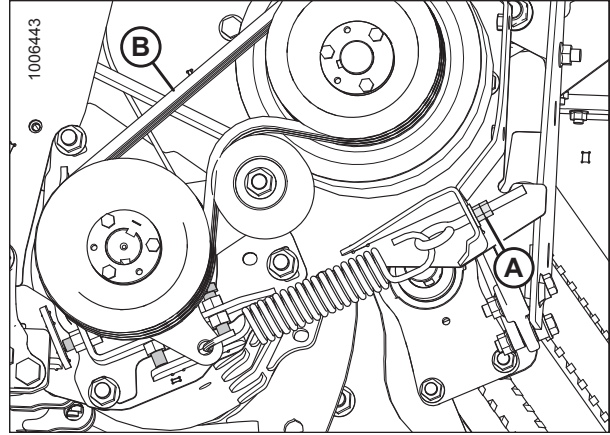


Figure 5.67: Auger Drive Belts

8. Install belts (A) on the pulleys. Ensure they are seated the pulley grooves.
9. Check alignment of belts on pulleys. Belts must not overhang the edge of idler pulley (B). Contact your MacDon Dealer if pulleys need realigning.

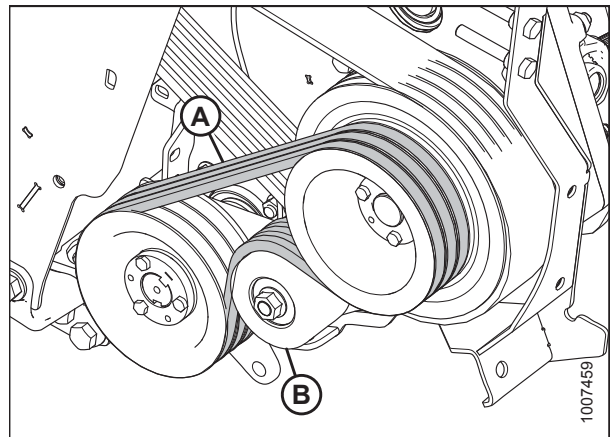


Figure 5.68: Auger Drive Belts

10. Tension the belts (B) with adjuster nuts (A). Refer to [Inspecting and Adjusting the Auger Drive Belts, page 166](#).

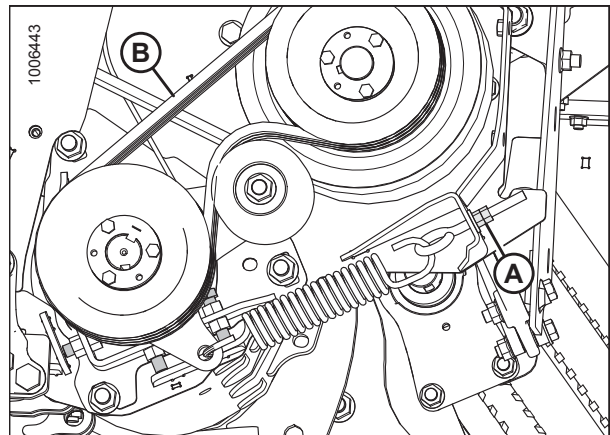


Figure 5.69: Auger Drive Belts

11. Reinstall cover (B) with bolts (A).
12. Close the driveshield. Refer to [3.4 Driveshields, page 30](#).
13. Adjust the tension of new belts after a short break-in period (about 5 hours).

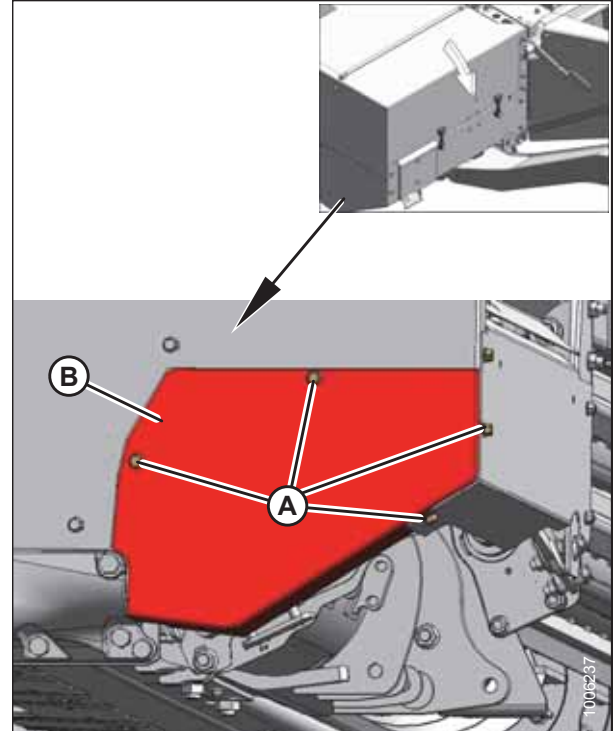


Figure 5.70: Drive Cover – SP

### 5.4.6 Installing Sealed Bearings

Follow these steps to install sealed bearings:

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.

**NOTE:**

The collar should be locked in the same direction the shaft rotates. Tighten the setscrew in the collar.

5. Tighten the flangette bolts.
6. Loosen the flangette bolts on the mating bearing one turn and retighten. This will allow the bearing to line up.

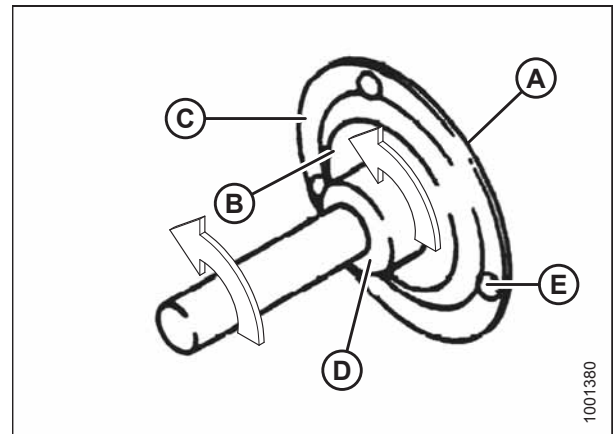


Figure 5.71: Sealed Bearing



## 5.5 Hydraulics

Refer to your windrower operator's manual for hydraulic system maintenance procedures.

### 5.5.1 Hydraulic Motor

The hydraulic motor does not require regular maintenance or servicing. If repairs are required, it should be serviced by your Dealer.

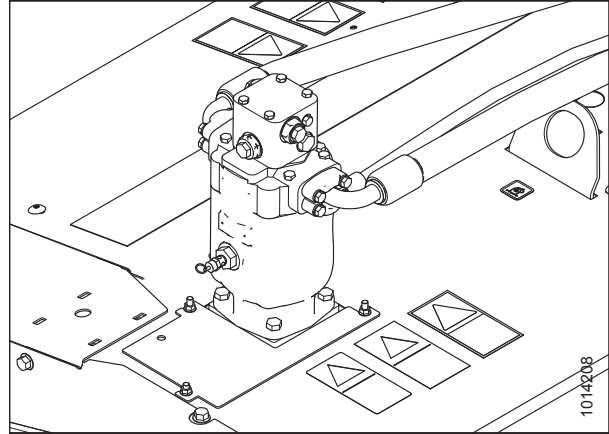


Figure 5.72: Hydraulic Motor

#### *Removing the Hydraulic Motor*

Follow these steps to remove the hydraulic motor:



#### **DANGER**

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

1. If the machine is connected to a windrower, lower to ground.
2. Stop the engine, and remove the key.
3. Disconnect case drain hose (A) from motor (B).
4. Disconnect pressure and return hoses at fittings (C).

#### **IMPORTANT:**

To protect the motor from contamination and prevent spillage of excess fluid, install caps and plugs on open fittings and hoses.

5. Remove four bolts (D).
6. Use a sling and a lifting device to remove the motor.

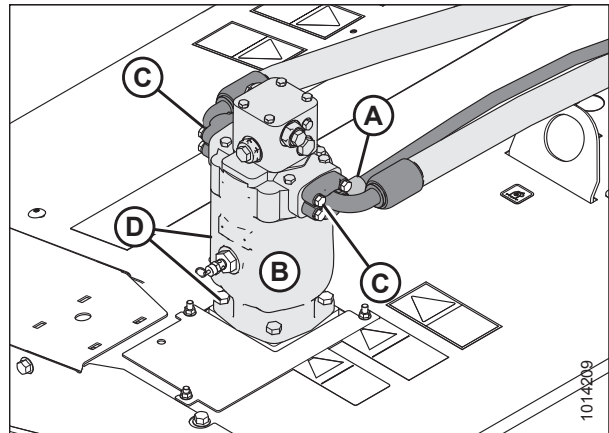


Figure 5.73: Hydraulic Motor

## MAINTENANCE AND SERVICING

7. Cover gearbox opening (A) with a rag or plastic.

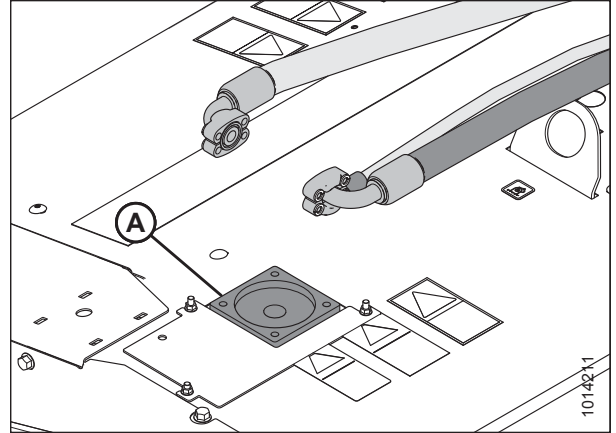


Figure 5.74: Hydraulic Motor Removed

### *Installing the Hydraulic Motor*

Follow these steps to install the hydraulic motor:

1. Remove covering from gearbox opening (A).
2. Attach a sling to the motor with the opposite end to a lifting device.

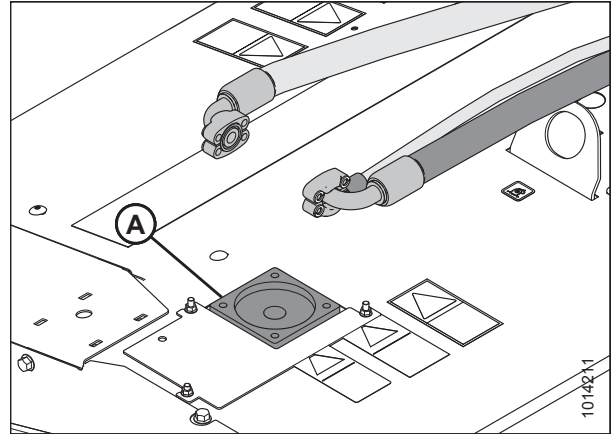


Figure 5.75: Hydraulic Motor Removed

3. Lower motor (B) on gearbox opening.
4. Install four bolts (D) and torque to 140 Nm (103 lbf·ft).
5. Remove caps from motor ports and hoses.
6. Connect case drain hose (A) to motor.
7. Connect hoses (C) to motor (B) with split flanges (E) and torque to 64–77 Nm (47–57 lbf·ft).

**NOTE:**

Hydraulic connections vary depending on the windrower. Refer to the specific instruction supplied with your hydraulic drive kit.

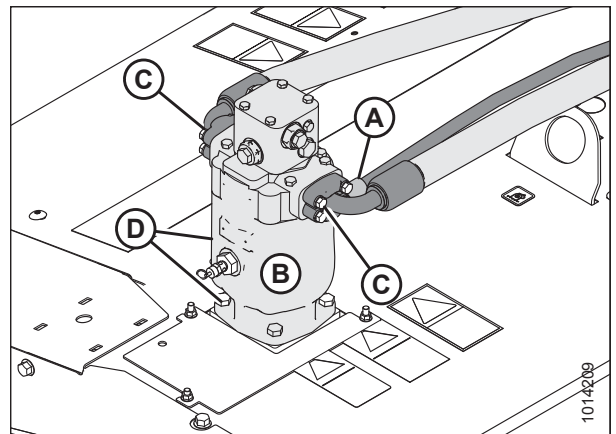


Figure 5.76: Hydraulic Motor: 16-foot



## 5.5.2 Hydraulic Hoses and Lines

Check hydraulic hoses and lines daily for signs of leaks.

### WARNING

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



Figure 5.77: Hydraulic Pressure Hazard

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

### IMPORTANT:

Keep hydraulic coupler tips and connectors clean. Allowing dust, dirt, water, or foreign material to enter the system is the major cause of hydraulic system damage. Do **NOT** attempt to service hydraulic systems in the field. Precision fits require a perfectly clean connection during overhaul.

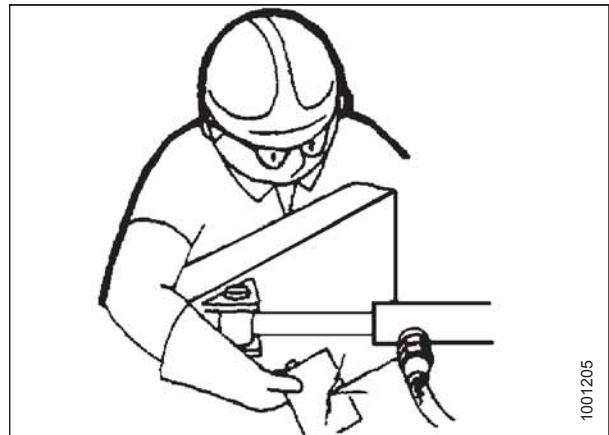


Figure 5.78: Testing for Hydraulic Leaks

## 5.6 Electrical System

Use electrical tape and wire clips as required to prevent wires from dragging or rubbing.

Keep lights clean and replace defective bulbs.

### 5.6.1 Hazard Lights

#### *Replacing Amber Hazard/Signal Bulb*

1. Remove two Phillips screws (A) from fixture, and remove the plastic lens.
2. Replace bulb, and reinstall plastic lens and screws.
  - Bulb—Trade #1157

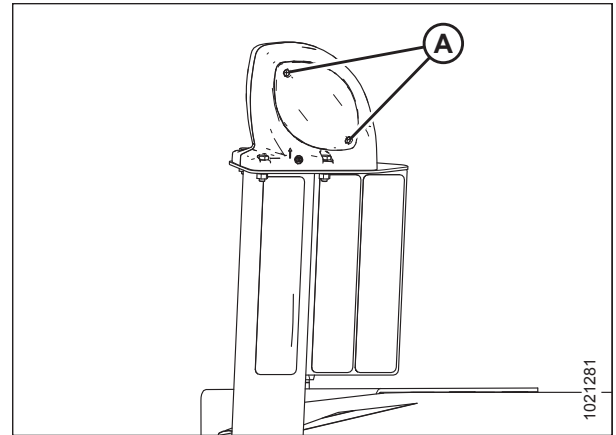


Figure 5.79: Plastic Lens and Screws

#### *Replacing Amber Hazard/Signal Light Fixture*

1. Remove four nuts (A) (only three shown) securing light to bracket and remove light. Disconnect light from electrical harness.
2. Connect new light to the electrical harness
3. Install four nuts (A) and tighten.

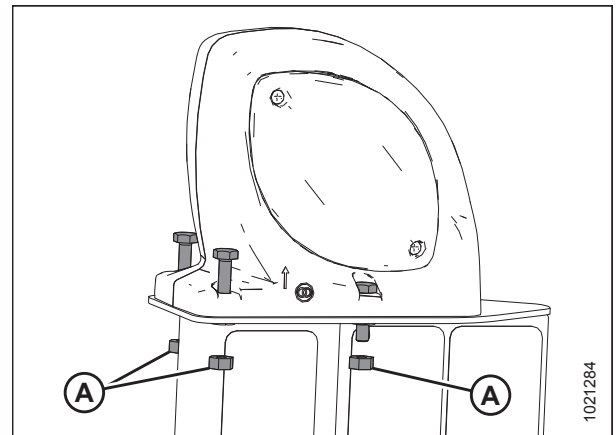


Figure 5.80: Amber Hazard Light



## 6 Options and Attachments

### 6.1 Options and Attachments: Kits

The following kits are available through your MacDon Dealer. The Dealer will require the “B” number for pricing and availability.

#### 6.1.1 Adjustable Skid Shoe Kit

The skid shoe kit installs at either end of the cutterbar. The shoes can be adjusted for varying cutting height. The kit includes two skid shoe assemblies, attachment hardware, and installation instructions.

MD #B5660

Instruction part number: MD #169972

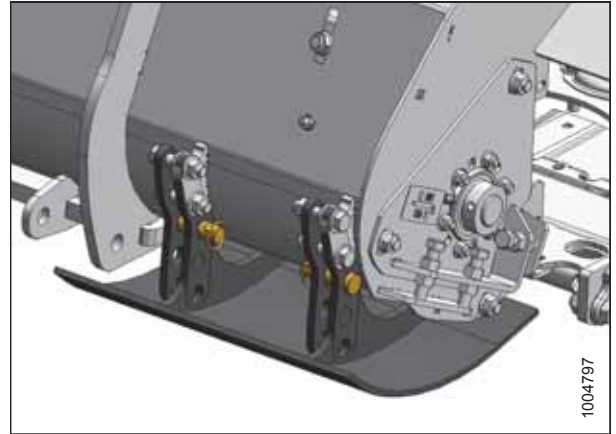


Figure 6.1: MD #B5660

#### 6.1.2 Cutterbar Repair Tool Kit

The cutterbar repair tool kit contains the tools required to replace the cutterbar idler gears.

MD #B4905

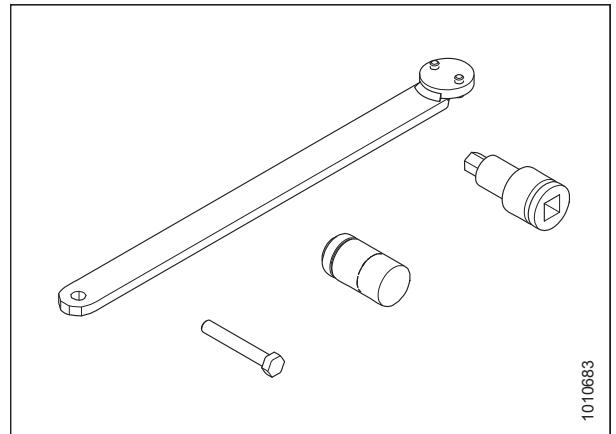


Figure 6.2: MD #B4905

## OPTIONS AND ATTACHMENTS

### 6.1.3 Double Windrow Attachment (DWA)

Allows headers to lay a double windrow when installed on a self-propelled windrower. The kit includes a draper deck, linkage assembly, hydraulics, and installation instructions.

#### **M205**

MD #C1987 consists of:

- MD #B4655 Deck
- MD #B5270 Linkage assembly
- MD #B5301 Hydraulic kit
- Double Windrow Attachment (DWA) manual

#### **M1240**

MD #C2006 consists of:

- MD #B5973 Deck
- MD #B5974 Mounting frame, and hydraulic/electrical connections
- Double Windrow Attachment (DWA) manual

### 6.1.4 Gauge Roller

MD #B5650

Instruction part number: MD #169467

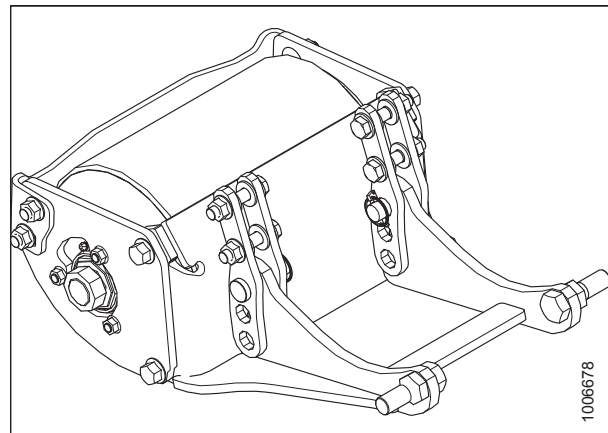


Figure 6.3: MD #B5650

### 6.1.5 Hydraulic Drive: 16-Foot for M200 Self-Propelled

MD #B5455

Instruction part number: MD #169483

## OPTIONS AND ATTACHMENTS

### 6.1.6 Tall Crop Divider Kit

The tall crop dividers attach to the ends of the header for clean crop dividing and cutterbar entry in tall crops. The kit includes left and right dividers and attachment hardware.

MD #B5509

Instruction part number: MD #169485

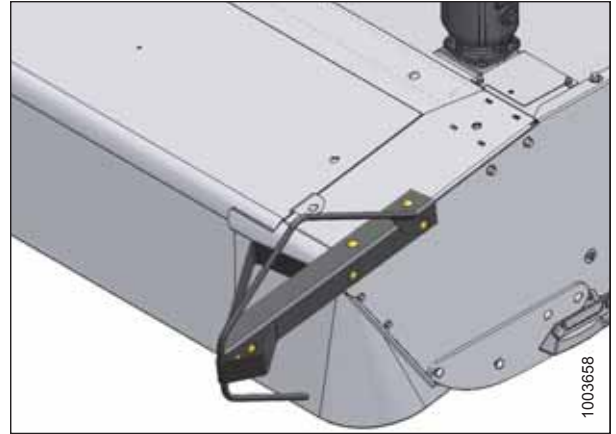


Figure 6.4: MD #B5509

### 6.1.7 Tall Crop Feed Plate Kit

The tall crop feed plates (A) assist the feeding of tall crops into the conditioner by encouraging material flow from behind the cage deflectors (B).

MD #B4903

**NOTE:**

One set is supplied standard.

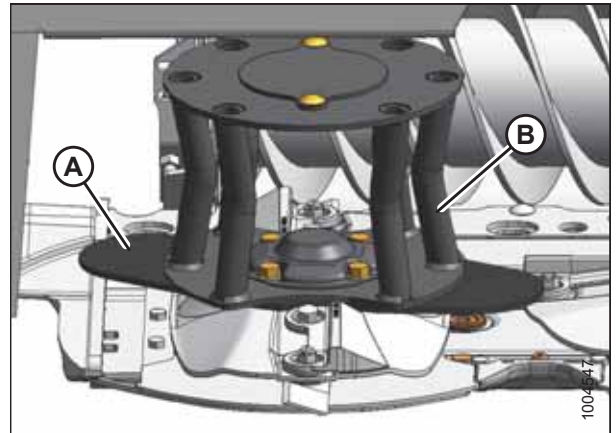


Figure 6.5: MD #B4903

## OPTIONS AND ATTACHMENTS

### 6.1.8 Solid Drums and Shields Kit

The Solid Drums and Shields kit reduces crop wrapping of the vertical shaft and improves crop feeding into the conditioners.

MD #268223

Instruction part number: MD #214191

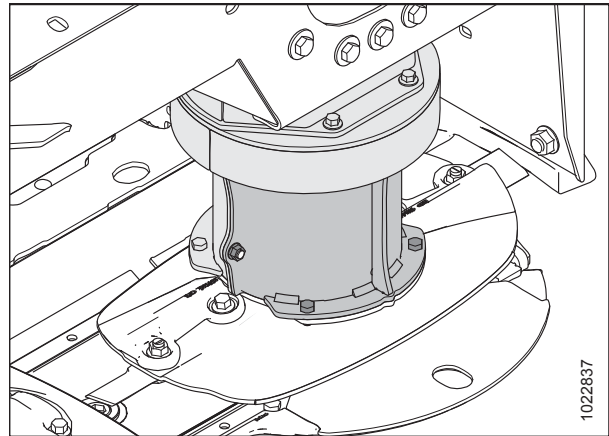


Figure 6.6: MD #268223

## 7 Troubleshooting

### 7.1 Header Performance

Symptom	Problem	Solution	Refer to
Cutterbar plugging	Dull, bent, or badly worn blades	Replace blades.	<a href="#">Replacing the Cutterblades, page 144</a>
Cutterbar plugging	Auger drive belt slipping	Adjust tension or change belts.	<a href="#">5.4.5 Auger Drive Belt, page 166</a> and <a href="#">5.4.2 Conditioner Drive Belt, page 159</a>
Cutterbar plugging	Conditioner drive belt slipping	Adjust tension or change belts.	<a href="#">5.4.5 Auger Drive Belt, page 166</a> and <a href="#">5.4.2 Conditioner Drive Belt, page 159</a>
Cutterbar plugging	Built-up of dirt between rock guards	Decrease header angle and increase float. In some conditions, it may be necessary to carry header slightly with header lift cylinders.	<a href="#">4.6 Header Angle, page 97</a> and <a href="#">4.1 Header Float, page 81</a>
Strips of uncut crop left on field	Built-up of dirt between rock guards	Decrease header angle and increase float.	<a href="#">4.6 Header Angle, page 97</a> and <a href="#">4.1 Header Float, page 81</a>
Strips of uncut crop left on field	Bent cutter blades	Replace blades.	<a href="#">Replacing the Cutterblades, page 144</a>
Strips of uncut crop left on field	Excessive header speed	Reduce header disc speed.	<a href="#">4.8 Disc Speed, page 100</a>
Strips of uncut crop left on field	Foreign object on cutterbar	Disengage header and stop the engine. When all moving parts are completely stopped, remove foreign object.	<a href="#">4.16 Unplugging the Header, page 119</a>
Strips of uncut crop left on field	Ground speed too slow	Increase ground speed.	<a href="#">4.9 Ground Speed, page 101</a>
Cutting height varies from one side to the other	Float not properly balanced	Adjust header float.	<a href="#">4.1 Header Float, page 81</a>
Ragged or uneven cutting of crop	Header float too light causing bouncing	Adjust to heavier float setting.	<a href="#">4.1 Header Float, page 81</a>
Ragged or uneven cutting of crop	Excessive ground speed	Reduce ground speed.	<a href="#">4.9 Ground Speed, page 101</a>
Ragged or uneven cutting of crop	Header angle too flat for guards to pick up down crop	Increase header angle.	<a href="#">4.6 Header Angle, page 97</a>
Ragged or uneven cutting of crop	Downed crop	Adjust header angle to cut closer to ground.	<a href="#">4.6 Header Angle, page 97</a>



## TROUBLESHOOTING

Symptom	Problem	Solution	Refer to
Conditioner rolls plugging	Ground speed too fast	Reduce ground speed.	<a href="#">4.9 Ground Speed, page 101</a>
Conditioner rolls plugging	Roll gap too large for proper feeding	Decrease roll gap.	<a href="#">4.2.2 Adjusting Roll Gap, page 87</a>
Conditioner rolls plugging	Roll gap too small in thick stemmed cane-type crops	Increase roll gap.	<a href="#">4.2.2 Adjusting Roll Gap, page 87</a>
Conditioner rolls plugging	Baffle set too low	Raise baffle.	<a href="#">4.5.3 Adjusting the Swath Baffle, page 95</a>
Conditioner rolls plugging	Roll speed too low	Increase disc speed.	<a href="#">4.8 Disc Speed, page 100</a>
Conditioner rolls plugging	Foreign object between rolls	Disengage header and stop the engine. When all moving parts are completely stopped, remove foreign object.	—
Conditioner rolls plugging	Conditioner belt slipping	Adjust belt tension.	<a href="#">5.4.2 Conditioner Drive Belt, page 159</a>
Conditioner rolls plugging	Auger belt slipping	Adjust belt tension.	<a href="#">5.4.5 Auger Drive Belt, page 166</a>
Conditioner rolls plugging	Cutting height too low	Decrease header angle to raise cutting height.	<a href="#">4.6 Header Angle, page 97</a>
Conditioner rolls plugging	Rolls improperly timed	Adjust roll timing.	<a href="#">4.4 Roll Timing, page 90</a>
Uneven formation and bunching of windrow	Rear deflector bypassing or dragging crop	Adjust rear deflector for proper crop control.	<a href="#">4.5.2 Adjusting the Rear Deflector (Fluffer Shield), page 95</a>
Uneven formation and bunching of windrow	Forming shields improperly adjusted	Adjust forming shield.	<a href="#">4.5 Forming Shields, page 93</a>
Uneven formation and bunching of windrow	Roll gap too large	Adjust roll gap.	<a href="#">4.2.2 Adjusting Roll Gap, page 87</a>
Uneven formation and bunching of windrow	Auger belts slipping	Replace belts.	<a href="#">5.4.5 Auger Drive Belt, page 166</a>
Uneven formation and bunching of windrow	Conditioner rolls running too slow	Maintain rated header speed.	Refer to windrower operator's manual
Uneven windrow formation in light crop	Uneven feeding	Reduce header speed.	Refer to windrower operator's manual
Plugging behind end cage deflectors	No cutting full header width	Cut full header width.	—
Plugging behind end cage deflectors	Ground speed too slow	Increase ground speed.	<a href="#">4.9 Ground Speed, page 101</a>
Not cutting short enough in down crop	Ground speed too fast	Reduce ground speed.	<a href="#">4.9 Ground Speed, page 101</a>

## TROUBLESHOOTING

Symptom	Problem	Solution	Refer to
Not cutting short enough in down crop	Broken, bent, or dull blades	Replace blades or turn blades over.	<i>Replacing the Cutterblades, page 144</i>
Not cutting short enough in down crop	Cutting height too high	Adjust header angle to lower cutting height if field conditions allow.	<i>4.6 Header Angle, page 97</i>
Material being pulled out by roots when cutting tall crop leaning into machine	Crop in conditioner rolls before crop is cut	Increase roll gap.	<i>4.2.2 Adjusting Roll Gap, page 87</i>
Damaged leaves and broken stems	Insufficient roll gap	Increase roll gap.	<i>4.2.2 Adjusting Roll Gap, page 87</i>
Damaged leaves and broken stems	Roll timing off	Check roll timing and adjust if necessary.	<i>4.4 Roll Timing, page 90</i>
Slow crop drying	Crop is bunched in windrow	Adjust forming shields/baffle.	<i>4.5 Forming Shields, page 93</i>
Slow crop drying	Rolls not crimping crop sufficiently	Decrease roll gap.	<i>4.2.2 Adjusting Roll Gap, page 87</i>
Excessive drying or bleaching of crop	Excessive crimping	Increase roll gap.	<i>4.2.2 Adjusting Roll Gap, page 87</i>
Excessive drying or bleaching of crop	Crop is spread too wide in windrow	Adjust forming shields.	<i>4.5 Forming Shields, page 93</i>
Poorly formed or bunchy windrows	Forming shields not properly adjusted	Adjust forming shields.	<i>4.5 Forming Shields, page 93</i>

## 7.2 Mechanical Problems

Symptom	Problem	Solution	Refer to
Excessive noise	Bent cutterblade	Replace blade.	<a href="#">Replacing the Cutterblades, page 144</a>
Excessive noise	Conditioner roll timing off	Check roll timing and adjust if necessary.	<a href="#">4.4 Roll Timing, page 90</a>
Excessive noise	Conditioner roll gap too small	Check gap and adjust if necessary.	<a href="#">4.2.2 Adjusting Roll Gap, page 87</a>
Excessive vibration or noise in header	Conditioner rolls contacting each other	Increase roll gap.	<a href="#">4.2.2 Adjusting Roll Gap, page 87</a>
Excessive vibration or noise in header	Conditioner rolls contacting each other	Check roll timing.	<a href="#">4.4 Roll Timing, page 90</a>
Excessive vibration or noise in header	Auger center support loose	Tighten bolts on support.	<a href="#">4.13.1 Adjusting the Overshot Auger, page 111</a>
Excessive vibration or noise in header	Mud deposits on conditioner rolls	Clean rolls.	—
Excessive heat in cutterbar	Too much lubricant in cutterbar	Drain lubricant and refill with specified amount.	<a href="#">5.2.7 Lubricating the Cutterbar, page 132</a>
Frequent blade damage	Mud on cutterbar	Remove mud from cutterbar: do not allow mud to dry on cutterbar.	—
Frequent blade damage	Spindle bearing failure	Replace spindle bearing.	See MacDon Dealer
Frequent blade damage	Material wrapped around spindle	Remove disc and remove material.	<a href="#">5.3 Cutterbar Discs, page 137</a>
Frequent blade damage	Cutting too low in rocky field conditions	Decrease header angle: increase float.	<a href="#">4.6 Header Angle, page 97</a> and <a href="#">4.1 Header Float, page 81</a>
Frequent blade damage	Ground speed too high in rocky field conditions. At High ground speed, header tends to dig rocks from ground instead of floating over them	Reduce ground speed.	<a href="#">4.9 Ground Speed, page 101</a>
Frequent blade damage	Blade incorrectly mounted	Check all blade mounting hardware ensuring blades are free to move.	<a href="#">Inspecting Discblades, page 141</a>
Frequent blade damage	Header float set too heavy	Increase float.	<a href="#">4.1 Header Float, page 81</a>
Machine pulling to one side	Header dragging to one end and pulling to that side	Adjust header float on both ends.	<a href="#">4.1 Header Float, page 81</a>
Excessive wear of cutting components	Header angle too steep	Reduce header angle.	<a href="#">4.6 Header Angle, page 97</a>

## TROUBLESHOOTING

Symptom	Problem	Solution	Refer to
Excessive wear of cutting components	Crop residue and dirt deposits on cutterbar	Clean cutterbar.	—
Excessive wear of cutting components	Mud on cutterbar	Remove mud from cutterbar: do not allow mud to dry on cutterbar.	—
Breakage of conditioner drive belt	Improper belt tension	Adjust conditioner drive belt tension.	<a href="#">5.4.2 Conditioner Drive Belt, page 159</a>
Breakage of conditioner drive belt	Belt not in proper groove in pulley	Move belt to proper groove.	
Breakage of conditioner drive belt	Foreign object between rolls	Disengage header and stop the engine. When all moving parts are completely stopped, remove foreign object.	—
Breakage of conditioner drive belt	Belt pulleys and idlers misaligned	Align pulleys and idler.	See MacDon Dealer
Discs don't turn when engaging header	Mud on cutterbar	Remove mud from cutterbar: do not allow mud to dry on cutterbar.	—
Discs don't turn when engaging header	Faulty drive belt	Check belt on pulleys.	<a href="#">5.4.2 Conditioner Drive Belt, page 159</a>
Discs don't turn when engaging header	Hoses not connected	Connect hoses.	<a href="#">3.7 Attaching the Header, page 41</a>
Header slows when going uphill	Hydraulic oil level in windrower is low	Add oil to windrower reservoir.	Refer to windrower operator's manual
Header runs while unloaded but slows or stops when starting to cut	Hydraulic oil level in windrower is low	Add oil to windrower reservoir.	Refer to windrower operator's manual
Header runs while unloaded but slows or stops when starting to cut	Defective hydraulic motor	Repair/replace hydraulic motor.	See MacDon Dealer
Header runs while unloaded but slows or stops when starting to cut	Defective hydraulic pump in windrower	Repair/replace pump.	See MacDon Dealer
Header runs while unloaded but slows or stops when starting to cut	Defective relief valve in windrower	Repair/replace relief valve.	See MacDon Dealer
Header runs while unloaded but slows or stops when starting to cut	Cold oil in hydraulic drive system	Reduce ground speed until oil reaches operating temperature.	<a href="#">4.9 Ground Speed, page 101</a>



## 8 Reference

### 8.1 Torque Specifications

The following tables provide correct torque values for various bolts, cap screws, and hydraulic fittings.

- Tighten all bolts to torque values specified in charts (unless otherwise noted throughout this manual).
- Replace hardware with same strength and grade of bolt.
- Use torque value tables as a guide and periodically check tightness of bolts.
- Understand torque categories for bolts and cap screws by using their identifying head markings.

#### ***Jam nuts***

When applying torque to finished jam nuts, multiply the torque applied to regular nuts by  $f=0.65$ .

#### ***Self-tapping screws***

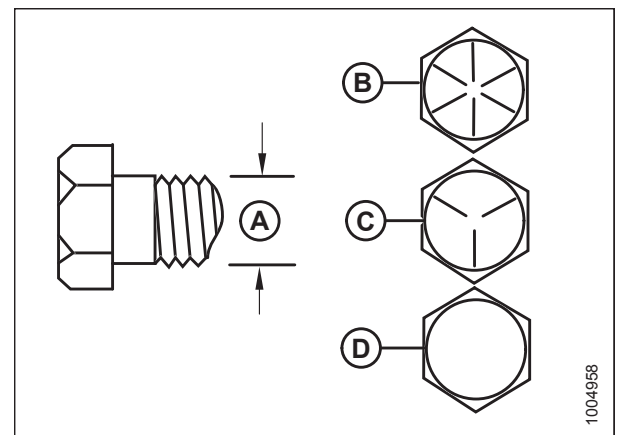
Standard torque is to be used (not to be used on critical or structurally important joints).

#### 8.1.1 SAE Bolt Torque Specifications

Torque values shown in following tables are valid for non-greased, or non-oiled threads and heads; therefore, do **NOT** grease or oil bolts or cap screws unless otherwise specified in this manual.

**Table 8.1 SAE Grade 5 Bolt and Grade 5 Free Spinning Nut**

Nominal Size (A)	Torque (Nm)		Torque (lbf·ft) (*lbf·in)	
	Min.	Max.	Min.	Max.
1/4-20	11.9	13.2	*106	*117
5/16-18	24.6	27.1	*218	*241
3/8-16	44	48	32	36
7/16-14	70	77	52	57
1/2-13	106	118	79	87
9/16-12	153	170	114	126
5/8-11	212	234	157	173
3/4-10	380	420	281	311
7/8-9	606	669	449	496
1-8	825	912	611	676



**Figure 8.1: Bolt Grades**

A - Nominal Size  
C - SAE-5

B - SAE-8  
D - SAE-2

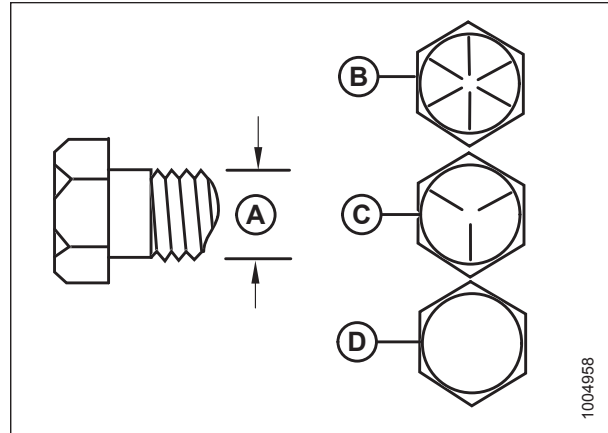
## REFERENCE

**Table 8.2 SAE Grade 5 Bolt and Grade F Distorted Thread Nut**

Nominal Size (A)	Torque (Nm)		Torque (lbf·ft) (*lbf·in)	
	Min.	Max.	Min.	Max.
1/4-20	8.1	9	*72	*80
5/16-18	16.7	18.5	*149	*164
3/8-16	30	33	22	24
7/16-14	48	53	35	39
1/2-13	73	80	54	59
9/16-12	105	116	77	86
5/8-11	144	160	107	118
3/4-10	259	286	192	212
7/8-9	413	456	306	338
1-8	619	684	459	507

**Table 8.3 SAE Grade 8 Bolt and Grade G Distorted Thread Nut**

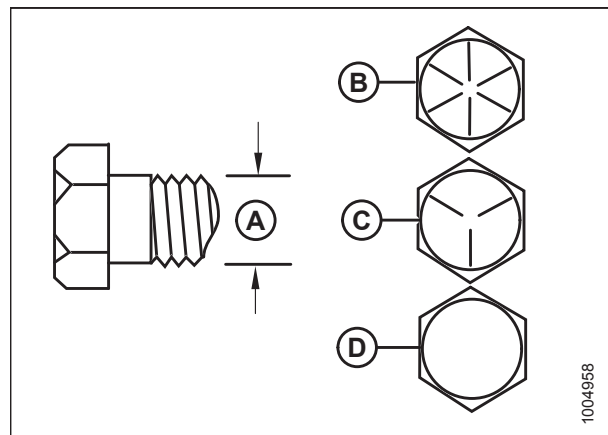
Nominal Size (A)	Torque (Nm)		Torque (lbf·ft) (*lbf·in)	
	Min.	Max.	Min.	Max.
1/4-20	16.8	18.6	*150	*165
5/16-18	24	26	18	19
3/8-16	42	46	31	34
7/16-14	67	74	50	55
1/2-13	102	113	76	84
9/16-12	148	163	109	121
5/8-11	204	225	151	167
3/4-10	362	400	268	296
7/8-9	583	644	432	477
1-8	874	966	647	716



**Figure 8.2: Bolt Grades**

A - Nominal Size  
C - SAE-5

B - SAE-8  
D - SAE-2



**Figure 8.3: Bolt Grades**

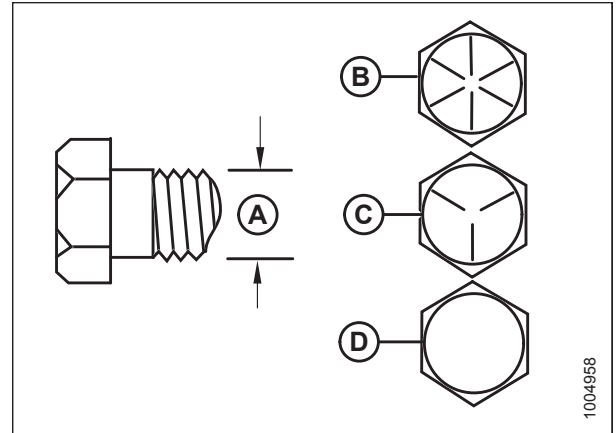
A - Nominal Size  
C - SAE-5

B - SAE-8  
D - SAE-2

## REFERENCE

**Table 8.4 SAE Grade 8 Bolt and Grade 8 Free Spinning Nut**

Nominal Size (A)	Torque (Nm)		Torque (lbf·ft) (*lbf·in)	
	Min.	Max.	Min.	Max.
1/4-20	16.8	18.6	*150	*165
5/16-18	35	38	26	28
3/8-16	61	68	46	50
7/16-14	98	109	73	81
1/2-13	150	166	111	123
9/16-12	217	239	160	177
5/8-11	299	330	221	345
3/4-10	531	587	393	435
7/8-9	855	945	633	700
1-8	1165	1288	863	954



**Figure 8.4: Bolt Grades**

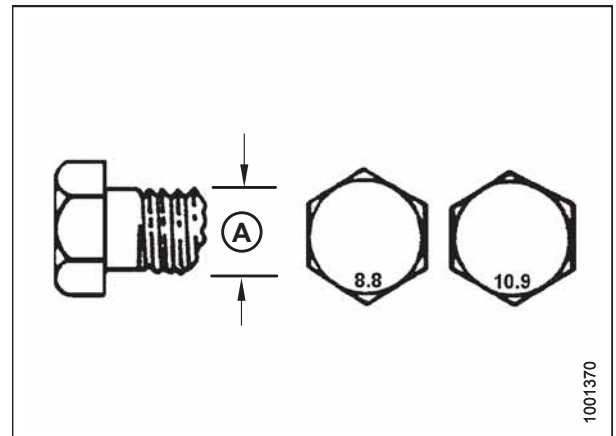
A - Nominal Size  
C - SAE-5

B - SAE-8  
D - SAE-2

### 8.1.2 Metric Bolt Specifications

**Table 8.5 Metric Class 8.8 Bolts and Class 9 Free Spinning Nut**

Nominal Size (A)	Torque (Nm)		Torque (lbf·ft) (*lbf·in)	
	Min.	Max.	Min.	Max.
3-0.5	1.4	1.6	*13	*14
3.5-0.6	2.2	2.5	*20	*22
4-0.7	3.3	3.7	*29	*32
5-0.8	6.7	7.4	*59	*66
6-1.0	11.4	12.6	*101	*112
8-1.25	28	30	20	23
10-1.5	55	60	40	45
12-1.75	95	105	70	78
14-2.0	152	168	113	124
16-2.0	236	261	175	193
20-2.5	460	509	341	377
24-3.0	796	879	589	651



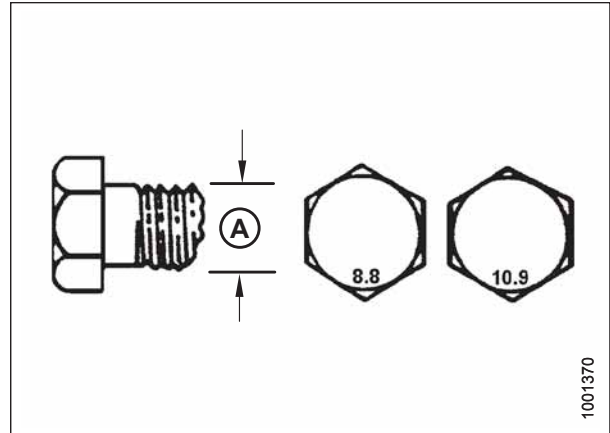
**Figure 8.5: Bolt Grades**



## REFERENCE

**Table 8.6 Metric Class 8.8 Bolts and Class 9 Distorted Thread Nut**

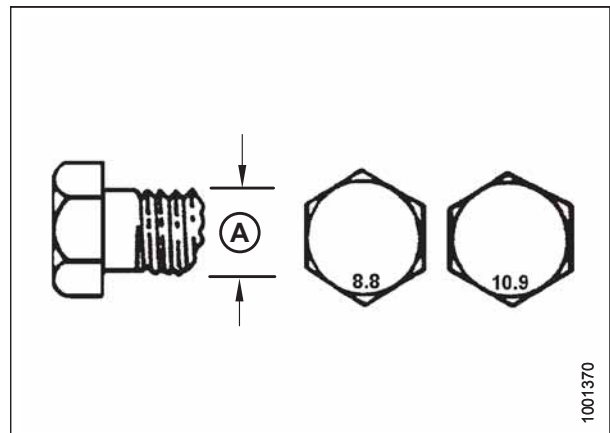
Nominal Size (A)	Torque (Nm)		Torque (lbf·ft) (*lbf·in)	
	Min.	Max.	Min.	Max.
3-0.5	1	1.1	*9	*10
3.5-0.6	1.5	1.7	*14	*15
4-0.7	2.3	2.5	*20	*22
5-0.8	4.5	5	*40	*45
6-1.0	7.7	8.6	*69	*76
8-1.25	18.8	20.8	*167	*185
10-1.5	37	41	28	30
12-1.75	65	72	48	53
14-2.0	104	115	77	85
16-2.0	161	178	119	132
20-2.5	314	347	233	257
24-3.0	543	600	402	444



**Figure 8.6: Bolt Grades**

**Table 8.7 Metric Class 10.9 Bolts and Class 10 Free Spinning Nut**

Nominal Size (A)	Torque (Nm)		Torque (lbf·ft) (*lbf·in)	
	Min.	Max.	Min.	Max.
3-0.5	1.8	2	*18	*19
3.5-0.6	2.8	3.1	*27	*30
4-0.7	4.2	4.6	*41	*45
5-0.8	8.4	9.3	*82	*91
6-1.0	14.3	15.8	*140	*154
8-1.25	38	42	28	31
10-1.5	75	83	56	62
12-1.75	132	145	97	108
14-2.0	210	232	156	172
16-2.0	326	360	242	267
20-2.5	637	704	472	521
24-3.0	1101	1217	815	901

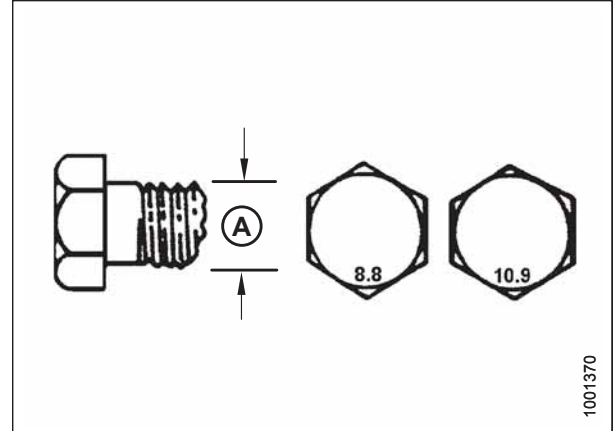


**Figure 8.7: Bolt Grades**

## REFERENCE

**Table 8.8 Metric Class 10.9 Bolts and Class 10 Distorted Thread Nut**

Nominal Size (A)	Torque (Nm)		Torque (lbf·ft) (*lbf·in)	
	Min.	Max.	Min.	Max.
3-0.5	1.3	1.5	*12	*13
3.5-0.6	2.1	2.3	*19	*21
4-0.7	3.1	3.4	*28	*31
5-0.8	6.3	7	*56	*62
6-1.0	10.7	11.8	*95	*105
8-1.25	26	29	19	21
10-1.5	51	57	38	42
12-1.75	90	99	66	73
14-2.0	143	158	106	117
16-2.0	222	246	165	182
20-2.5	434	480	322	356
24-3.0	750	829	556	614

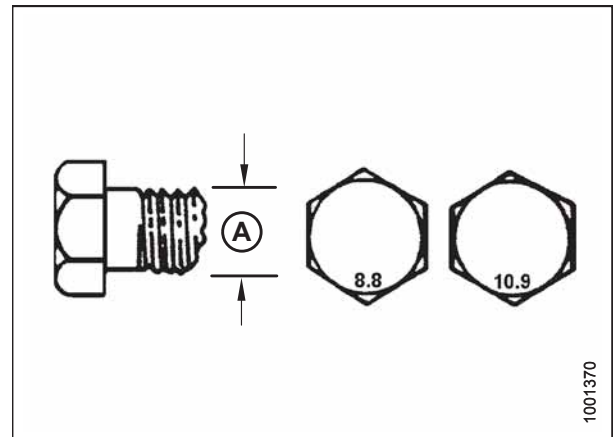


**Figure 8.8: Bolt Grades**

### 8.1.3 Metric Bolt Specifications Bolting into Cast Aluminum

**Table 8.9 Metric Bolt Bolting into Cast Aluminum**

Nominal Size (A)	Bolt Torque			
	8.8 (Cast Aluminum)		10.9 (Cast Aluminum)	
	Nm	lbf·ft	Nm	lbf·ft
M3	—	—	—	1
M4	—	—	4	2.6
M5	—	—	8	5.5
M6	9	6	12	9
M8	20	14	28	20
M10	40	28	55	40
M12	70	52	100	73
M14	—	—	—	—
M16	—	—	—	—



**Figure 8.9: Bolt Grades**

## 8.1.4 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 flared surfaces.
3. Torque fitting nut (E) to specified number of flats from finger tight (FFFT) or to a given torque value in Table 8.10, page 190.
4. Use two wrenches to prevent fitting (D) from rotating. Place one wrench on fitting body (D), and tighten nut (E) with other wrench to torque shown.
5. Assess final condition of connection.

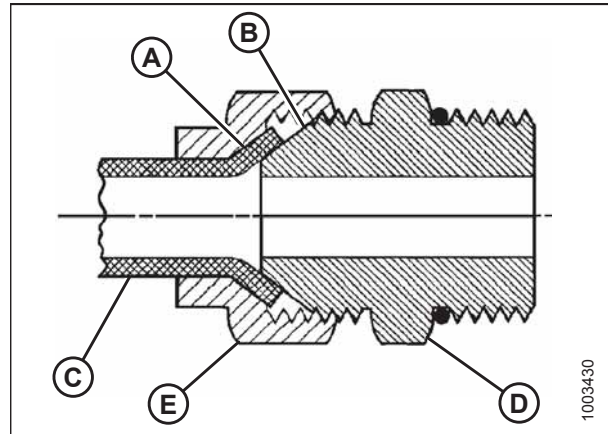


Figure 8.10: Hydraulic Fitting

Table 8.10 Flare-Type Hydraulic Tube Fittings

SAE Dash Size	Thread Size (in.)	Torque Value <sup>10</sup>		Flats from Finger Tight (FFFT)	
		Nm	lbf·ft	Tube	Swivel Nut or Hose
-2	5/16–24	4–5	3–4	—	—
-3	3/8–24	7–8	5–6	—	—
-4	7/16–20	18–19	13–14	2-1/2	2
-5	1/2–20	19–21	14–15	2	2
-6	9/16–18	30–33	22–24	2	1-1/2
-8	3/4–16	57–63	42–46	2	1-1/2
-10	7/8–14	81–89	60–66	1-1/2	1-1/2
-12	1-1/16–12	113–124	83–91	1-1/2	1-1/4
-14	1-3/16–12	136–149	100–110	1-1/2	1-1/4
-16	1-5/16–12	160–176	118–130	1-1/2	1
-20	1-5/8–12	228–250	168–184	1	1
-24	1-7/8–12	264–291	195–215	1	1
-32	2-1/2–12	359–395	265–291	1	1
-40	3–12	—	—	1	1

10. Torque values shown are based on lubricated connections as in reassembly.

### 8.1.5 O-Ring Boss (ORB) Hydraulic Fittings (Adjustable)

1. Inspect O-ring (A) and seat (B) for dirt or obvious defects.
2. Back off lock nut (C) as far as possible. Ensure that washer (D) is loose and is pushed toward lock nut (C) as far as possible.
3. Check that O-ring (A) is **NOT** on threads and adjust if necessary.
4. Apply hydraulic system oil to O-ring (A).

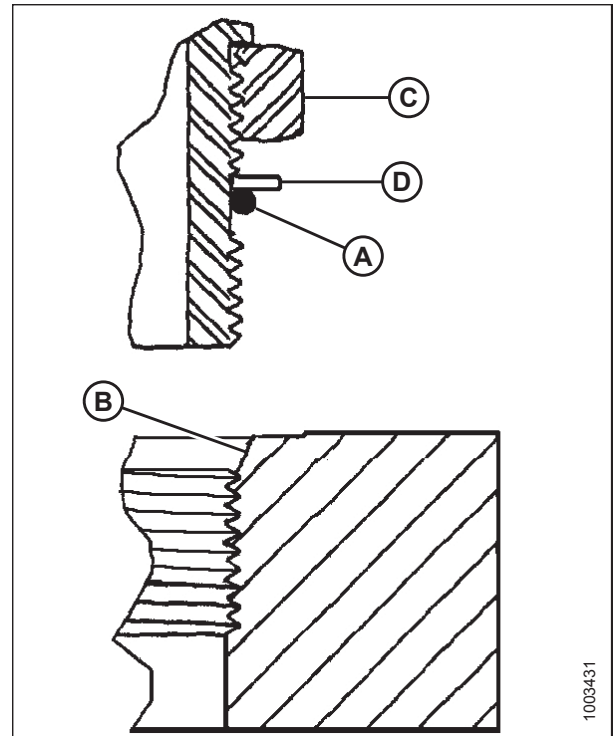


Figure 8.11: Hydraulic Fitting

5. Install fitting (B) into port until back up washer (D) and O-ring (A) contact 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 other on lock nut (C).
8. Check final condition of fitting.

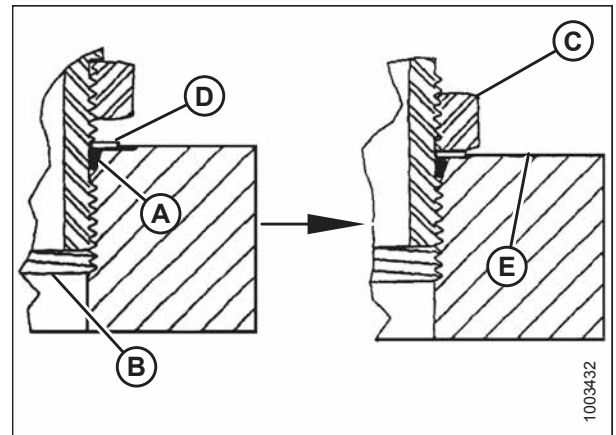


Figure 8.12: Hydraulic Fitting

## REFERENCE

**Table 8.11 O-Ring Boss (ORB) Hydraulic Fittings (Adjustable)**

SAE Dash Size	Thread Size (in.)	Torque Value <sup>11</sup>	
		Nm	lbf·ft (*lbf·in)
-2	5/16–24	6–7	*53–62
-3	3/8–24	12–13	*106–115
-4	7/16–20	19–21	14–15
-5	1/2–20	21–33	15–24
-6	9/16–18	26–29	19–21
-8	3/4–16	46–50	34–37
-10	7/8–14	75–82	55–60
-12	1-1/16–12	120–132	88–97
-14	1-3/8–12	153–168	113–124
-16	1-5/16–12	176–193	130–142
-20	1-5/8–12	221–243	163–179
-24	1-7/8–12	270–298	199–220
-32	2-1/2–12	332–365	245–269

---

11. Torque values shown are based on lubricated connections as in reassembly.

## REFERENCE

### 8.1.6 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 threads and adjust if necessary.
3. Apply hydraulic system oil to O-ring.
4. Install fitting (C) into port until fitting is hand-tight.
5. Torque fitting (C) according to values in Table 8.12, page 193.
6. Check final condition of fitting.

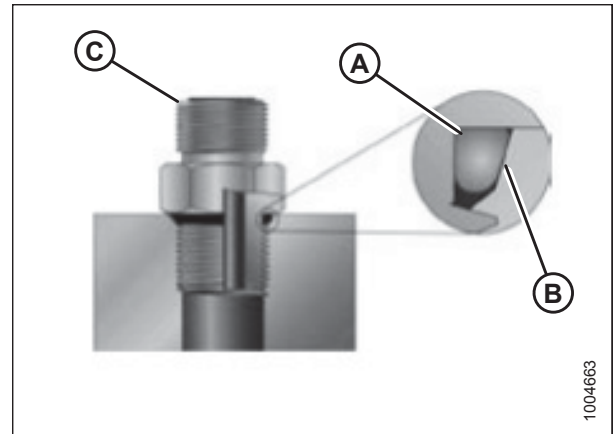


Figure 8.13: Hydraulic Fitting

Table 8.12 O-Ring Boss (ORB) Hydraulic Fittings (Non-Adjustable)

SAE Dash Size	Thread Size (in.)	Torque Value <sup>12</sup>	
		Nm	lbf·ft (*lbf·in)
-2	5/16-24	6-7	*53-62
-3	3/8-24	12-13	*106-115
-4	7/16-20	19-21	14-15
-5	1/2-20	21-33	15-24
-6	9/16-18	26-29	19-21
-8	3/4-16	46-50	34-37
-10	7/8-14	75-82	55-60
-12	1-1/16-12	120-132	88-97
-14	1-3/8-12	153-168	113-124
-16	1-5/16-12	176-193	130-142
-20	1-5/8-12	221-243	163-179
-24	1-7/8-12	270-298	199-220
-32	2-1/2-12	332-365	245-269

12. Torque values shown are based on lubricated connections as in reassembly.

## 8.1.7 O-Ring Face Seal (ORFS) Hydraulic Fittings

1. Check components to ensure that 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 O-ring (B).
3. Align tube or hose assembly so that flat face of 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 values in Table 8.13, page 194.

**NOTE:**

If applicable, hold hex on fitting body (E) to prevent rotation of fitting body and hose when tightening fitting nut (D).

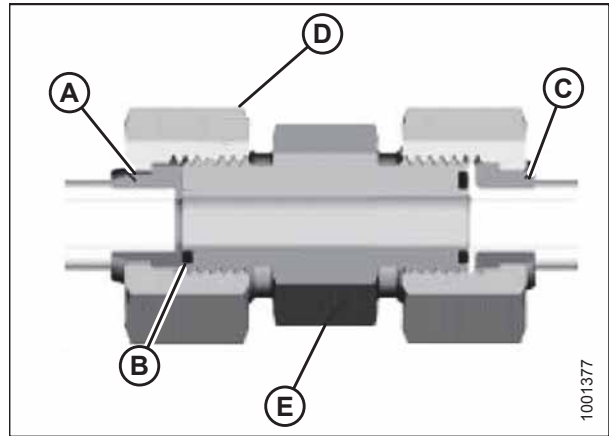


Figure 8.15: Hydraulic Fitting

6. Use three wrenches when assembling unions or joining two hoses together.
7. Check final condition of fitting.

**Table 8.13 O-Ring Face Seal (ORFS) Hydraulic Fittings**

SAE Dash Size	Thread Size (in.)	Tube O.D. (in.)	Torque Value <sup>13</sup>	
			Nm	lbf-ft
-3	Note <sup>14</sup>	3/16	—	—
-4	9/16	1/4	25–28	18–21
-5	Note <sup>14</sup>	5/16	—	—
-6	11/16	3/8	40–44	29–32
-8	13/16	1/2	55–61	41–45
-10	1	5/8	80–88	59–65
-12	1-3/16	3/4	115–127	85–94

13. Torque values and angles shown are based on lubricated connection as in reassembly.

14. O-ring face seal type end not defined for this tube size.

## REFERENCE

**Table 8.13 O-Ring Face Seal (ORFS) Hydraulic Fittings (continued)**

SAE Dash Size	Thread Size (in.)	Tube O.D. (in.)	Torque Value <sup>15</sup>	
			Nm	lbf·ft
-14	Note <sup>14</sup>	7/8	—	—
-16	1-7/16	1	150–165	111–122
-20	1-11/16	1-1/4	205–226	151–167
-24	1–2	1-1/2	315–347	232–256
-32	2-1/2	2	510–561	376–414

### 8.1.8 Tapered Pipe Thread Fittings

Assemble pipe fittings as follows:

1. Check components to ensure that fitting and port threads are free of burrs, nicks and scratches, or any form of contamination.
2. Apply pipe thread sealant (paste type) to external pipe threads.
3. Thread fitting into port until hand-tight.
4. Torque connector to appropriate torque angle. The Turns From Finger Tight (T.F.F.T.) values are shown in Table 8.14, page 195. Make sure that tube end of a shaped connector (typically 45° or 90°) is aligned to receive incoming tube or hose assembly. Always finish alignment of fitting in tightening direction. Never back off (loosen) pipe threaded connectors to achieve alignment.
5. Clean all residue and any excess thread conditioner with appropriate cleaner.
6. Assess final condition of fitting. Pay special attention to possibility of cracks to port opening.
7. Mark final position of fitting. If a fitting leaks, disassemble fitting and check for damage.

**NOTE:**

Overtorque failure of fittings may not be evident until fittings are disassembled.

**Table 8.14 Hydraulic Fitting Pipe Thread**

Tapered Pipe Thread Size	Recommended T.F.F.T.	Recommended F.F.F.T.
1/8–27	2–3	12–18
1/4–18	2–3	12–18
3/8–18	2–3	12–18
1/2–14	2–3	12–18
3/4–14	1.5–2.5	12–18
1–11 1/2	1.5–2.5	9–15
1 1/4–11 1/2	1.5–2.5	9–15
1 1/2–11 1/2	1.5–2.5	9–15
2–11 1/2	1.5–2.5	9–15

15. Torque values and angles shown are based on lubricated connection as in reassembly.



## 8.2 Conversion Chart

Table 8.15 Conversion Chart

Quantity	SI Units (Metric)		Factor	Inch-Pound Units (Imperial)	
	Unit Name	Abbreviation		Unit Name	Abbreviation
Area	hectares	ha	$\times 2.4710 =$	acres	acres
Flow	liters per minute	L/min	$\times 0.2642 =$	US gallons per minute	gpm
Force	Newtons	N	$\times 0.2248 =$	pounds force	lbf
Length	millimeters	mm	$\times 0.0394 =$	inch	in.
Length	meters	m	$\times 3.2808 =$	foot	ft.
Power	kilowatts	kW	$\times 1.341 =$	horsepower	hp
Pressure	kilopascals	kPa	$\times 0.145 =$	pounds per square inch	psi
Pressure	megapascals	MPa	$\times 145.038 =$	pounds per square inch	psi
Pressure	bar (Non-SI)	bar	$\times 14.5038 =$	pounds per square inch	psi
Torque	Newton meters	Nm	$\times 0.7376 =$	pound feet or foot pounds	lbf·ft
Torque	Newton meters	Nm	$\times 8.8507 =$	pound inches or inch pounds	lbf·in
Temperature	degrees Celsius	°C	$(^{\circ}\text{C} \times 1.8) + 32 =$	degrees Fahrenheit	°F
Velocity	meters per minute	m/min	$\times 3.2808 =$	feet per minute	ft/min
Velocity	meters per second	m/s	$\times 3.2808 =$	feet per second	ft/s
Velocity	kilometers per hour	km/h	$\times 0.6214 =$	miles per hour	mph
Volume	liters	L	$\times 0.2642 =$	US gallons	US gal
Volume	milliliters	ml	$\times 0.0338 =$	ounces	oz.
Volume	cubic centimeters	cm <sup>3</sup> or cc	$\times 0.061 =$	cubic inches	in. <sup>3</sup>
Weight	kilograms	kg	$\times 2.2046 =$	pounds	lb.

# Index

## A

accelerators .....	145–146
replacing .....	147
API .....	
definitions .....	19
APT .....	
definitions .....	19
ASTM .....	
definitions .....	19
attaching .....	
windrowers .....	41
attaching/detaching headers .....	
attaching to M1240 windrower .....	57
attaching to M200 and M205 windrowers .....	44
detaching from M1240 windrower .....	68
detaching from M200 windrower .....	75
detaching from M205 windrower .....	71
augers .....	111, 166
drive belts .....	166–167
inspect/adjust .....	166
replacing .....	167
stripper bars .....	
adjusting .....	114

## B

bearings .....	169
bevel gearbox .....	158
changing lubricant .....	158
bolts .....	
definitions .....	19
break-in period .....	78

## C

center-links .....	19
definitions .....	19
CGVW .....	
definitions .....	19
component identification .....	21
conditioner drive belts .....	159
inspecting .....	159
replacing .....	160
conditioner gearbox, <i>See</i> drive systems .....	
conditioner roll tension, <i>See</i> roll tension .....	
conditioner roll timing, <i>See</i> roll timing .....	
conditioner rolls .....	86
conversion charts .....	196
curtains .....	
inspecting .....	156

cutterbar doors .....	33, 156
adjusting .....	156
closing .....	
export headers .....	37
North American headers .....	35
inspecting latches .....	
export headers .....	156
latch brackets .....	
replacing .....	157
latches .....	156
replacing .....	157
opening .....	
export headers .....	36
North American headers .....	34
cutterbars .....	
accelerators .....	
inspecting .....	146
replacing .....	147
cutterblades .....	140
hardware .....	142
replacing .....	144
discs .....	137
accelerators .....	145
inspecting .....	138
installing .....	139
nut shields .....	148
removing .....	138
lubricant .....	
draining lubricant .....	132
filling cutterbar with lubricant .....	134
nut shield .....	
inspecting .....	148
replacing .....	149
repair tool kits .....	175
spindles .....	
direction of rotation .....	137
cutting height .....	98
gauge roller height .....	
adjusting .....	98
skid shoes .....	99

## D

definition of terms .....	19
disc maintenance .....	
inspecting .....	138
discblades .....	
inspecting discblades .....	141
discs .....	138
cutterbar discs .....	137
disc speed .....	100

## INDEX

spindle keys	
replacing .....	153
spindles .....	153
doors, <i>See</i> cutterbar doors	
double windrowing .....	102
drive systems .....	158
auger drive belts .....	166
inspect/adjust .....	166
replacing .....	167
bevel gearbox .....	158
changing lubricant .....	158
conditioner drive belts .....	159
replacing .....	160
conditioner gearbox .....	162
changing lubricant .....	162
hydraulic motor	
installing .....	171
removing .....	170
driveshields .....	30
closing	
export headers .....	31
North American headers .....	30
opening	
export headers .....	31
North American headers .....	30
right endshield	
installing .....	32
removing .....	32
drying agents .....	118

## E

export headers	
definitions .....	19

## F

FFFT	
definitions .....	19
finger tight	
definitions .....	19
fixtures, <i>See</i> lights	
float	
adjusting .....	82
checking .....	81
floats, <i>See</i> header float	
fluids and lubricants, <i>See</i> lubrication	
forming shields .....	93
adjusting side deflectors .....	93
attaching .....	41
rear deflector/fluffer shield	
adjusting .....	95
swath baffle	

adjusting .....	95
-----------------	----

## G

gauge rollers .....	176
gearbox speed sensors .....	164
adjusting .....	164
replacing .....	165
glossary .....	19
greasing	
maintenance schedule/record .....	122
ground speed .....	101
GVW	
definitions .....	19

## H

haying tips .....	117
chemical drying agents .....	118
curing .....	117
driving on windrows .....	118
raking and tedding .....	118
topsoil moisture .....	117
weather and topography .....	117
windrow characteristics .....	118
header float	
checking float .....	83
float operating guidelines .....	83
removing and restoring float .....	84
header operation .....	25
header float	
checking float .....	83
float operating guidelines .....	83
headers	
angle .....	97
attaching hydraulic center-link for M1240	
windrowers .....	57
attaching hydraulics and electrical components	
M1240 windrowers .....	62
M200 windrowers .....	51
M205 windrowers .....	45
attaching mechanical components to M200 and	
M205 windrowers .....	44
detaching .....	68
M200 windrowers .....	75
M205 windrowers .....	71
detaching from windrower	
detaching – M1240 windrower .....	68
operating .....	81
transporting .....	80
unplugging .....	119
hex keys	
definitions .....	19

## INDEX

hydraulic motors, *See* motors

hydraulics

fittings

flare-type..... 190

O-ring boss (ORB) adjustable ..... 191

O-ring boss (ORB) non-adjustable ..... 193

O-ring face seal (ORFS)..... 194

tapered pipe thread fittings ..... 195

hoses and lines ..... 172

hydraulic safety ..... 6

installing motor ..... 171

maintenance ..... 170

removing motor ..... 170

## I

identification ..... 21

inspections

auger drive belts ..... 166

conditioner drive belts ..... 159

cutterbar discs ..... 138

cutterbar door latches (export) ..... 156

disclades ..... 141

maintenance schedule/record ..... 122

nut shield ..... 148

rock guards ..... 136

rotary deflectors ..... 149

## K

kits

adjustable skid shoes ..... 175

cutterbar repair tool ..... 175

gauge roller ..... 176

hydraulic drive - 16-foot for M200 ..... 176

solid drums and shields ..... 178

tall crop divider ..... 177

tall crop feed plate ..... 177

## L

lights ..... 173

amber hazard/signal lights

replacing bulbs ..... 173

replacing light fixtures ..... 173

lubrication

draining cutterbar lubricant ..... 132

filling the cutterbar with lubricant ..... 134

fluids and lubricants ..... 203

lubrication and servicing ..... 126

## M

M1240 windrowers

attaching header ..... 57

detaching header ..... 68

M200 windrowers

attaching header ..... 44

detaching header ..... 75

M205 windrowers

attaching header ..... 44

detaching header ..... 71

maintenance and servicing ..... 121

cutterbar lubrication ..... 132

end of season service ..... 125

greasing procedure ..... 127

lubrication and servicing ..... 126

maintenance records ..... 122

maintenance requirements ..... 122

schedule ..... 122

service ..... 125, 127

preseason/annual service ..... 125

service intervals ..... 127

maintenance safety ..... 5

metric bolts

torque specifications ..... 187

moisture ..... 117

motors

hydraulic ..... 170

installing hydraulic motor ..... 171

removing hydraulic motor ..... 170

## N

North American headers

closing cutterbar doors ..... 35

closing driveshield ..... 30

definitions ..... 19

opening cutterbar doors ..... 34

opening driveshield ..... 30

NPT

definitions ..... 19

nut shields ..... 148

inspecting ..... 148

replacing ..... 149

## O

operation ..... 25, 28, 81

operator responsibilities ..... 25

options and attachments ..... 175

adjustable skid shoes ..... 175

cutterbar repair tool ..... 175

double windrow attachment (DWA) ..... 176

## INDEX

gauge roller .....	176
hydraulic drive - 16-foot for M200 .....	176
solid drums and shields .....	178
tall crop divider.....	177
tall crop feed plate.....	177
ORB	
definitions.....	19
overshot augers	
adjusting .....	111
owner responsibilities .....	25

## P

preseason service .....	125
-------------------------	-----

## R

raking .....	118
recommended fluids and lubricants, See lubrication	
revisions list .....	iv
rock guards.....	136
inspecting.....	136
RoHS	
definitions.....	19
roll gap	
adjusting .....	87
checking.....	86
roll tension .....	89
adjusting .....	89
roll timing .....	90
adjusting .....	91
checking.....	90
rotary deflectors .....	149
driveline deflectors	
installing .....	152
removing.....	151
driven deflectors	
installing .....	151
removing.....	150
inspecting deflectors .....	149
rpm	
definitions.....	19

## S

SAE	
bolt torques .....	185
definitions.....	19
safety .....	1
alert symbols .....	1
daily start-up checks.....	39
decals location .....	8

general safety .....	3
header safety props .....	28
hydraulic safety.....	6
maintenance and servicing .....	5
operational safety.....	26
preparing for service.....	121
safety sign decals .....	7
installing decals .....	7
interpreting decals .....	11
shutdown procedure.....	79
signal words .....	2
screws	
definitions.....	19
sealed bearings	
installing.....	169
serial numbers .....	vii
shields, See forming shields	
shut-down procedures .....	79
skid shoes .....	98, 175
adjusting .....	99
specifications .....	22
fluids and lubricants .....	203
torque specifications .....	185
speed sensors .....	164
adjusting .....	164
replacing .....	165
spindles	
direction of spindle rotation .....	137
replacing spindle keys .....	153
start-up procedures .....	39
stripper bars.....	114
adjusting .....	114

## T

tall crop dividers .....	108
removing .....	109
tall crop feed plates .....	103
installing plates	
under driveline deflector .....	105
under driven deflector .....	104
removing .....	106
removing from storage.....	103
removing plates	
under driveline deflector .....	107
under driven deflector .....	106
storage position .....	107
tedding .....	118
TFFT	
definitions.....	19
topography .....	117
torque	
definitions.....	19

## INDEX

torque angles	
definitions .....	19
torque specifications .....	185
flare-type hydraulic fittings .....	190
metric bolt specifications .....	187
bolting into cast aluminum .....	189
O-ring boss (ORB) hydraulic fittings	
(adjustable) .....	191
O-ring boss (ORB) hydraulic fittings (non-	
adjustable) .....	193
O-ring face seal (ORFS) fittings .....	194
SAE bolt torque specifications .....	185
tapered pipe thread fittings .....	195
torque tensions	
definitions .....	19
transporting the header .....	80
troubleshooting	
mechanical .....	182
mower performance .....	179
trucks	
definitions .....	19

## W

washers	
definitions .....	19
weather .....	117
windrows	
driving on windrows .....	118
windrow characteristics .....	118



**MacDon Industries Ltd.**

680 Moray Street  
Winnipeg, Manitoba  
Canada R3J 3S3  
t. (204) 885-5590  
f. (204) 832-7749

**MacDon, Inc.**

10708 N. Pomona Avenue  
Kansas City, Missouri  
United States 64153-1924  
t. (816) 891-7313  
f. (816) 891-7323

**MacDon Australia Pty. Ltd.**

A.C.N. 079 393 721  
P.O. Box 243, Suite 3, 143 Main Street  
Greensborough, Victoria, Australia 3088  
t. 03 9432 9982  
f. 03 9432 9972

**LLC MacDon Russia Ltd.**

123317 Moscow, Russia  
10 Presnenskaya nab, Block C  
Floor 5, Office No. 534, Regus Business Centre  
t. +7 495 775 6971  
f. +7 495 967 7600

## CUSTOMERS

[MacDon.com](http://MacDon.com)

## DEALERS

[Portal.MacDon.com](http://Portal.MacDon.com)

Trademarks of products are the marks of their  
respective manufacturers and/or distributors.

Printed in Canada