MacDon

HC10
Hay Conditioner for D Series Draper Headers

Setup, Operation, and Parts Manual

214358 Revision A

Original Instruction

The harvesting specialists.

MacDon HC10 Hay Conditioner

Published July 2017.

Introduction

This manual contains safety information, setup instructions, operating and maintenance procedures, and parts information for the MacDon HC10 Hay Conditioner.

Conditioning or crimping cut hay allows moisture release for quicker drying and earlier processing. This hay conditioner, when teamed with an M Series Self-Propelled Windrower and a double-knife drive D Series Draper Header, will condition crop cut by the header, which the windrower lays into uniform, fluffy windrows.

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

The HC10 Hay Conditioner is NOT intended for use with the M205 Self-Propelled Windrower. Refer to the following table to determine if the HC10 Hay Conditioner is compatible with your windrower in your market:

Carrier (North America only)	MacDon M150, M155, M155*E4*, and M200 Self-Propelled Windrowers
Carrier (Export only)	MacDon M100, M105, M150, M155, and M200 Self-Propelled Windrowers

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 given in this manual, your hay conditioner will work well for many years. Use this manual in conjunction with your windrower and draper header manuals.

Use the Table of Contents and Index to guide you to specific topics. Review the Table of Contents to familiarize yourself with how the material is organized.

Keep this manual handy for frequent reference and to pass on to new Operators or Owners. Call your Dealer if you need assistance, information, or additional copies of this manual.

Warranty information

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

Conventions

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

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).

A Russian translation of this manual can be ordered from MacDon, downloaded from the Dealer Portal (*https://portal.macdon.com*) (login required), or downloaded from the MacDon International Website (*http://www.macdon.com/world*).

List of Revisions

The following list provides an account of major changes from the previous version of this document.

Summary of Change	Location
Added warranty information and conventions.	*Introduction, page i*
Revised first step. Fin deflectors and hardware are now shipped loose in plastic bags.	*3.9 Assembling the Forming Shield, page 41*
Revised belt deflection values. Revised torque values for nut on motor shaft.	*5.7.1 Adjusting Drive Belt Tension, page 86*
Revised torque values for nut on motor shaft.	*5.7.2 Adjusting Drive Belt Pulley Alignment, page 87*
Revised torque values for nut on motor shaft.	*5.7.3 Checking and Adjusting Drive Belt Tracking, page 88*
Revised torque values for nut on motor shaft.	*5.7.4 Removing Drive Belt, page 90*
Revised torque values for nut on motor shaft.	*5.7.5 Installing Drive Belt, page 90*
Replaced sub-assembly spring MD #183660 with spring assembly MD #130644.	*6.3 Upper Roll Assembly, page 100*
Replaced cover MD #156815 with MD #187723.	*6.4 Cover and Supports, page 102*
Added shaft repair kit MD #159692.	*6.5 Hydraulic Motor, Mounts, and Tensioner, page 106*
Added fitting MD #135245, caps MD #30999 and 108233, and plugs MD #135374, 103576, and 50178. Added note about kit MD #159692.	*6.7 Hydraulic Completion Package, page 112*
Replaced bolt MD #21760 with MD #21880.	*6.8 Gears and Roll Coupling Assembly, page 116*

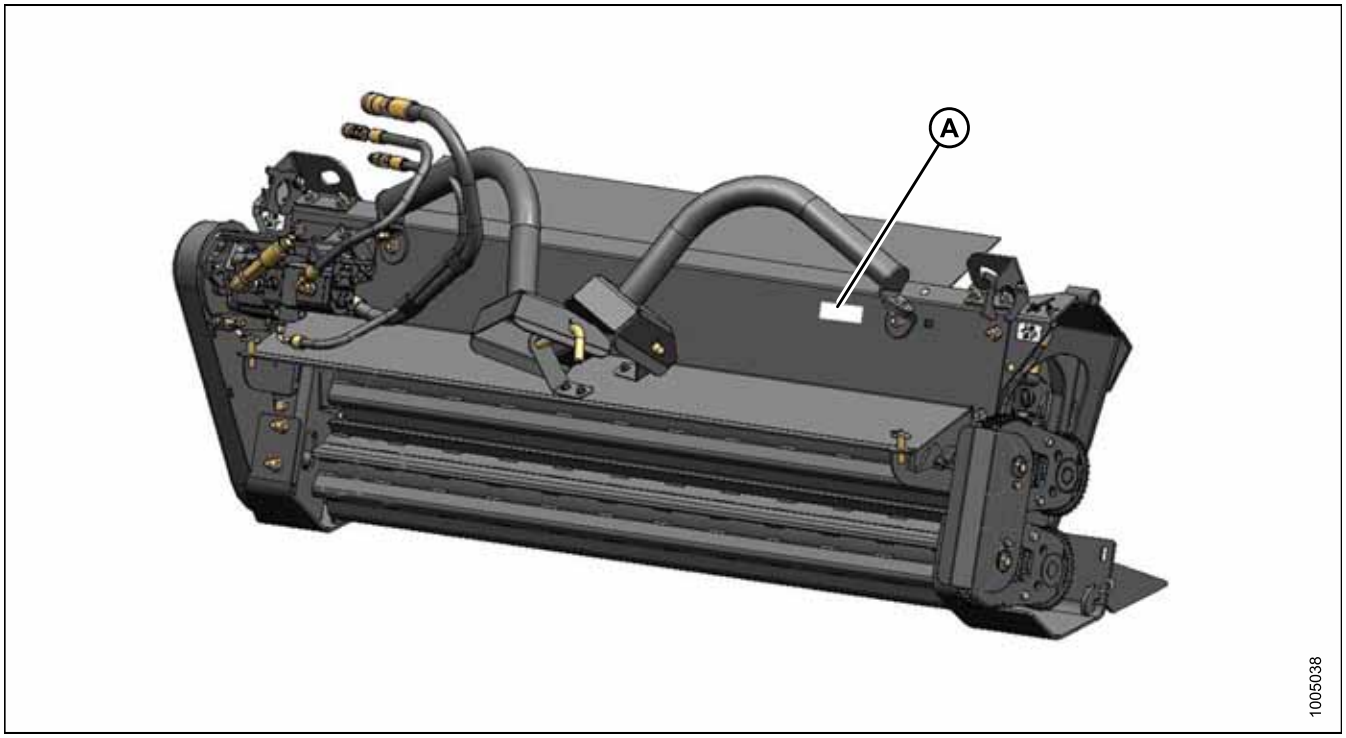
Serial Numbers

Record the serial number of the hay conditioner in the space below.

Hay Conditioner Serial Number: _____

Serial number plate (A) is located on the rear cover of the conditioner frame as shown below.

Figure 1. Serial Number Plate



1 Safety

1.1 Safety Alert Symbols

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

This symbol means:

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

Carefully read and follow the safety message accompanying this symbol.

Why is safety important to you?

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

Figure 1.1: Safety Symbol

1.2 Signal Words

Three signal words, **DANGER, WARNING**, and **CAUTION**, are used to alert you to hazardous situations. The appropriate signal word for each situation has been selected using the following guidelines:

DANGER

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

WARNING

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

CAUTION

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

1.3 General Safety

CAUTION

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

Protect yourself.

- When assembling, operating, and servicing machinery, wear all protective clothing and personal safety devices that could be necessary for job at hand. Do **NOT** take chances. You may need the following:
  - Hard hat
  - Protective footwear with slip resistant soles
  - Protective glasses or goggles
  - Heavy gloves
  - Wet weather gear
  - Respirator or filter mask
- Be aware that exposure to loud noises can cause hearing impairment or loss. Wear suitable hearing protection devices such as earmuffs or earplugs to help protect against loud noises.

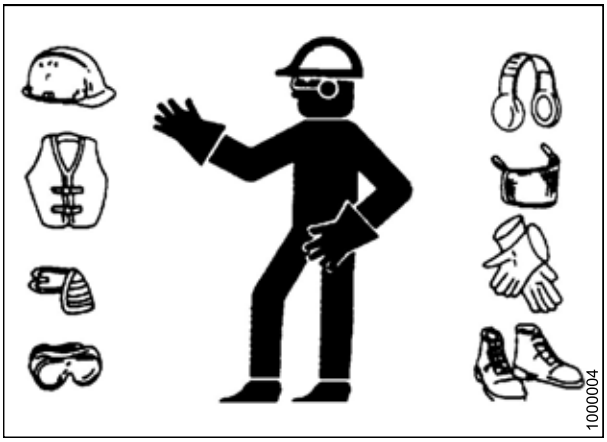


Figure 1.2: Safety Equipment

Figure 1.3: Safety Equipment

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

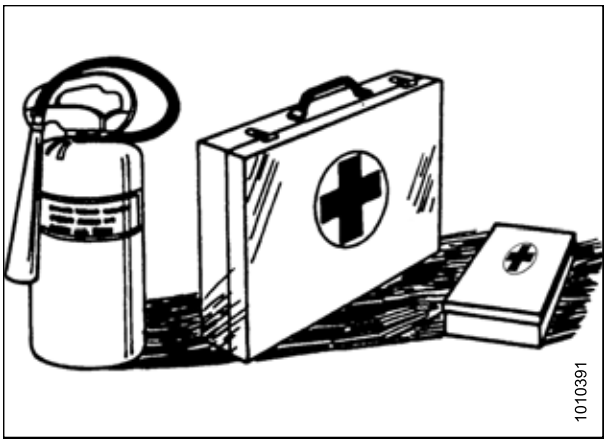


Figure 1.4: Safety Equipment

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

Figure 1.5: Safety around Equipment

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

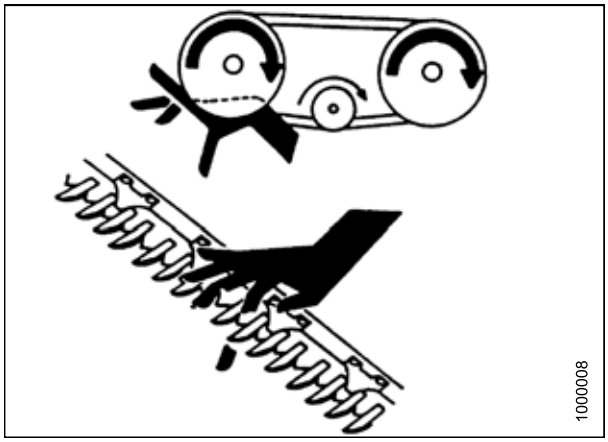


Figure 1.6: Safety around Equipment

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

Figure 1.7: Safety around Equipment

1.4 Maintenance Safety

To ensure your safety while maintaining machine:

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

Figure 1.8: Safety around Equipment

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

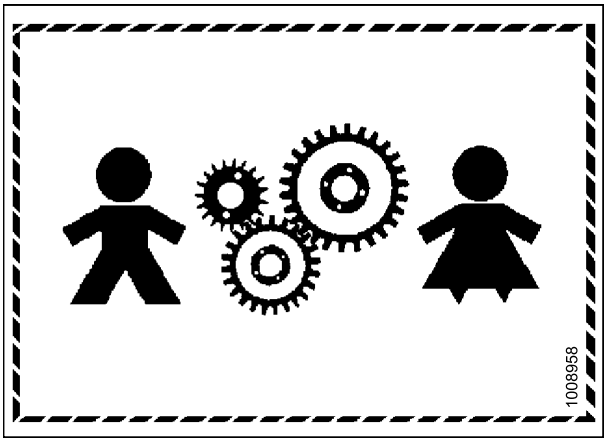


Figure 1.9: Equipment NOT Safe for Children

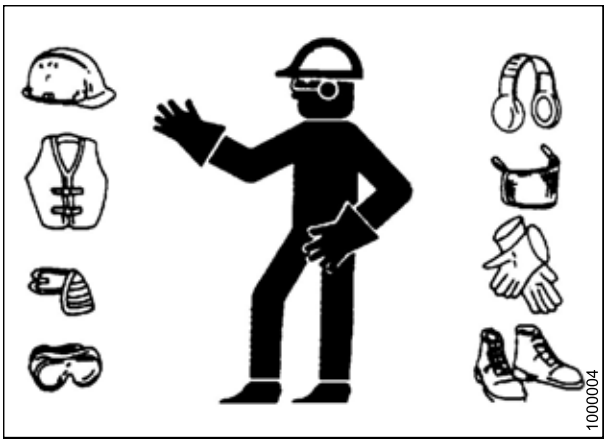


Figure 1.10: Safety Equipment

1.5 Hydraulic Safety

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

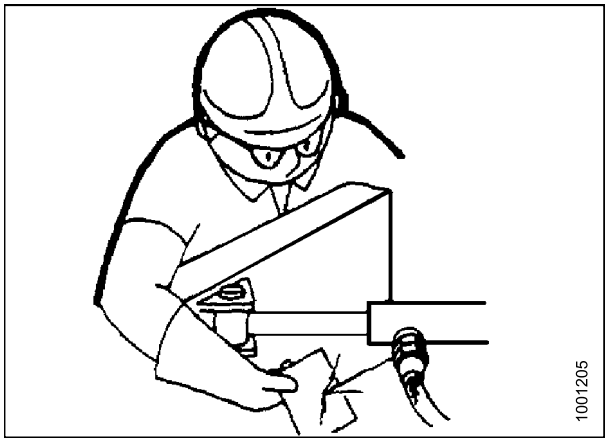


Figure 1.11: Testing for Hydraulic Leaks

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

Figure 1.12: Hydraulic Pressure Hazard

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

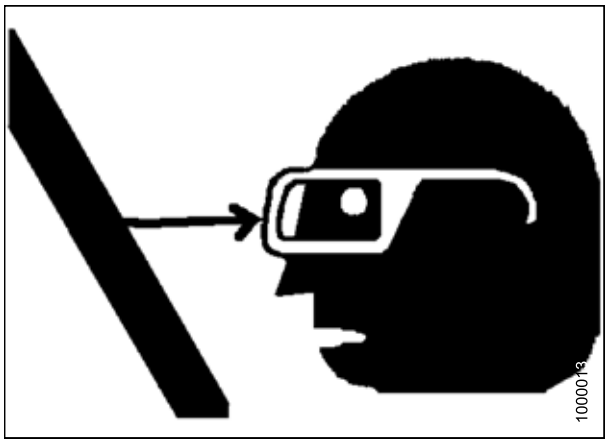


Figure 1.13: Safety around Equipment

1.6 Safety Signs

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

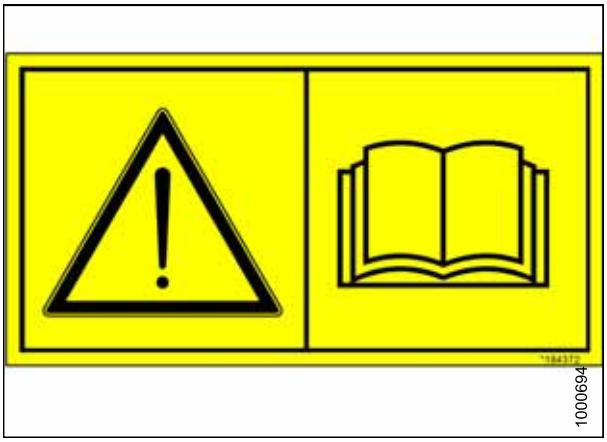


Figure 1.14: Operator's Manual Decal

1.6.1 Installing Safety Decals

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

2 Product Overview

2.1 Definitions

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

Term	Definition
API	American Petroleum Institute
ASTM	American Society of Testing and Materials
Bolt	A headed and externally threaded fastener that is designed to be paired with a nut
Center-link	A hydraulic cylinder link between header and machine used to change header angle
CGVW	Combined gross vehicle weight
D Series header	MacDon D50, D60, and D65 rigid draper headers
DK	Double knife
DKD	Double-knife drive
Finger tight	Finger tight is a reference position where sealing surfaces or components are making contact with each other, and fitting has been tightened to a point where fitting is no longer loose
FFFT	Flats from finger tight
GVW	Gross vehicle weight
Hard joint	A joint made with use of a fastener where joining materials are highly incompressible
Header	A machine that cuts and lays crop into a windrow and is attached to a self-propelled windrower
Hex key	A tool of hexagonal cross-section used to drive bolts and screws that have a hexagonal socket in head (internal-wrenching hexagon drive); also known as an Allen key and various other synonyms
HDS	Hydraulic deck shift
hp	Horsepower
JIC	Joint Industrial Council: A standards body that developed standard sizing and shape for original 37° flared fitting
n/a	Not applicable
Nut	An internally threaded fastener that is designed to be paired with a bolt
N-DETENT	The slot opposite the NEUTRAL position on operator’s console
NPT	National Pipe Thread: A style of fitting used for low pressure port openings. Threads on NPT fittings are uniquely tapered for an interference fit
ORB	O-ring boss: A style of fitting commonly used in port opening on manifolds, pumps, and motors
ORFS	O-ring face seal: A style of fitting commonly used for connecting hoses and tubes This style of fitting is also commonly called ORS, which stands for O-ring seal

Term	Definition
rpm	Revolutions per minute
RoHS (Reduction of Hazardous Substances)	A directive by the European Union to restrict use of certain hazardous substances (such as hexavalent chromium used in some yellow zinc platings)
SAE	Society of Automotive Engineers
Screw	A headed and externally threaded fastener that threads into preformed threads or forms its own thread into a mating part
Soft joint	A joint made with use of a fastener where joining materials are compressible or experience relaxation over a period of time
Timed knife drive	Synchronized motion applied at cutterbar to two separately driven knives from a single hydraulic motor
Tension	Axial load placed on a bolt or screw, usually measured in Newtons (N) or pounds (lb.)
TFFT	Turns from finger tight
Torque	The product of a force X lever arm length, usually measured in Newton-meters (Nm) or foot-pounds (lbf·ft)
Torque angle	A tightening procedure where fitting is assembled to a precondition (finger tight) and then nut is turned farther a number of degrees to achieve its final position
Torque-tension	The relationship between assembly torque applied to a piece of hardware and axial load it induces in bolt or screw
Washer	A thin cylinder with a hole or slot located in the center that is to be used as a spacer, load distribution element, or a locking mechanism

2.2 Specifications

NOTE:

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

Item		Specification			
Frame and Structure					
Total Weight (estimated)		770 kg (1700 lb.)			
Carrier (North America only)		MacDon M150, M155, M155*E4*, and M200 Self-Propelled Windrowers			
Carrier (Export only)		MacDon M100, M105, M150, M155, and M200 Self-Propelled Windrowers			
Header		MacDon double-knife drive D60 and D65 Draper Headers			
Manual Storage		In windrower cab			
Drives					
Main Conditioner		51.83 cc (3.16 cu in.) hydraulic motor with 21.14 cc (1.29 cu in.) flow divider			
Feed Deck		65 cc (4.0 cu in.) hydraulic motor with 921 psi relief			
Connections		Flat-faced quick attach couplers – connect under pressure			
Normal Operating Pressure	Conditioner	17.0–20.7 MPa (2500–3000 psi)			
	Feed Deck	4.1 MPa (600 psi)			
Conditioner					
Drive		Hydraulic motor to belt-driven roll to open timing gear system			
Header Size		15 ft.	20 ft. and 25 ft.	30 ft.[1]	35 ft.[1]
Roll Speed		772–977 rpm	720–874 rpm	695–927 rpm	695–868 rpm
Feed Draper Speed		437–553 fpm	407–495 fpm	393–525 fpm	393–491 fpm
Roll Type		Intermeshing steel bars			
Roll Diameter		233 mm (9.17 in.) / 168.4 mm (6.63 in.) OD tube			
Roll Length		1830 mm (72 in.)			
Swath Width		915–2540 mm (36–102 in.)			
Forming Shields		Header-mounted tractor-supported adjustable forming shield system			

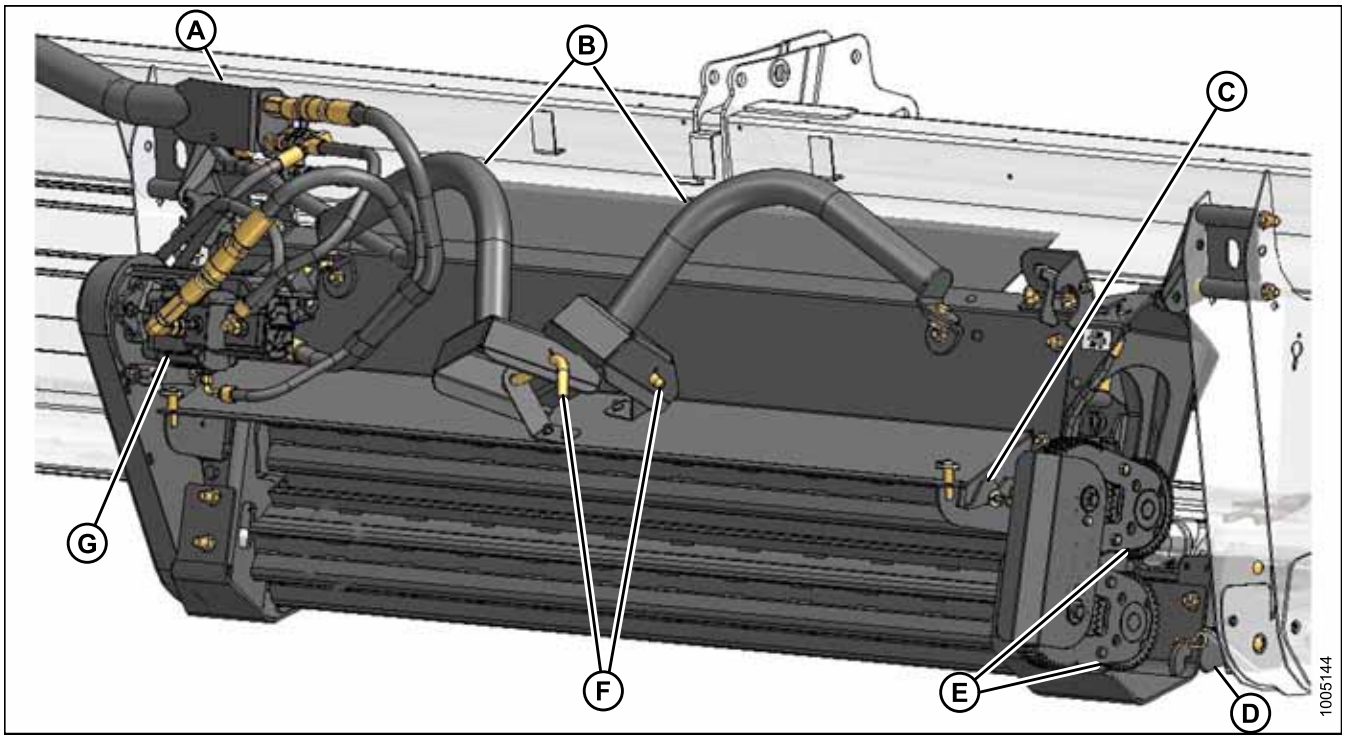
NOTE:

To avoid excessive vibration and poor performance, the HC10 Hay Conditioner should **NOT** be attached to single-knife drive headers. **The HC10 Hay Conditioner is NOT intended for use with the M205 Self-Propelled Windrower, and is for use with the M100 or M105 Self-Propelled Windrower ONLY in Export markets.**

1. To avoid poor performance, the HC10 Hay Conditioner should **NOT** be attached to 30 ft. or 35 ft. draper headers in heavy crop conditions.

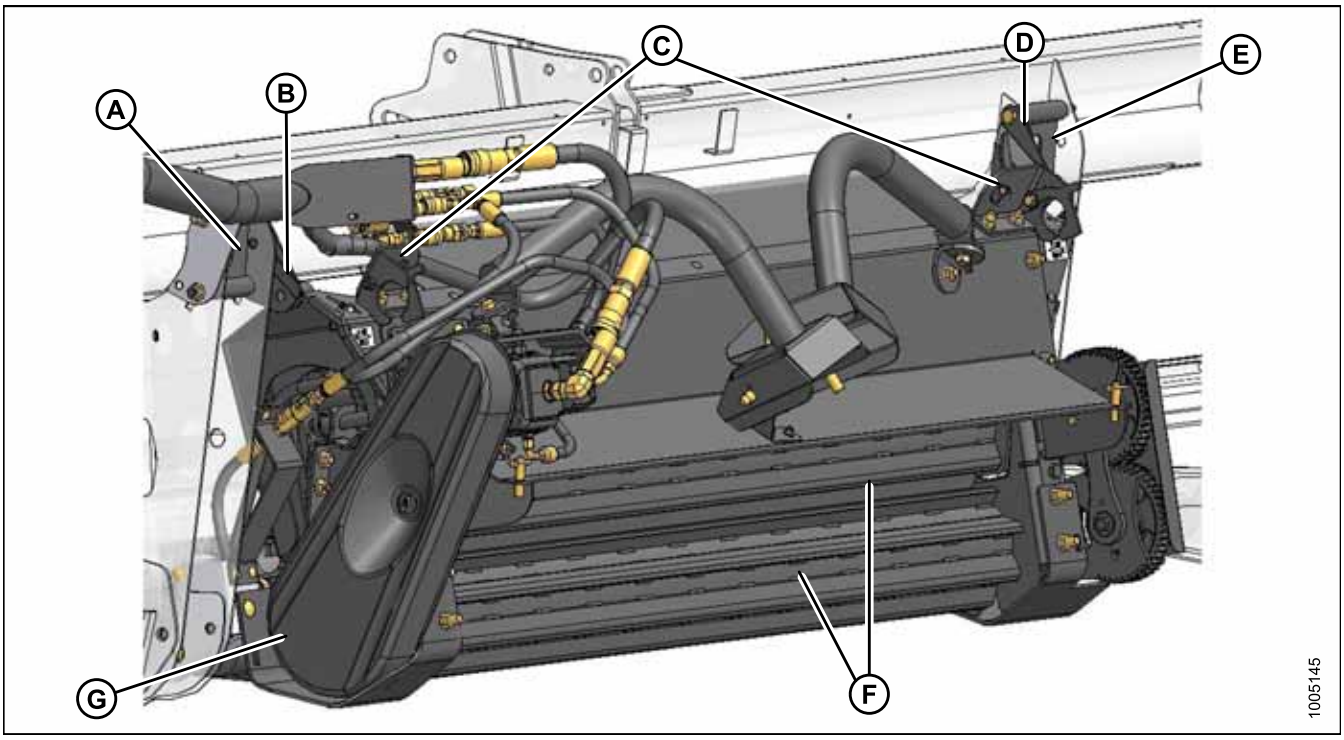
2.3 Component Identification

Figure 2.1: Back View of Hay Conditioner Installed in Header



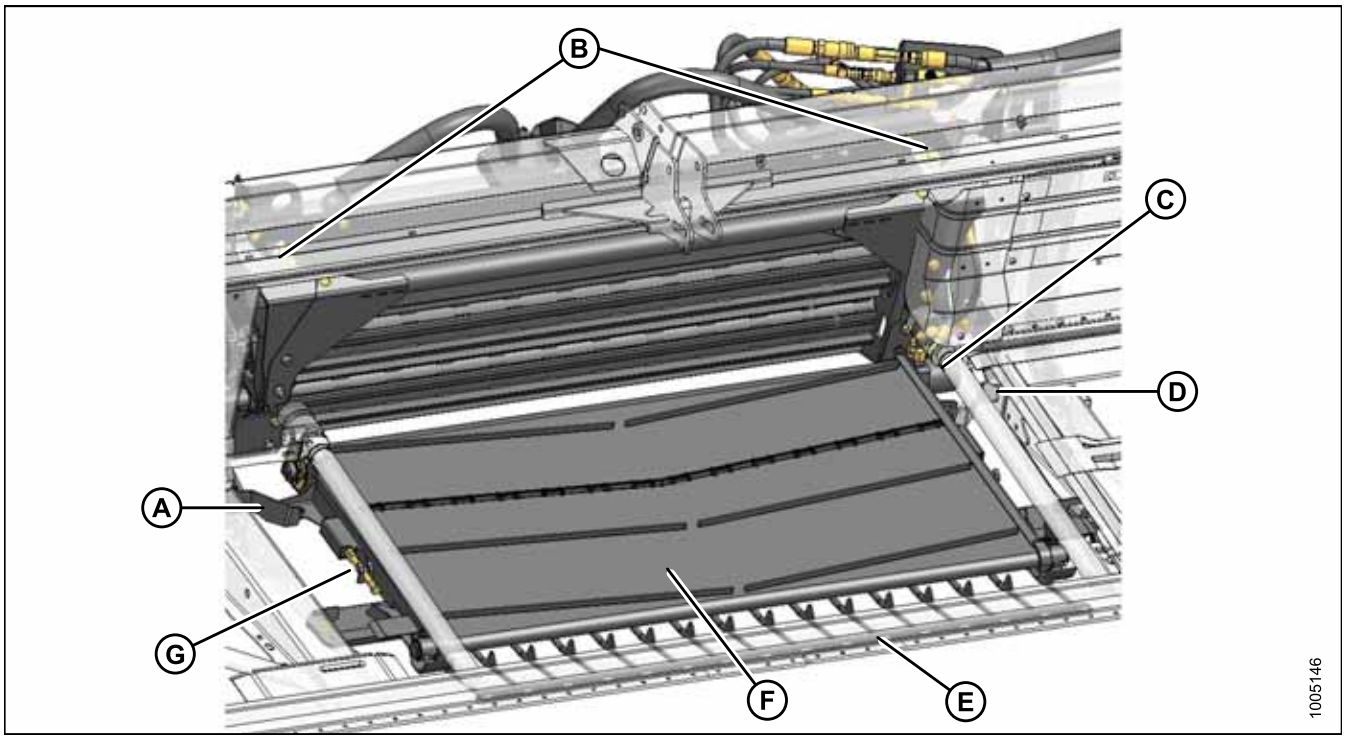
A - Hydraulics to Header **B - Lift Arms** **C - Roll Timing Tool** **D - Stand**
E - Timing Gears **F - L-Pins** **G - Hydraulic Motor**

Figure 2.2: Back View of Hay Conditioner Installed in Header



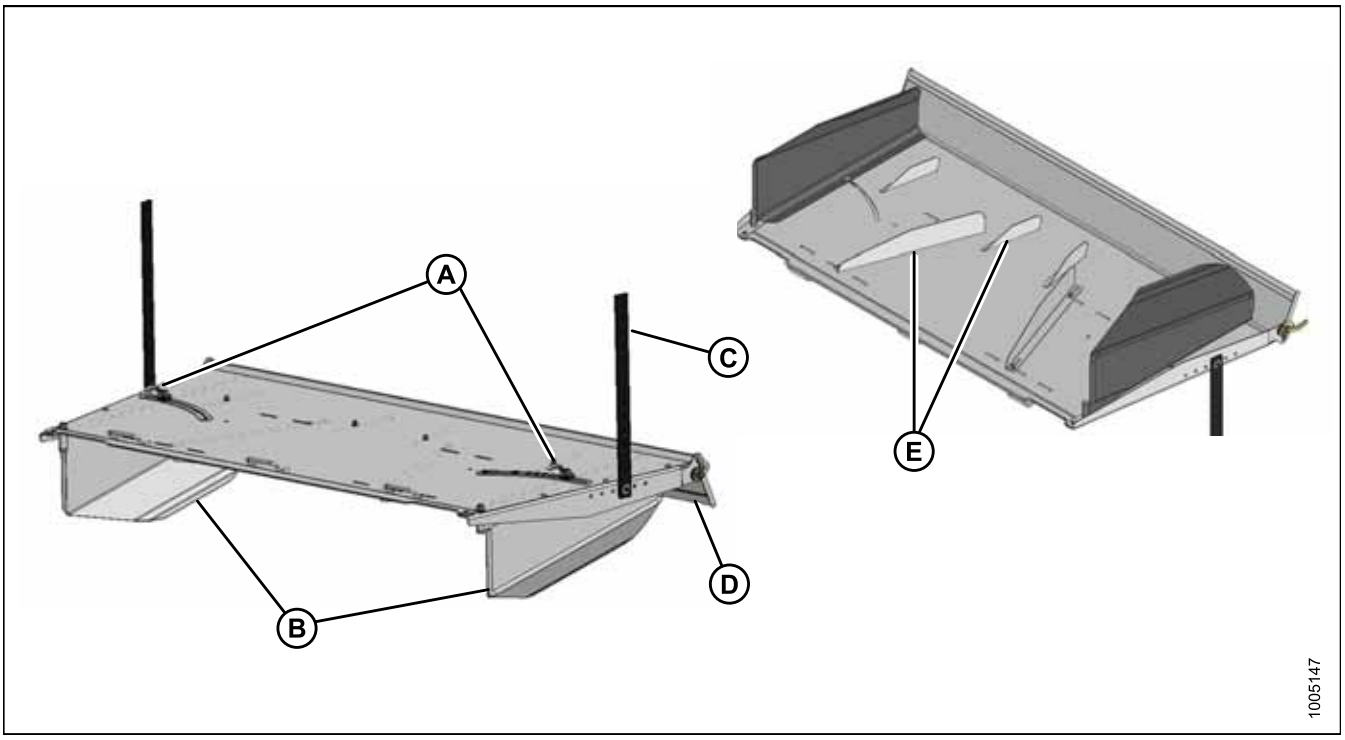
A - Spacer
B - Mounting Bracket
C - Lifting Lugs
D - Mounting Bracket
E - Spacer
F - Rolls
G - Drive Belt Shield

Figure 2.3: Front View of Hay Conditioner Installed in Header



A - Mounting Bracket
B - Roll Gap Adjusters
C - Feed Deck Motor
D - Mounting Bracket
E - Rock Grate
F - Feed Deck
G - Draper Tension Adjusters (2)

Figure 2.4: Swath Forming Shield



A - Side Deflector Adjusters **B - Side Deflectors** **C - Height Adjust Strap** **D - Fluffer Shield**
E - Deflector Fins

3 Unloading and Assembly

To unload and assemble an HC10 Hay Conditioner, follow each of the procedures in this chapter in order.

3.1 Unloading the Hay Conditioner

CAUTION

To avoid injury to bystanders from being struck by machinery, do NOT allow people to stand in unloading area.

CAUTION

Equipment used for unloading must meet or exceed the requirements specified below. Using inadequate equipment may result in vehicle tipping or machine damage.

Table 3.1 Lifting Vehicle Requirements

Minimum Lifting Capacity[2]	908 kg (2000 lb.)
Minimum Fork Length	1524 mm (60 in.)

IMPORTANT:

Forklifts are normally rated for a load located 610 mm (24 in.) ahead of back end of the forks. To obtain the forklift capacity at 1220 mm (48 in.), check with your forklift distributor.

WARNING

Be sure forks are secure before moving away from load. Stand clear when lifting.

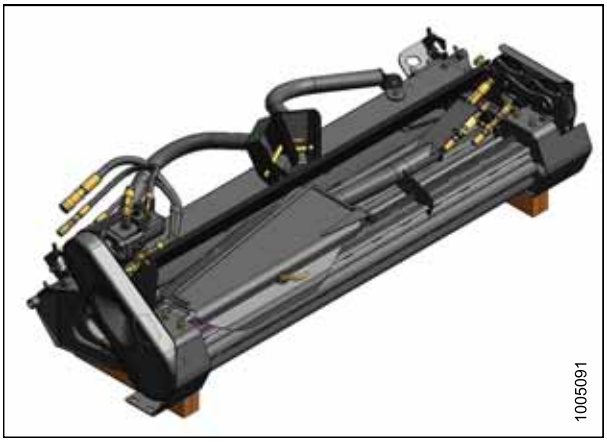


Figure 3.1: Hay Conditioner Bundle MD #B4798

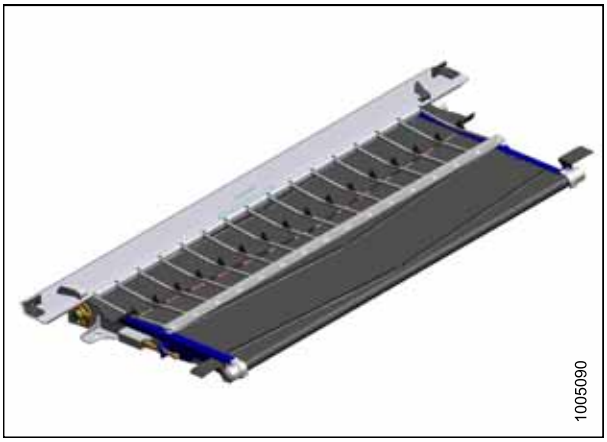


Figure 3.2: Feed Deck Bundle MD #B4799

2. At 1220 mm (48 in.) from back end of forks.

To unload the hay conditioner, follow these steps:

1. Remove hauler's tie down straps and chains.
2. Use forklift to lift the first of three pallets of hay conditioner components off of the trailer deck.
3. Back up until unit clears trailer and slowly lower to 150 mm (6 in.) from ground.
4. Take to storage or setup area.
5. Set pallet down securely on level ground.
6. Check for shipping damage and missing parts.
7. Repeat above steps for remaining pallets.

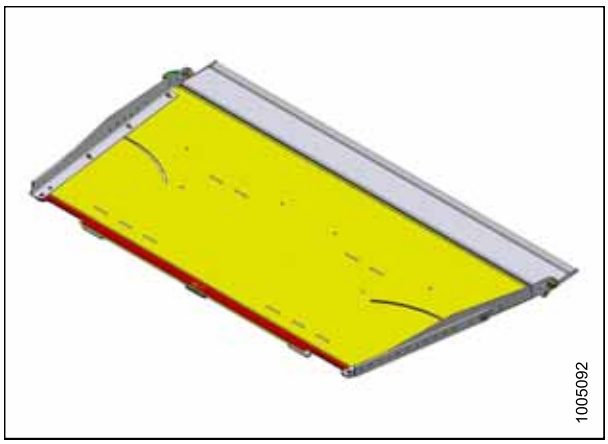


Figure 3.3: Forming Shield Bundle MD #B4800

3.2 Preparing the Header

To prepare the draper header for installation of the hay conditioner, follow these steps:

1. Adjust the header stand (A) to mid-position.

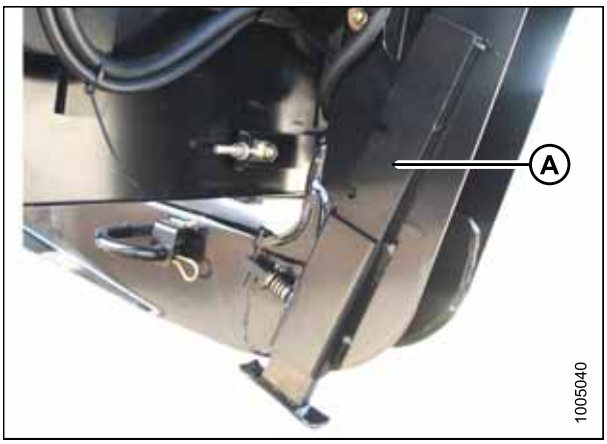


Figure 3.4: Header Stand

2. Trim plastic deflector along creased line (A) on back of deflector for proper fit up to conditioner.

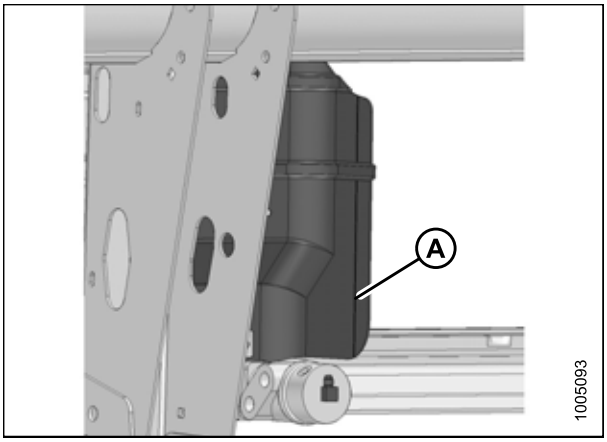


Figure 3.5: Plastic Deflector

3.3 Installing the Rock Grate

To install the rock grate, follow these steps:

1. Unpack feed deck / rock grate bundle.
2. Position rock grate (A) into center area of header.
3. Lift rock grate (A) and position the rear tabs (C) so they slide over the header leg flanges.
4. Position the front lip (B) of rock grate (A) in front of the bottom edge of the cutterbar and slide forward so it engages the cutterbar.
5. If the header is equipped with cutterbar wearplate, set the rock grate on top of the wearplate in front of the cutterbar, then push down and forward to seat the rock grate onto the cutterbar.

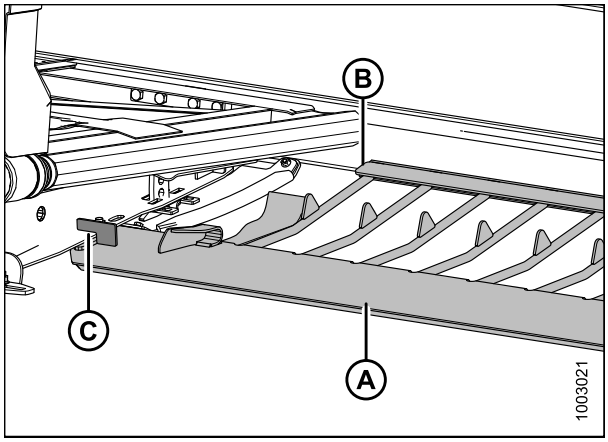


Figure 3.6: Rock Grate

6. Ensure rock grate is completely pushed forward, and secure with two bolts (A) installed from underside.
7. Tighten both bolts.

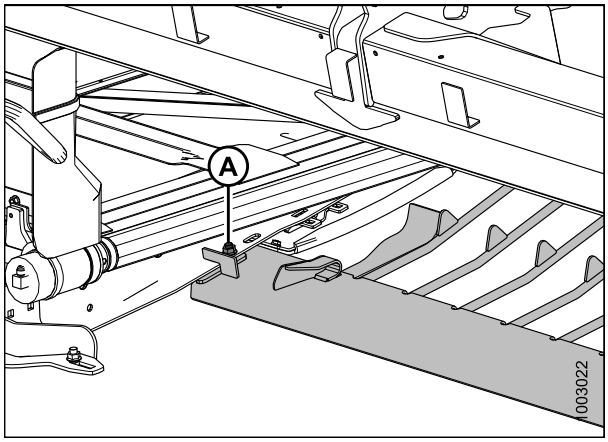


Figure 3.7: Rock Grate

3.4 Installing Deck Brackets

To install the deck brackets onto the header, follow these steps:

1. Install the two lower brackets (A) onto the inside of both center header legs with two bolts and nuts (B) in each bracket.

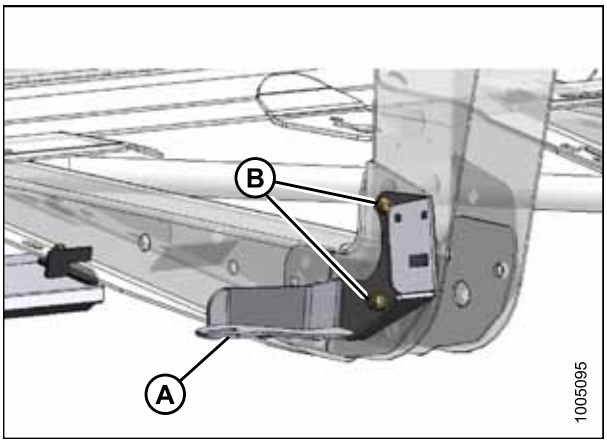


Figure 3.8: Lower Deck Brackets

2. Install right upper bracket (A) and spacer (B) on the right center leg as shown in illustration at right, and install nut (C).

   NOTE:

   For headers with a sheet metal hose cover, install bolts from the outboard side.

3. Install the other bolt through the bracket and spacer and secure with a nut (D).
4. Tighten both bolts.

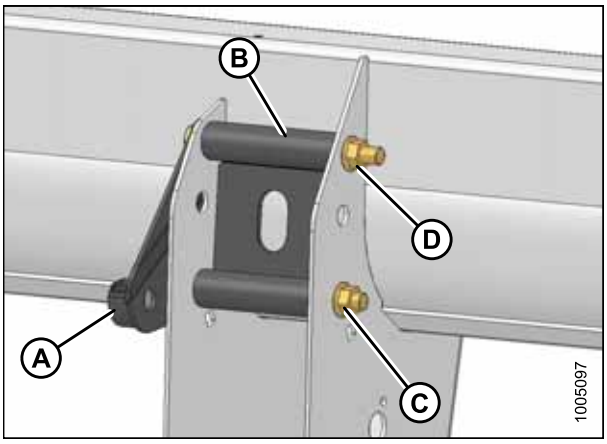


Figure 3.9: 15-Foot Header Shown

5. Install the left upper bracket (A) and spacer (B) onto the inboard side of left center leg as shown in illustration at right.

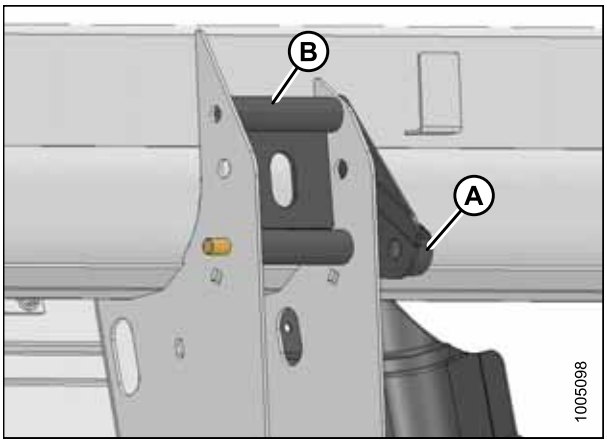


Figure 3.10: Upper Bracket – Left

6. Remove the hose guide (A) located near the left center leg. (For 20-foot and larger headers, remove this support from its mounting position on sheet metal hose cover.)

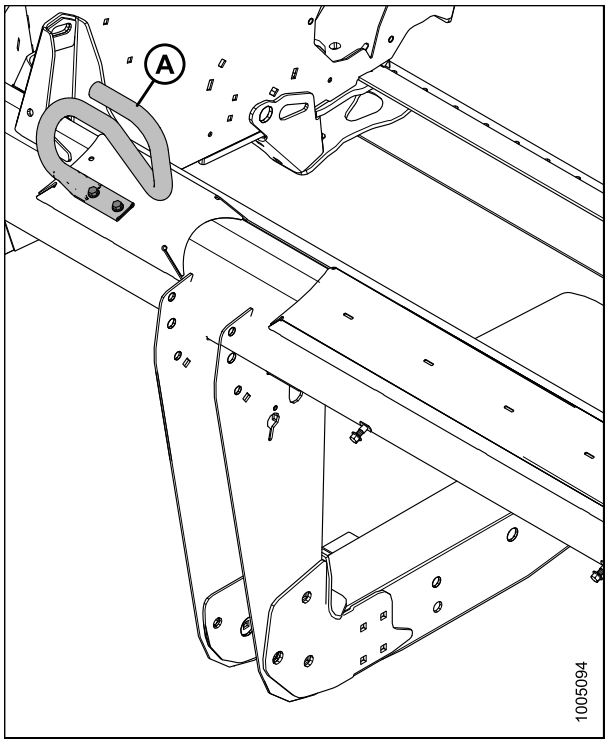


Figure 3.11: 15-Foot Header Shown

7. Attach hose assembly (A) onto the left center leg and install nut on lower bolt (C). Ensure correct hole is used when attaching hose assembly (use hole [D] for 15-foot headers).

   NOTE:

   For headers with a sheet metal hose cover, install bolts from the outboard side.

8. Install other bolt (B) through bracket, spacer, and hose assembly and secure with a nut.
9. Tighten both bolts.

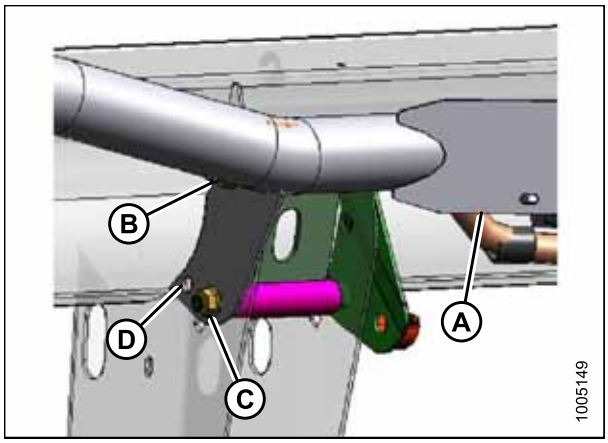


Figure 3.12: 20–35-Foot Header Shown

3.5 Installing the Feed Deck

To install the feed deck, follow these steps:

1. Slide feed deck (A) under header opening from the rear. Deck drive motor faces aft.

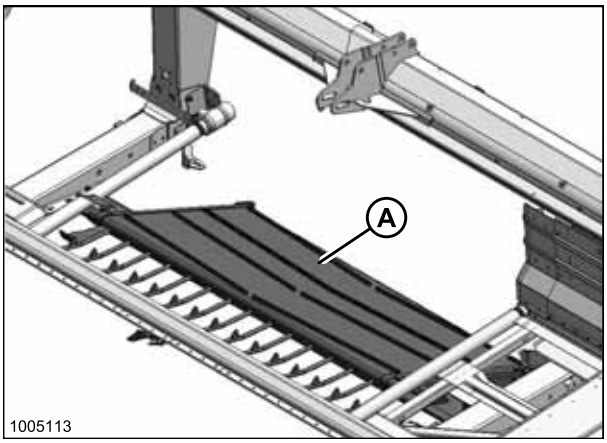


Figure 3.13: Feed Deck

2. Set front of deck (A) onto the rock grate and slide the feed deck forward until the locating pins (B) reach the pockets on the rock grate.
3. Lift the rear of the feed deck so the mounts on the deck clear the brackets on the leg, and then slide deck forward until mounting pins are fully positioned inside the pockets.

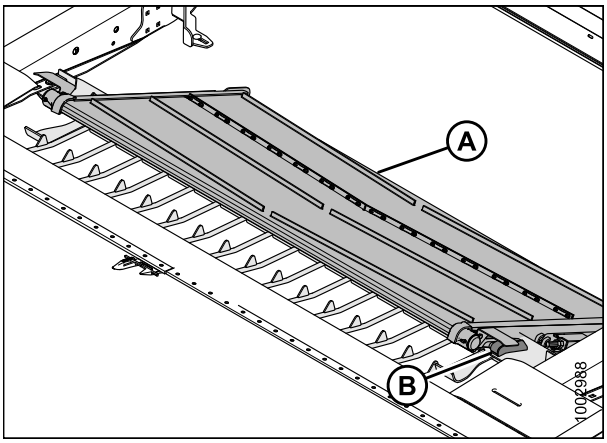


Figure 3.14: Feed Deck

4. Install two 1/2 x 1-1/4 in. long carriage bolts (A) at rear mounting brackets.

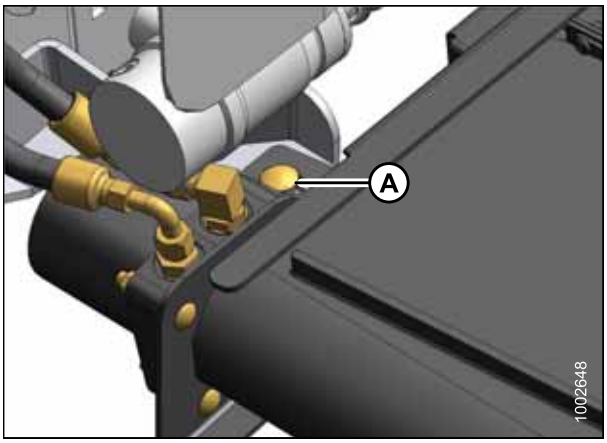


Figure 3.15: Feed Deck – Left Side

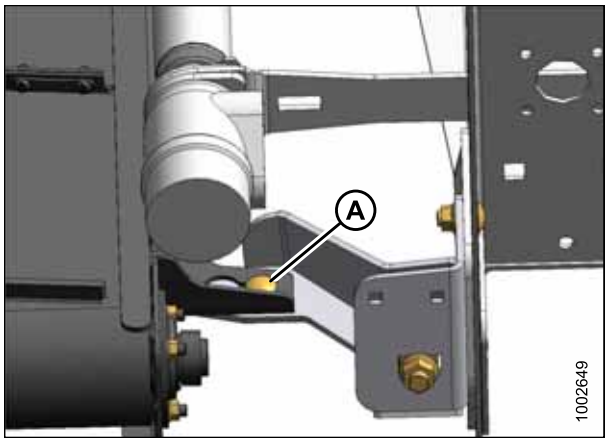


Figure 3.16: Feed Deck – Right Side

5. Attach the hose bracket (A) to the mounting bracket with two 3/8 x 1.0 in. long carriage bolts (B).
6. Adjust header side drapers to overlap feed deck by 65 to 75 mm (2-1/2 to 3 in.). Refer to header operator's manual for procedure.

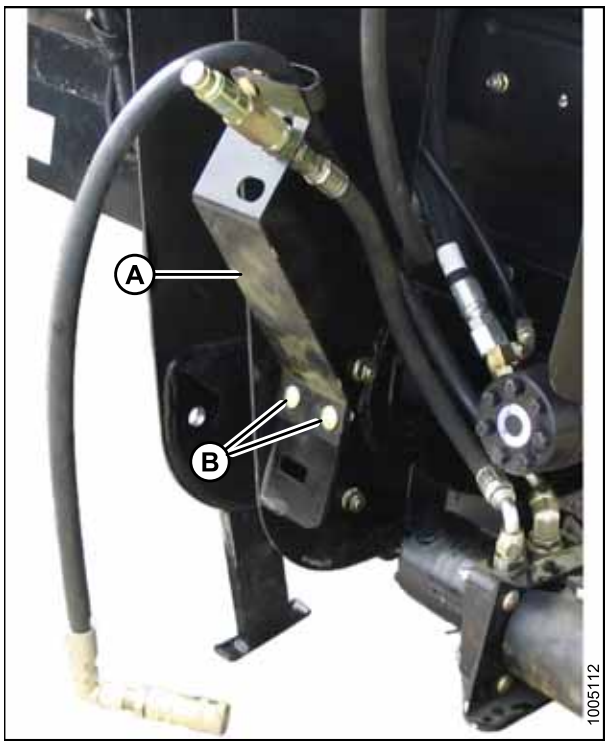


Figure 3.17: Hose Bracket

3.6 Installing the Conditioner

There are two methods for installing the conditioner. Refer to the following sections for instructions:

- The lifting method, refer to *3.6.1 Installing Conditioner: Lifting Method, page 25*
- The windrower method, refer to *3.6.2 Installing Conditioner: Windrower Method, page 27*

3.6.1 Installing Conditioner: Lifting Method

DANGER

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

CAUTION

Equipment used for unloading must meet or exceed the requirements specified below. Using inadequate equipment may result in vehicle tipping or machine damage.

Table 3.2 Lifting Vehicle Requirements

Minimum Lifting Capacity[3]	908 kg (2000 lb.)
Minimum Fork Length	1524 mm (60 in.)

IMPORTANT:

Forklifts are normally rated for a load located 610 mm (24 in.) ahead of back end of the forks. To obtain the forklift capacity at 1220 mm (48 in.), check with your forklift distributor.

Table 3.3 Lifting Chain Requirements

Chain Type	Overhead Lifting Quality (1/2 in.)
Minimum Working Load	2270 kg (5000 lb.)

To install the conditioner using the lifting method, follow these steps:

1. Attach chain to lifting brackets (A) on conditioner and secure chain to lifting device (B).
2. Lift conditioner to upright position.
3. Remove shipping blocks if present.
4. Position conditioner into header opening from the rear.

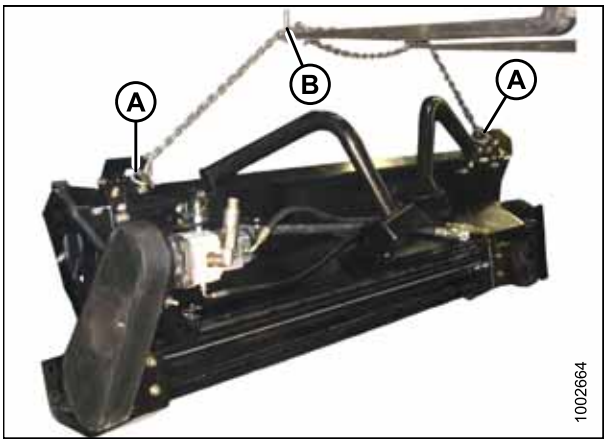


Figure 3.18: Conditioner and Lifting Brackets

3. At 1220 mm (48 in.) from back end of forks.

5. Carefully lower the windrower lift legs until lugs (A) on conditioner are seated in the U-shaped brackets (B) on header.
6. Ensure the conditioner is seated properly in the brackets and remove the chains.

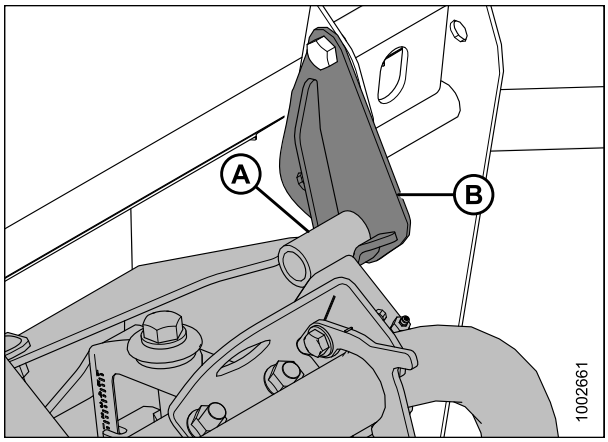


Figure 3.19: Conditioner Lug

7. Install 5/8 in. x 1-1/2 in. carriage bolt (A) in the lower right attachment location.

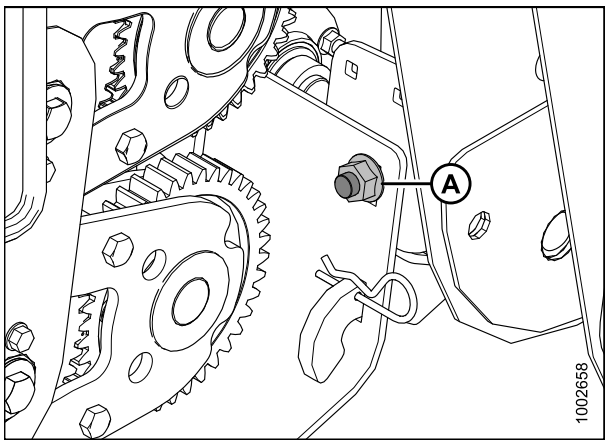


Figure 3.20: Conditioner – Right Side

8. Install 5/8 in. x 1-1/2 in. carriage bolt (A) in the lower left attachment location.

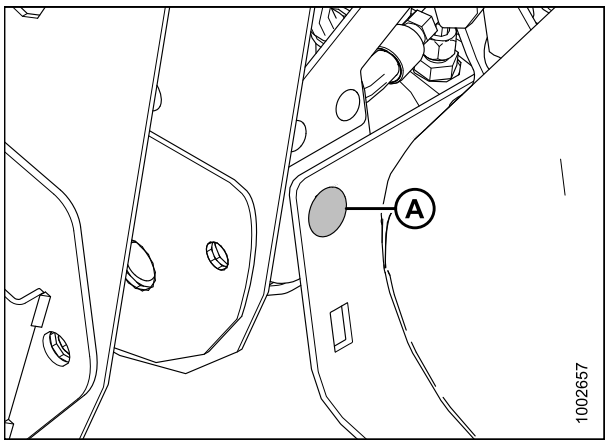


Figure 3.21: Conditioner – Left Side

9. Connect the five hydraulic hoses between the conditioner and the header as follows:
   - Small male quick-disconnect from motor to header (A)
   - Large female quick-disconnect from motor to header (B)
   - Small female quick-disconnect from deck to header (C)
   - Small female quick-disconnect from motor to deck (D)
   - Large female quick-disconnect from header to motor (E)

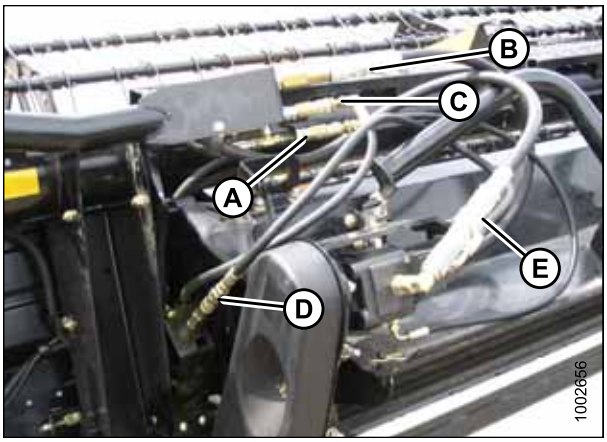


Figure 3.22: Hydraulic Hoses

A - Case Drain
B - Conditioner Motor Pressure
C - Deck Motor Return
D - Deck Motor Pressure
E - Conditioner Motor Return

3.6.2 Installing Conditioner: Windrower Method

DANGER

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

To install the conditioner using the windrower method, follow these steps:

1. Lower header stand to mid-position (A).

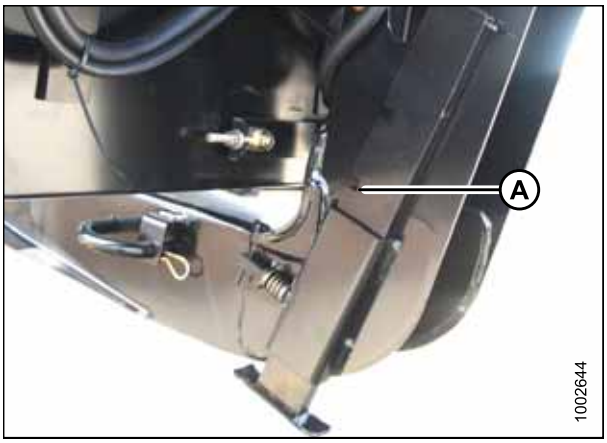


Figure 3.23: Header Stand

2. Attach chain (A) to lifting brackets (B) on conditioner and secure chain to lifting device.
3. Lift conditioner off shipping pallet and set on ground in upright position.

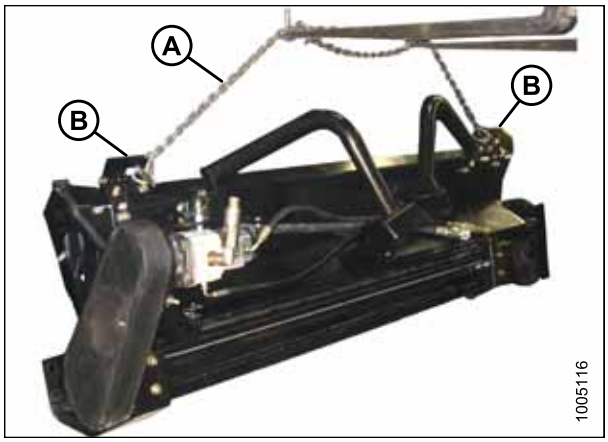


Figure 3.24: Conditioner and Lifiting Brackets

4. Retrieve stand (A) and hairpin (B) from conditioner bundle (MD #B4798) and install stand in slot in base at lower right end of conditioner. Secure stand with hairpin.
5. Remove shipping blocks if present.

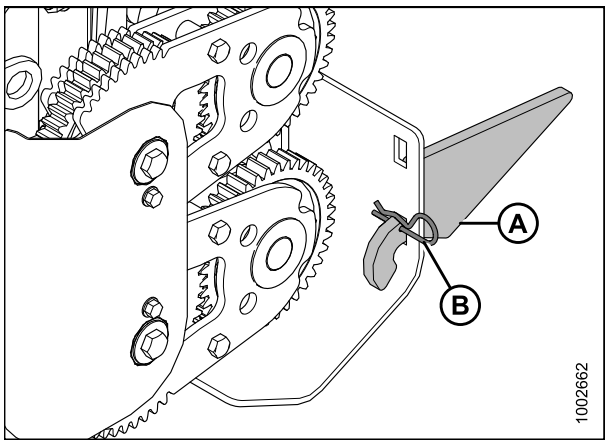


Figure 3.25: Conditioner Stand

6. Hardware at lifting arms has been tightened for shipping. Loosen two bolts (A) per side just enough to allow arms (B) to swing out.

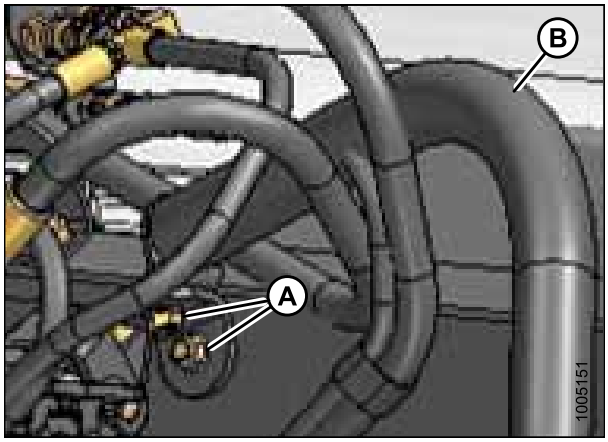


Figure 3.26: Lifting Arm – Left Side

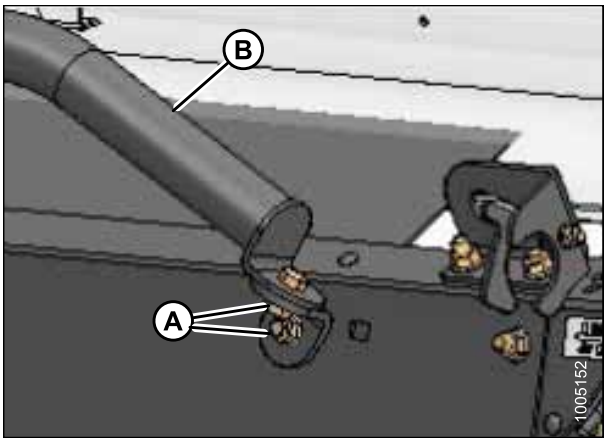


Figure 3.27: Lifting Arm – Right Side

7. Remove L-pins (A) securing lifting arms to conditioner. (Rotate pins to align key-hole slot.)

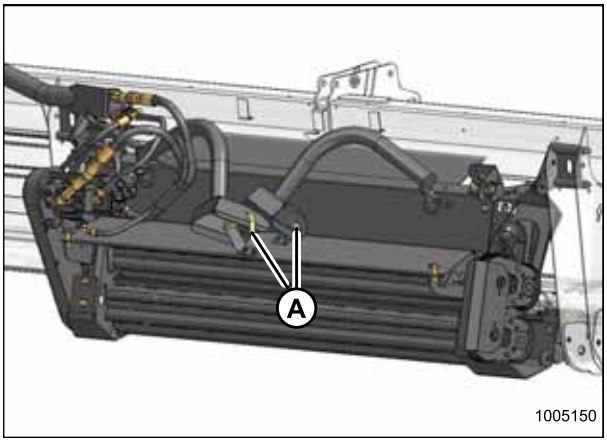


Figure 3.28: Conditioner

8. Swing out lift arms (A) and secure latches.

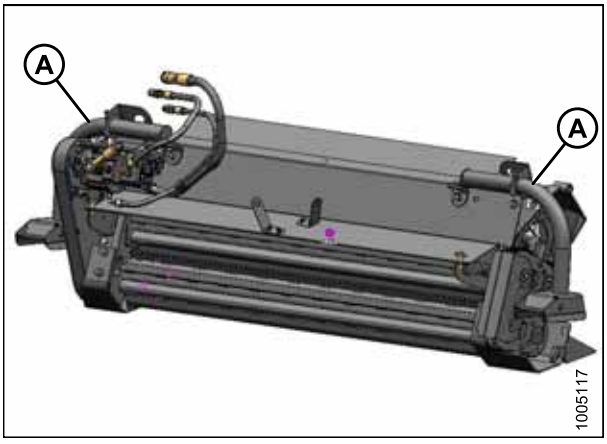


Figure 3.29: Conditioner

9. Position the windrower arms in the lift arm pockets and insert the L-pins (A) for safety.

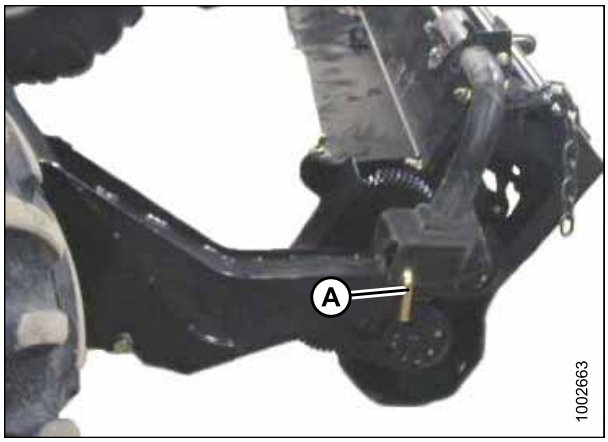


Figure 3.30: Windrower Arms

10. Remove the stand (A) and store with hairpin (B) in toolbox.
11. Lift the conditioner and position into the header opening from the rear.

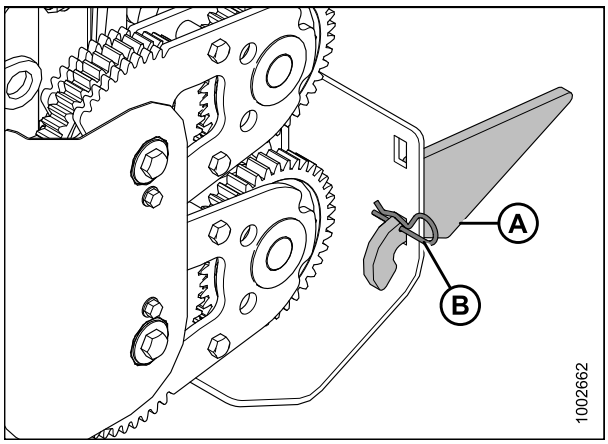


Figure 3.31: Conditioner Stand

12. Carefully lower the windrower lift legs until lugs (A) on conditioner are seated in the U-shaped brackets (B) on header.
13. Ensure the conditioner is seated properly in the brackets before you disconnect from windrower.

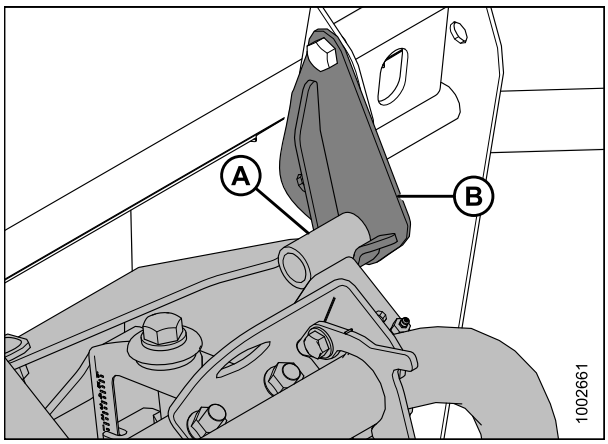


Figure 3.32: Conditioner Lug

14. Lift latch (B) to release conditioner lift arm (A) and fold up to storage position on conditioner.

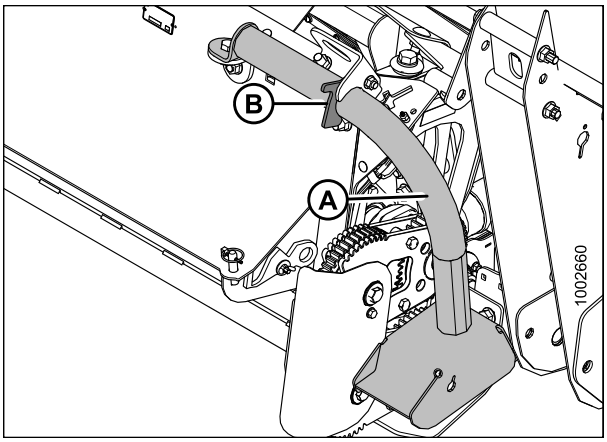


Figure 3.33: Conditioner Lift Arm

15. Install L-pin (A) through arm and bracket on conditioner and lock into place. (Rotate L-pins to align spring pins with key-hole slot). Repeat for other arm.

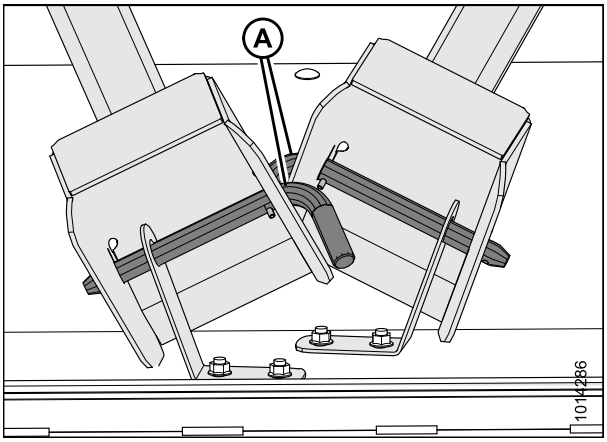


Figure 3.34: L-Pins on Header Arm

16. Install 5/8 in. x 1-1/2 in. carriage bolt (A) in the lower right attachment location.

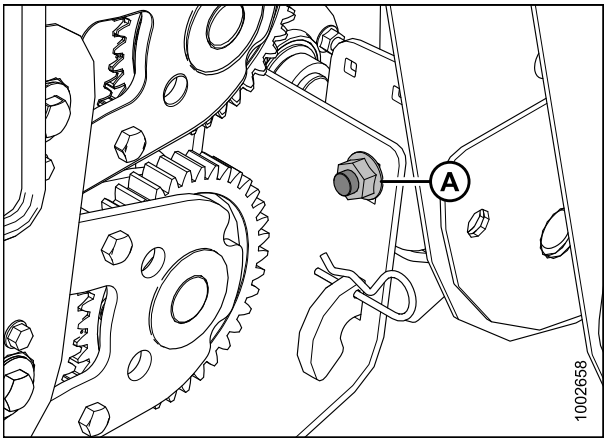


Figure 3.35: Conditioner – Right Side

17. Install 5/8 in. x 1-1/2 in. carriage bolt (A) in the lower left attachment location.

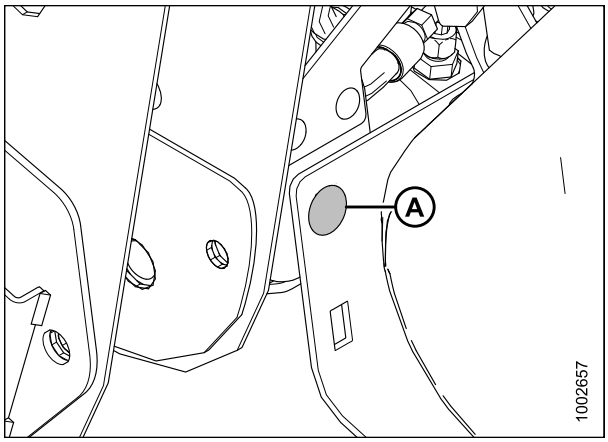


Figure 3.36: Conditioner – Left Side

18. Connect the five hydraulic hoses between the conditioner and the header as follows:
    - Small male quick-disconnect from motor to header (A)
    - Large female quick-disconnect from motor to header (B)
    - Small female quick-disconnect from deck to header (C)
    - Small female quick-disconnect from motor to deck (D)
    - Large female quick-disconnect from header to motor (E)

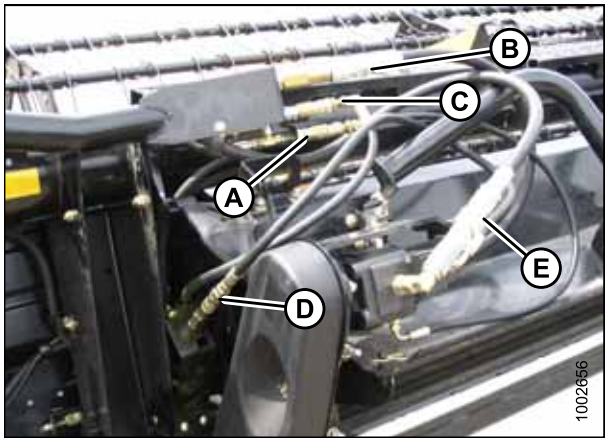


Figure 3.37: Hydraulic Hoses

A - Case Drain
B - Conditioner Motor Pressure
C - Deck Motor Return
D - Deck Motor Pressure
E - Conditioner Motor Return

3.7 Attaching Hydraulics

The procedure for attaching hydraulics is different for 15-foot draper headers.

- If attaching a 15-foot header, refer to *3.7.1 Attaching Hydraulics: 15-Foot Headers, page 33*.
- If attaching any other size header, refer to *3.7.2 Attaching Hydraulics: All Headers Except 15-Foot, page 36*.

3.7.1 Attaching Hydraulics: 15-Foot Headers

To attach hydraulics to a 15-foot draper header, follow these steps:

1. Disconnect return hose (A) at elbow on motor.

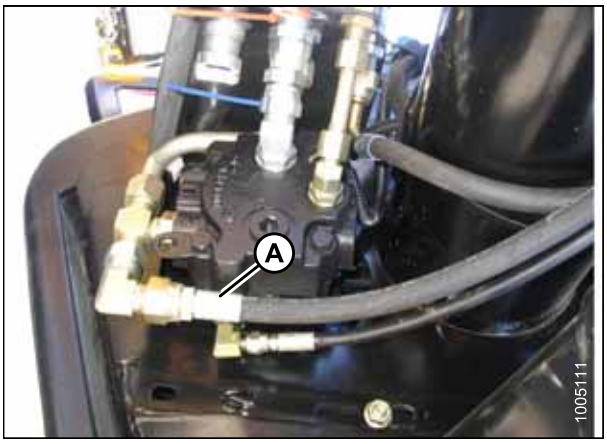


Figure 3.38: Return Hose

2. Install check valve tee (A) on elbow and reconnect return hose (B) to tee (A).
3. Connect feed draper return line (C) from the conditioner hose package onto the check valve.

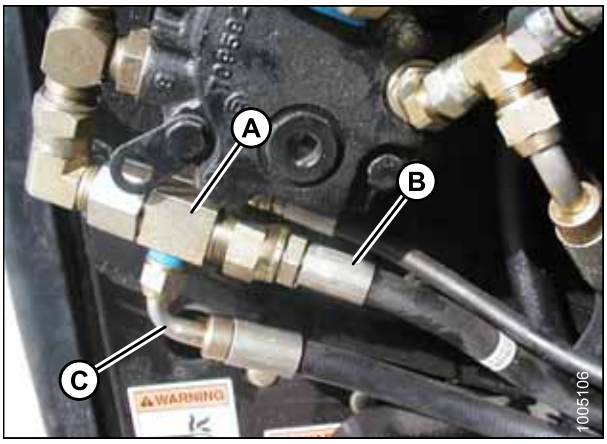


Figure 3.39: Check Valve and Hoses

4. Remove knife drive coupler (A), draper drive coupler (B), case drain coupler (C), and its extension tube (D).

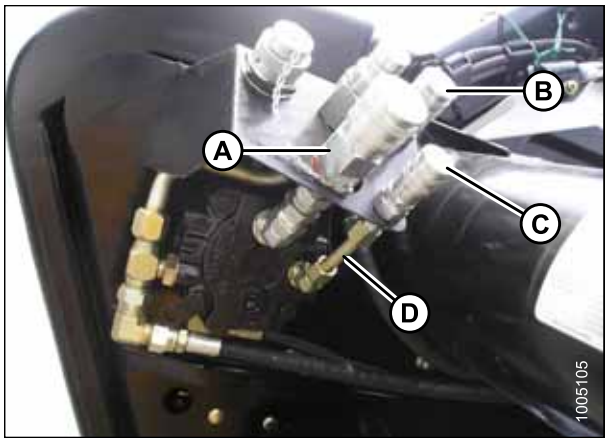


Figure 3.40: Hydraulic Couplers

5. Retrieve coupler bracket (A) from bundle and position coupler bracket (A) onto housing.
6. Reinstall draper drive coupler (B) in original location and install knife drive coupler (C) onto the end of new bracket (A).

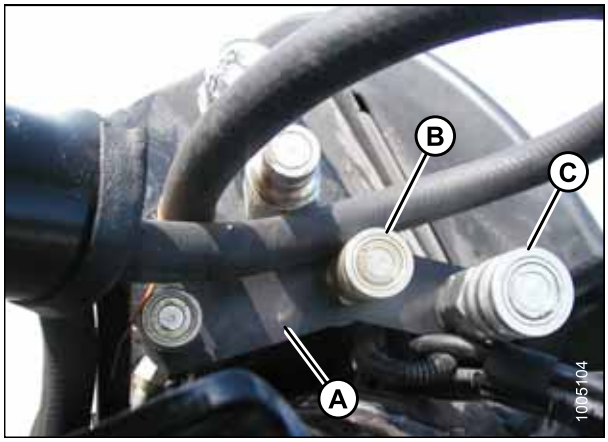


Figure 3.41: Hydraulic Couplers

7. Install tee fitting (A) and union (B) onto the motor case drain.
8. Reinstall case drain coupler (C).
9. Route conditioner case drain hose (D) (45° bent tube) behind the motor and connect to tee fitting (A).

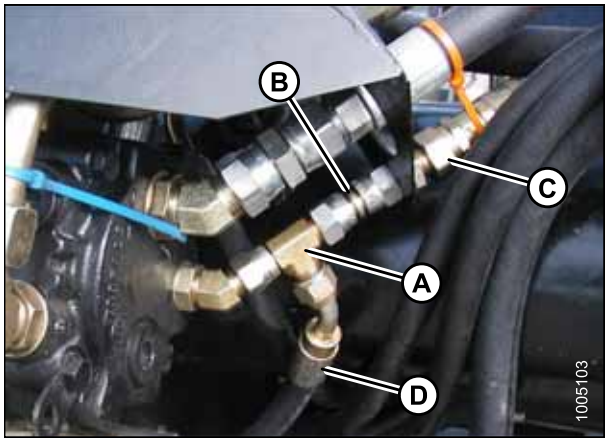


Figure 3.42: Case Drain Hydraulics

10. Route conditioner pressure hose (A) (orange cable tie) behind the motor and attach it to coupler (B).

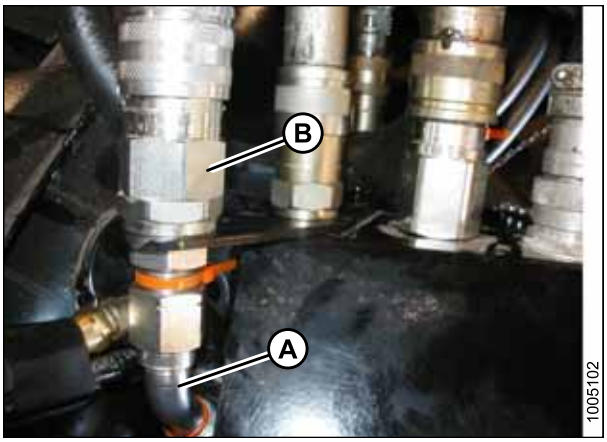


Figure 3.43: Conditioner Hydraulics

11. Loop conditioner return line (A) up over top of the couplers and connect to pressure port (B) on the motor. Ensure all hoses will be clear of windrower tires.

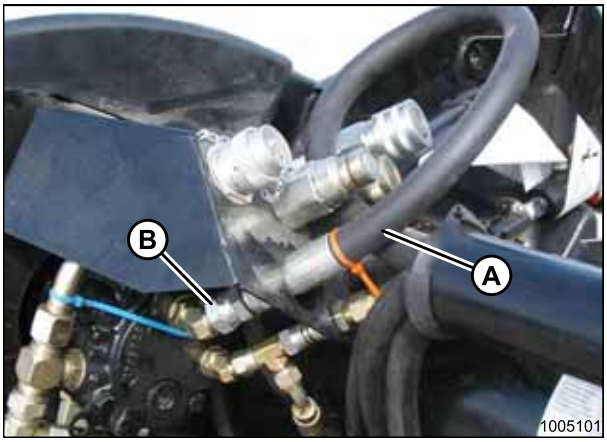


Figure 3.44: Conditioner Hydraulics

3.7.2 Attaching Hydraulics: All Headers Except 15-Foot

To attach hydraulics to all headers (not including 15-foot), follow these steps:

1. Identify the hydraulic coupler components shown in Figure *3.45, page 36*.
2. Remove hose cover (A) from left coupler mount.
3. Disconnect side draper return hose (C) at the main return tee (refer to item [E] in Figure *3.45, page 36*).

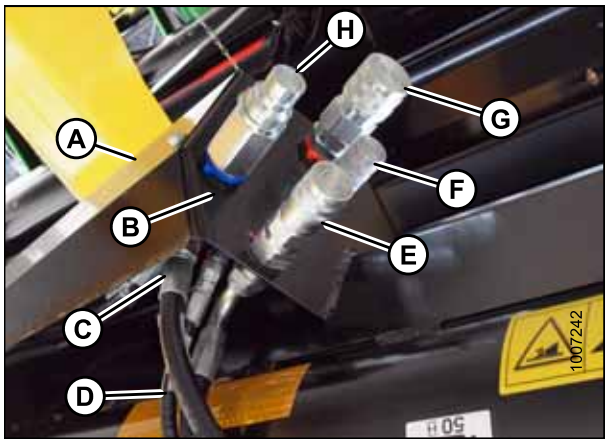


Figure 3.45: Hydraulic Coupler Components

A - Hose Cover
B - Coupler Mount
C - Side Draper Return
D - Left Draper Case Drain
E - To Side Drapers (Pressure)
F - Case Drain Coupler
G - Knife/Conditioner Pressure
H - Header Return

4. Detach knife motor case drain line (D) from the bulkhead fitting at coupler mount (A).
5. Install conditioner case tee fitting (B) and conditioner case drain line (C).
6. Remove knife drive hose (G).

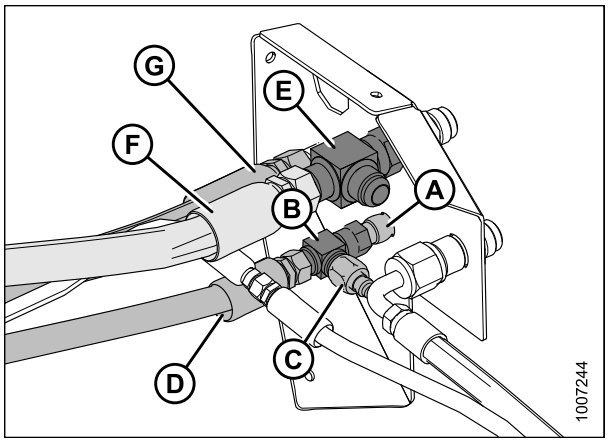


Figure 3.46: Hydraulic Coupler Components

A - Coupler Mount
B - Conditioner Case Tee
C - Conditioner Case Drain
D - Knife Motor Case Return
E - Header Return Tee
F - Knife Return
G - Knife Drive Hose

7. Install check valve tee (A) on main return tee (E).

   NOTE:

   Arrow on check valve tee fitting should face up.

8. Connect feed draper return hose (C) with the blue tie to check valve tee (A).
9. Reinstall the side draper return hose (B) that was removed in Step *3, page 36*, to the new check valve tee (A).
10. Connect conditioner return hose (D) with union to hnife drive hose (F) removed in Step *6, page 36*.
11. Connect conditioner drive hose (G) with orange tie to the coupler where knife drive hose was removed in Step *6, page 36*.
12. Bundle the hoses with cable ties as required. Ensure hoses do **NOT** contact sharp edges.
13. Replace hose cover.

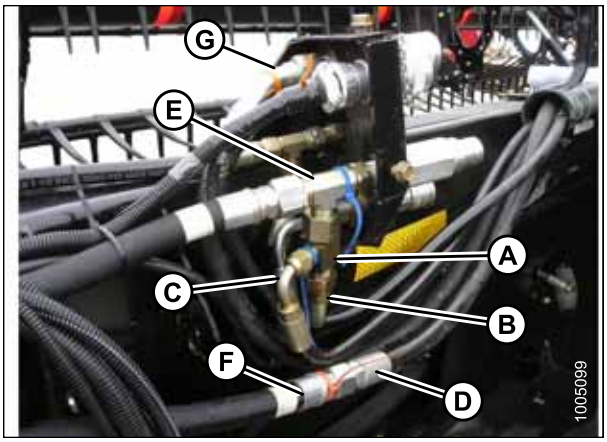
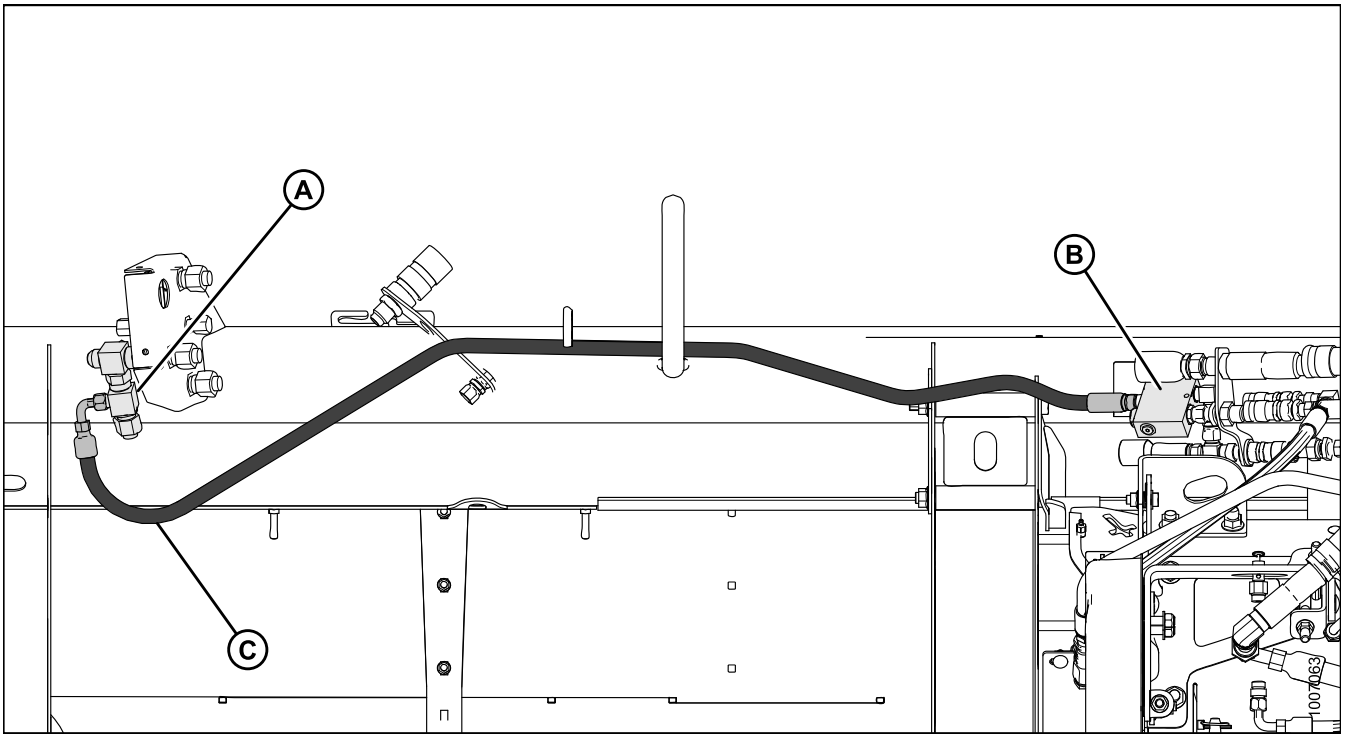


Figure 3.47: Hydraulic Coupler Components

A - Check Valve Tee
B - Side Draper Motor Return
C - Feed Draper Return
D - Conditioner Return
E - Header Return Tee
F - Knife Drive Hose
G - Conditioner Drive

Figure 3.48: Feed Draper Return Hydraulics (Shields Removed to Expose the Feed Draper Return Hose Connection)



A - Check Valve Tee
B - Pressure Reducing Valve
C - Feed Draper Return Hose

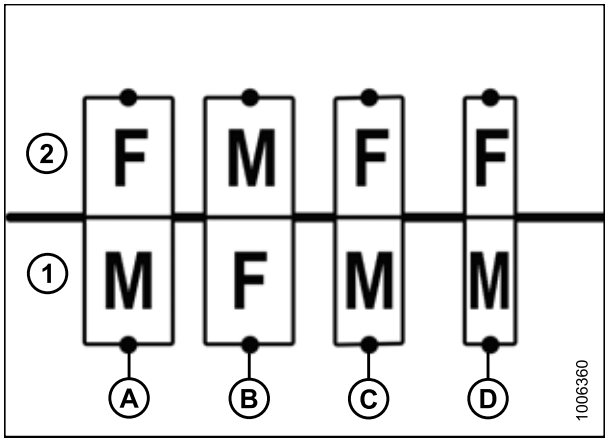
3.8 Header Schematics

For an explanation of the acronyms used in this section, refer to *2.1 Definitions, page 9*.

NOTE:

Callout 1 is the windrower coupler side. Callout 2 is the header coupler side.

Figure 3.49: Coupler Legend when Connected to a Windrower

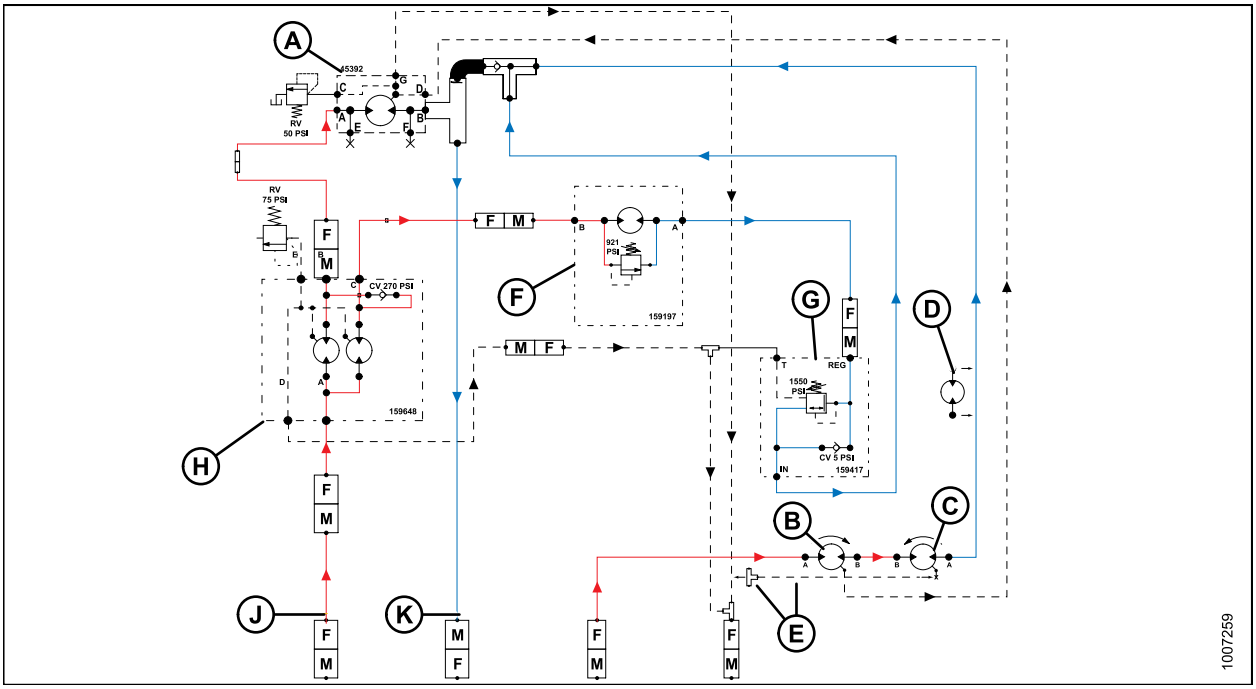


A - Knife Drive Pressure (3/4 in. Coupler)
B - Draper/Knife Return Line (3/4 in. Coupler)
C - Draper Pressure (1/2 in. Coupler)
D - DKD Header Case Return Only (3/8 in. Coupler)

NOTE:

Red line is pressure, blue line is return, and dotted line is case drain.

Figure 3.50: D Series 15-Foot Double-Knife Drive, Timed, Hydraulic Deck Shift, HC10

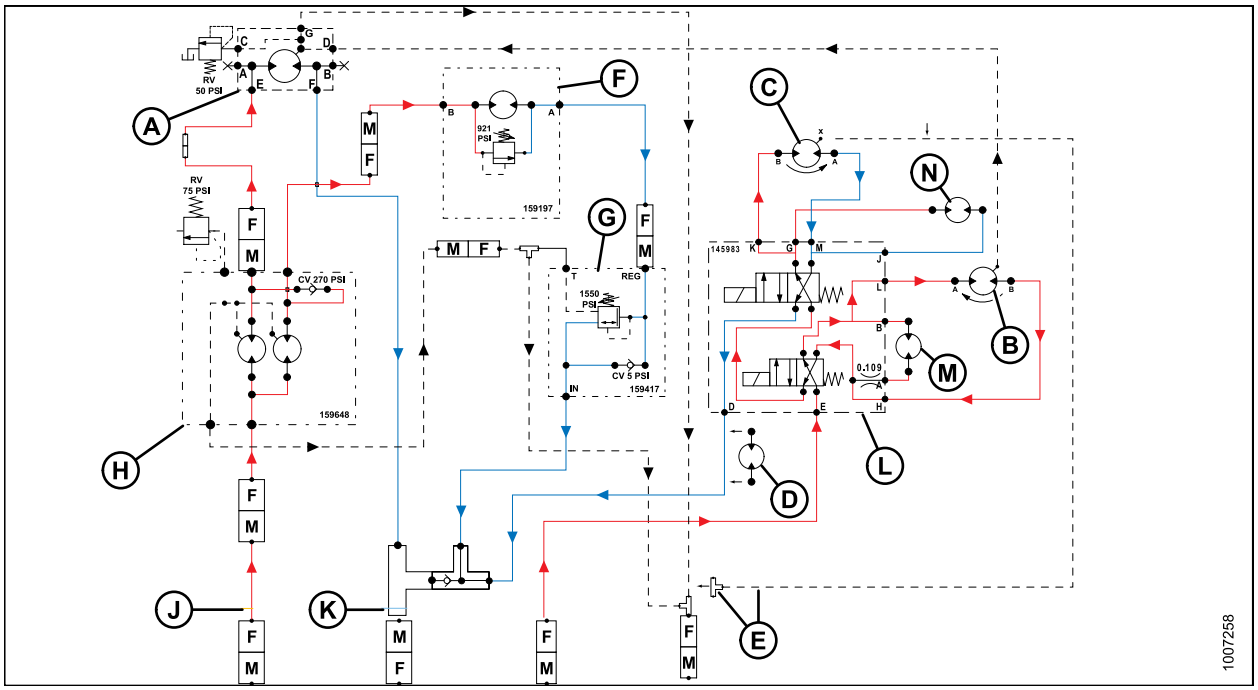


A - Timed Knife Drive Motor
B - Left Draper Motor (Inboard)
C - Right Draper Motor (Inboard)
D - Upper Cross Auger Motor (Option)
E - Case Drain Kit (MD #B5842)
F - Feed Deck Motor
G - Pressure Reducing Valve
H - Hay Conditioner Motor
J - Orange Cable Tie
K - Blue Cable Tie

NOTE:

Red line is pressure, blue line is return, and dotted line is case drain.

Figure 3.51: D Series Double-Knife Drive, Timed, Hydraulic Deck Shift, HC10, Upper Cross Auger (All Headers Except 15-Foot)



A - Timed Knife Drive Motor
B - Left Draper Motor (Inboard)
C - Right Draper Motor (Inboard)
D - UCA Motor (Option) Plumb at Port D
E - Case Drain Kit (MD #B5842)
F - Feed Deck Motor
G - Pressure Reducing Valve
H - Hay Conditioner Motor
J - Orange Cable Tie
K - Blue Cable Tie
L - Deck Shift Valve
M - Left Deck Shift Motor
N - Right Deck Shift Motor

3.9 Assembling the Forming Shield

To assemble forming shield, follow these steps:

1. Unpack the forming shield cover and extract fin deflectors and hardware from plastic bag.
2. Lay cover (A) upside down (flanges of side supports facing up) on a flat surface.

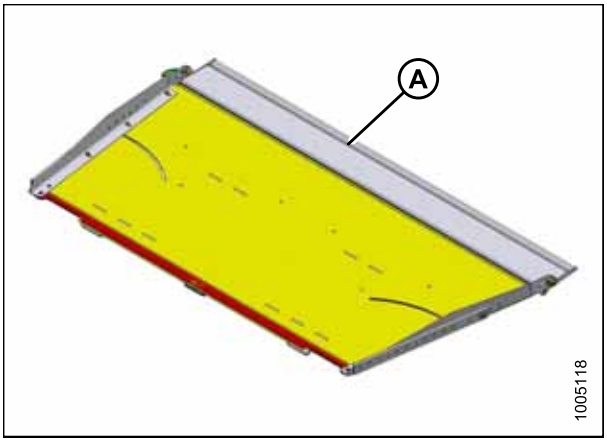


Figure 3.52: Forming Shield Cover

3. Assemble fins (A) to bottom of shield as shown in illustration at right using hardware provided. The two long fins (B) are handed (outboard and inboard sides) and should be installed with bolts on outboard side of the fin. Bolts should be installed with nuts against the fins.

   NOTE:

   Fins are only effective for windrows greater than 1778 mm (70 in.) or if satisfactory formation is not achieved. Store for future use if not installed.

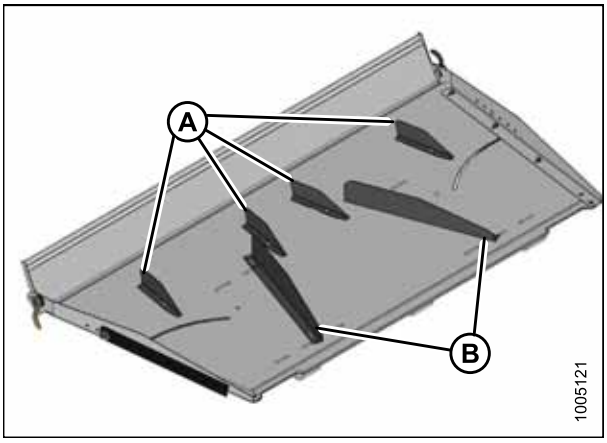


Figure 3.53: Deflector Fins

4. Position fins approximately as shown in illustration at right, and tighten hardware.

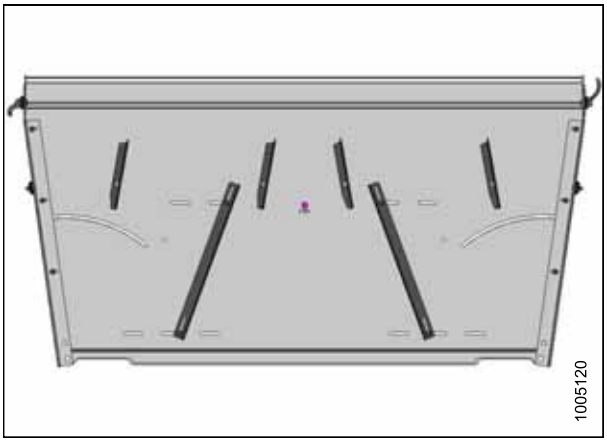


Figure 3.54: Deflector Fins

5. Remove hardware (A) from side deflectors (B).

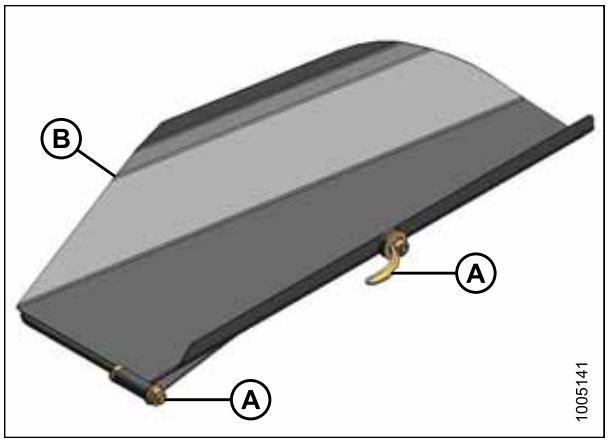


Figure 3.55: Side Deflector

6. Position deflector (A) on cover as shown in illustration at right, and install with hex bolt (B) and flange nut removed in previous step.
7. Tighten flange nut enough to hold deflector (A) in position, but still allow deflector to move.

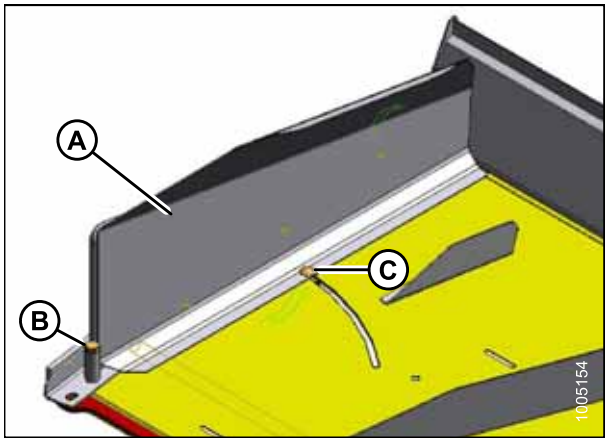


Figure 3.56: Side Deflector – Left

A - Side Deflector **B - Hex Bolt**
C - Bolt (referred to in next step)

8. Install bolt, washers, and handle nut (A) as shown in illustration at right. Rubber washer (B) must be positioned between metal washers (C).
9. Tighten handle nut (A) against cover to lock deflector in desired position.
10. Repeat for the other deflector.

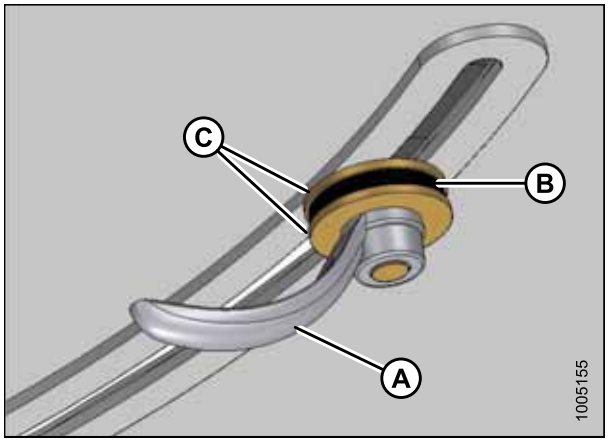


Figure 3.57: Handle – Left

11. Invert forming shield to installation position as shown in illustration at right.

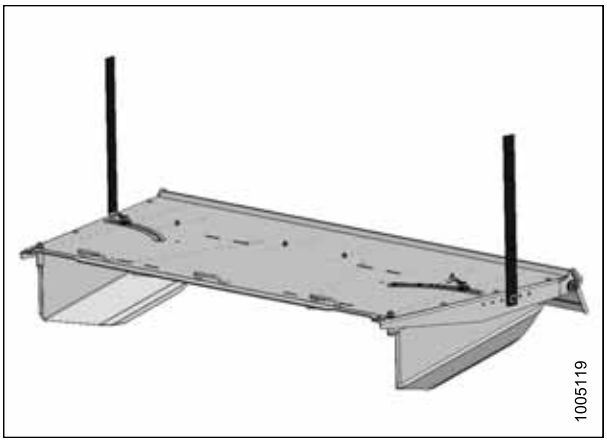


Figure 3.58: Forming Shield

3.10 Installing the Forming Shield

To install the forming shield, follow these steps:

1. Position the forward end of the forming shield (A) onto the two pins (B) located on the rear cover of the conditioner.

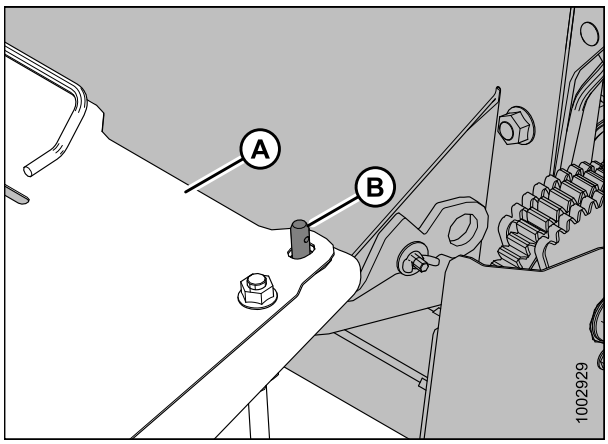


Figure 3.59: Forming Shield

2. Insert lynch pins (A) to secure forming shield to conditioner.

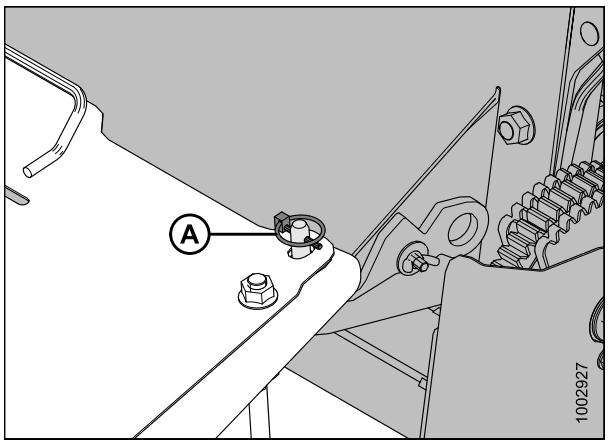


Figure 3.60: Lynch Pin

3. Set forming shield side deflectors to desired width by loosening handle (A) and moving deflector (B). Set both deflectors to approximately the same position.
4. Tighten handles (A).
5. Loosen handles (C) and adjust fluffer shield (D) to middle position.
6. Tighten handles (C).

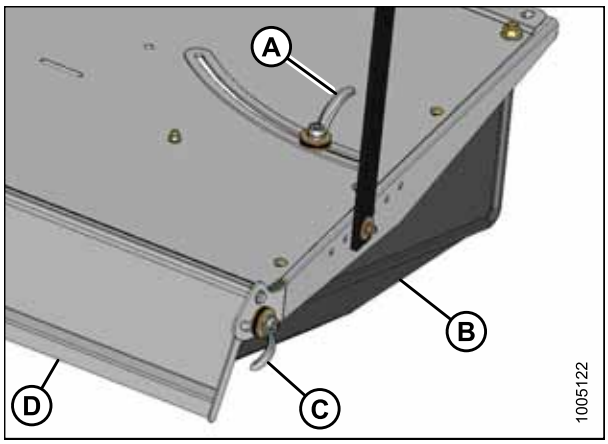


Figure 3.61: Forming Shield

7. Install shield transport support (A) on windrower frame with two 3/8 x 1.0 in. carriage bolts and nuts (B).

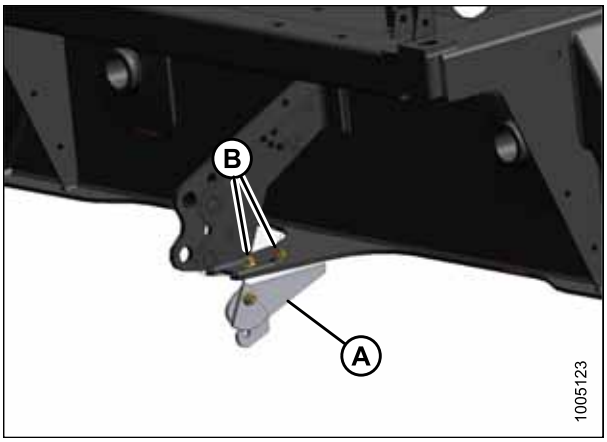


Figure 3.62: Shield Transport Support

3.11 Attaching to a Windrower

Refer to the windrower unloading and assembly instructions or operator's manual for instructions on attaching the header to an M Series Self-Propelled Windrower.

Once the header and windrower are attached, follow these steps:

1. Lift the aft end of the forming shield and attach straps (B) to pins (A) on windrower frame.
2. Retrieve washers and hairpins from shipping bundle and install to secure strap. Use the middle hole and adjust height to suit the crop.

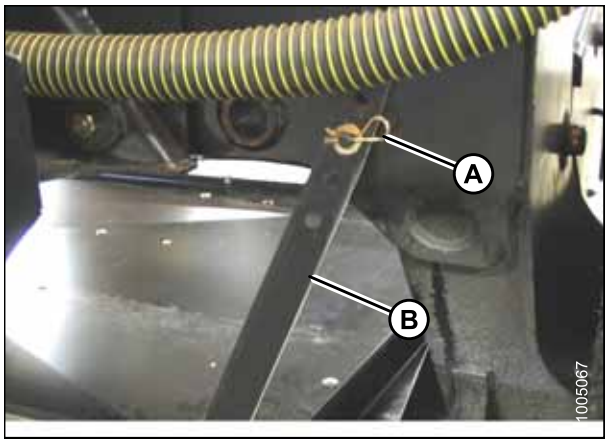


Figure 3.63: Rubber Strap

3.12 Lubricating the Conditioner

3.12.1 Greasing Procedure

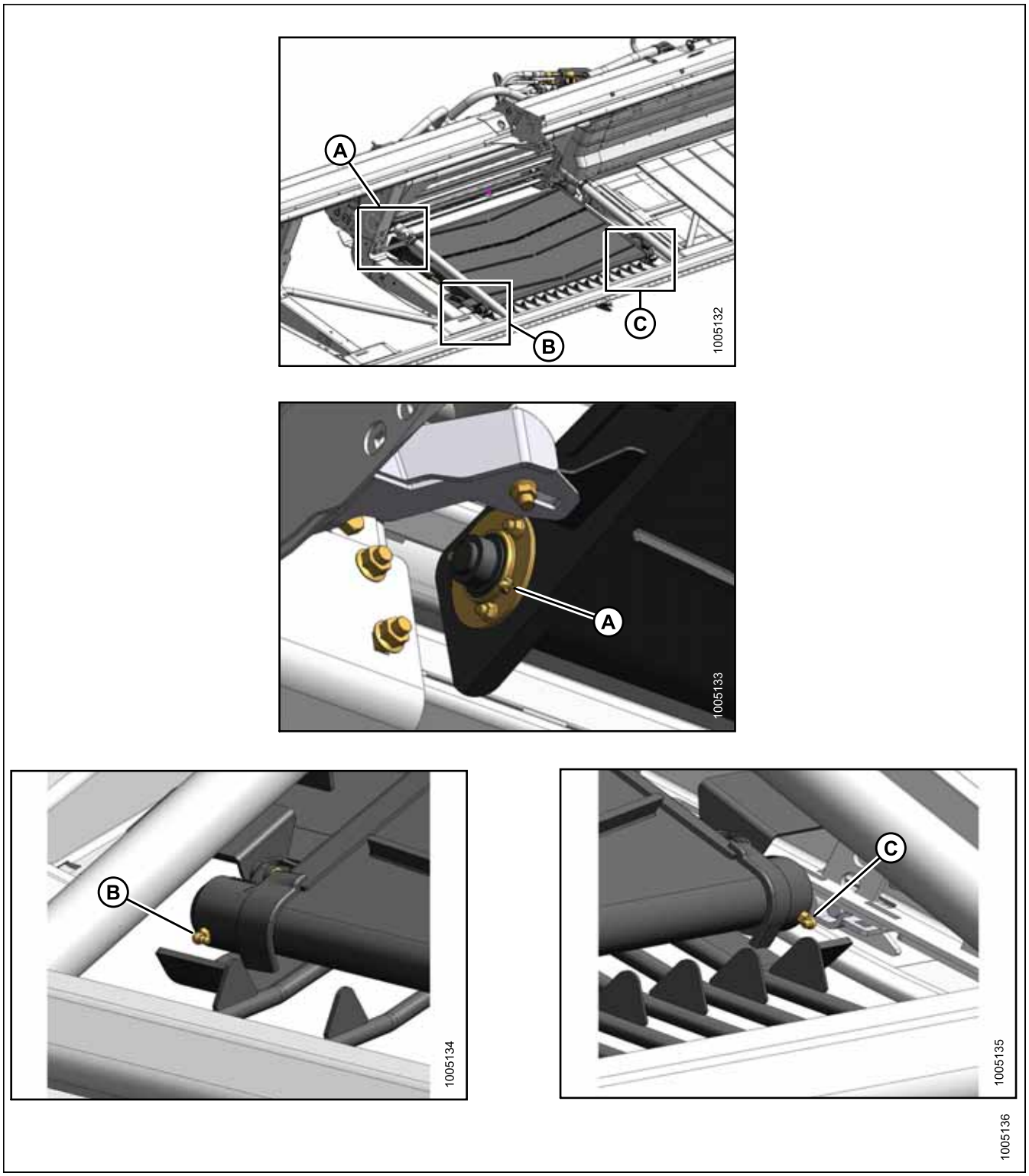
CAUTION

To avoid personal injury, before servicing header or opening drive covers, follow procedures in *5.1 Preparation for Servicing, page 79*.

1. To avoid injecting dirt and grit, wipe grease fitting with a clean cloth before greasing. For various locations of grease fittings, refer to *3.12.2 Lubrication Points, page 48*.
2. Inject grease through fitting with grease gun until grease overflows fitting, except where noted. For detailed lubrication information, refer to *5.4 Lubrication, page 82*.
3. Leave excess grease on fitting to keep out dirt.
4. Replace any loose or broken fittings immediately.
5. If fitting will not take grease, remove and clean thoroughly. Also clean lubricant passageway. Replace fitting if necessary.

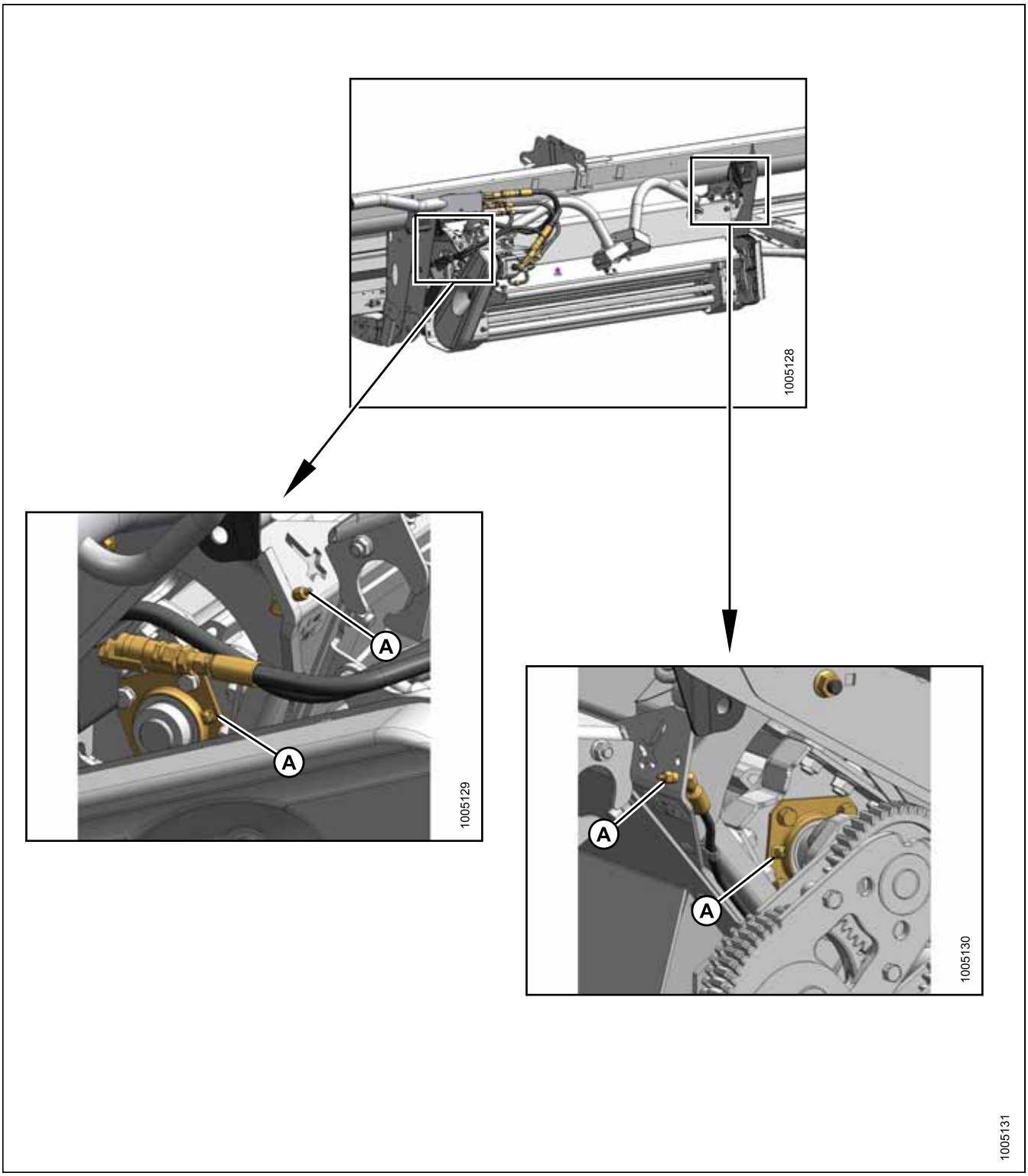
3.12.2 Lubrication Points

Figure 3.64: Lubrication Points



A - Drive Roller Bearing Lubrication Point **B - Idler Roller Bearing Lubrication Point** **C - Idler Roller Bearing Lubrication Point**

Figure 3.65: Lubrication Points



A - Roll Shaft Bearing Lubrication Points (Four Places)

3.13 Performing Predelivery Checks

DANGER

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

Perform the final checks and adjustments as listed on the **Predelivery Checklist** (yellow sheet attached to this instruction – refer to *Predelivery Checklist, page 143*) along with the header final checks and adjustments to ensure the machine is field-ready. Refer to the following pages for detailed instructions as indicated on the checklist.

The completed checklist should be retained either by the Operator or the Dealer.

3.13.1 Checking Roll Drive Belt Tension

To check the roll drive belt tension, follow these steps:

1. Remove wing nut and washer (A) and remove drive cover (B).

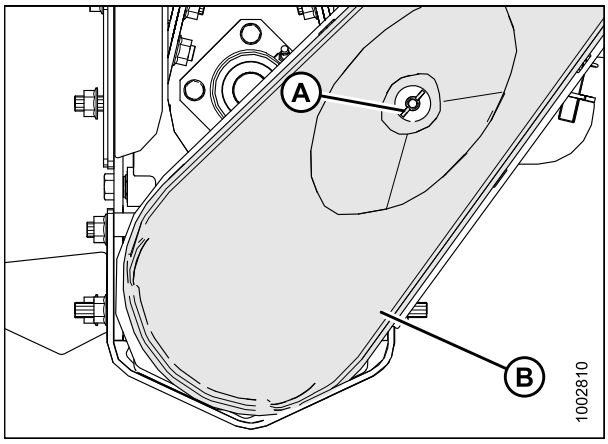


Figure 3.66: Drive Cover

2. Apply force to deflect belt (A). Belt should deflect 7 mm (1/4 in.) when a force of 36–72 N (8–16 lbf) is applied at the center of the span. If belt tension requires adjusting, refer to *5.7.1 Adjusting Drive Belt Tension, page 86*.
3. Replace cover and secure with washer and wing nut.

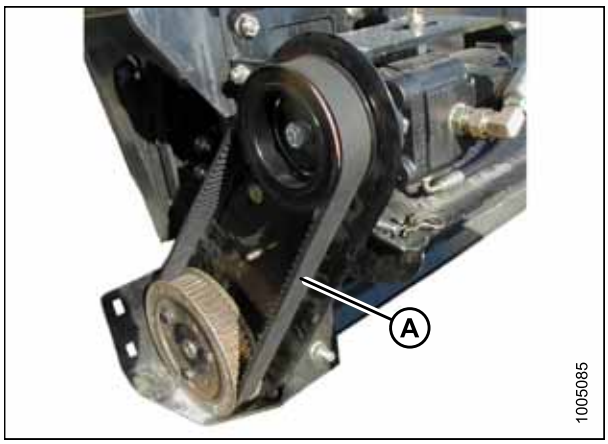


Figure 3.67: Drive Belt

3.13.2 Checking Roll Gap

Factory setting should be 20 mm (3/4 in.) or at 1.5 line on gauge (A). Gauge readings should be the same at both ends of the roll. If roll gap requires adjusting, refer to *4.9.2 Adjusting Roll Gap, page 72*.

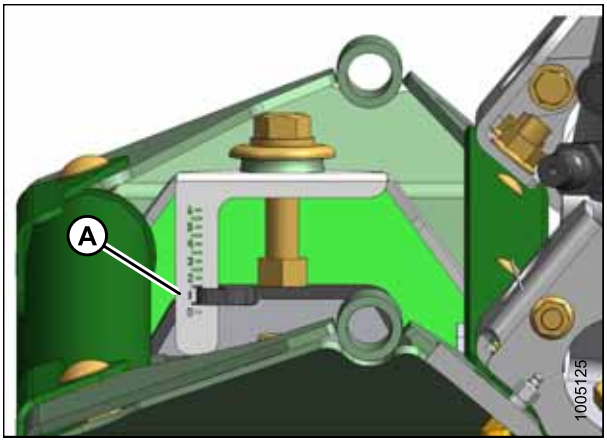


Figure 3.68: Roll Gap Gauge

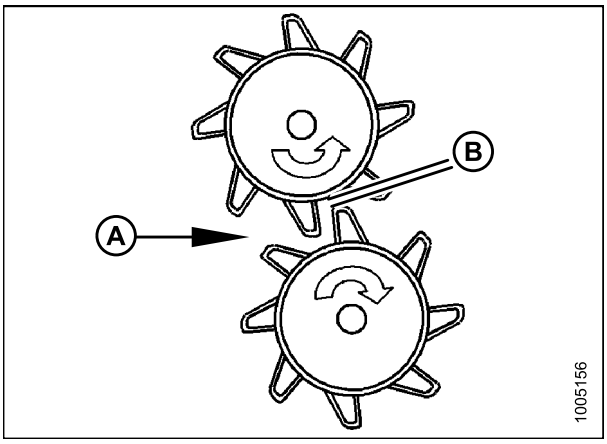


Figure 3.69: Roll Gap

A - Crop direction **B - Roll gap**

3.13.3 Checking Roll Timing

DANGER

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

To check the roll timing, follow these steps:

1. Lower header to ground, shut down windrower, and remove key.
2. Remove wing nut (A) and remove tool (B) from panel at right end of conditioner.

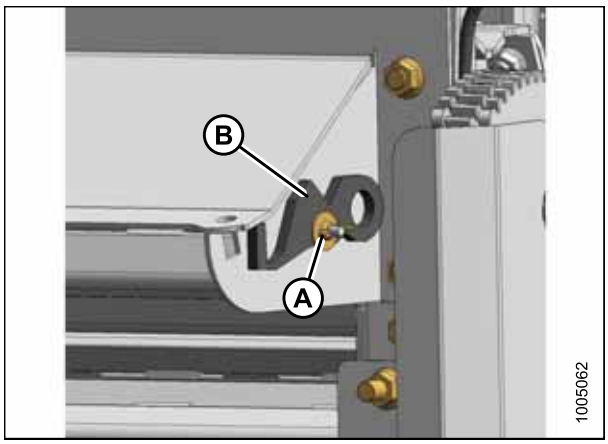


Figure 3.70: Conditioner End – Right

3. From the rear of the conditioner, locate tool at center of rolls (A) as shown in illustration at right, and manually turn rolls to limits of tool. Rolls will engage the tool if timing is correct.
4. Manually turn rolls to release tool.

WARNING

Remove tool from rolls and return it to storage location before starting machine.

5. Replace tool on conditioner with washer and wing nut.
6. If roll timing requires adjusting, refer to *4.9.3 Checking and Adjusting Roll Timing, page 73*.

Figure 3.71: Roll Timing Tool

A - Start Position **B - Gauge Position**

3.13.4 Running up the Conditioner

CAUTION

Never start or move the machine until you are sure all bystanders have cleared the area.

CAUTION

Clear the area of other persons, pets etc. Keep children away from machinery. Walk around the machine to be sure no one is under, on, or close to it.

CAUTION

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

Refer to the windrower unloading and assembly instructions or operator's manual for windrower operating instructions.

To run up the conditioner, follow these steps:

1. Start windrower and run the machine. Operate the conditioner slowly for 5 minutes, watching and listening FROM THE OPERATOR'S SEAT for binding or interfering parts.
2. Run machine for 15 minutes.
3. Perform the run-up check as listed on the Predelivery Checklist (yellow sheet attached to this instruction—refer to *Predelivery Checklist, page 143*) and the header run-up check to ensure the machine is field-ready.

3.13.5 Storing Manuals

Place this manual in the storage case (A) in the windrower. The Predelivery Checklist (yellow sheet attached to this instruction—refer to *Predelivery Checklist, page 143*) should be retained by either the Dealer or the Operator.

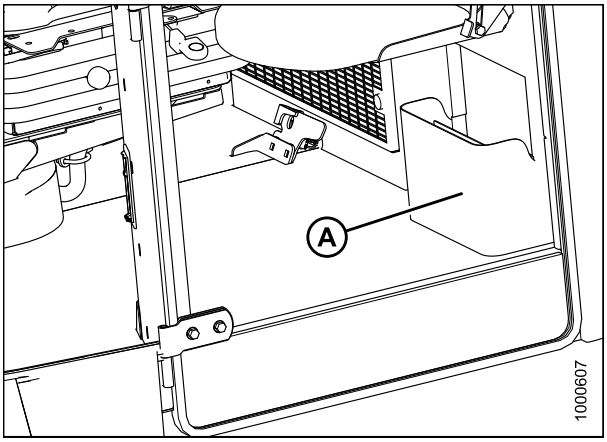


Figure 3.72: Manual Storage Case (M155 Shown)

4 Operation

4.1 Owner/Operator Responsibilities

CAUTION

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

4.2 Operational Safety

CAUTION

Follow these safety precautions:

- **Follow all safety and operational instructions given in your windrower operator's manuals. If you do not have a windrower manual, get one from your Dealer and read it thoroughly.**
- **Never start or move the machine until you are sure all bystanders have cleared the area.**
- **Stop engine and remove key before adjusting or removing plugged material from the machine.**
- **Check for excessive vibration and unusual noises. If there is any indication of trouble, shut down and inspect the machine. Follow proper shutdown procedure. Refer to *4.2.1 Shutting down the Machine, page 56*.**
- **Operate only in daylight or good artificial light.**

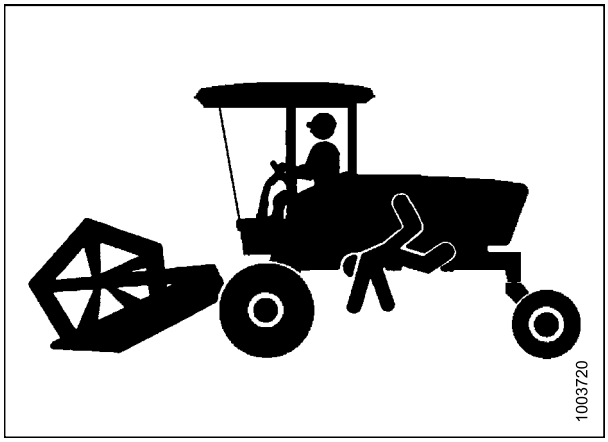


Figure 4.1: Safety around Windrower

4.2.1 Shutting down the Machine

Before inspecting the machine, follow these steps to shut it off:

1. Return GSL to N-DETENT and center steering wheel to lock.
2. Disengage header drives.
3. Turn off engine and remove key.
4. Wait for all movement to stop.
5. Dismount and engage lift cylinder safety props on windrower lift legs before inspecting raised machine.

4.3 Attaching Hay Conditioner to Header

Refer to the following sections in order for instructions on installing the HC10 Hay Conditioner and forming shield on your D Series draper header.

- *3.3 Installing the Rock Grate, page 20*
- *3.4 Installing Deck Brackets, page 21*
- *3.7 Attaching Hydraulics, page 33*
- *3.5 Installing the Feed Deck, page 23*
- *3.6 Installing the Conditioner, page 25*
- *3.9 Assembling the Forming Shield, page 41*
- *3.10 Installing the Forming Shield, page 44*

4.4 Detaching Hay Conditioner from Header

There are two methods for detaching the hay conditioner from the header. Refer to the following sections for instructions:

- The windrower method – refer to *4.4.1 Detaching Hay Conditioner: Windrower Method, page 58*
- The lifting method – refer to *4.4.2 Detaching Hay Conditioner: Lifting Method, page 62*

4.4.1 Detaching Hay Conditioner: Windrower Method

CAUTION

To prevent accidental movement of windrower, return GSL to N-DETENT, center steering wheel to lock, shut off engine, and remove key.

To detach the hay conditioner from the header using the windrower method, follow these steps:

1. Disconnect straps (A) from windrower frame.

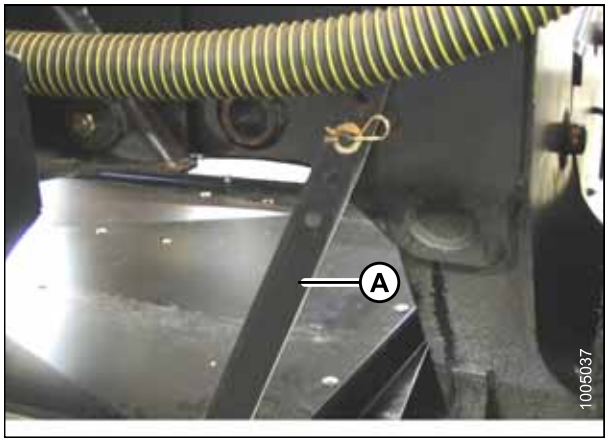


Figure 4.2: Rubber Strap

2. Lower header stand (A) to mid-position.
3. Detach header from windrower. Refer to windrower operator's manual for instructions.

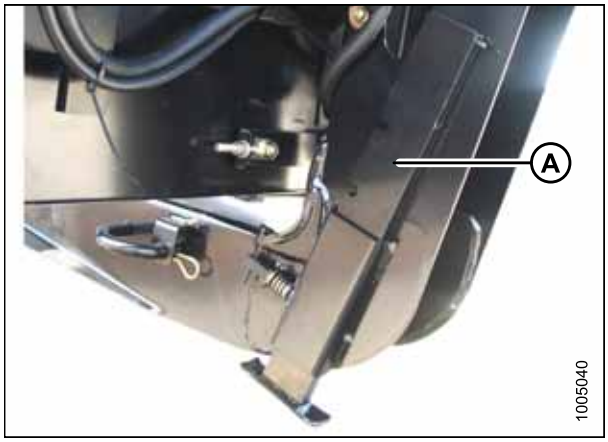


Figure 4.3: Header Stand

4. Remove the two lynch pins (A) securing forming shield to conditioner pins and remove shield.

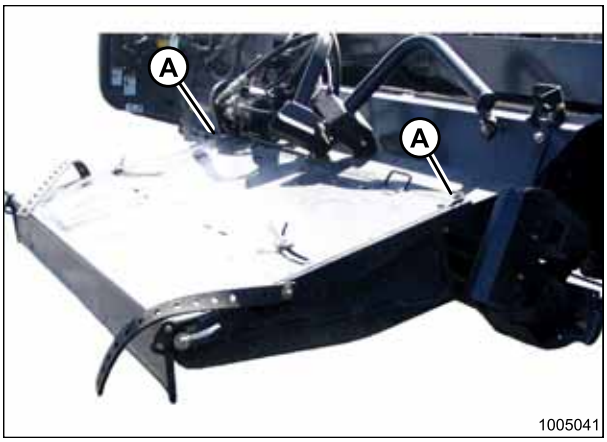


Figure 4.4: Forming Shield

5. Disconnect the five hydraulic hoses between the conditioner and the header:
   - Conditioner motor pressure hose (A)
   - Deck motor return hose (B)
   - Case drain hose (C)
   - Deck motor pressure hose (D)
   - Conditioner motor return hose (E)

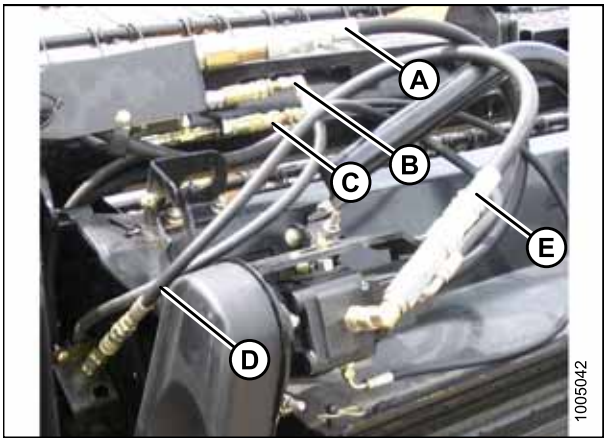


Figure 4.5: Hydraulic Hoses

6. Remove the two carriage bolts (A) that attach conditioner to header.

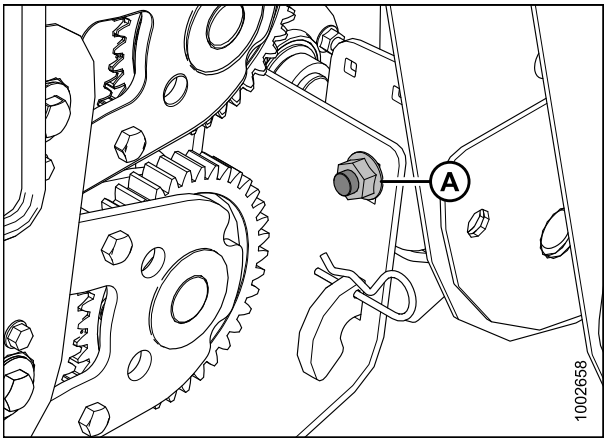


Figure 4.6: Conditioner – Right Side

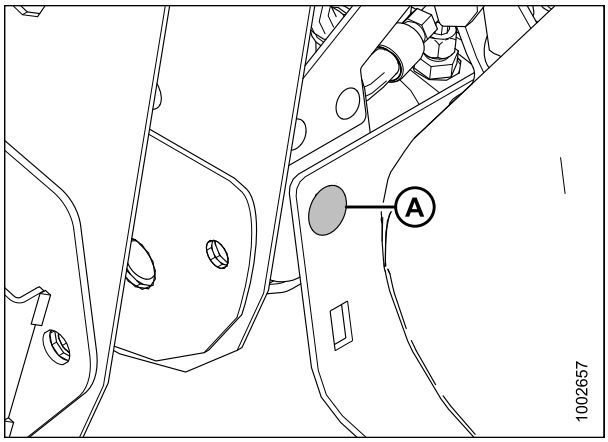


Figure 4.7: Conditioner – Left Side

7. Hardware at lifting arms has been tightened for shipping. If not done previously, loosen two bolts per side just enough to allow arms to swing out.
8. Remove L-pins (A) securing lifting arms to conditioner. (Rotate L-pins to align spring pins with key-hole slot.)

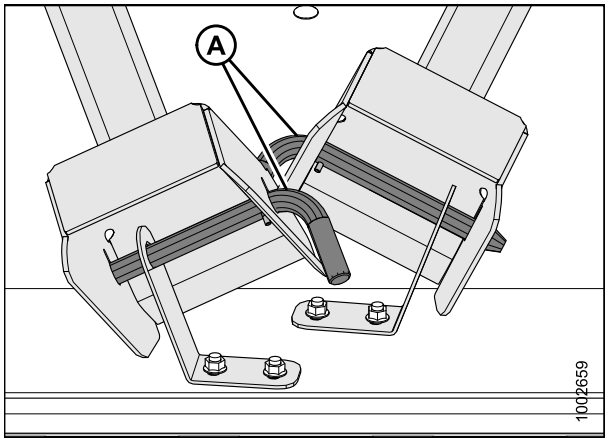


Figure 4.8: L-Pins on Header Arm

9. Swing out lift arms (A) and secure in latches (B).

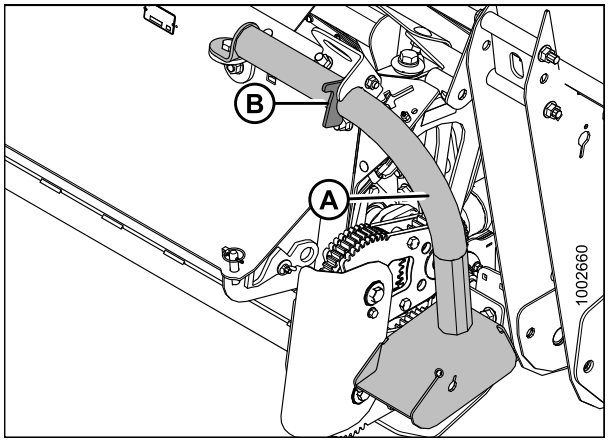


Figure 4.9: Conditioner Lift Arm

10. Position the windrower arms in the lift arm pockets (A) and insert the L-pins for safety.

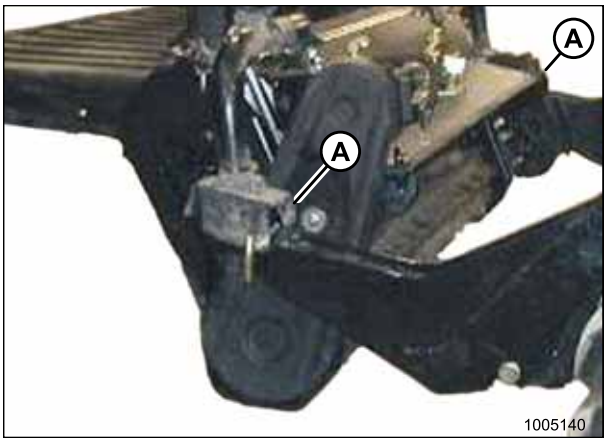


Figure 4.10: Lift Arm Pockets

11. Carefully raise the windrower lift legs until lugs (A) on conditioner clear the U-shaped brackets (B) on header.
12. Slowly back windrower away from header.

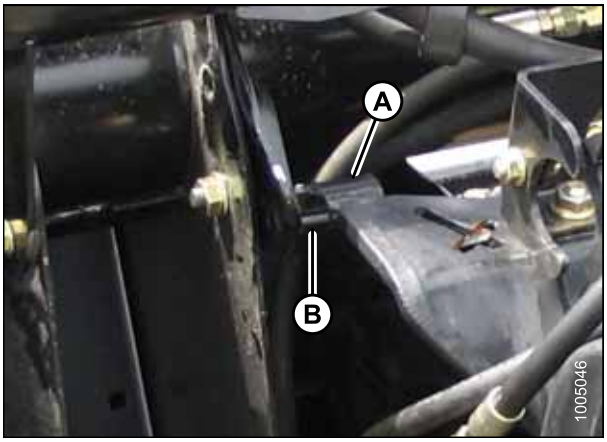


Figure 4.11: Conditioner Lug

13. Retrieve stand (A) from toolbox and install in slot at bottom of conditioner base. Secure with hairpin (B).
14. Lower conditioner to ground.

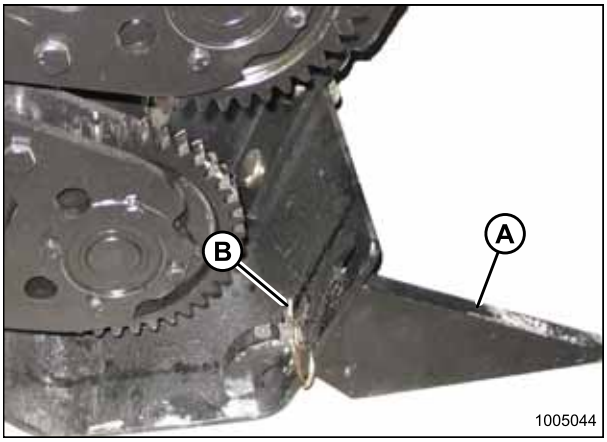


Figure 4.12: Conditioner Stand

15. Remove L-pins (A) from lift arms and back windrower away from conditioner.
16. Replace L-pins in conditioner lift arms.

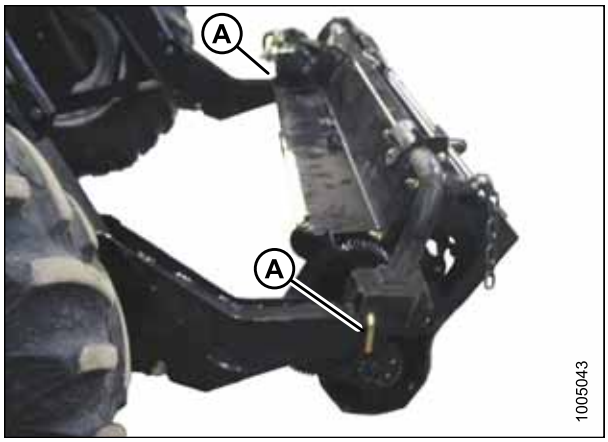


Figure 4.13: L-Pins

4.4.2 Detaching Hay Conditioner: Lifting Method

CAUTION

To prevent accidental movement of windrower, return GSL to N-DETENT, center steering wheel to lock, shut off engine, and remove key.

To detach the hay conditioner from the header using the lifting method, follow these steps:

1. Disconnect straps (A) from windrower frame.

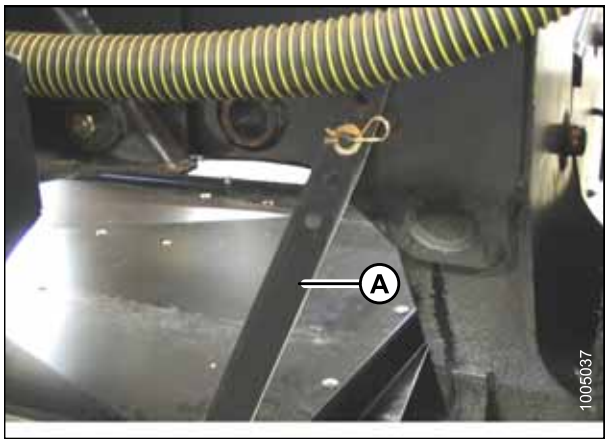


Figure 4.14: Rubber Strap

2. Lower header stand (A) to mid-position.
3. Detach header from windrower. Refer to windrower operator's manual for instructions.

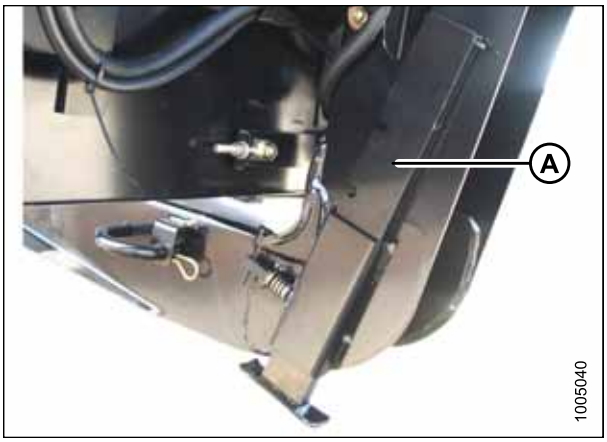


Figure 4.15: Header Stand

4. Remove the two lynch pins (A) securing forming shield to header pins and remove the forming shield.

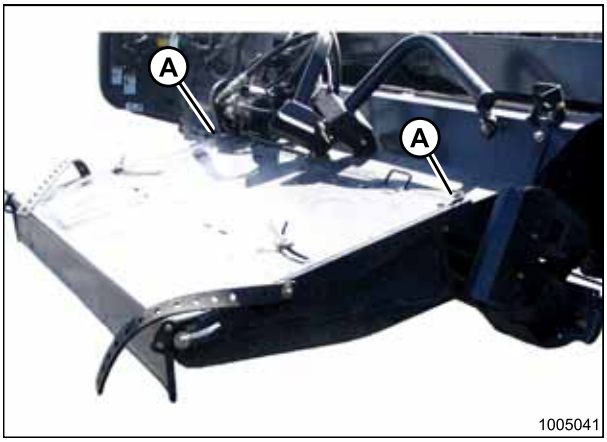


Figure 4.16: Forming Shield

5. Disconnect the five hydraulic hoses between the conditioner and the header:
   - Conditioner motor pressure hose (A)
   - Deck motor return hose (B)
   - Case drain hose (C)
   - Deck motor pressure hose (D)
   - Conditioner motor return hose (E)

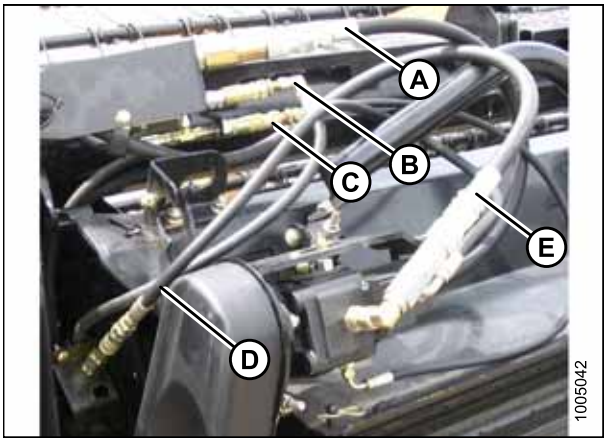


Figure 4.17: Hydraulic Hoses

6. Remove the two carriage bolts (A) that attach conditioner to header.

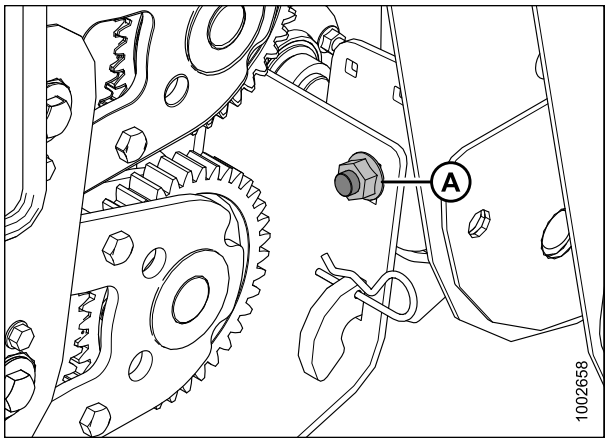


Figure 4.18: Conditioner – Right Side

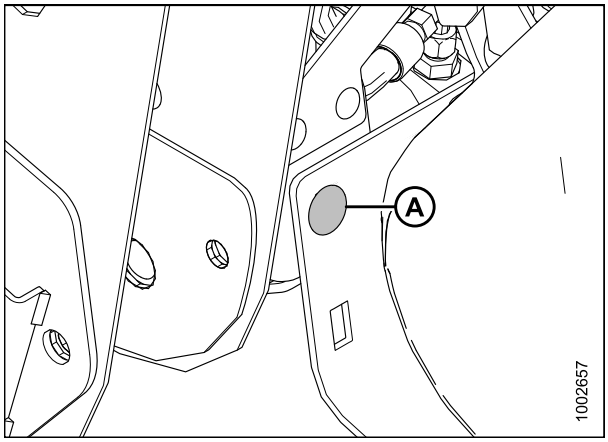


Figure 4.19: Conditioner – Left Side

7. Attach chain to lifting brackets (A) on conditioner and secure chain to lifting device (B).

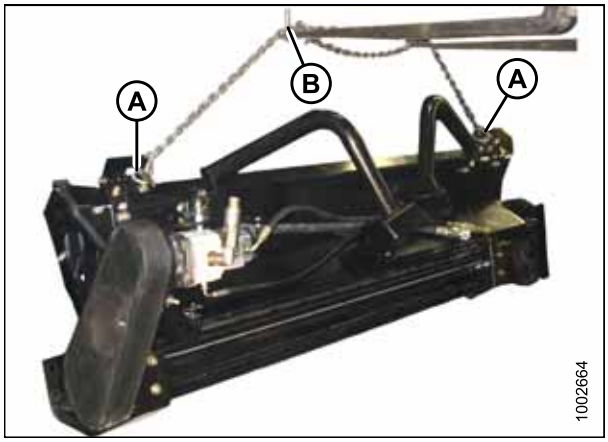


Figure 4.20: Conditioner and Lifting Brackets

8. Carefully raise the lifting device until lugs (A) on conditioner clear the U-shaped brackets (B) on header.
9. Slowly back windrower away from header.

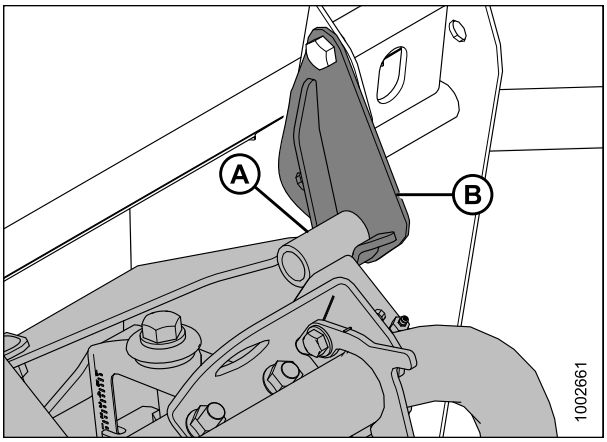


Figure 4.21: Conditioner Lug

10. Retrieve stand (A) from toolbox and install in slot at bottom of conditioner base. Secure with hairpin (B).
11. Lower conditioner to ground.
12. Unhook chains.

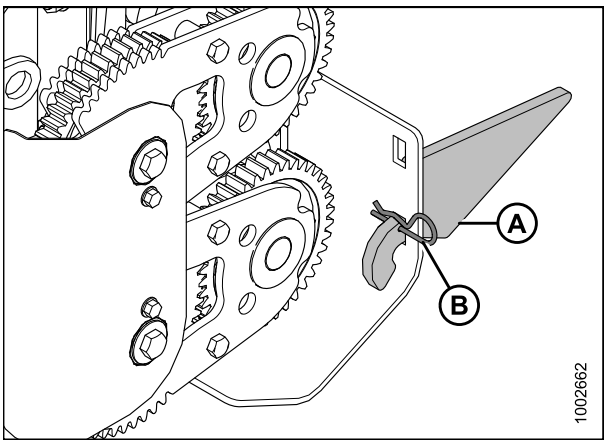


Figure 4.22: Conditioner Stand

4.5 Detaching Feed Deck and Rock Grate

To detach the feed deck and rock grate from the hay conditioner, follow these steps:

1. Remove the two carriage bolts (A) that attach the hose brace to the header, and lay hoses on deck.

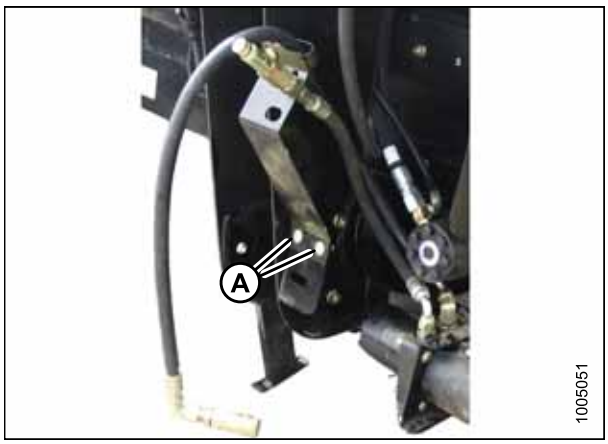


Figure 4.23: Hose Brace

2. Remove the two bolts (A) at the rear of the deck that secure the deck to the header.

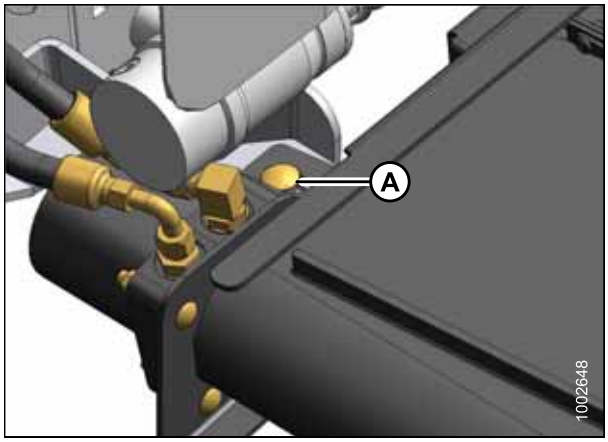


Figure 4.24: Feed Deck – Left Side

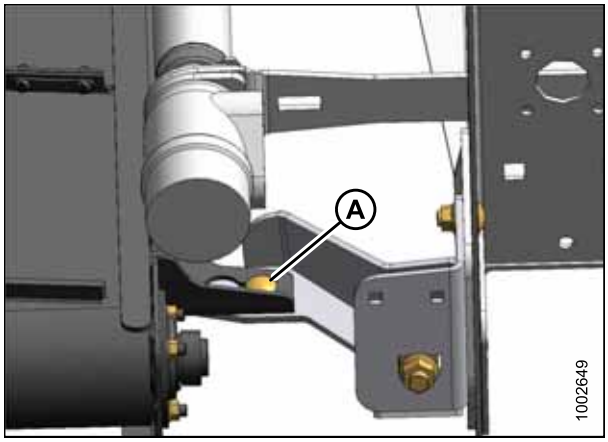


Figure 4.25: Feed Deck – Right Side

3. Slide deck (A) back slightly until deck mounts clear the header brackets. Lower aft of deck to ground.
4. Continue sliding deck back until deck drops free of rock grate. Move deck to storage.

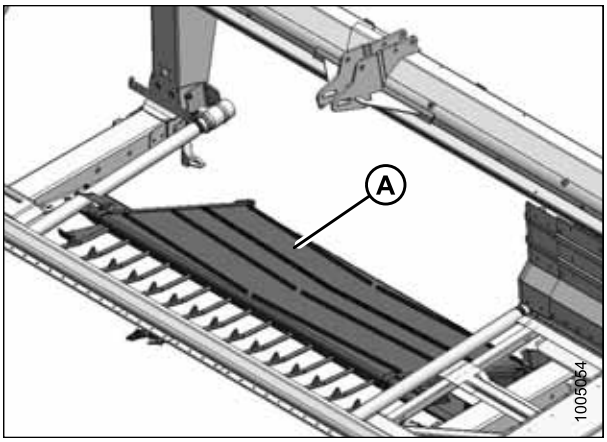


Figure 4.26: Feed Deck

5. Remove the two bolts (A) attaching rock grate to header legs.

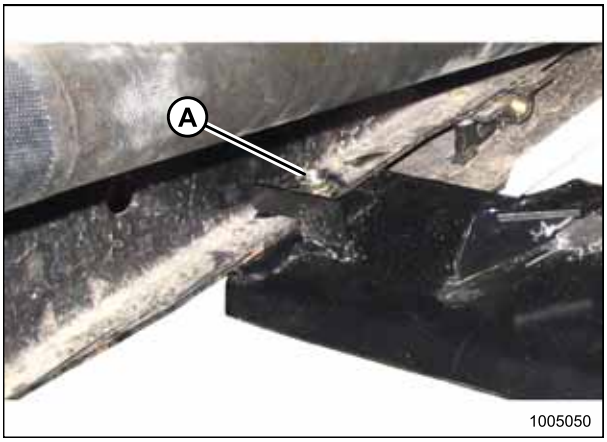


Figure 4.27: Rock Grate

6. Pull rock grate (A) off cutterbar and header legs. Move rock grate to storage.

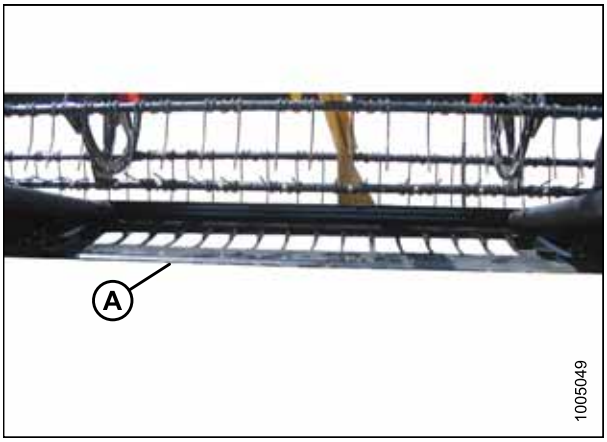


Figure 4.28: Rock Grate

7. If necessary, remove the conditioner attachment brackets (A) and spacers (B) from the header legs and store with the feed deck.

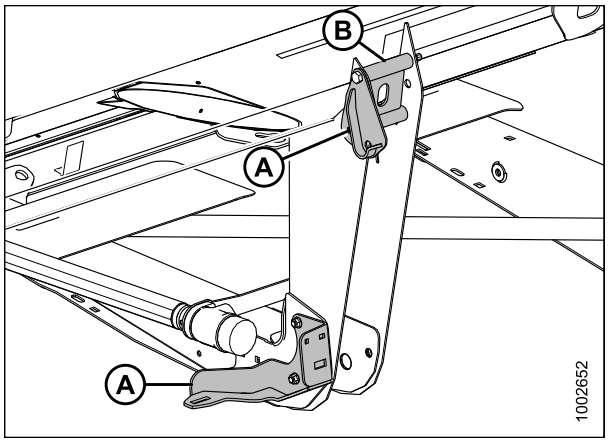


Figure 4.29: Conditioner Attachment Brackets

4.6 Break-in Period

When operating the hay conditioner for the first time, operate the conditioner slowly for five minutes, watching and listening FROM THE OPERATOR'S SEAT for binding or interfering parts.

CAUTION

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

NOTE:

Conditioner will **NOT** operate until oil flow fills the lines.

NOTE:

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

After First Five Hours of Operation:

- Adjust the tension of roll drive belt. Refer to *5.7 Drive Belt, page 86*. Continue to check the belt tension periodically for the first 50 hours.
- Tighten any loose hardware. Refer to *2 Product Overview, page 9*.

4.7 Preseason Check

CAUTION

- **Review the operator's manual to refresh your memory on safety and operating recommendations.**
- **Review all safety signs and other decals on the header and note hazard areas.**
- **Be sure all shields and guards are properly installed and secured. Never alter or remove safety equipment.**
- **Be sure you understand and have practiced safe use of all controls. Know the capacity and operating characteristics of the machine.**
- **Check the first aid kit and fire extinguisher. Know where they are and how to use them.**

Perform the following tasks at the beginning of each operating season:

- Adjust tension on drive belt. Refer to *5.7 Drive Belt, page 86*.
- Perform all annual maintenance. Refer to *5.8 Maintenance Schedule, page 92*.

4.8 Daily Startup Check

CAUTION

- **Clear the area of other persons, pets, etc. Keep children away from machinery. Walk around the machine to be sure no one is under, on, or close to it.**
- **Wear close-fitting clothing and protective shoes with slip-resistant soles.**
- **Remove foreign objects from the machine and surrounding area.**
- **As well, carry with you any protective clothing and personal safety devices that COULD be necessary through the day. Don't take chances. You may need a hard hat, protective glasses or goggles, heavy gloves, a respirator or filter mask, or wet weather gear.**

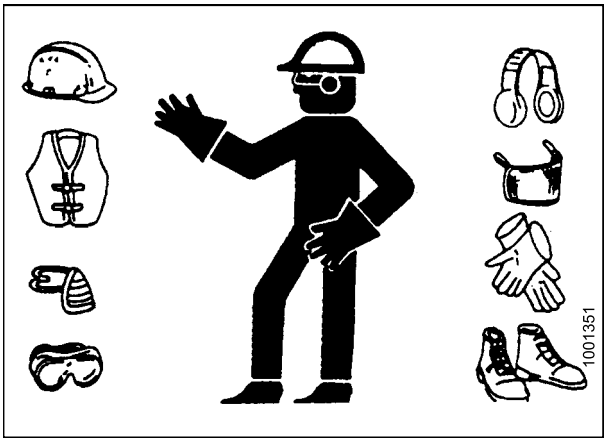


Figure 4.30: Protective Clothing and Personal Safety Devices

- **Protect against noise. Wear a suitable hearing protection device such as earmuffs or earplugs to protect against objectionable or uncomfortable loud noises.**

Complete the following tasks each day before start-up:

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

   NOTE:
   Use proper procedure when searching for pressurized fluid leaks. Refer to *5.5 Hydraulics, page 84*.

2. Clean all lights and reflective surfaces on the machine.
3. Perform all daily maintenance. Refer to *5.8 Maintenance Schedule, page 92*.

4.9 Conditioner Operation

WARNING

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

WARNING

To avoid bodily injury or death from unexpected startup of machine, stop engine and remove key before adjusting rolls.

4.9.1 Roll and Feed Draper Speed

The roll and feed draper speeds change whenever the header knife speed is changed since the drives use the same hydraulic circuit. They cannot be independently adjusted.

4.9.2 Adjusting Roll Gap

Intermeshing steel rolls condition the crop by crimping and crushing the stem in several places. This allows moisture release for quicker drying. The degree to which the crop is conditioned as it passes through the rolls is controlled by roll gap (refer to illustration at right). The gap is factory set at 20 mm (3/4 in.) or at 1.5 line on gauge. Gauge readings should be the same at both ends of the roll.

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

Grass type crops may require less gap for proper feeding and conditioning. A larger gap (up to 25 mm [1 in.]) may be desirable in thick-stemmed cane-type crops; however, too large a gap may cause feeding problems.

If required, you can adjust the roll gap by loosening nut (A) and turning adjuster (B). Retighten nut (A) after adjusting.

IMPORTANT:

When adjusting roll gap, be sure that the gauge (C) reading is the same on both sides of the conditioner roll to achieve consistent intermesh across the rolls.

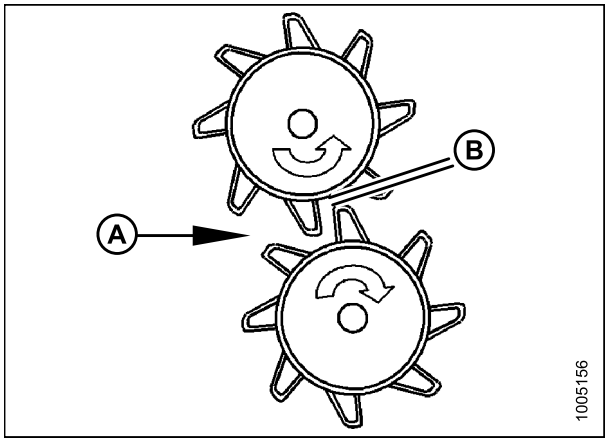


Figure 4.31: Roll Gap

A - Crop Direction **B - Roll Gap**

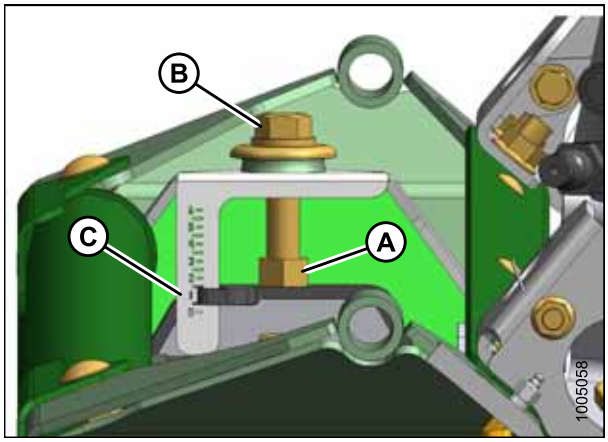


Figure 4.32: Roll Gap Gauge

4.9.3 Checking and Adjusting Roll Timing

For proper conditioning, the rolls must be properly timed and aligned; each steel bar on one roll must be centered between two bars on the other roll as shown in illustration at right. The factory setting should be suitable for most crop conditions.

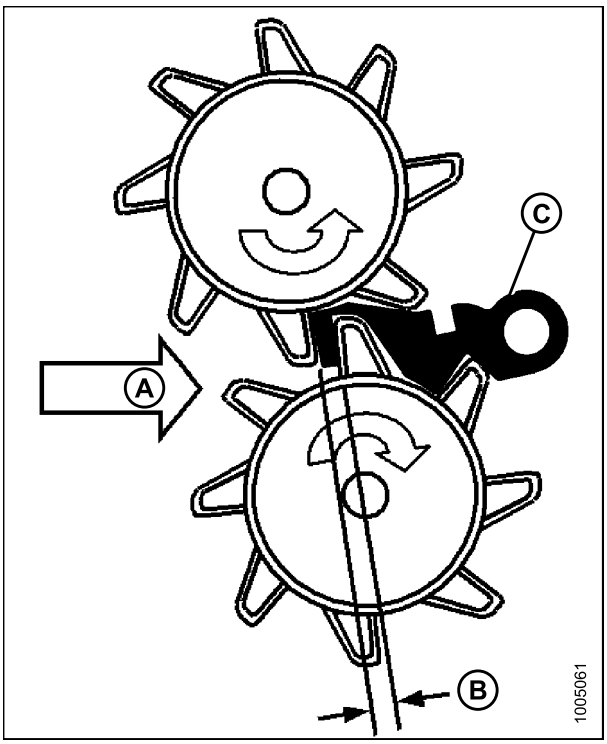


Figure 4.33: Roll Timing Tool

A - Crop Direction **B - Timing Gap**
C - Roll Timing Tool

To check roll timing, follow these steps:

1. Lower header to ground, shut down windrower, and remove key.
2. Remove wing nut and washer (A) and remove tool (B) from panel at right end of conditioner.

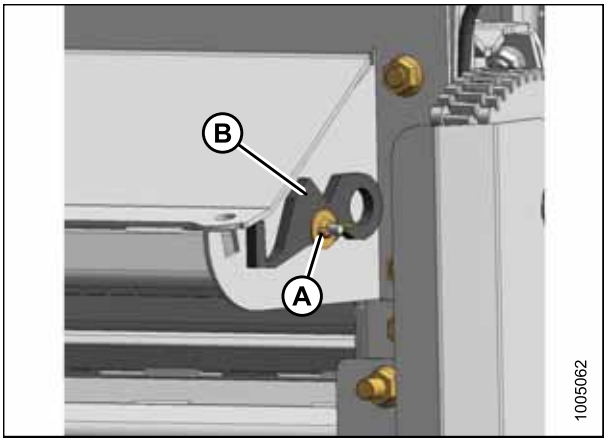


Figure 4.34: Conditioner End – Right

3. From the rear of the conditioner, position tool at center of rolls (A) as shown in illustration at right, and manually turn rolls to limits of tool. Rolls will engage the tool if timing is correct.
4. Manually turn rolls to release tool.

WARNING

Remove tool from rolls and return it to storage location before starting machine.

5. If roll timing is correct, replace tool on conditioner with washer and wing nut, and then skip remaining steps.

   If roll timing needs adjusting, continue to the next step.

6. Loosen the four bolts (A) on one of the small timing gears.
7. Insert tool as described above and allow rolls to adjust to tool.
8. Tighten bolts on timing gear.
9. Return tool to storage position.

Figure 4.35: Roll Timing Tool

A - Start Position **B - Gauge Position**

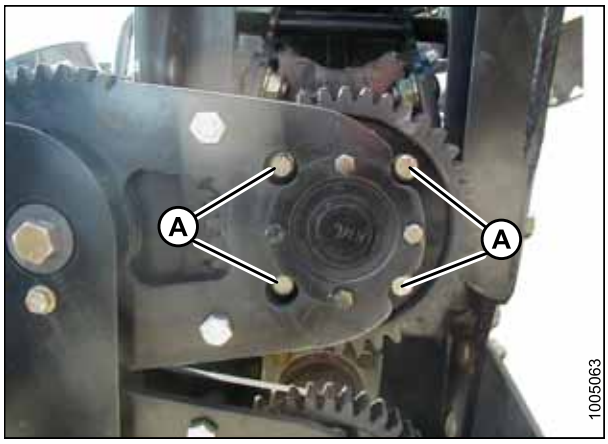


Figure 4.36: Timing Gear

4.9.4 Adjusting Conditioner Roll Tension

The conditioner roll tension is maintained by two tension springs providing adequate pressure for correct conditioning of the crop. These springs also allow the rolls to open to allow passage of small solid objects without damage to the rolls.

1. Locate the adjustment nuts on top of the conditioner channel.
2. Loosen jam nuts (A).
3. Turn adjusting nut (B) clockwise to increase tension, and counterclockwise to decrease tension.
4. Adjust nuts (B) on both sides equal amounts.
5. Tighten jam nuts (A).

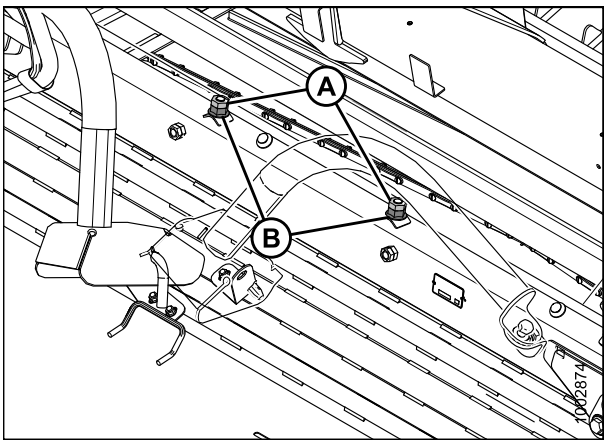


Figure 4.37: Conditioner Channel

4.9.5 Forming Shields

The position of the forming shields controls the width and placement of the windrow. The decision on forming shield position (settings between 915 and 2346 mm [36 and 92 in.]) should be based on the following factors:

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

Where weather conditions permit or when drying is not critical (for example, when cutting for silage or green-feed), a narrower windrow may be preferred for ease of pick-up.

Adjusting Forming Shield Height

⚠ DANGER

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

The height of the forming shield affects the shape and consistency of the windrow. A heavy crop will require the forming shield to be set near the highest position and a lighter crop needs the forming shield to be lower. Adjust the forming shield height as follows:

1. Remove hairpins (A) securing straps (B) to pins on windrower frame.
2. Support aft end of forming shield and relocate straps to the desired hole.
3. Secure straps with hairpins.

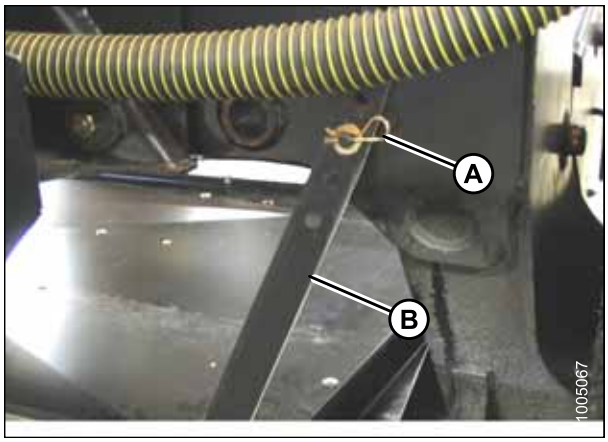


Figure 4.38: Rubber Strap

Adjusting Side Deflectors

DANGER

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

The position of the side deflectors controls the width and placement of the windrow. To adjust the position, follow these steps:

1. Set side deflectors (A) to desired width by loosening handle (B) and moving deflector (A). Tighten handle. Set both deflectors to approximately the same position.

   IMPORTANT:

   To ensure windrow placement is centered with respect to windrower wheels, adjust both side deflectors to the same position. To achieve this setting, adjuster handles must be in the same location on both sides.
2. If side deflector attachment is too tight or too loose, tighten or loosen nut (C) as required.

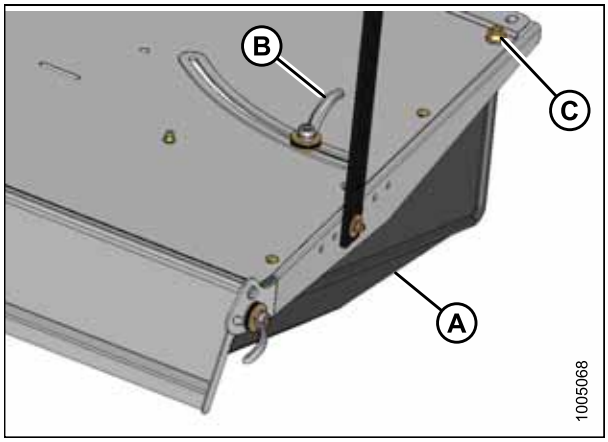


Figure 4.39: Side Deflector – Right

Adjusting Rear Deflector (Fluffer Shield)

DANGER

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

The rear deflector slows the crop exiting the conditioner rolls, directs the flow downward, and "fluffs" the material. To adjust the rear deflector, follow these steps:

1. For more crop control in light material, lower the rear deflector (A) by pushing down on one side of the deflector and then down on the other side. Locking bolts (B) are located at either end of the deflector and may be loosened slightly.
2. For heavier crops, raise the deflector by pulling up on one side and then up on the other side.

   NOTE:

   For even windrow formation, be sure the deflector is not twisted.

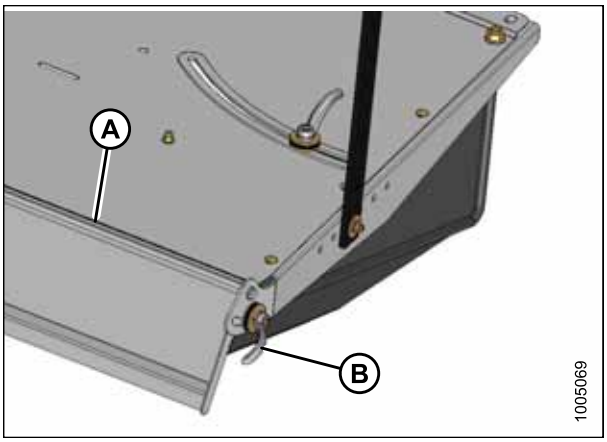


Figure 4.40: Rear Deflector

Adjusting Deflector Fins

DANGER

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

Adjustable deflector fins help to provide different swath widths and distribution of crop across the windrow. To adjust the deflector fins, follow these steps:

1. Angles for the short fins (A) can be adjusted by loosening mounting bolt(s) and rotating as required. The long fins (B) can be adjusted using the slots in the cover.
2. Set fins approximately parallel to side deflectors for wide swath and adjust as required for even distribution of crop across full width. For narrow windrow less than 1780 mm (70 in.), remove fins.

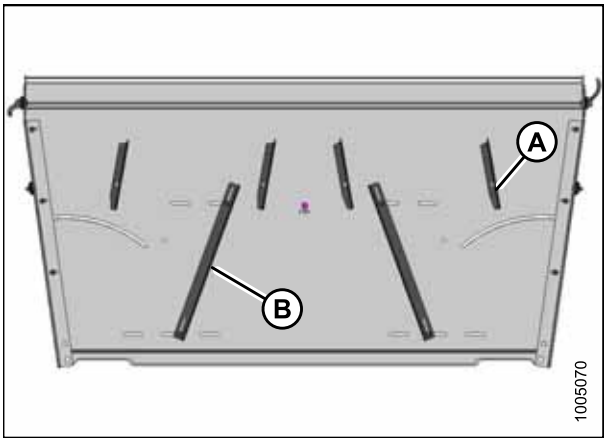


Figure 4.41: Deflector Fins

4.9.6 Unplugging the Conditioner

To unplug the conditioner, reverse the header drive. Refer to the windrower operator's manual for procedures on reversing the header drive.

4.10 Storing the Hay Conditioner

At the end of each operating season, perform the following maintenance items:

CAUTION

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

- Clean the conditioner thoroughly.
- Store in a dry, protected place if possible. If stored outside, always cover conditioner with a waterproof canvas or other protective material.
- Repaint all worn or chipped painted surfaces to prevent rust.
- Loosen drive belt.
- Lubricate the conditioner thoroughly, leaving excess grease on fittings to keep moisture out of bearings. Apply grease to exposed threads and sliding surfaces of components.
- Check for worn components and repair.
- Check for broken components and order replacement from your Dealer. Attention to these items right away will save time and effort at beginning of next season.
- Replace or tighten any missing or loose hardware. Refer to *2 Product Overview, page 9*.

5 Maintenance

5.1 Preparation for Servicing

The following instructions are provided to help you maintain your HC10 Hay Conditioner.

Contact your MacDon Dealer for detailed maintenance and service information.

CAUTION

To avoid personal injury, before servicing hay conditioner or opening header drive covers:

1. **Fully lower the header. If necessary to service in the raised position, always engage safety props.**
2. **Stop engine and remove key.**
3. **Engage park brake.**
4. **Wait for all moving parts to stop.**

5.2 Recommended Safety Procedures

Always follow these recommended safety procedures:

- Park on a level surface when possible. Block wheels securely if windrower is parked on an incline.
- Follow all recommendations in your header and windrower operator's manuals.
- Follow all safety sections in this manual. Refer to *1 Safety, page 1*.

5.3 Removing and Installing Driveshields

CAUTION

- **Keep all shields in place. Never alter or remove safety equipment.**
- **Do NOT operate machine with shield removed.**

1. To remove shield, undo wing nut (B) and remove washer. Pull shield (A) off conditioner.
2. To install shield, position shield (A) over drive pulleys and then secure with washer and wing nut (B).

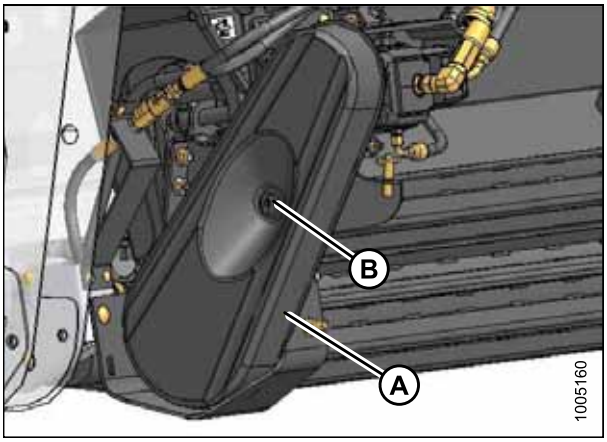


Figure 5.1: Driveshield

5.4 Lubrication

5.4.1 Lubricants

Use clean lubricants to keep your machine operating at top efficiency.

Use clean containers to handle all lubricants.

Store in an area protected from dust, moisture, and other contaminants.

Lubricant	Spec.	Description	Use
Grease	SAE Multi-Purpose	High temperature, extreme pressure (EP) 0–1% Max Molybdenum Disulphide (NLGI Grade 2) Lithium Complex Base Base Oil Viscosity of 190–250 CST @ 40C	As required unless otherwise specified

5.4.2 Greasing Procedure

CAUTION

To avoid personal injury, before servicing header or opening drive covers, follow procedures in *5.1 Preparation for Servicing, page 79*.

1. To avoid injecting dirt and grit, wipe grease fitting with a clean cloth before greasing. For various locations of grease fittings, refer to *3.12.2 Lubrication Points, page 48*.
2. Inject grease through fitting with grease gun until grease overflows fitting, except where noted. For detailed lubrication information, refer to *5.4 Lubrication, page 82*.
3. Leave excess grease on fitting to keep out dirt.
4. Replace any loose or broken fittings immediately.
5. If fitting will not take grease, remove and clean thoroughly. Also clean lubricant passageway. Replace fitting if necessary.

5.4.3 Greasing Points

Greasing points that have greasing intervals of 50 hours or less are marked on the machine by decals showing a grease gun (A) and grease interval (B) in hours of operation.

Log hours of operation and use the Maintenance Checklist provided to keep a record of scheduled maintenance. Refer to *5.8 Maintenance Schedule, page 92*.

To identify the various locations that require lubrication, refer to *3.12.2 Lubrication Points, page 48*.

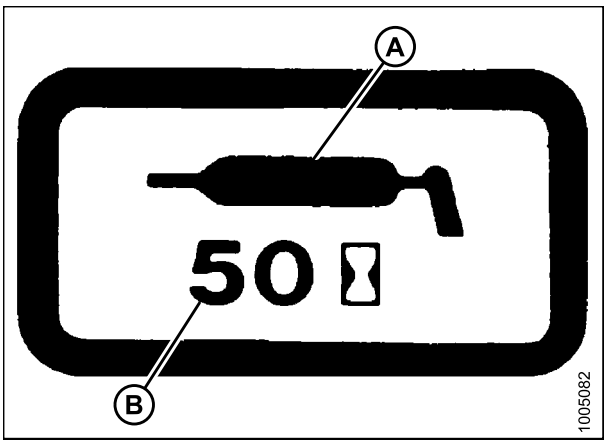


Figure 5.2: Grease Decal – 50 Hours

5.5 Hydraulics

5.5.1 Hydraulic Hoses and Lines

Check hydraulic hoses and lines daily for signs of leaks.

WARNING

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

Figure 5.3: Hydraulic Pressure Hazard

IMPORTANT:

Keep hydraulic coupler tips and connectors clean. Dust, dirt, water, and foreign material are the major causes of hydraulic system damage. **DO NOT** attempt to service hydraulic system in the field. Precision fits require WHITE ROOM CARE during overhaul.

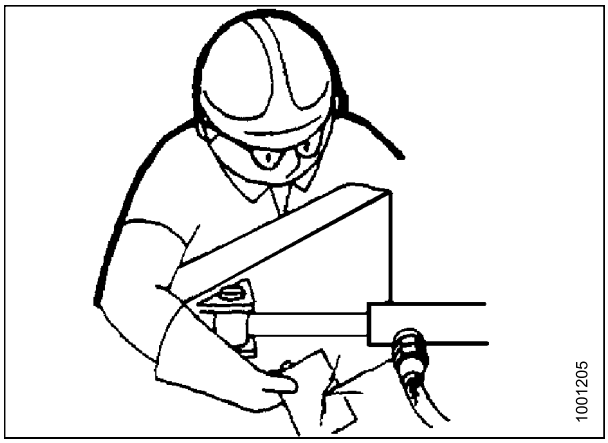


Figure 5.4: Safety Around Equipment

5.5.2 Hydraulic Schematics

For detailed hydraulic schematics, refer to *3.8 Header Schematics, page 38*.

5.6 Feed Draper

5.6.1 Adjusting Feed Draper Tension

DANGER

To avoid bodily injury or death from unexpected start-up or fall of raised machine, always stop engine, remove key, and engage safety props before going under header for any reason. Refer to your windrower operator's manual for instructions for use and storage of safety props.

DANGER

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

Feed draper tension should be just enough to prevent slipping and keep draper from sagging below cutterbar. Set draper tension as follows:

1. Raise header fully, stop engine, and remove key. Engage safety props.
2. Check that draper guide (A) (rubber track on underside of draper) is properly engaged in groove of drive roller (B), and that idler roller (C) is inboard of the draper guide.

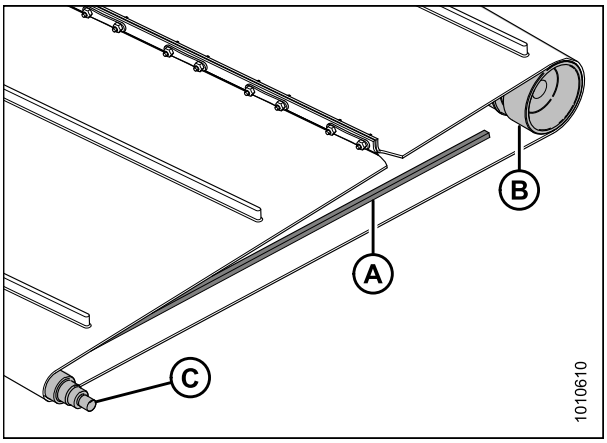


Figure 5.5: Draper Guide

3. Loosen jam nut (A).
4. Hold nut (B) with a wrench and turn bolt (C) clockwise to increase tension and counterclockwise to decrease tension.
5. Correct tension is when retainer (D) is flush with spring holder, and bolt (E) is free.
6. Tighten jam nut (A).
7. Perform equal adjustment on both sides of draper.

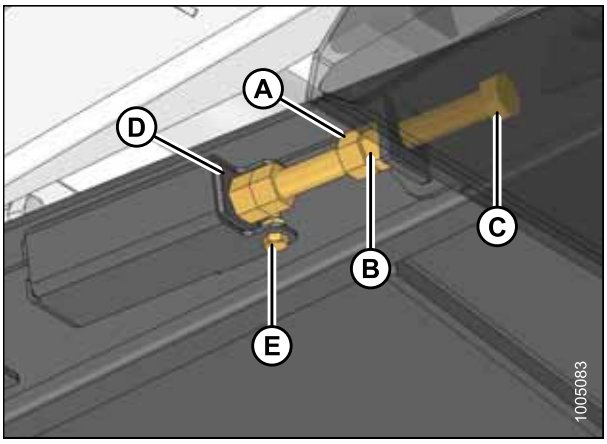


Figure 5.6: Tension Adjustment Hardware

5.7 Drive Belt

5.7.1 Adjusting Drive Belt Tension

1. Remove wing nut and washer (A) and remove drive cover (B).

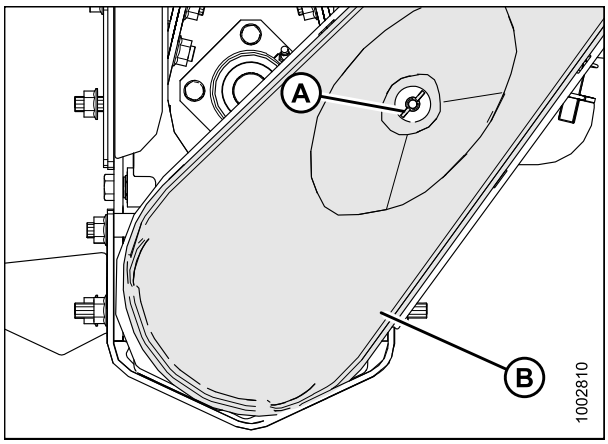


Figure 5.7: Drive Belt Cover

2. Belt (A) should deflect 7.9 mm (5/16 in.) when a force of 22–49 N (5–11 lbf) is applied at the center of the span.

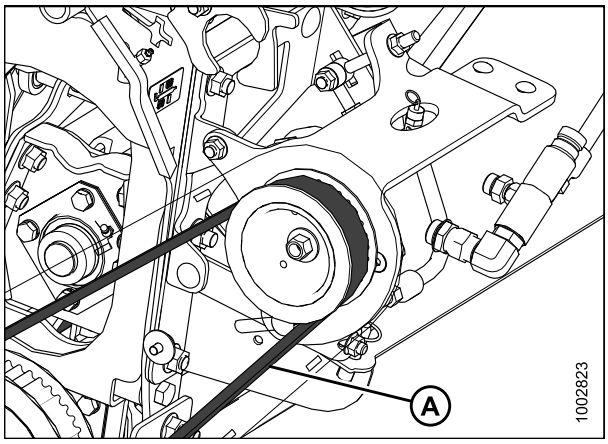


Figure 5.8: Drive Pulley

3. Loosen three motor mount bolts (A).
4. Turn tensioning nut (B) clockwise to tighten belt and counterclockwise to loosen.
5. Tighten the three motor mount bolts (A).
6. Recheck the belt (C) tension.

   NOTE:

   If drive pulley is loose, was removed, or replaced for any reason, torque nut (D) to 64–77 Nm (47–57 lbf·ft).

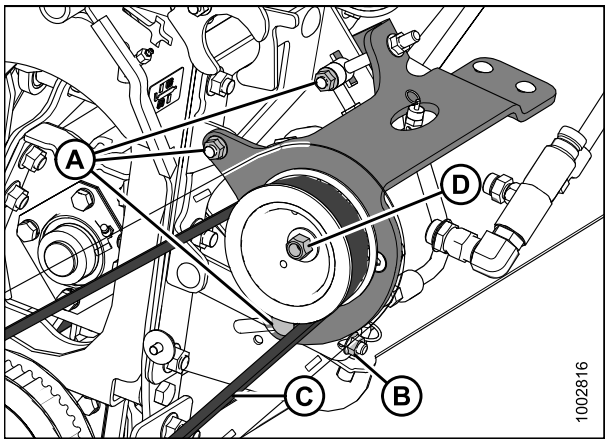


Figure 5.9: Drive Pulley

7. Replace cover (B) and secure with washer and wing nut (A).
8. Readjust tension of a new belt after a short run-in period (about 5 hours).

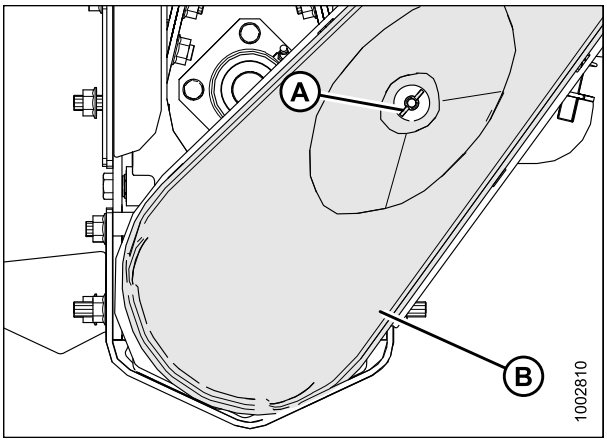


Figure 5.10: Drive Belt Cover

5.7.2 Adjusting Drive Belt Pulley Alignment

Pulleys should be aligned so that the belt tracks properly. If necessary, adjust as follows:

1. Remove wing nut (A) and washer and remove drive cover (B).

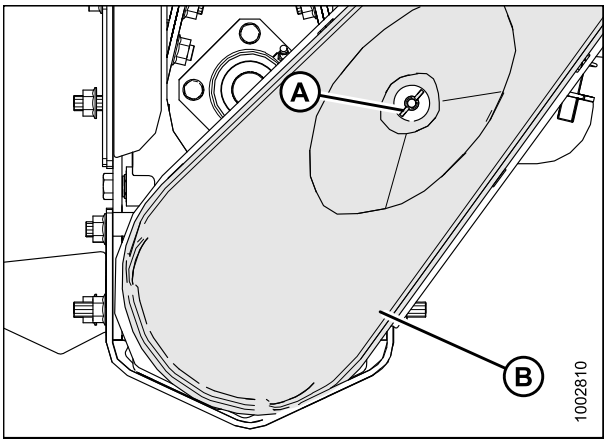


Figure 5.11: Drive Belt Cover

2. Loosen nut (A).
3. Adjust nuts (B) to align the drive pulley horizontally.
4. Adjust nuts (C) to align the drive pulley vertically.

   NOTE:

   If drive pulley is loose, was removed, or replaced for any reason, torque nut (D) to 64–77 Nm (47–57 lbf·ft).
5. Tighten nut (A).

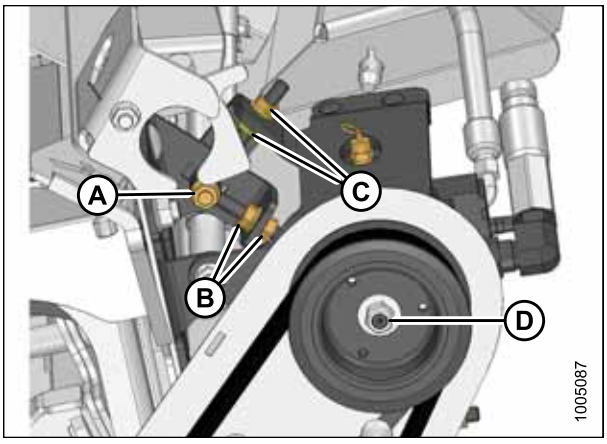


Figure 5.12: Drive Pulley

6. Replace cover (B) and secure with washer and wing nut (A).

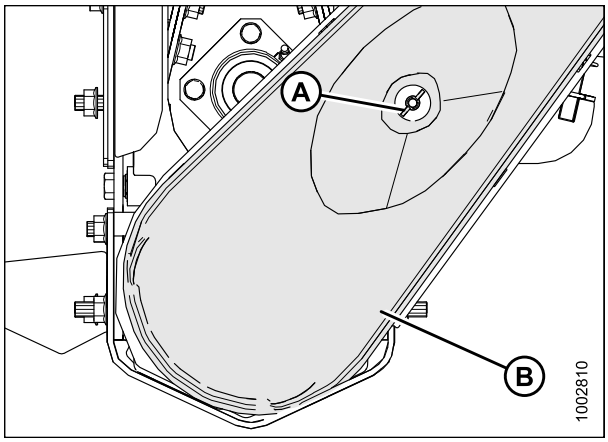


Figure 5.13: Drive Belt Cover

5.7.3 Checking and Adjusting Drive Belt Tracking

Proper tracking of the belt ensures there is no rubbing of the belt on either pulley.

1. Remove wing nut (A) and washer and remove drive cover (B).

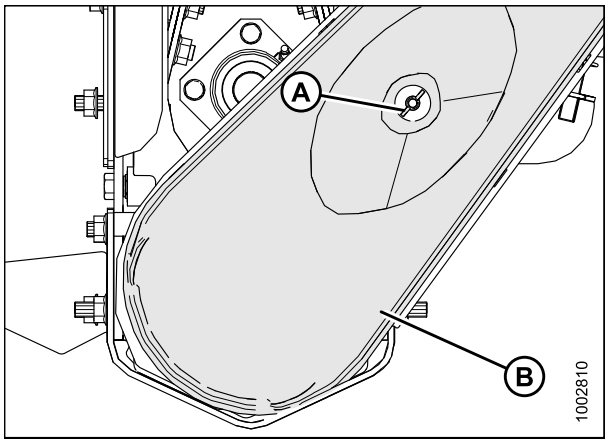


Figure 5.14: Drive Belt Cover

2. Check the belt and both pulleys (A) for evidence of belt rubbing.

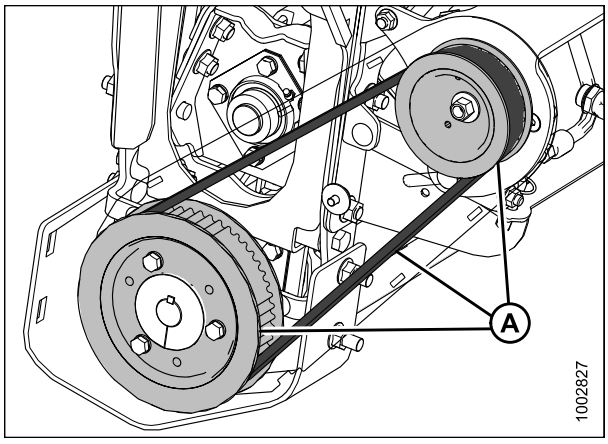


Figure 5.15: Drive Belt and Pulleys

3. Place a straight edge (A) across the face of the driving and driven pulleys. Check that the pulleys are aligned.

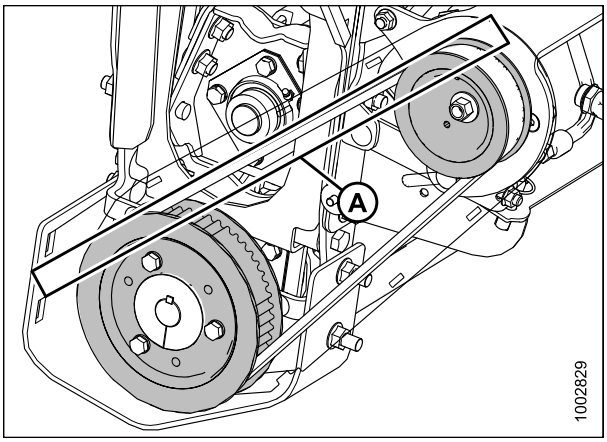


Figure 5.16: Drive Belt and Pulleys

4. Adjust the driving pulley by loosening nut (A).
5. Adjust nuts (B) to align the drive pulley horizontally. If belt is tracking to the outside of the pulley, turn jam nuts (B) clockwise.
6. Adjust nuts (C) to align the drive pulley vertically. If belt is tracking to the inside of the pulley, turn jam nuts (C) counterclockwise.

   NOTE:

   If drive pulley is loose, was removed, or replaced for any reason, torque nut (D) to 64–77 Nm (47–57 lbf·ft).
7. Tighten nut (A).

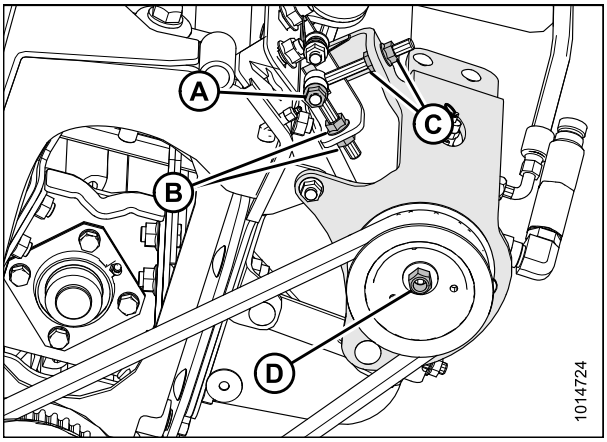


Figure 5.17: Drive Pulley

8. Run the conditioner to verify the belt is now tracking correctly.
9. Replace cover (B) and secure with washer and wing nut (A).

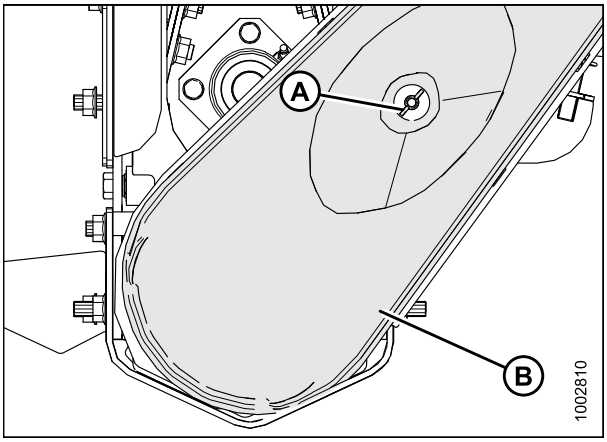


Figure 5.18: Drive Belt Cover

5.7.4 Removing Drive Belt

1. On the left side, remove the wing nut and washer (A), and then remove drive cover (B).

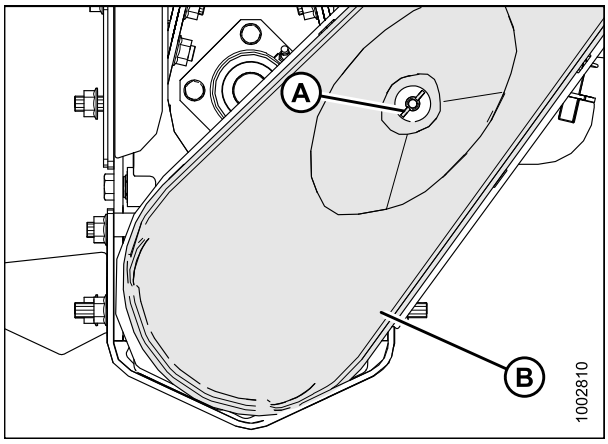


Figure 5.19: Drive Belt Cover

2. Loosen three motor mount bolts (A).
3. Turn tensioning nut (B) counterclockwise to loosen.
4. Remove the belt (C).

   NOTE:

   If drive pulley is loose, was removed, or replaced for any reason, torque nut (D) to 64–77 Nm (47–57 lbf·ft).

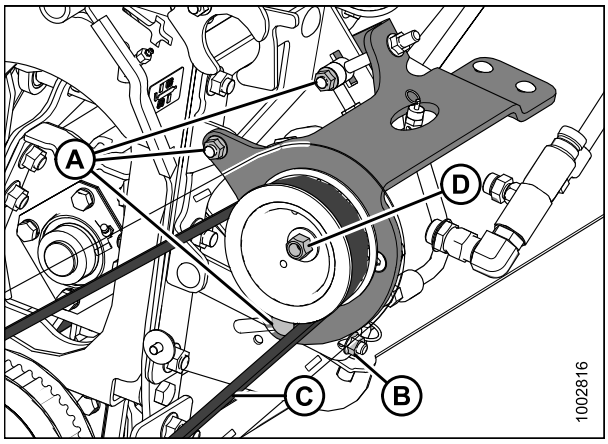


Figure 5.20: Motor Mount

5.7.5 Installing Drive Belt

NOTE:

Refer to *5.7.3 Checking and Adjusting Drive Belt Tracking, page 88* before installing a new belt to check possible cause of failure.

1. Install belt (A) onto pulleys.

   NOTE:

   When installing new belt, never pry belt over pulley. Be sure adjusting device is fully loosened, then tension belt.

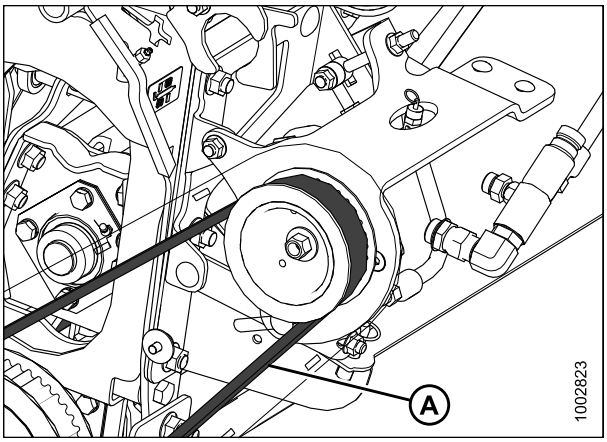


Figure 5.21: Drive Pulley

2. Loosen three motor mount bolts (A).
3. Turn tensioning nut (B) clockwise to tighten belt and counterclockwise to loosen.
4. Tighten the three motor mount bolts (A).
5. Recheck the belt (C) tension.

   NOTE:

   If drive pulley is loose, was removed, or replaced for any reason, torque nut (D) to 64–77 Nm (47–57 lbf·ft).

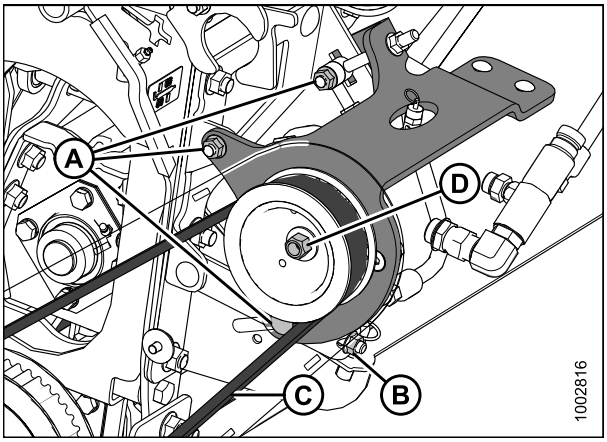


Figure 5.22: Drive Pulley

6. Replace cover (B) and secure with washer and wing nut (A).
7. Readjust tension of a new belt after a short run-in period (about 5 hours).

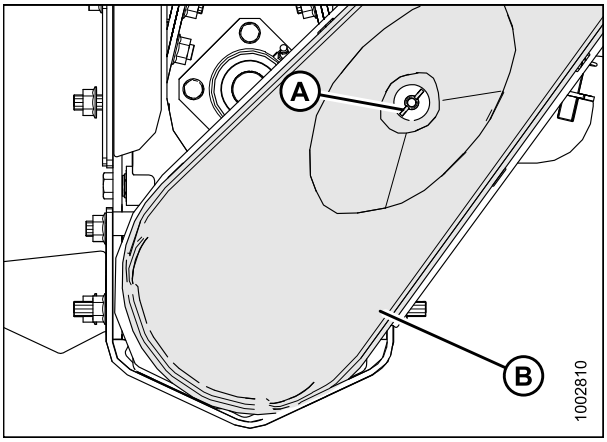


Figure 5.23: Drive Belt Cover

5.8 Maintenance Schedule

The following maintenance schedule is a listing of periodic maintenance procedures, organized by service intervals. Regular maintenance is the best insurance against early wear and untimely breakdowns. Following this schedule will increase machine life. For detailed instructions, refer to the specific headings in this manual. Use the lubricant specified in *5.4.1 Lubricants, page 82*.

Service Intervals: The recommended service intervals are in hours of operation. Where a service interval is given in more than one time frame, e.g., "100 hours or Annually", service the machine at whichever interval is reached first.

IMPORTANT:

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

CAUTION

Carefully follow safety messages given under *5.1 Preparation for Servicing, page 79* and *5.2 Recommended Safety Procedures, page 80*.

Table 5.1 Service Intervals

Interval	Service
First use	Refer to *4.6 Break-in Period, page 69*.
10 hours or daily	Check hydraulic hoses and lines.
50 hours	Grease roll shaft bearings. Grease feed deck drive and idler roller bearings.
100 hours or annually[4]	Check roll drive belt tension.
End of season	Refer to *4.10 Storing the Hay Conditioner, page 78*.

4. It is recommended that annual maintenance be done prior to the start of the operating season.

Table 5.2 Maintenance Record

	Action:	✓ – Check										♦ – Lubricate										
	Hour Meter Reading																					
	Date																					
	Serviced By																					
	First Use	Refer to *4.6 Break-in Period, page 69* for checklist.																				
	10 Hours or Daily																					
✓	Hydraulic Hoses and Lines	**NOTE:** A record of daily maintenance is not normally required, but is at the Owner/Operator's discretion.																				
	50 Hours																					
♦	Roll Shaft Bearings																					
♦	Feed Deck Roller Bearings																					
	100 Hours or Annually																					
✓	Roll Drive Belt Tension																					

5.9 Troubleshooting

Symptom	Problem	Solution	Section
Hay conditioner rolls will not turn	There is an obstruction or wad in the conditioner rolls	Turn mechanism in reverse and remove wad	*4.9.6 Unplugging the Conditioner, page 77*
Hay conditioner rolls will not turn	Drive belt is broken	Replace drive belt	*5.7.4 Removing Drive Belt, page 90* and *5.7.5 Installing Drive Belt, page 90*
Hay conditioner rolls will not turn	Drive belt is too loose	Tighten or replace conditioner drive belt	*5.7.4 Removing Drive Belt, page 90* and *5.7.5 Installing Drive Belt, page 90*
Crop is over-conditioned	Roll gap is too small	Increase roll gap	*4.9.2 Adjusting Roll Gap, page 72*
Crop is over-conditioned	Roll timing is off	Adjust roll timing	*4.9.3 Checking and Adjusting Roll Timing, page 73*
Crop is under-conditioned	Roll gap is too large	Reduce roll gap	*4.9.2 Adjusting Roll Gap, page 72*
Crop is under-conditioned	Roll timing is off	Adjust roll timing	*4.9.3 Checking and Adjusting Roll Timing, page 73*
Windrow is too wide	Forming shield side deflectors are too far apart	Position deflectors closer together	*Adjusting Side Deflectors, page 76*
Windrow is too narrow	Forming shield side deflectors are too close together	Position deflectors farther apart	*Adjusting Side Deflectors, page 76*
Windrow is too narrow	Deflector fins inside forming shield are improperly adjusted	Adjust fins	*Adjusting Deflector Fins, page 77*
Windrow is uneven	Forming shield is too low	Raise forming shield	*Adjusting Forming Shield Height, page 75*
Windrow is uneven	Deflector fins inside forming shield are improperly adjusted	Adjust fins	*Adjusting Deflector Fins, page 77*
Windrow is uneven	Overlap of side drapers and feed deck is inadequate	Adjust overlap	*3.5 Installing the Feed Deck, page 23*
Windrow lacks shape	Forming shield is too high	Lower forming shield	*Adjusting Forming Shield Height, page 75*

Symptom	Problem	Solution	Section
Windrow lacks shape	Deflector fins inside forming shield are improperly adjusted	Adjust fins	*Adjusting Deflector Fins, page 77*
Feed draper is not tracking properly	Feed draper tensioners are improperly adjusted	Check feed draper tension and adjust accordingly	*5.6.1 Adjusting Feed Draper Tension, page 85*
Side draper is backfeeding	Overlap of side drapers and feed deck is inadequate	Adjust overlap	*3.5 Installing the Feed Deck, page 23*

6 Repair Parts

This chapter lists all the replacement parts that can be ordered for a MacDon HC10 Hay Conditioner.

Bold text is used to indicate updates made at the current revision level. With each new revision of the manual, previous revisions are returned to regular text.

In this manual, right and left are determined from the operator's position, facing forward with the windrower in cab-forward position. An arrow is sometimes used in illustrations to indicate cab-forward position.

6.1 Abbreviations

The following abbreviations are used in this manual.

A/R – as required (quantity varies)
C/W – complete with
CSK – countersink
DK – double knife
DT – distorted thread
FLG – flange
I.D. – inside diameter
LH – left hand (Determined from operator's position, facing forward.)
NC – national coarse thread
NF – national fine thread
NSS – not serviced separately
O.D. – outside diameter
OPT – optional
REF – reference, part number called up elsewhere in manual
RH – right hand
RHSN – round head, square neck or square neck carriage bolt
RHSSN – round head, short, square neck
SMV – slow moving vehicle
SP – self-propelled header
PT – pull-type header

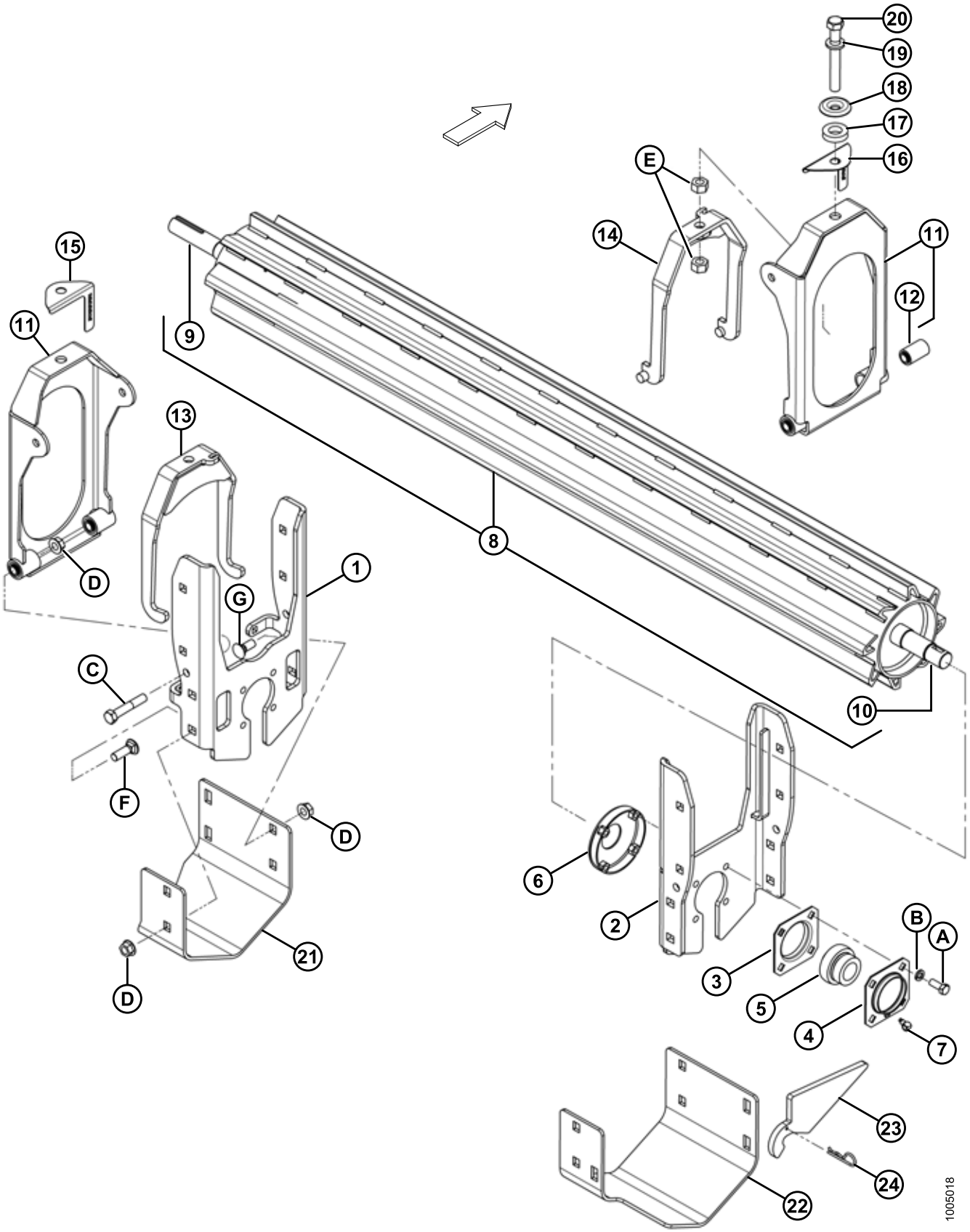
6.1.1 Serial Number Breaks

The side of the serial number on which the dash (–) appears determines whether the part is used "up to" or "after" the serial number given.

Example:

- –162249 Used on machines up to and including serial number 166249.
- 166250– Used on machines including and after serial number 166250.

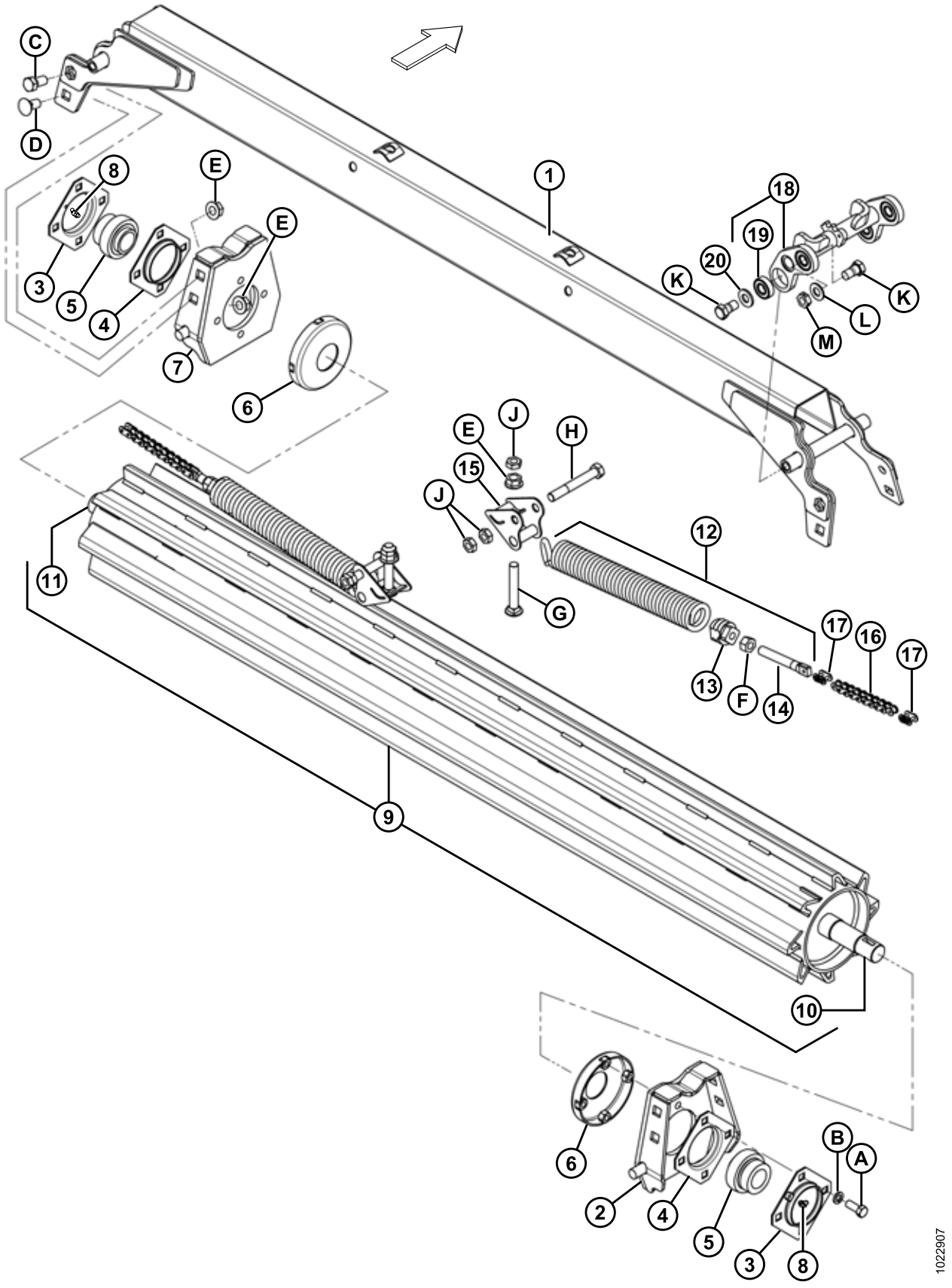
6.2 Lower Roll and Frame Assembly



Ref	Part Number	Description	Qty	Serial Number
1	159117	SUPPORT – LH	1	
2	159118	FRAME – RH LOWER WELDT	1	
3	30576	FLANGE	2	
4	50182	FLANGE	2	
5	30031	BEARING – SPH OD C/W COLLAR 1.5 IN BORE	2	
6	101173	DISC WELDT	2	
7	50187	FITTING – LUBE 90° ADAPTER [5]	2	
8	130445	ROLL – LOWER WELDT	1	
9	130704	SHAFT SPINDLE – LH LOWER ROLL (WELDED)	1	
10	130449	SHAFT SPINDLE – RH LOWER ROLL (WELDED)	1	
11	130476	CHANNEL – PIVOT C/W BUSHINGS	2	
12	13626	BUSHING – RUBBER	4	
13	130443	BRACKET – LH ADJUSTER WELDT	1	
14	130336	BRACKET – RH ADJUSTER WELDT	1	
15	130990	GAUGE – LH ROLL OPENING	1	
16	130994	GAUGE – RH ROLL OPENING	1	
17	47124	WASHER – RUBBER	2	
18	130532	WASHER – FORMED	2	
19	21540	WASHER – HARDENED	2	
20	135405	BOLT – HEXHD (MIN THD) 3/4 NC X 6.0 LG GR 5 ZP	2	
21	159404	SKID – LH CONDITIONER	1	
22	159405	SKID – RH CONDITIONER	1	
23	159352	SUPPORT	1	
24	13125	PIN – HAIR	1	
A	21491	BOLT – HEXHD 1/2 NC X 1.25 LG GR 5 ZP		
B	18638	WASHER – REG. LOCK 1/2 IN. NOM. I.D. ZP		
C	21406	BOLT – HEXHD 5/8 NC X 3.5 GR 5 ZP		
D	50225	NUT – FLANGE DT SMOOTH FACE .625-11 UNC		
E	18593	NUT – HEX 3/4-10 UNC GR 5 ZP		
F	18524	BOLT – RHSN, 5/8 NC X 2.0 LG GR 5 ZP		
G	18523	BOLT – RHSN, 5/8 NC X 1.5 LG GR 5 ZP		

5. Refer to Section *6.4 Cover and Supports, page 102*, for lube lines.

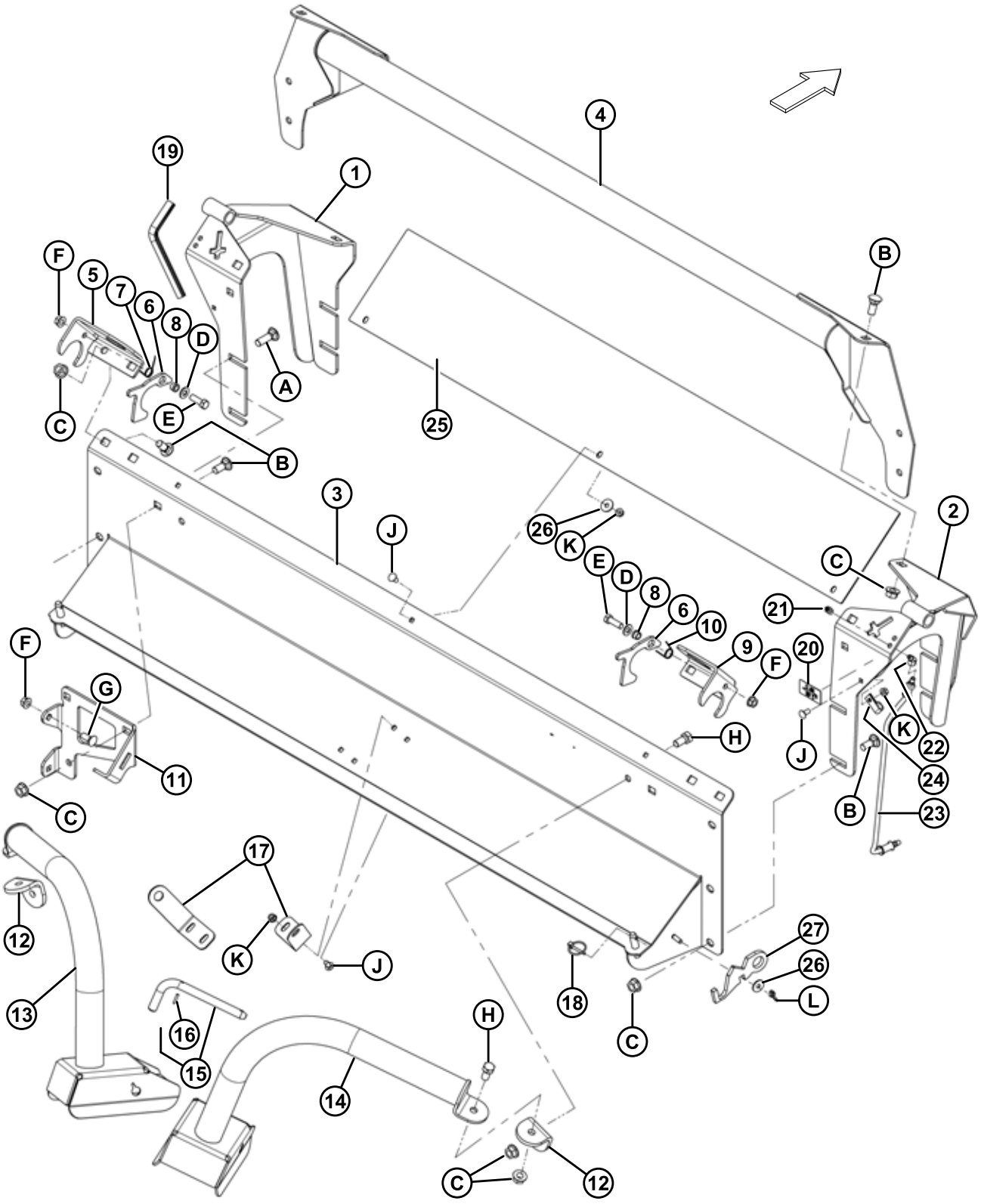
6.3 Upper Roll Assembly



Ref	Part Number	Description	Qty	Serial Number
1	130470	CHANNEL – CROSS WELDT	1	
2	130793	SUPPORT – RH WELDT	1	
3	50182	FLANGE	2	
4	30576	FLANGE	2	
5	30031	BEARING – SPH OD C/W COLLAR 1.5 IN. BORE	2	
6	101173	DISC WELDT	2	
7	130472	SUPPORT – LH WELDT	1	
8	21301	FITTING – LUBRICATION	2	
9	159187	ROLL – UPPER WELDMENT	1	
10	130449	SPINDLE – RH (WELDED)	1	
11	170332	SHAFT – STUB, LH (WELDED)	1	
12	**130644**	**ASSEMBLY – SPRING**[6]	**2**	
13	NSS	INSERT – MACHINED	2	
14	130527	STUD – THREADED	2	
15	130747	LEVER WELDT	2	
16	130645	CHAIN – #50 WO CONN (9 PITCHES)	2	
17	6634	LINK – CONNECTOR #50	4	
18	130450	TOGGLE ASSEMBLY C/W BEARINGS	2	
19	50185	BEARING – BALL CYL OD 17MM BORE	8	
20	30441	WASHER – HARDENED	4	
A	21491	BOLT – HEXHD 1/2 NC X 1.25 LG GR 5 ZP		
B	18638	WASHER – REG. LOCK 1/2 IN. NOM. I.D. ZP		
C	21585	BOLT – HEXHD 5/8 NC X 1.25 LG GR 5 ZP		
D	103562	BOLT – RHSN 5/8 NC X 1.25 GR 5 ZP		
E	50225	NUT – FLG DT SMTH FACE .625-11 UNC		
F	18592	NUT – HEX 5/8-11 UNC GR 5 ZP		
G	102658	BOLT – RHSN 5/8 NC X 4 TFL GR 5 ZP		
H	21720	BOLT – HEXHD 5/8 NC X 4.5 LG GR5 ZP		
J	21941	NUT – HEX LOCK JAM (DT) 5/8-11 UNC GR 5 ZP		
K	105141	BOLT – LOCKING SHOULDER		
L	18600	WASHER – SAE FLAT, 21/32 I.D. X 1-5/16 O.D. ZP		
M	105173	NUT – HEX JAM, CENTER LOCK		

6. Includes spring and machined insert.

6.4 Cover and Supports

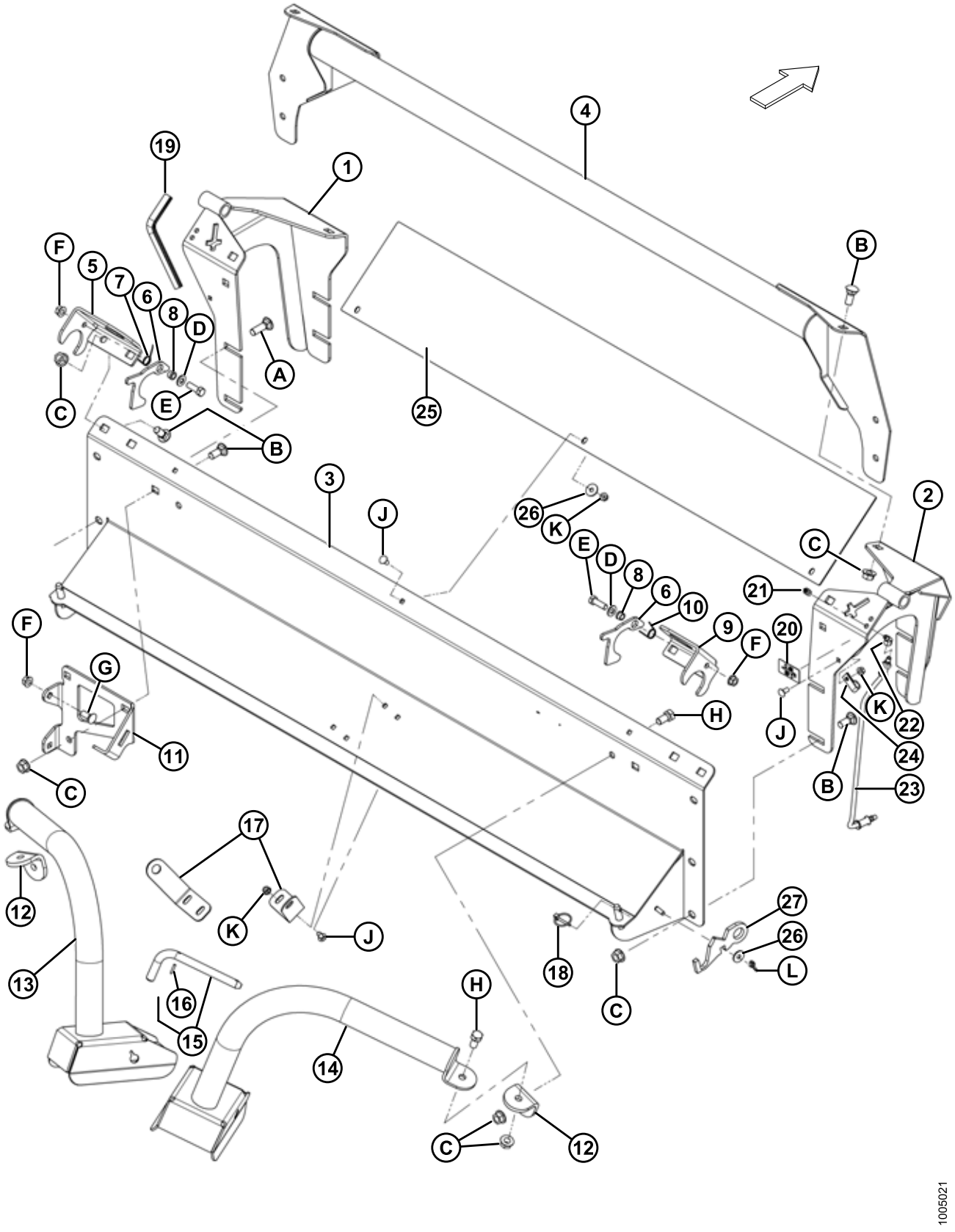


Ref	Part Number	Description	Qty	Serial Number
1	159231	SUPPORT WELDT – LH	1	
2	159582	SUPPORT WELDT – RH	1	
3	159200	COVER – TOP REAR WELDT	1	
4	130496	TUBE – CROSS WELDT	1	
5	159003	LATCH – WELDT, LH	1	
6	159001	LATCH	2	
7	159020	SPRING – TORSION	1	
8	159005	SPACER – 3/4 IN. O.D. X .120 WALL X 12 LONG [7]	2	
9	159007	LATCH – WELDT, RH	1	
10	144505	SPRING – TORSION	1	
11	130757	SUPPORT – HYD MOTOR	1	
12	130858	ANGLE	2	
13	159329	SUPPORT – WELDT, LIFT ARM, LH	1	
14	159333	SUPPORT – WELDT, LIFT ARM, RH	1	
15	144415	ASSY – L-PIN [8]	2	
16	16010	PIN – SPRING 3/16 DIA X 1.0 LG	2	
17	159002	ANGLE	2	
18	102264	PIN – LYNCH 3/16 X 1-9/16 IN.	2	
19	110737	MOULDING – FRAME (UNIGRIP)	1	
20	23165	DECAL – 50 HR LUBE	2	
21	50188	FITTING – LUBRICATION 1/8 NPT FEMALE	2	
22	115677	FITTING – ELBOW 45° HYD	2	
23	159583	HOSE – GREASE, 1/8 IN. NPT	2	
24	135232	CLAMP – DOUBLE HOSE INSULATED	2	
25	**187723**	**COVER**	1	
26	19685	WASHER – FLAT	4	
27	150572	PLATE – ROLL TIMING GAUGE	1	

NOTE:

For hardware, refer to next page.

7. Stepped.
8. Includes spring pin (MD #16010).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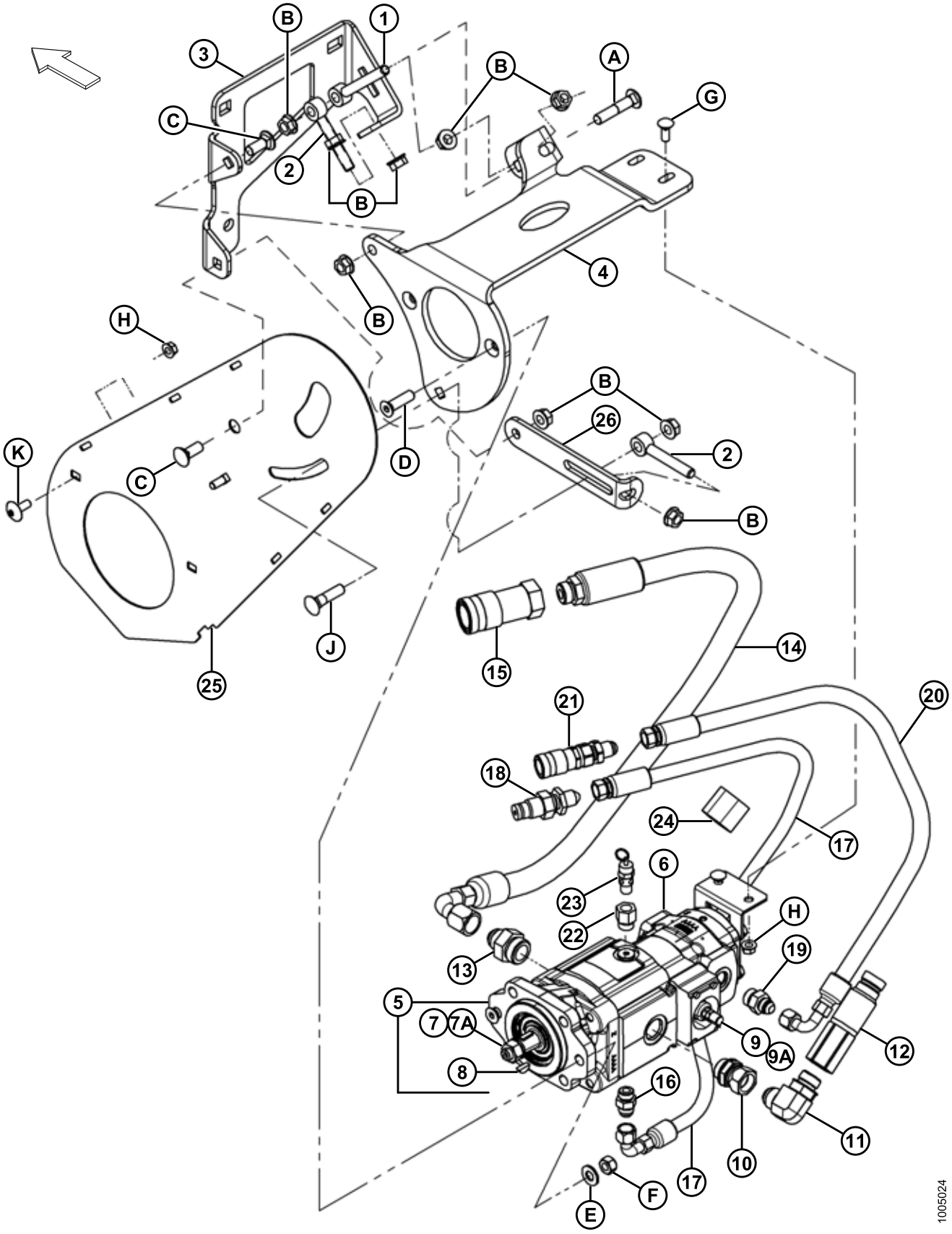
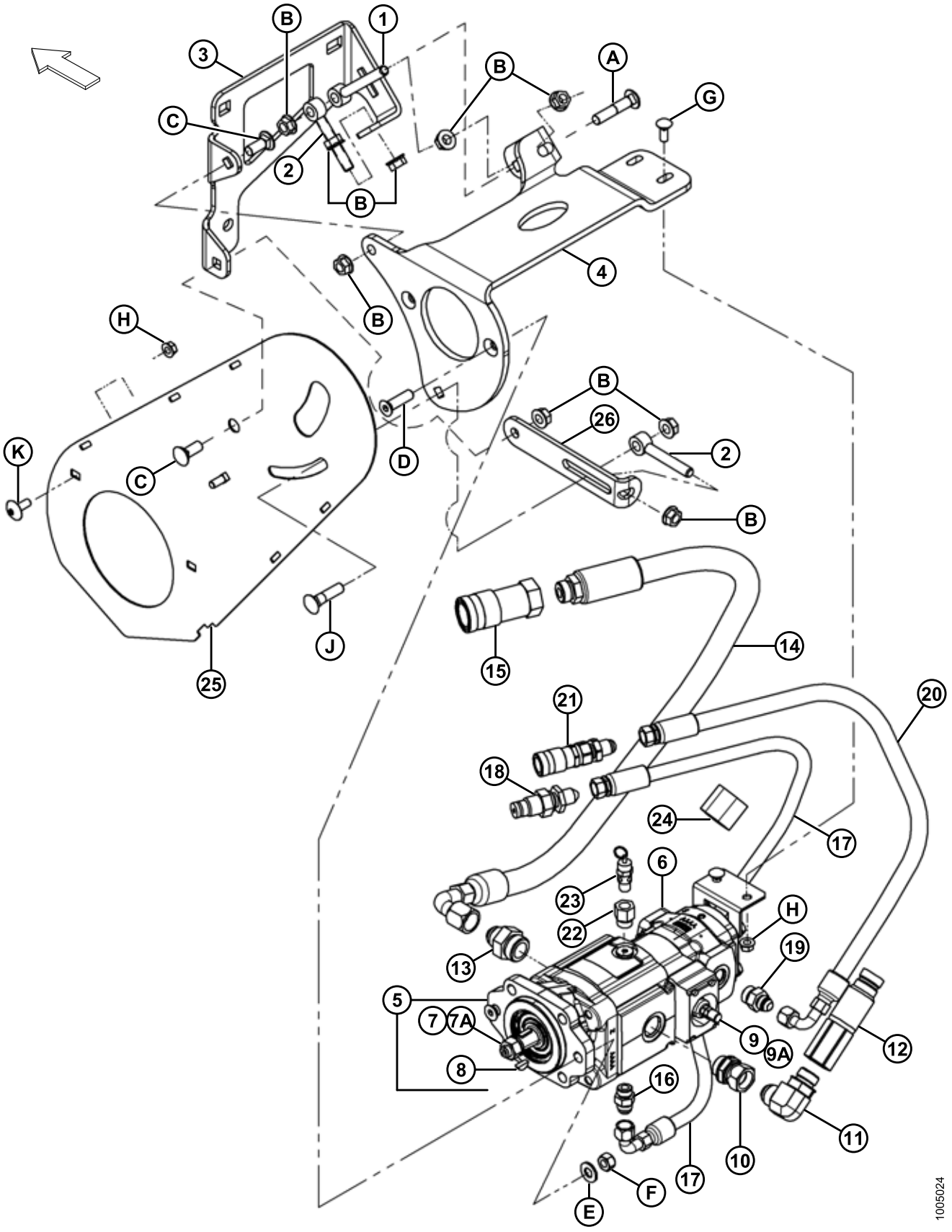
Ref	Part Number	Description	Qty	Serial Number
A	18524	BOLT – RHSN 5/8 NC X 2.0 LG GR 5 ZP		
B	18523	BOLT – RHSN 5/8 NC X 1.5 GR 5 ZP		
C	50225	NUT – FLG DT SMTH FACE .625-11 UNC		
D	18599	WASHER – SAE FLAT 17/32 I.D. X 1-1/16 IN. O.D. ZP		
E	18723	BOLT – HEX HD 1/2 NC X 1.5 LG TFL GR 5 ZP		
F	50186	NUT – FLG LK SMTH FACE DT .500-13 UNC GR 5		
G	21471	BOLT – RHSN 1/2 NC X 1.25 GR 5 ZP		
H	21585	BOLT – HEX HD 5/8 NC X 1.25 LG GR5 ZP		
J	21863	BOLT – RHSSN 3/8 NC X 0.75 LG GR 5 ZP		
K	30228	NUT – FLG DT SMTH FACE .375-16 UNC		
L	21289	NUT – WING TYPE A 3/8 NC ZP		

6.5 Hydraulic Motor, Mounts, and Tensioner



Ref	Part Number	Description	Qty	Serial Number
1	159452	BOLT WELDT – EYE	1	
2	130765	BOLT WELDT – EYE	2	
3	130757	SUPPORT – HYD MOTOR	1	
4	133965	SUPPORT – CASSAPA MOTOR	1	
5	159648	MOTOR – HYD FLOW DIVIDER [9]	1	
	159631	SEAL KIT (FOR MOTOR)		
	159692	**KIT – SHAFT REPAIR (FOR MOTOR)**		
6	159645	MOTOR – HYD, GEAR (CAST IRON BODY) [10]		
	159649	MOTOR – HYD, GEAR (ALUMINUM BODY) [11]		
7	REF	NUT – HEX LOCK DT 5/8-18 UNF ZP [12]	1	
7A	REF	WASHER – SAE FLAT 5/8 I.D. X 1-15/32 IN. O.D. ZP [12]	1	
8	159535	KEY – WOODRUFF (1/4 X 3/4 NOM.)	1	
9	159632	VALVE – RELIEF	1	
9A	159633	NUT – 8MM, M8 SPECIAL	1	
10	40241	FITTING – ADAPTER HYD C/W O-RING	1	
11	30970	FITTING – ELBOW 90° HYD	1	
12	135314	COUPLER – MALE HYD 3/4 IN. FLAT FACE	1	
	135479	SEAL KIT – 3/4 MALE COUPLER		
13	135483	FITTING – ADAPTER HYD	1	
14	159029	HOSE	1	
15	135565	COUPLER – FEMALE HYD 3/4 IN. FLAT FACE	1	
	111977	SEAL KIT – 3/4 FEMALE COUPLER		
16	21030	FITTING – CONNECTOR HYD, SAE 8 [13]	1	
17	159646	HOSE [13]	1	
18	135237	COUPLER – MALE HYD 3/8 IN. FLAT FACE BULKHEAD	1	
	111978	SEAL KIT – 3/8 MALE COUPLER		
19	21881	FITTING – ADAPTER HYD	1	
20	159028	HOSE	1	

9. Includes motor (MD #159645), key (MD #159535), valve (MD #159632), and special nut (MD #159633).
10. Preferred motor.
11. Use only if motor (MD #159645) is unavailable.
12. Nut and washer supplied on end shaft of motor (MD #159648) used only to protect threads during shipping. For service parts, order nut (MD #18714) and washer (MD #1624). For installation position, refer to Section *6.6 Belt Drive and Shield, page 110*.
13. Order fitting (MD #21030) and hose (MD #159646) together to ensure thread match.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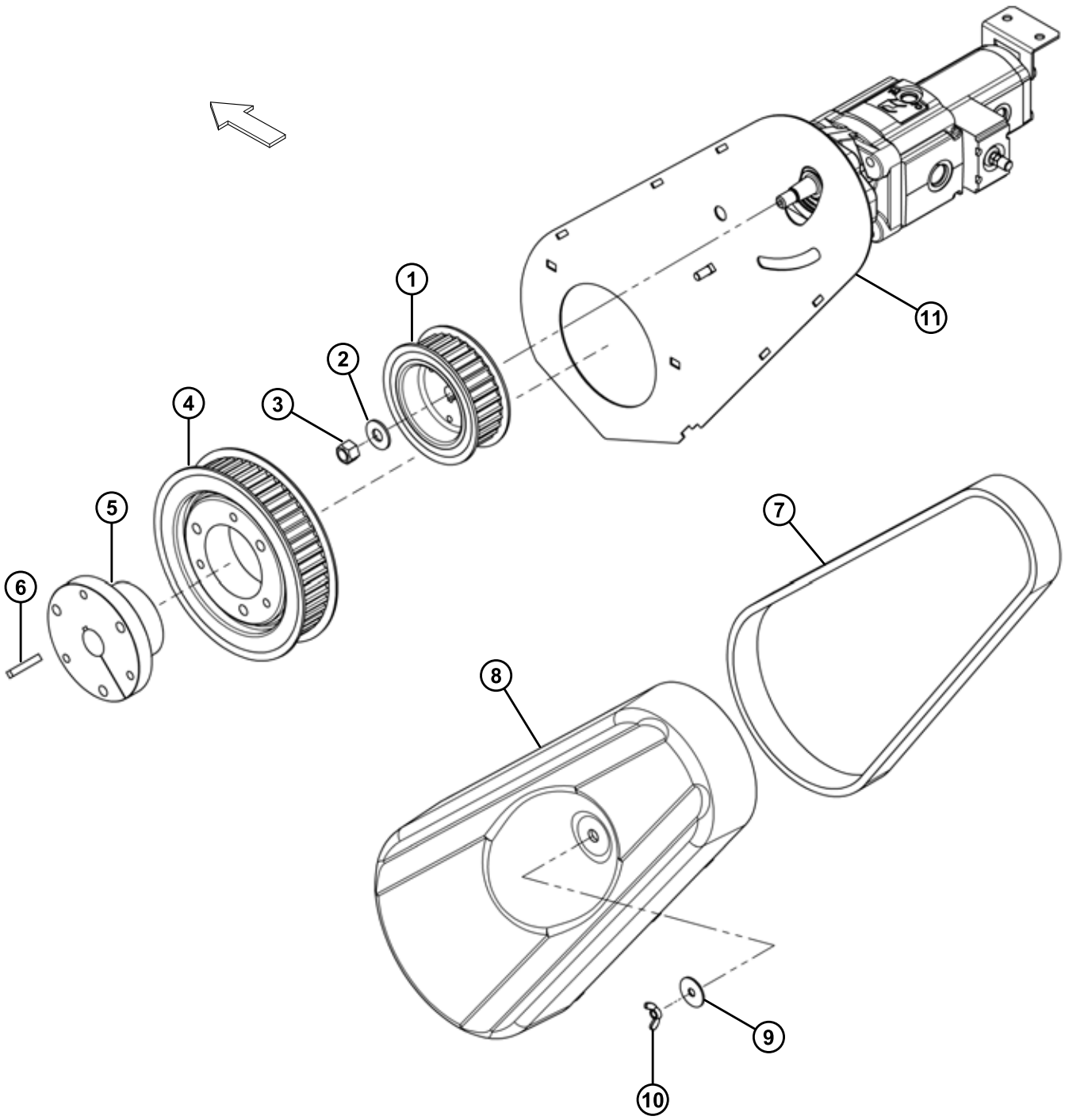
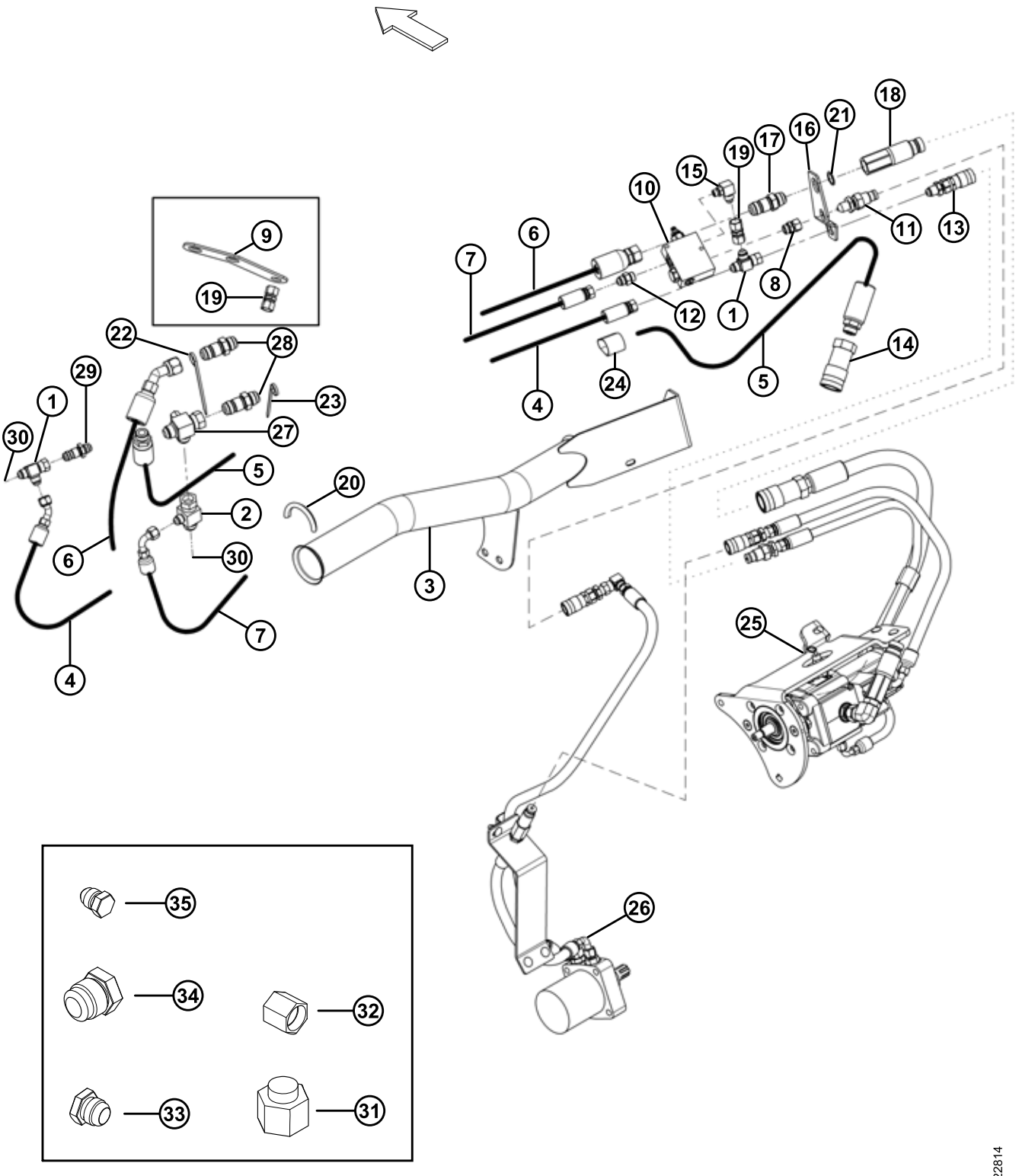
Ref	Part Number	Description	Qty	Serial Number
21	135213	COUPLER – FEMALE HYD 3/8 FLAT FACE BULKHEAD	1	
	135481	SEAL KIT – 3/8 FEMALE COUPLER		
22	159419	FITTING – ADAPTER HYD C/W O-RING	1	
23	159635	VALVE – RELIEF	1	
24	135444	FASTENER – CINCH STRAP 6 IN. LG	2	
25	159541	SHIELD WELD'T	1	
26	159634	BAR – TENSIONER	1	
A	21489	BOLT – RHSN 1/2 NC X 2.5 LG GR 5 ZP		
B	50186	NUT – FLG LK SMTH FACE DT .500-13 UNC GR 5		
C	21471	BOLT – RHSN 1/2 NC X 1.25 GR 5 ZP		
D	137503	BOLT – CSK SOCK. 1/2 NC X 1.75 GR. 5 ZP		
E	18599	WASHER – SAE FLAT 17/32 I.D. X 1-1/16 IN. O.D. ZP		
F	18697	NUT – HEX LOCK DT .500-13 UNC		
G	19965	BOLT – RHSN 3/8 NC X 1.0 GR 5 ZP		
H	30228	NUT – FLG DT SMTH FACE .375-16 UNC		
J	21474	BOLT – RHSN 1/2 NC X 2.0 LG GR 5 ZP		
K	135507	SCREW – MACHINE, TRUSS HD TORX, 38 NC X 1 LG		

6.6 Belt Drive and Shield



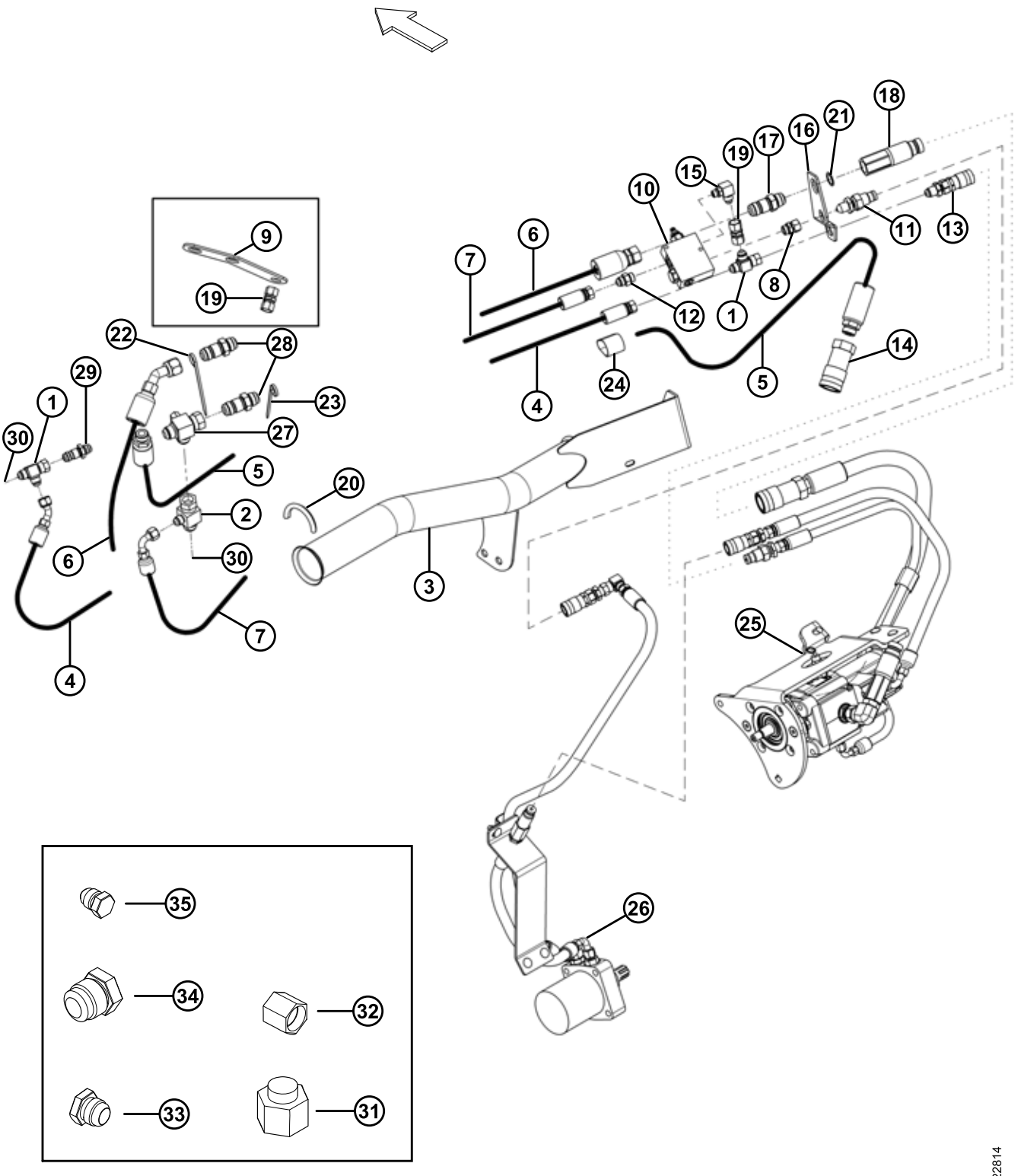
Ref	Part Number	Description	Qty	Serial Number
1	159430	SPROCKET – P32-14M-40	1	
2	1624	WASHER – SAE FLAT 5/8 I.D. X 1-15/32 IN. O.D. ZP	1	
3	18714	NUT – HEX LOCK DT 5/8-18 UNF ZP	1	
4	159215	SPROCKET – P52 14M 40	1	
5	130880	BUSHING – SPLIT TAPER QD-E-1.375 BORE	1	
6	17194	KEY	1	
7	130706	BELT – HTD 1610-14M-40	1	
8	159168	SHIELD – HT DRIVE	1	
9	14887	WASHER – FLAT	1	
10	21289	NUT – WING TYPE A 3/8 NC ZP	1	
11	REF	Refer to Section *6.5 Hydraulic Motor, Mounts, and Tensioner, page 106*.		

6.7 Hydraulic Completion Package



Ref	Part Number	Description	Qty	Serial Number
1	108268	FITTING – HYD TEE	2	
2	159038	VALVE – CHECK	1	
3	159158	HOLDER – HOSES	1	
4	159032	HOSE – HYDRAULIC, 1/2 IN. I.D.	1	
5	159030	HOSE – HYDRAULIC, 3/4 IN. I.D.	1	
6	120574	HOSE – HYDRAULIC, 3/4 IN. I.D.	1	
7	159159	HOSE – HYDRAULIC, 1/2 IN. I.D.	1	
8	135373	FITTING – ADAPTER HYD	1	
9	159358	SUPPORT – COUPLING (FOR 15 FT. HEADER ONLY)	1	
10	159417	VALVE – PRESSURE REDUCING	1	
11	135237	COUPLER – MALE HYD 3/8 IN. FLAT FACE BULKHEAD	1	
	111978	SEAL KIT – 3/8 MALE		
12	21030	FITTING – CONNECTOR HYD	1	
13	135213	COUPLING – FEMALE HYD 3/8 FLAT FACE BULKHEAD	1	
	135481	SEAL KIT – 3/8 FEMALE		
14	135565	COUPLER – FEMALE HYD 3/4 IN. FLAT FACE	1	
	111977	SEAL KIT – 3/4 FEMALE		
15	21805	FITTING – ELBOW HYD	1	
16	159421	PLATE	1	
17	135372	FTG – 3/4 IN. HYD BULKHEAD 37 DEG. FLAIR UNION	1	
18	135314	COUPLER – MALE HYD 3/4 IN. FLAT FACE	1	
	135479	SEAL KIT – 3/4 MALE		
19	135540	FITTING – FEMALE UNION HYD [14]	1	
20	109791	MOULDING	1	
21	30971	O-RING	1	
22	40704	FASTENER – CABLE TIE (ORANGE)	2	
23	40703	FASTENER – CABLE TIE (BLUE)	1	
24	135444	FASTENER – CINCH STRAP 6 IN. LG	1	
25	REF	Refer to Section *6.5 Hydraulic Motor, Mounts, and Tensioner, page 106*. [15]		
26	REF	Refer to Section *6.10 Feed Deck and Pan, page 120*.		

14. Quantity of two for 15-foot header.
15. Shaft repair kit (MD #159692) can be used to service the motor shaft without needing to replace the complete assembly.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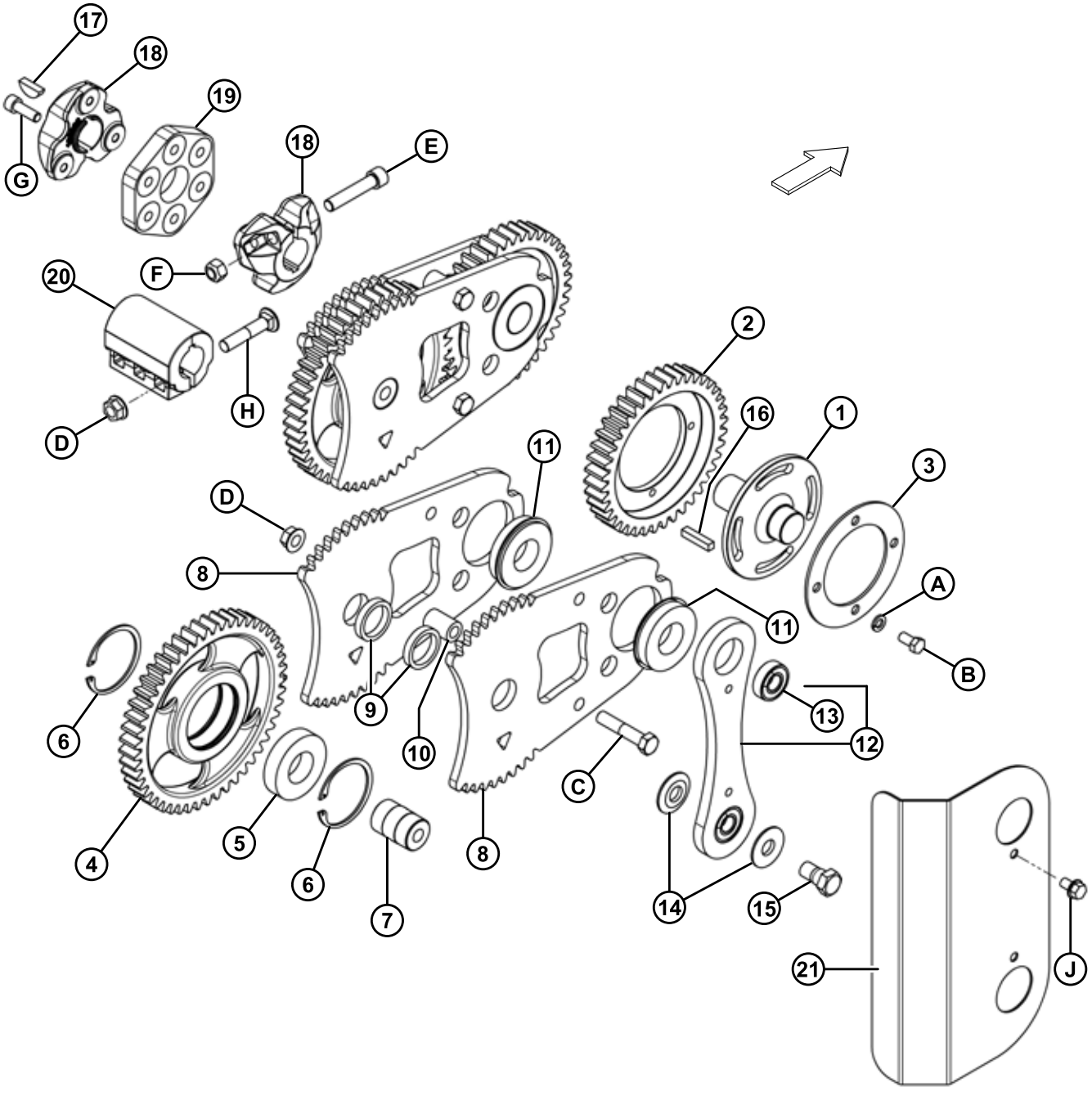
Ref	Part Number	Description	Qty	Serial Number
27	**135245**	FITTING – HYD TEE, SPECIAL [16]	1	
28	REF	FITTING – 3/4 IN. HYD BULKHEAD 37 DEG. FLAIR UNION [16]	2	
29	REF	FITTING – 1/2 IN. UNION HYDRAULIC [16]	1	
30	REF	See note [16]		
31	**30999**	**CAP – 3/4 IN. TUBE (for shipping only)**	**5**	
32	**108233**	**CAP – 1/2 IN. TUBE (for shipping only)**	**1**	
33	**135374**	**PLUG – 1/2 IN TUBE (for shipping only)**	**1**	
34	**103756**	**PLUG – 3/4 IN. TUBE (for shipping only)**	**2**	
35	**50178**	**PLUG – 3/8 IN. TUBE (for shipping only)**	**1**	

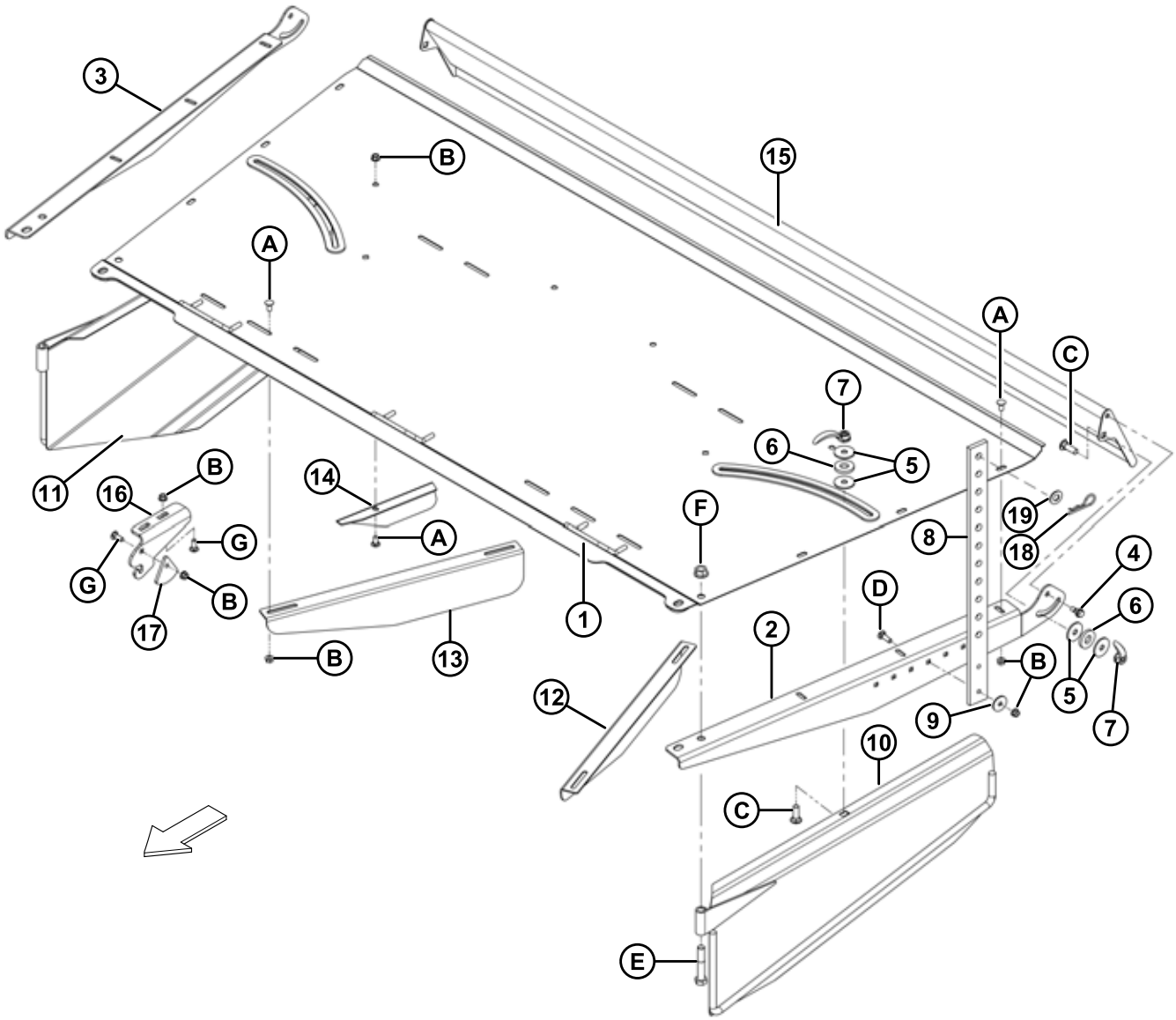
16. Refer to header parts catalog for connecting parts.

6.8 Gears and Roll Coupling Assembly



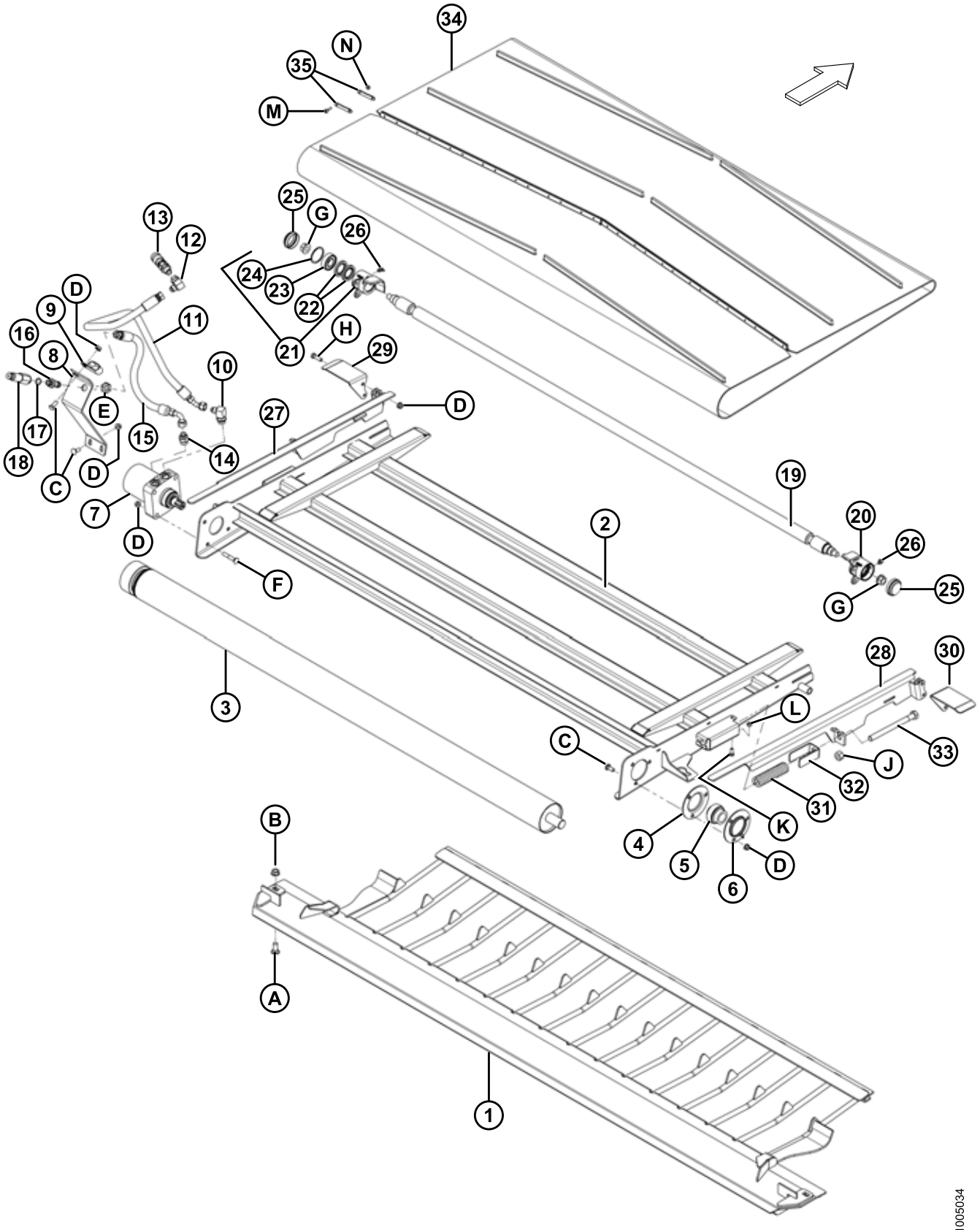
Ref	Part Number	Description	Qty	Serial Number
1	159550	HUB – MACHINING	2	
2	130680	GEAR – 40T	2	
3	129932	DISK	2	
4	130677	GEAR – 49T	2	
5	159474	BEARING – BALL CYL	2	
6	38854	RING – INT RETAINING	4	
7	130687	SHAFT – IDLER	2	
8	130685	PLATE, SIDE HEAT TREATMENT	4	
9	130689	SPACER	4	
10	130694	SPACER	4	
11	159478	BEARING – BALL CYL C3 WITH SNAP RING	4	
12	130691	SUB-ASSEMBLY – LINK	2	
13	50185	BEARING – BALL CYL OD 17 MM BORE	4	
14	130688	WASHER – MACHINED 11/16 I.D. X 1.75 IN. O.D. ZP	8	
15	105141	BOLT – LOCKING SHOULDER	4	
16	26846	KEY – HUB TO COUPLING	2	
17	11142	KEY – WOODRUFF (5/16 X 1-1/8 NOM.)	2	
18	130936	COUPLING-FLEX – MACHINING, UPPER ROLL	2	
19	130736	DISC – FLEX, UPPER ROLL	1	
20	159130	COUPLING – MACHINING, LOWER ROLL	1	
21	159218	COVER	1	
A	18637	WASHER – REG. LOCK 3/8 IN. NOM. I.D. ZP		
B	21567	BOLT – HEX HD .375-16 UNC X 0.75 LG		
C	**21880**	**BOLT – HEX HD 1/2 NC X 2.75 LG GR 5 ZP**		
D	50186	NUT – FLG LK SMTH FACE DT .500-13 UNC GR 5		
E	135403	BOLT – SKT HD 1/2 NC X 2.5 LG		
F	18697	NUT – HEX LOCK DT .500-13 UNC		
G	135401	BOLT – HEX SKT HD M10 X 1.5 X 30 LG ZP		
H	21489	BOLT – RHSN 1/2 NC X 2.5 LG GR 5 ZP		
J	101898	SCREW – HEX WASH HD THD ROLLING 3/8 NC X 5/8		

6.9 Forming Shields



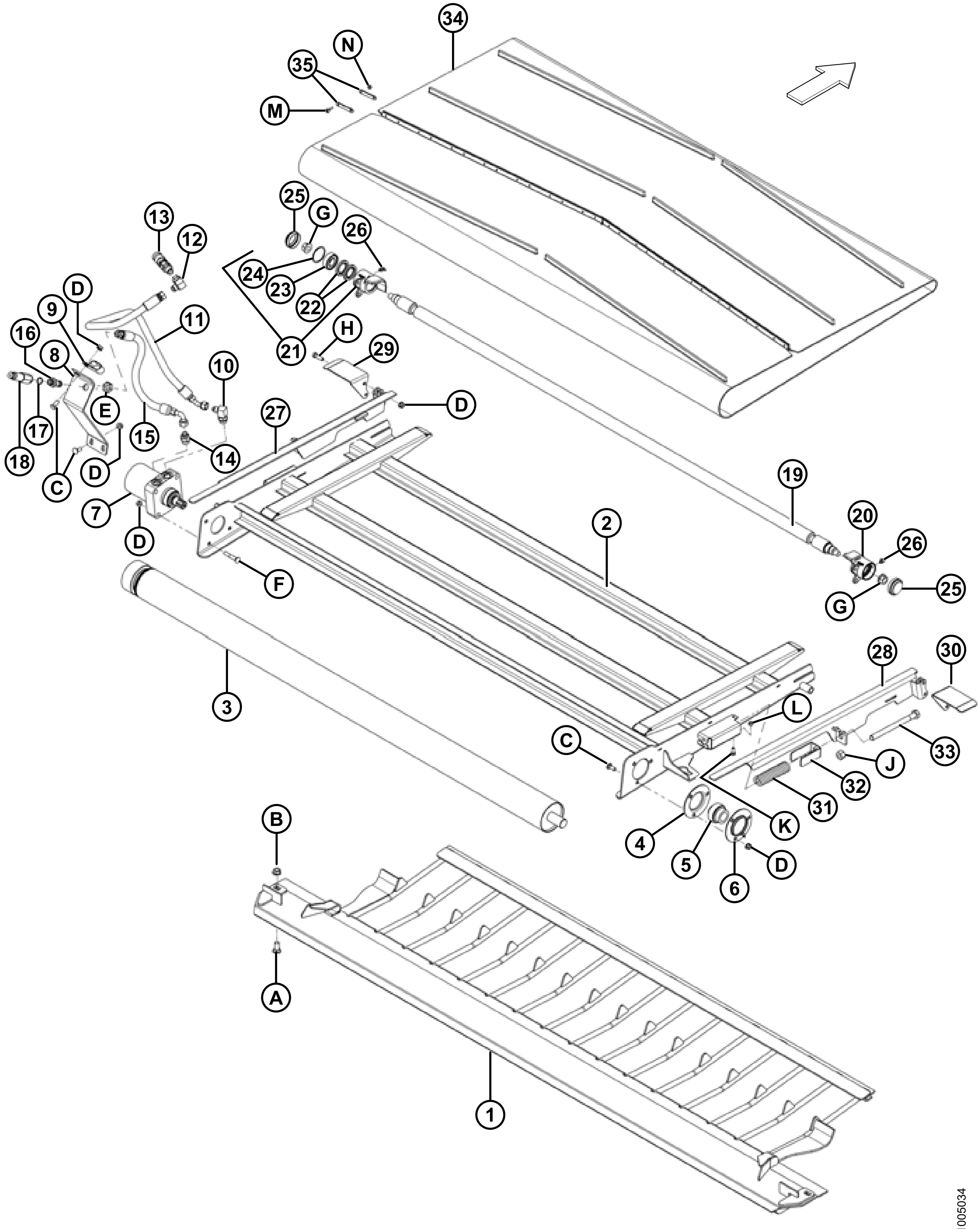
Ref	Part Number	Description	Qty	Serial Number
1	159204	COVER WELDT	1	
2	159206	SUPPORT – STRUT, LH	1	
3	159207	SUPPORT – STRUT, RH	1	
4	135001	BOLT – SHOULDER .375-16 UNC	2	
5	42592	WASHER – FLAT	8	
6	42045	WASHER – RUBBER	4	
7	149317	HANDLE	4	
8	159294	STRAP – RUBBER	2	
9	16652	WASHER – FLAT	2	
10	159220	DEFLECTOR WELDT, LH	1	
11	130911	DEFLECTOR WELDT, RH	1	
12	130905	DEFLECTOR – FIN, LH	1	
13	130906	DEFLECTOR – FIN, RH	1	
14	130548	DEFLECTOR – FIN	4	
15	130900	BAFFLE	1	
16	159598	SUPPORT – HANGER (TRACTOR MOUNTED)	1	
17	159325	SUPPORT – KEEPER	1	
18	13125	PIN – HAIR	2	
19	18600	WASHER – FLAT, 21/32 I.D. X 1-5/16 IN. O.D. ZP	2	
A	21863	BOLT – RHSSN 3/8 NC X 0.75 LG GR 5 ZP		
B	30228	NUT – FLANGE DT SMOOTH FACE .375-16 UNC		
C	21469	BOLT – RHSN 1/2 NC X 1.5 LG GR 5 ZP		
D	19966	BOLT – RHSN 3/8 NC X 1.25 LG GR 5 ZP		
E	21406	BOLT – HEXHD 5/8 NC X 3.5 GR 5 ZP		
F	50225	NUT – FLANGE DT SMOOTH FACE .625-11 UNC		
G	19965	BOLT – RHSN 3/8 NC X 1.0 GR 5 ZP		

6.10 Feed Deck and Pan



Ref	Part Number	Description	Qty	Serial Number
1	159432	PAN – FINGER FEED WELDT	1	
2	159399	FRAME, FEED DECK – WELDT	1	
3	133838	ROLLER – DRIVE 4 IN., WELDT	1	
4	49306	FLANGE	1	
5	21859	BEARING – SPH O.D. EXT INNER RACE 1-3/16 BORE	1	
6	30661	FLANGE	1	
7	159197	MOTOR – HYD 4.0 CID (WITH 921 PSI RELIEF)	1	
	37181	SEAL KIT – FOR MOTOR MD #159197		
	159606	VALVE – RELIEF, 921 PSI		
8	159183	HOLDER – COUPLING	1	
9	103738	CLAMP – PVC INSULATED 13/16 IN. TUBE SIZE	1	
10	21801	FITTING – ELBOW 90° HYD	1	
11	130998	HOSE	1	
12	30314	FITTING – ELBOW 90° HYD	1	
13	135213	COUPLING – FEMALE HYD 3/8 FLAT FACE BULKHEAD	1	
	135481	SEAL KIT – FOR 3/8 FEMALE COUPLER		
14	21881	FITTING – ADAPTER HYD	1	
15	159422	HOSE	1	
16	30819	FTG – 1/2 IN. HYD UNION	1	
17	44209	O-RING	1	
18	135386	COUPLER – MALE HYD 3/8 IN. FLAT FACE	1	
	111978	SEAL KIT – FOR 3/8 MALE COUPLER		
19	159256	SHAFT – IDLER ROLLER	1	
20	133124	HOUSING ASSY – RH IDLER CUP [17]	1	
21	133126	HOUSING ASSY – LH IDLER CUP [17]	1	
22	100862	SEAL – OIL	4	
23	118185	BEARING – BALL CYL, 52MM O.D., 25MM I.D.	2	
24	118011	RING – RETAINING, INTERNAL	2	
25	133372	CAP, DUST	2	
26	21010	FTG – LUBE 90 DEG 1/4-28 TAPER THD	2	
27	159383	SUPPORT WELDT – LH	1	
28	159385	SUPPORT WELDT – RH	1	
29	159260	GUIDE – LH	1	

17. Includes oil seal (MD #100862), bearing (MD #118185), and retaining ring (MD #118011).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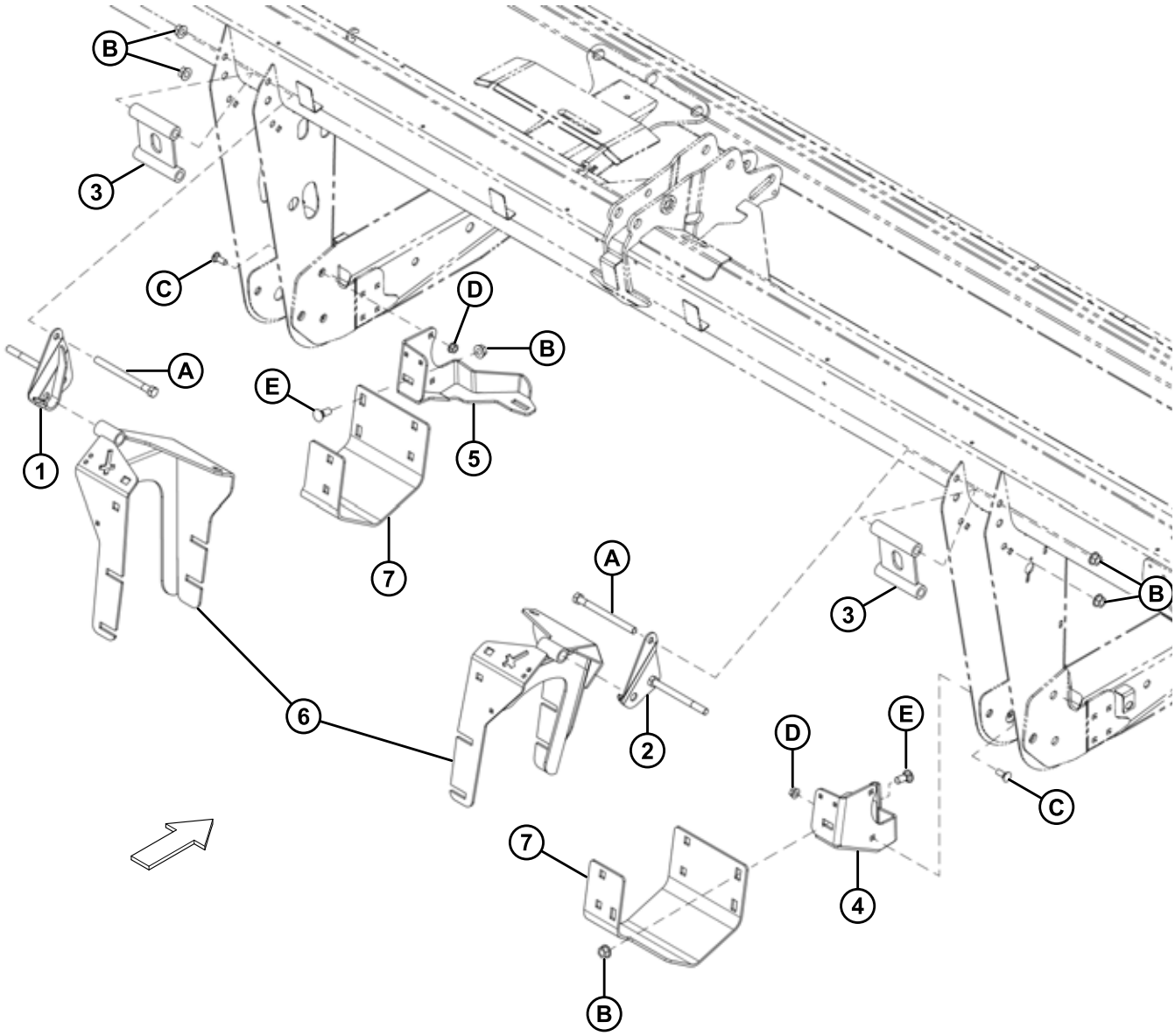
Ref	Part Number	Description	Qty	Serial Number
30	159264	GUIDE – RH	1	
31	133946	SPRING – COMPRESSION	2	
32	130246	RETAINER – SPRING	2	
33	135906	BOLT – HH 5/8 NC X 7.5 LG TFL GR 5 ZP	2	
34	159393	DRAPER – 1850 WIDE X 2107 LONG	1	
35	130283	STRAP – DRAPER CONN	28	
A	21471	BOLT – RHSN 1/2 NC X 1.25 GR 5 ZP		
B	50186	NUT – FLG LK SMTH FACE DT .500-13 UNC GR 5		
C	19965	BOLT – RHSN 3/8 NC X 1.0 GR 5 ZP		
D	30228	NUT – FLG DT SMTH FACE 0.375-16 UNC		
E	7674	NUT – HEX JAM 3/4-16 UNF GR 5 ZP		
F	21485	BOLT – RHSN 3/8 NC X 2.25 LG GR 5 ZP		
G	50225	NUT – FLG DT SMTH FACE .625-11 UNC		
H	21264	BOLT – HEX HD 3/8 NC X 1.25 LG GR 5 ZP		
J	18592	NUT – HEX 5/8-11 UNC GR 5 ZP		
K	21558	BOLT – HEX HD 5/16 NC X 0.75 LG GR 5 ZP		
L	18690	NUT – HEX LOCK DT 5/16-18 UNC ZP		
M	135630	SCREW – BT HD RIB NK, #12-24 NC X 0.920 IN. LG		
N	135626	NUT – CSK CENTER LOCK #12-24 NC		

6.11 Mounting Brackets



Ref	Part Number	Description	Qty	Serial Number
1	130802	SUPPORT – LH WELDT	1	
2	130803	SUPPORT – RH WELDT	1	
3	159590	SPACER BRACKET	2	
4	130831	SUPPORT – RH WELDT	1	
5	130817	SUPPORT – LH WELDT	1	
6	REF	Refer to Section *6.4 Cover and Supports, page 102*.		
7	REF	Refer to Section *6.2 Lower Roll and Frame Assembly, page 98*.		
A	135906	BOLT – HH 5/8 NC X 7.5 LG TFL GR 5 ZP		
B	50225	NUT – FLG DT SMTH FACE .625-11 UNC		
C	21471	BOLT – RHSN 1/2 NC X 1.25 GR 5 ZP		
D	50186	NUT – FLG LK SMTH FACE DT .500-13 UNC GR 5		
E	18523	BOLT – RHSN 5/8 NC X 1.5 GR 5 ZP		

7 Reference

7.1 Torque Specifications

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

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

Jam nuts

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

Self-tapping screws

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

7.1.1 SAE Bolt Torque Specifications

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

Table 7.1 SAE Grade 5 Bolt and Grade 5 Free Spinning Nut

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

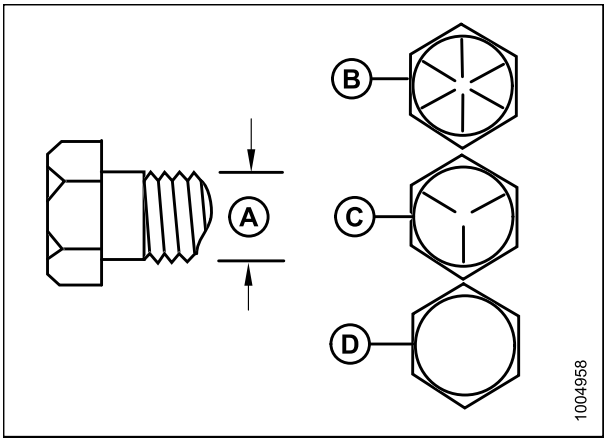


Figure 7.1: Bolt Grades

A - Nominal Size
B - SAE-8
C - SAE-5
D - SAE-2

Table 7.2 SAE Grade 5 Bolt and Grade F Distorted Thread Nut

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

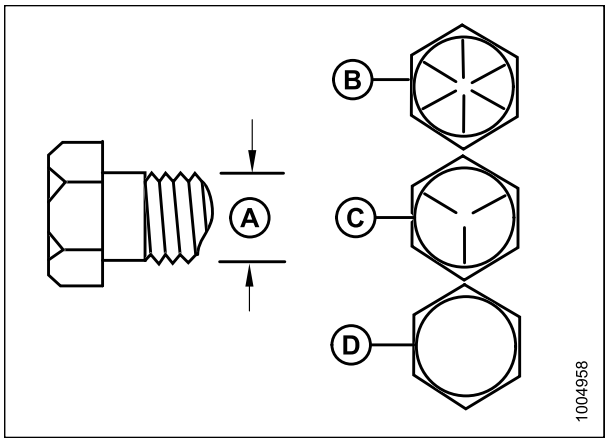


Figure 7.2: Bolt Grades

A - Nominal Size **B - SAE-8**
C - SAE-5 **D - SAE-2**

Table 7.3 SAE Grade 8 Bolt and Grade G Distorted Thread Nut

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

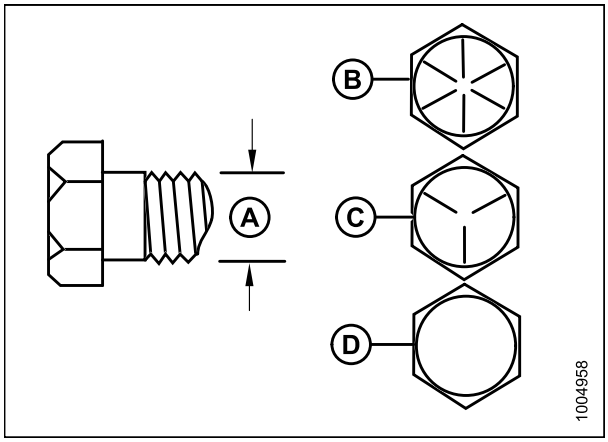


Figure 7.3: Bolt Grades

A - Nominal Size **B - SAE-8**
C - SAE-5 **D - SAE-2**

Table 7.4 SAE Grade 8 Bolt and Grade 8 Free Spinning Nut

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

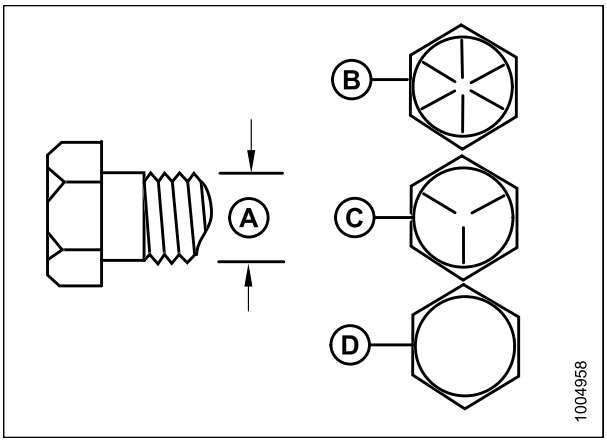


Figure 7.4: Bolt Grades

A - Nominal Size **B - SAE-8**
C - SAE-5 **D - SAE-2**

7.1.2 Metric Bolt Specifications

Table 7.5 Metric Class 8.8 Bolts and Class 9 Free Spinning Nut

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

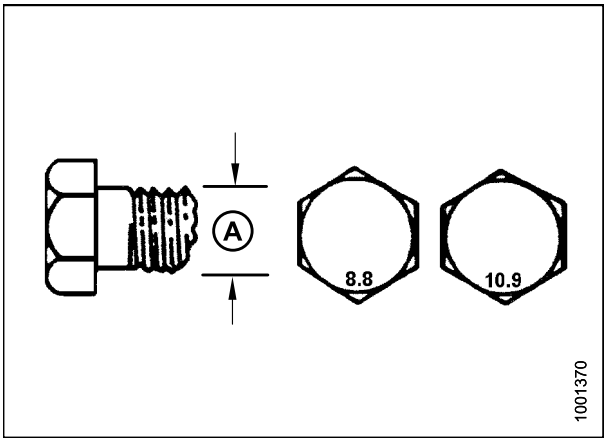


Figure 7.5: Bolt Grades

Table 7.6 Metric Class 8.8 Bolts and Class 9 Distorted Thread Nut

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

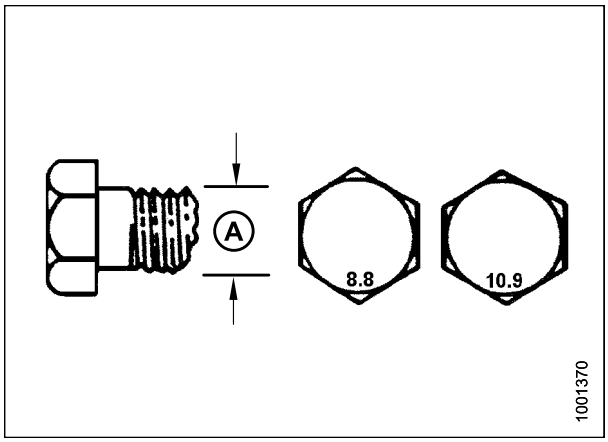


Figure 7.6: Bolt Grades

Table 7.7 Metric Class 10.9 Bolts and Class 10 Free Spinning Nut

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

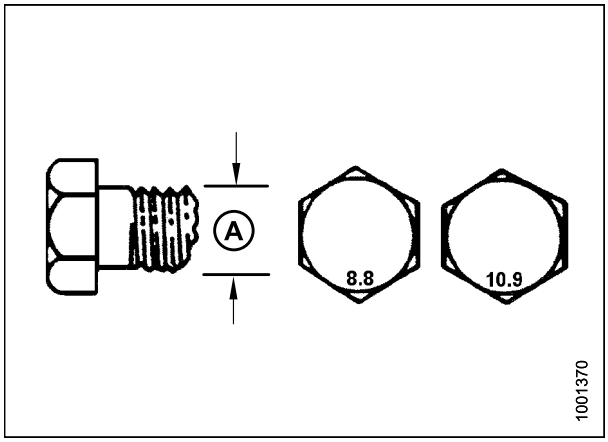


Figure 7.7: Bolt Grades

Table 7.8 Metric Class 10.9 Bolts and Class 10 Distorted Thread Nut

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

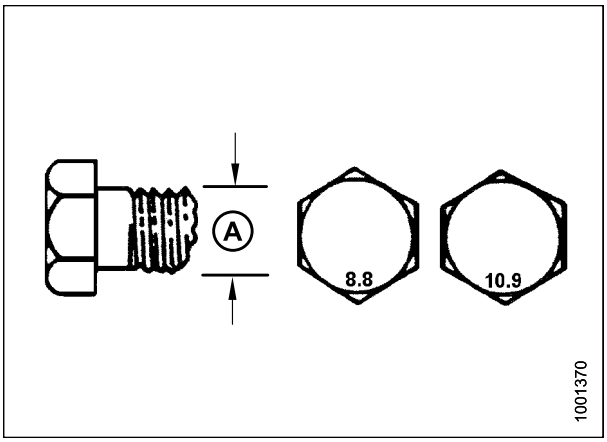


Figure 7.8: Bolt Grades

7.1.3 Metric Bolt Specifications Bolting into Cast Aluminum

Table 7.9 Metric Bolt Bolting into Cast Aluminum

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

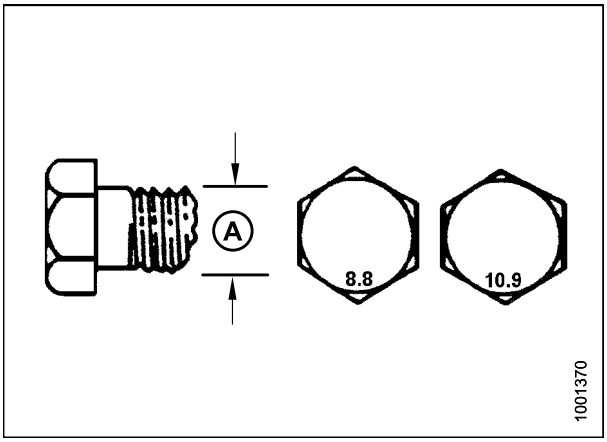


Figure 7.9: Bolt Grades

7.1.4 Flare-Type Hydraulic Fittings

1. Check flare (A) and flare seat (B) for defects that might cause leakage.
2. Align tube (C) with fitting (D) and thread nut (E) onto fitting without lubrication until contact has been made between flared surfaces.
3. Torque fitting nut (E) to specified number of flats from finger tight (FFFT) or to a given torque value in Table *7.10, page 132*.
4. Use two wrenches to prevent fitting (D) from rotating. Place one wrench on fitting body (D), and tighten nut (E) with other wrench to torque shown.
5. Assess final condition of connection.

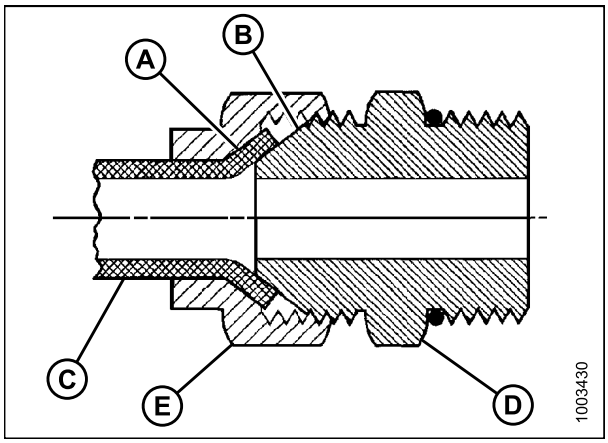


Figure 7.10: Hydraulic Fitting

Table 7.10 Flare-Type Hydraulic Tube Fittings

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

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

7.1.5 O-Ring Boss (ORB) Hydraulic Fittings (Adjustable)

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

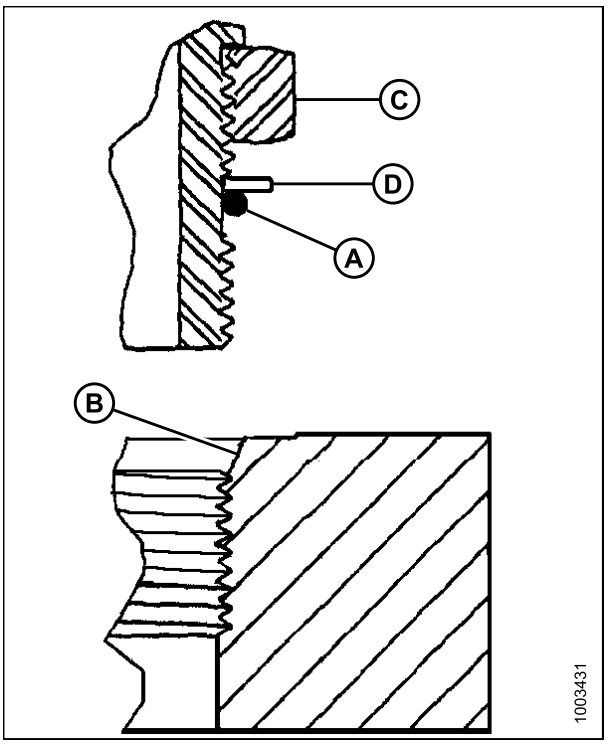


Figure 7.11: Hydraulic Fitting

5. Install fitting (B) into port until back up washer (D) and O-ring (A) contact part face (E).
6. Position angle fittings by unscrewing no more than one turn.
7. Turn lock nut (C) down to washer (D) and tighten to torque shown. Use two wrenches, one on fitting (B) and other on lock nut (C).
8. Check final condition of fitting.

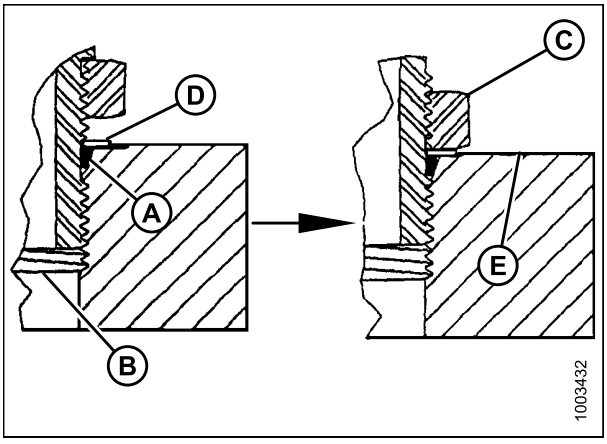


Figure 7.12: Hydraulic Fitting

Table 7.11 O-Ring Boss (ORB) Hydraulic Fittings (Adjustable)

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

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

7.1.6 O-Ring Boss (ORB) Hydraulic Fittings (Non-Adjustable)

1. Inspect O-ring (A) and seat (B) for dirt or obvious defects.
2. Check that O-ring (A) is **NOT** on threads and adjust if necessary.
3. Apply hydraulic system oil to O-ring.
4. Install fitting (C) into port until fitting is hand-tight.
5. Torque fitting (C) according to values in Table *7.12, page 135*.
6. Check final condition of fitting.

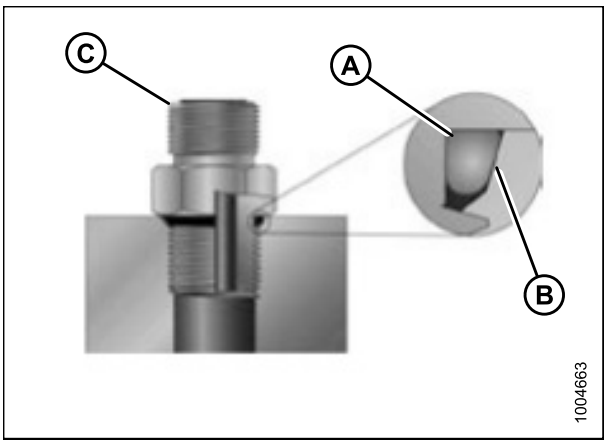


Figure 7.13: Hydraulic Fitting

Table 7.12 O-Ring Boss (ORB) Hydraulic Fittings (Non-Adjustable)

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

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

7.1.7 O-Ring Face Seal (ORFS) Hydraulic Fittings

1. Check components to ensure that sealing surfaces and fitting threads are free of burrs, nicks, scratches, or any foreign material.

Figure 7.14: Hydraulic Fitting

2. Apply hydraulic system oil to O-ring (B).
3. Align tube or hose assembly so that flat face of sleeve (A) or (C) comes in full contact with O-ring (B).
4. Thread tube or hose nut (D) until hand-tight. The nut should turn freely until it is bottomed out.
5. Torque fittings according to values in Table *7.13, page 136*.

   NOTE:

   If applicable, hold hex on fitting body (E) to prevent rotation of fitting body and hose when tightening fitting nut (D).
6. Use three wrenches when assembling unions or joining two hoses together.
7. Check final condition of fitting.

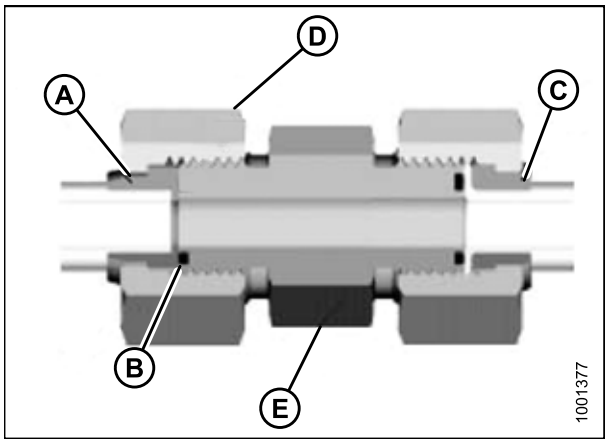


Figure 7.15: Hydraulic Fitting

Table 7.13 O-Ring Face Seal (ORFS) Hydraulic Fittings

SAE Dash Size	Thread Size (in.)	Tube O.D. (in.)	Torque Value[21]	
			Nm	lbf·ft
-3	Note[22]	3/16	–	–
-4	9/16	1/4	25–28	18–21
-5	Note[22]	5/16	–	–
-6	11/16	3/8	40–44	29–32
-8	13/16	1/2	55–61	41–45
-10	1	5/8	80–88	59–65
-12	1-3/16	3/4	115–127	85–94

21. Torque values and angles shown are based on lubricated connection as in reassembly.
22. O-ring face seal type end not defined for this tube size.

Table 7.13 O-Ring Face Seal (ORFS) Hydraulic Fittings (continued)

SAE Dash Size	Thread Size (in.)	Tube O.D. (in.)	Torque Value[23]	
			Nm	lbf·ft
-14	Note[22]	7/8	–	–
-16	1-7/16	1	150–165	111–122
-20	1-11/16	1-1/4	205–226	151–167
-24	1–2	1-1/2	315–347	232–256
-32	2-1/2	2	510–561	376–414

7.1.8 Tapered Pipe Thread Fittings

Assemble pipe fittings as follows:

1. Check components to ensure that fitting and port threads are free of burrs, nicks and scratches, or any form of contamination.
2. Apply pipe thread sealant (paste type) to external pipe threads.
3. Thread fitting into port until hand-tight.
4. Torque connector to appropriate torque angle. The Turns From Finger Tight (T.F.F.T.) values are shown in Table *7.14, page 137*. Make sure that tube end of a shaped connector (typically 45º or 90º) is aligned to receive incoming tube or hose assembly. Always finish alignment of fitting in tightening direction. Never back off (loosen) pipe threaded connectors to achieve alignment.
5. Clean all residue and any excess thread conditioner with appropriate cleaner.
6. Assess final condition of fitting. Pay special attention to possibility of cracks to port opening.
7. Mark final position of fitting. If a fitting leaks, disassemble fitting and check for damage.

   NOTE:

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

Table 7.14 Hydraulic Fitting Pipe Thread

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

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

7.2 Conversion Chart

Table 7.15 Conversion Chart

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

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Predelivery Checklist

Perform these checks and adjustments prior to delivery to your Customer. Refer to Unloading and Assembly Instructions for adjustment details. The completed checklist should be retained either by the Operator or the Dealer.

CAUTION

Carefully follow the instructions given. Be alert for safety-related messages, which bring your attention to hazards and unsafe practices.

Conditioner Serial Number: _____

Table .16 HC10 Hay Conditioner Predelivery Checklist

✓	Item	Reference
	Check for shipping damage or missing parts. Be sure all shipping material is removed.	—
	Check roll drive belt tension.	*3.13.1 Checking Roll Drive Belt Tension, page 50*
	Check conditioner roll gap, timing, and alignment.	*3.13.2 Checking Roll Gap, page 51* and *3.13.3 Checking Roll Timing, page 51*
	Check rear and side forming shields evenly set to desired position.	*3.10 Installing the Forming Shield, page 44*
	Grease all bearings.	*3.12 Lubricating the Conditioner, page 47*
	Check roll intermesh hardware is securely tightened.	*4.9.2 Adjusting Roll Gap, page 72*
	Check hydraulic hose routing.	*4.3 Attaching Hay Conditioner to Header, page 57*
	Run-up procedure	*3.13.4 Running up the Conditioner, page 52*
	Check reverse operating mode.	Refer to windrower manual.
	Check hydraulic hose routing for clearance when raising or lowering header.	—
	Post run-up checks. Stop engine.	—
	Check for hydraulic leaks.	—
	Check belt drive for alignment and heated bearings.	*5.7 Drive Belt, page 86*
	Check manuals in windrower cab.	*3.13.5 Storing Manuals, page 53*

Date checked:

Checked by:

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