MacDon

R113
Rotary Disc Header

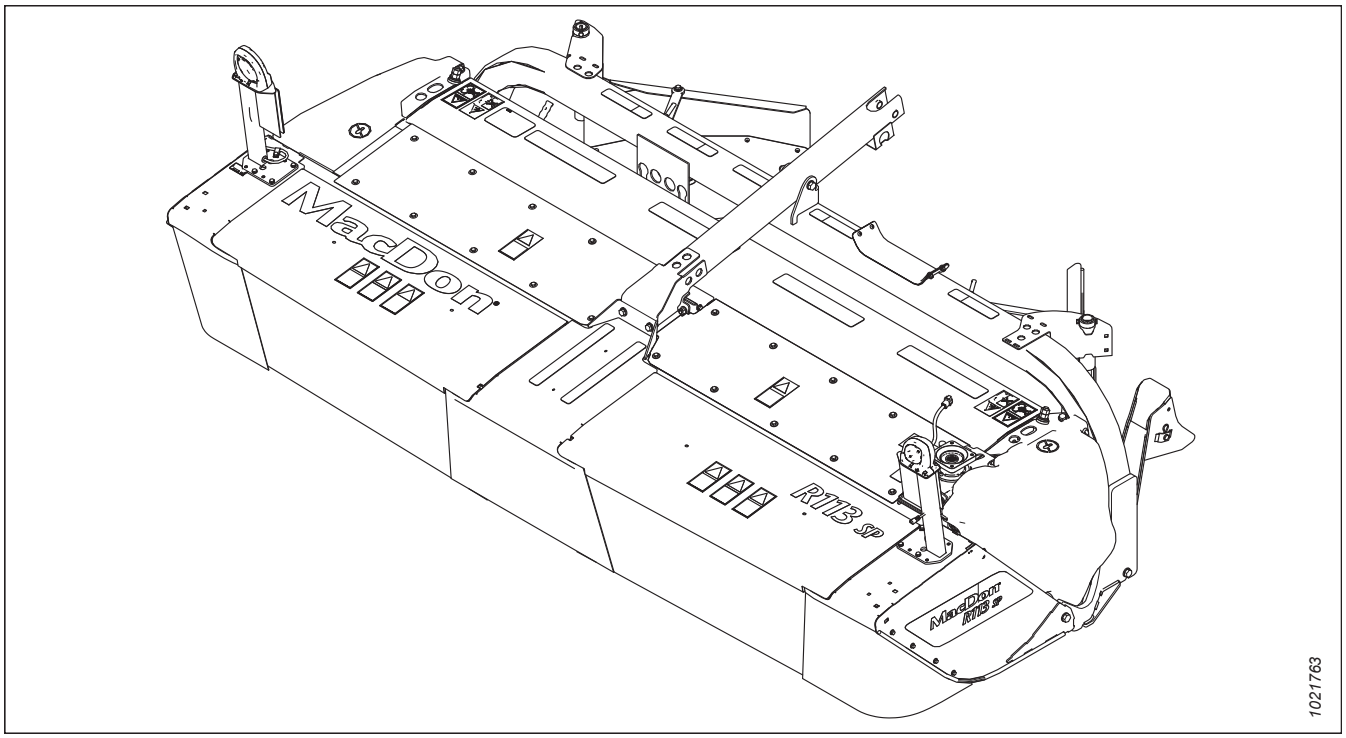
Operator's Manual

262705 Revision A

Original Instruction

The Harvesting Specialists.

R113 Rotary Disc Header



Published June 2024.

Noise Levels

The A-weighted sound pressure level inside the Operator's station (e.g., a MacDon M1170 Windrower), when operated in conjunction with this R113 Rotary Disc Header, **is 70 dBA**. This measurement was taken in accordance with ISO 5131. The sound pressure level depends on the rotary disc speed, crop conditions, and the exact type of self-propelled vehicle used to power the R113 Rotary Disc Header.

Declaration of Conformity

EC Declaration of Conformity

[1] MacDon

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

[2] Rotary Disc Header

[3] MacDon R1 SP Series

[4] As per Shipping Document

[5] 22-Apr-24

[6] _____
Adrienne Tankeu
Product Integrity

EN

We, [1]

Declare, that the product:

Machine Type: [2]

Name & Model: [3]

Serial Number(s): [4]

fulfils all the relevant provisions of the Directive 2006/42/EC.

Harmonized standards used, as referred to in Article 7(2):

EN ISO 4254-1:2015
EN ISO 4254-1:2015/A1:2021
EN ISO 4254-7:2017

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:

Guillaume Quenot
General Manager, MacDon Europe GmbH
Hagenauer Straße 59
65203 Wiesbaden (Germany)
gquenot@macdon.com

BG

Ние, [1]

декларираме, че следният продукт:

Тип машина: [2]

Наименование и модел: [3]

Сериен номер(а) [4]

отговаря на всички приложими разпоредби на директива 2006/42/ЕО.

Използвани са следните хармонизирани стандарти според чл. 7(2):

EN ISO 4254-1:2015
EN ISO 4254-1:2015/A1:2021
EN ISO 4254-7:2017

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:

Гуиллауме Яуенот
Управител, MacDon Europe GmbH
Hagenauer Straße 59
65203 Wiesbaden (Германия)
gquenot@macdon.com

CZ

My, [1]

Prohlašujeme, že produkt:

Typ zařízení: [2]

Název a model: [3]

Sériové(á) číslo)a): [4]

splňuje všechna relevantní ustanovení směrnice 2006/42/EC.

Byly použity harmonizované standardy, jak je uvedeno v článku 7(2):

EN ISO 4254-1:2015
EN ISO 4254-1:2015/A1:2021
EN ISO 4254-7:2017

Místo a datum prohlášení: [5]

Identita a podpis osoby oprávněné k vydání prohlášení: [6]

Jméno a adresa osoby oprávněné k vyplnění technického souboru:

Guillaume Quenot
generální ředitel, MacDon Europe GmbH
Hagenauer Straße 59
65203 Wiesbaden (Německo)
gquenot@macdon.com

DA

Vi, [1]

erklærer, at prduktet:

Maskintype [2]

Navn og model: [3]

Serienummer (-numre): [4]

Opfylder alle bestemmelser i direktiv 2006/42/EF.

Anvendte harmoniserede standarder, som henvist til i paragraf 7(2):

EN ISO 4254-1:2015
EN ISO 4254-1:2015/A1:2021
EN ISO 4254-7:2017

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:

Guillaume Quenot
Direktør, MacDon Europe GmbH
Hagenauer Straße 59
D-65203 Wiesbaden (Tyskland)
gquenot@macdon.com

DE

Wir, [1]

Erklären hiermit, dass das Produkt:

Maschinentyp: [2]

Name & Modell: [3]

Seriennummer (n): [4]

alle relevanten Vorschriften der Richtlinie 2006/42/EG erfüllt.

Harmonisierte Standards wurden, wie in folgenden Artikeln angegeben, verwendet 7(2):

EN ISO 4254-1:2015
EN ISO 4254-1:2015/A1:2021
EN ISO 4254-7:2017

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:

Guillaume Quenot
General Manager, MacDon Europe GmbH
Hagenauer Straße 59
65203 Wiesbaden
gquenot@macdon.com

ES

Nosotros [1]

declaramos que el producto:

Tipo de máquina: [2]

Nombre y modelo: [3]

Números de serie: [4]

cumple con todas las disposiciones pertinentes de la directriz 2006/42/EC.

Se utilizaron normas armonizadas, según lo dispuesto en el artículo 7(2):

EN ISO 4254-1:2015
EN ISO 4254-1:2015/A1:2021
EN ISO 4254-7:2017

Lugar y fecha de la declaración: [5]

Identidad y firma de la persona facultada para draw redactar la declaración: [6]

Nombre y dirección de la persona autorizada para elaborar el expediente técnico:

Guillaume Quenot
Gerente general - MacDon Europe GmbH
Hagenauer Straße 59
65203 Wiesbaden (Alemania)
gquenot@macdon.com

ET

Meie, [1]

deklareerime, et toode

Seadme tüüp: [2]

Nimi ja mudel: [3]

Seerianumbrid: [4]

vastab kõigile direktiivi 2006/42/EÜ asjakohastele sätetele.

Kasutatud on järgnevaid harmoniseeritud standardeid, millele on viidatud ka punktis 7(2):

EN ISO 4254-1:2015
EN ISO 4254-1:2015/A1:2021
EN ISO 4254-7:2017

Deklaratsiooni koht ja kuupäev: [5]

Deklaratsiooni koostamiseks volitatud isiku nimi ja allkiri: [6]

Tehnilise dokumendi koostamiseks volitatud isiku nimi ja aadress:

Guillaume Quenot
Peadirektor, MacDon Europe GmbH
Hagenauer Straße 59
65203 Wiesbaden (Saksamaa)
gquenot@macdon.com

FR

Nous soussignés, [1]

Déclarons que le produit :

Type de machine : [2]

Nom et modèle : [3]

Numéro(s) de série : [4]

Est conforme à toutes les dispositions pertinentes de la directive 2006/42/EC.

Utilisation des normes harmonisées, comme indiqué dans l'Article 7(2):

EN ISO 4254-1:2015
EN ISO 4254-1:2015/A1:2021
EN ISO 4254-7:2017

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 :

Guillaume Quenot
Directeur général, MacDon Europe GmbH
Hagenauer Straße 59
65203 Wiesbaden (Allemagne)
gquenot@macdon.com

EC Declaration of Conformity

IT

Noi, [1]

Dichiariamo che il prodotto:

Tipo di macchina: [2]

Nome e modello: [3]

Numero(i) di serie: [4]

soddisfa tutte le disposizioni rilevanti della direttiva 2006/42/CE.

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

EN ISO 4254-1:2015
EN ISO 4254-1:2015/A1:2021
EN ISO 4254-7:2017

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:

Guillaume Quenot
General Manager, MacDon Europe GmbH
Hagenauer Straße 59
65203 Wiesbaden (Germania)
gquenot@macdon.com

HU

Mi, [1]

Ezennel kijelentjük, hogy a következő termék:

Gép típusa: [2]

Név és modell: [3]

Sériaszám(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 4254-1:2015
EN ISO 4254-1:2015/A1:2021
EN ISO 4254-7:2017

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:

Guillaume Quenot
Vezérigazgató, MacDon Europe GmbH
Hagenauer Straße 59
65203 Wiesbaden (Németország)
gquenot@macdon.com

LT

Mes, [1]

Pareiškiame, kad šis produktas:

Mašinos tipas: [2]

Pavadinimas ir modelis: [3]

Serijos numeris (-iai): [4]

atitinka taikomus reikalavimus pagal Direktyvą 2006/42/EB.

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

EN ISO 4254-1:2015
EN ISO 4254-1:2015/A1:2021
EN ISO 4254-7:2017

Deklaracijos vieta ir data: [5]

Asmens tapatybės duomenys ir parašas asmens, įgalioto sudaryti šią deklaraciją: [6]

Vardas ir pavardė asmens, kuris įgaliotas sudaryti šį techninį failą:

Guillaume Quenot
Generalinis direktorius, MacDon Europe GmbH
Hagenauer Straße 59
65203 Wiesbaden (Vokietija)
gquenot@macdon.com

LV

Mēs, [1]

Deklarējam, ka produkts:

Mašīnas tips: [2]

Nosaukums un modelis: [3]

Sērijas numurs(-i): [4]

Atbilst visām būtiskajām Direktīvas 2006/42/EK prasībām.

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

EN ISO 4254-1:2015
EN ISO 4254-1:2015/A1:2021
EN ISO 4254-7:2017

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:

Guillaume Quenot
Ģenerāldirektors, MacDon Europe GmbH
Hagenauer Straße 59
65203 Wiesbaden (Vācija)
gquenot@macdon.com

NL

Wij, [1]

Verklaren dat het product:

Machinetype: [2]

Naam en model: [3]

Serienummer(s): [4]

voldoet aan alle relevante bepalingen van de Richtlijn 2006/42/EC.

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

EN ISO 4254-1:2015
EN ISO 4254-1:2015/A1:2021
EN ISO 4254-7:2017

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:

Guillaume Quenot
Algemeen directeur, MacDon Europe GmbH
Hagenauer Straße 59
65203 Wiesbaden (Duitsland)
gquenot@macdon.com

PO

My niżej podpisani, [1]
Oświadczamy, że produkt:

Typ urządzenia: [2]

Nazwa i model: [3]

Numer seryjny/numery seryjne: [4]

spełnia wszystkie odpowiednie przepisy dyrektywy 2006/42/WE.

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

EN ISO 4254-1:2015
EN ISO 4254-1:2015/A1:2021
EN ISO 4254-7:2017

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:

Guillaume Quenot
Dyrektor generalny, MacDon Europe GmbH
Hagenauer Straße 59
65203 Wiesbaden (Niemcy)
gquenot@macdon.com

PT

Nós, [1]

Declaramos, que o produto:

Tipo de máquina: [2]

Nome e Modelo: [3]

Número(s) de Série: [4]

cumpre todas as disposições relevantes da Directiva 2006/42/CE.

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

EN ISO 4254-1:2015
EN ISO 4254-1:2015/A1:2021
EN ISO 4254-7:2017

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:

Guillaume Quenot
Gerente Geral, MacDon Europa Ltda.
Hagenauer Straße 59
65203 Wiesbaden (Alemanha)
gquenot@macdon.com

RO

Noi, [1]

Declarăm, că următorul produs:

Tipul maşinii: [2]

Denumirea şi modelul: [3]

Număr (numere) serie: [4]

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

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

EN ISO 4254-1:2015
EN ISO 4254-1:2015/A1:2021
EN ISO 4254-7:2017

Data şi locul declaraţiei: [5]

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

Numele şi semnătura persoanei autorizate pentru întocmirea cărţii tehnice:

Guillaume Quenot
Manager General, MacDon Europe GmbH
Hagenauer Straße 59
65203 Wiesbaden (Germania)
gquenot@macdon.com

SR

Mi, [1]

Izjavljujemo da proizvod

Tip mašine: [2]

Naziv i model: [3]

Serijski broj(evi): [4]

Ispunjava sve relevantne odredbe direktive 2006/42/EC.

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

EN ISO 4254-1:2015
EN ISO 4254-1:2015/A1:2021
EN ISO 4254-7:2017

Datum i mesto izdavanja deklaracije: [5]

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

Ime i adresa osobe ovlašæene za sastavljanje tehniène datoteke:

Guillaume Quenot
Generalni direktor, MacDon Europe GmbH
Hagenauer Straße 59
65203 Wiesbaden (Nemačka)
gquenot@macdon.com

SV

Vi, [1]

Intygar att produkten:

Maskintyp: [2]

Namn och modell: [3]

Serienummer: [4]

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

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

EN ISO 4254-1:2015
EN ISO 4254-1:2015/A1:2021
EN ISO 4254-7:2017

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:

Guillaume Quenot
Administrativ chef, MacDon Europe GmbH
Hagenauer Straße 59
65203 Wiesbaden (Tyskland)
gquenot@macdon.com

SL

Mi, [1]

izjavljamo, da izdelek:

Vrsta stroja: [2]

Ime in model: [3]

Serijska/-e številka/-e: [4]

ustreza vsem zadevnim določbam Direktive 2006/42/ES.

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

EN ISO 4254-1:2015
EN ISO 4254-1:2015/A1:2021
EN ISO 4254-7:2017

Kraj in datum izjave: [5]

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

Ime in naslov osebe, pooblaščene za pripravo tehnične datoteke:

Guillaume Quenot
Generalni direktor, MacDon Europe GmbH
Hagenauer Straße 59
65203 Wiesbaden (Nemčija)
gquenot@macdon.com

SK

My, [1]

týmto prehlasujeme, že tento výrobok:

Typ zariadenia: [2]

Názov a model: [3]

Výrobné číslo: [4]

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

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

EN ISO 4254-1:2015
EN ISO 4254-1:2015/A1:2021
EN ISO 4254-7:2017

Miesto a dátum prehlásenia: [5]

Meno a podpis osoby oprávnenej vypracovať toto prehlásenie: [6]

Meno a adresa osoby oprávnenej zostaviť technický súbor:

Guillaume Quenot
Generálny riaditeľ MacDon Europe GmbH
Hagenauer Straße 59
65203 Wiesbaden (Nemecko)
gquenot@macdon.com

UK Declaration of Conformity

[1] MacDon

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

[2] Rotary Disc Header

[3] MacDon R1 SP Series

[4] As per Shipping Document

[5] 22-Apr-24

[6] _____
Adrienne Tankeu
Product Integrity

We, [1]

Declare, that the product:

Machine Type: [2]

Name & Model: [3]

Serial Number(s): [4]

fulfills all relevant provisions of the Supply of Machinery (Safety) Regulations 2008

Designated standards used are :

EN ISO 4254-1:2015

EN ISO 4254-1:2015/A1:2021

EN ISO 4254-7:2017

Place and date of declaration: [5]

Identity and signature of the person empowered to draw up the declaration: [6]

Introduction

This manual contains safety, operating, and maintenance procedures for the MacDon R113 Rotary Disc Header.

Your machine

The rotary disc header, when attached to a MacDon windrower, is designed to cut, condition, and lay a wide variety of grasses and hay crops in windrows. The following is a list of windrowers which are compatible with the rotary disc header:

- M155 Self-Propelled Windrower
- M155*E4* Self-Propelled Windrower
- M205 Self-Propelled Windrower
- M1170 Windrower
- M1240 Windrower
- M2170 Windrower
- M2260 Windrower

Your warranty

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

Your manual

Carefully read all the material provided before attempting to unload, assemble, or use the machine.

Use this manual as your first source of information about the machine. If you follow the instructions provided in this manual, and use MacDon parts when repair is necessary, the rotary disc header will work well for many years.

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

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 the functionality of the machine, reduce its service life, and may result in a hazardous situation for the Operator or bystanders.

Conventions

The following conventions are used in this document:

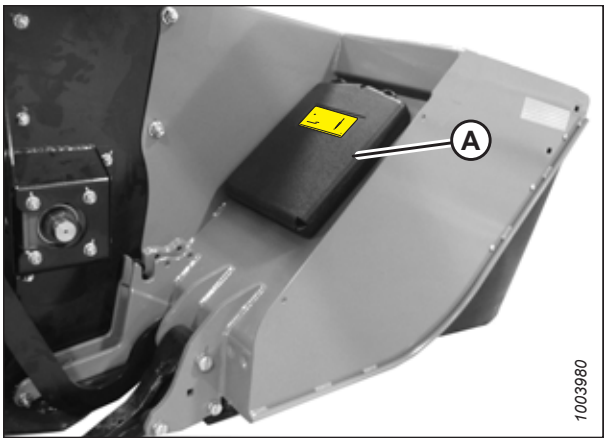
- Right and left are determined from the operator's position. The front of the rotary disc header faces the crop.
- Unless otherwise noted, use the standard torque values provided in this manual. When torque values of 30 Nm or less are listed, their equivalents will be provided in both foot-pounds (lbf·ft) and inch-pounds (lbf·in).

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

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

NOTE:

This document is currently available in Chinese, English, and Russian.



Manual Storage Case

Summary of Changes

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

Section	Summary of Change	Internal Use Only
Throughout	• Updated for M2 Series Windrowers. • Removed context illustrations showing driveshields. • Removed references to R116 Rotary Disc Headers.	Technical Publications
1.9 Safety Sign Locations, page 12	Changed illustration.	Technical Publications
3.3.1 Engaging and Disengaging Header Safety Props – M1 Series and M2 Series Windrower, page 27	Updated for M2 Series Windrowers.	Technical Publications
3.4 Attaching Header to Windrower, page 31	Updated for M2 Series Windrowers.	Technical Publications
3.4.1 Attaching Header to M2 Series Windrower, page 31	Added topic.	Technical Publications
3.4.5 Attaching Hydraulic and Electrical Components, page 55	Updated for M2 Series Windrowers.	Technical Publications
3.5.1 Detaching Header from M2 Series Windrower, page 90	Added topic.	Technical Publications
3.8.4 Ground Speed, page 120	Changed illustration.	Technical Publications
4.5.2 Cutterbar Discs, page 160	Changed illustration.	Product Support
Installing Cutterbar Spindles, page 167	Added illustration showing suitable spindle rotation pattern.	Technical Publications
Inspecting Disc Blade Hardware, page 175	Updated topic.	Product Support
4.5.5 Accelerators, page 179	Updated topic.	Product Support
4.6.1 Checking and Changing Lubricant in Conditioner Roll Timing Gearbox, page 207	Updated topic to show new locations of sight glass and breather hole.	ECN 65369
5.1.5 Updated Blades Kit, page 246	Added illustration.	Technical Publications

Model and Serial Number

The serial number identifies the header and it is required if you request technical assistance. Record the serial number and model year of the header in the spaces below.

Serial number: _____

Model year: _____

Serial number plate (A) is located near the base of the right hazard/signal light on the right side of the rotary disc header.

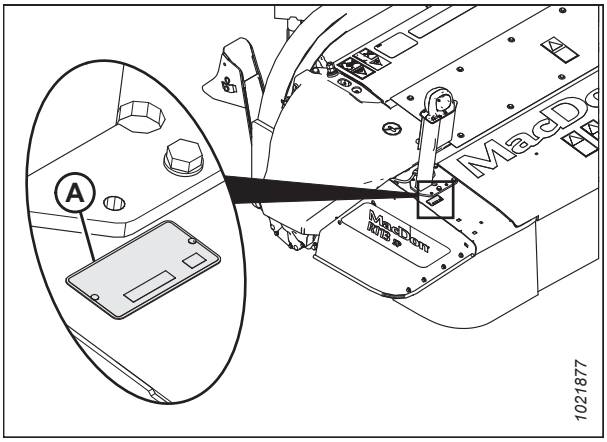


Figure 1: Right Side of Header

Chapter 1: Safety

Understanding and consistently following these safety procedures will help to ensure the safety of those operating the machine and of bystanders.

1.1 Safety Alert Symbols

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

This symbol means:

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

Carefully read and follow the safety message accompanying this symbol.

Why is safety important to you?

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

Figure 1.1: Safety Symbol

1.2 Signal Words

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

Signal words are selected using the following guidelines:

DANGER

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

WARNING

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

CAUTION

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

IMPORTANT:

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

NOTE:

Provides additional information or advice.

1.3 General Safety

Operating, servicing, and assembling machinery presents several safety risks. These risks can be reduced or eliminated by following the relevant safety procedures and wearing the appropriate personal protective equipment.

CAUTION

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

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

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

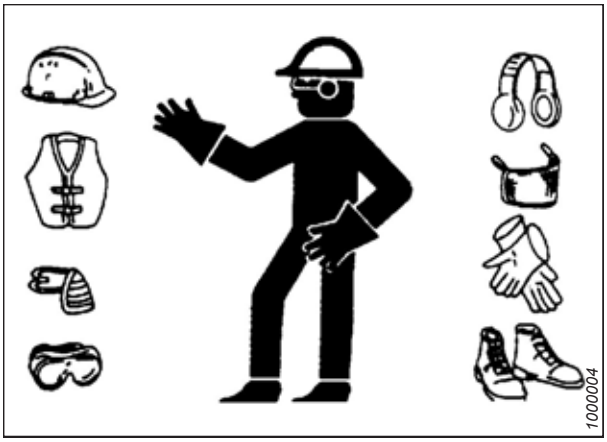


Figure 1.2: Safety Equipment

In addition, take the following precautions:

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

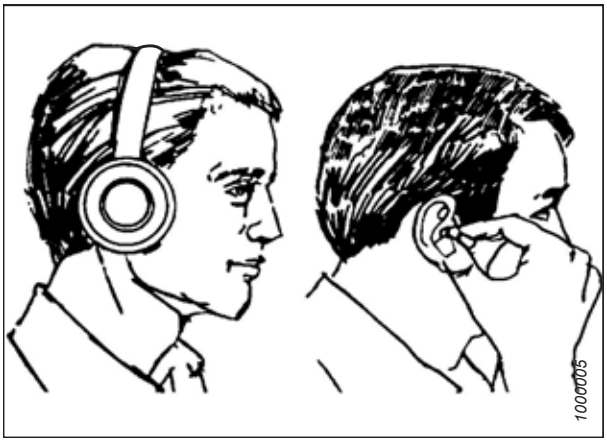


Figure 1.3: Safety Equipment

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

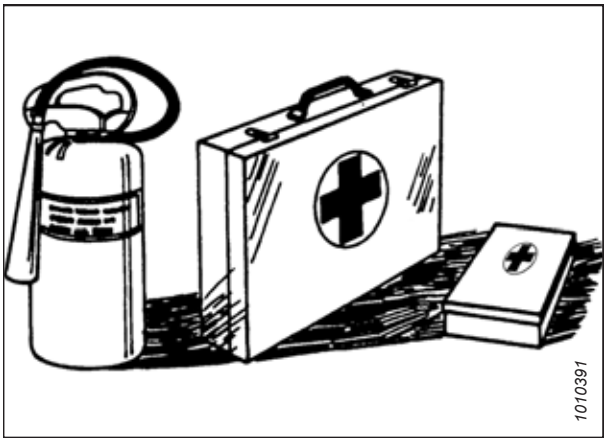


Figure 1.4: Safety Equipment

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

Figure 1.5: Safety around Equipment

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

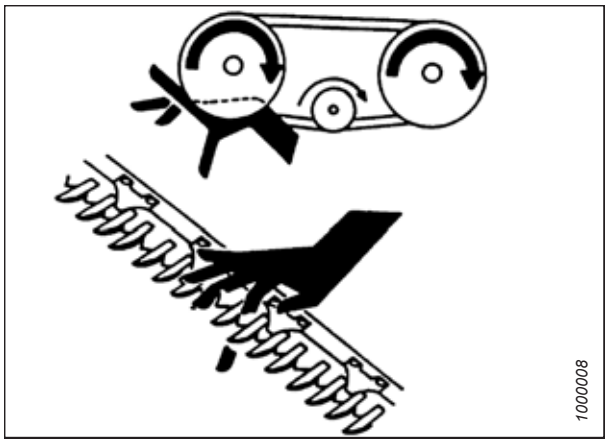


Figure 1.6: Safety around Equipment

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

Figure 1.7: Safety around Equipment

1.4 Maintenance Safety

Maintaining your equipment safely requires that you follow the relevant safety procedures and wear the appropriate personal protective equipment for the task.

To ensure your safety while maintaining the machine:

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

Figure 1.8: Wet Floors Present Safety Risks

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

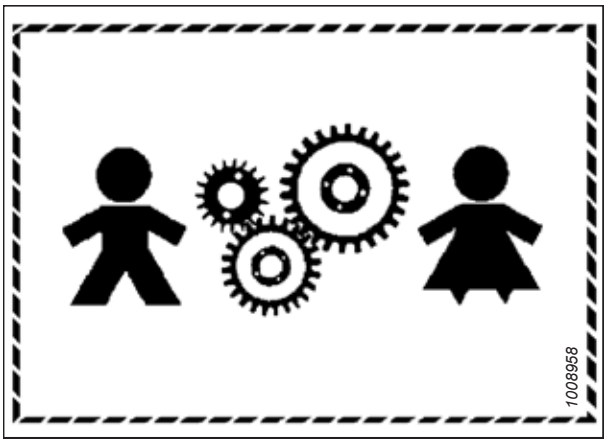


Figure 1.9: Equipment is NOT Safe for Children

- Wear protective gear when working on the machine.
- Wear heavy gloves when working on knife components.

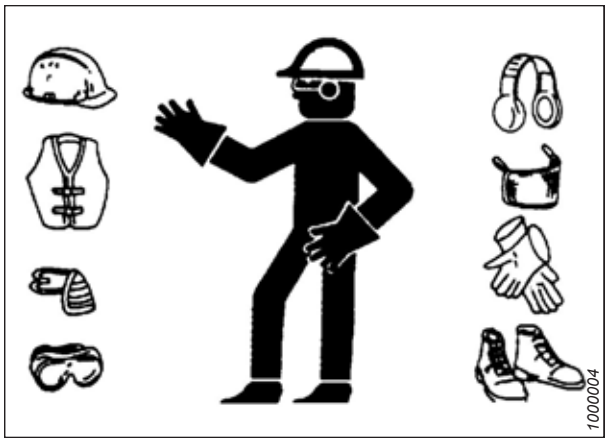


Figure 1.10: Personal Protective Equipment

1.5 Hydraulic Safety

Because hydraulic fluid is under extreme pressure, hydraulic fluid leaks can be very dangerous. Follow the proper safety procedures when inspecting hydraulic fluid leaks and servicing hydraulic equipment.

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

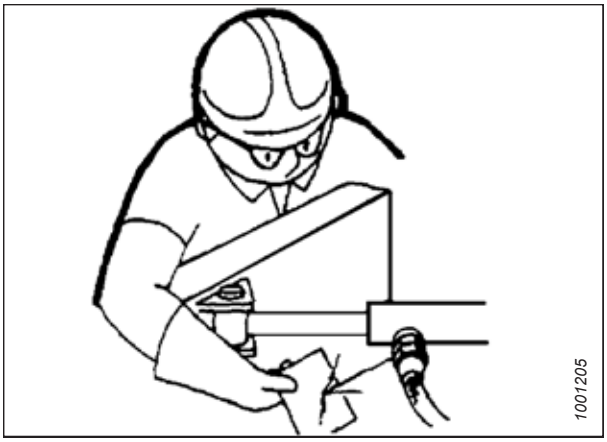


Figure 1.11: Testing for Hydraulic Leaks

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

Figure 1.12: Hydraulic Pressure Hazard

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

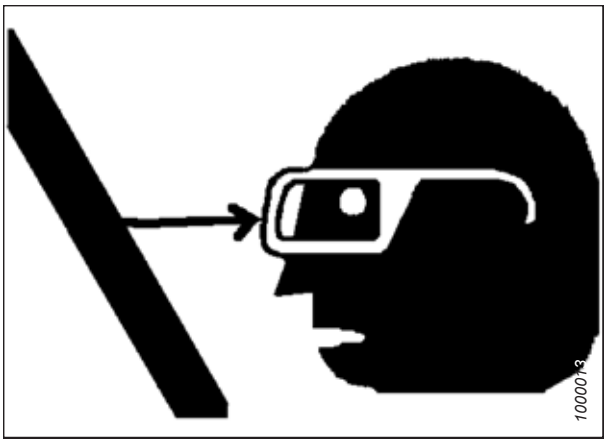


Figure 1.13: Safety around Equipment

1.6 Welding Precautions

To prevent damage to sensitive electronics, **NEVER** attempt welding on the header while it is connected to a windrower.

WARNING

NEVER attempt welding on the header while it is connected to a windrower. Severe damage to sensitive, expensive electronics can result from welding on the header while it is connected to a windrower. It can be impossible to know what effect a high current may have regarding future malfunctions or a shorter lifespan.

For further welding precautions, consult the windrower operator's manual.

1.7 Decommissioning and Disposing of Agricultural Equipment

When agricultural equipment is no longer serviceable and needs to be decommissioned and disposed of, recyclable materials including ferrous and non-ferrous metals, rubber, and plastics; fluids such as lubricants, refrigerants, and fuels; and hazardous materials found in batteries, some light bulbs, and electronic equipment must be handled safely and not introduced into the environment.

Comply with local regulations and authorities.

Products with symbol (A) should **NOT** be disposed of with domestic waste.

Figure 1.14: Symbol for Do NOT Dispose with Domestic Waste

Materials with symbol (B) should be recycled as labelled.

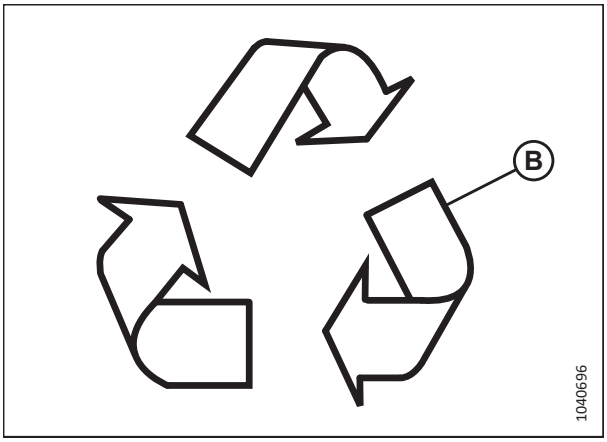


Figure 1.15: Symbol for Recycle as Labelled

- Use appropriate personal protective equipment when removing and handling objects and materials.
- Use appropriate personal protective equipment when handling objects with residue from pesticides, fertilizers, or other agricultural chemicals. Follow local regulations when handling and disposing of these objects.
- Safely release stored energy from suspension components, springs, hydraulic, and electrical systems.
- Recycle or reuse packaging material.
- Recycle or reuse plastics that are labelled with specifications for a material such as PP TV 20. Do **NOT** dispose of them with domestic waste.
- Return batteries to the vendor or take them to a collection point. Batteries contain hazardous substances. Do **NOT** dispose of batteries with domestic waste.
- Follow local regulations to correctly dispose of hazardous materials such as oils, hydraulic fluids, brake fluids, and fuels.
- Take refrigerants to qualified people at specialized facilities for disposal. Refrigerants must **NEVER** be released into the atmosphere.

1.8 Safety Signs

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

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

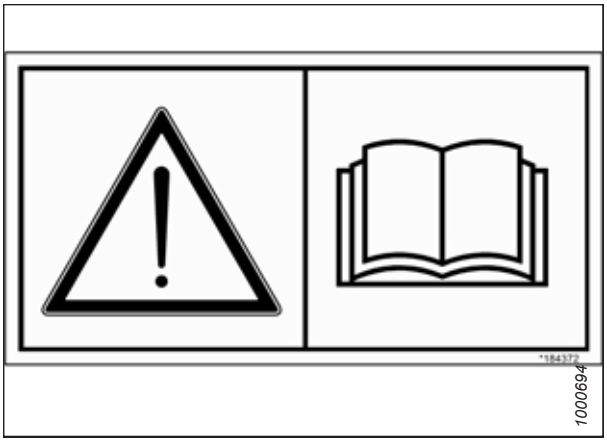


Figure 1.16: Operator's Manual Decal

1.8.1 Installing Safety Decals

Worn or damaged safety decals will need to be removed and replaced.

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

1.9 Safety Sign Locations

Safety signs are installed in several locations on the header. Replace any missing or damaged decals on the machine with identical parts.

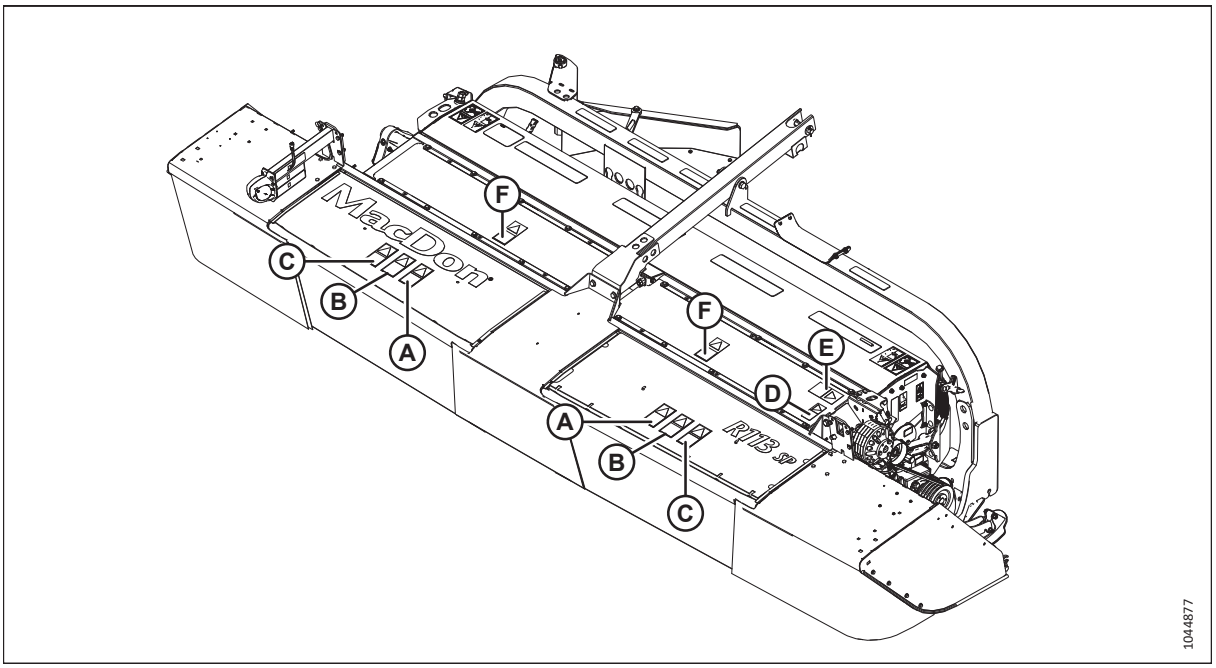


Figure 1.17: Safety Sign Decal Locations

A - MD #194466
B - MD #247167
C - MD #194465
D - MD #166466
E - MD #113482
F - MD #190546
G - MD #304865

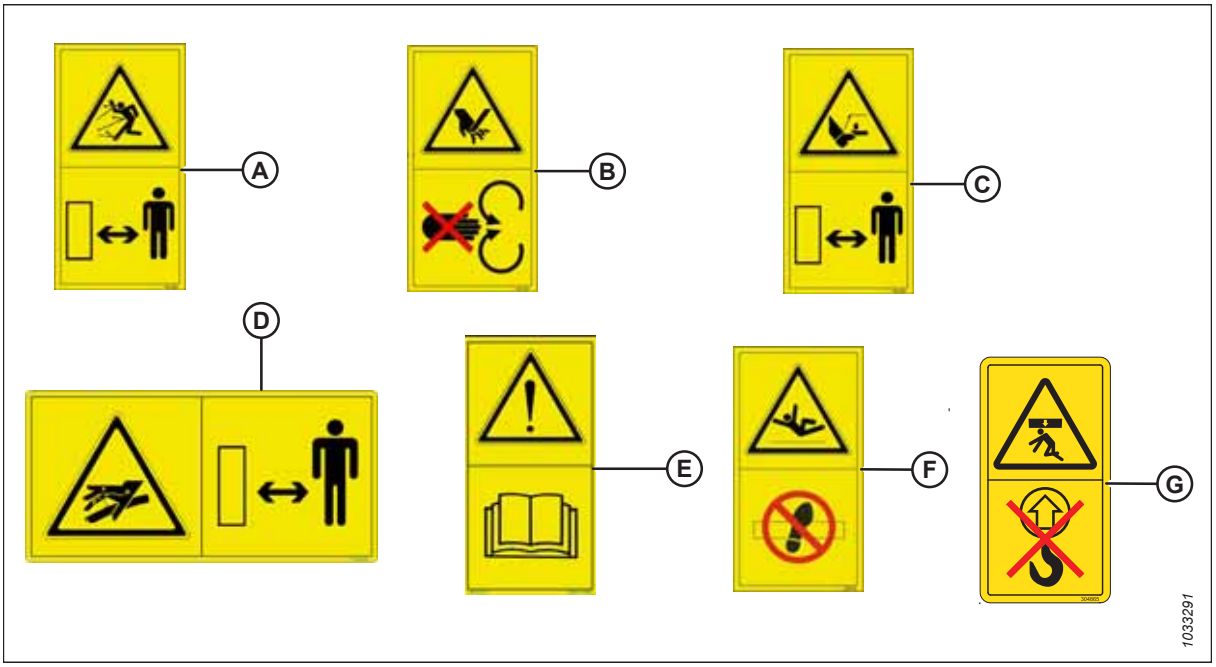


Figure 1.18: Safety Sign Decals

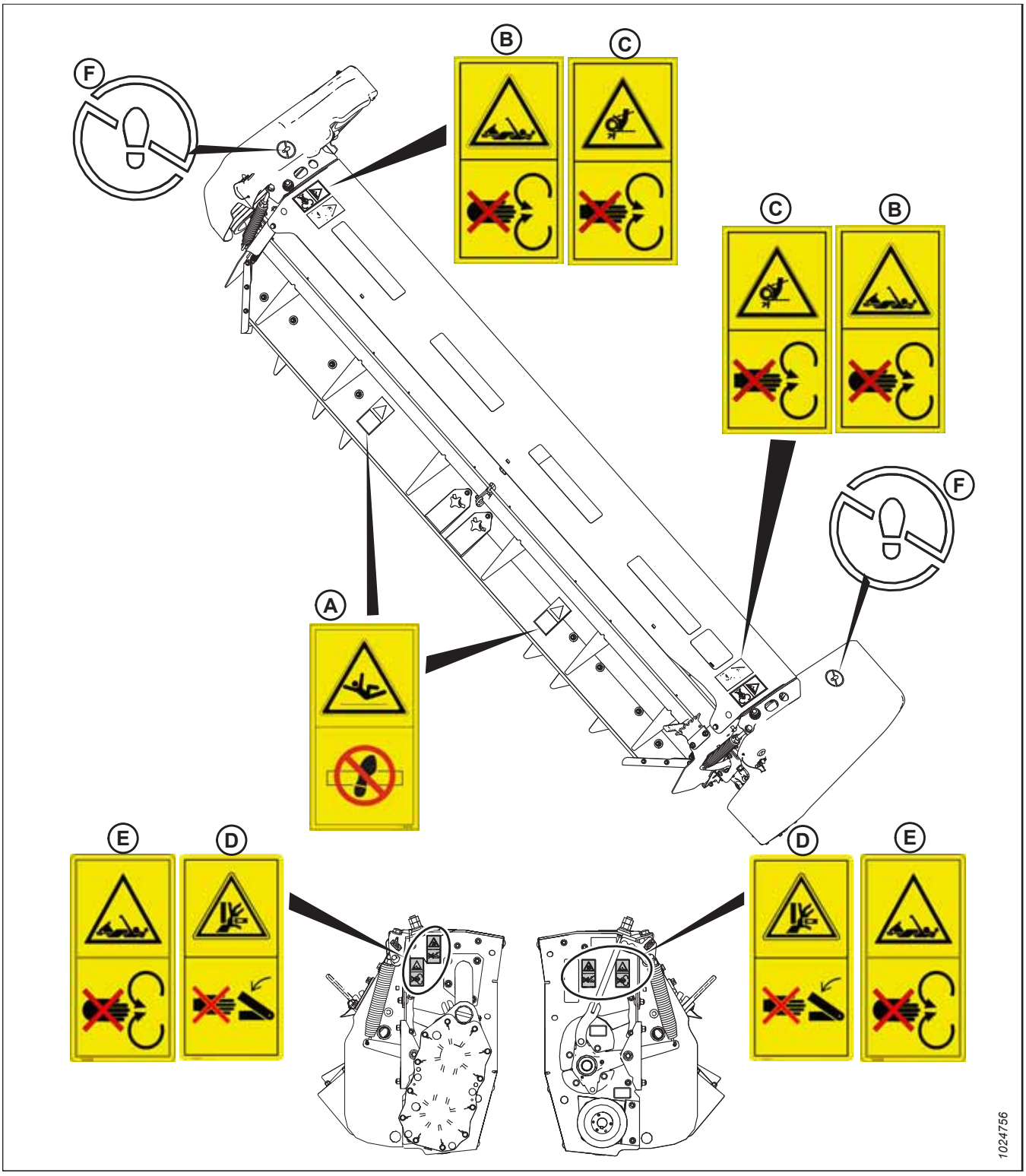


Figure 1.19: Safety Sign Decal Locations – Roll Conditioner

A - MD #190546
B - MD #184385
C - MD #184371
D - MD #246959
E - MD #246956
F - NO STEP Symbol (Imprinted on Shield)

1.10 Understanding Safety Signs

Safety sign decals use illustrations to convey important safety or equipment maintenance information.

MD #113482

General hazard pertaining to machine operation and servicing

DANGER

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

- Read the operator's manual and follow all safety instructions. If you do not have a manual, obtain one from your Dealer.
- Do **NOT** allow untrained persons to operate the machine.
- Review the safety instructions with all Operators every year.
- Ensure that all safety signs are installed and legible.
- Make certain everyone is clear of the machine before starting the engine and during operation.
- Keep riders off of the machine.
- Keep the shields in place and stay clear of moving parts.
- Disengage the header drive, put the transmission in Neutral, and wait for all movement to stop before leaving the operator's position.
- Shut down the engine and remove the key from the ignition before servicing the machine.
- To prevent a raised unit from falling, engage the safety props before servicing the unit in the raised position.
- Use the 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

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

- Do **NOT** go near hydraulic oil leaks.
- Do **NOT** use your body to check for hydraulic oil leaks.
- Before loosening any hydraulic fittings, lower the load or relieve the pressure in the hydraulic system.
- If hydraulic fluid has penetrated the skin, seek emergency medical help. **IMMEDIATE** surgery is required to remove hydraulic oil which has penetrated the skin.

Figure 1.21: MD #166466

MD #166832

High-pressure hydraulic fluid hazard

WARNING

To prevent serious injury, gangrene, or death:

- Hydraulic fluid from a leak can easily puncture skin and can cause serious injury, gangrene, or death.
- Do **NOT** go near hydraulic leaks.
- Do **NOT** use your body to check for hydraulic leaks.
- Before loosening any hydraulic fittings, relieve the pressure in the hydraulic system.
- If hydraulic fluid has penetrated the skin, seek emergency medical help. **IMMEDIATE** surgery is required to remove the oil and prevent gangrene.

Figure 1.22: MD #166832

MD #174434

Header crushing hazard

DANGER

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

- Fully raise the header, shut down the engine, remove the key from the ignition, and engage the mechanical safety props on the windrower before going under the header.
- Alternatively, rest the header on the ground, shut down the engine, and remove the key from the ignition before servicing the machine.

Figure 1.23: MD #174434

MD #184385

Auger entanglement hazard

DANGER

To prevent injury:

- Shut down the engine, and remove the key from the ignition before opening the shield.
- Do **NOT** operate the machine without shields in place.

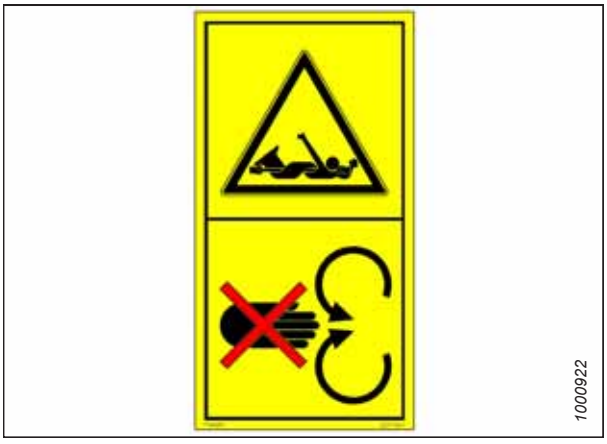


Figure 1.24: MD #184385

MD #190546

Slipping hazard

WARNING

To prevent injury or death:

- Do **NOT** use this area as a step or platform.

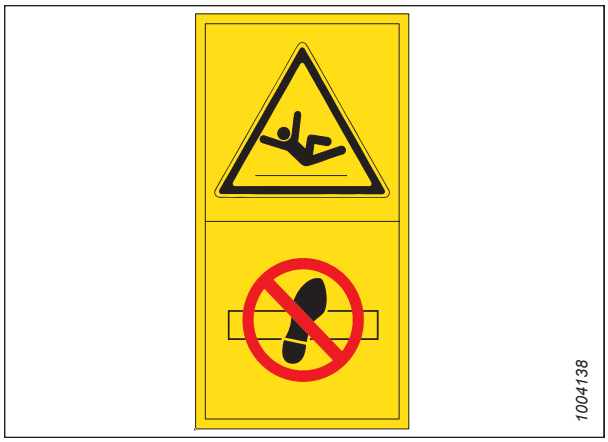


Figure 1.25: MD #190546

MD #194465

Blade cutting hazard

WARNING

To prevent injury from sharp cutting blades:

- Do **NOT** operate the machine without the shields in place.
- Stand clear of the header while the machine is running.
- Disengage the power take-off (PTO), shut down the engine, and remove the key from the ignition before opening the shield.
- Listen and look for rotation before opening the shield.
- The blades may continue to rotate after power is shut off.

Figure 1.26: MD #194465

MD #194466

Thrown objects hazard

WARNING

To prevent injury or death from thrown objects:

- Stand clear of the header while the machine is running.
- Crop materials exiting at high speed.
- Stop the machine, look, listen, and wait for all movement to stop before approaching.

Figure 1.27: MD #194466

MD #246956

Driveline entanglement hazard

DANGER

To prevent injury:

- Shut down the engine, and remove the key from the ignition before opening the shield.
- Do **NOT** operate the machine without the shields in place.

Figure 1.28: MD #246956

MD #246959

Pinch point hazard

CAUTION

To prevent injury:

- Do **NOT** reach into the pinch area.

Figure 1.29: MD #246959

MD #247167

Blade cutting hazard

WARNING

To prevent injury from sharp cutting blades:

- Do **NOT** operate the machine without shields in place.
- Disengage the power take-off (PTO), shut down the engine, and remove the key from the ignition before opening the shields.
- Listen and look for rotation before opening the shield.
- The blades may continue to rotate after power is shut off.

Figure 1.30: MD #247167

MD #304865

Header crushing hazard

WARNING

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

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

Figure 1.31: MD #304865

Chapter 2: Product Overview

Refer to this section to learn about the machine's dimensions, weights, and specifications.

2.1 Specifications

Consult this section to learn about the physical characteristics of and equipment specifications for your machine.

NOTE:

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

Frame and Structure	
Width (transport)	4063 mm (160 in.)
Weight: base machine and adapter frame	1364 kg (3007 lb.)
Weight: base machine, adapter frame, and steel roll conditioner	1850 kg (4079 lb.)
Weight: base machine, adapter frame, and polyurethane roll conditioner	1868 kg (4118 lb.)
Compatible windrowers	MacDon M155, M155*E4*, M205, M1170, M1240, M2170, and M2260
Lighting	Left and right turn signals
Manual storage	Plastic case on header right driveshield
Cutterbar	
Number of cutting discs	Eight
Blades per disc	Two 18° bevel down
Disc speed (full engine speed)	2500 rpm
Blade max tip speed	80.5 m/s (180 mph)
Effective cutting width	3978 mm (13 ft.)
Minimum cutting height	27 mm (1 1/16 in.)
Cutting angle range	0–8° below horizontal
Adjustable shoes	Standard
Gear train protection	Shear pin (safecut)
Converging Drums	Two-drum type
Drives	
Hydraulic motor	Piston type into 90° gearbox
Cutterbar	Direct drive through 90° gearbox and universal shaft
Conditioner drive	Belt drive (4HB) from 90° gearbox to conditioner
Conditioner roll timing	Timing gearbox

Hay Conditioner Options	
Steel rolls	Optional
Roll type	Steel on steel chevron conditioner rolls
Roll length	3275 mm (129 in.)
Roll diameter	229 mm (9.0 in.) / 179 mm (7.0 in.) OD tube
Roll speed	1009 rpm
Polyurethane rolls	Optional
Roll type	Polyurethane intermeshing conditioner rolls
Roll length	3275 mm (129 in.)
Roll diameter	254 mm (10.0 in.) / 203 mm (8.0 in.) OD tube
Roll speed	1009 rpm
Swath width[1]	915–2540 mm (36–102 in.)
Forming shields	Full width adjustable baffle on conditioner with adjustable side deflectors on support frame
No conditioner	Optional (includes rear curtain)

1. Actual swath width may vary based upon conditioner type, crop type, and crop volume.

2.2 Component Identification

Operating and maintaining the header requires understanding the names of its parts and their locations.

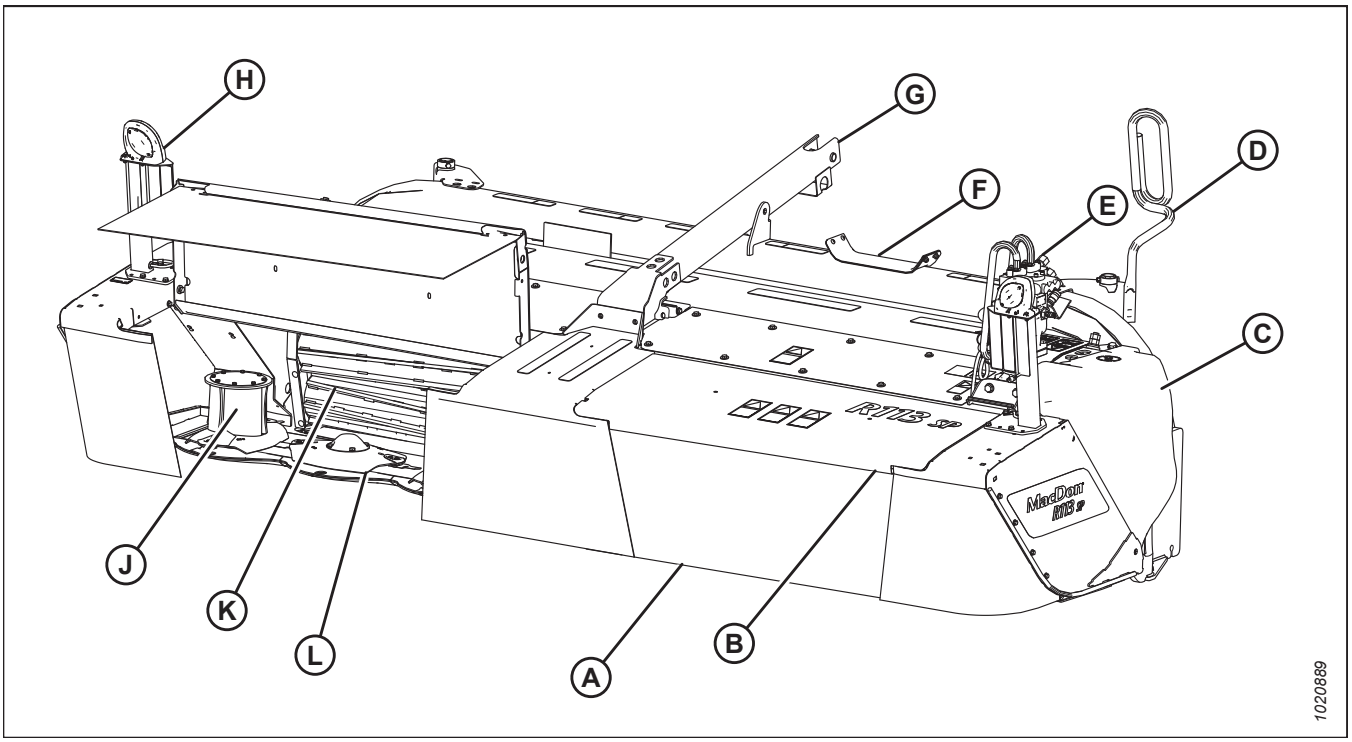


Figure 2.1: R113 Rotary Disc Header

A - Front Curtains
B - Cutterbar Doors
C - Drive Shield (Left)
D - Hose Support[2]
E - Hydraulic Motor[3]
F - Hose Support
G - Center-Link Tube
H - Hazard/Brake Lights
J - Disc Drum (Right)
K - Conditioner Rolls
L - 8-Disc Cutterbar

2. M155/M155*E4* Self-Propelled Windrower only.
3. M155/M155*E4* Self-Propelled Windrower motor shown.

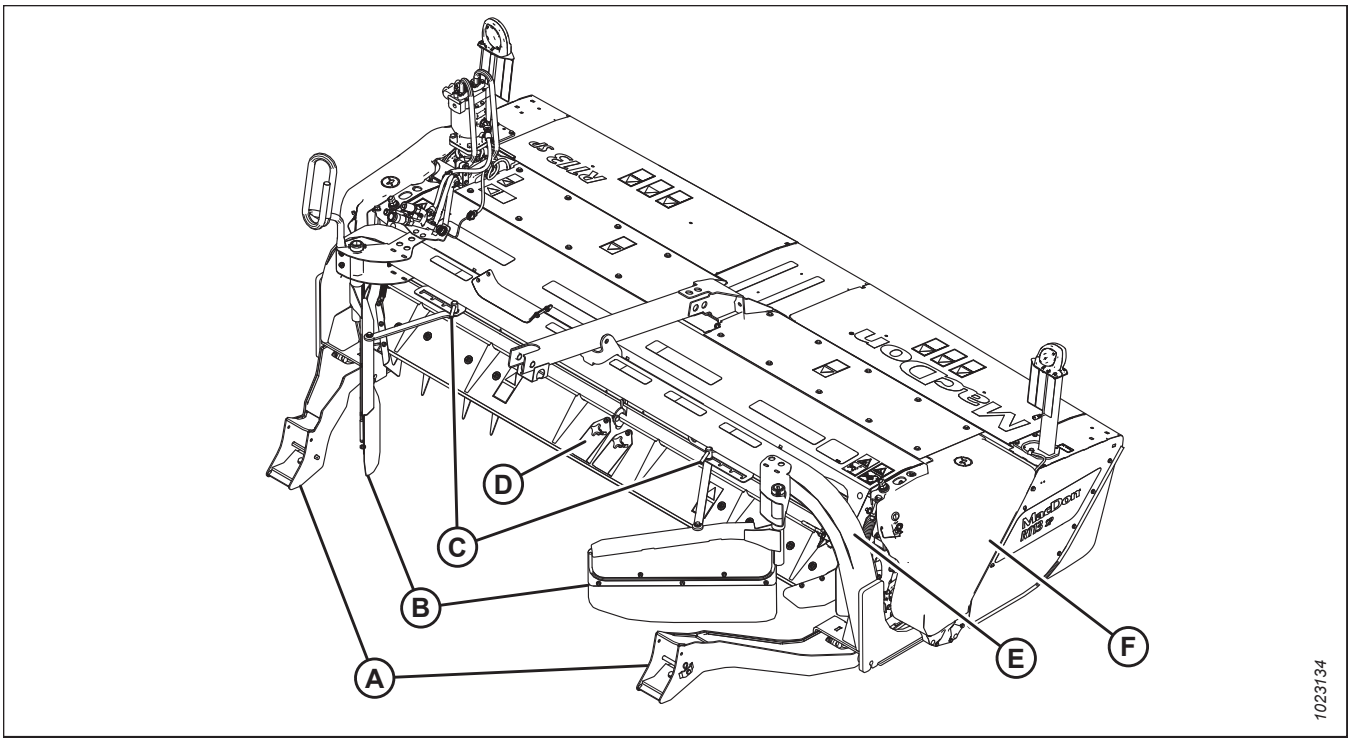


Figure 2.2: R113 Rotary Disc Header

A - Header Supports
B - Side Deflectors
C - Side Deflector Adjuster Handles
D - Rear Crop Baffle
E - Adapter Frame
F - Drive Shield

2.3 Definitions

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

Table 2.1 Definitions

Term	Definition
API	American Petroleum Institute
Bolt	A headed and externally threaded fastener designed to be paired with a nut
Cab-forward	Windrower operation mode in which the operator's seat faces the header
Center-link	A hydraulic cylinder or manually adjustable turnbuckle type connection between the header and the vehicle, which is used to change the angle of the header relative to the vehicle
CGVW	Combined gross vehicle weight
Export header	The header configuration typical outside North America
FFFT	Flats from finger tight
Finger tight	A reference position in which the given sealing surfaces or components are making contact with each other. The fitting has been tightened by hand to a point where the fitting is no longer loose and cannot be tightened further by hand
GVW	Gross vehicle weight
Hard joint	A joint made with use of a fastener where joining materials are highly incompressible
Header	A machine that cuts and lays crop into a windrow when attached to a windrower
Hex key	A tool of hexagonal cross-section used to drive bolts and screws that have a hexagonal socket in the head (internal-wrenching hexagon drive); also known as an Allen key
M Series Windrowers	MacDon M100, M105, M150, M155, M155*E4*, M200, and M205 Windrowers
M1 Series Windrowers	MacDon M1170, M1170 *NT*, M1170 *NT5*, and M1240 Windrowers
M2 Series Windrowers	MacDon M2170, M2170 *NT*, and M2260 Windrowers
n/a	Not applicable
North American header	The header configuration typical in North America
Nut	An internally threaded fastener designed to be paired with a bolt
ORB	O-ring boss: A style of fitting commonly used in port openings on manifolds, pumps, and motors
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
SAE	Society of Automotive Engineers
Screw	A headed and externally threaded fastener that threads into preformed threads or forms its own thread when it is inserted into a mating part
Soft joint	A flexible joint made by use of a fastener in which the joining materials compress or relax over a period of time
Tension	An axial load placed on a bolt or screw, usually measured in Newtons (N) or pounds (lb.). This term can also be used to describe the force a belt exerts on a pulley or sprocket
TFFT	Turns from finger tight
Torque	The product of a force * the length of a lever arm, usually measured in Newton-meters (Nm), foot-pounds (lbf·ft), or inch-pounds (lbf·in)
Torque angle	A tightening procedure in which a fitting is assembled to a specified tightness (usually finger tight) and then the nut is turned farther by a specified number of degrees until it achieves its final position

Table 2.1 Definitions (continued)

Term	Definition
Torque-tension	The relationship between the assembly torque applied to a piece of hardware and the axial load it induces in a bolt or screw
Washer	A thin cylinder with a hole or a slot located in the center, used as a spacer, a load distribution element, or a locking mechanism
Windrower	The power unit for a header

Chapter 3: Operation

Safely operating your machine requires familiarizing yourself with its capabilities.

3.1 Break-In Period

A brand-new machine must be operated gently when it is run for the first time.

After attaching the header to the windrower for the first time, operate the machine slowly for five minutes, watching and listening from the operator's 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.

DANGER

Before investigating an unusual sound or attempting to correct a problem, shut down the engine, engage the parking brake, and remove the key from the ignition.

NOTE:

Perform the items specified in *4.3.2 Break-in Inspections, page 146*.

3.2 Daily Start-Up Check

Perform this procedure before operating the machine.

CAUTION

- **Ensure that the windrower and the header are properly attached, that all controls are in neutral, and that the windrower brakes are engaged.**
- **Clear the area of bystanders. Walk around the header to confirm that no one is nearby.**
- **Wear close-fitting clothing and protective shoes with slip-resistant soles. Have at hand any protective clothing and personal safety devices that MIGHT be necessary throughout the day. Don't take chances when it comes to safety.**
- **Clear any obstacles that might interfere with the operation of the machine.**

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

   NOTE:

   Use the proper procedure when searching for pressurized fluid leaks. For instructions, refer to *4.12.1 Checking Hydraulic Hoses and Lines, page 244*.

2. Clean all lights and reflective surfaces on the machine, and check the lights to ensure that they are operating correctly.
3. Perform all daily maintenance procedures. For instructions, refer to *4.3.1 Maintenance Schedule/Record, page 144*.

3.3 Engaging and Disengaging Header Safety Props

The safety props are located on both header lift cylinders on the windrower.

Refer to the relevant procedure for your windrower:

- For M1 Series and M2 Series Windrowers, refer to *3.3.1 Engaging and Disengaging Header Safety Props – M1 Series and M2 Series Windrower, page 27*.
- For M Series Self-Propelled Windrowers, refer to *3.3.2 Engaging and Disengaging Header Safety Props – M155, M155E4, or M205 Self-Propelled Windrower, page 28*.

3.3.1 Engaging and Disengaging Header Safety Props – M1 Series and M2 Series Windrower

The safety props are located on both of the header lift cylinders on the windrower. Engage the props any time you are going to work on or around a raised header. When engaged, the safety props prevent the header from dropping suddenly if the lift system hydraulics lose pressure.

DANGER

Ensure that all bystanders have cleared the area.

DANGER

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

1. Start the engine. For instructions, refer to the windrower operator's manual.
2. Press HEADER UP switch (A) on the ground speed lever (GSL) to raise the header to its maximum height.

   NOTE:

   If one end of the header does **NOT** fully rise, 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. The cylinders are now phased.
3. Shut down the engine, and remove the key from the ignition.

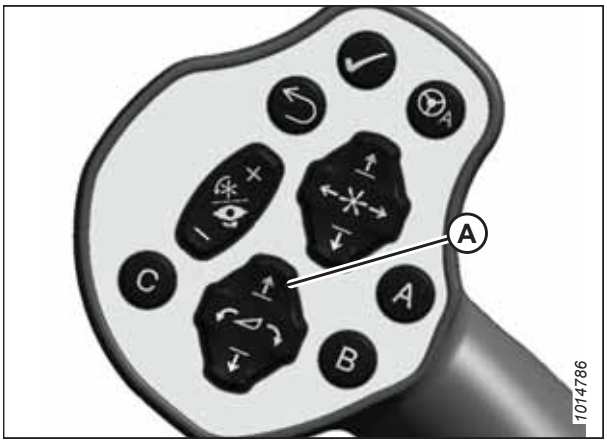


Figure 3.1: Ground Speed Lever (GSL)

4. Engage the safety props on both lift cylinders as follows:

   a. Pull lever (A) toward you to release it, then rotate it toward the header to lower the safety prop onto the cylinder.

   b. Repeat the previous step for the opposite lift cylinder.

   IMPORTANT:

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

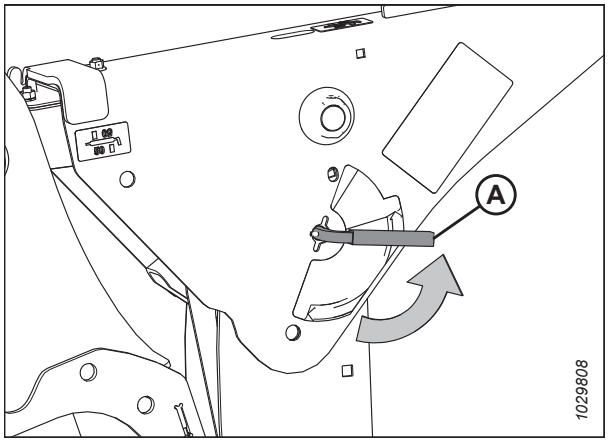


Figure 3.2: Safety Prop Lever

5. Disengage the safety props on both lift cylinders as follows:

   a. Turn lever (A) away from the header to raise the safety prop until the lever locks into the vertical position.

   b. Repeat the previous step for the opposite cylinder.

   NOTE:

   If the safety prop will **NOT** disengage, raise the header to release the prop.

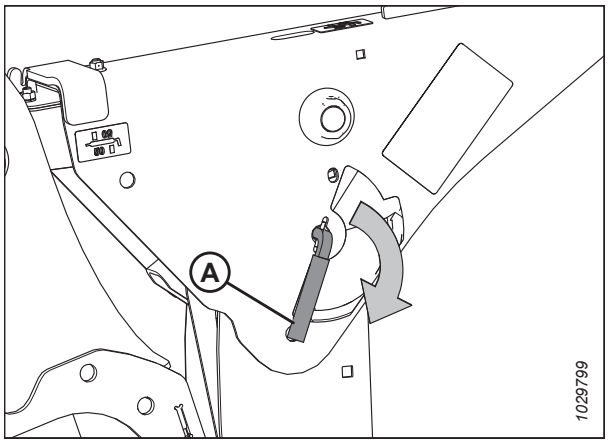


Figure 3.3: Safety Prop Lever

3.3.2 Engaging and Disengaging Header Safety Props – M155, M155*E4*, or M205 Self-Propelled Windrower

Safety props are located on both header lift cylinders on the windrower. Engage the props any time you are going to work on or around the header when it is raised. When engaged, the safety props prevent a header from dropping suddenly if the lift system hydraulics lose pressure.

DANGER

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

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

Ensure that all bystanders have cleared the area.

1. Start the engine.
2. Press HEADER UP switch (A) to raise the header to its maximum height.
3. Rephase the cylinders if one end of the header does not rise fully:
   a. Press and hold HEADER UP switch (A) until both cylinders stop moving.
   b. Continue to hold the switch for 3–4 seconds. The cylinders are now phased.

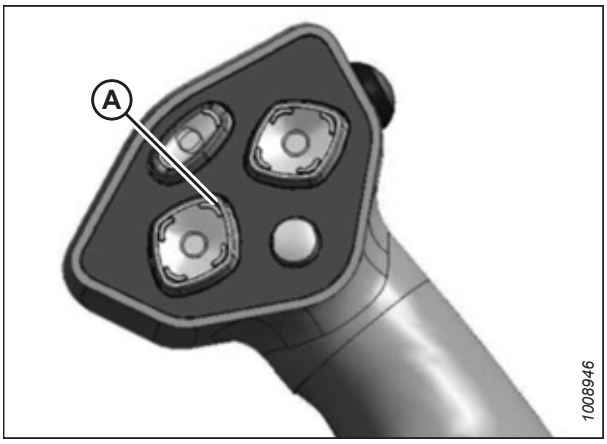


Figure 3.4: Ground Speed Lever (GSL)

4. To engage the safety props on the lift cylinders:
   a. Pull lever (A) and rotate it toward the header to lower safety prop (B) onto the cylinder.
   b. Repeat the previous step for the opposite lift cylinder.

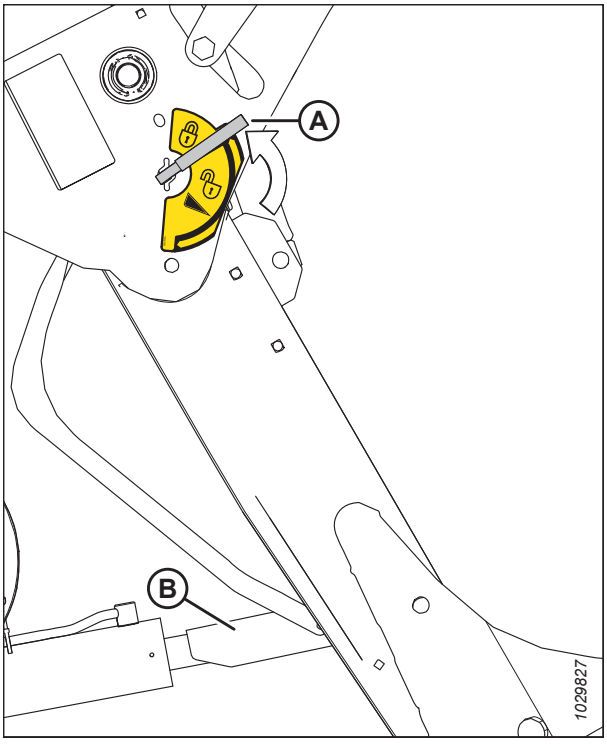


Figure 3.5: Safety Prop

5. To disengage the safety props on the lift cylinders:
   a. Turn lever (A) away from the header to raise the safety prop until the lever locks into the vertical position.
   b. Repeat the previous step for the opposite cylinder.
6. Start the engine.
7. Lower the header fully.
8. Shut down the engine, and remove the key from the ignition.

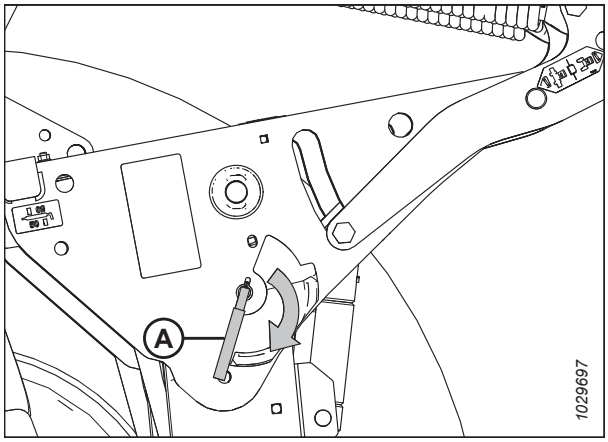


Figure 3.6: Safety Prop

3.4 Attaching Header to Windrower

The procedure for attaching a rotary disc header to a windrower varies depending on the windrower model and how that windrower is equipped.

Proceed to the procedure that is suitable for your windrower:

- *3.4.1 Attaching Header to M2 Series Windrower, page 31*
- *3.4.2 Attaching Header to M1 Series Windrower, page 38*
- *3.4.3 Attaching Header to M155, M155E4, or M205 Self-Propelled Windrower – Hydraulic Center-Link with Self-Alignment, page 44*
- *3.4.4 Attaching Header to M155, M155E4, or M205 Self-Propelled Windrower – Hydraulic Center-Link without Self-Alignment, page 49*

3.4.1 Attaching Header to M2 Series Windrower

The windrower's lift linkage and center-link will need to be connected to the header.

IMPORTANT:

The R113 Rotary Disc Header is compatible with an M2170 or M2260 Windrower, but **NOT** an M2170 NT Windrower.

DANGER

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

DANGER

Ensure that all bystanders have cleared the area.

1. Shut down the engine, and remove the key from the ignition.
2. Remove hairpin (A) from clevis pin (B), and remove the pin from header support (C). Remove the hairpin and the clevis pin from the other header support.
3. Start the engine.

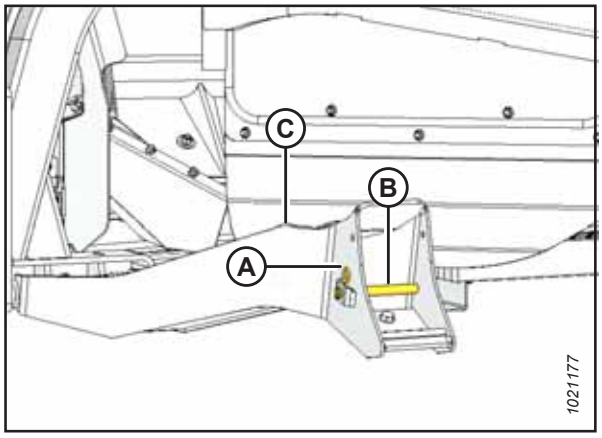


Figure 3.7: Header Support

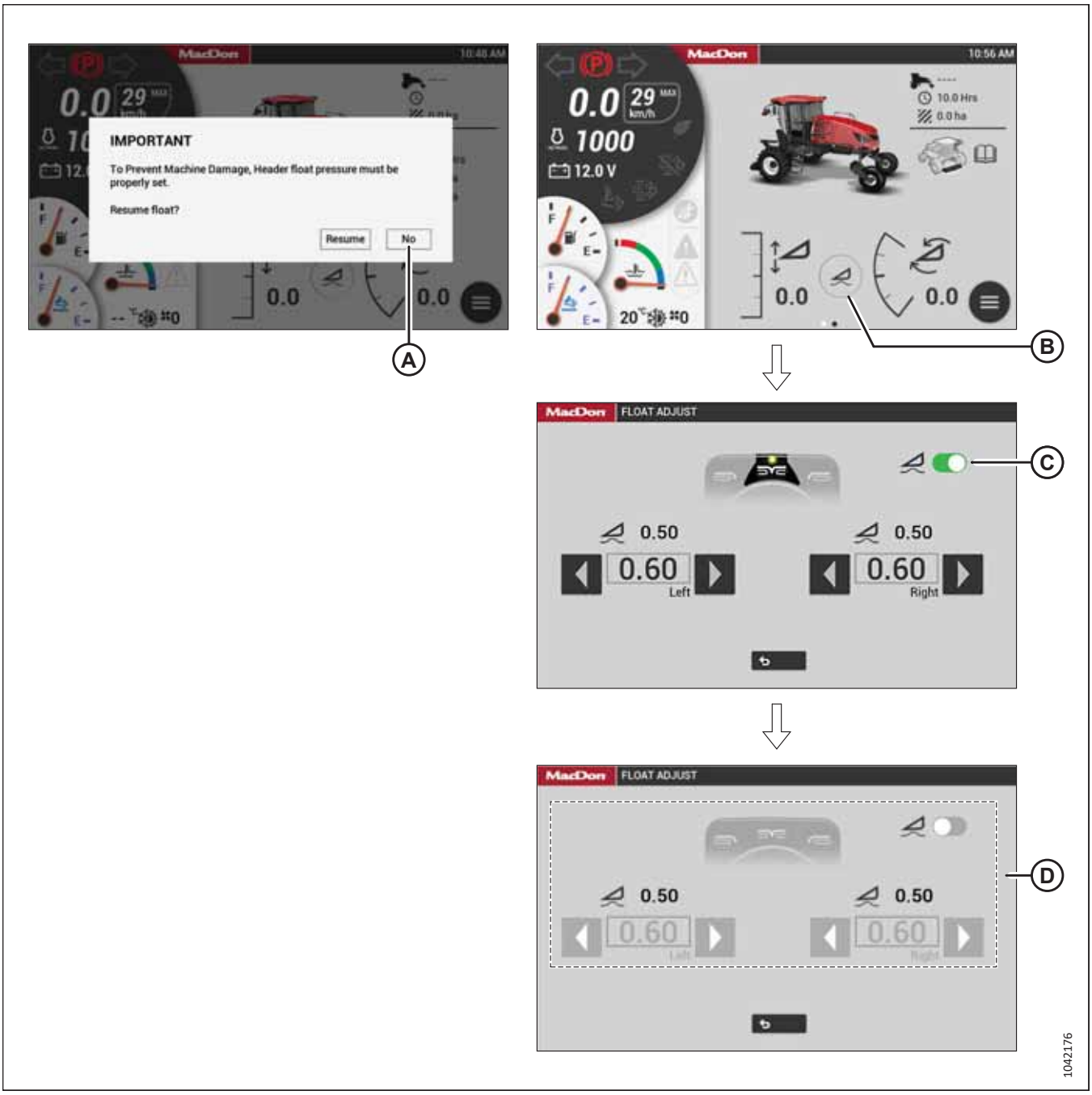


Figure 3.8: Float Removal

4. Remove the float as follows:

   - If the HarvestTouch™ Display shows the message “Resume Float?”, then select NO (A).
   - If the HarvestTouch™ Display does **NOT** show the message, then select FLOAT ADJUST (B), select switch (C), and confirm the switch and float settings (D) are grayed out.

   IMPORTANT:

   Removing the float will release the tension in the float springs. This will prevent damage to the header lift linkages when lowering the legs without a header or weight box attached to the windrower.

5. Prepare the center-link as follows:

   - **If not equipped with the Center-Link Alignment kit:** Relocate pin (A) in the frame linkage as needed to raise center-link (B) until the hook is above the attachment pin on the header.
   - **If equipped with the Center-Link Alignment kit:** Press REEL UP switch (D) on the ground speed lever (GSL) to raise the center-link until the hook is above the attachment pin on the header.

   IMPORTANT:

   Ensure that the center-link is positioned high enough that it does not contact the header as the windrower approaches the header.

6. Press HEADER DOWN switch (C) on the GSL until the windrower lift linkages are fully lowered.

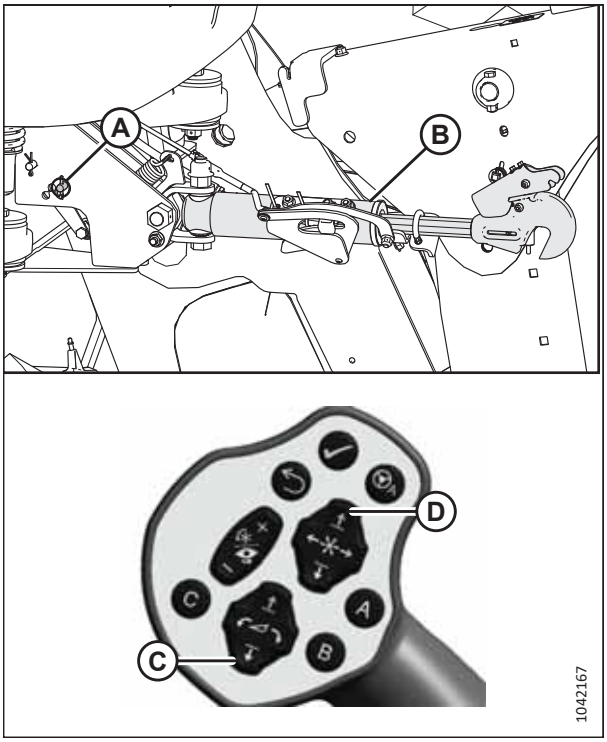


Figure 3.9: Center-Link without Self-Alignment

7. Slowly drive the windrower forward until feet (A) enter header supports (B). Continue to drive forward until the feet engage the supports and the header nudges forward.

8. Ensure that feet (A) are properly engaged in header supports (B).

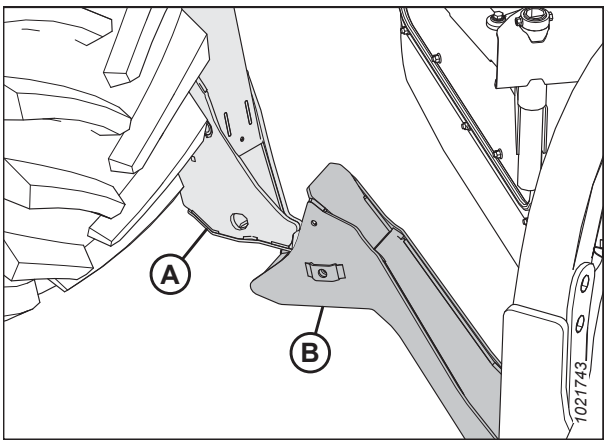


Figure 3.10: Header Support

9. **Windrowers equipped with the Center-Link Alignment kit:**

   a. Press HEADER TILT UP (A) or HEADER TILT DOWN (B) switches on the GSL to extend or retract the center-link cylinder until hook (C) is aligned with the header attachment pin.

   b. Lower the center-link onto the header with REEL DOWN (D) switch on the GSL until the center-link locks into position and hook release (E) is down.

      IMPORTANT:

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

   c. Check that the center-link is locked onto the header by pressing REEL UP (F) switch on the GSL.

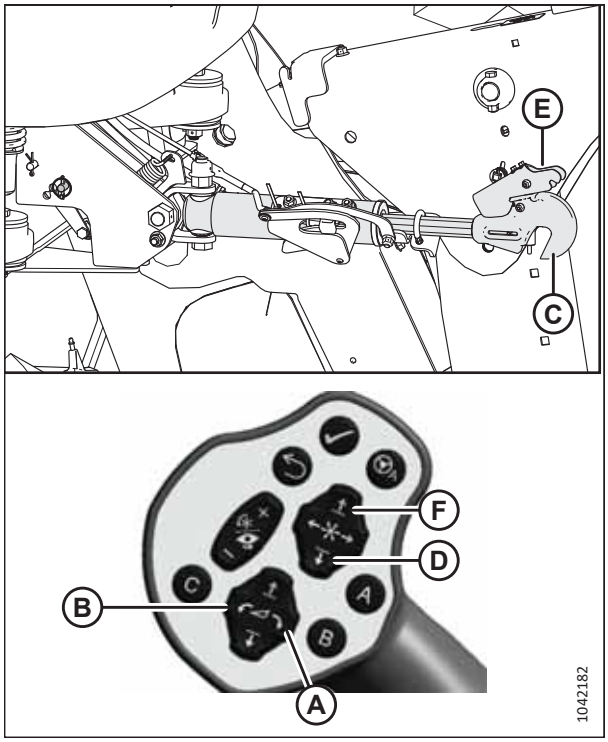


Figure 3.11: Hydraulic Center-Link

10. **Windrowers without the Center-Link Alignment kit:**

   a. Press HEADER TILT UP (A) or HEADER TILT DOWN (B) switches on the GSL to extend or retract the center-link cylinder until the hook is aligned with the header attachment pin.

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

   c. Push down on rod end (C) of the link cylinder until hook (D) engages and locks onto the header pin.

      IMPORTANT:

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

   d. Check that the center-link is locked onto the header by pulling upward on rod end (C) of the cylinder.

   e. Start the engine.

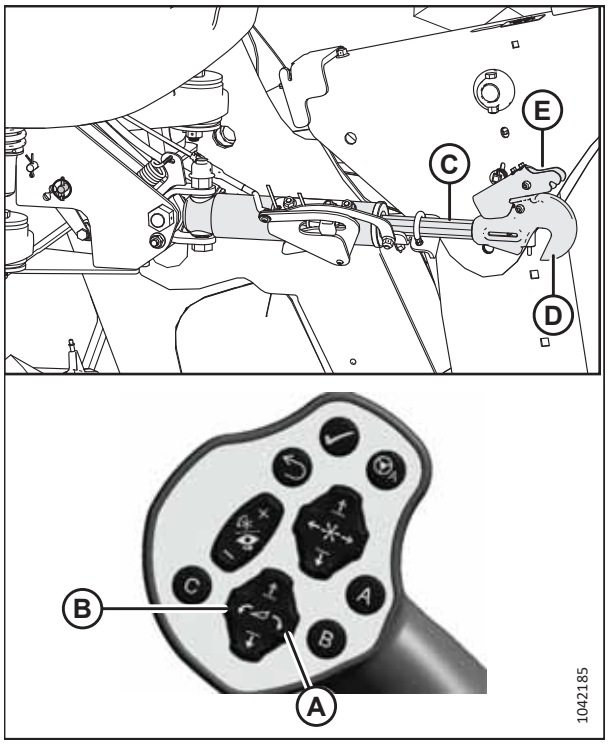


Figure 3.12: Hydraulic Center-Link

11. Press HEADER UP switch (A) to raise the header to its maximum height.

    NOTE:

    If one end of the header does **NOT** fully rise, 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. The cylinders are now phased.

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

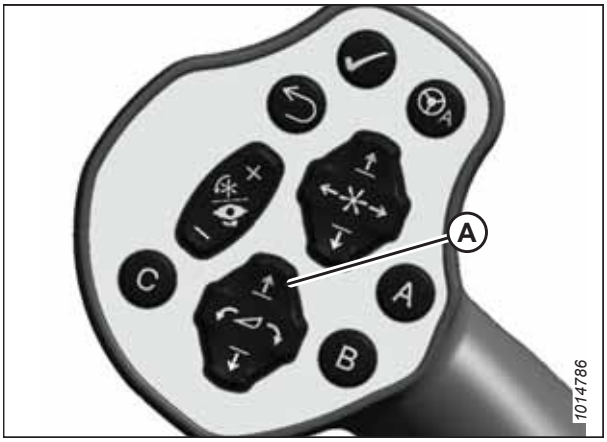


Figure 3.13: Ground Speed Lever (GSL)

13. Engage the safety props on both lift cylinders as follows:

    a. Pull lever (A) toward you to release it, then rotate it toward the header to lower the safety prop onto the cylinder.

    b. Repeat the previous step for the opposite lift cylinder.

    IMPORTANT:

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

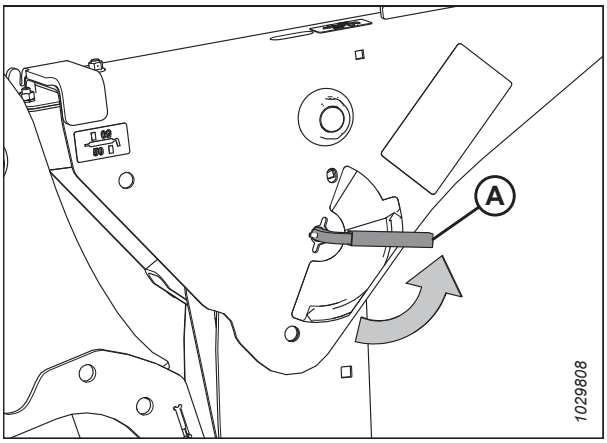


Figure 3.14: Safety Prop Lever

14. Install clevis pin (A) through the support and the windrower lift arm and secure the clevis pin with hairpin (B). Install the clevis pin and the hairpin on the opposite side of the header.

    IMPORTANT:

    Ensure that clevis pin (A) is inserted as far as possible and that the hairpin is installed behind the bracket as shown.

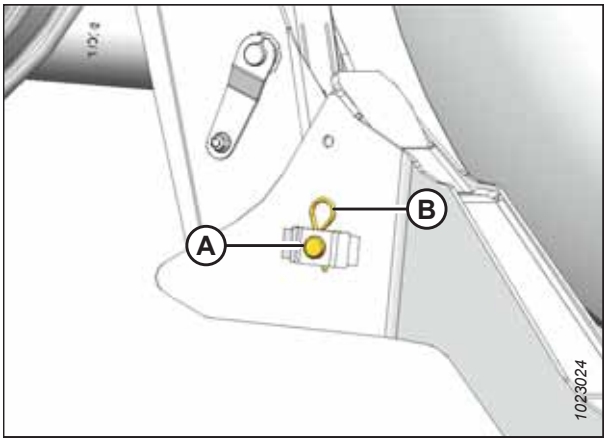


Figure 3.15: Header Support

15. Disengage the safety props on both lift cylinders as follows:

    a. Turn lever (A) away from the header to raise the safety prop until the lever locks into the vertical position.

    b. Repeat the previous step for the opposite cylinder.

    NOTE:

    If the safety prop will **NOT** disengage, raise the header to release the prop.

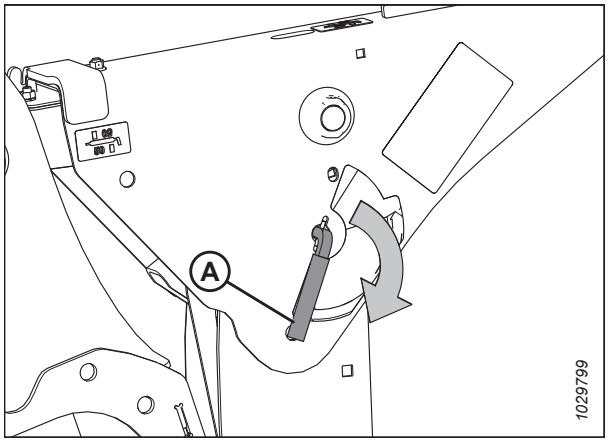


Figure 3.16: Safety Prop Lever

16. Press HEADER DOWN switch (A) on the GSL to fully lower the header.

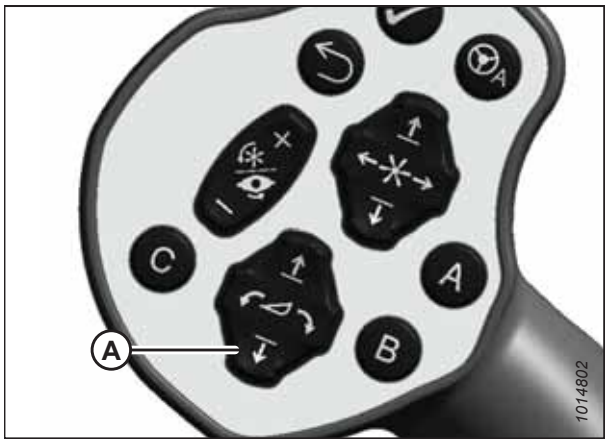


Figure 3.17: Ground Speed Lever (GSL)

17. Select FLOAT ADJUST (A).

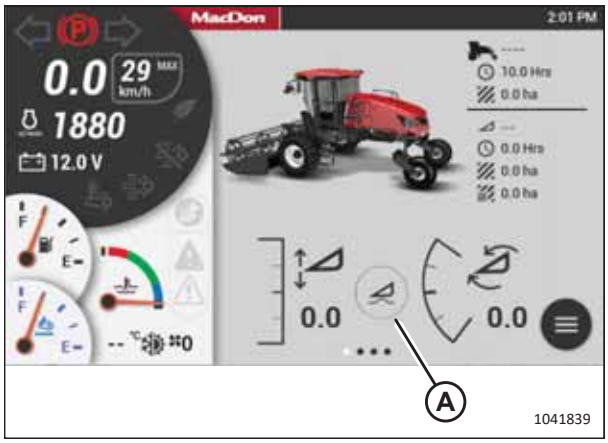


Figure 3.18: HarvestTouch™ Display

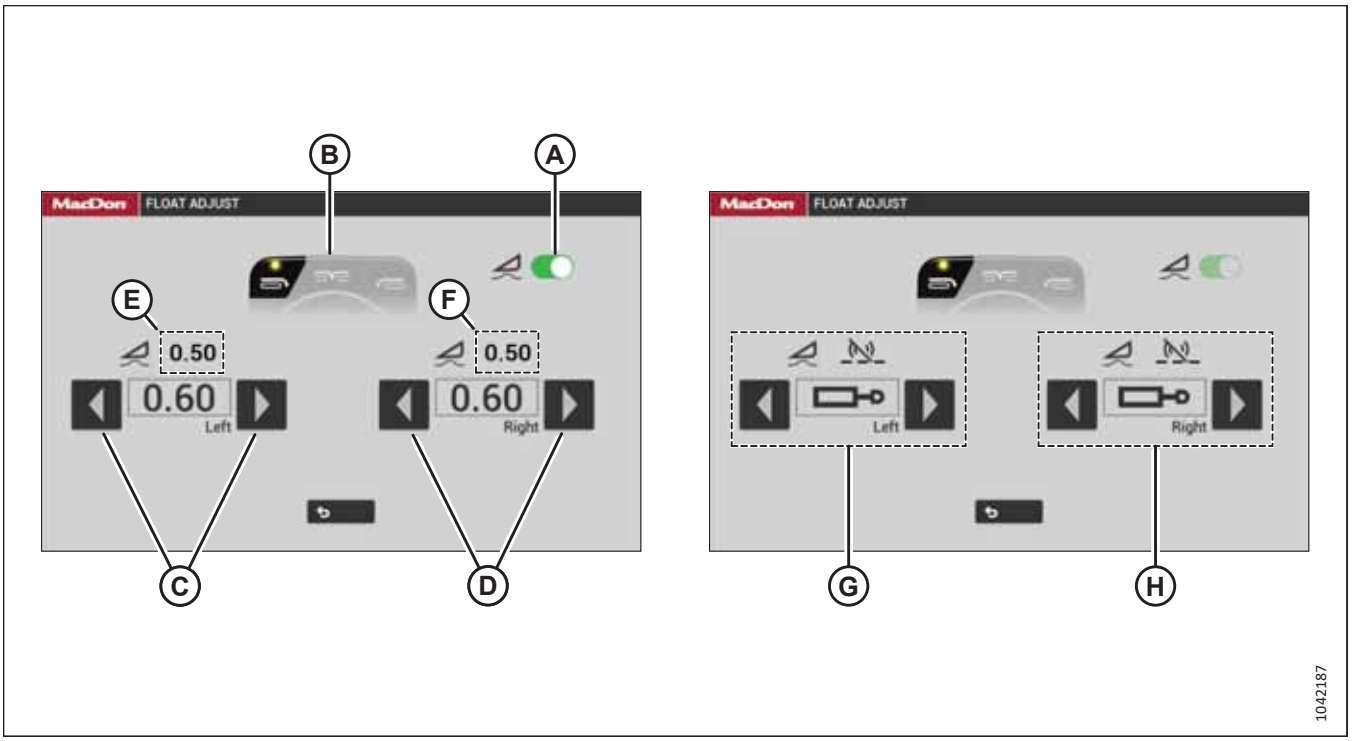


Figure 3.19: Float Adjustment

18. Select switch (A), so that it turns green, to activate the float.
19. If the float is not already set up, set the float as follows:
    a. The float preset, which is selected using the operator's console, is displayed at location (B). Confirm if the desired preset is selected.
    b. Select arrows (C) to set the target float for the left side of the header. Value (E) is the actual amount of float (measured by the left float sensor).
    c. Select arrows (D) to set the target float for the right side of the header. Value (F) is the actual amount of float (measured by the left float sensor).

    NOTE:

    Adjusting the float by increments of 1.0 (out of 10) changes the header weight at the cutterbar by approximately 91 kg (200 lb.). Adjust the float in increments of 0.05 to fine-tune the header's performance.
20. Shut down the engine, and remove the key from the ignition.
21. Check the float as follows:
    a. Grasp one end of the header and lift it. The lifting force used should be 426–471 N (95–105 lbf).
    b. Repeat this step on the other side of the header.
22. Proceed as follows:
    - If you are attaching the header to an M2170 Windrower, proceed to *Connecting Header Hydraulic and Electrical Systems – M2170 Windrower, page 55*.
    - If you are attaching the header to an M2260 Windrower, proceed to *Connecting Header Hydraulic and Electrical Systems – M2260 Windrower, page 58*.

3.4.2 Attaching Header to M1 Series Windrower

The procedure for attaching the header to an M1 Series Windrower varies depending on whether or not the self-aligning center-link is installed.

IMPORTANT:

The R113 Rotary Disc Header is compatible with the M1170 and M1240 Windrowers, but **NOT** the M1170 *NT* and M1170 *NT5* Windrowers.

DANGER

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

DANGER

Ensure that all bystanders have cleared the area.

1. Shut down the engine, and remove the key from the ignition.
2. Locate hydraulic center-link (A).

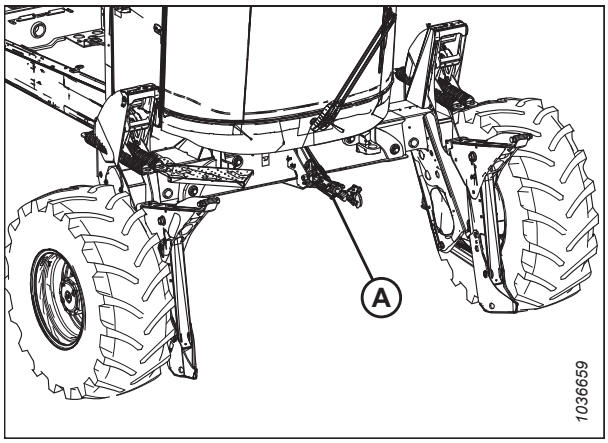


Figure 3.20: Hydraulic Center-Link Location

3. **Hydraulic center-link without self-alignment:** Remove pin (A) and raise center-link (B) until the hook is above the attachment pin on the header. Replace pin (A) to hold the center-link in place.

   IMPORTANT:

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

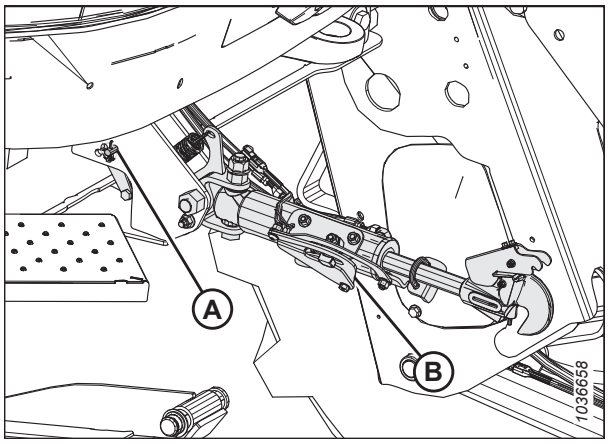


Figure 3.21: Hydraulic Center-Link and Pin

4. Remove hairpin (A) from clevis pin (B) from header support (C) on both sides of the header.

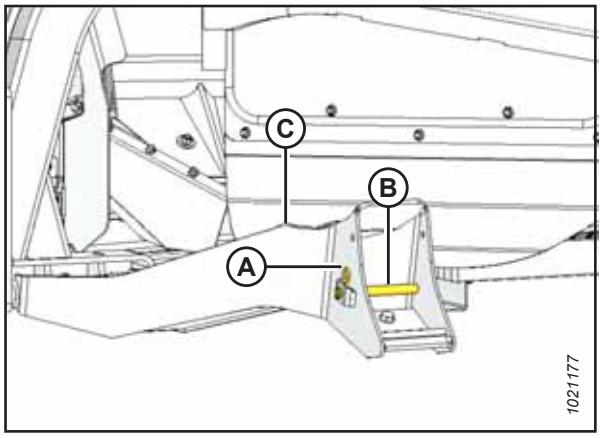


Figure 3.22: Header Support

5. If you are lowering the header lift legs with a header or weight box attached, proceed to Step *9, page 40*.

   If you are lowering the header lift legs without a header or weight box attached, fully release the tension in float springs (A):

   - If you are prompted by the Harvest Performance Tracker (HPT) to remove the float, then remove the float and proceed to Step *6, page 39*.
   - If you are not prompted by the HPT to remove the float, then remove the float manually. For instructions, refer to the windrower operator's manual. Once the float is removed, proceed to Step *9, page 40*.

   IMPORTANT:

   When you are lowering the header lift legs without a header or a weight box attached to the windrower, fully release the tension on the float springs to prevent damage to the header lift linkages.

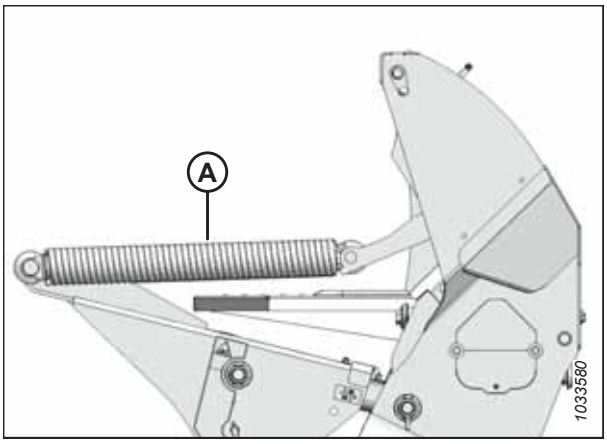


Figure 3.23: Header Float Springs

6. Press rotary scroll knob (A) on the to highlight the QuickMenu options.

7. Rotate scroll knob (A) to highlight HEADER FLOAT symbol (B), and press the scroll knob to select it. The Float Adjust page appears.

Figure 3.24: HPT Display

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

   NOTE:

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

Figure 3.25: HPT Display

9. Press HEADER DOWN switch (E) on the ground speed lever (GSL) to fully retract the header lift cylinders.

10. **Self-aligning hydraulic center-link:** 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.

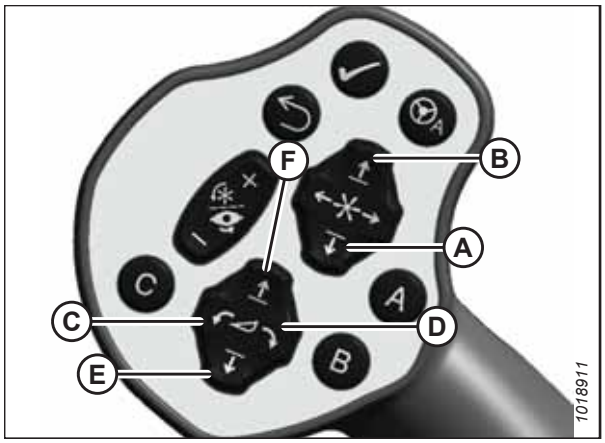


Figure 3.26: GSL

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

11. Slowly drive the windrower forward until feet (A) enter header supports (B). Continue to drive forward until the feet engage the supports and the header nudges forward.

12. Ensure that feet (A) properly engage header supports (B).

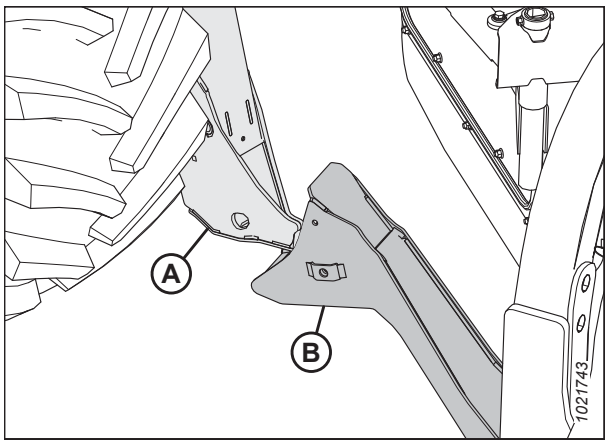


Figure 3.27: Header Support

13. **Windrowers equipped with the Center-Link Alignment kit:**

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

    IMPORTANT:

    Hook release (C) must be down to enable the self-locking mechanism to function.

    b. If hook release (C) is open (in the up position), shut down the engine, and remove the key from the ignition. Manually push hook release (C) down after the hook engages the header pin.

    c. Lower center-link (A) onto the header with the REEL DOWN switch on the GSL until the center-link locks into position and hook release (C) is down.

    d. Check that the center-link is locked onto the header by pressing the REEL UP switch on the GSL.

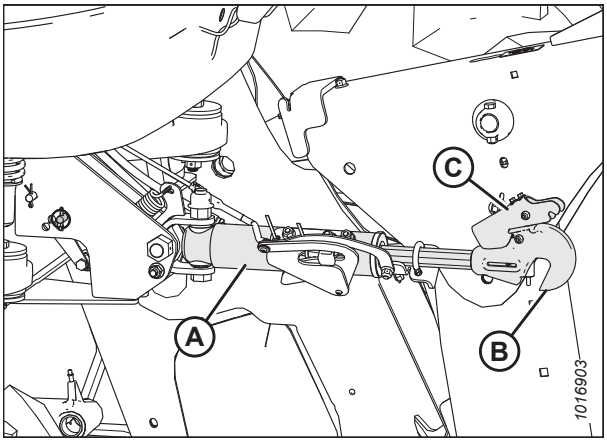


Figure 3.28: Hydraulic Center-Link

14. **Windrowers without the Center-Link Alignment kit:**

    a. Press the HEADER TILT UP or HEADER TILT DOWN cylinder switches on the GSL to extend or retract the center-link cylinder until the hook is aligned with the header attachment pin.

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

    c. Push down on rod end (B) of the link cylinder until the hook engages and locks onto the header pin.

    IMPORTANT:

    The hook release must be down to enable the self-locking mechanism to function. If the hook release is open (in the up position), manually push it down after the hook engages the pin.

    d. Check that center-link (A) is locked onto the header by pulling upward on rod end (B) of the cylinder.

    e. Start the engine.

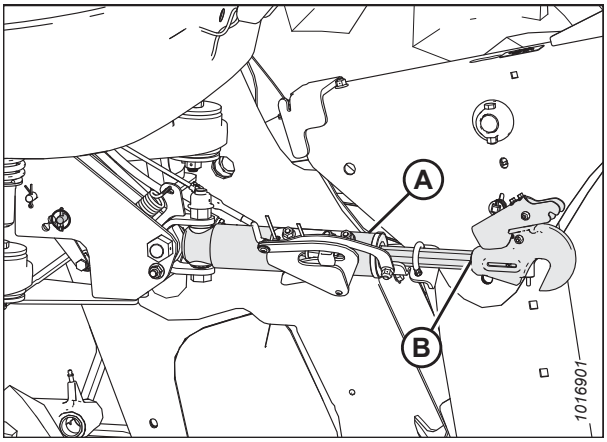


Figure 3.29: Hydraulic Center-Link

15. Press HEADER UP switch (A) to fully raise the header.

    NOTE:

    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. The cylinders are now phased.

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

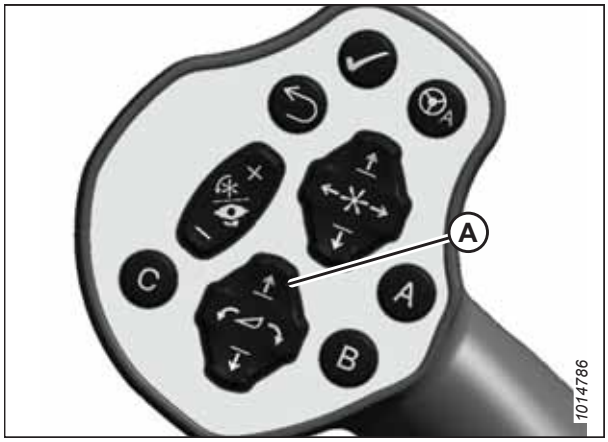


Figure 3.30: GSL

17. Engage the safety props on both lift cylinders as follows:

    a. Pull lever (A) toward you to release it, then rotate it toward the header to lower the safety prop onto the cylinder.

    b. Repeat the previous step for the opposite lift cylinder.

    IMPORTANT:

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

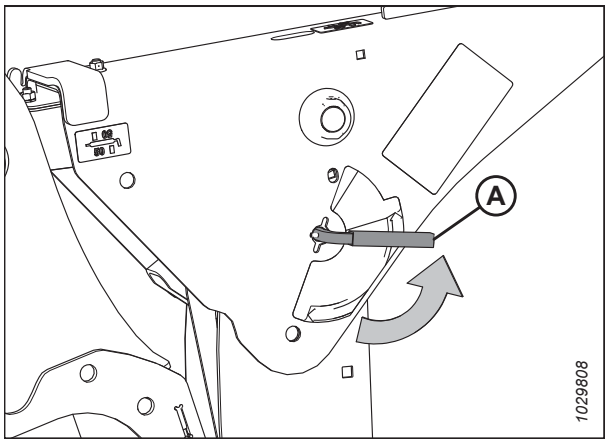


Figure 3.31: Safety Prop Lever

18. Install clevis pin (A) through the header support and the windrower lift arm. Secure the clevis pin with hairpin (B). Repeat this step for the opposite side of the header.

    IMPORTANT:

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

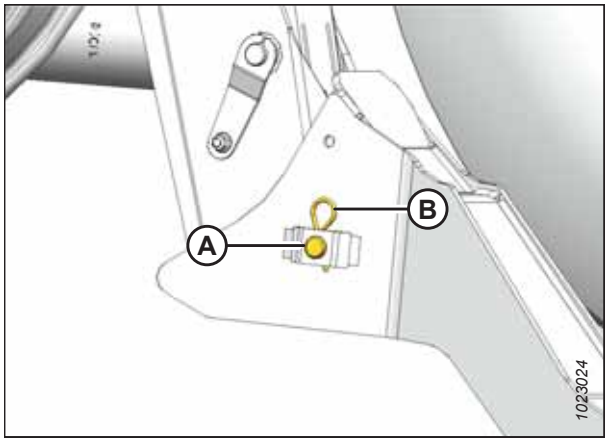


Figure 3.32: Header Support

19. Disengage the safety props on both lift cylinders as follows:

    a. Turn lever (A) away from the header to raise the safety prop until the lever locks into the vertical position.

    b. Repeat the previous step for the opposite cylinder.

    NOTE:

    If the safety prop will **NOT** disengage, raise the header to release the prop.

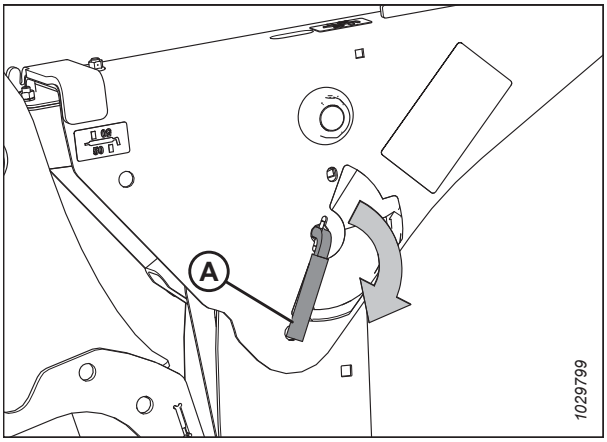


Figure 3.33: Safety Prop Lever

20. Press HEADER DOWN switch (A) on the GSL to fully lower the header.

    NOTE:

    If you are not prompted by the HPT display to restore the float, restore the float manually.

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

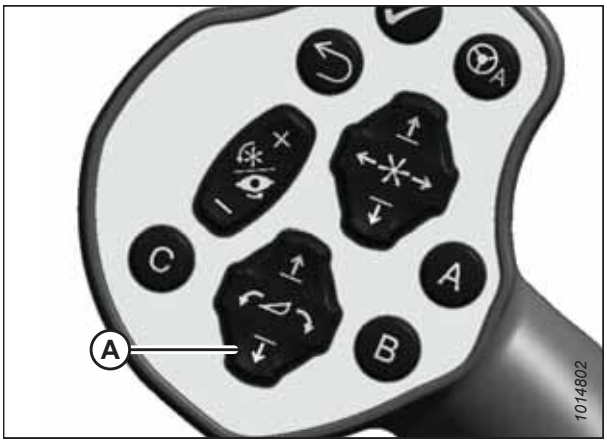


Figure 3.34: GSL

3.4.3 Attaching Header to M155, M155*E*4, or M205 Self-Propelled Windrower – Hydraulic Center-Link with Self-Alignment

The header will need to be physically attached to the windrower, and the hydraulic and electrical connections completed. The windrower may be equipped with an optional self-aligning hydraulic center-link, which allows the Operator to control the vertical position of the center-link from the cab.

DANGER

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

DANGER

Ensure that all bystanders have cleared the area.

1. Shut down the engine, and remove the key from the ignition.
2. Locate header supports (A) on the rear of the header.

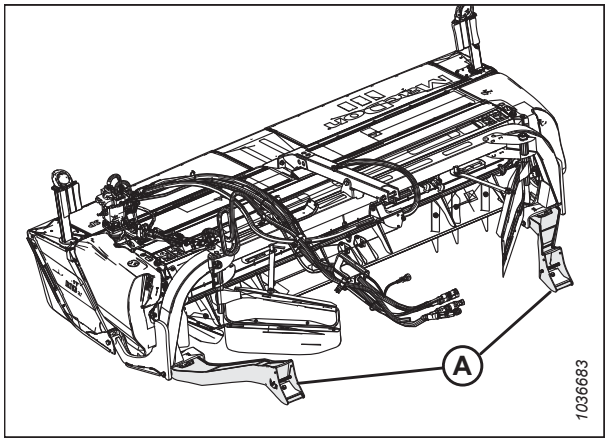


Figure 3.35: Header Supports

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

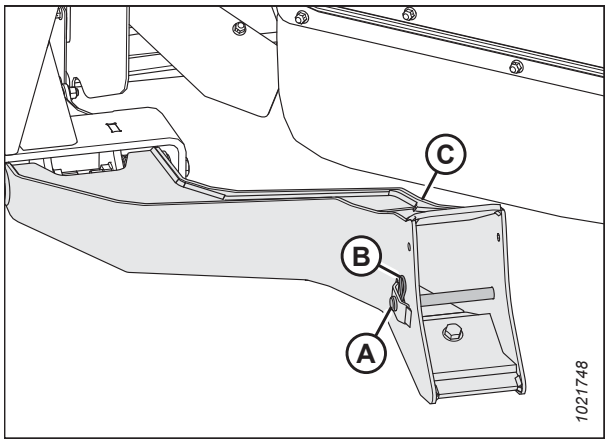


Figure 3.36: Header Support

4. Remove the float engagement pin from hole (A) to disengage the float springs, and insert the float engagement pin into storage hole (B). Secure the pin with the lynch pin. Repeat this step for the opposite linkage.

   IMPORTANT:

   To prevent damage to the lift system when lowering the header lift linkages without a header or a weight box attached to the windrower, ensure that the float engagement pin is installed in storage hole (B) and **NOT** in engaged position (A).

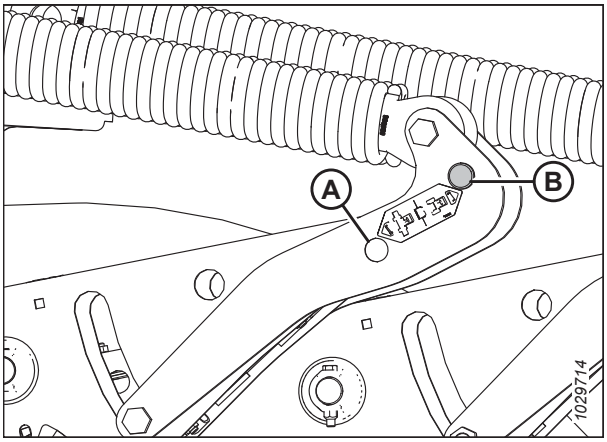


Figure 3.37: Float Linkage

5. Activate HEADER DOWN button (A) on the ground speed lever (GSL) to fully retract the header lift cylinders.

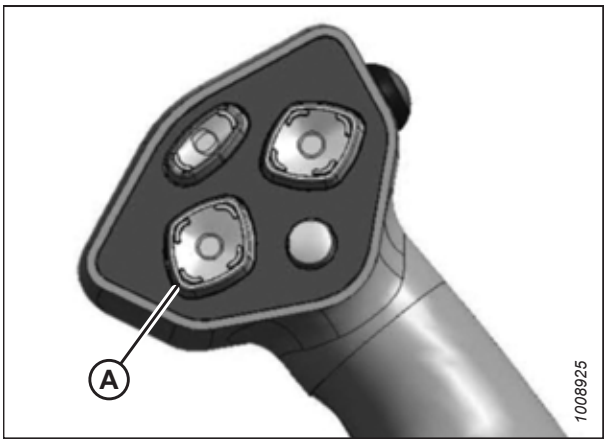


Figure 3.38: Ground Speed Lever

6. Press REEL UP switch (A) 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.

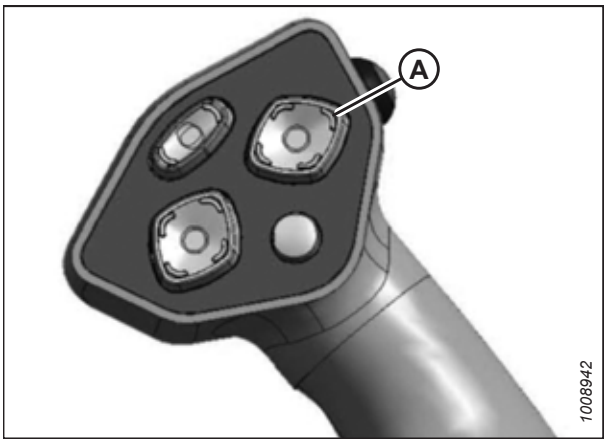


Figure 3.39: Ground Speed Lever

7. Slowly drive the windrower forward until windrower feet (A) enter header supports (B). Continue driving slowly forward until the feet engage the supports and the header is nudged forward.

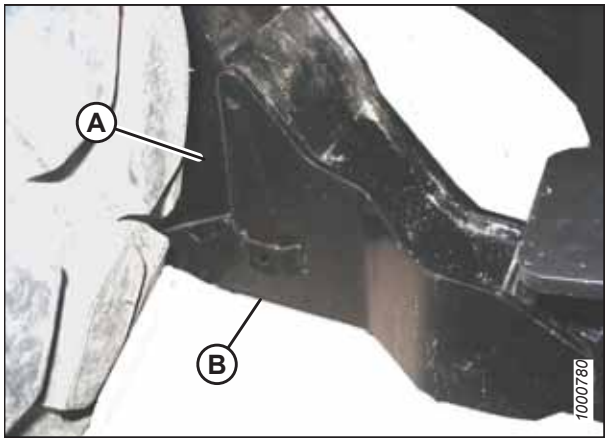


Figure 3.40: Header Support

8. Use the following GSL functions to position the center-link hook above the header attachment pin:
   - REEL UP (A) to raise the center-link
   - REEL DOWN (B) to lower the center-link
   - HEADER TILT UP (C) to retract the center-link
   - HEADER TILT DOWN (D) to extend the center-link

   IMPORTANT:

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

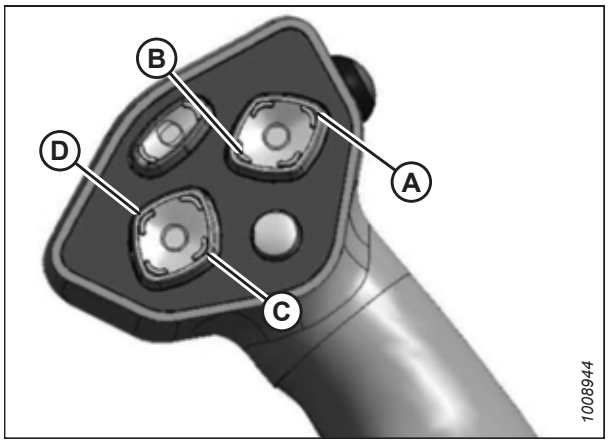


Figure 3.41: Ground Speed Lever

9. Adjust the position of center-link cylinder (A) with the REEL UP and REEL DOWN switches on the GSL until the hook is positioned above the header attachment pin.

   IMPORTANT:

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

10. Lower center-link (A) onto the header using the REEL DOWN switch on the GSL until the center-link locks into position and hook release (B) is down.

11. Check that the center-link is locked onto the header by pressing the REEL UP switch on the GSL.

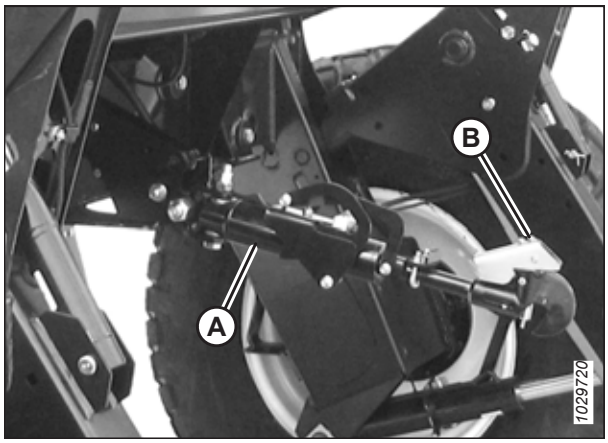


Figure 3.42: Hydraulic Center-Link

12. Press HEADER UP switch (A) to raise the header to its maximum height.

13. If one end of the header does **NOT** fully rise, rephase the lift cylinders as follows:

    a. Press and hold the HEADER UP switch until both cylinders stop moving.

    b. Continue to hold the switch for 3–4 seconds to fully phase the cylinders.

    NOTE:

    It may be necessary to repeat this procedure if there is air in the hydraulic system.

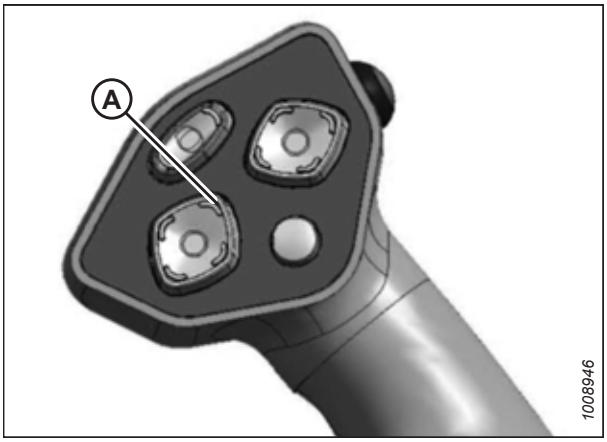


Figure 3.43: Ground Speed Lever

14. Engage the safety props on both lift cylinders:

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

    b. Pull lever (A) and rotate it towards the header to release and lower safety prop (B) onto the lift cylinder.

    c. Repeat the previous steps for the opposite lift cylinder.

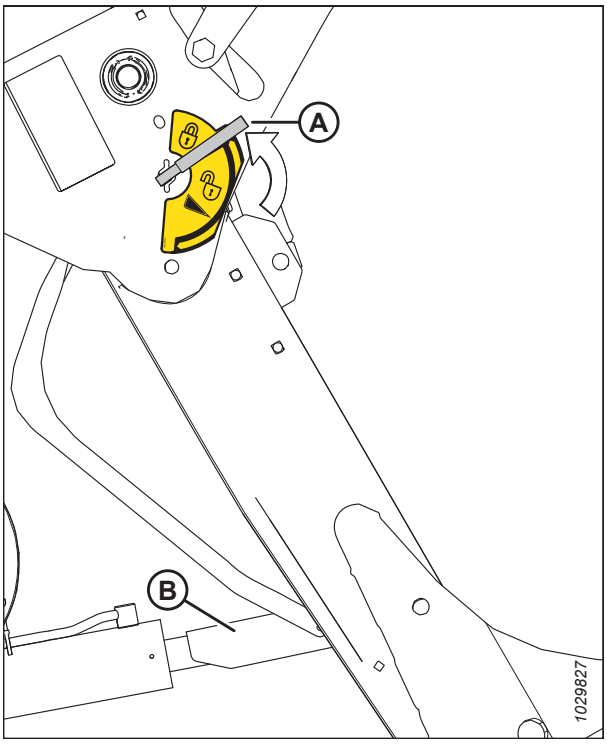


Figure 3.44: Safety Prop

15. Install clevis pin (A) through the support and the windrower lift member, and secure it with hairpin (B). Repeat this step for the opposite side of the machine.

    IMPORTANT:

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

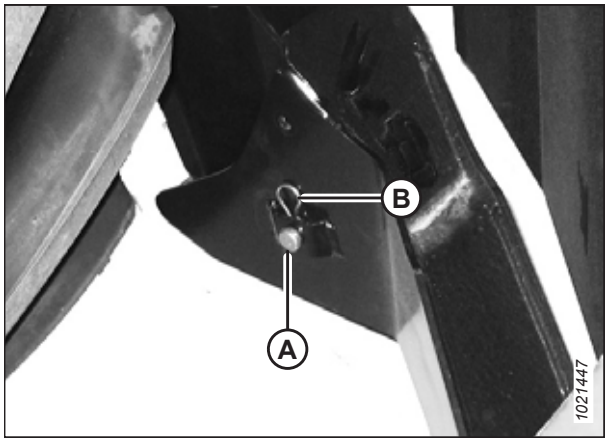


Figure 3.45: Header Support

16. Remove the clevis pin from storage position (B) in the linkage and insert it into hole (A) to engage the float springs. Secure it with the hairpin. Repeat this step on the opposite float linkage.

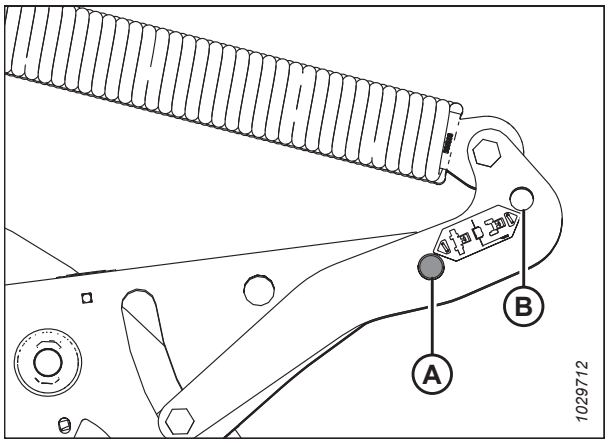


Figure 3.46: Header Float Linkage

17. Disengage the safety prop by turning lever (A) downwards until the lever locks into the vertical position.

18. Repeat the previous step to disengage the other safety prop.

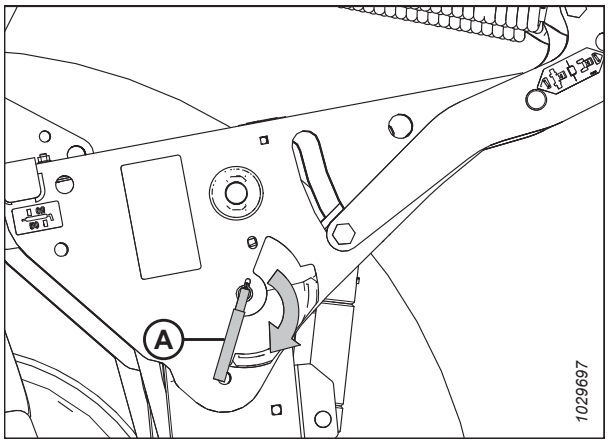


Figure 3.47: Safety Prop Lever

19. Press HEADER DOWN switch (A) on the GSL to fully lower the header.
20. Shut down the engine, and remove the key from the ignition.

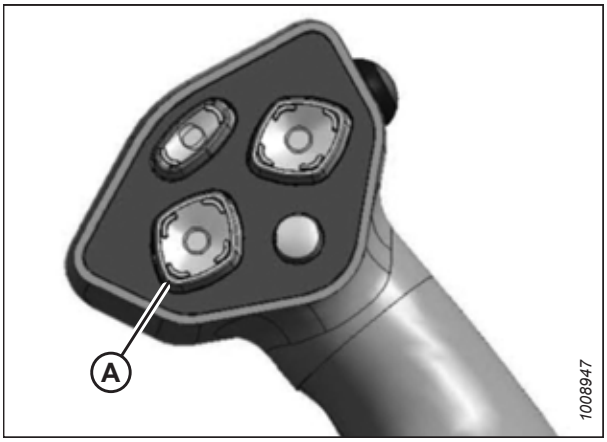


Figure 3.48: Ground Speed Lever

3.4.4 Attaching Header to M155, M155*E*4, or M205 Self-Propelled Windrower – Hydraulic Center-Link without Self-Alignment

The header will need to be physically attached to the windrower, and the hydraulic and electrical connections completed. If the windrower is equipped with a hydraulic center-link that lacks the self-alignment capability, the Operator will have to manually attach the hydraulic center-link's hook to the header's center pin.

DANGER

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

DANGER

Ensure that all bystanders have cleared the area.

1. Shut down the engine, and remove the key from the ignition.
2. Locate header supports (A) on the rear of the header.

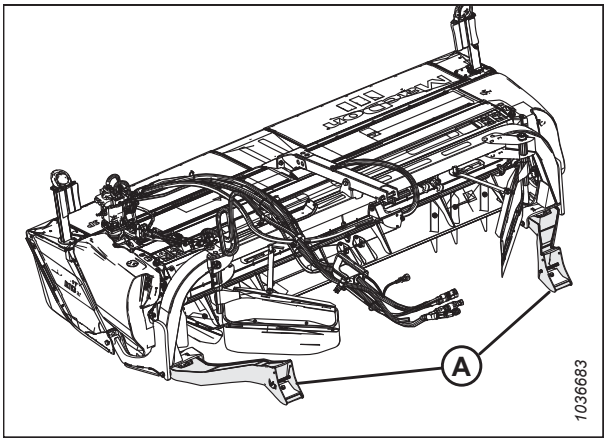


Figure 3.49: Header Supports

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

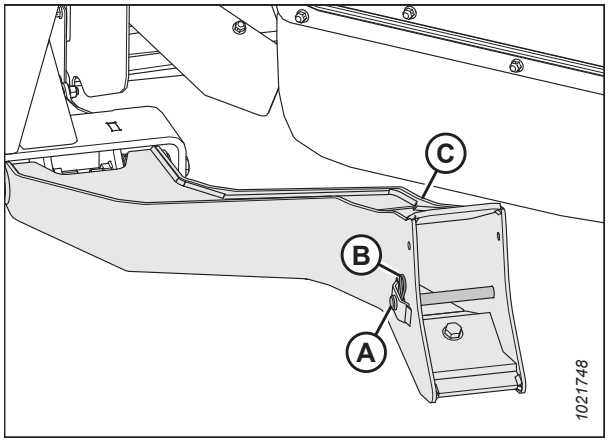


Figure 3.50: Header Support

4. To disengage the float springs, move the float engagement pin from engaged position (A) and insert the pin into storage hole (B). Secure the float engagement pin with a lynch pin. Repeat this step for the opposite linkage.

   IMPORTANT:

   To avoid damaging the lift system when lowering the header lift linkages without a header or a weight box attached, ensure that the float engagement pin is installed in storage position (B) and **NOT** in engaged position (A).

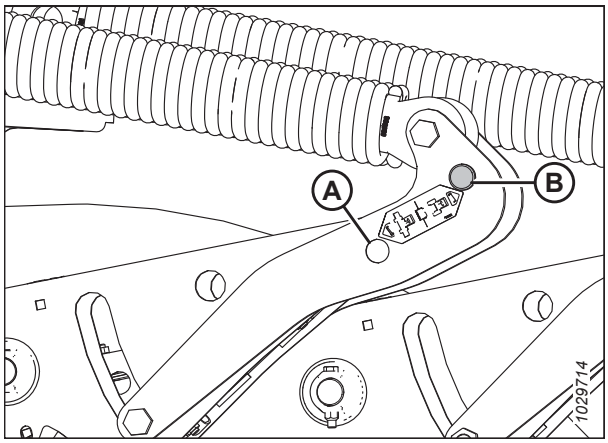


Figure 3.51: Header Float Linkage

5. Activate HEADER DOWN button (A) on the ground speed lever (GSL) to fully retract the header lift cylinders.

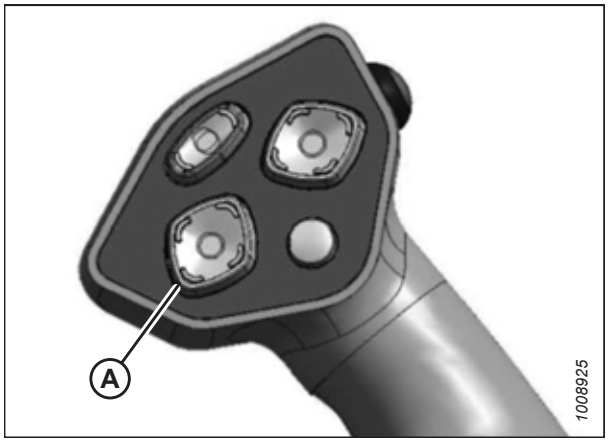


Figure 3.52: Ground Speed Lever

6. Remove pin (A) from the frame linkage and raise center-link (B) until the hook is above the attachment pin on the header. Replace pin (A) to hold the center-link in place.

   IMPORTANT:

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

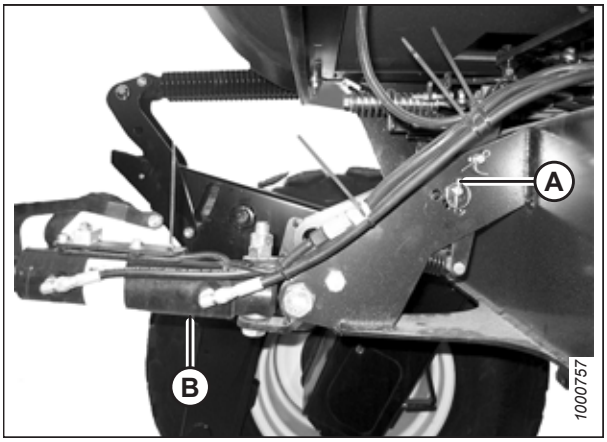


Figure 3.53: Hydraulic Center-Link

7. Slowly drive the windrower forward until windrower feet (A) enter header supports (B). Continue driving slowly forward until the feet engage the supports and the header nudges forward.

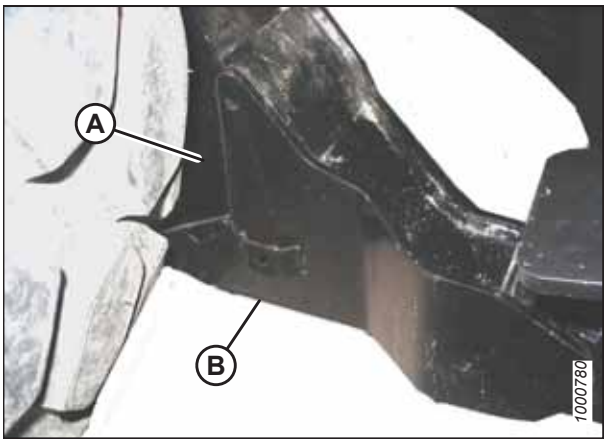


Figure 3.54: Header Support

8. Use the following GSL functions to position the center-link hook above the header attachment pin:
   - HEADER TILT UP (A) to retract the center-link
   - HEADER TILT DOWN (B) to extend the center-link
9. Shut down the engine, and remove the key from the ignition.

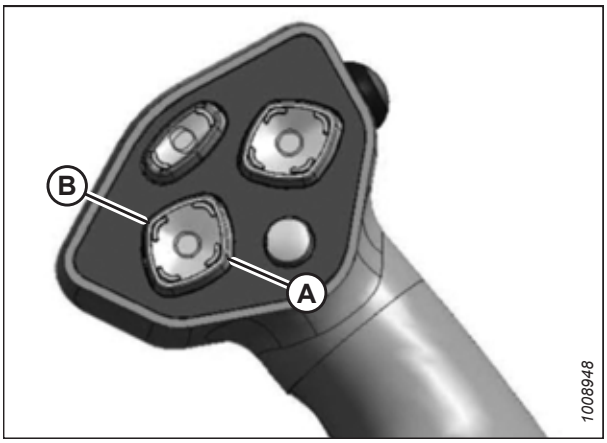


Figure 3.55: Ground Speed Lever

10. Push down on the rod end of link cylinder (A) until hook (B) engages and locks onto the header pin.

    IMPORTANT:

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

11. Check that center-link (A) is locked onto the header by pulling upward on the rod end of the cylinder.

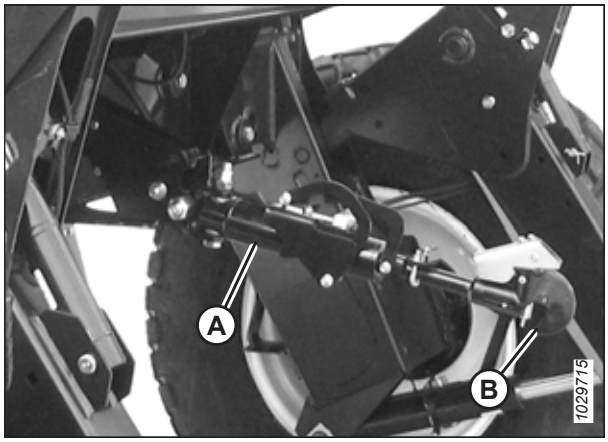


Figure 3.56: Hydraulic Center-Link

12. Press HEADER UP switch (A) to fully raise the header.

13. If one end of the header does **NOT** fully raise, rephase the lift cylinders as follows:

    a. Press and hold the HEADER UP switch until both cylinders stop moving.

    b. Continue to hold the switch for 3–4 seconds. The cylinders are now phased.

    NOTE:

    It may be necessary to repeat this procedure if there is air in the system.

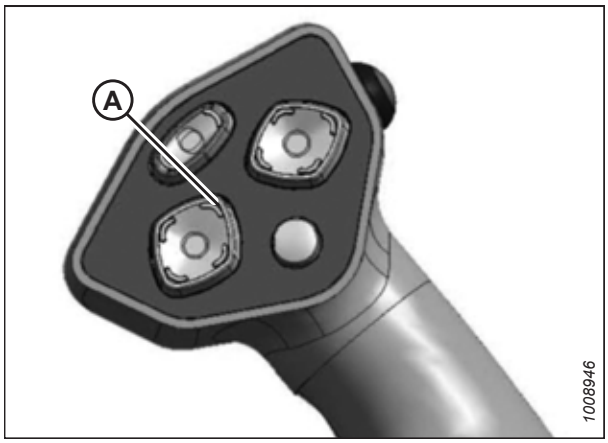


Figure 3.57: Ground Speed Lever

14. Engage the safety props on both lift cylinders:

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

    b. Pull lever (A) and rotate it towards the header to release and lower safety prop (B) onto the lift cylinder.

    c. Repeat the previous steps for the opposite lift cylinder.

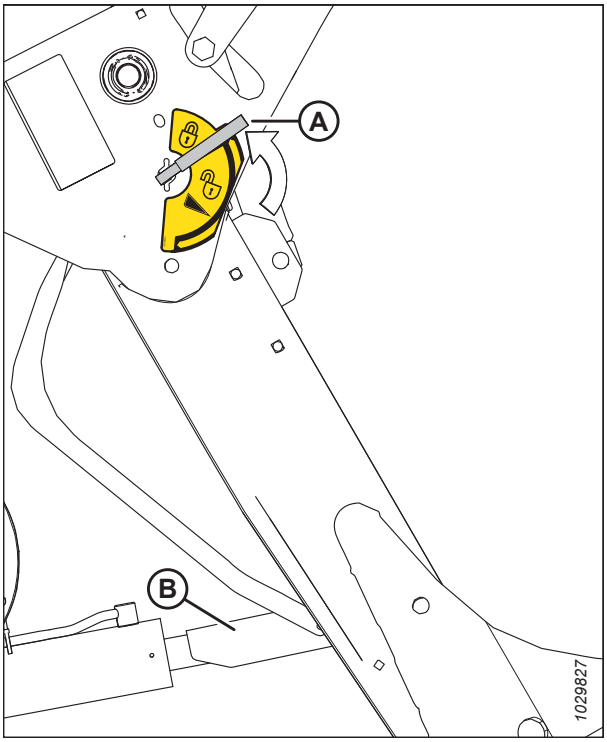


Figure 3.58: Safety Prop

15. Install clevis pin (A) through the header support and the windrower lift member, and secure the clevis pin with hairpin (B). Repeat this step on the opposite side of the machine.

    IMPORTANT:

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

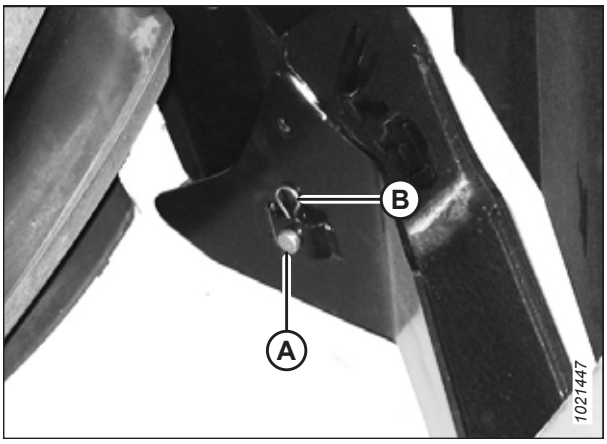


Figure 3.59: Header Support

16. Remove the clevis pin from storage position (B) in the linkage and insert it into hole (A) to engage the float springs. Secure it with the hairpin. Repeat this step on the opposite float linkage.

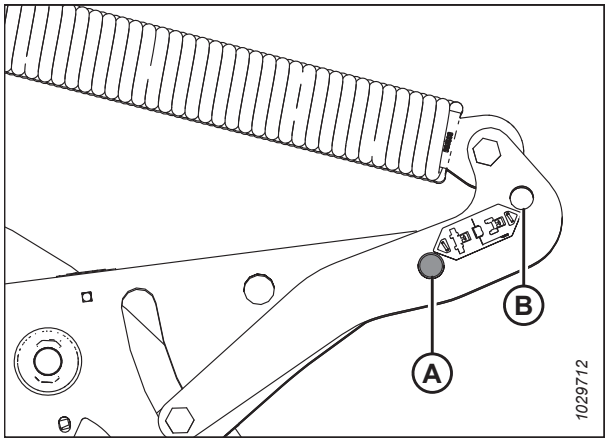


Figure 3.60: Header Float Linkage

17. Disengage the safety prop by turning lever (A) downwards until the lever locks into the vertical position.
18. Repeat the previous step to disengage the other safety prop.

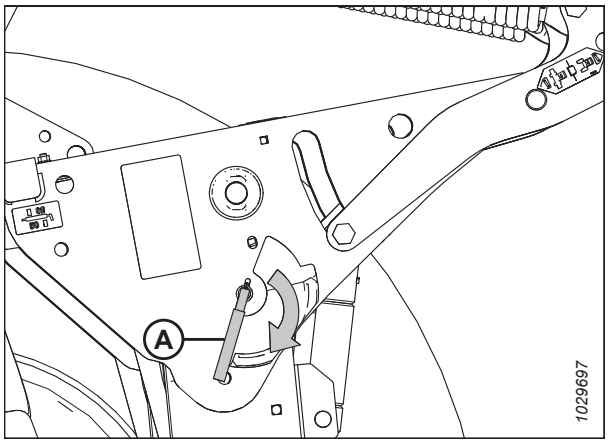


Figure 3.61: Safety Prop Lever

19. Press HEADER DOWN switch (A) on the GSL to fully lower the header.
20. Shut down the engine, and remove the key from the ignition.

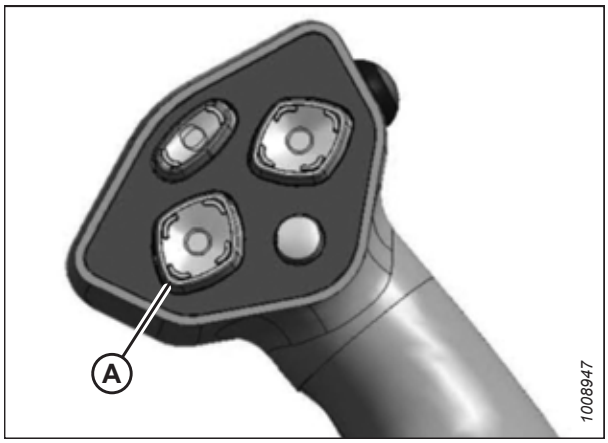


Figure 3.62: Ground Speed Lever

3.4.5 Attaching Hydraulic and Electrical Components

The procedure for attaching the header hydraulic and electrical components depends on the windrower model.

NOTE:

M1 and M2-configured headers have a bent-axis motor, while M-configured headers are fitted with an in-line motor.

NOTE:

Hydraulic conversion kits are needed to configure headers for different windrowers. Contact your MacDon Dealer for more information.

Refer to the relevant hydraulic and electrical attachment procedure:

- *Connecting Header Hydraulic and Electrical Systems – M2170 Windrower, page 55*
- *Connecting Header Hydraulic and Electrical Systems – M2260 Windrower, page 58*
- *Connecting Header Hydraulics and Electrical Systems – M1 Series Windrower, page 68*
- *Connecting Header Hydraulics and Electrical Systems – M155 or M155E4 Self-Propelled Windrower, page 72*
- *Connecting Header Hydraulics and Electrical Systems – M205 Self-Propelled Windrower, page 80*

Connecting Header Hydraulic and Electrical Systems – M2170 Windrower

The header's hydraulic and electrical multicoupler will need to be connected to the windrower.

DANGER

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

CAUTION

Do NOT stand on an unlocked platform. It is unstable and may cause you to fall.

IMPORTANT:

To prevent contamination of the hydraulic system, use a clean rag to remove dirt and moisture from all (fixed and movable) hydraulic couplers.

1. Shut down the engine, and remove the key from the ignition.
2. Retrieve the hydraulic hoses from the header.
3. Push latch (A) to unlock platform (B).

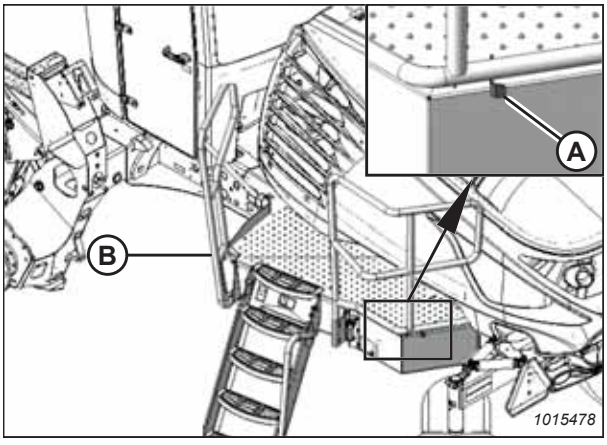


Figure 3.63: Left Platform

4. Pull platform (A) toward the cab until it stops and the latch is engaged.

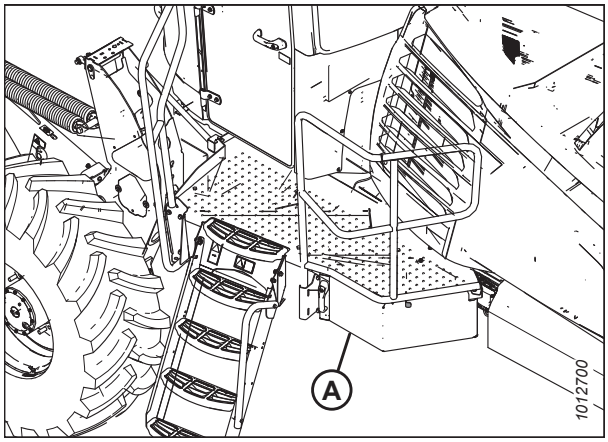


Figure 3.64: Left Platform

5. Attach hose support (A) to the frame near the windrower left cab-forward leg. Route the hoses under the frame.

   NOTE:

   Ensure that the hoses remain as straight as possible and that they are not subject to damage from abrasion.

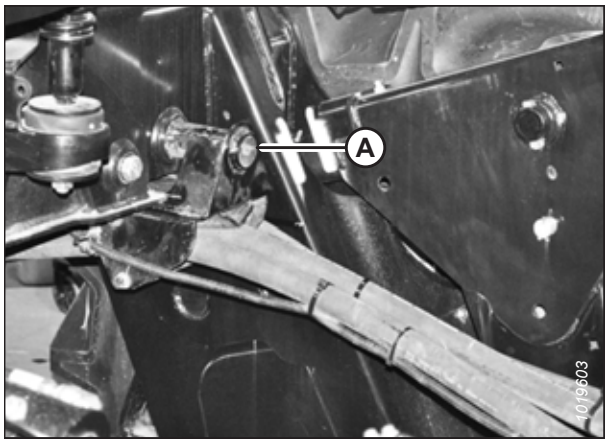


Figure 3.65: Hose Support Attachment

6. **If you are replacing an auger header:** Disconnect hose (A) from knife pressure receptacle (C) on the frame.

7. Move the hose to storage location (B).

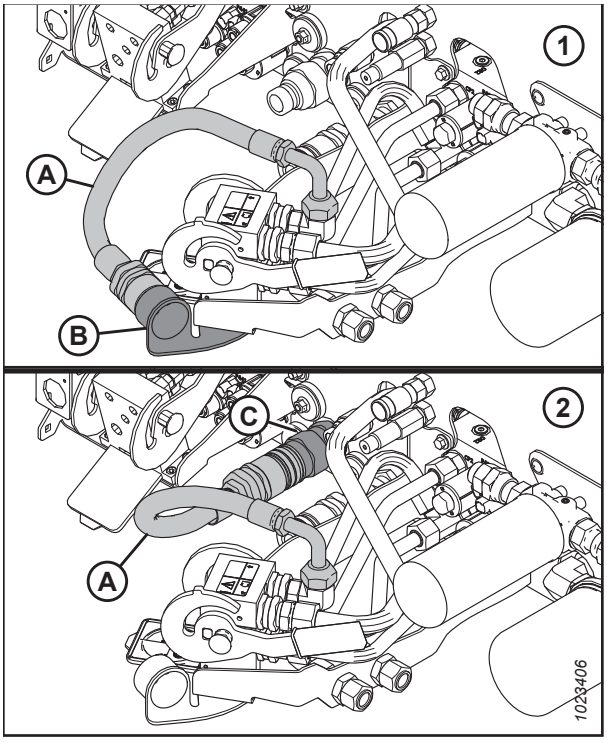


Figure 3.66: Knife Pressure Hose Positions

1 - Knife Pressure Hose in Storage Position – Rotary Configuration
2 - Hose to Knife Pressure Receptacle – Auger/Draper Configuration

8. Attach the couplers to the receptacles on the windrower as follows:

   a. Connect the pressure hose female coupler to receptacle (A).

   b. Connect the return hose male coupler to receptacle (B).

   c. Connect the case drain hose coupler to receptacle (C).

   d. Connect the electrical harness to receptacle (D).

   IMPORTANT:

   The hydraulic hoses should **NOT** come in contact with multicoupler (E). To increase the slack in the hoses, loosen and adjust the hose holder on the front windrower leg before pulling the hoses back toward the windrower.

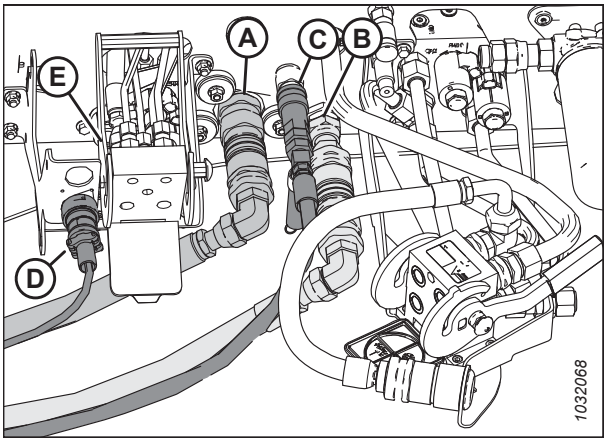


Figure 3.67: Hydraulic and Electrical Connections

9. Push latch (A) to unlock platform (B).

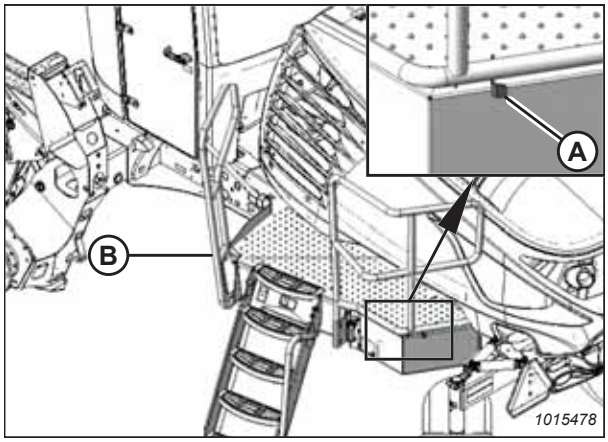


Figure 3.68: Left Platform

10. Pull platform (A) toward the cab until it stops and the latch is engaged.
11. Calibrate the header on the windrower. For instructions, refer to the windrower operator's manual.

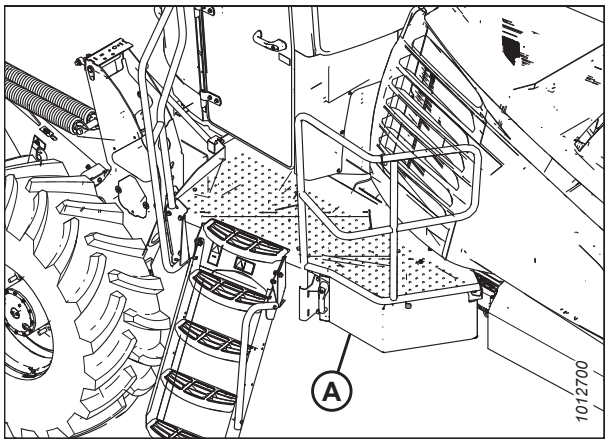


Figure 3.69: Left Platform

Connecting Header Hydraulic and Electrical Systems – M2260 Windrower

The header's electrical and hydraulic systems must be connected to the windrower. The procedure for connecting the header's hydraulic and electrical systems to the windrower differs depending on the configuration of the windrower.

IMPORTANT:

The Low Pressure Case Drain kit (B6698) must be installed on the M2260 Windrower before an R113 Rotary Disc Header can be connected.

The procedure for connecting the header's hydraulic connections to the windrower depends on the windrower's configuration:

- Auger/rotary disc/draper header-ready windrowers are equipped with a set of hydraulic quick couplers which are compatible with the header drive hoses on the rotary disc header.
- Rotary disc header-ready windrowers are equipped with hard-plumbed hydraulic connections.

NOTE:

The hydraulic bundle includes a complete set of quick couplers that can be installed onto a windrower configured for use with rotary disc headers.

Proceed to the relevant procedure:

For auger/rotary disc/draper-ready configuration (A), refer to *Auger/Rotary Disc/Draper-Ready Configuration – Quick Coupler Connections, page 60* for instructions.

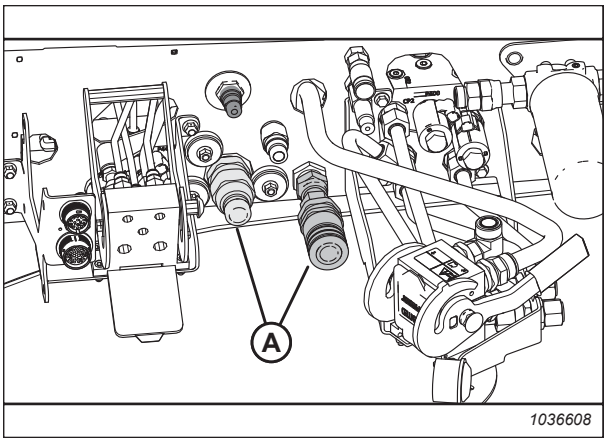


Figure 3.70: Header Hydraulics Configurations – Auger/Rotary Disc/Draper-Ready

For rotary disc-only hard-plumbed configuration (A), refer to *Rotary Disc-Only Configuration – Hard-Plumbed Fittings, page 62* for instructions.

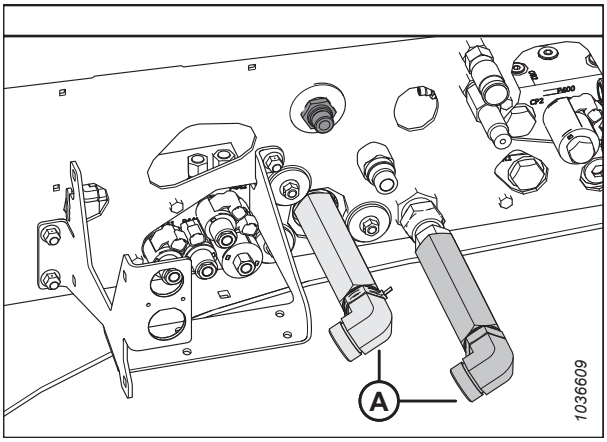


Figure 3.71: Header Hydraulics Configuration – Rotary Disc-Ready with Hard-Plumbed Connections

For rotary disc-ready configuration with quick couplers (A), refer to *Rotary Disc-Only Configuration – Quick Coupler Connections, page 65* for instructions.

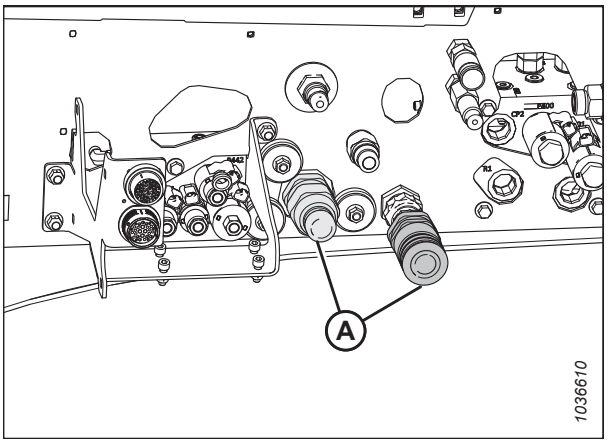


Figure 3.72: Header Hydraulics Configuration – Rotary Disc-Ready with Quick Couplers

Auger/Rotary Disc/Draper-Ready Configuration – Quick Coupler Connections

Windrowers with the auger/rotary disc/draper-ready configuration are equipped with the hydraulic connections needed to pair with an auger, rotary disc, or a draper header.

DANGER

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

CAUTION

Do NOT stand on an unlocked platform. It is unstable and may cause you to fall.

IMPORTANT:

To prevent contamination of the hydraulic system, use a clean rag to remove dirt and moisture from all (fixed and movable) hydraulic couplers.

1. Shut down the engine, and remove the key from the ignition.
2. Approach platform (A) on the left side of the windrower. Ensure that the cab door is closed.
3. Push latch (B) and pull platform (A) toward the walking beam until it stops and the latch engages.

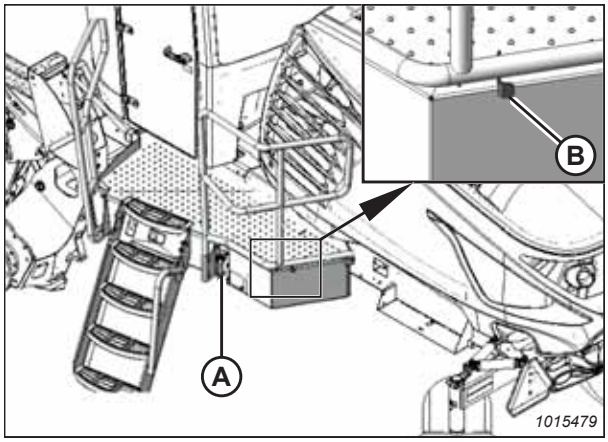


Figure 3.73: Left Platform

4. Attach hose support (A) to the frame near the windrower left cab-forward leg. Route the hoses under the frame.

   NOTE:

   Ensure that the hoses remain as straight as possible and that they are not subject to damage from abrasion.

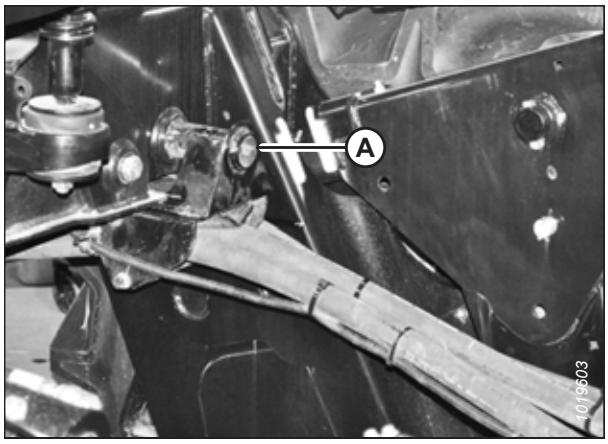


Figure 3.74: Hose Support Attachment

5. Ensure that hose (A) is disconnected from windrower receptacle (B) and placed in storage cup (C) on the multicoupler.

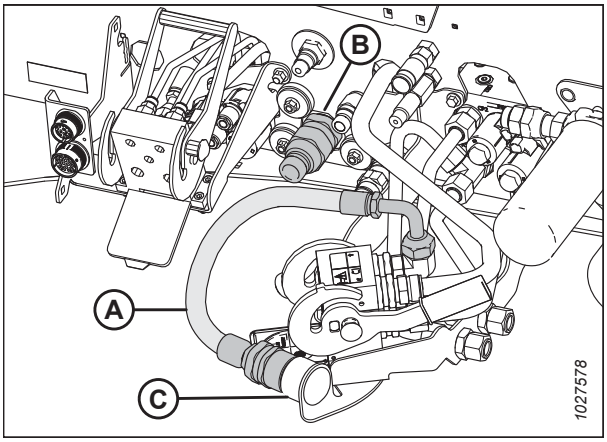


Figure 3.75: Couplers – Auger/Rotary/Draper Header-Ready Configuration with Case Drain Kit Installed

6. Remove the extra hydraulic quick couplers from pressure hose (A) and return hose (B). These can be stored and used as replacement parts.

   NOTE:

   It is normal to have an extra set of quick couplers on windrowers with the auger/rotary disc/draper-ready configuration.

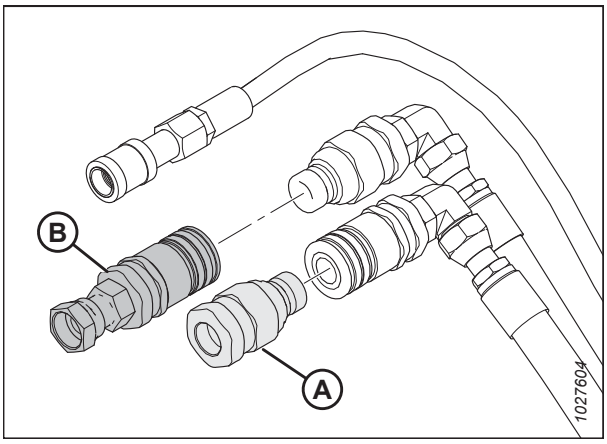


Figure 3.76: Hydraulic Quick Couplers

7. Connect the hydraulic hoses to the windrower with the quick coupler fittings as follows:

   a. Connect the pressure hose female coupler to receptacle (A).

   b. Connect the return hose male coupler to receptacle (B).

   c. Connect case drain hose (C) to the mating 1/2 in. coupler on the frame.

      NOTE:

      This coupler is only present if the Low Pressure Case Drain kit (B6698) has been installed.

      IMPORTANT:

      Do **NOT** connect the case drain coupler to 1/2 in. flat faced coupler (E).

   d. Connect the electrical harness to receptacle (D).

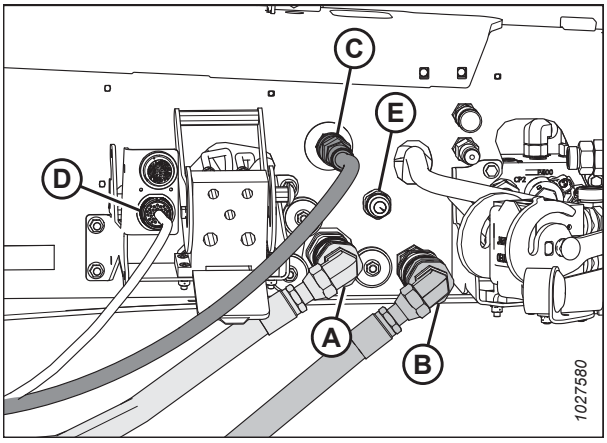


Figure 3.77: Hydraulics and Electrical Installed – Auger/Rotary/Draper-Ready Windrower

8. Push latch (A) to unlock platform (B).

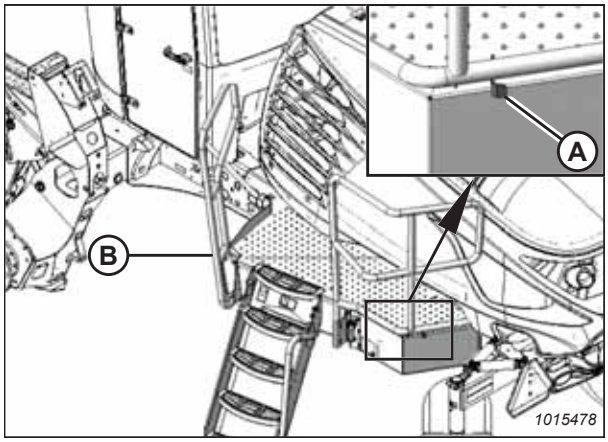


Figure 3.78: Left Platform

9. Pull platform (A) toward the cab until it stops and the latch is engaged.
10. Calibrate the header on the windrower. For instructions, refer to the windrower operator's manual.

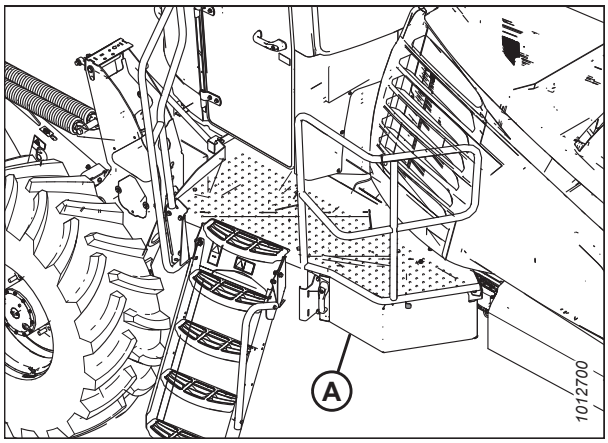


Figure 3.79: Left Platform

Rotary Disc-Only Configuration – Hard-Plumbed Fittings

The rotary disc-only configuration allows the windrower to operate with compatible rotary disc headers.

DANGER

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

CAUTION

Do NOT stand on an unlocked platform. It is unstable and may cause you to fall.

IMPORTANT:

To prevent contamination of the hydraulic system, use a clean rag to remove dirt and moisture from all (fixed and movable) hydraulic couplers.

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

2. Approach platform (A) on the left side of the windrower. Ensure that the cab door is closed.

3. Push latch (B) and pull platform (A) toward the walking beam until it stops and the latch engages.

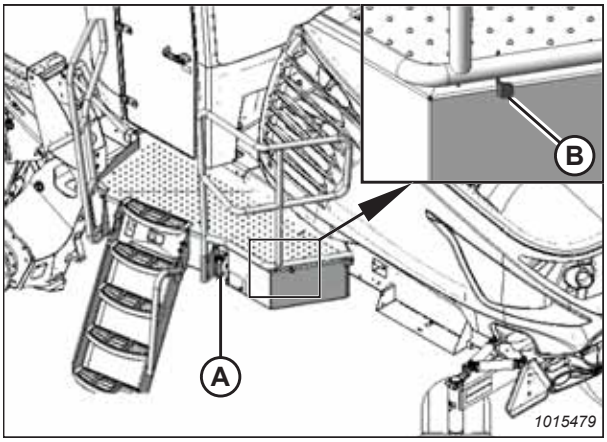


Figure 3.80: Left Platform

4. Attach hose support (A) to the frame near the windrower left cab-forward leg. Route the hoses under the frame.

   NOTE:

   Ensure that the hoses remain as straight as possible and that they are not subject to damage from abrasion.

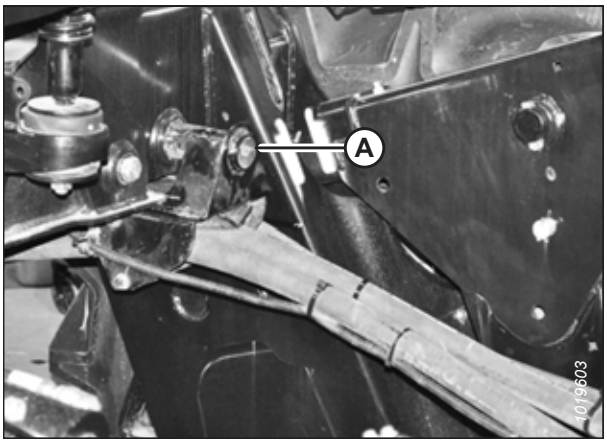


Figure 3.81: Hose Support Attachment

5. Remove the existing quick couplers and elbow fittings (if they are installed) from header hydraulic pressure hose (A) and return hose (B). Do **NOT** remove the fittings from case drain hose (C).

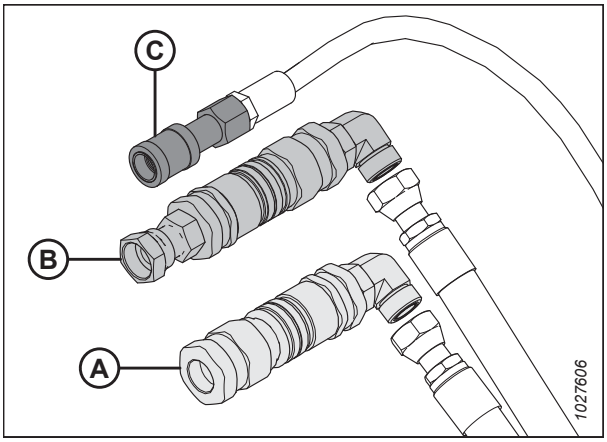


Figure 3.82: Rotary Disc Header Hose Bundle

6. Connect the hydraulic hoses to the windrower as follows:

   a. Connect rotary disc pressure hose (A) as shown and torque it to 215 Nm (159 lbf·ft).

   b. Connect rotary disc return hose (B) as shown and torque it to 215 Nm (159 lbf·ft).

   c. Connect case drain hose (C) to the mating 1/2 in. coupler as shown.

      NOTE:

      The case drain hose coupler will be present only if the Low Pressure Case Drain kit (B6698) has been installed.

      IMPORTANT:

      Ensure that the case drain hose is connected to port (C), **NOT** port (E).

   d. Connect the electrical harness to receptacle (D).

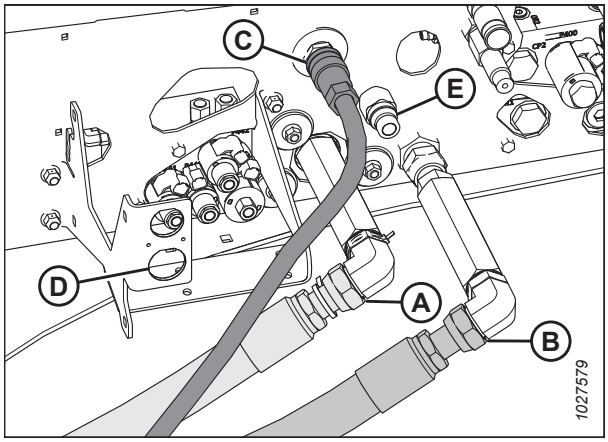


Figure 3.83: Hard Plumbed Connections on Disc Header-Ready Windrower with Case Drain Kit

7. Push latch (A) to unlock platform (B).

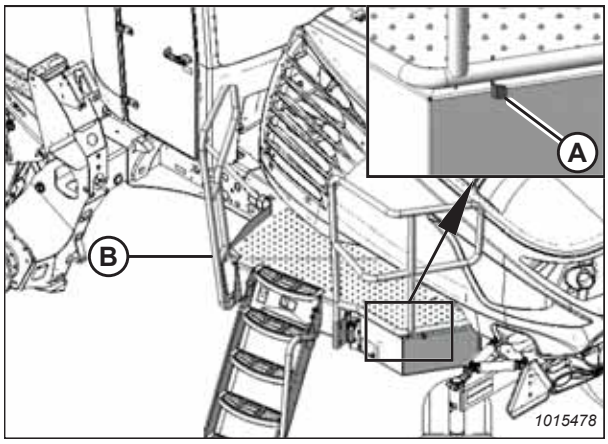


Figure 3.84: Left Platform

8. Pull platform (A) toward the cab until it stops and the latch is engaged.

9. Calibrate the header on the windrower. For instructions, refer to the windrower operator's manual.

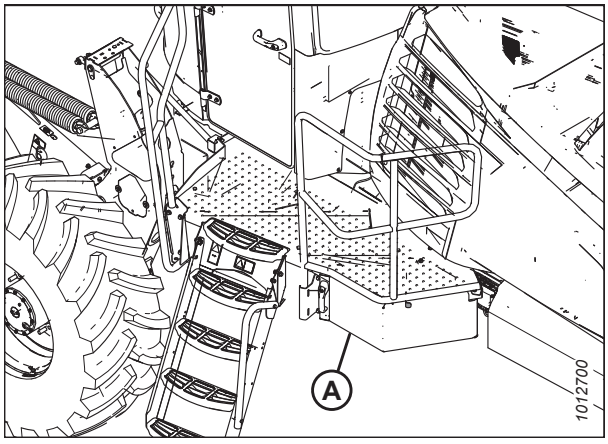


Figure 3.85: Left Platform

Rotary Disc-Only Configuration – Quick Coupler Connections

The rotary disc-only configuration allows the windrower to operate with compatible rotary disc headers. Attaching the header's hydraulic connections to the windrower's ports using quick couplers does not require any additional tools or hardware.

DANGER

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

CAUTION

Do NOT stand on an unlocked platform. It is unstable and may cause you to fall.

IMPORTANT:

To prevent contamination of the hydraulic system, use a clean rag to remove dirt and moisture from all (fixed and movable) hydraulic couplers.

1. Shut down the engine, and remove the key from the ignition.
2. Approach platform (A) on the left side of the windrower. Ensure that the cab door is closed.
3. Push latch (B) and pull platform (A) toward the walking beam until it stops and the latch engages.

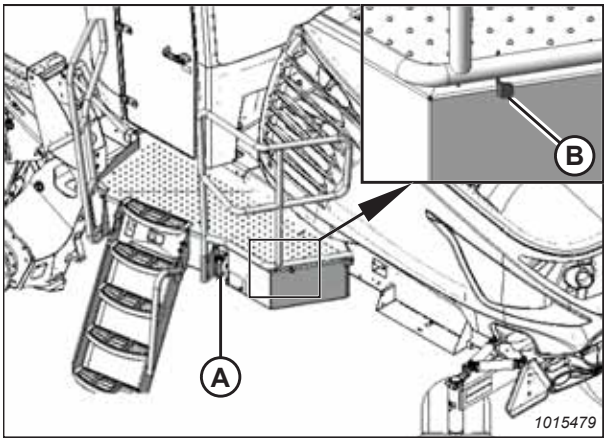


Figure 3.86: Left Platform

4. Attach hose support (A) to the frame near the windrower left cab-forward leg. Route the hoses under the frame.

   NOTE:

   Ensure that the hoses remain as straight as possible and that they are not subject to damage from abrasion.

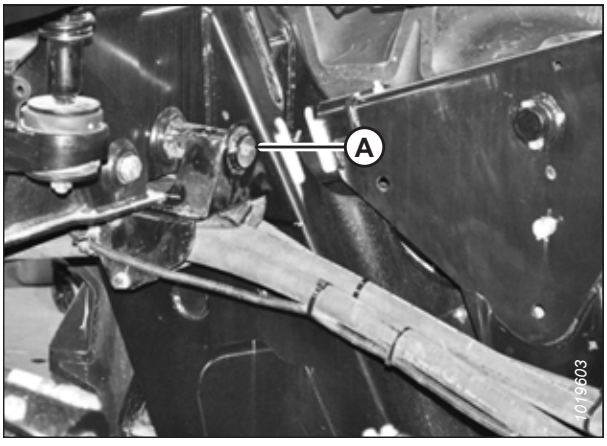


Figure 3.87: Hose Support Attachment

5. Remove extension fittings and elbows (A) from the rotary disc header's hydraulic pressure and return connections.

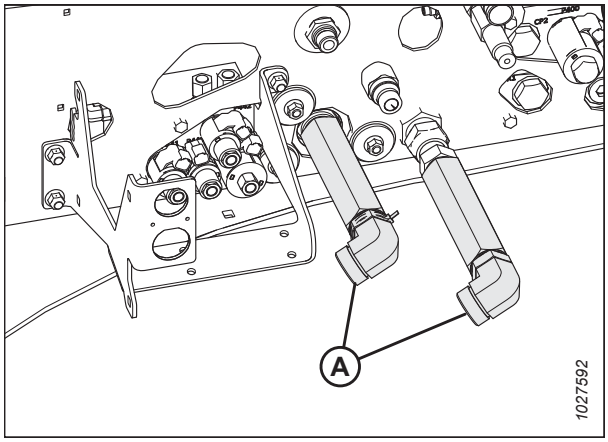


Figure 3.88: Hard Plumbed Connections – Rotary Disc-Ready Windrower

6. Remove and retain the extra hydraulic quick couplers from pressure hose (A) and return hose (B).

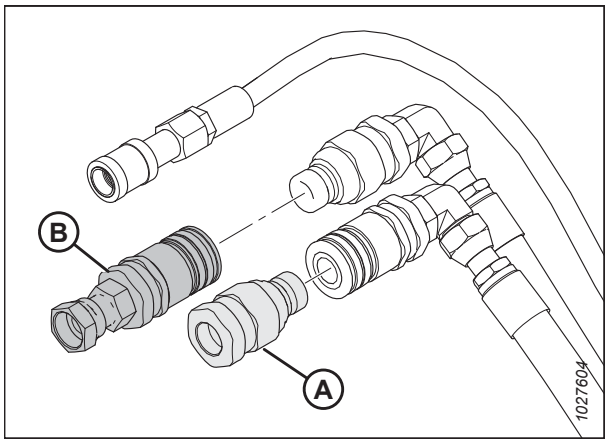


Figure 3.89: Hydraulic Quick Couplers

7. Install the male quick coupler at windrower pressure receptacle (A) as shown.
8. Install the female quick coupler at windrower return receptacle (B) as shown.

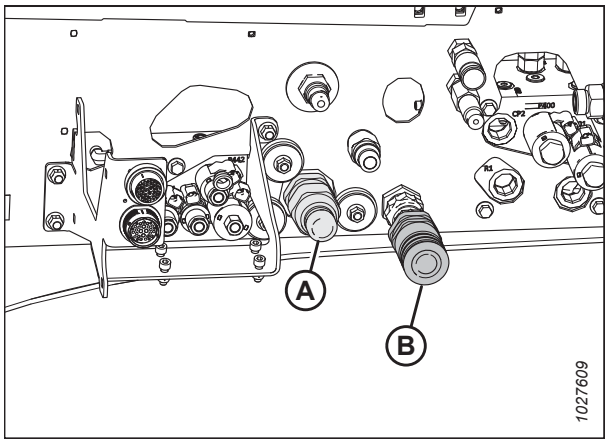


Figure 3.90: Quick Couplers on Rotary Disc-Ready Windrower

9. Connect the hydraulic hoses to the windrower as follows:

   a. Connect pressure hose female coupler (A) as shown.

   b. Connect return hose male coupler (B) as shown.

   c. Connect case drain hose (C) as shown.

      NOTE:

      The case drain hose coupler will be present only if the Low Pressure Case Drain kit (B6698) has been installed.

      IMPORTANT:

      Ensure that the case drain hose is connected to port (C), **NOT** port (E).

   d. Connect the header's electrical harness to receptacle (D).

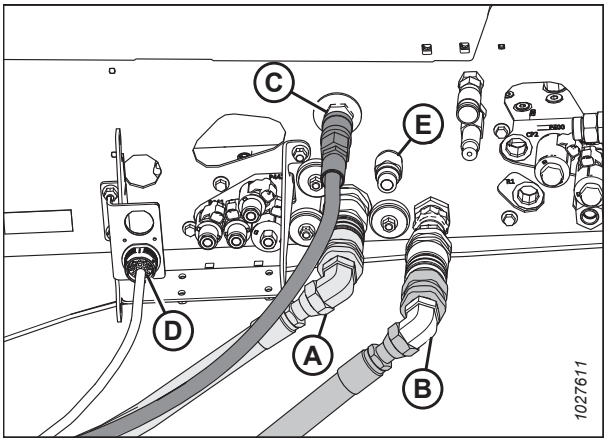


Figure 3.91: Quick Couplers on Rotary Disc-Ready Windrower with Case Drain Kit

10. Push latch (A) to unlock platform (B).

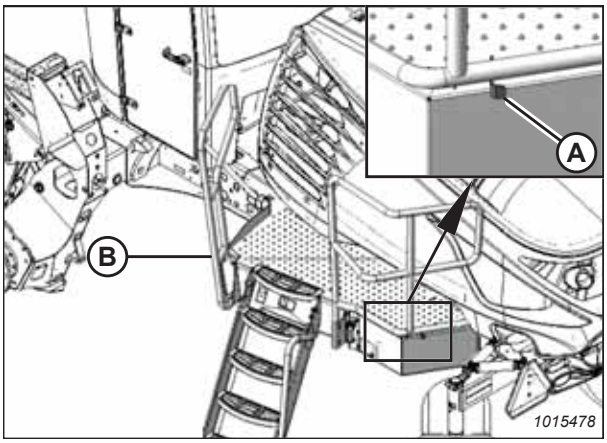


Figure 3.92: Left Platform

11. Pull platform (A) toward the cab until it stops and the latch is engaged.

12. Calibrate the header on the windrower. For instructions, refer to the windrower operator's manual.

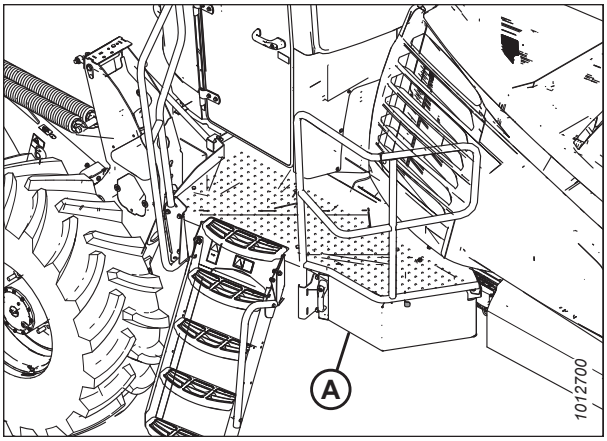


Figure 3.93: Left Platform

Connecting Header Hydraulics and Electrical Systems – M1 Series Windrower

Ensure that the hydraulic hoses and electrical harness are routed so that they do not interfere with any moving parts, and so that they are not damaged by rubbing.

NOTE:

To connect the header to an M1 Series Windrower, hydraulic drive kit (B6845) is required. To order this kit, contact your MacDon Dealer.

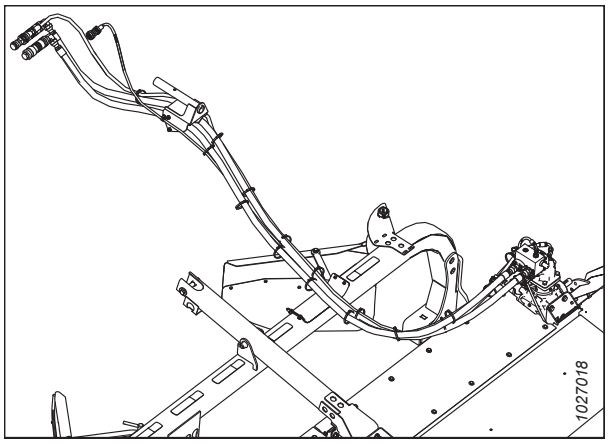


Figure 3.94: Hydraulic Drive Kit (B6845)

NOTE:

To connect the header to an M1240 Windrower, Low Pressure Case Drain kit (A) (B6698) is required. This kit contains an alternative case drain line which routes directly to the hydraulic reservoir via a special set of 1/2 in. hydraulic couplers.

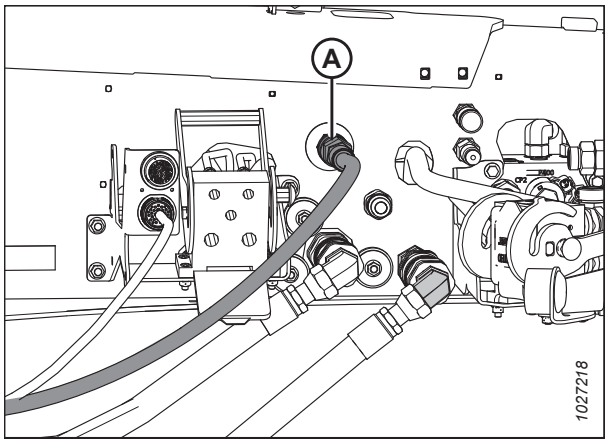


Figure 3.95: Low Pressure Case Drain Kit (B6698)

1. Move the windrower's left platform to the OPEN position. Refer to your windrower operator's manual for instructions.
2. Retrieve the hydraulic hoses from the header.

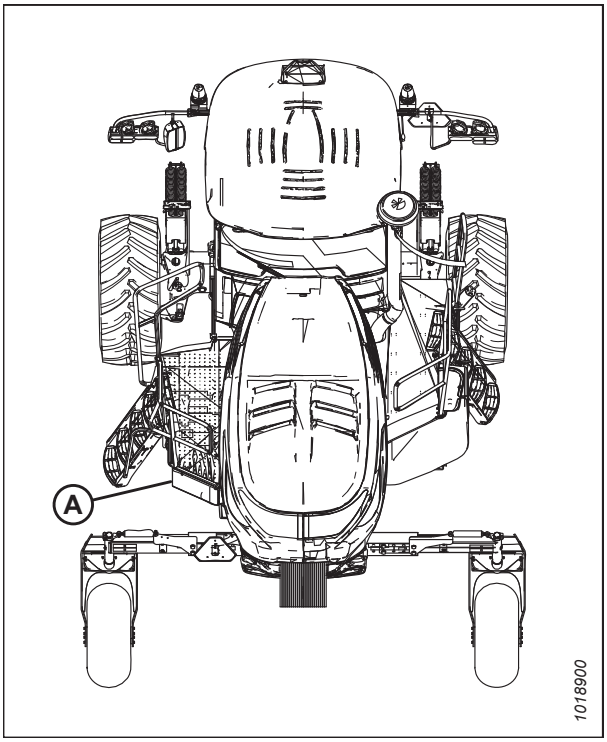


Figure 3.96: Windrower Left Platform Open – M1240

3. Attach hose support (A) to the windrower frame near the left leg, and route the hose bundle under the frame.

   NOTE:

   Route the hydraulic hoses as straight as possible while avoiding rub or wear points that could damage the hoses.

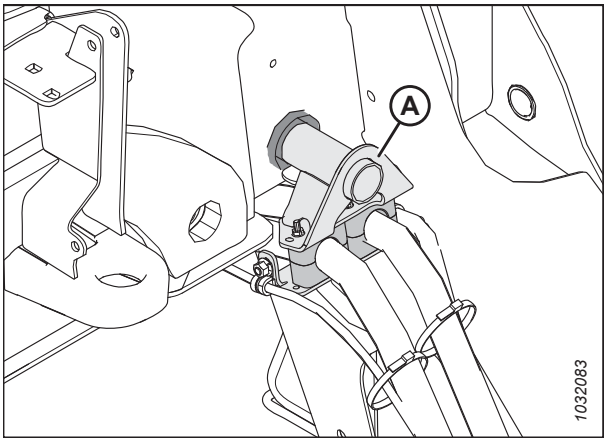


Figure 3.97: Hose Support Attachment

4. Rest the hose bundle from the windrower on header hose support (A).

5. If necessary, use a clean rag to remove any dirt and moisture from the couplers.

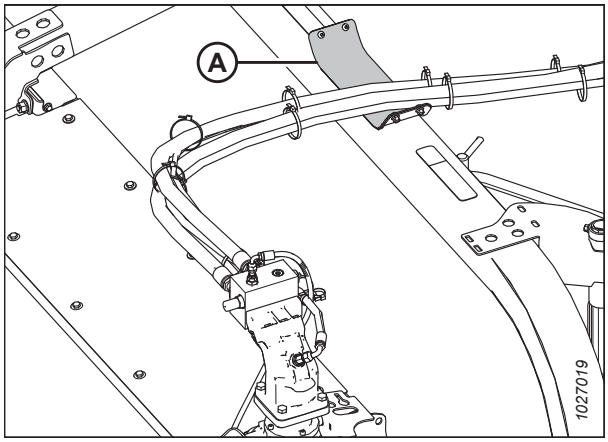


Figure 3.98: Hose Support

6. Connect the header hydraulic hoses and electrical harness as follows:

   a. Connect the pressure hose to receptacle (A).

   b. Connect the return hose to receptacle (B).

   c. Connect the case drain hose to receptacle (C).

   d. Connect the electrical harness to windrower electrical harness (D).

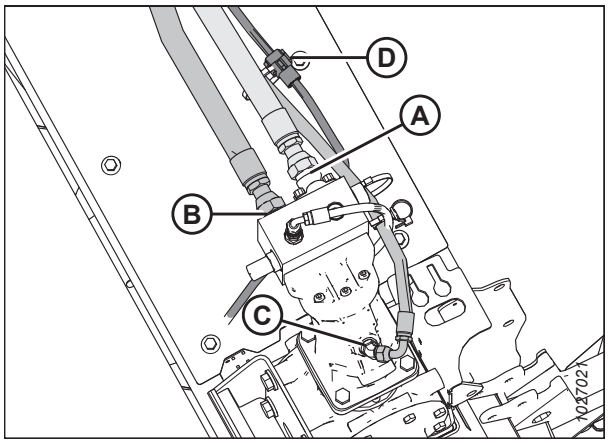


Figure 3.99: Header Drive Motor Hydraulic Connections

7. **M1170 Windrowers:** Connect the hydraulic hoses and the electrical harness to the receptacles on the windrower as follows:

   a. Connect the pressure hose to receptacle (A).

   b. Connect the return hose to receptacle (B).

   c. Connect the case drain hose to receptacle (C).

   d. Connect the electrical harness to receptacle (D).

   NOTE:

   The hydraulic hoses should **NOT** come in contact with multicoupler (E). You can increase the slack in the hoses by loosening and adjusting the hose holder on the front windrower leg and pulling the hoses backward toward the windrower.

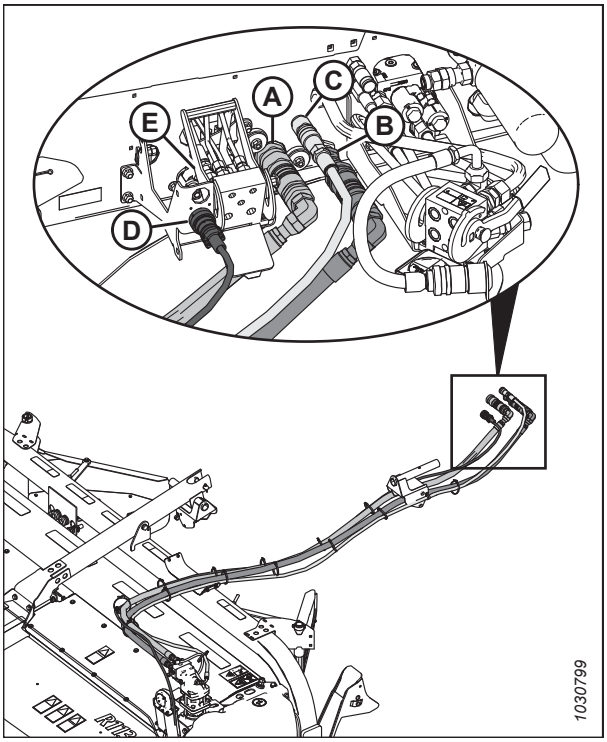


Figure 3.100: M1170 Hydraulic and Electrical Connections

8. **M1240 Windrowers:** Connect the hydraulic hoses and electrical harness to the receptacles on the windrower. Refer to the illustration which describes the configuration of your windrower.

   a. Connect the pressure hose to receptacle (A).

   b. Connect the return hose to receptacle (B).

   c. Connect the case drain hose non-flat face coupler to receptacle (C).

      NOTE:

      The R113 SP, when attached to an M1240 Windrower, requires Low Pressure Case Drain kit (B6698); this kit has a different hose connection to the hydraulic fluid reservoir.

   d. Connect the electrical harness to receptacle (D).

      NOTE:

      The hydraulic hoses should have enough slack to pass by multicoupler (E) in Figure *3.101, page 72* without contacting it. You can increase the slack in the hoses by loosening and adjusting the hose holder on the front windrower leg and by pulling the hoses back toward the windrower.

      NOTE:

      The 1/2 in. flat-faced coupler for case drain (E) in Figure *3.102, page 72* is **NOT** suitable for the R113 SP.

9. Close the windrower's left side platform. For instructions, refer to the windrower operator's manual.

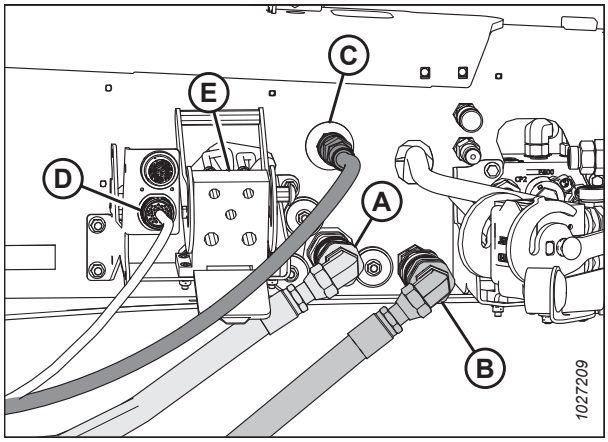


Figure 3.101: M1240 Hydraulic and Electrical Connections – Draper Ready Configuration

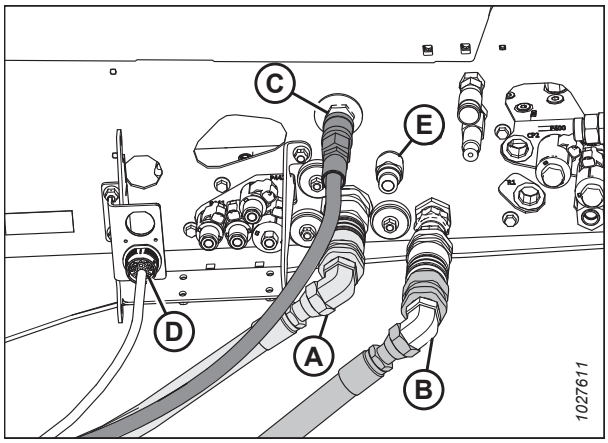


Figure 3.102: M1240 Hydraulic and Electrical Connections – Disc Ready Configuration

Connecting Header Hydraulics and Electrical Systems – M155 or M155E4 Self-Propelled Windrower

Ensure that the hydraulic hoses and electrical harness do not interfere with any moving parts and are susceptible to damage.

NOTE:

To connect the header to an M155 or an M155*E4* Self-Propelled Windrower, hydraulic drive kit (A) (B6272) is required. To order this kit, contact your MacDon Dealer.

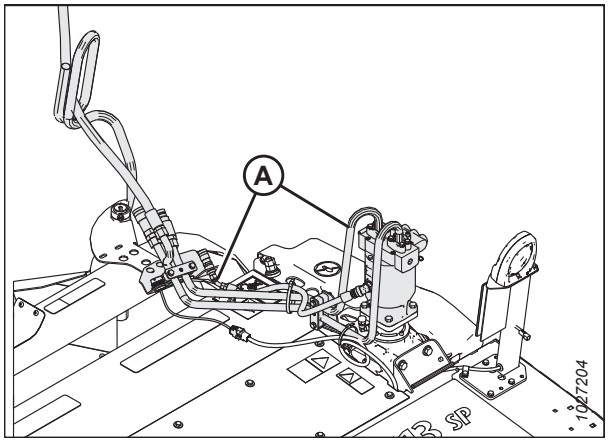


Figure 3.103: Hydraulic Drive Kit (B6272)

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

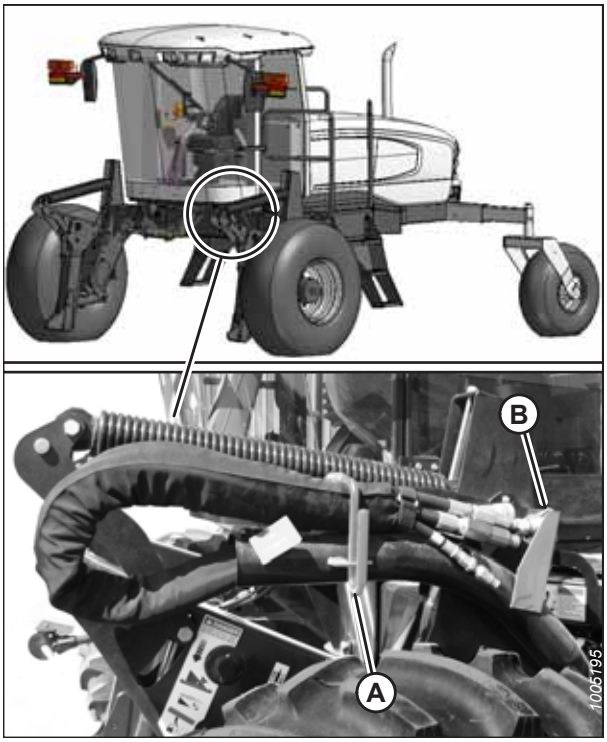


Figure 3.104: Hose Bundle

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

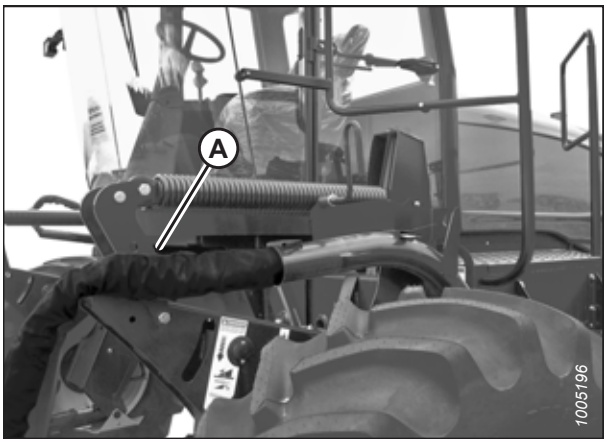


Figure 3.105: Hose Bundle

4. Position the hose support so that lower bolt (A) is in the forward hole as shown. Loosen both bolts and adjust them as required.

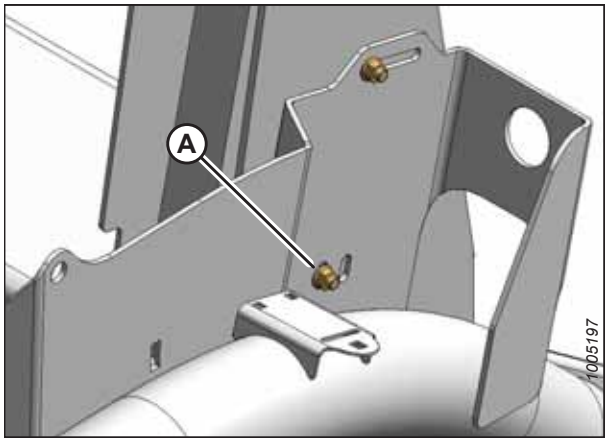


Figure 3.106: Hose Support

5. Move the windrower's left platform (A) to the OPEN position. Refer to your windrower operator's manual for instructions.

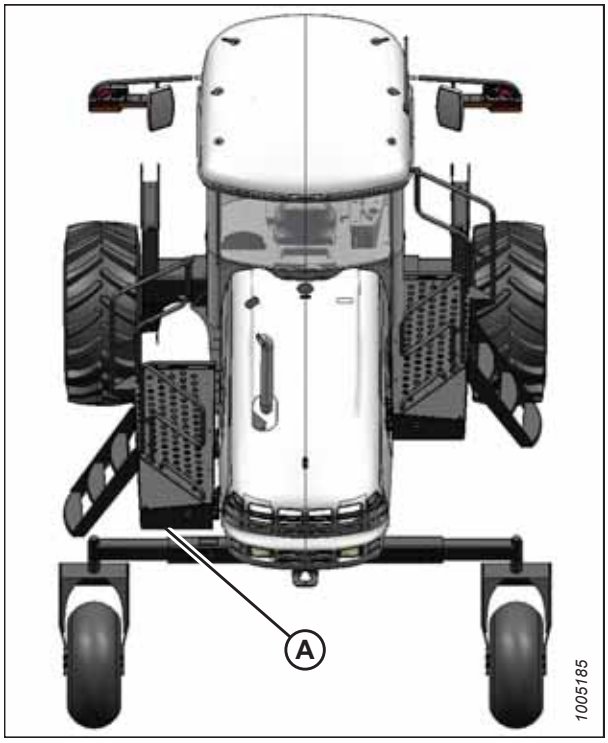


Figure 3.107: Windrower Left Platform in Open Position

6. Route windrower hose bundle (A) through hose support (B) on the header.

   NOTE:

   Keep the hoses as straight as possible. Do not allow the hoses to rub against other parts.

7. Route pressure hose (C) from the header through support (B) to the windrower.

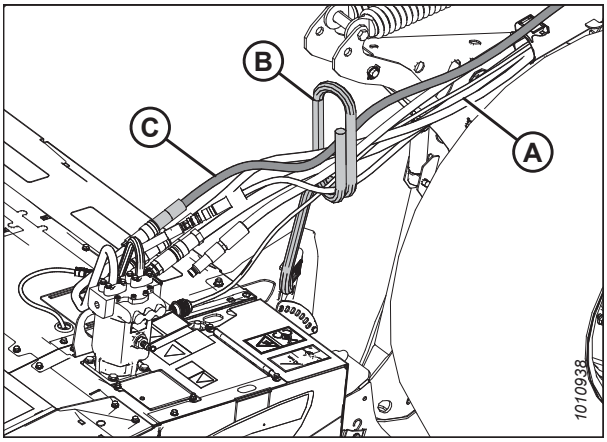


Figure 3.108: Hose Bundle

8. Connect pressure hose (A) routed from the header to the hydraulic coupler at port M2 (B) on the windrower's auxiliary disc drive manifold (the middle valve block).

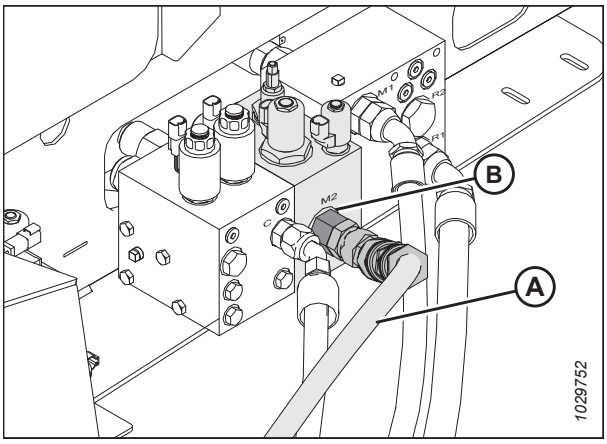


Figure 3.109: Hydraulic Connections

9. Connect pressure hose (B) from port M1 (C) on the windrower's drive manifold to the female coupler at the steel line attached to port (A) on the header motor.

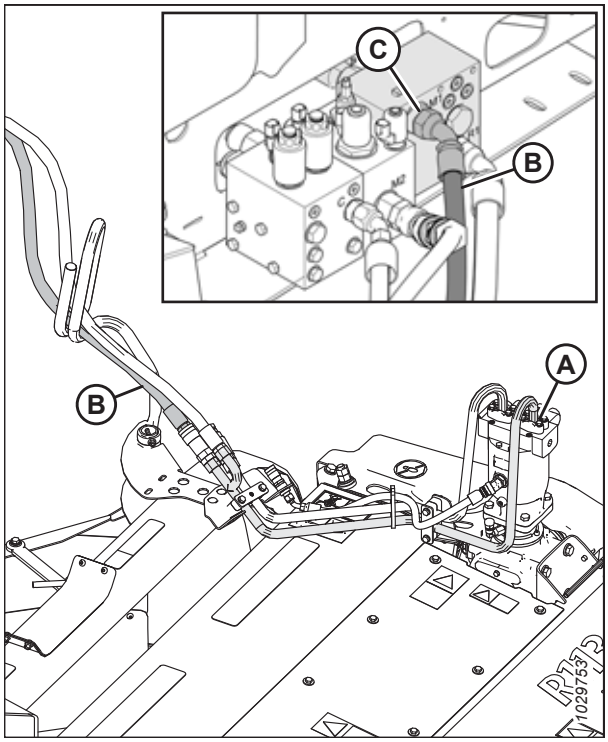


Figure 3.110: Hydraulic Connections

10. Connect return hose (A) from port R1 (C) on the windrower's drive manifold to the coupler on steel line (B) attached to the aft port on the header motor.

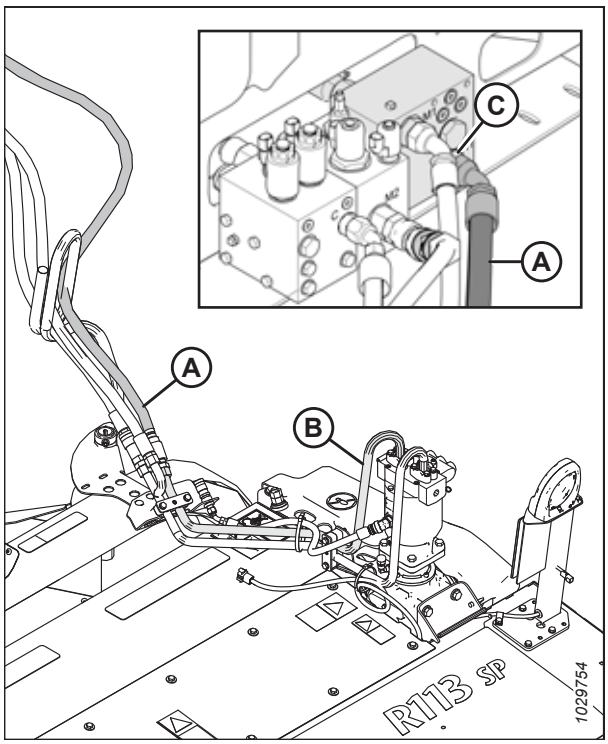


Figure 3.111: Hydraulic Connections

NOTE:

If the windrower is equipped with reverser manifold (A) for an auger header, route return hose (B) from port R1 (D) on the windrower's reverser manifold to steel line (C) attached to the aft port on the header motor.

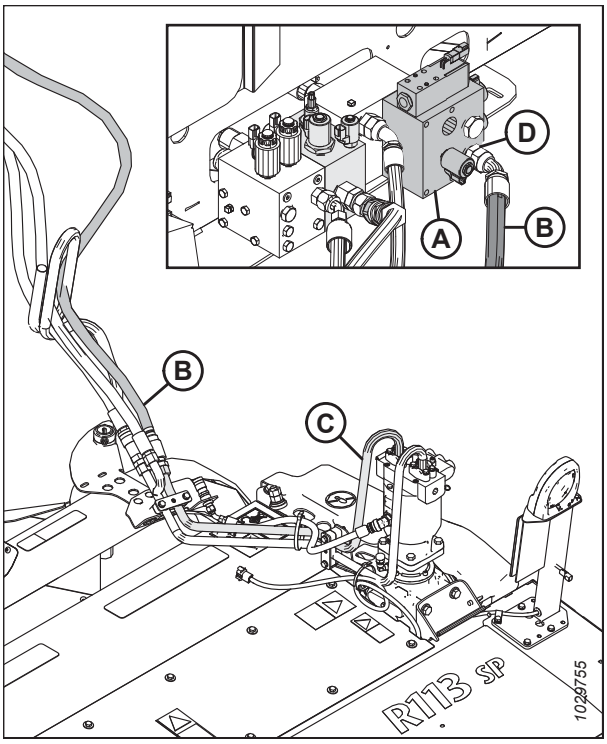


Figure 3.112: Windrower Hose Connections with Reverser

11. Connect case drain hose (A) from lift manifold port T3 (C) to the 1/2 in. female coupler at the bulkhead, which is attached to motor port (B).

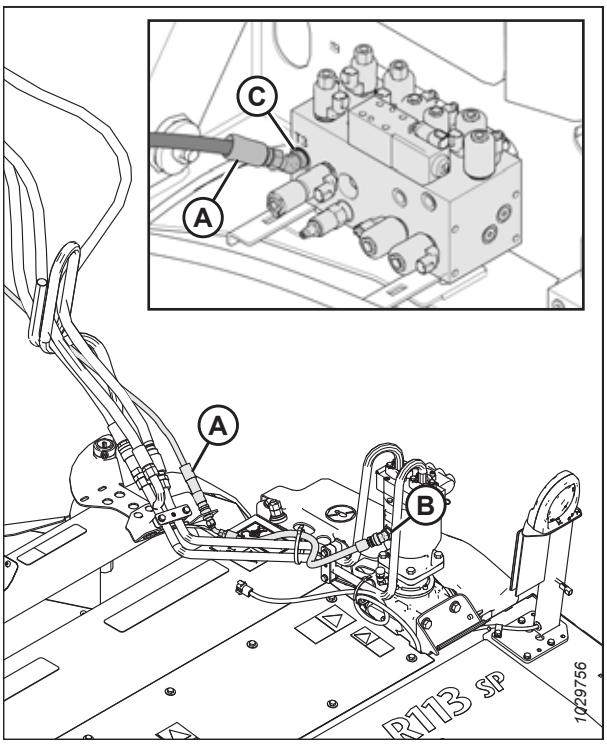


Figure 3.113: Hydraulic Connections

12. Connect electrical harness (A) from the windrower to electrical connector (B) on the header.

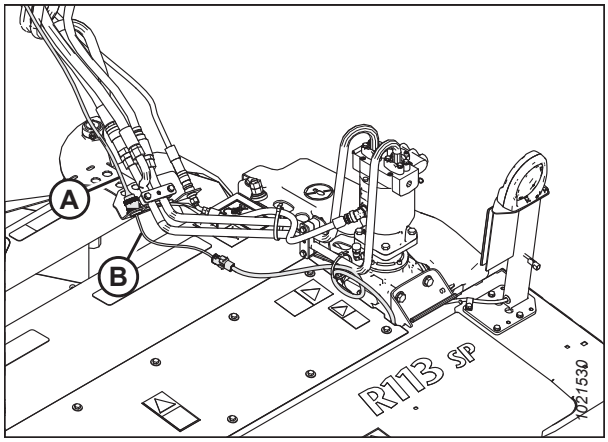


Figure 3.114: Electrical Connection

13. Lower and lock lever (A).
14. Secure hose (B) with three adjustable straps (C).

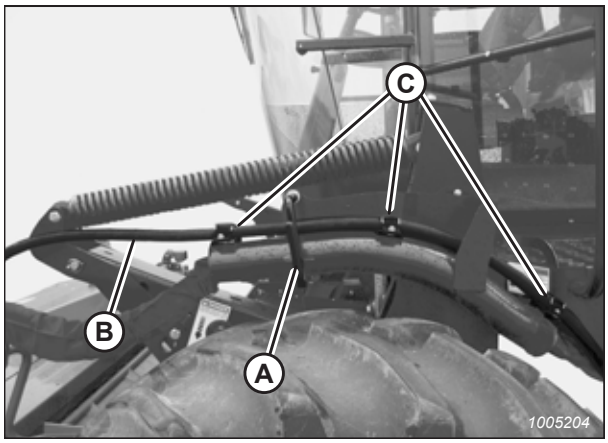


Figure 3.115: Hose Bundle

15. Move platform (A) to the CLOSED position.

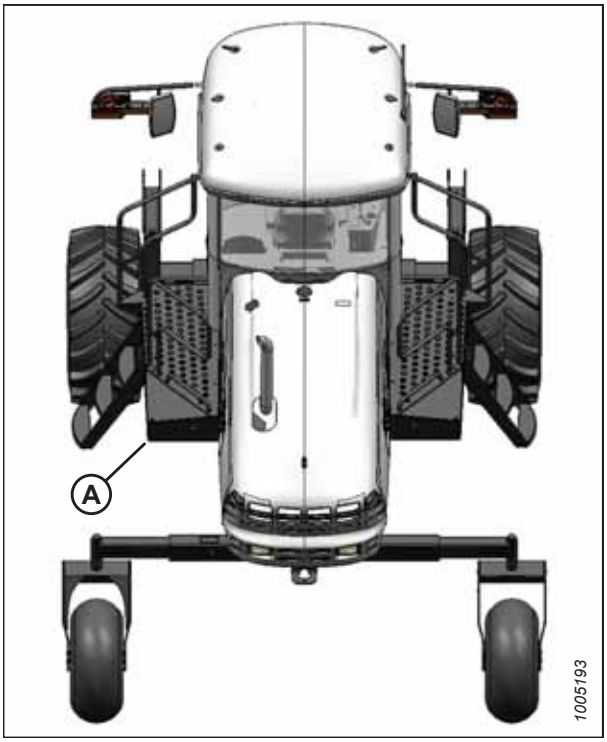


Figure 3.116: Top View of Windrower

Connecting Header Hydraulics and Electrical Systems – M205 Self-Propelled Windrower

Ensure that the hydraulic hoses and electrical harness do not interfere with any moving parts and are susceptible to damage.

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.

IMPORTANT:

The M205 Self-Propelled Windrower requires a compatibility kit (MD #257188) to connect to the R113 Rotary Disc Header.

- If the header does not have a hydraulic motor, install the Hydraulic Drive kit (B6845) before proceeding.
- If the header is configured to operate with an M155*E4* Windrower, remove the hydraulic motor from the header and install the M1170 Compatibility kit (B6845); however, do **NOT** reposition the conditioner drive speed sensor on the rotary disc header as described in the kit instruction.

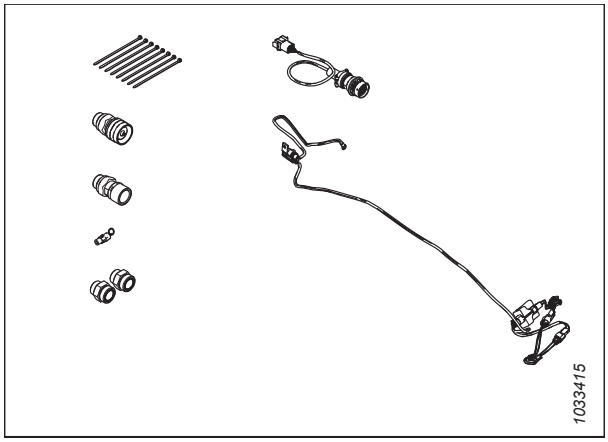


Figure 3.117: M205 Compatibility Kit (MD #257188)

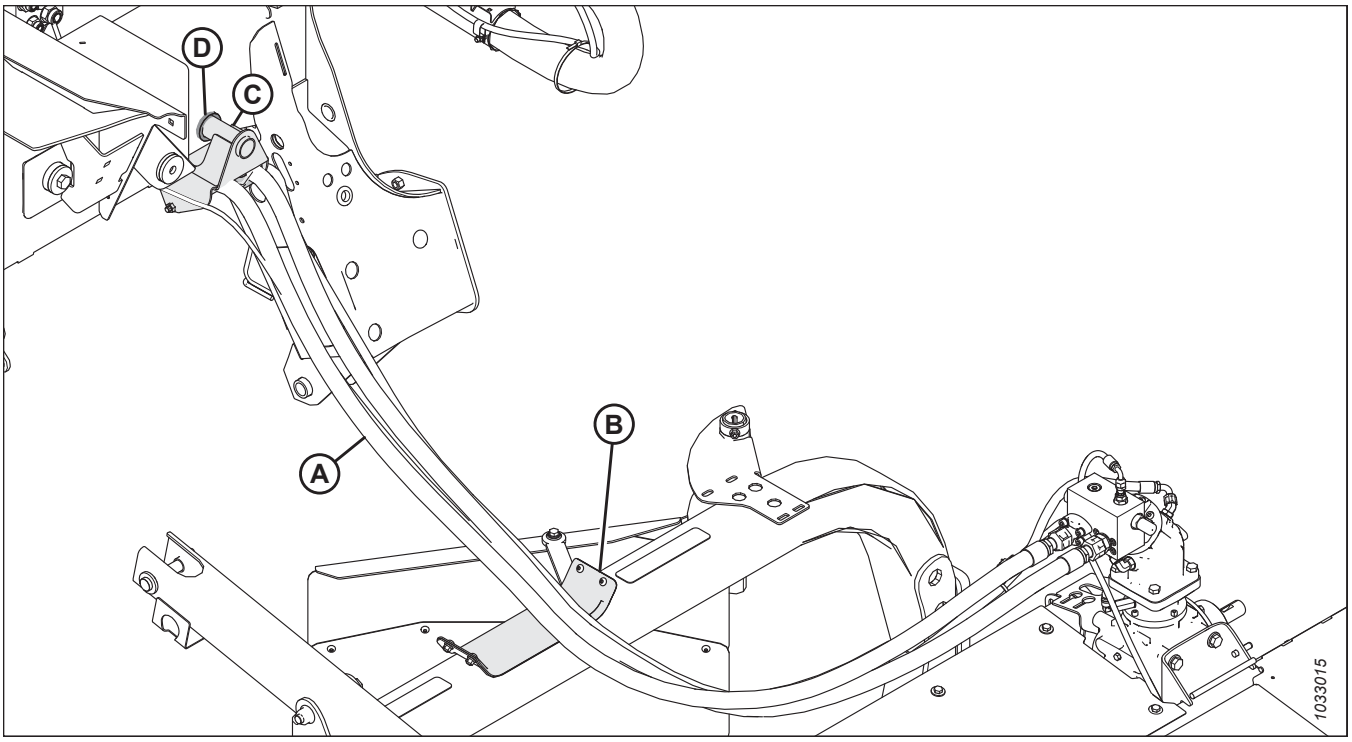


Figure 3.118: Hose Routing from Header to Windrower

1. Route header hose bundle (A) from the header over support (B) and under the windrower frame. Insert the pin on hose support (C) into hole (D) in the windrower frame near the left leg.

   IMPORTANT:

   Route the hydraulic hoses as straight as possible while avoiding wear points that could damage the hoses.

   NOTE:

   The pressure hose crosses on top of the return hose once it is routed past support (B).

2. Proceed according to the type of hydraulic couplers or fittings used on the M205 Windrower:

   - If the M205 Self-Propelled Windrower is equipped with quick couplers (A) to connect to the header, proceed to *Connecting Header Hydraulics – M205 Self-Propelled Windrower with Quick Couplers, page 82*.

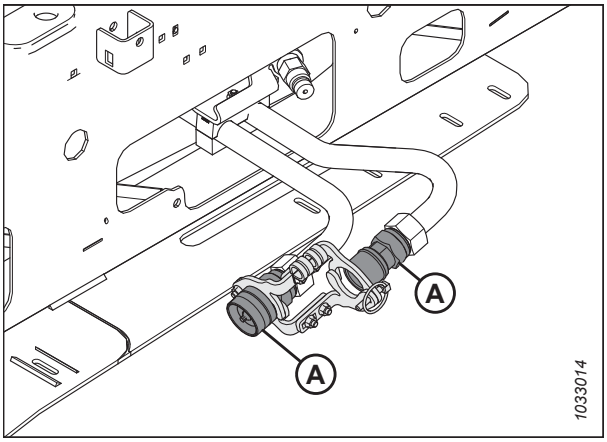


Figure 3.119: Pressure and Return Steel Lines with Quick Couplers – Left Side of Windrower

- If the M205 Self-Propelled Windrower uses union fittings (A) instead of quick couplers to connect to the header, remove union fittings (A) from the steel lines, and proceed to *Connecting Header Hydraulics – M205 Self-Propelled Windrower without Quick Couplers, page 85*.

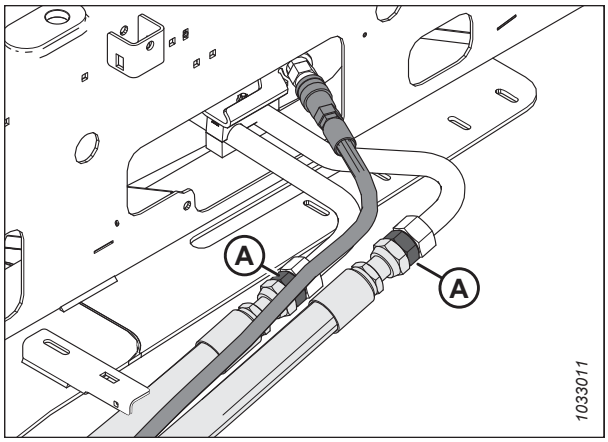


Figure 3.120: Pressure and Return Steel Lines with Union Fittings – Left Side of Windrower

- If the M205 Self-Propelled Windrower has plugs (A) installed in the steel lines, then proceed to *Connecting Header Hydraulics – M205 Self-Propelled Windrower without Quick Couplers, page 85*.

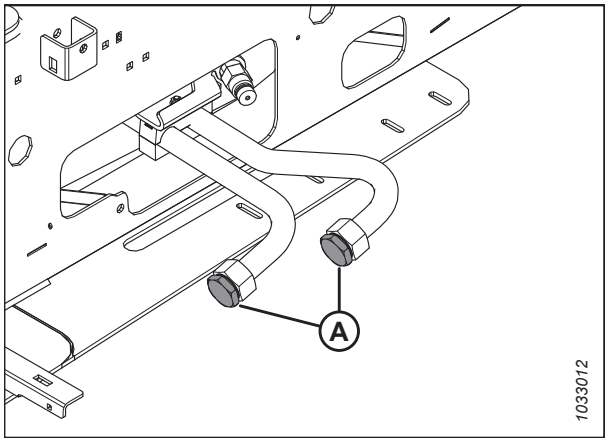


Figure 3.121: Pressure and Return Steel Lines with Plugs – Left Side of Windrower

Connecting Header Hydraulics – M205 Self-Propelled Windrower with Quick Couplers

Ensure that the couplers are fully mated when connecting the R113 Rotary Disc Header to an M205 Self-Propelled Windrower with hydraulic quick couplers.

1. Locate pressure and return hoses (A) on the left side of the header.

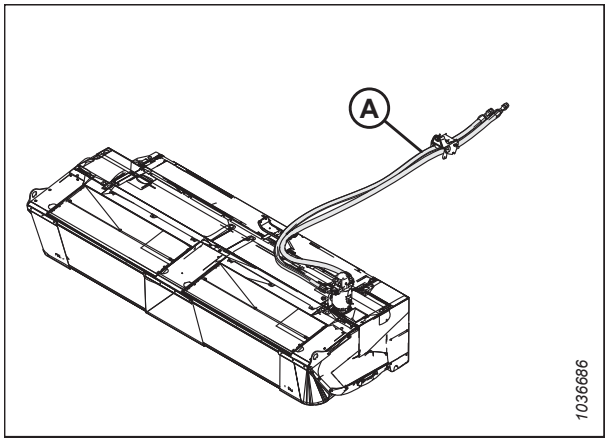


Figure 3.122: Pressure and Return Hoses

2. Install female coupler (A) onto header pressure hose (B).

   NOTE:

   Some portions of the hoses have been removed from the illustration for clarity.

3. Install male coupler (C) onto header return hose (D).

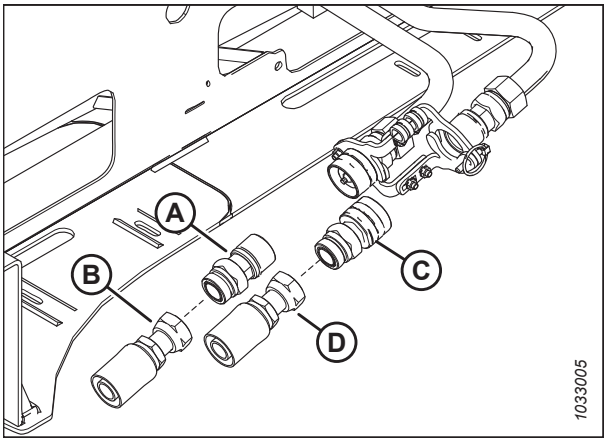


Figure 3.123: M205 Equipped with Quick Couplers

4. Connect pressure coupler (A) to inboard steel line coupler (B).

   NOTE:

   Some portions of the hoses have been removed from the illustration for clarity.

   NOTE:

   The other end of the pressure hose is connected to split flange clamp (C) on the hydraulic motor.

5. Connect return coupler (D) to outboard steel line coupler (E).

   NOTE:

   The other end of the return hose is connected to fitting (F) on the hydraulic motor.

6. Close coupler lock assembly (G) over the couplers and secure the assembly with pin (H).

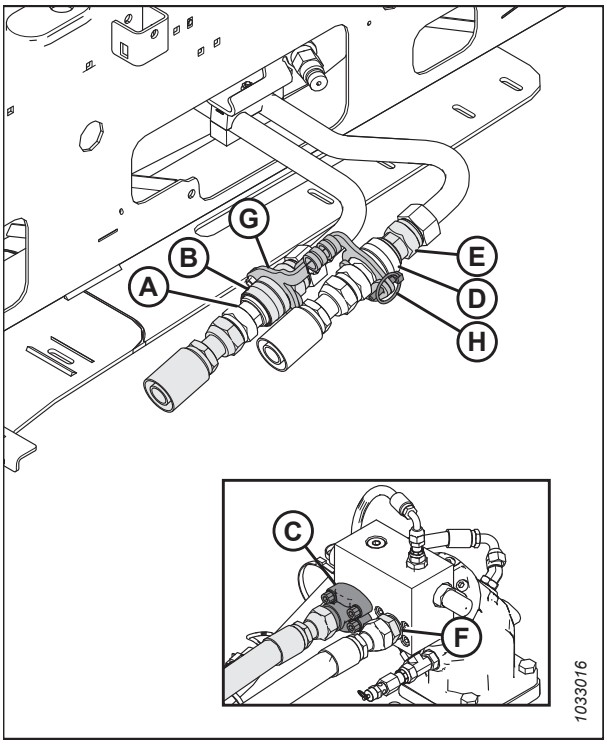


Figure 3.124: Header Pressure and Return Connections

7. Confirm that the quick couplers are connected properly. Couplers (B) are fully mated while couplers (C) are not fully mated. You should **NOT** be able to see O-ring (A).

   IMPORTANT:

   If the couplers are not fully mated, the couplers will restrict the flow of oil. Restricting the flow of oil can cause the couplers to overheat and damage themselves.

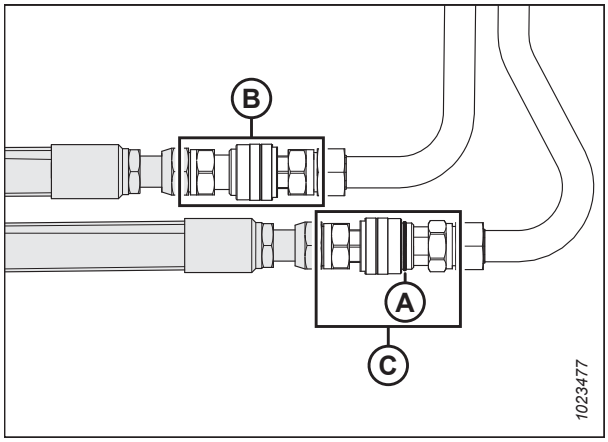


Figure 3.125: Quick Couplers – View from Top

8. Connect case drain hose (A) to 1/2 in. male flat face fitting (B).
9. Secure the case drain hose to the coupler lock assembly with two clamps (C).
10. Open the left driveshield. For instructions, refer to *3.6.1 Opening Driveshields, page 112*.

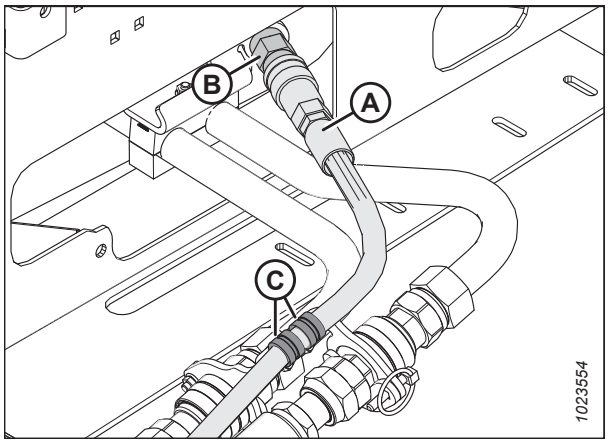


Figure 3.126: Case Drain Connection

11. Ensure that the speed sensor is installed correctly for the windrower; use top hole (A) for the M205 Self-Propelled Windrower.
12. Close the left driveshield. For instructions, refer to *3.6.2 Closing Driveshields, page 113*.

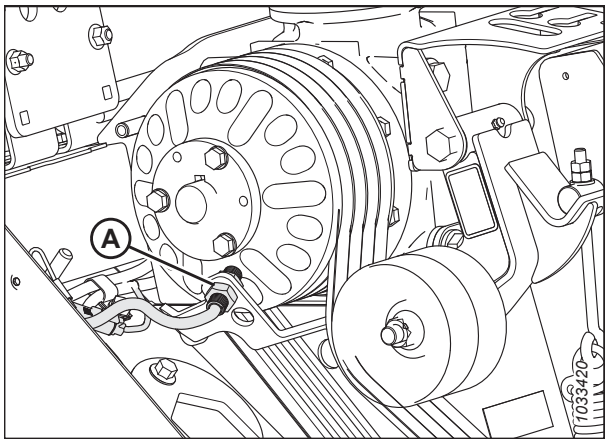


Figure 3.127: Speed Sensor

Connecting Header Hydraulics – M205 Self-Propelled Windrower without Quick Couplers

The hydraulic hoses on the header will need union fittings installed before they can be connected to an M205 Self-Propelled Windrower.

1. Locate pressure and return hoses (A) on the left side of the header.

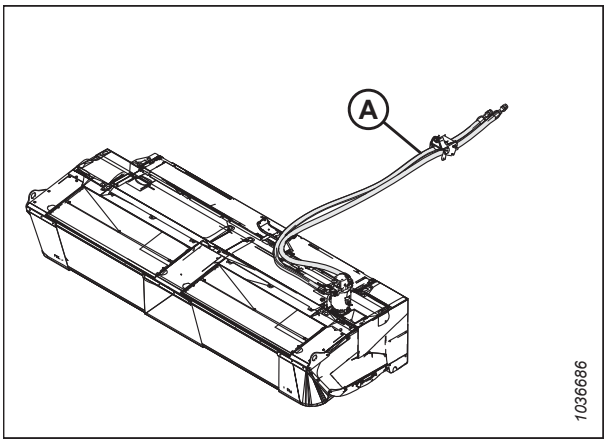


Figure 3.128: Pressure and Return Hoses

2. Install union fitting (A) onto header pressure hose (B).
3. Install union fitting (C) onto header return hose (D).

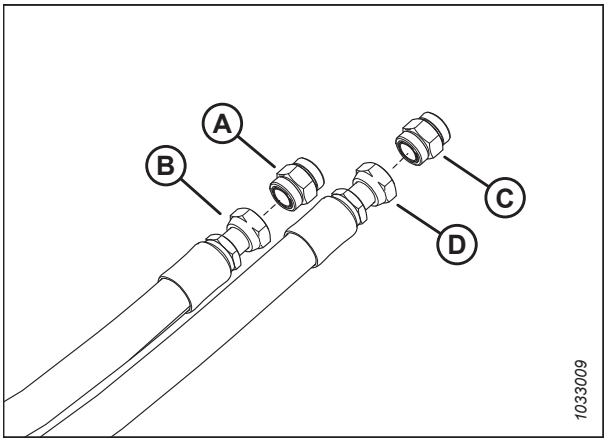


Figure 3.129: Header Hoses and Union Fittings

4. Connect the pressure hose with union fitting (A) to inboard steel line (B) on the left side of the windrower.

   NOTE:

   The other end of the pressure hose is connected to split flange clamp (C) on the hydraulic motor.

5. Connect the return hose with union fitting (D) to outboard steel line (E).

   NOTE:

   The other end of the return hose is connected to fitting (F) on the hydraulic motor.

6. Connect case drain hose (G) to 1/2 in. male flat face fitting (H).

7. Open the left driveshield. For instructions, refer to *3.6.1 Opening Driveshields, page 112*.

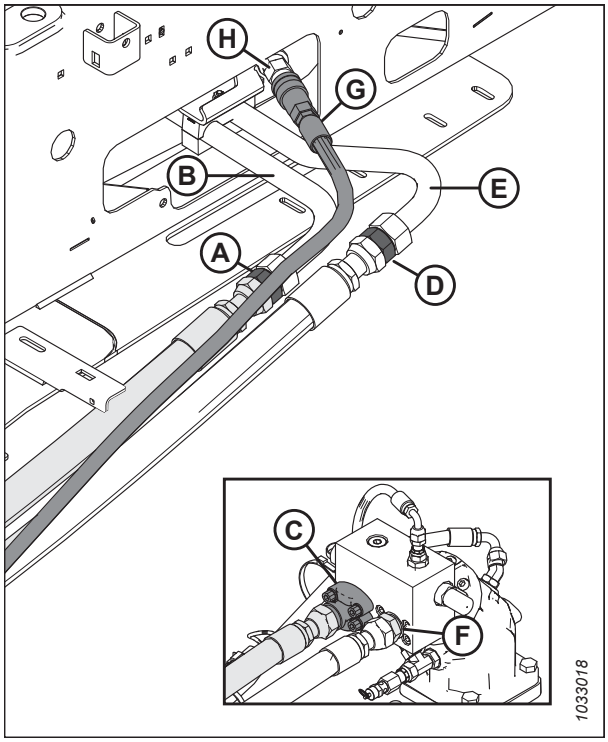


Figure 3.130: Header Hydraulic Connections – Left Side of Windrower

8. Ensure that the speed sensor is installed correctly for the windrower; use top hole (A) for the M205 Self-Propelled Windrower.

9. Close the left driveshield. For instructions, refer to *3.6.2 Closing Driveshields, page 113*.

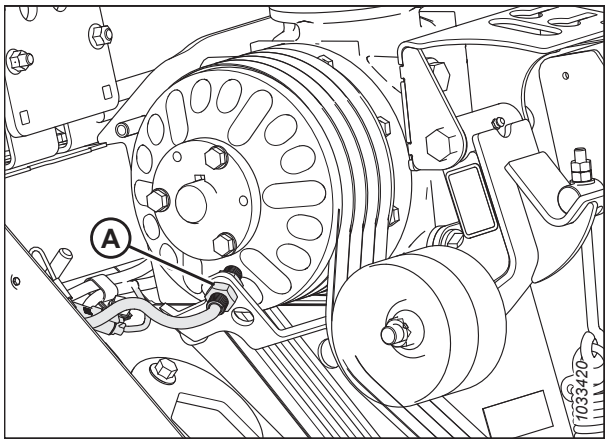


Figure 3.131: Speed Sensor

Connecting Header Electrical Components – M205 Self-Propelled Windrower

The adapter harness and the power limiter harness on the R113 must be connected to the M205's electrical system.

1. If your windrower is equipped with a draper/auger header drive, disconnect the hose bundle connectors (not shown) from the chassis harness connectors labeled HC-2 (A) and HC-1 (B).

   NOTE:

   If the windrower was connected to an R80 or R85 Rotary Disc Header, the header will have been disconnected from the chassis harness when the header was detached from the windrower.

2. Connect the R113 harness to the M205 harness as follows:

   - Connect 8-pin female connector (C) to chassis harness connector HC-2 (A).
   - Route the harness between the frame channel and protrusion (D) (shown partly cutoff), and on top of the front axle.
   - Connect 29-pin round male connector (E) to R113 header connector (F).

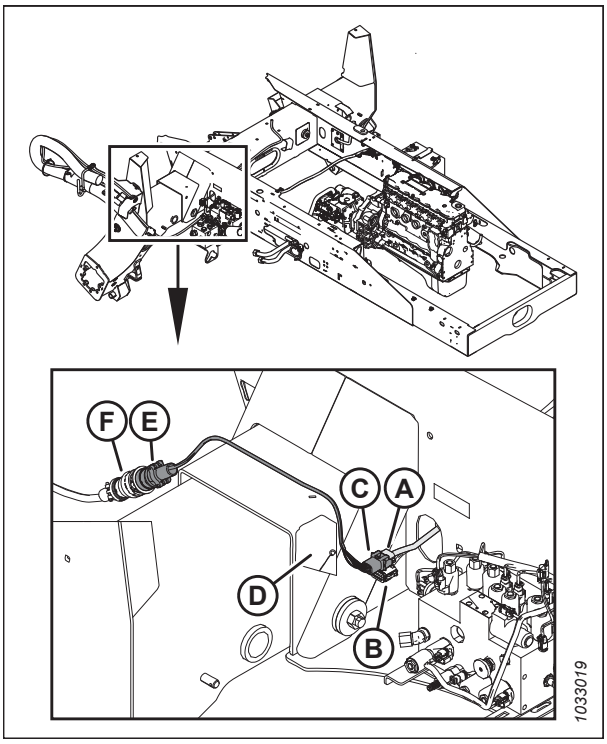


Figure 3.132: Installation of R113 to M205 Harness

3. Disconnect 4-pin female piston pump connector (A) from header pump relay harness (B).

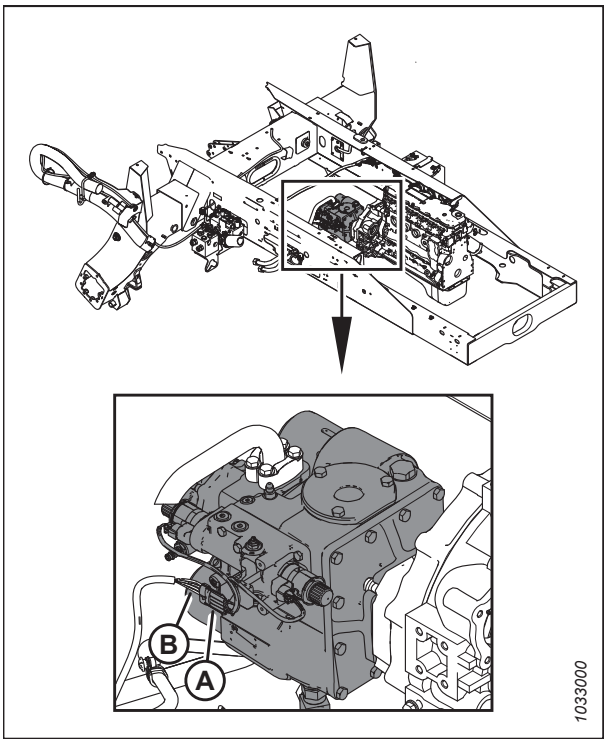


Figure 3.133: Piston Pump

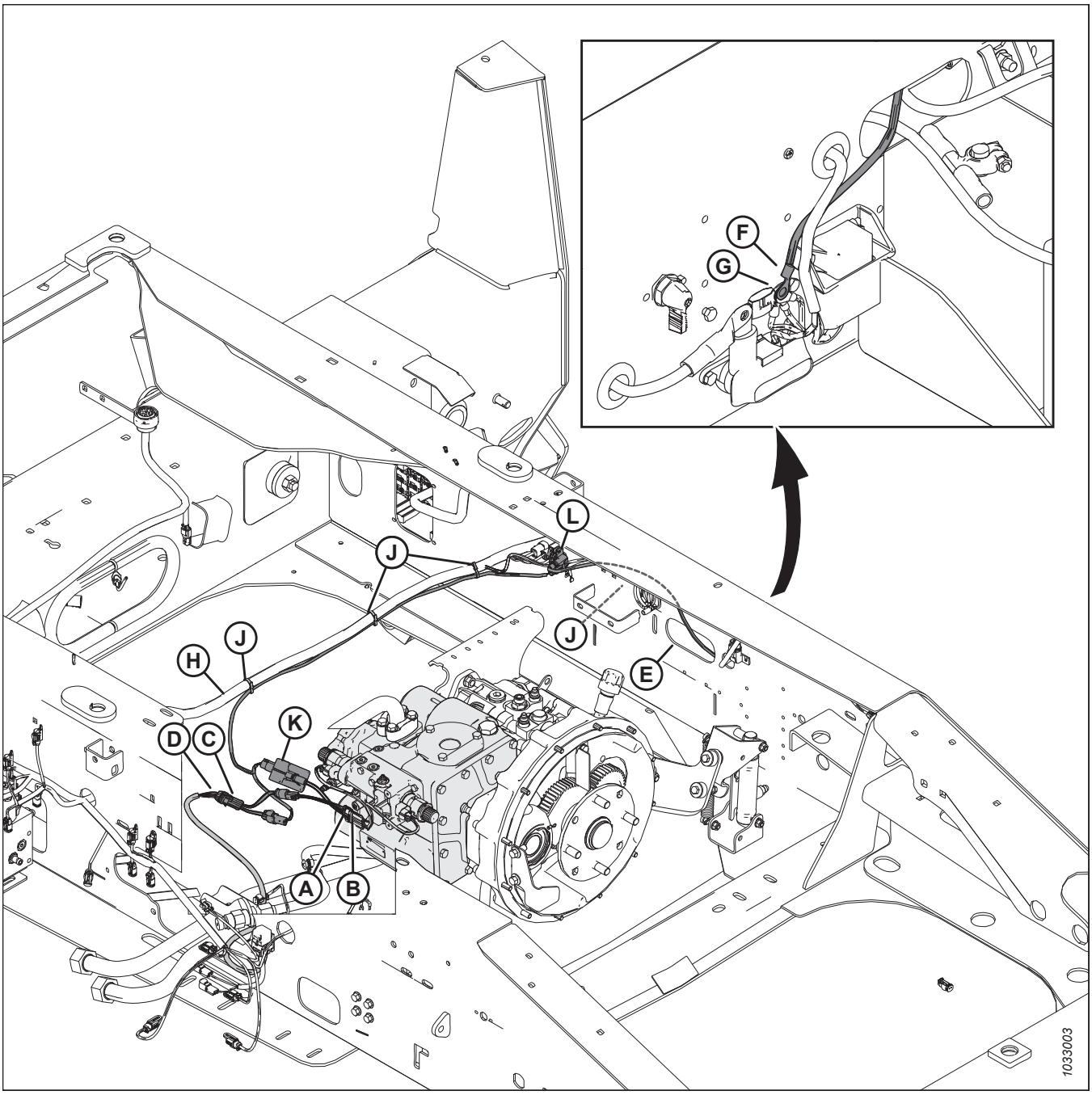


Figure 3.134: Installation of PWM Module and Power Assembly

4. Connect the PWM module and power assembly (MD #256651) as follows:

   - Connect 4-pin male connector (A) to piston pump (B).
   - Connect 4-pin female connector (C) to header pump relay harness (D).
   - Route the power wire with terminal (F) through frame channel hole (E) and connect it to bus bar stud (G) beside the battery. Tighten the terminal nut to 11 Nm (8.1 lbf·ft [100 lbf·in]).
   - Secure the harness to chassis harness (H) using cable ties (J).

     NOTE:

     In the illustration above, the locations of module (K) and fuse (L) are approximate.

5. Confirm that the PWM valve control harness (part of the PWM module and power assembly) is functional by checking the red LED light on module (A):
   - If the light is solid, then the harness is functioning correctly.
   - If the light is flashing, then the connection is incorrect. These are the possible causes of an incomplete connection:
     – The power supply might be reversed.
     – The polarity of the 4-pin connections to the header pump relay harness or to the piston pump might be reversed.
6. Confirm that the R113 to M205 harness is functional:
   - In the cab, check the cab display module (CDM). Depending on the software version, the header ID might appear as DISC after starting the engine, or binary code “0001” may appear in the upper right portion of the HEADER CUT WIDTH page. Both of these header IDs are correct.
   - Confirm that the four-way hazard lights and turn signals operate correctly.

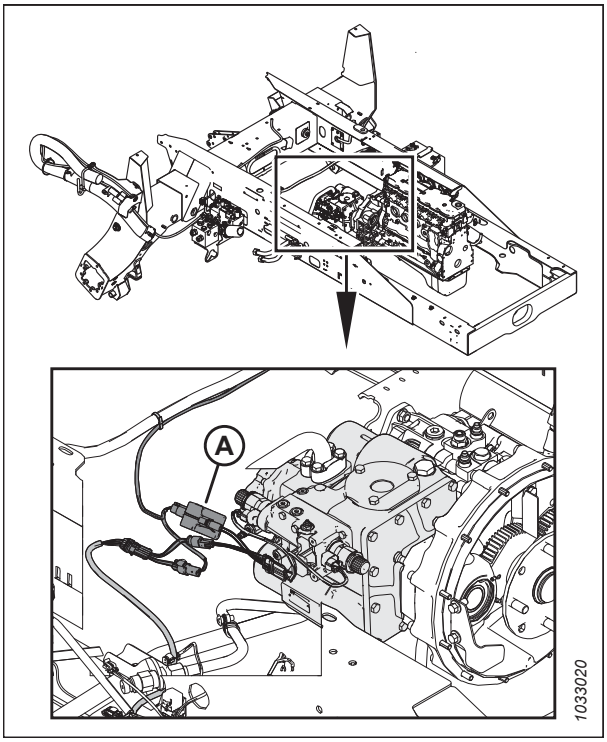


Figure 3.135: Power Limiter Harness Module

3.5 Detaching Header from Windrower

Detach the header when replacing the header with a different one or when storing the header.

3.5.1 Detaching Header from M2 Series Windrower

Detaching the header from the windrower requires removing the electrical and hydraulic connections, detaching the header supports, and releasing the center-link.

DANGER

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

DANGER

Ensure that all bystanders have cleared the area.

IMPORTANT:

Install caps and plugs on open lines to prevent contamination.

1. Start the engine.
2. Press HEADER UP button (A) on the ground speed lever (GSL) to fully raise the header.
3. If one end of the header does **NOT** rise fully, rephase the cylinders as follows:
   a. Press and hold HEADER UP (A) switch until both cylinders stop moving.
   b. Continue to hold the switch for 3–4 seconds. The cylinders are now phased.
4. Shut down the engine, and remove the key from the ignition.

Figure 3.136: Ground Speed Lever (GSL)

5. Engage the safety props on both lift cylinders as follows:
   a. Pull lever (A) toward you to release it, then rotate it toward the header to lower the safety prop onto the cylinder.
   b. Repeat the previous step for the opposite lift cylinder.

   IMPORTANT:

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

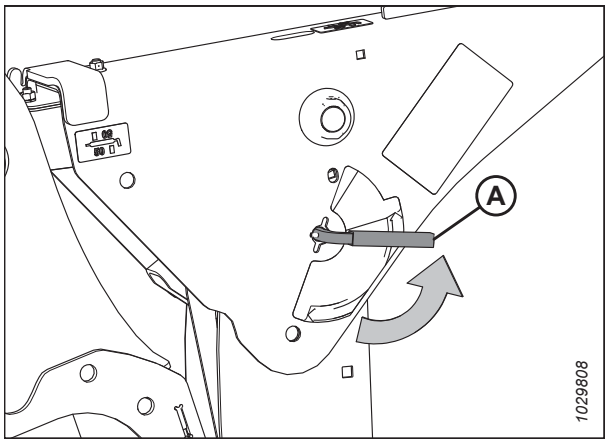


Figure 3.137: Safety Prop Lever

6. Remove hairpin (B) and clevis pin (A) from header support (C) on each side of the header.

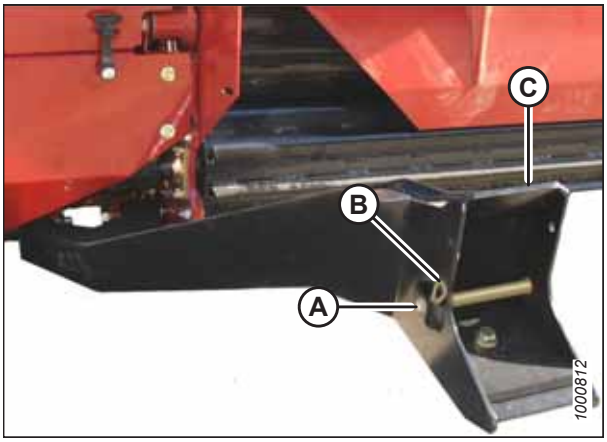


Figure 3.138: Header Support

7. **Windrowers with self-aligning center-link:** Release center-link latch (A).

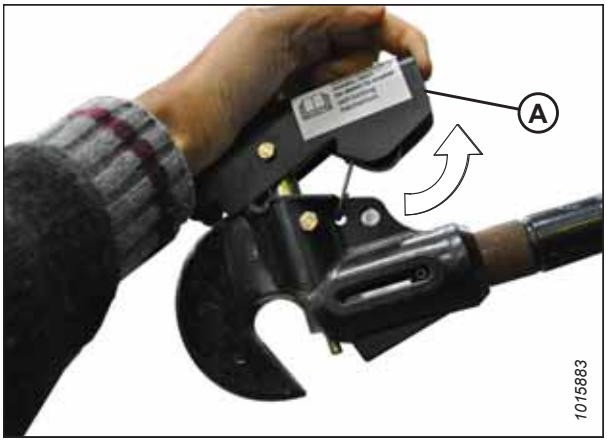


Figure 3.139: Center-Link

8. Disengage the safety props on both lift cylinders as follows:

   a. Turn lever (A) away from the header to raise the safety prop until the lever locks into the vertical position.

   b. Repeat the previous step for the opposite cylinder.

   NOTE:

   If the safety prop will **NOT** disengage, raise the header to release the prop.

9. Start the engine.

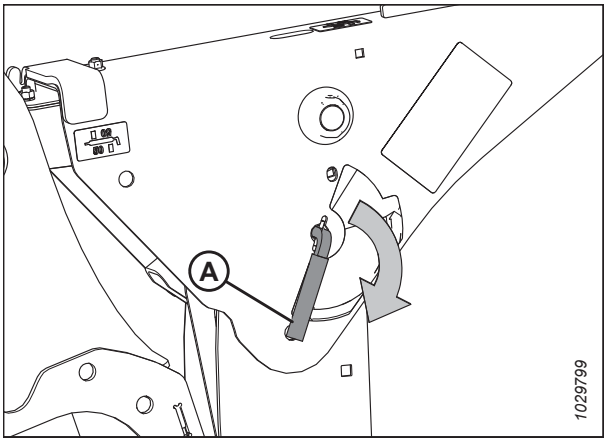


Figure 3.140: Safety Prop Lever

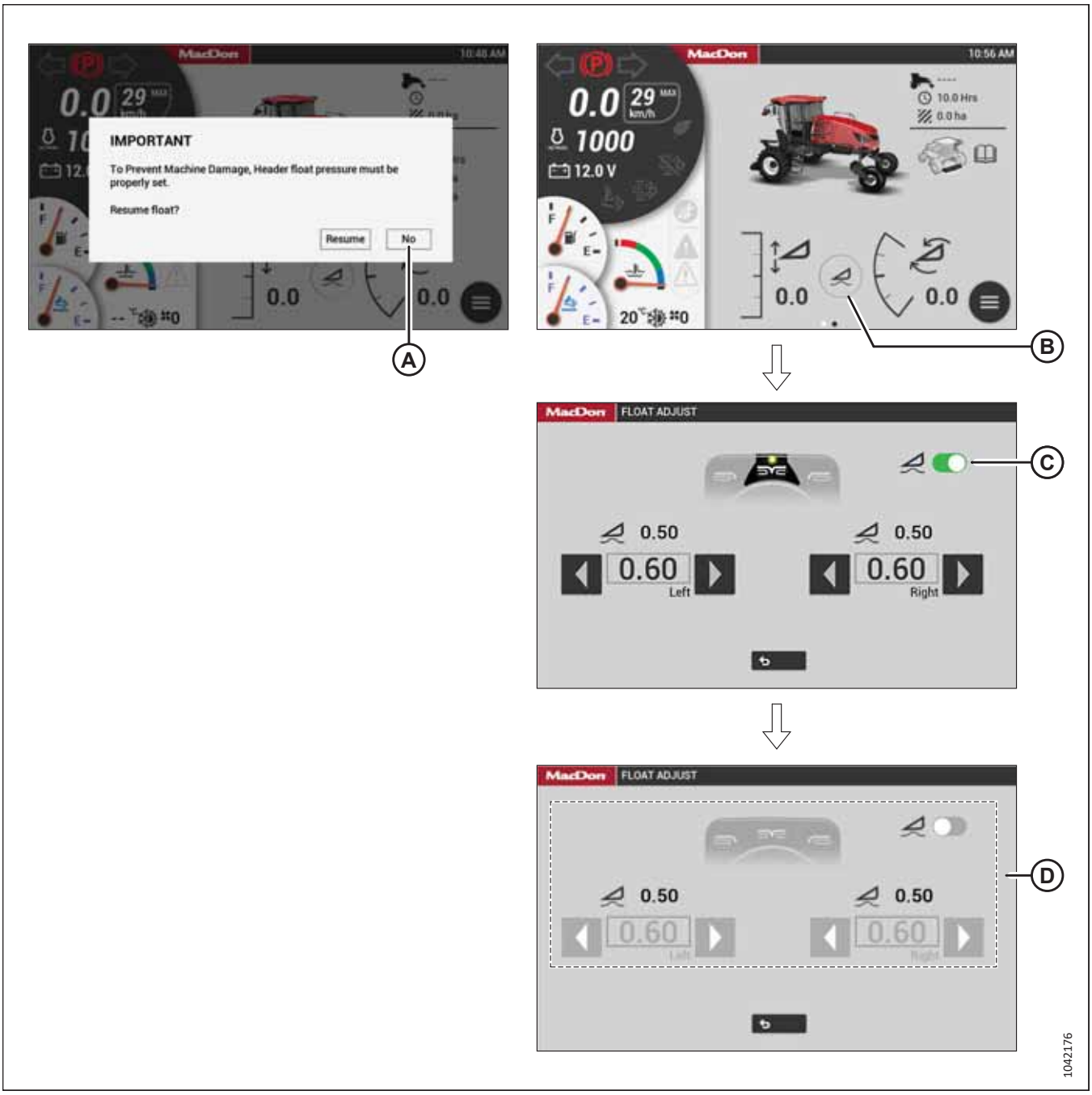


Figure 3.141: Float Removal

10. Remove the float as follows:

    - If the HarvestTouch™ Display shows the message “Resume Float?”, then select NO (A).
    - If the HarvestTouch™ Display does **NOT** show the message, then select FLOAT ADJUST (B), select switch (C), and confirm the switch and float settings (D) are grayed out.

    IMPORTANT:

    Removing the float will release the tension in the float springs. This will prevent damage to the header lift linkages when lowering the legs without a header or weight box attached to the windrower.

11. Lower the header fully using HEADER DOWN switch (A).

12. Press HEADER TILT switches (B) as needed on the GSL to release the load on the center-link.

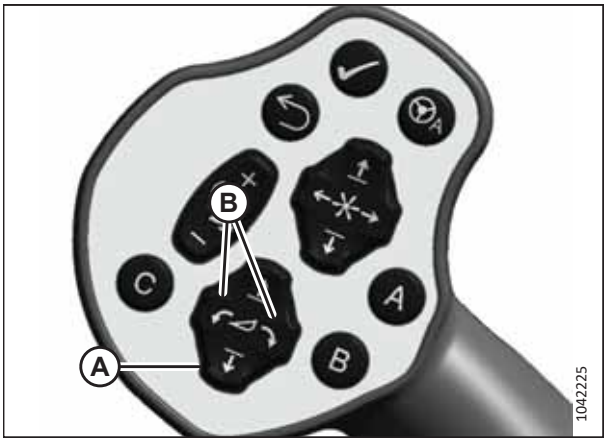


Figure 3.142: GSL

13. **Windrowers with self-aligning center-link:**

    a. Press REEL UP switch (A) to disengage the center-link from the header.

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

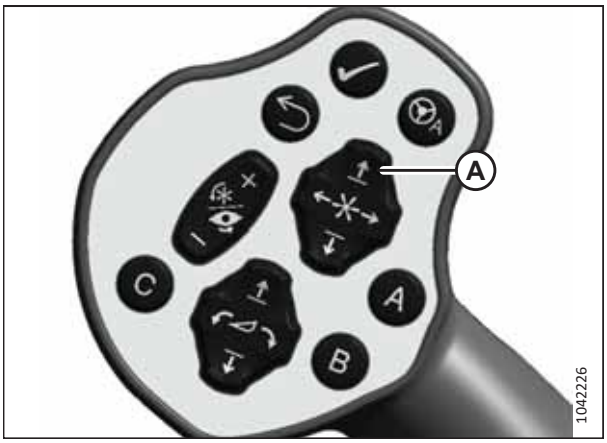


Figure 3.143: GSL

14. **Windrowers without the self-aligning center-link:**

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

    b. Disconnect the center-link by lifting release (A) and lift hook (B) off the header.

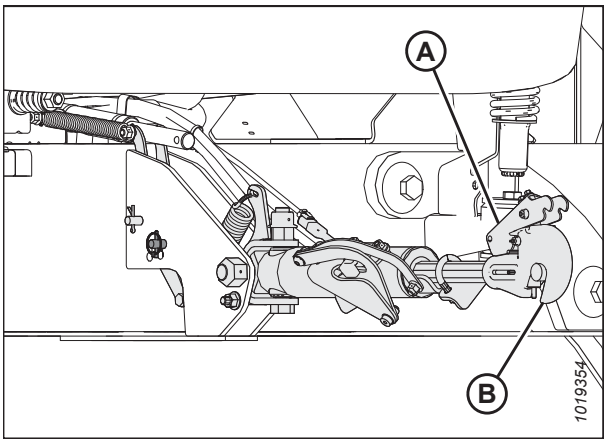


Figure 3.144: Hydraulic Center-Link

15. Approach platform (A) on the left side of the windrower. Ensure that the cab door is closed.
16. Push latch (B) and pull platform (A) toward the walking beam until it stops and the latch engages.

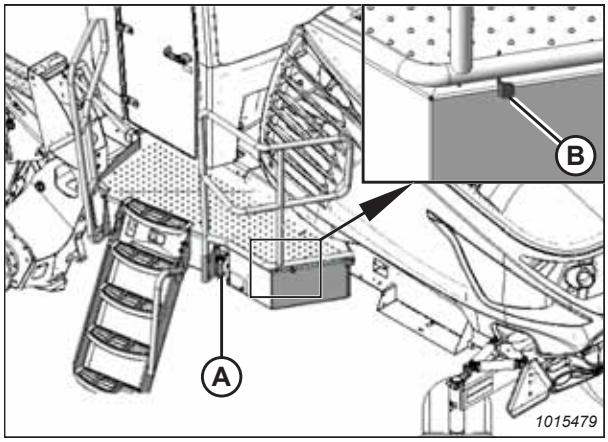


Figure 3.145: Left Platform

17. Disconnect electrical harness (D), and hydraulic hoses (A), (B), and (C) from the windrower.

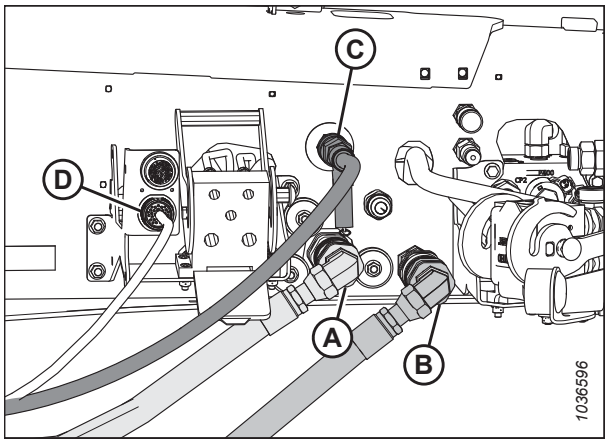


Figure 3.146: Header Drive Hydraulics – M2260 Connection Locations, Low Pressure Case Drain Kit B6698 Installed

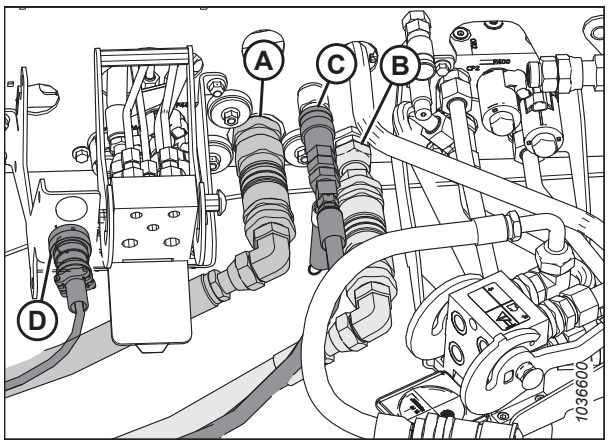


Figure 3.147: Header Drive Hydraulics – M2170 Connection Locations

18. Push latch (A) to unlock platform (B).

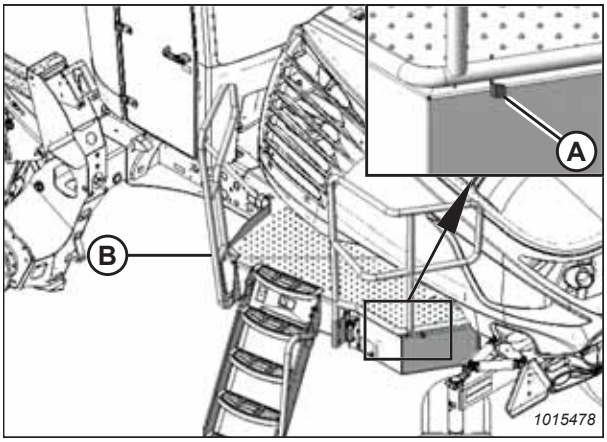


Figure 3.148: Left Platform

19. Pull platform (A) toward the cab until it stops and the latch is engaged.

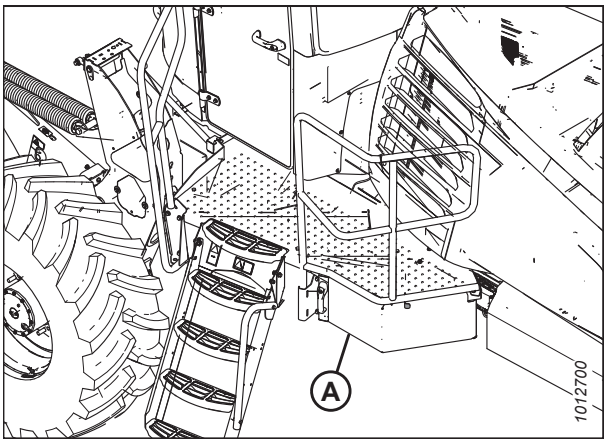


Figure 3.149: Left Platform

20. Remove hose support (A) and the hose bundle from the windrower frame.

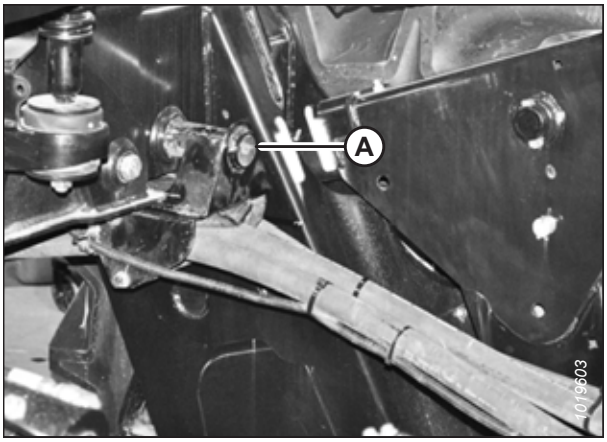


Figure 3.150: Hoses on Windrower

21. Slide support (A) into center-link support (B) and secure it with hardware (C).

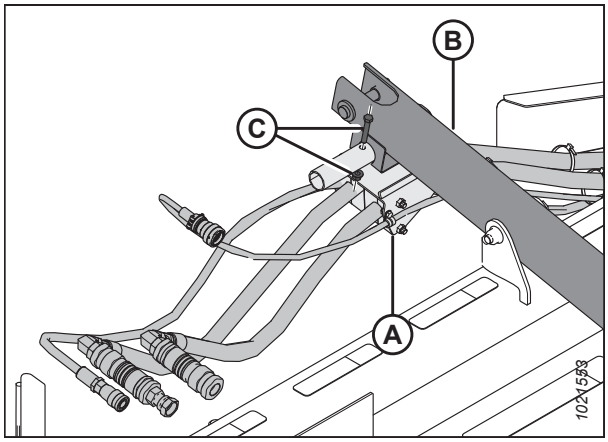


Figure 3.151: Hose Storage Position

22. Place hoses (A) and electrical harness (B) disconnected from the windrower into storage plate (C).

    NOTE:

    Install caps and plugs on open lines to prevent contamination while the header is in storage.

    NOTE:

    Some parts have been removed from the illustration for the sake of clarity.

23. Back the windrower away from the header.

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

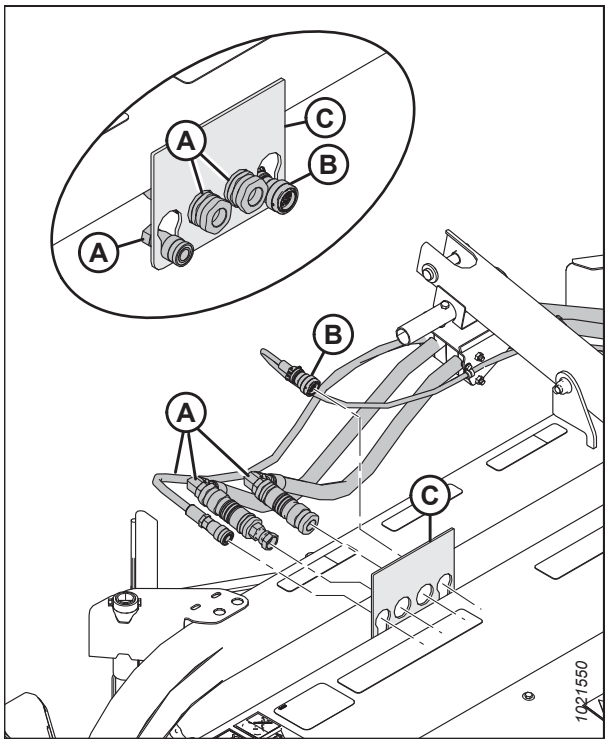


Figure 3.152: Hydraulic Storage Plate

25. Reinstall clevis pin (A) through header support (C) and secure the clevis pin with hairpin (B). Repeat this step on the opposite side of the header.

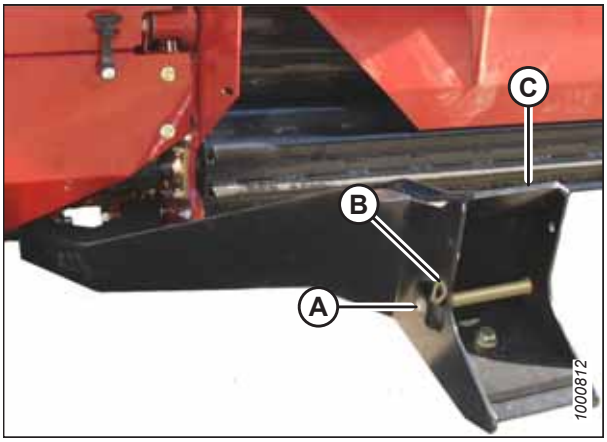


Figure 3.153: Header Support

3.5.2 Detaching Header from M1 Series Windrower

Detaching the header from the windrower requires removing the electrical and hydraulic connections, detaching the header supports, and releasing the center-link.

DANGER

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

DANGER

Ensure that all bystanders have cleared the area.

1. Start the engine.
2. Press switch (A) to raise the header to its maximum height.
3. Shut down the engine, and remove the key from the ignition.

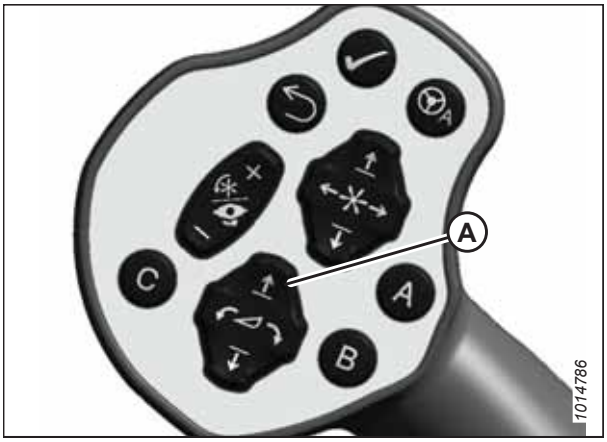


Figure 3.154: Ground Speed Lever (GSL)

4. Engage the safety props on both lift cylinders as follows:

   a. Pull lever (A) toward you to release it, then rotate it toward the header to lower the safety prop onto the cylinder.

   b. Repeat the previous step for the opposite lift cylinder.

   IMPORTANT:

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

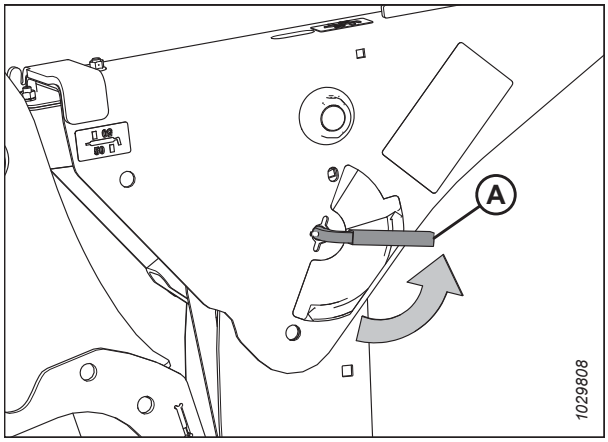


Figure 3.155: Safety Prop Lever

5. Open left platform (A) on the windrower. For instructions, refer to the windrower operator's manual.

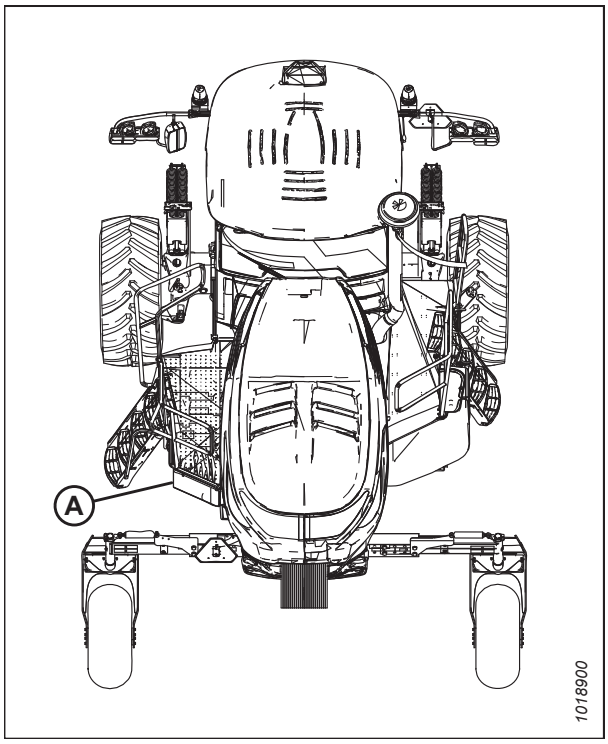


Figure 3.156: Left Platform Open – M1240 Windrower

6. Disconnect electrical harness (A) and hydraulic hoses (B), (C), and (D) from the windrower.

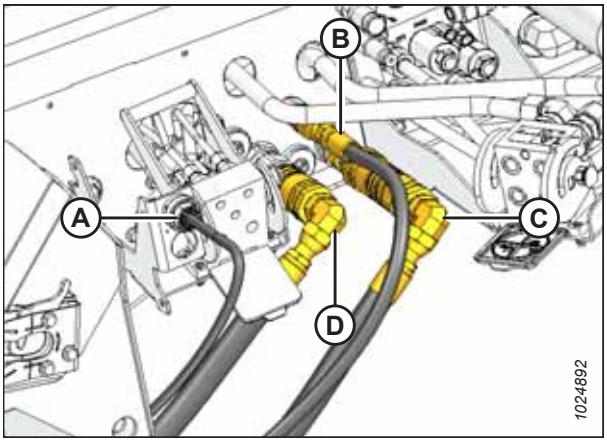


Figure 3.157: Header Drive Hydraulics

7. Remove hose support (A) and the hose bundle from the windrower frame.

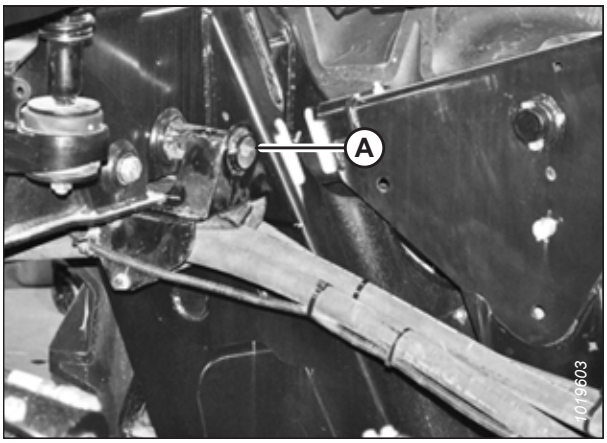


Figure 3.158: Hoses on Windrower

8. Slide support (A) into center-link support (B) and secure it with hardware (C).

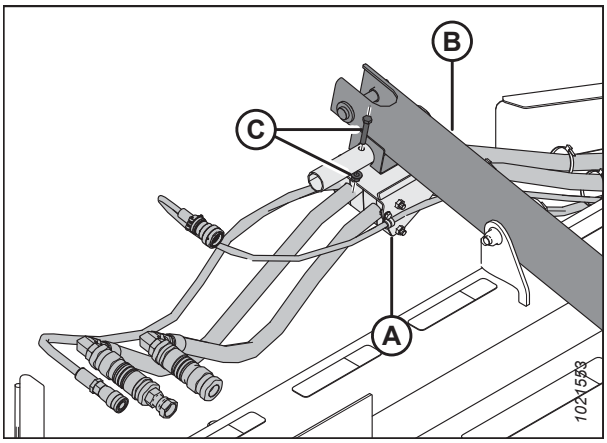


Figure 3.159: Hose Storage Position

9. Store hoses (A) and electrical harness (B) disconnected from the windrower in Step *6, page 99* into storage plate (C).

   NOTE:

   Install caps and plugs on open lines to prevent contamination while the header is in storage.

   NOTE:

   Some parts have been removed from the illustration.

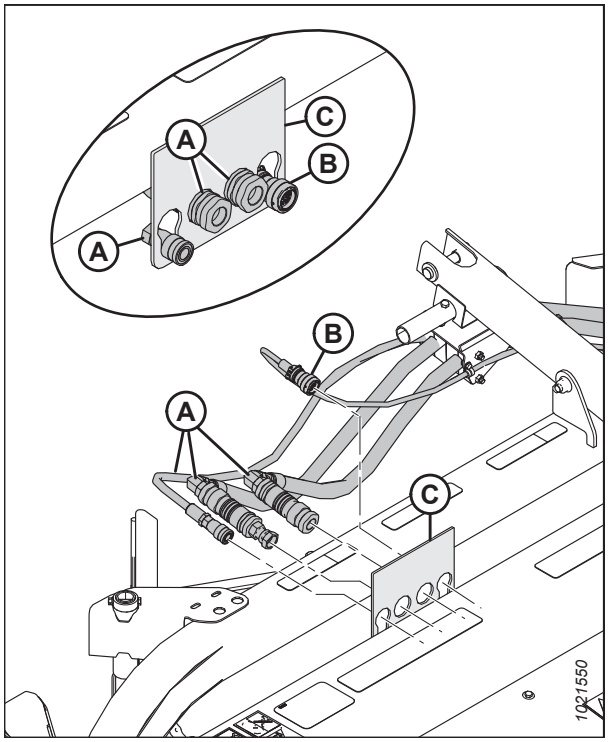


Figure 3.160: Hydraulic Storage Plate

10. Remove hairpin (B) and clevis pin (A) from header support (C) on each side of the header.

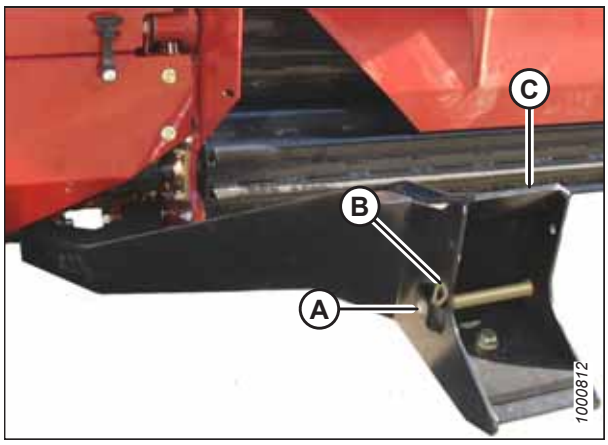


Figure 3.161: Header Supports

11. **Windrowers WITH center-link self-alignment kit:** Release center-link latch (A).

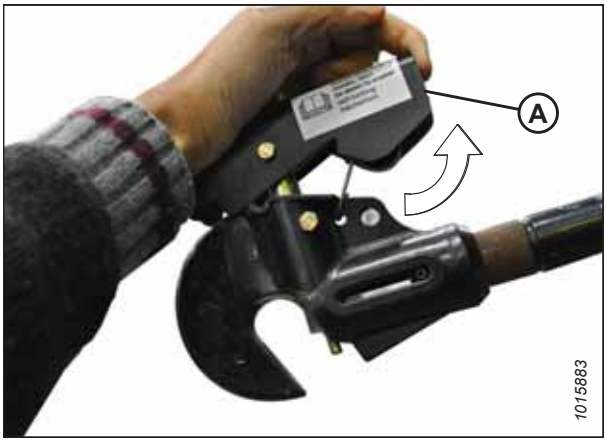


Figure 3.162: Center-Link

12. Disengage the safety props on both lift cylinders as follows:
    a. Turn lever (A) away from the header to raise the safety prop until the lever locks into the vertical position.
    b. Repeat the previous step for the opposite cylinder.

    NOTE:

    If the safety prop will **NOT** disengage, raise the header to release the prop.

13. Repeat the previous step for the opposite side.

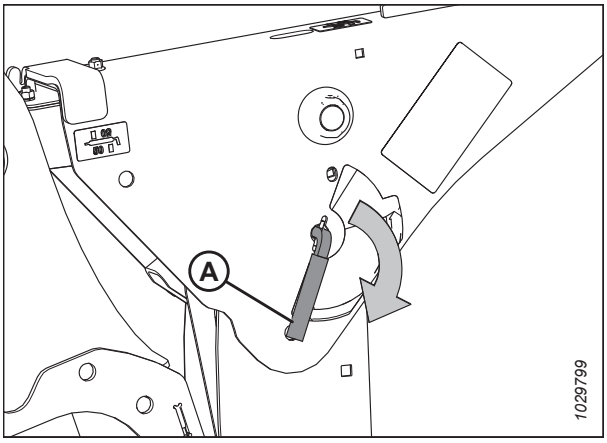


Figure 3.163: Safety Prop Lever

14. Start the engine.
15. Remove the header float when prompted by the Harvest Performance Tracker (HPT).

    NOTE:

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

16. Lower the header.

17. Use HEADER TILT cylinder switches (A) on the GSL to release the load on the center-link cylinder.

18. **Windrowers WITH center-link self-alignment kit:** Operate the link lift cylinder with REEL UP switch (B) to disengage the center-link from the header. Proceed to Step *22, page 102*.

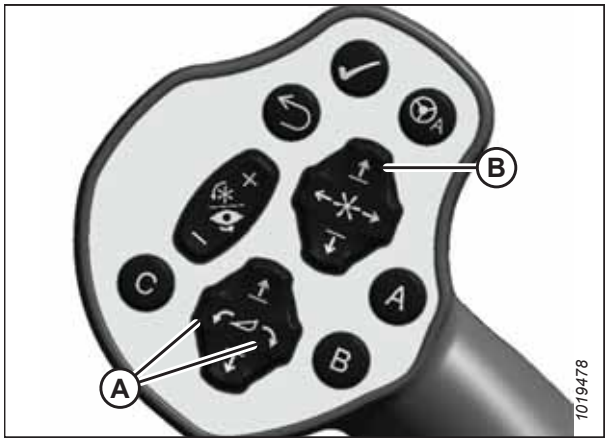


Figure 3.164: GSL

19. **Windrowers WITHOUT center-link self-alignment kit:** Shut down the engine, and remove the key from the ignition.

20. Lift hook release (A) and lift hook (B) off of the header pin.

21. Start the engine. For instructions, refer to the windrower operator's manual.

22. Back the windrower slowly away from the header.

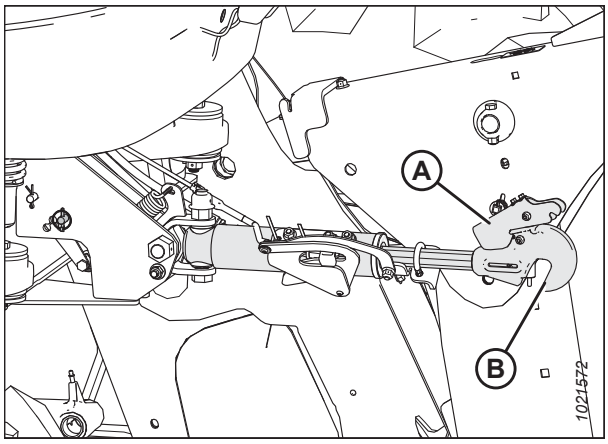


Figure 3.165: Hydraulic Center-Link

23. Reinstall clevis pin (A) through header support (C) and secure the pin with hairpin (B). Repeat this step on the opposite side of the header.

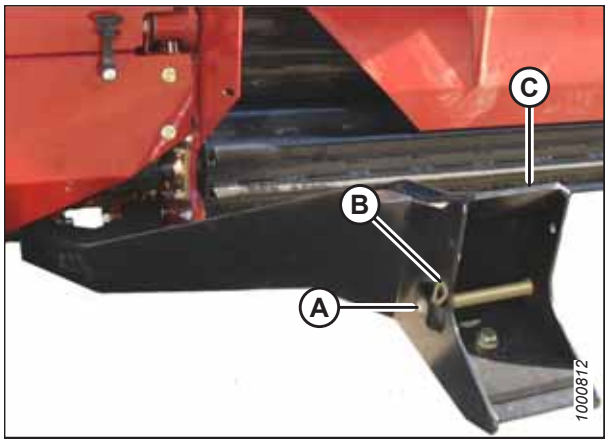


Figure 3.166: Header Support

3.5.3 Detaching Header from M155 or M155*E4* Self-Propelled Windrower

Detaching the header from the windrower involves removing the electrical and hydraulic connections and then following the detaching procedure in the windrower operator's manual.

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

Ensure that all bystanders have cleared the area.

1. Lower the header to the ground. If the ground is soft, place blocks under the header.
2. Shut down the engine, and remove the key from the ignition.
3. Move left platform (A) to the open position.

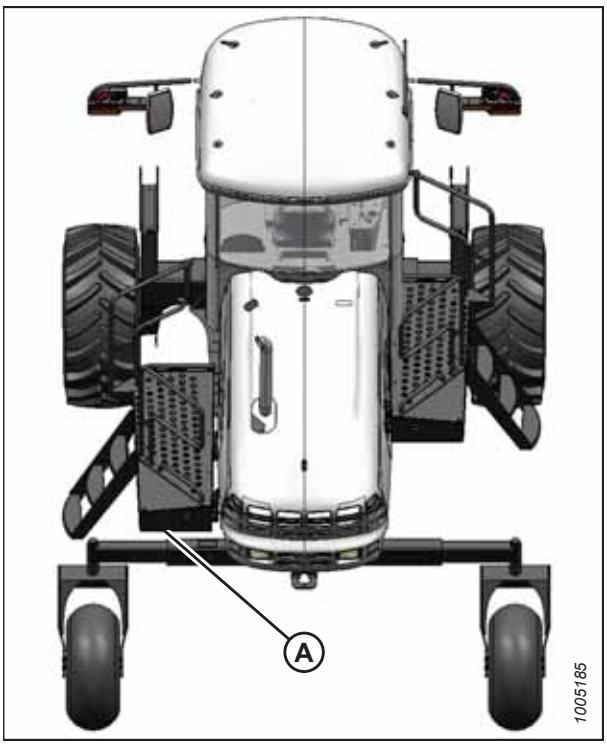


Figure 3.167: Windrower Left Side Platform

4. Disconnect hose (A) from port M2 on the disc drive valve.

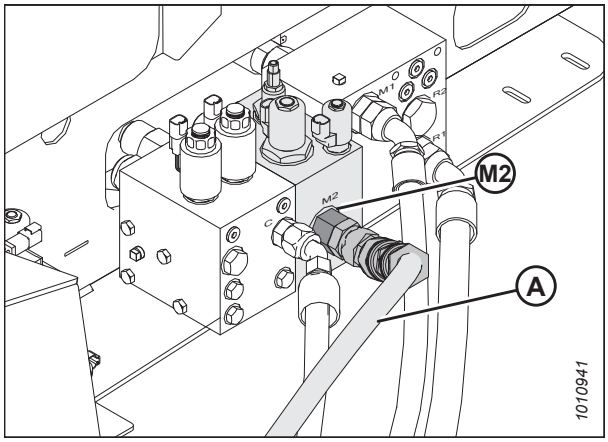


Figure 3.168: Hydraulic Connections

5. Raise lever (A) and undo three cinch straps (C).
6. Move hose (B) so that it can be stored on the header.

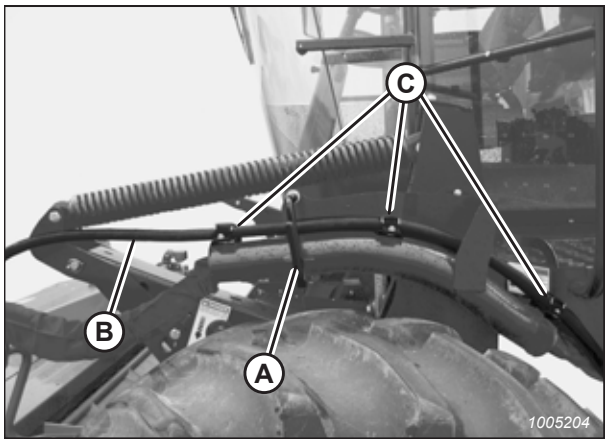


Figure 3.169: Hose Bundle

7. Disconnect the following hoses from the hydraulic motor:
   - Pressure hose (A)
   - Return hose (B)
   - Case drain hose (C)
8. Install caps on the connectors and on the ends of the hoses to prevent contamination.

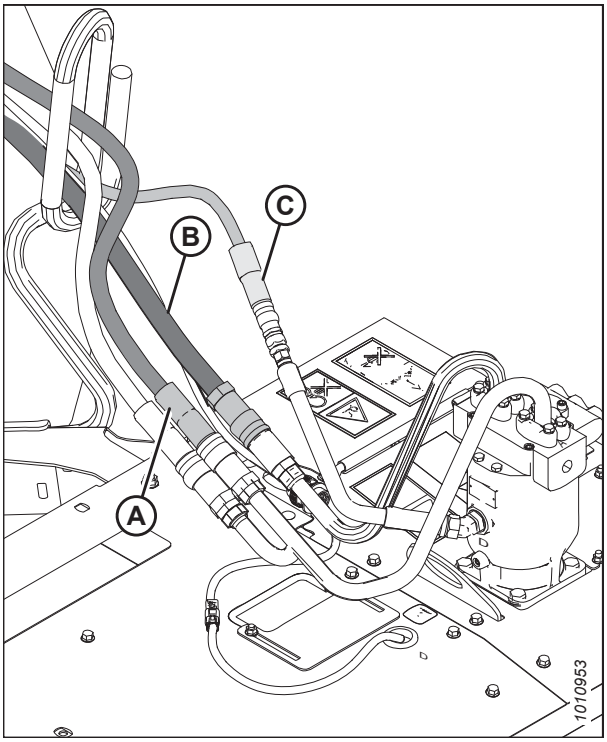


Figure 3.170: Hose Bundle

9. Disconnect electrical connector (A) by turning the collar counterclockwise and pulling on the connector.

   NOTE:

   The hydraulic lines and hoses in the illustration have been hidden in order to show the electrical connection.

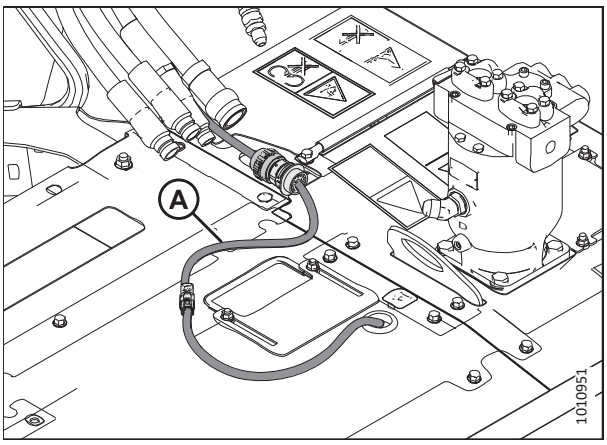


Figure 3.171: Electrical Connection

10. Move the hose bundle from the header to left hose support (B).
11. Rotate lever (A) clockwise and push it forward so that it engages with the bracket.
12. Route the electrical harness through hose support (B) and attach a cap to electrical connector (C).

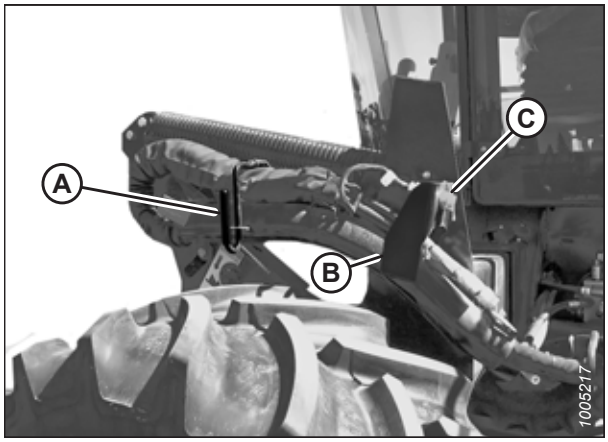


Figure 3.172: Hose Bundle

13. Move windrower platform (A) to the CLOSED position.
14. Refer to the windrower operator's manual for instructions on how to mechanically detach the header from the windrower.

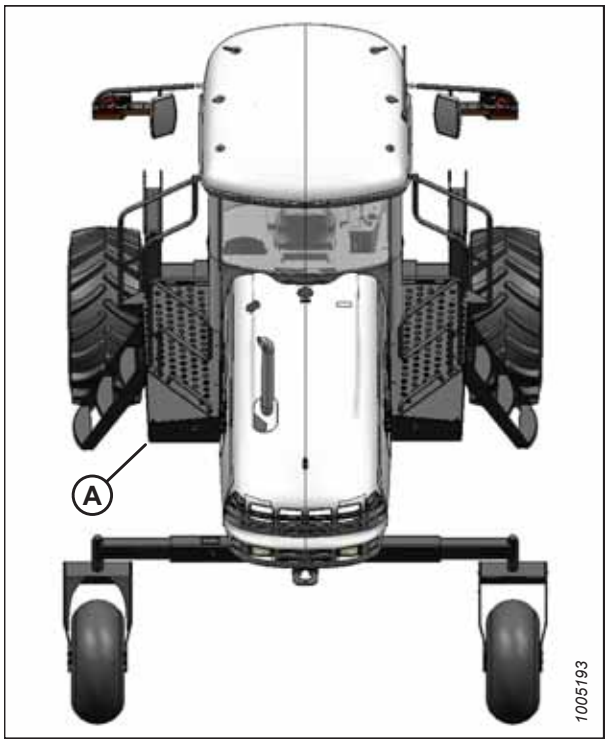


Figure 3.173: M155 Windrower

3.5.4 Detaching Header from M205 Self-Propelled Windrower

The procedure for detaching your R113 Rotary Disc Header from an M205 Self-Propelled Windrower will depend on whether or not the windrower is equipped with hydraulic quick couplers.

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

Ensure that all bystanders have cleared the area.

1. Lower the header to the ground. If the ground is soft, place blocks under the header.
2. Shut down the engine, and remove the key from the ignition.
3. Move left platform (A) to the open position.
4. To disconnect the header from an M205 Windrower equipped with quick couplers, refer to *Disconnecting Header Hydraulics – M205 Self-Propelled Windrower with Quick Couplers, page 107*.
5. To disconnect the header from an M205 Windrower not equipped with quick couplers, refer to *Disconnecting Header Hydraulics – M205 Self-Propelled Windrower without Quick Couplers, page 108*.

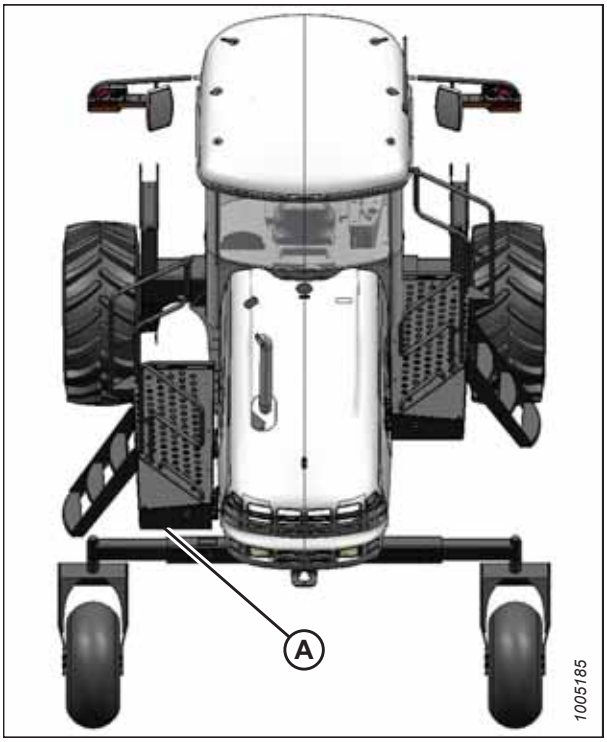


Figure 3.174: Windrower Left Side Platform

Disconnecting Header Hydraulics – M205 Self-Propelled Windrower with Quick Couplers

Quick couplers allow for Operators to disconnect the header's hydraulic lines from the windrower without tools.

1. Disconnect case drain hose (A) from 1/2 in. male flat face fitting (B).
2. Remove two clamps (C) securing the case drain hose to the coupler lock assembly.

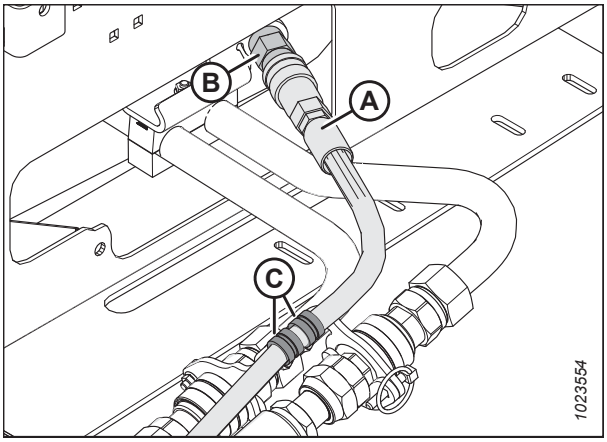


Figure 3.175: Case Drain Connection

3. Disconnect **PRESSURE** coupler (A) from inboard steel line coupler (B).

   NOTE:

   Some portions of the hoses have been removed from the illustration for clarity.

4. Disconnect **RETURN** coupler (C) from outboard steel line coupler (D).

5. Remove pin (E) and open coupler lock assembly (F) over the couplers.

6. Disconnect the electrical connectors. For instructions, refer to *Disconnecting Header Electrical System – M205 Self-Propelled Windrower, page 109*.

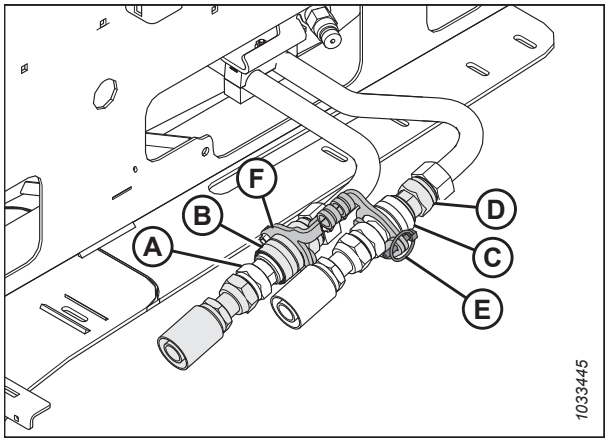


Figure 3.176: Header Pressure and Return Connections

Disconnecting Header Hydraulics – M205 Self-Propelled Windrower without Quick Couplers

Disconnecting the header's hydraulic hoses from a windrower not fitted with quick couplers will require the use of wrenches.

1. Disconnect the **PRESSURE** hose with union fitting (A) from inboard steel line (B).

   NOTE:

   For reference, the other end of the pressure hose is connected to split flange clamp (C) on the hydraulic motor.

2. Disconnect the **RETURN** hose with union fitting (D) from outboard steel line (E).

   NOTE:

   For reference, the other end of the return hose is connected to fitting (F) on the hydraulic motor.

3. Disconnect case drain hose (G) from 1/2 in. male flat face fitting (H).

4. Disconnect the electrical connectors. For instructions, refer to *Disconnecting Header Electrical System – M205 Self-Propelled Windrower, page 109*.

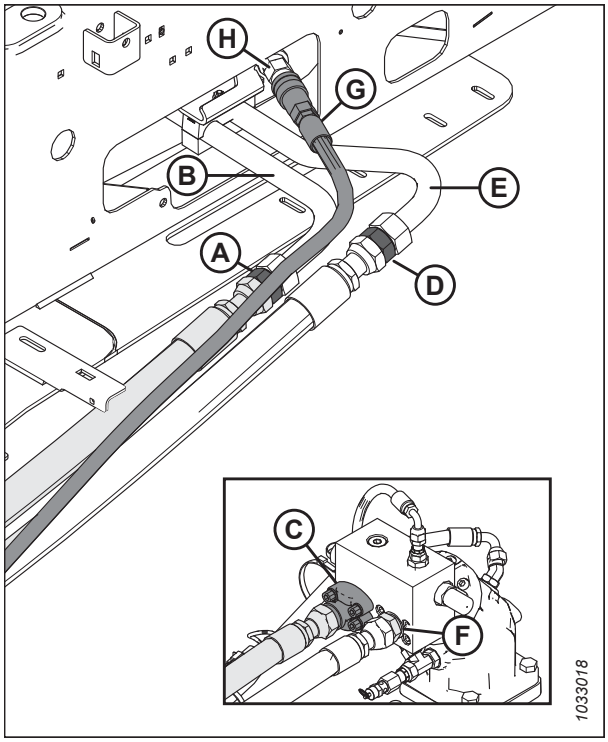


Figure 3.177: Header Hydraulic Connections

Disconnecting Header Electrical System – M205 Self-Propelled Windrower

The procedure for disconnecting an R113 Rotary Disc Header from an M205 Self-Propelled Windrower differs depending on whether or not you are simply swapping the header or storing it long-term.

Disconnect the following when switching headers:

1. Disconnect the power limiter harness:
   - Disconnect 4-pin male connector (A) from piston pump (B).
   - Disconnect 4-pin female connector (C) from header pump relay harness (D).
   - If you are swapping to another header, disconnect module (E) from header pump relay harness (D).

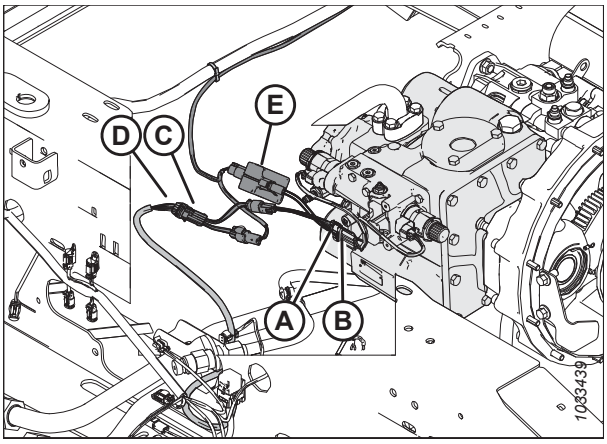


Figure 3.178: Power Limiter Harness Removal

2. Disconnect 4-pin female piston pump connector (A) from header pump relay harness (B).

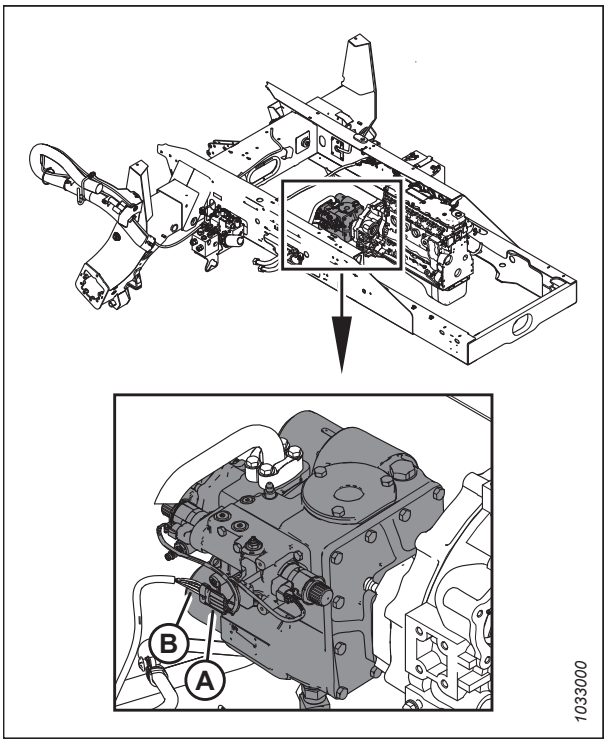


Figure 3.179: Piston Pump

3. Disconnect the adapter harness:
   - Disconnect 8-pin female connector (B) from chassis harness connector HC-2 (A).
   - Disconnect 29-pin round male connector (C) from header connector (D).
4. If you are swapping the rotary disc header for another header, proceed to Step *6, page 111*.

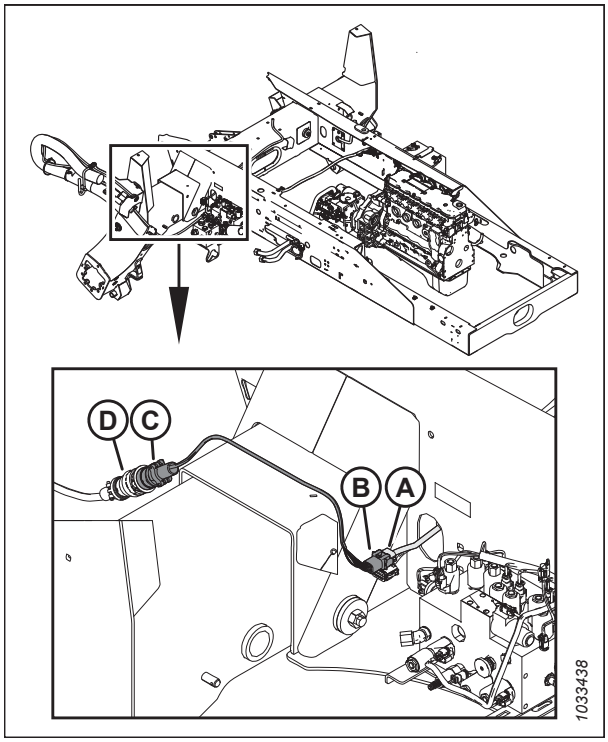


Figure 3.180: M205 Adapter Harness

5. If you are storing or servicing the header, disconnect 29-pin round male connector (A) from header connector (B).

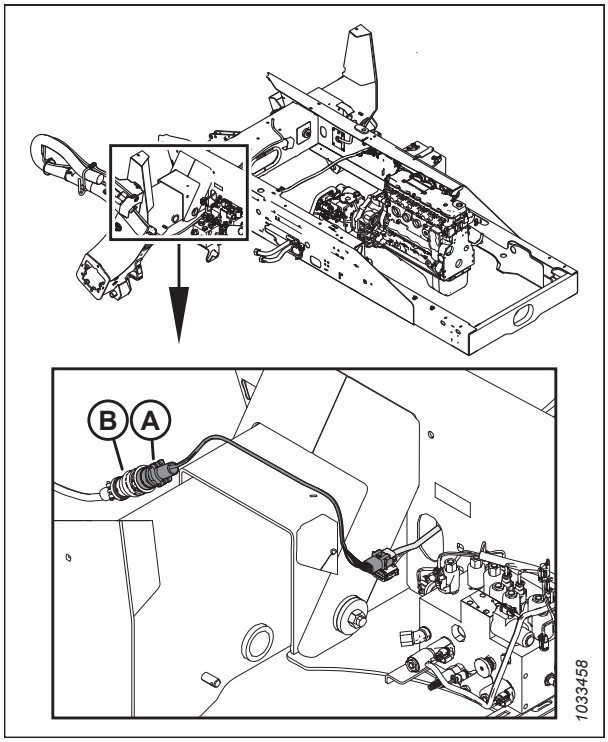


Figure 3.181: M205 Adapter Harness

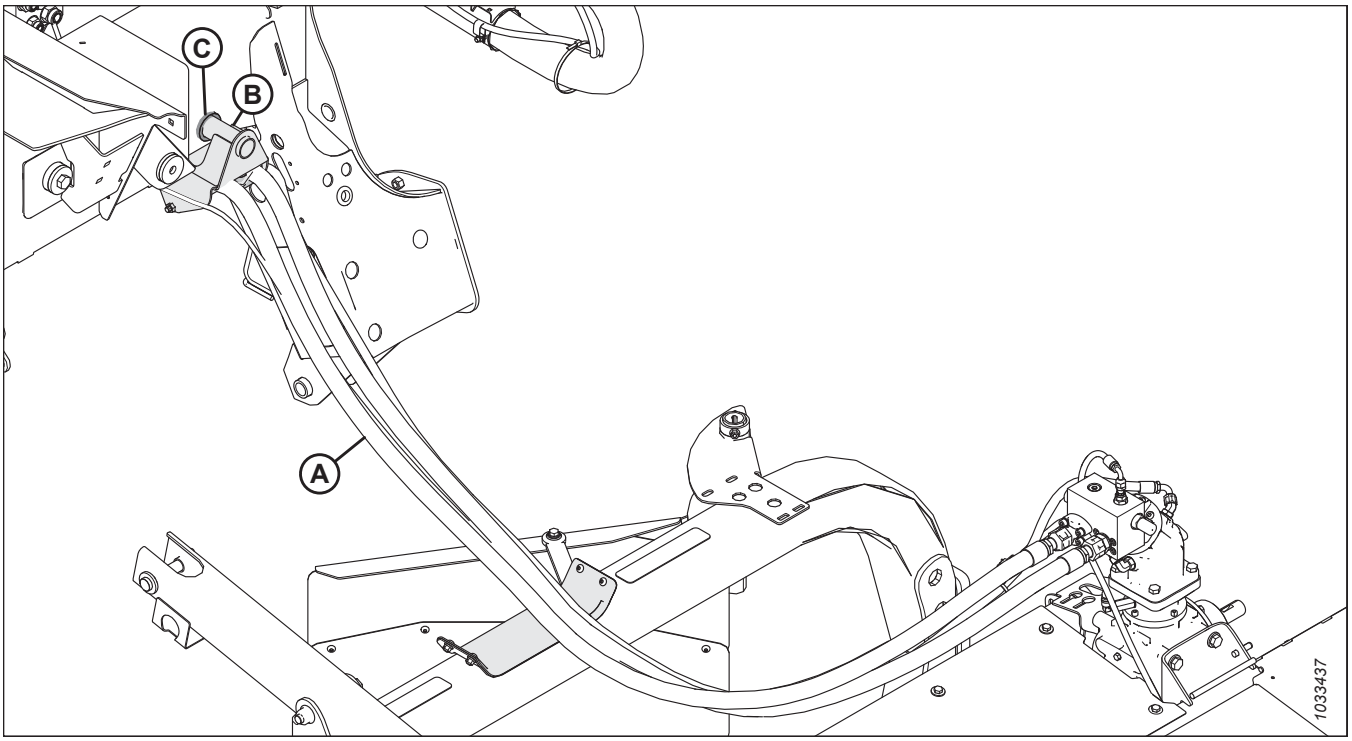


Figure 3.182: Detaching Header Hose from Windrower

6. Remove hose support pin (B) from hole (C) in the windrower frame.
7. Place header hose bundle (A) on top of the rotary disc header.

3.6 Driveshields

Driveshields offer protection from the rotating belts and drives. The header has two driveshields: one on the left side, and one on the right side.

3.6.1 Opening Driveshields

The driveshields offer protection from moving components. Open them only when you intend to service the machine.

DANGER

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

WARNING

To reduce the risk of personal injury, do NOT operate the machine without the driveshields in place and secured.

NOTE:

The illustrations in this procedure show the left driveshield; the right driveshield is similar.

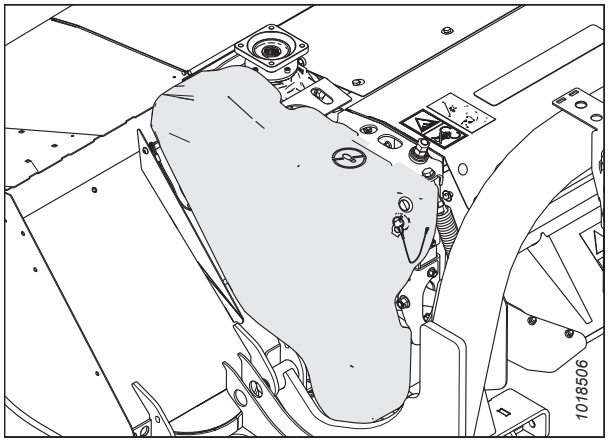


Figure 3.183: Left Driveshield

1. Shut down the engine, and remove the key from the ignition.
2. Remove lynch pin (A) and tool (B) from pin (C).

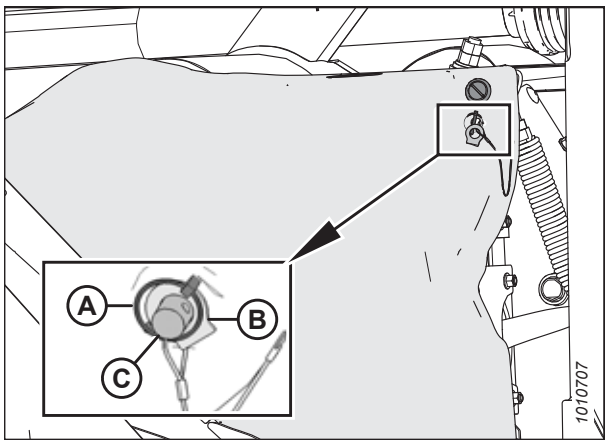


Figure 3.184: Left Driveshield

3. Insert the flat end of tool (A) into latch (B) and turn it counterclockwise to unlock the driveshield.

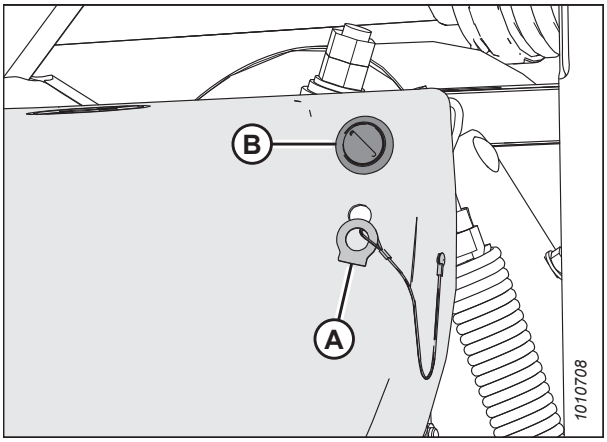


Figure 3.185: Driveshield Latch

4. Pull the top of driveshield (A) away from the machine to open it.

   NOTE:

   For improved access, lift the driveshield off the pins at the base of the shield, and lay the shield on the machine. For instructions, refer to *Removing Driveshields, page 237*.

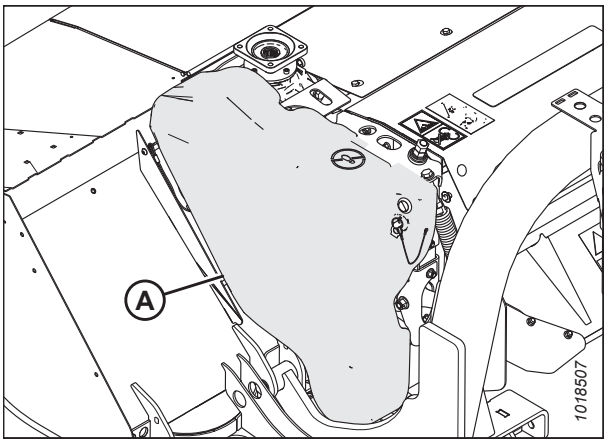


Figure 3.186: Left Driveshield

3.6.2 Closing Driveshields

Close the driveshields when your maintenance or repair tasks are complete.

WARNING

To reduce the risk of personal injury, do NOT operate the machine without the driveshields in place and secured.

NOTE:

The illustrations shown in this procedure apply to the left driveshield; the right driveshield is similar.

1. Position the driveshield onto the pins, if necessary.
2. Push driveshield (A) to engage latch (B).
3. Ensure that the driveshield is properly secured.

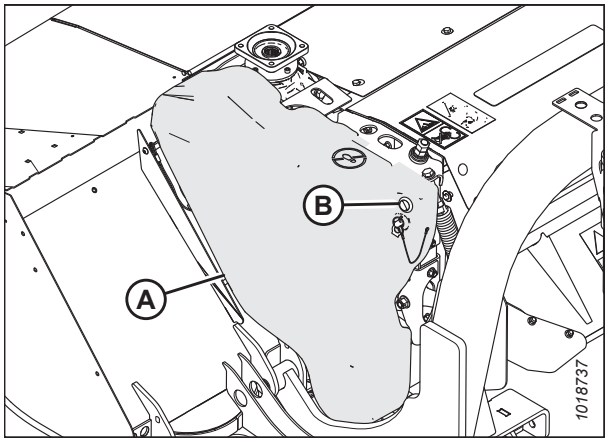


Figure 3.187: Left Driveshield

4. Replace tool (B) and lynch pin (A) onto pin (C).

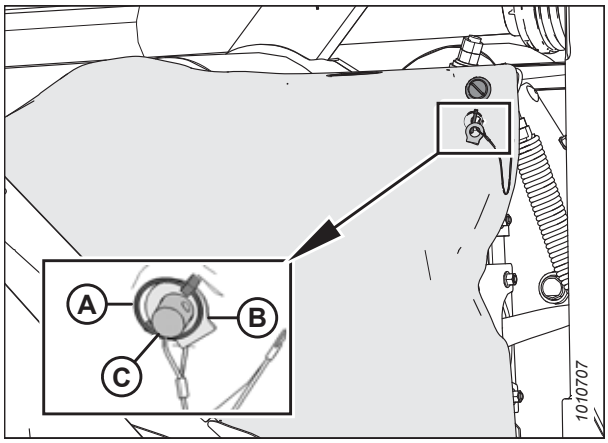


Figure 3.188: Left Driveshield

3.7 Cutterbar Doors

Two doors with rubber curtains provide access to the cutterbar area.

WARNING

To reduce the risk of personal injury and machine damage, do NOT operate the machine without all the cutterbar doors down or without curtains installed and in good condition. Objects in the path of the blades can eject with considerable force when the machine is started.

Rotary disc headers sold outside of North America have latches on cutterbar doors (A).

Curtains (B) and (C) are attached to each front corner and at the center respectively. Always lower the curtains when operating the rotary disc header.

IMPORTANT:

Replace the curtains if they become worn or damaged. For instructions, refer to *4.9 Maintaining Curtains, page 213*.

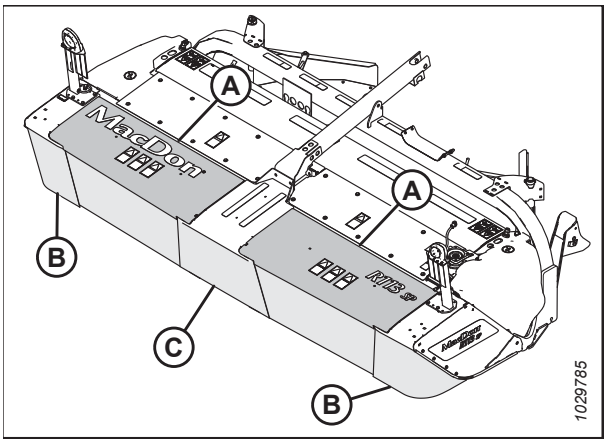


Figure 3.189: Cutterbar Doors and Curtains

3.7.1 Opening Cutterbar Doors – North America

You will need to open the cutterbar doors to access the cutterbar.

If the machine was sold outside of North America, it will have export-style latches. For instructions, refer to *3.7.2 Opening Cutterbar Doors – Export, page 116*.

DANGER

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

1. Shut down the engine, and remove the key from the ignition.
2. Lift up doors (A) at the front of the machine.

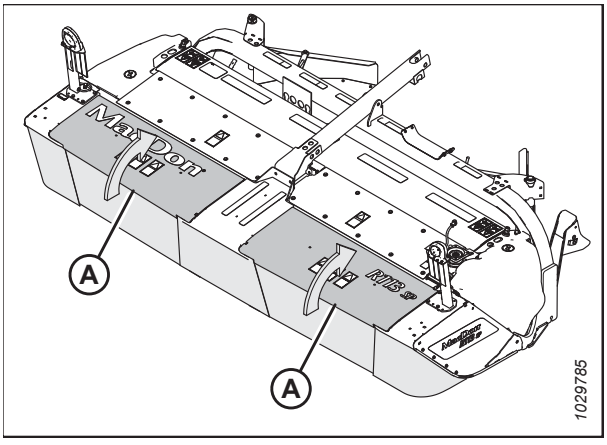


Figure 3.190: Cutterbar Doors and Curtains

3.7.2 Opening Cutterbar Doors – Export

Machines sold outside North America have a tool-operated latch on the cutterbar doors.

DANGER

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

1. Shut down the engine, and remove the key from the ignition.
2. Locate latch access holes (A) for each door.

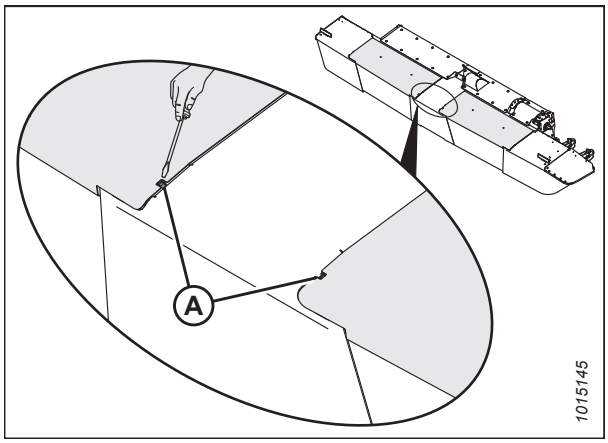


Figure 3.191: Cutterbar Door Latch Access Hole – Export Only

3. Use a rod or screwdriver to press down on latch (A) to release the cutterbar door.

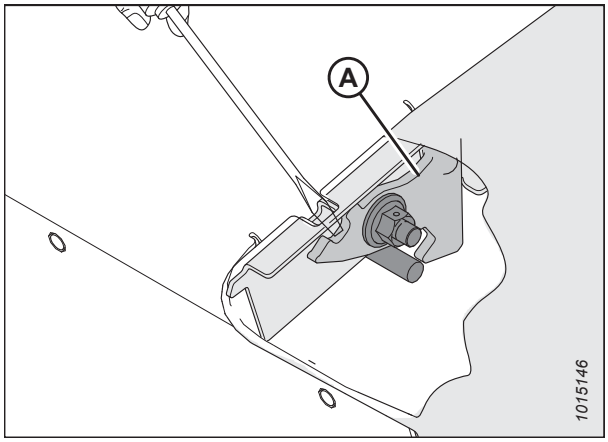


Figure 3.192: Cutterbar Door Latch – Cutaway View

4. Lift up on doors (A) while pressing down on the latch.

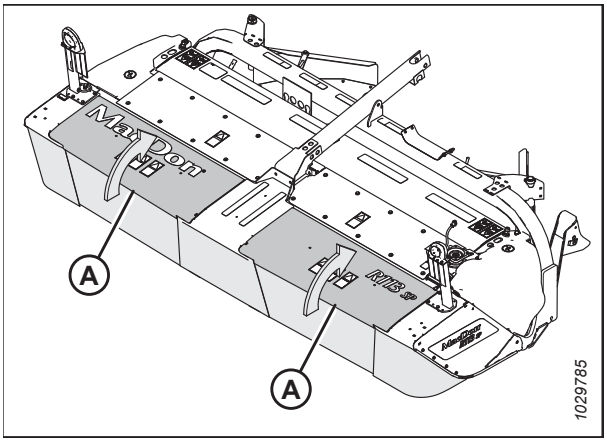


Figure 3.193: Cutterbar Doors and Curtains

3.7.3 Closing Cutterbar Doors

Do **NOT** operate the machine without closing the cutterbar doors.

CAUTION

Keep your hands and fingers away from the corners of the doors when you are closing them.

1. Pull down on door (A) from the top to close it.
2. Ensure that the curtains hang properly and completely enclose the cutterbar area.

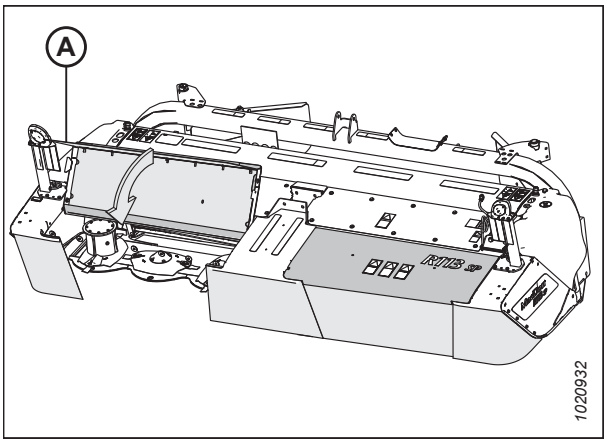


Figure 3.194: Cutterbar Doors and Curtains

3.8 Header Settings

Satisfactory operation of the rotary disc header in all situations requires making proper adjustments to suit various crops and conditions.

Correct operation of the machine reduces crop loss and increases productivity. Proper adjustments and timely maintenance extend the service life of the machine.

The variables listed in the following table and detailed in this manual affect the performance of the rotary disc header. Most of these variables have been set at the factory, but these variables can be changed to suit the cutting conditions.

Table 3.1 Header Operating Variables

Variable	Refer to
Cutting height	*3.8.1 Cutting Height, page 118*
Cutterbar angle	*3.8.2 Cutterbar Angle, page 120*
Float	*3.8.3 Header Float, page 120*
Ground speed	*3.8.4 Ground Speed, page 120*
Crop stream configuration	*3.9 Reconfiguring Cutterbar Crop Stream, page 122*
Conditioner settings	*3.10 Conditioner, page 124*
Cutterbar deflectors	*3.11 Cutterbar Deflectors, page 134*

3.8.1 Cutting Height

The cutting height is determined by a combination of the cutterbar angle and the skid shoe settings. Adjust the cutting height for optimum cutting performance while preventing the excessive build-up of mud and soil inside the rotary disc header, which can lead to poor crop flow and increased wear on cutting components.

Lowering the skid shoes and decreasing the cutterbar angle increases the cutting height, resulting in higher stubble that helps material dry faster. This may be desirable in stony conditions to help reduce damage to cutting components.

Raising the skid shoes and increasing the cutterbar angle decreases the cutting height, resulting in a shorter stubble. For instructions, refer to *Adjusting Cutting Height, page 119*.

To choose a cutterbar angle that maximizes performance for your crop and field conditions, refer to *3.8.2 Cutterbar Angle, page 120*.

To minimize cutterbar damage, scooping soil, and soil build-up at the cutterbar in damp conditions, the float should be set as light as possible without causing excessive bouncing. For instructions, refer to *3.8.3 Header Float, page 120*.

Adjusting Cutting Height

Lowering the skid shoes and decreasing the cutterbar angle increases the cutting height, resulting in taller stubble that helps material dry faster. Raising the skid shoes and increasing the cutterbar angle decreases the cutting height, resulting in shorter stubble.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, stop the engine, remove the key from the ignition, and engage the windrower's lift cylinder safety props before going under the machine.

DANGER

Ensure that all bystanders have cleared the area.

NOTE:

There are two skid shoes on the R113 SP.

1. Raise the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Engage the windrower lift cylinder safety props. For instructions, refer to *3.3 Engaging and Disengaging Header Safety Props, page 27*.
4. Loosen bolts (C).
5. Remove bolts, nuts, and washers (D).
6. Raise or lower the skid shoe.

   NOTE:

   Skid shoes have two adjustment settings: fully raised (A) and fully lowered (B).
7. Install bolts, nuts, and washers (D).
8. Tighten bolts (C).
9. Adjust the cutterbar angle to the desired working position. If the angle is not critical, set it to the mid-position. For instructions, refer to *3.8.2 Cutterbar Angle, page 120*.
10. Check the header float. For instructions, refer to the windrower operator's manual.

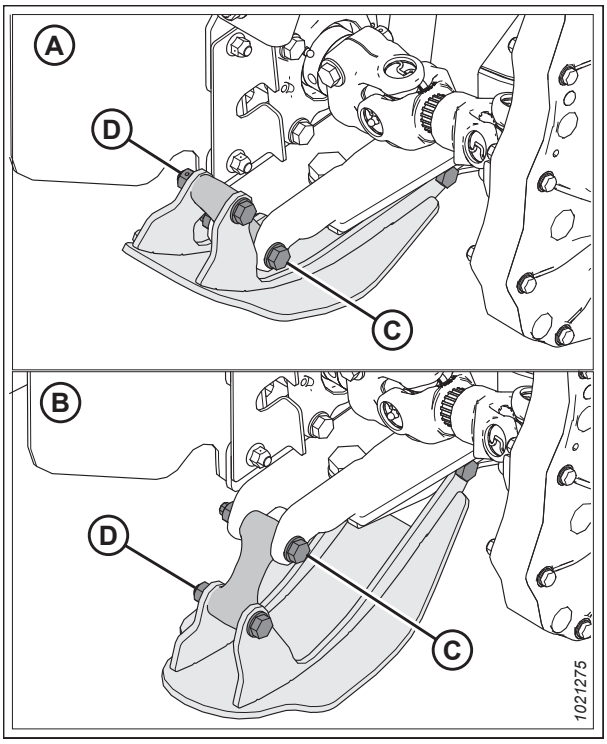


Figure 3.195: Skid Shoes

3.8.2 Cutterbar Angle

The cutterbar angle (sometimes called the header angle) is the angle at which the cutterbar approaches the crop relative to the ground. It is one of the variables that impact the cutting height and quality.

Cutterbar angle (A) adjustment ranges from 0° to 8° below the horizontal plane. Choose an angle that maximizes the performance of the machine for your crop and field conditions.

A flatter angle provides better clearance in stony conditions, while a steeper angle is required in lodged crops for better lifting action.

Check the float after significantly adjusting the cutterbar angle. Adjusting the cutterbar angle affects the header float, because the header's center of gravity shifts when the cutterbar angle is changed.

Refer to your windrower operator's manual for instructions.

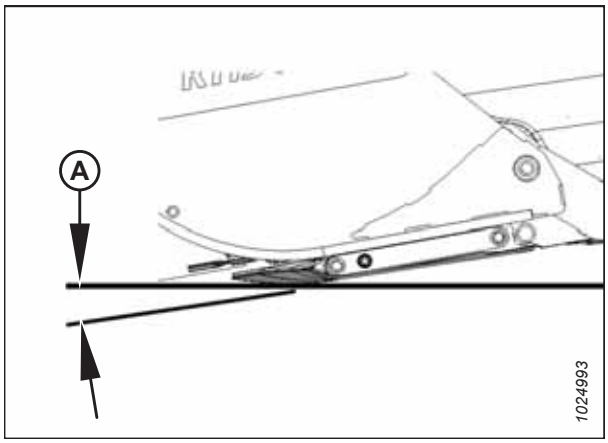


Figure 3.196: Cutterbar Angle

3.8.3 Header Float

The header float feature allows the header to closely follow the contours of the ground and respond quickly to changes in elevation or obstacles. The ideal float setting is one where the cutterbar is on the ground and is able to cut with minimal header bouncing and without scooping or pushing soil.

M1 and M2 Series Windrowers can completely adjust the header float from the cab. For M Series Windrowers, Operators make coarse adjustments to the float at the spring drawbolt, then make fine adjustments from the cab.

IMPORTANT:

- Before setting the header float, install the header options you will need (such as crop dividers).
- When adding or removing options that change the weight of the header, adjust the float accordingly.
- Set the header float to as light a setting as possible, though not so light that the header bounces frequently. This will reduce the chance of damage to knife components and prevent the header from scooping soil when it is cutting. It will also reduce soil from building up at the cutterbar in wet conditions.
- Avoid excessive bouncing, which will result in ragged cutting. You can avoid ragged cutting by operating the header at a slower ground speed when the float setting is light.
- Changing the angle of the header affects the float setting. Check the float setting after making changes to the header angle.

For instructions on setting and adjusting the header float, refer to your windrower operator's manual.

3.8.4 Ground Speed

Choose a ground speed that allows the cutterbar to cut the crop smoothly and evenly.

Try different combinations of disc speed and ground speed to suit your specific crop. Operating the header at the minimum disc speed will extend the service life of the cutting components.

CAUTION

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

In tough cutting conditions (such as when cutting native grasses) set the disc speed to MAXIMUM.

In light crops, reduce the disc speed while maintaining the same ground speed.

NOTE:

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

The example shown in Figure *3.197, page 121* illustrates the relationship between the ground speed and the cut area for R113 Rotary Disc Headers. The chart demonstrates that a ground speed of 21 km/h (13 mph) would produce a cut area of approximately 8 hectares (20 acres) per hour.

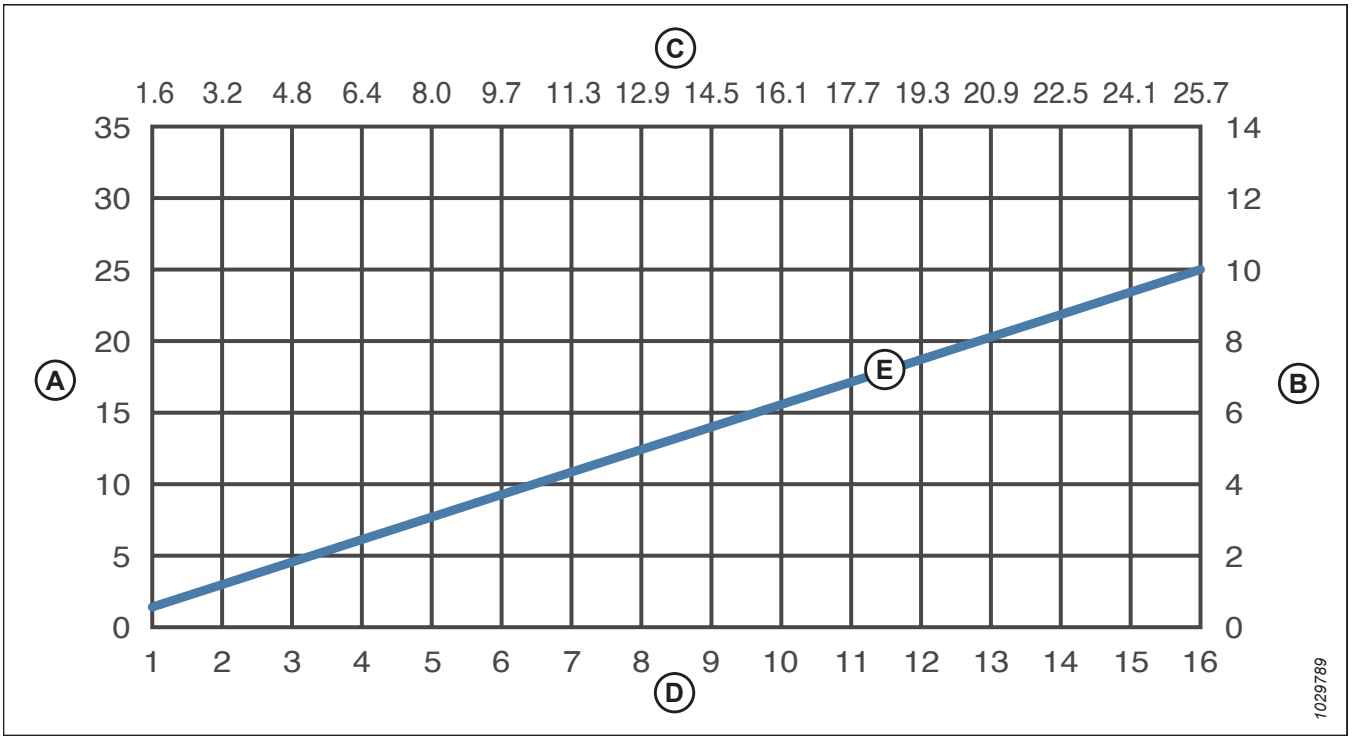


Figure 3.197: Ground Speed

A - Acres/Hour **B - Hectares/Hour** **C - Kilometers/Hour** **D - Miles/Hour**
E - R113 SP

3.9 Reconfiguring Cutterbar Crop Stream

Discs are factory-installed to produce three crop streams; however, the disc rotation pattern can be changed by changing the spindle and its disc to suit crop conditions. Each spindle and disc pair is designed to rotate in one direction, and must be changed as a set when the crop flow is altered.

Reducing or increasing the number of crop streams will produce the following results:

- Reducing the number of crop streams will result in narrower windrows.
- Increasing the number of crop streams will result in smoother, wider windrows.

NOTE:

Increasing the number of crop streams will also increase the number of diverging disc pairs. This may negatively affect the quality of the cutting.

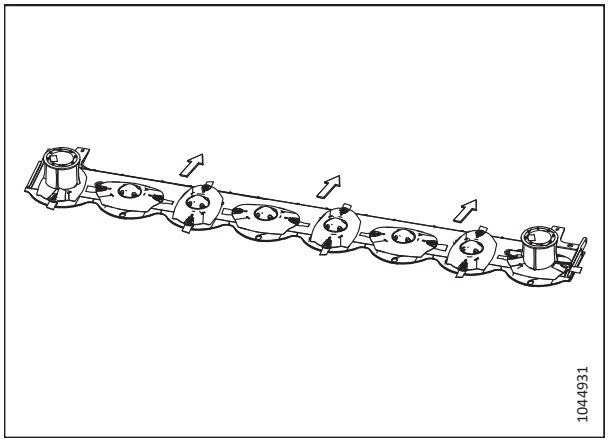


Figure 3.198: Cutterbar

IMPORTANT:

- Spindles that rotate clockwise have right-leading threading and are identified by a smooth top on spindle gear shaft (A).
- Spindles that rotate counterclockwise have left-leading threading and are identified by machined grooves on spindle gear shaft (B) and nut (C).
- If the spindle position in the cutterbar has changed, the rotational direction of that spindle **MUST** remain the same (that is, a clockwise spindle must maintain its clockwise rotation).
- Failure to maintain the rotation pattern can result in damage to the spindle and/or to the cutterbar components.
- The shear pin will not perform properly if the spindles used are in the wrong orientation.

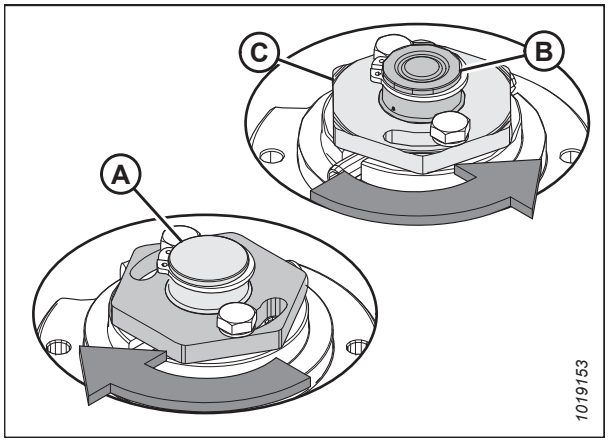
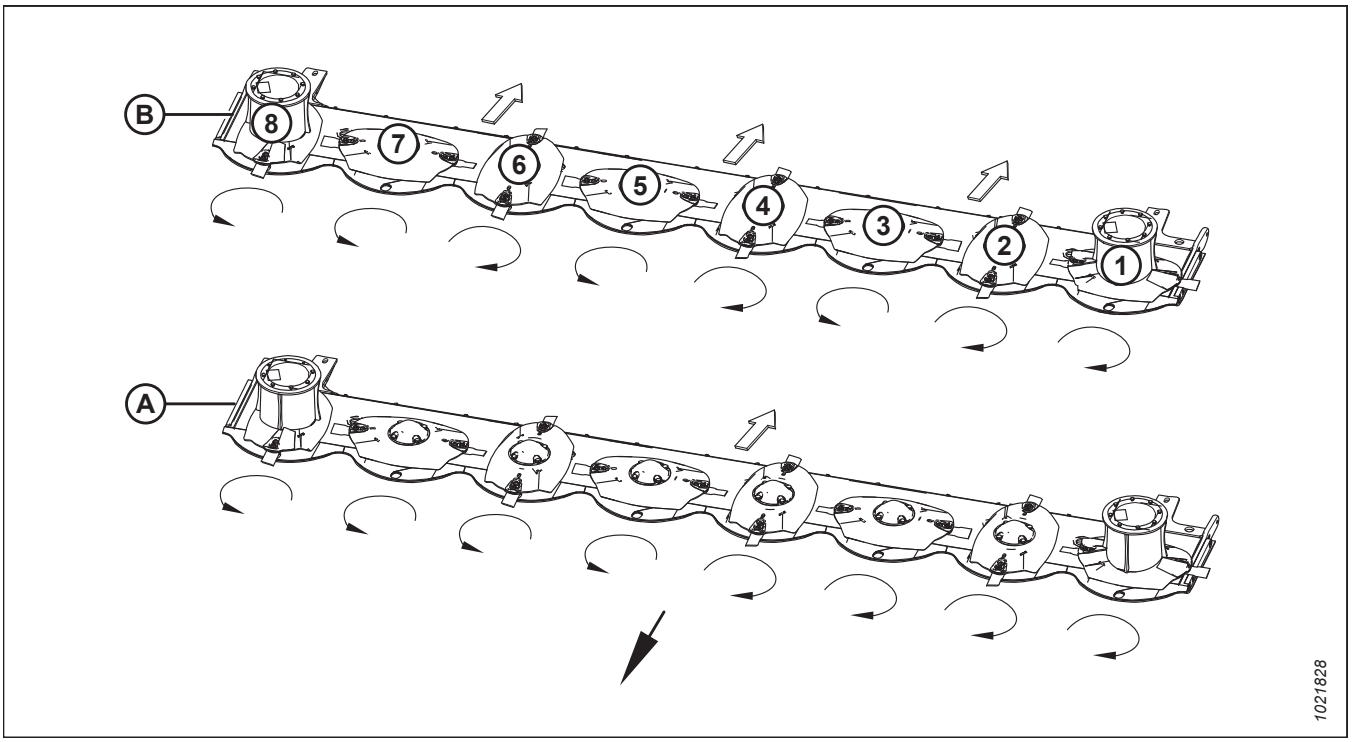


Figure 3.199: Cutterbar Spindles

3.9.1 Changing Cutterbar Crop Stream Configuration

Two crop stream settings are possible: one stream and three streams.

Figure 3.200: Spindle Rotation Pattern and Crop Streams



A - One Crop Stream **B - Three Crop Streams**

To change the spindle rotation from three crop streams (B) to one crop stream (A):

- Swap disc/spindle (3) with disc/spindle (6).

To change the spindle rotation from one crop stream (A) to three crop streams (B):

- Swap disc/spindle (6) with disc/spindle (3).

For instructions, refer to *Removing Cutterbar Spindles, page 164* and *Installing Cutterbar Spindles, page 167*.

3.10 Conditioner

Conditioner rolls crimp and crush the stem of the crop in several places, allowing the release of moisture and resulting in faster crop drying times. Both steel and polyurethane conditioner rolls are available.

Refer to Chapter *5 Options and Attachments, page 245* for information on ordering conditioner rolls.

3.10.1 Conditioner Roll Gap

The roll gap is the distance between the two conditioner rolls. The roll gap controls the degree to which the crop is conditioned as it passes through the rolls. The roll gap is factory-set at approximately 3 mm (1/8 in.) for polyurethane rolls, and at 6 mm (1/4 in.) for steel rolls.

Polyurethane rolls are better suited for crushing stems with minimal crimping and are recommended for alfalfa, clover, legumes, and similar crops. Correct crop conditioning is achieved when 90% of the stems show cracking, but no more than 5% of the leaves are damaged. Set the roll gap appropriately to achieve these results.

Steel rolls can be operated over a larger range of roll gap settings, since they are able to intermesh, and are therefore suited to a wider range of crops, from alfalfa to thicker-stemmed cane-type crops. They are capable of a roll gap of up to 25 mm (1 in.); however, too large a gap may cause crop feeding problems.

Grass-type crops may require a smaller gap for proper feeding and conditioning.

Checking Roll Gap

To prevent equipment damage, check the size of the roll gap when you are using a roll gap setting smaller than that set at the factory.

IMPORTANT:

Choose the roll gap setting that is suitable for your crop conditions. Refer to *3.10.1 Conditioner Roll Gap, page 124* for factory and custom roll gap settings.

DANGER

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

DANGER

Ensure that all bystanders have cleared the area.

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

3. **Polyurethane rolls:** Insert a feeler gauge through the inspection hole in the conditioner endsheet to check the roll gap on polyurethane roll conditioners. The factory setting is 3 mm (1/8 in.).

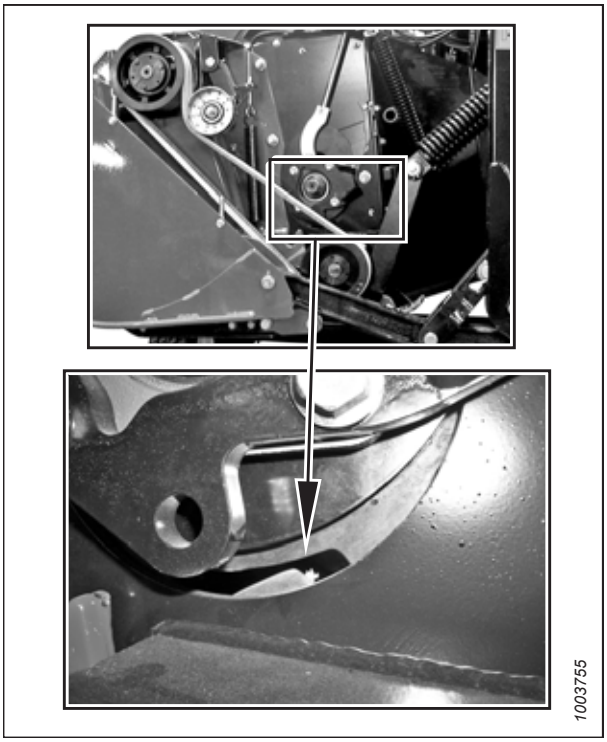


Figure 3.201: Polyurethane Roll Conditioner

4. **Steel rolls:** The length of thread (A) extending above the jam nut on the adjustment rods can be used as an approximation of the roll gap; however, this method does **NOT** provide consistent roll gap measurements. The roll gap factory setting for steel rolls is 6 mm (1/4 in.). If adjustments are required, refer to *Adjusting Roll Gap – Steel Rolls, page 126* for adjustment instructions.

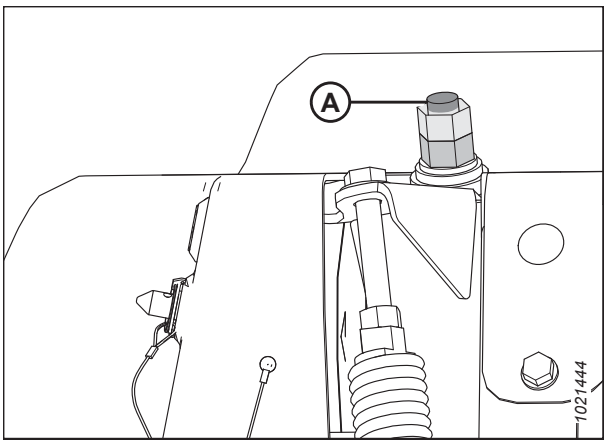


Figure 3.202: Roll Gap Adjustment

Adjusting Roll Gap – Polyurethane Rolls

Because polyurethane rolls operate at smaller gaps and the conditioning is less aggressive, the roll gap setting is more sensitive than on steel rolls.

DANGER

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

DANGER

Ensure that all bystanders have cleared the area.

1. Lower the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Loosen upper jam nut (A) on both sides of the conditioner attachment.
4. Turn lower nut (B) counterclockwise until the upper roll rests on the lower roll.
5. Turn lower nut (B) one full turn clockwise to raise the upper roll and achieve a 3 mm (1/8 in.) roll gap.
6. Hold nut (B) and tighten jam nut (A) on both sides of the conditioner attachment.

   IMPORTANT:

   Make sure the roll gap adjustment nuts are adjusted equally on both sides to achieve a consistent gap across the rolls.
7. Rotate the rolls manually and use a feeler gauge at the ends of the rolls to check that the actual gap is no less than 2 mm (1/16 in.) and no more than 4 mm (5/32 in.).

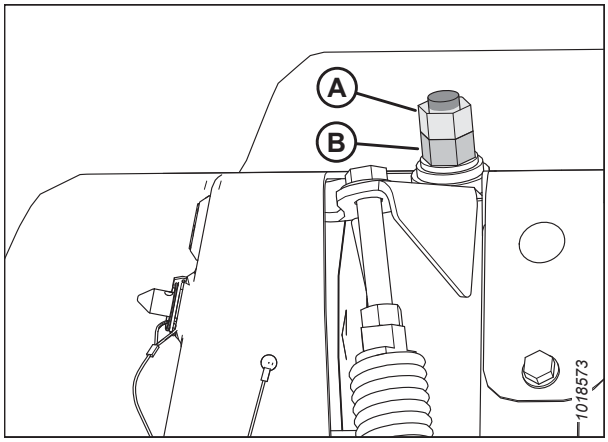


Figure 3.203: Roll Gap Adjustment

Adjusting Roll Gap – Steel Rolls

The length of thread extending above the jam nut on the adjustment rods can be used as an approximation of roll gap but does **NOT** provide consistent roll gap measurements.

DANGER

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

DANGER

Ensure that all bystanders have cleared the area.

To ensure the roll gap is at the factory setting, follow the procedure below:

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

3. Loosen jam nut (A) on both sides of the conditioner.
4. Turn lower nut (B) counterclockwise until the upper roll rests on the lower roll. Ensure the rolls intermesh.
5. Turn lower nut (B) two and a half full turns clockwise to raise the upper roll and achieve a 6 mm (1/4 in.) roll gap.
6. Hold nut (B) and tighten jam nut (A) on both sides of the conditioner.

   IMPORTANT:

   Make sure the roll gap adjustment nuts are adjusted equally on both sides to achieve a consistent gap across the rolls.
7. If further adjustment to roll gap is required:
   - Turn lower nut (B) clockwise to increase the roll gap.
   - Turn lower nut (B) counterclockwise to decrease the roll gap.

   NOTE:

   Make further adjustments to the roll gap based on cutting performance and crop conditions.

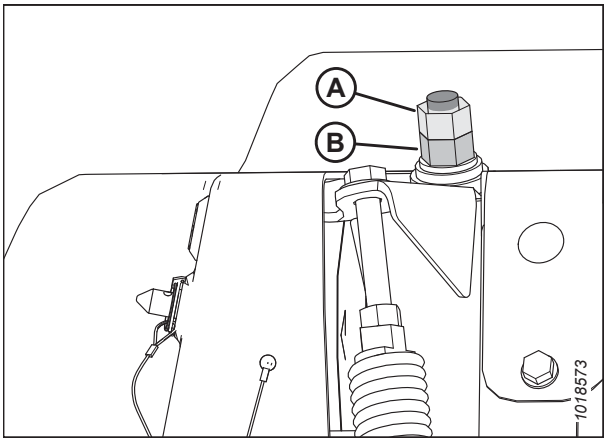


Figure 3.204: Roll Gap Adjustment

3.10.2 Roll Tension

Roll tension refers to the tension holding the rolls together. It is factory-set to maximum and should rarely require adjustment. Heavy crops or tough forage can, however, cause the rolls to separate. In such conditions, maximum roll tension is required to ensure that the cut crop is crimped sufficiently.

Adjusting Roll Tension

The amount of pressure that is applied to the crop as it passes through the roll conditioner is adjusted by changing the roll tension setting. Generally, maximum roll tension is desirable.

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

Ensure that all bystanders have cleared the area.

To adjust the roll tension back to the factory setting, follow these steps:

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

3. Loosen jam nut (A) on both sides of the conditioner.
4. Turn spring drawbolt (B) clockwise to tighten spring (C) and increase the roll tension.
5. Turn spring drawbolt (B) counterclockwise to loosen spring (C) and decrease the roll tension.
6. Measure the amount of exposed thread on spring drawbolt (B) at each end of the conditioner. Measurement (D) should be 12–15 mm (1/2–9/16 in.) for both polyurethane and steel roll conditioners.

   IMPORTANT:

   Turn each bolt equally. Each turn of the bolt changes the roll tension by approximately 32 N (7.2 lbf).
7. Tighten jam nuts (A) on each end of the conditioner.

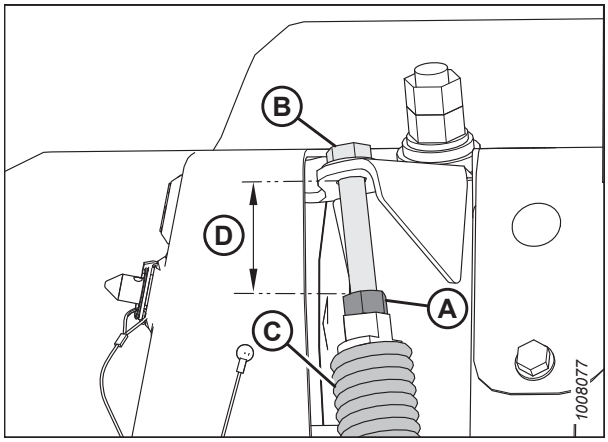


Figure 3.205: Adjusting Roll Tension

3.10.3 Roll Timing

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

IMPORTANT:

Roll timing is critical when the roll gap is decreased because conditioning is affected and the bars may contact each other.

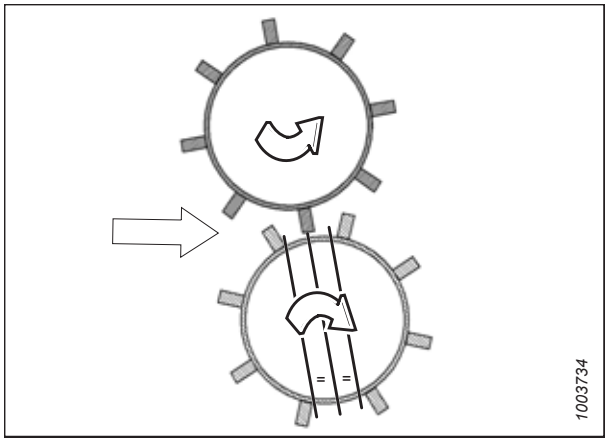


Figure 3.206: Properly Timed Rolls

Checking Roll Timing

Check the roll timing if excessive noise is coming from the conditioner rolls.

The roll timing is factory-set and should not require adjustment; however, if there is excessive noise coming from the conditioner rolls, the timing will need to be adjusted.

Listen to the rollers. Excessive noise may come from dirt build-up, or the rollers being out of time (and would therefore require adjustment).

For instructions, refer to *Adjusting Roll Timing, page 129*.

Adjusting Roll Timing

The roll timing is factory-set and should not require adjustment; however, if there is excessive noise coming from the conditioner rolls, the timing will need to be adjusted.

DANGER

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

1. Shut down the engine, and remove the key from the ignition.
2. On the upper roll, loosen four bolts (A) securing yoke plate (B).

   NOTE:

   Only three of the four bolts are shown in the illustration.

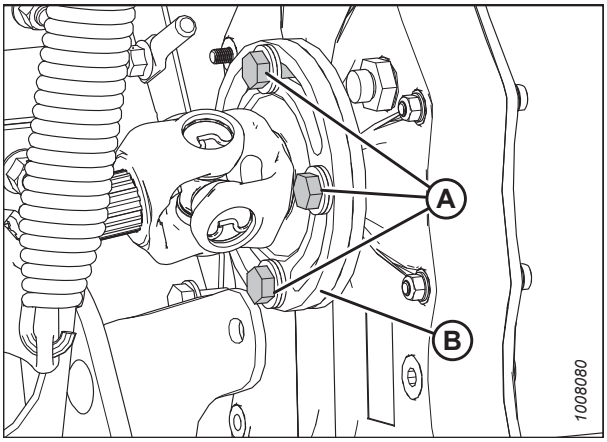


Figure 3.207: Conditioner Drive

3. Secure bottom roll (A).
4. Rotate upper roll (B) counterclockwise until it stops.
5. Make a mark (C) across yoke (D) and gearbox flange (E).

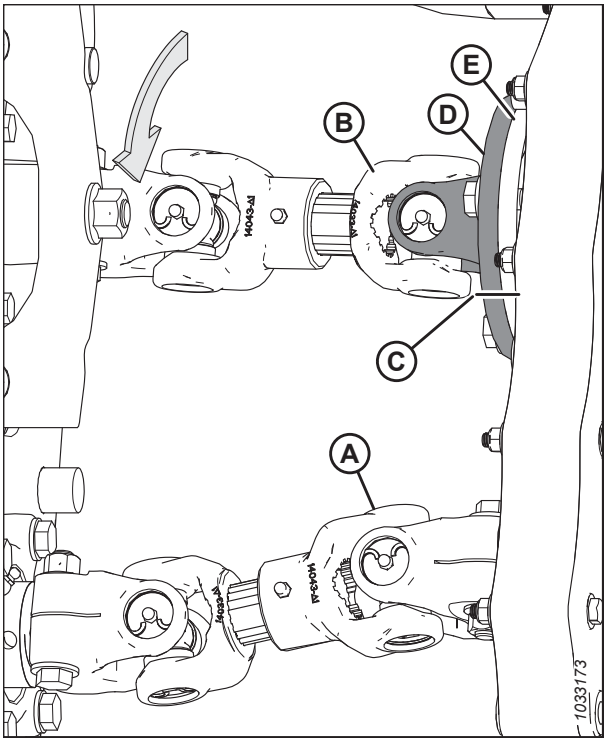


Figure 3.208: Conditioner Drive

6. Secure bottom roll (A).
7. Rotate upper roll (B) clockwise until it stops.
8. Make a mark (C) across yoke (D) and gearbox flange (E).

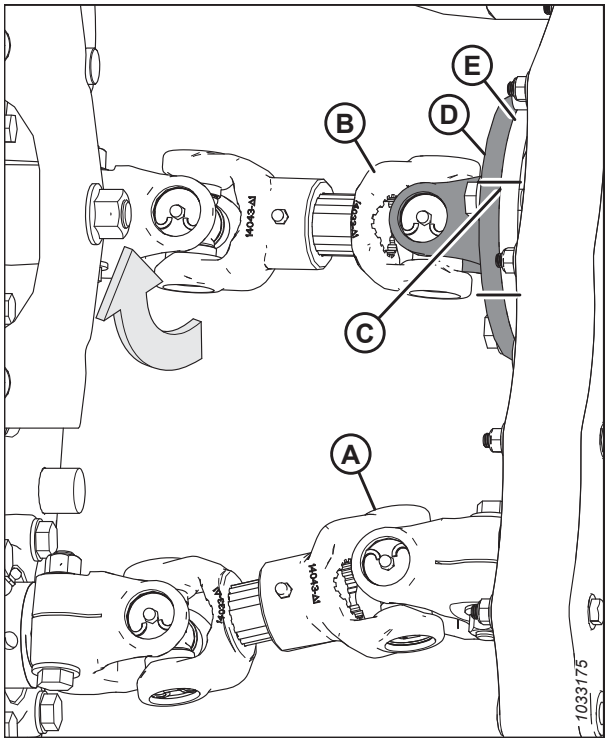


Figure 3.209: Conditioner Drive

9. Determine center point (A) between the two marks on the yoke plate, and place a third mark.
10. Rotate upper roll (B) counterclockwise until the mark on the gearbox flange lines up with the third (center) mark.

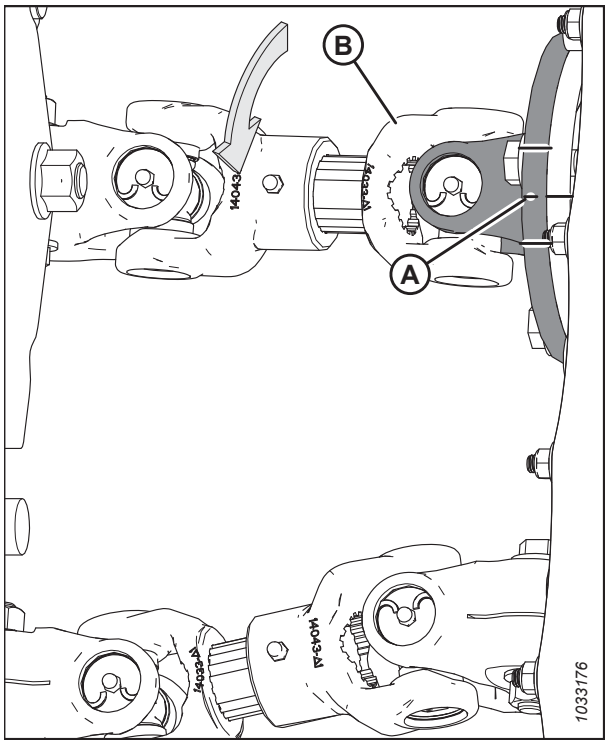


Figure 3.210: Conditioner Drive

11. Ensure that the threads on four bolts (A) are clean and free of lubricant.

    NOTE:

    Only three of the four bolts are shown in the illustration.

12. Apply medium-strength threadlocker (Loctite® 242 or equivalent) to bolts (A).

13. Torque the bolts to 95 Nm (70 lbf·ft).

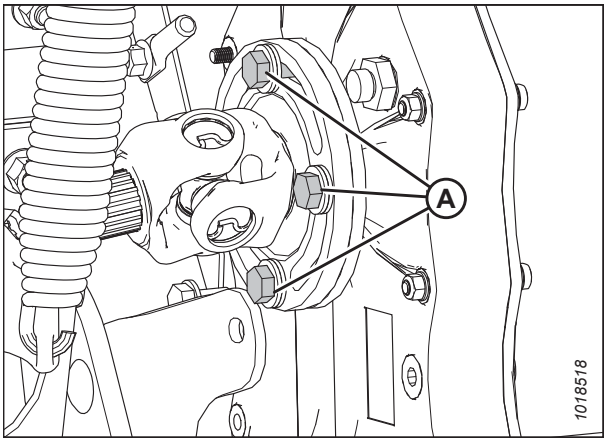


Figure 3.211: Conditioner Drive

3.10.4 Forming Shields – Roll Conditioner

The forming shield position controls the width and placement of the windrow.

Consider the following factors when setting the forming shield position:

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

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

Positioning Forming Shield Side Deflectors – Roll Conditioner

The position of the side deflectors controls the width and placement of the windrow. To ensure that windrow placement is centered between the wheels, adjust the left and right deflectors to the same position.

DANGER

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

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

2. Loosen locking handle (A).
3. Slide adjuster bar (B) along adjuster plate (C) to the desired deflector position.
4. Tighten locking handle (A).
5. Repeat Step *2, page 132* to Step *4, page 132* on the opposite side of the conditioner.

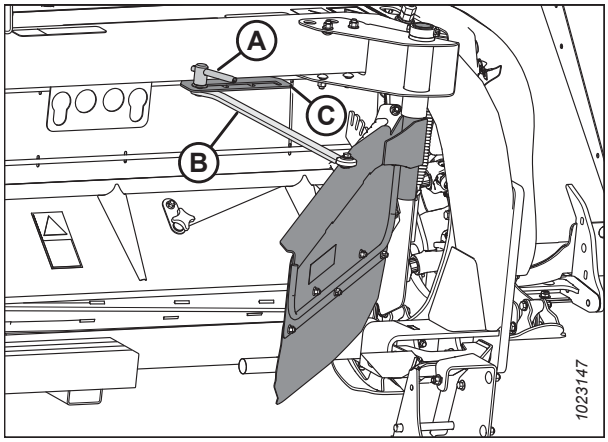


Figure 3.212: Forming Shield Side Deflector and Adjuster Bar

Positioning Rear Baffle – Roll Conditioner

The rear baffle is used in conjunction with the side deflectors to determine the height and width of the windrow.

The rear baffle is located immediately behind and above the conditioner rolls and can be positioned to do the following:

- Raise the baffle and direct crop flow into the forming shields for a fluffier, narrower windrow.
- Lower the baffle and direct crop downward to form a flatter, wider windrow.
- Provide even material distribution across the windrow with the adjustable fins under the rear baffle. For instructions, refer to *Positioning Rear Baffle Deflector Fins, page 133*.

To position the rear baffle, follow these steps:

DANGER

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

1. Shut down the engine, and remove the key from the ignition.
2. Remove lynch pin (A) securing rear baffle adjustment lever (B) to bracket (C).
3. Pull rear baffle adjustment lever (B) inboard to disengage it from bracket (C).
4. Position rear baffle adjustment lever (B) as follows:
   - Move the lever forward to raise the baffle.
   - Move the lever backward to lower the baffle.
5. Release rear baffle adjustment lever (B) so that the tab engages the middle notch in bracket (C).
6. Secure baffle adjustment lever (B) with lynch pin (A).

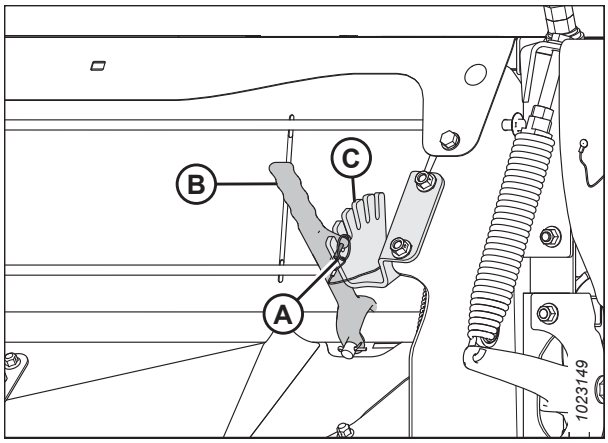


Figure 3.213: Right End of Conditioner

Positioning Rear Baffle Deflector Fins

The additional rear baffle deflector fins are stored on top of the baffle, but can be moved under the baffle when a narrower windrow is desired.

To install the fins, follow these steps:

WARNING

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

1. Remove two deflector fins (A) from rear baffle (B).

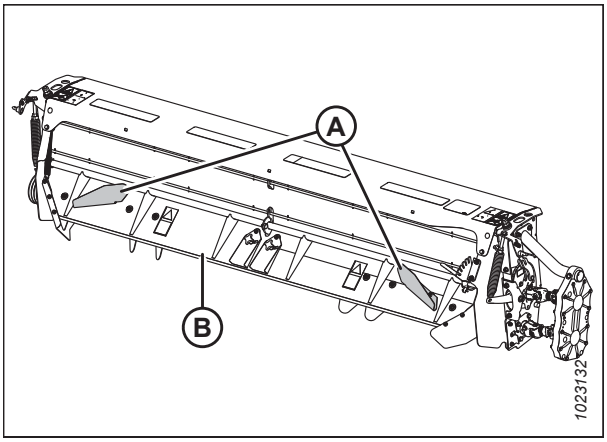


Figure 3.214: Deflector Fins in Storage Position

2. Position deflector fin (A) under the baffle and secure it with existing bolt and nut (B). Install the bolt so that the bolt head faces down.
3. Adjust the fin to an angle of approximately 60° as shown, and torque the nut to 69 Nm (51 lbf·ft).
4. Repeat Step *2, page 133* to Step *3, page 133* for the opposite deflector fin.

   NOTE:

   Adjusting the angle of the fins can be useful to spread crop within the width of the windrow.

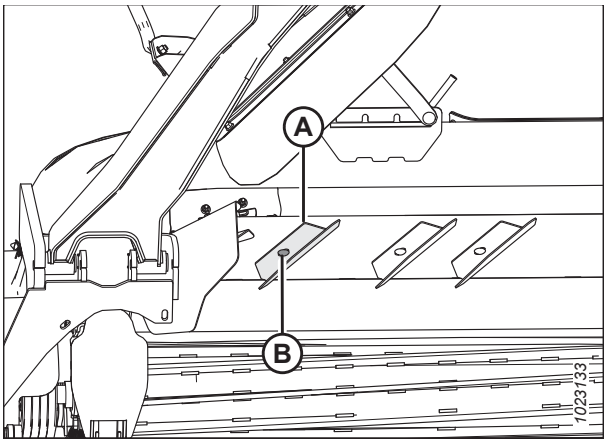


Figure 3.215: Left Deflector Fins in Field Position under Baffle

3.11 Cutterbar Deflectors

A two-piece cutterbar deflector is attached to the cutterbar just below the conditioner rolls. Cutterbar deflectors improve feeding into the conditioner rolls and prevent long-stemmed crop from feeding under the rolls.

Refer to the following table for the suitability of cutterbar deflectors in different crops and field conditions:

Table 3.2 Conditions for Using Cutterbar Deflectors

Crop/Field Condition	Use Deflector?
Average crop/normal field conditions	No
Long-stemmed and heavy/normal field conditions	Yes
Long-stemmed and heavy/sandy soil	No
Long-stemmed and heavy/gopher mounds or rocks[4]	No

3.11.1 Removing Cutterbar Deflectors

When cutting a short-stemmed crop in normal field conditions, the cutterbar deflectors may not be necessary and can be removed.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, stop the engine, remove the key from the ignition, and engage the windrower's lift cylinder safety props before going under the machine.

DANGER

Ensure that all bystanders have cleared the area.

WARNING

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

1. Raise the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Engage the windrower lift cylinder safety props. For instructions, refer to *3.3 Engaging and Disengaging Header Safety Props, page 27*.

4. Removing the deflector helps feed dirt/rocks through the header and prevents debris buildup, wear, and damage from rocks.

4. Locate deflector (A) behind the cutterbar.
5. Clear any debris from the deflector area.
6. Remove bolt (C) shared with the rock guard on the outboard end of the deflector. Retain the hardware.
7. Remove and retain three bolts and nuts (B) securing deflector (A) to the cutterbar. Remove deflector (A).
8. Repeat Steps *6, page 135* and *7, page 135* on the opposite side of the machine.

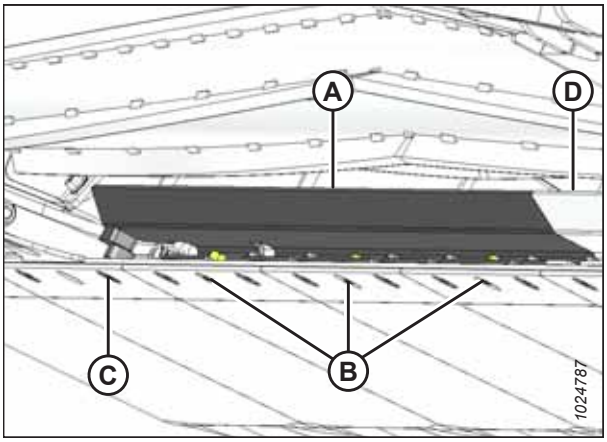


Figure 3.216: Left Deflector – Behind the Cutterbar

3.11.2 Installing Cutterbar Deflectors

Cutterbar deflectors are recommended when cutting long-stemmed crops in certain field conditions.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, stop the engine, remove the key from the ignition, and engage the windrower's lift cylinder safety props before going under the machine.

DANGER

Ensure that all bystanders have cleared the area.

WARNING

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

1. Raise the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Engage the windrower lift cylinder safety props. For instructions, refer to *3.3 Engaging and Disengaging Header Safety Props, page 27*.
4. Clean any debris from the ledge and the six mounting holes along the aft edge of the cutterbar.

5. Position left deflector (A) on the back edge of the cutterbar. Align the slots in the deflector with the existing fasteners and the cutterbar plug.
6. At the outboard end of the deflector, install bolt (C) shared with the rock guard.
7. Secure the deflector to the cutterbar with three M10 bolts and lock nuts (B).

   NOTE:

   Insert the bolts from under the cutterbar.
8. Tighten bolts (B) to 54 Nm (40 lbf·ft).
9. Repeat Steps *4, page 135* to *8, page 136* to install the right deflector.

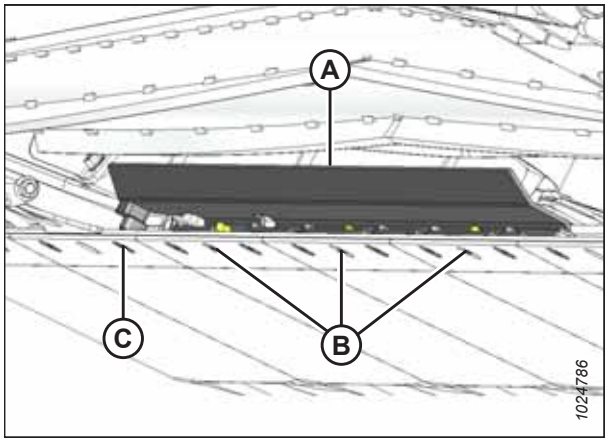


Figure 3.217: Left Cutterbar Deflector Viewed from Underside of Cutterbar

3.12 Haying Tips

Follow the recommendations in this section to ensure the highest quality hay production.

3.12.1 Curing

Curing crops quickly helps maintain the highest quality of crop material. Approximately 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.

3.12.2 Topsoil Moisture

Topsoil moisture is an important consideration when determining the timing of hay cutting and the type of windrow needed.

Table 3.3 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, do **NOT** create a wide and thin windrow. A narrower, thicker windrow will dry faster than hay left flat on wet ground.
- When the ground is wetter than the hay, the moisture from the soil is absorbed by the hay above it. Determine the moisture level of the toposil before you begin cutting. Use a soil moisture tester or estimate the level.
- If the ground is wet due to irrigation, wait until the soil moisture level drops below 45%.
- If the ground is wet due to frequent rains, cut the hay when the weather allows. Let the hay 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.

3.12.3 Weather and Topography

Time your hay cutting so that the cut hay is able to cure as rapidly as possible.

- Cut as much hay as possible by midday. Drying conditions are best in the afternoon.
- Sun-facing slopes receive up to 100% more exposure to the sun’s heat than slopes that do not face the sun. If the hay is to be baled and chopped, consider baling sun-facing slopes and chopping slopes that do not face the sun.
- When the relative humidity is high, the evaporation rate is low and so hay dries slowly.
- Humid air is trapped around the windrow in calm conditions. Raking or tedding will expose the hay to fresher and drier air.
- Cut hay perpendicular to the direction of the prevailing winds, if possible.

3.12.4 Windrow Characteristics

The shape and density of the windrow is an important factor with respect to how rapidly the hay cures.

Refer to Chapter *3 Operation, page 25* for instructions on adjusting the header.

Table 3.4 Recommended Windrow Characteristics

Characteristic	Advantage
High and fluffy	Enables airflow through the 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

3.12.5 Driving on Windrows

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

However, driving on windrows in high-yield crops may be unavoidable if a full width windrow is necessary.

3.12.6 Using Chemical Drying Agents

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

Before deciding to use a drying agent, carefully compare the costs and benefits of doing so.

3.13 Transporting Header

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

IMPORTANT:

For cab-forward road travel, M Series Windrowers must have the lighting and marking bundle installed (B5412).

Chapter 4: Maintenance and Servicing

This section provides information about routine servicing for the header. A parts catalog is located in a plastic case at the right end of the header.

Log the machine's hours of operation and use the maintenance record provided (refer to *4.3.1 Maintenance Schedule/ Record, page 144*) to keep track of maintenance procedures as they are performed.

4.1 Preparing Machine for Servicing

Follow these steps to safely prepare your equipment for maintenance or repair.

DANGER

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

1. Lower or raise the header fully, according to the task.
2. Engage the parking brake.
3. Shut down the engine, and remove the key from the ignition.
4. Wait for all moving parts to stop moving.
5. If the header is raised fully, then engage the safety props on the windrower's lift cylinders. For instructions, refer to *3.3 Engaging and Disengaging Header Safety Props, page 27*.

4.2 Recommended Safety Procedures

These procedures will minimize the chances of injury when maintaining or repairing the machine.

- Park on a level surface when possible. Follow all recommendations in your windrower operator's manual.
- Wear close-fitting clothing and cover any long hair. Never wear dangling items such as scarves or bracelets.

Figure 4.1: Safety Around Equipment

- Wear protective shoes with slip-resistant soles, a hard hat, protective glasses or goggles, and heavy gloves, as needed.

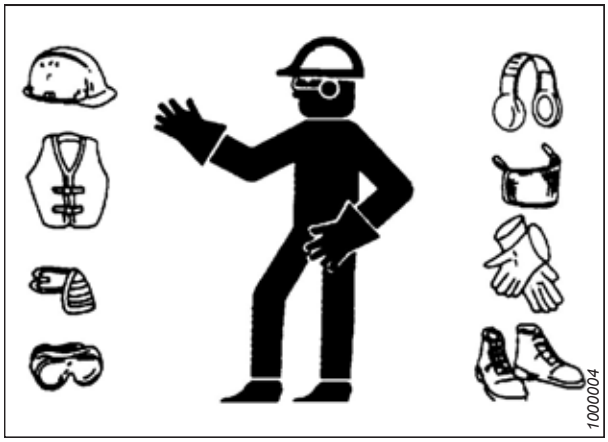


Figure 4.2: Safety Equipment

- Be aware that if more than one person is servicing the machine at the same time, rotating a driveline or other mechanically driven component by hand (for example, to access a lubrication fitting) will cause drive components in other areas (belts, pulleys, and discs) to move. Stay clear of driven components at all times. Communicate regularly with your co-workers.

Figure 4.3: Safety Around Equipment

- Be prepared to deal with an accident should it occur. Know where the first aid kits and fire extinguishers are located, and know how to use them.

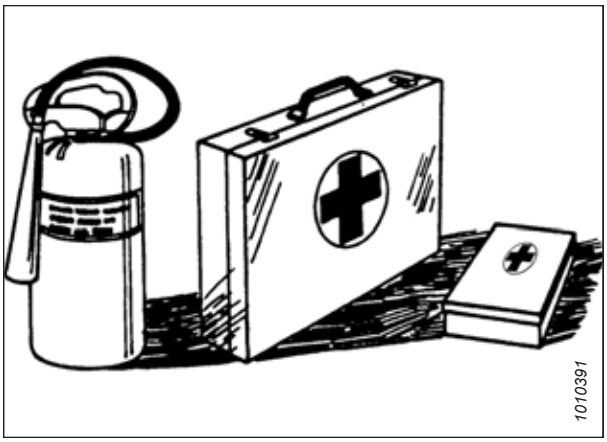


Figure 4.4: Safety Equipment

- Keep the service area clean and dry. Wet or oily floors are slippery. Wet spots can be dangerous when working with electrical equipment. Ensure that all electrical outlets and tools are properly grounded.

Figure 4.5: Safety Around Equipment

- Use adequate light for the job at hand.
- Replace all shields removed or opened for service.
- Use only service and repair parts made or approved by the equipment manufacturer. Substituted parts may not meet strength, design, or safety requirements.
- Keep machinery clean. Never use gasoline, naphtha, or any volatile material for cleaning purposes. These materials may be toxic and/or flammable.

4.3 Maintenance Requirements

Regular maintenance is the best insurance against early wear and untimely breakdowns. Following the maintenance schedule will increase your machine's service life. Periodic maintenance requirements are organized according to service intervals.

IMPORTANT:

The recommended intervals are based on typical operating conditions. Service the machine more often if the machine operates regularly under adverse conditions (for example, severe dust, extra heavy loads, etc.).

If more than one interval is specified for a service item (for example, 100 hours or annually), service the machine at whichever interval is reached first.

When servicing the machine, refer to the specific headings in this section. Use only the fluids and lubricants specified in the inside back cover of this book.

Log the hours of machine operation. Use the maintenance record provided in this manual, and keep extra copies of these maintenance records. Refer to *4.3.1 Maintenance Schedule/Record, page 144*.

CAUTION

Follow all safety messages. For more information, refer to *4.2 Recommended Safety Procedures, page 142*.

4.3.1 Maintenance Schedule/Record

Keep a record of maintenance as evidence of a properly maintained machine. Daily maintenance records are not required to meet normal warranty conditions.

✎	Hour meter reading												
✎	Service date												
✎	Serviced by												

First use	For instructions, refer to *4.3.2 Break-in Inspections, page 146*.
End of season	For instructions, refer to *4.3.4 End-of-Season Servicing, page 148*.

Action	✓ Check	♦ Lubricate	▲ Change

At First 10 Hours and then Daily		
✓	Inspect cutterbar discs. For instructions, refer to *Inspecting Cutterbar Discs, page 160*.	**Daily maintenance records are not required to meet normal warranty conditions.**
✓	Inspect disc blades. For instructions, refer to *Inspecting Disc Blades, page 174*.	
✓	Inspect accelerators. For instructions, refer to *Inspecting Accelerators, page 179*.	
✓	Inspect rock guards. For instructions, refer to *Inspecting Rock Guards, page 183*.	
✓	Inspect drums. For instructions, refer to *Inspecting Large Drums, page 189*.	
✓	Check hydraulic hoses and lines. For instructions, refer to *4.12.1 Checking Hydraulic Hoses and Lines, page 244*.	

At First 25 Hours[5]													
✓	Check conditioner drive belt tension. For instructions, refer to *Inspecting Conditioner Drive Belt, page 222*.												
✓	Check roll timing gearbox lubricant level. For instructions, refer to *4.6.1 Checking and Changing Lubricant in Conditioner Roll Timing Gearbox, page 207*.												
Every 25 Hours													
✓	Check conditioner drive belt tension. For instructions, refer to *Inspecting Conditioner Drive Belt, page 222*												
♦	Lubricate idler pivot. For instructions, refer to *4.4 Lubrication, page 149*.												
♦	Lubricate upper and lower driveline universal joints. For instructions, refer to *4.4 Lubrication, page 149*.												
♦	Lubricate roller conditioner bearings. For instructions, refer to *4.4 Lubrication, page 149*.												
♦	Lubricate conditioner roll driveline slip joints. For instructions, refer to *4.4 Lubrication, page 149*.												
At First 50 Hours													
▲	Change roll timing gearbox lubricant. For instructions, refer to *4.6.1 Checking and Changing Lubricant in Conditioner Roll Timing Gearbox, page 207*.												
▲	Change header drive gearbox oil. For instructions, refer to *4.7.1 Changing Header Drive Gearbox Lubricant, page 210*.												
✓	Check cutterbar lubricant. For instructions, refer to *4.5.1 Lubricating Cutterbar, page 155*.												

5. The driveline inside the driven drum is lubricated for life and does not require any routine lubrication.

Every 100 Hours or Annually[6]													
✓	Check conditioner drive belt tension. For instructions, refer to *Inspecting Conditioner Drive Belt, page 222*.												
✓	Check roll timing gearbox lubricant. For instructions, refer to *4.6.1 Checking and Changing Lubricant in Conditioner Roll Timing Gearbox, page 207*.												
✓	Check rotary disc header drive gearbox lubricant. For instructions, refer to *4.7.1 Changing Header Drive Gearbox Lubricant, page 210*.												
♦	Lubricate forming shield pivot tube. For instructions, refer to *4.4 Lubrication, page 149*.												
Every 250 Hours or Annually													
▲	Change roll timing gearbox lubricant. For instructions, refer to *4.6.1 Checking and Changing Lubricant in Conditioner Roll Timing Gearbox, page 207*.												
▲	Change rotary disc header drive gearbox lubricant. For instructions, refer to *4.7.1 Changing Header Drive Gearbox Lubricant, page 210*.												
▲	Change cutterbar lubricant. For instructions, refer to *4.5.1 Lubricating Cutterbar, page 155*.												

4.3.2 Break-in Inspections

The header is factory-ready for normal operation; however, there are several maintenance tasks to complete during the early operating hours of the machine's service life.

Table 4.1 Break-In Inspection Schedule

Inspection Interval	Item	Refer to
1 Hour	Check for loose hardware and tighten to required torque	*7.1 Torque Specifications, page 257*
5 Hours	Check for loose hardware and tighten to required torque	*7.1 Torque Specifications, page 257*
5 Hours	Check conditioner drive belt tension	*Inspecting Conditioner Drive Belt, page 222*
25 Hours	Check conditioner drive belt tension	*Inspecting Conditioner Drive Belt, page 222*
50 Hours	Check conditioner drive belt tension	*Inspecting Conditioner Drive Belt, page 222*
50 Hours	Change header drive gearbox lubricant	*4.7.1 Changing Header Drive Gearbox Lubricant, page 210*

6. 100-hour check intervals continue after 250 hours.

Table 4.1 Break-In Inspection Schedule (continued)

Inspection Interval	Item	Refer to
50 Hours	Check cutterbar lubricant	*4.5.1 Lubricating Cutterbar, page 155*
150 Hours	Check conditioner drive belt tension	*Inspecting Conditioner Drive Belt, page 222*

4.3.3 Preseason Servicing

Perform these procedures when taking the machine out of storage.

CAUTION

- **Review the operator's manual to refresh your memory on safety and operating recommendations.**
- **Review all safety signs and other decals on the rotary disc header and note any potential hazard areas.**
- **Ensure that all shields and guards are properly installed and secured. Never alter or remove safety equipment.**
- **Ensure that you understand and have practised safe use of all controls. Know the capacity and the operating characteristics of the machine.**
- **Check the first aid kit and the fire extinguisher. Know where they are and how to use them.**

At the beginning of each operating season:

1. Lubricate the machine completely. For instructions, refer to *4.4 Lubrication, page 149* and *4.5.1 Lubricating Cutterbar, page 155*.
2. Perform all annual maintenance tasks as listed in *4.3.1 Maintenance Schedule/Record, page 144*.

4.3.4 End-of-Season Servicing

Perform these procedures when storing the machine at the end of the season.

DANGER

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

WARNING

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

CAUTION

Cover the cutterbar to prevent injury from accidental contact with the blades.

1. Raise the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Engage the windrower lift cylinder safety props. For instructions, refer to *3.3 Engaging and Disengaging Header Safety Props, page 27*.
4. Clean the header thoroughly.
5. Check for worn components and repair them as necessary.
6. Check for any broken components and order replacements from your Dealer. Immediately repairing these items will save time and effort at beginning of the next season.
7. Replace or tighten any missing or loose hardware. For information, refer to *7.1 Torque Specifications, page 257*.
8. Lubricate the header thoroughly, leaving excess grease on the fittings to keep moisture out of the lubricated component.
9. Apply grease to any exposed threads, cylinder rods, and sliding surfaces of components.
10. Oil the cutterbar components to prevent rust from forming.
11. Loosen the drive belt.
12. If the divider rods are equipped, remove them to reduce the space required for inside storage.
13. Repaint all worn or chipped painted surfaces to prevent rust from forming.
14. If possible, store the machine in a dry, protected place. If you are storing the machine outside, always cover the header with a waterproof canvas or other protective material.

4.4 Lubrication

Proper lubrication is essential to ensuring the service life of the machine.

WARNING

To avoid personal injury, before servicing the header or opening the drive covers, refer to *4.1 Preparing Machine for Servicing, page 141*.

Greasing points are marked on the machine by decals showing a grease gun and the grease interval, which is specified in hours of operation.

Log the hours of machine operation. Use the maintenance schedule provided in this manual to keep a record of scheduled maintenance. For details, refer to *4.3.1 Maintenance Schedule/ Record, page 144*.

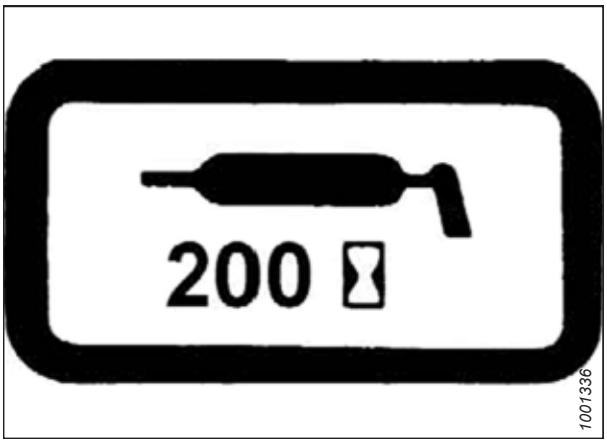


Figure 4.6: Grease Interval Decal

4.4.1 Greasing Procedure

Refer to this procedure whenever a component requires grease.

DANGER

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

1. Open the driveshields at the ends of the header to access the greasing points. For instructions, refer to *3.6.1 Opening Driveshields, page 112*.
2. Before greasing a fitting, wipe it with a clean cloth to avoid injecting dirt and grit into the component.
3. Replace any loose or broken fittings immediately.
4. Inject grease through the fitting with a grease gun until grease overflows the fitting (unless the instructions specify otherwise).
5. Leave excess grease on the fitting to keep out dirt.
6. Remove and thoroughly clean any fitting that will not take grease and clean the lubricant passageway. Replace the fitting if necessary.

First 25 Hours

After the first 25 hours of operation, you will need to check the conditioner drive belt tension and inspect the conditioner roll timing gearbox's lubricant level.

To check the conditioner roll timing gearbox oil level, refer to *4.6.1 Checking and Changing Lubricant in Conditioner Roll Timing Gearbox, page 207*.

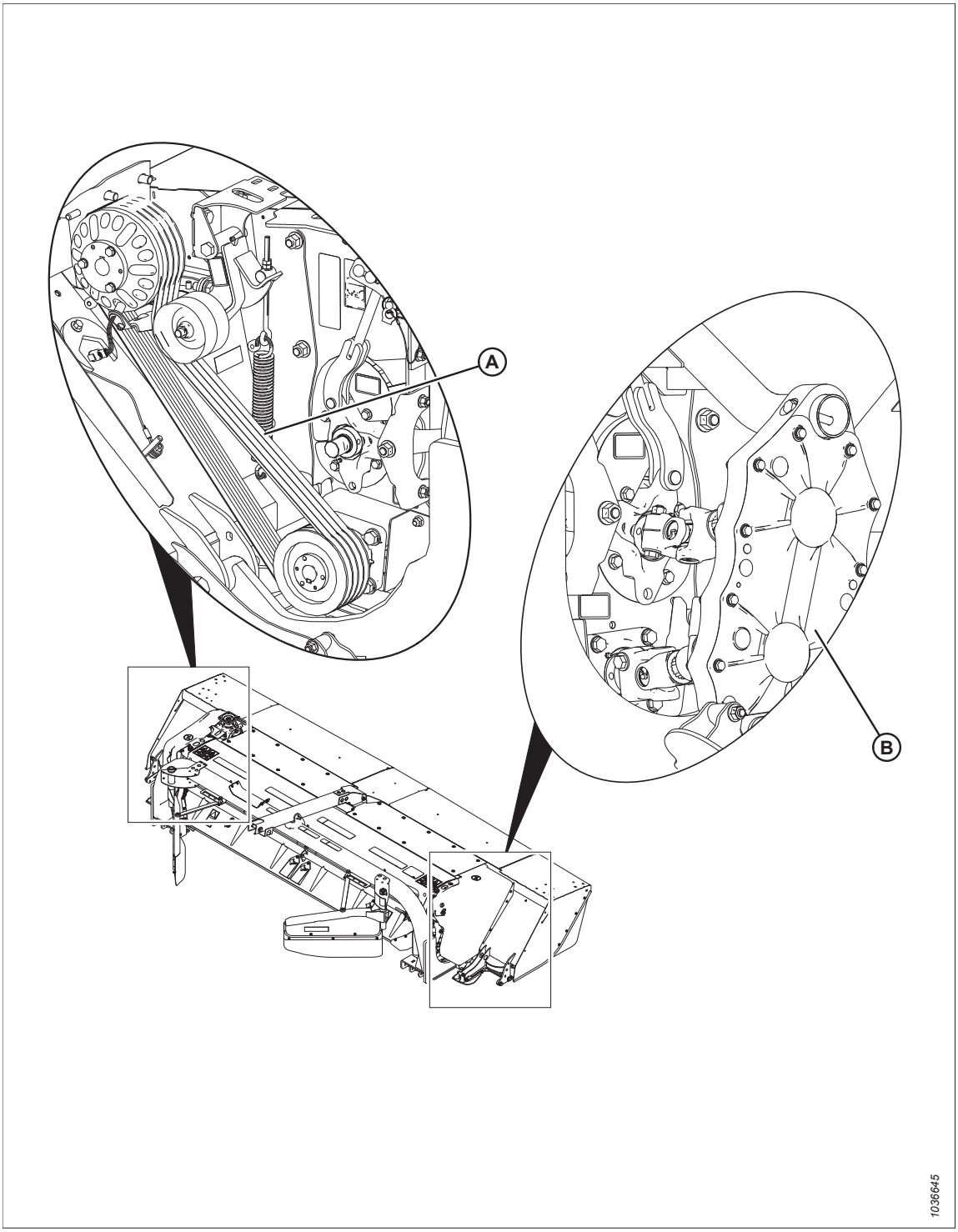


Figure 4.7: First 25 Hours

A - Conditioner Drive Belt Tensioner

B - Conditioner Roll Timing Gearbox

Every 25 Hours

After every 25 hours of machine operation, add grease to the idler/tensioner pivot, the roller conditioner bearing, the driveline U-joints, and the driveline slip joints.

When adding grease, use high-temperature extreme-pressure (EP2) performance grease with 1% max molybdenum disulphide (NLGI grade 2) lithium base unless otherwise specified.

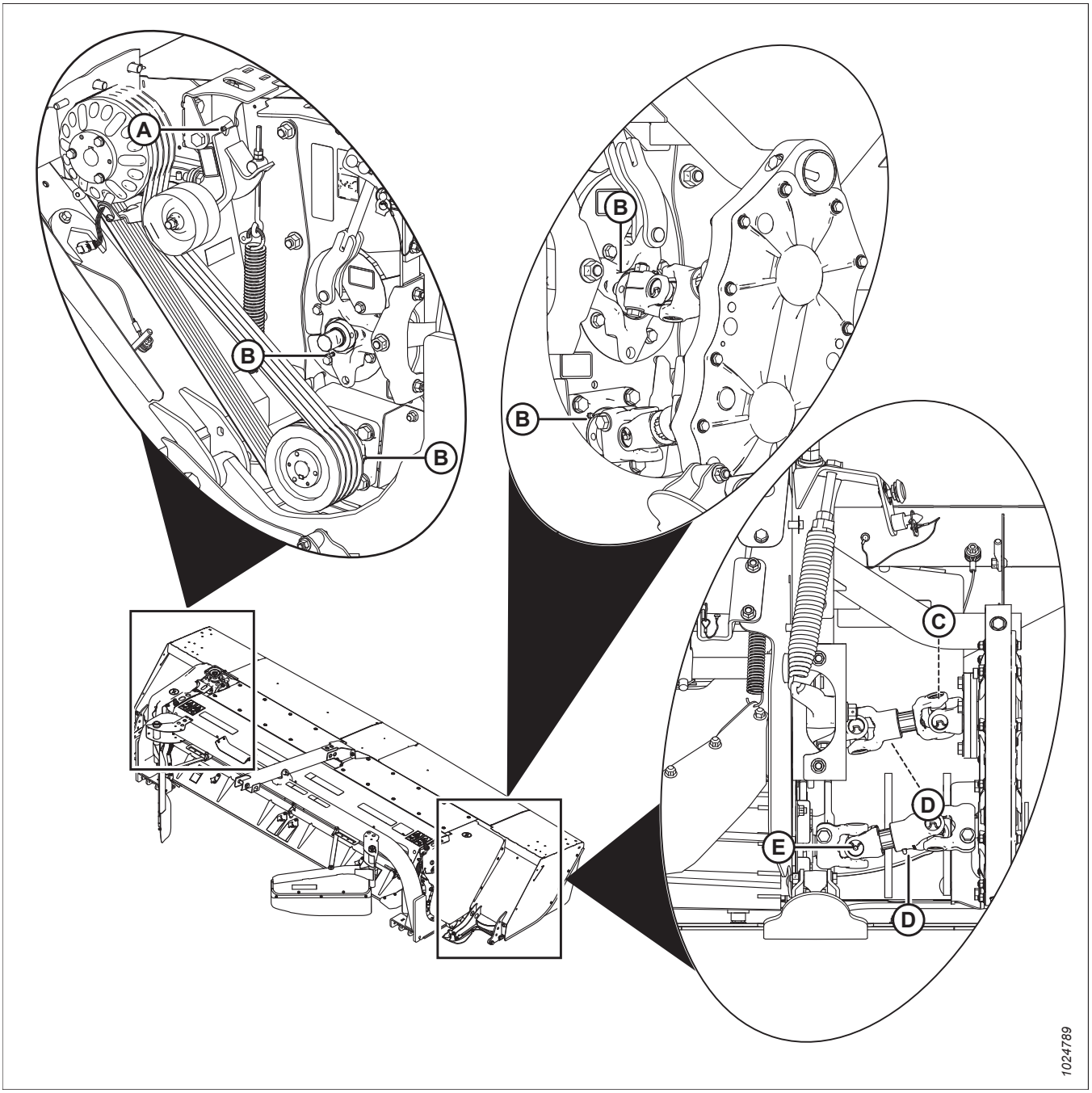


Figure 4.8: Every 25 Hours

A - Idler/Tensioner Pivot
B - Bearing, Roller Conditioner (4 Places)
C - U-Joint, Upper Driveline (2 Places)
D - Slip Joints, Conditioner Drivelines
E - U-Joint, Lower Driveline (2 Places)

First 50 Hours

After the first 50 hours of machine operation, the conditioner roll timing gearbox's lubricant will need to be changed, the header drive gearbox's lubricant will need to be changed, and the cutterbar lubricant level should be inspected.

To change the conditioner roll timing gearbox oil level, refer to *4.6.1 Checking and Changing Lubricant in Conditioner Roll Timing Gearbox, page 207*.

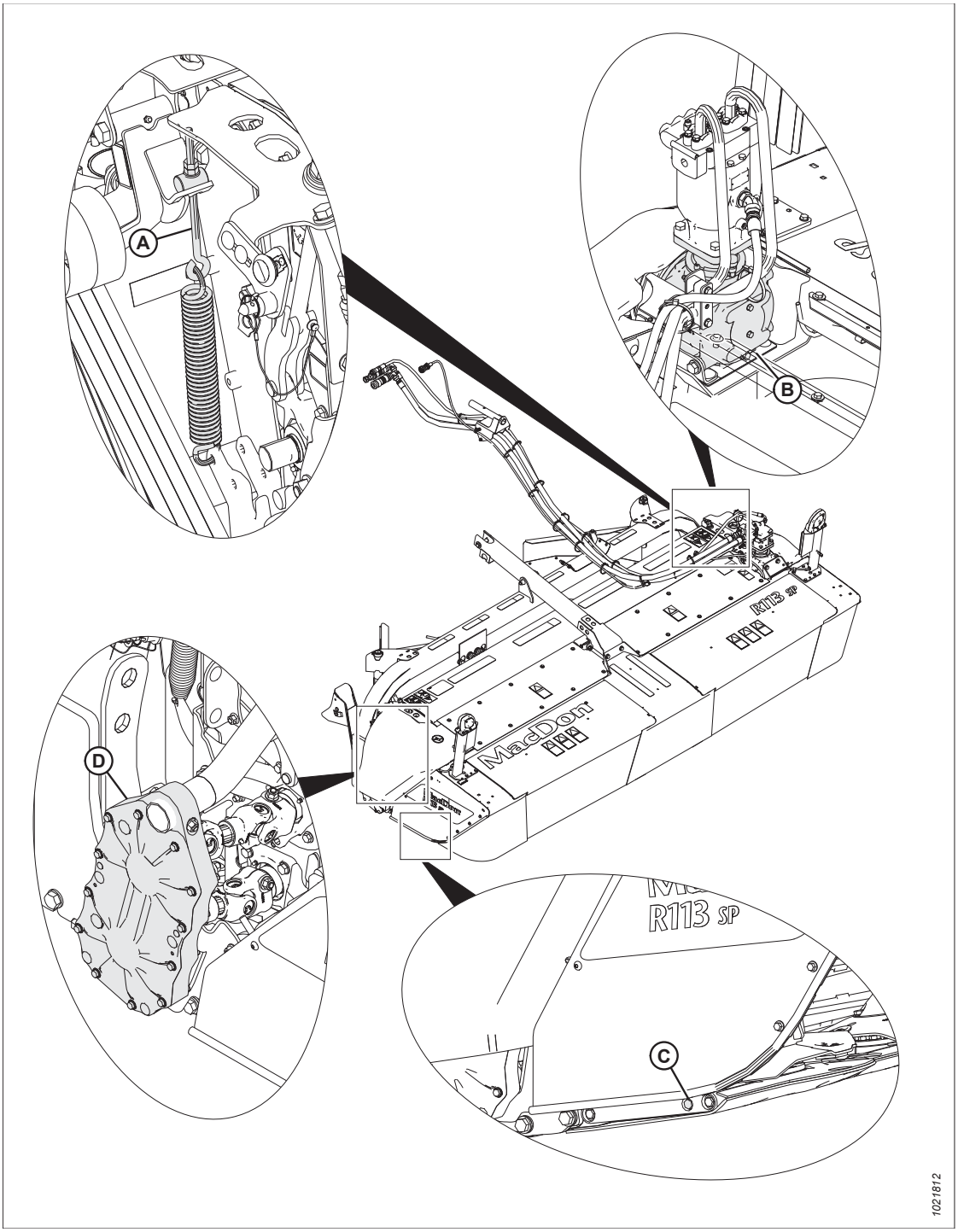


Figure 4.9: First 50 Hours

A - Conditioner Drive Belt Tensioner
B - Header Drive Gearbox
C - Cutterbar
D - Conditioner Roll Timing Gearbox

Every 100 Hours or Annually

After 100 hours of machine operation, or annually (whichever interval occurs first), the conditioner drive belt tension should be checked, the conditioner roll timing gearbox's lubricant level should be checked, the rotary disc header drive gearbox's lubricant level should be checked, and the forming shield pivot tubes should be lubricated.

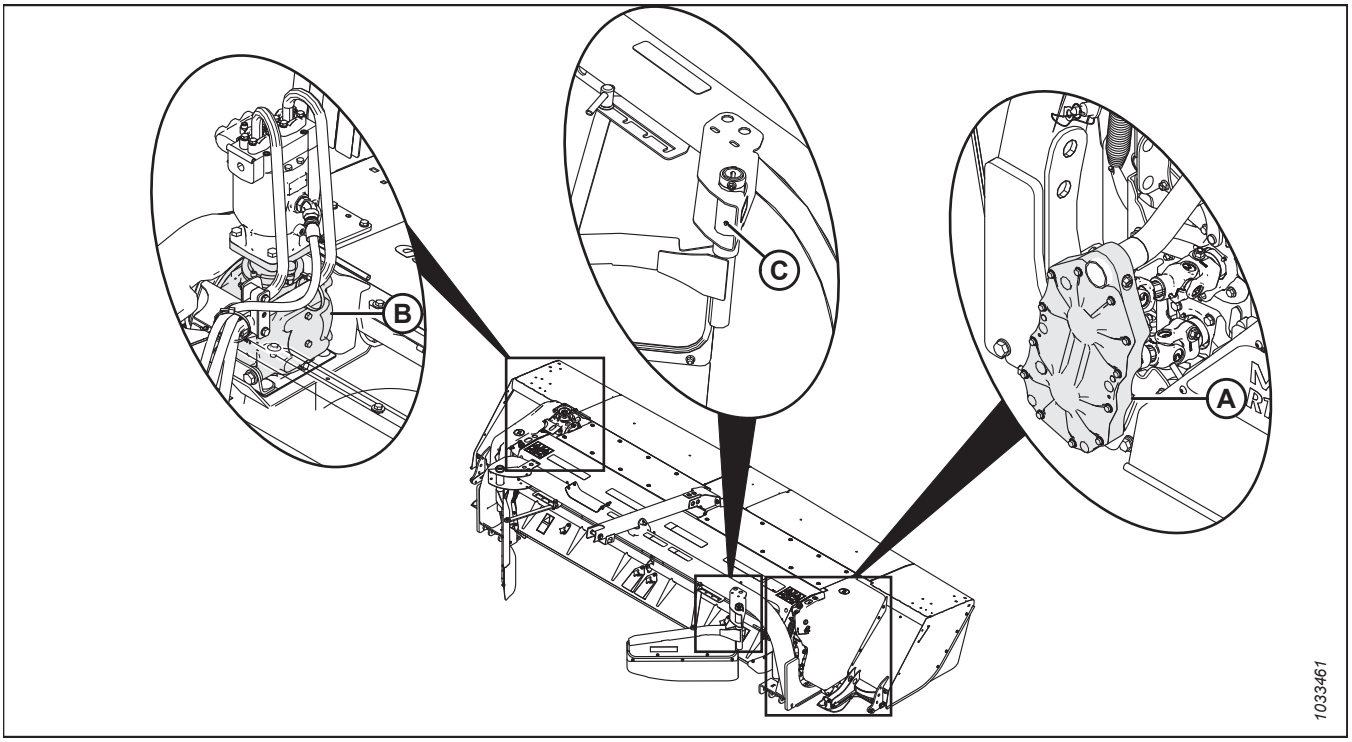


Figure 4.10: Every 100 Hours

A - Conditioner Roll Timing Gearbox **B - Header Drive Gearbox** **C - Forming Shield Pivot Point Tube (Two Places)**

Every 250 Hours

After every 250 hours, or annually (whichever interval occurs first), the conditioner roll gearbox lubricant should be changed, the rotary disc header drive gearbox lubricant should be changed, and the cutterbar lubricant should be changed.

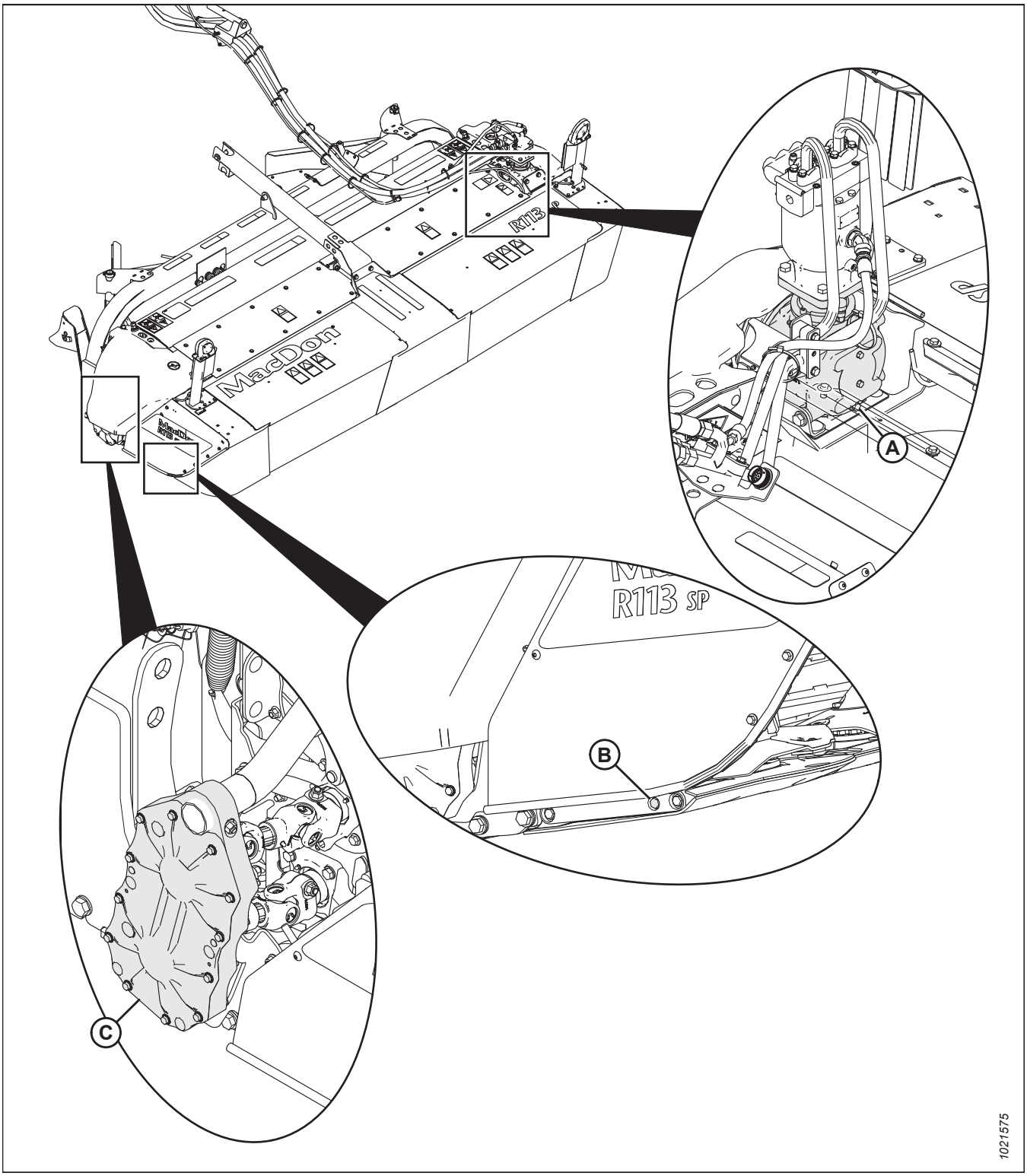


Figure 4.11: Every 250 Hours

A - Header Drive Gearbox **B - Cutterbar** **C - Conditioner Roll Timing Gearbox**

4.5 Cutterbar System

Cutterbar (A) is 3.9 m (13 ft.) long. The 3.9 m (13 ft.) cutterbar holds eight discs that rotate to a maximum of 2500 rpm at full engine speed.

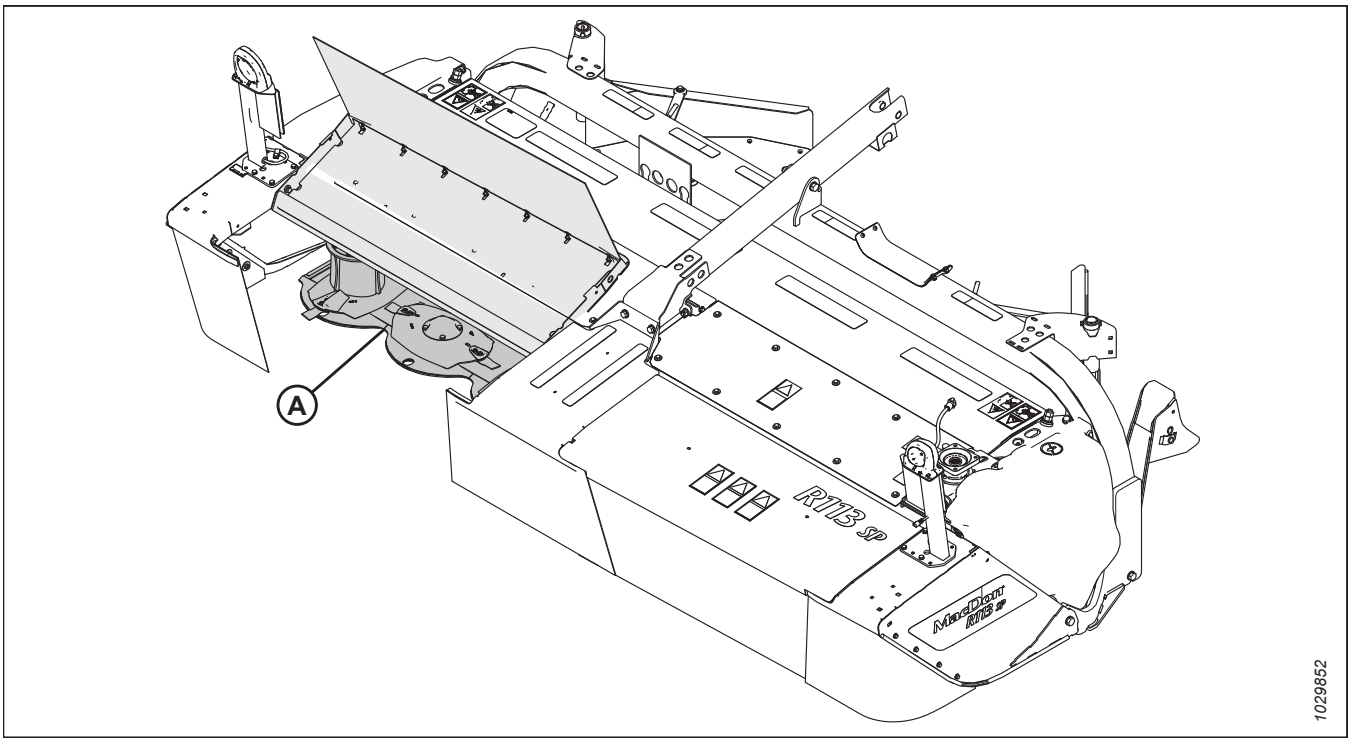


Figure 4.12: Cutterbar

Each cutterbar disc carries two cutting blades.

4.5.1 Lubricating Cutterbar

The machine should be on flat, level ground when checking and changing the lubricant in the cutterbar.

Checking and Adding Lubricant – Cutterbar

The correct lubricant levels are essential to the performance and longevity of the cutterbar.

DANGER

To prevent injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key from the ignition before leaving the operator's seat or making adjustments to the machine. Never work on or beneath an unsupported header. If the header is fully raised, always engage the safety props. If the header is off of the ground but not raised to its full height, place blocks under the header.

DANGER

Ensure that all bystanders have cleared the area.

WARNING

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

IMPORTANT:

Check the cutterbar lubricant level when the lubricant is warm. If the lubricant is cold, idle the machine for approximately 10 minutes prior to checking.

1. Park the machine on a flat, level surface.
2. Shut down the engine, and remove the key from the ignition.
3. Place blocks under each end, or just inside each end, of the cutterbar.
4. Lower the header onto the blocks.
5. Shut down the engine, and remove the key from the ignition.
6. Open the cutterbar doors. For instructions, refer to *3.7.1 Opening Cutterbar Doors – North America, page 115* or *3.7.2 Opening Cutterbar Doors – Export, page 116*.
7. Use spirit level (A) to ensure that the cutterbar is level in both directions. Adjust the cutterbar position accordingly.

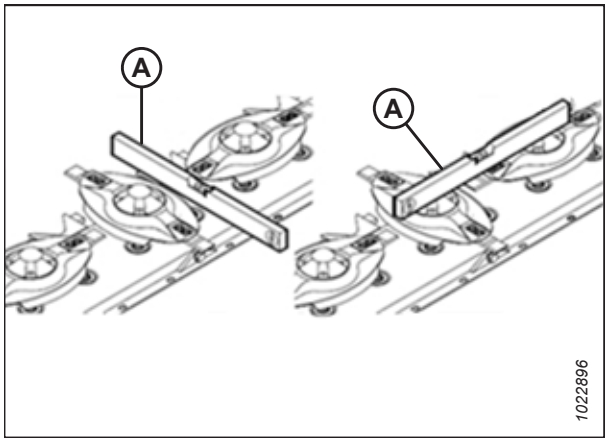


Figure 4.13: Spirit Level on Cutterbar

8. Clean the area around plug (A). Place a 5 liter (5.2 US qts) capacity container under the plug.
9. Remove plug (A) and O-ring (B) from the cutterbar. The oil level must be up to the inspection plug hole.
10. If the oil is up to the inspection plug hole, reinstall the plug and proceed to Step *16, page 157*. If the oil is **NOT** up to the inspection plug hole, proceed to the next step.

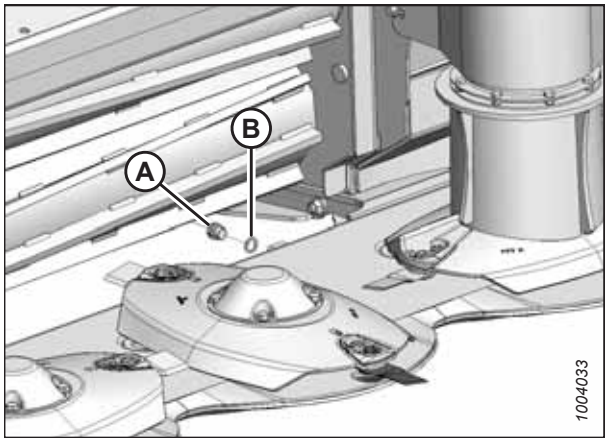


Figure 4.14: Cutterbar Oil Inspection Plug

11. Raise the header slightly.
12. Lower the header onto blocks so that the left end is slightly higher than the right end.
13. Shut down the engine, and remove the key from the ignition.

14. Add lubricant through the inspection hole that is used to check the oil level.

    IMPORTANT:

    Do **NOT** overfill the cutterbar. Overfilling can cause overheating, damage, and failure of cutterbar components.

    NOTE:

    Refer to the inside back cover of this manual for lubricant specifications.

15. Recheck the oil level.

16. Check O-ring (B) for breaks or cracks, and replace it if necessary.

17. Install plug (A) and O-ring (B).

18. Close the cutterbar doors. For instructions, refer to *3.7.3 Closing Cutterbar Doors, page 117*.

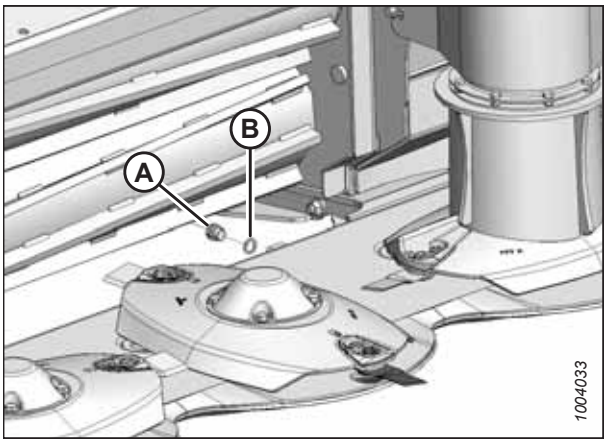


Figure 4.15: Cutterbar Oil Inspection Plug

Draining Cutterbar

In order to change the cutterbar lubricant, the cutterbar will first need to be drained.

DANGER

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

DANGER

Ensure that all bystanders have cleared the area.

WARNING

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

1. Remove the right outboard rock guard. This will improve access to the drain plug located in the end cap of the cutterbar. To remove the outboard rock guard, refer to *Removing Outboard Rock Guards, page 186*.

2. Raise the header.

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

4. Place a block under each end of the header so that the right end is lower than the left end.

    IMPORTANT:

    Always drain lubricant from the right end of the header. Draining lubricant from the left end of the header may contaminate the breather or cause it to fail.

5. Lower the header onto the blocks.

6. Shut down the engine, and remove the key from the ignition.
7. Place a 10 liter (10.5 US qts) container under the right end of the cutterbar.
8. Clean the area around plug (A) and remove it.

   IMPORTANT:

   Do **NOT** remove hex head bolts (B) securing the cutterbar end plate to the cutterbar or lubricant may leak.
9. Let the lubricant drain. Reinstall cutterbar plug (A) when the lubricant has fully drained.

   NOTE:

   Do **NOT** flush the cutterbar.
10. Fill the cutterbar with lubricant before operating the header. For instructions, refer to *Filling Cutterbar with Lubricant, page 158*.

    IMPORTANT:

    Dispose of used lubricant responsibly.
11. Reinstall the right outboard rock guard. For instructions, refer to *Installing Outboard Rock Guards, page 187*.

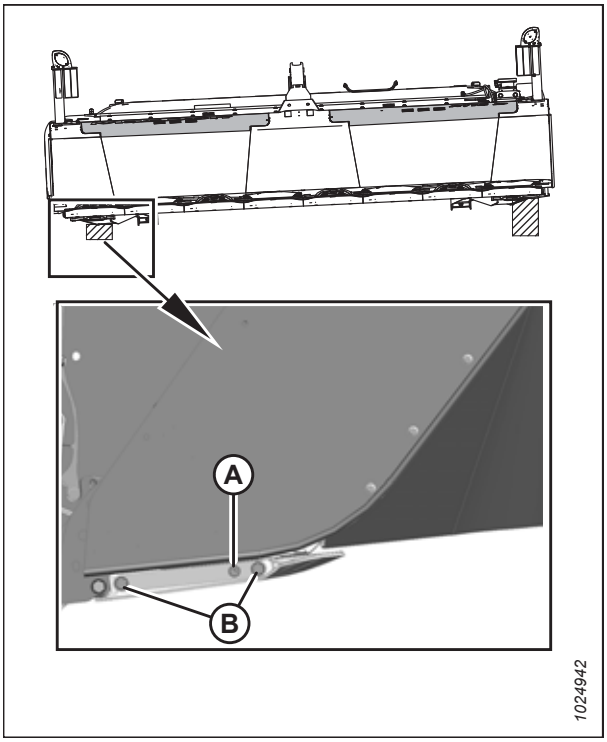


Figure 4.16: Front View of Header on Blocks

Filling Cutterbar with Lubricant

Refer to this procedure after completely draining the cutterbar of oil.

If you are checking the oil level or topping it up, proceed to *Checking and Adding Lubricant – Cutterbar, page 155*.

DANGER

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

DANGER

Ensure that all bystanders have cleared the area.

WARNING

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

IMPORTANT:

The cutterbar should be completely empty of oil before filling it. For instructions, refer to *Draining Cutterbar, page 157*.

1. Remove the right outboard rock guard. This will improve access to the drain plug located in the end cap of the cutterbar. To remove the outboard rock guard, refer to *Removing Outboard Rock Guards, page 186*.
2. Raise the header fully.
3. Shut down the engine, and remove the key from the ignition.

4. Place blocks under the right end of the header so that the right end is higher than the left end.
5. Lower the header onto the blocks.
6. Shut down the engine, and remove the key from the ignition.
7. Remove access plug (A) from the left end of the cutterbar and add the **EXACT** amount of lubricant specified. Refer to the inside back cover of this manual for lubricant types and quantities.

   IMPORTANT:

   Do **NOT** overfill the cutterbar. Overfilling can damage the cutterbar and cause it to fail.
8. Reinstall access plug (A).
9. Torque the plug to 30 Nm (22 lbf·ft [266 lbf·in]).
10. Raise the header fully.
11. Shut down the engine, and remove the key from the ignition.

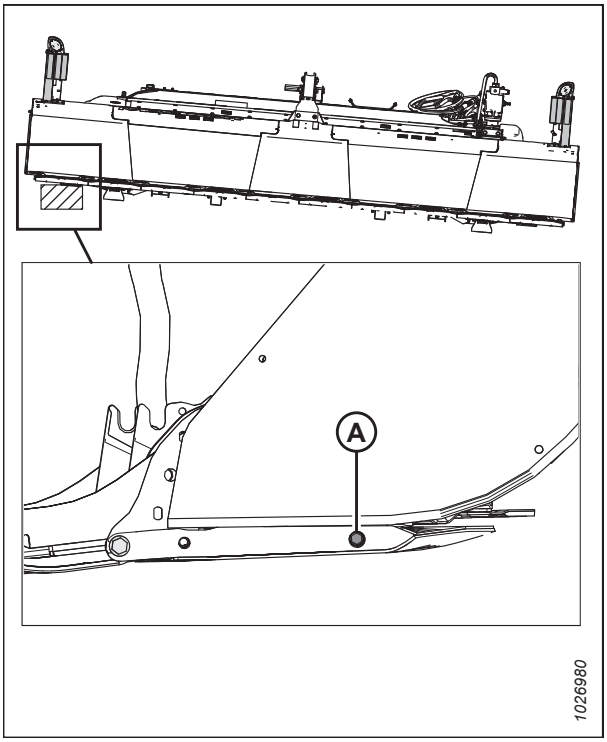


Figure 4.17: Filling Cutterbar

12. Engage the windrower lift cylinder safety props. For instructions, refer to *3.3 Engaging and Disengaging Header Safety Props, page 27*.
13. Remove the blocks from under the cutterbar.
14. Check the lubricant level. For instructions, refer to *Checking and Adding Lubricant – Cutterbar, page 155*.
15. Reinstall the right outboard rock guard. For instructions, refer to *Installing Outboard Rock Guards, page 187*.

4.5.2 Cutterbar Discs

The cutterbar discs provide rotary cutting action. They may need to be replaced from time to time.

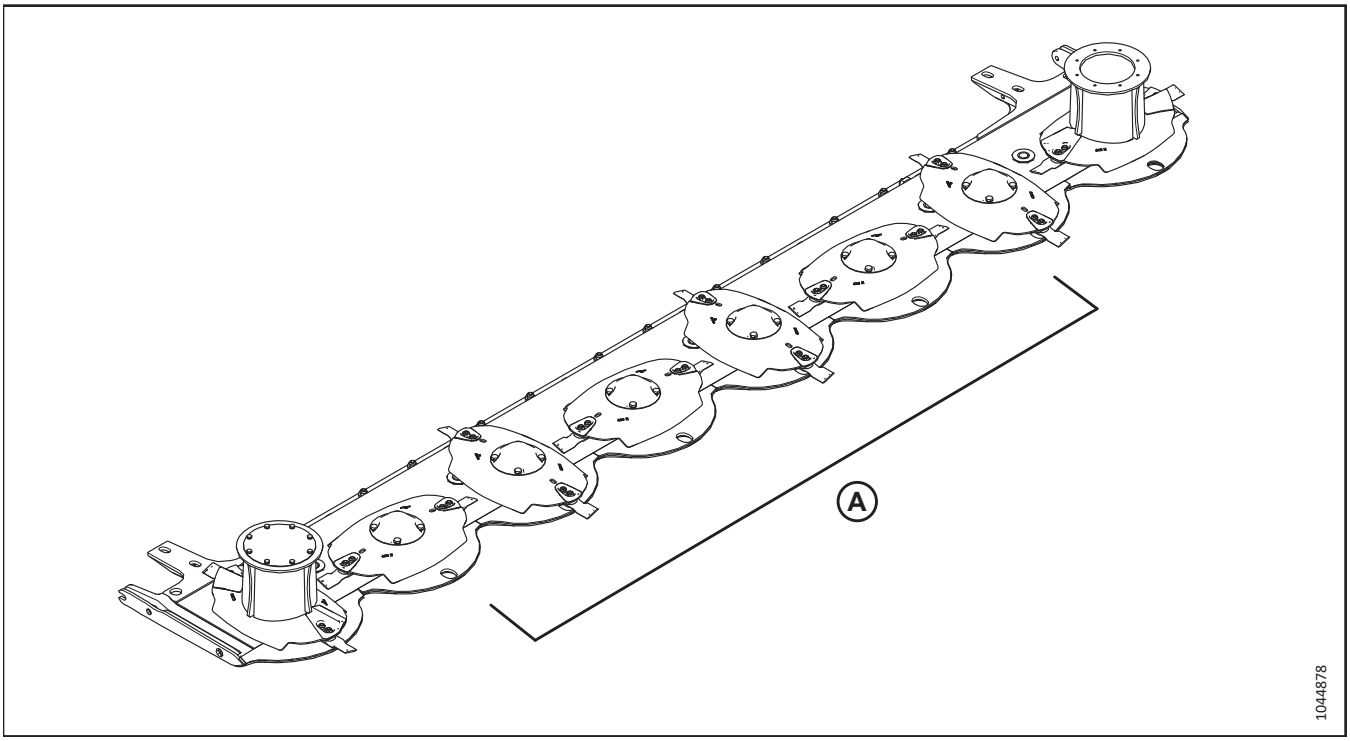


Figure 4.18: Interchangeable Cutterbar Discs

Cutterbar discs (A) are interchangeable and can be moved to a spindle that rotates in the opposite direction, so long as the disc is in usable condition and the blades are oriented to cut in the correct direction.

Perform daily inspections to ensure that the cutterbar discs are not damaged or deformed.

The cutterbar discs are **NOT** repairable and must be replaced if they are 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.

Inspecting Cutterbar Discs

Damaged cutterbar discs cut poorly and may damage the cutterbar. Replace damaged discs immediately.

DANGER

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

WARNING

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

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

2. Inspect the cutterbar disc for any deformity on the side of the disc blades. Dimension (A) must not exceed 48 mm (1 7/8 in.). Replace any damaged discs immediately.

   IMPORTANT:

   Cutterbar discs are **NOT** repairable and must be replaced if damaged.

   NOTE:

   Dimension (A) is between the cutterbar and the edge of the disc as shown.

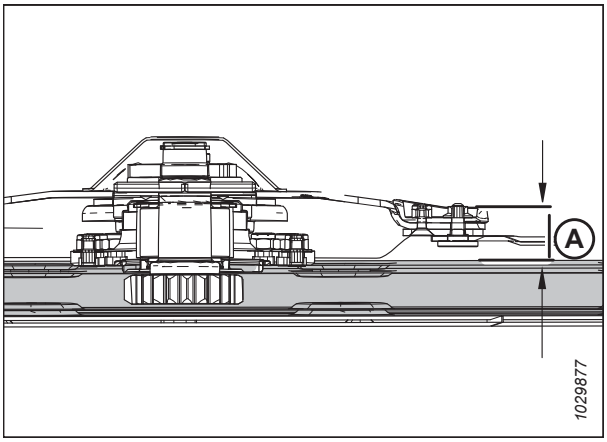


Figure 4.19: Cutterbar Disc

3. Inspect the discs for abrasion (A) at the cutting blade sides. Replace the disc if the material thickness is less than 3 mm (1/8 in.).

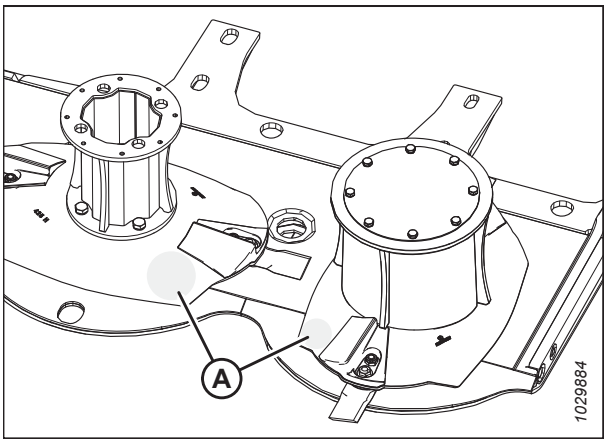


Figure 4.20: Cutterbar Disc

4. Inspect cutterbar disc surface (D) for cracks, excessive wear, and check if the disc is distorted. Replace any damaged discs immediately.
5. Inspect cutterbar disc edges (E) for cracks, excessive wear, and check if the edge is distorted. Replace any damaged components immediately.
6. Ensure that disc blade fasteners (A) are securely attached to the cutterbar disc and that nut shields (B) are present and undamaged. Replace any damaged components immediately.
7. Check that cutterbar disc bolts (C) are securely attached to the spindles. Tighten the bolts as needed.

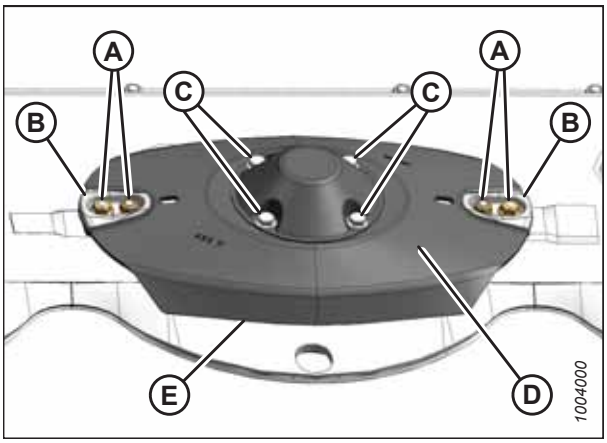


Figure 4.21: Cutterbar Disc

Removing Cutterbar Discs

Cutterbar discs may need to be removed for replacement or so they can be swapped to change the type of crop stream.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, stop the engine, remove the key from the ignition, and engage the windrower's lift cylinder safety props before going under the machine.

WARNING

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

1. Raise the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Engage the windrower lift cylinder safety props. For instructions, refer to *3.3 Engaging and Disengaging Header Safety Props, page 27*.
4. Open the cutterbar doors. For instructions, refer to *3.7.1 Opening Cutterbar Doors – North America, page 115* or *3.7.2 Opening Cutterbar Doors – Export, page 116*.
5. Place a pin (or equivalent) in front hole (B) of the rock guard to prevent the discs from rotating while you are loosening the bolts.
6. Remove four M12 bolts and washers (A).

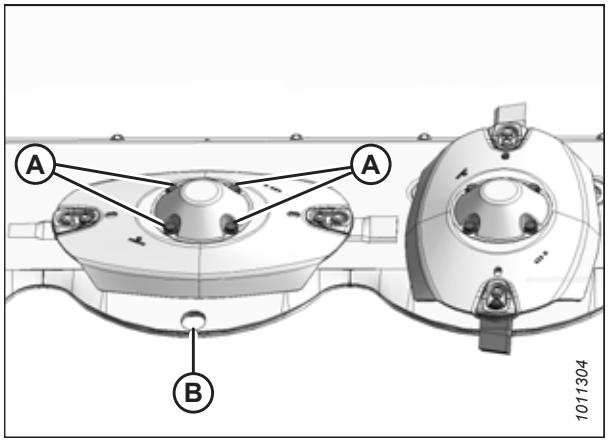


Figure 4.22: Cutterbar Disc Bolts

7. Remove cutterbar disc cap (A).
8. Remove cutterbar disc (B).

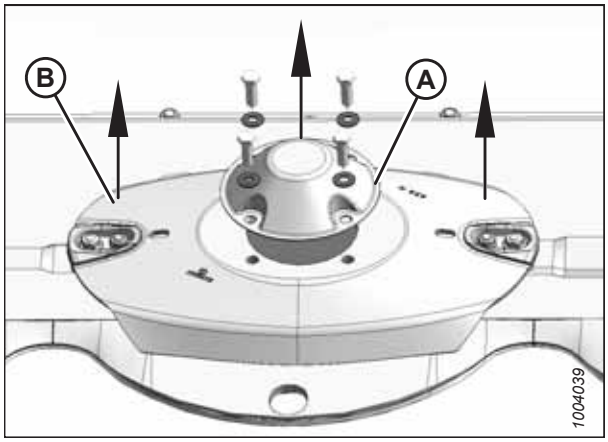


Figure 4.23: Cutterbar Disc and Cap

Installing Cutterbar Discs

Ensure that the blades of the installed disc are perpendicular to those on the adjacent discs.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, stop the engine, remove the key from the ignition, and engage the windrower's lift cylinder safety props before going under the machine.

WARNING

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

1. Shut down the engine, and remove the key from the ignition.
2. Install spacer plate (A) on the spindle.

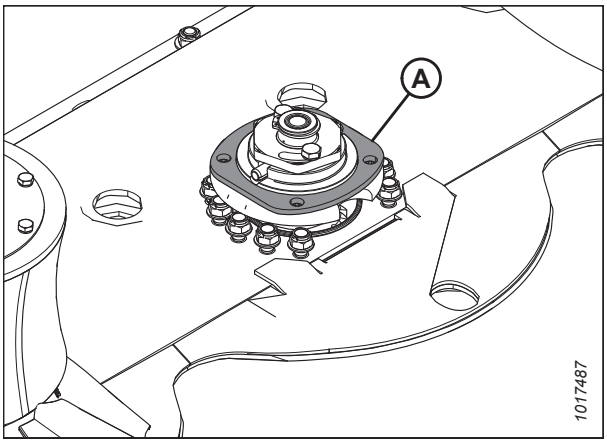


Figure 4.24: Disc Spindle

3. To prevent the disc from rotating while you are tightening the bolts, place a pin (or equivalent) in front hole (D) of the rock guard.
4. Position new disc (A) on the spindle so that the blades are perpendicular to those on the adjacent discs.
5. Install cutter disc cap (B), and secure the assembly with four M12 bolts and washers (C).
6. Torque the bolts to 85 Nm (63 lbf·ft).

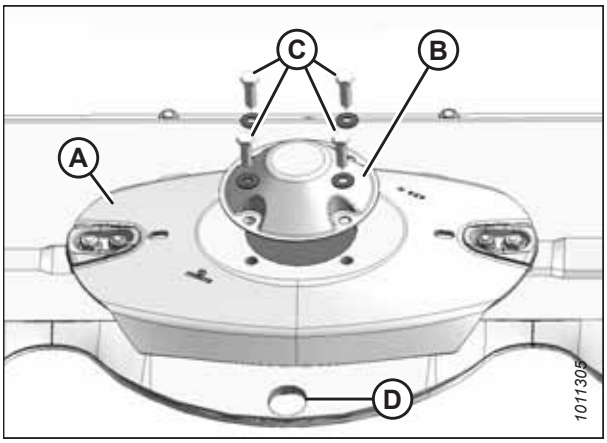


Figure 4.25: Cutterbar Disc and Cap

WARNING

Ensure that the cutterbar is completely clear of foreign objects. Foreign objects can be ejected with considerable force when the machine is started, which can result in serious injury or cause damage to the machine.

7. Remove the pin (or equivalent) from the front hole of the rock guard.
8. Close the cutterbar doors. For instructions, refer to *3.7.3 Closing Cutterbar Doors, page 117*.

4.5.3 Replacing Cutterbar Spindles

Cutterbar spindles allow for the rotation of the cutterbar discs. They have either right or left-handed threads, and are equipped with a shear pin.

A shear pin (A) is installed on each disc in order to prevent damage to the cutterbar if the disc collides with an obstacle.

If the disc contacts a large object such as a stone or stump, the pin will shear and the disc will stop rotating and move upwards. The disc will remain attached to the spindle because of snap ring (B).

NOTE:

Once the spindle has risen due to shear pin failure, the spindle's bearing will become unloaded. Do **NOT** replace the spindle simply because the spindle exhibits excessive play. Check the play of the spindle after torquing the spindle nut and replacing any damaged shear pins.

Refer to *4.5.8 Replacing Cutterbar Spindle Shear Pin, page 200* for instructions on replacing the shear pin.

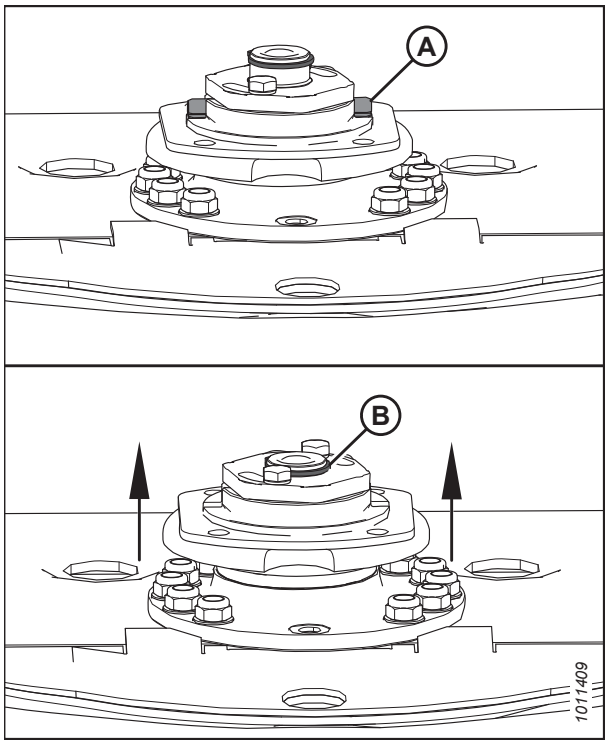


Figure 4.26: Cutterbar Spindles

IMPORTANT:

- Spindles that rotate clockwise have right-leading threading and are identified by a smooth top on spindle gear shaft (A).
- Spindles that rotate counterclockwise have left-leading threading and are identified by machined grooves on spindle gear shaft (B) and nut (C).
- If the spindle position in the cutterbar has changed, the rotational direction of that spindle **MUST** remain the same (that is, a clockwise spindle must maintain its clockwise rotation).
- Failure to maintain the rotation pattern can result in damage to the spindle and/or to the cutterbar components.
- The shear pin will not perform properly if the spindles used are in the wrong orientation.

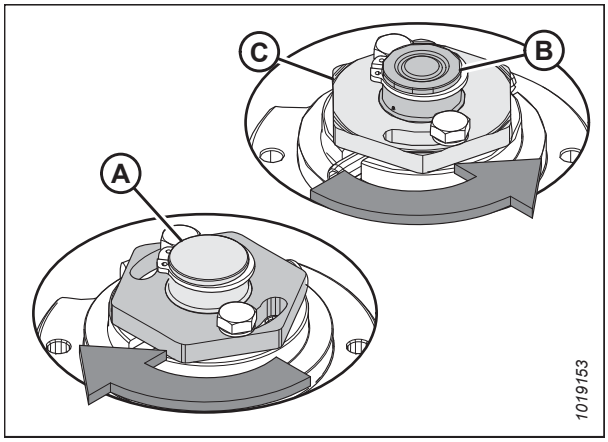


Figure 4.27: Cutterbar Spindles

Removing Cutterbar Spindles

The cutterbar spindles are secured to the cutterbar frame with 11 nuts and washers.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, stop the engine, remove the key from the ignition, and engage the windrower's lift cylinder safety props before going under the machine.

DANGER

Ensure that all bystanders have cleared the area.

WARNING

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

1. Park the machine on a flat, level surface.
2. Lower the header fully.

   NOTE:

   To prevent oil from spilling from the cutterbar while you are removing the disc spindles, ensure that the header is on a flat, level surface and that the header is tilted all the way back.
3. Shut down the engine, and remove the key from the ignition.
4. Open the cutterbar doors. For instructions, refer to *3.7.1 Opening Cutterbar Doors – North America, page 115* or *3.7.2 Opening Cutterbar Doors – Export, page 116*.
5. To prevent the disc from rotating while you are loosening the bolts, place a pin (or equivalent) in front hole (B) of the rock guard.
6. Remove four M12 bolts and washers (A).

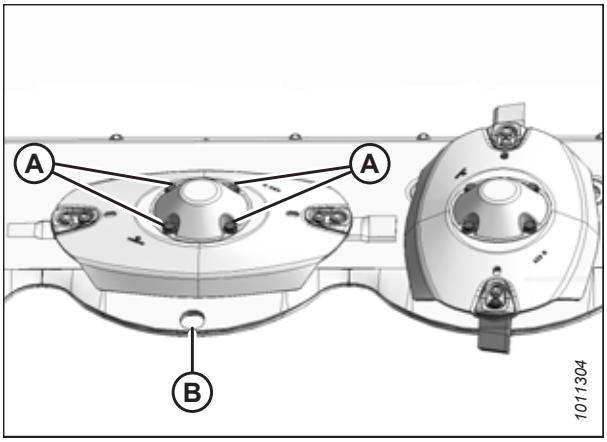


Figure 4.28: Cutterbar Disc Bolts

7. Remove cutterbar disc cap (A).
8. Remove cutterbar disc (B).

   IMPORTANT:

   The blades are oriented to cut in one direction or the other. Therefore, swap the entire disc when swapping spindles.

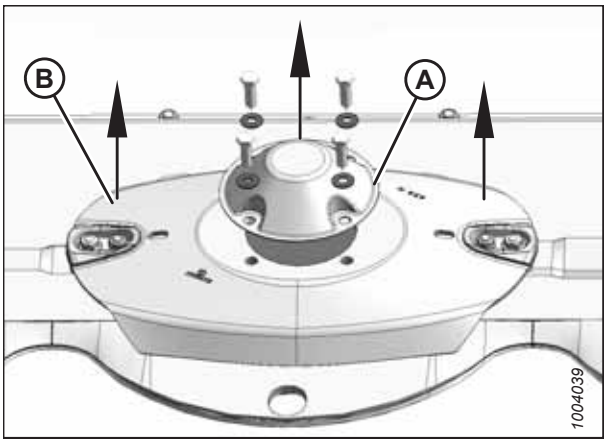


Figure 4.29: Cutterbar Disc and Cap

9. Remove spacer plate (A).

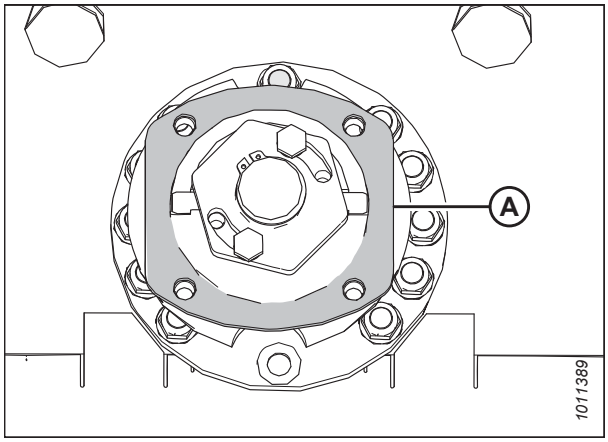


Figure 4.30: Spacer Plate

10. Rotate spindle hub (A) to access the nuts, and remove 11 M12 lock nuts and washers (B).

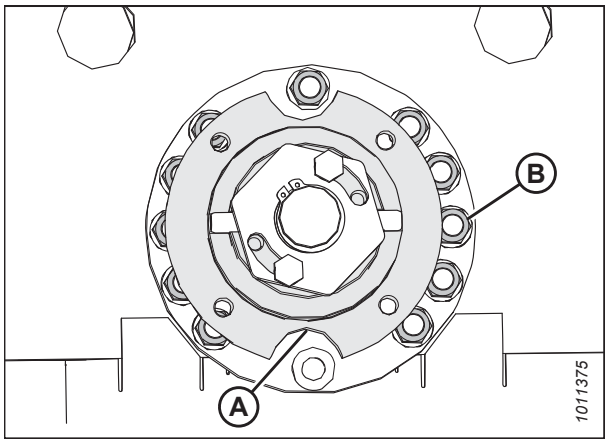


Figure 4.31: Left Spindle Hub and Hardware

11. Remove spindle (A) from the cutterbar.

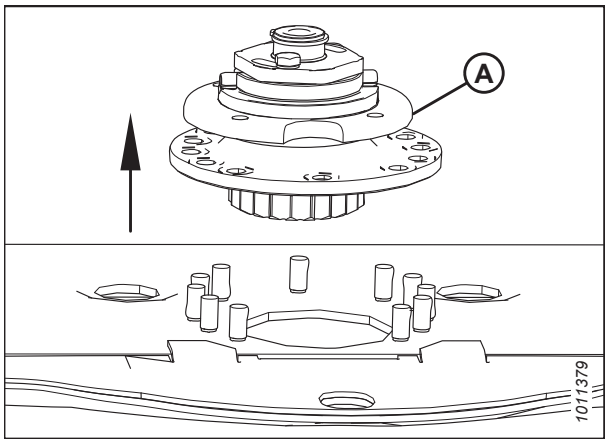


Figure 4.32: Left Spindle

Installing Cutterbar Spindles

Ensure that the discs are timed correctly when installing the cutterbar spindles or the cutterbar may become damaged.

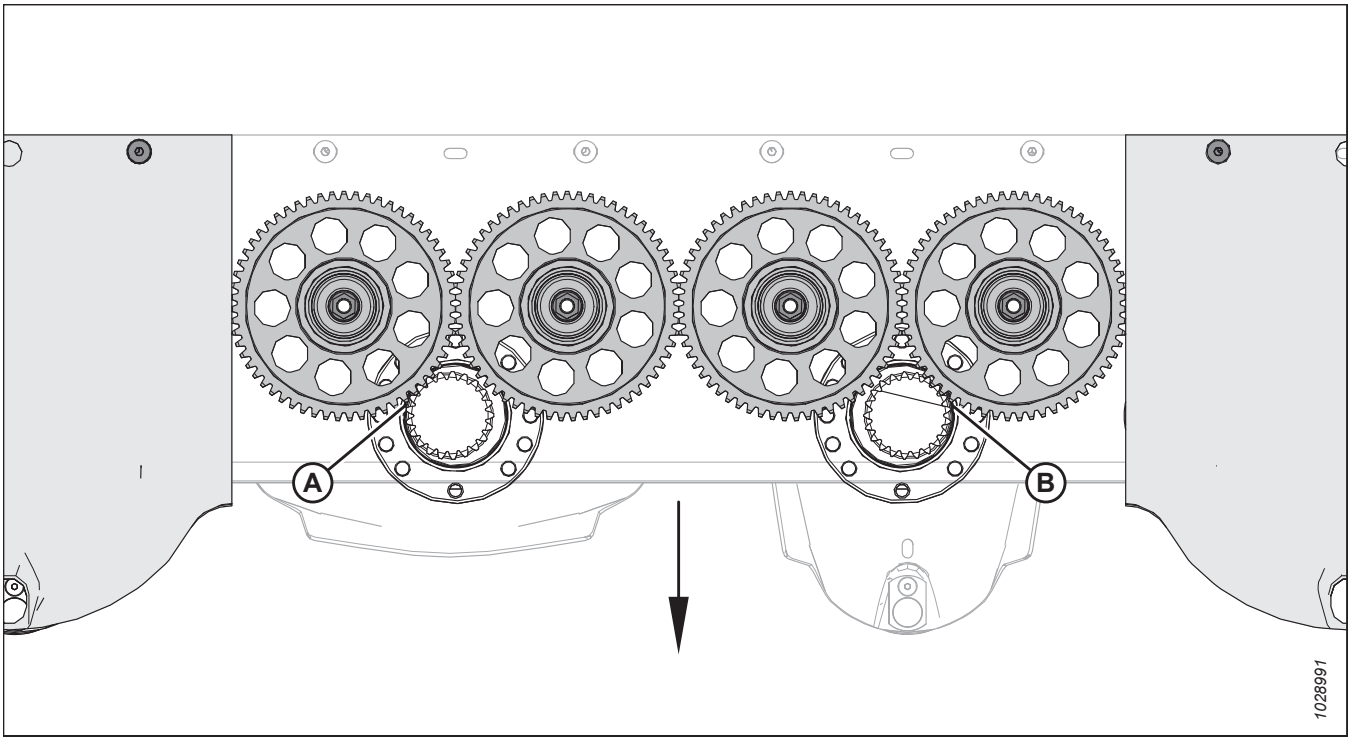


Figure 4.33: Underside of Cutterbar Spindles

NOTE:

Right discs (A) and left discs (B) are slightly offset as shown, depending on which idler gear the spindle is turning:

- Spindles that rotate clockwise have left-leading threading.
- Spindles that rotate counterclockwise have right-leading threading.

IMPORTANT:

Right discs (A) and left discs (B) are timed and must be installed at a 90° angle relative to the neighboring discs. Misaligned discs could result in the following:

- Disc blades of co-rotating discs hitting each other
- Disc blades of diverging discs hitting adjacent discs

Before securing the spindle to the cutterbar, inspect the disc timing using the disc timing tool. The disc is correctly timed if the spindle hub is aligned with the disc timing tool as shown in Figure *4.36, page 169*.

Turn the disc by hand to ensure that the disc blades do **NOT** contact each other or those of adjacent discs.

If the alignment is incorrect, lift the spindle clear of the mounting bolts, rotate the spindle by 180° (ensuring that the base does not turn), and reinstall the spindle.

Before securing the hub, recheck the timing. The spindles do **NOT** need to be bolted to the disc timing tool; visual confirmation of the alignment is sufficient.

NOTE:

Remove the driveshield and retrieve disc timing tools (A) from the left rear side of the header.

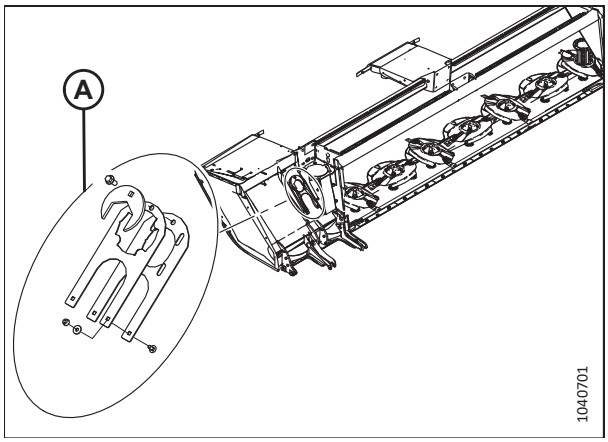


Figure 4.34: Disc Timing Tool Location – Left Rear Side

NOTE:

Assemble disc timing tools (A) and (B) and secure them with M8 carriage head bolt (C), washer (D), and M8 flange hex nut (E).

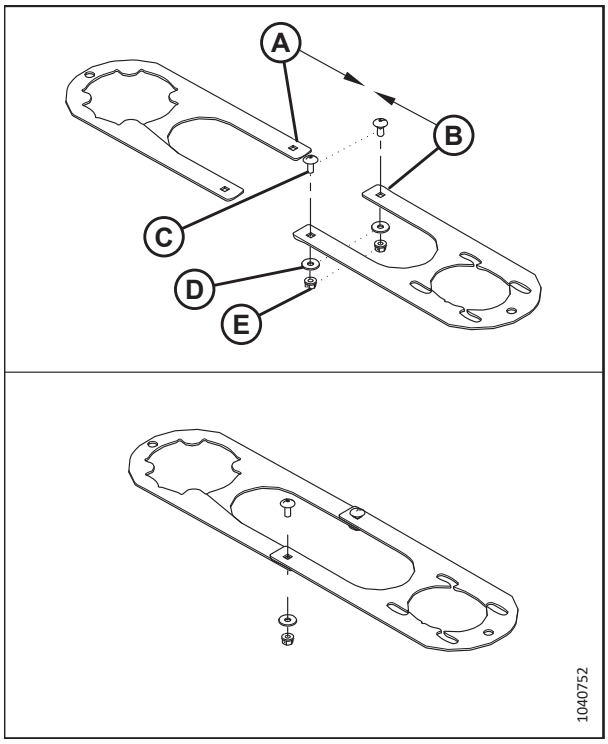


Figure 4.35: Disc Timing Tool

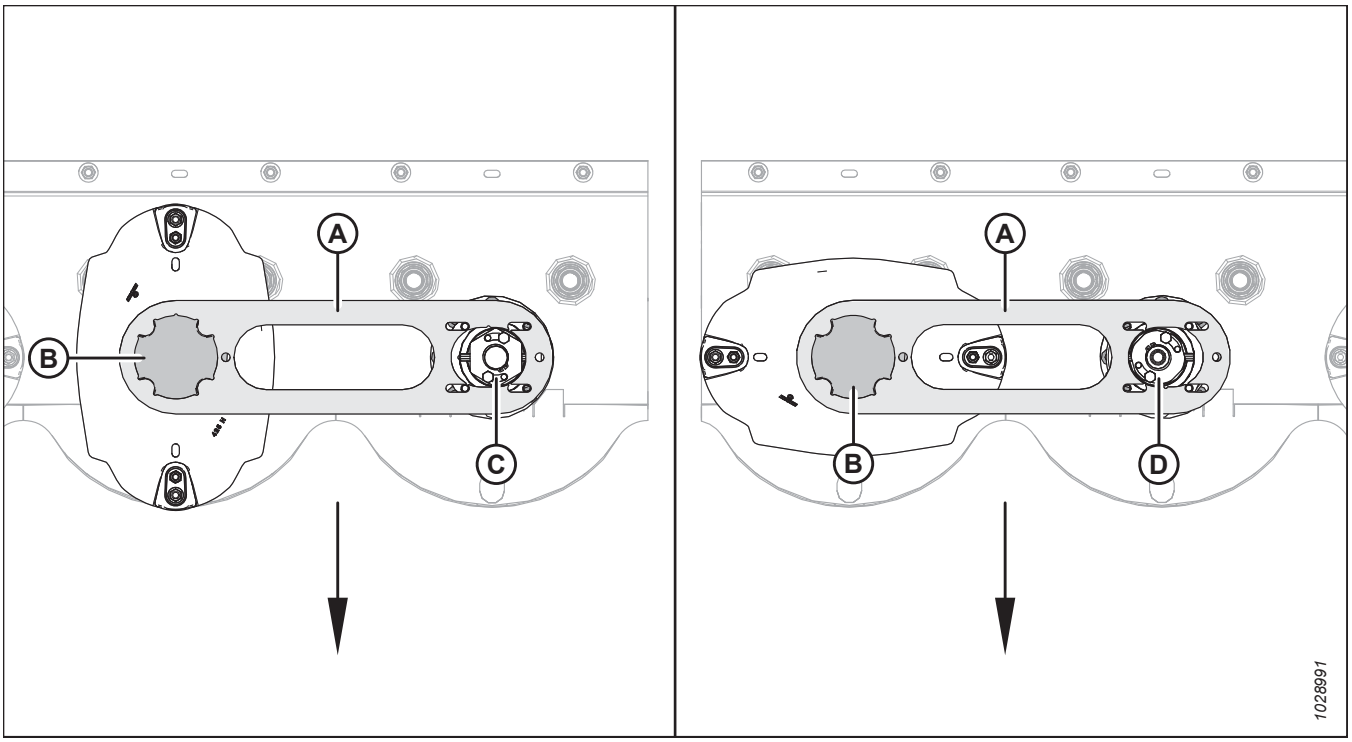


Figure 4.36: Checking Timing with Disc Timing Tool – View from Above

A - Disc Timing Tool
B - Cutter Disc Cap
C - Right Disc, Correct Timing
D - Left Disc, Correct Timing

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, stop the engine, remove the key from the ignition, and engage the windrower's lift cylinder safety props before going under the machine.

DANGER

Ensure that all bystanders have cleared the area.

WARNING

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

1. Park the machine on a flat, level surface.
2. Lower the header fully.

   NOTE:

   To prevent oil from spilling from the cutterbar while you are removing the disc spindles, ensure that the header is on a flat, level surface and that it is tilted all the way back.

3. Shut down the engine, and remove the key from the ignition.
4. Open the cutterbar doors. For instructions, refer to *3.7.1 Opening Cutterbar Doors – North America, page 115* or *3.7.2 Opening Cutterbar Doors – Export, page 116*.

5. Choose a suitable spindle rotation pattern. For more information, refer to *4.5.3 Replacing Cutterbar Spindles, page 164*.

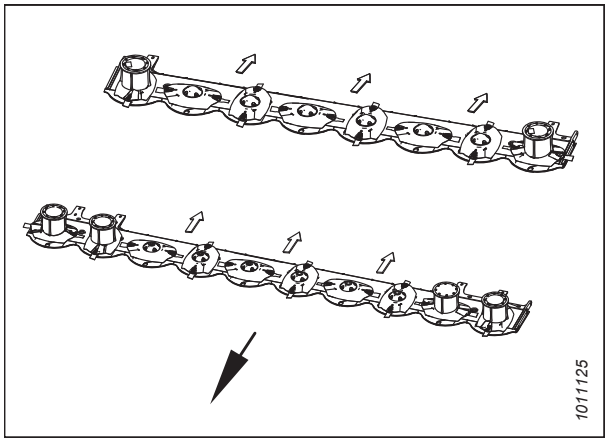


Figure 4.37: Cutterbars

6. Ensure that spindle O-ring (A) is properly seated, cleaned, and undamaged.

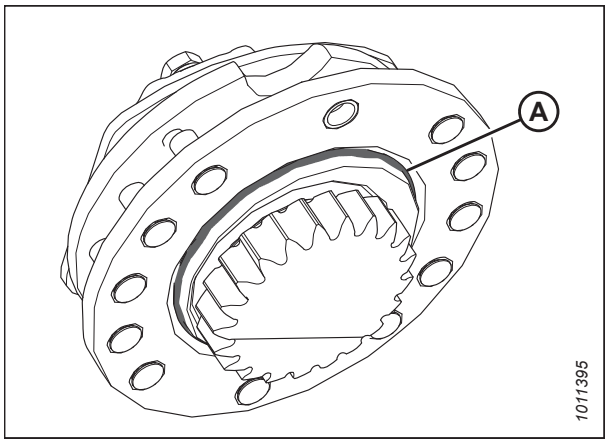


Figure 4.38: Left Spindle O-Ring

7. Insert spindle (A) into the cutterbar.

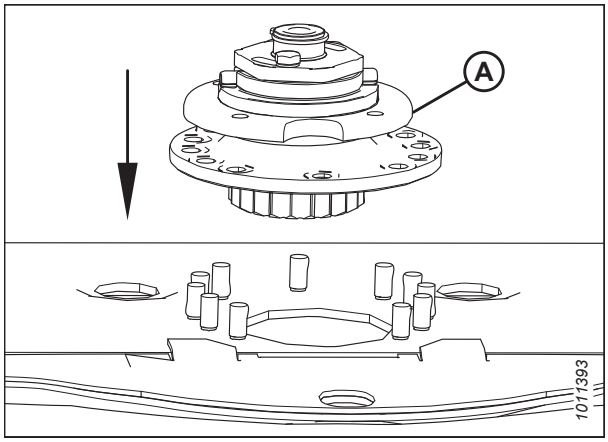


Figure 4.39: Left Spindle

8. Insert studs (A) into the spindle as shown.

   NOTE:

   The plugs are factory-installed as shown in position (B), but may loosen over time. Ensure that the studs are inserted into the proper location.

   IMPORTANT:

   The design of the cutterbar makes it possible to install spindles that rotate in the wrong direction. This will prevent the discs from spinning up and can result in damage to the cutterbar. Ensure that the clockwise spindles rotate clockwise and that the counterclockwise spindles (with machined grooves) rotate counterclockwise.

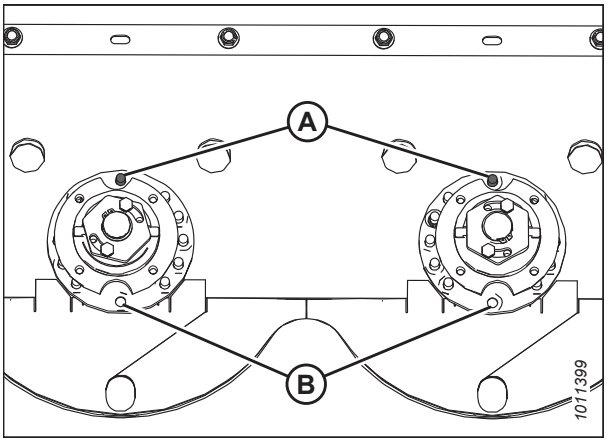


Figure 4.40: Spindle Orientation

9. Check and adjust the disc timing as follows:

   NOTE:

   There are an odd number of teeth on the cutterbar gears; this can make aligning the spindle hub challenging.

   a. Place one end of disc timing tool (A) on adjacent disc (B) and the other end of the disc timing tool on the left spindle as shown.

   b. Check bolt hole alignment (C) as shown.

   c. If the alignment is slightly off, lift the spindle and rotate it by one tooth in either direction to try and line up the bolt holes.

   d. Recheck the timing using the disc timing tool. If the discs are still not lining up, lift the spindle and rotate the hub by 1/4 turn at a time. Recheck the timing using the disc timing tool.

   e. Repeat the disc alignment procedure until the bolt holes are aligned.

   NOTE:

   The arrow in the illustration points to the front of the header.

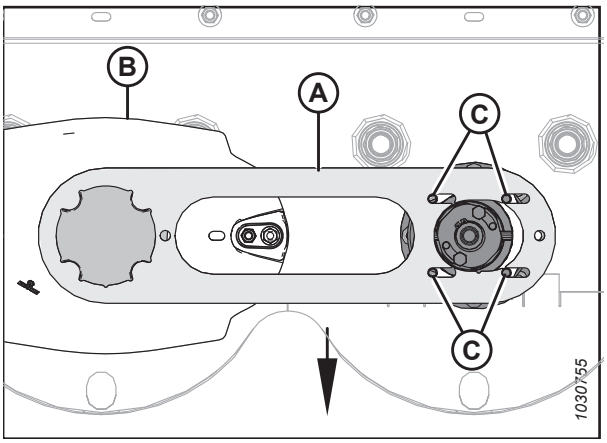


Figure 4.41: Alignment Tool

10. Ensure that hub (A) is fully seated into the cutterbar before tightening nuts (B).

11. Rotate spindle hub (A) to access the studs, and install 11 M12 lock nuts (B) and washers.

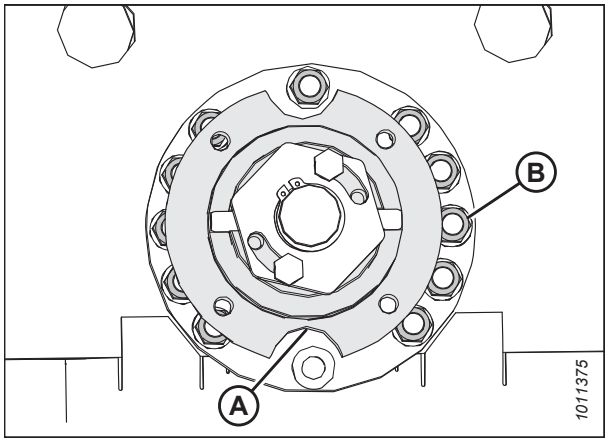


Figure 4.42: Left Spindle Hub

12. Torque the bolts to 50 Nm (37 lbf·ft) following the tightening pattern shown.

    NOTE:

    The hub has been removed from the illustration for clarity.

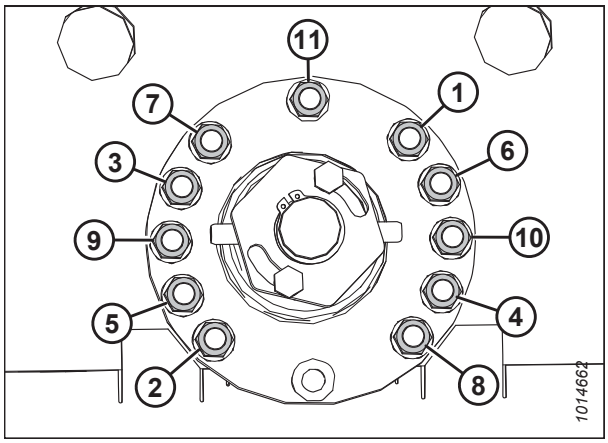


Figure 4.43: Tightening Pattern

13. Install spacer plate (A).

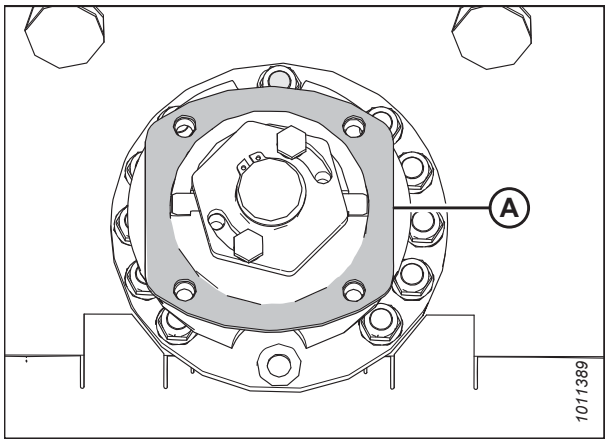


Figure 4.44: Spacer Plate

14. To prevent the disc from rotating while you are tightening the bolts, place a pin (or equivalent) in front hole (D) of the rock guard.

    IMPORTANT:

    The blades are oriented to cut in one direction or the other. Swap the entire disc when you are swapping spindles.

15. Position disc (A) on the spindle, ensuring that it is positioned at a 90° angle relative to the adjacent discs.

    NOTE:

    Turn disc (A) by hand to ensure that the disc blades do not contact each other or adjacent discs.

16. Install cutter disc cap (B) and secure the assembly with four M12 bolts and washers (C).

17. Torque the bolts to 85 Nm (63 lbf·ft).

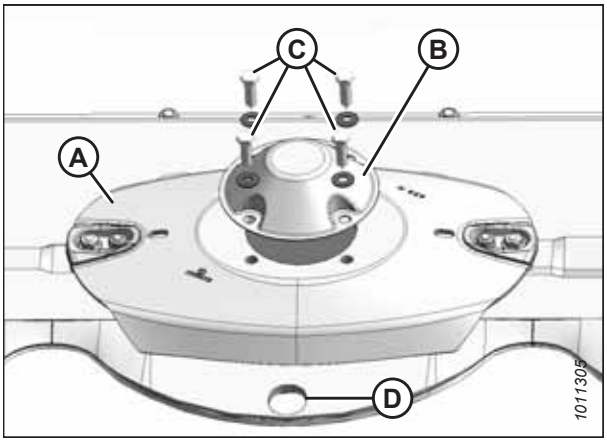


Figure 4.45: Cutterbar Disc and Cap

WARNING

Ensure that the cutterbar is completely clear of foreign objects. Foreign objects can be ejected with considerable force when the machine is started, which can result in serious injury or cause damage to the machine.

18. Remove the pin (or equivalent) from the front hole of the rock guard.

19. Close the cutterbar doors. For instructions, refer to *3.7.3 Closing Cutterbar Doors, page 117*.

4.5.4 Maintaining Disc Blades

Each disc has two blades attached at opposite ends that are free to rotate horizontally on a specially designed shoulder bolt.

Each blade (A) has two cutting edges and can be flipped over so that the blade does not need replacing as often.

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

IMPORTANT:

Always use factory replacement parts.

NOTE:

Discs are equipped with 18° bevel-down blades; 11° bevel-down blades are offered as a non-standard option. For more information, refer to the header parts catalog.

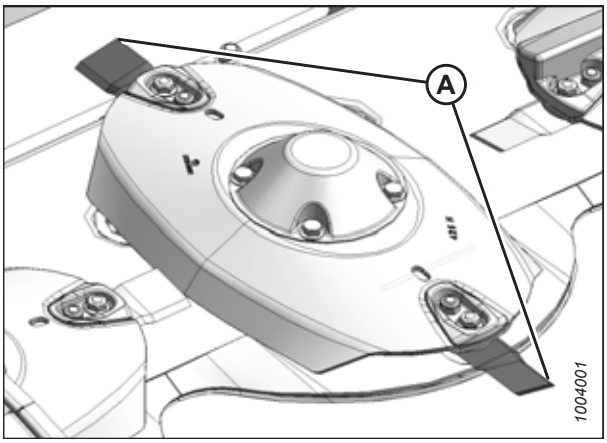


Figure 4.46: Disc Blades

Inspecting Disc Blades

Inspect the disc blades daily and flip or replace them as needed.

DANGER

To prevent injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key from the ignition before leaving the operator's seat or making adjustments to the machine. Never work on or beneath an unsupported header. If the header is fully raised, always engage the safety props. If the header is off of the ground but not raised to its full height, place blocks under the header.

WARNING

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

WARNING

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

IMPORTANT:

Damaged blades cut poorly and may damage the cutterbar. Replace damaged blades immediately.

1. Place the header in a position where you can access the component that will be serviced.
2. Shut down the engine, and remove the key from the ignition.
3. If the header is fully raised, engage the safety props. If the header is off the ground and not fully raised, place blocks under the header. Never work on or beneath an unsupported header.
4. On a daily basis, check that the disc blades are securely attached to the disc.
5. Inspect the blades for cracks, blade wear (A), and holes (B), which may have widened beyond safe operating limits (C).
6. Replace any potentially damaged blades immediately.

   IMPORTANT:

   Replace blades in pairs so that the disc remains balanced.

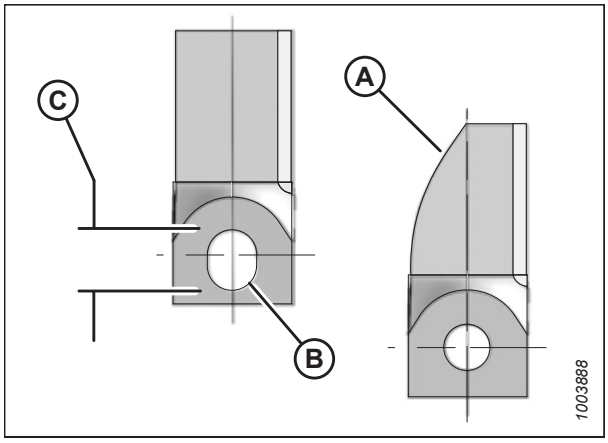


Figure 4.47: Disc Blades

A - Blade Wear to Center Line
B - Elongated Hole
C - Maximum Elongation 21 mm (13/16 in.)

IMPORTANT:

The disc blades have cutting edges on both sides so that 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 *3.9.1 Changing Cutterbar Crop Stream Configuration, page 123* for instructions.

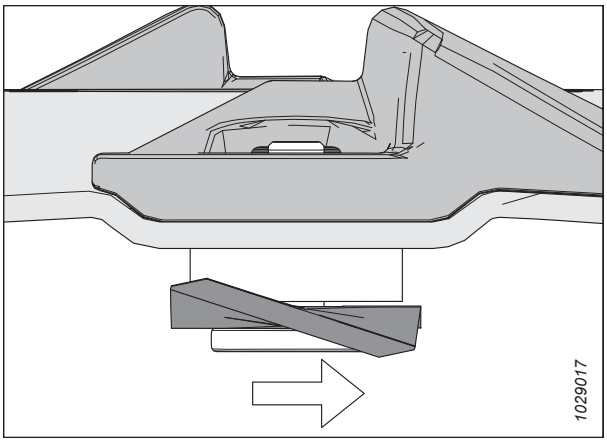


Figure 4.48: Counterclockwise Disc Rotation

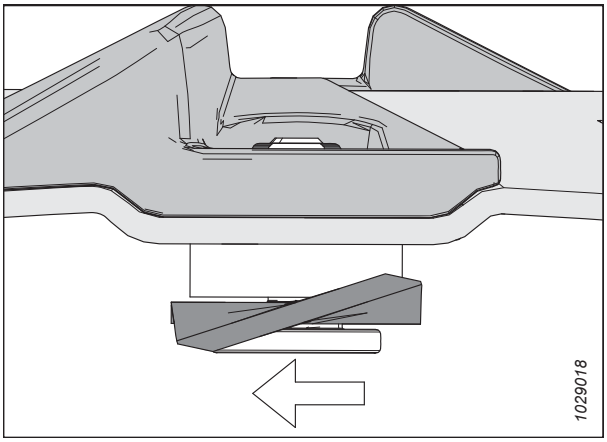


Figure 4.49: Clockwise Disc Rotation

Inspecting Disc Blade Hardware

Inspect the blade attachment hardware each time the blades are changed.

DANGER

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

WARNING

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

WARNING

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

For hardware replacement instructions, refer to *Removing Disc Blades, page 177* and *Installing Disc Blades, page 178*.

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

2. When inspecting the blades, check each blade-attachment bolt and replace it if:
   - The bolt has been removed and installed five times
   - Head (A) is worn flush with the bearing surface of the blade
   - Diameter (B) of the bolt neck has been worn down to 3 mm (1/8 in.) or less
   - The bolt is cracked (C)
   - The bolt is visibly distorted (D)
   - The bolt shows evidence of interference (E) with adjacent parts

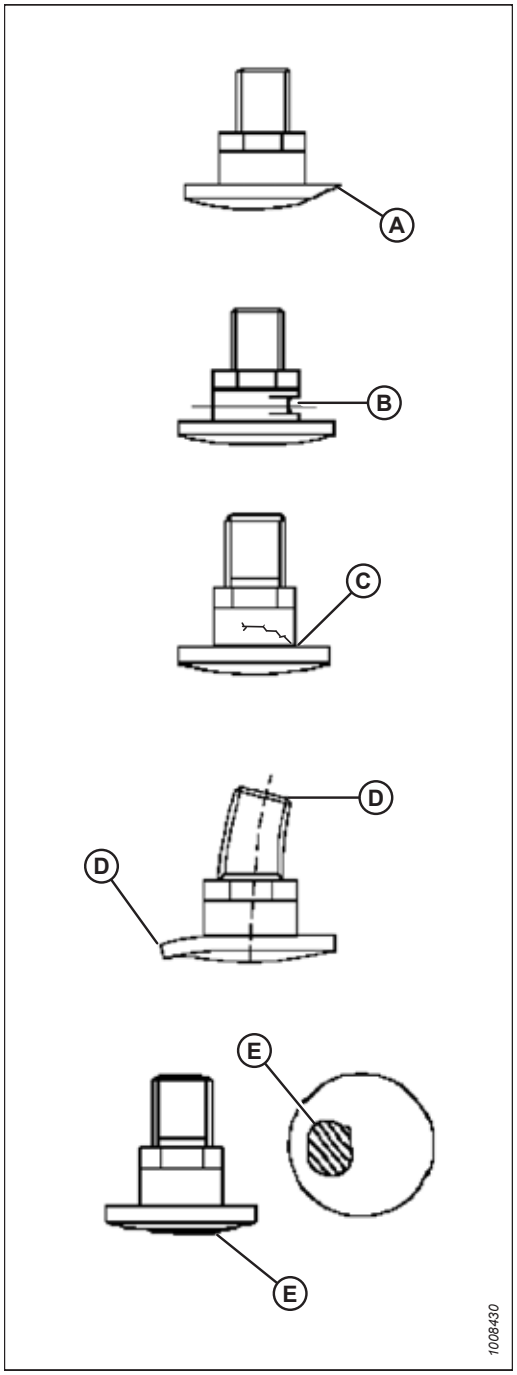


Figure 4.50: Disc Blade Bolts

3. Check the nuts holding the disc blades. Replace the nuts if:
   - The nut has been previously installed; nuts are one-time-use items only.
   - The nut shows signs of wear (A) such that the nut has lost more than half the original height (B) in one or more areas.
   - The nut is cracked.

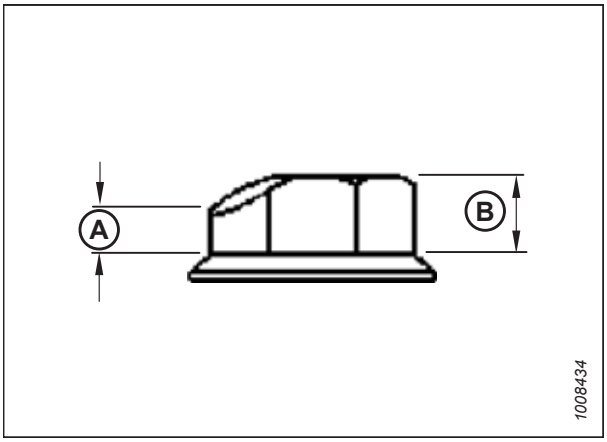


Figure 4.51: Disc Blade Nut

Removing Disc Blades

Use new nuts whenever you are replacing or flipping disc blades.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, stop the engine, remove the key from the ignition, and engage the windrower's lift cylinder safety props before going under the machine.

DANGER

Ensure that all bystanders have cleared the area.

WARNING

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

1. Raise the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Engage the windrower lift cylinder safety props. For instructions, refer to *3.3 Engaging and Disengaging Header Safety Props, page 27*.
4. Open the cutterbar doors. For instructions, refer to *3.7.1 Opening Cutterbar Doors – North America, page 115* or *3.7.2 Opening Cutterbar Doors – Export, page 116*.

5. Rotate disc (A) so blade (B) faces forward and lines up with hole (C) in the rock guard.

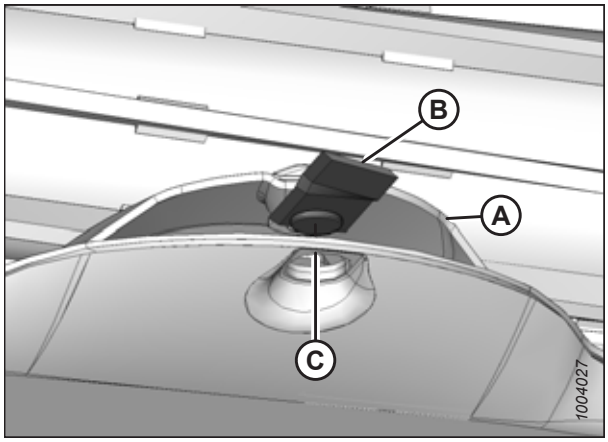


Figure 4.52: Disc Blade Aligned with Hole in Rock Guard

6. To prevent the disc from rotating while loosening the blade bolts, place a pin (or equivalent) in the front hole of the rock guard.
7. Clean debris from the blade attachment area.
8. Remove and discard nut (A).

   IMPORTANT:

   Nuts are one-time use items. When flipping or replacing a blade, use a **NEW** nut.
9. Remove shoulder bolt (B) and blade (C).

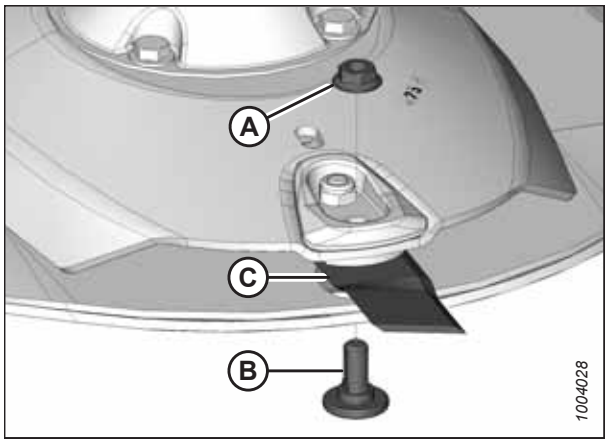


Figure 4.53: Disc Blade

Installing Disc Blades

Check the disc blade hardware for damage while you are installing the disc blades.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, stop the engine, remove the key from the ignition, and engage the windrower's lift cylinder safety props before going under the machine.

DANGER

Ensure that all bystanders have cleared the area.

WARNING

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

IMPORTANT:

If you are unsure in which direction the spindles rotate, refer to *3.9 Reconfiguring Cutterbar Crop Stream, page 122*.

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

2. To prevent the disc from rotating while you are tightening the blade bolts, place a pin (or equivalent) in the front hole of the rock guard.
3. Install new or reversed blade (A) with shoulder bolt (B) onto disc (C).

   IMPORTANT:

   Nuts are one-time use items. When flipping or replacing a blade, use a **NEW** nut.
4. Install new nut (D) and torque it to 125 Nm (92 lbf·ft).

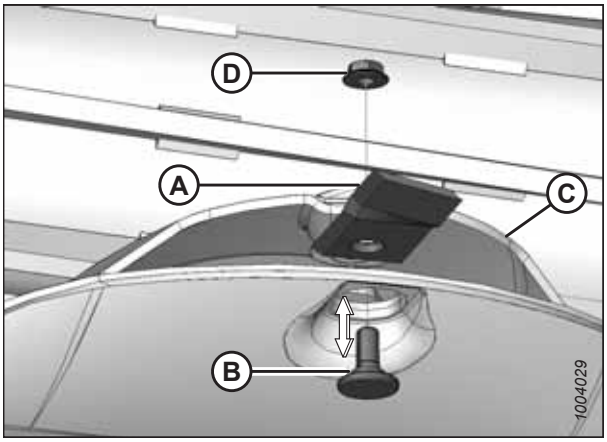


Figure 4.54: Disc Blade

WARNING

Ensure that the cutterbar is completely clear of foreign objects. Foreign objects can be ejected with considerable force when the machine is started, which can result in serious injury or cause damage to the machine.

5. Close the cutterbar doors. For instructions, refer to *3.7.3 Closing Cutterbar Doors, page 117*.

4.5.5 Accelerators

Accelerators are mounted on each outboard disc and are designed to quickly move cut material off the disc and into the conditioner.

Two pairs of accelerators are installed on an 8-disc cutterbar. There is one pair of accelerators (A) on the outboard disc at each end of the cutterbar.

Periodically inspect the accelerators for damage and loose or missing fasteners. Replace damaged components as necessary.

IMPORTANT:

Always replace accelerators in pairs to ensure that the discs remain balanced.

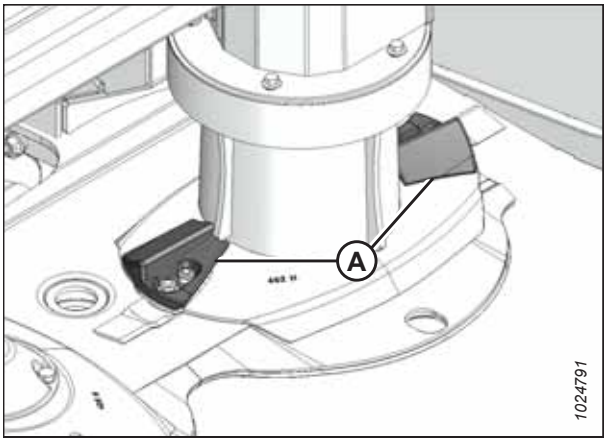


Figure 4.55: Eight Disc Cutterbar Accelerators

Inspecting Accelerators

Inspect the accelerators regularly to ensure that they are in good condition and can effectively move crop off the disc and into the conditioner.

DANGER

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

DANGER

Ensure that all bystanders have cleared the area.

WARNING

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

1. Raise the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Engage the windrower lift cylinder safety props. For instructions, refer to *3.3 Engaging and Disengaging Header Safety Props, page 27*.
4. Open the cutterbar doors. For instructions, refer to *3.7.1 Opening Cutterbar Doors – North America, page 115* or *3.7.2 Opening Cutterbar Doors – Export, page 116*.
5. Inspect accelerators (A) for damage and wear. Replace the accelerators if they are worn to 50% or more of their original height or if they no longer effectively move crop.

   IMPORTANT:

   Always replace accelerators in pairs to ensure that the discs remain balanced.
6. Tighten or replace loose or missing fasteners.

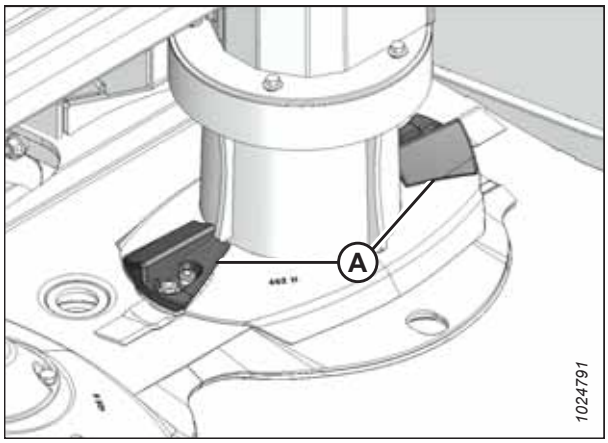


Figure 4.56: Eight Disc Cutterbar Accelerators

Removing Accelerators

Remove the accelerators when they are damaged or when they can no longer effectively move crop from the discs to the conditioner.

DANGER

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

DANGER

Ensure that all bystanders have cleared the area.

WARNING

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

IMPORTANT:

Always replace accelerators in pairs to ensure that the discs remain balanced.

1. Raise the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Engage the windrower lift cylinder safety props. For instructions, refer to *3.3 Engaging and Disengaging Header Safety Props, page 27*.
4. Open the cutterbar doors. For instructions, refer to *3.7.1 Opening Cutterbar Doors – North America, page 115* or *3.7.2 Opening Cutterbar Doors – Export, page 116*.
5. Remove nut (A), flange bolt (B), and disc blade (C) from the disc. Discard the nut.

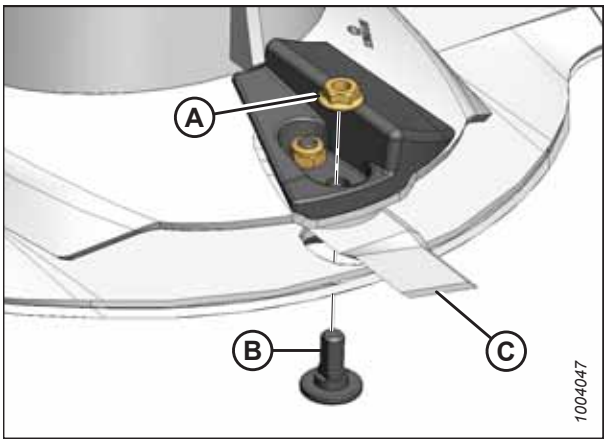


Figure 4.57: Accelerator Removal

6. Remove lock nut (A), accelerator (B), blade holder (C), and hex-socket bolt (D).
7. Repeat Steps *5, page 181* and *6, page 181* to remove the second accelerator.

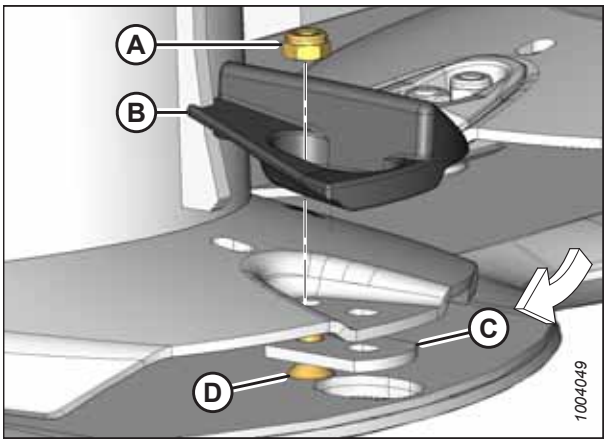


Figure 4.58: Accelerator Removal

Installing Accelerators

A new pair of accelerators should be installed when the old ones can no longer effectively move crop off the disc and into the conditioner.

WARNING

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

IMPORTANT:

Always replace accelerators in pairs to ensure that the discs remain balanced.

1. To prevent the cutterbar discs from rotating while you are tightening the blade bolts, place a wooden block between the two discs.

   IMPORTANT:

   Accelerators are unidirectional: both clockwise and counterclockwise accelerators are used on the cutterbar. Verify the direction of the disc before installing any accelerators. If you are unsure in which direction the spindle rotates, refer to *4.5.3 Replacing Cutterbar Spindles, page 164*.

2. Install lock nut (A), accelerator (B), blade holder (C), and hex-socket bolt (D). Do **NOT** tighten the hardware yet.

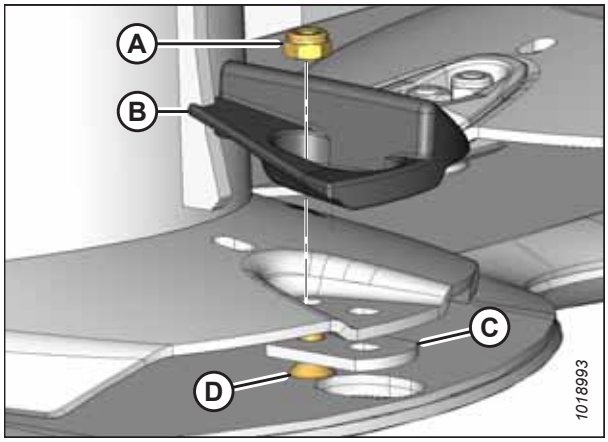


Figure 4.59: Accelerator Installation

3. Install new nut (A), flange bolt (B), and disc blade (C) onto the disc.

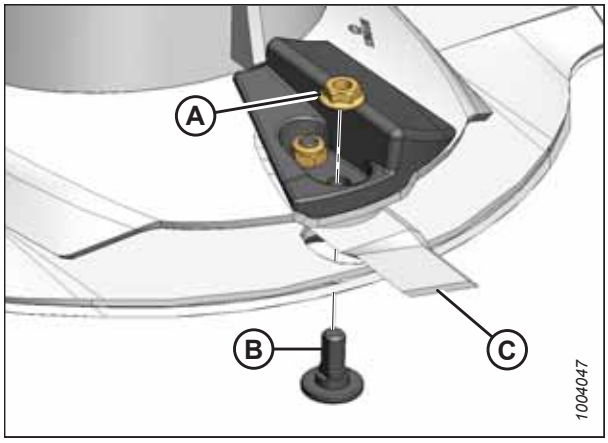


Figure 4.60: Accelerator Installation

4. Torque inside nut (A) to 58 Nm (43 lbf·ft).
5. Torque outside nut (B) (closest to the blade) to 125 Nm (92 lbf·ft).
6. Repeat Steps *1, page 182* to *5, page 182* to replace the second accelerator.

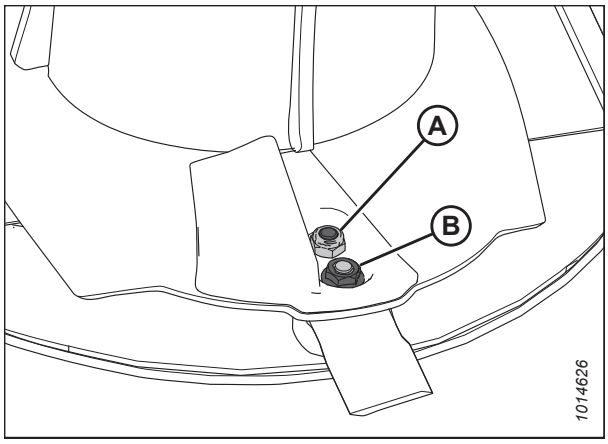


Figure 4.61: Accelerator Installation

WARNING

Ensure that the cutterbar is completely clear of foreign objects. Foreign objects can be ejected with considerable force when the machine is started, which can result in serious injury or cause damage to the machine.

7. Remove the wooden block from between the cutterbar discs.
8. Close the cutterbar doors. For instructions, refer to *3.7.3 Closing Cutterbar Doors, page 117*.

4.5.6 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 into contact with stones and other debris. Periodically inspect the rock guards for damage and replace them as necessary.

Inspecting Rock Guards

Rock guards protect the cutting blades from damage. Inspect them periodically to ensure that they are not damaged or worn out.

DANGER

To prevent injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key from the ignition before leaving the operator's seat or making adjustments to the machine. Never work on or beneath an unsupported header. If the header is fully raised, always engage the safety props. If the header is off of the ground but not raised to its full height, place blocks under the header.

WARNING

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. Shut down the engine, and remove the key from the ignition.
3. Engage the windrower's lift cylinder safety props. For instructions, refer to *3.3 Engaging and Disengaging Header Safety Props, page 27*.
4. Inspect the rock guards for damage. Replace any rock guard if it has been worn down to 75% or less of its original thickness.

   NOTE:

   The factory thickness of the rock guards is 5 mm (0.2 in.).
5. Check the guards for loose or missing fasteners. Tighten or replace the fasteners as needed.

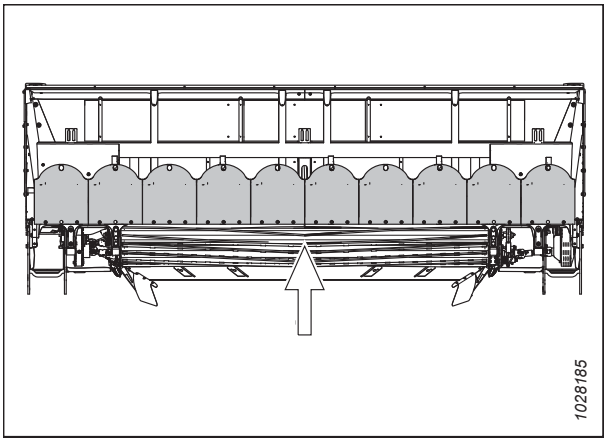


Figure 4.62: Rock Guards

Removing Inboard Rock Guards

Remove any damaged or worn rock guards to maximize the life of the cutting blades.

DANGER

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

WARNING

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. Shut down the engine, and remove the key from the ignition.
3. Engage the windrower lift cylinder safety props. For instructions, refer to *3.3 Engaging and Disengaging Header Safety Props, page 27*.
4. Remove two hex head screws, washers, and lock nuts (A).

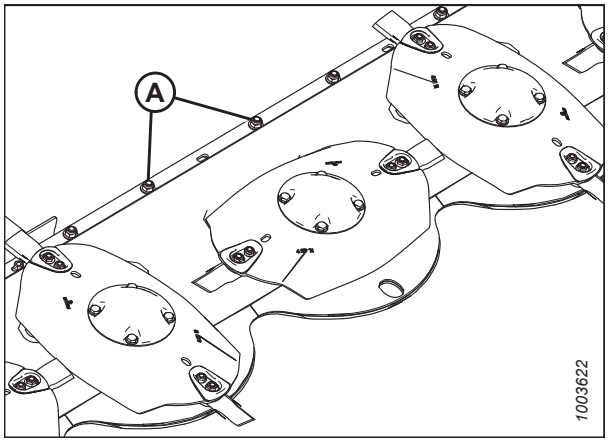


Figure 4.63: Inboard Rock Guards

5. Slide inboard rock guard (A) forward (in the direction of arrow [B]) and remove it.

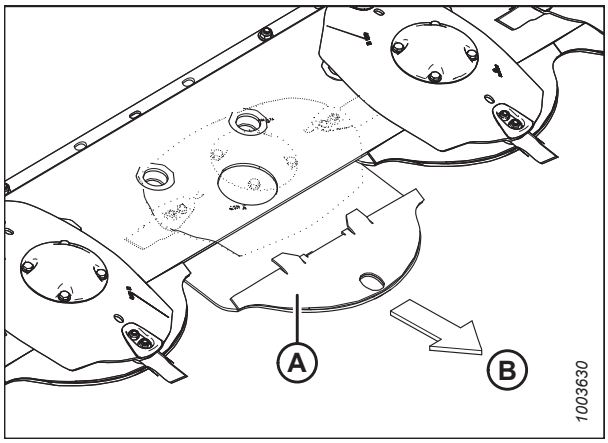


Figure 4.64: Inboard Rock Guards

Installing Inboard Rock Guards

When installing an inboard rock guard, ensure that the nuts securing the rock guards are installed on top of the cutterbar.

DANGER

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

WARNING

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. Shut down the engine, and remove the key from the ignition.
3. Engage the windrower lift cylinder safety props. For instructions, refer to *3.3 Engaging and Disengaging Header Safety Props, page 27*.
4. Guide the inboard rock guard onto the cutterbar until tabs (A) sit on top of the cutterbar, and the bottom back bolt holes in the rock guard line up with the holes in the cutterbar.

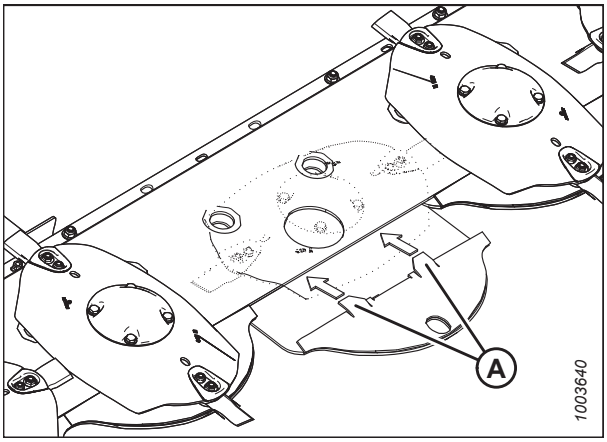


Figure 4.65: Inboard Rock Guards

5. Install two hex head screws, washers, and lock nuts (A). Torque the hardware to 68 Nm (50 lbf·ft).

   NOTE:

   Lock nuts (A) must be installed on top of the cutterbar.

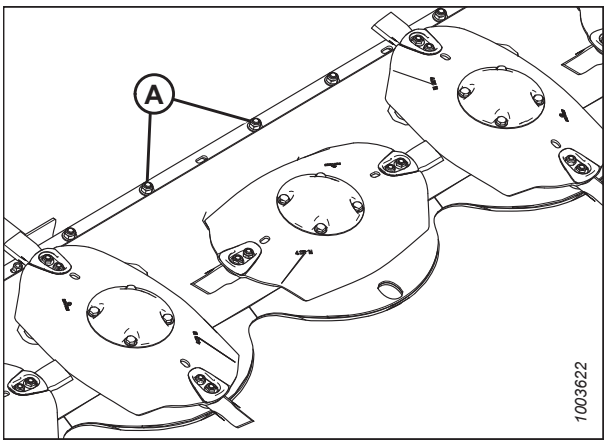


Figure 4.66: Inboard Rock Guards

Removing Outboard Rock Guards

The outboard rock guards are secured to the cutterbar with more hardware than the inboard rock guards.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, stop the engine, remove the key from the ignition, and engage the windrower's lift cylinder safety props before going under the machine.

WARNING

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. Shut down the engine, and remove the key from the ignition.
3. Engage the windrower lift cylinder safety props. For instructions, refer to *3.3 Engaging and Disengaging Header Safety Props, page 27*.
4. Locate rock guard (B) under the outboard end of the cutterbar. There is one guard on each end of the cutterbar.
5. Remove two hex head screws (A).
6. Remove washers and lock nuts (C) securing rock guard (B) to the cutterbar assembly.

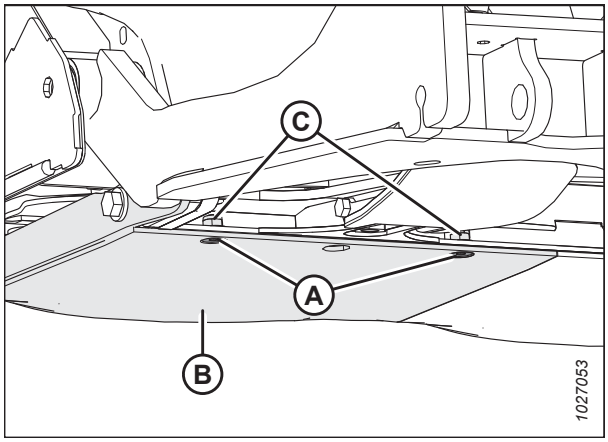


Figure 4.67: Left Outboard Rock Guard – Rear View

7. Remove bolt and washers (A).
8. Loosen bolt (B).
9. Remove rock guard (C) by sliding it forward.
10. Repeat Step *4, page 186* to Step *9, page 186* on the opposite side of the cutterbar.

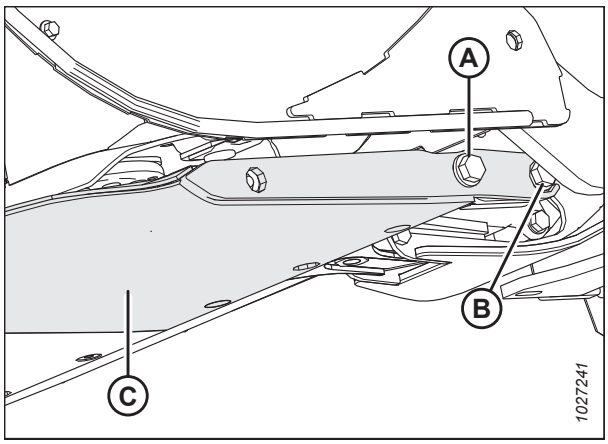


Figure 4.68: Left Outboard Rock Guard – Side View

Installing Outboard Rock Guards

Use a rubber mallet to properly install the outboard rock guard.

DANGER

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

WARNING

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. Shut down the engine, and remove the key from the ignition.
3. Engage the windrower lift cylinder safety props. For instructions, refer to *3.3 Engaging and Disengaging Header Safety Props, page 27*.
4. Remove any debris on the cutterbar which could obstruct the installation of the outboard rock guard.
5. Apply medium-strength threadlocker (Loctite® 242 or equivalent) to bolt (B).

   NOTE:

   Some parts have been removed from the illustration for clarity.
6. With a single washer, install bolt (B) onto the cutterbar.
7. Angle rock guard (A) outward as shown. Align the slot in the side plate between the washer and the cutterbar on rear M16 bolt (B).
8. Rotate the rock guard toward the center of the header until the tabs on the front of the rock guard are supported by the cutterbar.
9. Using a rubber mallet, tap rock guard (A) so that it is parallel and flush against cutterbar (B).

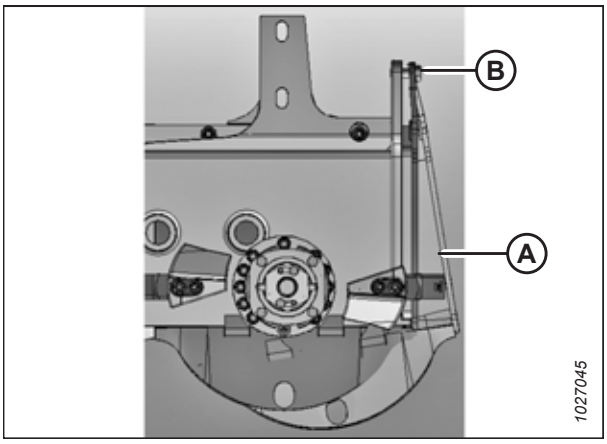


Figure 4.69: Left Outboard Rock Guard – Angled

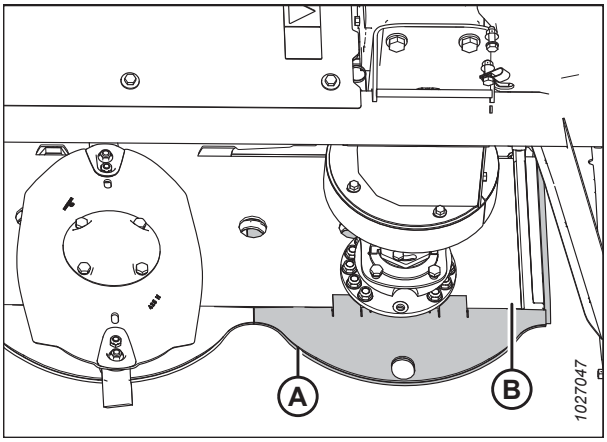


Figure 4.70: Outboard Rock Guard

10. Ensure that rock guards (B) and (C) are parallel. Gap (A) should be 5–7 mm (3/16–1/4 in.).

    NOTE:

    You may need to loosen the next one or two rock guards to adjust gap (A).

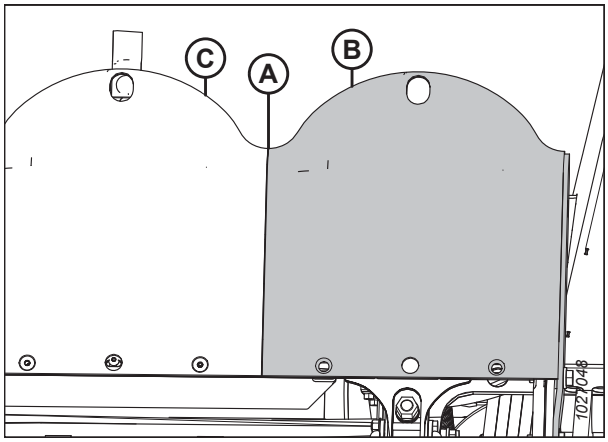


Figure 4.71: Outboard Rock Guard Installed

11. Apply medium-strength threadlocker (Loctite® 242 or equivalent) on two hex head screws (C). Loosely install the screws with lock nuts.
12. Install M16 x 60 bolt (A) and one washer (B) as shown. Torque bolts (A) and (D) to 251 Nm (185 lbf·ft).
13. Torque screws (C) to 54 Nm (40 lbf·ft).

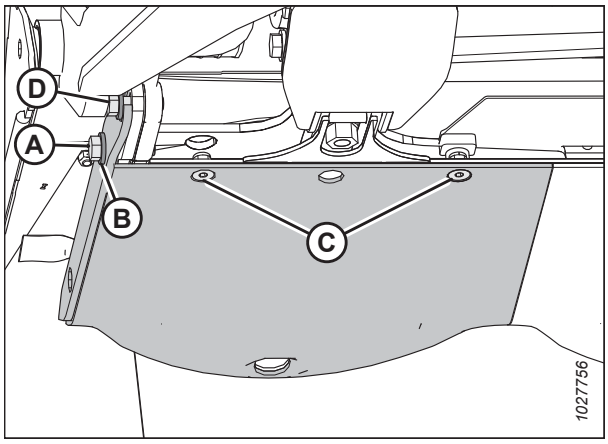


Figure 4.72: Left Outboard Rock Guard – Rear View

4.5.7 Maintaining Large Drums

Drums deliver cut material from the ends of the cutterbar and help maintain an even crop flow into the conditioner. Large drums are attached to the two outboard discs on 8-disc cutterbars.

NOTE:

Large drums measure 250 mm (9 7/8 in.) in diameter.

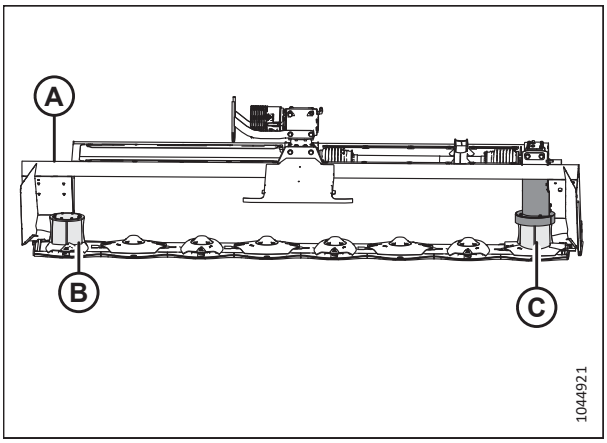


Figure 4.73: Cutterbars

A - Eight Disc Cutterbar **B - Large Drums**
C - Large Driven Drum

Inspecting Large Drums

Inspect the large drums daily for signs of damage or wear.

DANGER

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

DANGER

Ensure that all bystanders have cleared the area.

WARNING

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

1. Lower the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Open the cutterbar doors. For instructions, refer to *3.7.1 Opening Cutterbar Doors – North America, page 115* or *3.7.2 Opening Cutterbar Doors – Export, page 116*.

4. Inspect large drums (B) and (C) for signs of damage or wear. Replace the large drums if the drum feed bars are 50% or less of their original thickness. Do **NOT** repair the drums.
5. Examine the drums for large dents. Replace dented drums to prevent an imbalance in the cutterbar.
6. Tighten or replace loose or missing fasteners.

WARNING

Ensure that the cutterbar is completely clear of foreign objects. Foreign objects can be ejected with considerable force when the machine is started, which can result in serious injury or cause damage to the machine.

7. Close the cutterbar doors. For instructions, refer to *3.7.3 Closing Cutterbar Doors, page 117*.

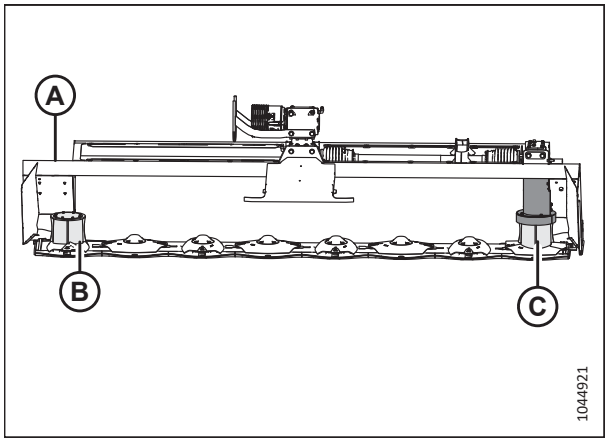


Figure 4.74: Cutterbars

A - Eight Disc Cutterbar **B - Large Drums**
C - Large Driven Drum

Removing Large Driven Drums and Driveline

The large driven drum is on the left end of the cutterbar.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, stop the engine, remove the key from the ignition, and engage the windrower's lift cylinder safety props before going under the machine.

DANGER

Ensure that all bystanders have cleared the area.

WARNING

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

1. Shut down the engine, and remove the key from the ignition.
2. Open the cutterbar doors. For instructions, refer to *3.7.1 Opening Cutterbar Doors – North America, page 115* or *3.7.2 Opening Cutterbar Doors – Export, page 116*.

3. Remove four M10 hex flange head bolts (A) and remove vertical driveshield (B).

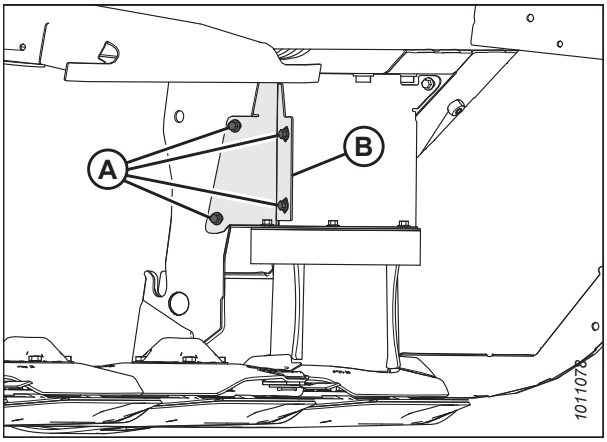


Figure 4.75: Vertical Drive Shield

4. Remove two M10 hex flange head bolts (A) and remove cover plate (B).

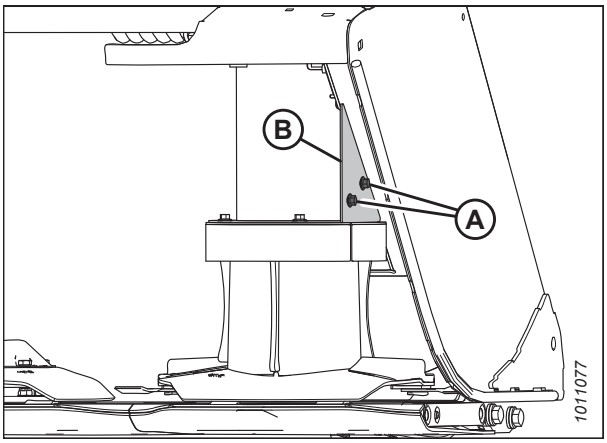


Figure 4.76: Cover Plate

5. Remove four M10 hex flange head bolts (A), and remove top plate (B) and drum top (C).

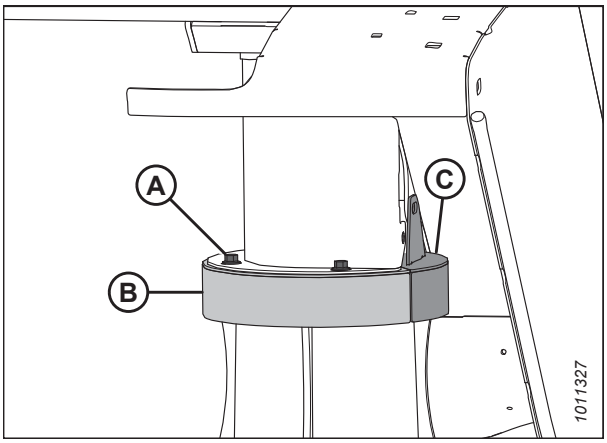


Figure 4.77: Top Plate and Drum Top

6. Remove one M10 x 20 hex flange head bolt (A), two M10 x 16 hex flange head bolts (B), and vertical shield (C).

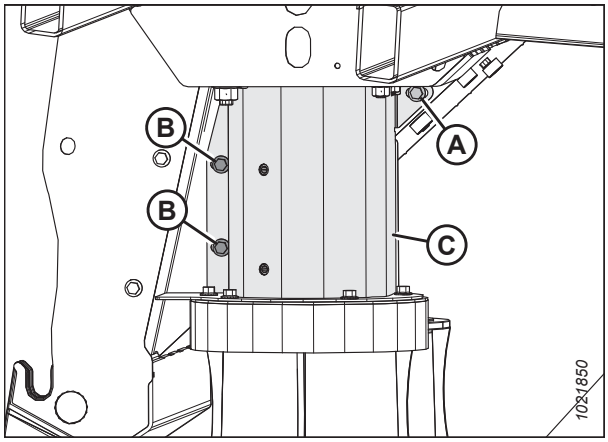


Figure 4.78: Vertical Shield

7. Remove eight M8 hex flange head bolts (A), and remove two drum shields (B).

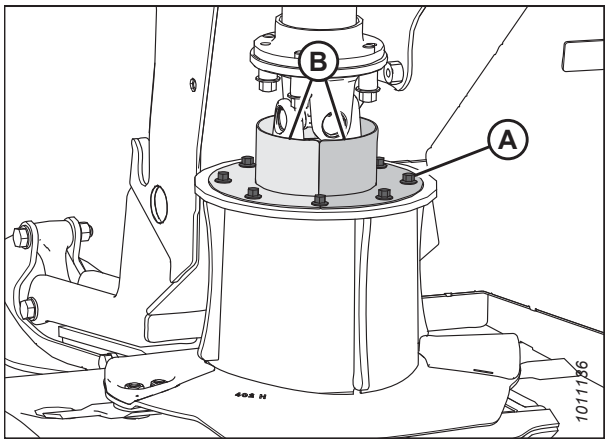


Figure 4.79: Drum Shields

8. Remove four M12 hex flange head bolts and spacers (A) securing driveline assembly (B) to hub drive (C).

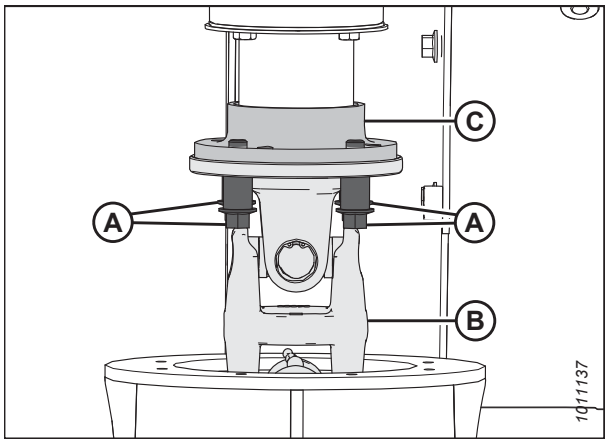


Figure 4.80: Hub Drive to Driveline Connection

9. Slide driveline (A) downwards, and tilt it to the side. Pull the driveline up and out of the drum.

   NOTE:

   The illustration shows a cutaway view of the drum and the tube shield.

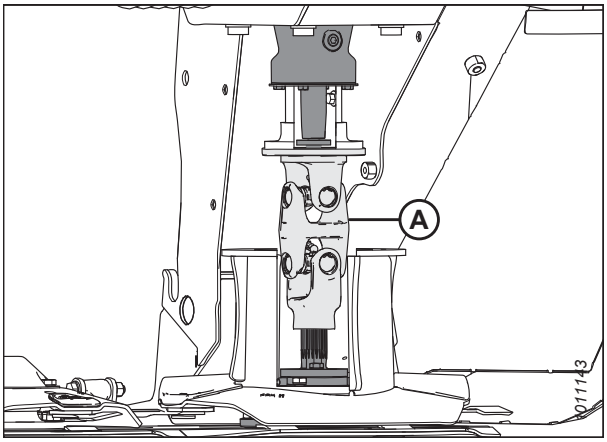


Figure 4.81: Hub Drive to Driveline Connection

10. Inside the drum, remove four M12 bolts and washers (A) holding the drum disc in place.
11. Remove the drum disc assembly.

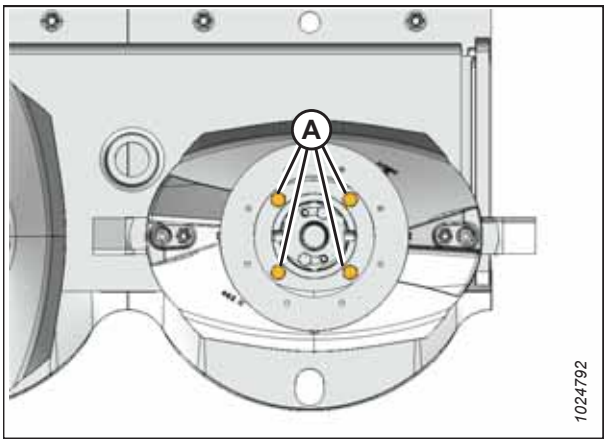


Figure 4.82: Driven Drum

Installing Large Driven Drums and Driveline

The large driven drum is on the left end of the cutterbar.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, stop the engine, remove the key from the ignition, and engage the windrower's lift cylinder safety props before going under the machine.

DANGER

Ensure that all bystanders have cleared the area.

WARNING

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

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

2. Ensure that spacer plate (A) is on the spindle.

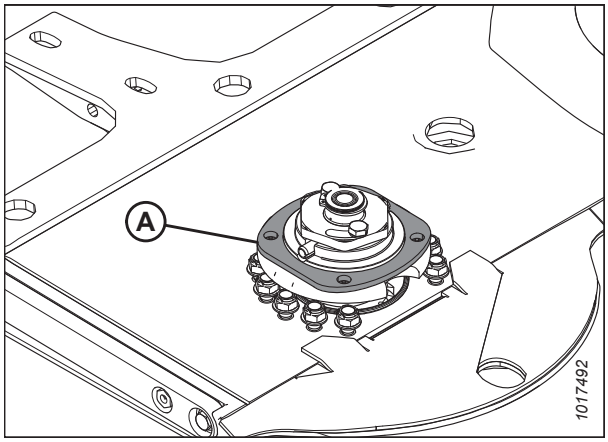


Figure 4.83: Spacer Plate

3. Position the drum disc assembly as shown.

   NOTE:

   Orient the disc so that the blades are perpendicular to those on the adjacent disc.

4. Install four M12 bolts and washers (A) that hold the drum disc in place. Torque the hardware to 85 Nm (63 lbf·ft).

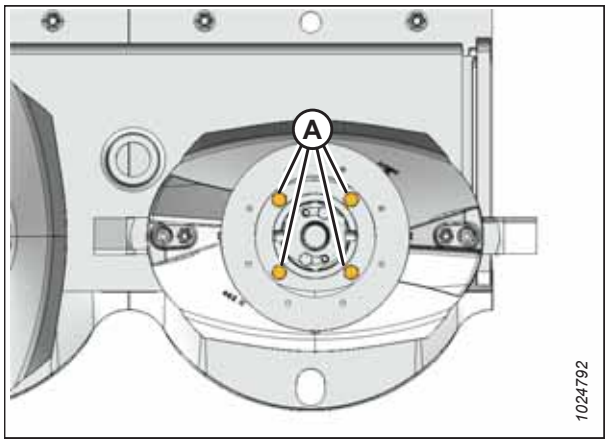


Figure 4.84: Drum

5. Lubricate spindle splines (A). For specifications, refer to the inside back cover of this manual.

   NOTE:

   The driveline U-joints were greased at the factory and are considered to be lubricated for life. No further lubrication is required.

   NOTE:

   The illustration shows a cutaway view of the drum and the tube shield.

6. Insert driveline (B) at an angle and guide it past hub drive (C) and drum (D).

7. Insert splined spindle end (A) into the splined bore on driveline (B).

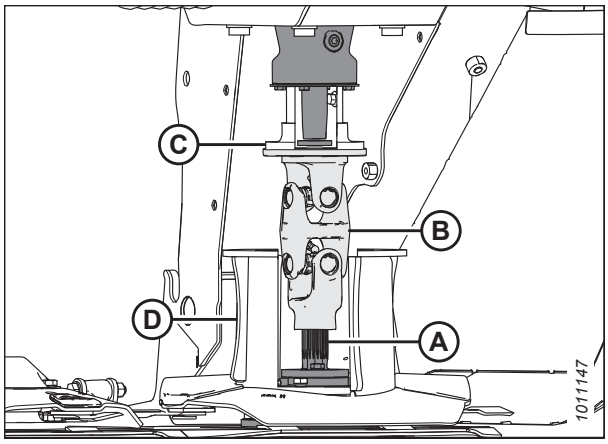


Figure 4.85: Hub Drive to Driveline Connection

8. Place a bead of medium-strength threadlocker (Loctite® 243 or equivalent) around the threads of four M12 hex flange head bolts (A).

9. Use the bolts and spacers to secure driveline assembly (B) to hub drive (C). Torque the bolts to 102 Nm (75 lbf·ft).

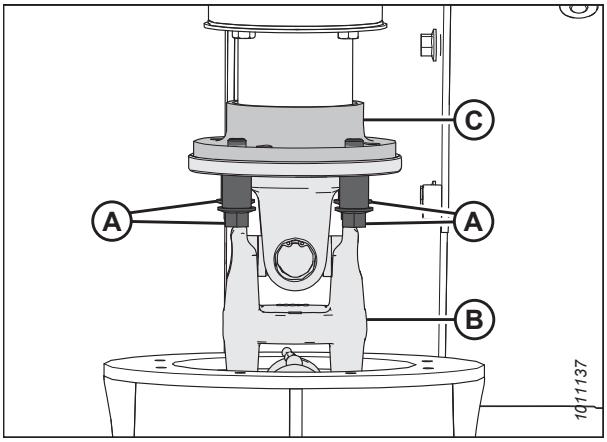


Figure 4.86: Hub Drive to Driveline Connection

10. Position two drum shields (B) as shown.

11. Apply a bead of medium-strength threadlocker (Loctite® 243 or equivalent) around the threads of eight M8 hex flange head bolts (A).

12. Use the bolts to secure the drum shields. Torque the bolts to 27 Nm (20 lbf·ft [239 lbf·in]).

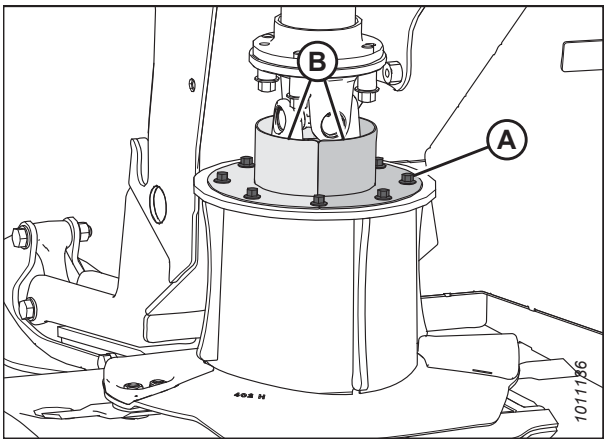


Figure 4.87: Drum Shield

13. Position vertical shield (A) as shown.

14. Apply a bead of medium-strength threadlocker (Loctite® 243 or equivalent) around the threads of one M10 hex flange head bolt (B) and two M10 hex flange head bolts (C).

15. Use bolts (B) and (C) to secure the vertical shield. Torque the bolts to 61 Nm (45 lbf·ft).

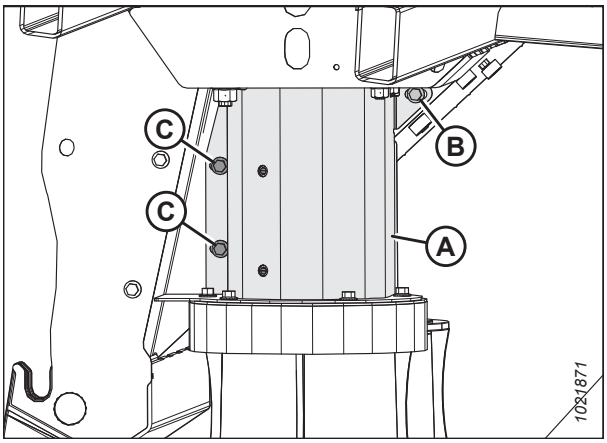


Figure 4.88: Vertical Shield

16. Position top plate (B) and drum top (C) onto the drum as shown.
17. Apply a bead of medium-strength threadlocker (Loctite® 243 or equivalent) around the threads of four M10 hex flange head bolts (A).
18. Use the bolts to secure the top plate and drum top. Torque the hardware to 61 Nm (45 lbf·ft).

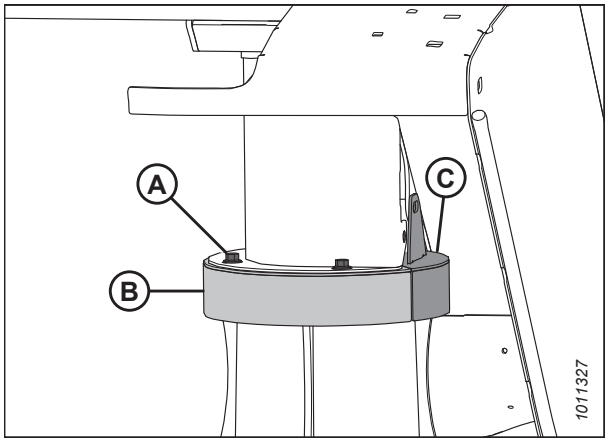


Figure 4.89: Top Plate and Drum Top

19. Apply a bead of medium-strength threadlocker (Loctite® 243 or equivalent) around the threads of M10 hex flange head bolt (B).
20. Install bolt (B) through cover plate (A) and top plate (C). Torque the bolt to 61 Nm (45 lbf·ft).
21. Apply a bead of medium-strength threadlocker (Loctite® 243 or equivalent) around the threads of M10 hex flange head bolt (D).
22. Install bolt (D) through cover plate (A) and vertical shield (E). Torque the bolt to 61 Nm (45 lbf·ft).

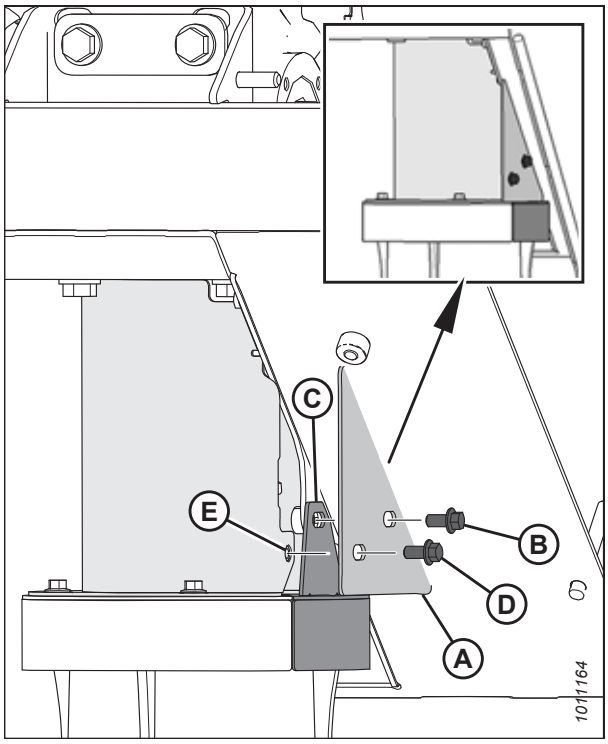


Figure 4.90: Cover Plate and Top Plate

23. Position vertical driveshield (B) as shown.
24. Apply a bead of medium-strength threadlocker (Loctite® 243 or equivalent) around the threads of four M10 hex flange head bolts (A).
25. Use bolts (A) to secure the vertical driveshield.
26. Torque the bolts to 61 Nm (45 lbf·ft).

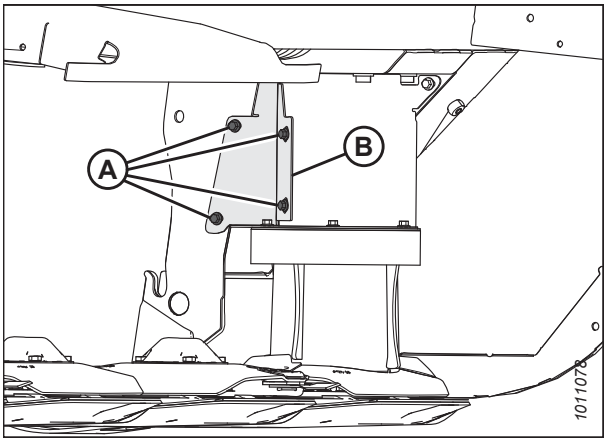


Figure 4.91: Vertical Shield

WARNING

Ensure that the cutterbar is completely clear of foreign objects. Foreign objects can be ejected with considerable force when the machine is started, which can result in serious injury or cause damage to the machine.

27. Close the cutterbar doors. For instructions, refer to *3.7.3 Closing Cutterbar Doors, page 117*.

Removing Large Non-Driven Drums

The non-driven large drums are held in place with four bolts.

DANGER

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

DANGER

Ensure that all bystanders have cleared the area.

WARNING

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

1. Shut down the engine, and remove the key from the ignition.
2. Open the cutterbar doors. For instructions, refer to *3.7.1 Opening Cutterbar Doors – North America, page 115* or *3.7.2 Opening Cutterbar Doors – Export, page 116*.

3. To prevent the disc from rotating while you are loosening the blade bolts, place a wooden block between the two cutterbar discs.
4. Remove eight M8 bolts and washers (A) securing cover (B) to the non-driven drum.
5. Remove the cover.

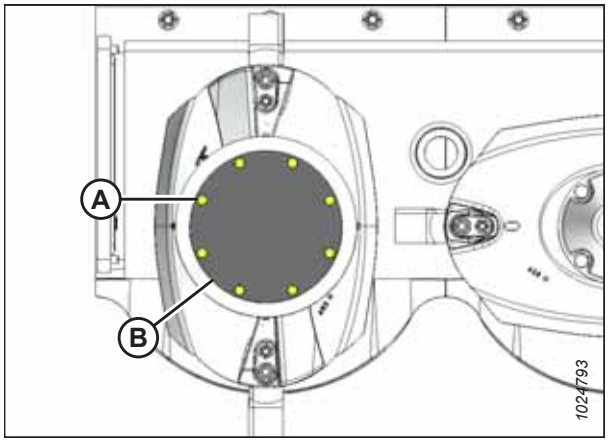


Figure 4.92: Non-Driven Drum

6. Remove four M10 bolts (A) from inside the drum.
7. Remove the wooden block.
8. Remove drum/disc (B).

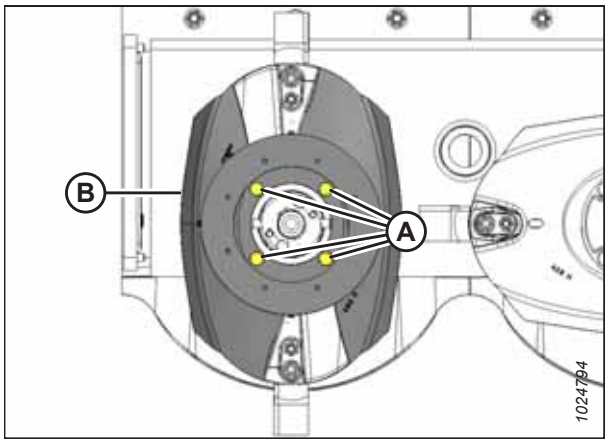


Figure 4.93: Non-Driven Drum

Installing Large Non-Driven Drums

Before installing the large non-driven drum, ensure that the spacer is in place.

DANGER

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

DANGER

Ensure that all bystanders have cleared the area.

WARNING

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

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

2. Ensure that spacer (A) is on the spindle.

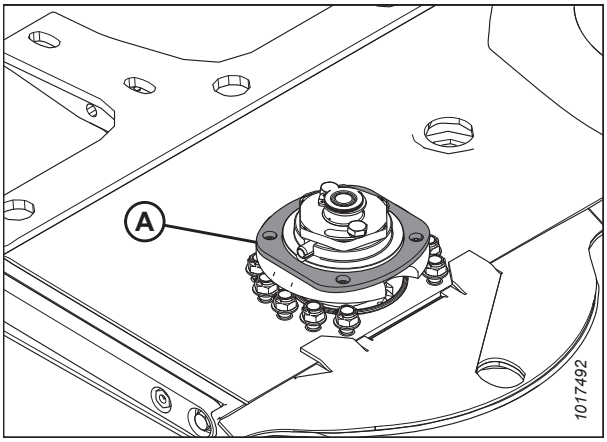


Figure 4.94: Non-Driven Spindle

3. Position non-driven drum/disc (B) onto the spindle as shown.
4. Install four M12 bolts and washers (A) to secure the drum and disc assembly to the spindle.
5. Torque the hardware to 85 Nm (63 lbf·ft).

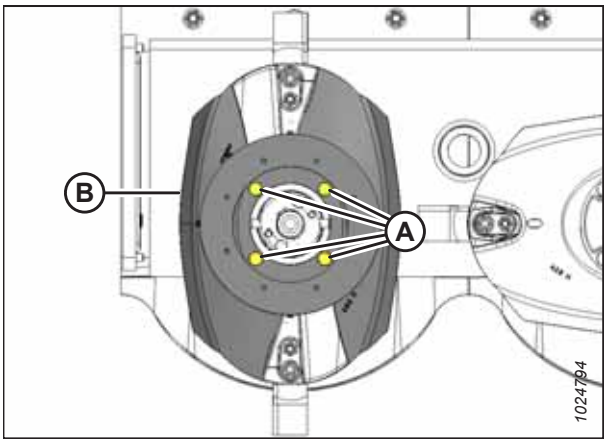


Figure 4.95: Non-Driven Drum

6. Install eight M8 bolts and washers (A) to secure cover (B) to the non-driven drum.
7. Torque the bolts to 28 Nm (21 lbf·ft [248 lbf·in]).

WARNING

Ensure that the cutterbar is completely clear of foreign objects. Foreign objects can be ejected with considerable force when the machine is started, which can result in serious injury or cause damage to the machine.

8. Close the cutterbar doors. For instructions, refer to *3.7.3 Closing Cutterbar Doors, page 117*.

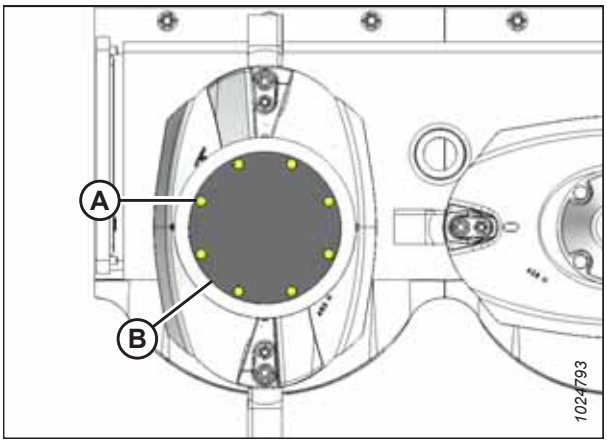


Figure 4.96: Non-Driven Drum

4.5.8 Replacing Cutterbar Spindle Shear Pin

To prevent damage to the cutterbar and drive systems, each disc is attached to a spindle containing a shear pin.

If the disc contacts a large object such as a stone or stump, pin (A) will shear and the disc will stop rotating and move upwards. Snap ring (B) ensures that the disc will remain attached to the spindle.

IMPORTANT:

- Ensure that the slots on both shear pins (A) are aligned horizontally.
- Spindles that rotate clockwise have right-leading threading.
- Spindles that rotate counterclockwise have left-leading threading.

NOTE:

Once the spindle has risen due to the shear pin, the spindle's bearing will become unloaded. The spindle will appear to be damaged. Do **NOT** replace the spindle simply because it has excessive play. Check the play of the spindle **AFTER** torquing the spindle nut and replacing the damaged shear pin.

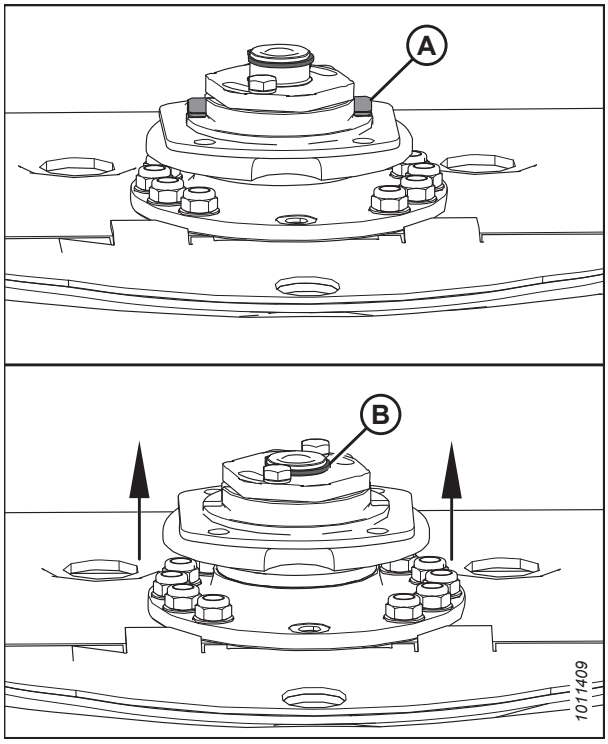


Figure 4.97: Cutterbar Spindles

Removing Cutterbar Spindle Shear Pin

Once the shear pin on a cutterbar spindle has broken, it will need to be removed.

DANGER

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

DANGER

Ensure that all bystanders have cleared the area.

WARNING

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. Shut down the engine, and remove the key from the ignition.
3. Engage the windrower lift safety props. For instructions, refer to *3.3 Engaging and Disengaging Header Safety Props, page 27*.
4. Open the cutterbar doors. For instructions, refer to *3.7.1 Opening Cutterbar Doors – North America, page 115* or *3.7.2 Opening Cutterbar Doors – Export, page 116*.
5. Clean any debris from the work area.
6. Remove cutterbar disc (A). For instructions, refer to *Removing Cutterbar Discs, page 162*.
7. Remove the drum.
   - To remove a driven drum (B), refer to *Removing Large Driven Drums and Driveline, page 190*.
   - To remove a non-driven drum (C), refer to *Removing Large Non-Driven Drums, page 197*.

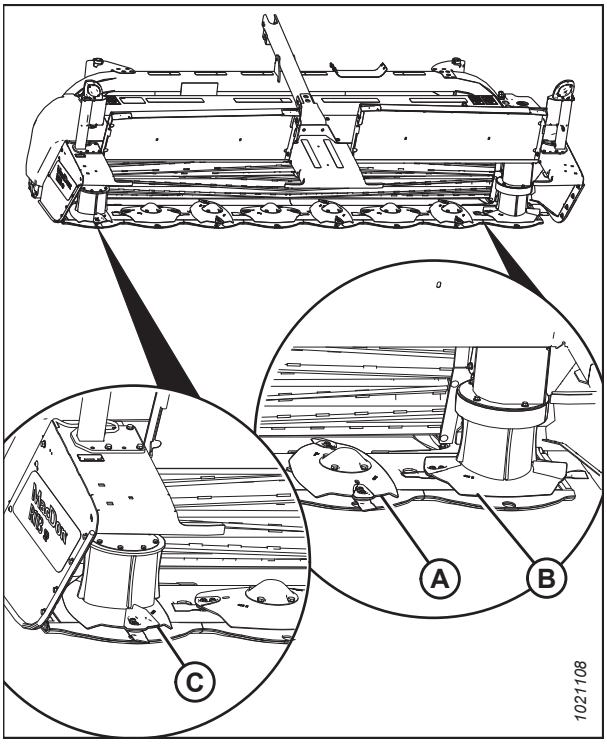


Figure 4.98: Cutterbar

8. Remove retaining ring (A).

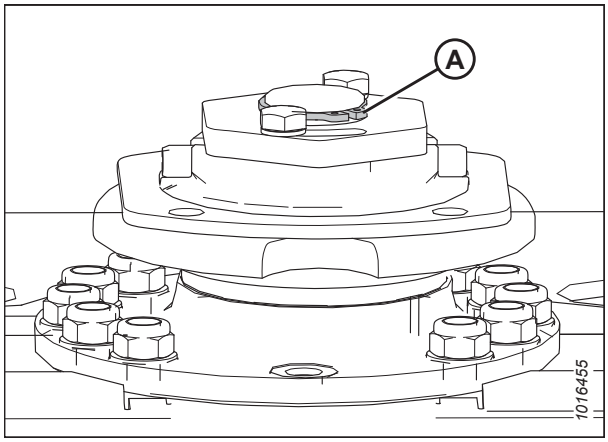


Figure 4.99: Cutterbar Spindle

9. Remove the M12 bolt securing Safecut spindle-nut wrench (A) to its storage location.
10. Remove the Safecut spindle-nut wrench and reinstall the M12 bolt for safekeeping.

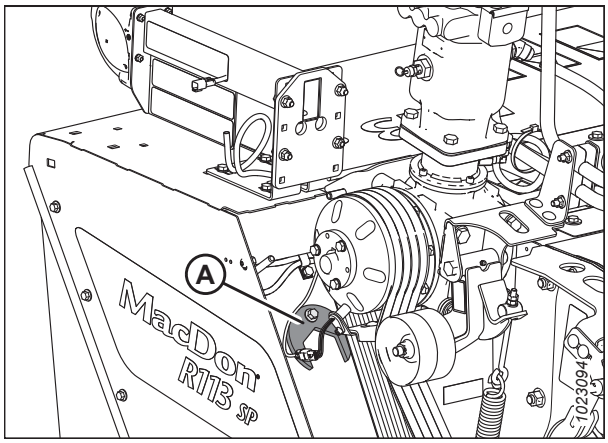


Figure 4.100: Safecut Spindle-Nut Wrench Location

IMPORTANT:

- Spindles that rotate clockwise have right-leading threading and a smooth top on spindle gear shaft (A).
- Spindles that rotate counterclockwise have left-leading threading and machined grooves on spindle gear shaft (B) and nut (C).
- If the spindle position in the cutterbar has changed, the rotational direction of that spindle **MUST** remain the same (that is, a clockwise spindle must maintain its clockwise rotation). Failure to maintain the rotation pattern can damage to the spindle and/or the cutterbar components.

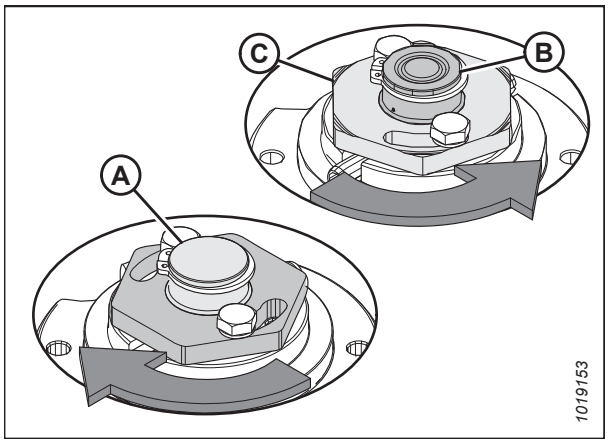


Figure 4.101: Cutterbar Spindles

11. Remove two M10 bolts and washers (A).

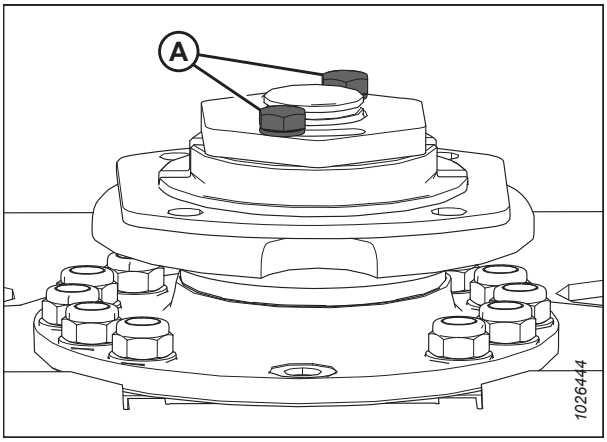


Figure 4.102: Cutterbar Spindle

12. Use the Safecut spindle-nut wrench to remove nut (A).

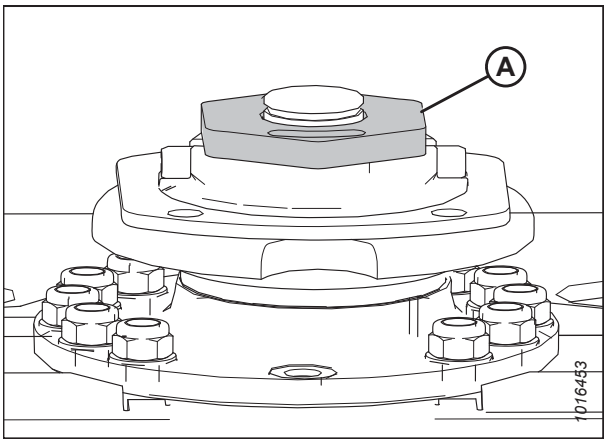


Figure 4.103: Cutterbar Spindle

13. Remove shear pins (B).

    IMPORTANT:

    Do **NOT** damage the pin bore on the pinion.

14. Remove hub (A).

15. Check the nut and the hub for damage. Replace them if necessary.

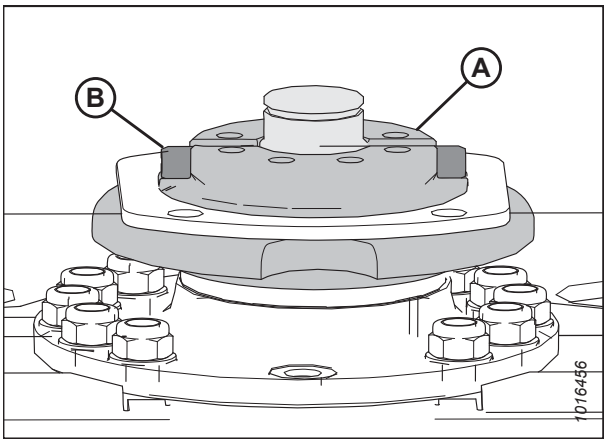


Figure 4.104: Cutterbar Spindle

Installing Cutterbar Spindle Shear Pin

Ensure that the grooves in the shear pin are parallel to the cutterbar when it is installed into the spindle.

DANGER

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

WARNING

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

1. Shut down the engine, and remove the key from the ignition.
2. Fill the space above the bearing with grease.
3. Place hub (A) on spindle (C).
4. Install shear pins (B) so that both shear pin grooves are parallel to the cutterbar.

   NOTE:

   Ensure that the ends of shear pins (B) do not protrude past the step in hub (A).

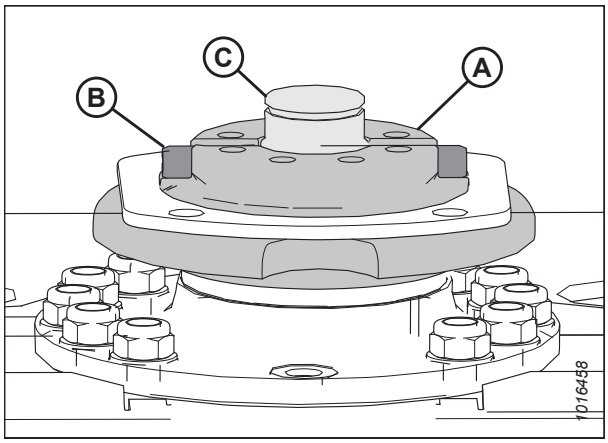


Figure 4.105: Cutterbar Spindle

5. Observe the orientation of the grooves in shear pins (A).

   IMPORTANT:

   The correct shear pin orientation is critical. Both shear pin grooves (A) must be parallel to the cutterbar. They do not need to be facing in the same direction.

   NOTE:

   The shaft has been removed from the illustration for clarity.

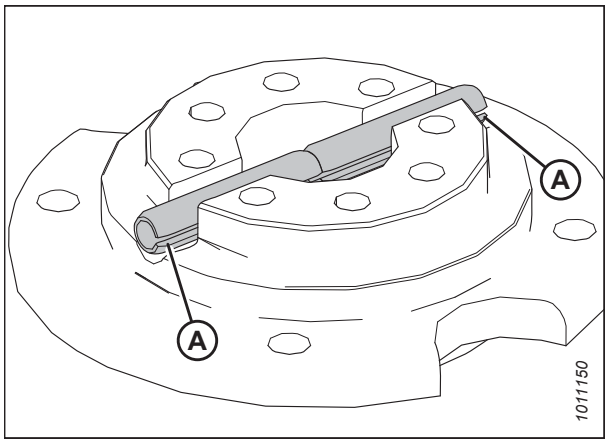


Figure 4.106: Shear Pin Orientation

6. Install nut (A).

7. Retrieve the Safecut spindle-nut wrench from the left shield plate.

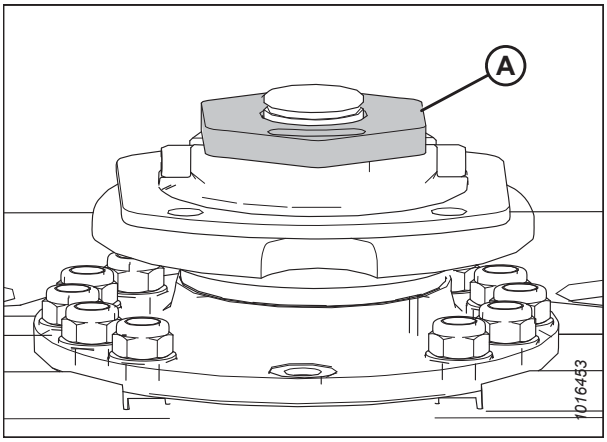


Figure 4.107: Cutterbar Spindle

8. Attach Safecut spindle-nut wrench (B) by 90° (D) to torque wrench (A).

   IMPORTANT:

   The Safecut spindle-nut wrench **MUST** be used with a torque wrench.

9. Position Safecut spindle-nut wrench (B) on spindle nut (C). Torque the nut to 300 Nm (221 lbf·ft).

10. Return Safecut spindle-nut wrench (B) to the left shield plate.

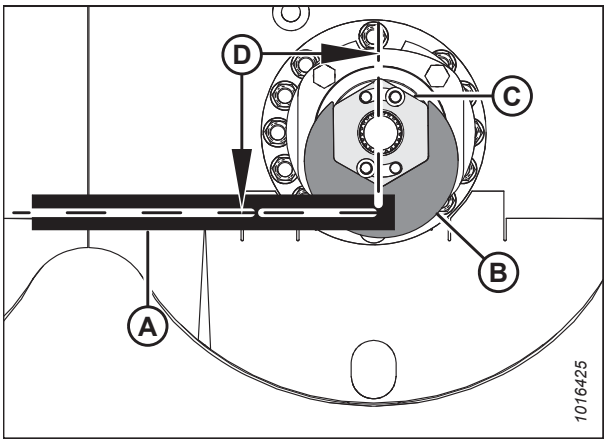


Figure 4.108: Spindle Nut

11. Inspect the threads of two M10 bolts (A) and replace them if they are damaged.

12. Install two M10 bolts and washers (A).

13. Torque the hardware to 55 Nm (40 lbf·ft).

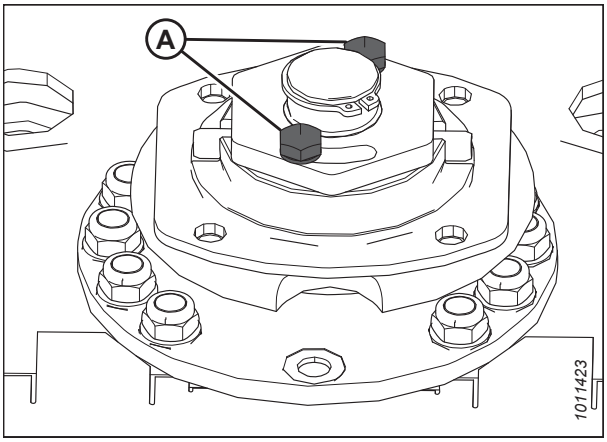


Figure 4.109: Cutterbar Spindle

14. Install retaining ring (A).

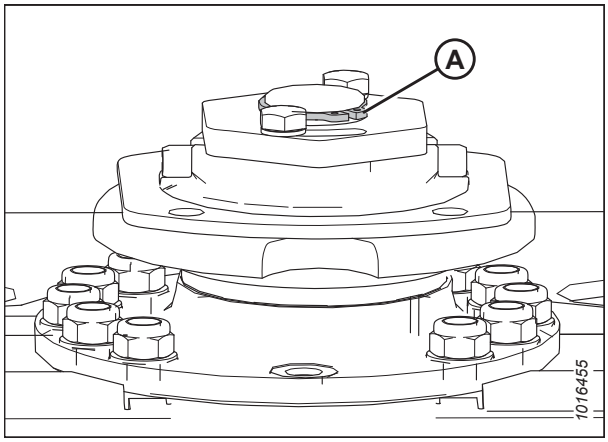


Figure 4.110: Cutterbar Spindle

15. Install the disc or drum. Refer to the relevant procedure:
    - Install cutterbar disc (A). For instructions, refer to *Installing Cutterbar Discs, page 163*.
    - Install driven drum (B). For instructions, refer to *Installing Large Driven Drums and Driveline, page 193*.
    - Install non-driven drum (C). For instructions, refer to *Installing Large Non-Driven Drums, page 198*.

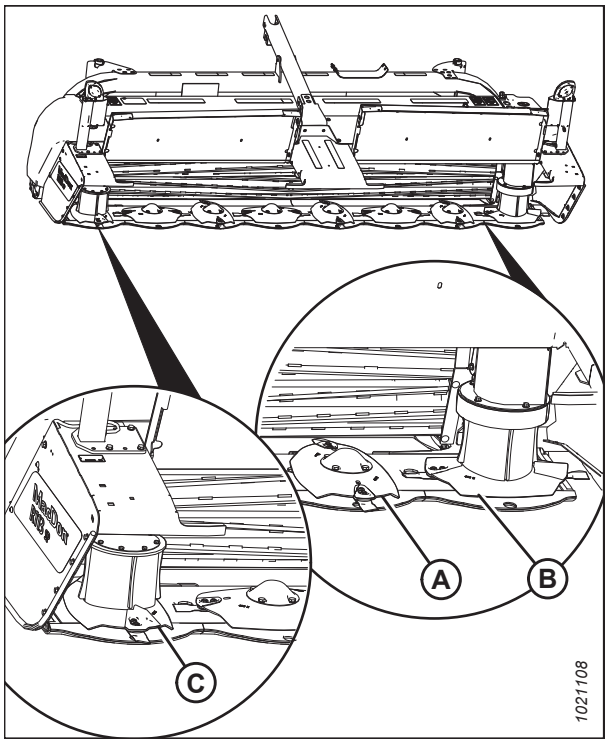


Figure 4.111: Cutterbar

WARNING

Ensure that the cutterbar is completely clear of foreign objects. Foreign objects can be ejected with considerable force when the machine is started, which can result in serious injury or cause damage to the machine.

16. Close the cutterbar doors. For instructions, refer to *3.7.3 Closing Cutterbar Doors, page 117*.

4.6 Conditioner Roll Timing Gearbox

The conditioner roll timing gearbox transfers power from the gearbox-driven lower roll to the upper roll.

Conditioner roll timing gearbox (A) is located inside the drive compartment at the right of the header.

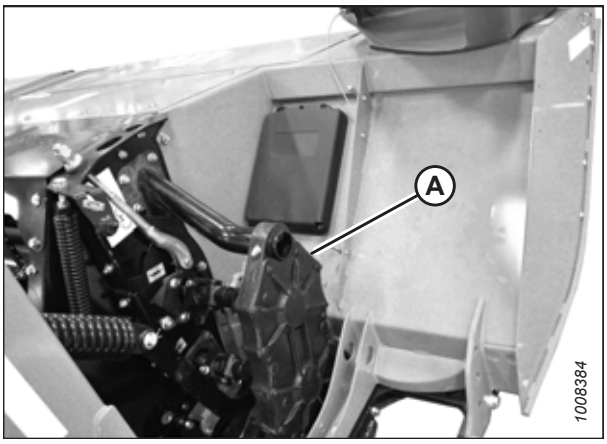


Figure 4.112: Conditioner Roll Timing Gearbox

4.6.1 Checking and Changing Lubricant in Conditioner Roll Timing Gearbox

The conditioner roll timing gearbox will need its lubricant changed from time to time. For information on how often this procedure should be performed, refer to *4.3.1 Maintenance Schedule/Record, page 144*.

DANGER

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

DANGER

Ensure that all bystanders have cleared the area.

1. Lower the header to the ground.
2. Adjust the angle (tilt) of the header so that the top of the conditioner is parallel with the ground.
3. Shut down the engine, and remove the key from the ignition.
4. Open the right driveshield. For instructions, refer to *3.6.1 Opening Driveshields, page 112*.

Checking the conditioner roll timing gearbox lubricant level:

5. Clean any dirt from around lubricant level sight glass (A) and breather (B) on the inboard side of the gearbox.

6. Ensure that the lubricant is level at the top of the sight glass. If necessary, add lubricant through breather (B). Refer to this manual's inside back cover for a list of recommended fluids, lubricants, and capacities.

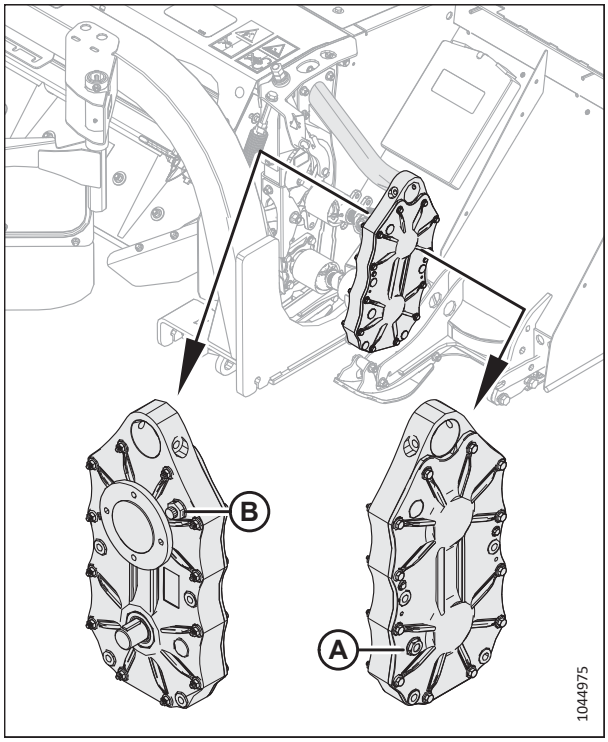


Figure 4.113: Roll Timing Gearbox

Changing the conditioner roll timing gearbox lubricant:

DANGER

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

7. Raise the header to access drain plug (A).
8. Shut down the engine, and remove the key from the ignition.
9. Engage the windrower lift cylinder safety props. For instructions, refer to *3.3 Engaging and Disengaging Header Safety Props, page 27*.
10. Clean around drain plug (A) on the bottom of the gearbox and around level plug (B) on the inboard side of the gearbox.
11. Place a 1 liter (1.05 qts [US]) container underneath the conditioner gearbox.
12. Remove drain plug (A) using a hex key.
13. Let the lubricant drain.
14. Replace drain plug (A) and tighten it.
15. Fill the gearbox with the volume of lubricant specified on the inside back cover of this manual or until the lubricant is visible in sight glass (B).
16. Properly dispose of the old lubricant.

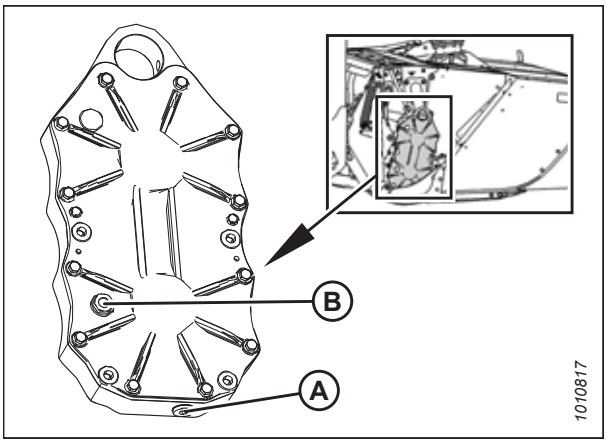


Figure 4.114: Roll Timing Gearbox

4.7 Servicing Header Drive Gearbox

The header drive gearbox transfers power from the hydraulic motor to the cutterbar and to the conditioner. It is located inside the drive compartment at the left end of the header.

The only regular servicing that header drive gearbox (A) requires is maintaining the lubricant level and changing the lubricant according to the intervals specified in this manual. For more information, refer to *4.3.1 Maintenance Schedule/Record, page 144*.

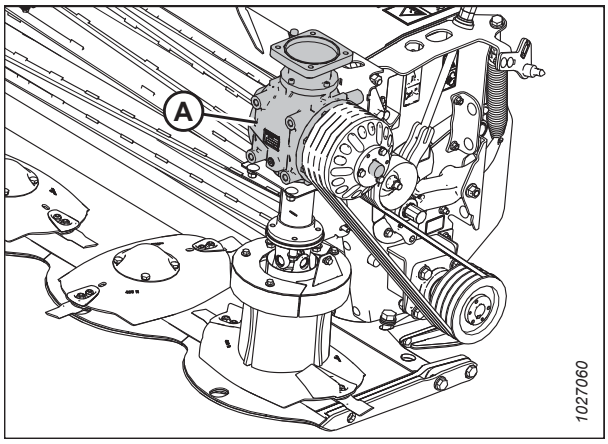


Figure 4.115: Header Drive Gearbox

4.7.1 Changing Header Drive Gearbox Lubricant

The header drive gearbox will need its lubricant changed from time to time. Refer to the Maintenance Schedule for information on how often this procedure should be performed.

DANGER

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

1. Lower the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Open the left cutterbar door. For instructions, refer to *3.7.1 Opening Cutterbar Doors – North America, page 115* or *3.7.2 Opening Cutterbar Doors – Export, page 116*.

4. Clean around lubricant drain plug (A) on the bottom of the gearbox and around lubricant level plug (B) on the inboard side of the gearbox.
5. Place a 4 liter (1 gal. [US]) container under drain (A).
6. Remove hex plug (A).
7. Allow sufficient time for lubricant to drain, replace lubricant drain plug (A), and tighten it.
8. Remove the lubricant level plug from bore hole (B).
9. Remove the plug from fill hole (C).
10. Add lubricant through fill hole (C) until the lubricant level is even with bore hole (B). For a list of recommended fluid and lubricant types and amounts, refer to this manual's inside back cover.
11. Replace the plugs in bore hole (B) and fill hole (C). Tighten the plugs.
12. Clean up any spilled lubricant and properly dispose of any used lubricant and rags.
13. Close the cutterbar door. For instructions, refer to *3.7.3 Closing Cutterbar Doors, page 117*.

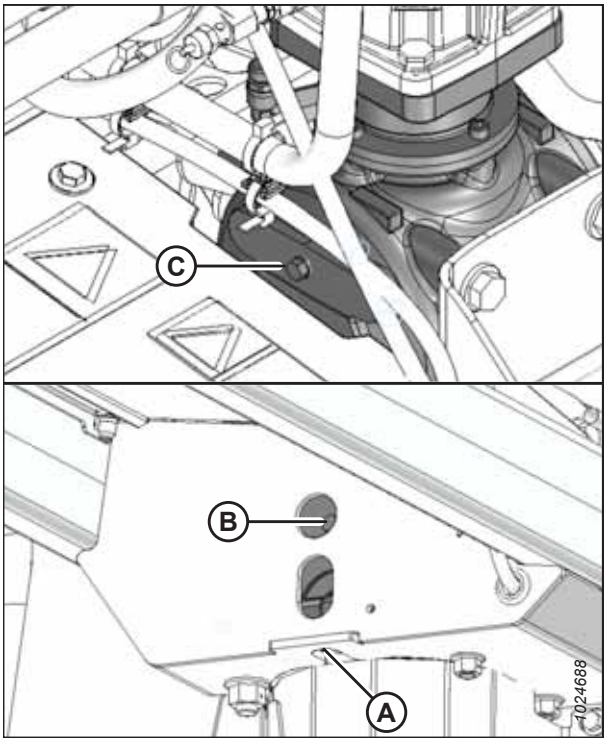


Figure 4.116: Header Drive Gearbox

4.8 Inspecting Cutterbar Doors

The cutterbar doors protect bystanders from flung objects and protect the blades from obstacles. They should be inspected periodically.

DANGER

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

1. Shut down the engine, and remove the key from the ignition.
2. Ensure that the door operates smoothly and lies flat when it is closed. Adjust the doors if necessary.
3. Inspect hinge pin bolts (A). If the bolts are loose, tighten them to 69 Nm (51 lbf·ft).
4. Check the door for cracks. Repair the door if any cracks are found.
5. Check the door for exposed metal and surface rust. Repair and repaint the door if necessary.
6. Check shield/curtain bolts (B) and replace them if they are missing. If they are loose, tighten them.
7. Repeat Step *3, page 212* to Step *6, page 212* for the other cutterbar door.

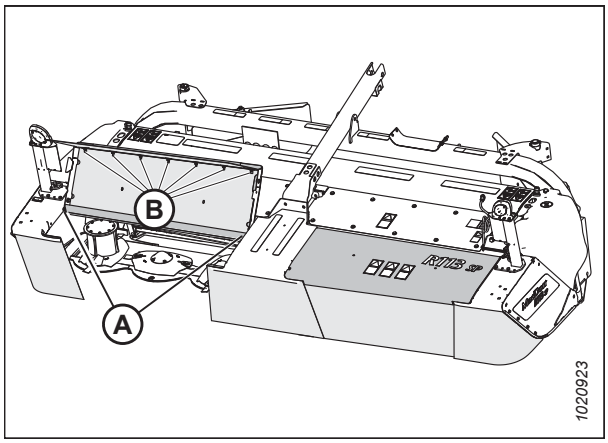


Figure 4.117: Right Cutterbar Door Open

4.9 Maintaining Curtains

The curtains prevent objects from being ejected from the cutterbar area. Always lower the curtains down when operating the header.

Rubber curtains are installed at the following locations:

- Inboard curtain (A) is attached to the center fixed cover
- Door curtains (B) is attached to each cutterbar door
- Outboard curtains (C) is attached to each front corner

Replace the curtains if they become worn or damaged.

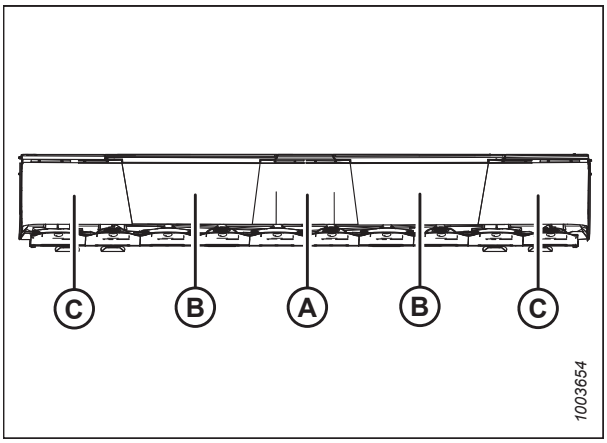


Figure 4.118: Cutterbar Curtains

4.9.1 Inspecting Curtains

The cutterbar curtains should be inspected periodically for damage and loose or missing hardware.

DANGER

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

WARNING

To reduce the risk of personal injury and machine damage, do NOT operate the machine without all the cutterbar doors down or without curtains installed and in good condition. Objects in the path of the blades can eject with considerable force when the machine is started.

1. Shut down the engine, and remove the key from the ignition.
2. Check cutterbar curtains (A) for the following conditions:
   - Rips and tears. If any are found, replace the curtain.
   - Cracking. While the curtain may look whole, this is an indicator that failure is imminent, and so the curtain should be replaced.
   - Missing bolts. Replace any missing hardware before operating the machine.

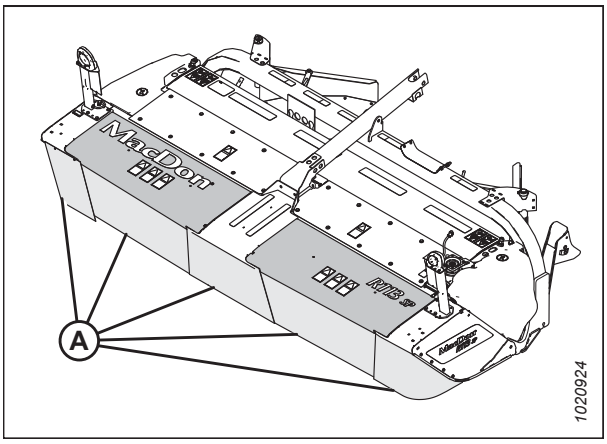


Figure 4.119: Cutterbar Curtains

4.9.2 Removing Cutterbar Door Curtains

The procedure for removing the cutterbar door curtains is the same for both doors.

DANGER

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

DANGER

Ensure that all bystanders have cleared the area.

WARNING

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

1. Shut down the engine, and remove the key from the ignition.
2. Open the cutterbar doors. For instructions, refer to *3.7.1 Opening Cutterbar Doors – North America, page 115* or *3.7.2 Opening Cutterbar Doors – Export, page 116*.
3. Remove seven nuts (A) from the bolt studs.
4. Remove aluminum liner (B).
5. Remove curtain (C).
6. Repeat Step *3, page 214* to Step *5, page 214* for the other cutterbar door.

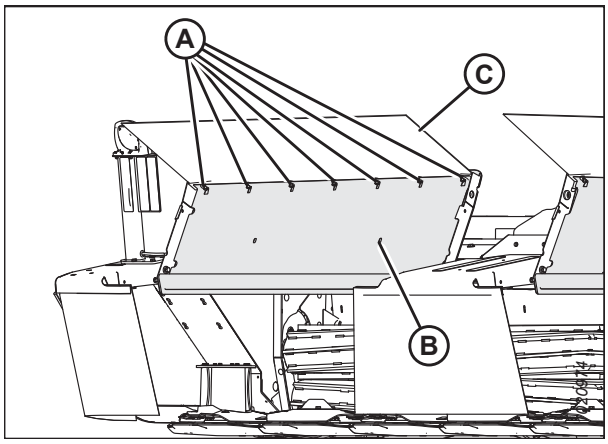


Figure 4.120: Cutterbar Door

4.9.3 Installing Cutterbar Door Curtains

Do **NOT** overtighten the nuts when installing the cutterbar door curtains.

DANGER

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

WARNING

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

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

2. Insert seven cutterbar door stud bolts (B) into the precut holes on curtain (A).
3. Install seven large washers (C).
4. Install liner panel (D) against the washers.
5. Install seven nuts (E) onto the bolt studs. Torque the nuts to 28 Nm (21 lbf·ft [248 lbf·in]).

   IMPORTANT:

   To avoid damaging the bolt studs, do **NOT** overtighten the nuts.
6. Close the cutterbar doors. For instructions, refer to *3.7.3 Closing Cutterbar Doors, page 117*.

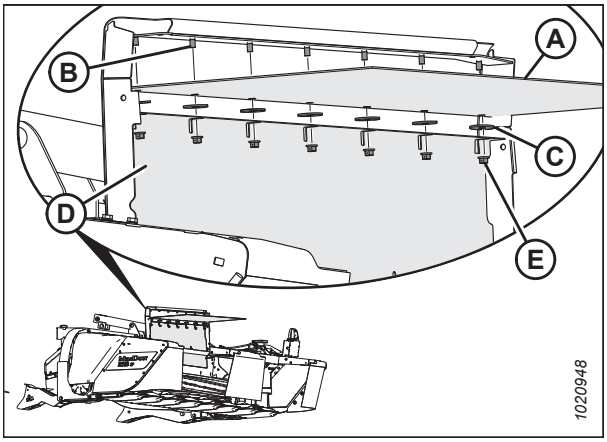


Figure 4.121: Cutterbar Curtain

4.9.4 Removing Cutterbar Inboard Curtain

Remove the cutterbar inboard curtain if it is torn or cracked.

DANGER

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

WARNING

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

1. Shut down the engine, and remove the key from the ignition.
2. Open the cutterbar doors. For instructions, refer to *3.7.1 Opening Cutterbar Doors – North America, page 115* or *3.7.2 Opening Cutterbar Doors – Export, page 116*.
3. Remove two M10 carriage head bolts (A) and nuts securing curtain assembly (B) to the rotary disc header, and remove the curtain assembly.

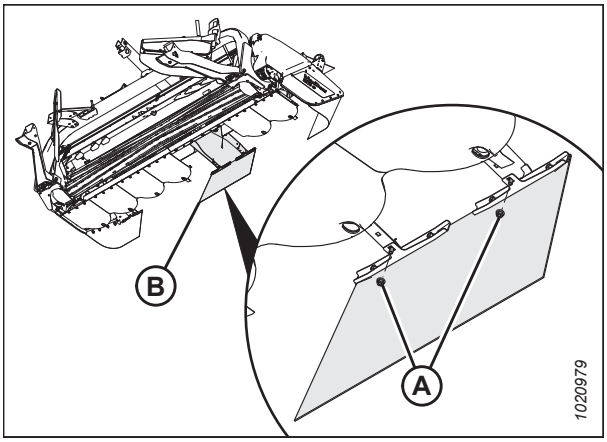


Figure 4.122: Inboard Curtain

4. Remove four nuts (A) from the studs on the center shield.
5. Remove two curtain brackets (B).
6. Remove the curtain.

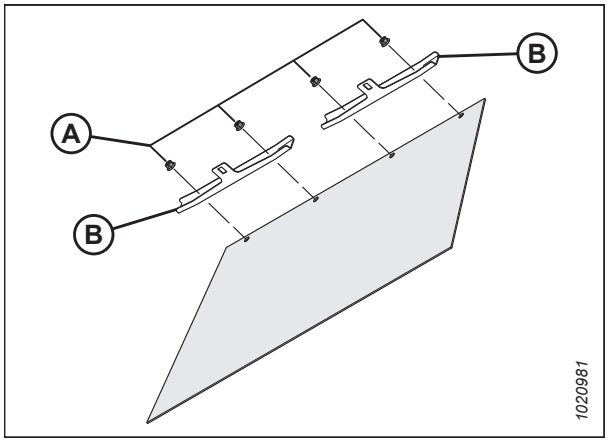


Figure 4.123: Inboard Curtain

4.9.5 Installing Cutterbar Inboard Curtain

Do **NOT** overtighten the nuts when installing the inboard curtain.

DANGER

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

WARNING

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

1. Shut down the engine, and remove the key from the ignition.
2. Open the cutterbar doors. For instructions, refer to *3.7.1 Opening Cutterbar Doors – North America, page 115* or *3.7.2 Opening Cutterbar Doors – Export, page 116*.
3. Install the curtain onto the studs on the center shield. Install two curtain brackets (B) and secure the brackets to the curtain with four nuts (A).
4. Torque the hardware to 28 Nm (20.7 lbf·ft [248 lbf·in]).

   IMPORTANT:

   To avoid damaging the bolts, do **NOT** overtighten the nuts.

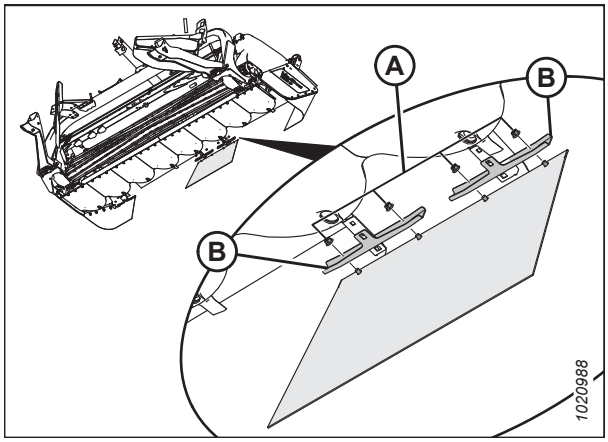


Figure 4.124: Inboard Curtain

5. Secure two curtain brackets (A) to the center shield using two M10 carriage head bolts and nuts (B).

6. Torque bolts (B) to 39 Nm (29 lbf·ft).

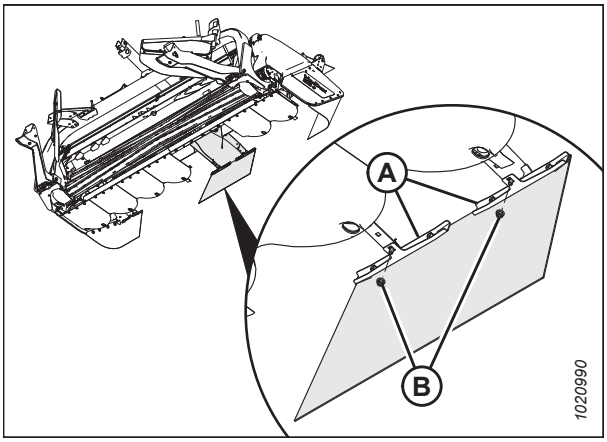


Figure 4.125: Inboard Curtain

4.9.6 Removing Outboard Curtains

Remove the outboard curtains if they are damaged or cracked.

DANGER

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

WARNING

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

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

2. Open the cutterbar doors. For instructions, refer to *3.7.1 Opening Cutterbar Doors – North America, page 115* or *3.7.2 Opening Cutterbar Doors – Export, page 116*.

3. Remove four bolts, large washers, and nuts (A) securing outboard curtain (B) to the endsheet.

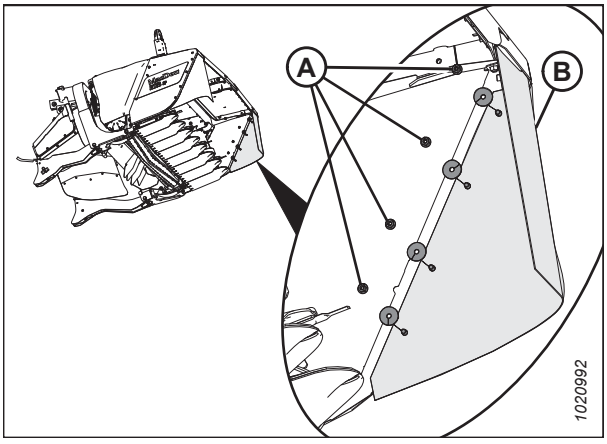


Figure 4.126: Left Endsheet

4. Remove two nuts (A) from the bolt studs.
5. Remove nut (B) from the carriage head bolt, remove bracket (C), and remove curtain (D).

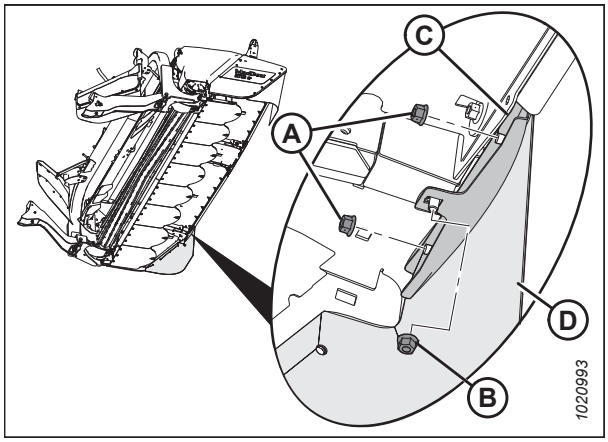


Figure 4.127: Outboard Curtain

4.9.7 Installing Outboard Curtains

The procedure for installing outboard curtains is the same for both sides of the machine.

DANGER

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

WARNING

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

1. Shut down the engine, and remove the key from the ignition.
2. Open the cutterbar doors. For instructions, refer to *3.7.1 Opening Cutterbar Doors – North America, page 115* or *3.7.2 Opening Cutterbar Doors – Export, page 116*.
3. Install curtain (A) into bracket (B).
4. Install two nuts (D) and tighten them.
5. Slide bracket (B) into position and install square neck carriage head bolt and flange nut (C).
6. Torque flange nut (C) to 39 Nm (29 lbf·ft).

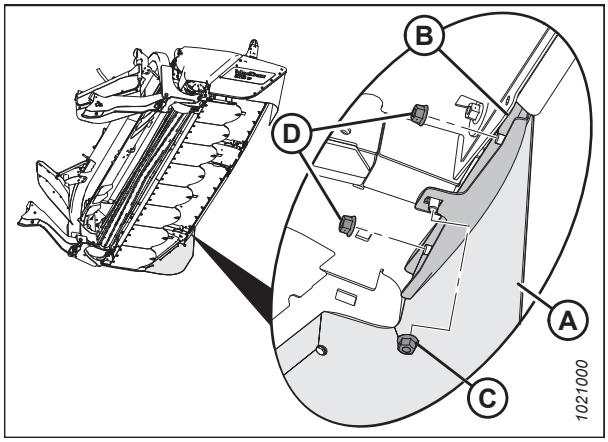


Figure 4.128: Outboard Curtain

7. Install four bolts, large washers, and nuts (A) to secure outboard curtain (B) to the endsheet. Torque the bolts to 39 Nm (29 lbf·ft).

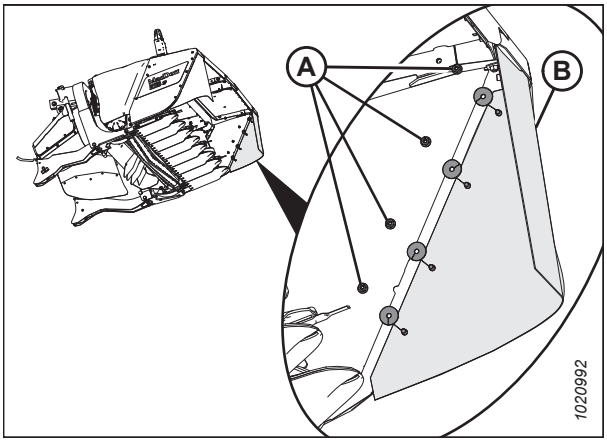


Figure 4.129: Left Endsheet

4.10 Conditioner System

The conditioner system crimps and crushes crop stems, helping crop dry faster.

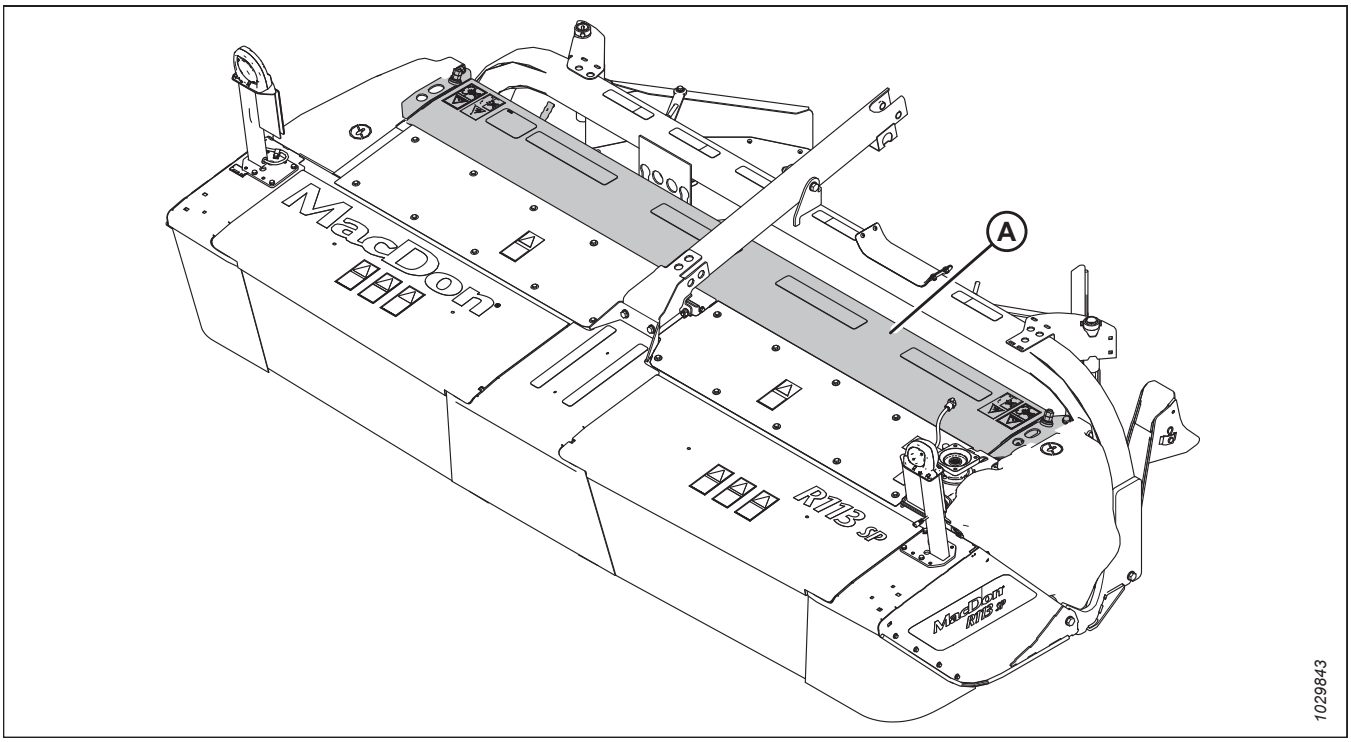


Figure 4.130: Conditioner System

Conditioner system (A) is attached to the rear of the header.

4.10.1 Inspecting Roll Conditioner

The conditioner bearings, U-joints, and roll timing gearbox should be inspected periodically for signs of wear or damage.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, stop the engine, remove the key from the ignition, and engage the windrower's lift cylinder safety props before going under the machine.

WARNING

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

1. Lower the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Remove the left and right driveshields. For instructions, refer to *Removing Driveshields, page 237*.

4. Inspect conditioner roll left bearing (A) for signs of wear or damage. If the bearing needs replacing, contact your MacDon Dealer.

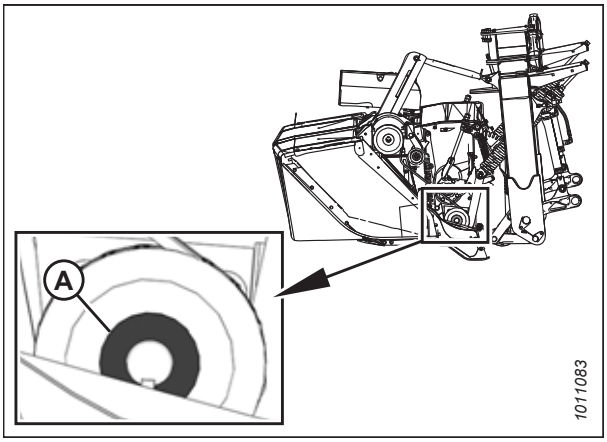


Figure 4.131: Conditioner Roll Left Bearing

5. Inspect conditioner drive U-joints (A) for signs of wear or damage. If the U-joints need replacing, contact your MacDon Dealer.

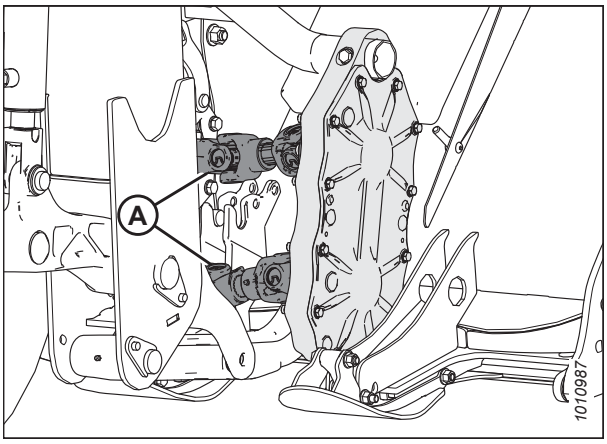


Figure 4.132: Conditioner Drive U-Joints

6. Inspect roll timing gearbox bearings (A) for signs of wear or damage. If the bearings need replacing, contact your MacDon Dealer.

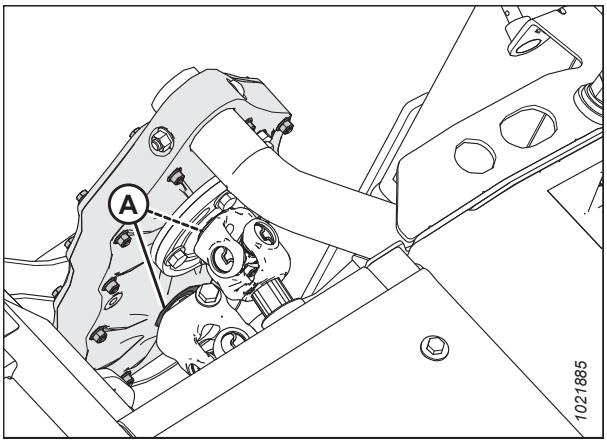


Figure 4.133: Roll Timing Gearbox Bearings

4.10.2 Conditioner Drive Belt

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

Inspecting Conditioner Drive Belt

The belt tension must be checked and inspected for damage or wear according to the intervals specified.

DANGER

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

DANGER

Ensure that all bystanders have cleared the area.

1. Lower the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Open the left driveshield. For instructions, refer to *3.6.1 Opening Driveshields, page 112*.
4. Inspect drive belt (A). Replace it if it is torn or cracked.
5. Check that jam nut (B) and adjuster nut (C) are tight.

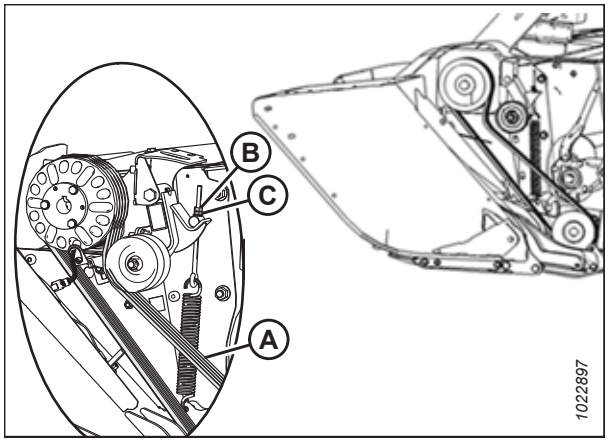


Figure 4.134: Conditioner Drive

6. Measure the length of spring (A). Spring length (B) should be 366 mm (14 3/8 in.) in accordance with spring tension decal (C). If the spring length requires adjustment, refer to the instructions in *Installing Conditioner Drive Belt, page 223*.
7. Close the driveshield. For instructions, refer to *3.6.2 Closing Driveshields, page 113*.

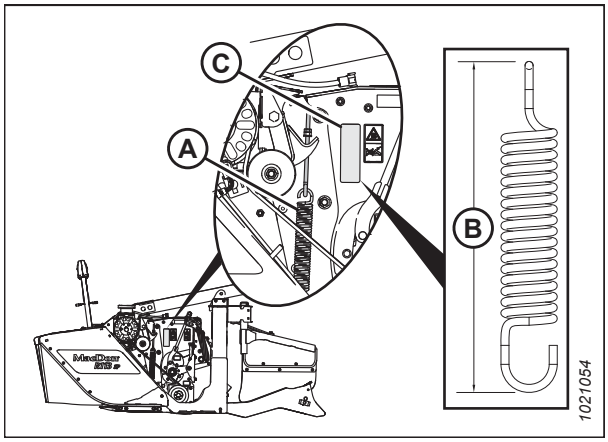


Figure 4.135: Belt Tensioner Spring

Removing Conditioner Drive Belt

Remove the conditioner drive belt if it is torn or cracked.

DANGER

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

1. Lower the header fully.
2. Shut down the engine, and remove key from the ignition.
3. Open the left driveshield. For instructions, refer to *3.6.1 Opening Driveshields, page 112*.
4. Disconnect wire harness (A) from speed sensor (B).

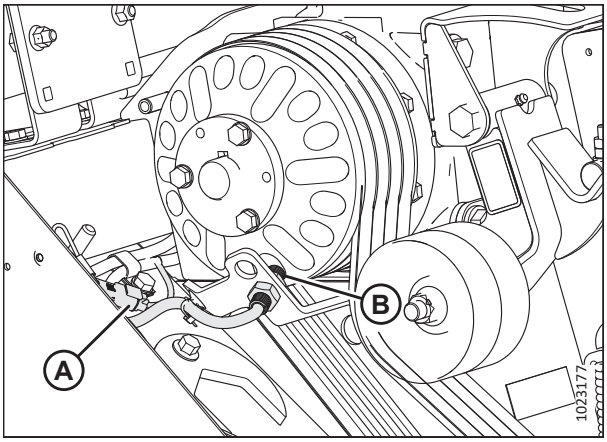


Figure 4.136: Speed Sensor Assembly

5. Turn jam nut (A) counterclockwise to unlock the tension adjustment.
6. Turn jam nut (A) and adjuster nut (B) counterclockwise to fully collapse tensioner spring (C), and release the tension from conditioner drive belt (D).
7. Remove drive belt (D).

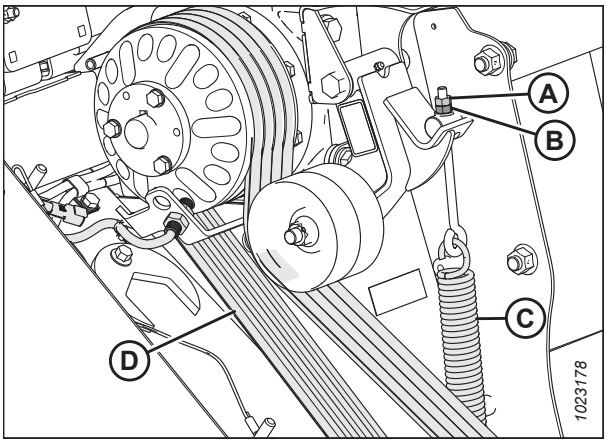


Figure 4.137: Conditioner Drive

Installing Conditioner Drive Belt

Ensure that the length of the tensioner spring is set correctly when installing the conditioner drive belt.

DANGER

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

1. Lower the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Install drive belt (A) onto driven pulley (C) first, and then onto drive pulley (B), ensuring that the belt is in the pulley grooves.

   NOTE:

   If necessary, loosen the jam nut and adjuster nut to relieve the spring tension.

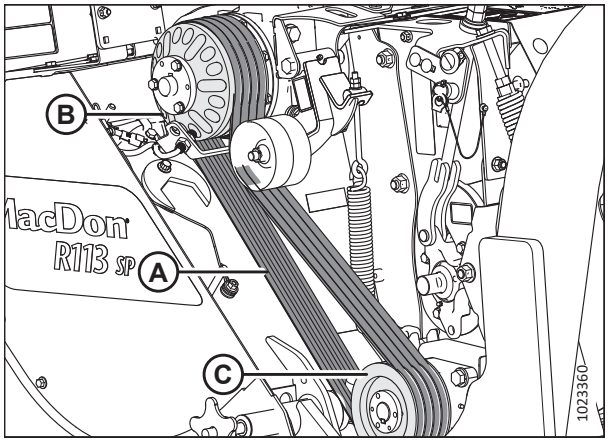


Figure 4.138: Conditioner Drive

4. Measure the length of tensioner spring (C). Dimension (D) should be set to 365 mm (14 3/8 in.) to ensure that the belt is tensioned correctly.
5. To adjust the spring tension, loosen jam nut (A).
6. Turn adjuster nut (B) clockwise to increase the belt tension, or turn adjuster nut (B) counterclockwise to decrease the belt tension.
7. Once the correct spring measurement has been achieved, hold adjuster nut (B) and tighten jam nut (A) against it.

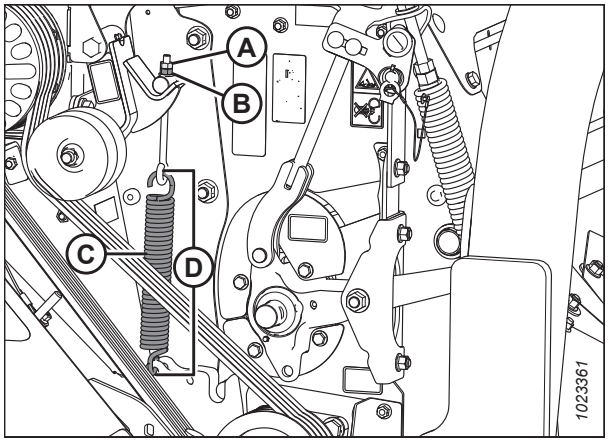


Figure 4.139: Conditioner Drive

8. Reconnect speed sensor (B) to wiring harness (A).

   NOTE:

   Use the bottom hole for M1 Series and M2 Series Windrowers; use the top hole for M Series Windrowers.

9. Close the left driveshield. For instructions, refer to *3.6.2 Closing Driveshields, page 113*.

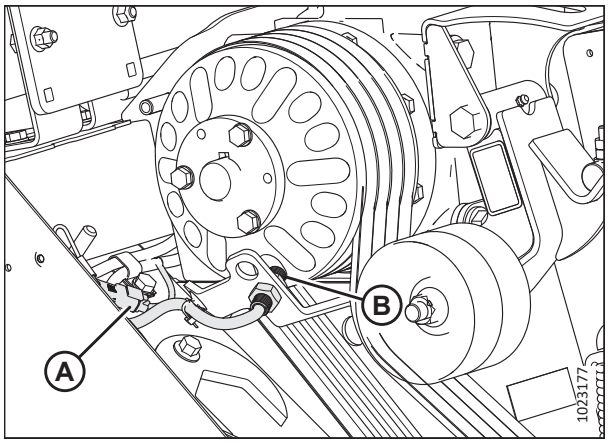


Figure 4.140: Speed Sensor

4.10.3 Changing Conditioner

There are several ways that the conditioner can be configured, depending on your particular machine.

The R113 Rotary Disc Header can be operated either with no conditioner, with a polyurethane roll conditioner, or with a steel roll conditioner. If the rotary disc header is not conditioner-equipped, a shield must be installed.

NOTE:

These instructions apply to all conditioners. Exceptions are identified where applicable.

Removing Conditioner

The conditioner is very heavy. Removing the conditioner requires a forklift or an equivalent lifting device.

1. Detach the header from the windrower.
2. Open the driveshields. For instructions, refer to *3.6.1 Opening Driveshields, page 112*.
3. Remove the conditioner drive belt. For instructions, refer to *Removing Conditioner Drive Belt, page 223*.
4. **M1/M2 Series and M205 Windrowers:** Move hose bundle (A) clear of the frame and lay it on the header.

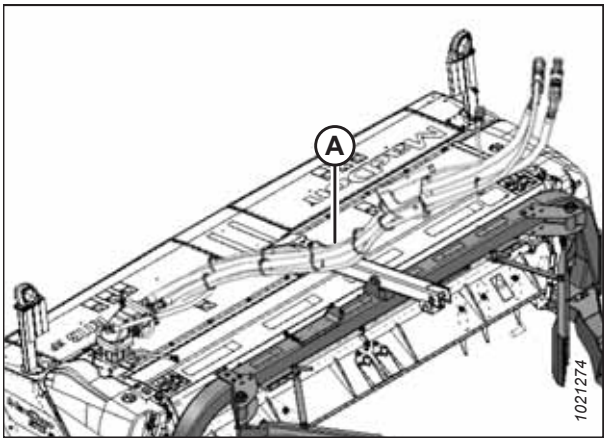


Figure 4.141: Windrower Hose Bundle

5. **M155 and M155*E4* Windrowers:** Remove two bolts (A) securing hose bracket (B) to the header frame.
6. Place the hose bundle and the bracket onto the header.

   NOTE:

   Do **NOT** disconnect the hoses from the motor.

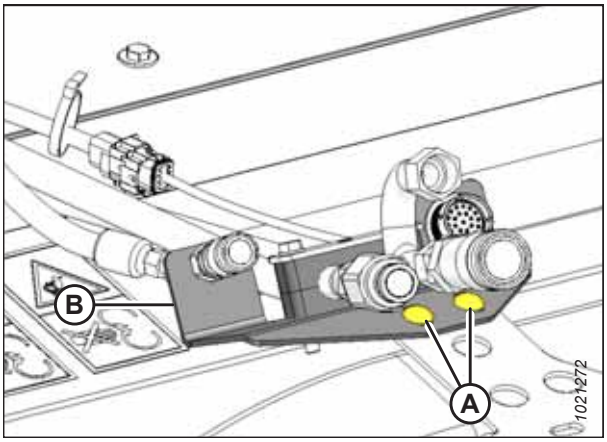


Figure 4.142: M155 and M155*E4* Hose Support

WARNING

To prevent the frame from slipping off of the forks, ensure that the frame is secured to the forks. Failing to secure the frame to the forks could result in death or serious injury.

7. Support and secure the adapter frame for lifting. Use one of the two methods below:

Method 1:

a. Attach straps (A) to adapter frame (B) and to the forklift forks. Straps with a minimum working load of 454 kg (1000 lb.) should be used.

NOTE:

The forks should **NOT** directly contact the frame.

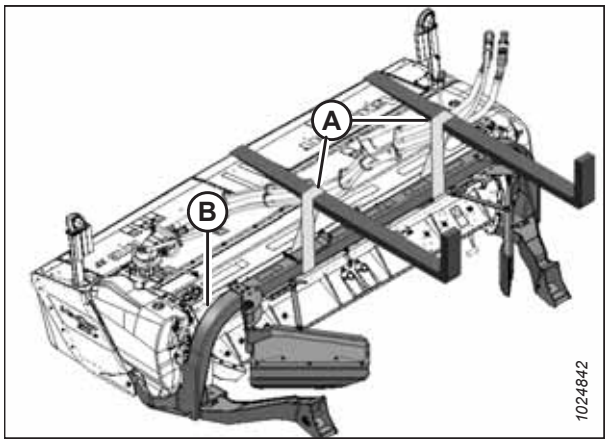


Figure 4.143: Supporting Frame Using Straps

Method 2:

a. To protect the finish on the frame, wrap packing foam (A) (or equivalent) around the frame at approximately the locations shown.

b. Position forks (B) under the packing foam on the frame as shown. Raise the forks and lift the frame slightly.

NOTE:

The forks should **NOT** directly contact the frame.

c. To secure the frame to the forks, wrap chain (C) around the end of the forks and attach the other end of the chain to the forklift.

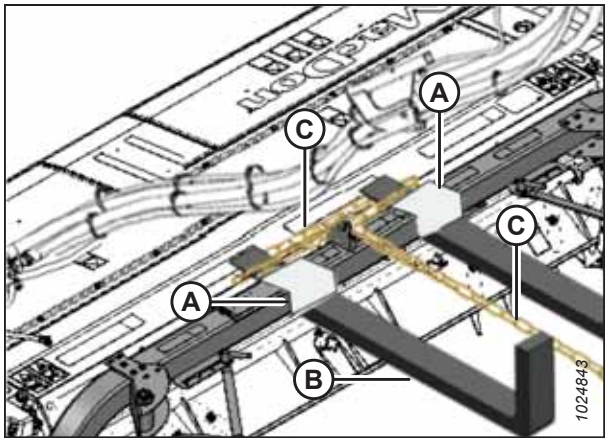


Figure 4.144: Supporting Frame Using Chain

8. Lift the header with the forklift and place 150 mm (6 in.) wooden blocks (A) under the skid shoes. Lower the header onto the blocks and allow the header to tilt forward.

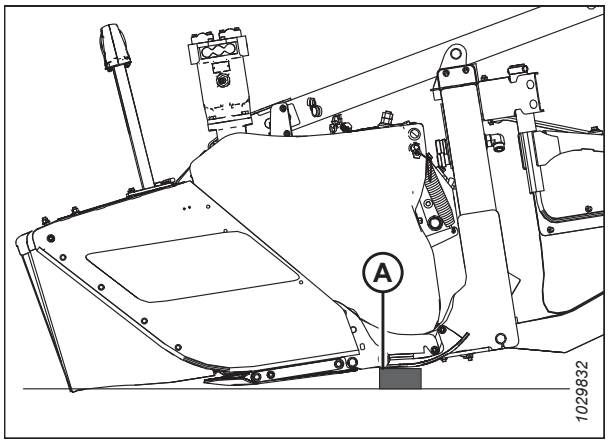


Figure 4.145: Header on Blocks

9. Remove nut (A) securing bolt (B), washer (C), and washer shims (D) from the center-link support. If necessary, adjust the height of the forks lifting the frame. Retain the hardware for reinstallation.

   NOTE:

   Some sections are made hidden in the illustration to help clarify the position of shims (D).

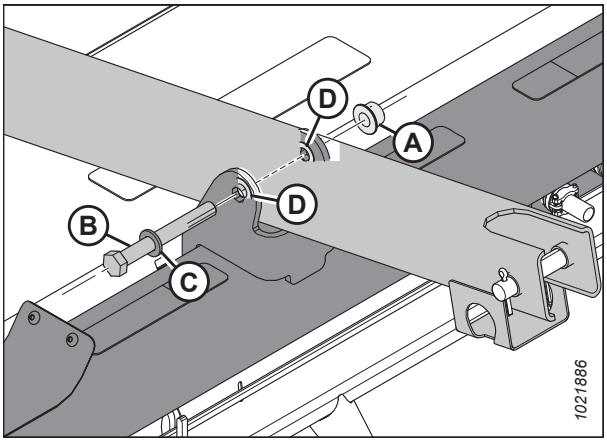


Figure 4.146: Center-Link Support

CAUTION

Stand clear when the frame is being detached, because the frame may shift when the bolts are removed.

10. Remove nut (B).

11. Remove bolt (A) from frame (C). If necessary, adjust the height of the forks to improve access to bolt (A). Repeat this step at the opposite side of the frame. Retain the hardware for reinstallation.

12. Slowly and carefully back the forklift away from the header until the frame is clear of the header. Move the frame away from the work area, lower it to the ground, and disconnect it from the forklift.

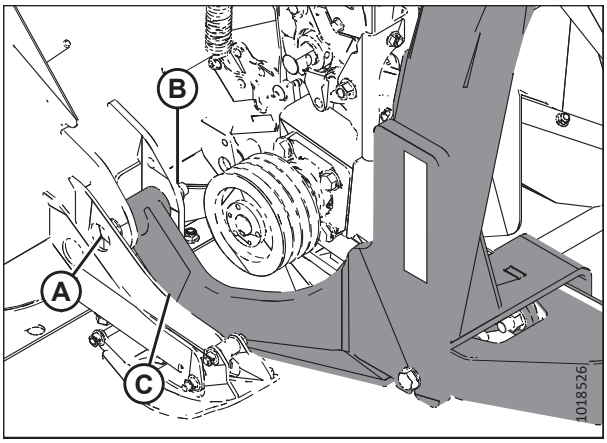


Figure 4.147: Left Side of Adapter Frame

WARNING

To prevent the conditioner from falling backward, ensure that the lifting chains are secure. Failure to do so may result in death or serious injury.

13. Attach spreader bar (A) to a forklift or equivalent lifting device, and attach chains to lugs (B) on conditioner (C). Use a chain rated for overhead lifting with a minimum working load of 1135 kg (2500 lb.).

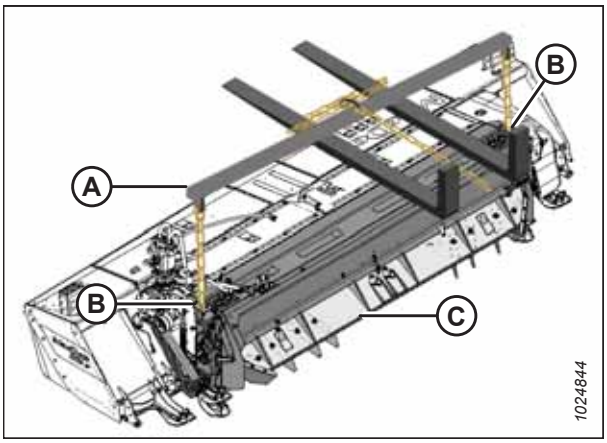


Figure 4.148: Spreader Bar

14. Loosen two M16 hex head bolts (A) on each side of the conditioner.

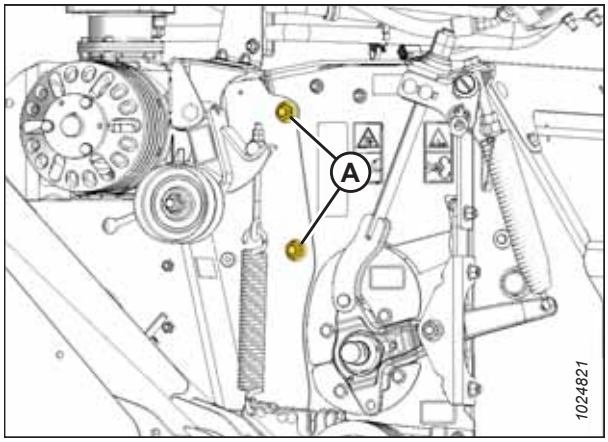


Figure 4.149: Left Side of Conditioner – Right Side Similar

15. Loosen two carriage bolts (A) securing conditioner gearbox support (B) to the header.

16. Adjust the height of the forks to raise the conditioner slightly. Remove the loosened bolts and retain the hardware for reinstallation.

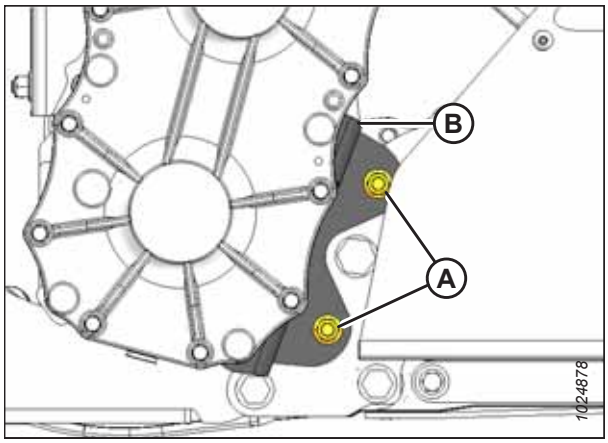


Figure 4.150: Conditioner Gearbox

WARNING

Ensure that the spreader bar is secured to the forks so that it cannot slide off the forks or toward the header. Failing to do so could result in death or serious injury.

17. Using the forklift, lift conditioner (A) off of header (B). Avoid contact between the top of the conditioner and center-link anchor (C).

18. Move the frame away from the work area, set it on the ground, and remove the chains securing the conditioner to the spreader bar.

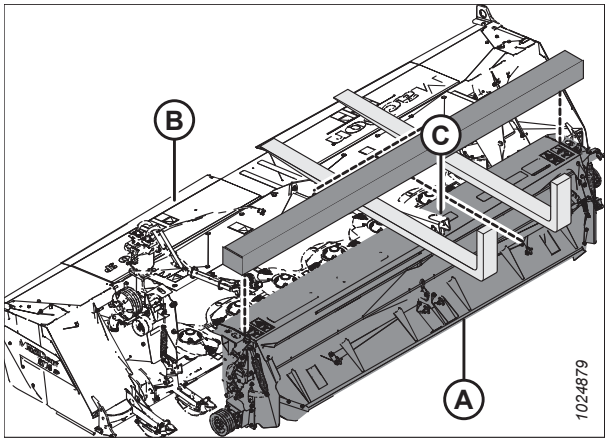


Figure 4.151: Lifting Conditioner

Installing Conditioner

The conditioner is very heavy. Installing it will require a forklift or an equivalent lifting device.

1. Attach spreader bar (A) to the forklift (or an equivalent lifting device) and attach chains to lugs (B) on the conditioner. Use a chain rated for overhead lifting with a minimum working load of 1135 kg (2500 lb.).

WARNING

Ensure that the spreader bar is secured to the forks so that it cannot slide off the forks or toward the header while you are attaching the conditioner to the header. Failing to do so could result in death or serious injury.

2. Lift conditioner (C) and align it with the header opening.

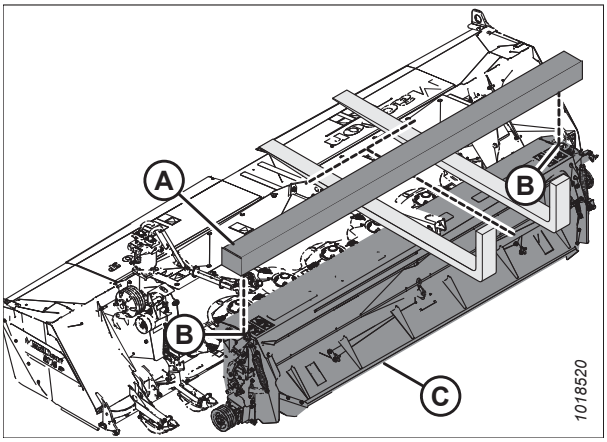


Figure 4.152: Lifting Conditioner

3. Carefully align pin (B) at each end of conditioner (A) with lug (C) on the header.
4. Lower conditioner (A) until pins (B) engage lugs (C) on the header.

   NOTE:

   Avoid contact between the top of the conditioner and the center-link anchor.

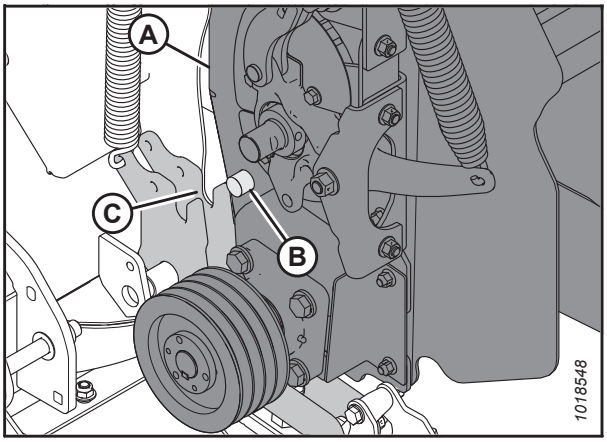


Figure 4.153: Installing Conditioner

5. Align the mounting holes and install four M16 x 40 hex head bolts (A) with the heads facing inboard (two per side).
6. Secure the bolts with four M16 center lock flanged nuts.

   NOTE:

   Do **NOT** tighten the nuts yet.

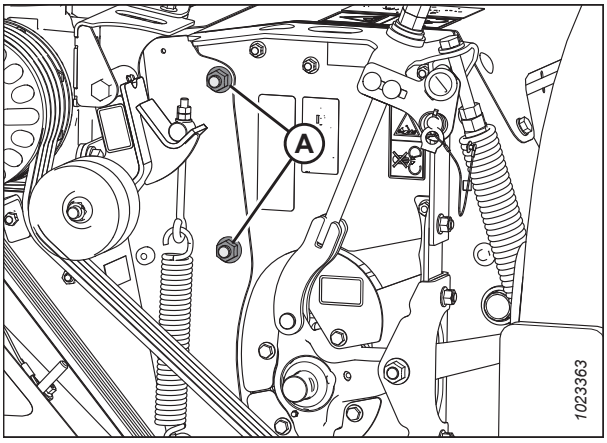


Figure 4.154: Left Side of Conditioner – Right Side Similar

7. Align the holes in support (B) with the mounting holes in the header frame.
8. Install two carriage bolts (A) to secure conditioner gearbox support (B) to the header.

   NOTE:

   The bolt heads must face inboard.
9. Torque the nuts to 69 Nm (51 lbf·ft).

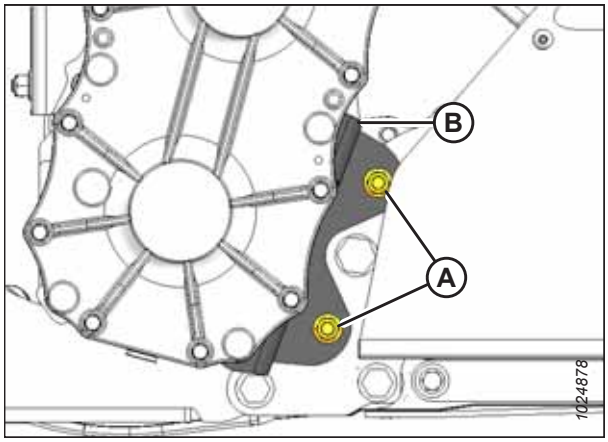


Figure 4.155: Conditioner Gearbox

10. Torque nuts (A) on the sides of the conditioner to 170 Nm (126 lbf·ft).
11. Remove the lifting chains from the conditioner and move the lifting device clear of the work area.
12. If the header was originally shipped without a conditioner, install the conditioner drive components. For instructions, refer to *Installing Conditioner Drive, page 234*.

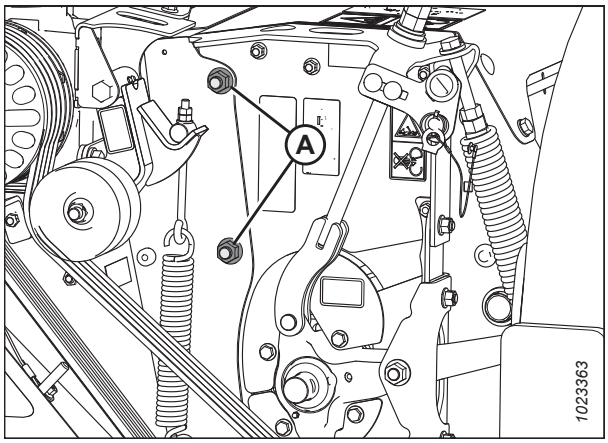


Figure 4.156: Left Side of Conditioner – Right Side Similar

WARNING

To prevent the frame from slipping off of the forks, ensure that the frame is secured to the forks. Failure to do so could result in death or serious injury.

13. Support and secure the adapter frame for lifting. Use one of the two methods below:

Method 1:

a. Attach straps (A) to adapter frame (B) and the forks of the forklift.

NOTE:

Use straps rated for overhead lifting with a minimum working load of 454 kg (1000 lb.).

b. Pick up the frame and position it against the header.

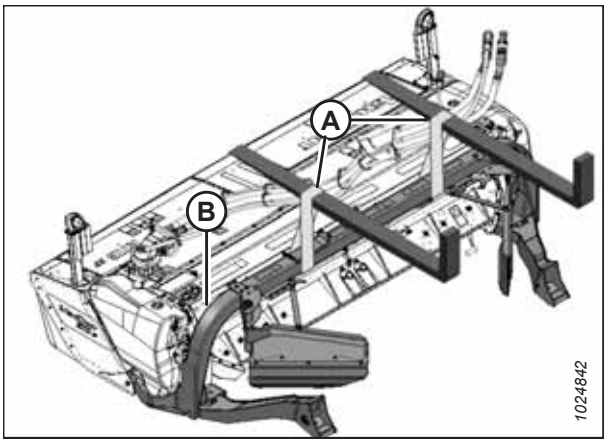


Figure 4.157: Supporting Frame Using Straps

Method 2:

a. To protect the finish on the frame, wrap packing foam (A) (or equivalent) around the frame as shown.

b. Position forks (B) under the packing foam on the frame as shown. Raise the forks and lift the frame slightly.

NOTE:

The forks should not directly contact the frame.

c. To secure the frame to the forks, wrap chain (C) around the end of the forks and attach it to the forklift.

d. Pick up the frame and position it against the header.

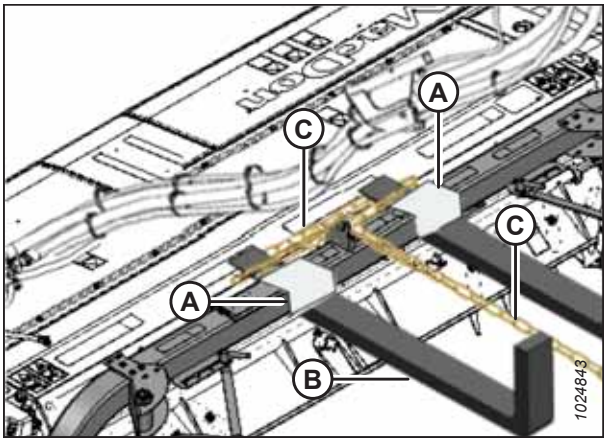


Figure 4.158: Supporting Frame Using Chain

14. Slowly move the conditioner forward until lift arm (C) is aligned with mounting holes (A) and (B) in the frame.

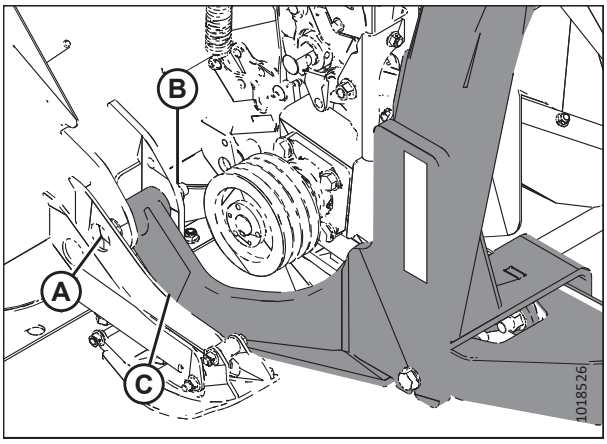


Figure 4.159: Frame – Left Side Shown

15. Install bolt (A) through frame (B) and bushing (D) in the lift arm. Repeat this step for the opposite side of the machine.
16. Check gaps (C) between bushing inner steel sleeve (D) and frame (B).

    NOTE:

    If there is a gap, install 1.2 mm thick flat washers to minimize the gap on both sides of the bushing.
17. Remove bolt (A).

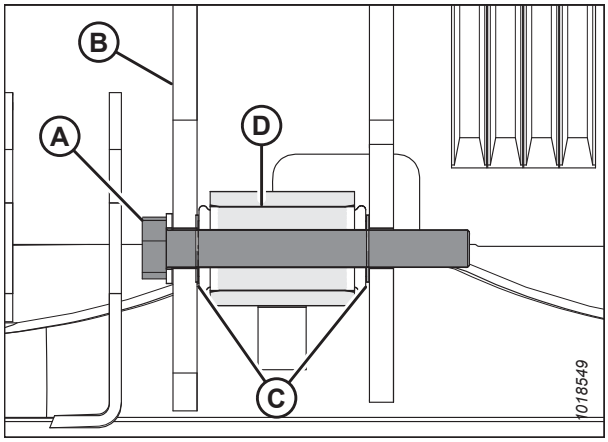


Figure 4.160: Frame Attachment – Left Side Shown

18. Apply anti-seize compound to the shank of bolt (B).

    NOTE:

    Do **NOT** apply anti-seize compound to the bolt threads.
19. Install washer (A) onto bolt (B).
20. Install bolt (B) with washers (C) as determined in Step *16, page 232*.
21. Install three washers (D) and nut (E) onto the bolt.
22. Torque the bolt to 339 Nm (250 lbf·ft).
23. Repeat Step *16, page 232* to Step *21, page 232* for the opposite side of the machine.

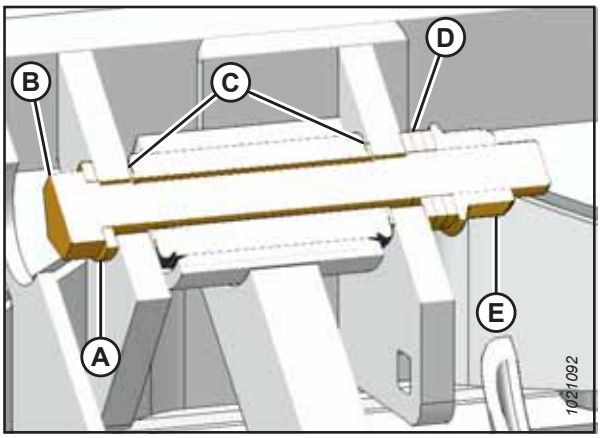


Figure 4.161: Frame Attachment – Cross Section View

24. With flat washer shim (A) on both sides of the center-link support, install securing bolt (B) and washer (C) through the conditioner center-link support bracket and the center-link support.
25. Install nut (D) and torque it to 339 Nm (250 lbf·ft).

    NOTE:

    Some sections are made hidden in the illustration to help clarify the position of shims (A).

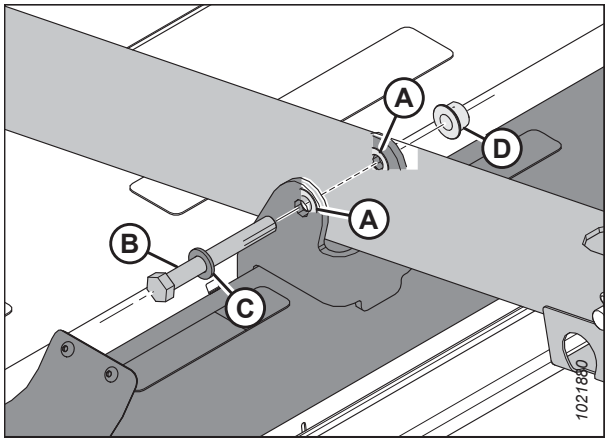


Figure 4.162: Center-Link Support

WARNING

To prevent the frame from slipping off of the forks, ensure that the frame is secured to the forks. Failure to do so could result in death or serious injury.

26. Lift the header and remove wooden blocks (A) under the skid shoes.
27. Lower the header to the ground.
28. Remove any straps or chains securing the frame to the forks, and back the forklift away from the work area.

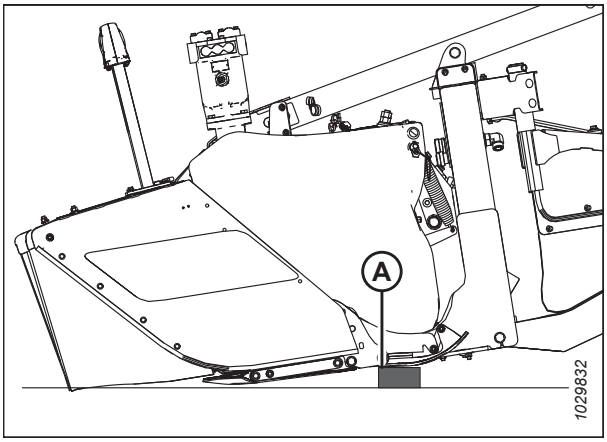


Figure 4.163: Header on Blocks

29. **M155 and M155*E4* Windrowers:** Position the hose bundle and hose support (B) onto the adapter and secure it with bolts and nuts (A).

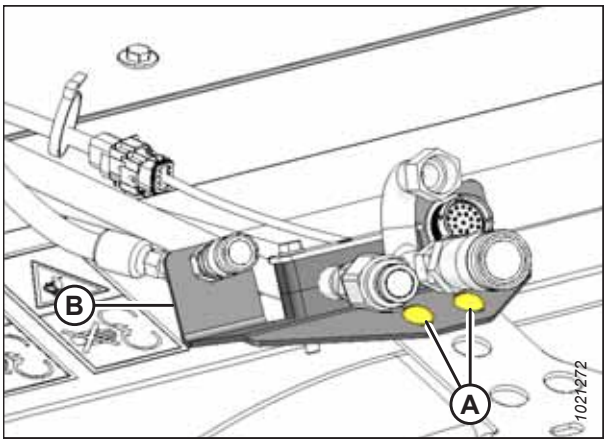


Figure 4.164: M155 and M155*E4* Hose Support

30. **M1/M2 Series and M205 Windrowers:** Reposition hose bundle (A) on the frame.
31. Install the conditioner drive belt. For instructions, refer to *Installing Conditioner Drive Belt, page 223*.
32. Close the driveshields. For instructions, refer to *3.6.2 Closing Driveshields, page 113*.

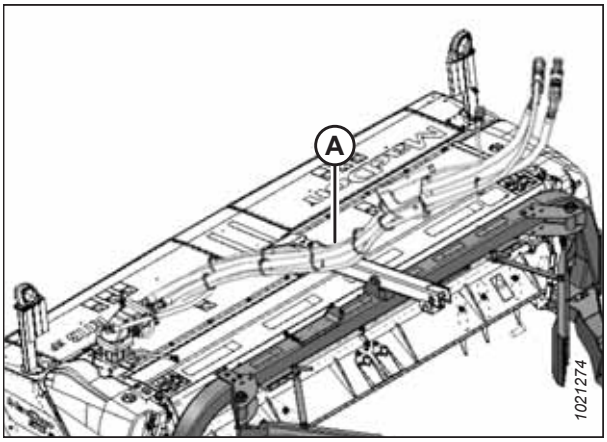


Figure 4.165: Windrower Hose Bundle

Installing Conditioner Drive

This procedure describes the installation of conditioner drive components on a machine that was originally supplied with no conditioner. The procedure is similar for machines which have a conditioner installed.

If a conditioner is to be installed on the R113 SP, refer to *Installing Conditioner, page 229* and *Installing Conditioner Drive Belt, page 223*.

1. Remove drive cover (A) from the left side of the header by removing hex head bolt (B), flat washer (C), and nut (D).
2. Slide the cover off of pins (E).

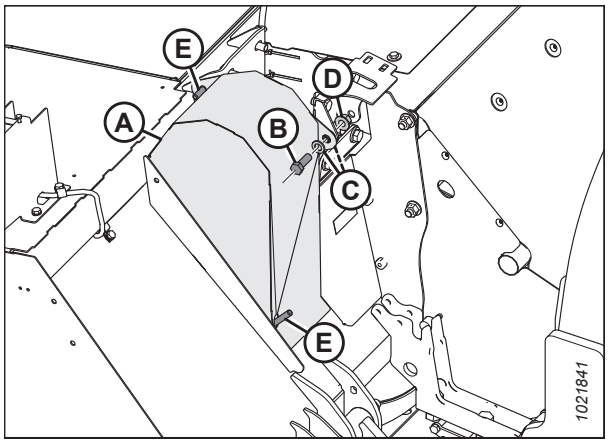


Figure 4.166: Drive Cover

3. Position tensioner assembly (A) as shown.
4. Secure the assembly with M16 x 120 bolt (B) and nut (C).
5. Torque nut (C) to 50 Nm (37 lbf·ft).

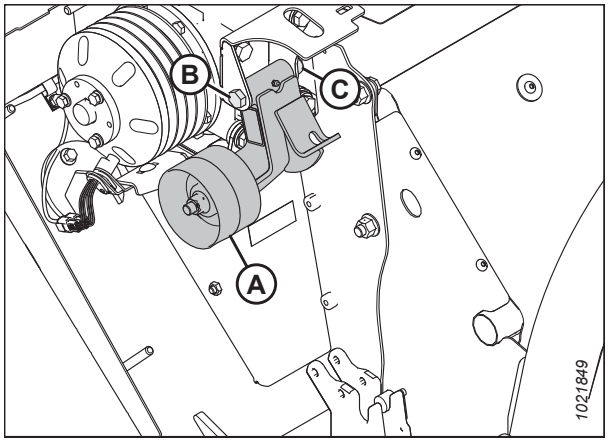


Figure 4.167: Tensioner

6. Install spring (A) into forward hole (B) in the frame.
7. Install eyebolt (C) onto spring (A) and tensioner (D).
8. Secure eyebolt (C) to tensioner (D) with hardened washer (E), two M10 nuts (F), and straight pin (G).

   NOTE:

   Install the conditioner drive belt after reattaching the header to the adapter.

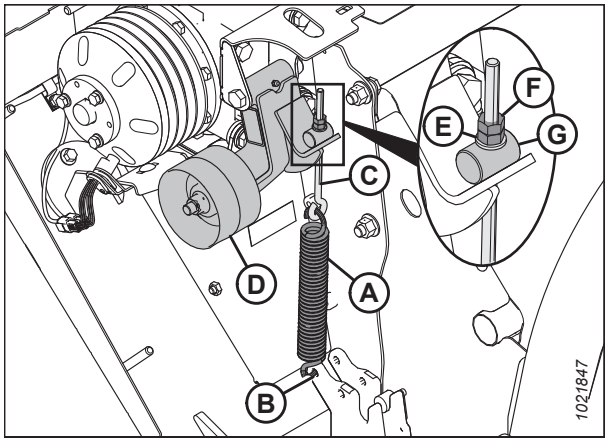


Figure 4.168: Tensioner

4.10.4 Replacing Discharge Shield – No Conditioner

If the discharge shield on a header not equipped with a conditioner is damaged, it will need to be replaced.

Removing Discharge Shield – No Conditioner

The discharge shields on a rotary disc header may occasionally need to be removed for machine service.

IMPORTANT:

The discharge shield must be installed if operating the machine without a conditioner.

DANGER

Ensure that all bystanders have cleared the area.

1. Disconnect and remove the header from the windrower. For instructions, refer to *3.5 Detaching Header from Windrower, page 90*.

2. On both ends of the header, remove four M16 hex head bolts, nuts, and flat washers (A) securing shield (B) to header panel (C).

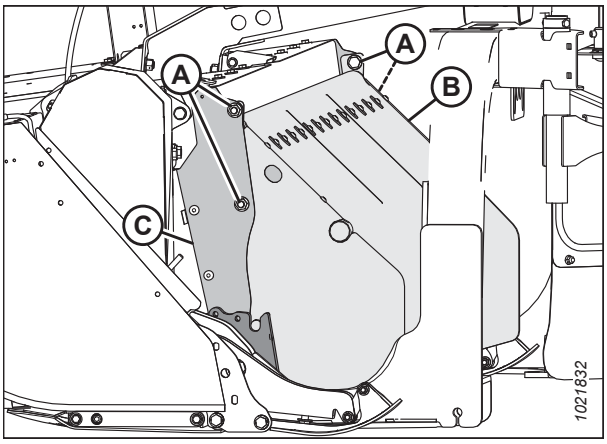


Figure 4.169: Left Side of Header – Right Opposite

3. Lift shield (A) until pins (B) (one on each side) disengage from the slots in support (C).

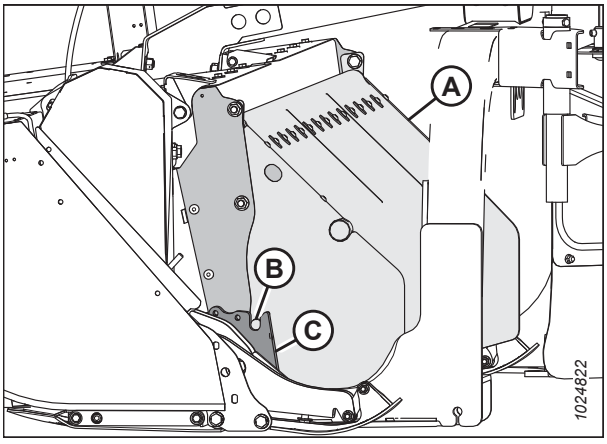


Figure 4.170: Left Side of Header – Right Opposite

Installing Discharge Shield – No Conditioner

The discharge shields on a rotary disc header may occasionally need to be removed for machine service.

IMPORTANT:

The discharge shield must be installed if operating the machine without a conditioner.

DANGER

Ensure that all bystanders have cleared the area.

1. Position shield (A) until pins (B) (one on each side) engage the slots in support (C) and the bolt holes in shield (A) align with holes (D) in the header.

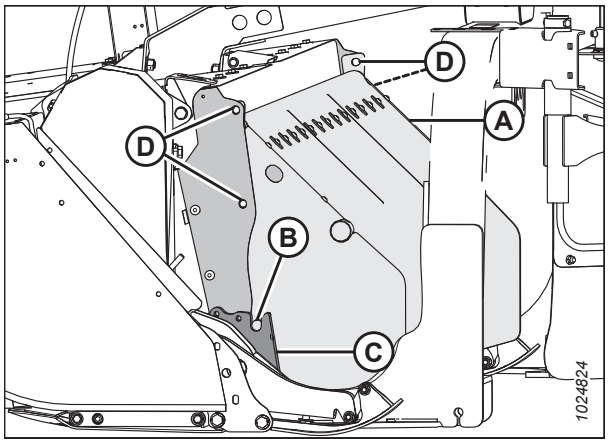


Figure 4.171: Left Side of Header – Right Opposite

2. Secure shield (B) to the header with four M16 hex head bolts (A), nuts, and flat washers.
3. Ensure the bolt heads face inboard and torque the nuts to 261 Nm (193 lbf·ft).

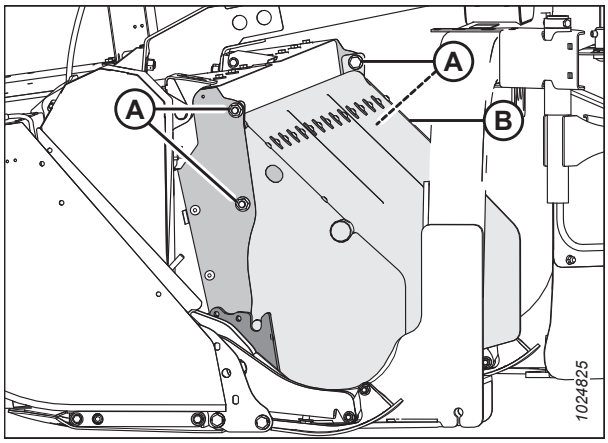


Figure 4.172: Left Side of Header – Right Opposite

4.10.5 Replacing Driveshields

If driveshields are missing, severely damaged, or are not securely installed due to damage, they must be replaced.

Removing Driveshields

No additional tools are needed to remove the driveshields.

WARNING

To reduce the risk of personal injury, do NOT operate the machine without the driveshields in place and secured.

NOTE:

The illustrations shown in this procedure depict the left driveshield; the right driveshield is similar.

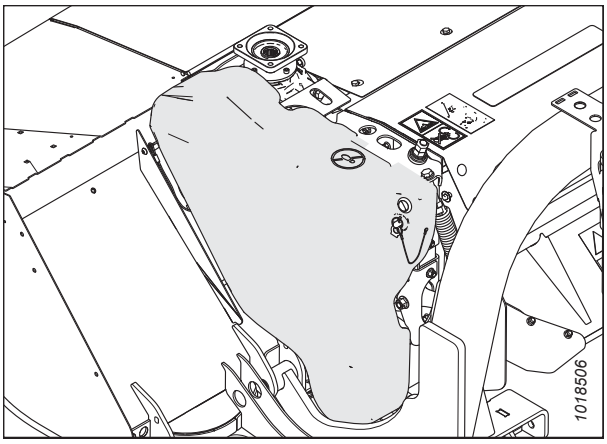


Figure 4.173: Left Driveshield

1. Remove lynch pin (A) and tool (B) from pin (C).

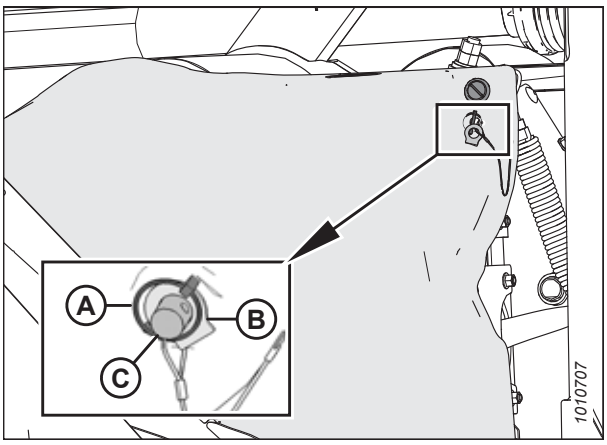


Figure 4.174: Tool to Unlock Driveshield

2. Insert the flat end of tool (A) into latch (B) and turn it counterclockwise to unlock the latch.

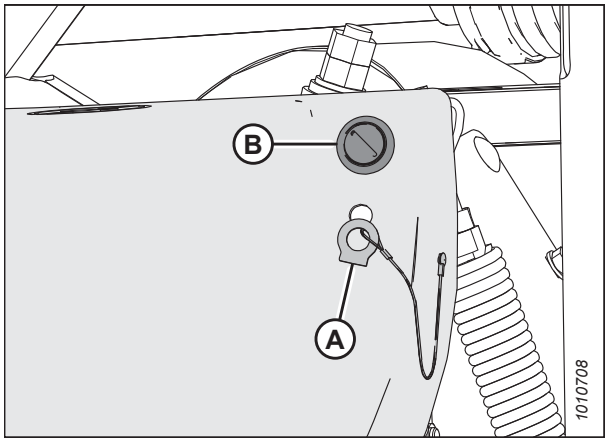


Figure 4.175: Tool to Unlock Driveshield and Latch

3. Pull the top of driveshield (A) away from the header and lift the driveshield off of the pins at the base of the shield.

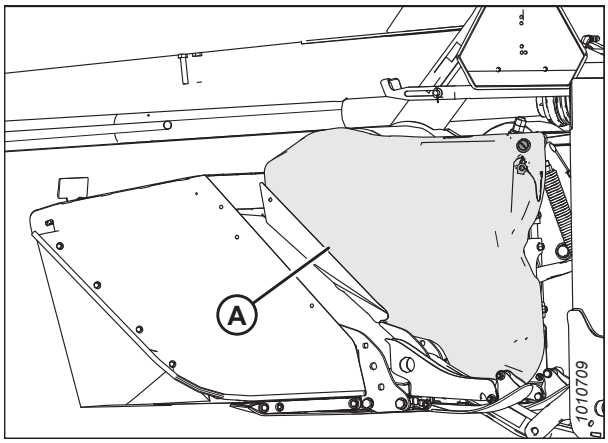


Figure 4.176: Driveshield

Installing Driveshields

No additional tools are needed to install the driveshields.

WARNING

To reduce the risk of personal injury, do NOT operate the machine without the driveshields in place and secured.

NOTE:

The illustrations shown in this procedure depict the left driveshield; the right driveshield is similar.

1. Position driveshield (A) onto pins (B) at the base of the driveshield.
2. Push the driveshield so that latch (C) is engaged.
3. Check that driveshield (A) is properly secured.

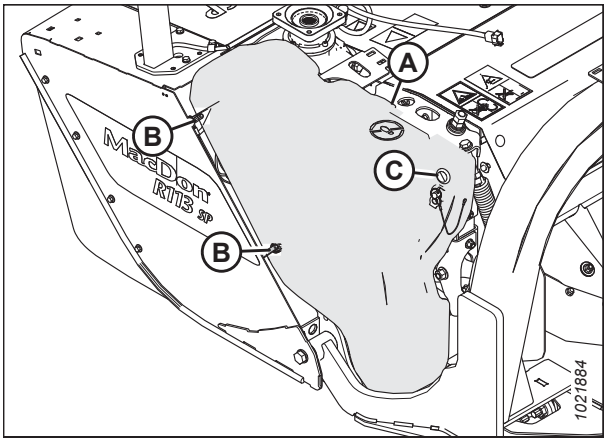


Figure 4.177: Driveshield and Latch

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

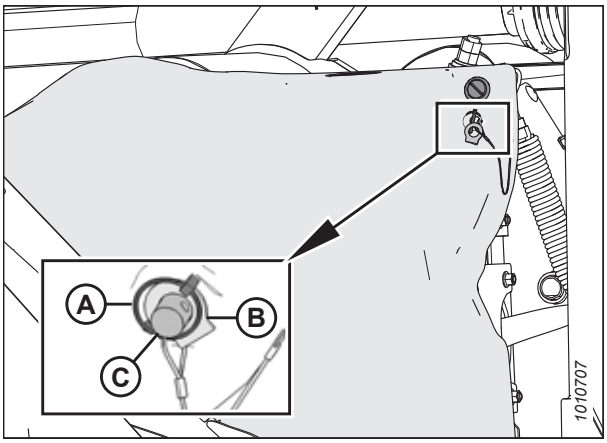


Figure 4.178: Tool to Unlock Driveshield

Replacing Driveshield Latch

The driveshield is an important safety component. If the latch is not holding the driveshield securely, it will need to be replaced.

WARNING

To reduce the risk of personal injury, do NOT operate the machine without the driveshields in place and secured.

NOTE:

The illustrations shown depict the left driveshield; the right driveshield is similar.

1. Remove the driveshield. For instructions, refer to *Removing Driveshields, page 237*.

2. Remove and retain hex nut and flat washer (A) securing the latch to the backside of the driveshield.
3. Remove the latch and replace it with the new part.
4. Reinstall retained hex nut and flat washer (A).

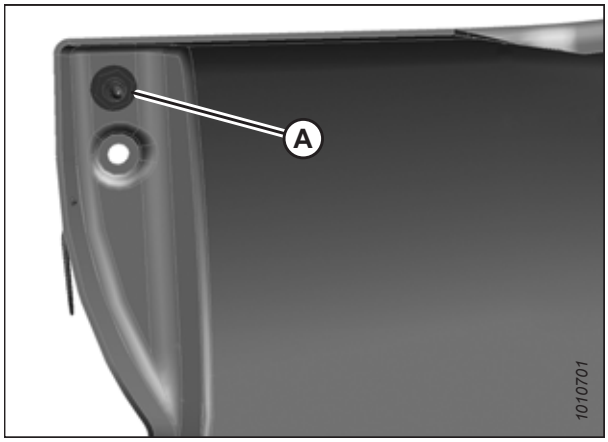


Figure 4.179: Backside of Driveshield

5. Remove two carriage bolts (A), replace stud and clip assembly (B) if it is worn or damaged, and reinstall the carriage bolts.

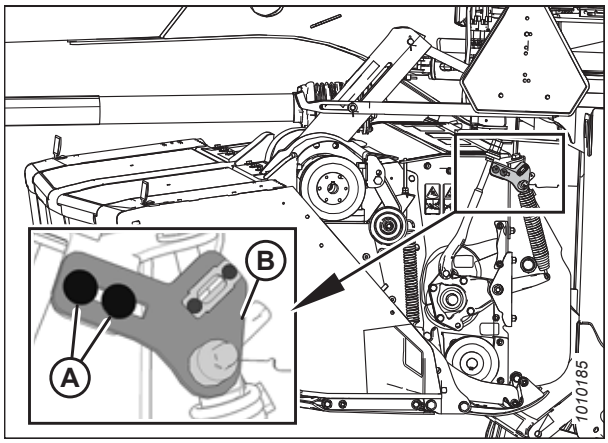


Figure 4.180: Stud and Clip Assembly

6. Reinstall the driveshield. For instructions, refer to *Installing Driveshields, page 239*.

4.11 Electrical System

The electrical system is powered by the windrower.

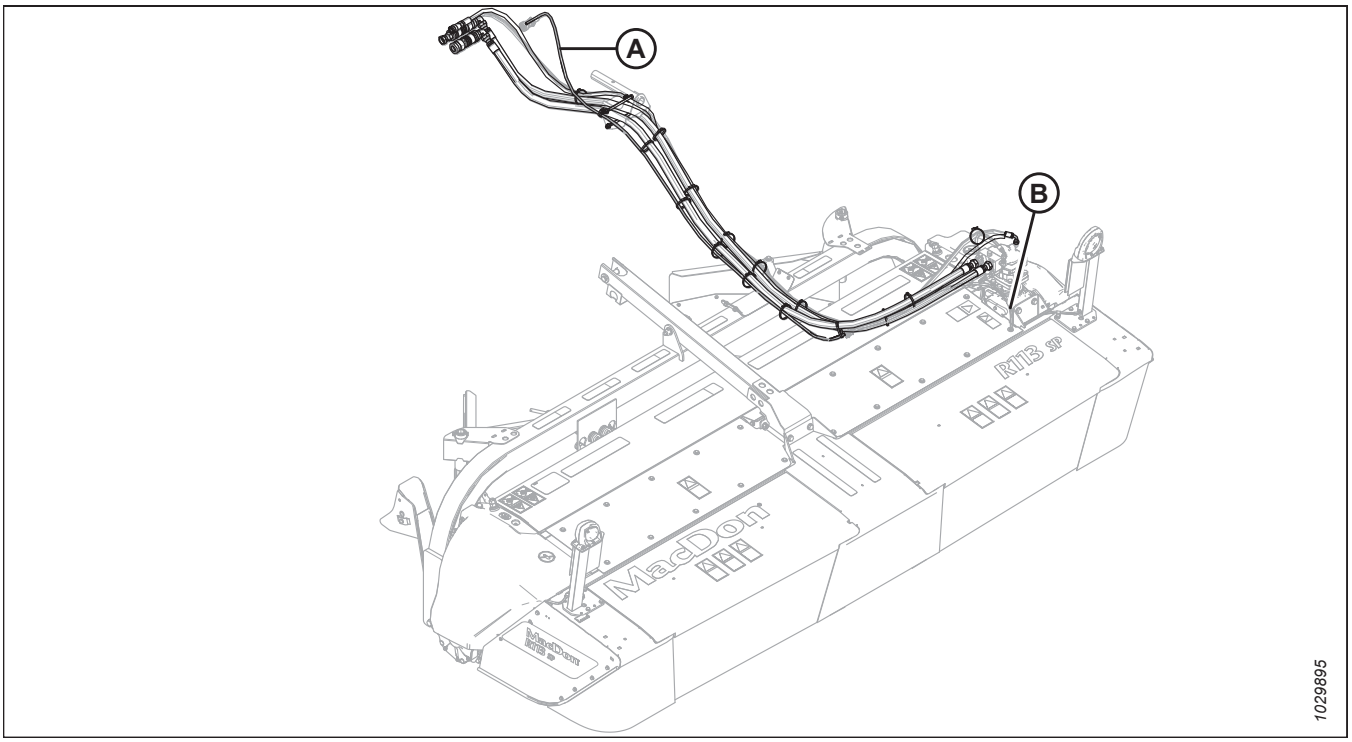


Figure 4.181: Electrical Harness

Electrical harness (A) connects the header to the windrower, supplying power to the hazard and signal lights. The system also receives signals from speed sensor (B).

4.11.1 Maintaining Electrical System

Proper maintenance of the electrical system helps prevent future problems.

- Use electrical tape and cable ties as required to prevent the wiring harness from dragging or rubbing.
- Keep the lights clean and replace any defective bulbs or LED lights.

4.11.2 Replacing Amber Hazard/Signal Light Fixture

Replace the amber hazard or signal light fixtures if they are damaged or inoperable.

DANGER

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

DANGER

Ensure that all bystanders have cleared the area.

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

3. Remove four nuts (A) and bolts (B) securing the light to the bracket.

   NOTE:

   Only three bolts are shown in the illustration.

4. Remove the light and disconnect it from the electrical harness.
5. Connect the new light to the electrical harness.
6. Position the new light on the bracket, insert bolts (B), and install and tighten four nuts (A).
7. Check the operation of the new light.

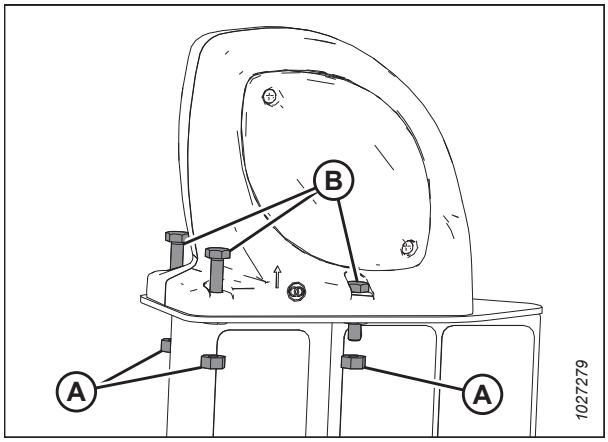


Figure 4.182: Amber Hazard Light

4.11.3 Replacing Amber Hazard/Signal Bulb

Replace the amber hazard or signal bulbs if they are damaged or inoperable.

DANGER

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

DANGER

Ensure that all bystanders have cleared the area.

1. Lower the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Remove two Phillips screws (A) from the fixture.
4. Remove the plastic lens.
5. Replace the bulb.
6. Reinstall the plastic lens and screws.

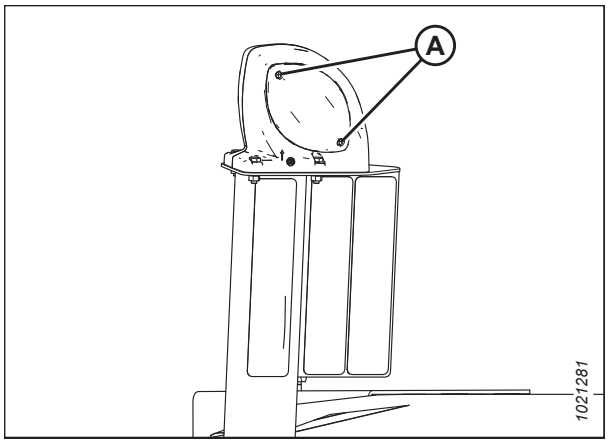


Figure 4.183: Plastic Lens and Screws

4.11.4 Replacing Header Speed Sensor

If the header speed sensor malfunctions or is damaged, it will need to be replaced.

1. Lower the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Open the left driveshield. For instructions, refer to *3.6.1 Opening Driveshields, page 112*.
4. Remove plastic fastener (B) from the bracket. Cut cable tie (E) securing the sensor wire to the wiring harness.
5. Disconnect wire harness (C) from speed sensor connector (D).
6. Remove nut (F) from the end of the speed sensor and remove the sensor from bracket (A).
7. Remove the nut from the end of the new speed sensor. Install the new sensor into bracket (A) and secure it with nut (F).

   NOTE:

   Use the bottom hole for M1 Series and M2 Series Windrowers; use the top hole for M Series Windrowers.
8. Connect the speed sensor wire to harness (C).
9. Install plastic fastener (B) in the small hole in bracket (A). Secure the speed sensor wire to fastener (B) with a cable tie, allowing a gap of 102–104 mm (4 4 3/16 in.) between the fastener and sensor.
10. Secure the speed sensor wire to header harness (C) with plastic cable tie (E).

    NOTE:

    Ensure that the wires are clear of the belt and the pulley.
11. Adjust nuts (A) as required to achieve a 2–3 mm (1/16–1/8 in.) gap (B) between speed sensor (C) and pulley (D). Ensure that the sensor face and the pulley face are parallel. Bend bracket (E) as required.
12. Tighten nuts (A) to 12 Nm (8.85 lbf·ft [106 lbf·in]).
13. Close the driveshield. For instructions, refer to *3.6.2 Closing Driveshields, page 113*.
14. Start the windrower, engage the header, and check the operation of the speed sensor on the monitor. The sensor may require recalibrating. Refer to the windrower operator's manual for the calibration procedure.

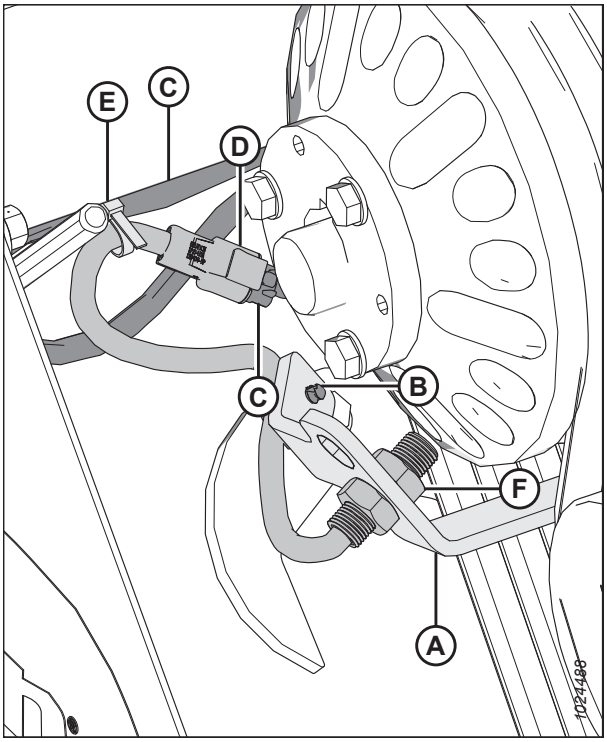


Figure 4.184: Header Speed Sensor

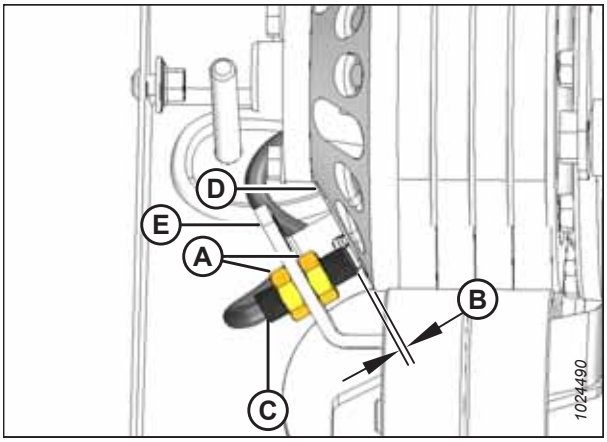


Figure 4.185: Header Speed Sensor

4.12 Hydraulics

Consult this section for general information on the hydraulic system. Detailed procedures for maintaining and repairing the hydraulic system are beyond the scope of the operator's manual.

4.12.1 Checking Hydraulic Hoses and Lines

Check the hydraulic hoses and lines daily for signs of damage or leaks. Replace any damaged or leaking hoses immediately. Follow all applicable safety procedures while inspecting and maintaining the hydraulic system.

WARNING

- **Avoid high-pressure fluids. Escaping fluid can penetrate the skin, causing serious injury. Relieve the pressure from the hydraulic system before disconnecting any hydraulic lines. Tighten all hydraulic connections before applying pressure. Keep your limbs away from pin holes and nozzles, which can eject fluids with enormous force.**
- **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 4.186: 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. Overhauls must be performed in an environment free of dust and debris.

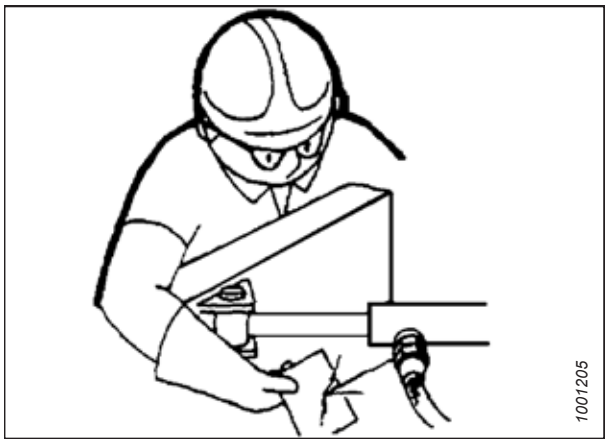


Figure 4.187: Testing for Hydraulic Leaks

Chapter 5: Options and Attachments

Consult this section to learn about additional hardware and configuration options for your machine. Contact your Dealer for more information.

5.1 Performance Kits

Performance kits allow your machine to cut different types of crop in different conditions. The following kits are available through your MacDon Dealer. The Dealer will require the bundle number for pricing and availability.

5.1.1 Tall Crop Divider Kit

Tall crop dividers attach to the ends of the machine for clean crop dividing and cutterbar entry in tall crops.

The kit includes left and right crop dividers and the hardware needed to attach them.

B5800

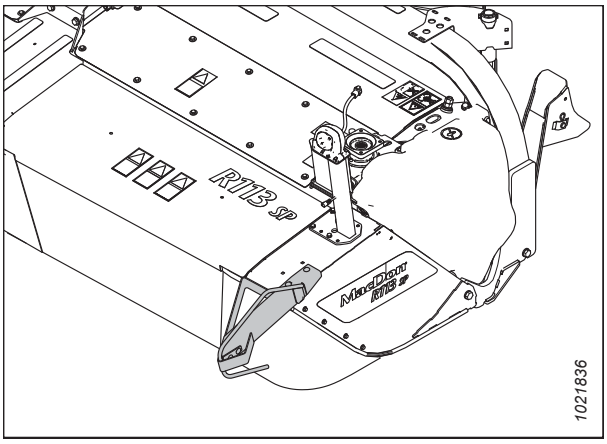


Figure 5.1: Tall Crop Divider — Left Side Shown

5.1.2 No Conditioner Kit

The header can be operated without a conditioner. The kit includes the required rear windrow shielding and curtain.

B5818

5.1.3 Polyurethane Roll Conditioner Kit

Roll conditioners allow for faster crop drying times by crimping and crushing the crop stem as it exits the machine. A polyurethane roll conditioner is suited for crushing stems with minimal crimping; polyurethane is recommended for alfalfa, clover, legumes, and similar crops.

The kit includes a polyurethane roll conditioner and the hardware needed for installation.

B6557

5.1.4 Steel Roll Conditioner Kit

Roll conditioners allow for faster crop drying times by crimping and crushing the crop stem as it exits the machine. Steel rolls with a larger roll gap (up to 25 mm [1 in.]) may be desirable for thick-stemmed cane-type crops; however, too large a gap may cause feeding problems. Steel rolls are recommended for these types of situations.

The kit includes a steel conditioner and the hardware needed for installation.

B6558

5.1.5 Updated Blades Kit

The blades included in this kit have a larger cut length, providing a cleaner cut in lighter crops.

MD #359122

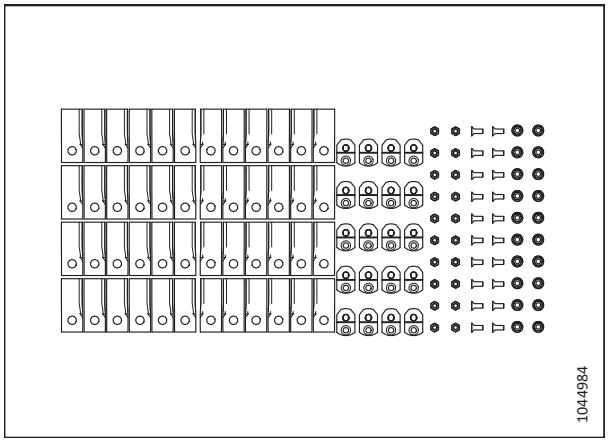


Figure 5.2: Updated Blades Kit

5.2 Hydraulic Drive Conversion Kits

Headers can be reconfigured for other MacDon windrowers by using hydraulic conversion kits.

5.2.1 R113 SP to M1/M2/M205 Hydraulic Drive Kit

The Hydraulic Drive kit is required to configure an R113 SP Rotary Disc Header for use with an M155 or M155*E4* SP Windrower to an M205 SP, M1 Series, or an M2 Series Windrower.

B6845

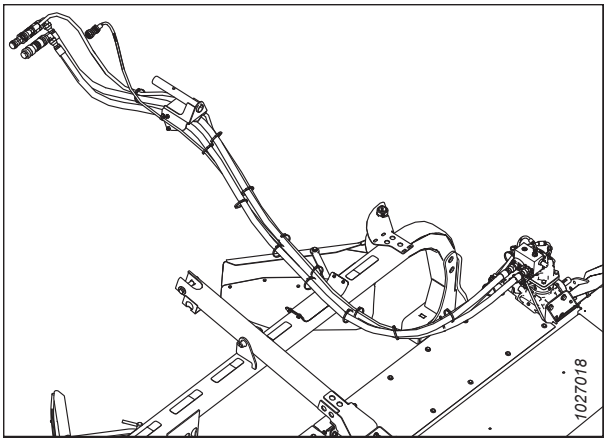


Figure 5.3: Hydraulic Drive Kit (B6845)

5.2.2 M1240/M2260 Case Drain Kit

When connecting the R113 SP Rotary Disc Header to an M1240 or an M2260 Windrower, the Case Drain kit must be installed onto the windrower.

This kit contains an alternative case drain line (A) which routes directly to the hydraulic reservoir and includes a special set of 1/2 in. hydraulic couplers.

B6698

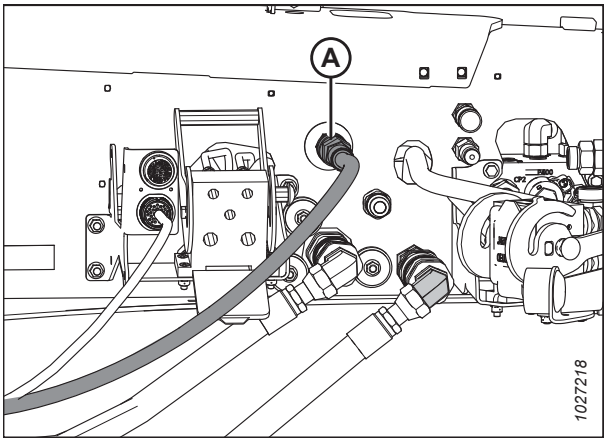


Figure 5.4: Case Drain Kit (B6698)

5.2.3 M155 and M155*E4* Hydraulic Drive Conversion Kit

The Hydraulic Drive kit is required for an R113 Rotary Disc Header to operate correctly with M155 or M155*E4* Self-Propelled Windrowers.

The hydraulic motor supplied in the kit will need to be installed on the header gearbox and hydraulic lines (A) will need to be attached to the motor.

B6272

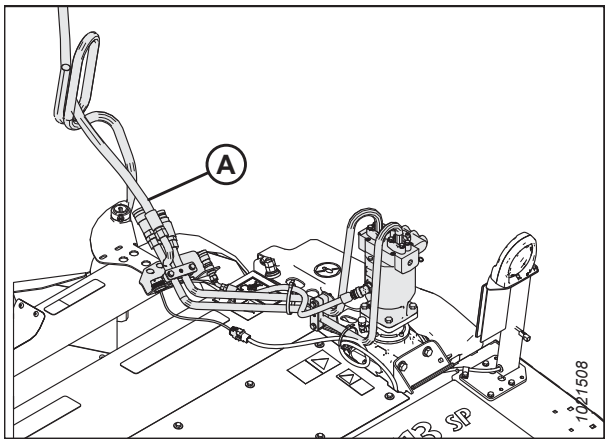


Figure 5.5: Hydraulic Drive Kit (B6272)

5.2.4 M205 Compatibility Kit

The M205 Compatibility kit is required for an R113 Rotary Disc Header to operate on an M205 Self-Propelled Windrower.

MD #257188

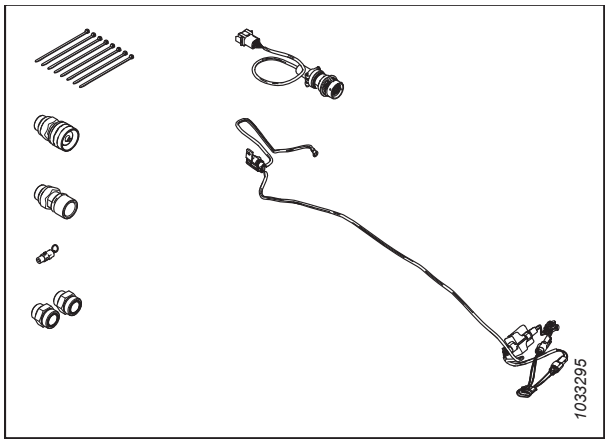


Figure 5.6: M205 Compatibility Kit (MD #257188)

Chapter 6: Troubleshooting

Refer to this table if you encounter problems while operating your machine.

6.1 Performance Problems

If your machine is in good mechanical condition but is not performing to your satisfaction, consult this table.

Problem	Solution	Refer to
Symptom: Cutterbar plugging		
Dull, bent, or badly worn disc blades	Replace the disc blades.	• *Removing Disc Blades, page 177* • *Installing Disc Blades, page 178*
Dirt between the rock guards	Decrease the header angle and increase the float. **NOTE:** In some conditions, it may be necessary to carry the header slightly using the header lift cylinders.	• *3.8.1 Cutting Height, page 118* • Windrower operator's manual
Conditioner drive belt is slipping	Adjust the conditioner drive belt tension.	*4.10.2 Conditioner Drive Belt, page 222*
Symptom: Ragged or uneven cutting of crop		
Header angle is too flat for the guards to pick up downed crop	Increase the header angle.	*3.8.1 Cutting Height, page 118*
Downed crop	Adjust the header angle to cut closer to the ground.	*3.8.1 Cutting Height, page 118*
Header float is too light, causing the header to bounce	Switch to a heavier float setting.	Windrower operator's manual
Excessive ground speed	Reduce the ground speed.	—
Symptom: Strips of uncut crop left on field		
Dull, bent, or badly worn disc blades	Replace the disc blades.	• *Removing Disc Blades, page 177* • *Installing Disc Blades, page 178*
Dirt between the rock guards	Decrease the header angle and increase the float. **NOTE:** In some conditions, it may be necessary to carry the header slightly using the header lift cylinders.	• *3.8.1 Cutting Height, page 118* • Windrower operator's manual
Excessive header speed	Reduce the header disc speed.	—
Foreign object on the cutterbar	Disengage the header and stop the engine. When all moving parts have completely stopped, remove the foreign object.	*4.5.2 Cutterbar Discs, page 160*
Disc is not turning	Replace the spindle shear pin.	*4.5.8 Replacing Cutterbar Spindle Shear Pin, page 200*
Ground speed too slow	Increase the ground speed.	—

Problem	Solution	Refer to
Symptom: Conditioner rolls plugging		
Ground speed is too fast	Reduce the ground speed.	—
Roll gap too large for the proper feeding of crop	Decrease the roll gap.	• *Adjusting Roll Gap – Polyurethane Rolls, page 125* • *Adjusting Roll Gap – Steel Rolls, page 126*
Roll gap is too small in thick-stemmed cane-type crops	Increase the roll gap.	• *Adjusting Roll Gap – Polyurethane Rolls, page 125* • *Adjusting Roll Gap – Steel Rolls, page 126*
Swath baffle set too low	Raise the swath baffle.	*3.10.4 Forming Shields – Roll Conditioner, page 131*
Roll speed too low	Increase the disc speed.	—
Foreign object between the rolls	Disengage the header and stop the engine. When all moving parts have completely stopped, remove the foreign object.	*4.5.2 Cutterbar Discs, page 160*
Cutting height is too low	Decrease the header angle in order to raise the cutting height.	*3.8.1 Cutting Height, page 118*
Backing into the windrow	Raise the header before backing up.	—
Rolls improperly timed	Adjust the roll timing.	*Adjusting Roll Timing, page 129*
Symptom: Uneven formation and bunching of windrow		
Swath baffle (deflector) bypassing or dragging crop	Adjust the rear deflector for proper crop control.	*Positioning Rear Baffle – Roll Conditioner, page 132*
Forming shields are improperly adjusted	Adjust the roll conditioner forming shields.	• *Positioning Forming Shield Side Deflectors – Roll Conditioner, page 131* • *Positioning Rear Baffle – Roll Conditioner, page 132*
Roll gap is too large	Adjust the roll gap.	• *Adjusting Roll Gap – Polyurethane Rolls, page 125* • *Adjusting Roll Gap – Steel Rolls, page 126*
Conditioner rolls are running too slowly	Maintain the rated header speed.	Windrower operator's manual
Symptom: Uneven windrow formation in light crop		
Uneven crop feeding	Reduce the header speed.	Windrower operator's manual
Symptom: Plugging behind end hourglass deflectors		
Ground speed is too slow	Increase the ground speed.	—
Dirt building up on the cutterbar	Remove the crop deflectors attached to the rear of the cutterbar.	*3.11.1 Removing Cutterbar Deflectors, page 134*

Problem	Solution	Refer to
Symptom: Not cutting short enough in down crop		
Ground speed is too fast	Reduce the ground speed.	—
Broken, bent, or dull blades	Replace the blades or turn the blades over.	• *Removing Disc Blades, page 177* • *Installing Disc Blades, page 178*
Cutting height is too high	If field conditions allow, adjust the header angle so that it is steeper. This will lower the cutting height.	*3.8.1 Cutting Height, page 118*
Symptom: Material being pulled out by roots when cutting, and tall crop leaning into machine		
Crop in the conditioner rolls before the crop is cut	Increase the roll gap.	• *Adjusting Roll Gap – Polyurethane Rolls, page 125* • *Adjusting Roll Gap – Steel Rolls, page 126*
Symptom: Damaged leaves and broken stems		
Insufficient roll gap	Increase the roll gap.	• *Adjusting Roll Gap – Polyurethane Rolls, page 125* • *Adjusting Roll Gap – Steel Rolls, page 126*
Roll timing is off	Check the roll timing and adjust it if necessary.	• *Checking Roll Timing, page 128* • *Adjusting Roll Timing, page 129*
Symptom: Cutting height varies from one side to the other		
Float is not properly balanced	Adjust the header float.	Windrower operator's manual
Symptom: Slow crop drying		
Crop is bunched in windrow	Adjust the forming shields or the baffle.	• *Positioning Forming Shield Side Deflectors – Roll Conditioner, page 131* • *Positioning Rear Baffle – Roll Conditioner, page 132*
Rolls are not crimping crop sufficiently	Decrease the roll gap.	• *Adjusting Roll Gap – Polyurethane Rolls, page 125* • *Adjusting Roll Gap – Steel Rolls, page 126*
Symptom: Excessive drying or bleaching of crop		
Excessive crimping of crop	Increase the roll gap.	• *Adjusting Roll Gap – Polyurethane Rolls, page 125* • *Adjusting Roll Gap – Steel Rolls, page 126*

Problem	Solution	Refer to
Crop is spread too wide in the windrow	Adjust the forming shields.	• *Positioning Forming Shield Side Deflectors – Roll Conditioner, page 131* • *Positioning Rear Baffle – Roll Conditioner, page 132*
Symptom: Poorly formed or bunchy windrows		
Forming shields not properly positioned	Adjust the forming shields.	• *Positioning Forming Shield Side Deflectors – Roll Conditioner, page 131* • *Positioning Rear Baffle – Roll Conditioner, page 132*

6.2 Mechanical Problems

If your machine develops mechanical problems, consult this table for guidance.

Problem	Solution	Refer to
Symptom: Excessive noise		
Bent disc blade	Replace the blade.	• *Removing Disc Blades, page 177* • *Installing Disc Blades, page 178*
Conditioner roll timing is off	Check the roll timing and adjust it, if necessary.	• *Checking Roll Timing, page 128* • *Adjusting Roll Timing, page 129*
Bent drum deflector	Replace the drum.	*4.5.7 Maintaining Large Drums, page 189*
Conditioner roll gap is too small	Check the gap and adjust it, if necessary.	• *Checking Roll Gap, page 124* • *Adjusting Roll Gap – Polyurethane Rolls, page 125* • *Adjusting Roll Gap – Steel Rolls, page 126*
Symptom: Excessive vibration or noise in header		
Mud deposits found on the conditioner rolls	Clean the rolls.	—
Conditioner rolls are contacting each other	Increase the roll gap.	• *Adjusting Roll Gap – Polyurethane Rolls, page 125* • *Adjusting Roll Gap – Steel Rolls, page 126*
Conditioner rolls are contacting each other	Check the roll timing.	*Checking Roll Timing, page 128*
Symptom: Excessive heat in cutterbar		
Incorrect level of lubricant in cutterbar —either too little or too much	Drain the lubricant and refill it with the amount specified in this manual.	*Draining Cutterbar, page 157*
Symptom: Frequent blade damage		
Mud on the cutterbar	Remove the mud from the cutterbar. Do **NOT** allow mud to dry on the cutterbar.	—
Spindle bearing failure	Replace the spindle bearing.	• *Removing Cutterbar Spindles, page 164* • *Installing Cutterbar Spindles, page 167*
Header float is too heavy	Increase the float.	Windrower operator's manual
Material wrapped around spindle	Remove disc and remove material.	• *Removing Disc Blades, page 177* • *Installing Disc Blades, page 178*
Machine is cutting too low in rocky field conditions	Decrease the header angle and/or increase the float.	• *3.8.1 Cutting Height, page 118* • Windrower operator's manual

Problem	Solution	Refer to
Ground speed is too high in rocky field conditions. At high ground speed, the header tends to dig rocks from the ground instead of floating over them.	Reduce the ground speed.	—
Disc blades are incorrectly mounted	Check all blade mounting hardware and ensure that the blades move freely.	*Inspecting Disc Blades, page 174*
Symptom: Excessive wear of cutting components		
Header angle is too steep	Reduce the header angle.	*3.8.1 Cutting Height, page 118*
Crop residue and dirt deposits found on the cutterbar	Clean the cutterbar.	—
Mud on found on the cutterbar	Remove mud from the cutterbar. Do **NOT** allow mud to dry on the cutterbar.	—
Symptom: Machine pulling to one side		
Header is dragging on one end and pulling to that side	Adjust the header float on both ends.	Windrower operator's manual
Symptom: Breakage of conditioner roll timing belt		
Belt is not seated in the proper groove in the pulley	Align the belt.	*4.10.2 Conditioner Drive Belt, page 222*
Foreign object found between the rolls	Disengage the header and stop the engine. When all moving parts have completely stopped, remove the foreign object.	*Inspecting Conditioner Drive Belt, page 222*
Belt pulleys and idlers misaligned	Align the pulleys and the idler.	Contact your MacDon Dealer
Symptom: Conditioner roll does not rotate		
Faulty drive belt	Check the drive belt pulleys.	*Inspecting Conditioner Drive Belt, page 222*
Symptom: Disc does not turn when engaging header		
Hydraulic hoses are not connected	Connect the hydraulic hoses.	*3.4 Attaching Header to Windrower, page 31*
Poor electrical connection at the pump solenoid	Check the connection at the windrower.	Windrower operator's manual
Faulty header drive gearbox	Check the gearbox.	• *4.7 Servicing Header Drive Gearbox, page 210* • *4.7.1 Changing Header Drive Gearbox Lubricant, page 210*
Symptom: Header slows down when going uphill		
Hydraulic oil level in the windrower is low	Add oil to the windrower reservoir.	Windrower operator's manual
Symptom: Header runs while unloaded, but slows down or stops when starting to cut		
Defective hydraulic motor	Repair or replace the hydraulic motor.	Contact your MacDon Dealer
Defective hydraulic pump in the windrower	Repair or replace the pump.	Contact your MacDon Dealer

Problem	Solution	Refer to
Defective relief valve in the windrower	Repair or replace the relief valve.	Contact your MacDon Dealer
Cold oil in the hydraulic drive system	Reduce ground speed until the oil reaches operating temperature.	—

Chapter 7: Reference

The reference chapter provides additional information such as torque specifications and a unit conversion chart.

7.1 Torque Specifications

The following tables provide torque values for various bolts, cap screws, and hydraulic fittings. Refer to these values only when no other torque value has been specified in a given procedure.

- Tighten all bolts to the torque values specified in the charts below, unless you are directed otherwise in this manual.
- Replace removed hardware with hardware of the same strength and grade.
- Refer to the torque value tables as a guide when periodically checking the tightness of bolts.
- Understand the torque categories for bolts and cap screws by reading the markings on their heads.

Jam nuts

Jam nuts require less torque than nuts used for other purposes. When applying torque to finished jam nuts, multiply the torque applied to regular nuts by 0.65 to obtain the modified torque value.

Self-tapping screws

Refer to the standard torque values when installing the self-tapping screws. Do **NOT** install the self-tapping screws on structural or otherwise critical joints.

7.1.1 Metric Bolt Specifications

Specifications are provided for the appropriate final torque values to secure various sizes of metric bolts.

NOTE:

The torque values provided in the following metric bolt torque tables apply to hardware installed dry; that is, hardware with no grease, oil, or threadlocker on the threads or heads. Do **NOT** add grease, oil, or threadlocker to bolts or cap screws unless you are directed to do so in this manual.

Table 7.1 Metric Class 8.8 Bolts and Class 9 Free Spinning Nut

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

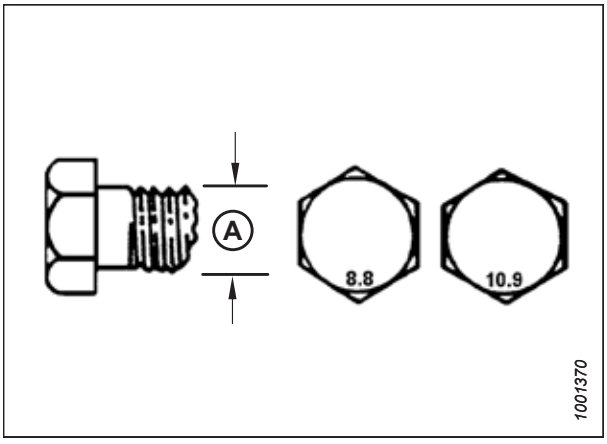


Figure 7.1: Bolt Grades

Table 7.2 Metric Class 8.8 Bolts and Class 9 Distorted Thread Nut

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

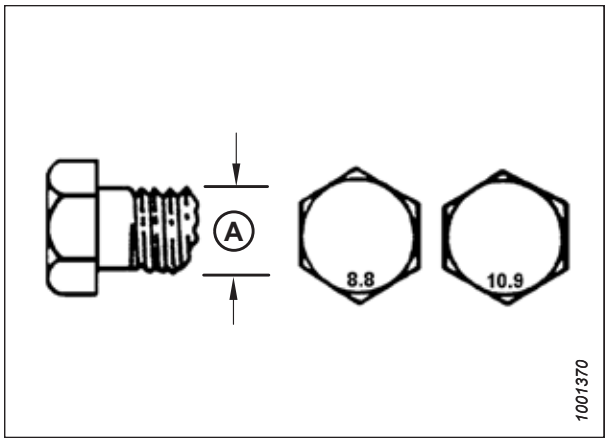


Figure 7.2: Bolt Grades

Table 7.3 Metric Class 10.9 Bolts and Class 10 Free Spinning Nut

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

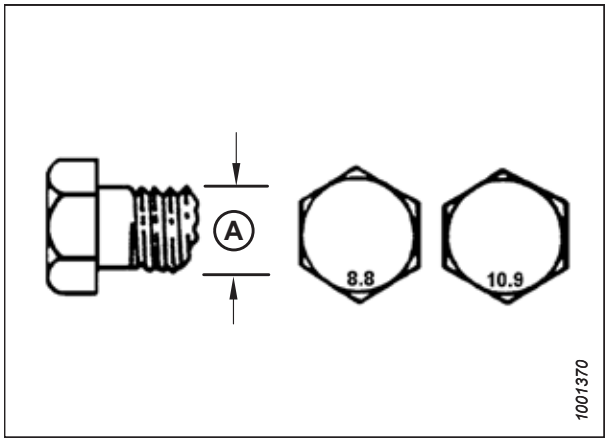


Figure 7.3: Bolt Grades

Table 7.4 Metric Class 10.9 Bolts and Class 10 Distorted Thread Nut

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

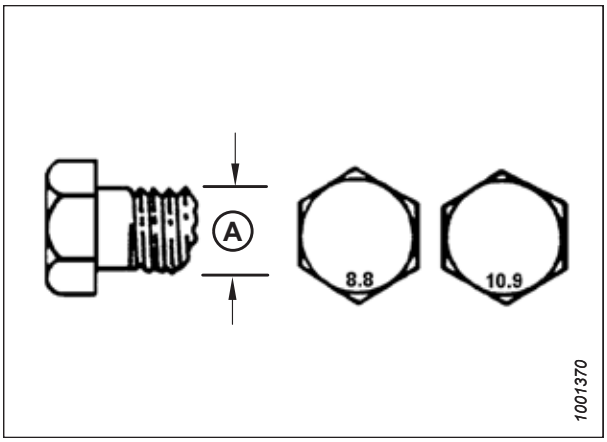


Figure 7.4: Bolt Grades

7.1.2 Metric Bolt Specifications – Cast Aluminum

Specifications are provided for the appropriate final torque values for various sizes of metric bolts in cast aluminum.

NOTE:

The torque values provided in the following metric bolt torque tables apply to hardware installed dry; that is, hardware with no grease, oil, or threadlocker on the threads or heads. Do **NOT** add grease, oil, or threadlocker to bolts or cap screws unless you are directed to do so in this manual.

Table 7.5 Metric Bolt Bolting into Cast Aluminum

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

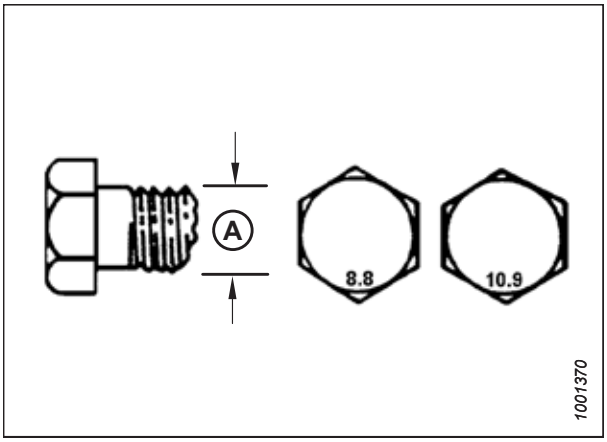


Figure 7.5: Bolt Grades

7.1.3 O-Ring Boss Hydraulic Fittings – Adjustable

The standard torque values are provided for adjustable hydraulic fittings. If a procedure specifies a different torque value for the same type and size of fitting found in this topic, refer to the value specified in the procedure instead.

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

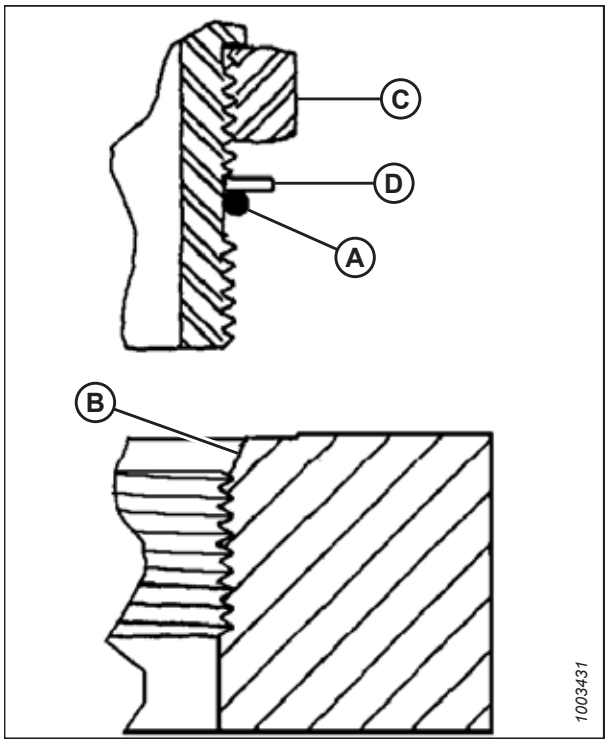


Figure 7.6: Hydraulic Fitting

5. Install fitting (B) into the port until backup washer (D) and O-ring (A) contact part face (E).
6. Position the angle fittings by unscrewing no more than one turn.
7. Turn lock nut (C) down to washer (D) and tighten it to the torque value indicated in the table. Use two wrenches, one on fitting (B) and the other on lock nut (C).
8. Verify the final condition of the fitting.

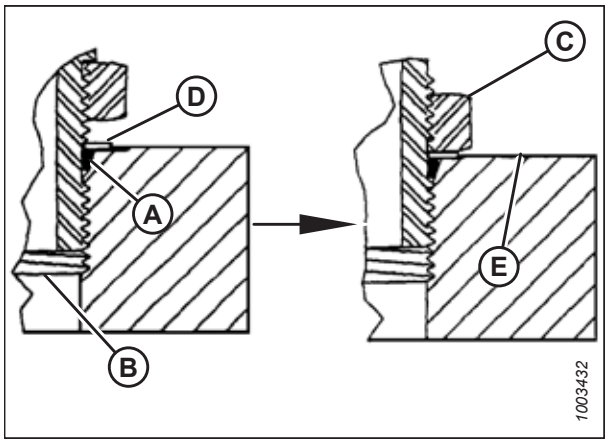


Figure 7.7: Hydraulic Fitting

Table 7.6 O-Ring Boss (ORB) Hydraulic Fittings – Adjustable and Non-Adjustable

SAE Dash Size	Thread Size (in.)	Torque Value[7]	
		Nm	lbf·ft (*lbf·in)
-2	5/16–24	10–11	*89–97
-3	3/8–24	18–20	*159–177
-4	7/16–20	29–32	21–24
-5	1/2–20	32–35	24–26
-6	9/16–18	40–44	30–32
-8	3/4–16	70–77	52–57
-10	7/8–14	115–127	85–94
-12	1 1/16–12	183–201	135–148
-14	1 3/16–12	237–261	175–193
-16	1 5/16–12	271–298	200–220
-20	1 5/8–12	339–373	250–275
-24	1 7/8–12	414–455	305–336
-32	2 1/2–12	509–560	375–413

7.1.4 O-Ring Boss Hydraulic Fittings – Non-Adjustable

The standard torque values for non-adjustable hydraulic fittings are provided. If a procedure specifies a different torque value for the same type and size of fitting found in this topic, use the value specified in the procedure instead.

1. Inspect O-ring (A) and seat (B) for dirt or defects.
2. Ensure that O-ring (A) is **NOT** on the threads. Adjust O-ring (A) if necessary.
3. Apply hydraulic system oil to the O-ring.
4. Install fitting (C) into the port until the fitting is hand-tight.
5. Torque fitting (C) according to values in Table *7.7, page 261*.
6. Verify the final condition of the fitting.

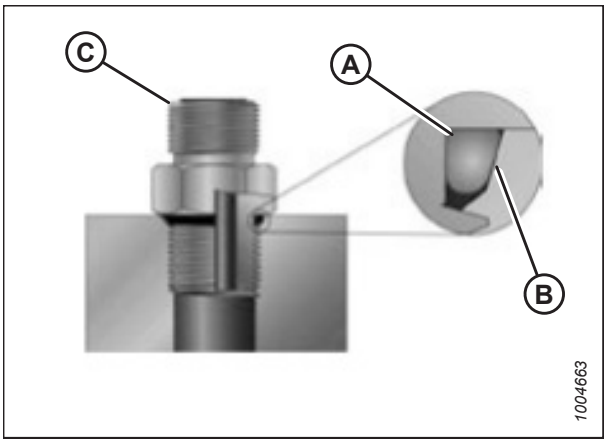


Figure 7.8: Hydraulic Fitting

Table 7.7 O-Ring Boss (ORB) Hydraulic Fittings – Adjustable and Non-Adjustable

SAE Dash Size	Thread Size (in.)	Torque Value[7]	
		Nm	lbf·ft (*lbf·in)
-2	5/16–24	10–11	*89–97
-3	3/8–24	18–20	*159–177
-4	7/16–20	29–32	21–24
-5	1/2–20	32–35	24–26

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

Table 7.7 O-Ring Boss (ORB) Hydraulic Fittings – Adjustable and Non-Adjustable (continued)

SAE Dash Size	Thread Size (in.)	Torque Value[8]	
		Nm	lbf·ft (*lbf·in)
-6	9/16–18	40–44	30–32
-8	3/4–16	70–77	52–57
-10	7/8–14	115–127	85–94
-12	1 1/16–12	183–201	135–148
-14	1 3/16–12	237–261	175–193
-16	1 5/16–12	271–298	200–220
-20	1 5/8–12	339–373	250–275
-24	1 7/8–12	414–455	305–336
-32	2 1/2–12	509–560	375–413

7.1.5 O-Ring Face Seal Hydraulic Fittings

The standard torque values are provided for O-ring face seal hydraulic fittings. If a procedure specifies a different torque value for the same type and size of fitting found in this topic, refer to the value specified in the procedure instead.

Torque values are shown in the Table *7.8, page 263*.

1. Ensure that the sealing surfaces and the fitting threads are free of burrs, nicks, scratches, and any foreign material.

Figure 7.9: Hydraulic Fitting

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

2. Apply hydraulic system oil to O-ring (B).
3. Align the tube or hose assembly so that the flat face of sleeve (A) or (C) comes into full contact with O-ring (B).
4. Thread tube or hose nut (D) until it is hand-tight. The nut should turn freely until it bottoms out.
5. Torque the fittings according to values in Table *7.8, page 263*.

   NOTE:

   If applicable, hold the hex flange on fitting body (E) to prevent the rotation of the fitting body and the hose when tightening fitting nut (D).
6. Use three wrenches when assembling unions or joining two hoses together.
7. Verify the final condition of the fitting.

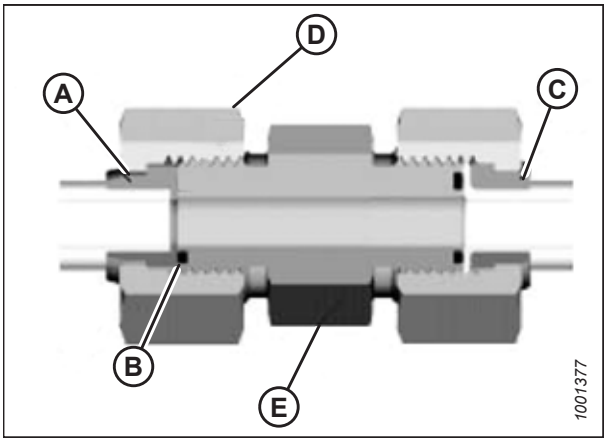


Figure 7.10: Hydraulic Fitting

Table 7.8 O-Ring Face Seal (ORFS) Hydraulic Fittings

SAE Dash Size	Thread Size (in.)	Tube O.D. (in.)	Torque Value[9]	
			Nm	lbf·ft
-3	Note[10]	3/16	–	–
-4	9/16	1/4	25–28	18–21
-5	Note[10]	5/16	–	–
-6	11/16	3/8	40–44	30–32
-8	13/16	1/2	55–61	41–45
-10	1	5/8	80–88	59–65
-12	1 3/16	3/4	115–127	85–94
-14	Note[10]	7/8	–	–
-16	1 7/16	1	150–165	111–122
-20	1 11/16	1 1/4	205–226	151–167
-24	2	1 1/2	315–347	232–256
-32	2 1/2	2	510–561	376–414

7.1.6 Tapered Pipe Thread Fittings

The standard torque values are provided for tapered pipe thread fittings. If a procedure specifies a different torque value for the same type and size of fitting found in this topic, refer to the value specified in the procedure instead.

Assemble pipe fittings as follows:

1. Ensure that the fitting and the port threads are free of burrs, nicks, scratches, and any other form of contamination.
2. Apply paste-type pipe thread sealant to the external pipe threads.
3. Thread the fitting into the port until it is hand-tight.

9. Torque values and angles shown are based on lubricated connection as in reassembly.
10. O-ring face seal type end not defined for this tube size.

4. Torque the connector to the appropriate torque angle. The turns from finger tight (TFFT) and flats from finger tight (FFFT) values are shown in Table *7.9, page 264*. Ensure that the tube end of a shaped connector (typically a 45° or 90° elbow) is aligned to receive the incoming tube or hose assembly. Always finish the alignment of the fitting in the direction of tightening. Never loosen the threaded connectors to achieve alignment.

5. Clean all residue and any excess thread conditioner with an appropriate cleaner.

6. Inspect the final condition of the fitting. Pay special attention to the possibility of cracks in the port opening.

7. Mark the final position of the fitting. If a fitting leaks, disassemble the fitting and check it for damage.

   NOTE:

   The failure of fittings due to over-torquing may not be evident until the fittings are disassembled and inspected.

Table 7.9 Hydraulic Fitting Pipe Thread

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

7.2 Conversion Chart

This manual uses both SI units (including metric) and US customary units (sometimes referred to as standard units) of measurement. A list of those units along with their abbreviations and conversion factors is provided here for your reference.

Table 7.10 Conversion Chart

Quantity	SI Units (Metric)		Factor	US Customary Units (Standard)	
	Unit Name	Abbreviation		Unit Name	Abbreviation
Area	hectare	ha	x 2.4710 =	acre	acres
Flow	liters per minute	L/min	x 0.2642 =	US gallons per minute	gpm
Force	Newton	N	x 0.2248 =	pound force	lbf
Length	millimeter	mm	x 0.0394 =	inch	in.
Length	meter	m	x 3.2808 =	foot	ft.
Power	kilowatt	kW	x 1.341 =	horsepower	hp
Pressure	kilopascal	kPa	x 0.145 =	pounds per square inch	psi
Pressure	megapascal	MPa	x 145.038 =	pounds per square inch	psi
Pressure	bar (Non-SI)	bar	x 14.5038 =	pounds per square inch	psi
Torque	Newton meter	Nm	x 0.7376 =	pound feet or foot pounds	lbf·ft
Torque	Newton meter	Nm	x 8.8507 =	pound inches or inch pounds	lbf·in
Temperature	degrees Celsius	°C	(°C x 1.8) + 32 =	degrees Fahrenheit	°F
Velocity	meters per minute	m/min	x 3.2808 =	feet per minute	ft/min
Velocity	meters per second	m/s	x 3.2808 =	feet per second	ft/s
Velocity	kilometers per hour	km/h	x 0.6214 =	miles per hour	mph
Volume	liter	L	x 0.2642 =	US gallon	US gal
Volume	milliliter	mL	x 0.0338 =	ounce	oz.
Volume	cubic centimeter	cm^3 or cc	x 0.061 =	cubic inch	$in.^3$
Weight	kilogram	kg	x 2.2046 =	pound	lb.

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Recommended Lubricants

Keep your machine operating at top efficiency by using only clean lubricants and by ensuring the following:

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

IMPORTANT:

Do **NOT** overfill the cutterbar when adding lubricant. Overfilling could result in overheating and failure of cutterbar components.

Specification	Description	Use	Capacities
Lubricant: Grease			
SAE Multipurpose	High-temperature, extreme-pressure (EP) performance with 1% max. molybdenum disulphide (NLGI Grade 2) lithium base	As required unless otherwise specified	—
SAE Multipurpose	High-temperature, extreme-pressure (EP) performance with 10% max. molybdenum disulphide (NLGI Grade 2) lithium base	Driveline slip-joints	—
Lubricant: Gear Lubricant			
SAE 80W-90	High thermal and oxidation stability API service class GL-5	Cutterbar	8 L (8.5 qts [US])
SAE 85W-140	Fully synthetic oil API GL-5 minimum, SAE J2360 preferred	Conditioner roll timing gearbox	0.7 L (0.75 qts [US])
SAE 80W-140	Fully synthetic oil API GL-5 minimum, SAE J2360 preferred	Header drive 90° gearbox	1.65 L (1.74 qts [US])

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