

A40-D Self-Propelled Windrower Auger Header

Unloading and Assembly Instructions

147913 Revision A
2017 Model Year
Original Instruction

A40-D Self-Propelled Windrower Auger Header



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Introduction

This instructional manual describes the unloading, setup, and predelivery requirements for the MacDon A40-D Self-Propelled Windrower Auger Header, including a Grass Seed version.

Use the Table of Contents to guide you to specific topics.

Follow the procedures provided in this manual in the order given.

CAREFULLY READ THE INFORMATION PROVIDED IN THIS MANUAL BEFORE ATTEMPTING TO UNLOAD, ASSEMBLE, OR USE THE MACHINE.

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).

List of Revisions

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

Summary of Change	Location
Included note to lower header to the ground when checking roll gearbox lubricant level.	<i>4.6 Knife and Gearbox Oil, page 76</i> and <i>5.6 Checking Conditioner Rolls, page 83</i>

TABLE OF CONTENTS

Introduction	i
List of Revisions	ii
1 Safety	1
1.1 Signal Words	1
1.2 General Safety	2
1.3 Safety Signs	4
2 Unloading the Machine	5
2.1 Unloading the Header	5
2.1.1 Unloading the Header from a Truck Flatbed	5
3 Assembling the Machine	7
3.1 Removing Underside Shipping Stand	7
3.2 Installing Skid Shoes	8
3.3 Installing Gauge Rollers	9
3.4 Lowering the Header	11
3.5 Removing Shipping Stands	14
3.6 Installing Tall Crop Divider Kit	15
3.7 Adjusting Lean Bar	16
3.8 Adjusting Pan Extensions: Grass Seed Special	17
3.9 Adjusting Transport Lights	18
3.10 Assembling Forming Shield	19
3.11 Installing Forming Shield – SP Windrower Headers	22
3.12 Attaching A40-D Header to SP Windrower	25
3.12.1 Attaching to M100 or M105	25
3.12.2 Attaching to M150, M155, or M155E4	30
3.12.3 Attaching to M200	35
3.12.4 Attaching to M205	41
3.13 Modifying Hydraulics	47
3.13.1 Modifying Hydraulics – M100, M105	47
3.13.2 Modifying Hydraulics – M150, M155, M155E4	49
3.13.3 Modifying Hydraulics – M200 with Reverser Valve	51
3.13.4 Modifying Hydraulics – M200 without Reverser Valve	52
3.13.5 Modifying Hydraulics – M205	54
3.14 Routing Reverser Valve Jumper Hose	55
3.15 Attaching Hydraulics	56
3.16 Hydraulic Drive Hose Routing (Later-Build 2015 A40-D Units Only)	62
3.17 Hydraulic Drive Hose Routing (Early-Build 2015, 2014 and Earlier A40-D)	67
3.18 Repositioning Knife Drive Box Breather	69
4 Lubricating the Machine	71
4.1 Greasing Procedure	71
4.2 Lubrication Points: Left Side of Header	72
4.3 Lubrication Points: Right Side of Header	73
4.4 Lubrication Points: Hay Conditioner	74
4.5 Lubrication Points: Drivelines	75
4.6 Knife and Gearbox Oil	76
5 Performing Predelivery Checks	77
5.1 Checking Drive Belts and Chains	77
5.2 Checking Auger Stripper Bar Clearance	78
5.3 Checking Reel Tine to Header Pan Clearance	79
5.4 Checking/Adjusting Float	80
5.5 Checking Header Levelling	81
5.6 Checking Conditioner Rolls	83
5.7 Checking Conditioner Gearbox Oil Level	85
5.8 Checking Skid Shoes/Gauge Rollers	86

TABLE OF CONTENTS

5.9	Checking Lights	87
5.10	Running Up Header	88
5.11	Checking Knife Speed.....	89
5.11.1	Setting Knife Speed on an M100 or M105	89
	Setting Knife Speed (With Expansion Module MD #B4666)	89
	Setting Knife Speed (Without Expansion Module MD #B4666).....	91
5.12	Adjusting Knife	92
5.13	Checking Manuals	93
6	Reference	95
6.1	Recommended Torques	95
6.1.1	Torque Specifications	95
	SAE Bolt Torque Specifications.....	95
	Metric Bolt Specifications	97
	Metric Bolt Specifications Bolting into Cast Aluminum	100
	Flare-Type Hydraulic Fittings	100
	O-Ring Boss (ORB) Hydraulic Fittings (Adjustable)	102
	O-Ring Boss (ORB) Hydraulic Fittings (Non-Adjustable)	104
	O-Ring Face Seal (ORFS) Hydraulic Fittings	105
	Tapered Pipe Thread Fittings.....	107
6.2	Conversion Chart.....	108
6.3	Definitions	109
	Predelivery Checklist	111

1 Safety

1.1 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.

1.2 General Safety

CAUTION

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

Protect yourself.

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



Figure 1.1: Safety Equipment



Figure 1.2: Safety Equipment

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

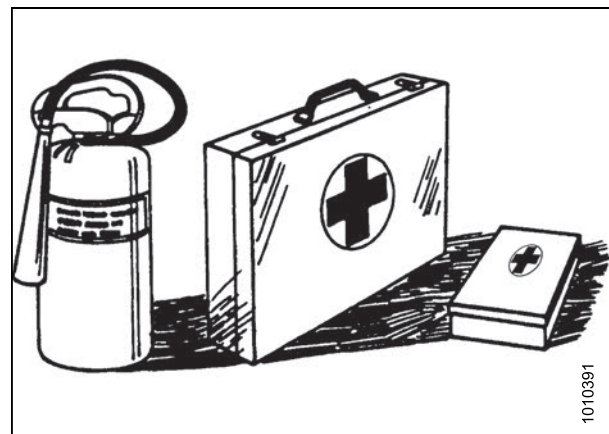


Figure 1.3: Safety Equipment

SAFETY

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



Figure 1.4: Safety around Equipment

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

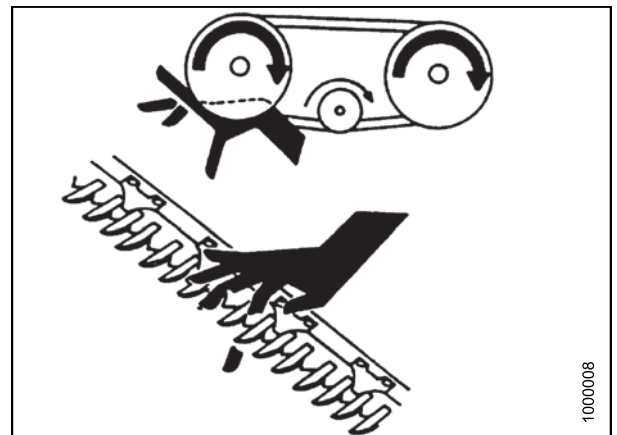


Figure 1.5: Safety around Equipment

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



Figure 1.6: Safety around Equipment

1.3 Safety Signs

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

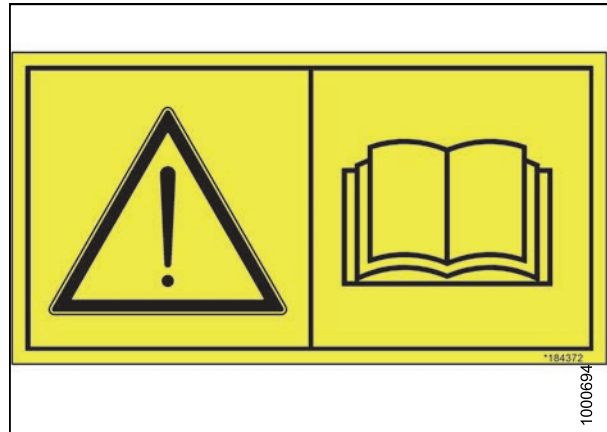


Figure 1.7: Operator's Manual Decal

2 Unloading the Machine

Follow each procedure in this chapter in order.

2.1 Unloading the Header

CAUTION

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

CAUTION

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

Table 2.1 Lifting Vehicle

Minimum Capacity ¹	3630 kg (8000 lb)
Minimum Fork Length	1981 mm (78 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.

2.1.1 Unloading the Header from a Truck Flatbed

IMPORTANT:

Do NOT unload using lean bar for lifting. Chain hook slots in lean bar are only for laying the machine over into working position after it is on the ground.

NOTE:

Take care not to bend parts on backtube.

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

UNLOADING THE MACHINE

To unload the header, follow these steps:

1. Remove hauler's tie-down straps and chains.
2. Approach header from either its underside or topside and slide forks (A) in underneath lifting framework as far as possible.

NOTE:

When possible, approach from the underside to minimize potential for scratching the unit.

3. Raise header off deck.

IMPORTANT:

If load is "two wide", take care not to contact the other machine.

4. Back up until unit clears trailer and slowly lower to 150 mm (6 in.) from ground.
5. Take to storage or setup area.
6. Set header down securely on level ground.
7. Repeat for other header if required.
8. Check for shipping damage and missing parts.

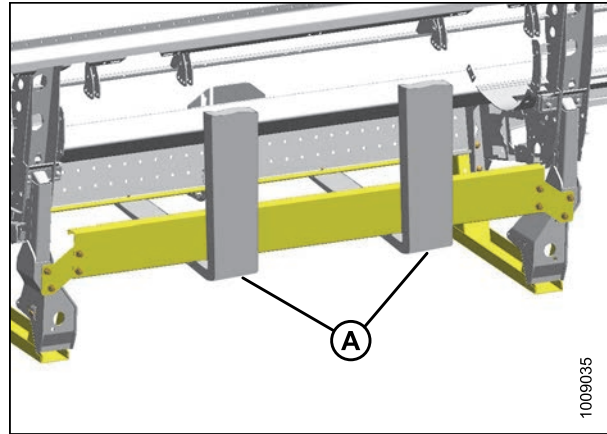


Figure 2.1: Forks in Position



Figure 2.2: Topside of Header in Shipping Configuration



Figure 2.3: Underside of Header in Shipping Configuration

3 Assembling the Machine

Once all unloading procedures have been completed, it is time to set up the machine. Follow each procedure in this chapter in order.

3.1 Removing Underside Shipping Stand

CAUTION

Keep feet clear when removing final bolts.

1. Remove four bolts (A) and remove shipping stand (B). Discard stand and hardware.

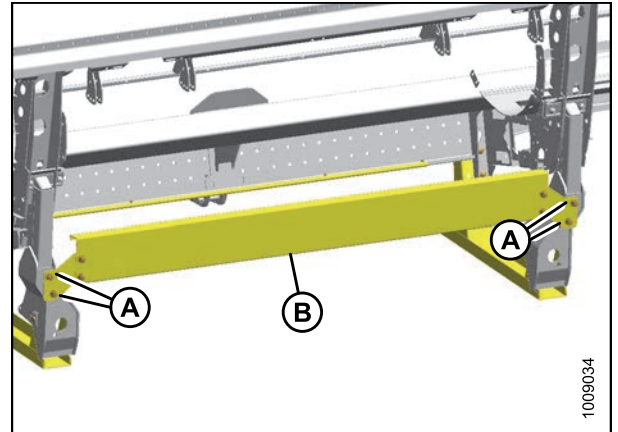


Figure 3.1: Underside Shipping Stand

3.2 Installing Skid Shoes

If kit is **NOT** supplied, proceed to [3.3 Installing Gauge Rollers, page 9](#). Otherwise, proceed as follows:

NOTE:

This kit may be installed later in the header assembly sequence, but it may be easier prior to laying the header down.

1. Unpack skid shoe bundle.
2. Remove two clevis pins (A) from each skid shoe.
3. Remove nuts, bolts, and clips (B) from skid shoe.

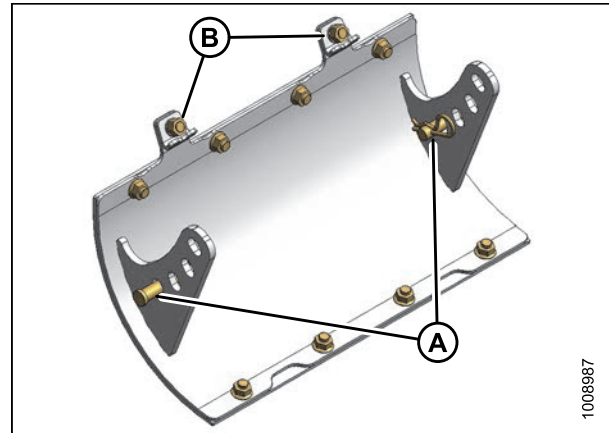


Figure 3.2: Skid Shoe Bundle

4. Position skid shoe below cutterbar and insert tabs on skid shoe into slots (A) in frame. Secure with clevis pin (B).

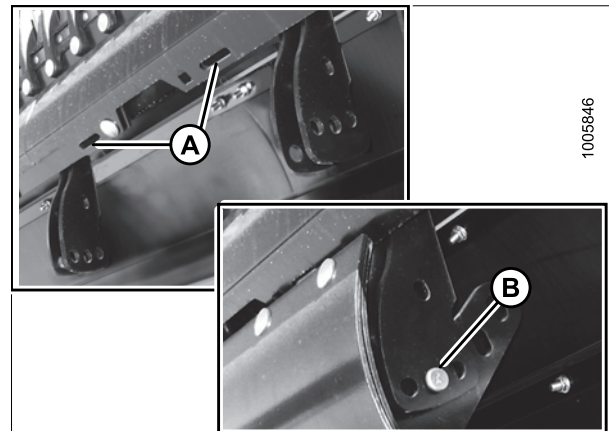


Figure 3.3: Skid Shoe Hardware

5. Attach clips (A) with bolts and nuts removed earlier in this procedure to secure skid shoe to cutterbar.

NOTE:

Use a socket and ratchet wrench to access the nuts.

6. Tighten nuts.
7. Remove clevis pin (B) and adjust skid shoe to desired height. Reinstall two clevis pins (B) and secure with lynch pins.
8. Repeat previous steps for opposite side. Set both skid shoes to the same position.

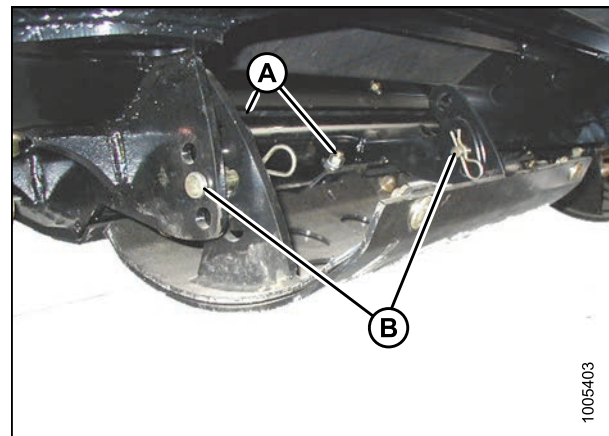


Figure 3.4: Skid Shoe Installed

3.3 Installing Gauge Rollers

If kit is **NOT** supplied, proceed to [3.4 Lowering the Header, page 11](#). Otherwise, proceed as follows.

NOTE:

This kit may be installed later in the header assembly sequence, but it may be easier prior to laying the header down.

1. Unpack gauge roller bundle.
2. Remove two locking pins (A) from each assembly.
3. Remove nuts, bolts, and clips (B) from assembly.

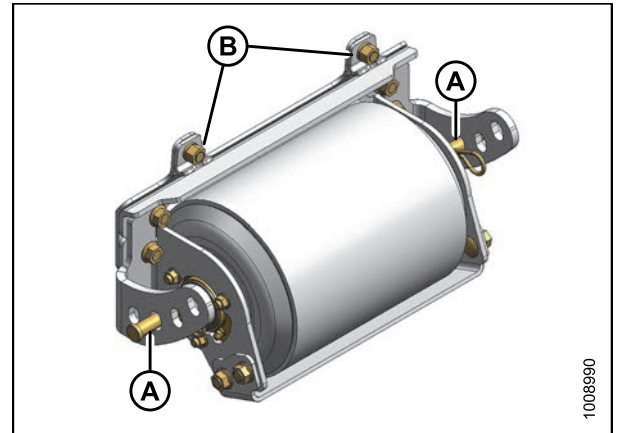


Figure 3.5: Gauge Roller in Shipping Configuration

4. Insert tabs on roller assembly into slots (A) on cutterbar at outboard mounting locations on frame.

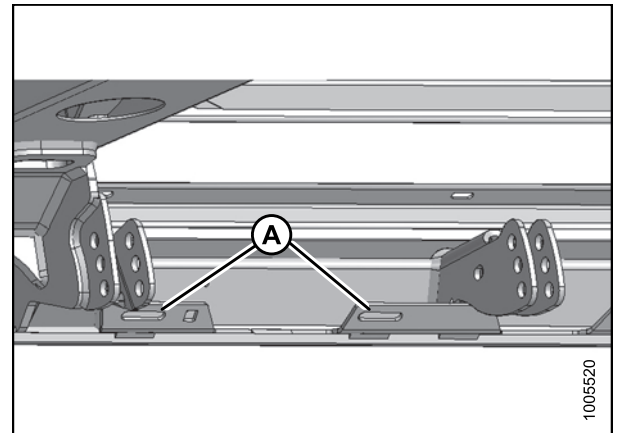


Figure 3.6: Gauge Roller Mounting Location

ASSEMBLING THE MACHINE

5. Secure to support bracket with locking pin (B) at lowest position.
6. Attach clips (A) with bolts and nuts removed earlier in this procedure to secure roller assembly to cutterbar.
7. Tighten nuts.

NOTE:

Use a socket and ratchet wrench to access the nuts.

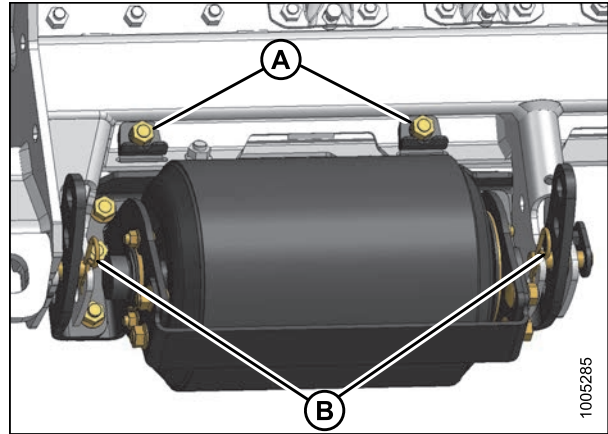


Figure 3.7: Gauge Roller

8. Remove locking pin (A) and adjust rollers to desired height. Reinstall both locking pins (A).
9. Ensure that nut (B) on each pin registers in adjacent hole in support bracket.
10. Secure pins with hairpins (C).
11. Repeat previous steps for opposite side. Set both gauge rollers to the same position.

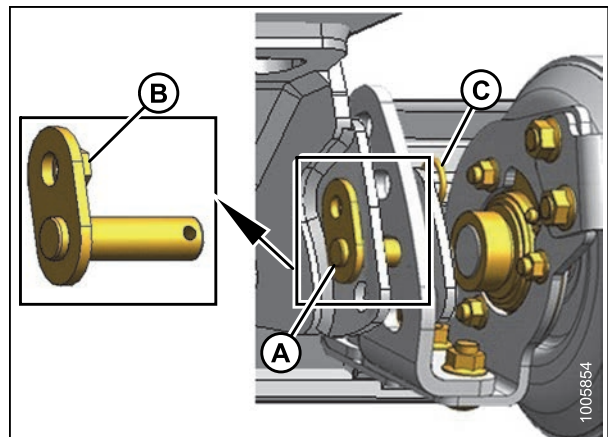


Figure 3.8: Gauge Roller and Locking Pin

3.4 Lowering the Header

To lower the header to the ground, follow these steps:

1. Attach either a spreader bar or chain to forks.

CAUTION

Ensure spreader bar or chain is secured to the forks so that it cannot slide off the forks or towards the mast as the header is lowered to the ground.

2. Drive lifting vehicle to approach header from its underside.
3. Attach chain hooks to lean bar at slots as shown.

IMPORTANT:

See table below for minimum chain specifications. Also, chain length must be sufficient to provide a minimum 1.2 m (4 ft.) vertical chain height.

Table 3.1 Chain Specifications

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

CAUTION

Stand clear when lowering, as machine may swing.

NOTE:

Do **NOT** lift at lean bar when unloading from trailer. This procedure is only for laying the machine over into working position.

4. Raise forks until lift chains are fully tensioned.

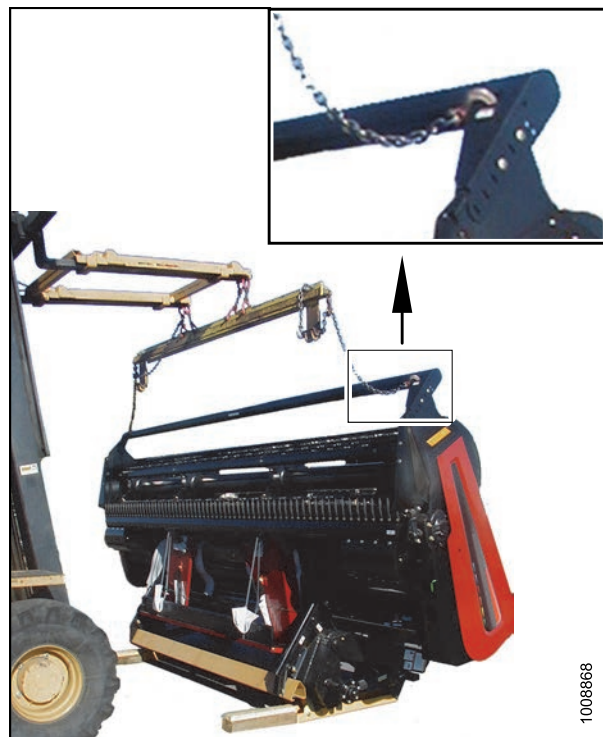


Figure 3.9: Header with Forklift

ASSEMBLING THE MACHINE

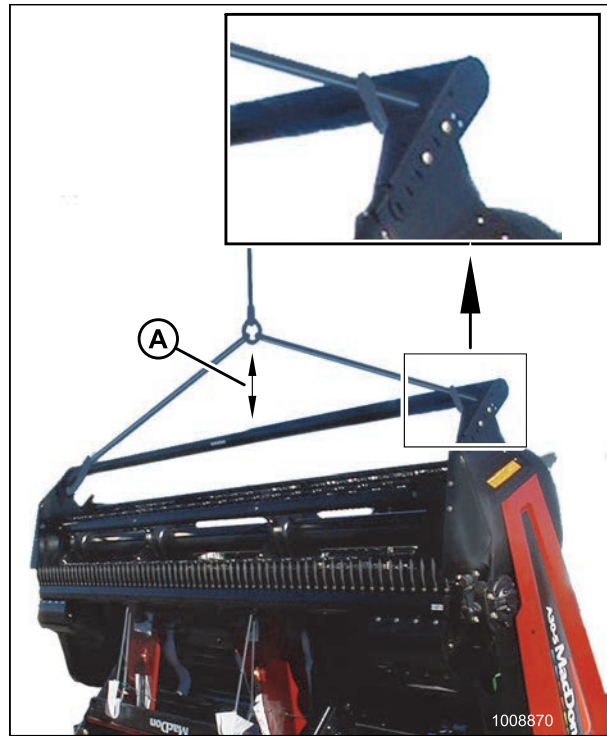


Figure 3.10: Header with Crane

A - 1.2 m (48 in.) Minimum

5. Back up **SLOWLY**, while simultaneously lowering machine, so that cutterbar skid shoes rest on blocks (A).
6. Remove chain hooks from lean bar.

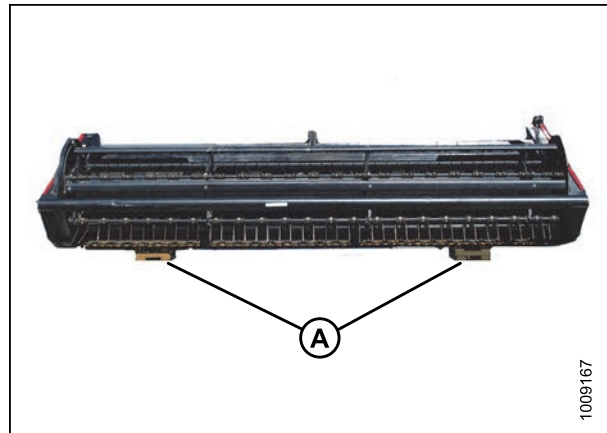


Figure 3.11: Header on Blocks

ASSEMBLING THE MACHINE

7. Attach chain to center-link anchor (A) on frame tube and raise rear of header approximately 305 mm (12 in.) off ground.

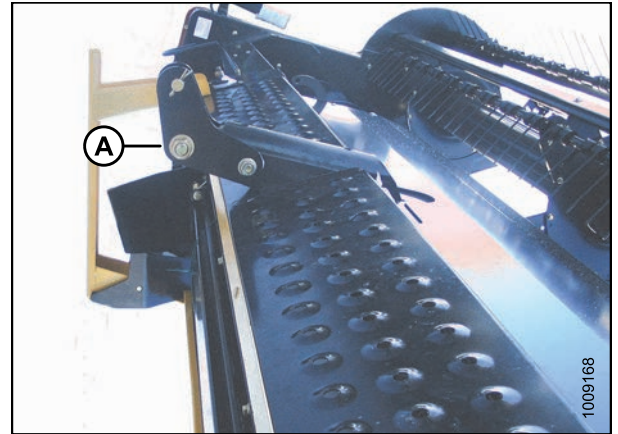


Figure 3.12: Center-Link Anchor

8. Remove lynch pin from clevis pin (A) in header stand at right side of header.
9. Hold stand (B) and remove clevis pin (A).

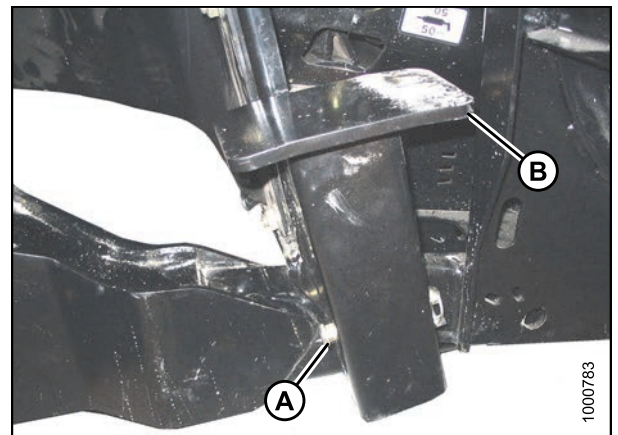


Figure 3.13: Header Stand in Shipping Position

10. Invert stand (A) and reinstall on header leg in upper hole location with clevis pin (B). Secure clevis pin (B) with lynch pin.

NOTE:

In soft conditions, use a wooden block under the stand.

11. Lower header onto stand (A).

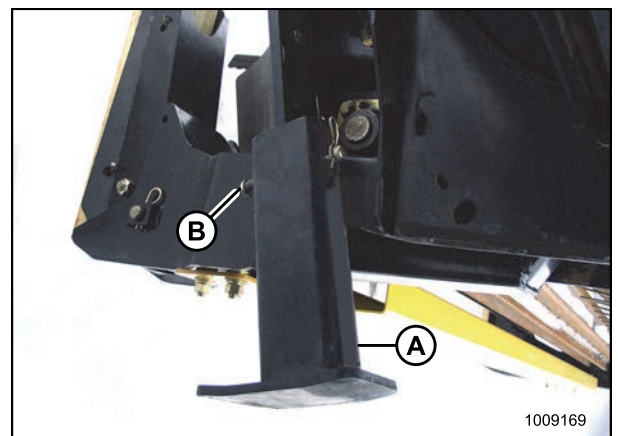


Figure 3.14: Header Stand

3.5 Removing Shipping Stands

To remove shipping stands, follow these steps:

1. Remove two bolts (A) from shipping stand (B).
2. Remove hairpin from pin (C).
3. Hold shipping stand (B), remove pin (C), and remove stand. Discard stand and hardware.

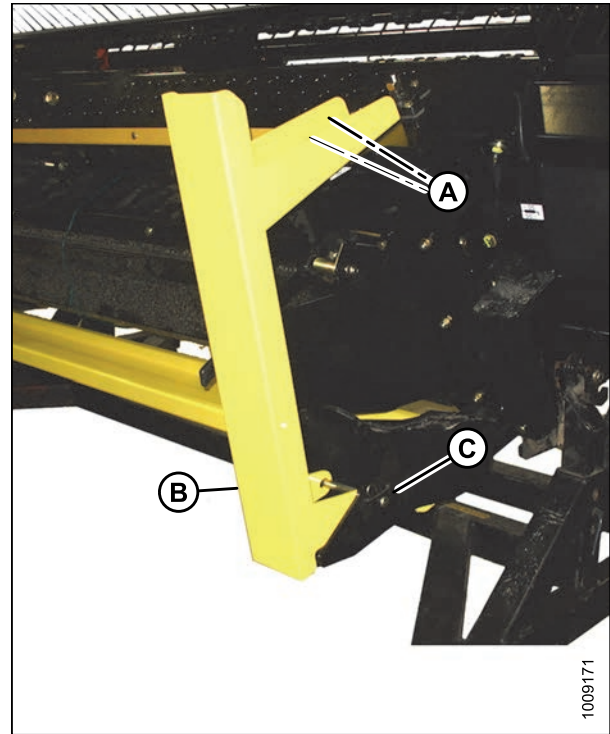


Figure 3.15: Shipping Stands

4. Remove four bolts (A) and remove angle (B). Discard angle and hardware.

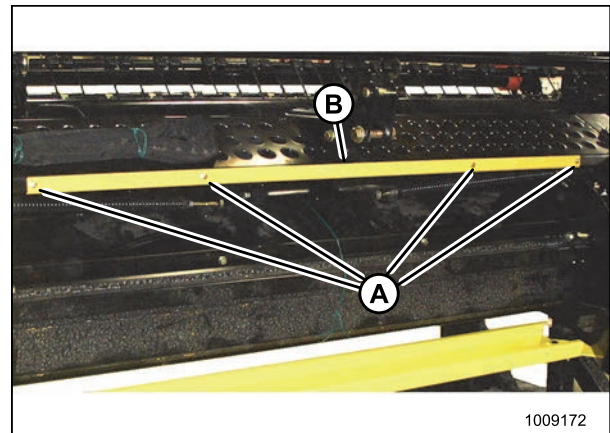


Figure 3.16: Shipping Stands

3.6 Installing Tall Crop Divider Kit

If kit is **NOT** supplied, proceed to [3.7 Adjusting Lean Bar, page 16](#). Otherwise, proceed as follows:

1. Unpack kit and disassemble hardware from divider.

NOTE:

If tall crop extension angles are not required, proceed to Step [5, page 15](#).

2. Remove hardware (A) on both sides of lean bar and remove lean bar from header.

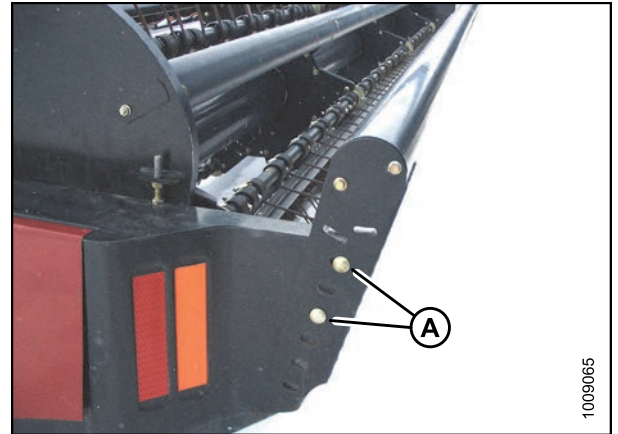


Figure 3.17: Lean Bar

3. Attach extension angles (A) to each end of lean bar (B) with four 1/2 x 1.0 in. hex bolts (C) and nuts provided.
4. Reinstall lean bar on header with existing hardware. Tighten bolts.

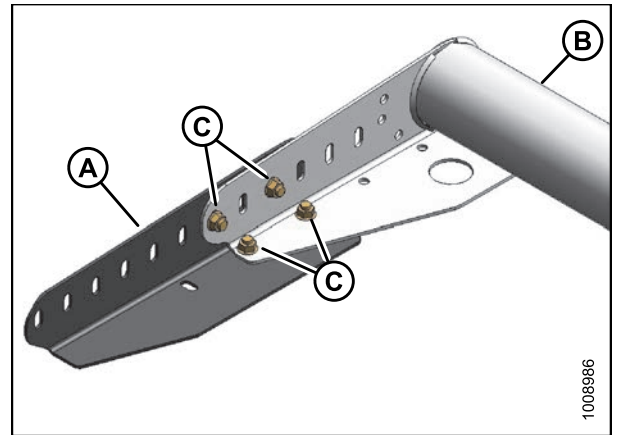


Figure 3.18: Extension Angles Attached to Ends of Lean Bar

5. Position left-hand divider (C) at left-hand side of lean bar and attach with U-bolt (A), two 3/8 in. nuts, and two 1/2 x 1.0 in. hex bolts (B) and nuts provided. The divider may be positioned as shown or using the optional mounting hole (D).
6. Adjust to desired position and tighten hardware.
7. Repeat the previous two steps for the right-hand side.

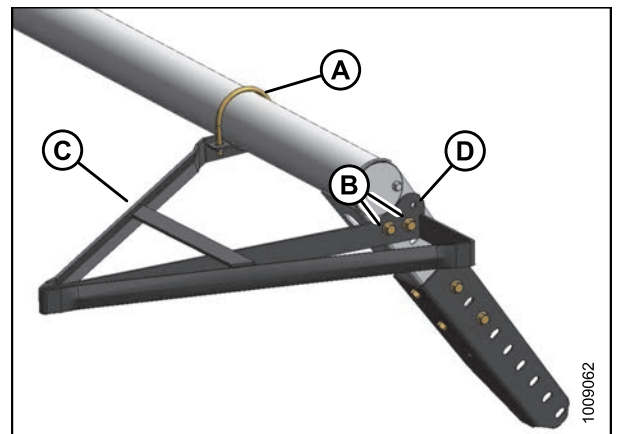


Figure 3.19: Tall Crop Divider Installed

3.7 Adjusting Lean Bar

The lean bar is fully retracted for shipping. Adjust as follows:

1. Remove hardware (A) on both sides and install lean bar in field position. Check that field position is suitable for the crop (normally 2/3 of crop height).

NOTE:

If optional tall crop divider kit is supplied, it can be installed prior to reinstalling the lean bar. Refer to [3.6 Installing Tall Crop Divider Kit, page 15](#).

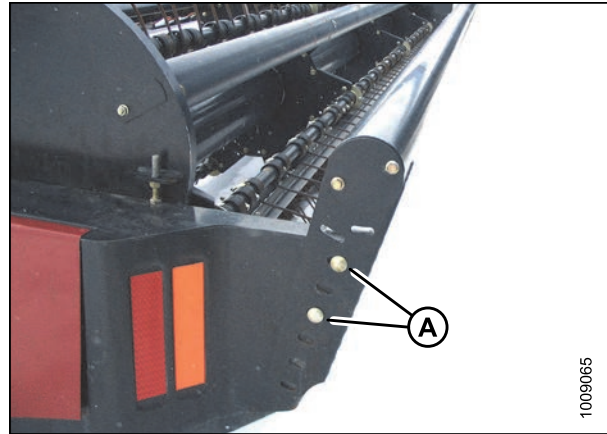


Figure 3.20: Lean Bar

3.8 Adjusting Pan Extensions: Grass Seed Special

The grass seed header auger pan extensions are factory-installed for the widest delivery. Adjust as follows:

1. Remove two bolts (A) and loosen bolt (B).

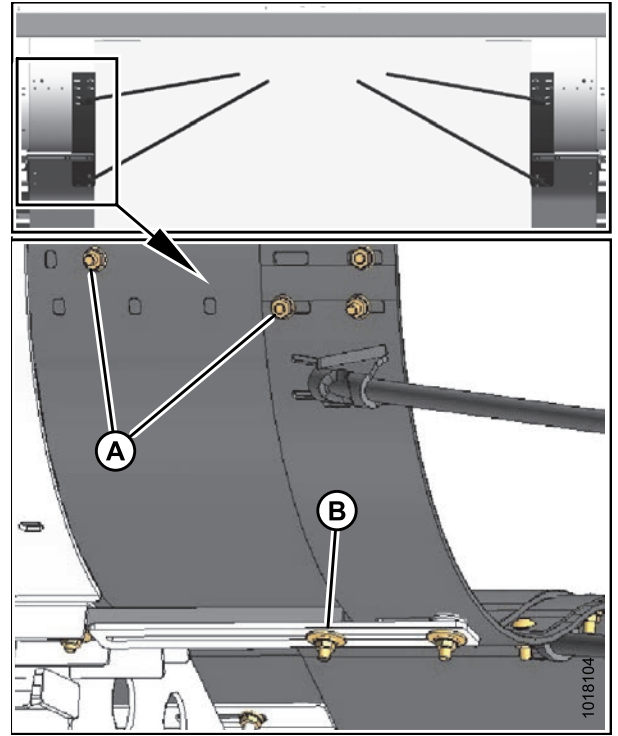


Figure 3.21: Pan Extension – Wide Setting

2. Slide pan extensions (C) and swath forming rods inboard to desired position and align holes.
3. Reinstall two bolts (A). Tighten bolts (A) and (B).
4. Repeat for opposite pan extension.

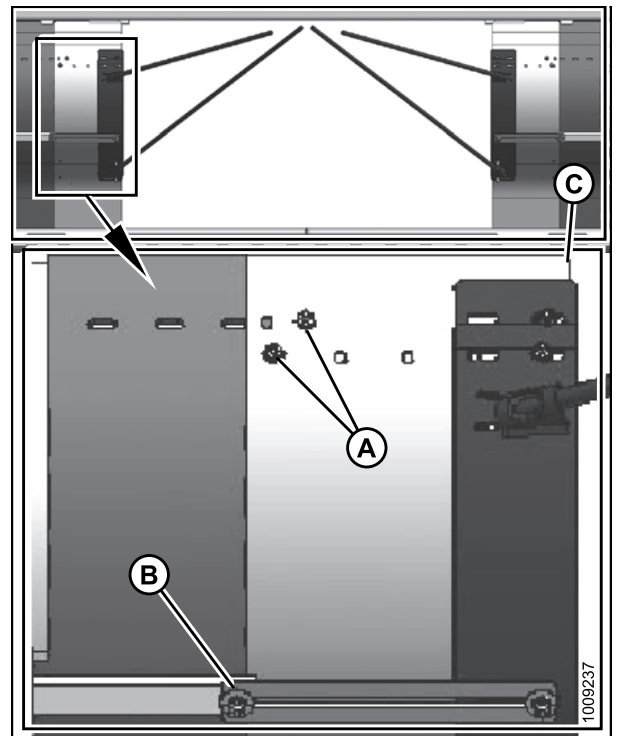


Figure 3.22: Pan Extension – Narrow Setting

3.9 Adjusting Transport Lights

1. Position amber light supports (A) perpendicular to header.
2. Check that pivot bolt (B) is tight enough to hold light support (A) in upright position, yet allows the light to pivot out of the way of obstructions.

NOTE:

Do **NOT** overtighten mounting hardware.

3. Ensure base of light housings and bolted connections on light supports provide proper electrical grounding.
4. Amber reflector (C) should face direction of travel. If required, remove bolts (D), flip reflector assembly, and reinstall bolts.

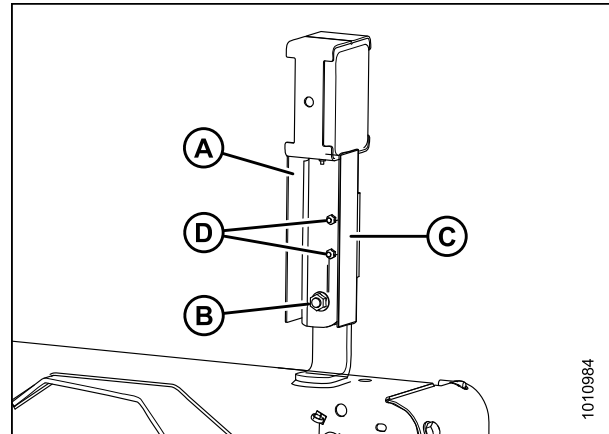


Figure 3.23: Amber Hazard Light

3.10 Assembling Forming Shield

1. Unpack and remove shipping material.
2. Remove bolts (B) from side deflectors (C).

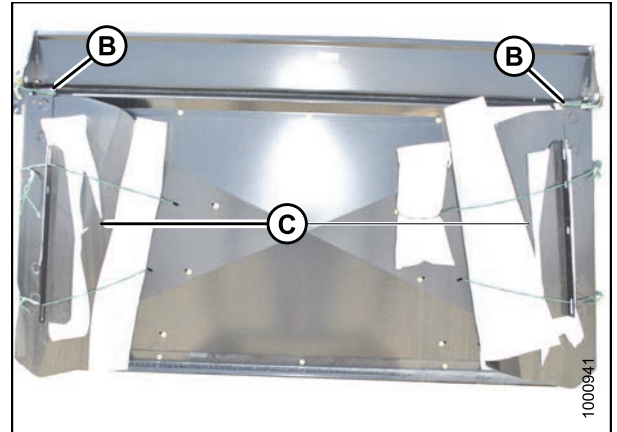


Figure 3.24: Forming Shield in Shipping Configuration

3. Install rubber strap (A) to the side bracket (B) using bolt (C), washer (D), and nut (E).
4. Repeat for the other side.

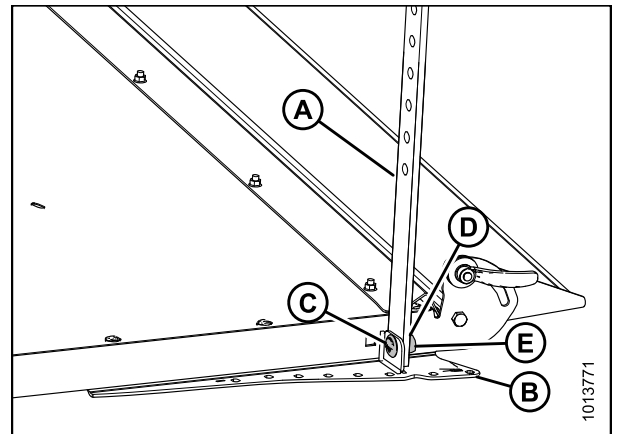


Figure 3.25: Rubber Strap

5. Lay cover (A) upside down on a flat surface.
6. Install the center deflectors (B) using three bolts (C) on each side.

NOTE:

Orient deflectors (B) so that narrow end (D) is toward the front of the cover (A) and deep end (E) is toward the rear as shown in Figure 3.26: [Center Deflectors, page 19](#).

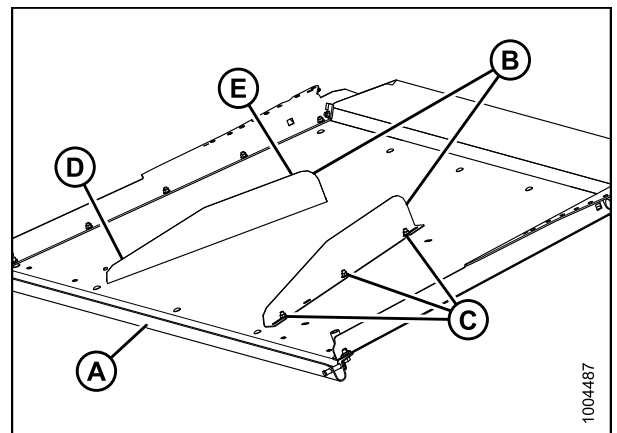


Figure 3.26: Center Deflectors

ASSEMBLING THE MACHINE

7. Assemble side deflectors (C) to cover with bolts (B), jam nut (E), washer (D), and nut (A) from previous step.
8. Tighten flange nut (A) enough to hold deflectors (C) in position, but still allow deflectors to move.
9. Tighten jam nut (E) against cover while holding bolt (B).

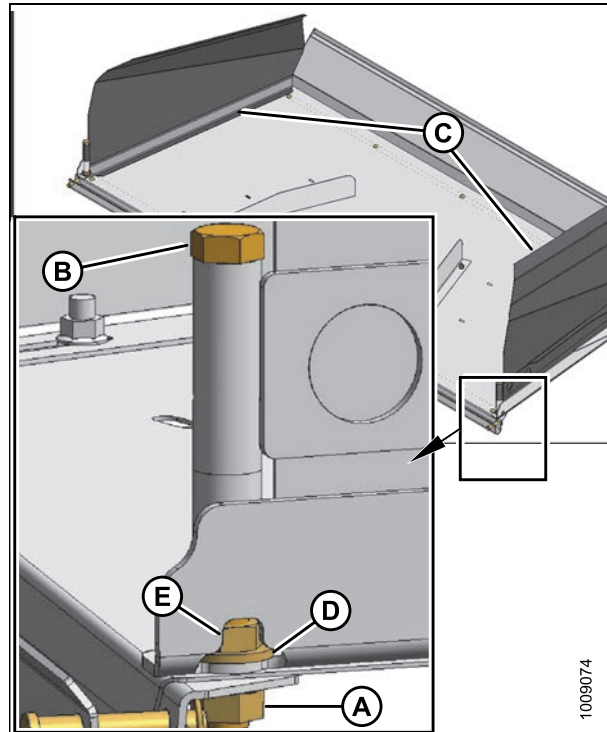


Figure 3.27: Side Deflectors

10. Remove lynch pin (A) from adjuster rod (B) and locate rod in hole in side deflector (C). Secure with lynch pin (A).
11. Repeat for other deflector.

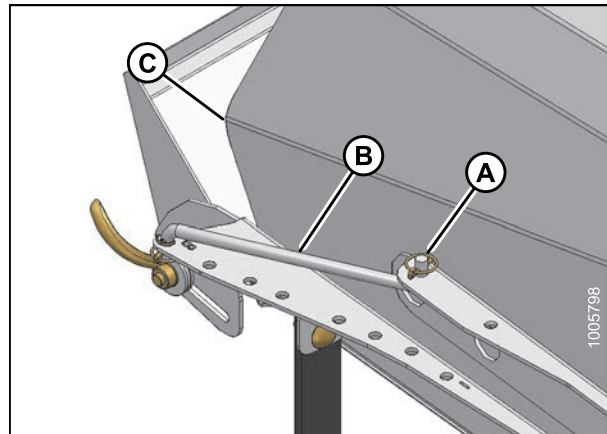


Figure 3.28: Adjuster Rod

ASSEMBLING THE MACHINE

12. Invert forming shield to installation position as shown.

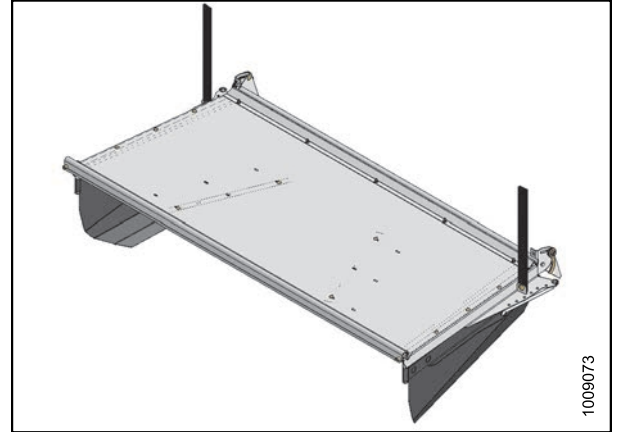


Figure 3.29: Forming Shield in Installation Position

3.11 Installing Forming Shield – SP Windrower Headers

1. Remove header from the windrower (if attached) for ease of installing the forming shield. Refer to windrower operator's manual for procedure.

NOTE:

Do **NOT** install the two triangular shaped plates. Triangular plates used with rotary headers.

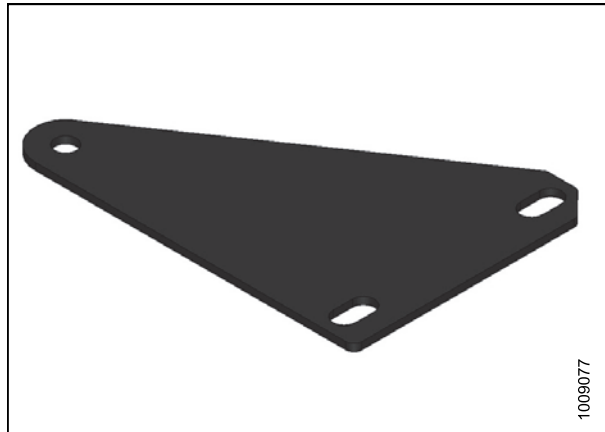


Figure 3.30: Triangular Plate

2. Install bolt (A) with spacer (B) and nut on each leg in the upper hole. Hardware is supplied with forming shield kit.

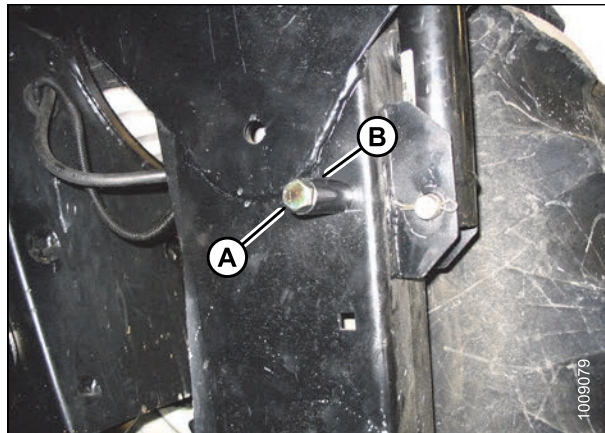


Figure 3.31: Windrower Leg

3. Remove two clevis pins (A) from forward end of forming shield.

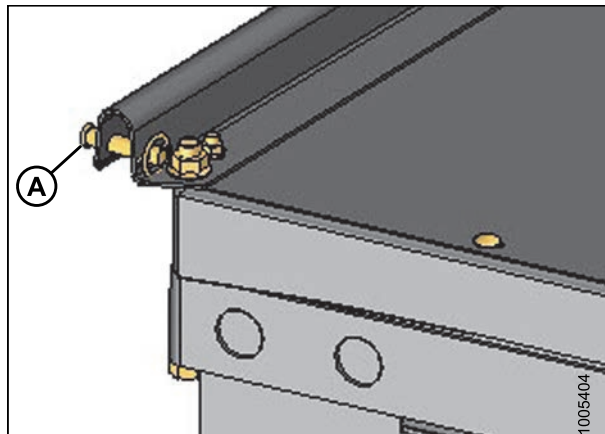


Figure 3.32: Forming Shield

ASSEMBLING THE MACHINE

4. Position forming shield (A) under windrower frame.

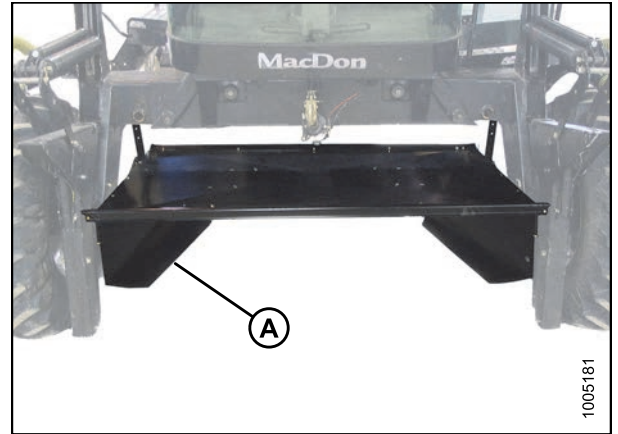


Figure 3.33: Forming Shield Under Windrower

5. Position forming shield onto bolts (A) in windrower legs and secure with clevis pins (B) and lynch pin.

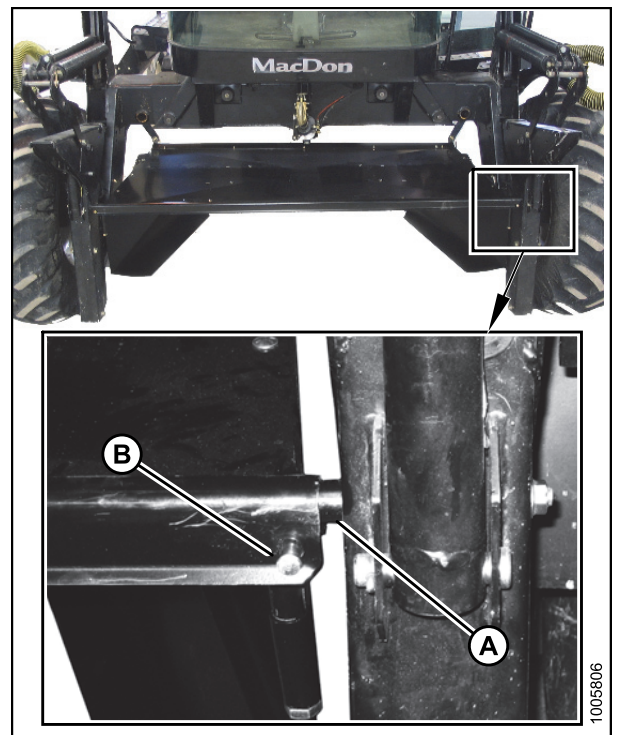


Figure 3.34: Forming Shield Attached to Windrower Legs

ASSEMBLING THE MACHINE

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

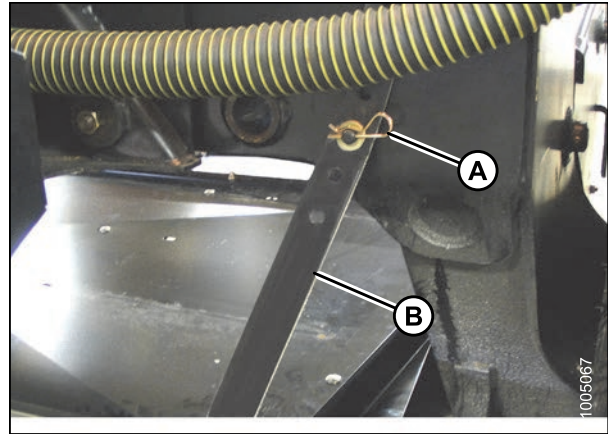


Figure 3.35: Forming Shield Attached to Windrower Frame

7. Set forming shield side deflectors to desired width by positioning adjuster bars (A). Use the same hole location on both sides.
 - Position deflectors at the narrowest setting for a narrow windrow (silage for example).
 - Position deflectors at the widest setting for a wide windrow.

NOTE:

Refer to the operator's manual or quick card for additional information on adjusting the forming shield.

8. Adjust fluffer shield (C) to middle position. Loosen handles (B) if required.

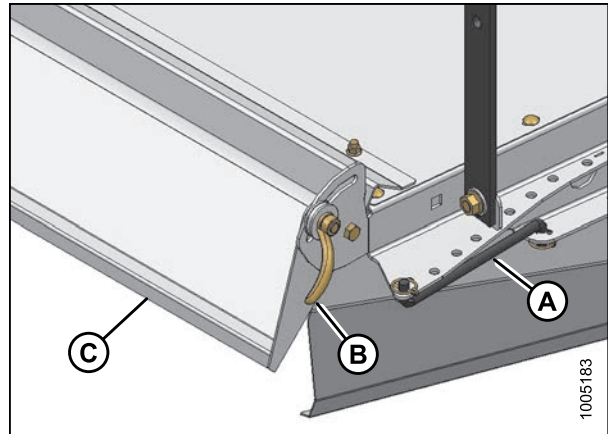


Figure 3.36: Side Deflectors and Fluffer Shield

3.12 Attaching A40-D Header to SP Windrower

Refer to your windrower operator's manual for procedures to mechanically attach the auger header to the self-propelled windrower and for modifications if required to the windrower hydraulic connections.

Refer to the following procedures for electrical and hydraulic connections. Header drive hydraulic hoses and electrical harness are located on the left-hand cab-forward side of the windrower.

IMPORTANT:

For M150, M155, M155E4, and M200 Windrowers with Reverser kit **MD #B4656** installed, hose plumbing to the reverser valve must be changed if switching between a D-Series Draper Header with a conditioner and an A40-D Auger Header to prevent draper header reel damage and improper operation. Refer to [3.14 Routing Reverser Valve Jumper Hose, page 55](#) and if necessary to instruction MD #169213 (Reverser Kit Installation Instructions), available from our Dealer-only site (<https://portal.macdon.com>) (login required).

NOTE:

Header reel motor hose routing must be properly configured before attaching the header to a windrower. The header is factory-configured for M150, M155, M155E4, and M200 Windrowers. For M100, M105, or M205 Windrowers, refer to:

- [3.12.1 Attaching to M100 or M105, page 25](#)
- [3.12.4 Attaching to M205, page 41](#)

3.12.1 Attaching to M100 or M105



CAUTION

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

M100 and M105 Self-Propelled Windrowers are factory-equipped with four header drive hoses on the left-hand side (A).



Figure 3.37: Header Drive Hoses

ASSEMBLING THE MACHINE

1. Disengage rubber latch (A) and open driveline shield (B).

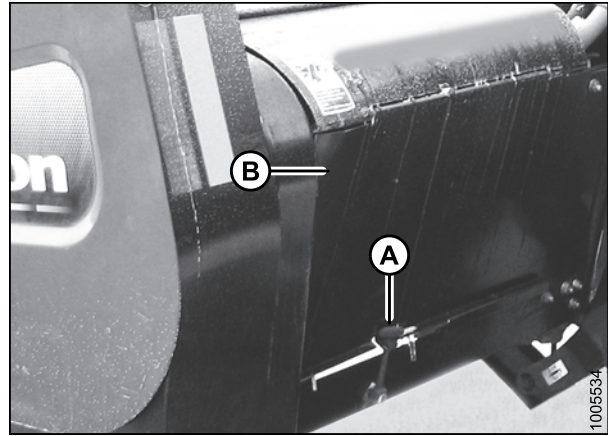


Figure 3.38: Driveline Shield

2. Remove the cap (A) from electrical connector and remove connector from support bracket.
3. Disengage and rotate lever (B) counterclockwise to fully up position to release the hose bundle (C).

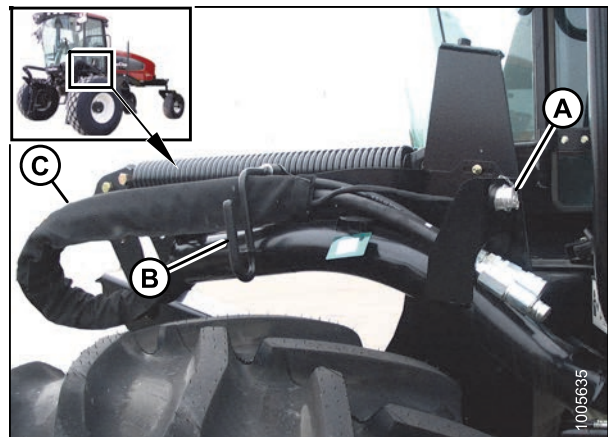


Figure 3.39: Support Bracket and Hose Bundle

4. Move hose/electrical bundle (A) to header.
5. Route bundle (A) from windrower through support (B) and access hole (C) in header frame alongside existing hose bundle (D) from header.
6. Remove cover on header electrical receptacle (E).
7. Push connector onto receptacle and turn collar on connector to lock it in place.
8. Attach cover to mating cover on windrower wiring harness.
9. Remove caps from hydraulic couplers. Clean if necessary.

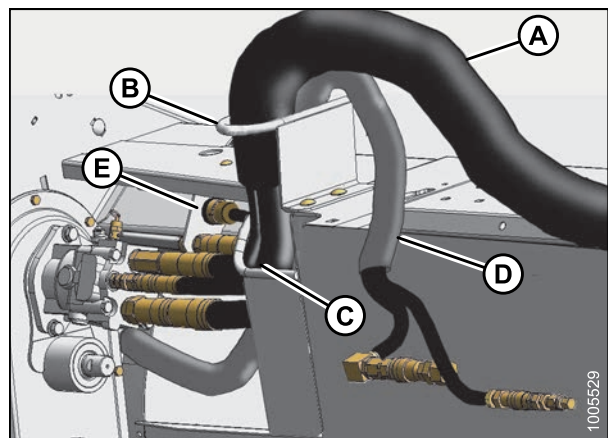


Figure 3.40: Hose and Electrical Bundle – 14-Ft. and 16-Ft. Header Shown (18-Ft. Similar)

ASSEMBLING THE MACHINE

NOTE:

At location (C), later-built 2015 will have a “tee” going to case drain on square reel motor only.

10. Push hose connectors onto mating receptacles as shown until collars on receptacles snap into lock position.

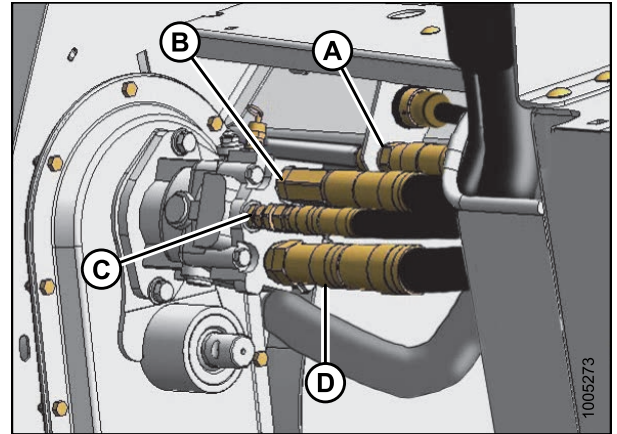


Figure 3.41: Early-Build 2015, 2014 and Earlier Standard Header – 14-Ft. and 16-Ft. Header Shown (18-Ft. Similar)

- A - Reel Pressure
- B - Knife and Conditioner Return
- C - Case Drain
- D - Knife and Conditioner Pressure

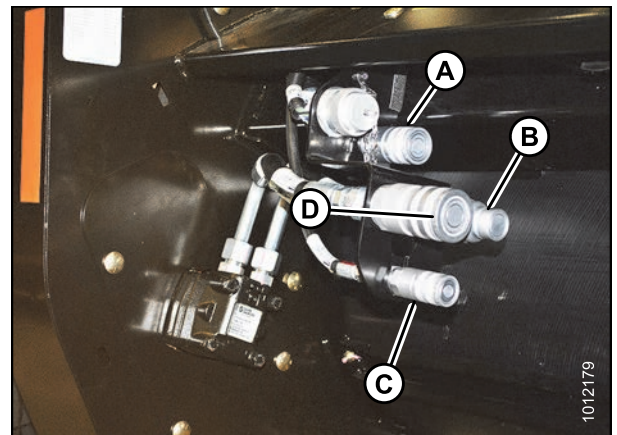


Figure 3.42: 2015 Grass Seed Header Hose Connectors

- A - Reel and Auger Pressure
- B - Knife and Conditioner Return
- C - Case Drain
- D - Knife and Conditioner Pressure

ASSEMBLING THE MACHINE

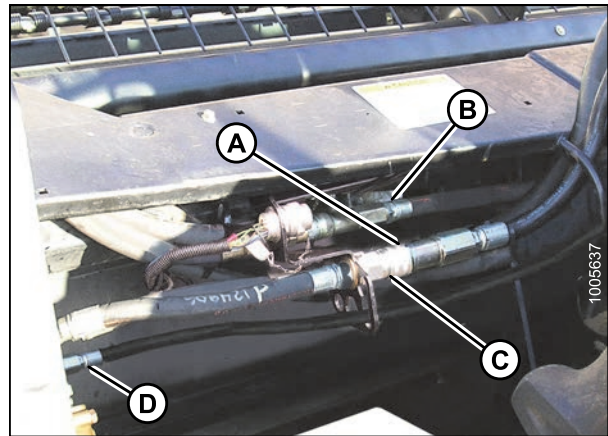


Figure 3.43: 2014 and Earlier Grass Seed Header

A - Knife Return (Male Fitting at Header) (Hidden in this Image)
B - Auger and Reel Pressure
C - Knife Pressure (Female Fitting at Header)
D - Case Drain

11. Route auger return and reel pressure hose bundle (A) from header to windrower, and position bundle above existing hose support (C) as shown.
12. Secure with three straps (D), and lower lever (B).

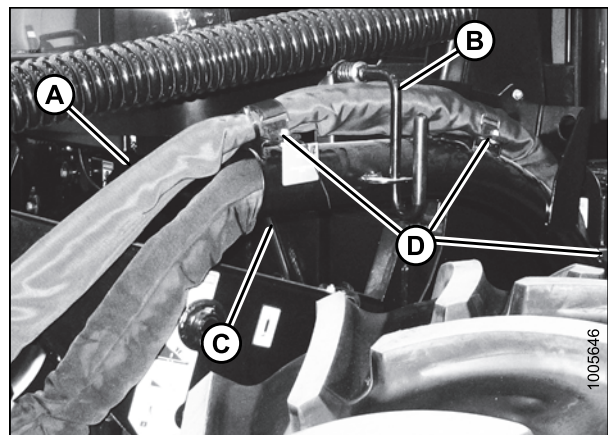


Figure 3.44: Auger Return and Reel Pressure Hose Bundle

13. If valve blocks are **NOT** configured as shown (A), refer to [3.13.1 Modifying Hydraulics – M100, M105, page 47](#).

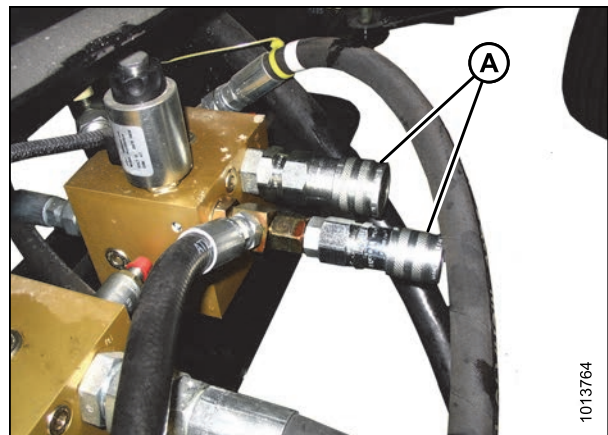


Figure 3.45: Valve Block Configuration

ASSEMBLING THE MACHINE

14. Push auger/reel pressure (A) and auger/reel return (B) hose couplers onto mating receptacles on valve block until collar on receptacle snaps into lock position.

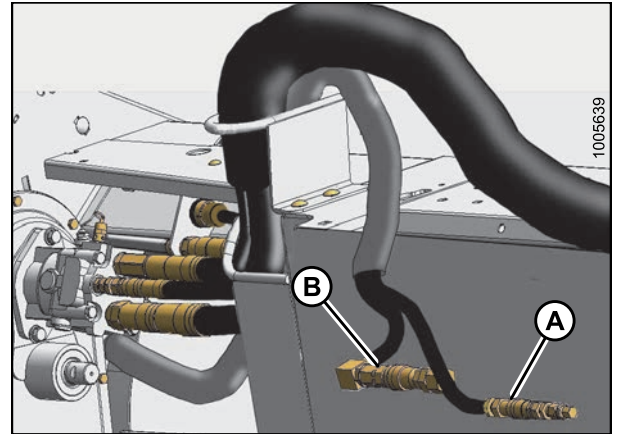


Figure 3.46: Auger/Reel Pressure and Auger/Reel Return Hose Couplers – 14-Ft. and 16-Ft. Header Shown (18-Ft. Similar)

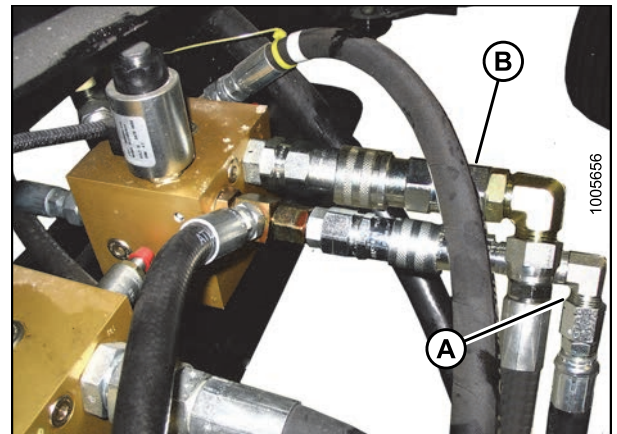


Figure 3.47: Auger/Reel Pressure and Auger/Reel Return Valve Block Receptacles

15. Open header left driveshield and check hose routing at the reel motor.

NOTE:

Reel drive motor may not be exactly as shown. Later-build 2015 A40-D units have a square reel motor; Early-build 2015 A40-D (and 2014 and earlier units) have a round reel motor. The image at the right shows a square reel motor and so is a later-build model.

The hose routing depends on which windrower model the header is being attached to. The header is factory-configured for M150, M155, and M200 Windrowers.

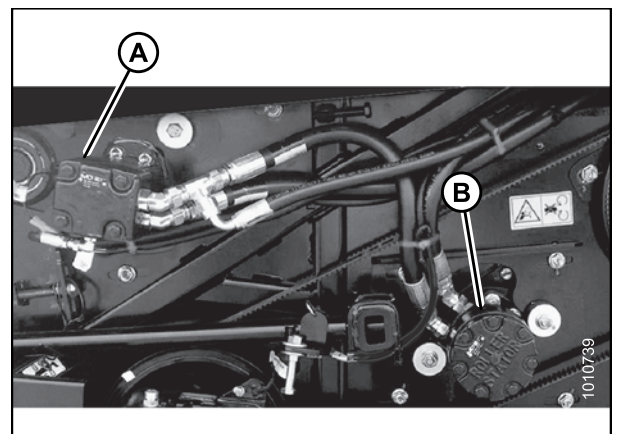


Figure 3.48: Factory Routing M150, M155, and M200 – Later-Build 2015 shown

A - Reel Motor

B - Auger Motor

ASSEMBLING THE MACHINE

16. For procedure to change hose routing for M100 or M105 Windrowers, refer to the section based on the year of manufacture:

- Later-build 2015: [3.16 Hydraulic Drive Hose Routing \(Later-Build 2015 A40-D Units Only\)](#), page 62
- Early-build 2015, 2014 and earlier: [3.17 Hydraulic Drive Hose Routing \(Early-Build 2015, 2014 and Earlier A40-D\)](#), page 67

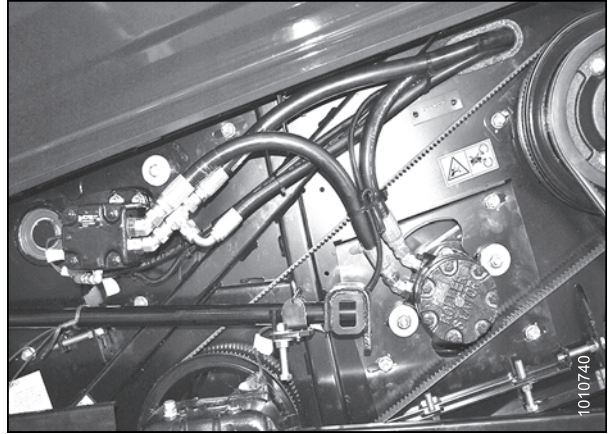


Figure 3.49: Modified Routing M100, M105, and M205 – Later-Build 2015 shown

3.12.2 Attaching to M150, M155, or M155E4

CAUTION

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

M150, M155, and M155E4 self-propelled windrowers are factory-equipped with four header drive hoses on the left-hand side (A).



Figure 3.50: Header Drive Hoses

ASSEMBLING THE MACHINE

1. Disengage rubber latch (A) and open driveline shield (B).

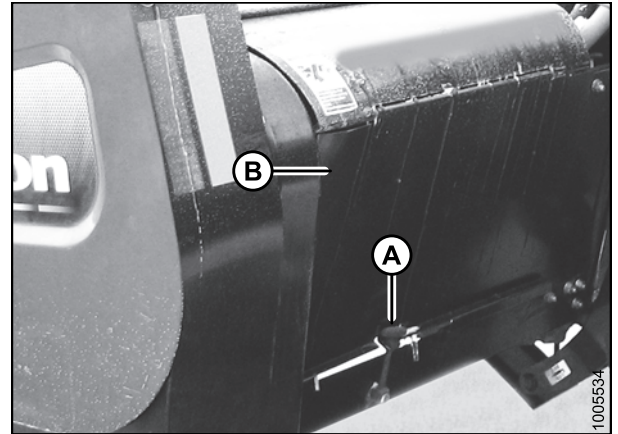


Figure 3.51: Driveline Shield

2. Remove the cap (A) from electrical connector and remove connector from support bracket.
3. Disengage and rotate lever (B) counterclockwise to fully up position to release the hose bundle (C).

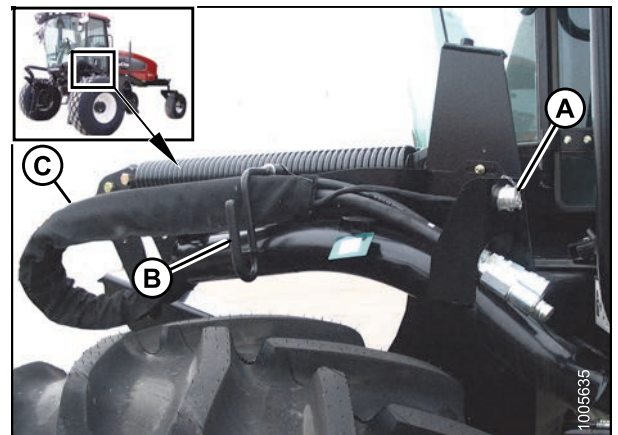


Figure 3.52: Support Bracket and Hose Bundle

4. Move hose/electrical bundle (A) to header.
5. Route bundle (A) from windrower through support (B) and access hole (C) in header frame alongside existing hose bundle (D) from header.
6. Remove cover on header electrical receptacle (E).
7. Push connector onto receptacle and turn collar on connector to lock it in place.
8. Attach cover to mating cover on windrower wiring harness.
9. Remove caps from hydraulic couplers. Clean if necessary.

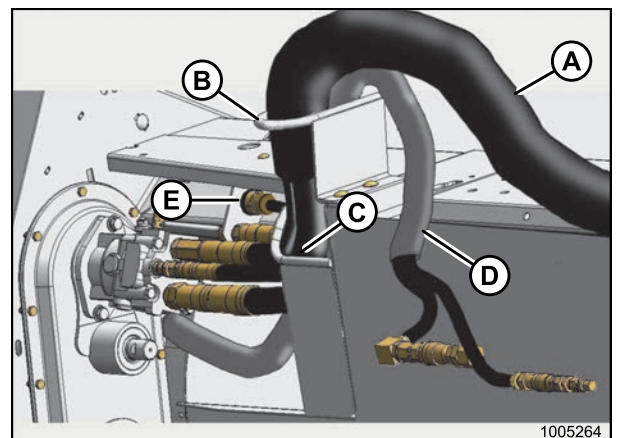


Figure 3.53: Hose and Electrical Bundle – 14-Ft. and 16-Ft. Header Shown (18-Ft. Similar)

ASSEMBLING THE MACHINE

NOTE:

At location (C), later-built 2015 will have a “tee” going to case drain on square reel motor only.

10. Push hose connectors onto mating receptacles as shown until collars on receptacles snap into lock position.

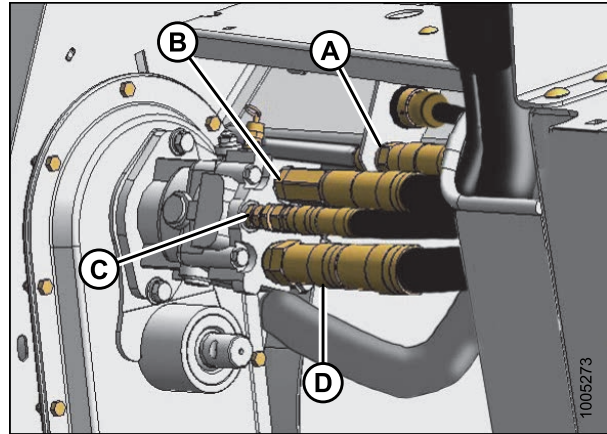


Figure 3.54: Early-Build 2015, 2014 and Earlier Standard Header – 14-Ft. and 16-Ft. Header Shown (18-Ft. Similar)

- A - Reel and Auger Pressure
- B - Knife and Conditioner Return
- C - Case Drain
- D - Knife and Conditioner Pressure

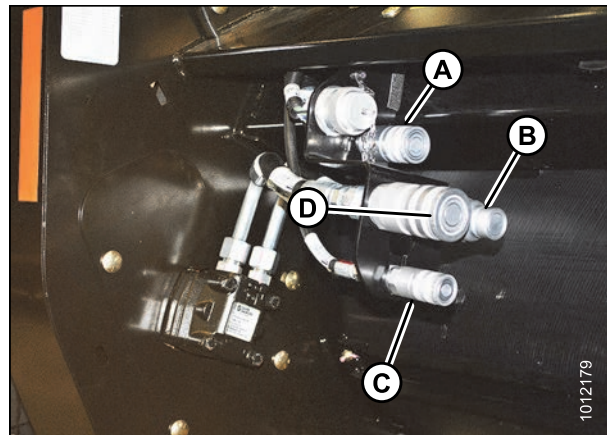


Figure 3.55: 2015 Grass Seed Header Hose Connectors

- A - Reel and Auger Pressure
- B - Knife and Conditioner Return
- C - Case Drain
- D - Knife and Conditioner Pressure

ASSEMBLING THE MACHINE

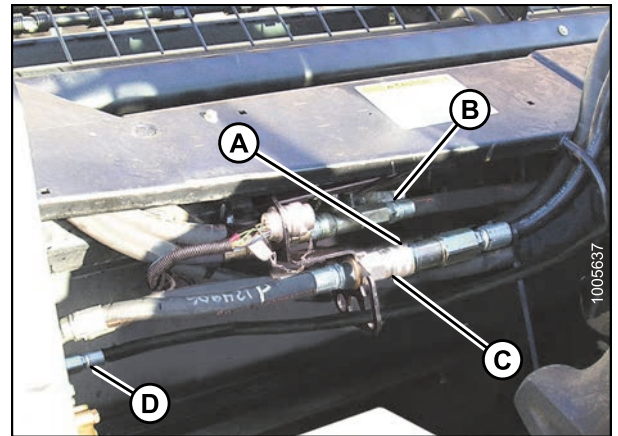


Figure 3.56: 2014 and Earlier Grass Seed Header

A - Knife Return (Male Fitting at Header) (Hidden in this Image)
B - Auger and Reel Pressure
C - Knife Pressure (Female Fitting at Header)
D - Case Drain

11. Route auger return and reel pressure hose bundle (A) from header to windrower and position bundle above existing hose support (C) as shown.
12. Secure with three straps (D), and lower lever (B).

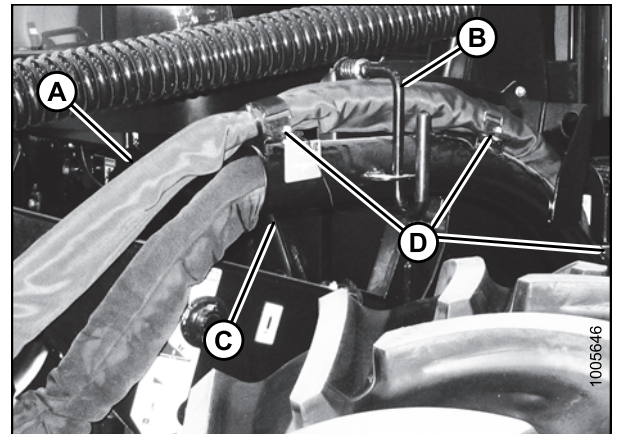


Figure 3.57: Auger Return and Reel Pressure Hose Bundle

13. If valve blocks are **NOT** configured as shown at right, refer to [3.13.2 Modifying Hydraulics – M150, M155, M155E4, page 49](#).

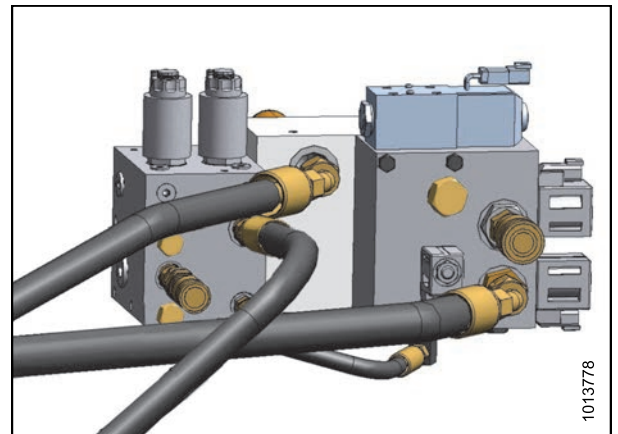


Figure 3.58: M150/M155/M155E4 with Reverser Valve

ASSEMBLING THE MACHINE

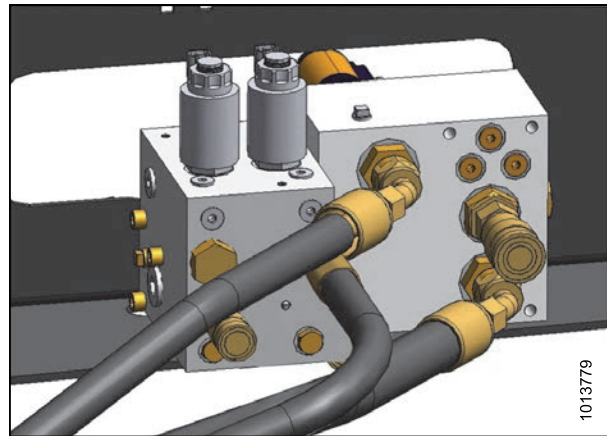


Figure 3.59: M150/M155/M155E4 without Reverser Valve

14. Locate the auger pressure (A) and auger/reel return (B) hoses.

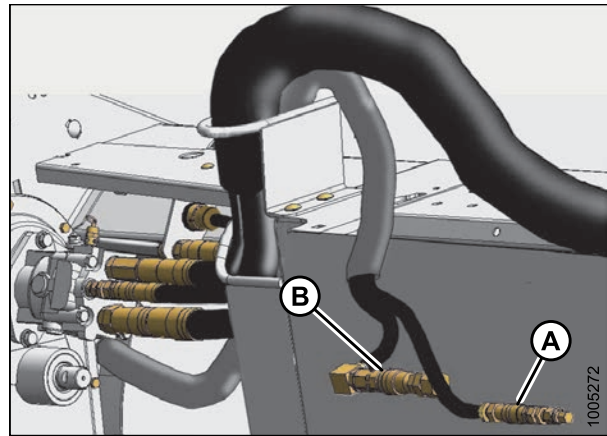


Figure 3.60: Auger Pressure and Auger/Reel Return Hose Couplers – 14-Ft. and 16-Ft. Header Shown (18-Ft. Similar)

15. Push auger pressure (A) and auger/reel return (B) hose couplers onto mating receptacles on valve block until collar on receptacle snaps into lock position.
16. Proceed to [3.14 Routing Reverser Valve Jumper Hose](#), page 55.

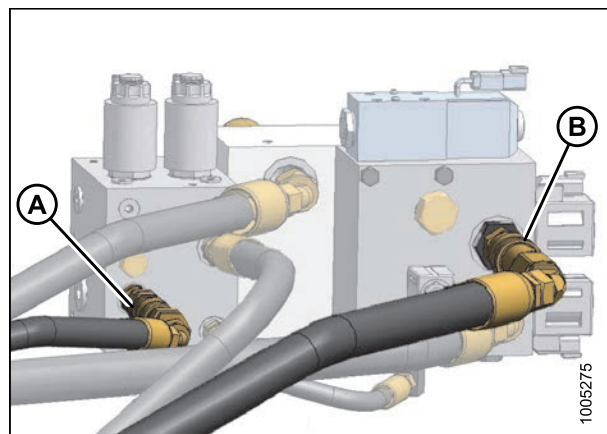


Figure 3.61: M150/M155/M155E4 with Reverser Valve

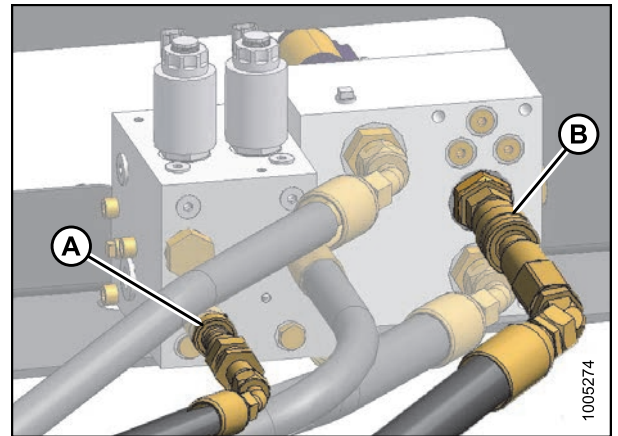


Figure 3.62: M150/M155/M155E4 without Reverser Valve

3.12.3 Attaching to M200

CAUTION

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

The M200 Windrower requires four drive hoses (A) to run an A40-D Auger Header.

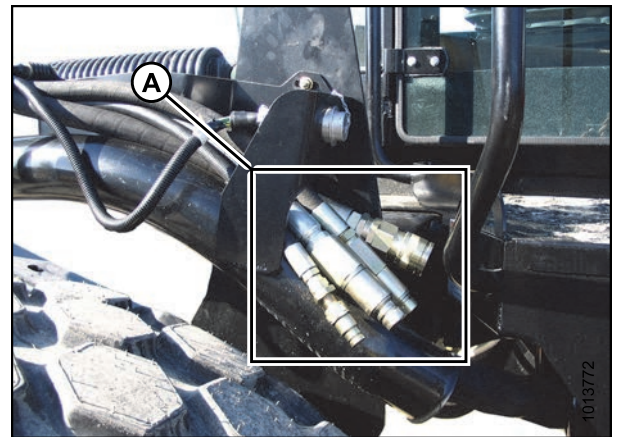


Figure 3.63: Drive Hoses

ASSEMBLING THE MACHINE

If only three drive hoses are present, before following the procedure below, configure the M200 to run an A40-D Auger Header by installing kit MD #B4651. The kit includes an additional hose (A), hardware, and installation instructions.

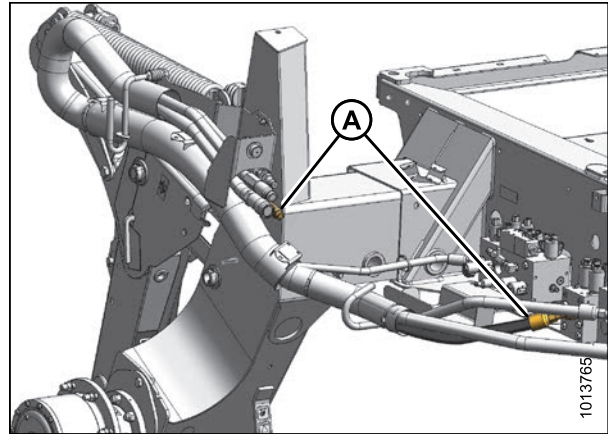


Figure 3.64: Kit MD #B4651

1. Disengage rubber latch (A), and open driveline shield (B).

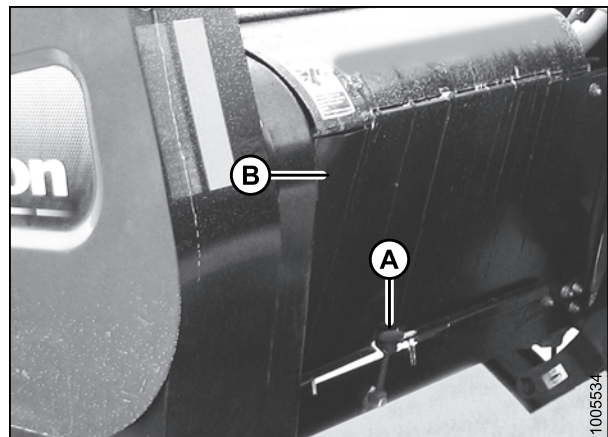


Figure 3.65: Driveline Shield

2. Remove cap (A) from electrical connector, and remove connector from support bracket.
3. Disengage and rotate lever (B) counterclockwise to fully up position to release the hose bundle (C).

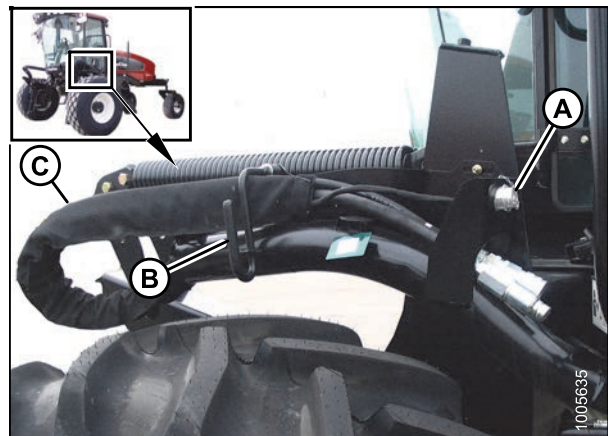


Figure 3.66: Support Bracket and Hose Bundle

ASSEMBLING THE MACHINE

4. Move hose/electrical bundle (A) to header.
5. Route bundle (A) from windrower through support (B) and access hole (C) in header frame alongside existing hose bundle (D) from header.
6. Remove cover on header electrical receptacle (E).
7. Push connector onto receptacle, and turn collar on connector to lock it in place.
8. Attach cover to mating cover on windrower wiring harness.
9. Remove caps from hydraulic couplers. Clean if necessary.

NOTE:

At location (C), later-build 2015 units will have a “tee” going to case drain on square reel motor only.

10. Push hose connectors onto mating receptacles as shown until collars on receptacles snap into lock position.

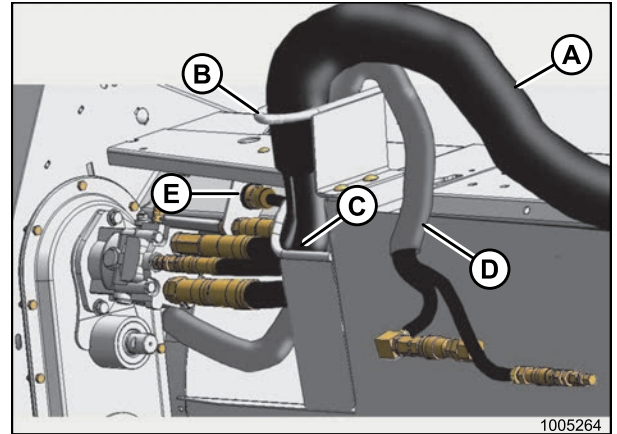


Figure 3.67: Hose and Electrical Bundle – 14-Ft. and 16-Ft. Header Shown (18-Ft. Similar)

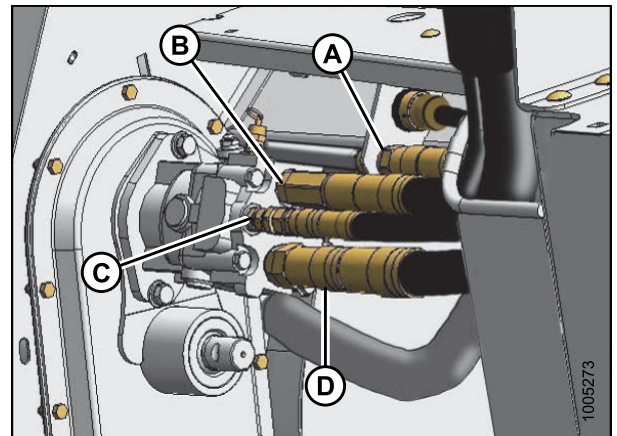


Figure 3.68: Early-Build 2015, 2014, and Earlier Standard Header – 14-Ft. and 16-Ft. Header Shown (18-Ft. Similar)

A - Reel and Auger Pressure
B - Knife and Conditioner Return
C - Case Drain
D - Knife and Conditioner Pressure

ASSEMBLING THE MACHINE

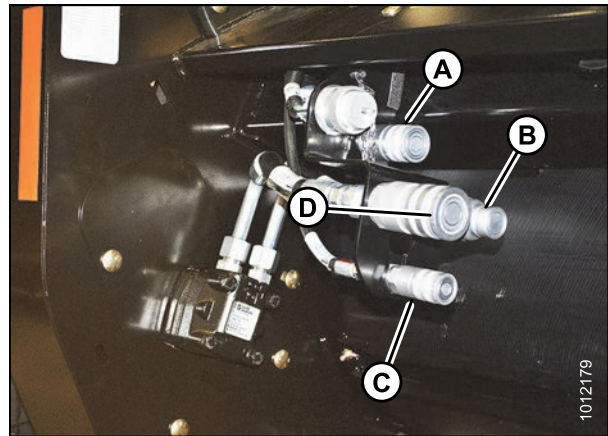


Figure 3.69: 2015 Grass Seed Header Hose Connectors

- A - Reel and Auger Pressure
- B - Knife and Conditioner Return
- C - Case Drain
- D - Knife and Conditioner Pressure

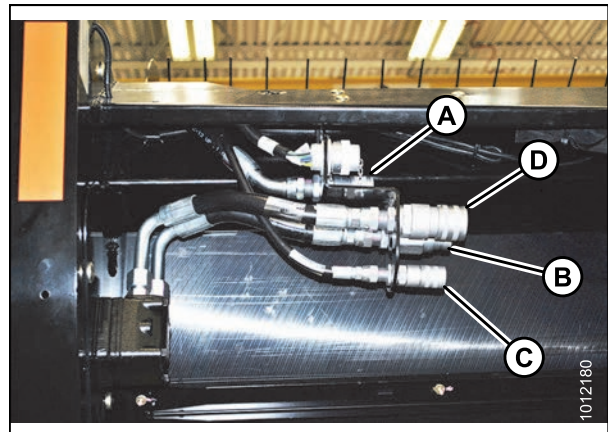


Figure 3.70: 2015 Grass Seed Header Hose Connectors Side View

ASSEMBLING THE MACHINE

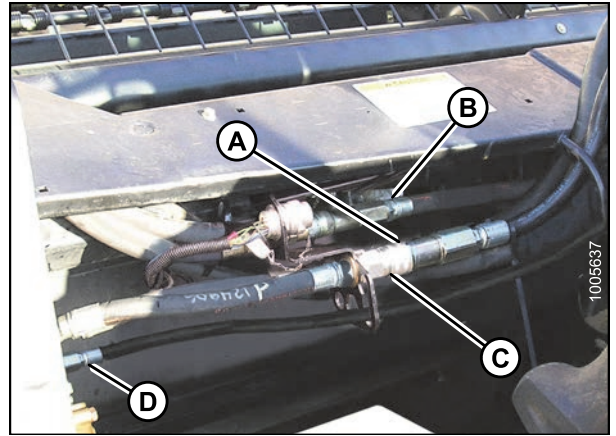


Figure 3.71: 2014 and Earlier Grass Seed Header

A - Knife Return (Male Fitting at Header) (Hidden in This Image)
B - Auger and Reel Pressure
C - Knife Pressure (Female Fitting at Header)
D - Case Drain

11. Route auger return and reel pressure hose bundle (A) from header to windrower, and position bundle above existing hose support (C) as shown.
12. Secure with three straps (D), and lower lever (B).

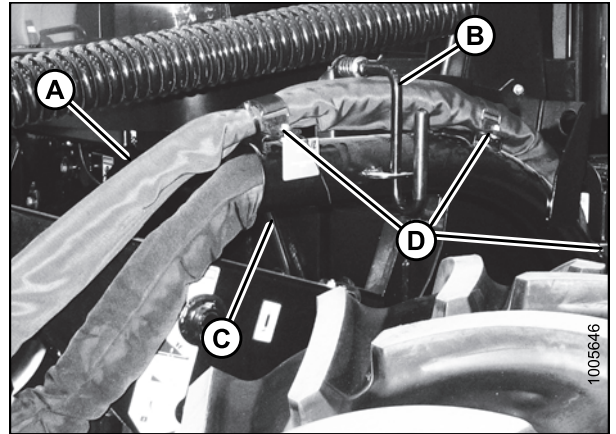


Figure 3.72: Auger Return and Reel Pressure Hose Bundle

ASSEMBLING THE MACHINE

13. If valve blocks are **NOT** configured as shown at right, refer to relevant section for your windrower:

- [3.13.3 Modifying Hydraulics – M200 with Reverser Valve, page 51](#)
- [3.13.4 Modifying Hydraulics – M200 without Reverser Valve, page 52](#)

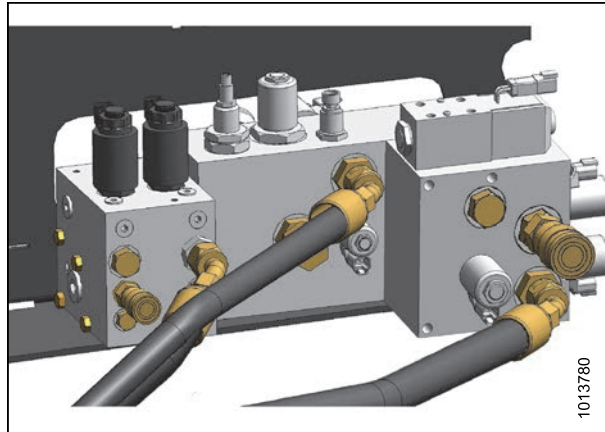


Figure 3.73: M200 with Reverser Valve

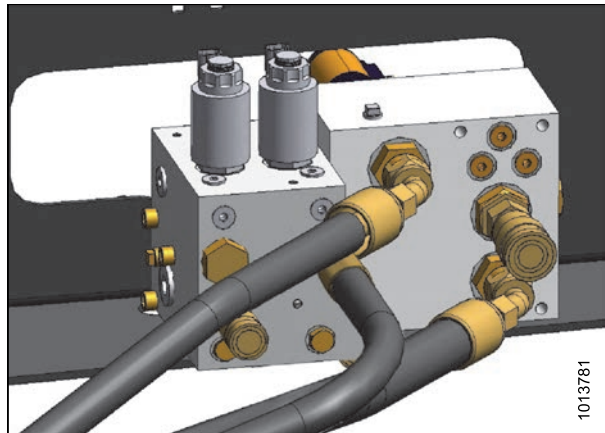


Figure 3.74: M200 without Reverser Valve

14. Locate the auger pressure (A) and auger/reel return (B) hoses.

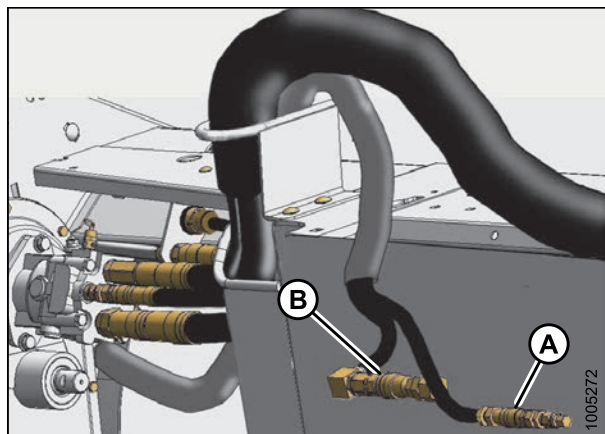


Figure 3.75: Auger Pressure and Auger/Reel Return Hose Couplers – 14-Ft. and 16-Ft. Header Shown (18-Ft. Similar)

ASSEMBLING THE MACHINE

15. Push auger pressure (A) and auger/reel return (B) hose couplers onto mating receptacles on valve block until collar on receptacle snaps into lock position.
16. Proceed to [3.14 Routing Reverser Valve Jumper Hose](#), [page 55](#).

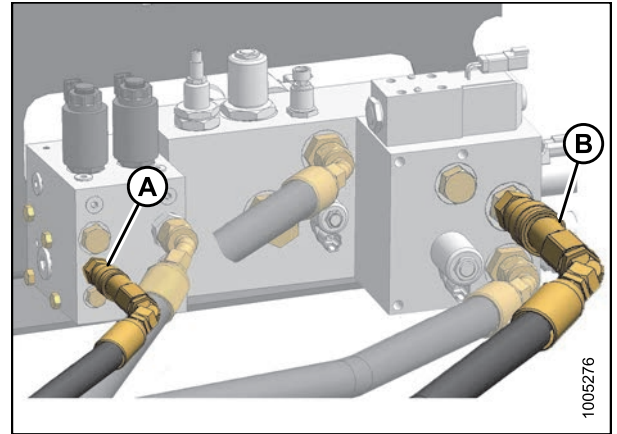


Figure 3.76: M200 with Reverser Valve

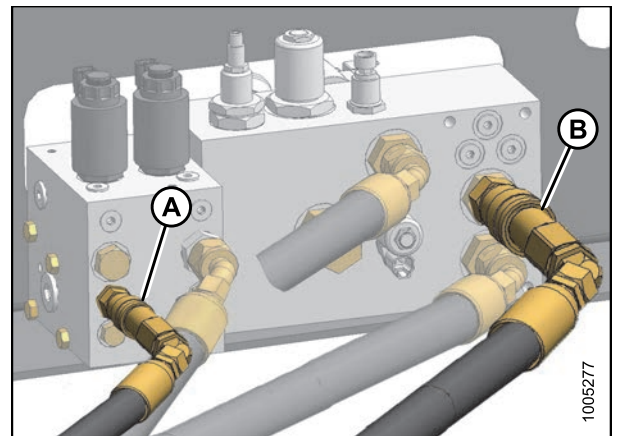


Figure 3.77: M200 without Reverser Valve

3.12.4 Attaching to M205

CAUTION

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

ASSEMBLING THE MACHINE

The M205 Windrower must be equipped with an auger drive basic kit and a completion kit as shown at right. If necessary, obtain the following kits from your MacDon Dealer and install them in accordance with the instructions supplied with the kits.

Kit Description	MacDon Part Number
Base kit	MD #B5491
Reverser kit ²	MD #B5492
Coupler	MD #B5497

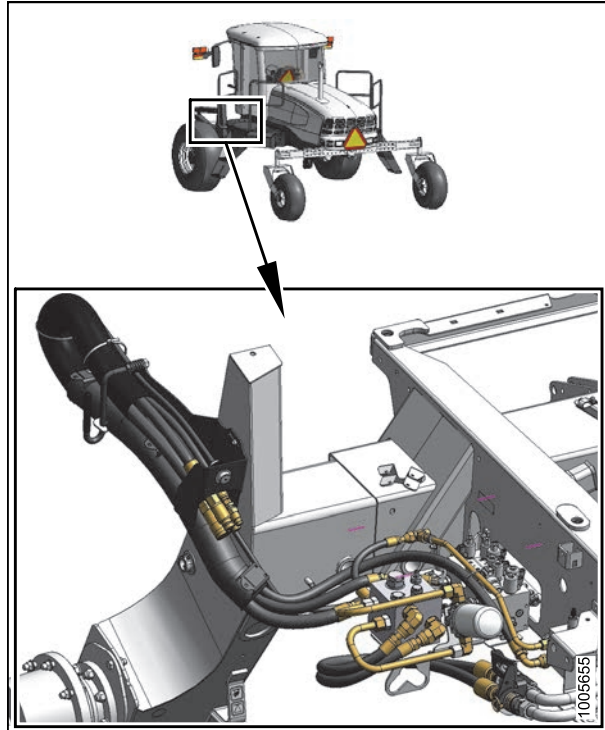


Figure 3.78: Auger Drive Basic Kit and Completion Kit Installed

1. Disengage rubber latch (A), and open driveline shield (B).

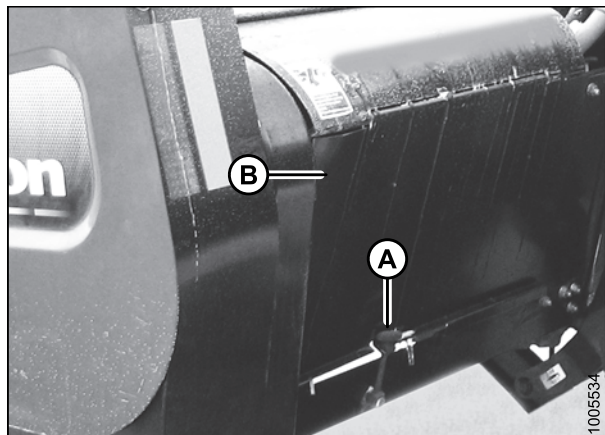


Figure 3.79: Driveline Shield

2. Reverser kit is optional and not required, although most A40-D Headers have a Reverser kit (MD #B5492) ordered for the windrower. Check with your Dealer, and install prior to hook-up if required.

ASSEMBLING THE MACHINE

2. Remove cap (A) from the electrical connector, and remove the connector from the support bracket.
3. Disengage and rotate lever (B) counterclockwise to fully up position to release the hose bundle (C).
4. Move hose/electrical bundle (C) to header.

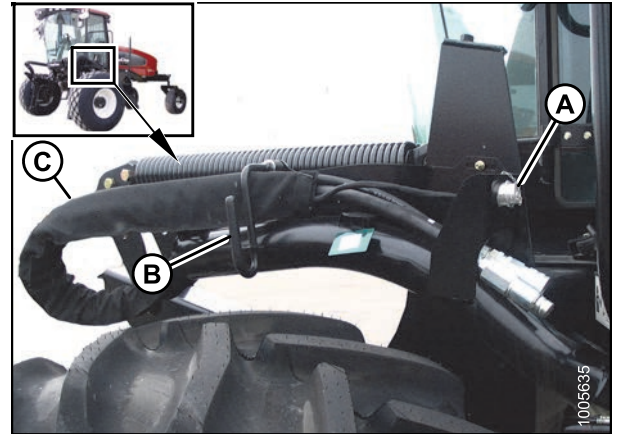


Figure 3.80: Support Bracket and Hose Bundle

5. Route bundle (A) from windrower through support (B) and access hole (C) in header frame alongside existing hose bundle (D) from header.
6. Remove cover on header electrical receptacle (E).
7. Push connector onto receptacle, and turn collar on connector to lock it in place.
8. Attach cover to mating cover on windrower wiring harness.
9. Remove caps from hydraulic couplers. Clean if necessary.

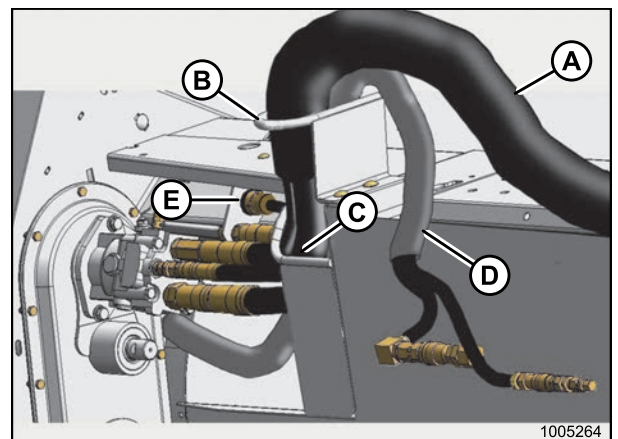


Figure 3.81: Hose and Electrical Bundle – 14-ft. and 16-Ft. Header Shown (18-Ft. Similar)

NOTE:

At location (C), later-build 2015 units will have a “tee” going to case drain on square reel motor only.

10. Push hose connectors onto mating receptacles as shown until collars on receptacles snap into lock position.

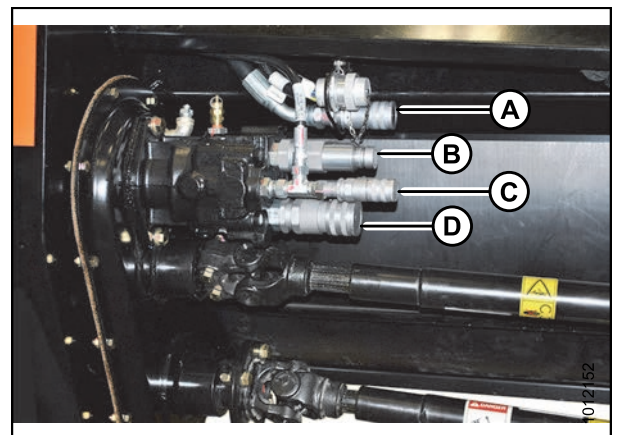


Figure 3.82: Early-Build 2015, 2014 and Earlier Standard Header – 14-Ft. and 16-Ft. Header Shown (18-Ft. Similar)

A - Reel/Auger Pressure
C - Case Drain

B - Knife and Conditioner Return
D - Knife and Conditioner Pressure

ASSEMBLING THE MACHINE

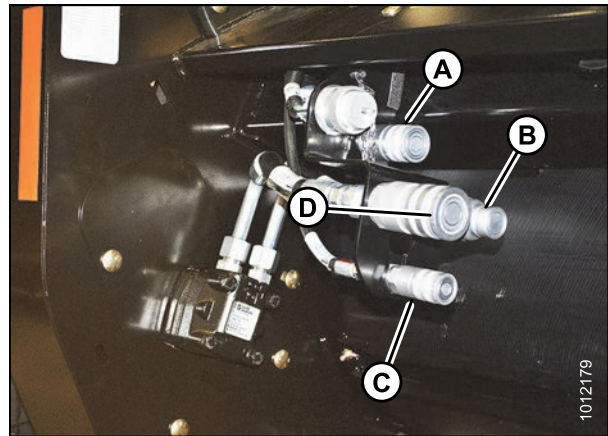


Figure 3.83: 2015 Grass Seed Header Hose Connectors

- A - Reel and Auger Pressure
- B - Knife and Conditioner Return
- C - Case Drain
- D - Knife and Conditioner Pressure

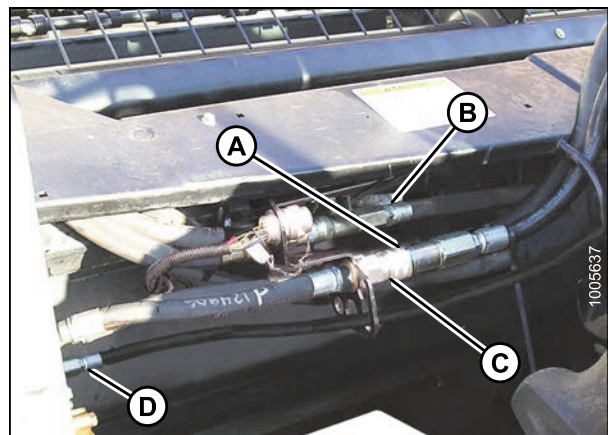


Figure 3.84: 2014 and Earlier Grass Seed Header

- A - Knife Return (Male Fitting at Header) (Hidden in this Image)
- B - Auger and Reel Pressure
- C - Knife Pressure (Female Fitting at Header)
- D - Case Drain

ASSEMBLING THE MACHINE

11. Route auger return and reel pressure hose bundle (A) from header to windrower, and position bundle above existing hose support (C) as shown.
12. Secure with three straps (D), and lower lever (B).

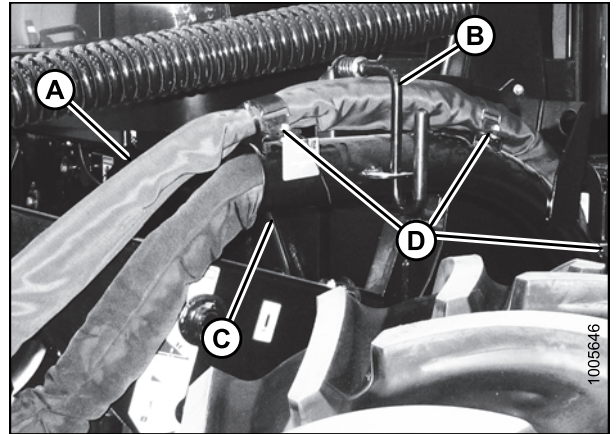


Figure 3.85: Auger Return and Reel Pressure Hose Bundle

13. Push auger/reel pressure (A) and auger/reel return (B) hose couplers onto mating receptacles on valve block until collar on receptacle snaps into lock position.

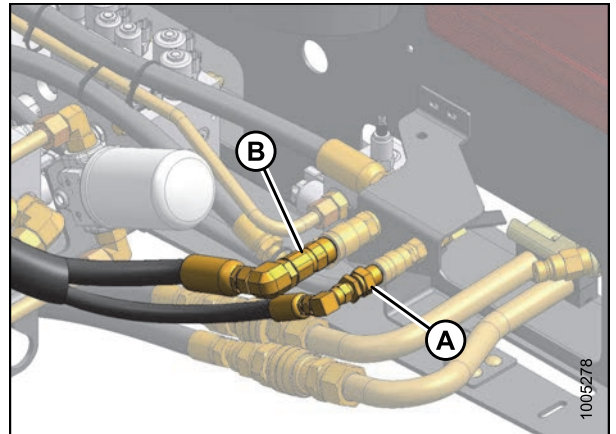


Figure 3.86: Auger/Reel Pressure and Auger/Reel Return Hose Couplers

14. Check hose routing at the reel motor (A). The hose routing depends on which windrower model the header is being attached to. The header is factory-configured for M150, M155, M155E4, and M200 Windrowers.

NOTE:

Reel drive motor may not be exactly as shown.

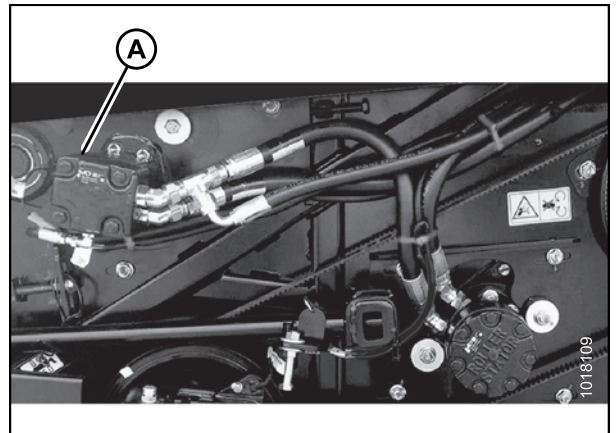


Figure 3.87: Later-build 2015 Factory Routing M150, M155, M155E4, and M200

ASSEMBLING THE MACHINE

15. For the procedure to change hose routing for M205 Windrowers, refer to the section based on the year of manufacture:

- Later-build 2015: [3.16 Hydraulic Drive Hose Routing \(Later-Build 2015 A40-D Units Only\)](#), page 62
- Early-build 2015, 2014 and earlier: [3.17 Hydraulic Drive Hose Routing \(Early-Build 2015, 2014 and Earlier A40-D\)](#), page 67.

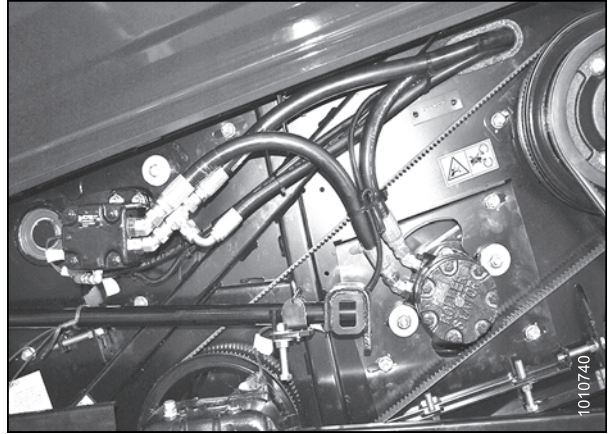


Figure 3.88: Modified Routing M100, M105, and M205

3.13 Modifying Hydraulics

The windrower hydraulics must be modified to work correctly with an A40-D Auger Header. Follow the instructions in the relevant section for your windrower model:

- [3.13.1 Modifying Hydraulics – M100, M105, page 47](#)
- [3.13.2 Modifying Hydraulics – M150, M155, M155E4, page 49](#)
- [3.13.3 Modifying Hydraulics – M200 with Reverser Valve, page 51](#)
- [3.13.4 Modifying Hydraulics – M200 without Reverser Valve, page 52](#)
- [3.13.5 Modifying Hydraulics – M205, page 54](#)

3.13.1 Modifying Hydraulics – M100, M105

1. Open left-hand maintenance platform on windrower.
2. At valve (A) on the valve block, remove cap (B) from port R1 fitting and plug (C) from DWA tee fitting. Ports might **NOT** be identified.

NOTE:

Check valve (D) is required when attaching an A40-D Auger Header to an M100 or M105 Windrowers. All M105 Windrowers made in 2012 and forward come factory-installed with check valve (D). If required, check valve (MD #167344) can be ordered from MacDon Parts Department.

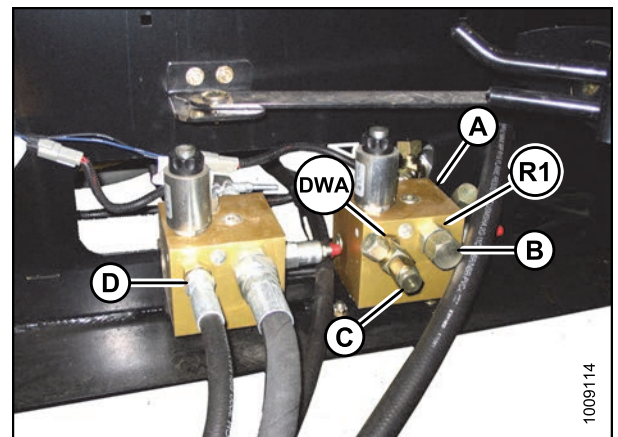


Figure 3.89: Valve Blocks in Factory Configuration

3. Remove female coupler assemblies (A) and (B) from auger return and reel pressure hose bundle (C) from header.

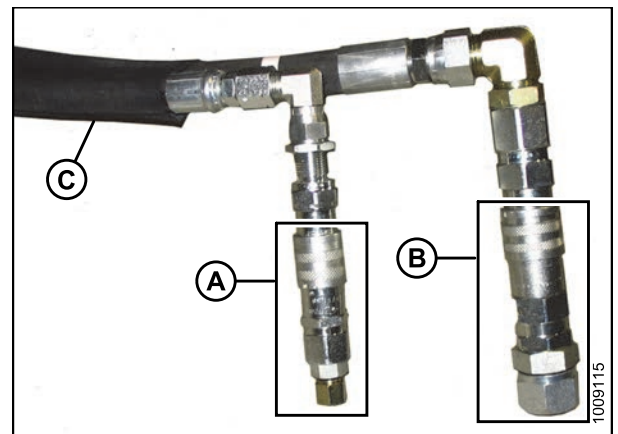


Figure 3.90: Auger Return and Reel Pressure Hose Bundle

ASSEMBLING THE MACHINE

4. Remove and discard cap (C) and adapter fitting (B) with O-ring from the large coupler (A).

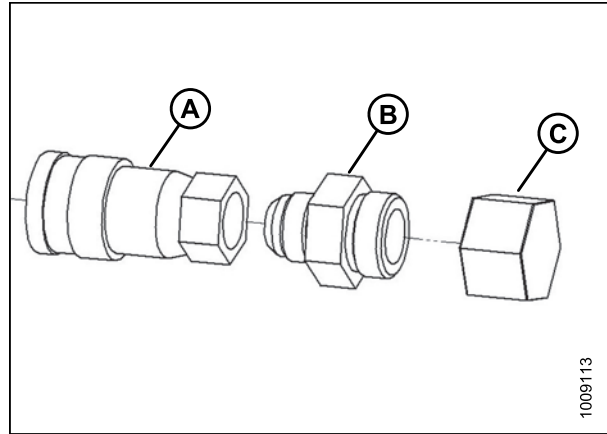


Figure 3.91: Large Coupler Assembly

5. Install large coupler (A) onto fitting at port R1 on valve block (B).

IMPORTANT:

Make sure O-ring is on JIC threads in port R1 to ensure a proper seal with the coupler (A). If O-ring is missing, reuse O-ring from discarded adapter fitting in Step 4., page 48.

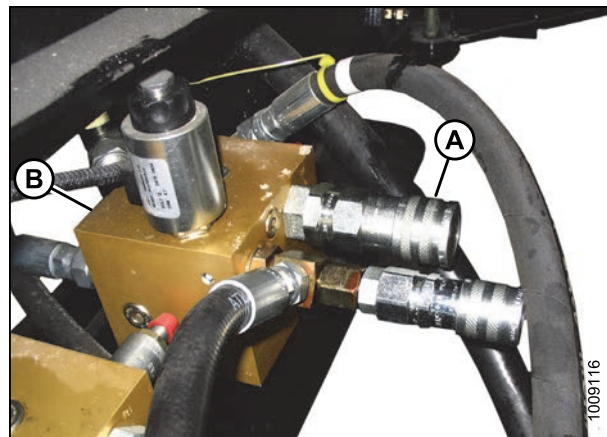


Figure 3.92: Valve Block Configured for Auger Header

6. Remove and discard cap (C) and adapter fitting (B) from the small coupler assembly (A).

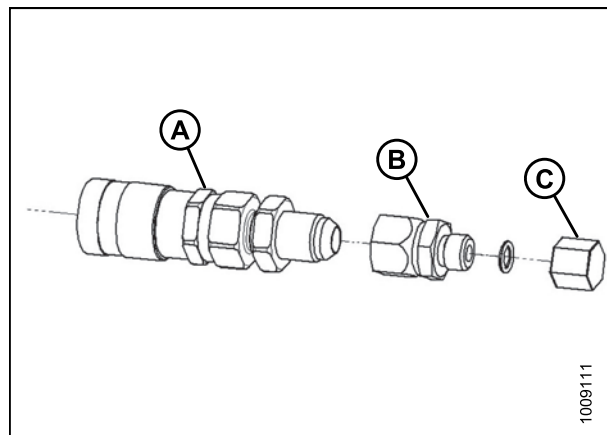


Figure 3.93: Small Coupler Assembly

ASSEMBLING THE MACHINE

7. Install the small coupler subassembly (A) onto the tee (B) on valve block (C).

NOTE:

Position of adjacent hoses may require slight adjustment to allow access for new hoses.

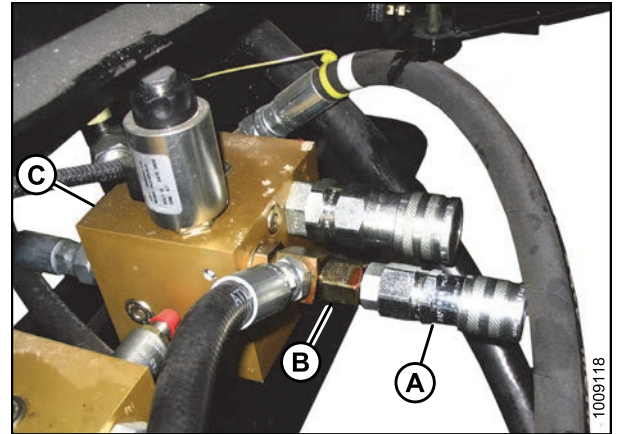


Figure 3.94: Valve Block Configured for Auger Header

3.13.2 Modifying Hydraulics – M150, M155, M155E4

1. Open left-hand maintenance platform on windrower.
2. Remove the plugs from ports R2 on valve blocks (A) and (B). Ports may **NOT** be identified.

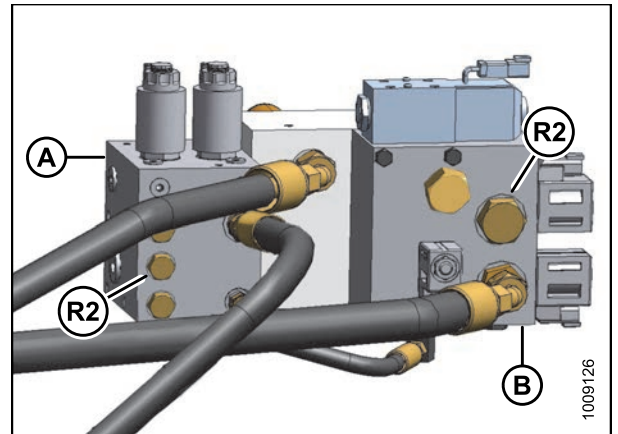


Figure 3.95: Valve Blocks with Reverser Valve in Factory Configuration

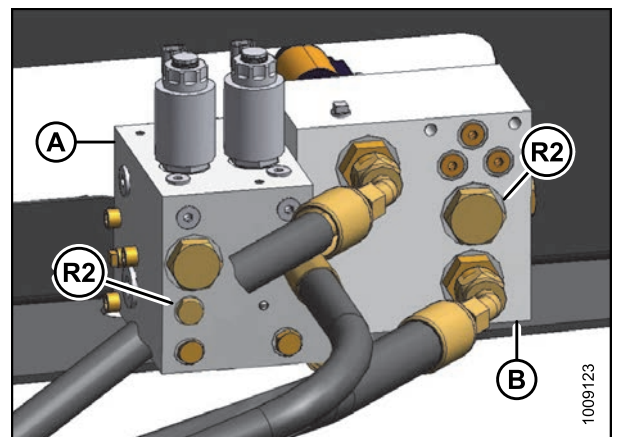


Figure 3.96: Valve Blocks without Reverser Valve in Factory Configuration

ASSEMBLING THE MACHINE

3. Remove female coupler assemblies (A) and (B) from hoses in bundle (C) from header and remove caps.

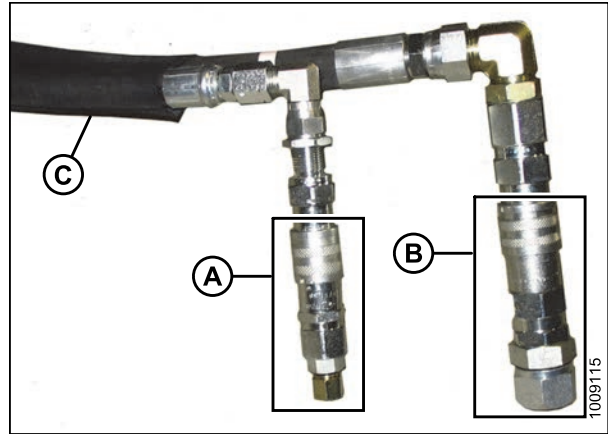


Figure 3.97: Header Hose Bundle

4. Install smaller coupler assembly (C) in port R2 on valve block (A) and the larger coupler assembly (D) in port R2 on valve block (B).
5. Proceed to [3.14 Routing Reverser Valve Jumper Hose](#), [page 55](#).

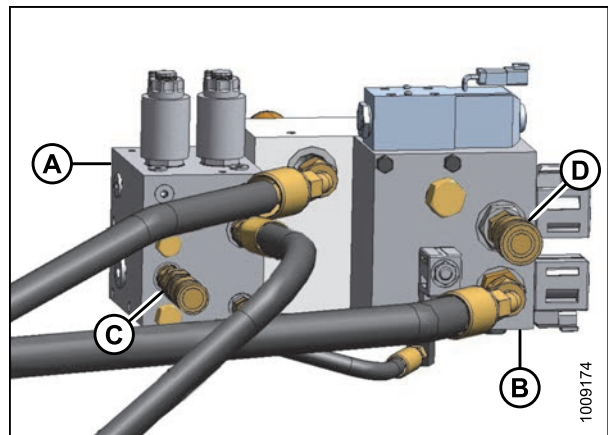


Figure 3.98: Valve Blocks with Reverser Valve Configured for Auger Header

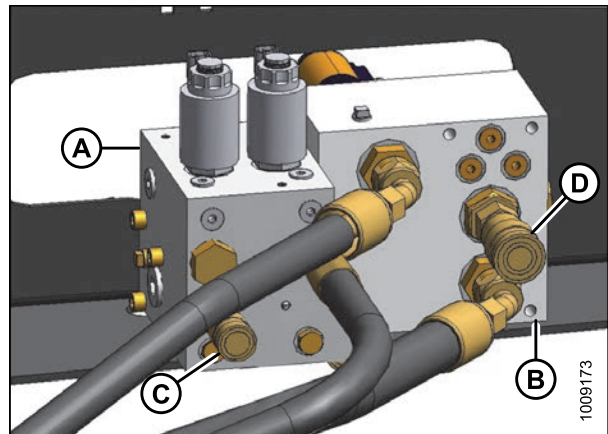


Figure 3.99: Valve Blocks without Reverser Valve Configured for Auger Header

3.13.3 Modifying Hydraulics – M200 with Reverser Valve

IMPORTANT:

For windrowers with Reverser kit **MD #B4656**, hose plumbing to reverser valve must be changed to suit the header type if switching between A40-D Auger Header and draper header to prevent draper header reel damage and improper operation. See instruction MD #169213 (Reverser Kit Installation Instructions) for proper plumbing articles for each header type.

1. Open left-hand maintenance platform on windrower.
2. Remove the plugs from ports R2 on valve blocks (A) and (B).

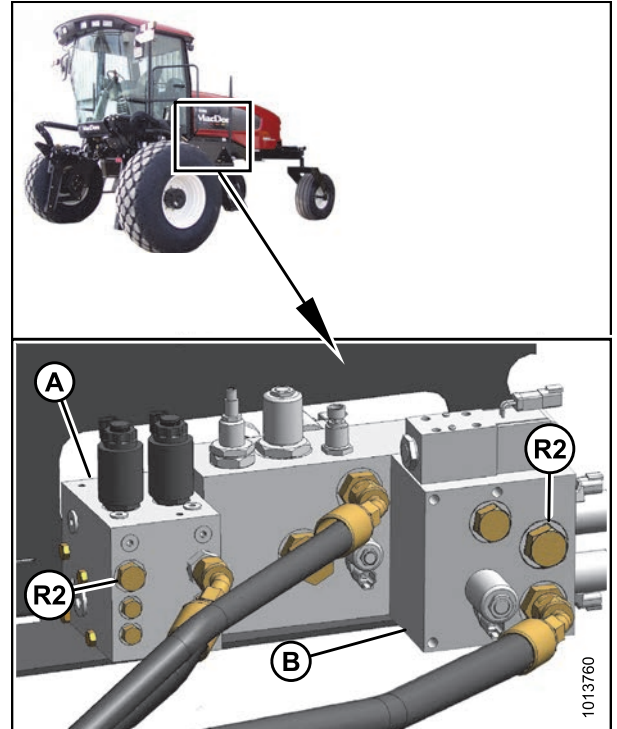


Figure 3.100: Valve Blocks with Reverser Valve in Factory Configuration

3. Remove female coupler assemblies (C) and (D) from hoses in bundle (E) from header, and remove caps.

NOTE:

To avoid contact with platform support, the reel/auger return hose uses a 45 degree fitting (MD #50098).

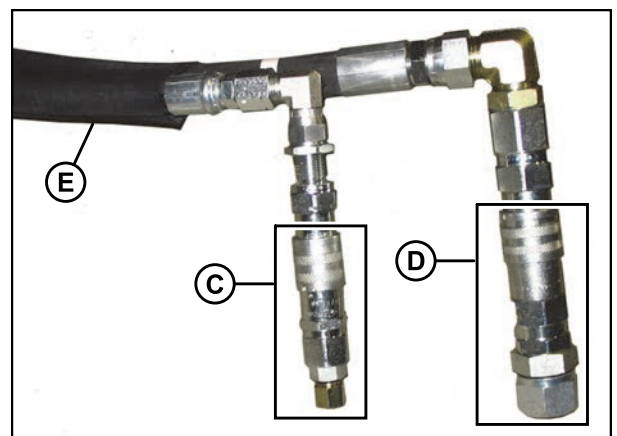


Figure 3.101: Header Hose Bundle

ASSEMBLING THE MACHINE

4. Install smaller coupler assembly (C) in port R2 on valve block (A) and the larger coupler assembly (D) in port R2 on valve block (B).

NOTE:

Position of adjacent hoses may require slight adjustment to allow access for new hoses. Align larger coupler assembly (D) with R1 hose (E).

5. Proceed to [3.14 Routing Reverser Valve Jumper Hose](#), page 55.

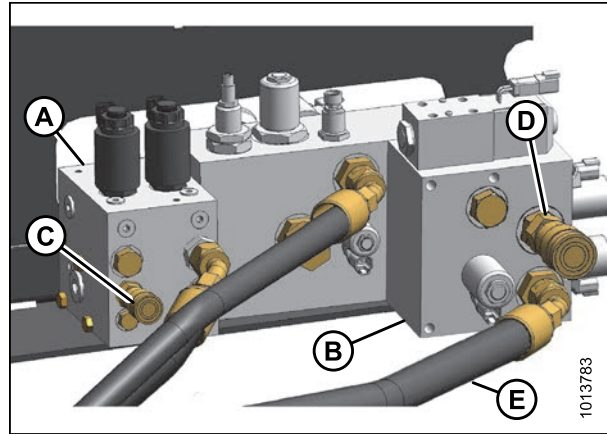


Figure 3.102: Valve Blocks with Reverser Valve Configured for Auger Header

3.13.4 Modifying Hydraulics – M200 without Reverser Valve

1. Open left-hand maintenance platform on windrower.
2. Remove the plug from port R2 on valve block (A) and the cap from fitting in port R2 on valve block (B). Ports may **NOT** be identified.

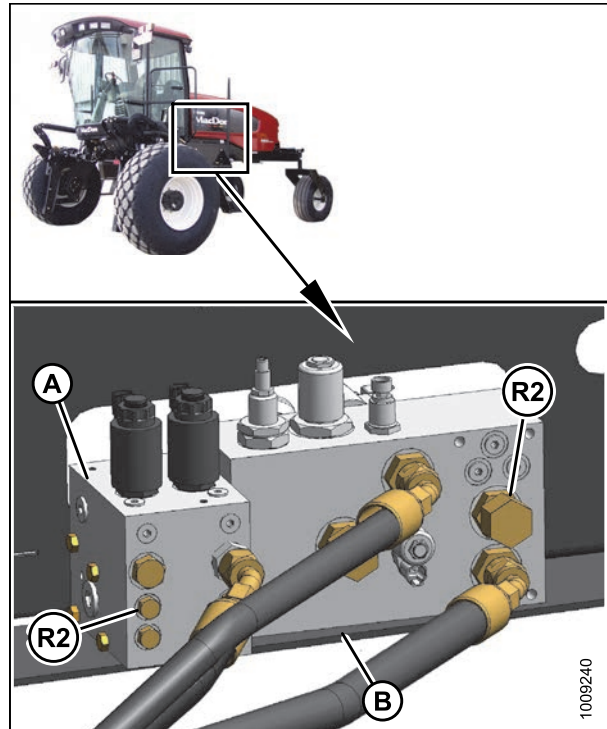


Figure 3.103: Valve Blocks without Reverser Valve in Factory Configuration

ASSEMBLING THE MACHINE

3. Remove female coupler assemblies (C) and (D) from hoses in bundle (E) from header.

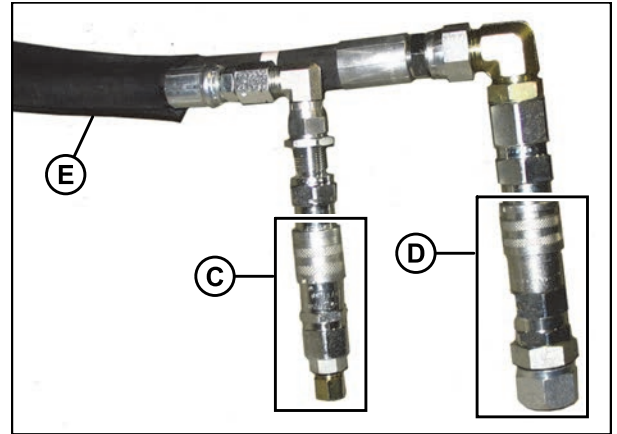


Figure 3.104: Header Hose Bundle (E)

4. Remove and discard the cap (F) and adapter fitting (G) with O-ring from the large coupler (H).

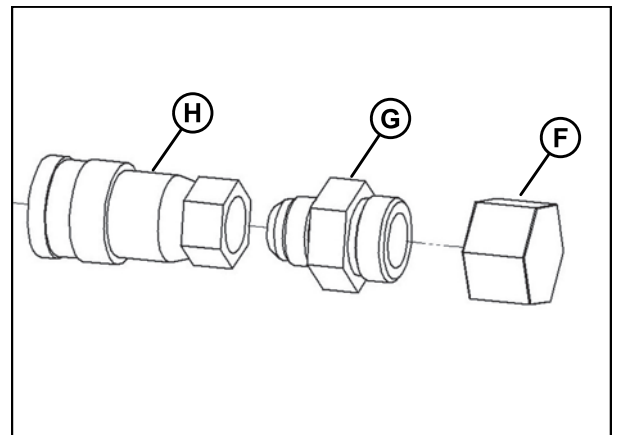


Figure 3.105: Large Coupler Assembly

5. Install larger coupler (H) onto fitting at port R2 on valve block (B).
6. Remove cap from smaller coupler assembly (C) and install assembly in port R2 on valve (A).

IMPORTANT:

Make sure O-ring is on JIC threads in port R1 to ensure a proper seal with the coupler (H). If O-ring is missing, reuse O-ring from discarded adapter fitting in Step 4., page 53.

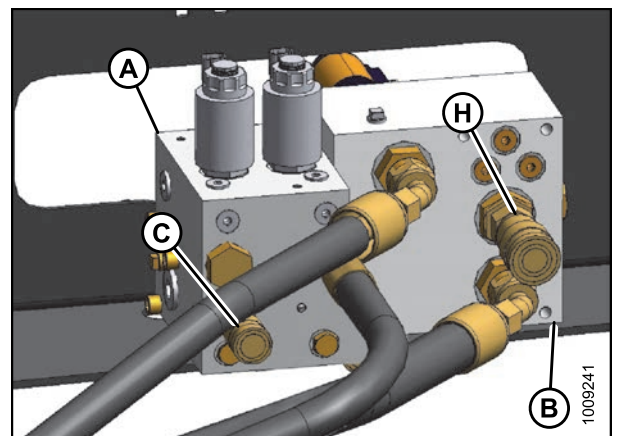


Figure 3.106: Valve Blocks without Reverser Valve Configured for Auger Header

3.13.5 Modifying Hydraulics – M205

The M205 hydraulics need to be modified to accept an A-Series Auger Header. Kits MD #B5491, MD #B5492, and MD #B5497 should have been supplied with your header. If required, the aforementioned kits can be ordered from your MacDon Dealer.

1. Install kits in accordance with the instructions that were supplied with the kits to achieve the configuration shown at right.
2. Proceed to [3.15 Attaching Hydraulics, page 56](#).

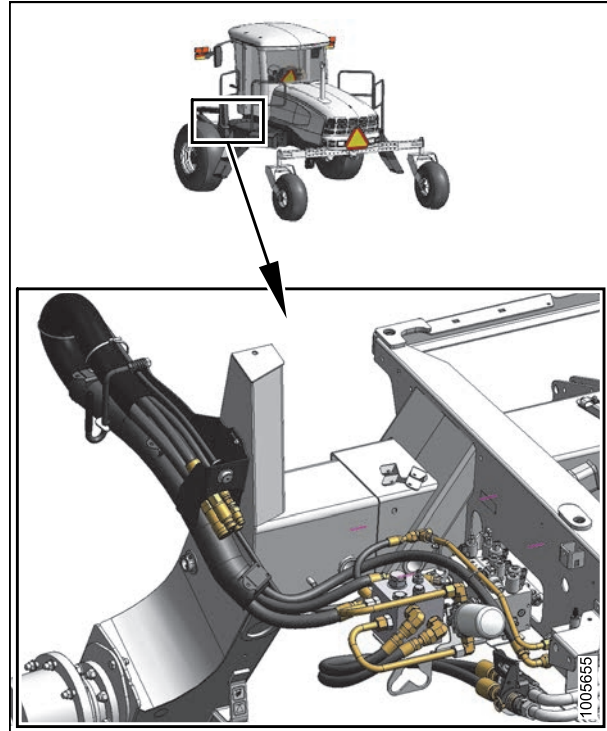


Figure 3.107: Auger Header Hydraulics

3.14 Routing Reverser Valve Jumper Hose

An optional valve block to reverse the header drive in the event of plugging **MAY HAVE BEEN** installed on the M150, M155, M155E4, and M200 windrowers.

If reverser valve block (A) is installed, proceed as follows. Otherwise, disregard this procedure.

IMPORTANT:

A jumper hose on the reverser valve has a specific routing for each model of header. Do **NOT** operate the header unless hose is routed as shown.

1. Move left-hand windrower platform to the open position to expose hydraulic valve blocks.
2. Check the routing of the jumper hose as follows and change as required.
3. Route jumper hose (B) from C2 conveyor circuit (C) to CR on reverser block (A) as shown.

NOTE:

For draper headers, CR is routed to port R4 (as shown in image to the right) on reverser block. Reroute jumper hose (B) when switching between draper and auger headers. This prevents draper header reel damage and improper operation, which occurs if reel runs backwards.

NOTE:

Jumper hose re-routing is unnecessary if hay conditioner is not installed on draper header.

NOTE:

The draper header reverser function is suppressed unless hay conditioner is activated in Windrower Setup using the cab display module (CDM).

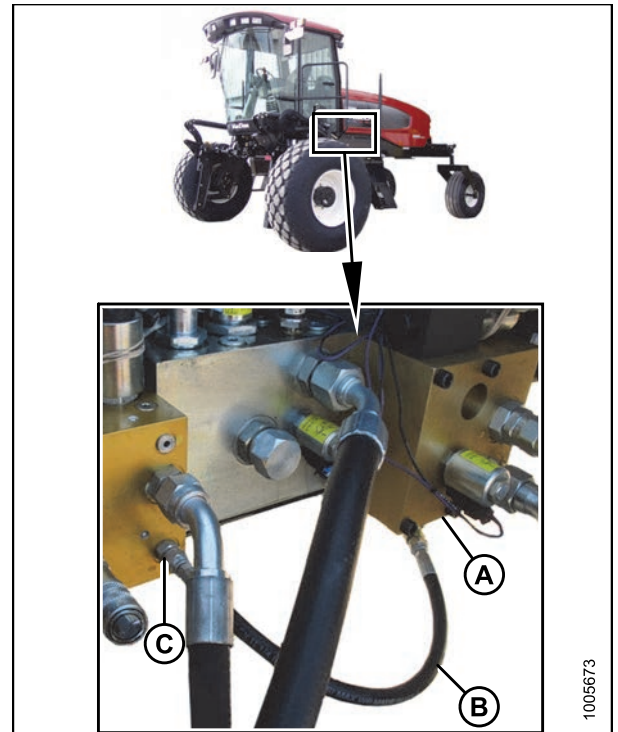


Figure 3.108: Hose (B) Position (A40-D on M200 Shown – M150, M155, and M155E4 Similar)

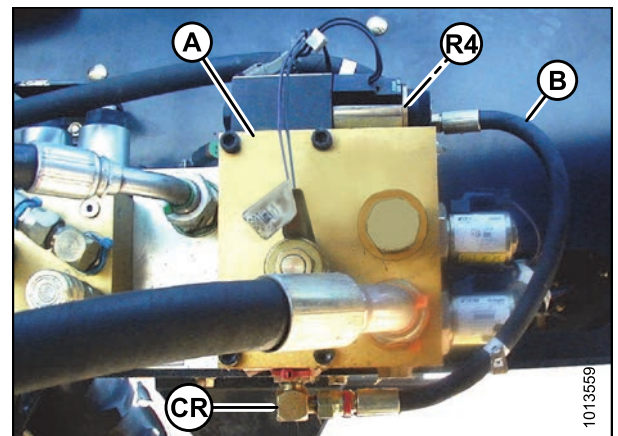


Figure 3.109: Hose Position (Draper Header on M150 Shown – M155, M155E4, and M200 Similar)

3.15 Attaching Hydraulics

CAUTION

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

1. Disengage rubber latch (A), and open driveline shield (B).

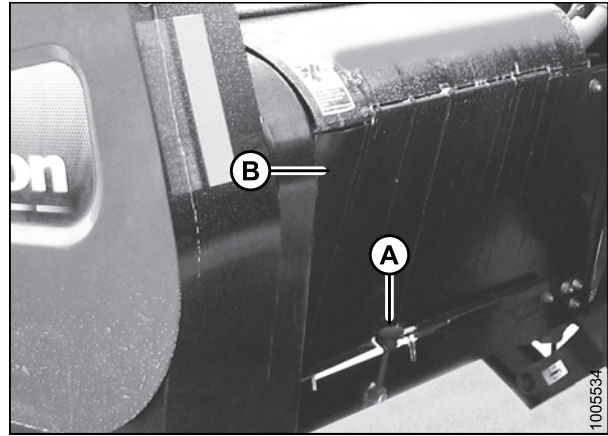


Figure 3.110: Driveline Shield

2. Remove cap (A) from electrical connector, and remove connector from support bracket.
3. Disengage and rotate lever (B) counterclockwise to the fully up position to release hose bundle (C).

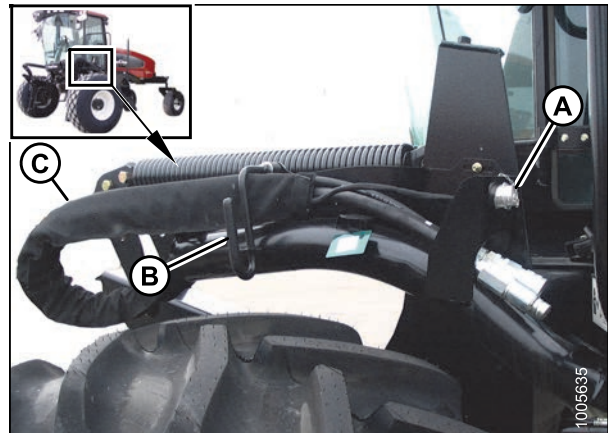


Figure 3.111: Windrower Hoses and Harness in Storage Position

4. Move hose bundle (A) to header.
5. Rotate lever (B) clockwise, and engage in bracket to store.

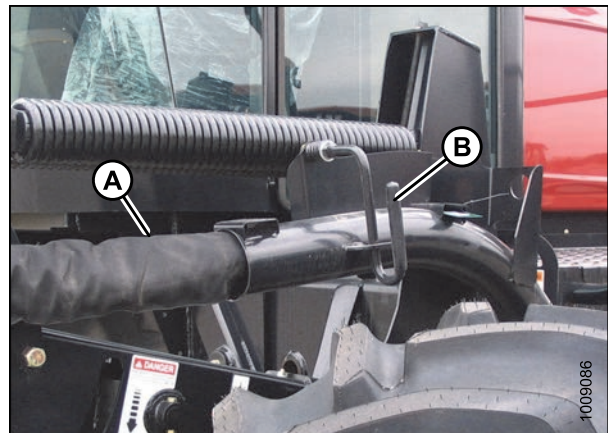


Figure 3.112: Windrower Hoses and Harness in Working Position

ASSEMBLING THE MACHINE

6. Route hoses (A) from windrower through support (B) and access hole (C) in header frame alongside hose bundle (D). Hose bundle (D) will be attached later in the procedure.
7. Remove cover on header electrical receptacle (E).
8. Push connector onto receptacle, and turn collar on connector to lock it in place.
9. Attach cover to mating cover on windrower wiring harness.
10. Remove caps from hydraulic couplers. Clean if necessary.
11. Connect the four hoses from windrower to mating receptacles on header. Ensure collar snaps into lock position.

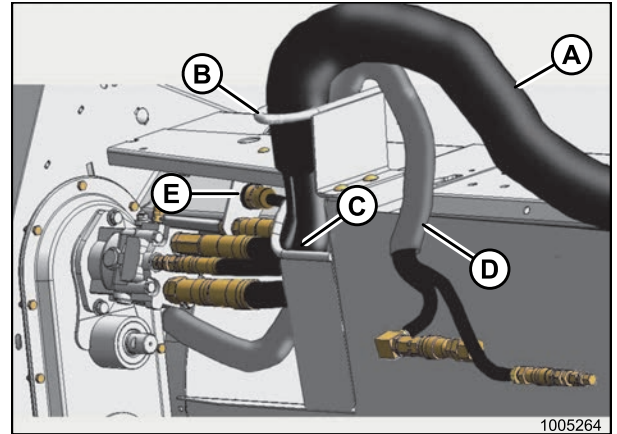


Figure 3.113: Windrower Hoses and Harness Connected to Header – 14-Ft. and 16-Ft. Header Shown (18-Ft. Similar)

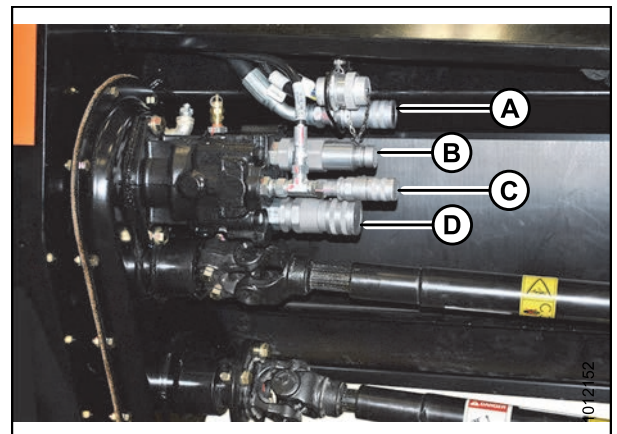


Figure 3.114: Hose Connections on Standard Header – 14-Ft. and 16-Ft. Header Shown

A - Reel/Auger Pressure B - Knife and Conditioner Return
C - Case Drain D - Knife and Conditioner Pressure

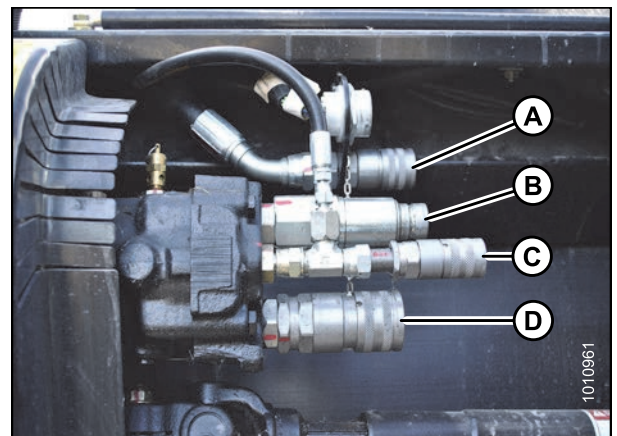


Figure 3.115: Hose Connections on Standard Header – 14-Ft. and 16-Ft. Header Shown

A - Reel/Auger Pressure B - Knife and Conditioner Return
C - Case Drain D - Knife and Conditioner Pressure

ASSEMBLING THE MACHINE



Figure 3.116: Hose Connections on Standard Header – 18-Ft. Header Shown

A - Reel/Auger Pressure B - Knife and Conditioner Return
C - Case Drain D - Knife and Conditioner Pressure

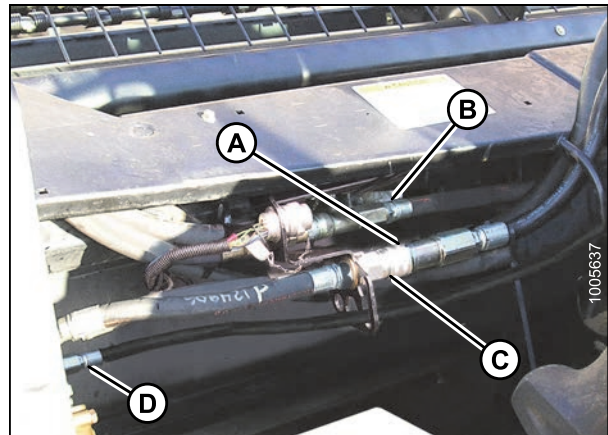


Figure 3.117: Hose Connections on Grass Seed Header

A - Knife Return (Male Fitting at Header) (Not Visible)
B - Auger/Reel Pressure
C - Knife Pressure (Female Fitting at Header)
D - Case Drain

ASSEMBLING THE MACHINE

12. If not already installed, retrieve package of three adjustable straps shipped with the header.
13. Position adjustable strap (A) through slot and under bracket (B) on hose support.
14. Attach strap to bracket with 1/2 in. carriage bolt (C) and locking nut. Install bolt from under bracket.
15. Repeat Step 13, page 59 through Step 14, page 59 at the two other brackets on hose support.

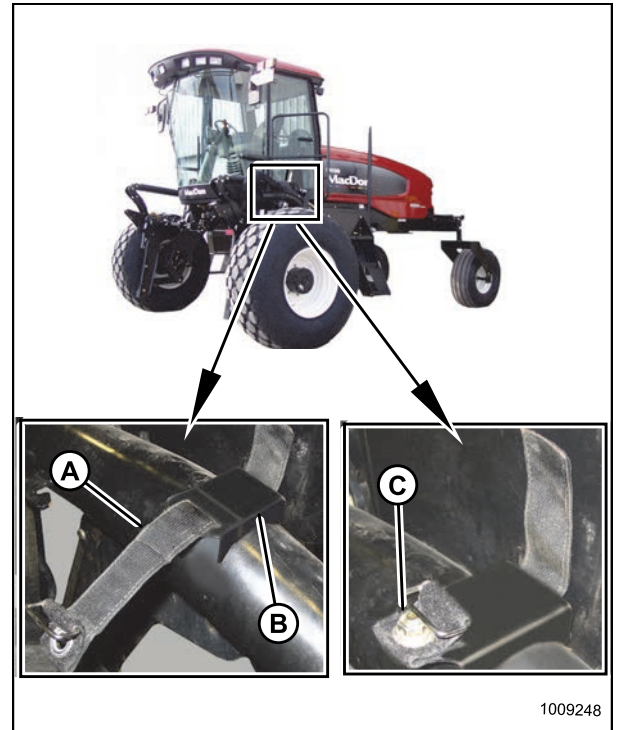


Figure 3.118: Adjustable Straps

16. Route reel/auger return and auger pressure hose bundle (A) from header to windrower, and position bundle above existing hose support (C) as shown.
17. Secure with three straps (D), and lower lever (B).

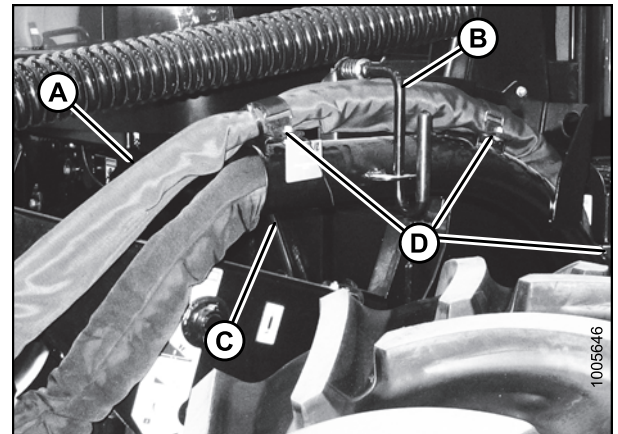


Figure 3.119: Reel/Auger Return and Auger Pressure Hose Bundle

ASSEMBLING THE MACHINE

18. Connect auger/reel pressure and reel/auger return hoses from header to receptacles on windrower valve block. Refer to the relevant illustration for your equipment.

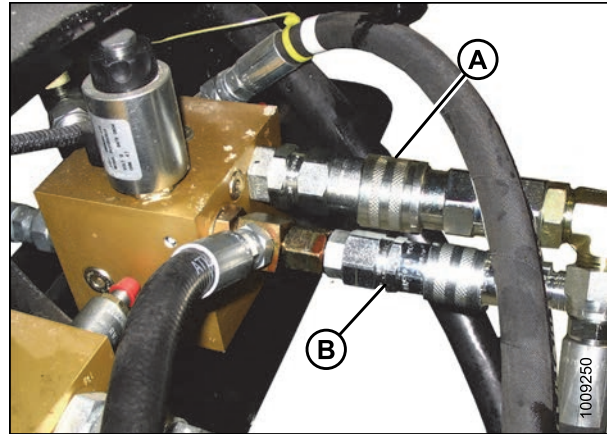


Figure 3.120: M100/M105

A - Reel/Auger Return

B - Auger/Reel Pressure

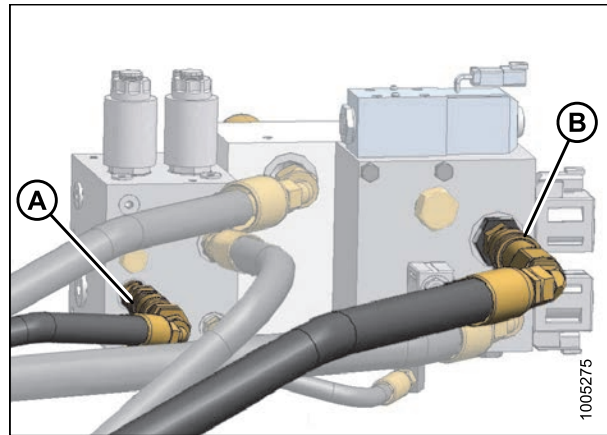


Figure 3.121: M150/M155/M155E4 with Reverser Valve

A - Auger Pressure

B - Reel/Auger Return

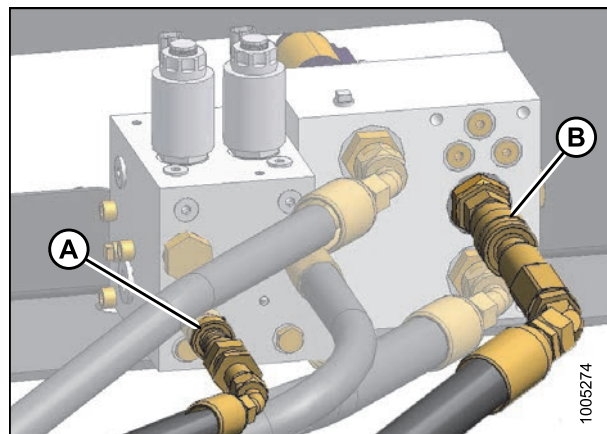


Figure 3.122: M150/M155/M155E4 without Reverser Valve

A - Auger Pressure

B - Reel/Auger Return

ASSEMBLING THE MACHINE

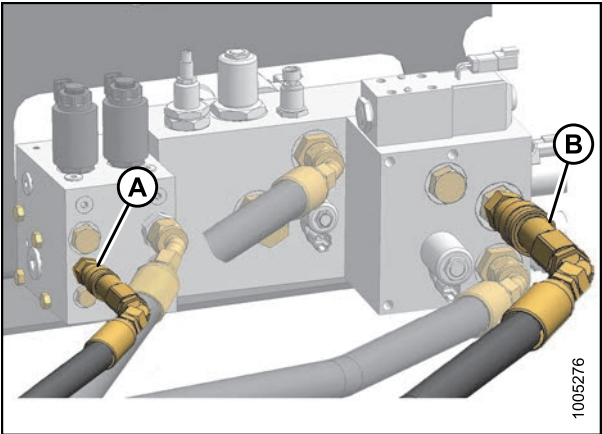


Figure 3.123: M200 with Reverser Valve
A - Auger Pressure B - Reel/Auger Return

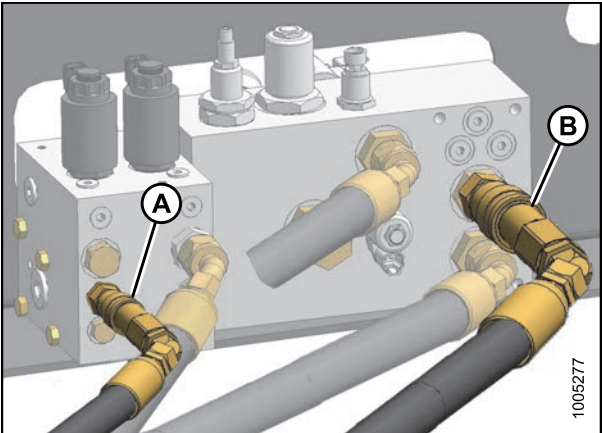


Figure 3.124: M200 without Reverser Valve
A - Auger Pressure B - Reel/Auger Return

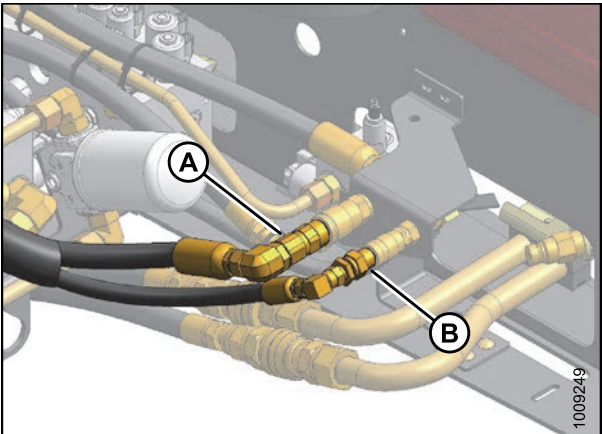


Figure 3.125: M205
A - Reel/Auger Return B - Auger/Reel Pressure

3.16 Hydraulic Drive Hose Routing (Later-Build 2015 A40-D Units Only)

The A40-D Auger Header hydraulic drive hose routing depends on the windrower model to which the header is being attached.

The header is factory-configured for M150, M155, M155E4, and M200 SP Windrowers as shown in Figure 3.131: *Factory Configuration (M150, M155, M155E4, and M200)*, page 64. To route hoses for M100, M105, and M205 Windrowers, proceed as follows:

IMPORTANT:

If you have a 2015 A40-D SP windrower header, confirm whether you have an early-build or a later-build 2015 unit. If the reel motor is **round** (B), then it is an earlier-build 2015 model. Refer to *3.17 Hydraulic Drive Hose Routing (Early-Build 2015, 2014 and Earlier A40-D)*, page 67. If the reel motor is **square** (A), then use the following procedure:

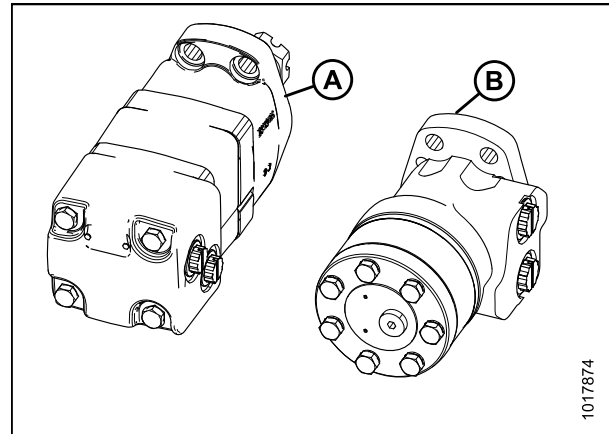


Figure 3.126: Auger Drive Motor

1. Press screwdriver against latch in opening (A) and lift to open header left-hand driveshield. Shield will latch at (B) to stay open.

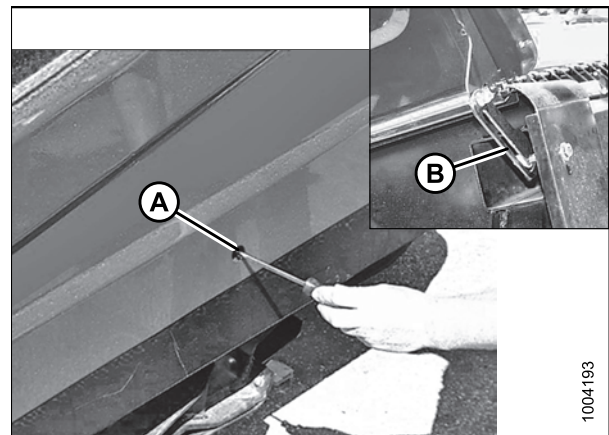


Figure 3.127: LH Driveshield

ASSEMBLING THE MACHINE

2. Disengage rubber latch (A), and open driveline shield (B).

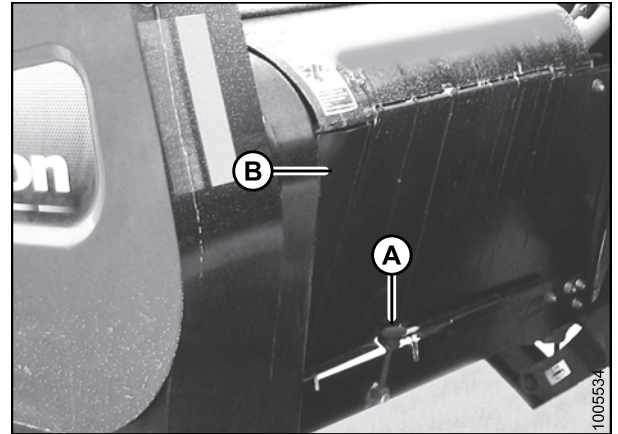


Figure 3.128: Driveline Shield

3. Loosen bulkhead nut (A) on auger and reel pressure coupler (B). This allows auger and reel pressure hose (C) to rotate freely.

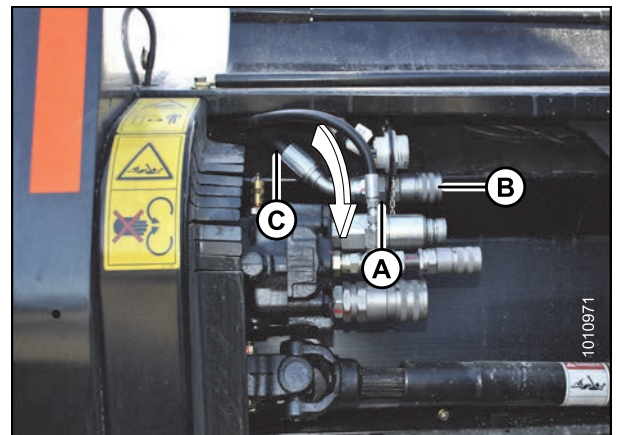


Figure 3.129: Auger and Reel Pressure Coupler and Hose – 14-Ft. and 16-Ft. Header Shown

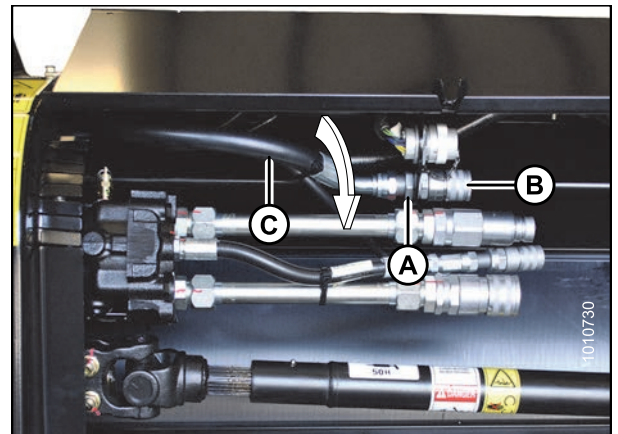


Figure 3.130: Auger and Reel Pressure Coupler and Hose – 18-Ft. Header Shown

ASSEMBLING THE MACHINE

4. Disconnect hoses as follows:
 - a. Disconnect hose (A) from tee (B).
 - b. Disconnect tee (B) from reel motor upper port.
 - c. Disconnect hose (C) from reel motor lower port.
5. Cut cable ties (D) at locations shown in illustration.

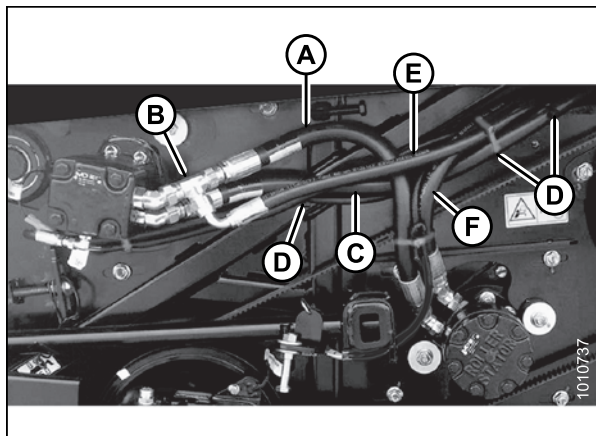


Figure 3.131: Factory Configuration (M150, M155, M155E4, and M200)

6. Reconnect hoses as follows:
 - a. Reroute hose (E) behind hose (A) and (F) to hose (C) and connect tee (B) to lower port fitting.
 - b. Reroute hose (C) above hose (E) and (F) and connect hose (C) to tee (B). Tighten hose (C).
 - c. Loosen 45 degree fittings at both ports. This allows room for wrenches when tightening tee (B) to lower port.
 - d. Connect hose (A) to upper port fitting as shown and check orientation of 45 degree fitting.

NOTE:

Ensure that hose (A) is routed in front of hose (C) and (E).

- e. Confirm orientation of upper port 45 degree fitting, back-off tee (B), and tighten upper port fitting in position determined. Tighten hose (A).
- f. Check orientation of lower port 45 degree fitting and tighten.
- g. Connect tee (B) to lower port 45 degree fitting and tighten.

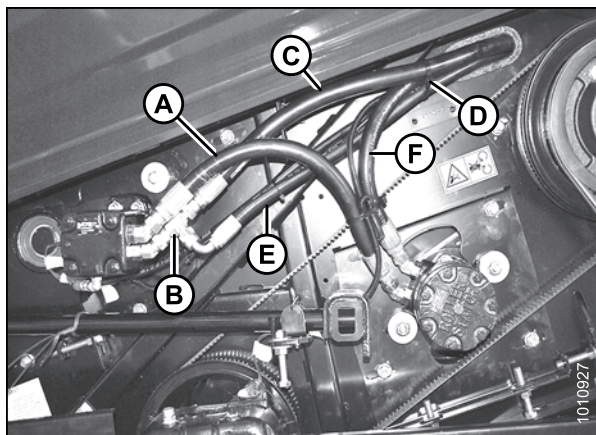


Figure 3.132: Adjusted Configuration (M100, M105, and M205)

ASSEMBLING THE MACHINE

- Secure electrical harness (B), motor case drain hose (C), and hose (D) together with cable ties (A), as shown.

IMPORTANT:

Ensure there is at least 25 mm (1 in.) clearance between hose bundle (E) and knife drive timing belt (F).

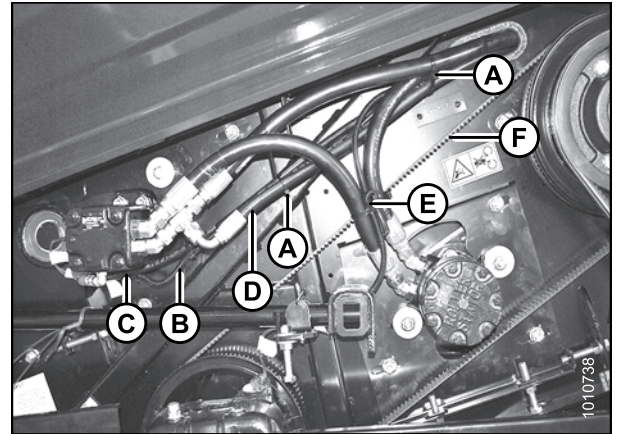


Figure 3.133: Adjusted Configuration (M100, M105, and M205)

- Rotate coupler (B) and hose (C) downward as shown until slack has been sufficiently reduced. Tighten bulkhead nut (A).

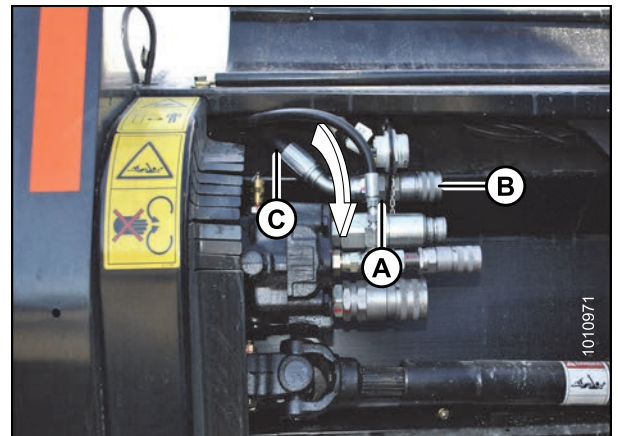


Figure 3.134: Auger and Reel Pressure Coupler and Hose – 14-Ft. and 16-Ft. Header Shown

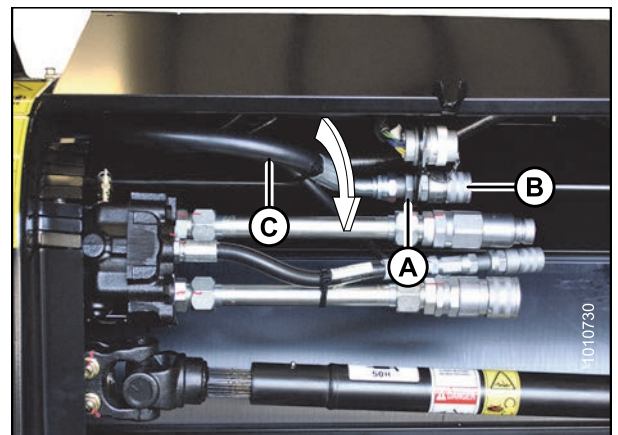


Figure 3.135: Auger and Reel Pressure Coupler and Hose – 18-Ft. Header Shown

ASSEMBLING THE MACHINE

9. Close driveline shield (B) and engage rubber latch (A).
10. Close driveshield before engaging header.

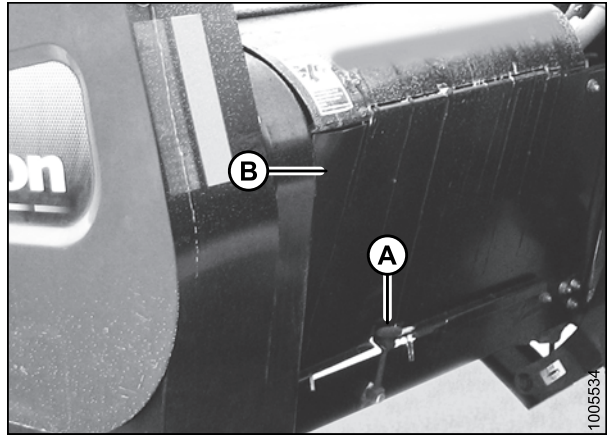


Figure 3.136: Driveline Shield

3.17 Hydraulic Drive Hose Routing (Early-Build 2015, 2014 and Earlier A40-D)

The A40-D Auger Header drive hose routing depends on the windrower model to which the header is being attached. Early build A40-D Headers are for use on M100, M105 and M205 Windrowers Only.

IMPORTANT:

If you have a 2015 A40-D SP windrower header, confirm whether you have an early-build or a later-build 2015 unit. If the reel motor is **square**, (A) then it is a later-build 2015 model. Refer to [3.16 Hydraulic Drive Hose Routing \(Later-Build 2015 A40-D Units Only\)](#), page 62. If the reel motor is **round**, (B) then use the following procedure:

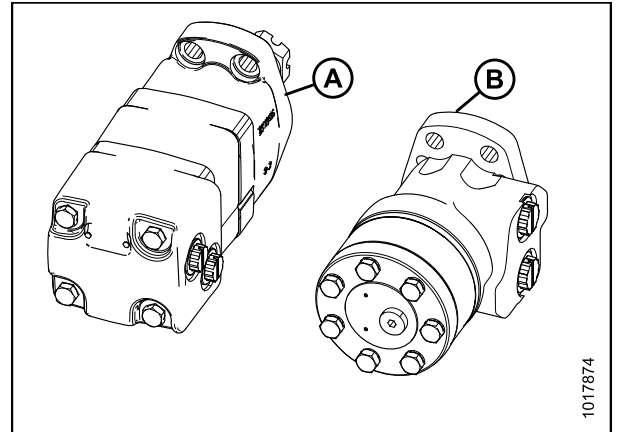


Figure 3.137: Auger Drive Motor

1. Press screwdriver against latch in opening (A) and lift to open header left-hand driveshield. Shield will latch at (B) to stay open.
2. Check hose routing at the reel motor. The header is factory-configured for M150, M155, and M200 Windrowers as shown in Figure [3.139: Early-Build 2015, 2014 and Earlier Factory Configuration \(M150, M155, and M200\)](#), page 68.

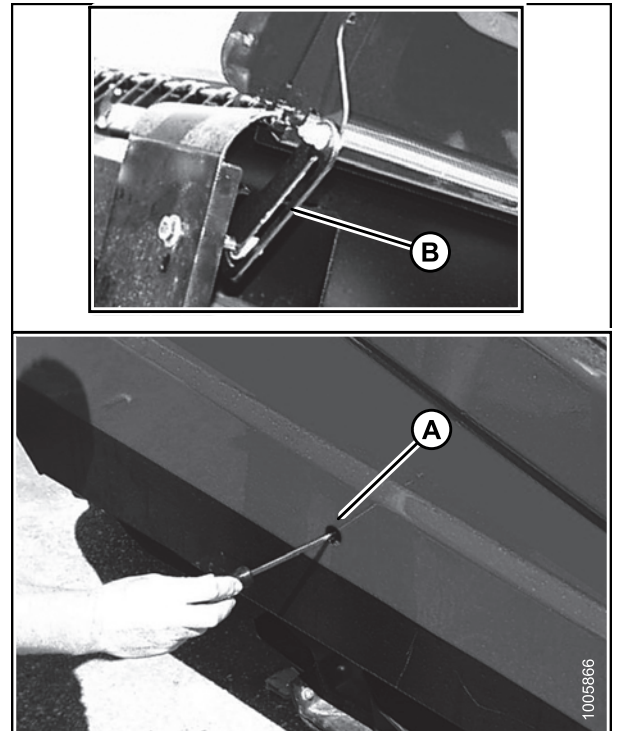


Figure 3.138: LH Driveshield

ASSEMBLING THE MACHINE

To route hoses on early-build 2015, 2014 and earlier A40-D Headers for use on M100, M105, and M205 Windrowers, proceed as follows.

3. Disconnect hoses as follows:
 - a. Disconnect hose (A) from tee (C).
 - b. Disconnect hose (B) from reel motor upper port.
 - c. Disconnect tee (C) from reel motor lower port.
4. Reconnect hoses as follows:
 - a. Relocate tee (C) to reel motor upper port.
 - b. Connect hose (B) to tee (C).
 - c. Connect hose (A) to reel motor lower port.

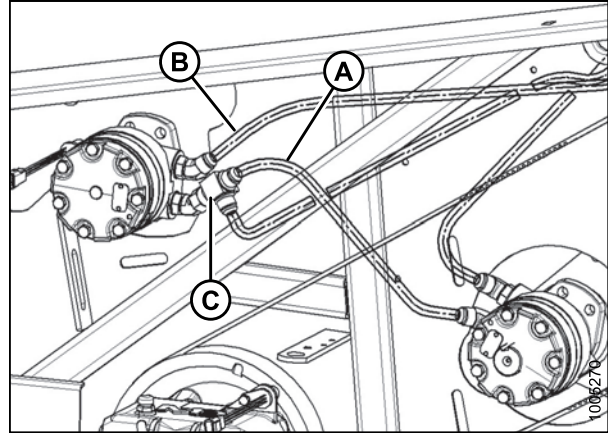


Figure 3.139: Early-Build 2015, 2014 and Earlier Factory Configuration (M150, M155, and M200)

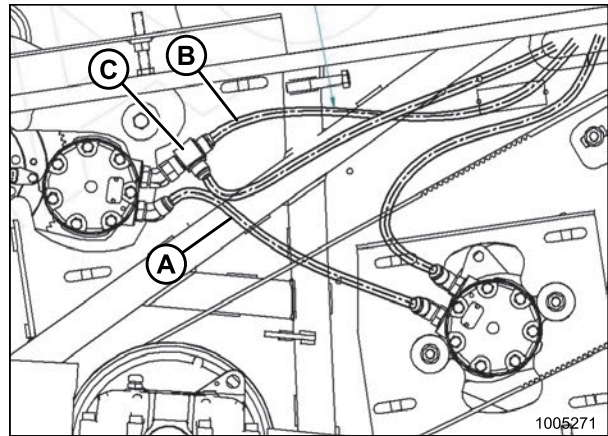


Figure 3.140: Adjusted Configuration (M100, M105, and M205)

5. Close driveline shield before engaging header.

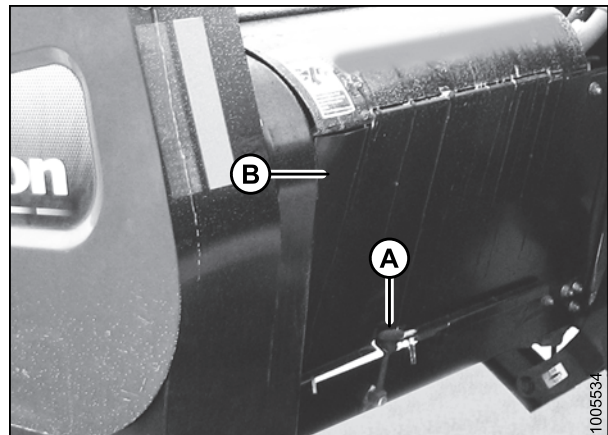


Figure 3.141: Driveline Shield

3.18 Repositioning Knife Drive Box Breather

There is one knife drive box at each end of the header.

1. Move breather/dipstick (A) to back port and install plug (B) in forward port at knife drive boxes.

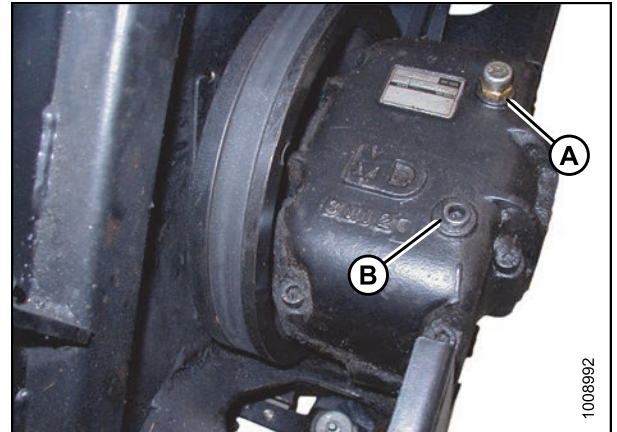


Figure 3.142: Top View of Knife Drive Box

2. With top of knife drive box horizontal, check oil level. It should be between the lower hole (A) and the end of the dipstick.
3. If required, add SAE 85W-140 lubricant.

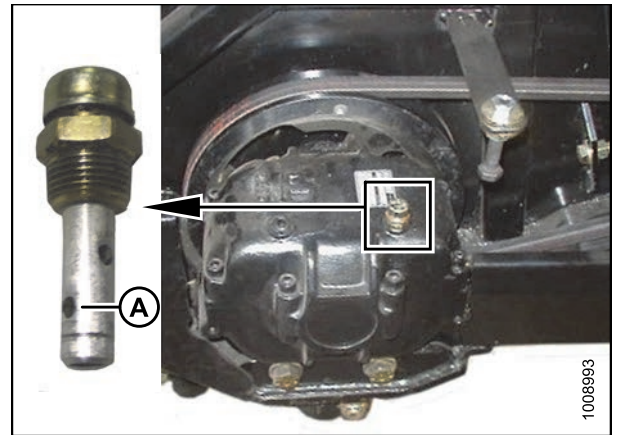


Figure 3.143: Side View of Knife Drive Box and Close-up of Dipstick

4 Lubricating the Machine

4.1 Greasing Procedure

WARNING

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

1. Wipe grease fitting with a clean cloth before greasing to avoid injecting dirt and grit.
2. Inject grease through fitting with grease gun until grease overflows fitting, except where noted.
3. Leave excess grease on fitting to keep out dirt.
4. Replace any loose or broken fittings immediately.
5. If fitting will not take grease, remove and clean thoroughly. Also clean lubricant passageway. Replace fitting if necessary.

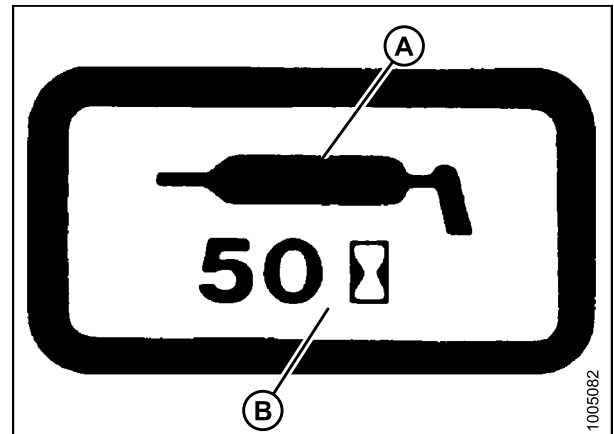


Figure 4.1: Grease Interval Decal

4.2 Lubrication Points: Left Side of Header

NOTE:

High Temperature Extreme Pressure (EP2) Performance With 1% Max Molybdenum Disulphide (NLGI Grade 2) Lithium Base. To prevent binding and/or excessive wear caused by knife pressing on guards, do **NOT** over-grease. If more than 6 to 8 pumps of grease gun are required to fill the cavity, replace the seal in the knifehead.

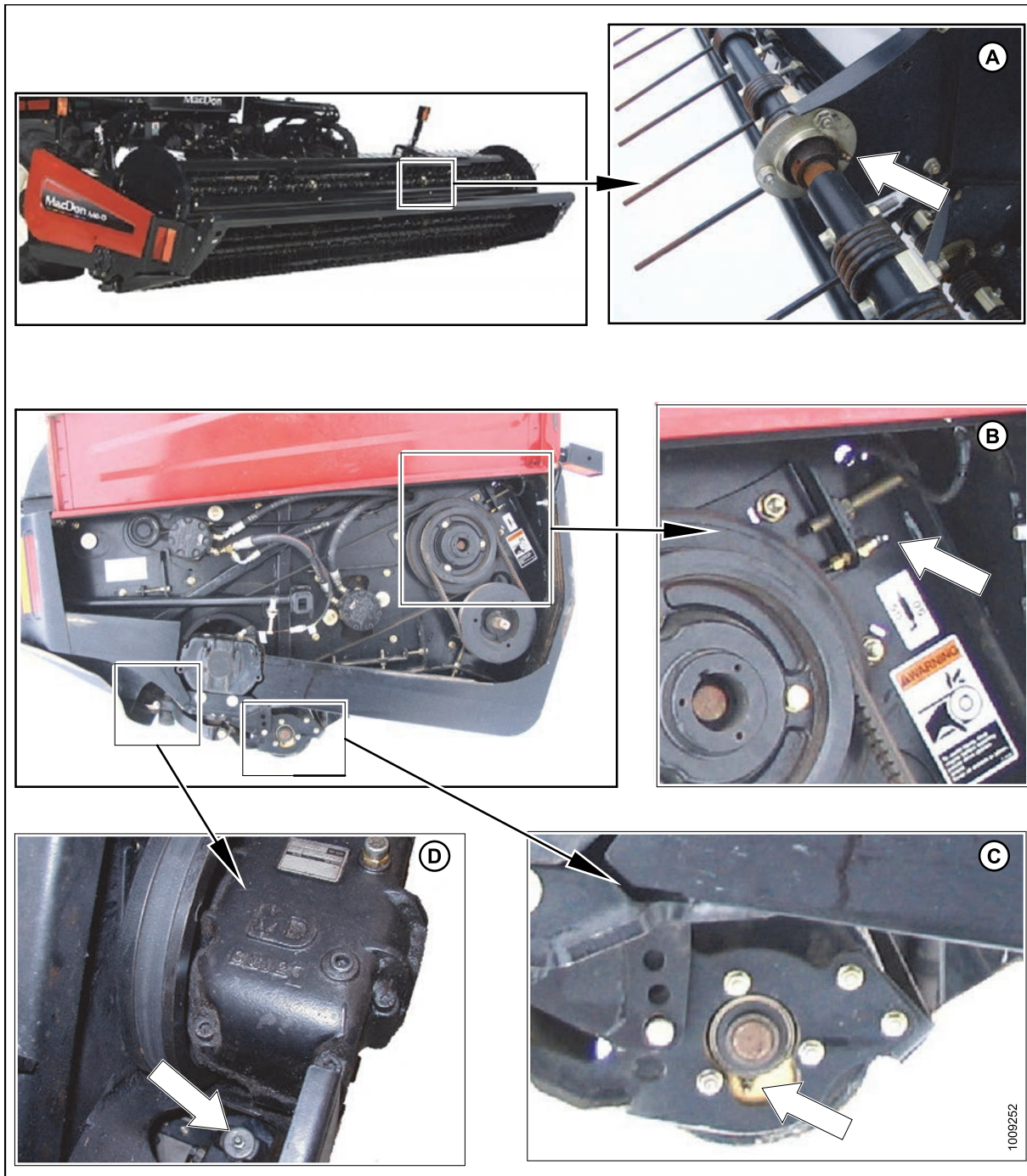


Figure 4.2: Header LH Side

A - Tine Bar Bearing (4 Places Each Tine Bar)

C - Gauge Roller Bearing (2 Places) (Both Sides if Installed)

B - Knife Drive Bearing (1 Place)

D - Knifehead Bearing (1 Place)

4.3 Lubrication Points: Right Side of Header

NOTE:

High Temperature Extreme Pressure (EP2) Performance With 1% Max Molybdenum Disulphide (NLGI Grade 2) Lithium Base. To prevent binding and/or excessive wear caused by knife pressing on guards, do **NOT** over-grease. If more than 6 to 8 pumps of grease gun are required to fill the cavity, replace the seal in the knifehead.



Figure 4.3: Header RH Side

A - Knife Drive Bearing (1 Place)
C - Auger Shaft Bearing (1 Place)

B - Reel Shaft Bearing (1 Place)
D - Knifehead Bearing (1 Place)

4.4 Lubrication Points: Hay Conditioner

NOTE:

High Temperature Extreme Pressure (EP2) Performance With 1% Max Molybdenum Disulphide (NLGI Grade 2) Lithium Base.

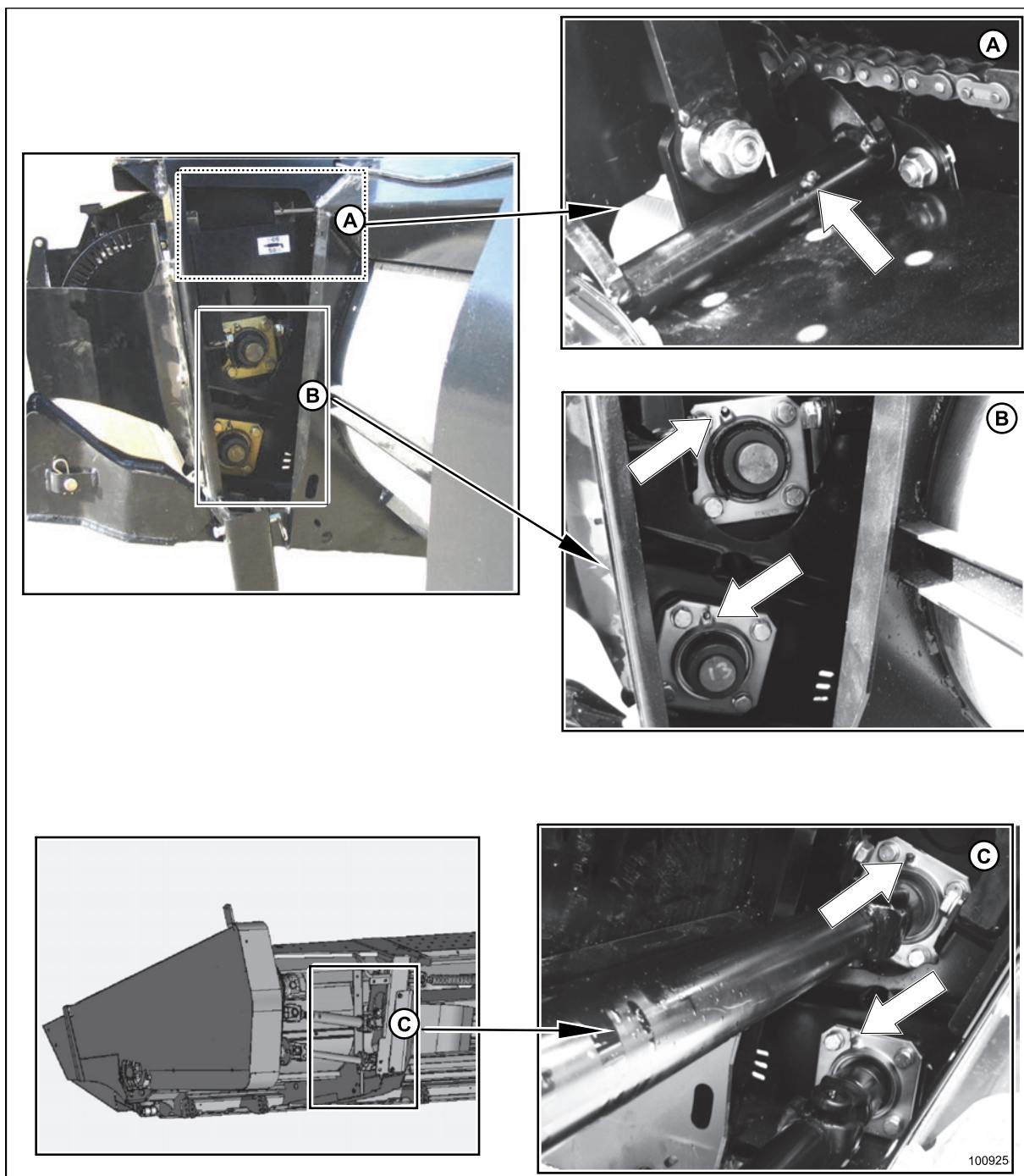


Figure 4.4: Hay Conditioner

A - Roll Pivot (1 Place - Both Sides)

B - Roll Shaft Bearings (2 Places)

C - Roll Shaft Bearings (2 Places)

4.5 Lubrication Points: Drivelines

NOTE:

High Temperature Extreme Pressure (EP2) Performance With 1% Max Molybdenum Disulphide (NLGI Grade 2) Lithium Base.

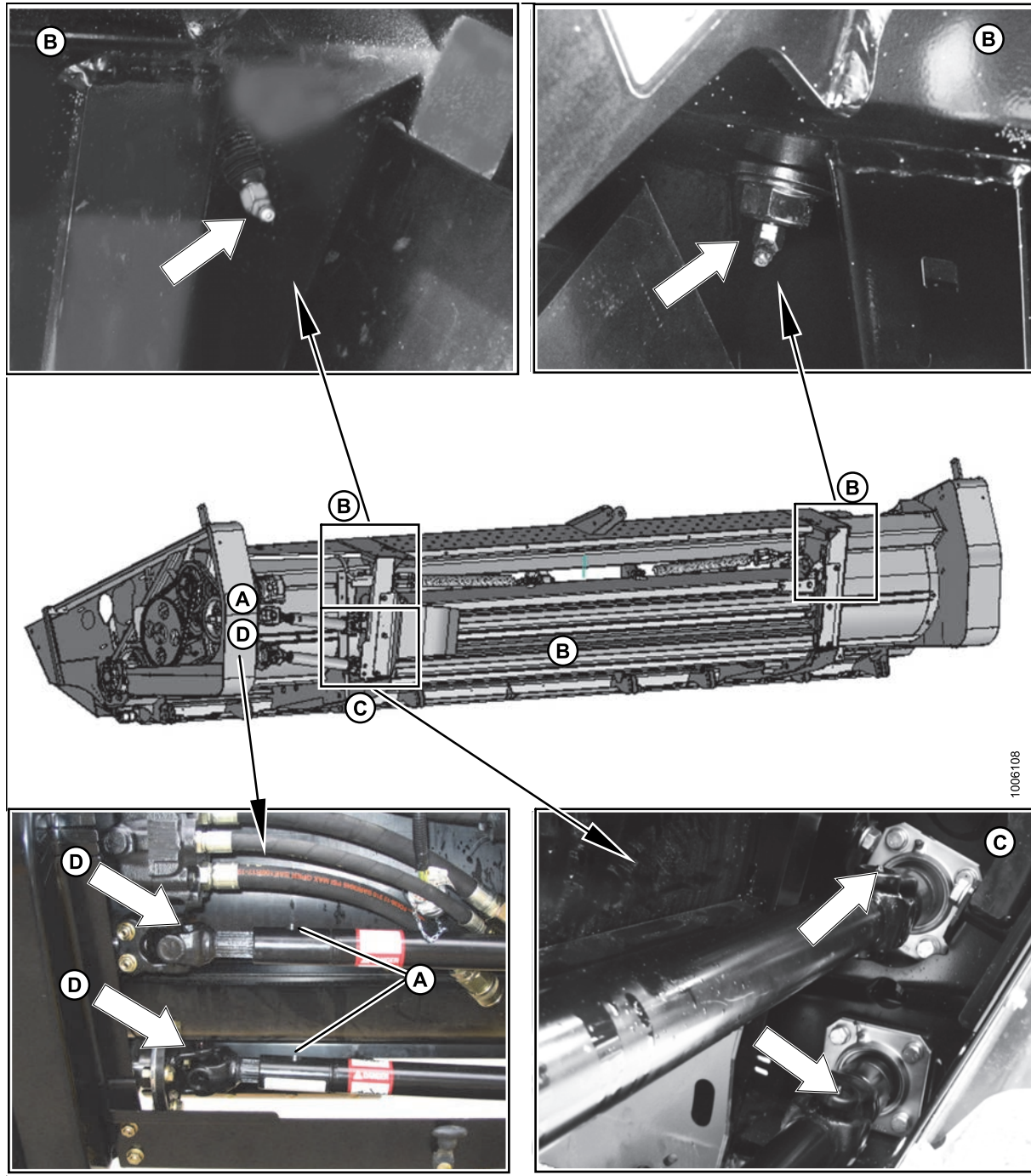


Figure 4.5: Drivelines

A - Driveline Shafts (2 Places) NOTE: 10% moly grease is recommended for driveline shaft slip joints ONLY.

B - Cross Shafts (2 Places)

C - Driveline Universals (2 Places)

D - Driveline Universals (2 Places)

4.6 Knife and Gearbox Oil

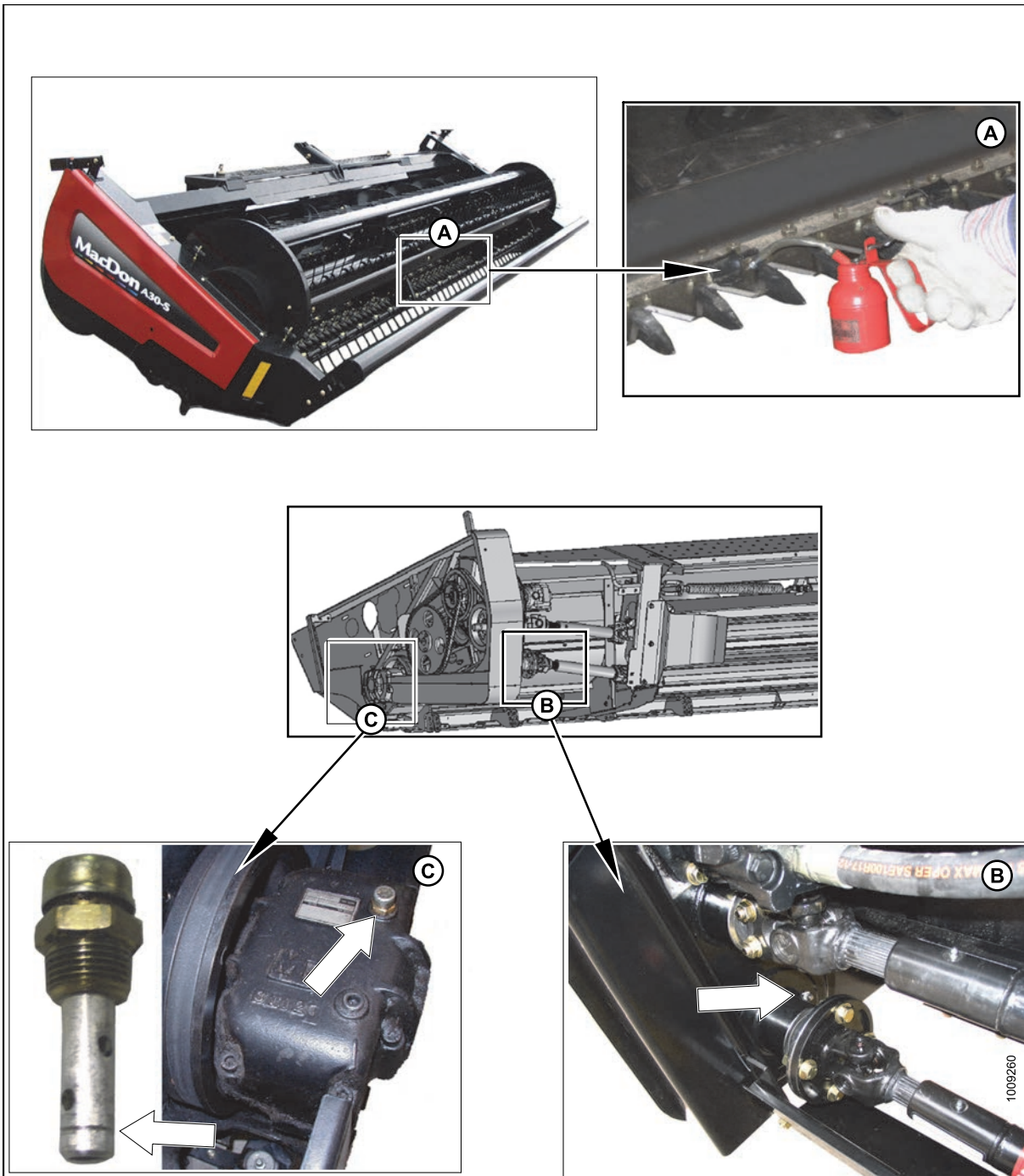


Figure 4.6: Knife and Gearbox Oil

A - Oil Knife Daily Except in Sandy Soil (SAE 30)

B - Check Roll Gearbox (1 Place) (Lower Header to the Ground).

C - Knife Drive Box (2 Places) (Check Oil Level with Knife Drive Box Horizontal)

5 Performing Predelivery Checks

CAUTION

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

IMPORTANT:

To avoid machine damage, check that no shipping dunnage has fallen down between auger and pans.

1. Perform final checks and adjustments as listed on the **Predelivery Checklist** (yellow sheet attached to back of this instruction – [Predelivery Checklist, page 111](#)) to ensure the machine is field-ready. Refer to the following pages for detailed instructions as indicated on the checklist.
2. The completed checklist should be retained either by the Operator or the Dealer.

5.1 Checking Drive Belts and Chains

1. Open shield on header right-hand side.
2. Check knife drive timing belt (A). It should deflect 14 mm (0.55 in.) when a load of 22–30 N (5–6.5 lbf) is applied at mid-span.

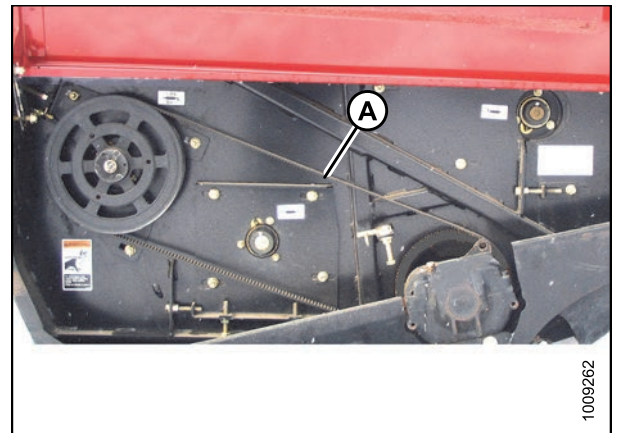


Figure 5.1: A40-D Header RH Side

3. Open shield on header left-hand side.
4. Check knife drive timing belt (A). It should deflect 14 mm (0.55 in.) when a load of 22–30 N (5–6.5 lbf) is applied at mid-span.
5. Check knife drive V-belts (B). They should deflect 4 mm (3/16 in.) when a load of 35–40 N (8–12 lbf) is applied to each belt at mid-span.
6. Close shields.

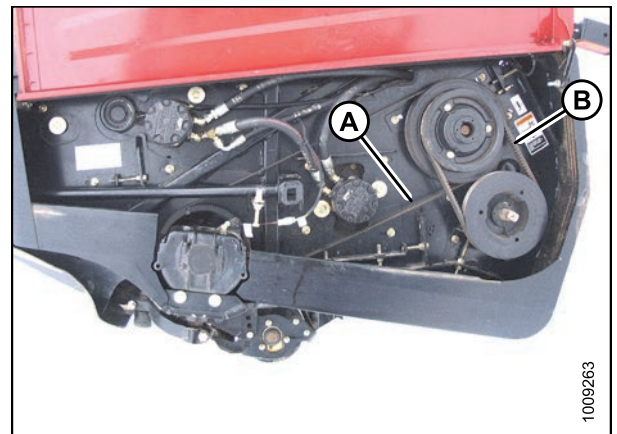


Figure 5.2: A40-D Header LH Side

5.2 Checking Auger Stripper Bar Clearance

1. Check for signs of auger flighting (A) rubbing stripper bars (B) after run-up.

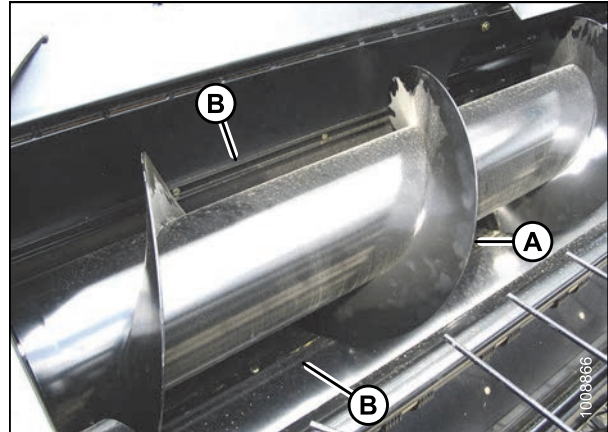


Figure 5.3: Auger

2. Check clearance between auger flighting (A) and stripper bars (B).

NOTE:

The auger flighting (A) should clear the stripper bars (B) on the auger pan by approximately 1–4 mm (1/32–5/32 in.). Shimming the stripper bars may be required.

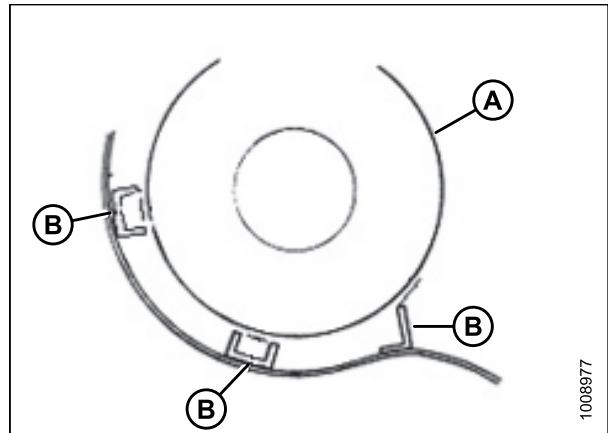


Figure 5.4: End View Diagram Showing Auger and Stripper Bars

5.3 Checking Reel Tine to Header Pan Clearance

IMPORTANT:

The dimensions provided are guidelines only. Tines may slightly contact the guards, but **NOT** the knife sections or the auger pan.

1. Rotate reel slowly by hand and check tine clearance at knife and pan. **Flex tines to simulate crop-loaded position to ensure tine clearances to knife sections and auger pan are adequate for working conditions.**
2. Check that reel rotates freely.

IMPORTANT:

If there are a few reel tine fingers that are touching the pan while the rest are at the correct height, trim the longer tines to match the rest. Be sure to adjust both sides of the reel. Ensure that tines do **NOT** contact the plastic header pan.

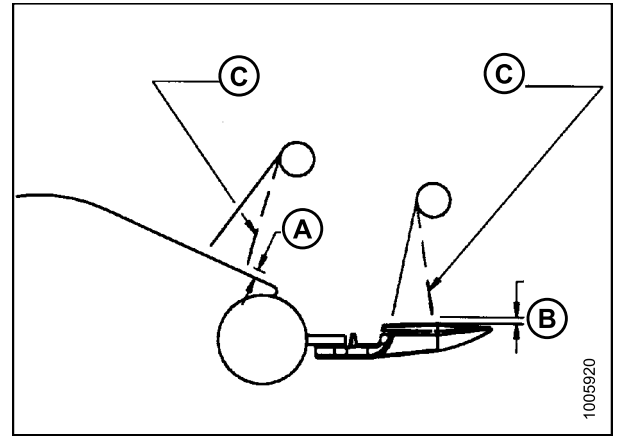


Figure 5.5: Reel Tine to Header Pan Clearance

A - 2-10 mm (.08-.39 in.) Clearance

B - 2 mm (.08 in.) Minimum to Knife Section

C - Flex Tines Back When Checking Clearance

5.4 Checking/Adjusting Float

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

CAUTION

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

To adjust the float, follow these steps:

1. Check float by grasping the lean bar and lifting. Lifting force should be 335–380 N (75–85 lbf) and should be approximately the same at both ends.
2. If necessary, perform the following steps to adjust the float:
 - a. Raise header fully, shut down engine, and remove key.
 - b. Turn drawbolt (A) clockwise to increase float (makes header lighter) or counterclockwise to decrease float (makes header heavier).
 - c. Recheck the float.

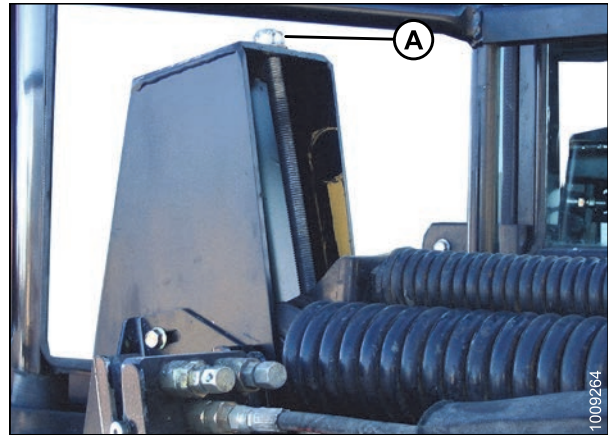


Figure 5.6: Drawbolt – Top of Windrower Wheel Leg Member Shown

5.5 Checking Header Levelling

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

If the header is **NOT** level, perform the following checks prior to adjusting the levelling linkages. The float springs are **NOT** used to level the header.

1. Park windrower on level ground.
2. Check windrower tire pressures.
3. Raise header fully and hold momentarily to allow lift cylinders to rephase.
4. Stop engine and remove key.

CAUTION

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

5. Place float pins (A) in locked out position.

CAUTION

Check to be sure all bystanders have cleared the area.



Figure 5.7: Float Pin

6. Start engine and set header approximately 150 mm (6 in.) off ground. Check that member (A) is against link (B).
7. Note high and low end of header.

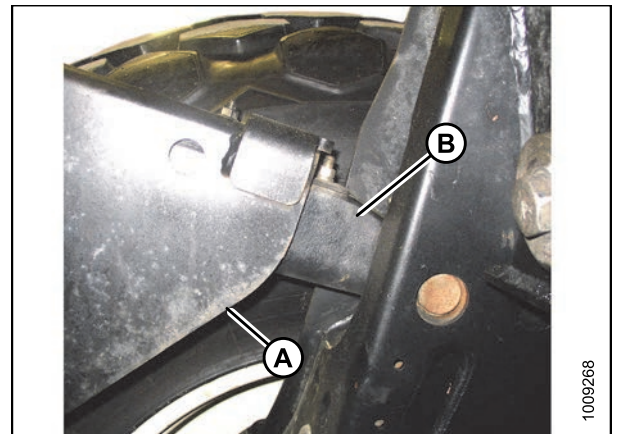


Figure 5.8: Member and Link

PERFORMING PREDELIVERY CHECKS

8. Place wooden blocks (A) under header cutterbar and legs.

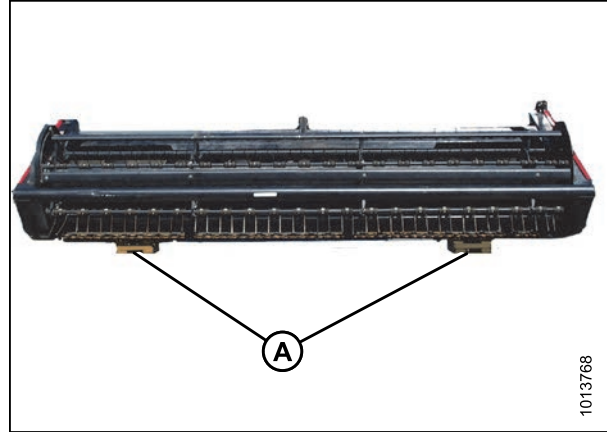


Figure 5.9: Header on Blocks

9. Lower header onto blocks so that members (A) lift off of links (B).
10. Shut down engine and remove key.

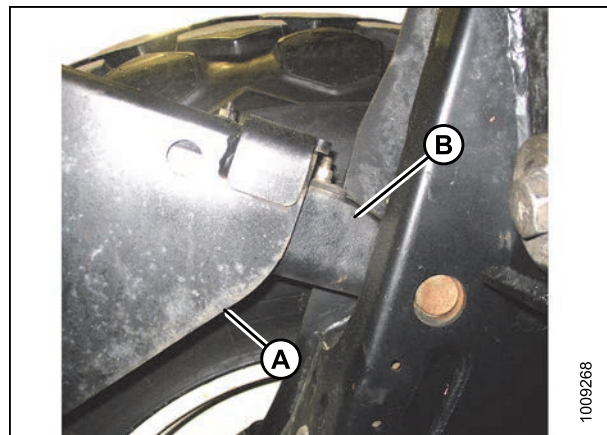


Figure 5.10: Member and Link

11. Remove nut, washer, and bolt (A) that attach shims (B) to link at the header high end.
12. Remove one or both shims (B) and reinstall the hardware (A).
13. Start engine and raise header slightly. Check level of header.
14. If additional levelling is required, install the removed shim on the opposite linkage.

NOTE:

If required, additional shims (MD #110854) can be ordered from your MacDon Dealer.

NOTE:

Float does **NOT** require adjustment after levelling header.

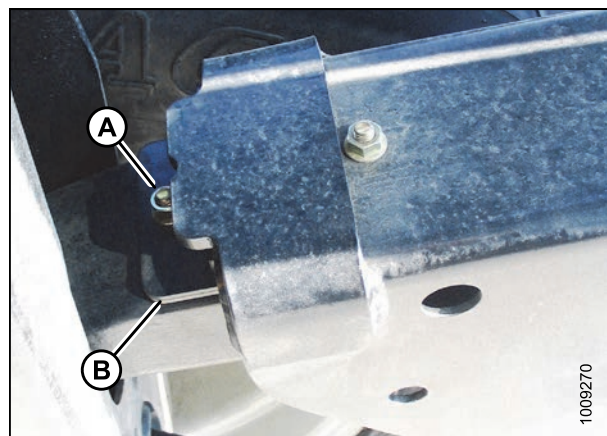


Figure 5.11: Shims

5.6 Checking Conditioner Rolls

CAUTION

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

1. Lower header fully, stop engine, and remove key.
2. Check that nut (A) is tight and top of nut (A) is at '2' on decal (C).
3. If required, adjust gap by loosening nut (A) and turning adjuster (B). Retighten nut (A).

NOTE:

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

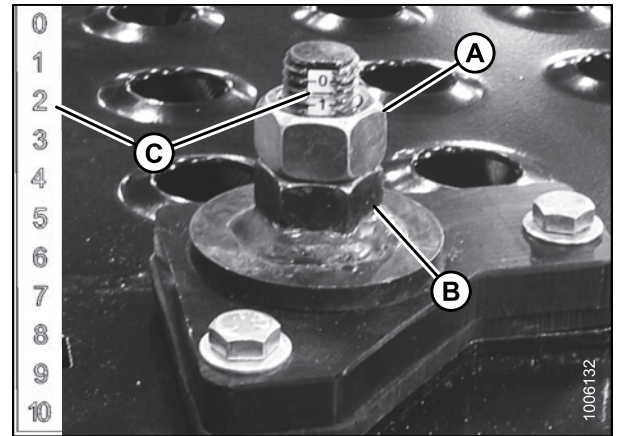


Figure 5.12: Roll Gap Adjustment Hardware

4. Loosen bolt (A) and rotate cover (B) to expose access port (C).
5. Check roll timing by examining distance 'X' at each end of the rolls (C). Each steel bar on one roll should be centered between two bars of the other roll, so that distance 'X' is 12 mm (0.5 in.).

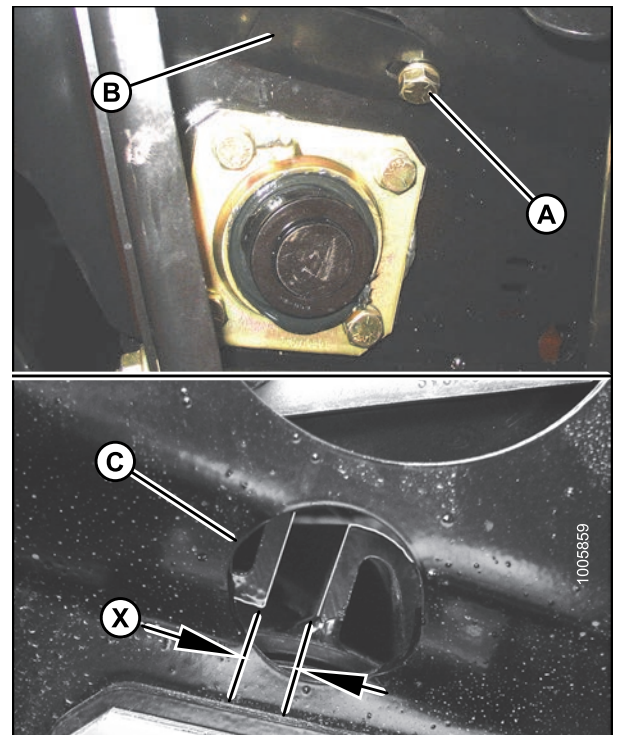


Figure 5.13: Access Port – Exposed

PERFORMING PREDELIVERY CHECKS

If required, adjust the roll timing as follows:

6. Loosen four bolts (A) in slots of yoke plate on lower roll universal shaft.
7. Turn rolls to achieve best timing.
8. When roll timing is satisfactory, tighten bolts (A) to secure the position.

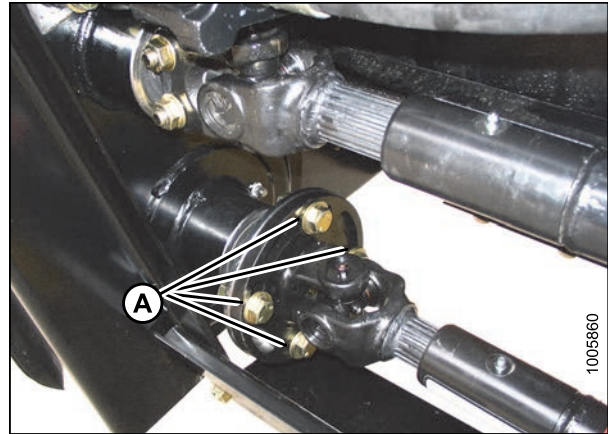


Figure 5.14: Roll Timing Adjustment Hardware

9. Reposition cover (A), and tighten bolt (B).

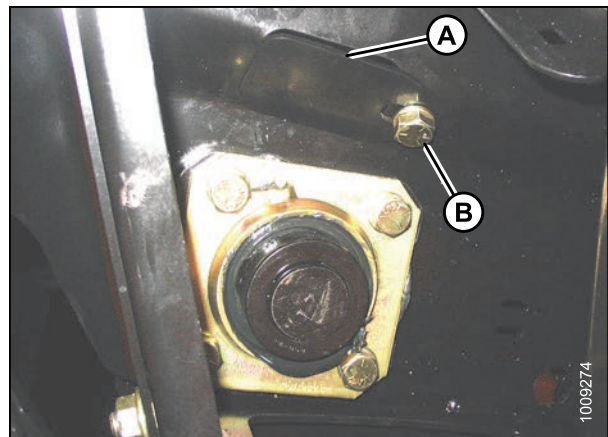


Figure 5.15: Access Port – Covered

5.7 Checking Conditioner Gearbox Oil Level

1. Lower header fully, stop engine, and remove key.

NOTE:

Check that gearbox is level with ground.

2. Remove check plug (A) and ensure that oil runs out. If oil does not run, fill conditioner gearbox using SAE 85W-140.
3. Replace check plug (A).

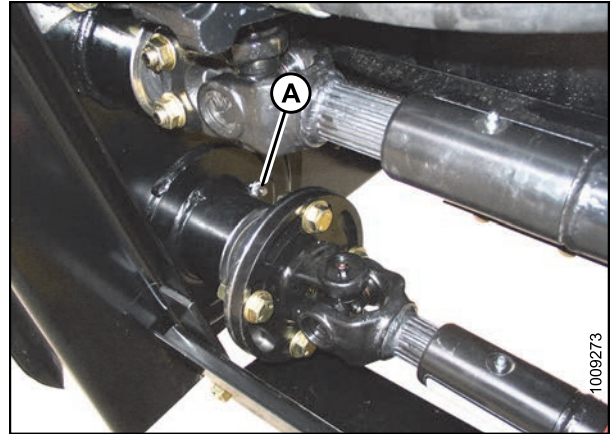


Figure 5.16: Check Plug

5.8 Checking Skid Shoes/Gauge Rollers

WARNING

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

1. Raise header and engage safety props.
2. Check that pins (A) are installed in the same position in all skid shoes/gauge rollers.

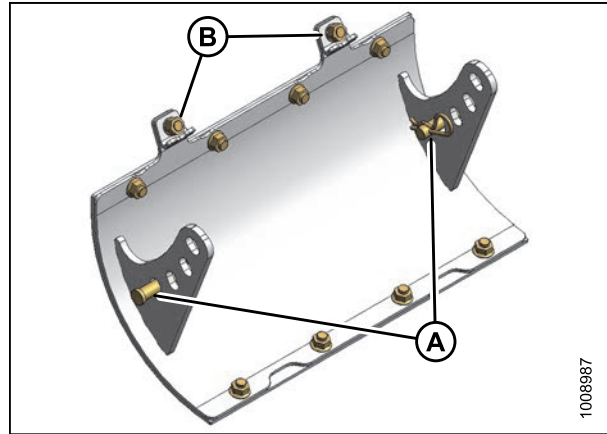


Figure 5.17: Skid Shoe

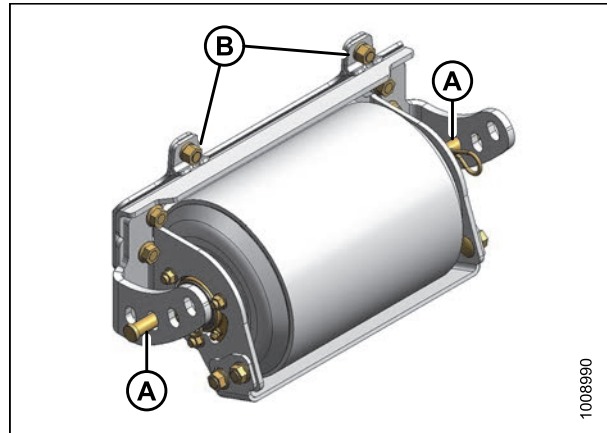


Figure 5.18: Gauge Roller

5.9 Checking Lights

Hazard lights, which are mounted on both ends of the header, are activated by switches in the windrower cab.

1. Check that pivot bolt (A) is tight enough to hold light support (B) in upright position, yet will permit the light to pivot out of the way of obstructions.

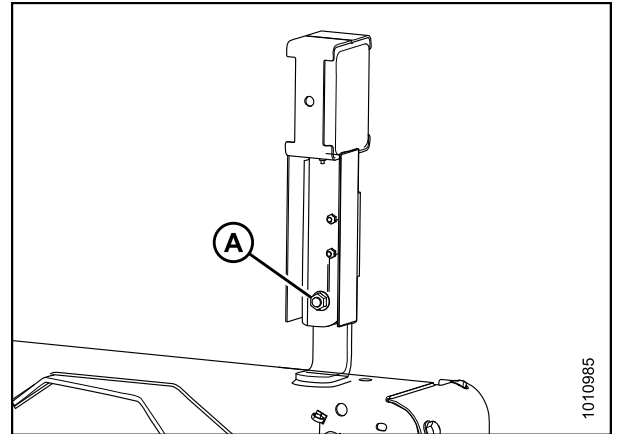


Figure 5.19: Hazard Light

5.10 Running Up Header

CAUTION

- Never start or move the machine until you are sure all bystanders have cleared the area.
- 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.
- Before investigating an unusual sound or attempting to correct a problem, return ground speed lever (GSL) to N-DETENT, center steering wheel to lock, shut off engine, and remove key.

Refer to your windrower unloading and assembly instructions or your windrower operator's manual.

1. Start windrower and operate header slowly for five minutes, watching and listening **FROM THE WINDROWER SEAT** for binding, interfering parts, or unusual noises.
2. Run the machine for 15 minutes at maximum engine operating rpm and perform the run-up check as listed on the **Predelivery Checklist** (yellow sheet attached to this manual – [Predelivery Checklist, page 111](#)) to ensure machine is field-ready.
3. Check knife speed in the windrower cab display module (CDM) during run-up and adjust knife speed to maximum on the CDM. Knife speed should be 1950 spm (actual speed of knife drive box pulley [A] should be 975 rpm) with the engine at maximum operating rpm.
4. If speed is incorrect, check the header ID in the windrower CDM. The header drive pump may also require adjusting. Refer to [5.11 Checking Knife Speed, page 89](#).

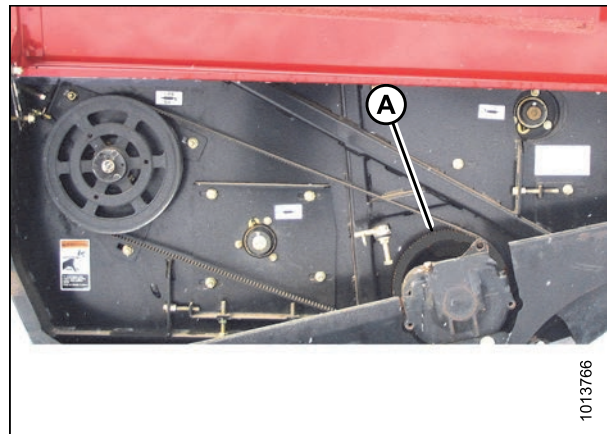


Figure 5.20: Right End of Header

5.11 Checking Knife Speed

Refer to the following sections to check header knife speed when attaching an A40-D Auger Header to an M100 or M105 Windrower.

Refer to windrower operator's manual to check header knife speed in windrower cab display module (CDM) when attaching an A40-D Auger Header to an M150, M155, M155E4, M200, or M205 Windrower.

5.11.1 Setting Knife Speed on an M100 or M105

The knife speed is manually set by making adjustments to the knife drive pump and has been preset at the lowest knife rpm.

For optimum performance, set the knife speed within the range specified. Refer to Table 5.1 A40-D Auger Header Knife Speed, page 89.

NOTE:

When attaching an A40-D Auger Header to an M100 or M105 Windrower for the first time, knife speed should be set to the **MAXIMUM** setting.

Table 5.1 A40-D Auger Header Knife Speed

Header Description		Knife Speed			
Type	Size	Minimum		Maximum	
		rpm ³	spm ⁴	rpm ⁵	spm ⁶
Auger A40-D	All	700	1400	975	1950

Setting Knife Speed (With Expansion Module MD #B4666)

1. Press SELECTOR button (B) on the ground speed lever (GSL) until the CDM (A) displays the knife speed in SPM (strokes per minute). This indicates that optional expansion module MD #B4666 is installed.
2. If knife speed is **NOT** displayed, the optional expansion module is not installed, proceed to [Setting Knife Speed \(Without Expansion Module MD #B4666\)](#), page 91.
3. Compare reading to Table 5.1 A40-D Auger Header Knife Speed, page 89.



Figure 5.21: Operator Console

3. rpm = speed of knife drive box pulley (revolutions per minute)
4. spm = strokes per minute of knife (rpm x 2)
5. rpm = speed of knife drive box pulley (revolutions per minute)
6. spm = strokes per minute of knife (rpm x 2)

PERFORMING PREDELIVERY CHECKS

4. If required, adjust knife speed as follows:
5. Shut down engine, and open engine hood.
6. Locate the knife drive pump (A) and knife speed adjuster screw (B) under the right (cab-forward) side of the windrower.

NOTE:

The knife speed adjuster screw may have a plastic cap (B) covering it. Pull this cap off to expose the screw.

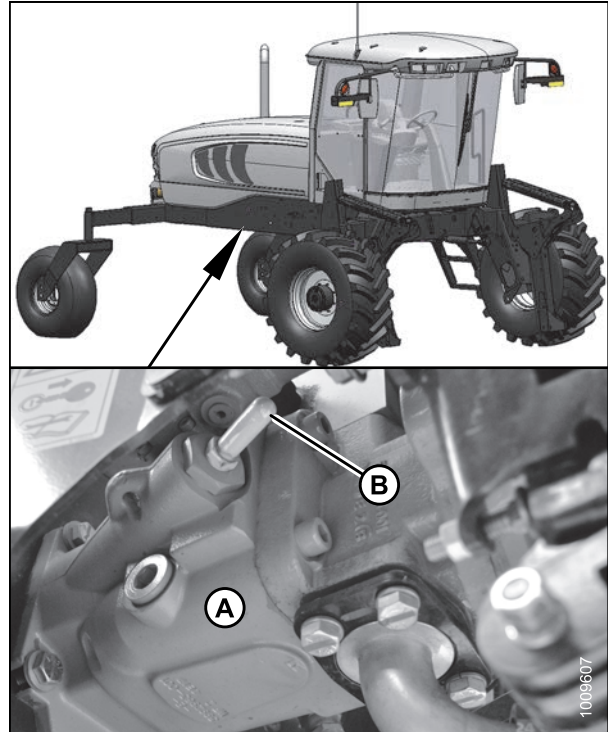


Figure 5.22: Knife Drive Pump

7. Loosen jam nut (A).
8. Turn adjuster screw (B) clockwise (screw in) to decrease knife speed, and counterclockwise (screw out) to increase the knife speed.

NOTE:

One turn of the adjuster screw (B) will change the knife speed by approximately 116 strokes per minute (spm), or the knife drive box pulley speed by 58 revolutions per minute (rpm).

9. Once adjustment has been made, torque jam nut (A).
10. Close hood, start engine, and recheck knife speed.

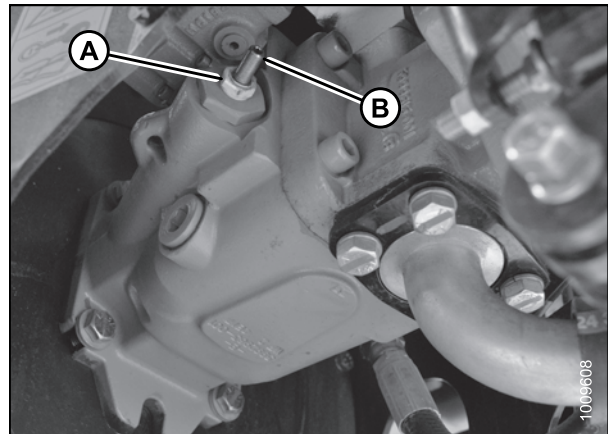


Figure 5.23: Knife Speed Adjuster Screw

PERFORMING PREDELIVERY CHECKS

Setting Knife Speed (Without Expansion Module MD #B4666)

1. Check header knife drive box pulley speed with a handheld tachometer.
2. Multiply the rpm reading by two to obtain the knife speed in strokes per minute.
3. Compare reading to Table [5.1 A40-D Auger Header Knife Speed, page 89](#).
4. If required, adjust knife speed. Refer to Step [4., page 90](#).

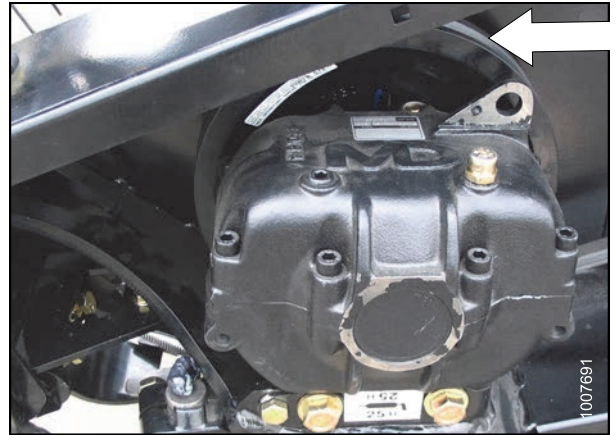


Figure 5.24: Knife Drive Box on Header

5.12 Adjusting Knife

WARNING

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

1. Stop engine and remove the key.
2. Check guards for signs of heating during run-up due to insufficient clearance between guard and knife.
3. If heating is evident, check gap between knifehead (A) and pitman arm (B). A business card should slide easily through the gap. If not, adjust gap by loosening bolt and tapping knifehead (A) with a hammer. Retighten bolt.

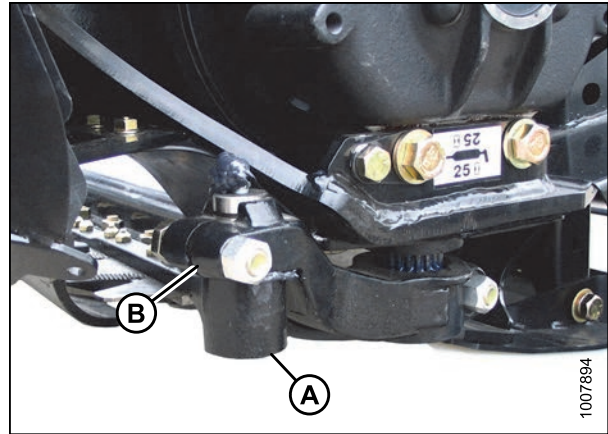


Figure 5.25: Knifehead and Pitman Arm

4. Adjust guard alignment as necessary using guard straightening tool (MD #140135). Adjust guard tips upwards by positioning tool as shown and pulling up.



Figure 5.26: Guard Tips – Upward Adjustment

5. Adjust guard tips downward by positioning tool as shown and pushing down.

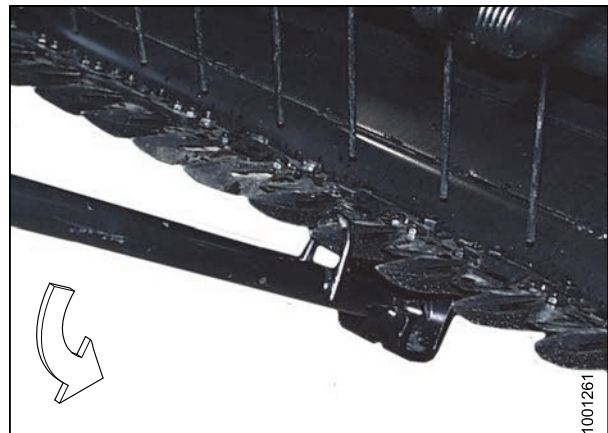


Figure 5.27: Guard Tips – Downward Adjustment

5.13 Checking Manuals

The manual case is located inside the right-hand endshield.

1. Open the right endshield (A) and remove cable tie (B) on manual case (C).

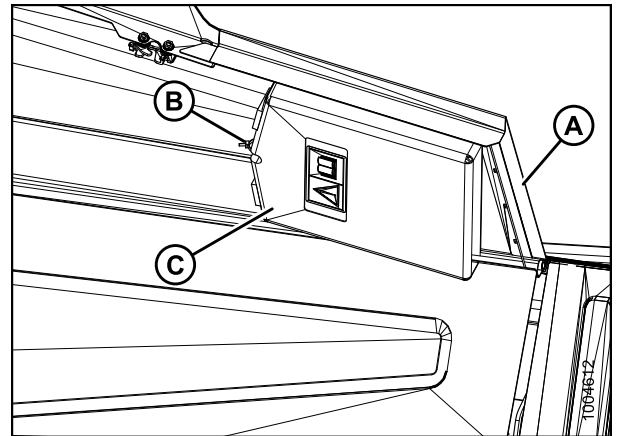


Figure 5.28: Manual Case

2. A-Series manuals are shipped with shipping documents and auger header unloading and assembly instructions. Be sure to place the following manuals in the manual case:
 - A-Series Auger Header Quick Card
 - A-Series Operator's Manual
 - A-Series Parts Catalog
3. Replace cable tie on manual case and close endshield.

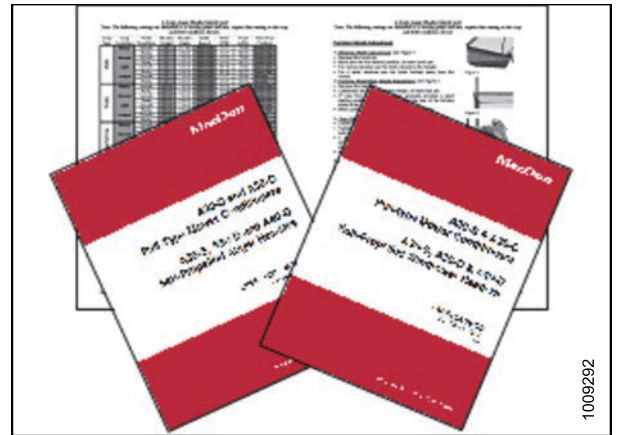


Figure 5.29: Manuals

6 Reference

6.1 Recommended Torques

6.1.1 Torque Specifications

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

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

SAE Bolt Torque Specifications

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

Table 6.1 SAE Grade 5 Bolt and Grade 5 Free Spinning Nut

Nominal Size (A)	Torque (N·m)		Torque (ft·lbf) (*in·lbf)	
	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

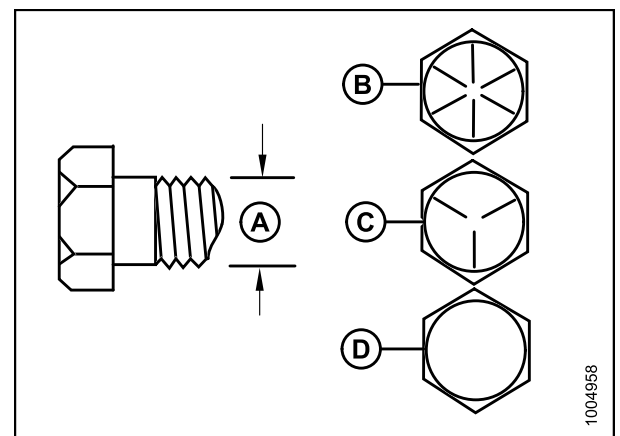


Figure 6.1: Bolt Grades

A - Nominal Size
C - SAE-5

B - SAE-8
D - SAE-2

REFERENCE

Table 6.2 SAE Grade 5 Bolt and Grade F Distorted Thread Nut

Nominal Size (A)	Torque (N·m)		Torque (ft·lbf) (*in·lbf)	
	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

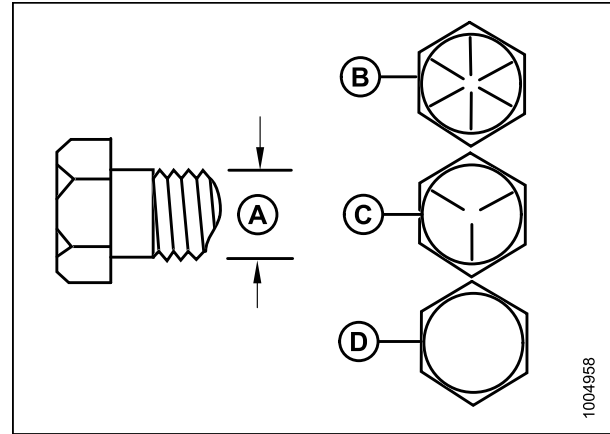


Figure 6.2: Bolt Grades

A - Nominal Size
C - SAE-5

B - SAE-8
D - SAE-2

Table 6.3 SAE Grade 8 Bolt and Grade G Distorted Thread Nut

Nominal Size (A)	Torque (N·m)		Torque (ft·lbf) (*in·lbf)	
	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

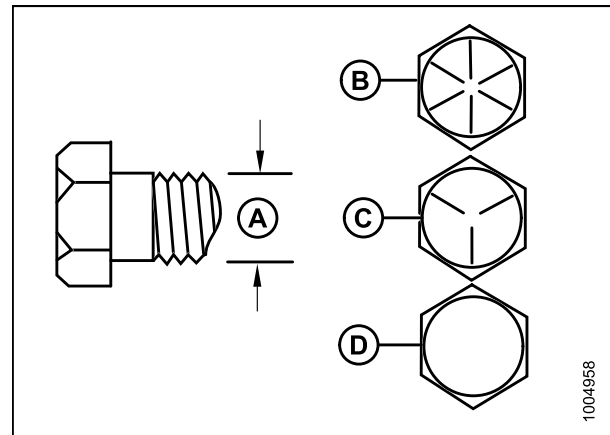


Figure 6.3: Bolt Grades

A - Nominal Size
C - SAE-5

B - SAE-8
D - SAE-2

REFERENCE

Table 6.4 SAE Grade 8 Bolt and Grade 8 Free Spinning Nut

Nominal Size (A)	Torque (N·m)		Torque (ft·lbf) (*in·lbf)	
	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

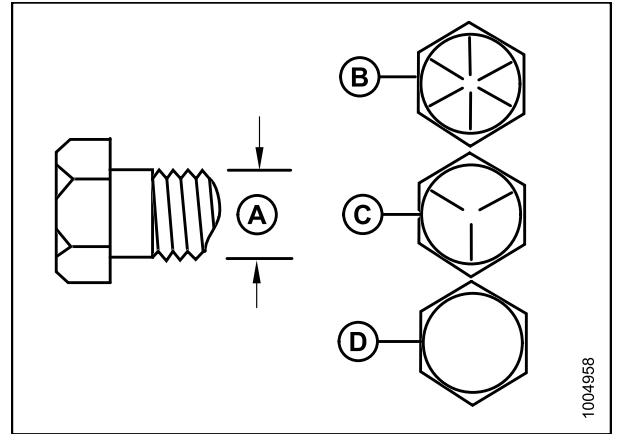


Figure 6.4: Bolt Grades

A - Nominal Size
C - SAE-5

B - SAE-8
D - SAE-2

Metric Bolt Specifications

Table 6.5 Metric Class 8.8 Bolts and Class 9 Free Spinning Nut

Nominal Size (A)	Torque (N·m)		Torque (ft·lbf) (*in·lbf)	
	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

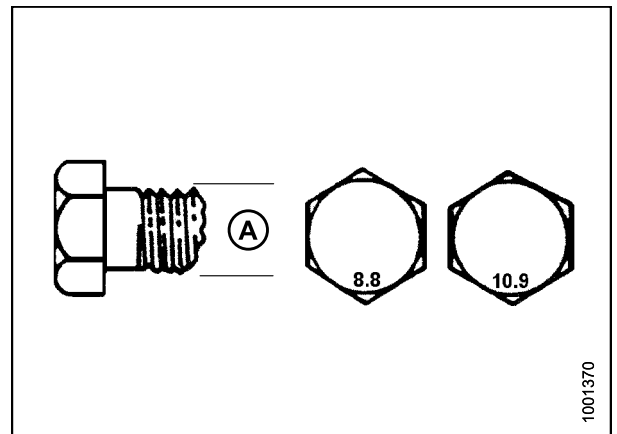


Figure 6.5: Bolt Grades

REFERENCE

Table 6.6 Metric Class 8.8 Bolts and Class 9 Distorted Thread Nut

Nominal Size (A)	Torque (N·m)		Torque (ft·lbf) (*in·lbf)	
	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

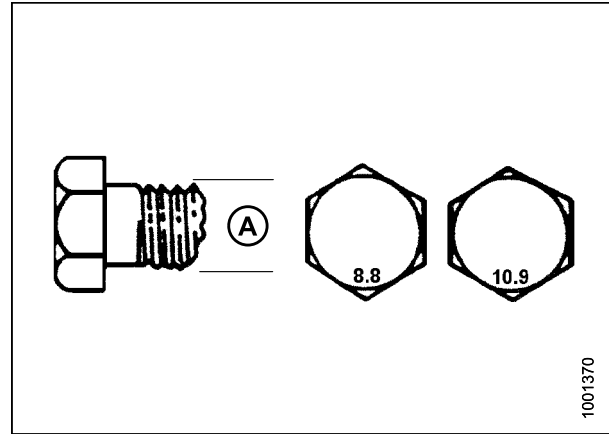


Figure 6.6: Bolt Grades

Table 6.7 Metric Class 10.9 Bolts and Class 10 Free Spinning Nut

Nominal Size (A)	Torque (N·m)		Torque (ft·lbf) (*in·lbf)	
	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

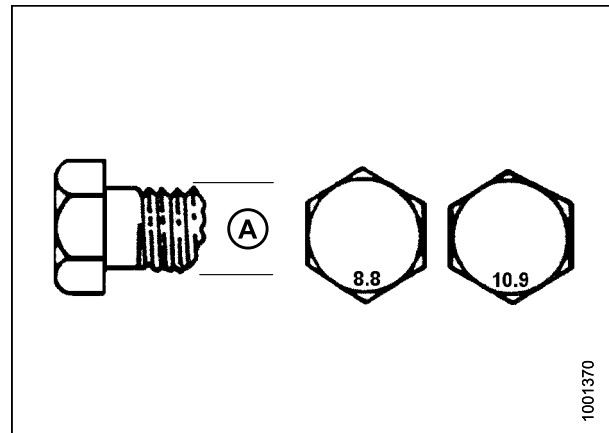


Figure 6.7: Bolt Grades

REFERENCE

Table 6.8 Metric Class 10.9 Bolts and Class 10 Distorted Thread Nut

Nominal Size (A)	Torque (N·m)		Torque (ft·lbf) (*in·lbf)	
	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

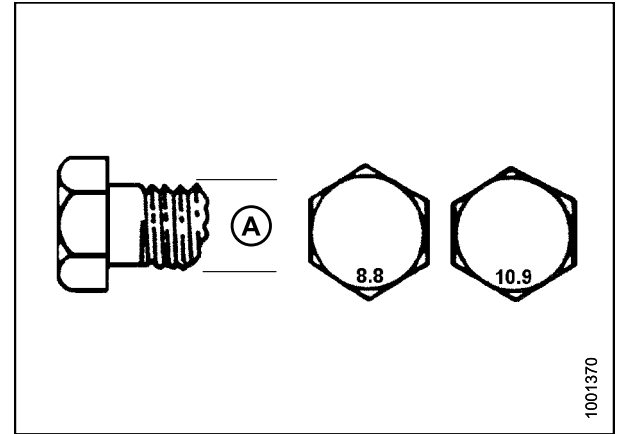


Figure 6.8: Bolt Grades

REFERENCE

Metric Bolt Specifications Bolting into Cast Aluminum

Table 6.9 Metric Bolt Bolting into Cast Aluminum

Nominal Size (A)	Bolt Torque			
	8.8 (Cast Aluminum)		10.9 (Cast Aluminum)	
	N·m	ft·lbf	N·m	ft·lbf
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	–	–	–	–

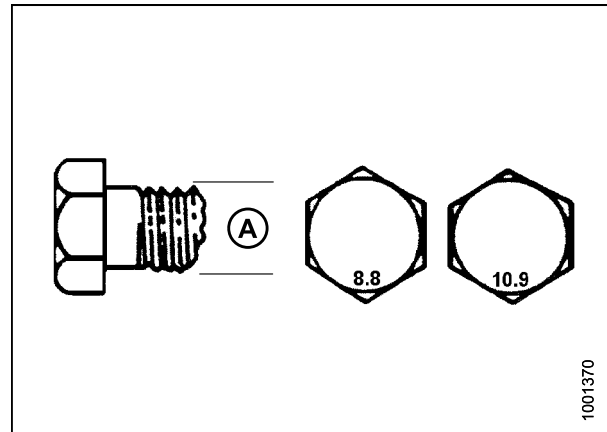


Figure 6.9: Bolt Grades

Flare-Type Hydraulic Fittings

1. Check flare (A) and flare seat (B) for defects that might cause leakage.
2. Align tube (C) with fitting (D) and thread nut (E) onto fitting without lubrication until contact has been made between the flared surfaces.
3. Torque the fitting nut (E) to the specified number of flats from finger tight (FFFT) or to a given torque value in [Table 6.10 Flare-Type Hydraulic Tube Fittings, page 101](#).
4. Use two wrenches to prevent fitting (D) from rotating. Place one wrench on the fitting body (D) and tighten nut (E) with the other wrench to the torque shown.
5. Assess the final condition of the connection.

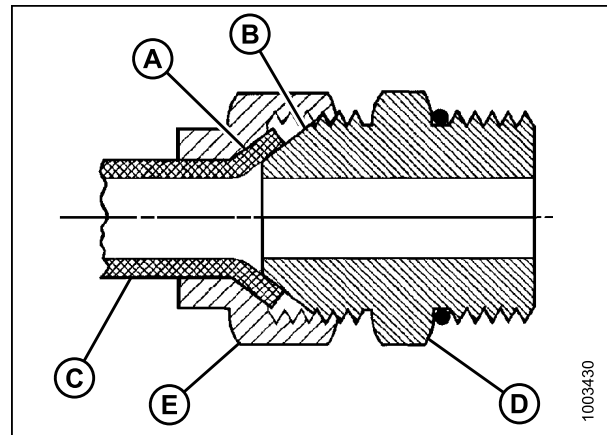


Figure 6.10: Hydraulic Fitting

REFERENCE

Table 6.10 Flare-Type Hydraulic Tube Fittings

SAE Dash Size	Thread Size (in.)	Torque Value ⁷		Flats from Finger Tight (FFFT)	
		N·m	ft·lbf	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

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

REFERENCE

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

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

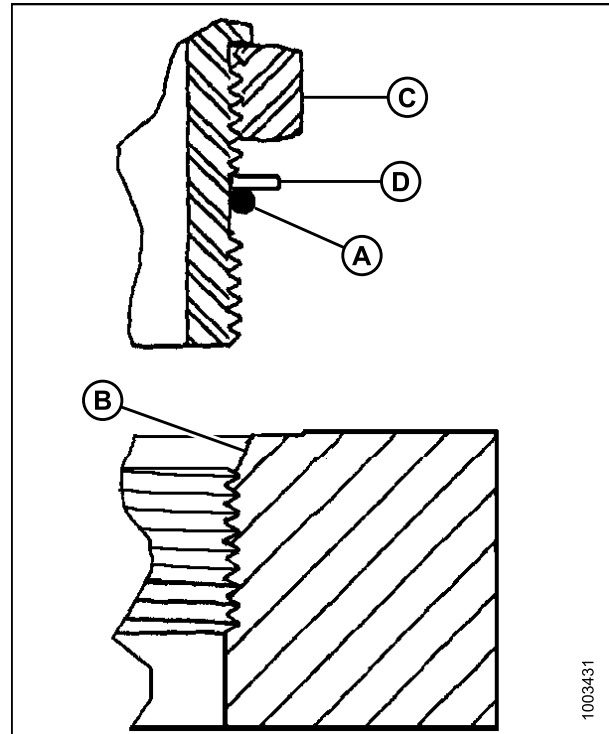


Figure 6.11: Hydraulic Fitting

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

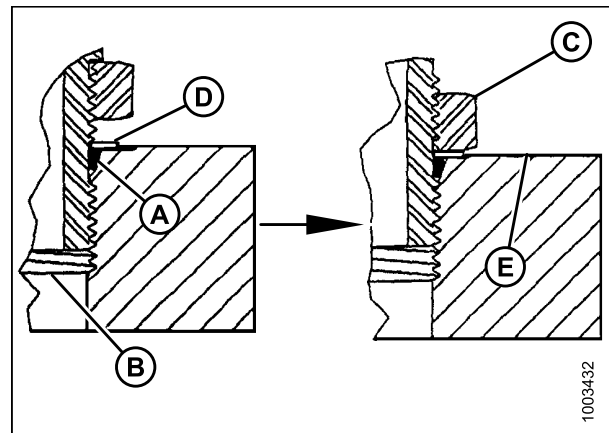


Figure 6.12: Hydraulic Fitting

REFERENCE

Table 6.11 O-Ring Boss (ORB) Hydraulic Fittings (Adjustable)

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

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

REFERENCE

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

1. Inspect O-ring (A) and seat (B) for dirt or obvious defects.
2. Check that O-ring (A) is **NOT** on the threads and adjust if necessary.
3. Apply hydraulic system oil to the O-ring.
4. Install fitting (C) into port until fitting is hand tight.
5. Torque fitting (C) according to the values in Table 6.12 *O-Ring Boss (ORB) Hydraulic Fittings (Non-Adjustable)*, page 104.
6. Check the final condition of the fitting.

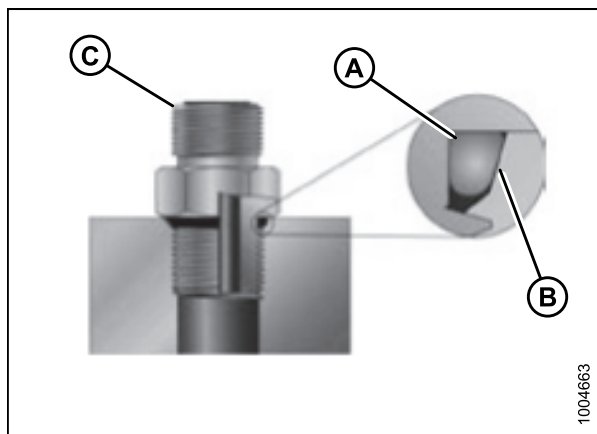


Figure 6.13: Hydraulic Fitting

Table 6.12 O-Ring Boss (ORB) Hydraulic Fittings (Non-Adjustable)

SAE Dash Size	Thread Size (in.)	Torque Value ⁹	
		N·m	ft·lbf (*in·lbf)
-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

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

REFERENCE

O-Ring Face Seal (ORFS) Hydraulic Fittings

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



Figure 6.14: Hydraulic Fitting

2. Apply hydraulic system oil to the O-ring (B).
3. Align the tube or hose assembly so that the flat face of the sleeve (A) or (C) comes in full contact with O-ring (B).
4. Thread tube or hose nut (D) until hand-tight. The nut should turn freely until it is bottomed out.
5. Torque fittings according to the values in Table [6.13 O-Ring Face Seal \(ORFS\) Hydraulic Fittings, page 106](#).

NOTE:

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

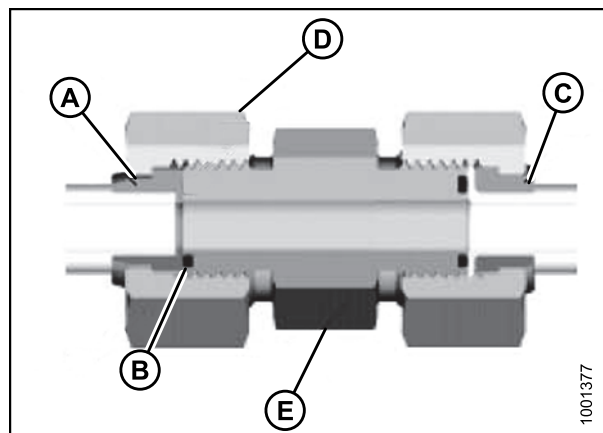


Figure 6.15: Hydraulic Fitting

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

REFERENCE

Table 6.13 O-Ring Face Seal (ORFS) Hydraulic Fittings

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

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

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

REFERENCE

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 the external pipe threads.
3. Thread the fitting into the port until hand-tight.
4. Torque the connector to the appropriate torque angle. The Turns From Finger Tight (TFFT) values are shown in Table 6.14 *Hydraulic Fitting Pipe Thread, page 107*. Make sure that the tube end of a shaped connector (typically 45° or 90°) is aligned to receive the incoming tube or hose assembly. Always finish alignment of fitting in the tightening direction. Never back off (loosen) pipe threaded connectors to achieve alignment
5. Clean all residue and any excess thread conditioner with the appropriate cleaner.
6. Assess the final condition of the fitting. Pay special attention to the possibility of cracks to the port opening.
7. Mark the final position of the fitting. If a fitting leaks, disassemble the fitting and check for damage.

NOTE:

*Over-torque failure of fittings may not be evident until the fittings are disassembled.

Table 6.14 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

6.2 Conversion Chart

Table 6.15 Conversion Chart

Quantity	SI Units (Metric)		Factor	Inch-Pound Units	
	Unit Name	Abbreviation		Unit Name	Abbreviation
Area	hectares	ha	$\times 0.4047 =$	acres	acres
Flow	liters per minute	L/min	$\times 3.7854 =$	US gallons per minute	gpm
Force	Newtons	N	$\times 4.4482 =$	pounds force	lbf
Length	millimeters	mm	$\times 25.4 =$	inch	in.
	meters	m	$\times 0.305 =$	foot	ft.
Power	kilowatts	kW	$\times 0.7457 =$	horsepower	hp
Pressure	kilopascals	kPa	$\times 6.8948 =$	pounds per square inch	psi
	megapascals	MPa	$\times .00689 =$		
	bar (Non-SI)	bar	$\div 14.5038 =$		
Torque	Newton meters	N·m	$\times 1.3558 =$	pound feet or foot pounds	ft·lbf
	Newton meters	N·m	$\times 0.1129 =$	pound inches or inch pounds	in·lbf
Temperature	Celsius	°C	$(^{\circ}\text{F}-32) \times 0.56 =$	degrees Fahrenheit	°F
Velocity	meters per minute	m/min	$\times 0.3048 =$	feet per minute	ft/min
	meters per second	m/s	$\times 0.3048 =$	feet per second	ft/s
	kilometers per hour	km/h	$\times 1.6063 =$	miles per hour	mph
Volume	liters	L	$\times 3.7854 =$	US gallons	US gal
	milliliters	ml	$\times 29.5735 =$	ounces	oz.
	cubic centimeters	cm ³ or cc	$\times 16.3871 =$	cubic inches	in. ³
Weight	kilograms	kg	$\times 0.4536 =$	pounds	lb.

6.3 Definitions

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

Term	Definition
A-Series header	MacDon auger header
API	American Petroleum Institute
ASTM	American Society of Testing and Materials
Bolt	A headed and externally threaded fastener that is designed to be paired with a nut
Cab-forward	Windrower operation with the Operator and cab facing in the direction of travel
CDM	Cab display module on a self-propelled windrower
Center-link	A hydraulic cylinder link between the header and the machine to which it is attached: It is used to change header angle
CGVW	Combined vehicle gross weight
DK	Double knife
DKD	Double-knife drive
DWA	Double Windrow Attachment
ECM	Engine control module
ECU	Electronic control unit
Export header	Header configuration typical outside North America
Finger tight	Finger tight is a reference position where sealing surfaces or components are making contact with each other and the fitting has been tightened to a point where the fitting is no longer loose
FFFT	Flats from finger tight
GSL	Ground speed lever
GSS	Grass Seed Special
GVW	Gross vehicle weight
Hard joint	A joint made with the use of a fastener where the 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 hex key or Allen key (also known by various other synonyms) is a tool of hexagonal cross-section used to drive bolts and screws that have a hexagonal socket in the head (internal-wrenching hexagon drive)
hp	Horsepower
JIC	Joint Industrial Council: A standards body that developed the standard sizing and shape for original 37° flared fitting
Knife	A cutting device which uses a reciprocating cutter (also called a sickle)
n/a	Not applicable
Nut	An internally threaded fastener that is designed to be paired with a bolt

REFERENCE

Term	Definition
N-DETENT	The slot opposite the NEUTRAL position on operator's console
North American header	Header configuration typical in North America
NPT	National Pipe Thread: A style of fitting used for low pressure port openings Threads on NPT fittings are uniquely tapered for an interference fit
ORB	O-ring boss: A style of fitting commonly used in port opening on manifolds, pumps, and motors
ORFS	O-ring face seal: A style of fitting commonly used for connecting hoses and tubes This style of fitting is also commonly called ORS, which stands for O-ring seal
rpm	Revolutions per minute
RoHS (Reduction of Hazardous Substances)	A directive by the European Union to restrict the use of certain hazardous substances (such as hexavalent chromium used in some yellow zinc platings)
SAE	Society of Automotive Engineers
Screw	A headed and externally threaded fastener that threads into preformed threads or forms its own thread in one of the mating parts
Self-Propelled (SP) Windrower	Self-propelled machine consisting of a power unit with a header
SK	Single knife
SKD	Single-knife drive
Soft joint	A joint made with the use of a fastener where the joining materials are compressible or experience relaxation over a period of time
spm	Strokes per minute
Timed knife drive	Synchronized motion applied at the cutterbar to two separately driven knives from a single hydraulic motor
Tension	Axial load placed on a bolt or screw, usually measured in 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 (N·m) or foot-pounds (ft·lbf)
Torque angle	A tightening procedure where the fitting is assembled to a precondition (finger tight) and then the nut is turned further a number of degrees or a number of flats to achieve its final position
Torque-tension	The relationship between the assembly torque applied to a piece of hardware and the axial load it induces in the bolt or screw
Untimed knife drive	Unsynchronized motion applied at the cutterbar to two separately driven knives from a single hydraulic motor or two hydraulic motors
Washer	A thin cylinder with a hole or slot located in the center that is to be used as a spacer, load distribution element, or a locking mechanism
Windrower	Power unit of a self-propelled header
WCM	Windrower control module

Predelivery Checklist

Perform these checks and adjustments prior to delivery to your Customer. If adjustments are required, refer to the appropriate page number in this manual. The completed checklist should be retained by either the Operator or the Dealer.

CAUTION

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

Header Serial Number:

Table 1 A40-D Predelivery Checklist

✓	Item	Reference
	Check for shipping damage or missing parts. Be sure all shipping dunnage is removed.	—
	Check for loose hardware. Tighten to required torque if applicable.	6.1 Recommended Torques, page 95
	Check knife drive belt tension.	5.1 Checking Drive Belts and Chains, page 77
	Check reel tine to header pan and knife clearance.	5.3 Checking Reel Tine to Header Pan Clearance, page 79
	Check auger stripper bar clearance.	5.2 Checking Auger Stripper Bar Clearance, page 78
	If mechanical link, set header angle to middle of adjustment range for first use.	—
	Check that header is level.	5.5 Checking Header Levelling, page 81
	Check header float: 335–380 N (75–85 lbf).	5.4 Checking/Adjusting Float, page 80
	Check lean bar is adjusted at a setting appropriate for first crop.	3.7 Adjusting Lean Bar, page 16
	Check skid shoes are evenly adjusted at a setting appropriate for first crop.	5.8 Checking Skid Shoes/Gauge Rollers, page 86
	Check knife drive box lube level and breather position.	3.18 Repositioning Knife Drive Box Breather, page 69
	Check that rear and side forming shields are evenly set to desired position.	3.10 Assembling Forming Shield, page 19
	Grease all bearings and drivelines.	4 Lubricating the Machine, page 71
	Check conditioner gear case lube level.	5.7 Checking Conditioner Gearbox Oil Level, page 85
	Check conditioner roll gap, timing, and alignment.	5.6 Checking Conditioner Rolls, page 83
	Check roll intermesh hardware is securely tightened.	5.6 Checking Conditioner Rolls, page 83

PREDELIVERY CHECKLIST

RUN-UP PROCEDURE		<i>5.10 Running Up Header, page 88</i>
	Check hydraulic hose and wiring harness routing for clearance when raising or lowering header and when retracting or extending center-link.	—
	Check knife speed.	<i>5.11 Checking Knife Speed, page 89</i>
	Check that amber flasher and signal lights are functional.	<i>5.9 Checking Lights, page 87</i>
	Check header ID on windrower CDM.	—
POST RUN-UP CHECKS. STOP ENGINE.		
	Check for hydraulic leaks.	—
	Check belt and chain drives for idler alignment and heated bearings.	<i>5.1 Checking Drive Belts and Chains, page 77</i>
	Check knife sections for discoloration caused by misalignment of components.	<i>5.12 Adjusting Knife, page 92</i>
	Check manuals in the right-hand header endshield.	<i>5.13 Checking Manuals, page 93</i>

Date Checked:

Checked by:

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