FD1-Series FlexDraper® Combine Header with FM100 Float Module

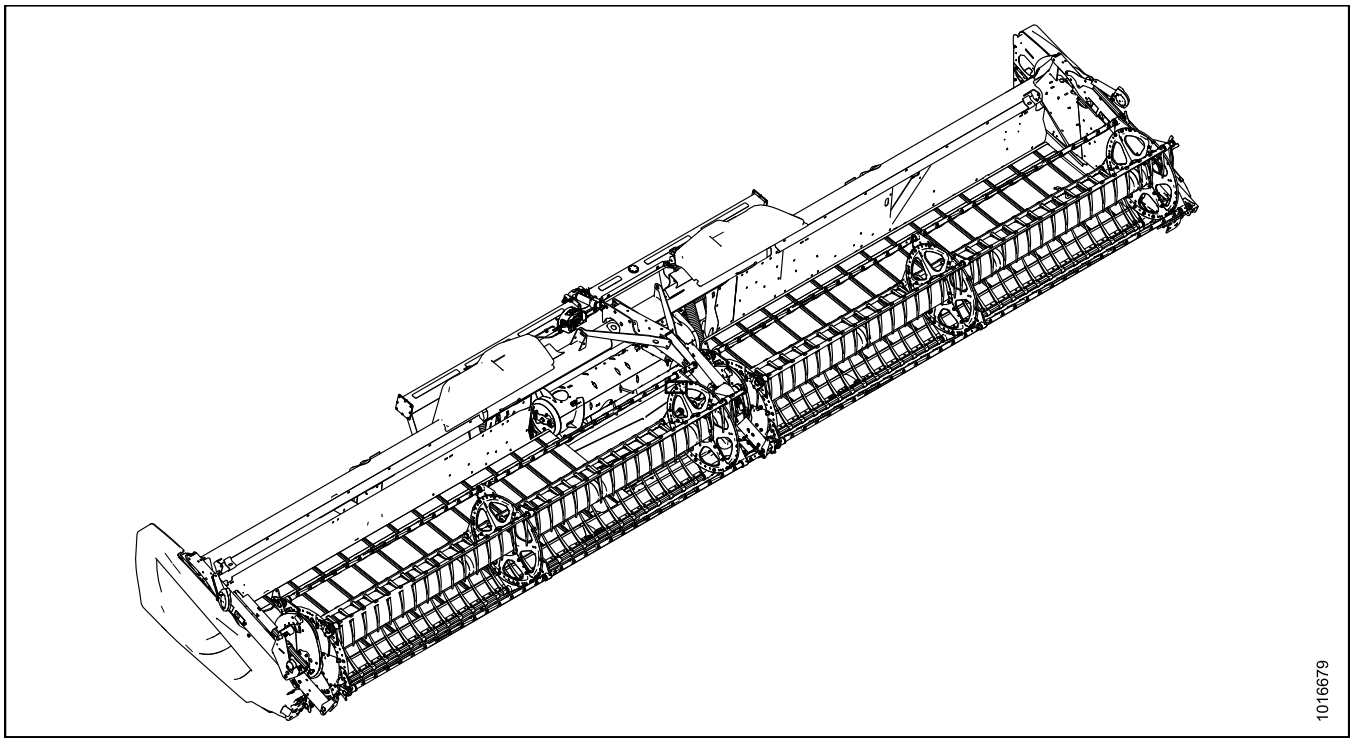
Unloading and Assembly Instructions (North America)

214068 Revision A
2017 Model Year
Original Instruction

Featuring MacDon FLEX-FLOAT Technology™

The harvesting specialists.

FD1 Series FlexDraper® Header for Combines



Published: January 2017

Introduction

This instruction manual describes the unloading, setup, and predelivery requirements for the MacDon FD1 Series FlexDraper® Combine Header with FM100 Float Module.

To ensure the best performance of this product and the safety of your customers, carefully follow the unload and assembly procedure from the beginning through to completion.

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

Retain this instruction for future reference.

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

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

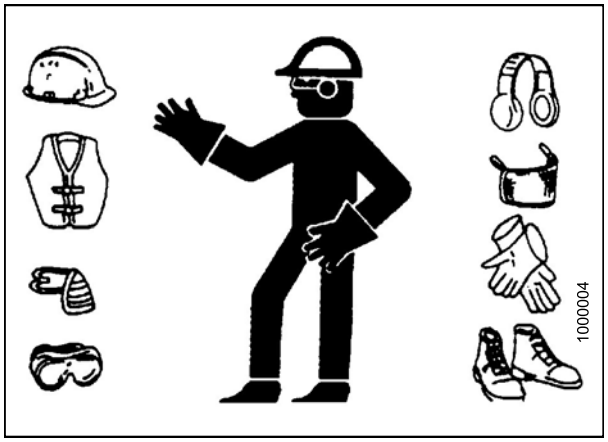


Figure 1.1: Safety Equipment

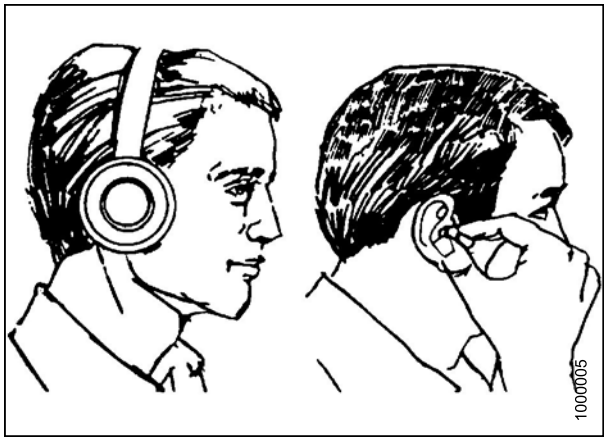


Figure 1.2: Safety Equipment

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

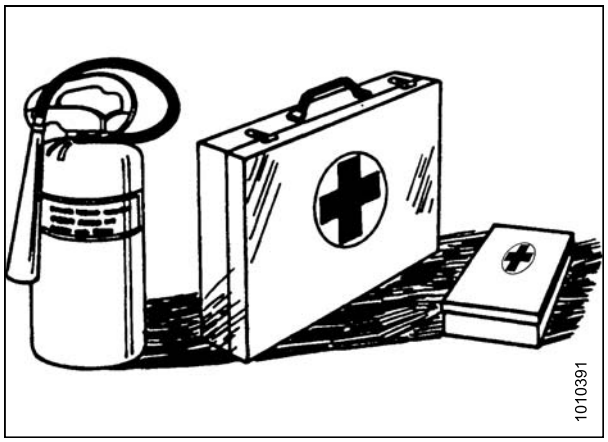


Figure 1.3: Safety Equipment

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

Figure 1.4: Safety around Equipment

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

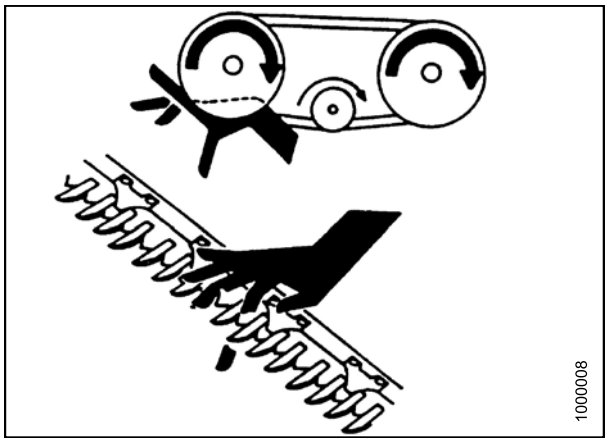


Figure 1.5: Safety around Equipment

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

Figure 1.6: 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 repair part also bears current safety sign.
- Safety signs are available from your MacDon Dealer.

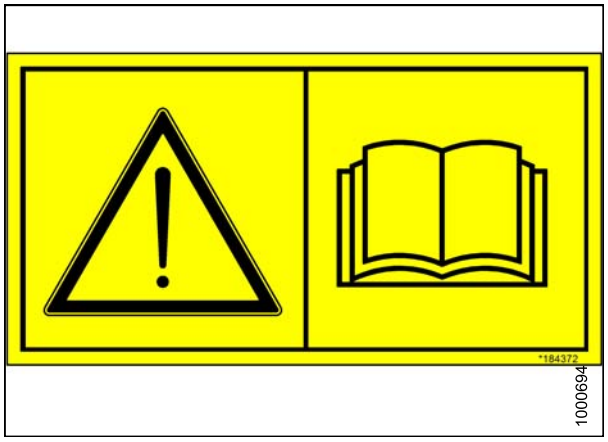


Figure 1.7: Operator's Manual Decal

2 Unloading

Perform all procedures in this chapter in the order in which they are listed.

2.1 Unloading Header and Float Module from Trailer

The following procedure assumes that two headers were shipped on the trailer.

CAUTION

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

CAUTION

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

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

Table 2.1 Lifting Vehicle

Minimum Lifting Capacity	4082 kg (9000 lb.) load center (A) at 1220 mm (48 in.) (B) from back of forks
Minimum Fork Length (C)	1981 mm (78 in.)

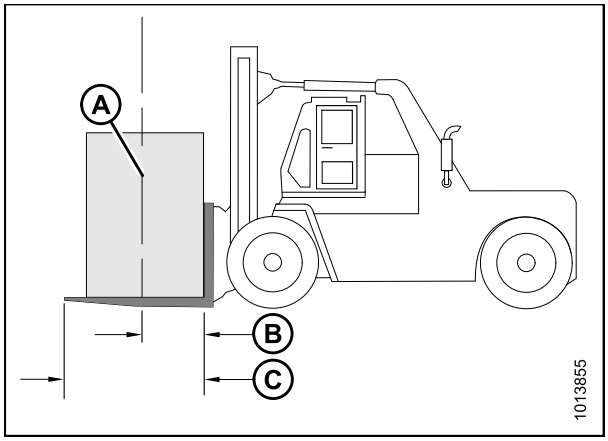


Figure 2.1: Minimum Lifting Capacity

A - Load Center of Gravity
B - Load Center 1220 mm (48 in.) from Back of Forks
C - Minimum Fork Length 1981 mm (78 in.)

To unload headers and float modules from a trailer, follow these steps:

1. Move trailer into position and block trailer wheels.
2. Lower trailer storage stands.

3. Approach one of the headers and line up forks (A) with fork slider channels (B) under the float module frame.
4. Slide forks (A) underneath fork slider channels (B) as far as possible without contacting the shipping support of the opposite header.

   IMPORTANT:
   Avoid lifting the second header and ensure the forks do not interfere with the shipping frame. If the forks contact the second header, damage to the headers may occur.
5. Remove hauler's tie-down straps, chains, and wooden blocks.
6. Slowly raise header off trailer deck.

WARNING

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

7. Back up until header clears trailer and slowly lower to 150 mm (6 in.) from ground.

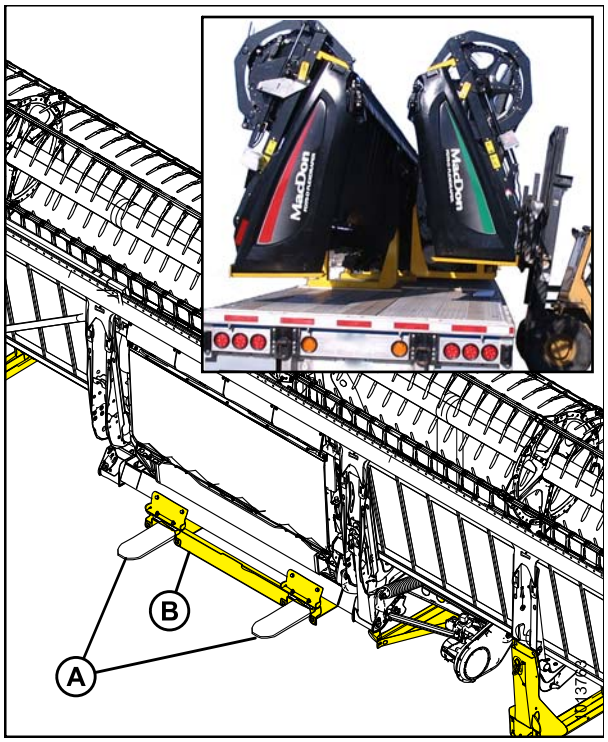


Figure 2.2: Header Shipping Supports

8. Take header to the storage or setup area. Ensure ground is flat and free of rocks or debris that could damage the header.
9. Repeat above steps for second header.
10. Check for shipping damage and missing parts.

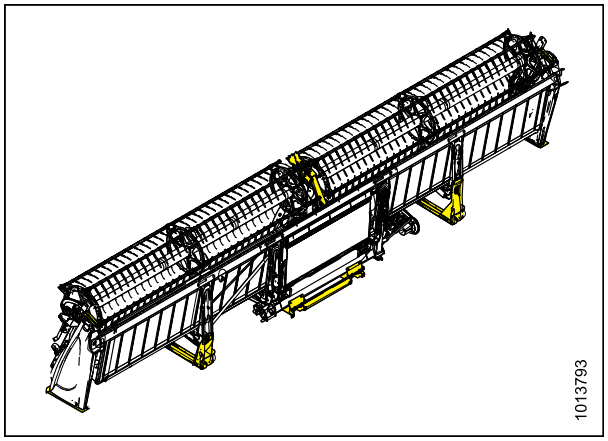


Figure 2.3: Header on Level Ground

2.2 Lowering Header

1. Approach the underside of the header with the lifting vehicle.
2. Attach chain to shipping support (A) at center reel arm.

   IMPORTANT:
   Do NOT attempt to lift at cutterbar when unloading from trailer. This procedure is ONLY for laying the machine over into working position.

CAUTION

Stand clear of header when lowering. Machine may swing.

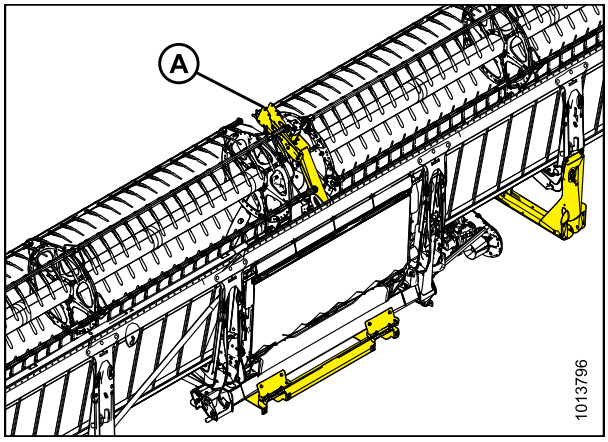


Figure 2.4: Underside of Header

3. Back up **SLOWLY** while lowering forks until header rests on the ground.

Figure 2.5: Header Lowered onto Ground

4. Place 150 mm (6 in.) blocks (A) under each end and at the center of cutterbar, then lower header onto blocks.
5. Remove chain.

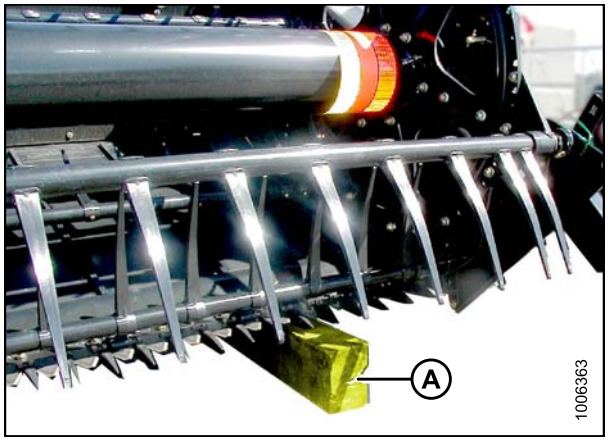


Figure 2.6: Blocks at Each End of Cutterbar

2.3 Removing Shipping Stands

NOTE:
Unless otherwise specified, discard stands, shipping material, and hardware. The removable stands are painted yellow.

1. Remove the two bolts (A) securing the right fork channel (B) to the shipping stand (C).

   NOTE:
   To access the bolts at the lower stand support, the header must be supported on 150 mm (6 in.) blocks, as directed in Step .

2. Remove two bolts (D) securing the right fork channel (B) to the lower brace (E).
3. Repeat the steps above for the left side.

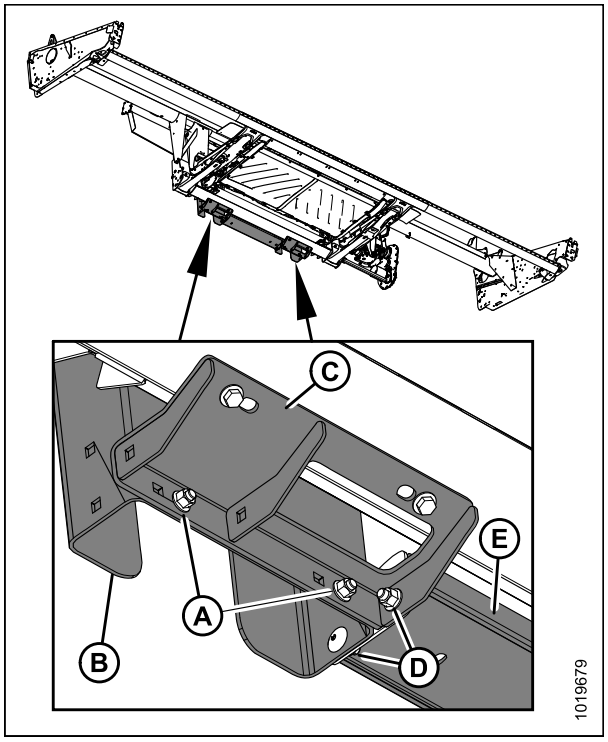


Figure 2.7: Shipping Supports

4. Remove the lower brace (A).

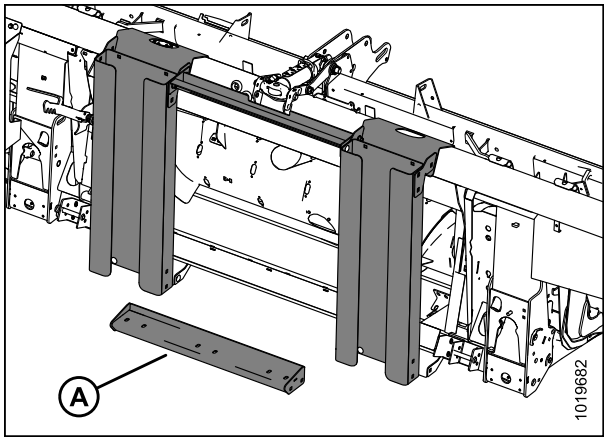


Figure 2.8: Shipping Supports

5. Remove the two bolts (A) from the upper brace. Repeat for the opposite side.

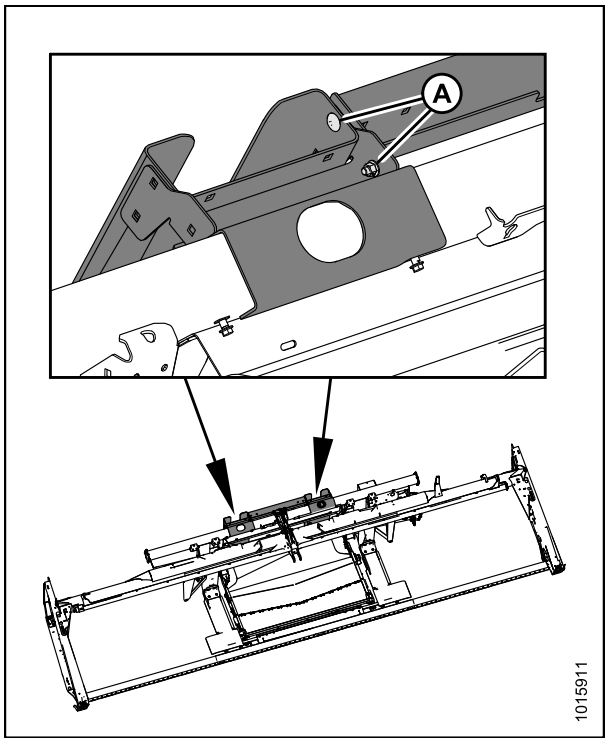


Figure 2.9: Shipping Supports

6. Remove the right and left fork channels (A).
7. Remove the upper brace (B).

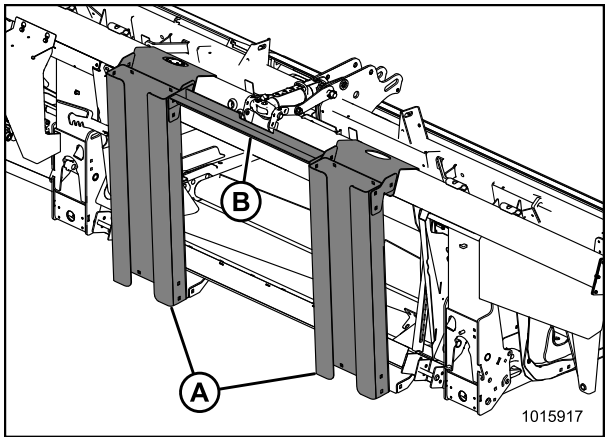


Figure 2.10: Shipping Supports

8. Remove four bolts (A) and remove shipping stands (B) from the bottom of the float module.

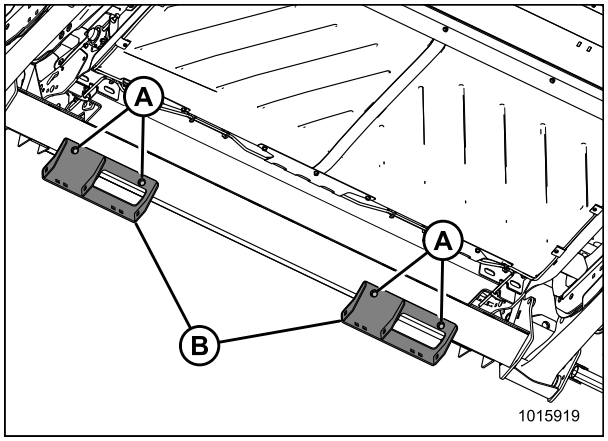


Figure 2.11: View from Below Header

9. Remove the two bolts (A) and loosen two bolts (B) securing the coupler cover (C) to the float module.
10. Remove the coupler cover.
11. Tighten two bolts (B).

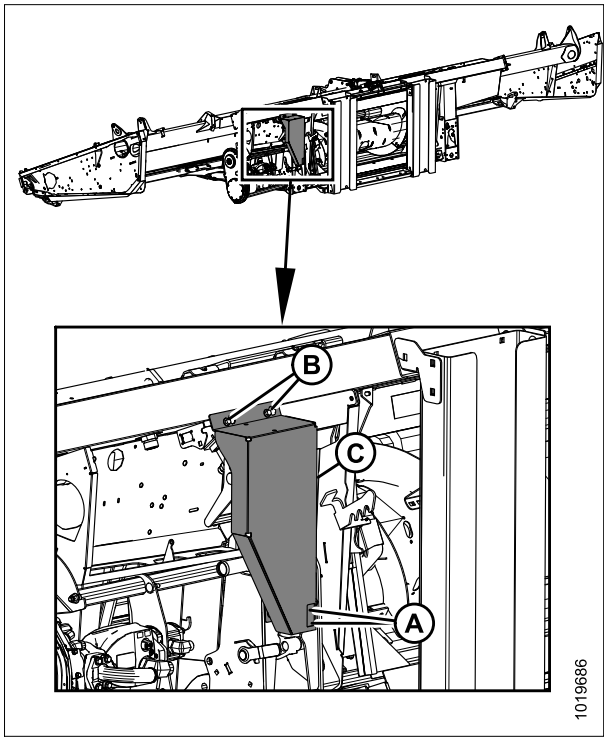


Figure 2.12: Coupler Cover

12. Remove the four bolts (A) from the shipping stands at both outboard header legs. Remove stands.

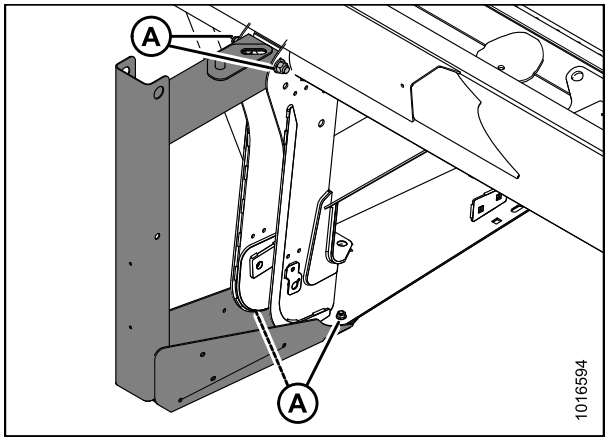


Figure 2.13: Shipping Stands at Outboard Legs (Right Side Shown)

13. Remove reel anti-rotation strap (A) between reel and endsheet.

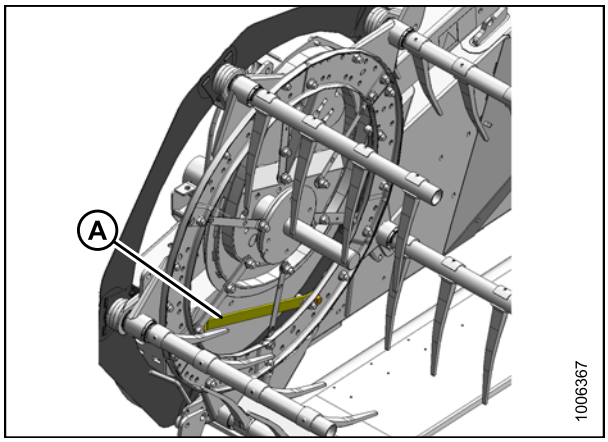


Figure 2.14: Reel Anti-Rotation Strap

14. Loosen three bolts (A) in each endshield guard (B), and remove guards. Hardware can be removed when header endshields are opened.

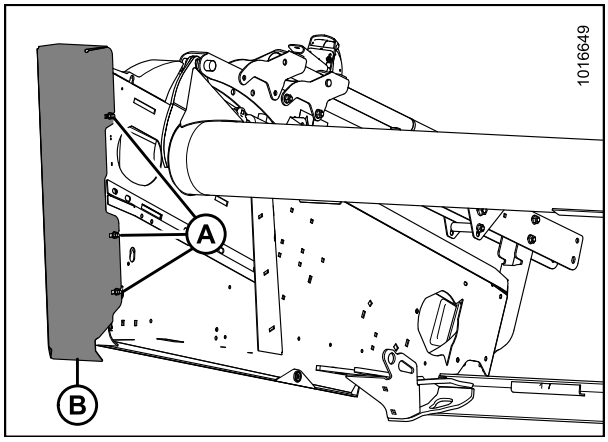


Figure 2.15: Endshield Guard

3 Assembling Header and Float Module

Perform all the procedures in this chapter in the order in which they are listed.

3.1 Attaching Reel Lift Cylinders

CAUTION

Bolts (A) (with tags) on reel arms keep the reel from sliding forward. Ensure fore-aft cylinders are attached before removing bolts.

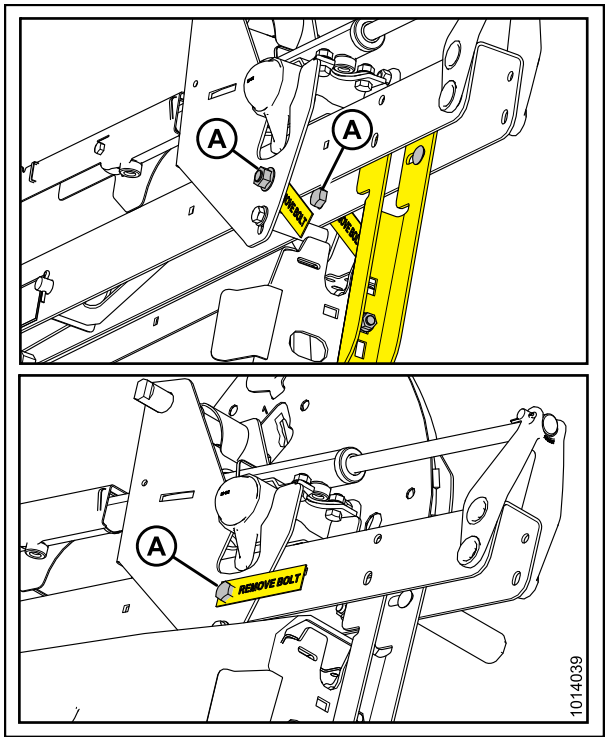


Figure 3.1: Reel Right Arm (Parts Removed for Clarity)

Top Image - Single Reel
Bottom Image - Double Reel

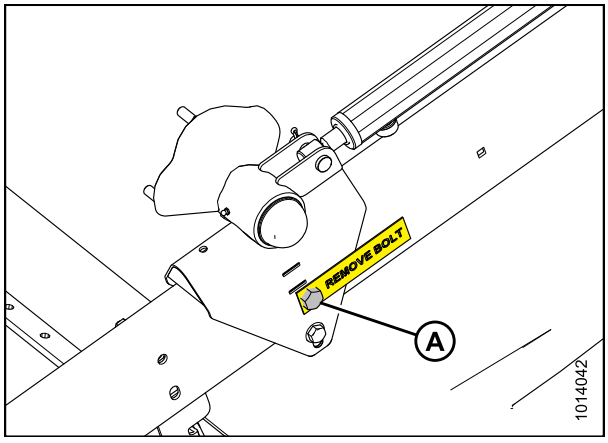


Figure 3.2: Reel Left Arm

1. Remove two top bolts (A) on outboard reel arm supports. Repeat for opposite side.

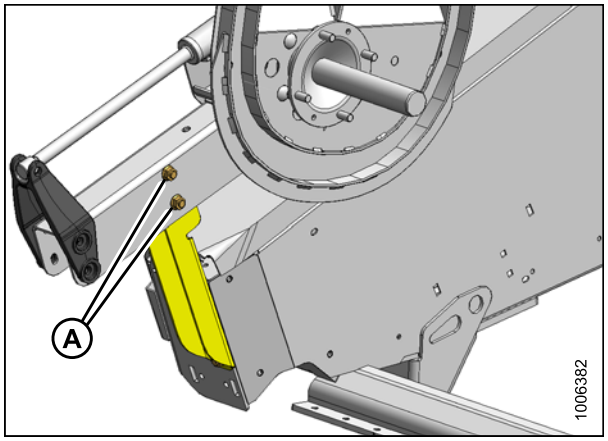


Figure 3.3: Reel Arm Shipping Support

2. Remove two top bolts (A) on center reel arm to allow the center reel arm to move.

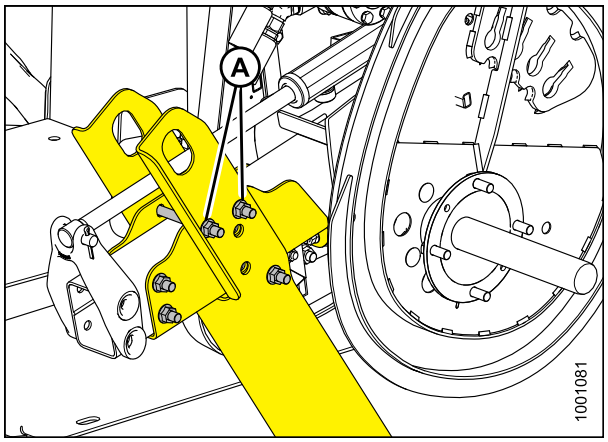


Figure 3.4: Double-Reel Center Arm

3. Position sling (A) around the reel tube (B) close to the outboard end of reel and attach sling to a forklift (or equivalent).
4. Remove shipping wire/banding from the reel lift cylinder that is secured to the reel right arm.

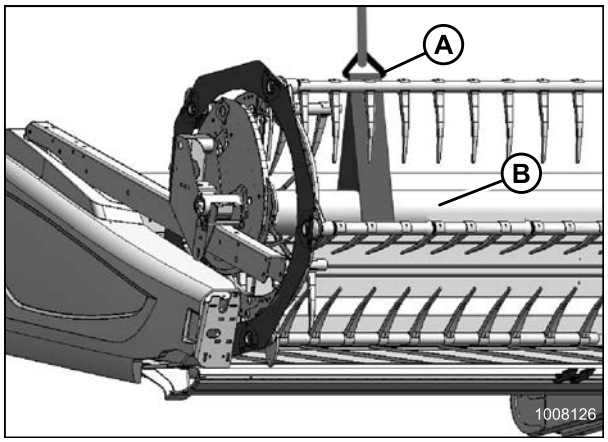


Figure 3.5: Reel Right End

5. Lift reel and remove pins from the endsheet and the reel arm.
6. Align the reel lift cylinder mounting holes until they line up with the lug on the endsheet and the hole in the reel arm.
7. Secure cylinder to endsheet and reel arm with clevis pins (A) and (B) as shown.
   - Insert cotter pin into clevis pin (A) on **OUTBOARD** side of reel arm.
   - Insert cotter pin into clevis pin (B) on **INBOARD** side of endsheet.

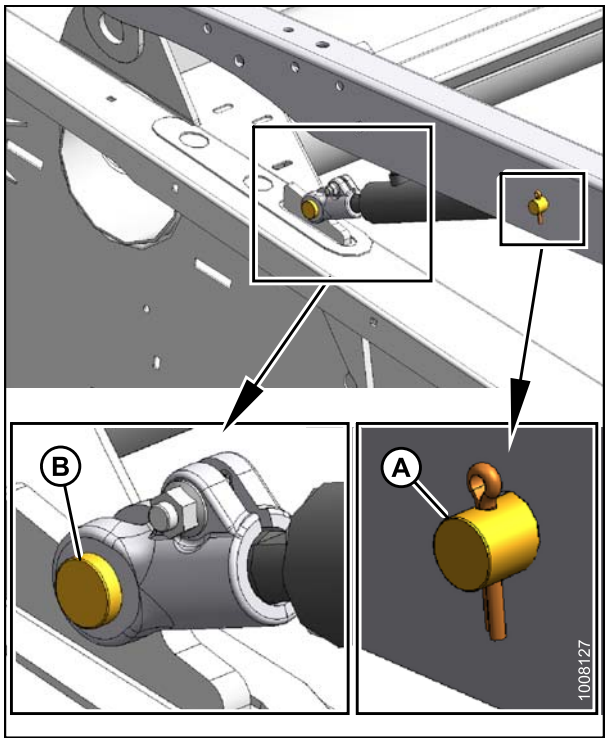


Figure 3.6: Reel Right Lift Cylinder Attachment

8. Position sling (A) around the reel tube near the reel center support arm.
9. Remove shipping wire and banding from center reel lift cylinder and remove socket head bolt and nut from cylinder rod.

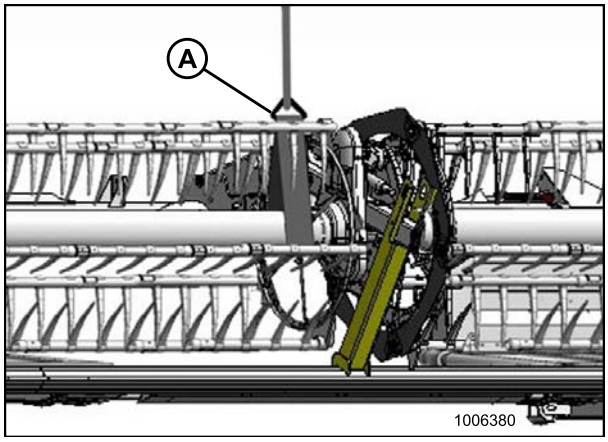


Figure 3.7: Lifting Double Reel

10. Lift reel so that hole in center lift cylinder rod lines up with mounting hole in reel arm.
11. Attach rod end of cylinder to reel arm with socket head bolt and nut (A). Access hardware through holes in reel arm braces.
12. Torque bolt and nut (A) to 54–61 Nm (40–45 lbf·ft).

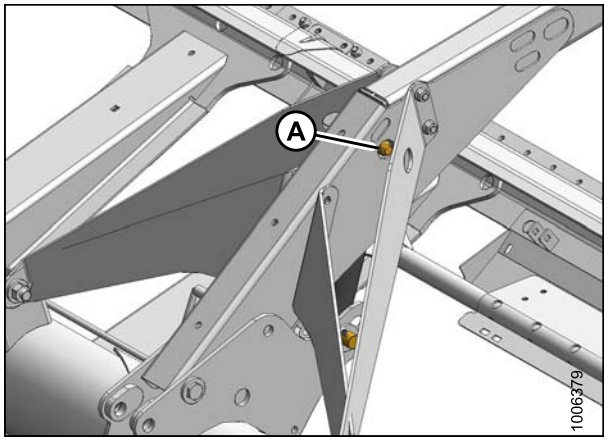


Figure 3.8: Reel Center Arm

13. Reposition the sling (A) around the reel tube near the opposite outboard reel arm.
14. Remove shipping wire and banding from the reel lift cylinder.

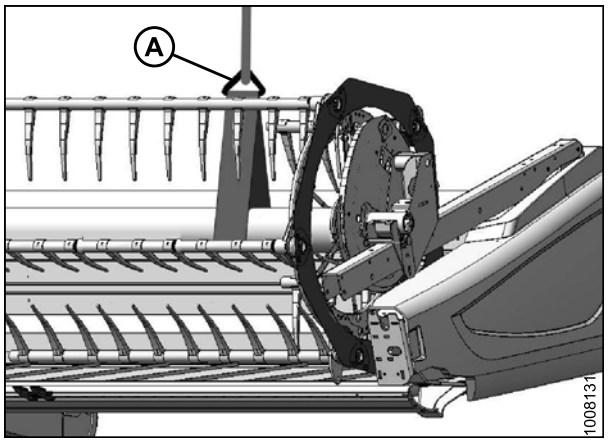


Figure 3.9: Outboard Reel Arm

15. Lift reel and remove pins from the endsheet and the reel arm.
16. Align the reel lift cylinder mounting holes until they line up with the lug on the endsheet and the hole in the reel arm.
17. Secure cylinder to endsheet and reel arm with pins as shown.
    - Insert cotter pin into clevis pin (A) on **OUTBOARD** side of reel arm.
    - Insert cotter pin into clevis pin (B) on **INBOARD** side of endsheet.

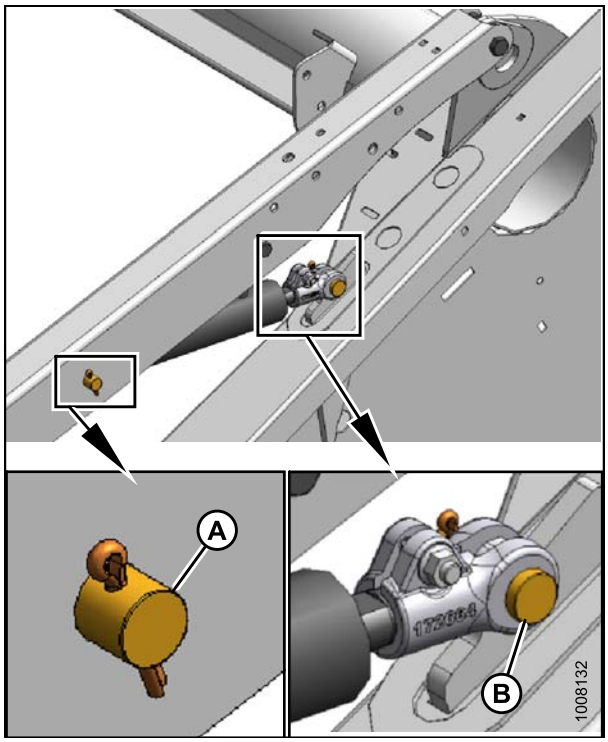


Figure 3.10: Lift Cylinder Attachment

18. Remove the remaining bolt (A), disengage center reel arm shipping support (B) from cutterbar, and remove shipping support.

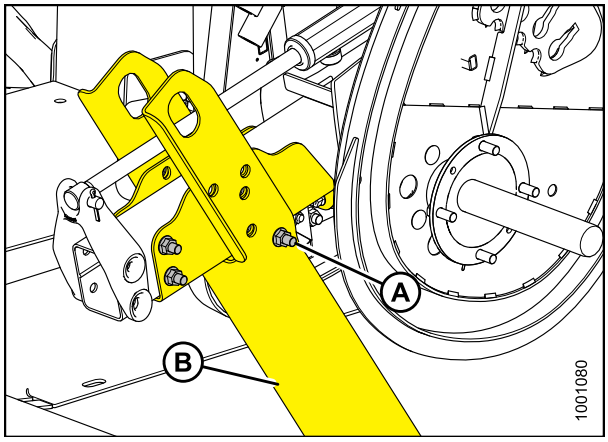


Figure 3.11: Reel Center Arm Shipping Support

19. Remove bolts (A) from reel arm support at endsheet and remove support. Repeat at other side.

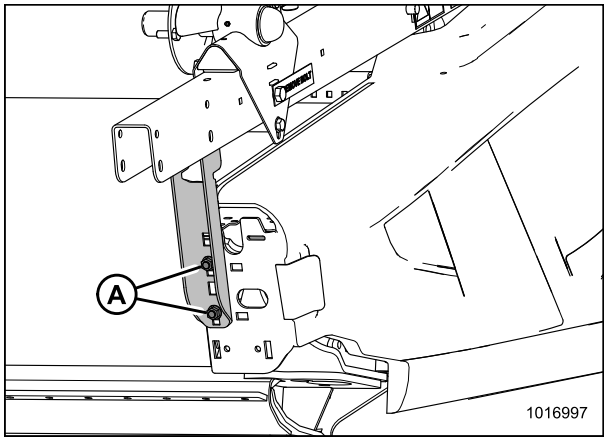


Figure 3.12: Reel Outboard Arm Support

20. Remove brace bolts and tags (A) locking the reel fore-aft position at outer reel arms.

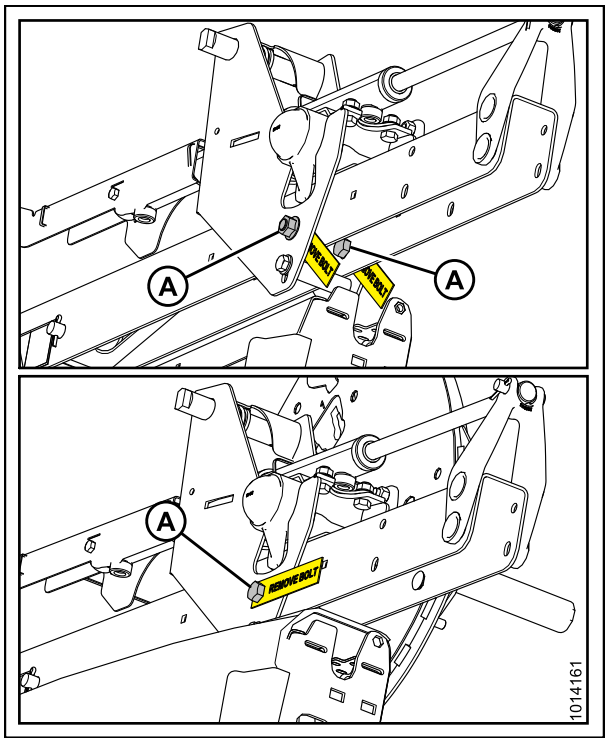


Figure 3.13: Reel Right Arm

Top Image - Single Reel
Bottom Image - Double Reel

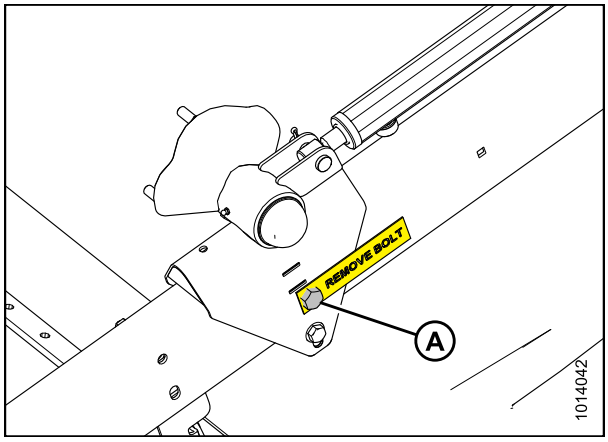


Figure 3.14: Reel Left Arm

21. Remove the remaining three bolts (A) locking the reel fore-aft position at the center reel arm, and remove shipping channel (B).

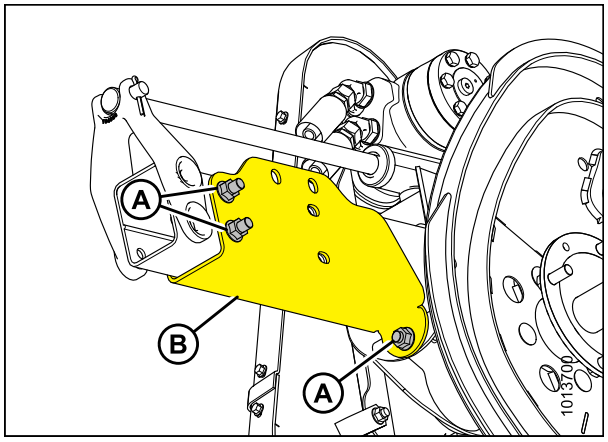


Figure 3.15: Center Arm Shipping Channel

3.2 Attaching Reel Height Sensor

The reel height sensor linkage was disconnected prior to shipping. Reconnect the sensor using the following procedure:

1. Remove the shipping wire.
2. Check that arm (C) and sensor pointer (D) are configured properly for your combine. Refer to Figure *3.16: Reel Height Sensor, page 23*.

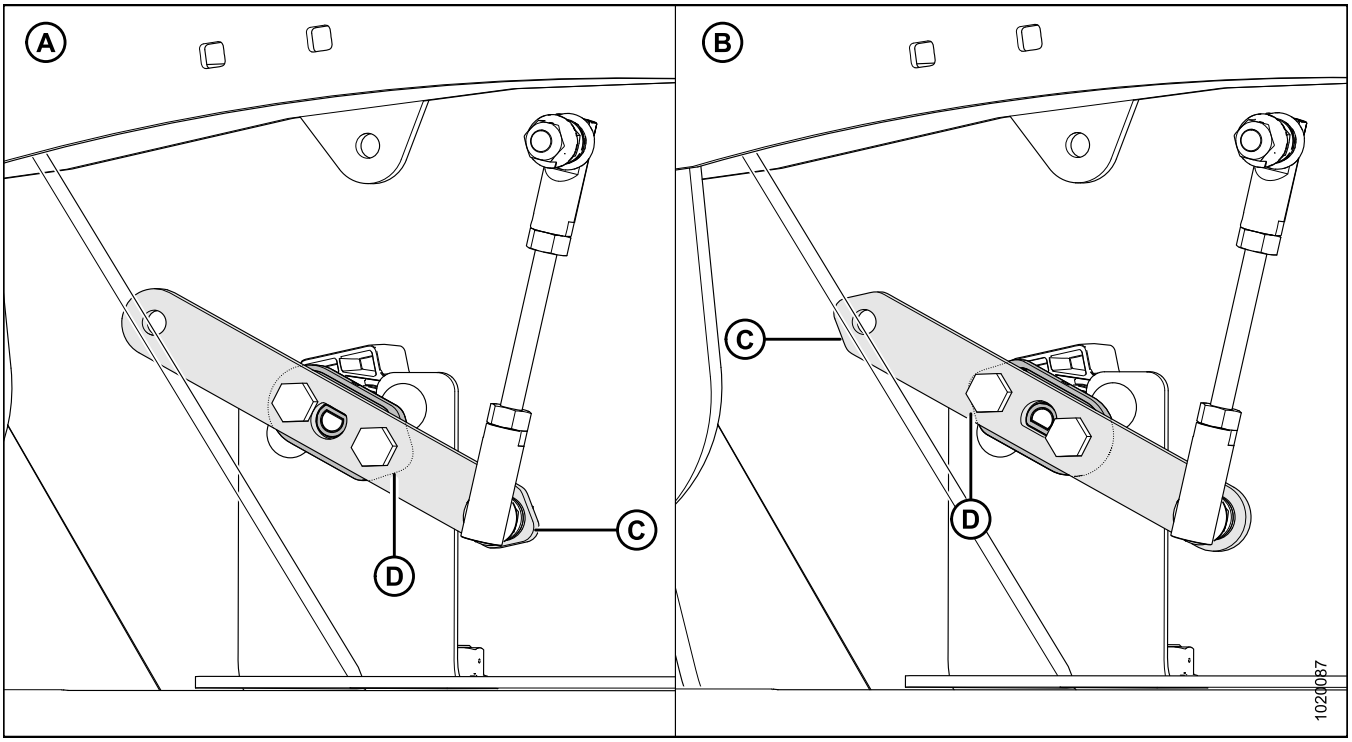


Figure 3.16: Reel Height Sensor

A – CNH

B – John Deere/CLAAS

C – Sensor Arm

D – Sensor Pointer

3. Attach the ball joint (A) to the sensor plate (B).
4. Secure the ball joint in place with flange nut (C) provided.
5. Proceed to *Installing Reel Endshields*.

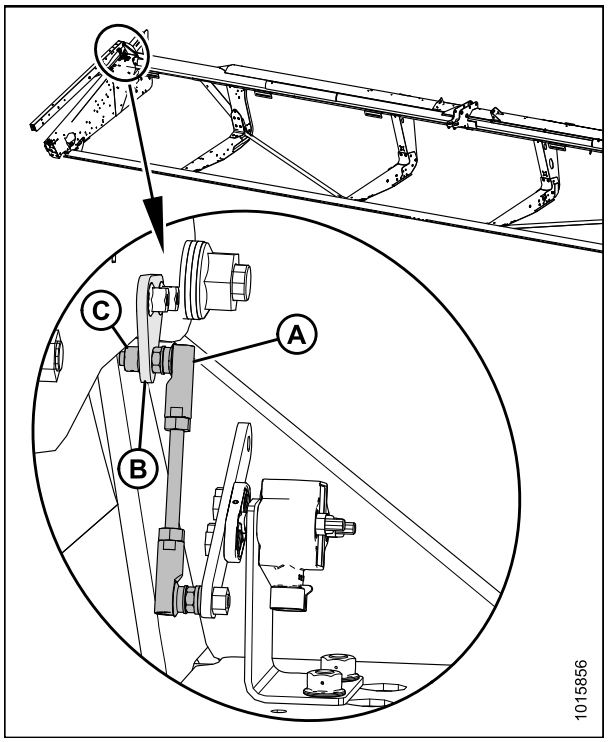


Figure 3.17: Reel Height Sensor

3.3 Setting up Float Module

Complete the following procedures in the order in which they are listed:

- *3.3.1 Installing Filler Cap, page 25*
- *Float Module Feed Auger Configurations*
- *3.3.4 Replacing CR Feeder Deflectors, page 27*

3.3.1 Installing Filler Cap

1. Remove filler cap from bag (A).

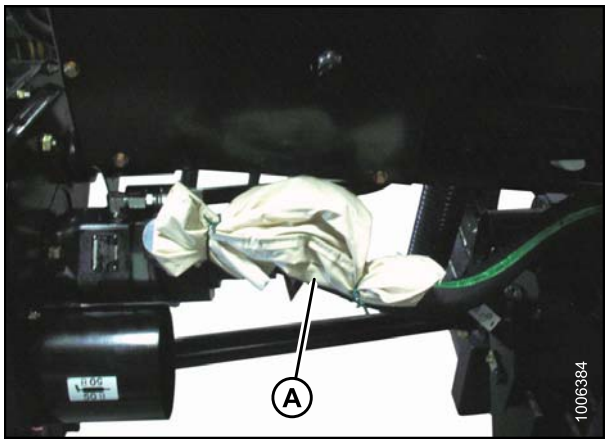


Figure 3.18: Hardware Bag

CAUTION

Fluid may be under pressure. Allow pressure to equalize by loosening screws and lifting the shipping cover slightly.

2. Remove yellow shipping cover (A) from float module frame. Discard cover. Keep screws if screws are not supplied with filler cap.

Figure 3.19: Yellow Shipping Cover

3. Remove top gasket (A) for use in the next step.

   NOTE:
   There are two gaskets—one on each side of the filler strainer flange.

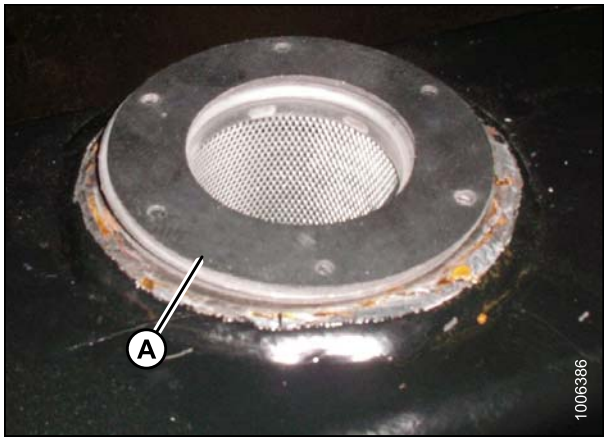


Figure 3.20: Top Gasket

4. Place gasket (A) (removed from the top of the filler strainer) onto the filler cap neck (B) and align holes.
5. Install #10-32 screws (if supplied with cap, otherwise use existing screws) into filler cap neck (B) and push screws through gasket (A).
6. Apply Loctite® #565 (or equivalent) to screws.

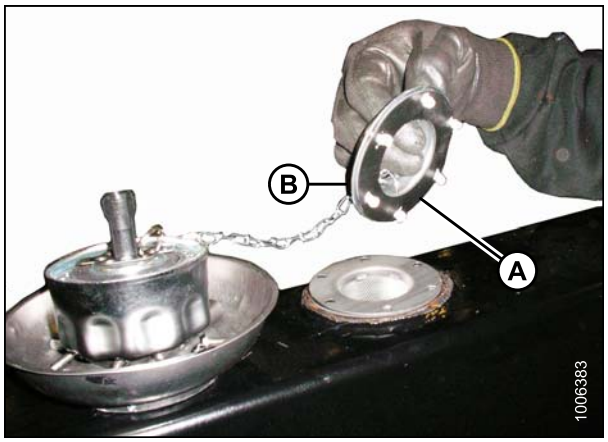


Figure 3.21: Filler Cap Neck

7. Place filler cap neck (A) (complete with screws) over opening and ensure the machine screws are aligned with the threaded holes.
8. Carefully thread in the machine screws using a cross pattern (as shown) in order to prevent cross threading of tapped holes.
9. Repeat pattern to gradually tighten screws to 3.5 N·m (31 lbf·in).

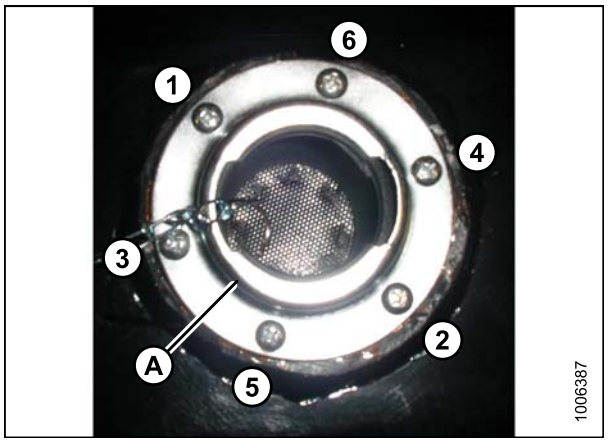


Figure 3.22: Screw Hole Locations

10. Install filler cap (A).

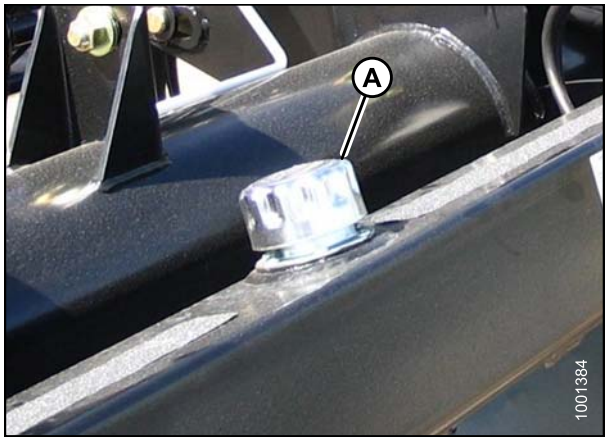


Figure 3.23: Filler Cap

3.3.2 Configuring Auger

The auger has been configured with the correct amount of flighting and fingers to perform well in most crop conditions. Options exist to further optimize the auger for specific combines and crop conditions. Refer to Float Module Feed Auger Configurations in the header operator's manual for more information about conversions.

3.3.3 Removing Stripper Bars

Stripper bar kits may have been supplied with your header to improve feeding in certain crops such as rice. They are **NOT** recommended for cereal crops.

NOTE:
New Holland CR960, 9060, 970, 9070, and 9080 combine FM100 float modules are not equipped with stripper bars. The following procedure does NOT apply to those models.

If necessary, remove auger stripper bars as follows:

1. Remove four bolts (A) and nuts securing bars (B) to float module frame, and remove bars.
2. Repeat for opposite set of stripper bars.

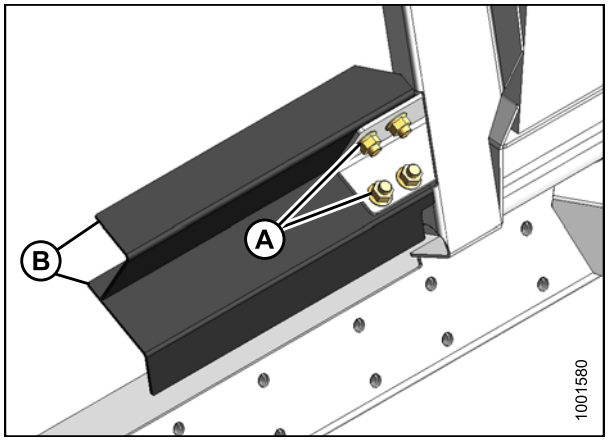


Figure 3.24: Auger Stripper Bar

3.3.4 Replacing CR Feeder Deflectors

If the header is configured for a New Holland CR 960, 9070, or 9080 combine, the float module has a factory-installed feeder deflector kit to improve feeding into the feeder house. The kit can be replaced if necessary.

⚠ DANGER

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

The FD1 Series/FM100 combine completion package for the New Holland models includes both a short feeder kit (installed at the factory) and a long feeder kit for narrow feeder house combines. Refer to Table *3.1 FM100 Feeder Kits for CR Model Combines, page 28*.

Table 3.1 FM100 Feeder Kits for CR Model Combines

Combine Model	Feeder House Size	Feeder Kit Size
CR970, 9070, 9080	Wide	Short: 200 mm (7–7/8 in.)
CR960, 9060, 940, 9040	Narrow	Long: 325 mm (12–3/4 in.)

If required, replace the feeder deflectors as follows:

1. Determine the position of existing deflector (A) by measuring the gap (X) between the deflector's forward edge and the pan. Record this measurement.

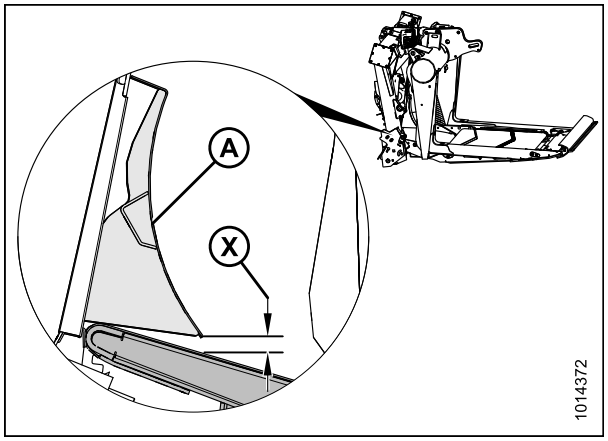


Figure 3.25: Side View of Deflector

2. Remove the two bolts and nuts (B) securing the deflector (A) to the float module frame and remove deflector.
3. Position the replacement deflector and reinstall bolts and nuts (B). Do not tighten bolts.

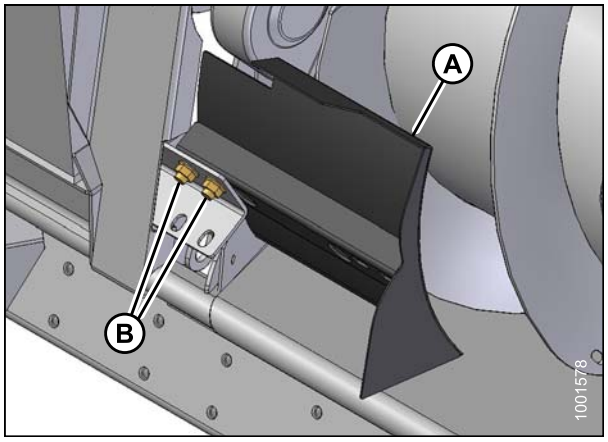


Figure 3.26: Replacement Deflector: Left Shown – Right Opposite

4. Set the gap (X) to the dimension recorded in Step *1., page 28* and tighten the nuts.
5. Repeat for the opposite deflector.

CAUTION

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

6. Attach the header to a combine and fully extend center-link.
7. Turn off the combine and remove the key from the ignition.
8. Recheck the gap (X) between the deflector (A) and the pan.

   NOTE:
   The minimum gap, when attached to the combine, should be 19–25 mm (3/4–1 in.).

9. If necessary, detach header from the combine and adjust the deflector to achieve the minimum gap.

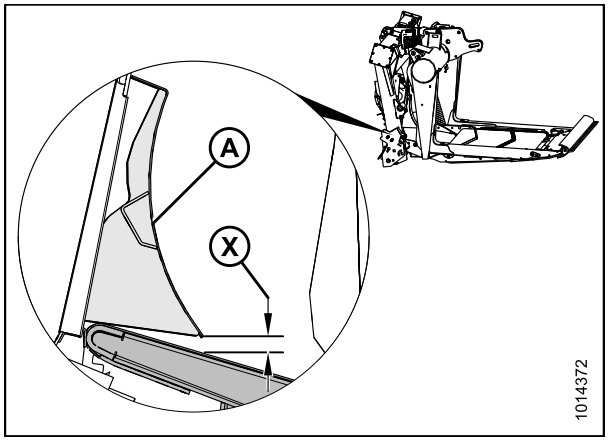


Figure 3.27: Side View of Deflector

4 Attaching Header to Combine

The procedures for attaching the header to a combine vary depending on the combine model. Refer to the following table for the appropriate procedure:

Table 4.1 Combine Model Header Attachment Procedures

Combine	Refer to
AGCO Gleaner R and S Series; Challenger 660, 670, 680B, 540C, and 560C; Massey 9690, 9790, 9895, 9520, 9540, and 9560	*4.1 AGCO (Challenger, Gleaner, and Massey Ferguson) Combines, page 31*
Case IH 7010, 8010, 7120, 8120, 9120, 5088, 6088, 7088, 5130, 6130, 7130, 7230, 8230, and 9230	*4.2 Case IH Combines, page 39*
John Deere 60, 70, S, and T Series	*4.3 John Deere Combines, page 45*
CLAAS 500, 600, and 700 (R Series)	*4.4 CLAAS Combines, page 57*
New Holland CR and CX	*4.5 New Holland Combines, page 73*

IMPORTANT:
Ensure applicable functions (Automatic Header Height Control [AHHC], Draper Header Option, Hydraulic Center-Link Option, Hydraulic Reel Drive, etc.) are enabled on the combine and in the combine computer. Failure to do so may result in improper header operation.

4.1 AGCO (Challenger, Gleaner, and Massey Ferguson) Combines

4.1.1 Installing Reel Fore-Aft / Header Tilt Selector Switch and Harness

Gleaner combines prior to 2014 are not equipped to accommodate hydraulic reel fore-aft and header tilt options. The following additional items are required and not supplied by MacDon:

- Valve (A) (AGCO #71389745)
- Hoses
- Electrical components
- Couplers

NOTE:
Model year 2014 and later Gleaner combines will have the above parts factory-installed.

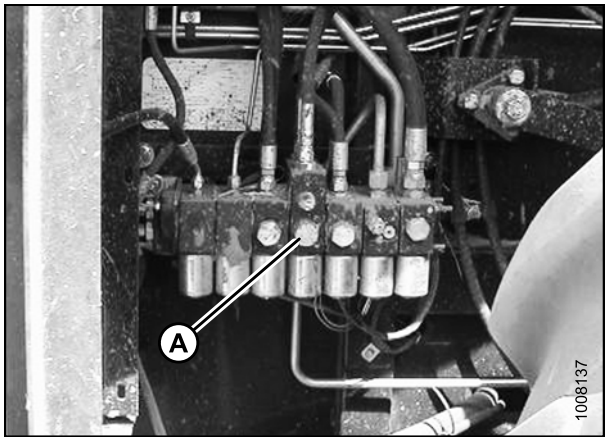


Figure 4.1: Converted Gleaner R72 Shown

To enable the reel fore-aft and header tilt options, install the switch and harness as follows:

IMPORTANT:
To prevent possible damage to electronic components, disconnect the positive cable from the combine battery before connecting harness to combine connectors.

1. Before attaching any cable ties, route switch harness (A) from the front of the feeder house to the power connection point in the cab. Ensure the harness is long enough to reach the wiring at the selector valve with the header tilted forward, and that the feeder house can be fully lowered with adequate slack in the harness.

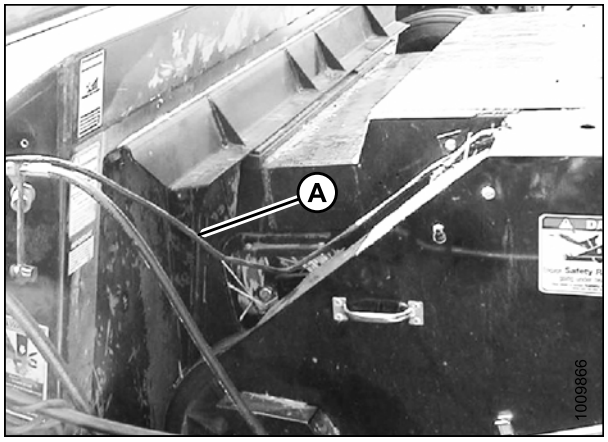


Figure 4.2: Switch Harness Routing

2. Use the cable ties provided to fasten the switch harness (A) to the main harness on the left side of the feeder house and under the cab floor at location (B).

   IMPORTANT:
   To prevent damage to harness, fully lower feeder house and ensure there is adequate slack before attaching cable ties (B) to the harness.

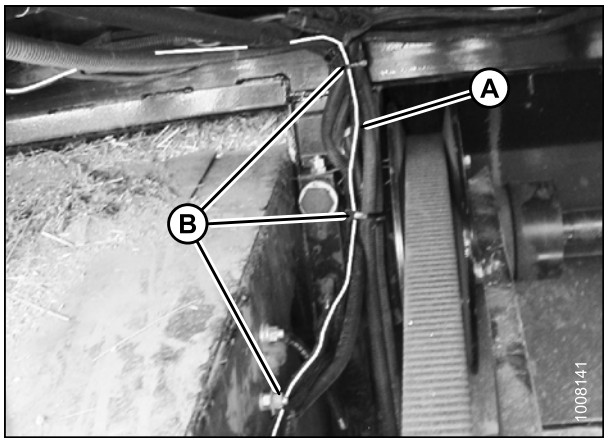


Figure 4.3: Left Side of Feeder House

3. Route the switch harness (A) at the rear of the feeder house up to the underside of the cab floor at location (B).
4. Use the cable ties provided to fasten the switch harness (A) to the main harness under cab floor at location (B).

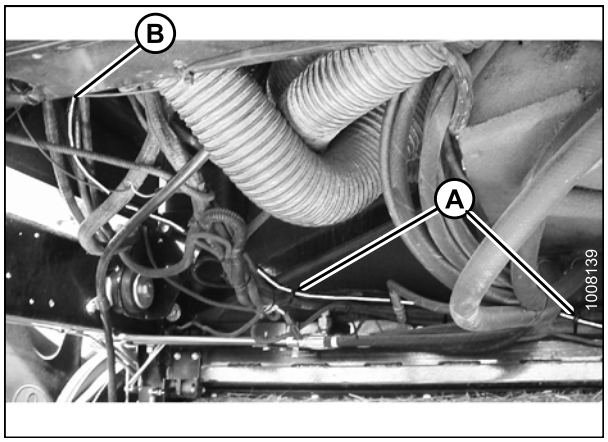


Figure 4.4: Harness under Right Side of Cab Floor

5. Route the switch harness (A) under the cab, through cab floor, and into console (B) at the foam seal (C).

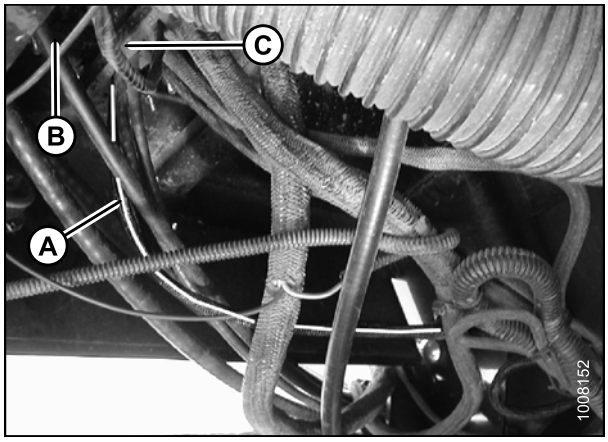


Figure 4.5: Harness through Cab Floor

6. Remove the console cover (A) as shown.
7. Connect the switch harness to the power supply inside the console at location (B).
   - The red wire from the inline fuse goes to the switched power supply (B).
   - The double black wire goes to ground.

   IMPORTANT:
   Connecting the switch harness to an unswitched power supply or cigarette lighter will supply constant power to the header tilt side of the solenoid valve and drain the combine battery during extended shutdown periods.

8. Route switch harness through grommet (C), and replace cover (A).

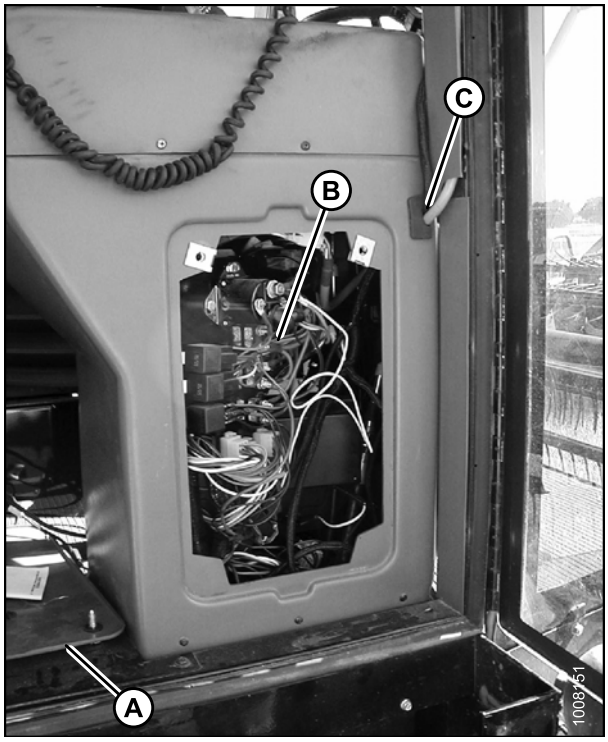


Figure 4.6: Switched Power Supply

9. Mount switch plate onto console (A) in a comfortable position.
10. Connect harness to switch with red wire to center terminal (B), and white wire to either outer terminal (C).
11. Reconnect the battery cable.
12. Operate the switch to select either REEL FORE-AFT or HEADER TILT function.

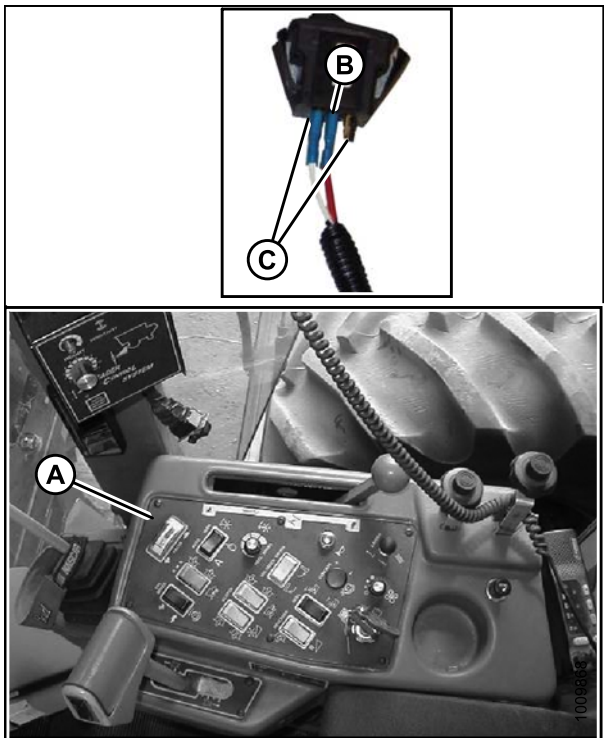


Figure 4.7: Switch and Console

4.1.2 Attaching Header to a Challenger, Gleaner, or Massey Ferguson Combine

DANGER

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

1. Use the lock handle (B) to retract the lugs (A) at the base of the feeder house.

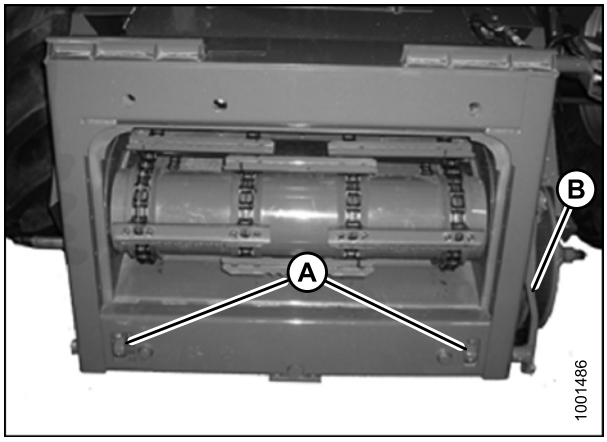


Figure 4.8: AGCO Group Feeder House

CAUTION

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

2. Start the engine and slowly approach the header until the feeder house is directly under the float module top cross member (A) and the alignment pins (C) on the feeder house (shown in the image below) are aligned with the holes (B) in the float module frame.

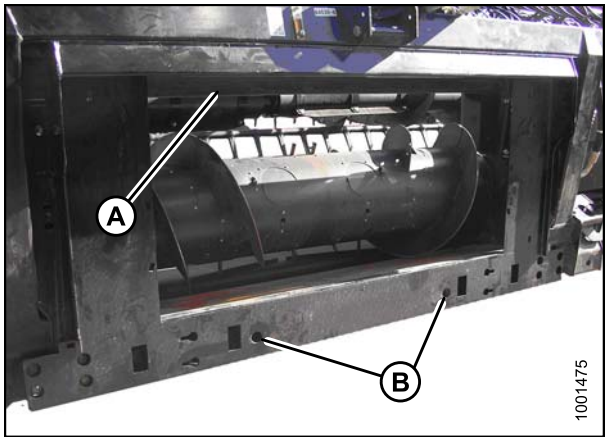


Figure 4.9: Float Module

NOTE:
Your combine feeder house may not be exactly as shown.

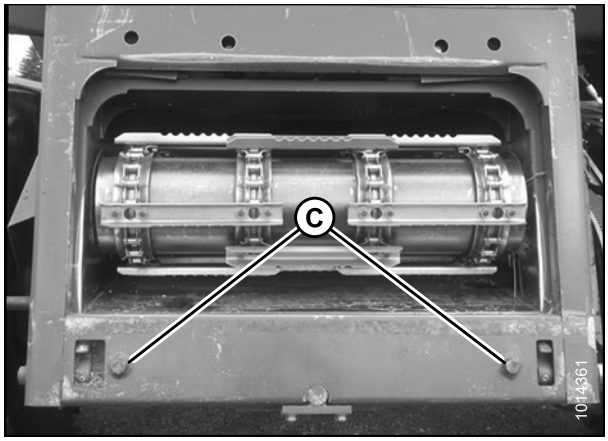


Figure 4.10: AGCO Group Alignment Pins

3. Raise the feeder house slightly to lift the header, ensuring the feeder house saddle (A) is properly engaged in the float module frame.
4. Stop the engine and remove the key from the ignition.

Figure 4.11: Feeder House and Float Module

5. Use the lock handle (B) to engage lugs (A) with the float module.

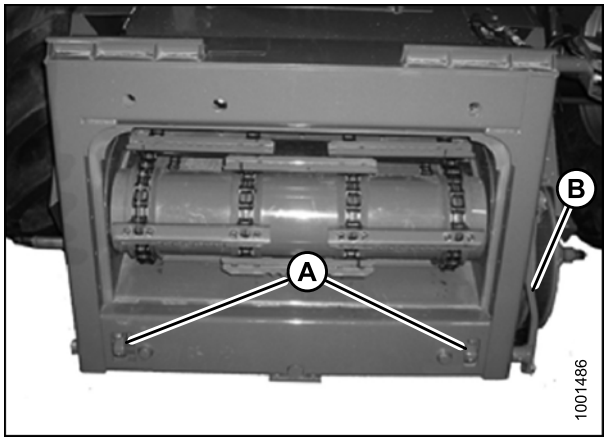


Figure 4.12: AGCO Group Feeder House

CAUTION

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

6. Start the engine and lower the header.
7. Stop the engine and remove the key from the ignition.

NOTE:
The FM100 Float Module is equipped with a multicoupler that connects to the combine. If your combine is equipped with individual connectors, a multicoupler kit (single-point connector) must be installed. Refer to Table *4.2 Multicoupler Kits, page 36* for a list of kits and installation instructions that are available through your combine Dealer.

Table 4.2 Multicoupler Kits

Combine	Kit Number
Challenger	71530662
Gleaner R/S Series	71414706
Massey Ferguson	71411594

8. Raise the handle (A) to release the multicoupler (B) from the float module.

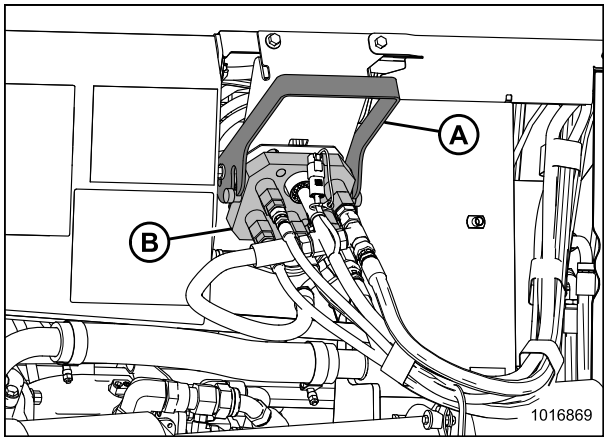


Figure 4.13: Float Module Multicoupler

9. Push the handle (A) on the combine to the fully-open position.
10. Clean the mating surfaces of the multicoupler (B) and receptacle if necessary.

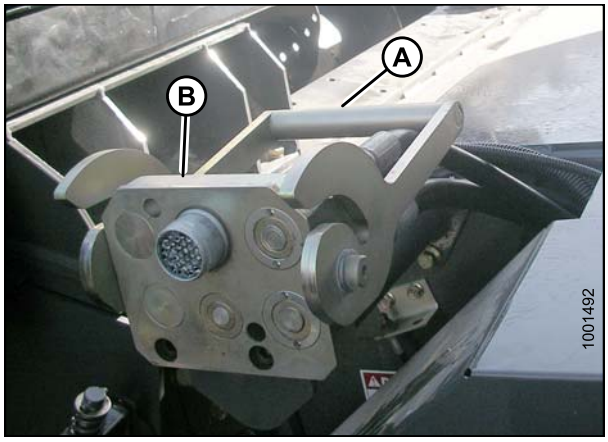


Figure 4.14: Combine Receptacle

11. Position the multicoupler (A) onto the combine receptacle, and pull the handle (B) to fully engage the multicoupler into the receptacle.
12. Connect the reel fore-aft/header tilt selector harness (C) to the combine harness (D).

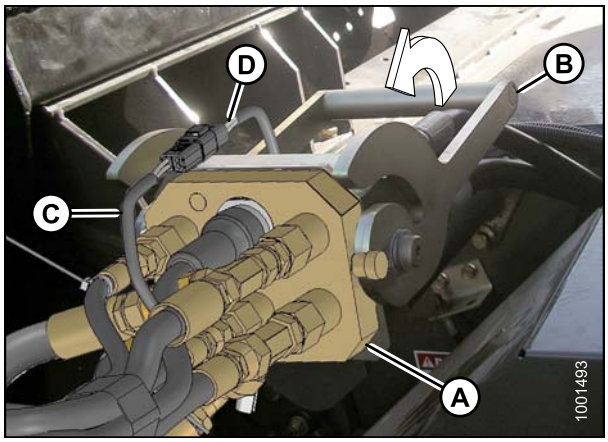


Figure 4.15: Multicoupler

13. Pull collar (A) back to release driveline (B) from support bracket (C). Remove the driveline from support bracket.

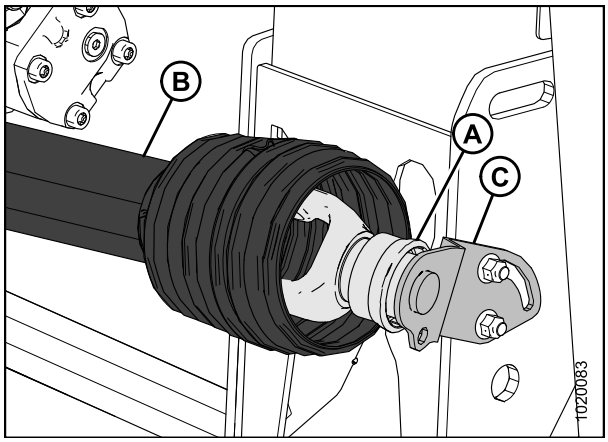


Figure 4.16: Driveline

14. Pull back the collar (A) on the end of the driveline, and push the driveline onto the combine output shaft (B) until the collar locks.

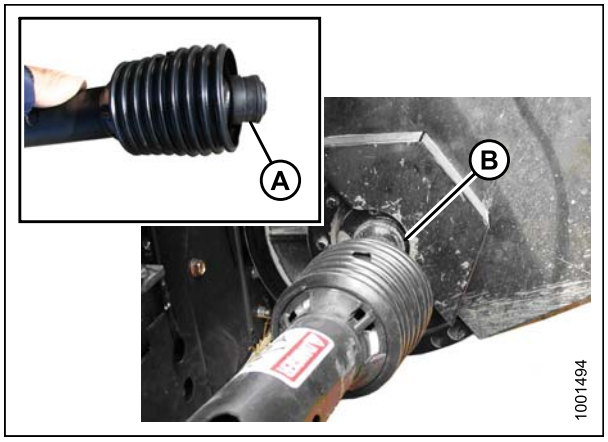


Figure 4.17: Driveline

15. Proceed to *4.6.1 Attaching Cam Arms, page 78*.

4.2 Case IH Combines

4.2.1 Attaching Header to Case IH Combine

DANGER

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

1. On the upper left side of the combine float module, remove nut (A), washer, spring, and lever (B).

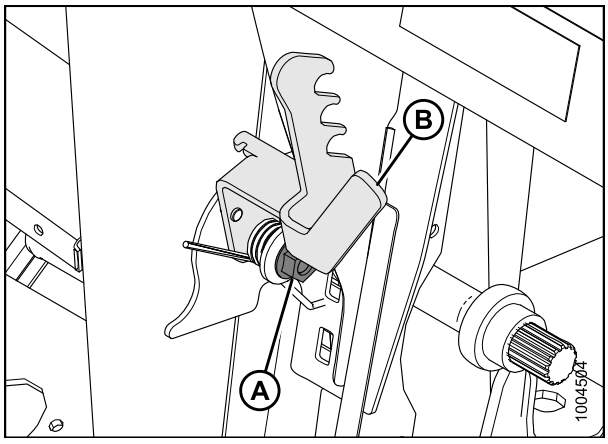


Figure 4.18: Combine Float Module Upper Left Side

2. Position lever (A) onto stud (B).

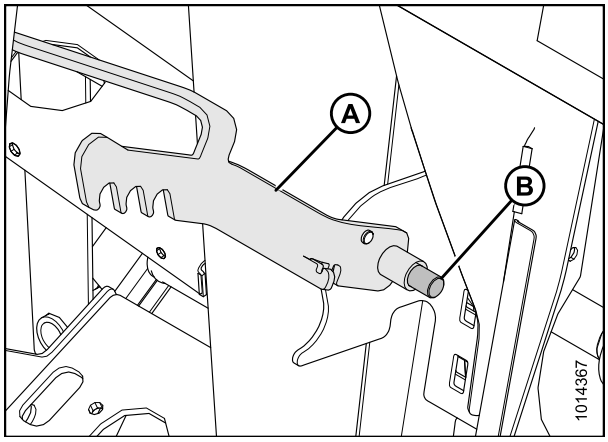


Figure 4.19: Combine Float Module Upper Left Side

3. Place spring arm (C) into hook on lever (B) to preload it, and tighten nut (A) with washer onto the combine float module.

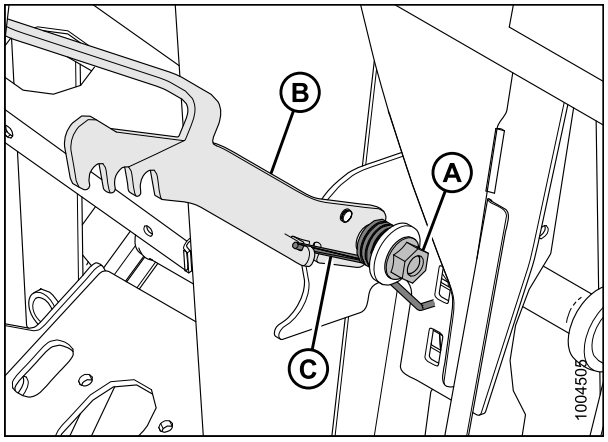


Figure 4.20: Combine Float Module Left Side

4. On the combine, ensure the lock handle (A) is positioned so the hooks (B) can engage the float module.

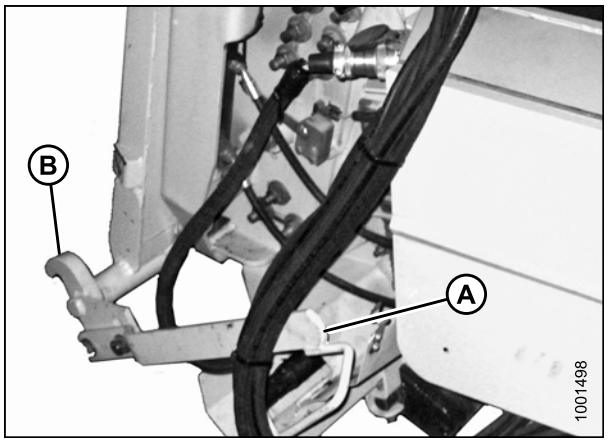


Figure 4.21: Feeder House Locks

CAUTION

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

5. Start the engine and slowly drive the combine up to the header until the feeder house saddle (A) is directly under the float module top cross member (B).
6. Raise the feeder house slightly to lift the header, ensuring the feeder saddle is properly engaged in the float module frame.
7. Stop the engine and remove the key from the ignition.

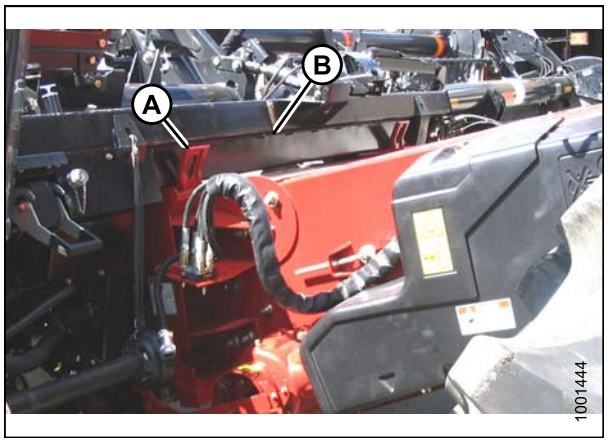


Figure 4.22: Combine and Float Module

8. On the left side of the feeder house, lift lever (A) on the float module and push handle (B) on the combine to engage locks (C) on both sides of the feeder house.
9. Push down on the lever (A) so the slot in the lever engages the handle and locks the handle in place.
10. If lock (C) does not fully engage the pin on the float module, loosen bolts (D) and adjust lock. Retighten bolts.

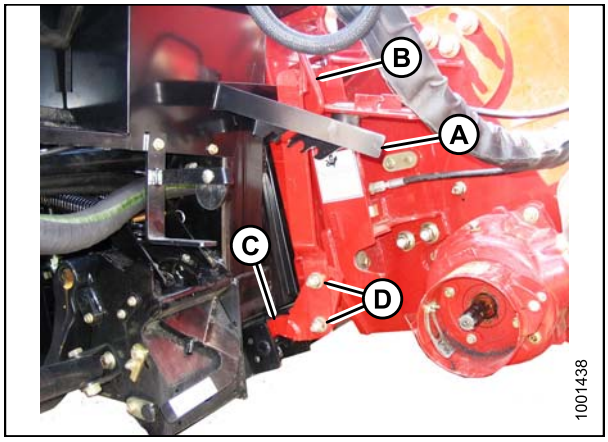


Figure 4.23: Combine and Float Module

11. Open the cover on the receptacle (A) located on the left side of the float module.
12. Press the lock button (B) and pull the handle (C) to the fully-open position.
13. Clean the receptacle mating surfaces.

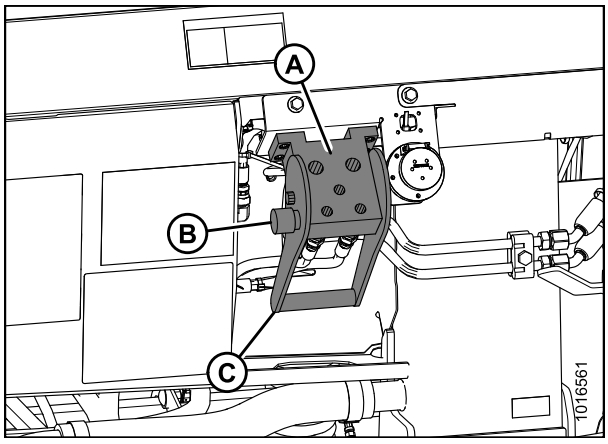


Figure 4.24: Float Module Receptacle

14. Remove the hydraulic quick coupler (A) from the combine, and clean the mating surfaces.

Figure 4.25: Combine Connectors

15. Position the coupler onto the coupler receptacle (A) and push the handle (B) (not shown) to engage the multicoupler pins into the receptacle.
16. Push the handle (B) to the closed position until the lock button (C) snaps out.

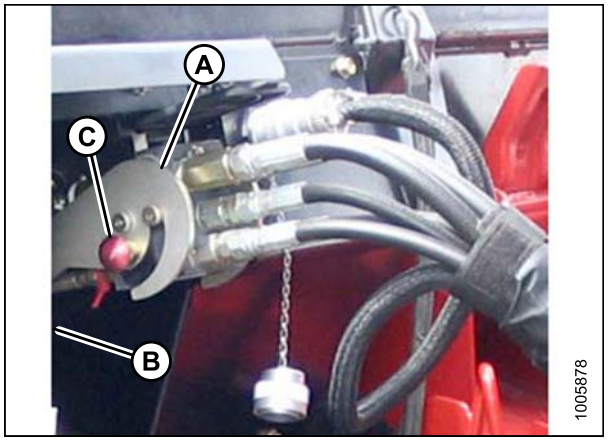


Figure 4.26: Hydraulic Connection

17. Remove the cover from the electrical receptacle (A). Ensure the receptacle is clean and has no signs of damage.

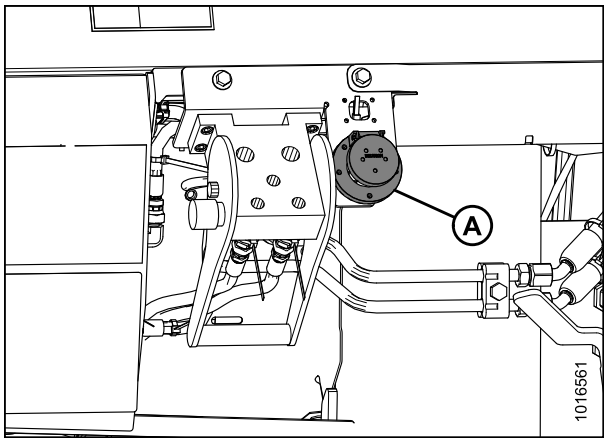


Figure 4.27: Electrical Receptacle

18. Remove the electrical connector (A) from the storage cup on the combine and route it to the float module receptacle.

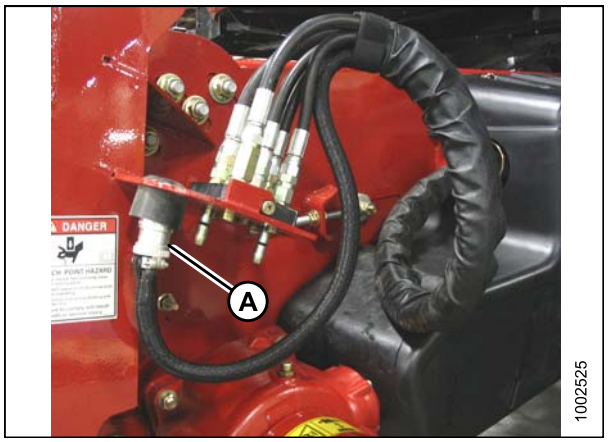


Figure 4.28: Combine Connectors

19. Align the lugs on the connector (A) with the slots in the receptacle (B), push the connector onto the receptacle, and turn the collar on the connector to lock it in place.

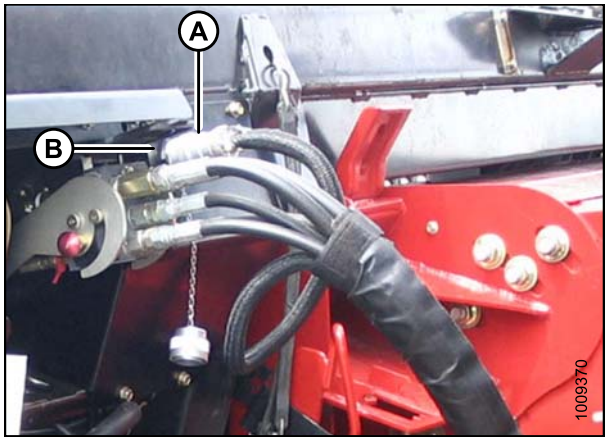


Figure 4.29: Electrical Connection

20. Pull collar (A) back to release driveline (B) from support bracket (C). Remove the driveline from support bracket.

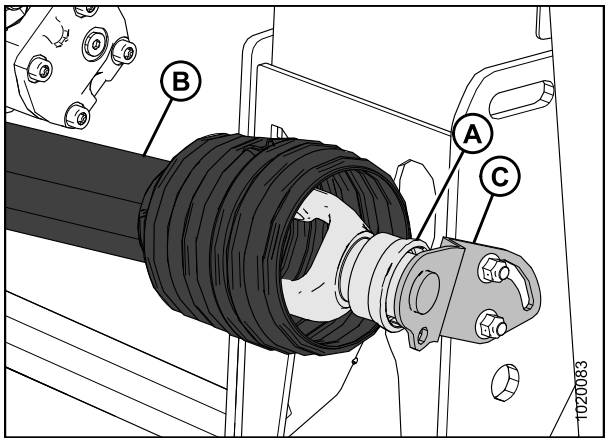


Figure 4.30: Driveline

21. Pull back the collar (A) on the end of the driveline, and push the driveline onto the combine output shaft (B) until the collar locks.

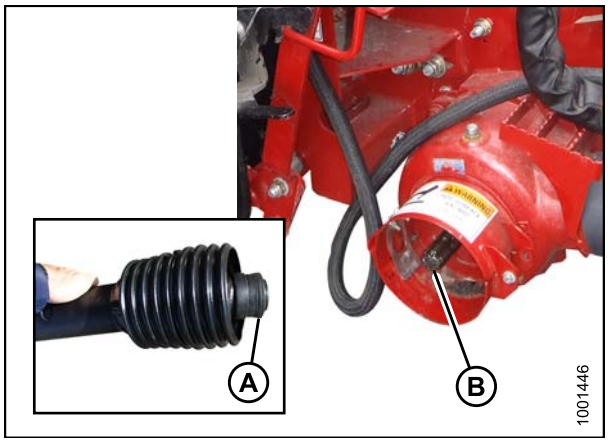


Figure 4.31: Combine Output Shaft

22. Disengage the float locks by pulling each float lock handle (A) away from the float module and setting it in the unlocked position (B).
23. Proceed to *4.6.1 Attaching Cam Arms, page 78*.

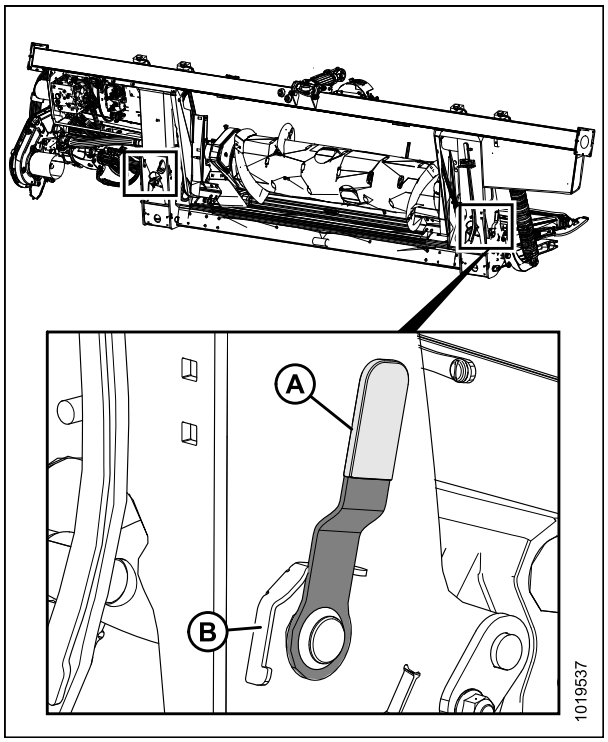


Figure 4.32: Float Locks - Right Shown, Left Opposite

4.3 John Deere Combines

The FD1 Series FlexDraper® Header is compatible with John Deere 60, 70, S, and T Series combines.

4.3.1 Installing Reel Fore-Aft / Header Tilt Switch: S and T Series Combines

The reel fore-aft/header tilt switch allows the combine Operator to select either reel FORE-AFT or HEADER TILT mode.

WARNING

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

This procedure is applicable to John Deere S and T Series combines. For John Deere 60 or 70 Series combines, refer to *4.3.2 Installing Reel Fore-Aft / Header Tilt Switch: 60 and 70 Series Combines, page 49*.

IMPORTANT:
To prevent damage to electronic components, disconnect the positive cable from the combine battery and turn the battery disconnect switch to the OFF position before connecting the reel fore-aft/header tilt harness to the combine's auxiliary power connectors.

Prepare the combine cab for switch and harness installation as follows:

1. Open storage compartment on the console.
2. Remove the two screws (A) attaching compartment cover (B) to console and remove cover.

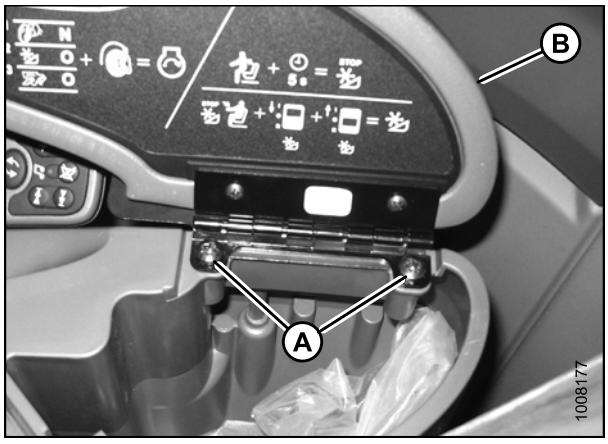


Figure 4.33: Storage Compartment and Cover

3. Lift floor mat (A) at forward right corner to access knockout (B).
4. Remove the knockout (B).

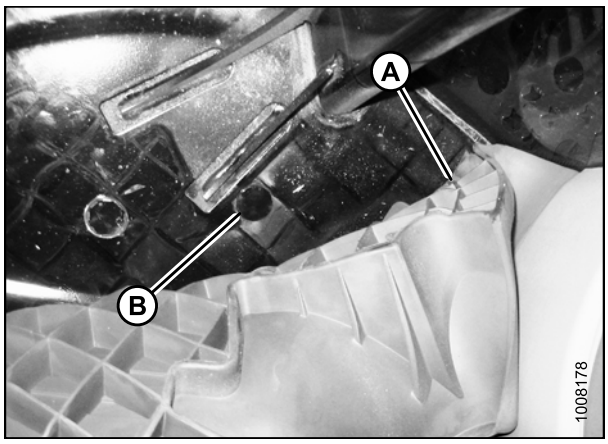


Figure 4.34: Floor Mat at Forward Right Corner and Knockout

5. Retrieve switch (A), harness (B), and support (C) provided with kit.
6. Install switch (A) into support (C) from the top. Ensure lugs on underside of support have secured the switch.

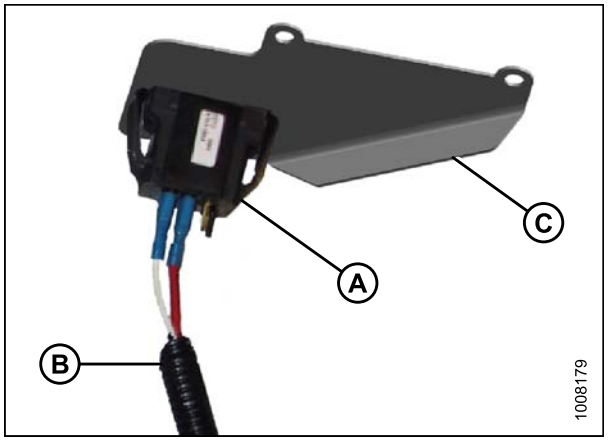


Figure 4.35: Switch and Harness

7. Connect the switch end of harness (A) to switch (B) with one of the wires to center terminal and the other wire to either outer terminal. The color of the wires does not matter; ensure one wire terminates at the center terminal.

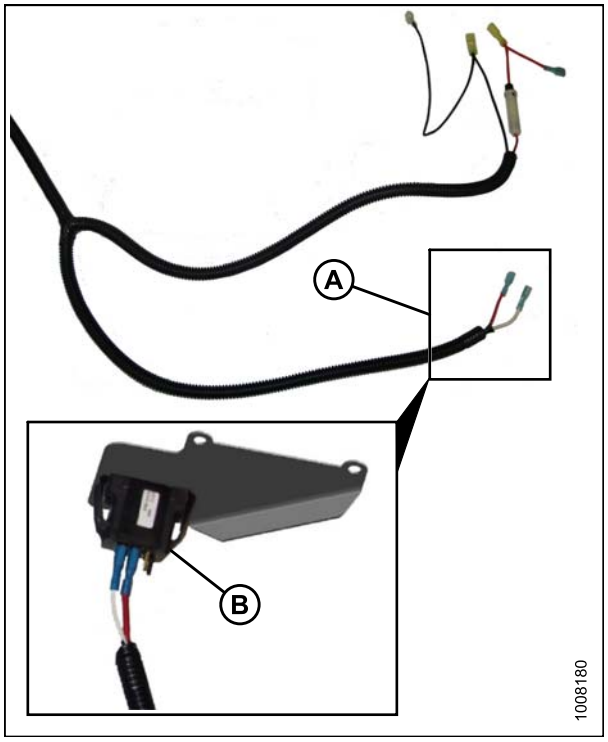


Figure 4.36: Switch End of Harness and Switch

8. Position support (C) onto console and align the holes in support with holes in the console.
9. Reinstall cover (B) with existing screws (A).

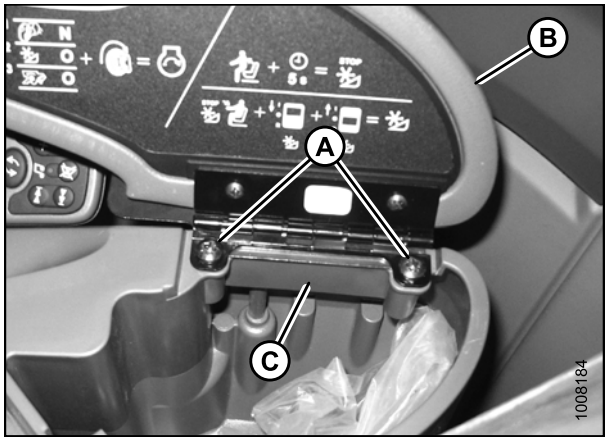


Figure 4.37: Support Position on Console

10. Close cover and ensure that switch (A) and support (B) are secure.

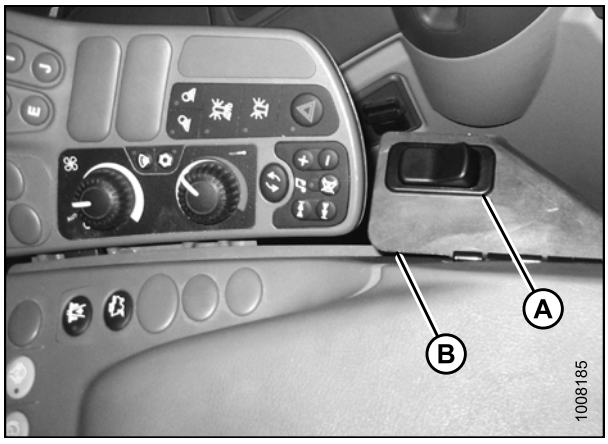


Figure 4.38: Secured Switch

11. Connect the feed end of harness (A) to the auxiliary power outlet strip on the right side of the cab floor.

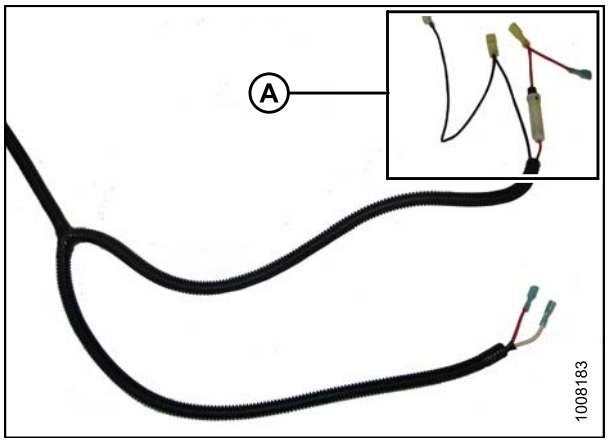


Figure 4.39: Feed End of Harness

12. Connect the harness end to one of the auxiliary power supply points (D).
13. Connect the wire (from the in-line fuse) to the switched power supply (C).
14. Connect the other wire to ground (B).

    IMPORTANT:
    Connecting the switch harness to an unswitched power supply or cigarette lighter will supply constant power to the header tilt side of the solenoid valve and drain the combine battery during extended shutdown periods.

15. Tape unused wire jumpers to harness.

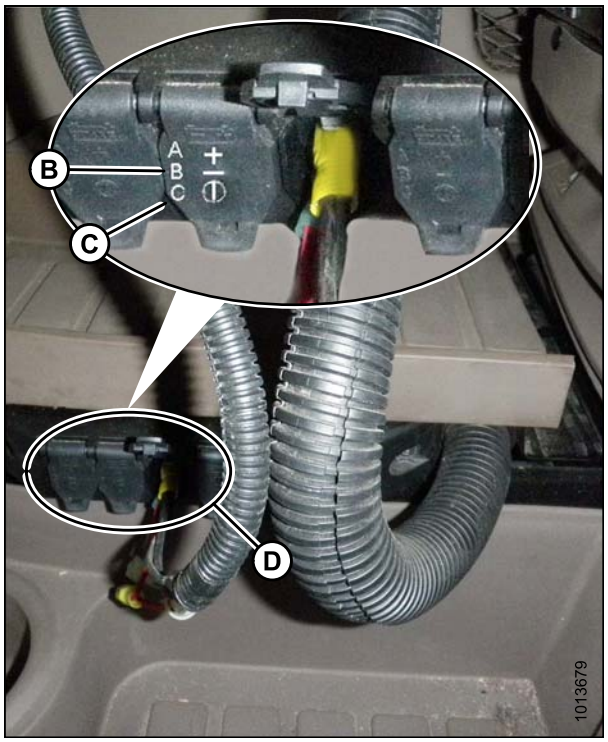


Figure 4.40: Combine Auxiliary Power Supply

16. Route plug end of harness (A) through hole (B) in cab floor, and feed the entire length outside the cab. Leave some slack in the cab to allow for console adjustment.
17. Reinstall floor mat.

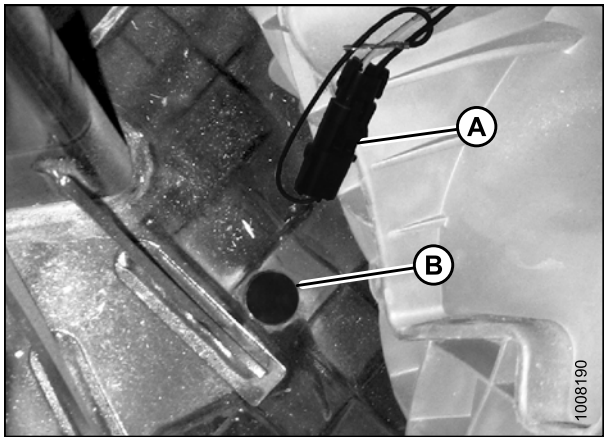


Figure 4.41: Plug End of Harness

18. Route harness (A) under the cab (along the existing hoses) to the left side of the feeder house, under hose shield (C), and to the multicoupler (B).
19. Secure the harness to hoses with cable ties as required.

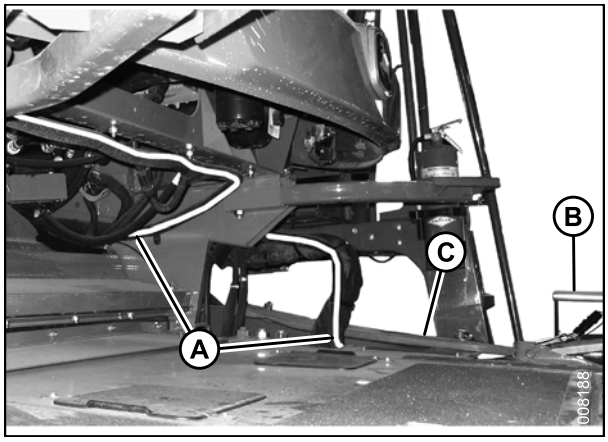


Figure 4.42: Harness and Feeder House Multicoupler

4.3.2 Installing Reel Fore-Aft / Header Tilt Switch: 60 and 70 Series Combines

The reel fore-aft/header tilt switch allows the combine Operator to select either reel FORE-AFT or HEADER TILT mode.

WARNING

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

This procedure applies to John Deere 60 and 70 Series combines. For John Deere S and T Series combines, refer to *4.3.1 Installing Reel Fore-Aft / Header Tilt Switch: S and T Series Combines, page 45*.

IMPORTANT:
To prevent damage to electronic components, disconnect the positive cable from the combine battery and turn the battery disconnect switch to the OFF position before connecting the reel fore-aft/header tilt harness to the combine's auxiliary power connectors.

1. To ensure the switch harness will attach to selector valve wiring harness (with header tilted forward) and that the feeder house can be fully lowered with adequate slack in the harness, lay the switch harness along the route from front of the feeder house to the auxiliary power supply in the cab.
2. Route the switch harness (A) through an existing grommet (B) on the combine's electrical plate (located at the rear of the right-hand side window).

   NOTE:
   To simplify feeding the harness through the grommet, wrap the switch and power plugs with electrical tape.

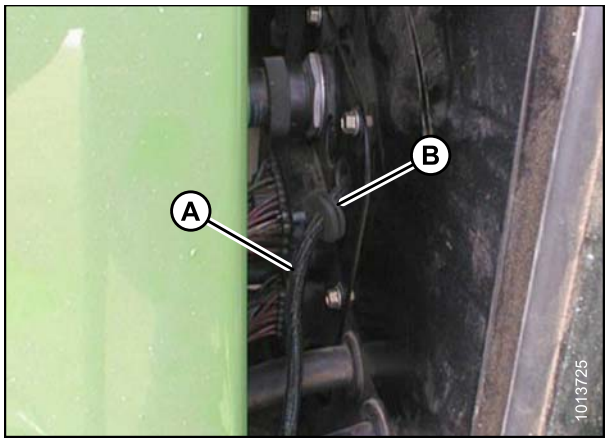


Figure 4.43: Switch Harness Routing

3. Retrieve switch (A) and support (C) provided with kit.
4. Install switch (A) into support (C) from the top. Ensure lugs on underside of support have secured the switch.

   NOTE:
   Image at right shows switch (A) connected to the harness (B).

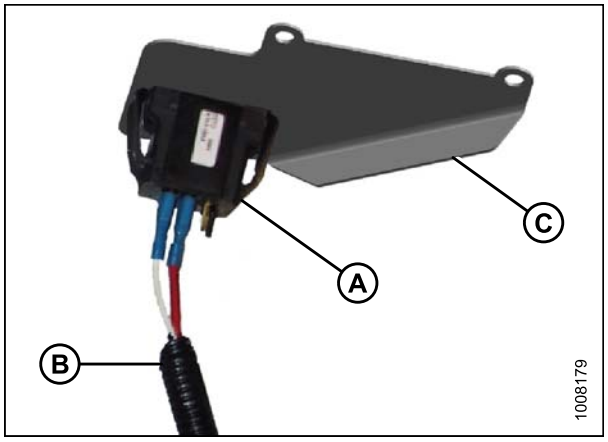


Figure 4.44: Switch and Harness

5. Mount switch plate (A) between the armrest cover hinge and the armrest using existing screws (B).

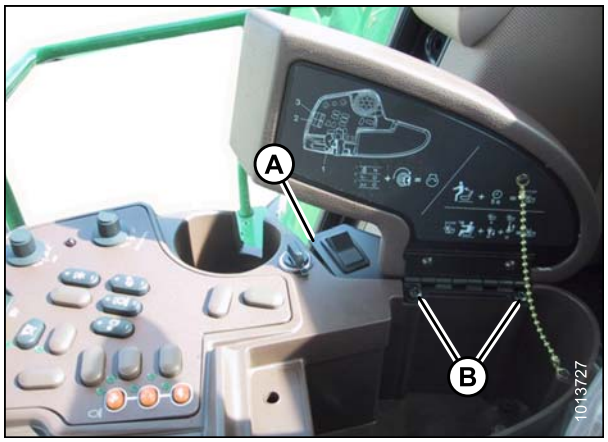


Figure 4.45: Switch Plate Mounting

6. Connect the switch end of harness (A) to switch (B) with one of the wires to center terminal and the other wire to either outer terminal.

   NOTE:
   The color of the wires does not matter; ensure one wire terminates at the center terminal.

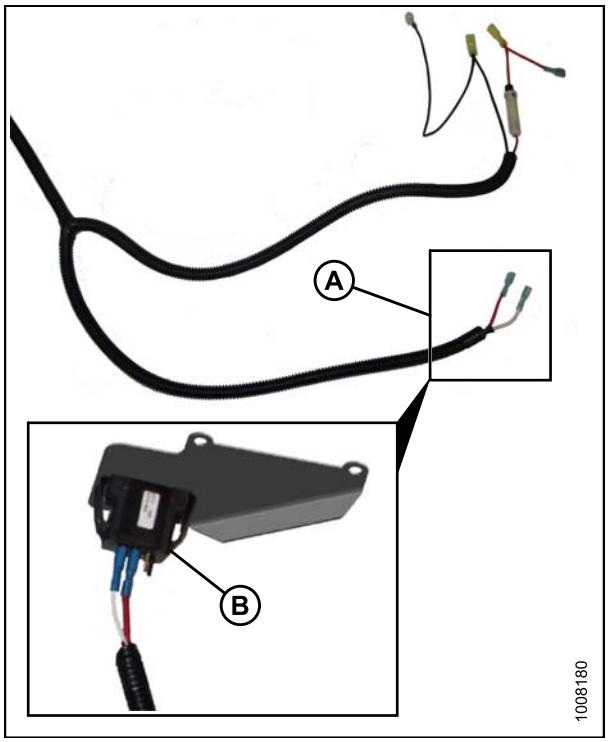


Figure 4.46: Switch End of Harness and Switch

7. Connect the switch harness to the auxiliary power supply (D). Connect the wire with the in-line fuse to the switched power supply (C) and the second wire to the ground (B).

   IMPORTANT:
   Connecting the switch harness to an unswitched power supply or cigarette lighter will supply constant power to the header tilt side of the solenoid valve and drain the combine battery during extended shutdown periods.

8. Tape the unused wire jumpers to the harness.

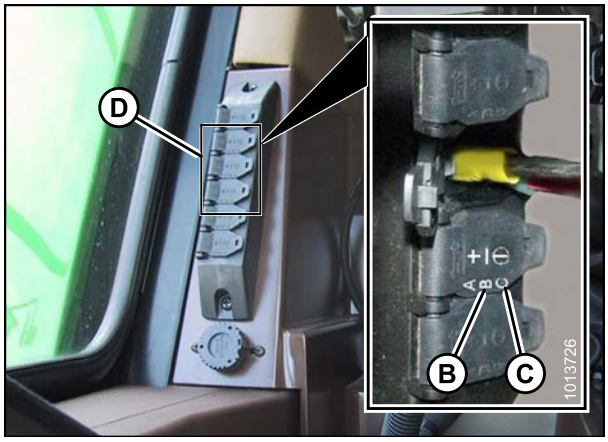


Figure 4.47: Auxiliary Power Supply

9. Route the switch harness (A) across the underside of the cab, alongside an existing harness, to the left side of the feeder house.

   IMPORTANT:
   To prevent damage to harness, ensure adequate slack by lowering the feeder house fully before securing harness with cable ties.

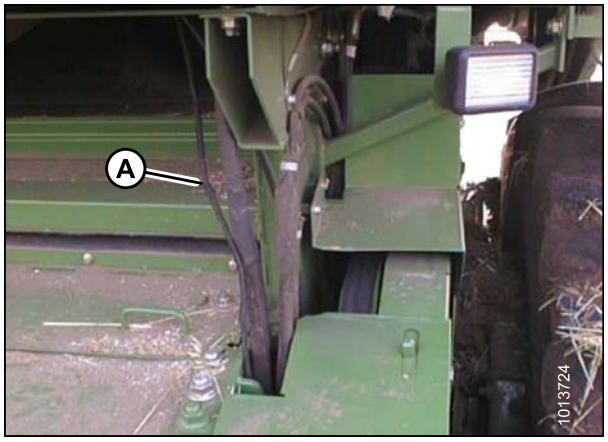


Figure 4.48: Switch Harness Routing

10. Secure the switch harness (A) at the rear of the feeder house with cable tie.

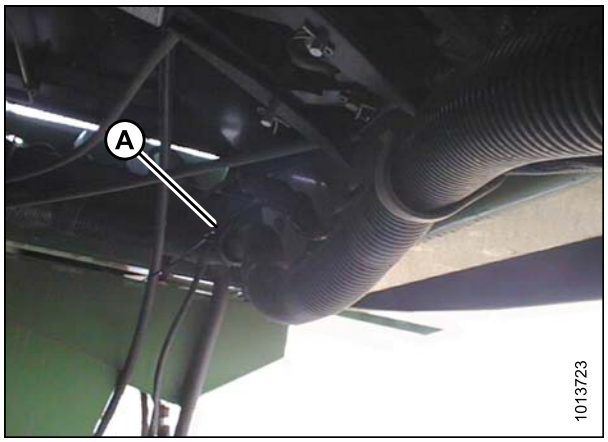


Figure 4.49: Switch Harness Routing

11. Route the switch harness (A) through the welded hose guide on feeder house.

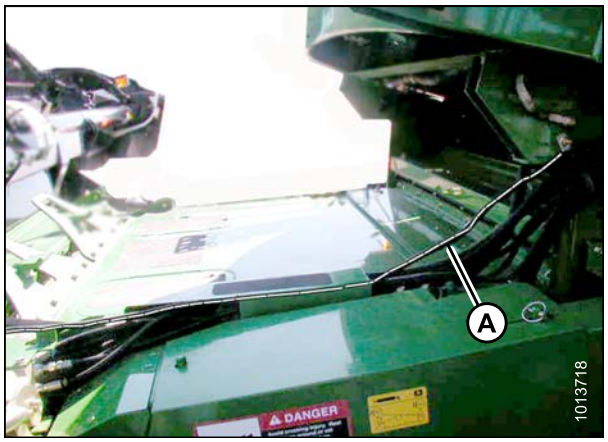


Figure 4.50: 60/70 Series Harness Routing

12. Secure the switch harness (A) at multicoupler with a cable tie. Leave 100 cm (40 in.) extending past location (B).

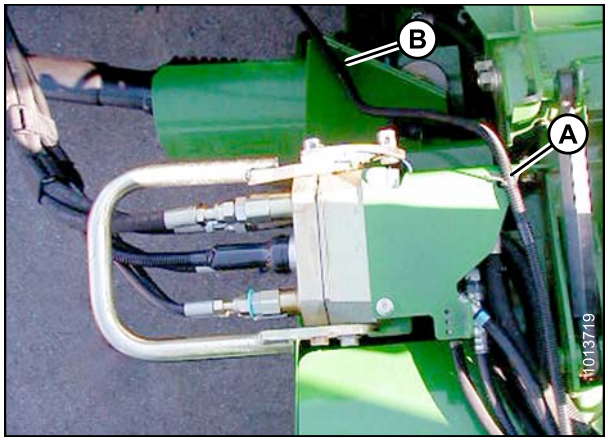


Figure 4.51: Switch Harness Routing

4.3.3 Attaching Header to John Deere Combine

DANGER

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

1. Push the handle (A) on the combine multicoupler receptacle towards the feeder house to retract the pins (B) at the bottom corners of the feeder house. Clean the receptacle.

CAUTION

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

2. Start the engine and slowly drive the combine up to the header until the feeder house saddle (C) is directly under the float module top cross member (D).
3. Raise the feeder house slightly to lift the header ensuring the feeder house saddle is properly engaged in the float module frame.
4. Stop the engine and remove the key from the ignition.

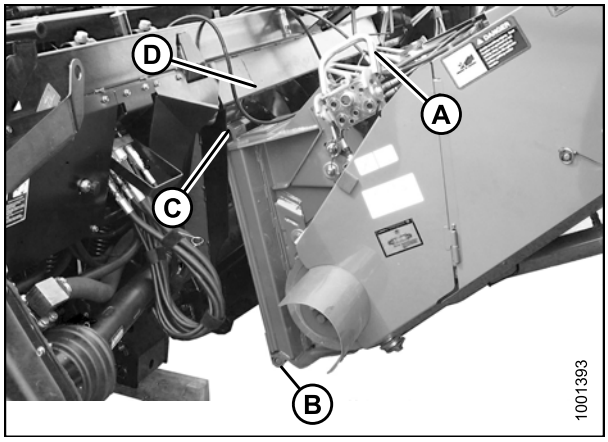


Figure 4.52: Combine and Float Module

5. Pull the handle (A) on the float module to release the multicoupler (B) from the storage position. Remove the multicoupler, and push the handle back into the float module to store.

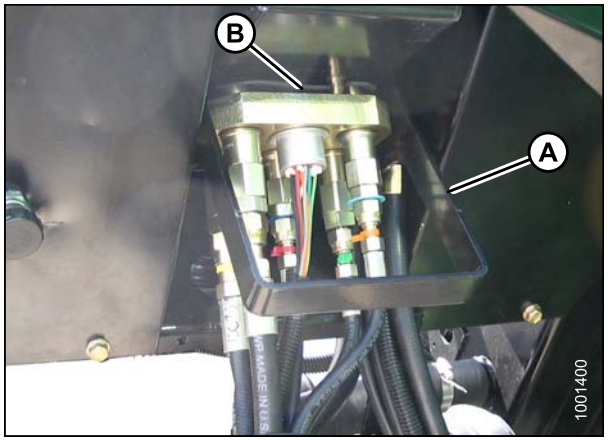


Figure 4.53: Multicoupler Storage

6. Position the multicoupler (A) onto the receptacle, and pull the handle (B) to engage the lugs on the multicoupler into the handle.
7. Pull the handle (B) to a horizontal position and ensure the multicoupler (A) is fully engaged into the receptacle.

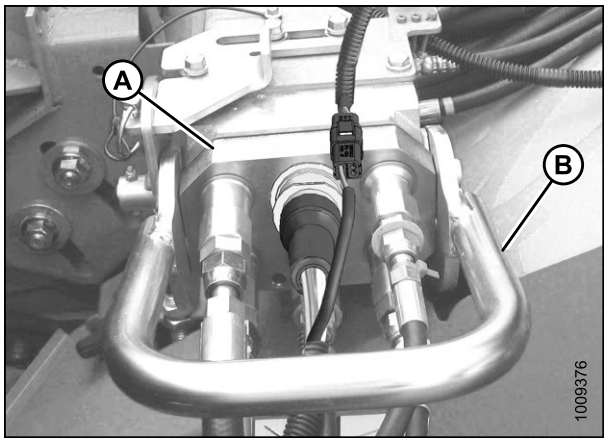


Figure 4.54: Multicoupler

8. Ensure that both feeder house pins (C) are fully engaged into the float module brackets.

   NOTE:
   If the pins (C) do not fully engage the float module brackets, loosen the bolts (D) and adjust the bracket as required.

9. Tighten bolts (D).

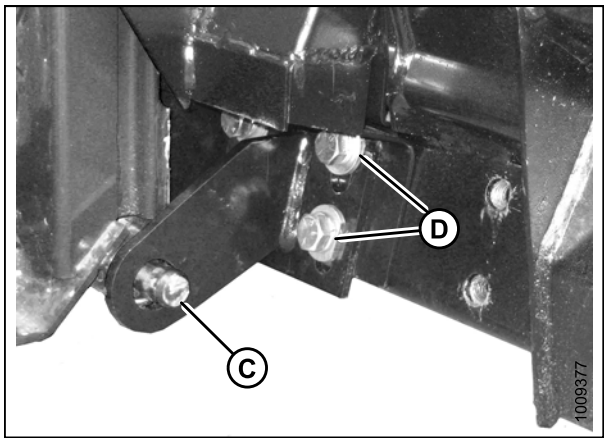


Figure 4.55: Feeder House Pin

10. Slide the latch (A) to lock the handle (B) in position and secure with the lynch pin (C).
11. If the float module is equipped with the reel fore-aft/header tilt selector, connect the harness (D) to the combine connector (E).

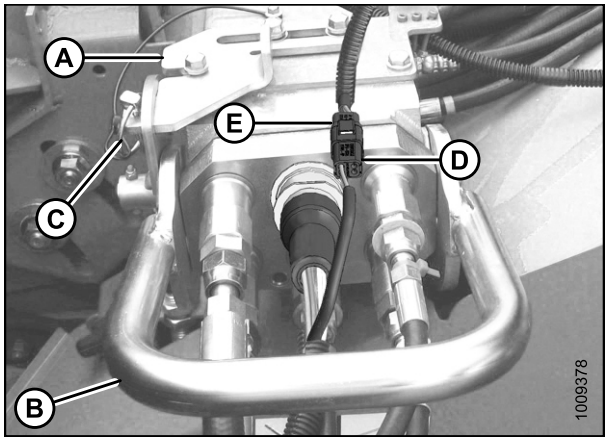


Figure 4.56: Multicoupler

12. Pull collar (A) back to release driveline (B) from support bracket (C). Remove the driveline from support bracket.

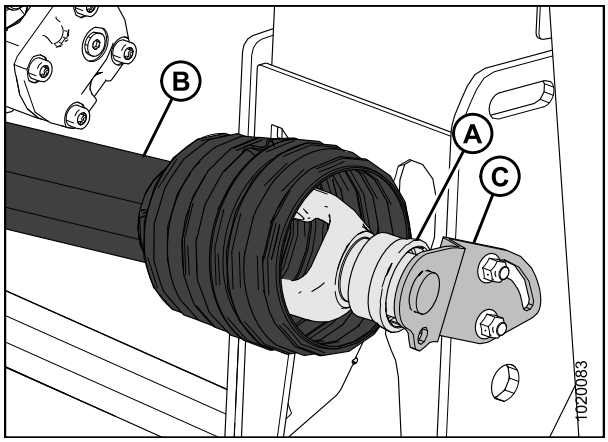


Figure 4.57: Driveline

13. Pull back the collar (A) on the end of the driveline, and push the driveline onto the combine output shaft (B) until the collar locks.

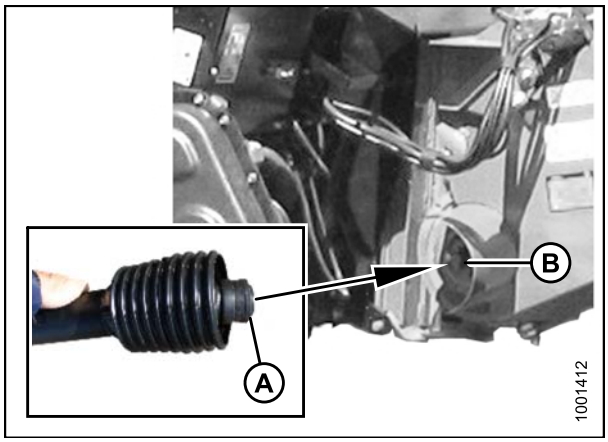


Figure 4.58: Driveline

14. Disengage the float locks by pulling each float lock handle (A) away from the float module, and setting it in the unlocked position (B).
15. Proceed to *4.6.1 Attaching Cam Arms, page 78*.

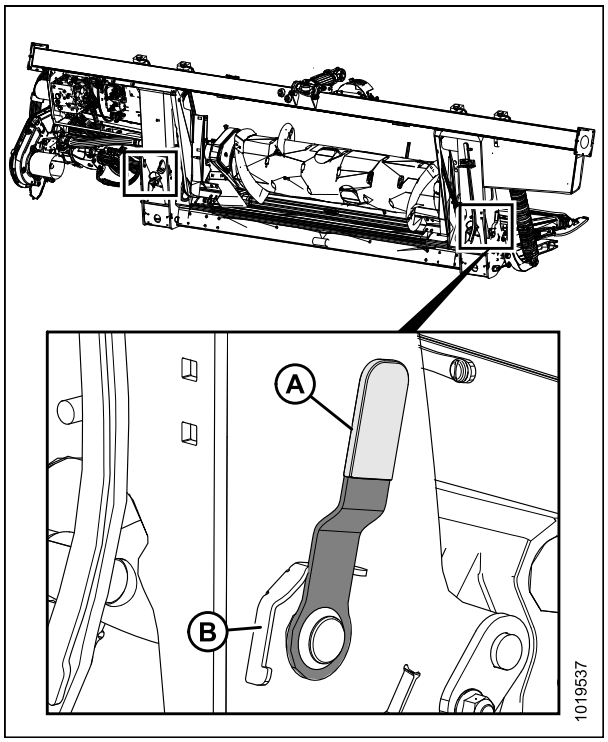


Figure 4.59: Float Locks - Right Shown, Left Opposite

4.4 CLAAS Combines

The FD1 Series FlexDraper® Header is compatible with CLAAS 500, 600, and 700 Series combines.

4.4.1 Installing Reel Fore-Aft / Header Tilt Selector Switch and Harness: 500 Series

1. Remove storage tray (A) from console.

Figure 4.60: Console Tray

2. Remove 13 mm hex nut (A) and washer from under combine monitor at front of console as shown.

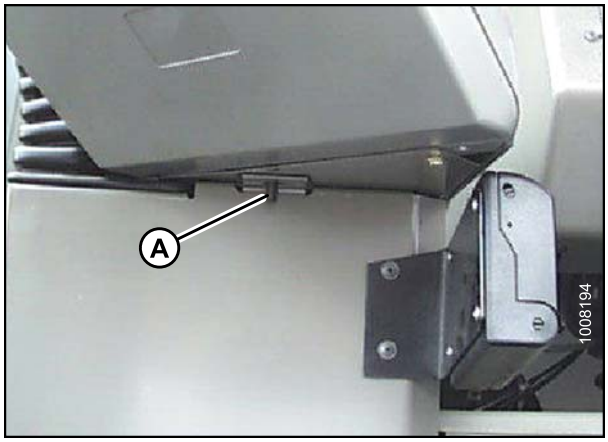


Figure 4.61: Combine Monitor

3. Tilt console (A) back.

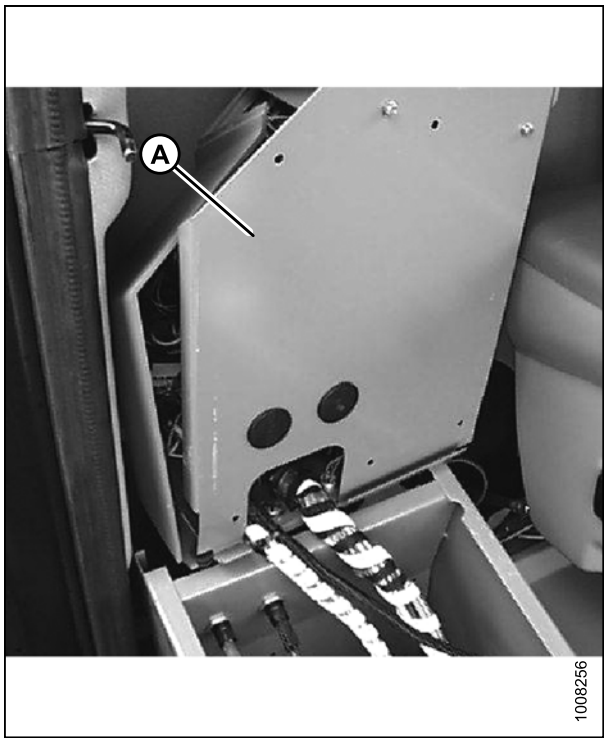


Figure 4.62: Tilted Console

4. Remove plug (A) from cab floor under console. Install adapter connector through hole and route harness through hole.
5. Cut a slit in the rubber floor plug (A) and slide plug over wiring harness.

   NOTE:
   Maintain some wire slack to prevent damage to harness.

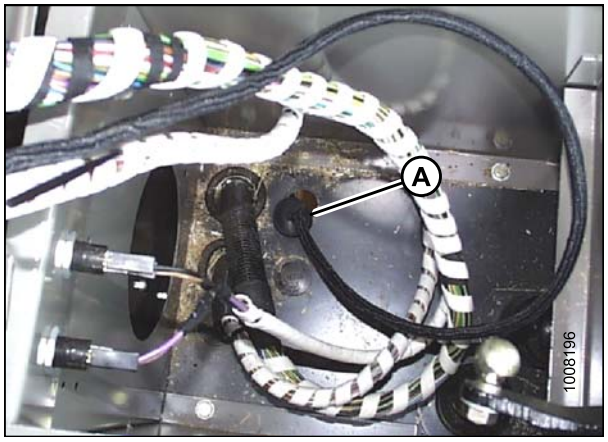


Figure 4.63: Harness through Hole in Floor

6. Remove five screws (A) to access wiring connections underneath console.

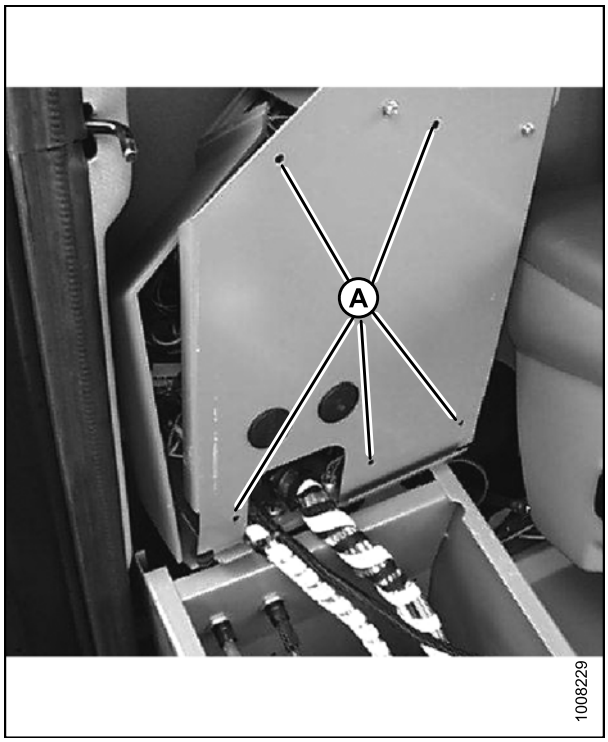


Figure 4.64: Five Screws in Console

7. Remove switch plug from top side of console at location shown (A), and push switch connector through the backside of console.

Figure 4.65: Switch Plug in Console

8. Connect switch (A) to the switch harness. Connect the red wire to the center terminal, and the white wire to either outer terminal.

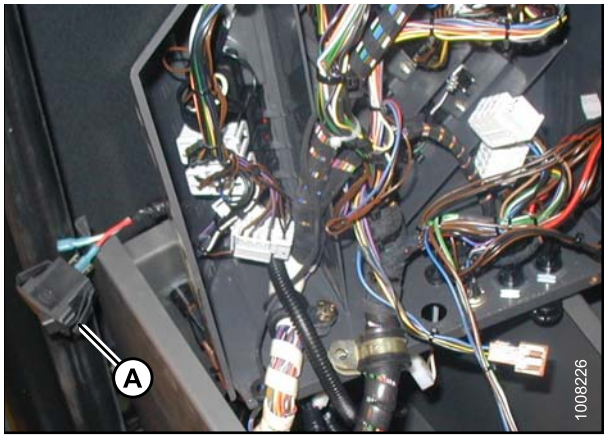


Figure 4.66: Back of Console (Rocker Switch Shown before Placement)

9. Snap switch (A) into place.

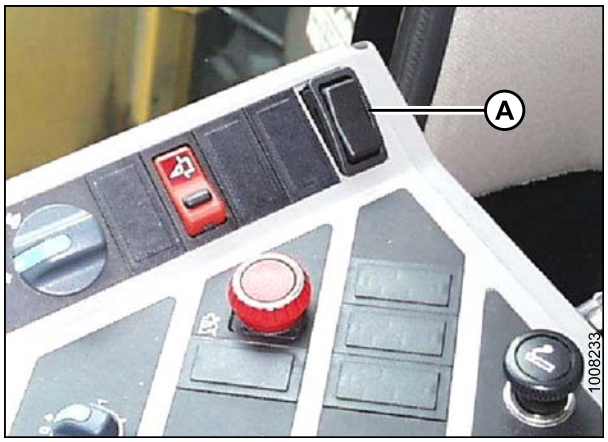


Figure 4.67: Rocker Switch in Place

10. Attach switch harness to existing wires (A) using a cable tie.

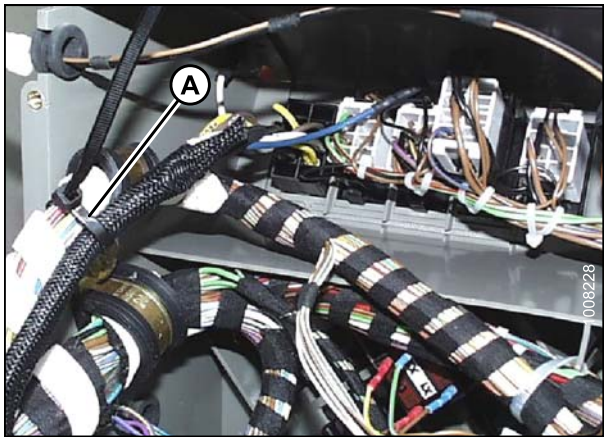


Figure 4.68: Cable Ties, Harness, and Existing Wires

11. Reinstall plug (A) in floor.
12. Return switch console to its original position and tilt console back. Replace the five screws that were removed in Step *6., page 59*.

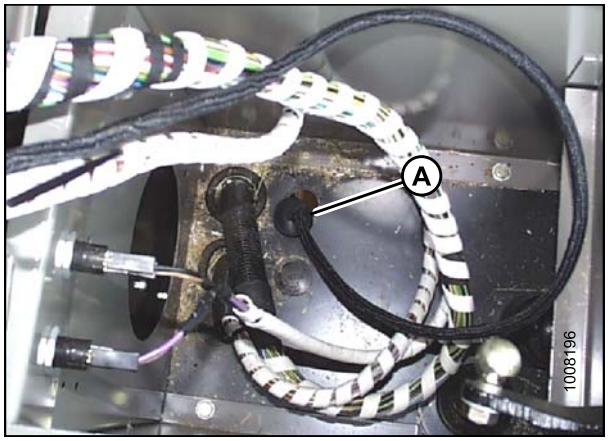


Figure 4.69: Plug in Floor

13. **For two-connector hookups:**
    a. Remove the brown wire (A) from the power source under the console and replace it with the black wire (B).
    b. Remove the black wire from the power source and replace it with the red wire (C).
    c. Attach the brown wire (removed from the power source) to the other red wire coming from the harness.
    d. Attach the black wire (removed from the power source) to the other black wire coming from the harness.

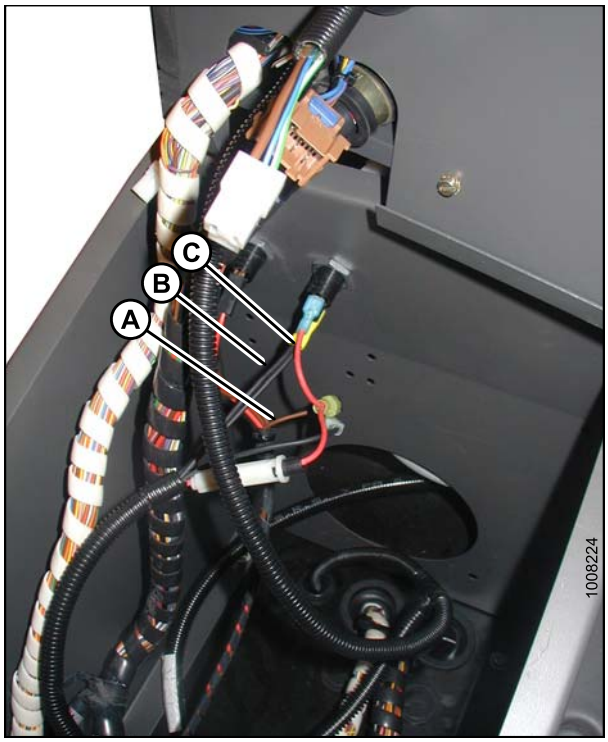


Figure 4.70: Two-Connector Hookup: Switch Harness Installed

14. **For single-connector hookups:**

    NOTE:
    Remove the insulation from the male blades on the wire harness to allow the blades to attach to plug (A).

    a. Remove the white plug (A) with the brown and black wire from the power source under the console.

    b. Replace the white plug with the black wire (B) from the switch harness on the top terminal and the red wire (C) on the bottom terminal.

    c. Attach the remaining wires coming from harness to the white plug (D). Ensure the wires are attached black to black, and brown to red.

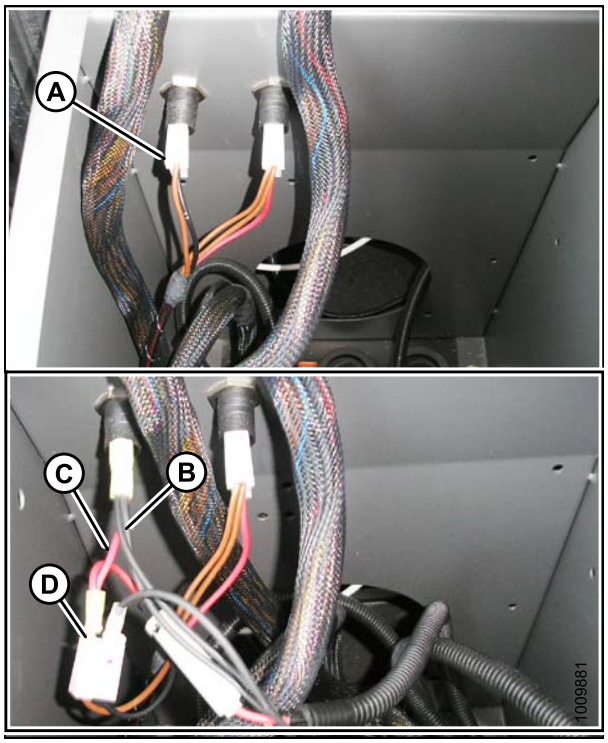


Figure 4.71: Single-Connector Hookup

Top - Before Connecting the Switch Harness
Bottom - After Connecting the Switch Harness

15. Return console to its original position and install the washer and 13 mm hex nut (A) removed in Step *2., page 57*.

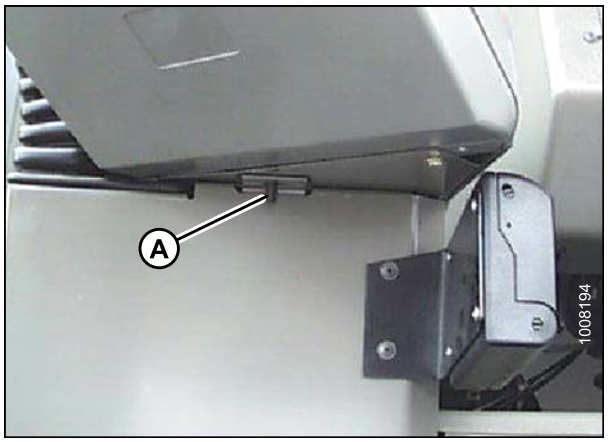


Figure 4.72: Combine Monitor in Original Position

16. Route wiring harness (A) underneath cab floor. Place harness in steel tray (B) along underside of cab floor to prevent it from being damaged.

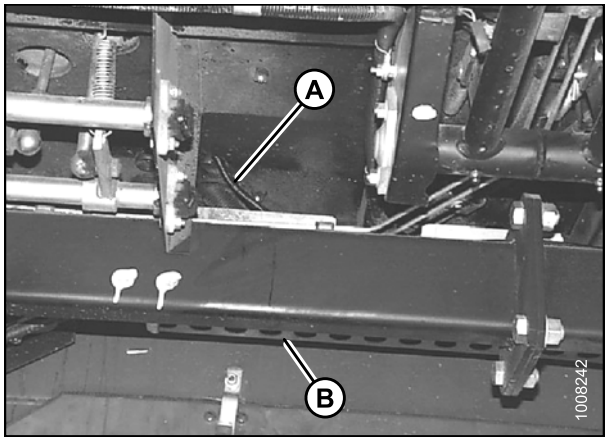


Figure 4.73: Harness underneath Cab Floor

17. Route wiring harness from the left corner of steel tray to conduit (A), between cab floor and frame as shown at location (B), and along conduit (A) to the multicoupler.

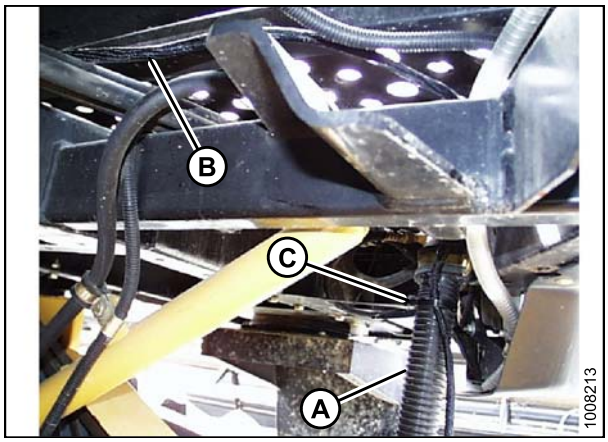


Figure 4.74: Harness between Steel Tray and Conduit

A - Conduit **B - Routing Location**
C - Cable Tie

18. Secure wiring harness to conduit (B) (starting from the multicoupler end) using cable ties at location (A).

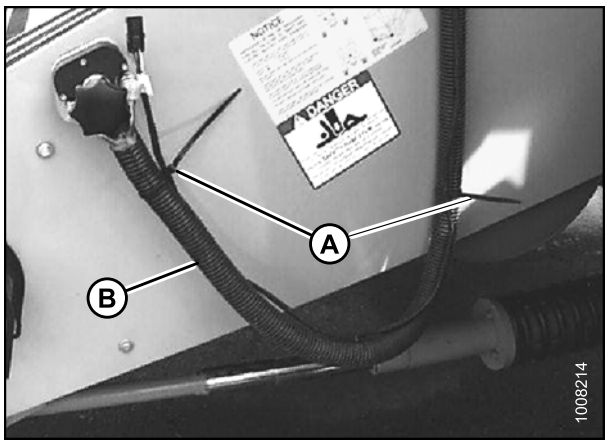


Figure 4.75: Cable Ties, Harness, and Conduit

4.4.2 Installing Reel Fore-Aft / Header Tilt Selector Switch and Harness: 700 Series

1. Remove two screws (A) from panel, and remove panel to access compartment.
2. Pull up on tab (B) to unlatch console.
3. Rotate the console upwards to expose the underside and make it easier to insert the tilt selector switch harness.

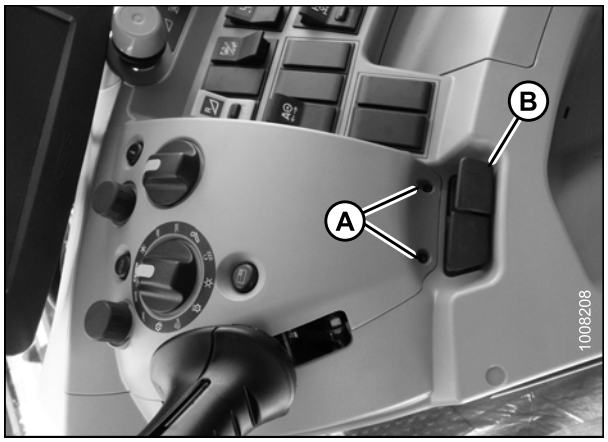


Figure 4.76: Console in Cab

4. Insert wire through bottom of console alongside wire (A) that goes to the CEBIS monitor.

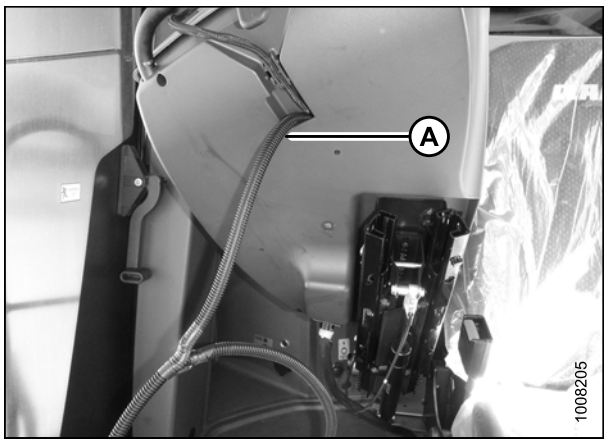


Figure 4.77: Bottom of Console

5. Remove blank cap from operator's panel at location (A).
6. Run wire from the panel that was previously removed through the opening and connect the switch (not shown) to harness (B). The red wire is connected to center terminal, and the white wire is connected to either outer terminal.
7. Snap switch into place.

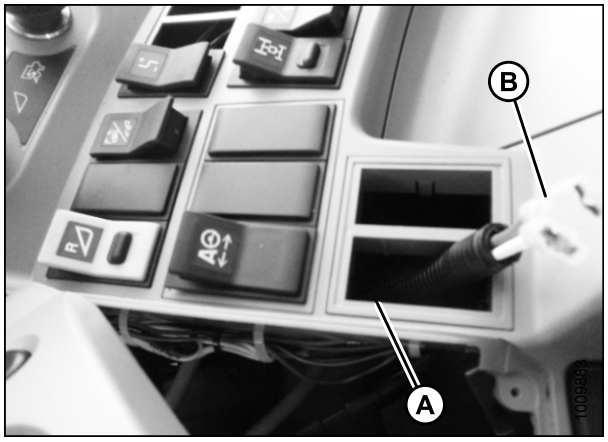


Figure 4.78: Switch and Console

8. Secure switch (A) into console and screw down the operator's panel.
9. Pull back the slack on the switch harness and use cable ties to secure it to the existing wire harness running to the CEBIS monitor (refer to Step *4., page 64*).

   NOTE:
   If autosteer is installed, select the blank plug next to (A).

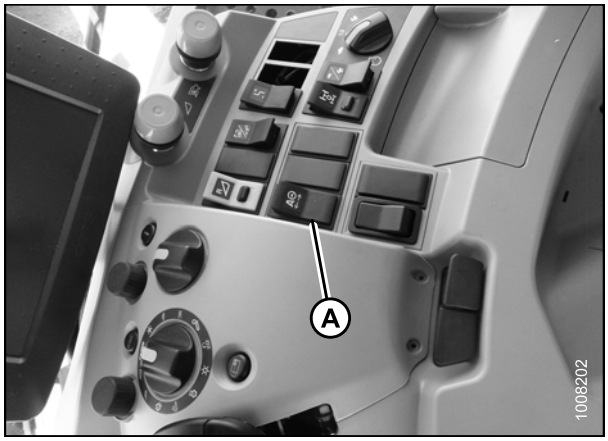


Figure 4.79: Switch in Console

10. Locate terminal compartment (A) on the floor at the right-hand side of the cab, and remove lid to access the 12 volt switched power.

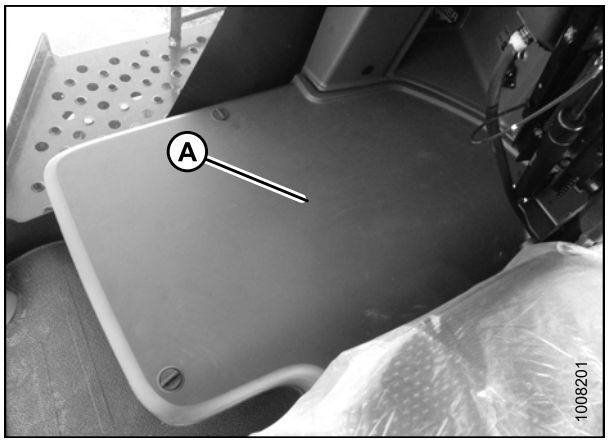


Figure 4.80: Lid of Terminal Compartment

11. Locate the single-wire harness (A) that provides switch power.
    a. Remove the insulation from the two male blades on the switch harness.
    b. Connect the red wire in plug (B) to the brown wire in plug (C).
    c. Connect the black wire in plug (C) to the black wire in plug (A).

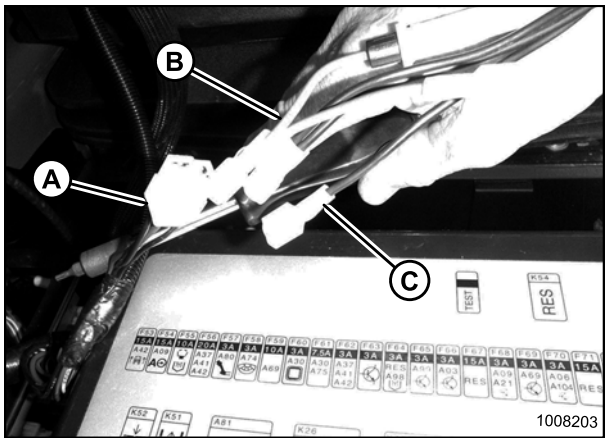


Figure 4.81: Wire Harness

12. Make an exit hole for the switch harness in one of the blank covers to the left side of the box at location (A).
13. Route the two-prong wire (black/white connector) of the switch harness through the hole.

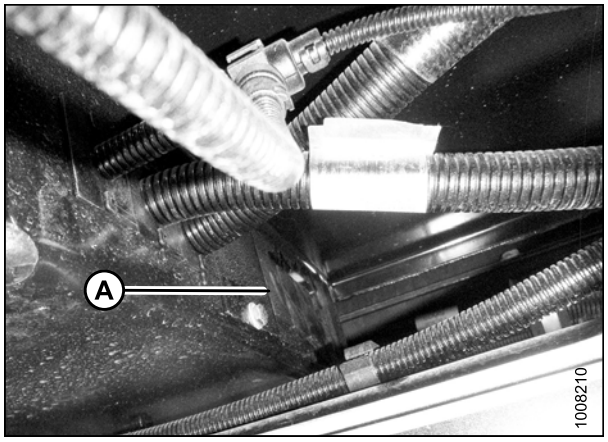


Figure 4.82: Exit Hole and Switch Harness

14. Route switch harness (A) under the cab floor alongside the existing harnesses. Do NOT secure harness with cable ties until routing is complete.

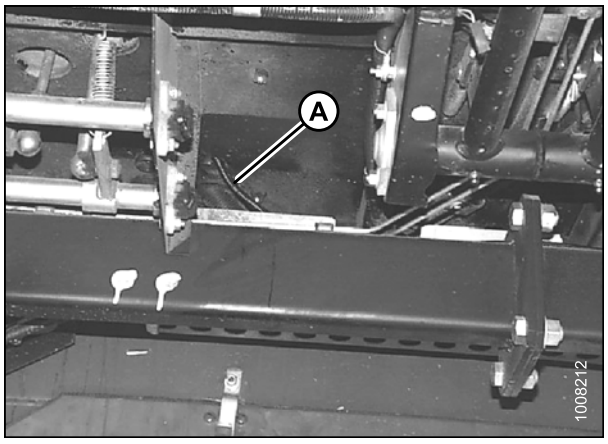


Figure 4.83: Harness under Cab Floor (500 Series CLAAS Shown)

15. Route the wiring harness from bottom left corner of cab to the conduit (A), between cab floor and frame as shown at location (B), and along conduit (A) to multicoupler.

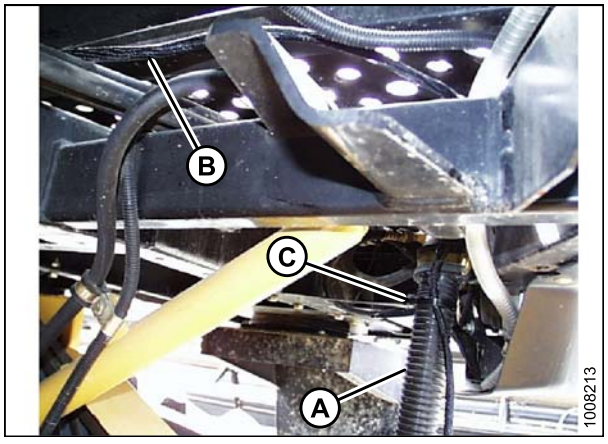


Figure 4.84: Harness through Conduit (500 Series CLAAS Shown)

A - Conduit **B - Routing Location**
C - Cable Tie

16. Secure wiring harness to conduit (B) (starting from the multicoupler end) using cable ties at location (A).

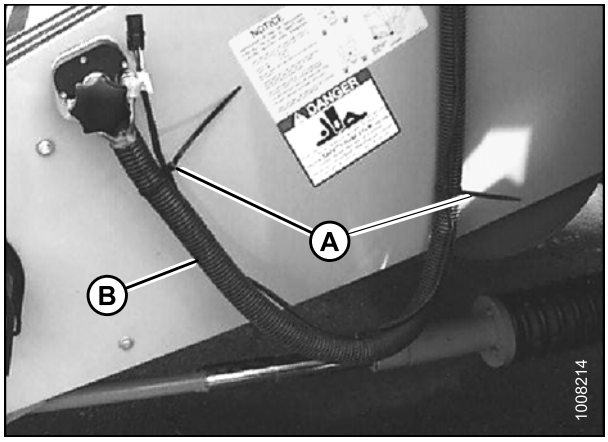


Figure 4.85: Cable Ties, Harness, and Conduit (500 Series CLAAS Shown)

17. Push excess harness back into terminal box once harness is secured with cable ties, and use cable ties to attach MacDon harness to existing harness (A) running to the console. This will prevent the harness from getting tangled when seat or console are moved.

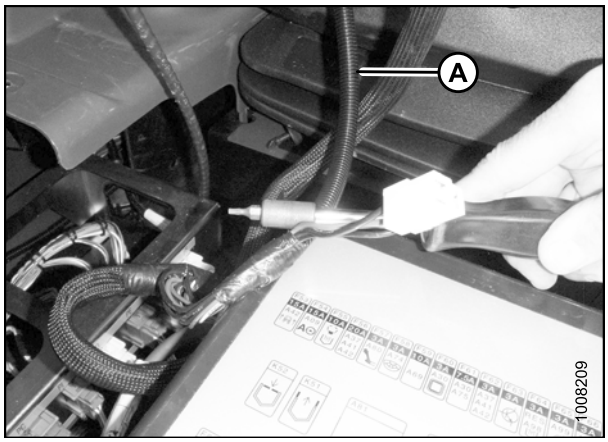


Figure 4.86: Existing Harness and MacDon Harness

4.4.3 Attaching Header to CLAAS Combine

DANGER

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

1. Move the handle (A) on the FM100 Float Module into the raised position, and ensure the pins (B) at the bottom corners of the float module are retracted.

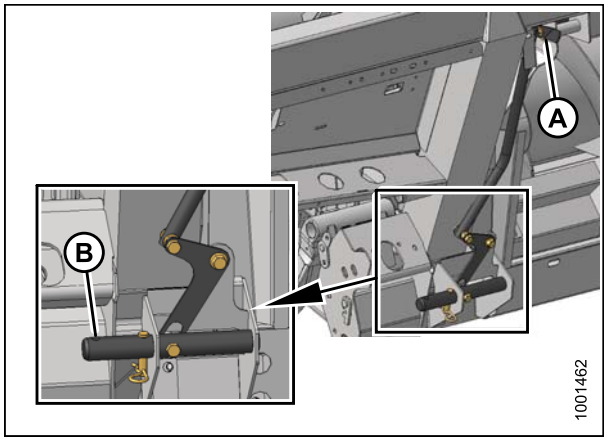


Figure 4.87: Pins Retracted

CAUTION

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

2. Start the engine and slowly drive the combine up to the header until the feeder house saddle (A) is directly under the float module top cross member (B).
3. Raise the feeder house slightly to lift the header ensuring the feeder saddle is properly engaged in the float module frame.
4. Stop the engine and remove the key from the ignition.

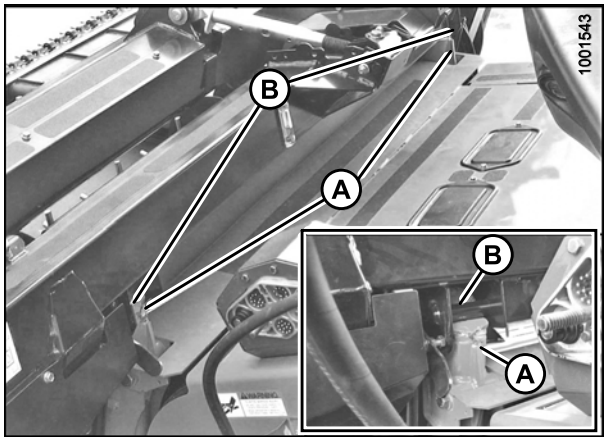


Figure 4.88: Header on Combine

5. Remove the locking pin (B) from the float module pin (A).

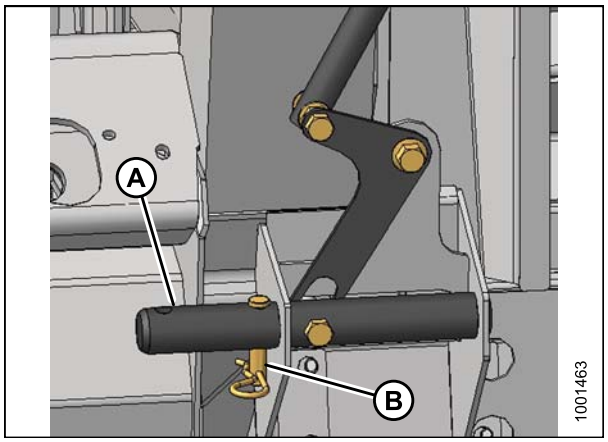


Figure 4.89: Locking Pins

6. Lower the handle (A) to engage the float module pins (B) into the feeder house. Reinsert the locking pin (C) and secure with the hairpin.
7. Remove the blocks from under the cutterbar.

CAUTION

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

8. Start the engine and lower the header.
9. Stop the engine and remove the key from the ignition.

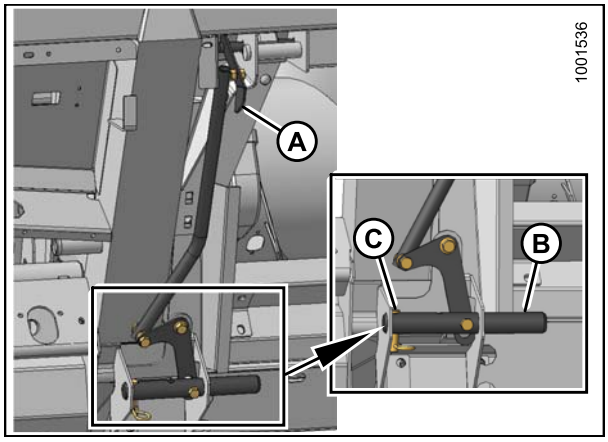


Figure 4.90: Engaging Pins

10. Unscrew the knob (A) on the combine coupler (B) to release the coupler from the combine receptacle and clean the coupler.

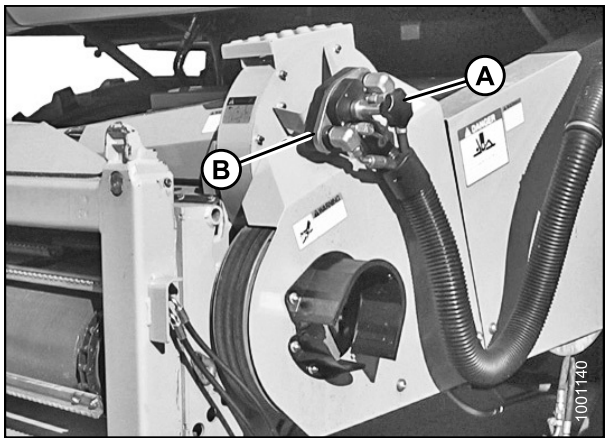


Figure 4.91: Combine Coupler

11. Remove float module receptacle cover (A).

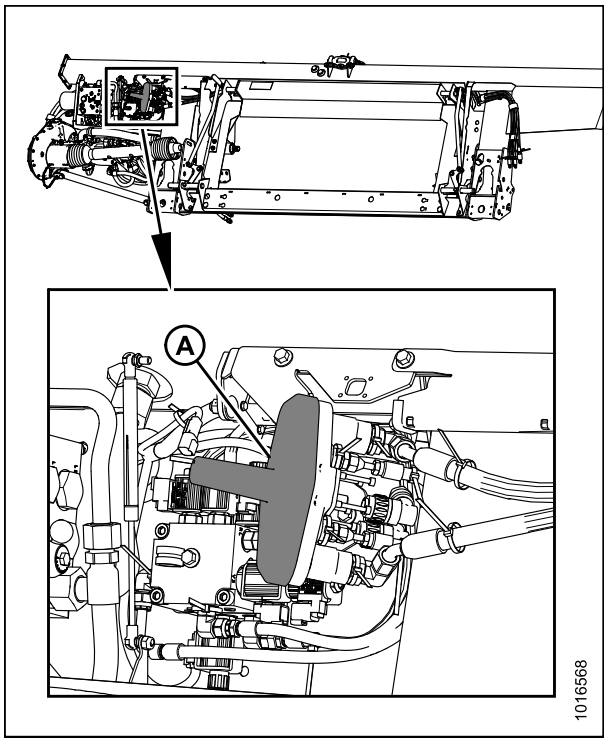


Figure 4.92: Receptacle Cover

12. Place the float module receptacle cover (A) onto the combine receptacle.

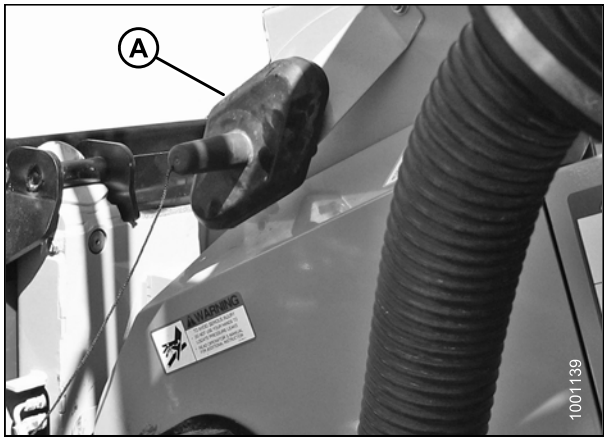


Figure 4.93: Receptacle Cover

13. Clean the mating surface of the coupler (A) and position onto the float module receptacle (B).
14. Turn the knob (C) to secure the coupler to the receptacle.

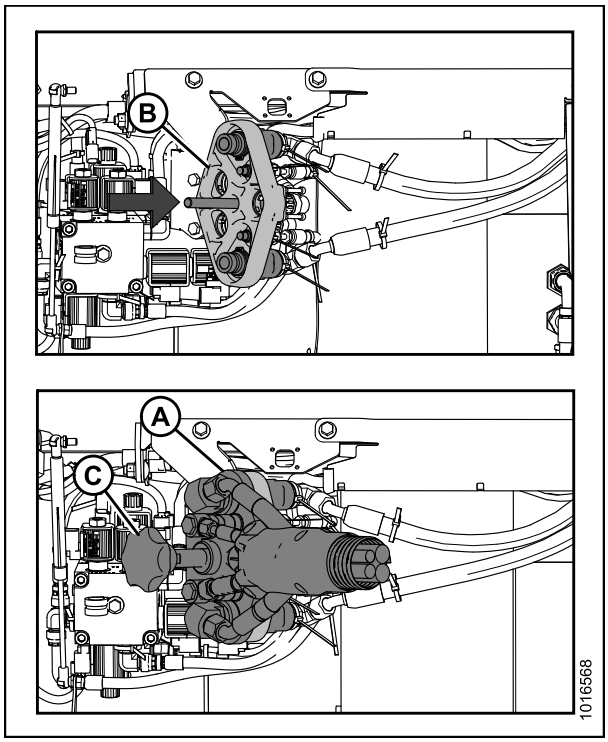


Figure 4.94: Coupler

15. Pull collar (A) back to release driveline (B) from support bracket (C). Remove the driveline from support bracket.

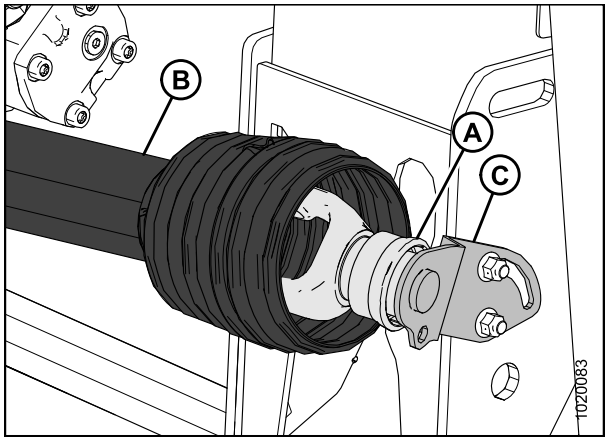


Figure 4.95: Driveline

16. Attach the driveline (A) to the combine output shaft.

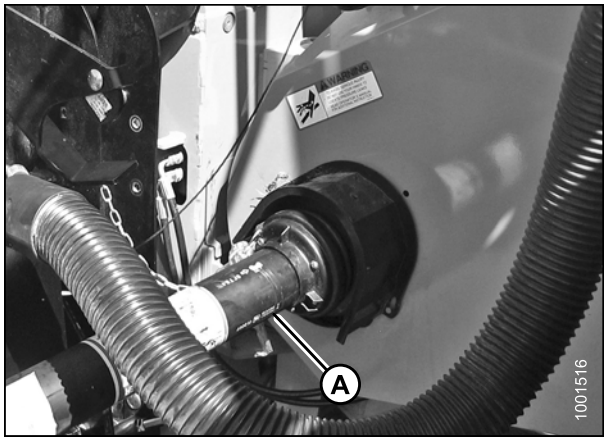


Figure 4.96: Driveline and Output Shaft

17. Disengage both header float locks by pulling each float lock handle (A) away from the float module and setting it in the unlocked position (B).
18. Proceed to *4.6.1 Attaching Cam Arms, page 78*.

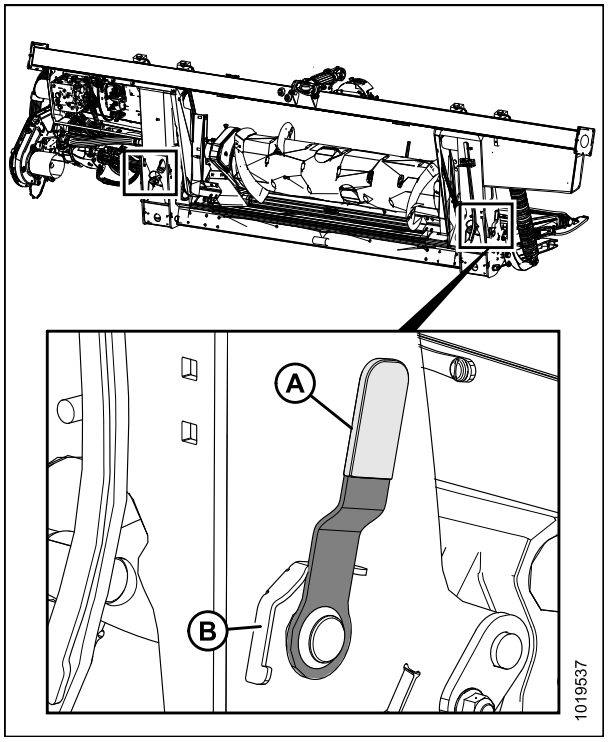


Figure 4.97: Float Locks - Right Shown, Left Opposite

4.5 New Holland Combines

The FD1 Series FlexDraper is compatible with the following New Holland combines:

Series	Combine Model
CR	920, 940, 960, 970, 980
	9020, 9040, 9060, 9065, 9070, 9080
	6090, 7090, 8080, 8090, 9090
	6.80, 6.90, 7.90, 8.90, 9.90, 10.90
CX	840, 860, 870, 880
	8070, 8080, 8090
	8080 Elevation, 8090 Elevation

4.5.1 Attaching Header to New Holland CR/CX Combine

DANGER

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

1. On the upper left side of the combine float module, remove nut (A), washer, spring, and lever (B).

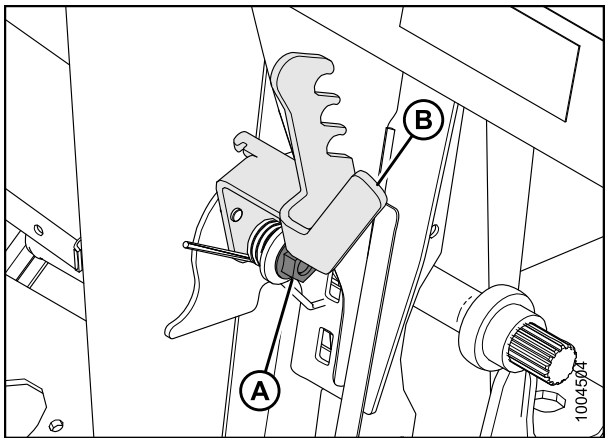


Figure 4.98: Combine Float Module Upper Left Side

2. Position lever (A) onto stud (B).

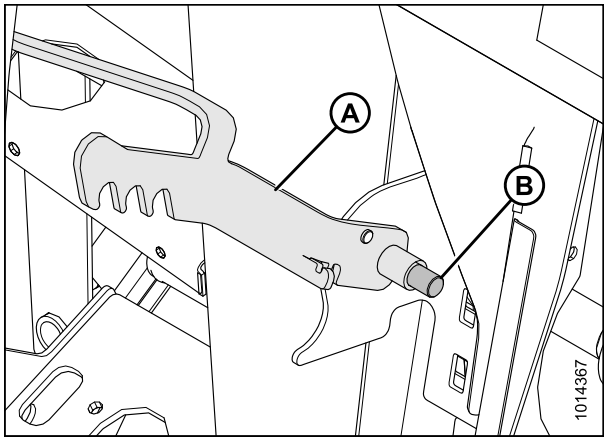


Figure 4.99: Combine Float Module Upper Left Side

3. Place spring arm (C) into hook on lever (B) to preload it, and tighten nut (A) with washer onto the combine float module.

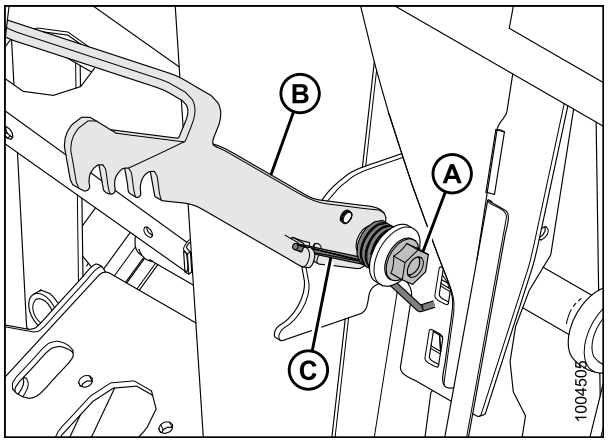


Figure 4.100: Combine Float Module Upper Left Side

4. Ensure the handle (A) is positioned so the hooks (B) can engage the float module.

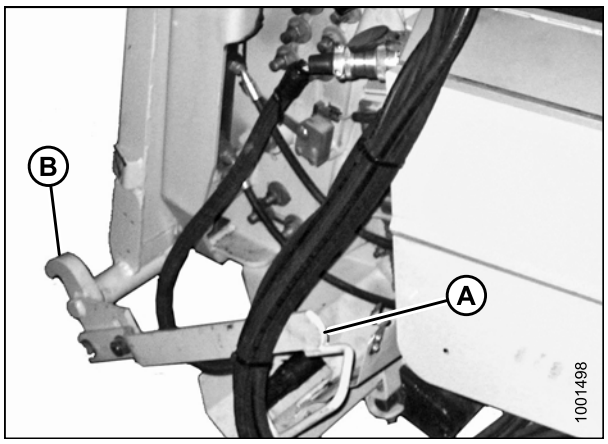


Figure 4.101: Feeder House Locks

CAUTION

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

5. Start the engine and slowly drive the combine up to the float module until the feeder house saddle (A) is directly under the float module top cross member (B).
6. Raise the feeder house slightly to lift the header ensuring the feeder saddle is properly engaged in the float module frame.
7. Stop the engine and remove the key from the ignition.

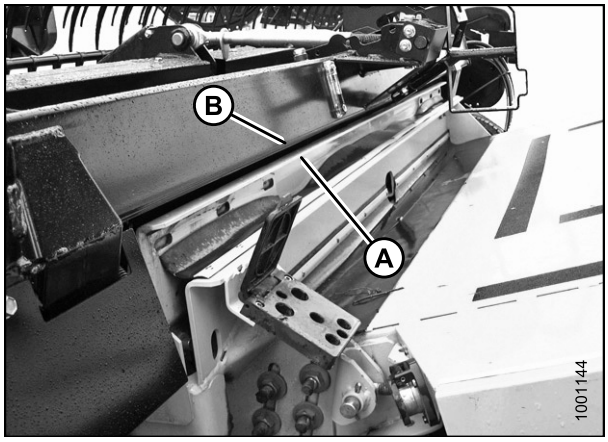


Figure 4.102: Header on Combine

8. Lift lever (A) on the float module on the left side of the feeder house, and push the handle (B) on the combine to engage the locks (C) on both sides of the feeder house.
9. Push down on the lever (A) so the slot in the lever engages the handle and locks the handle in place.
10. If the lock does not fully engage the pin on the float module when the lever (A) and handle (B) are engaged, loosen bolts (E) and adjust the lock (C). Retighten bolts.

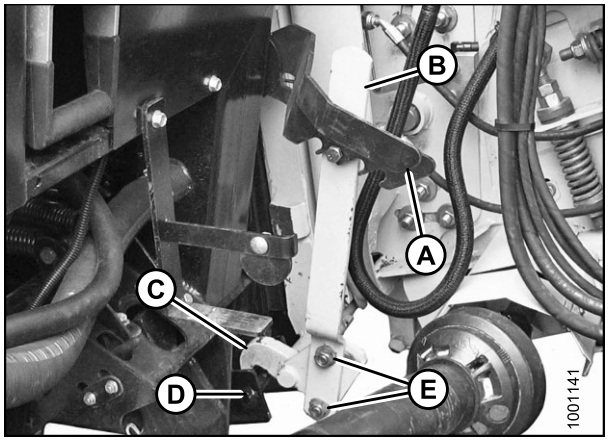


Figure 4.103: Feeder House Locks

11. Open the cover on the receptacle (A) located on the left side of the float module.
12. Push in the lock button (B) and pull the handle (C) to the full open position.
13. Clean the receptacle mating surfaces.

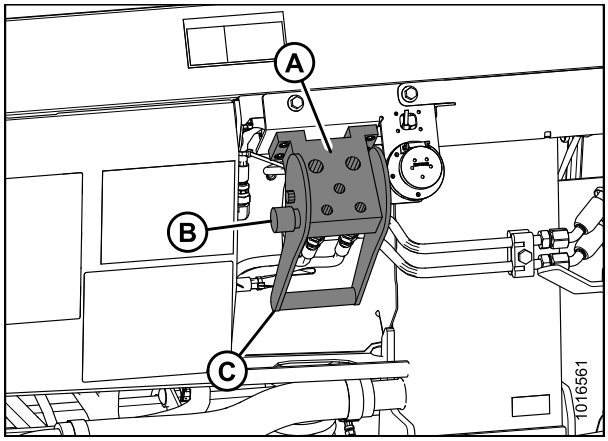


Figure 4.104: Float Module Receptacle

14. Remove the hydraulic quick coupler (A) from the storage plate on the combine, and clean the mating surface of the coupler.

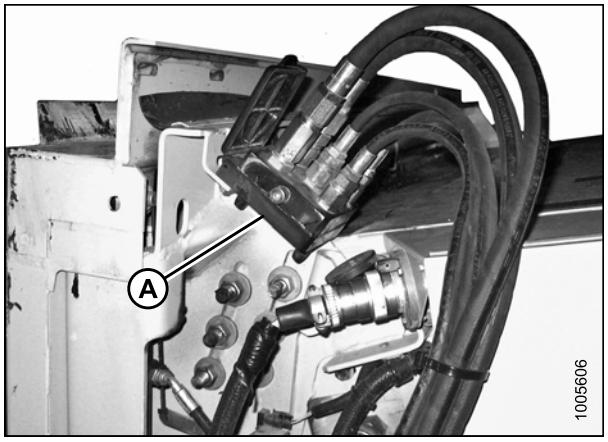


Figure 4.105: Combine Coupler

15. Position the coupler (A) onto the float module receptacle, and push the handle (B) to engage the pins into the receptacle.
16. Push the handle (B) to closed position until the lock button (C) snaps out.
17. Remove the cover on the float module electrical receptacle.
18. Remove the connector (D) from the combine.
19. Align the lugs on the connector (D) with the slots in the float module receptacle, and push the connector onto the receptacle. Turn the collar on the connector to lock it in place.

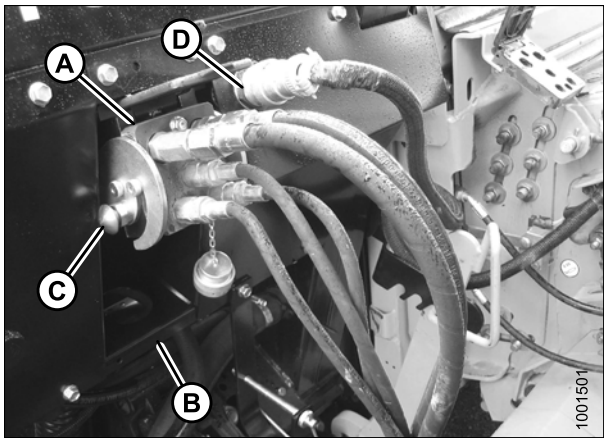


Figure 4.106: Connections

20. Pull collar (A) back to release driveline (B) from support bracket (C). Remove the driveline from support bracket.

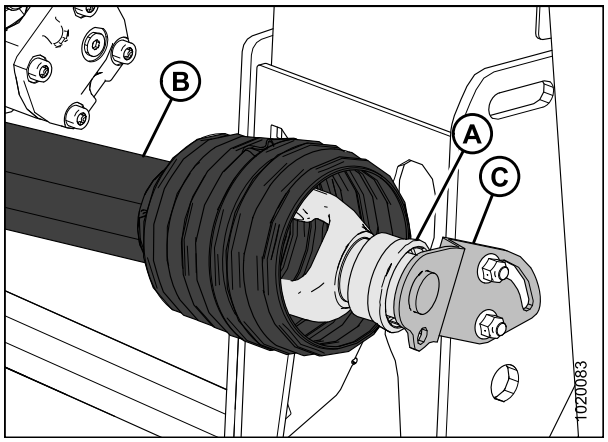


Figure 4.107: Driveline

21. Pull back the collar on the end of the driveline, and push the driveline onto the combine output shaft (A) until the collar locks.

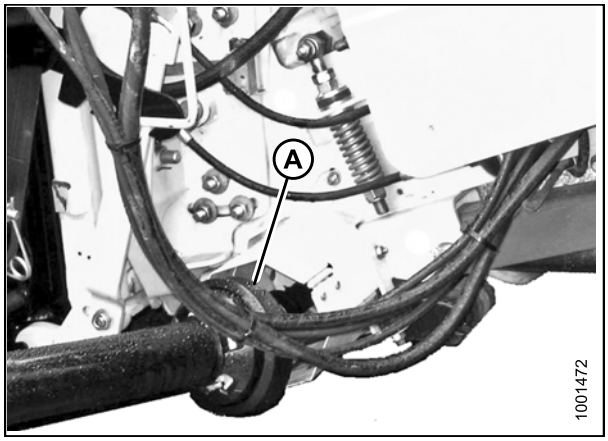


Figure 4.108: Driveline and Output Shaft

22. Disengage the float locks by pulling each float lock handle (A) away from the float module and setting it in the unlocked position (B).
23. Proceed to *4.6.1 Attaching Cam Arms, page 78*.

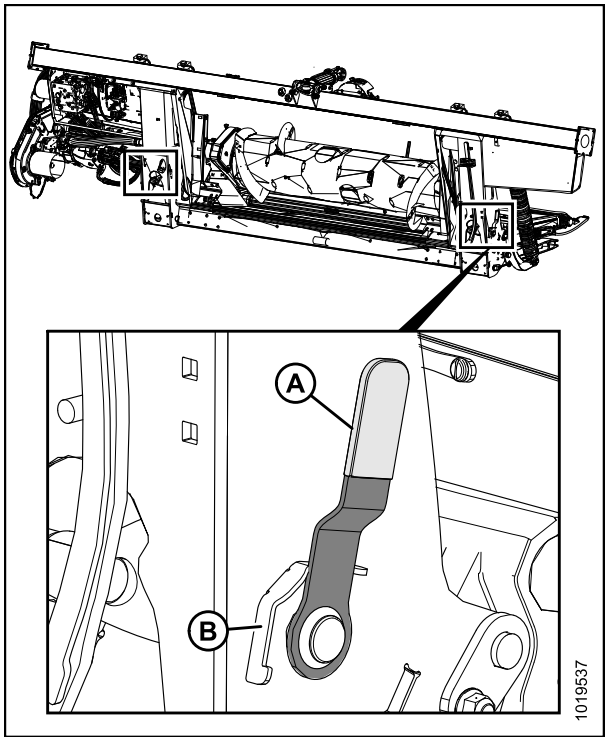


Figure 4.109: Float Locks - Right Shown, Left Opposite

4.6 Completing the Header Assembly

4.6.1 Attaching Cam Arms

To attach the reel cam arms, follow these steps:

1. Rotate the reel manually until the tine bars with disconnected cam links are accessible.
2. Remove shipping wire (A) (if not already removed).

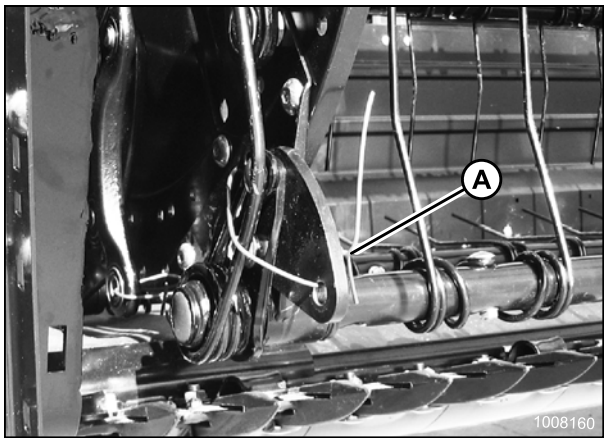


Figure 4.110: Disconnected Cam Links and Shipping Wire

3. Remove bag of hardware (A) from tine bar. It contains hardware for cam links and endshields.

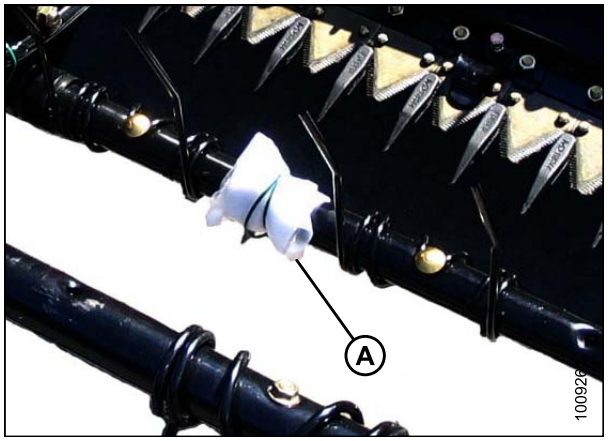


Figure 4.111: Hardware Bag Right Reel

4. Rotate tine bar crank (A) and position link (B) so attachment holes in bar crank are aligned with hole in link.
5. Install bolt (C) in link and position shim (D) on bolt so that shim is between link and tine bar crank.

   NOTE:
   Bolts are pre-coated with Loctite®, so no further locking method is required.

6. Realign link (B) and tine bar crank (A) and thread in bolt (C).
7. Repeat for remaining tine bars and torque bolts to 165 N·m (120 lbf·ft).

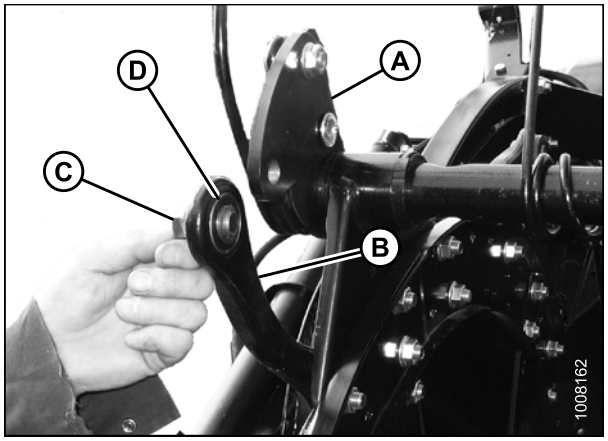


Figure 4.112: Bar Crank Attachment Holes and Link Alignment

8. Position reel pitch at position 4 to access bolt after rotating the reel. Reposition reel to position 2 when done.

   NOTE:
   This procedure is done only on the right reel.

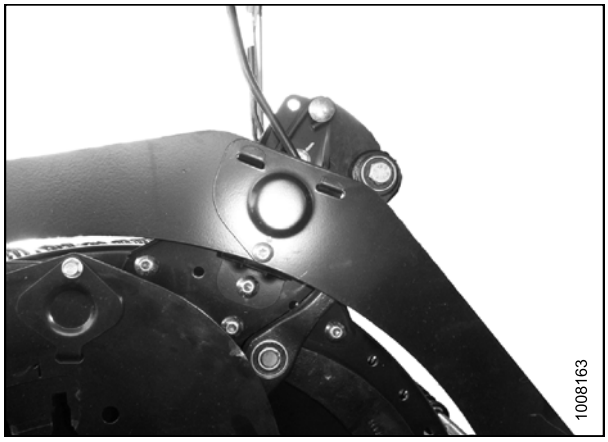


Figure 4.113: Right Reel with Cam Arms Attached

4.6.2 Repositioning Gearbox

To reposition the gearbox, follow these steps:

1. Remove shipping wire and wrapping on brace (A). Swing brace clear of gearbox.

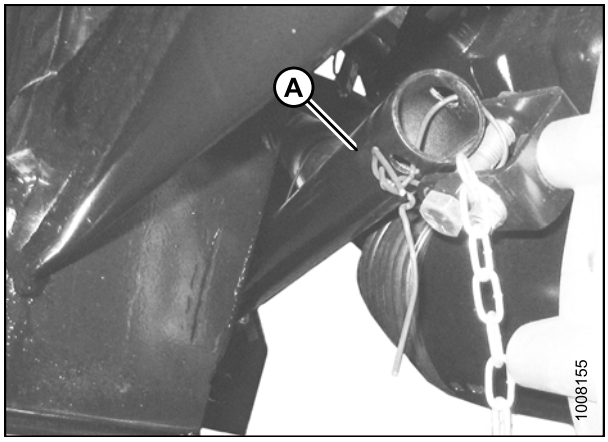


Figure 4.114: Shipping Wire and Brace

2. Loosen nut (A) and move bolt out of shipping position slot.

Figure 4.115: Shipping Position

3. Rotate gearbox and insert bolt into working position slot (A). Tighten nut.

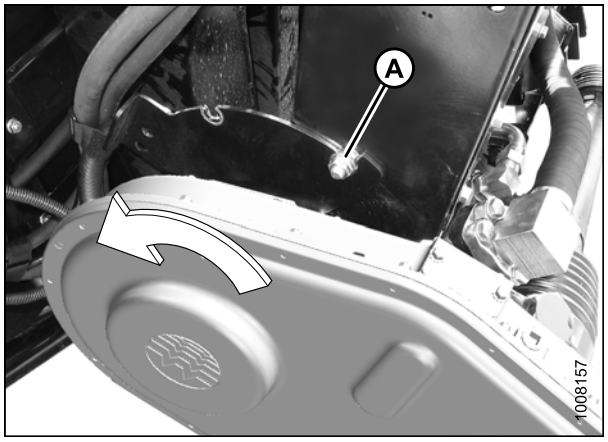


Figure 4.116: Working Position

4. Remove bolt and nut from bracket on gearbox.
5. Position brace (A) inside bracket, and reinstall bolt (B) and nut.

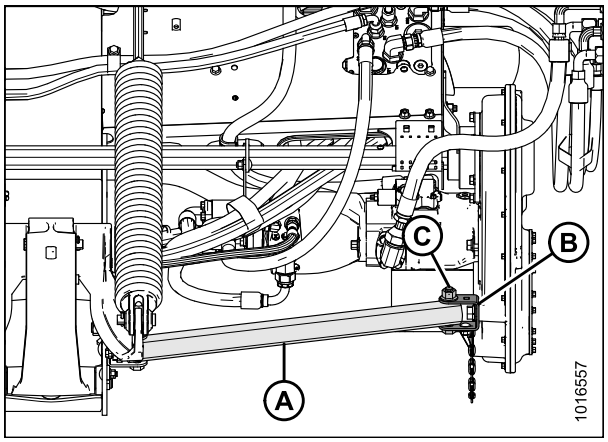


Figure 4.117: Brace Position

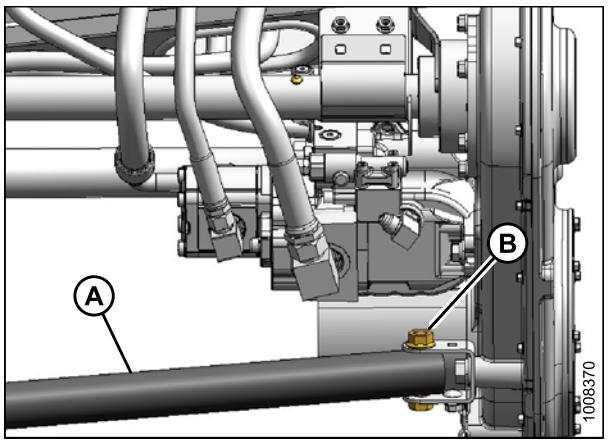


Figure 4.118: Brace Position

4.6.3 Removing Shipping Supports

The removable supports are painted yellow. Refer to illustrations and remove the remaining supports as follows:

NOTE:
Unless otherwise specified, discard supports as well as all shipping material and hardware.

1. Remove two bolts (A) and remove strap (B) from both sides of center frame.

   NOTE:
   If strap is difficult to remove, lift on one end of header to release the load on the strap so that bolts can be removed.

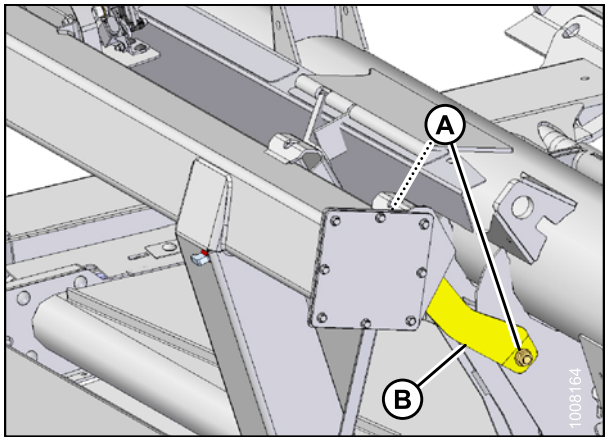


Figure 4.119: Strap on Center Frame

2. Remove lynch pin (A), nut and bolt (B), and remove shipping brace (C).
3. Reinstall lynch pin (A).

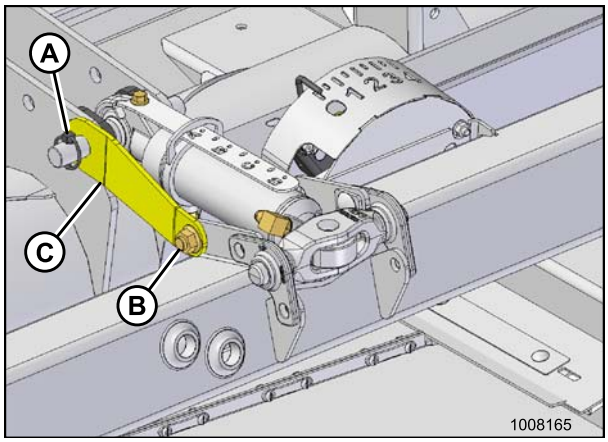


Figure 4.120: Lynch Pin, Hardware, and Shipping Brace

4.6.4 Positioning Transport Lights

Transport lights are located on each of outboard reel arms.

1. Position light (A) perpendicular to header. Light arm should move with normal hand force yet maintain its position. If not, proceed to next step.
2. Loosen jam nut (B) on light attachment bolt, and adjust hex nut (C) as required. Tighten jam nut (B).
3. Repeat above for opposite side.

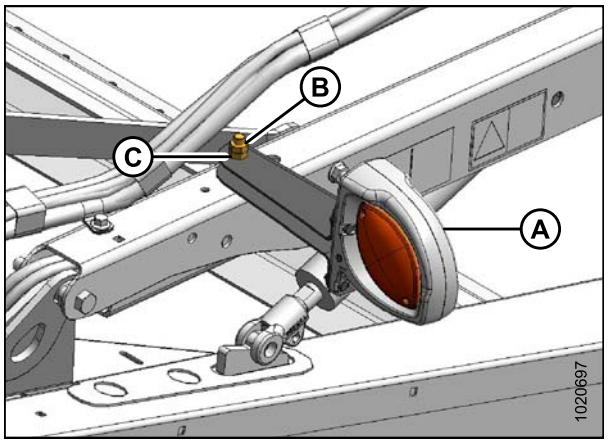


Figure 4.121: Transport Light

4.6.5 Installing Crop Dividers

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

Removing Crop Dividers from Storage

Crop dividers are shipped attached to the inboard side of the endsheets. To remove the crop dividers, follow these steps:

1. Support the crop divider and remove the shipping wire at the front end (A).
2. Remove bolt (B).
3. Remove the bolt with washer (C) and retain for installation.

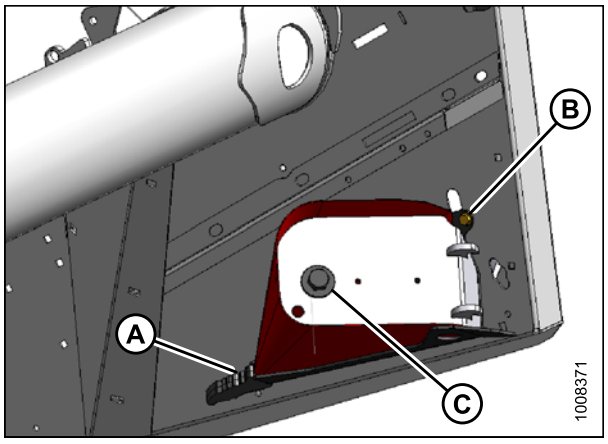


Figure 4.122: Crop Divider Stored on Endsheet

Opening Endshields

1. Push release lever (A) located on the backside of the endshield to unlock the shield.
2. Pull endshield open using handle depression (B).

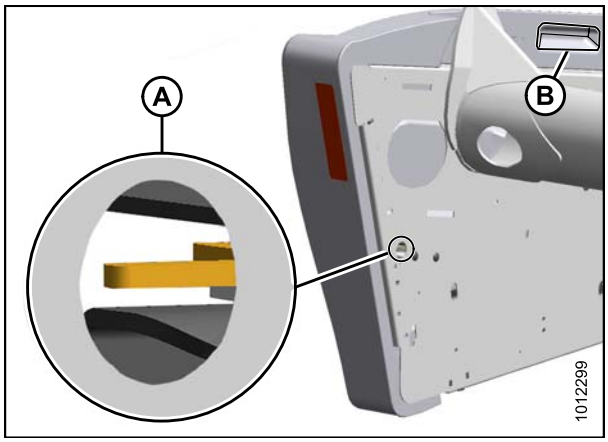


Figure 4.123: Left Endshield

3. Pull endshield at handle depression (A). Endshield is retained by a hinge tab (B) and will open in direction (C).

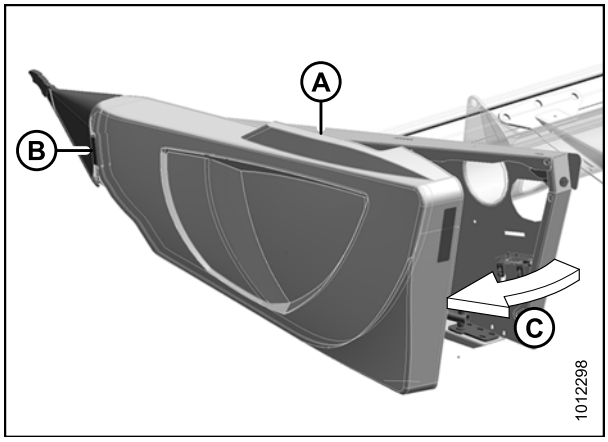


Figure 4.124: Left Endshield

4. Pull the endshield free of hinge tab (A) if additional clearance is required, and swing shield towards the rear of the header.
5. Engage safety latch (B) on hinge arm to secure the shield in fully-open position.

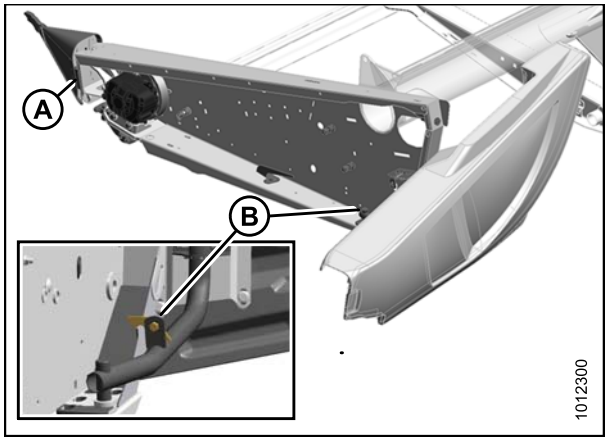


Figure 4.125: Left Endshield

Installing Crop Divider without Latch Option

NOTE:
If the crop divider latch option was ordered with the header, proceed to *Installing Crop Divider with Latch Option, page 85*. Otherwise, complete the following procedure:

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

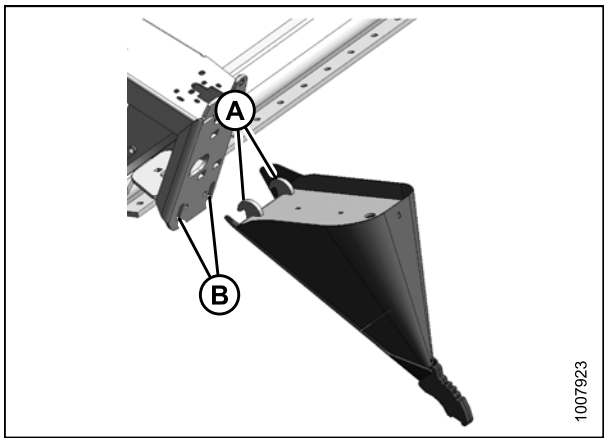


Figure 4.126: Crop Divider without Latch

2. Lift the forward end of the crop divider and install bolt (B) and special stepped washer (A) (step towards divider). Tighten bolt.

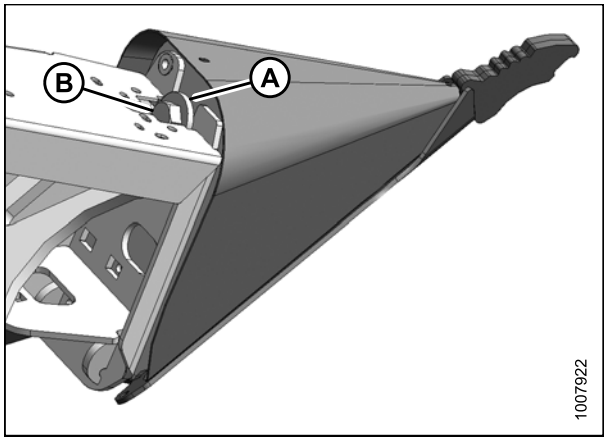


Figure 4.127: Crop Divider without Latch

3. Check that divider does NOT move laterally. Adjust bolts (A) as required to tighten divider, and remove lateral play when pulling at divider tip.

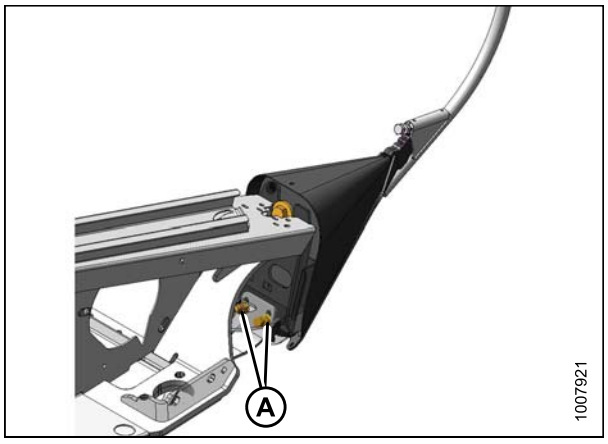


Figure 4.128: Adjustment

Installing Crop Divider with Latch Option

1. Position the crop divider as shown by inserting the lugs (A) into holes in the endsheet.
2. Lift the forward end of the divider until the pin (B) engages and closes the latch (C).
3. Push the safety lever (D) down to lock the pin in latch.

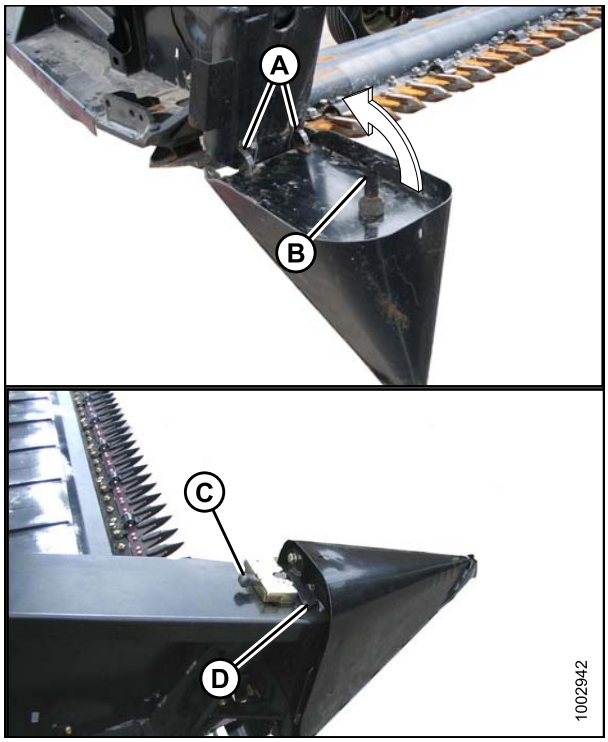


Figure 4.129: Crop Divider with Latch

4. Adjust bolts (A) to tighten divider and remove lateral play when pulling at divider tip.

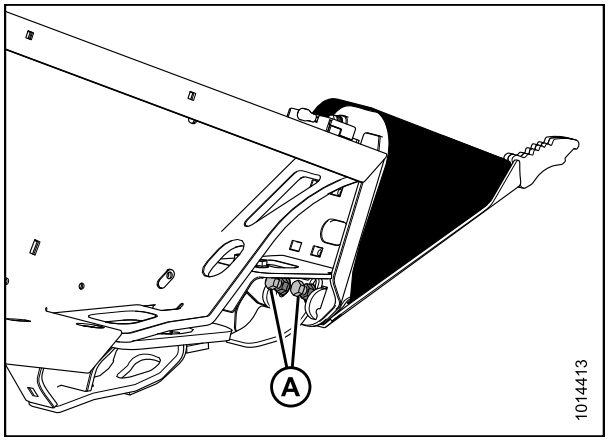


Figure 4.130: Adjustment

Closing Endshields

1. Disengage lock (B) to allow endshield to move.
2. Insert front of endshield behind hinge tab (A) and into divider cone.

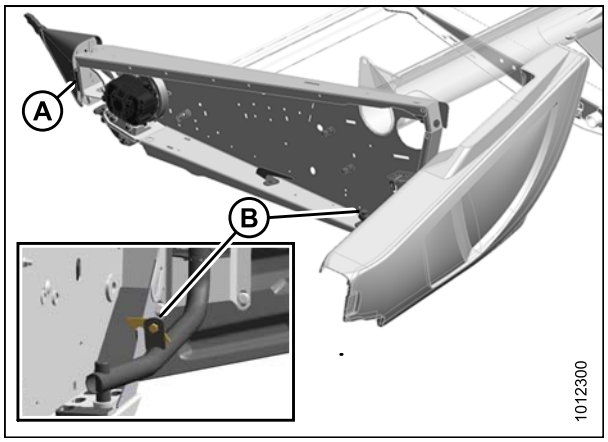


Figure 4.131: Left Endshield

3. Swing endshield in direction (A) into closed position. Engage lock with a firm push.
4. Check that endshield is locked.

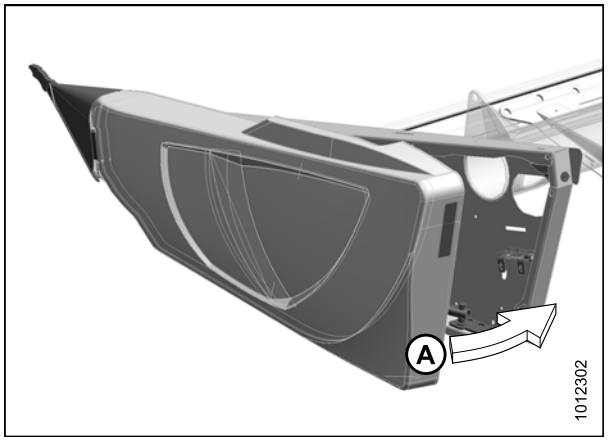


Figure 4.132: Left Endshield

Installing Crop Divider Rods

1. Remove divider rods from shipping location on header endsheet.
2. Position crop divider rod (B) on tip of crop divider as shown and tighten bolt (A).
3. Repeat procedure at opposite end of header.

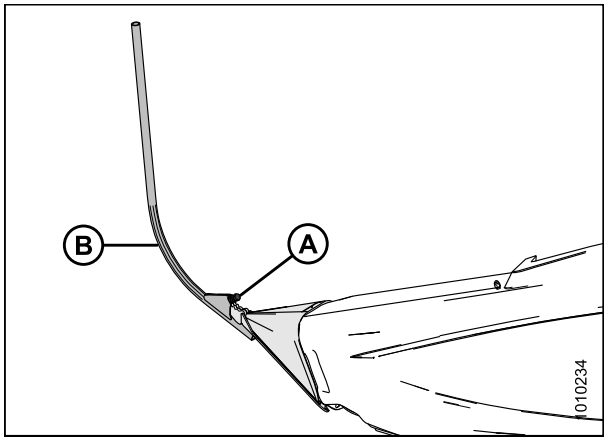


Figure 4.133: Divider Rod on Crop Divider

4.6.6 Installing Options

1. Retrieve the kits supplied as options with the header, and install them according to the instructions supplied with each kit.
2. Proceed to *5 Performing Predelivery Checks, page 89*.

5 Performing Predelivery Checks

This machine has been set at the factory and should not require further adjustments; however, the following checks will ensure your machine provides maximum performance. If adjustments are necessary, follow the procedures in this chapter.

WARNING

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

IMPORTANT:
To avoid machine damage, check that no shipping material has fallen into the machine.

1. Perform the final checks as listed on the **Predelivery Checklist** (yellow sheet attached to this instruction – *Predelivery Checklist, page 285*) to ensure the machine is field-ready. Refer to the following pages for detailed instructions as indicated on the Checklist. The completed Checklist should be retained either by the Operator or the Dealer.

5.1 Recording Model and Serial Number

Record the machine serial numbers on the Pre-Delivery Checklist

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

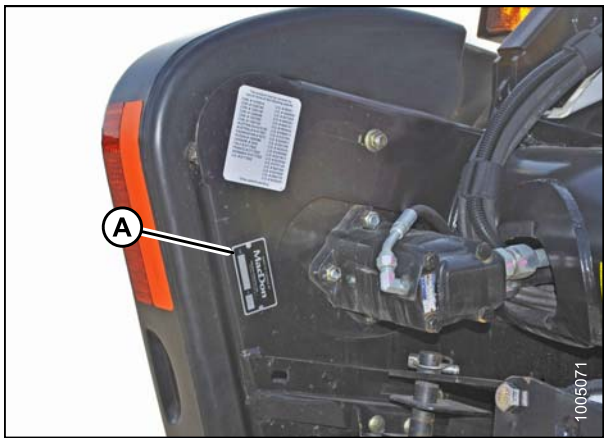


Figure 5.1: Header

The serial number plate (A) is located at the top left side of the float module.

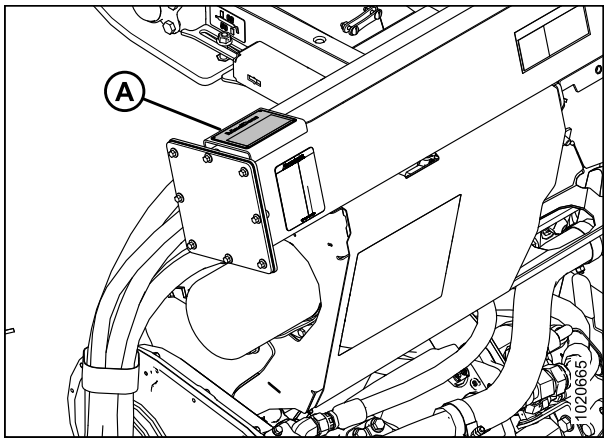


Figure 5.2: Float Module

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

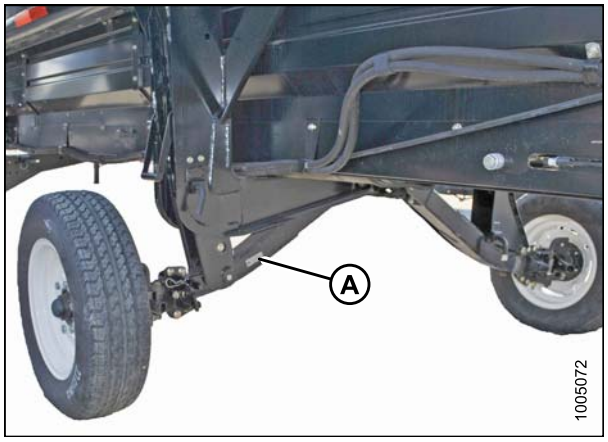


Figure 5.3: Transport/Stabilizer Option

5.2 Checking Tire Pressure: Transport and Stabilizer Wheels

Check tire inflation pressure. If necessary, inflate tires according to the following table:

Table 5.1 Tire Inflation Pressure

Size	Load Range	Pressure
ST205/75 R15	D	448 kPa (65 psi)
	E	552 kPa (80 psi)

IMPORTANT:
Do **NOT** exceed maximum pressure specified on tire sidewall.

5.3 Checking Wheel Bolt Torque

Perform the following procedure to ensure that transport and stabilizer wheel bolts are correctly torqued:

1. Check wheel bolt torque is 110–120 N·m (80–90 lbf·ft) and adjust as necessary. Refer to bolt tightening sequence illustration.

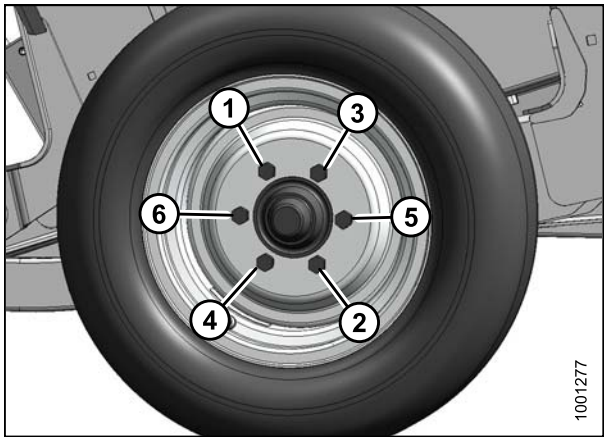


Figure 5.4: Bolt Tightening Sequence

5.4 Checking Knife Drive Box

To access the knife drive box(es), endshield(s) must be fully opened. Single-knife headers have one knife-drive box and double-knife headers have two knife-drive boxes.

WARNING

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

1. Press down on the latch in the opening (A) on the inboard side of the endsheet.
2. Pull endshield open using handle depression (B).

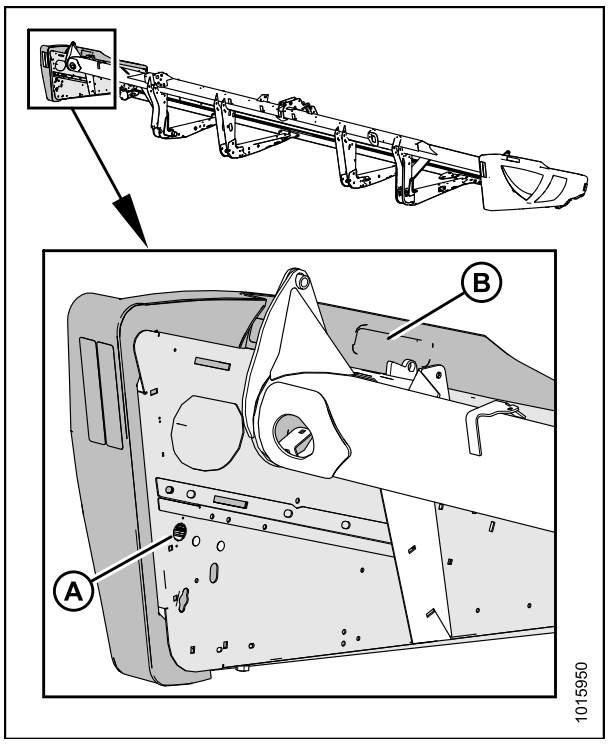


Figure 5.5: Endshield Latch Access

3. Swivel the endshield toward the back of the header and use the safety latch (B) to secure the endshield support tube (A) to the endsheet.

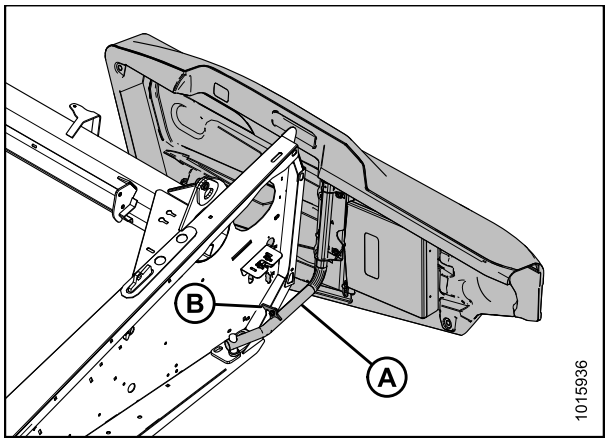


Figure 5.6: Left Endshield Support Tube

IMPORTANT:
The knife drive box breather is shipped in position (A) (forward) to prevent oil loss during transport. The breather **MUST** be repositioned to location (B) to prevent oil loss during normal operation. Failure to do so can result in damage to the knife drive box.

4. Check position of plug (A) and breather (B) at knife drive box. Position **MUST** be as shown.
5. Remove breather (B) and check oil level. The oil level should be between the bottom edge (C) of the lower hole (D) and the bottom (E) of the breather.

NOTE:
Check oil level with top of knife drive box horizontal and with the breather screwed in.

6. Reinstall breather and tighten.

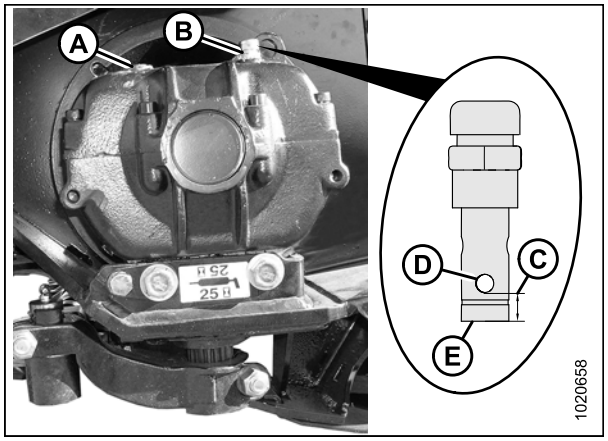


Figure 5.7: Knife Drive Box

5.5 Checking Oil Level in Header Drive Gearbox

DANGER

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

1. Lower the header to the ground and ensure the gearbox is in working position.
2. Shut down the combine, and remove the key from the ignition.
3. Remove the oil level plug (A) and check that the oil level is up to the bottom of the hole.
4. Replace the oil level plug (A).

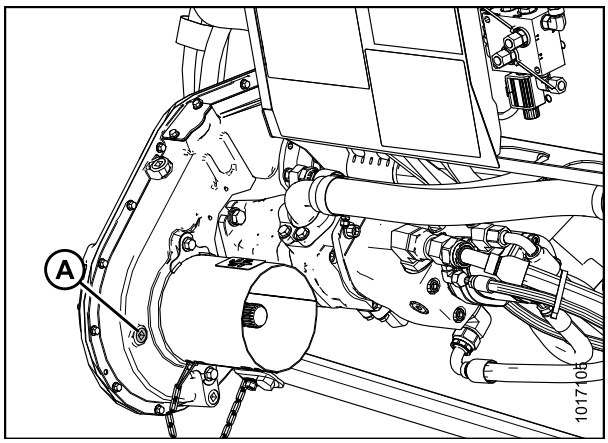


Figure 5.8: Header Drive Gearbox

5.6 Checking Oil Level in Hydraulic Reservoir

1. Check the oil level using the lower sight (A) and the upper sight (B) with the cutterbar just touching the ground and with center-link retracted.

   NOTE:
   Check the level when the oil is cold.

2. Ensure the oil is at the appropriate level for the terrain as follows:

   - **Hilly terrain (C):** Maintain level so lower sight (A) is full, and upper sight (B) is up to one-half filled.
   - **Normal terrain (D):** Maintain level so lower sight (A) is full, and upper sight (B) is empty.
   - **Level ground (E):** For slopes of 6° or less, oil level may be kept slightly lower if desired. Maintain level so lower sight (A) is one-half filled or slightly higher.

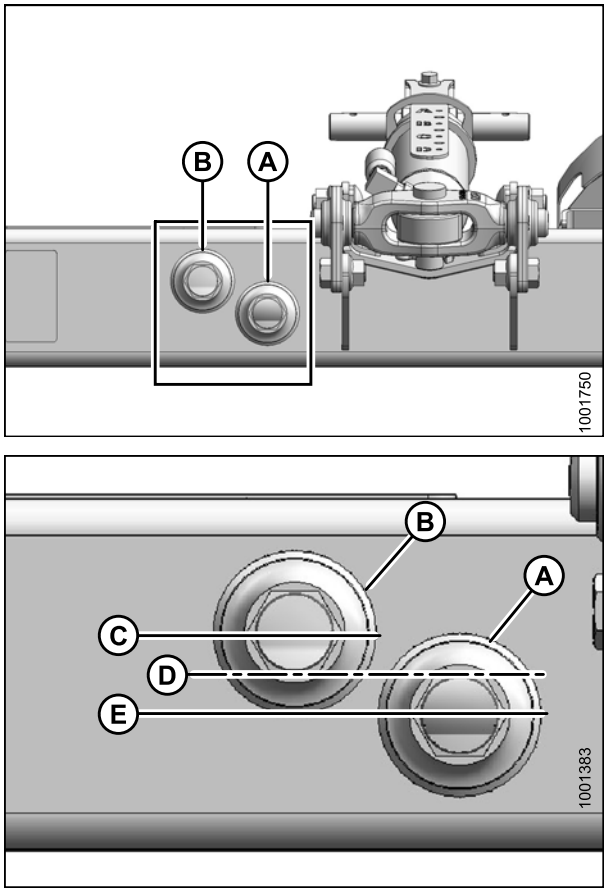


Figure 5.9: Oil Level Sight Glass

5.7 Checking Knife Drive Belt Tension

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

1. Open endshield(s).

   NOTE:
   The knife drive is identical on both sides of the header.

2. Check belt (C) tension by applying 90 N (20 lbf) by hand to belt at mid-span, and check that belt deflects 18 mm (3/4 in.). If necessary adjust tension as follows:

   a. Loosen two bolts (A) that secure the motor assembly to header endsheet.

   b. Turn adjuster bolt (B) as required (clockwise to tighten) to achieve specified tension.

3. Ensure that clearance between belt (A) and belt guide (B) is 1 mm (1/32 in.).
4. If required, loosen three bolts (C), and adjust position of guide (B).
5. Tighten bolts (C).
6. Close endshield(s).

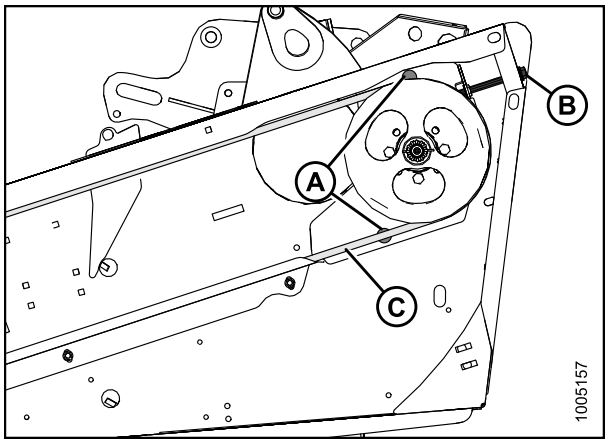


Figure 5.10: Left Shown – Right Opposite for Double-Knife Headers

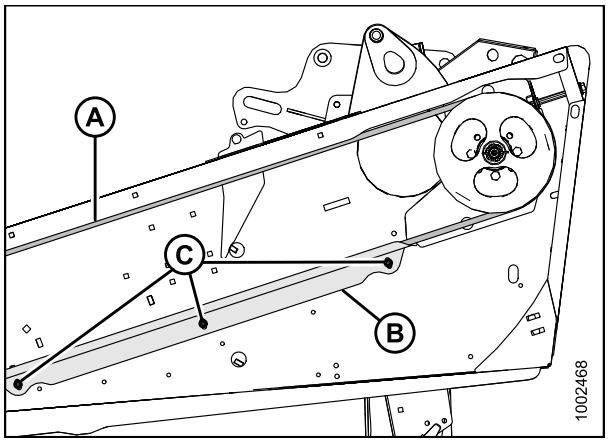


Figure 5.11: Knife Drive

5.8 Checking Knife Hold-Downs

Perform daily inspections to ensure the knife hold-downs are preventing the knife sections from lifting off the guards while permitting the knife to slide without binding. Use a feeler gauge to measure the clearance between the hold-downs and knife sections and refer to the following for adjustment procedures:

- *5.8.1 Adjusting Hold-Downs with Pointed Guards, page 98*
-

5.8.1 Adjusting Hold-Downs with Pointed Guards

WARNING

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

1. Shut down the combine, and remove the key from the ignition.
2. Use a feeler gauge to measure the clearance between the normal guard hold-down (A) and the knife section. Ensure the clearance is 0.1–0.6 mm (0.004–0.024 in.).
3. To lower the front of the hold-down and decrease clearance, turn bolt (B) clockwise; to raise the front of the hold-down and increase clearance, turn bolt (B) counterclockwise.

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

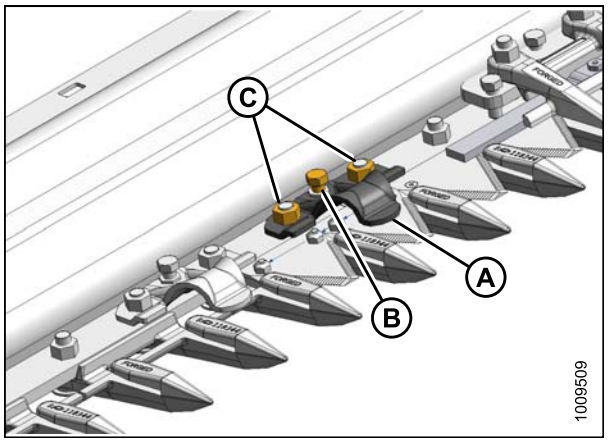


Figure 5.12: Normal Guard Hold-Down

4. Use a feeler gauge to measure the clearance between the center guard hold-down (A) and the knife section. Ensure the clearance is between the following measurements:
   - **At guide tip (B):** 0.1–0.4 mm (0.004–0.016 in.)
   - **At rear of guide (C):** 0.1–1.0 mm (0.004–0.040 in.)
5. Adjust the clearance as follows:
   a. Tighten nuts (D) until they are finger tight.
   b. Turn the three adjuster bolts (E) clockwise to raise the front of the hold-down and increase clearance, or counterclockwise to lower the front of the hold-down and decrease clearance.
   c. Torque the nuts (D) to 72 N·m (53 lbf·ft) after all the adjustments are complete and the specified clearances are achieved.

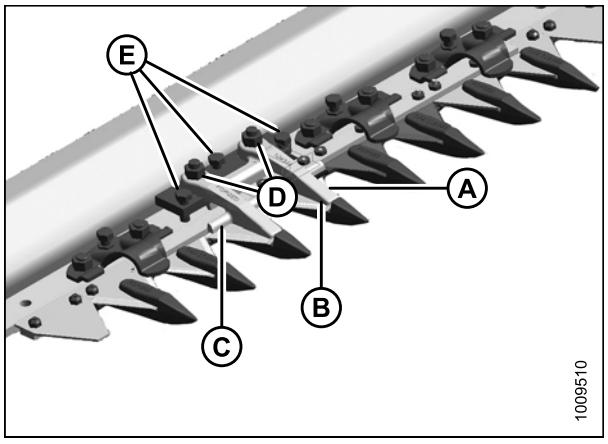


Figure 5.13: Center Guard Hold-Down

WARNING

Check to be sure all bystanders have cleared the area.

6. Complete the hold-down adjustments, run the header at low engine speed, and listen for noise caused by insufficient clearance.

   NOTE:
   Insufficient hold-down clearance will result in overheating of the knife and guards—readjust as necessary.

7.

5.9 Centering Reel

WARNING

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

1. Start engine and set cutterbar height at approximately 150 mm (6 in.) above ground.
2. Lower reel and adjust fore-aft position to 5 on reel arm indicator decal.
3. Stop engine and remove key from ignition.
4. Manually rotate reel to position a tine tube above cutterbar.
5. Measure clearance (A) at locations (B) between reel tine tube and endsheet at both ends of header. The clearances should be same if reel is centered. Refer to following steps to center reel.

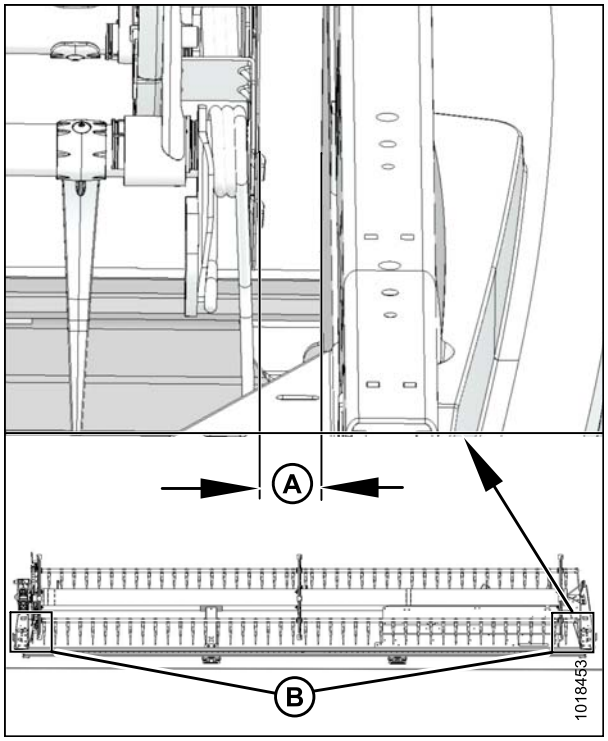


Figure 5.14: Centering Reel – Single Reel Shown, Double Reel Similar

6. Loosen bolts (A) on braces (B) at center support arm.
7. Move forward end of reel support arm (C) laterally as required to center reel.
8. Tighten bolts (A) and torque to 359 N·m (265 ft·lbf).

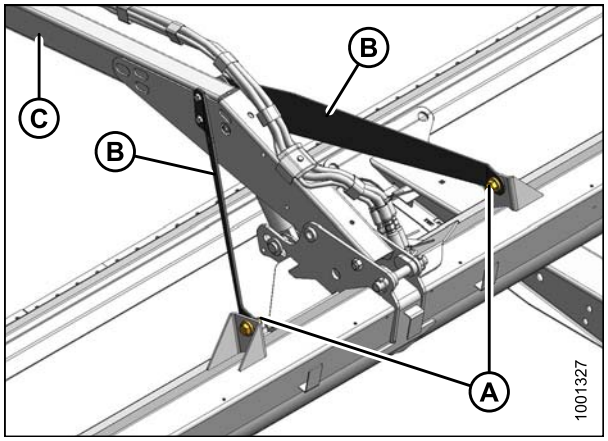


Figure 5.15: Center Support Arm

5.10 Checking and Adjusting Header Float

The header is equipped with a suspension system that floats the header over the ground to compensate for ridges, trenches, and other variations in ground contour. If the header float is not set properly, it may cause the cutterbar to push into the ground or leave uncut crop. This procedure describes how to check header float and adjust to the factory-recommended settings.

DANGER

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

1. Level the header and float module. If the header and float module are not level, perform the following checks before adjusting the float:

   IMPORTANT:
   Do **NOT** use the float module float springs to level the header.

   - Park the combine on a level surface.
   - Check that the combine feeder house is level. Refer to your combine operator's manual for instructions.
   - Check that the top of the float module is level with the combine axle.
   - Ensure the combine tires are inflated equally.

2. Adjust header so that the cutterbar is 150–254 mm (6–10 in.) off the ground.
3. Extend the header angle hydraulic cylinder (A) to B 1/2 on indicator (A).
4. Adjust the reel fore-aft position to between 5 and 6 on the position indicator decal (A) located on the reel right arm.
5. Lower the reel fully.
6. Shut down the combine, and remove the key from the ignition.

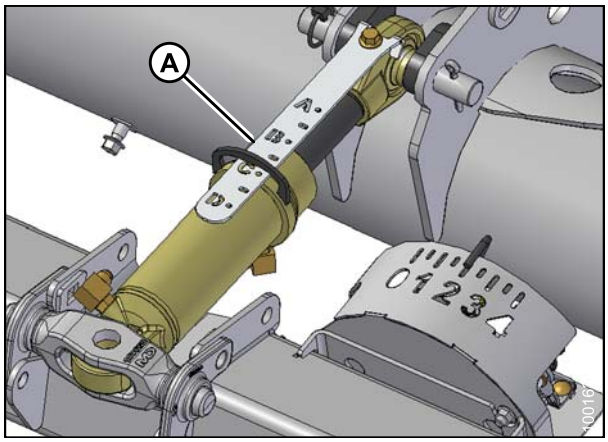


Figure 5.16: Center-Link

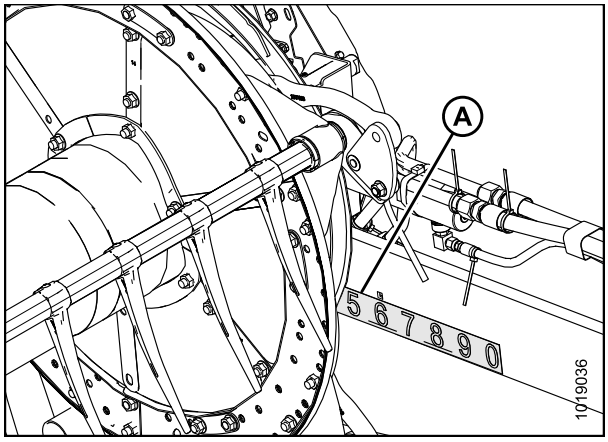


Figure 5.17: Fore-Aft Position

7. Place wing lock spring handles (A) in the LOCKED (upper) position.

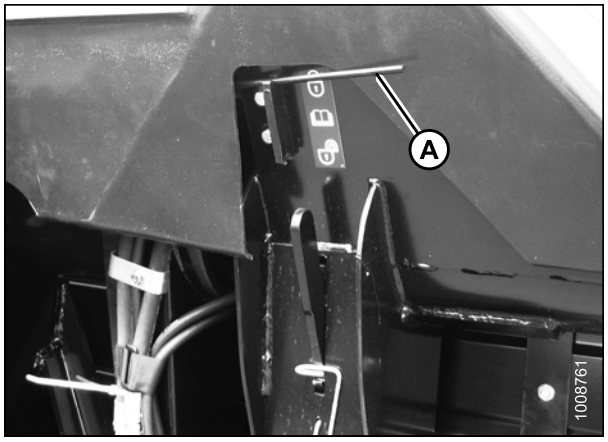


Figure 5.18: Wing Lock Spring Handle in Lock Position

8. Disengage both header float locks by pulling the float lock handle (A) away from the float module and pushing the float lock handle down and into position (B) (UNLOCK).

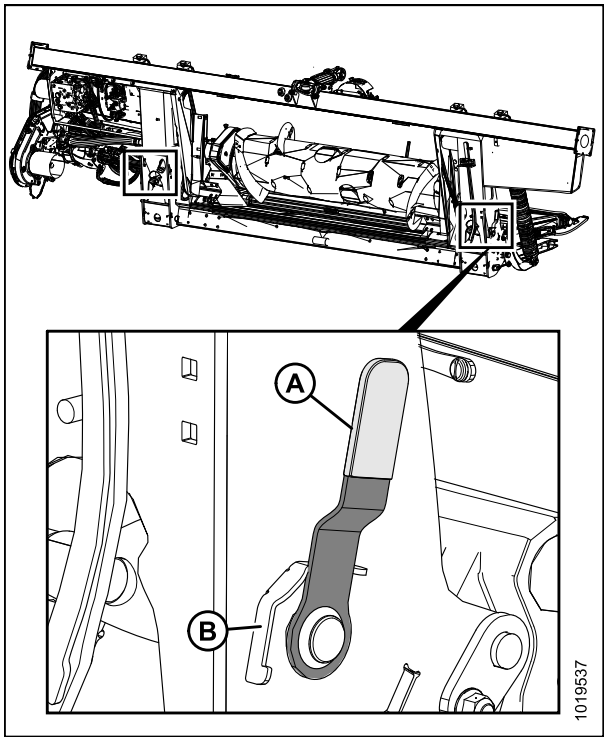


Figure 5.19: Header Float Lock (in Locked Position)

9. Place stabilizer wheels and slow speed transport wheels (if equipped) in storage position as follows:

   a. Support the wheel weight by lifting slightly with one hand, and pull up on handle (A) to release the lock.

   b. Lift the wheels to the desired height, and engage the support channel into the slot (B) in the upper support.

   c. Push down on the handle (A) to lock.

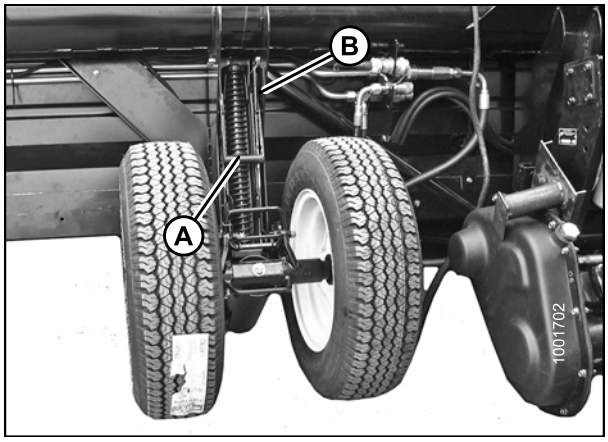


Figure 5.20: Left Wheel

10. Remove the supplied torque wrench (A) from its storage position at the right side of the float module frame. Pull in the direction shown to disengage the wrench from the hook.

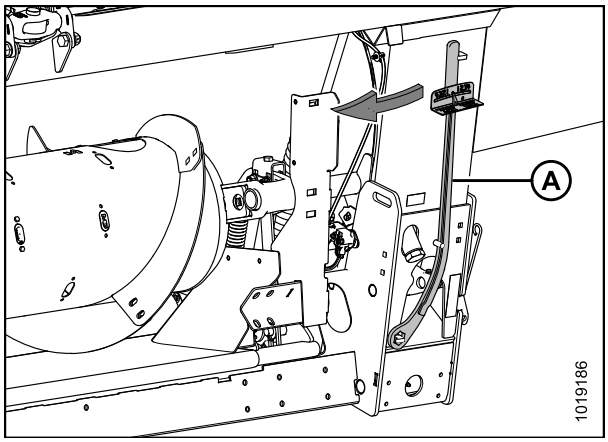


Figure 5.21: Torque Wrench Storage Location

11. Place the supplied torque wrench (A) onto the float lock (B). Note the position of the wrench for checking left or right side.
12. Push down on wrench to rotate bell crank (C) forward.

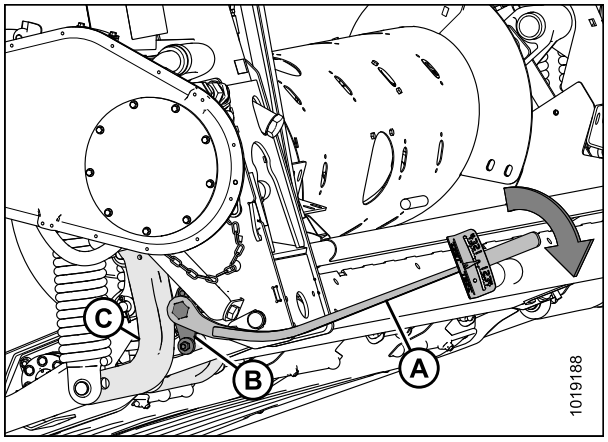


Figure 5.22: Left Side

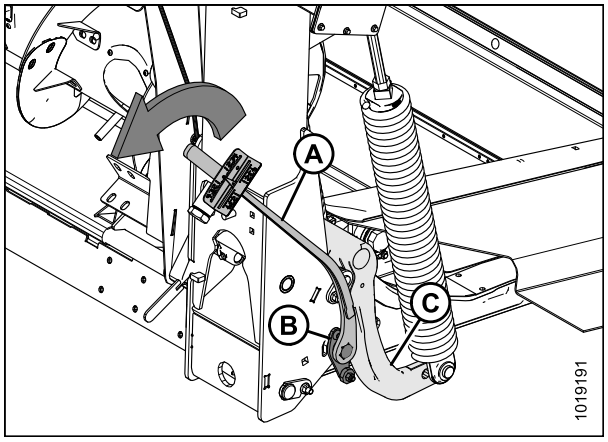


Figure 5.23: Right Side

13. Push down on the wrench until indicator (A) reaches a maximum reading and then begins to decrease. Note the maximum reading. Repeat at opposite side.

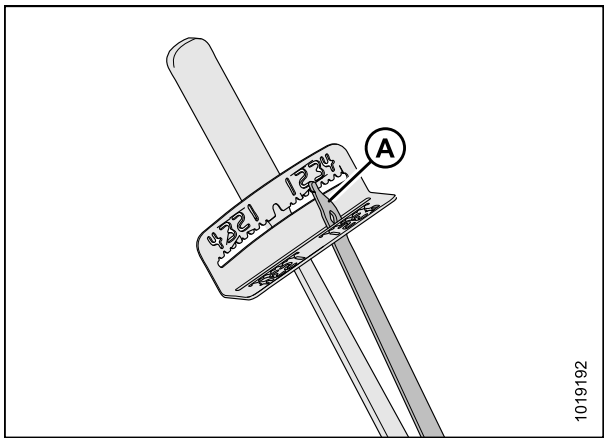


Figure 5.24: Indicator

14. Use the following table as a guide for float settings:
    - If reading on the wrench is high, the header is heavy
    - If reading on the wrench is low, the header is light

Table 5.2 Float Settings

Header Size (feet)	Indicator Reading	
	Cutting on the Ground	Cutting off the Ground
30 and 35	1-1/2 to 2	2 to 2-1/2
40 and 45	2 to 2-1/2	2-1/2 to 3

15. Before adjusting the float spring adjustment bolts (A), rotate the spring locks (B) by loosening bolts (C).
16. To increase float (decrease header weight), turn both adjustment bolts (A) on the left side clockwise. Repeat adjustment at opposite side.
17. To decrease float (increase header weight), turn left side adjustment bolts (A) counterclockwise. Repeat at opposite side.
18. Adjust the float so the wrench readings are equal on both sides of the header.

    NOTE:
    For 40- and 45-foot double-knife headers: adjust the float so the wrench readings are equal at both sides, and then loosen both right side spring bolts two turns.

19. Lock adjustment bolts (A) with spring locks (B). Ensure bolt heads (A) engaged in the spring lock cutouts. Tighten bolts (C) to secure spring locks in place.

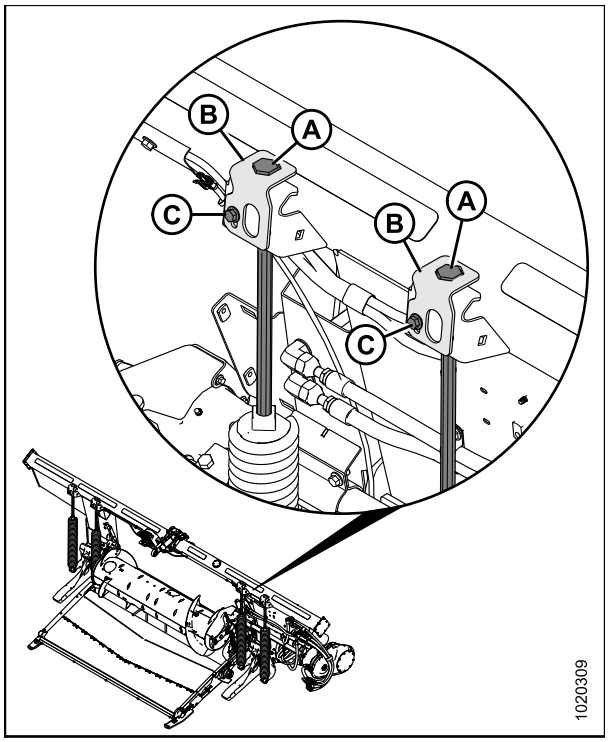


Figure 5.25: Float Adjustment (Left Side Shown)

20. Use the following guidelines when adjusting float:
    - Turn each bolt pair equal amounts. Refer to Step *13, page 104*, and repeat torque wrench reading procedure.
    - Set header float as light as possible without causing excessive bouncing to prevent knife component breakage, soil scooping, or soil build-up at the cutterbar in wet conditions.
    - Use a slower ground speed with a light float setting, if necessary, to avoid excessive bouncing and leaving a ragged cut.
    - Use the stabilizer wheels in conjunction with header float to minimize bouncing at the header ends and to control cut height when cutting off the ground.

    NOTE:
    If adequate header float cannot be achieved using all of the available adjustments, an optional heavy duty spring is available.

21. Proceed to *5.11.2 Adjusting Wing Balance, page 111*.

5.11 Checking and Adjusting Header Wing Balance

IMPORTANT:
Before proceeding, the header float must be set properly. Refer to *5.10 Checking and Adjusting Header Float, page 101*.

The header wing balance allows the wings to react to changing ground conditions. If set too light, the wings will bounce or not follow ground contours, leaving uncut crop. If set too heavy, the end of the header will dig into the ground. After the header float has been set, the wings must be balanced for the header to follow the ground contours properly.

5.11.1 Checking Wing Balance

This procedure describes how to check the balance of each wing.

IMPORTANT:
To ensure correct wing balance readings, make sure the header float is set properly before proceeding. Refer to *5.10 Checking and Adjusting Header Float, page 101*.

WARNING

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

If a header wing has a tendency to be in a smile (A) or a frown (B) position, wing balance may require adjusting. Perform the following steps to verify if the wings are not balanced, and the degree of imbalance:

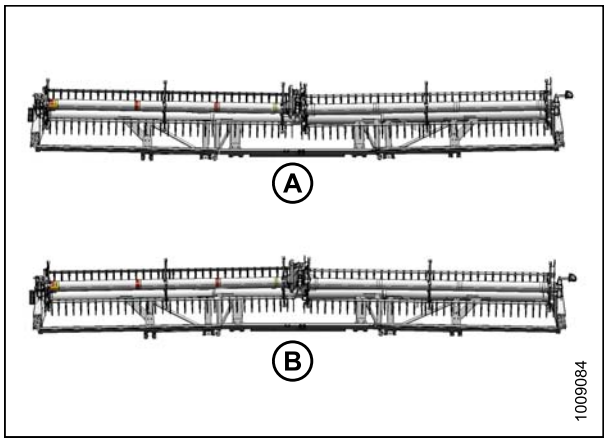


Figure 5.26: Wing Imbalance

1. Adjust the reel fore-aft position to between 5 and 6 on the position indicator decal (A) located on the reel right arm.
2. Lower the reel fully.

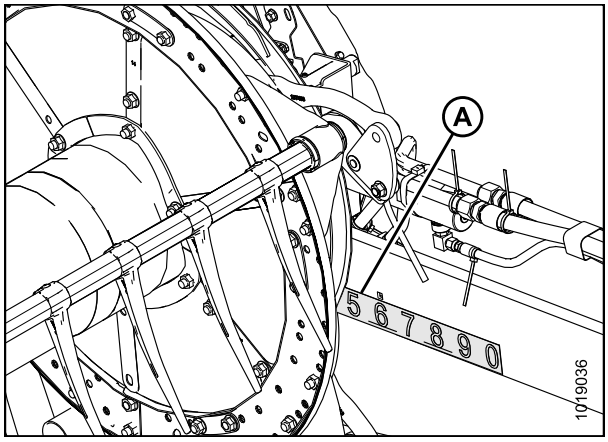


Figure 5.27: Fore-Aft Position

3. Adjust the center-link (A) so that indicator (B) is between **B** and **C** on gauge (C).
4. Park combine on level ground and raise header until cutterbar is 152–254 mm (6–10 in.) off the ground.
5. Shut down the combine, and remove the key from the ignition.
6. If installed, move transport/stabilizer wheels so that they are supported by header. Refer to instructions provided with the transport/stabilizer system.

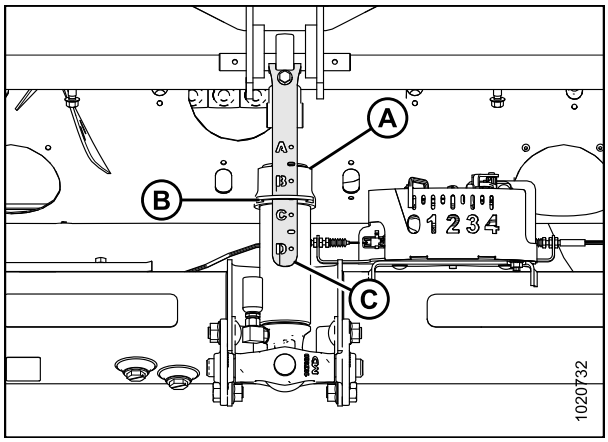


Figure 5.28: Center-Link

7. Remove linkage cover (A) by removing bolt (B) and rotating cover upward until inboard end can be lifted off.

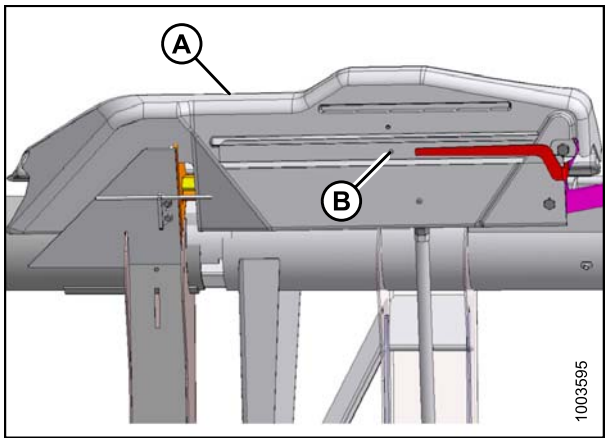


Figure 5.29: Linkage Cover

NOTE:
Refer to the decal (A) inside each linkage cover.

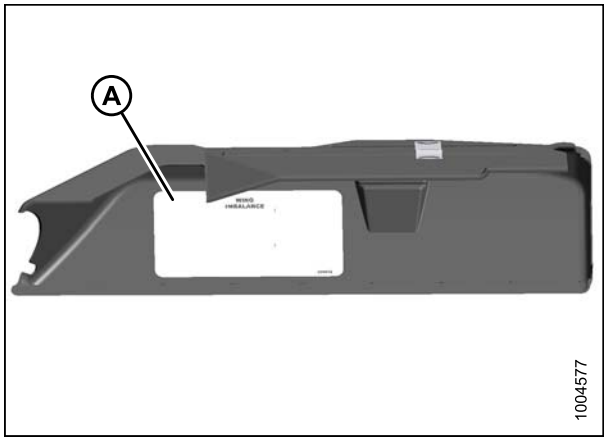


Figure 5.30: Linkage Cover

8. Unlock the wings by moving spring handles (A) to lower (UNLOCK) position.

NOTE:
If lock link does not engage lower slot, move with the torque wrench until lock link moves into slot.

9.

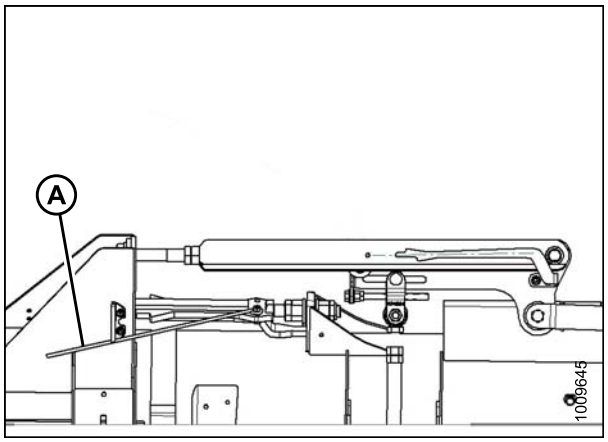


Figure 5.31: Wing Lock in UNLOCK Position

10. Retrieve wrench (A) from float module right leg.

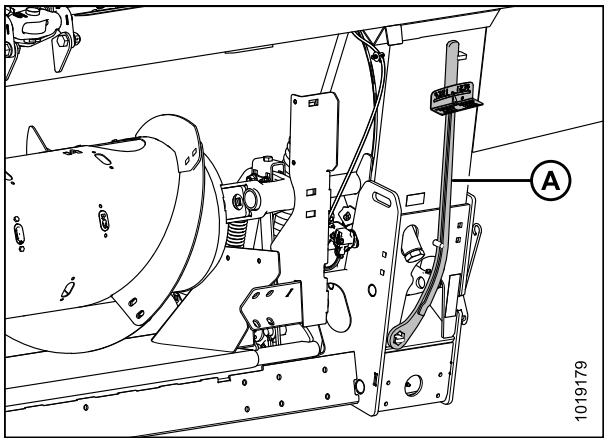


Figure 5.32: Torque Wrench

11. Place torque wrench (A) onto bolt (B).

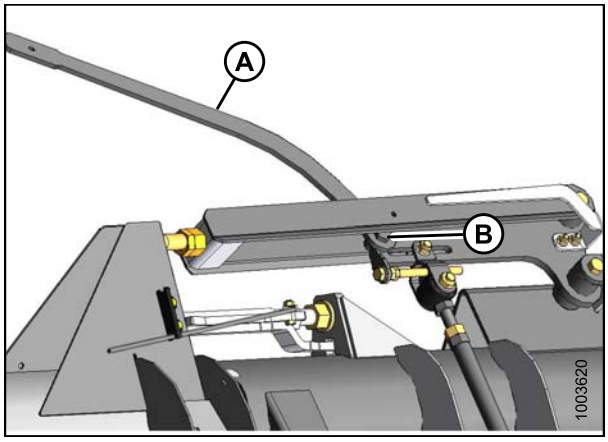


Figure 5.33: Balance Linkage

12. Check that pointer (D) is properly positioned as follows:
    a. Use wrench (A) to move bell crank (B) so that lower edge of bell crank is parallel to top-link (C).
    b. Check that pointer (D) is lined up with the top-link (C). Bend pointer if necessary.

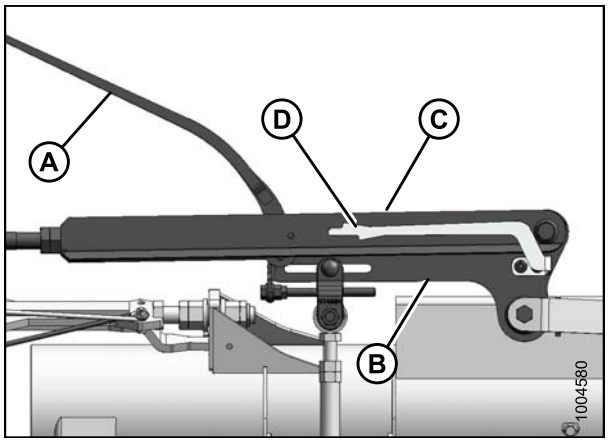


Figure 5.34: Balance Linkage

13. Move wing upward with torque wrench (A) until the pointer's lower alignment tab (C) lines up with the upper edge of the top-link (B). Observe the indicator reading (D) on wrench and record it.

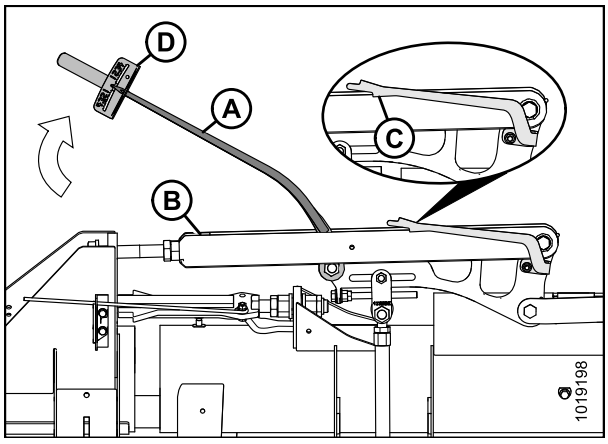


Figure 5.35: Balance Linkage

14. Move wing downward with torque wrench (A) until the pointer's upper alignment tab (C) lines up with the lower edge of the top-link (B). Observe indicator reading (A) on the wrench and record it.
    - If the difference between the readings is 0.5 or less, the wing is balanced and no further adjustment is required. To reinstall the linkage cover, refer to Steps *15., page 111* and *16., page 111*.
    - If the difference between the readings is more than 0.5, the wing is not balanced. Refer to *5.11.2 Adjusting Wing Balance, page 111*.

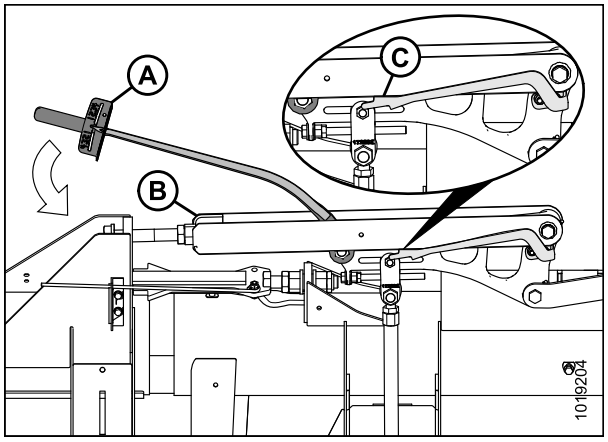


Figure 5.36: Balance Linkage

    - If the indicator range is as shown, the wing is too light.

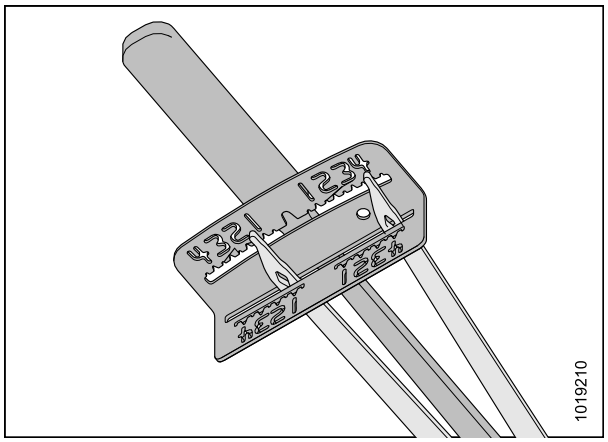


Figure 5.37: Wrench Indicator

    - If the indicator range is as shown, the wing is too heavy.

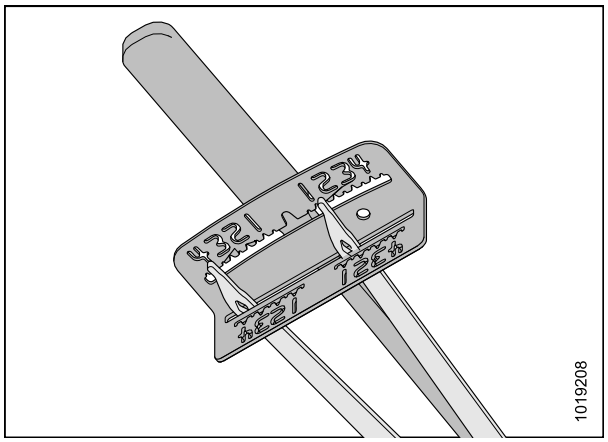


Figure 5.38: Wrench Indicator

15. If no adjustment is required, place wrench (A) back onto the float module right leg.

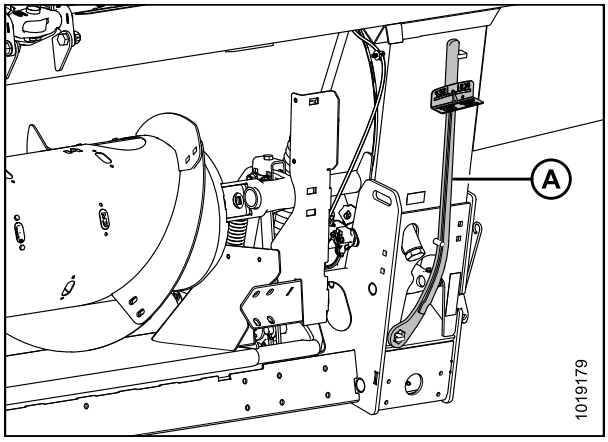


Figure 5.39: Torque Wrench

16. If no adjustment is required, reinstall linkage cover (A) and secure it with bolt (B). If adjustment is required, refer to *5.11.2 Adjusting Wing Balance, page 111*.

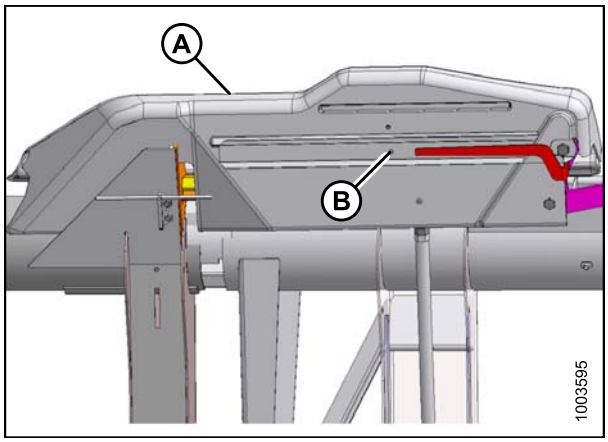


Figure 5.40: Linkage Cover

5.11.2 Adjusting Wing Balance

WARNING

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

This procedure describes how to adjust the balance of each wing. Before proceeding, refer to *5.11.1 Checking Wing Balance, page 106* to determine if adjustments are necessary.

IMPORTANT:
To ensure correct wing balance readings, make sure the header float is set properly before proceeding. Refer to *5.10 Checking and Adjusting Header Float, page 101*. The float module must be sitting level before performing any adjustments.

1. Place torque wrench (A) on bolt (B).

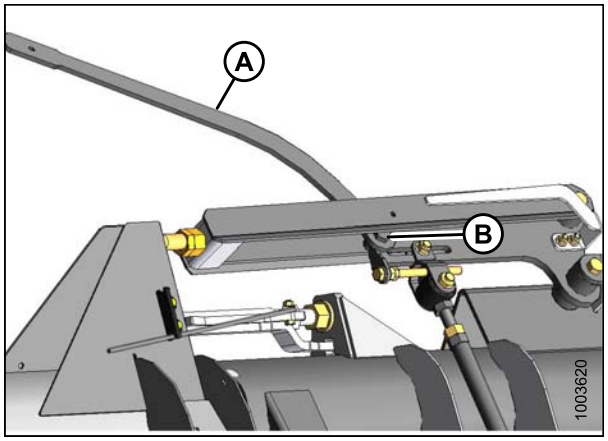


Figure 5.41: Balance Linkage (Left Side)

2. Loosen the clevis bolt (A) for the wing requiring adjustment as determined by the wing balance check.

   NOTE:
   Do **NOT** loosen any other hardware.

3. Adjust bolt (B) and set dimension (C). Refer to Table *5.3 Wing Balance Chart, page 112*.

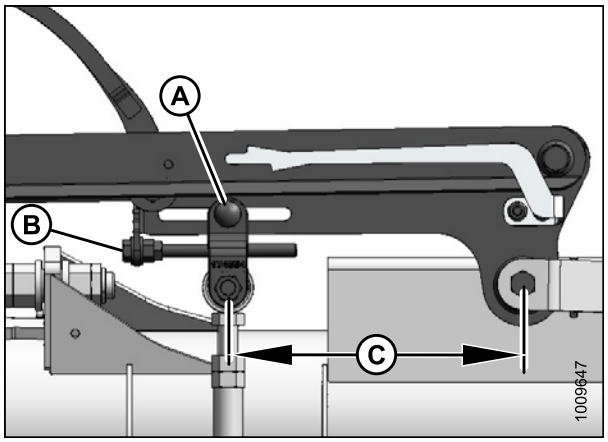


Figure 5.42: Balance Linkage (Left Side)

Table 5.3 Wing Balance Chart

Header Configuration	Wing Dimension (C)[1]	
	Left Wing mm (in.)	Right Wing mm (in.)
30-foot	290 (11-13/32)	285 (11-1/4)
35-foot	300 (11-13/16)	300 (11-13/16)
40-foot single-knife drive (SKD)	305 (12)	320 (12-19/32)
40-foot double-knife drive (DKD)	305 (12)	310 (12-3/16)
40-foot double-knife drive (DKD) split frame	305 (12)	310 (12-3/16)
45-foot double-knife drive (DKD) split frame	310 (12-3/16)	310 (12-3/16)

1. These dimensions are initial settings. Further adjustment will be required if any optional kits have been installed.

4. Recheck the wing balance. Refer to *5.11.1 Checking Wing Balance, page 106*.
5. If necessary, perform the following adjustments:
   - If the wing is too heavy, turn adjuster bolt (B) to move clevis (C) outboard (D).
   - If the wing is too light, turn adjuster bolt (B) to move clevis (C) inboard (E).
6. Adjust clevis (C) position if necessary until indicator readings are within one increment.
7. Tighten clevis bolt (A).

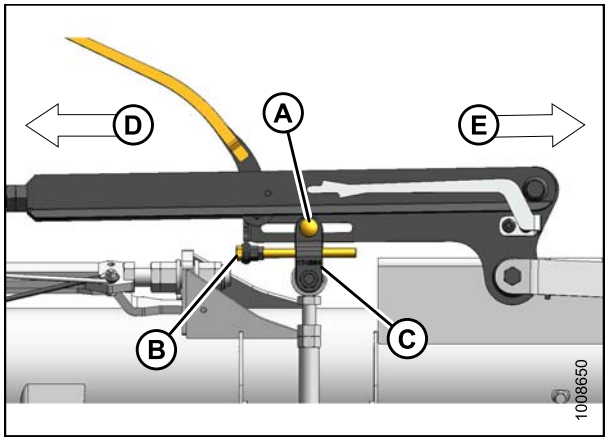


Figure 5.43: Balance Linkage (Left Side)

8. Move handle (A) to the upper LOCK position.
9. If lock does not engage, move the wing up and down with torque wrench until it locks. When locked, there will be some movement in the linkage.
10. If the cutterbar is not straight when wings are in lock mode, then further adjustments are required.

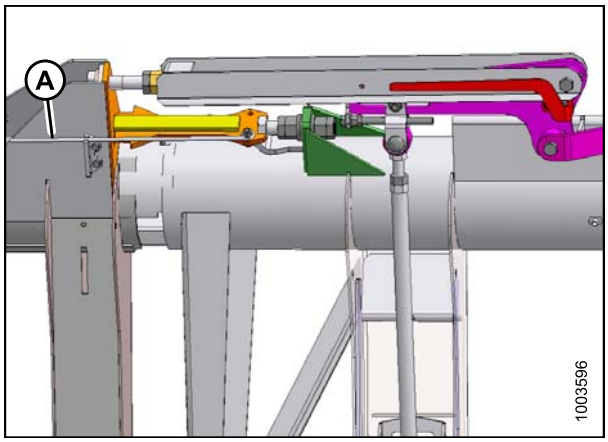


Figure 5.44: Wing Lock in Lock Position

11. Return the torque wrench (A) to its storage location on the float module frame.

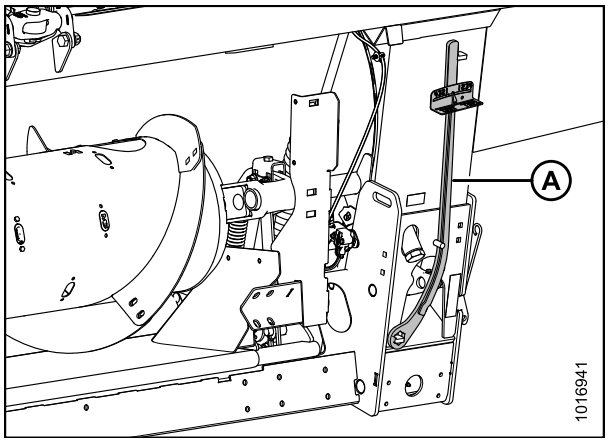


Figure 5.45: Torque Wrench

12. Reinstall linkage cover (A) and secure it with bolt (B).

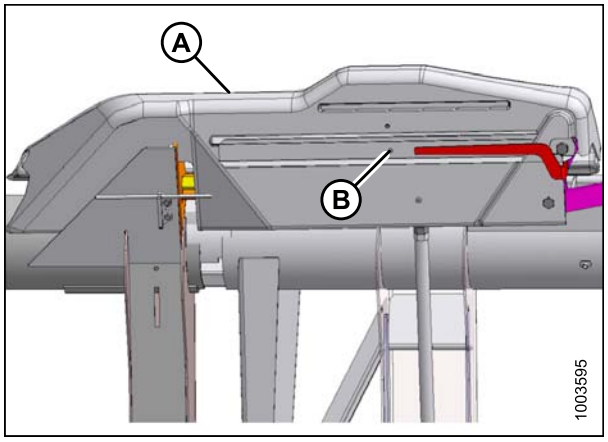


Figure 5.46: Linkage Cover

5.12 Measuring and Adjusting Reel Clearance to Cutterbar

The minimum clearance between the reel fingers and the cutterbar ensures that the reel fingers do not contact the cutterbar during operation. The clearance is set at the factory, but some adjustment may be necessary before operation.

The finger to guard/cutterbar clearances with reels fully lowered are shown in Table *5.4 Finger to Guard/Cutterbar Clearance, page 115*.

IMPORTANT:
Measurements must be taken at **both ends of each reel and at the cutterbar flex locations** with the header in full-frown mode.

Table 5.4 Finger to Guard/Cutterbar Clearance

Header Width	(X) 3 mm (+/- 1/8 in.) at Reel Ends and Flex Locations
30 ft.	20 mm (3/4 in.)
35 ft.	
40 ft.	
45 ft.	

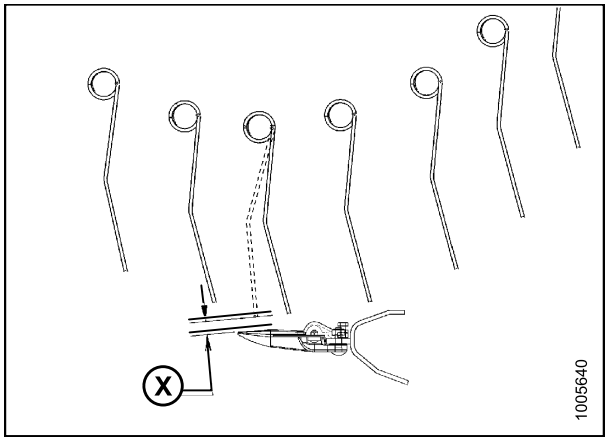


Figure 5.47: Finger Clearance

5.12.1 Measuring Reel Clearance

DANGER

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

1. Park the header on level ground.
2. Move spring handles (A) down to (UNLOCK) position.

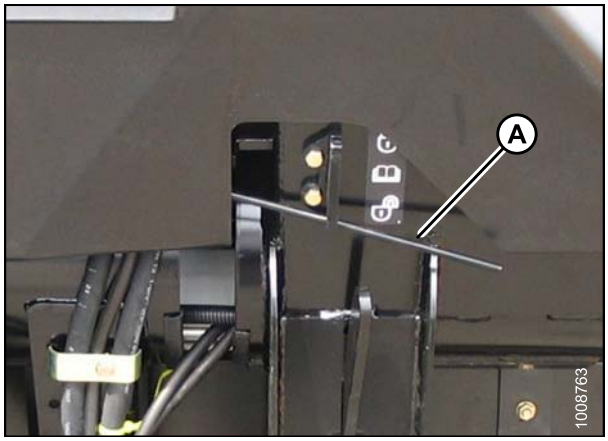


Figure 5.48: Wing Lock in Unlocked Position

3. Raise header and place two 150 mm (6 in.) blocks (A) under the cutterbar, just inboard of the wing flex points.
4. Lower header fully, allowing it to flex into full frown mode.

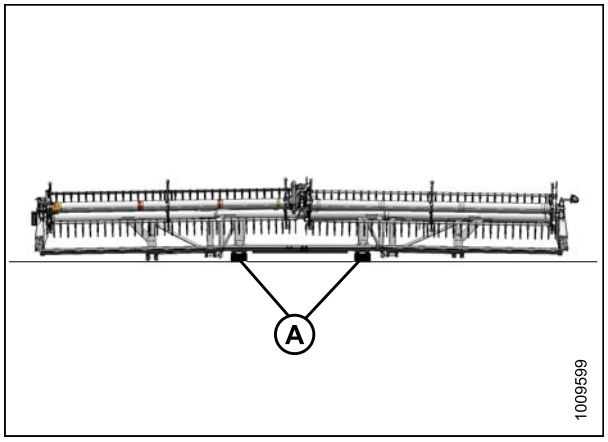


Figure 5.49: FlexDraper® Block Locations

5. Set the fore-aft position to the middle position (5) on the fore-aft position decal (A).
6. Lower the reel fully.
7. Shut down the engine and remove key from the ignition.

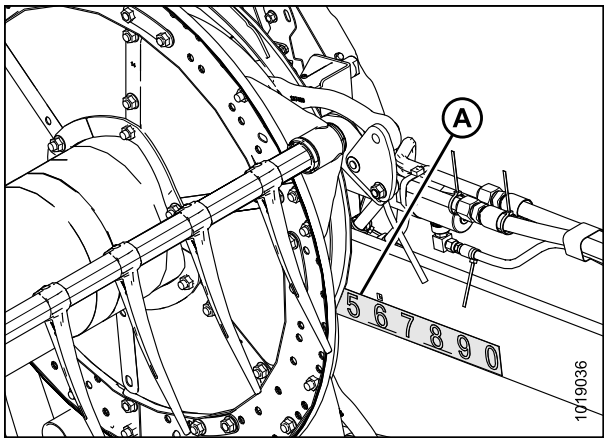


Figure 5.50: Fore-Aft Position

8. Measure the clearance (X) at all possible points of contact between points (B) and (C) at the ends of each reel (A) and at the flex locations (B).

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

   NOTE:
   When measuring reel clearance at the center of a double reel header, measure the lowest reel.

9. Check all possible points of contact between points (B) and (C). Depending on the reel fore-aft position, minimum clearance can result at the guard tine, hold-down, or cutterbar.

10. Adjust the reel if necessary. Refer to *5.12.2 Adjusting Reel Clearance, page 117*.

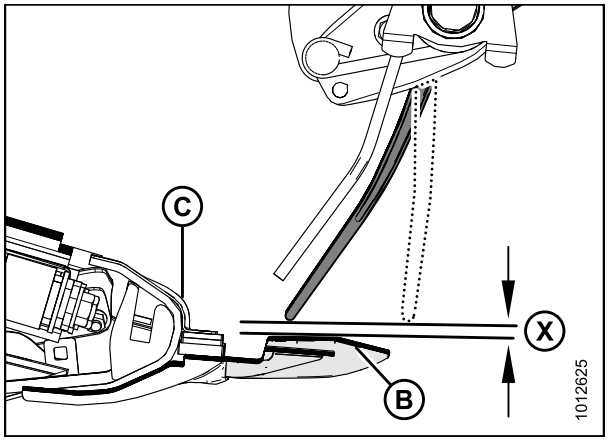


Figure 5.51: Reel Clearance

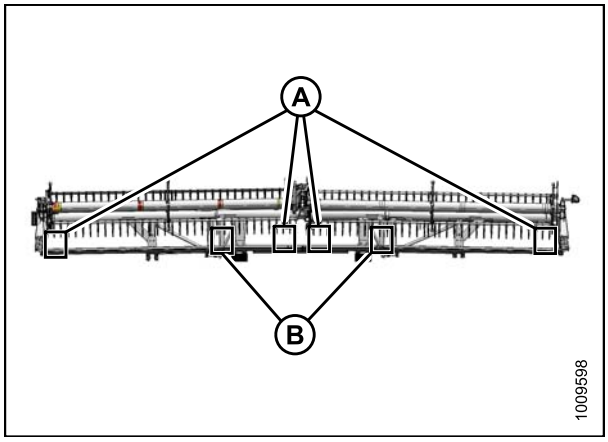


Figure 5.52: Measurement Locations

5.12.2 Adjusting Reel Clearance

DANGER

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

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

2. Adjust outboard reel arm lift cylinders to set clearance at outboard ends of reel as follows:

   a. Loosen bolt (A).

   b. Turn cylinder rod (B) out of clevis to raise reel and increase clearance to cutterbar, or turn cylinder rod into clevis to lower reel and decrease clearance.

   c. Tighten bolt (A).

   d. Repeat at opposite side.

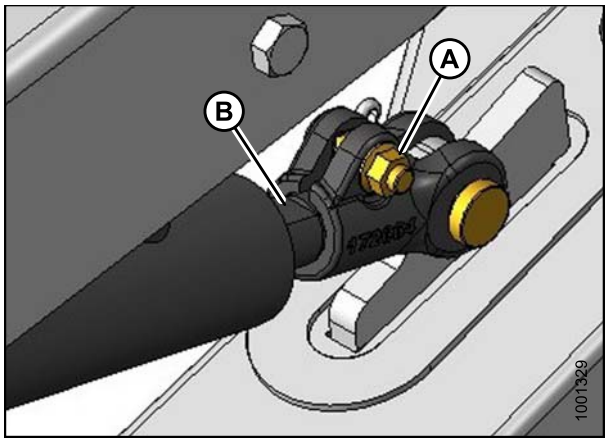


Figure 5.53: Outside Reel Arm

3. Adjust center arm lift cylinder stop (A) to change clearance at inboard ends of reels and clearance at flex points as follows:
   a. Loosen nut (B).
   b. Turn nut (C) counterclockwise to raise reel and increase clearance to cutterbar, or clockwise to lower reel and decrease clearance.
   c. Tighten nut (B).
4. Check measurements and if necessary, repeat adjustment procedures.
5. Move reel back to ensure steel end fingers do not contact deflector shields.
6. If contact is evident, adjust reel upward to maintain clearance at all reel fore/aft positions. Alternatively, trim steel end fingers to obtain proper clearance.
7. Periodically check for evidence of contact, and adjust clearance as required.

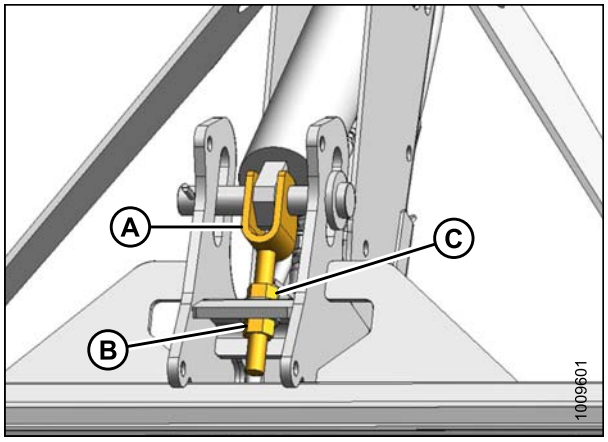


Figure 5.54: Underside of Center Arm

5.13 Adjusting Auger to Pan Clearance

DANGER

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

IMPORTANT:
Maintain an appropriate distance between the auger and the auger pan. Too little clearance may result in the fingers or flighting contacting and damaging the feed draper or pan when operating the header at certain angles. Look for evidence of contact when greasing the float module.

1. Extend the center-link to the steepest header angle, and position the header 150–254 mm (6–10 in.) off the ground.
2. Lock header wings.
3. Shut down the combine, and remove the key from the ignition.
4. Ensure the float lock linkage is on the down stops (washer [A] cannot be moved) at both locations.

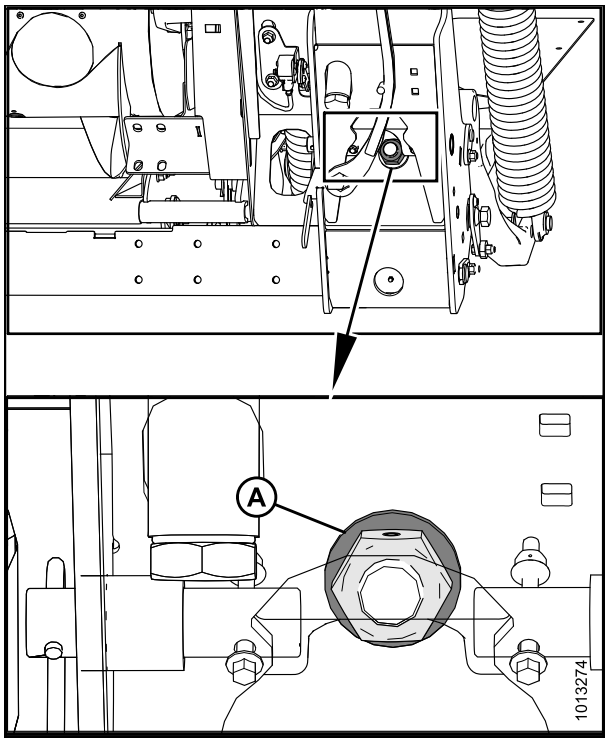


Figure 5.55: Float Lock

5. Before adjusting the auger to pan clearance, check the auger float position to determine how much clearance is required:

   - If the bolt head (A) is closest to the floating symbol (B), the auger is in the floating position.

CAUTION

Make sure the two bolts (A) are in the same location to prevent damage to the machine during operation.

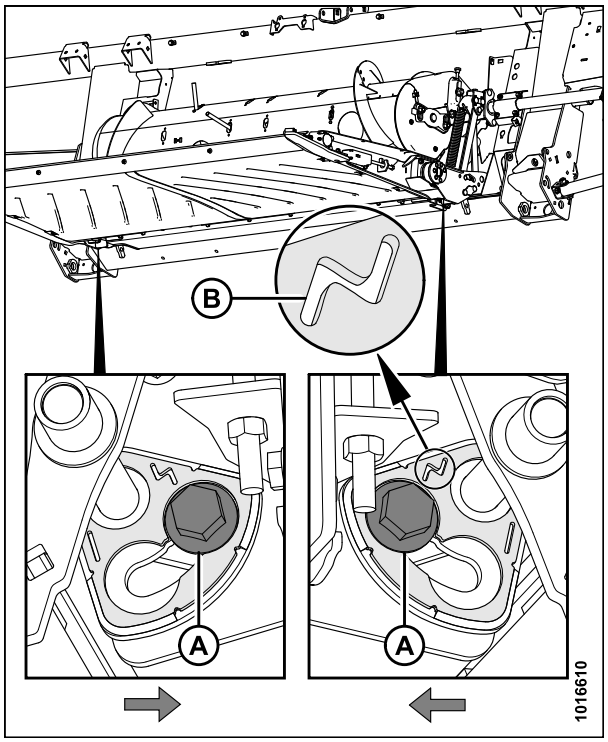


Figure 5.56: Floating Position

   - If the bolt head (A) is closest to the fixed symbol (B), the auger is in the fixed position.

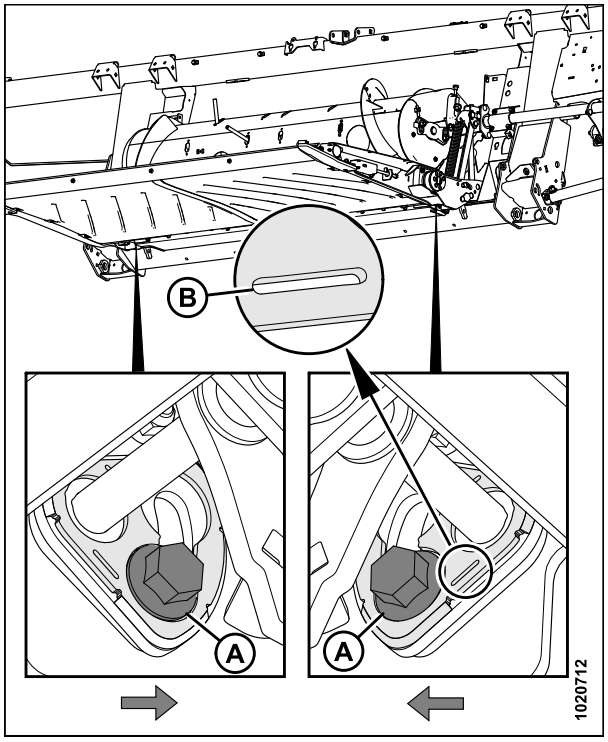


Figure 5.57: Fixed Position

6. Loosen two nuts (B).
7. Using the adjuster bolt (A), set clearance (C) to 22–26 mm (7/8–1.0 in.) if feed auger is in rigid position, and 11–15 mm (7/16–5/8 in.) if feed auger is in floating position. Turn bolt clockwise to increase clearance and counterclockwise to decrease clearance.

   NOTE:
   The clearance increases between 25–40 mm (1–1-1/2 in.) when the center-link is fully retracted.
8. Repeat Step *6, page 121* and Step *7, page 121* for the opposite end of the auger.

   IMPORTANT:
   Adjusting one side of the auger can affect the other side so recheck both sides after final adjustment is made.
9. Tighten nuts (B) on both ends of the feed auger. Torque the nuts to 93–99 N·m (68–73 lbf·ft).

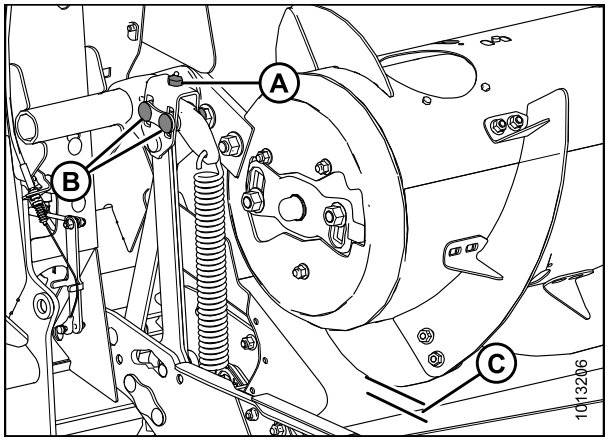


Figure 5.58: Auger Clearance

5.14 Checking Auger Finger Timing

This procedure is for checking the setting that determines when the fingers are fully extended from the auger.

NOTE:
Left side shown.

1. Raise the reel to maximum height. Engage reel safety props.
2. Shut down the combine and remove the key from the ignition.
3. Check that indicator (B) is set to the same position (A) at each end of the auger. Factory setting is **B**.

CAUTION

To avoid damaging the auger beyond repair, it is extremely important that both sides are at the same setting.

4. If necessary, loosen nuts (C) and adjust position of indicator (B). Tighten nuts.
5. Disengage reel safety props.

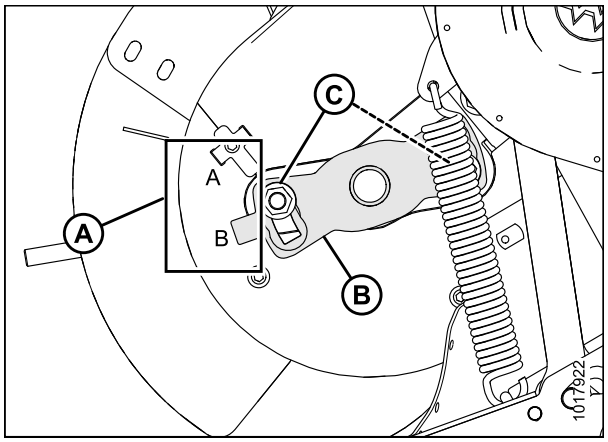


Figure 5.59: Auger Tine Timing (Left Side Shown)

5.15 Checking and Adjusting Side Draper Tension

WARNING

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

The drapers are tensioned at the factory and should not require adjustment. Draper tension should be just enough to prevent slipping and to keep draper from sagging below cutterbar.

1. Check that white bar (A) is approximately halfway in window.

   NOTE:
   Draper tension should be just enough to prevent slipping and to keep draper from sagging below cutterbar.

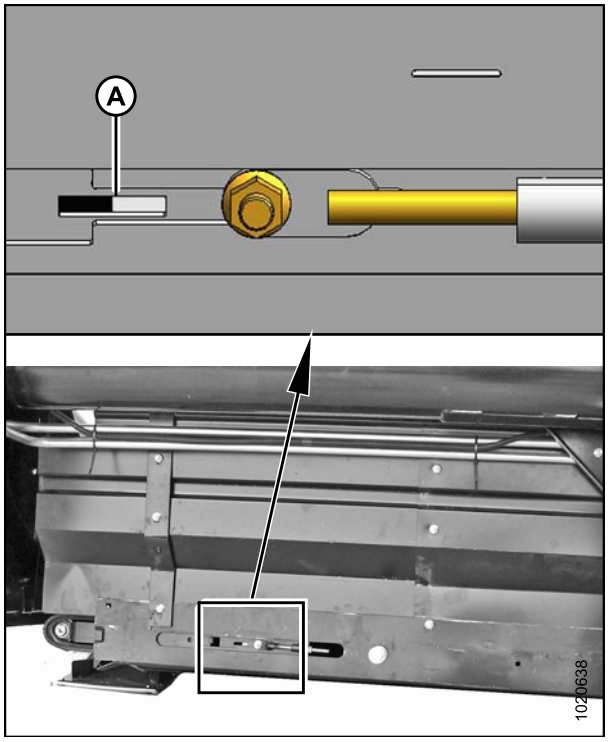


Figure 5.60: Tension Adjuster: Left Shown – Right Opposite

To adjust draper tension, follow these steps:

CAUTION

Check to be sure all bystanders have cleared the area.

2. Start engine and raise header.
3. Stop engine, remove key from ignition, and engage header safety props.
4. Check that draper guide (rubber track on underside of draper) is properly engaged in groove (A) of drive roller.

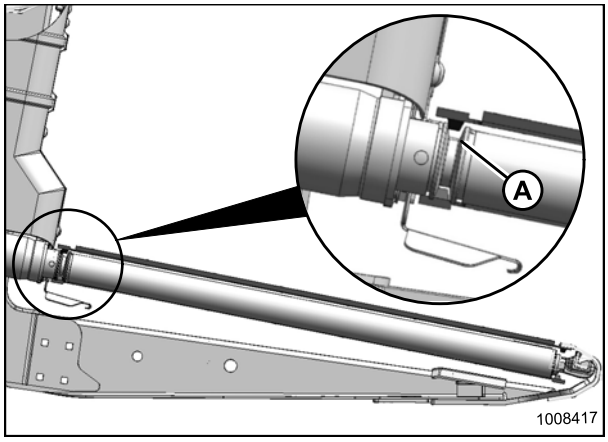


Figure 5.61: Drive Roller

5. Check that idler roller (A) is between guides (B).

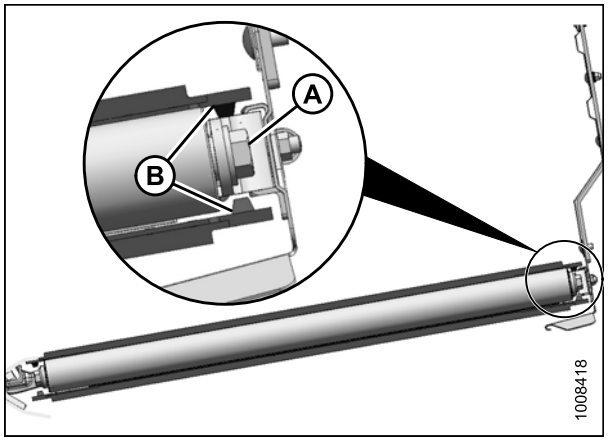


Figure 5.62: Idler Roller – Typical Both Ends of Roller

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

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

IMPORTANT:

- To avoid premature failure of draper, draper rollers, and/or tightener components, operate **ONLY** with the white bar visible.
- To prevent draper from scooping dirt, ensure draper is tight enough that it does **NOT** sag below point where cutterbar contacts the ground.

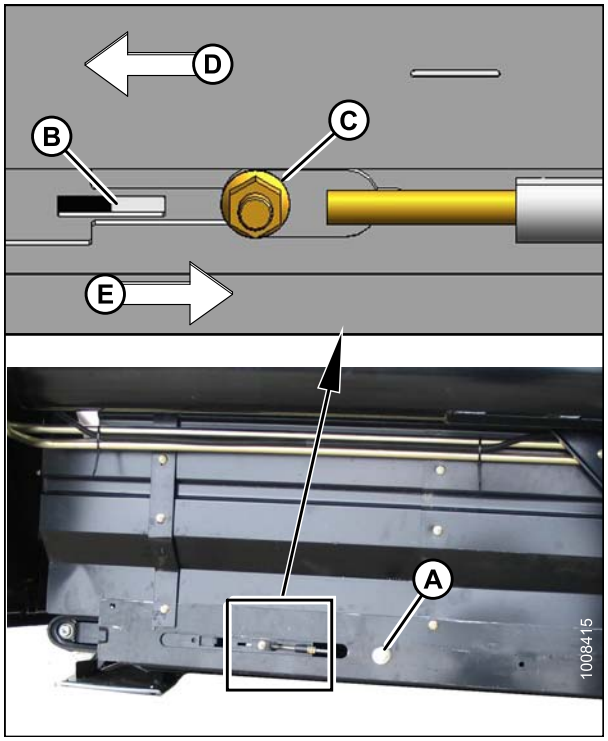


Figure 5.63: Tension Adjuster: Left Shown – Right Opposite

5.16 Adjusting Feed Draper Tension

DANGER

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

1. Raise the header to its full height, stop the engine, and the remove key from the ignition.
2. Engage the header safety props.
3. Ensure the draper guide (rubber track on the underside of the draper) is properly engaged in the groove on the drive roller and the idler roller is between the guides.
4. Loosen jam nut (A) and turn bolt (C) clockwise to increase draper tension or counterclockwise to decrease draper tension.
5. Adjust the draper tension until the white indicator (B) is centered within the indicator window on the spring box.

   IMPORTANT:
   Adjust both sides equally.

6. Tighten jam nut (A).

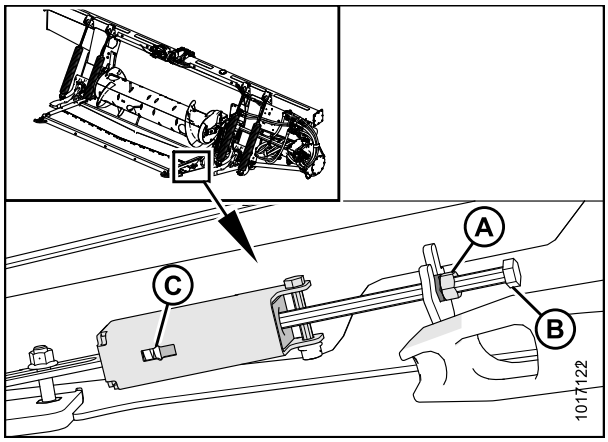


Figure 5.64: Tensioner

5.17 Checking Draper Seal

WARNING

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

1. Lower header to working position. Stop engine, and remove key from ignition.
2. Check clearance (A) between draper (B) and cutterbar (C) is 0–3 mm (1/8 in.). Take measurements at deck support locations. Refer to chart and illustration on following page for approximate support locations.

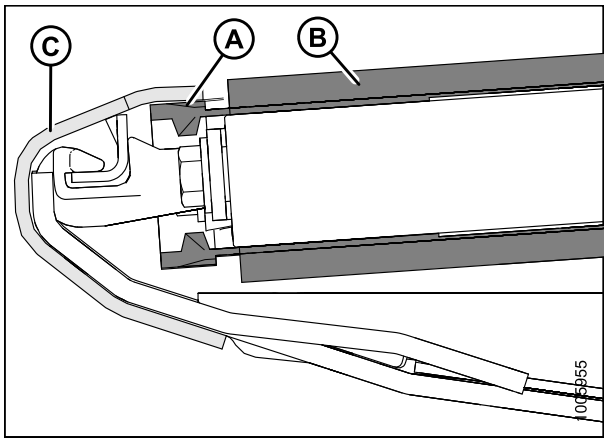


Figure 5.65: Draper Seal

Table 5.5 Deck Support Locations

Header Size (ft.)	Approximate Location of Support from Drive Roller (mm. [in.])				
	A	B	C	D	E
15 (F)	354 (13-15/16)	994 (39-1/8)	-	-	-
20 (F)	354 (13-15/16)	1662 (65-7/16)	-	-	-
25 (G)	354 (13-15/16)	1392 (54-13/16)	2427 (95-9/16)	-	-
30 (G)	354 (13-15/16)	1773 (69-13/16)	3191 (125-5/8)	-	-
35 (H)	354 (13-15/16)	1550 (61)	2747 (108-3/16)	3949 (155-7/16)	-
40 (H)	354 (13-15/16)	1809 (71-1/8)	3258 (128-1/4)	4710 (185-7/16)	-

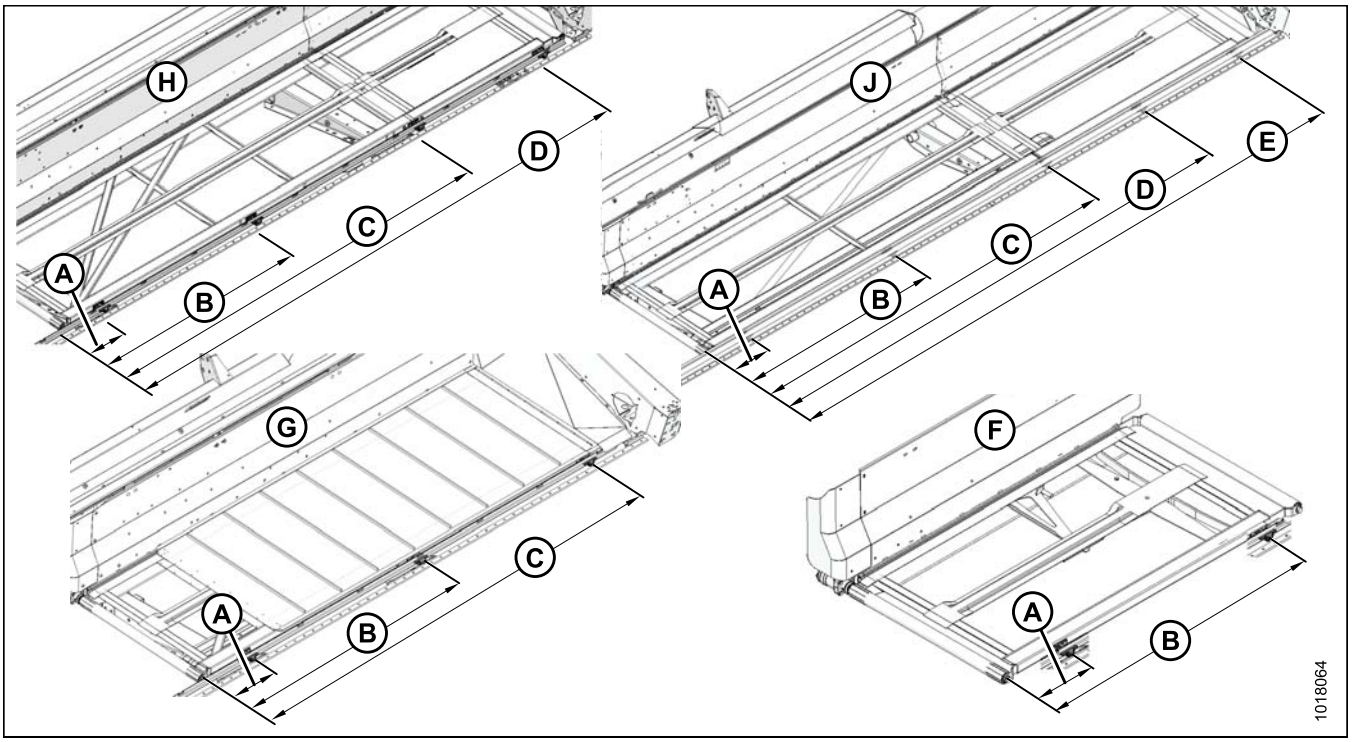


Figure 5.66: Deck Support Locations – Left Shown, Right Opposite

5.18 Lubricating the Header

Table 5.6 Recommended Lubricant

Specification	Description	Use
SAE multipurpose	High temperature, extreme pressure (EP2) performance with 1% max molybdenum disulphide (NLGI Grade 2) lithium base	As required unless otherwise specified
	High temperature, extreme pressure (EP) performance with 10% max molybdenum disulphide (NLGI Grade 2) lithium base	Driveline slip-joints

5.18.1 Greasing Procedure

Greasing points are identified on the machine by decals showing a grease gun and grease interval in hours of operation. Grease point layout decals are located on the header and on the right side of the float module.

DANGER

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

1. Wipe grease fitting with a clean cloth before greasing to avoid injecting dirt and grit.

   IMPORTANT:
   Use clean, high-temperature, extreme-pressure grease only.

2. Inject grease through fitting with grease gun until grease overflows fitting (except where noted).
3. Leave excess grease on fitting to keep out dirt.
4. Replace any loose or broken fittings immediately.
5. Remove and thoroughly clean any fitting that will not take grease. Also clean lubricant passageway. Replace fitting if necessary.
6. Use clean, high-temperature, extreme-pressure grease only.

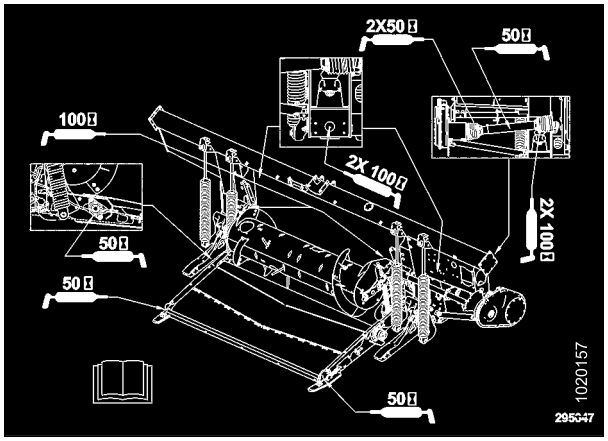


Figure 5.67: FM100 Grease Point Layout Decal

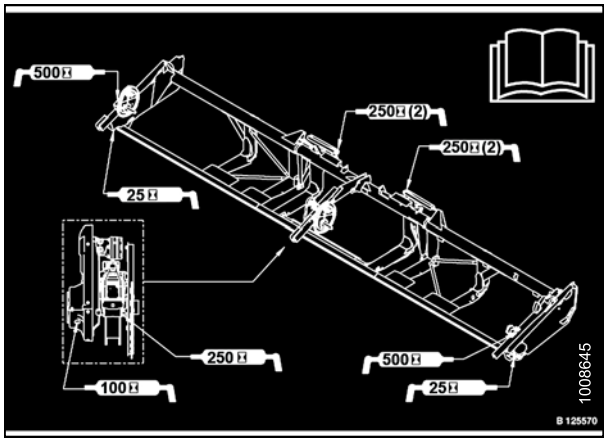


Figure 5.68: FD1 Series Grease Layout Decal

5.18.2 Lubrication Points

Knifehead

IMPORTANT:
Overgreasing can cause the knife to bend and make contact with the guards closest to the knifehead. Check for signs of excessive heating on first few guards after greasing. If required, relieve some pressure by removing the grease fitting.

- To prevent binding and/or excessive wear caused by knife pressing on guards, do **NOT** over grease the knifehead (A).
- Apply only 1–2 pumps of grease with a grease gun, or just until the knifehead starts to move away from the arm. Do **NOT** use an electric grease gun.
- If more than 6–8 pumps of the grease gun are required to fill the cavity, replace the seal in the knifehead.
- Check for signs of excessive heating on first few guards after greasing. If required, relieve pressure by pressing check-ball in grease fitting.

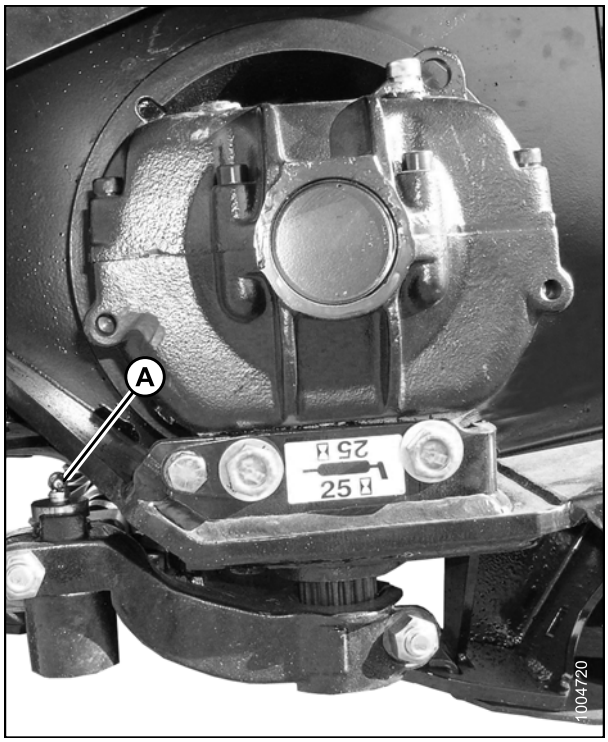


Figure 5.69: Knifehead
(Single Knife – One Place) **(Double Knife – Two Places)**

NOTE:
Use High Temperature Extreme Pressure (EP2) Performance with 1% Max Molybdenum Disulphide (NLGI Grade 2) Lithium Base grease unless otherwise specified.

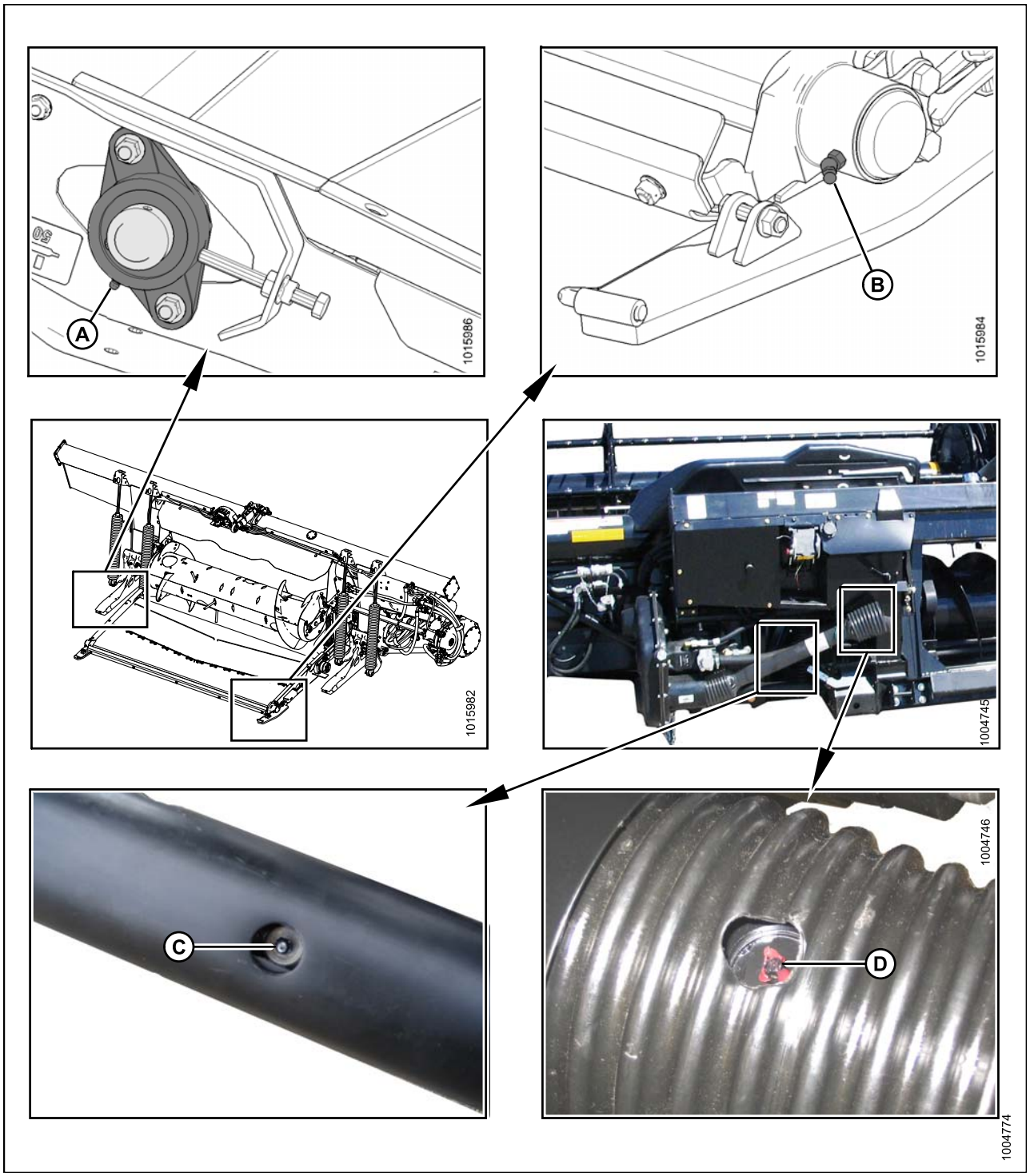


Figure 5.70: Drive Roller Bearing, Idler Roller, Slip Joint, and Driveline Universal

A - Drive Roller Bearing **B - Idler Roller - Both Sides** **C - Driveline Slip Joint**[2] **D - Driveline Universal (Two Places)**

2. 10% moly grease is recommended for the driveline slip joint.

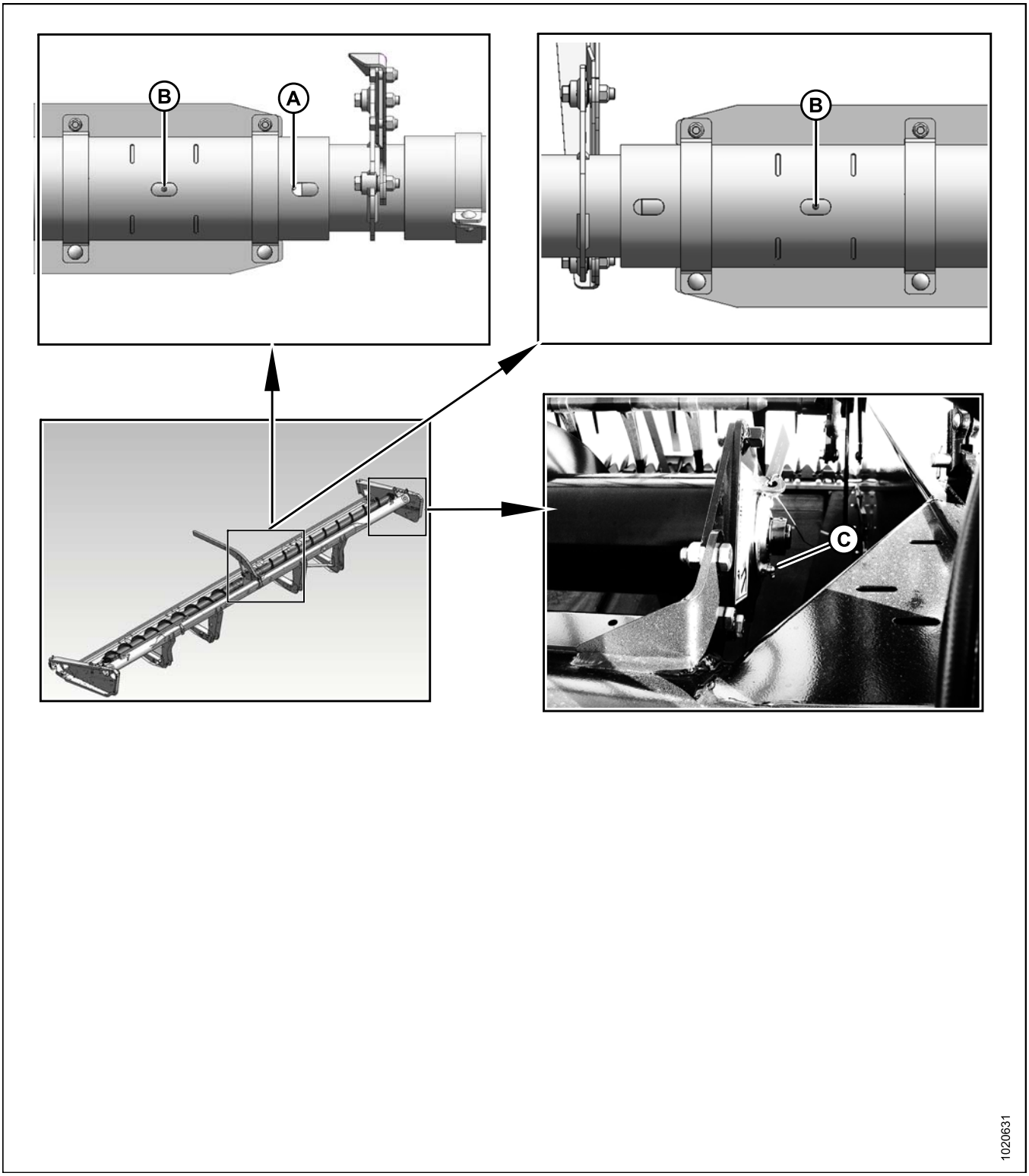


Figure 5.71: Upper Cross Auger

A - Upper Cross Auger U-Joint and Bearing **B - Upper Cross Auger Bearing (One Place)** **C - Upper Cross Auger (One Place)**

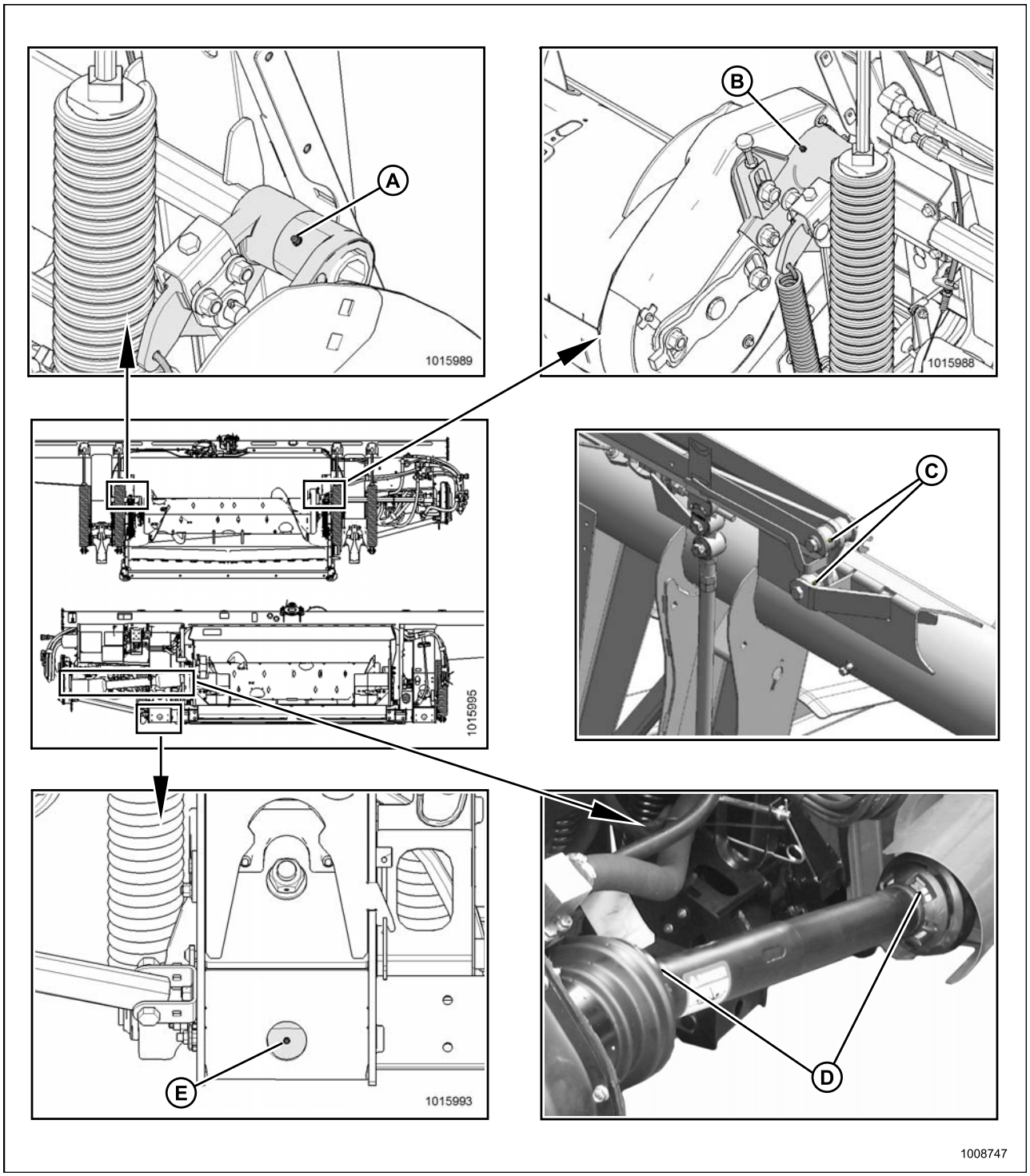


Figure 5.72: Float Pivot, Driveline Guard, Flex Linkage, and Auger Pivot

A - Auger Pivot (First Place)
B - Auger Pivot (Second Place)
C - Flex Linkage (Two Places) (Both Sides)
D - Driveline Guard (Two Places)
E - Float Pivot (Two Places)

IMPORTANT:
The reel U-joint (C) has an extended lubrication cross and bearing kit. Stop greasing when greasing becomes difficult or if U-joint stops taking grease. **OVERGREASING WILL DAMAGE U-JOINT.** Six to eight pumps is sufficient at first grease (factory). As U-joint wears and requires more than six pumps, grease the joint more often.

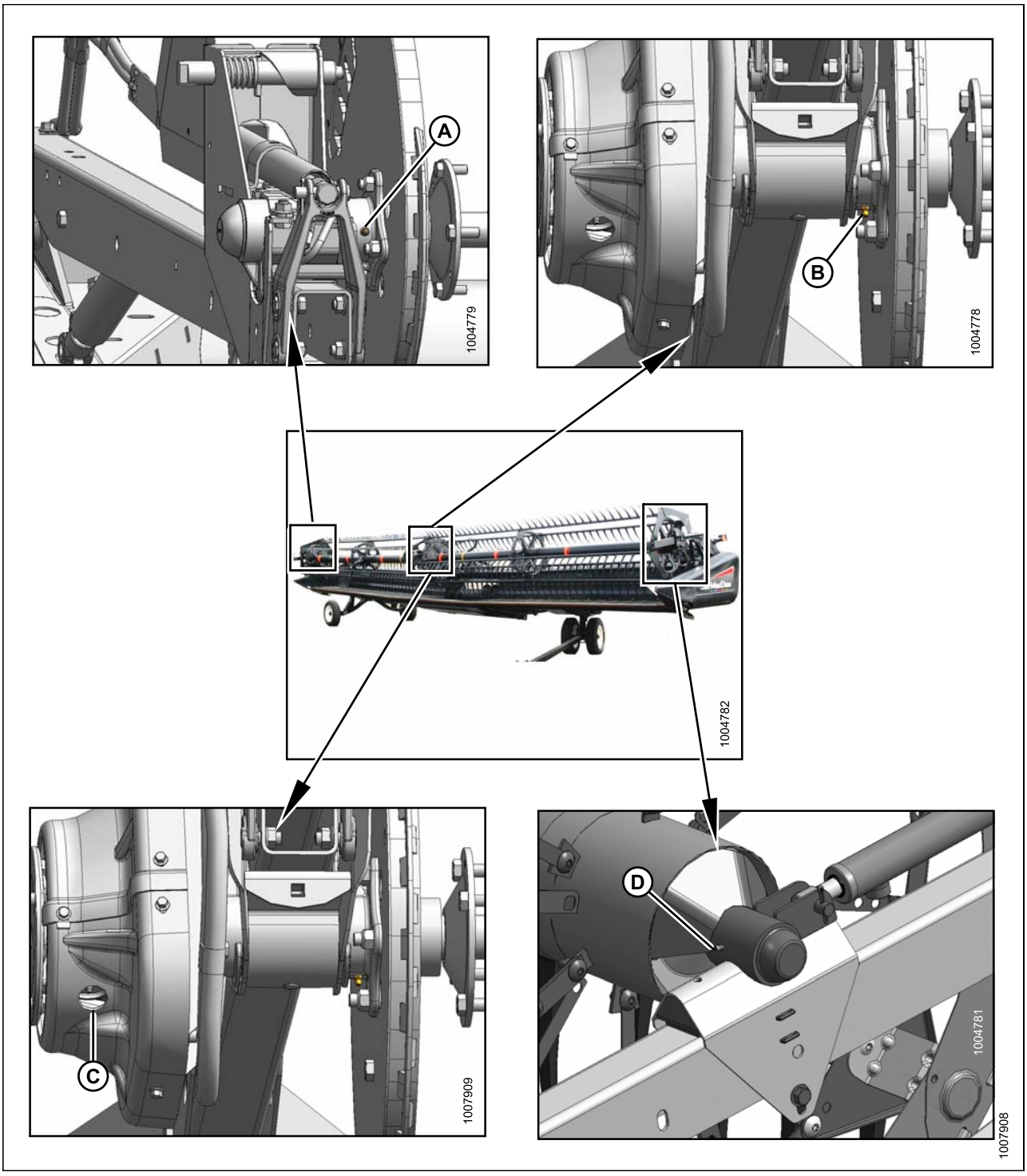


Figure 5.73: Reel Shaft Bearings

A - Reel Shaft Right Bearing (One Place) **B - Reel Center Bearing (One Place)** **C - Reel Universal (One Place)**
D - Reel Shaft left Bearing (One Place)

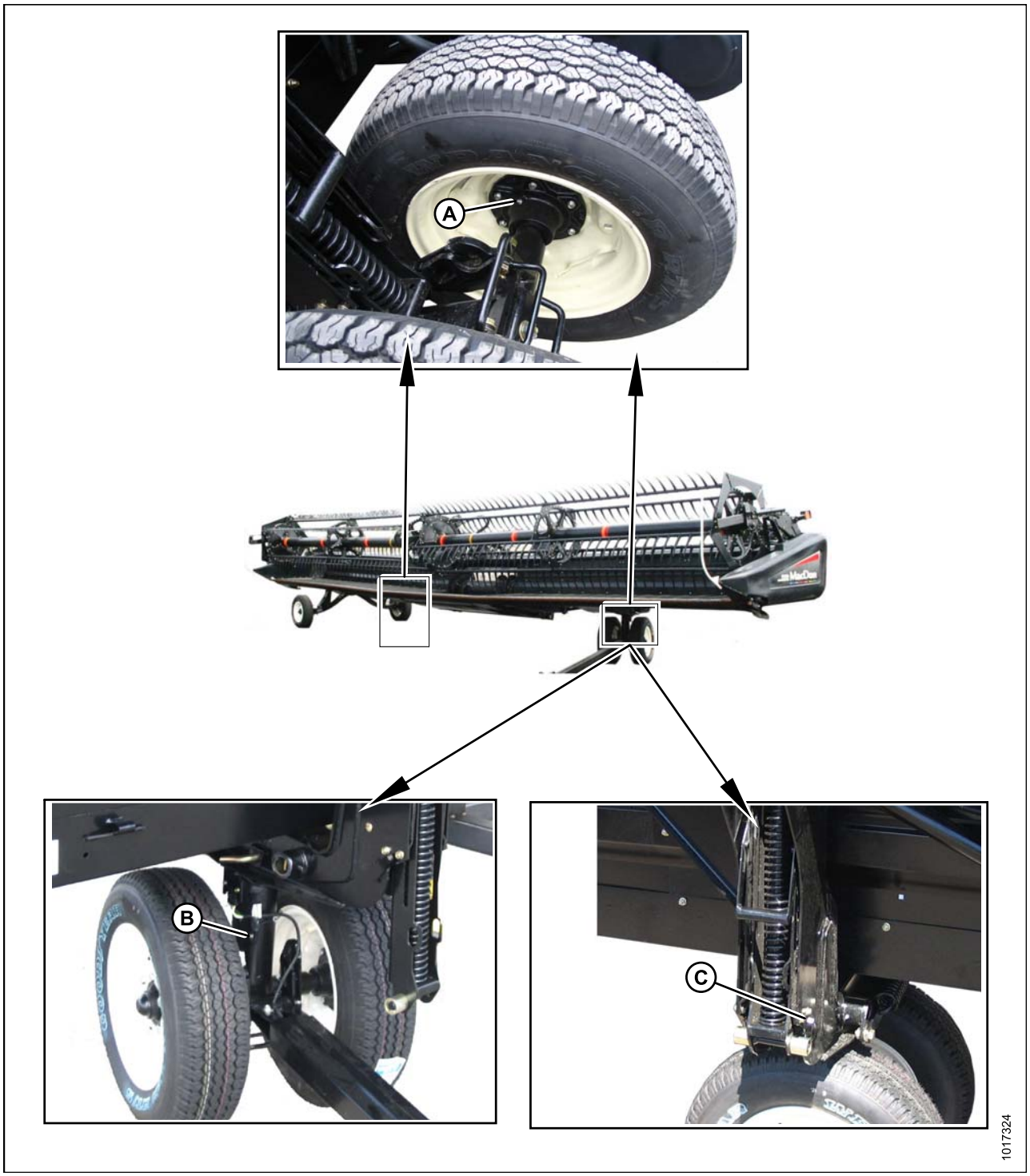


Figure 5.74: Rear Wheel Axle, Wheel Bearings, Frame/Wheel Pivot, and Front Wheel Pivot

A - Wheel Bearings (Four Places) **B - Front Wheel Pivot (One Place)** **C - Frame/Wheel Pivot (One Place) Both Sides**

5.19 Checking and Adjusting Endshields

Endshields are subject to expansion or contraction caused by large temperature variations. The position of the top pin and lower latch can be adjusted to compensate for dimensional changes.

1. Check gap (X) between front end of shields and header frame and compare to the values in Table *5.7 Endshield Gap at Various Temperatures, page 135*.

Table 5.7 Endshield Gap at Various Temperatures

Temperature in Degrees °C (°F)	Gap (X) in mm (in.)
7 (45)	13–18 (1/2 – 23/32)
18 (65)	10–15 (3/8 – 19/32)
29 (85)	7–12 (9/32 – 15/32)
41 (105)	4–9 (5/32 – 11/32)

NOTE:
If the endshield gap is correct, skip to the next procedure. If adjustment is required, follow these steps:

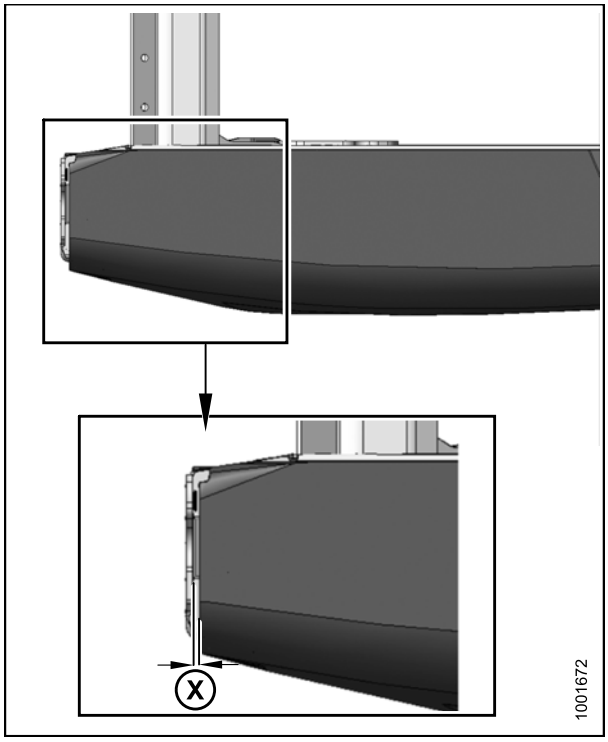


Figure 5.75: Gap between Endshield and Header Frame

Opening the endshield:

2. To unlock the shield, push the release lever (A) located on the backside of the endshield.
3. Pull endshield open using handle depression (B).

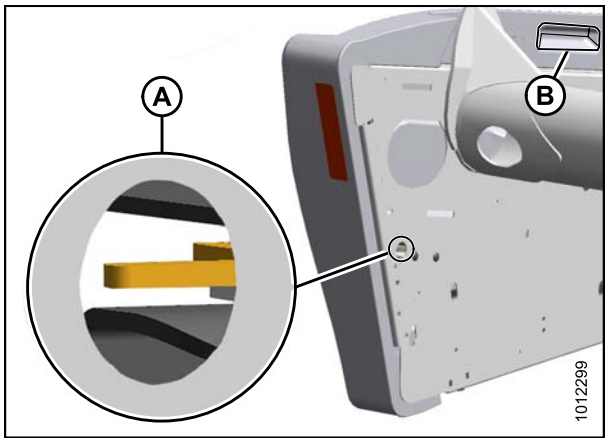


Figure 5.76: Left Endshield

4. Pull endshield at handle depression (A). Endshield is retained by a hinge tab (B) and will open in direction (C).

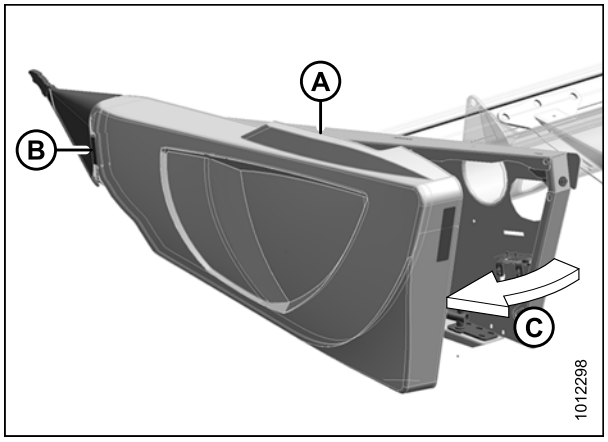


Figure 5.77: Left Endshield

5. Pull the endshield free of hinge tab (A) if additional clearance is required, and swing shield towards the rear of the header.
6. Engage safety catch (B) on hinge arm to secure the shield in fully-open position.

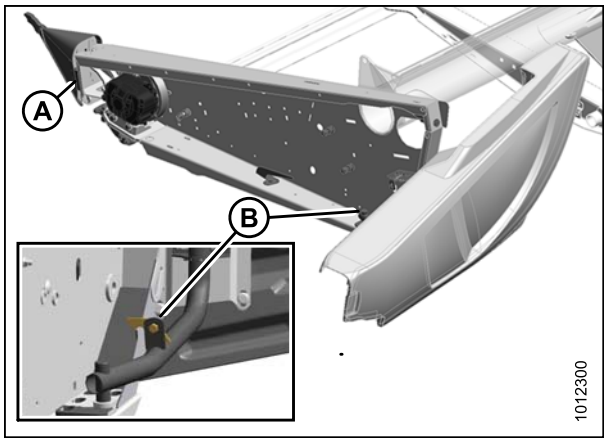


Figure 5.78: Left Endshield

Adjusting the endshield gap:

7. Loosen the four bolts (A) on the support tube bracket (B).

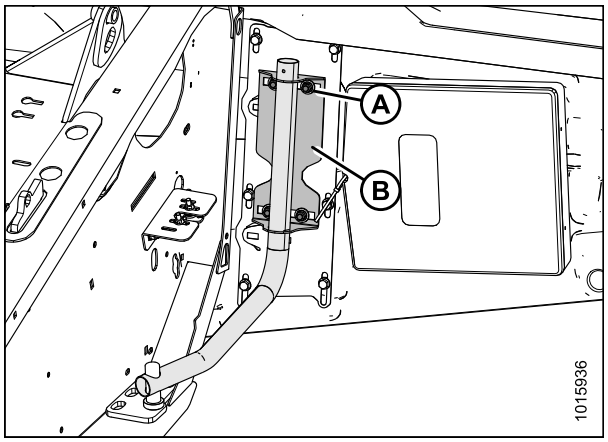


Figure 5.79: Left Endshield Support Tube

8. Loosen the three bolts (A) on latch assembly (B).
9. Adjust latch assembly (B) to achieve the desired gap between the front end of shield and header frame in accordance with Table *5.7 Endshield Gap at Various Temperatures, page 135*.
10. Tighten the three bolts (A) on the latch assembly.
11. Tighten the four bolts on the support tube bracket.
12. Close endshield.

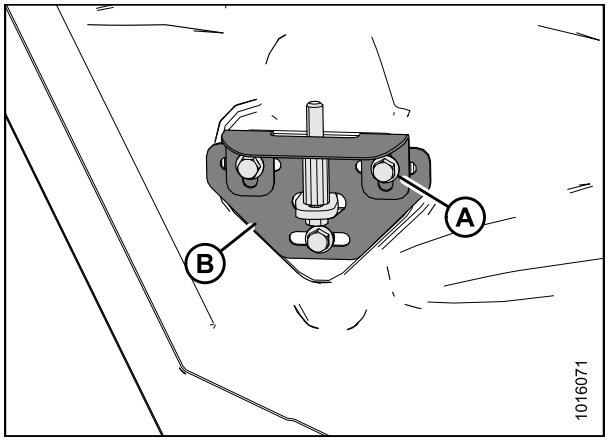


Figure 5.80: Left Endshield Latch Assembly

Closing the endshield:

13. Disengage lock (B) to allow endshield to move.
14. Insert front of endshield behind hinge tab (A) and into divider cone.

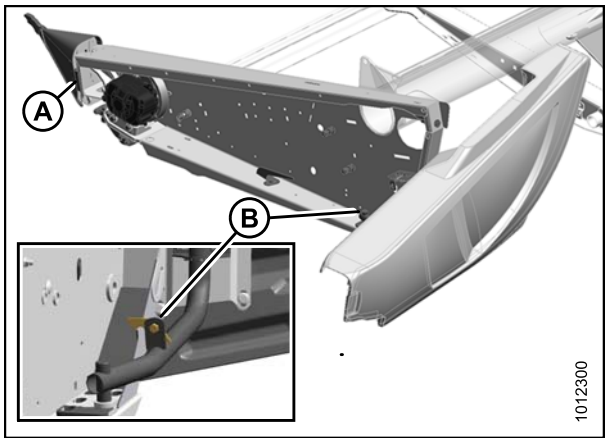


Figure 5.81: Left Endshield

15. Swing endshield in direction (A) into closed position. Engage lock with a firm push.
16. Verify that endshield is locked.

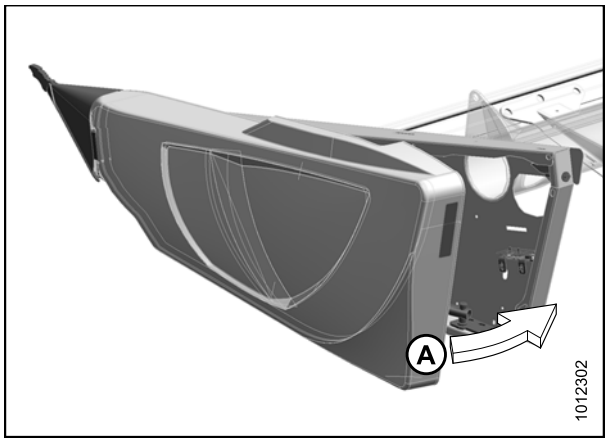


Figure 5.82: Left Endshield

5.20 Checking Manuals

Check manual case contents. The manual case is located inside the left endshield.

1. Open the left endshield. Remove the cable tie on the manual case.

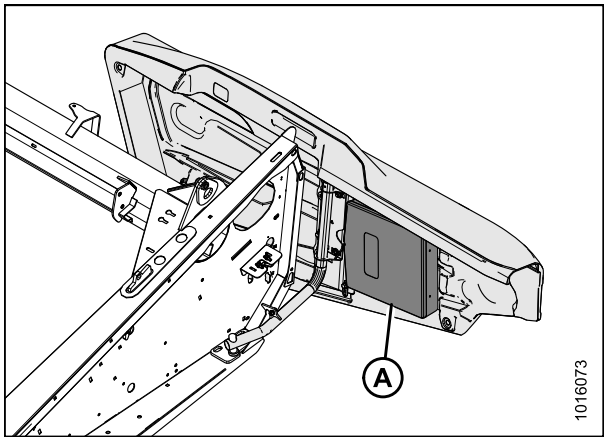


Figure 5.83: Manual Case

2. Confirm that the case contains the following manuals:
   - FD1 Series FlexDraper® Operator's Manual
   - FD1 Series FlexDraper® with FM100 Float Module Parts Catalog
3. Close case and endshield.

6 Setting up Auto Header Height Control

6.1 Auto Header Height Control (AHHC)

MacDon's auto header height control (AHHC) feature works in conjunction with the AHHC option available on certain combine models.

A sensor is installed in the float indicator box (A) on the FM100 Float Module. This sensor sends a signal to the combine allowing it to maintain a consistent cutting height and an optimum float as the header follows ground contours. A two-sensor system is also available as an optional kit.

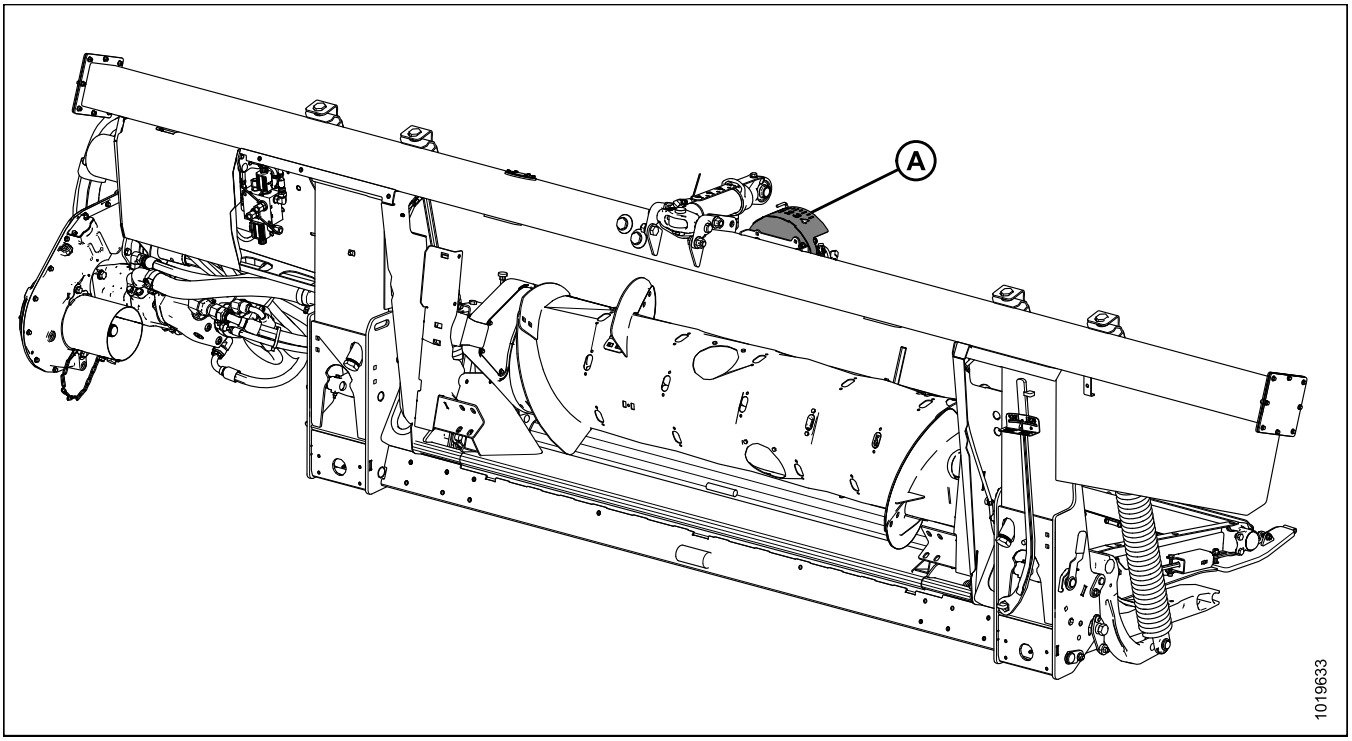


Figure 6.1: FM100 Float Module

FM100 Float Modules are factory-equipped for AHHC; however, before using the AHHC feature, you must do the following:

1. Ensure that the AHHC sensor's output voltage range is appropriate for the combine.
   For more information, refer to *6.1.1 Sensor Output Voltage Range – Combine Requirements, page 141*.
2. Prepare the combine to use the AHHC feature (applies only to some combine models—refer to the instructions for your combine).
3. Calibrate the AHHC system so that the combine can correctly interpret data from the height sensor on the combine float module (refer to the instructions for your combine).

   NOTE:
   Once calibration is complete, you are ready to use the AHHC feature in the field. Individual combine settings can improve AHHC performance (refer to your combine instruction manual).

SETTING UP AUTO HEADER HEIGHT CONTROL

Refer to the following instructions for your specific combine model:

6.1.1 Sensor Output Voltage Range – Combine Requirements

The auto header height control (AHHC) sensor output must be within a specific voltage range for each combine, or the AHHC feature will not work properly.

Table 6.1 Combine Voltage Limits

Combine	Low Voltage Limit	High Voltage Limit	Range (Difference between High and Low Limits)
Challenger, Gleaner A, Massey Ferguson	0.5 V	4.5 V	2.5 V
Case IH 5088/6088/7088, 5130/6130/7130, 7010/8010, 7120/8120/9120, 7230/8230/9230, and 7240/8240/9240	0.5 V	4.5 V	2.5 V
Case IH 2588/2577	2.8 V	7.2 V	4.0 V
Gleaner R and S Series	0.5 V	4.5 V	2.5 V
John Deere 60, 70, S, and T Series	0.5 V	4.5 V	2.5 V
CLAAS 500/600/700 Series	0.5 V	4.5 V	2.5 V
New Holland CR/CX - 5 V system	0.7 V	4.3 V	2.5 V
New Holland CR/CX - 10 V system	2.8 V	7.2 V	4.1–4.4 V

NOTE:
Some combine models do not support checking sensor output voltage from the cab (early 23/2588 series, CLAAS 500/600/700 Series). For these models, check output voltage manually. Refer to *Manually Checking Voltage Range: One-Sensor System, page 142* or *Manually Checking Voltage Range: Two-Sensor System, page 145*.

10 Volt Adapter (MD #276759) – New Holland Combines Only

New Holland combines with a 10 V system require the 10 V adapter (A) (MD #276759) for proper calibration of the auto header height control (AHHC) feature.

If a 10 V New Holland combine does not have the adapter installed, the AHHC output will always read 0 V, regardless of sensor position.

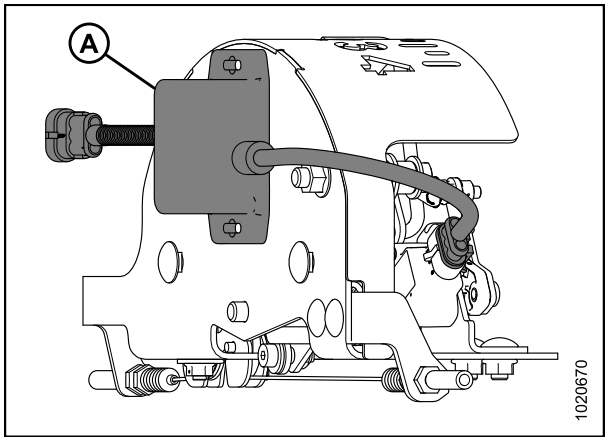


Figure 6.2: 10 V Adapter (MD #276759) Installed

Use a voltmeter to measure the voltage between the Pin 1 (power) and Pin 2 (ground) wires at the AHHC sensor (A). This will determine whether the combine has a 5 V system or a 10 V system.

NOTE:
Combine key must be in ON position, but engine does not need to be running.

The three possible voltage readings are listed below.

- 0 V – combine key is in OFF position, or there is a faulty harness / bad connection
- 5 V – standard combine reading
- 10 V – 10 V combine reading; adapter (MD #276759) is required

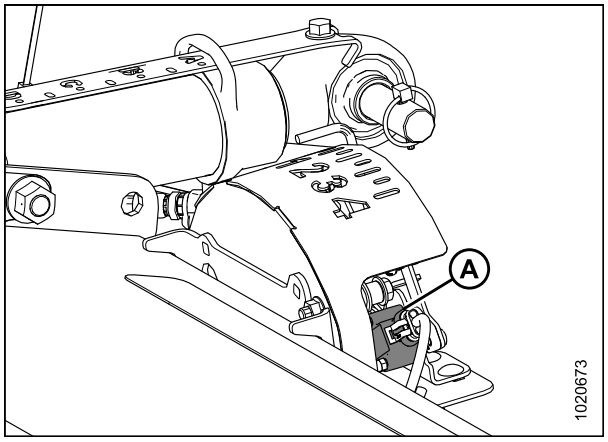


Figure 6.3: Float Indicator Box

Manually Checking Voltage Range: One-Sensor System

The one-sensor system is standard for the FM100 Float Module. If equipped with the optional two-sensor system, refer to *Manually Checking Voltage Range: Two-Sensor System, page 145*.

The output voltage range of the auto header height control (AHHC) sensors in some combines can be checked from the cab. For instructions, refer to your combine operator's manual or the AHHC instructions later in this document.

To manually check the sensor's output voltage range, follow these steps:

1. Position the header 150 mm (6 in.) above the ground, and unlock the float module's float.

2. Check that float lock linkage is on down stops (washer [A] cannot be moved) at both locations.

   NOTE:
   If the header is not on down stops during the next two steps, the voltage may go out of range during operation causing a malfunction of the AHHC system.

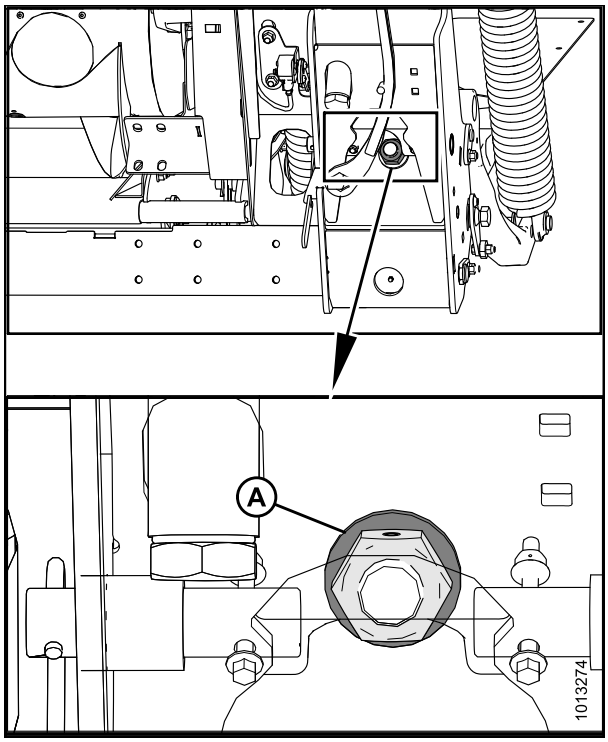


Figure 6.4: Float Lock

3. Adjust the cable take-up bracket (B) (if necessary) until the pointer (A) on the float indicator is on 0.

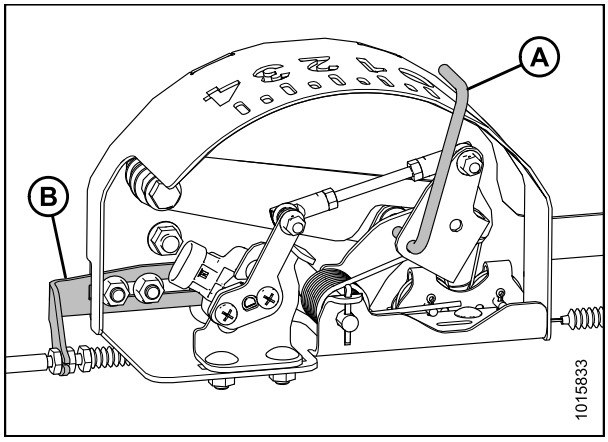


Figure 6.5: Float Indicator Box

4. Use a voltmeter (A) to measure the voltage between the ground (Pin 2) and signal (Pin 3) wires at the AHHC sensor in the float indicator box. Ensure it is at the high voltage limit for the combine. Refer to Table *6.1 Combine Voltage Limits, page 141*.

   NOTE:
   The wiring harness connector must be attached to the sensor. Do NOT disconnect it.

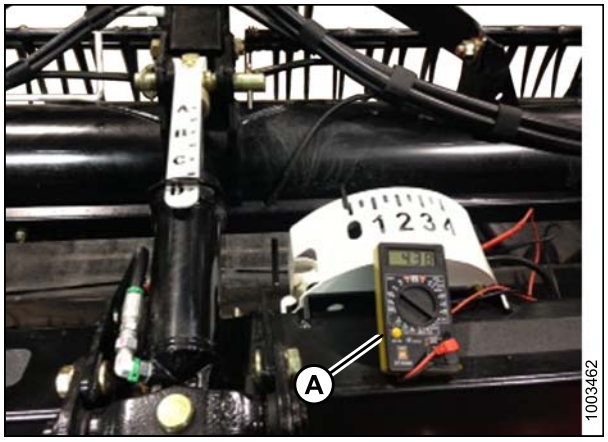


Figure 6.6: Measuring Voltage at Float Indicator Box

5. Fully lower the combine feeder house, and float the header up off the down stops (float indicator should be at 4, and the float module should be fully separated from the header).

   NOTE:
   You may need to hold the HEADER DOWN switch for a few seconds to ensure the feeder house is fully lowered.

6. Use a voltmeter (A) to measure the voltage between the ground and signal wires at the AHHC sensor in the float indicator box. It should be at the low voltage limit for the combine. Refer to Table *6.1 Combine Voltage Limits, page 141*.

   NOTE:
   The wiring harness connector must be attached to the sensor. Do NOT disconnect it.

7. If the sensor voltage is not within the low and high limits or if the range between the low and high limits is insufficient, adjust the voltage limits. Refer to *Adjusting Voltage Limits: One-Sensor System, page 147*.

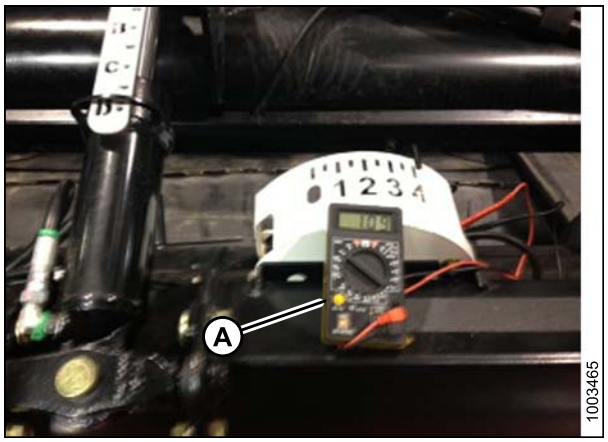


Figure 6.7: Measuring Voltage at Float Indicator Box

Manually Checking Voltage Range: Two-Sensor System

FM100 Float Modules equipped with the optional two-sensor system have a left and right sensor located on the back frame of the float module.

To manually check the sensor's output voltage range, follow these steps:

1. Position the header 150 mm (6 in.) above the ground, and unlock the float module's float.

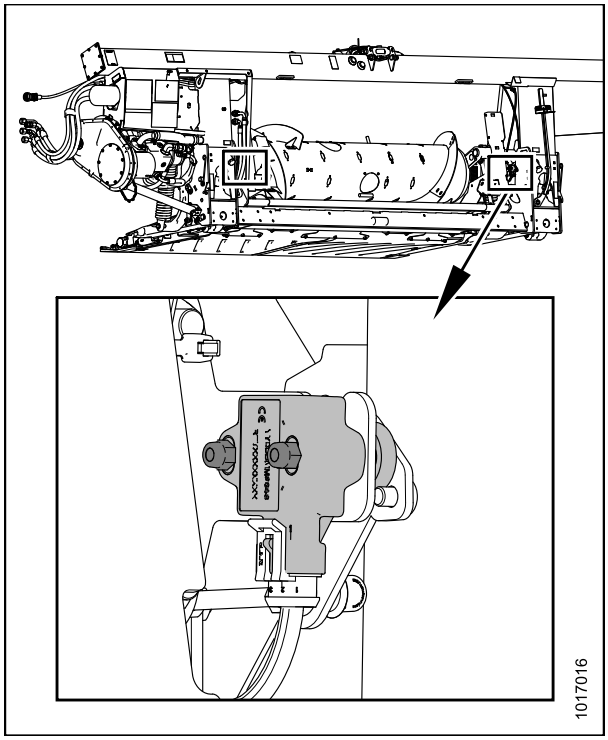


Figure 6.8: Optional Two-Sensor System

2. Check that float lock linkage is on down stops (washer [A] cannot be moved) at both locations.

   NOTE:
   If the header is not on down stops during the next two steps, the voltage may go out of range during operation causing a malfunction of the AHHC system.

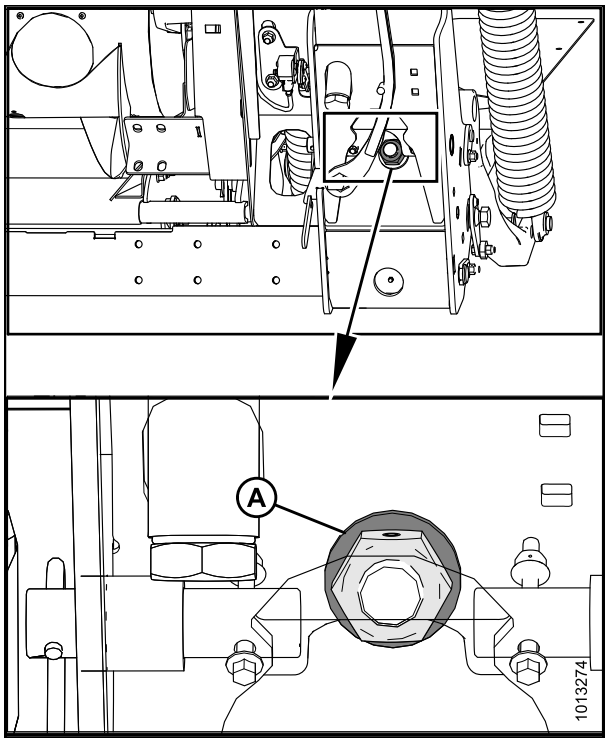


Figure 6.9: Float Lock

3. Adjust the cable take-up bracket (B) (if necessary) until the pointer (A) on the float indicator is on 0.

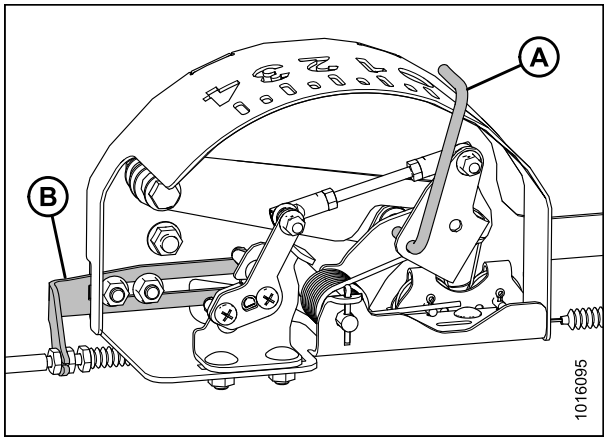


Figure 6.10: Float Indicator Box

4. Use a voltmeter to measure the voltage between the ground (Pin 2) and signal (Pin 3) wires of the AHHC sensor (A) at the back of the float module side frame. Ensure it is at the high voltage limit for the combine. Refer to Table *6.1 Combine Voltage Limits, page 141*.

   NOTE:
   The wiring harness connector must be attached to the sensor. Do NOT disconnect it.

5. Repeat at the opposite side.

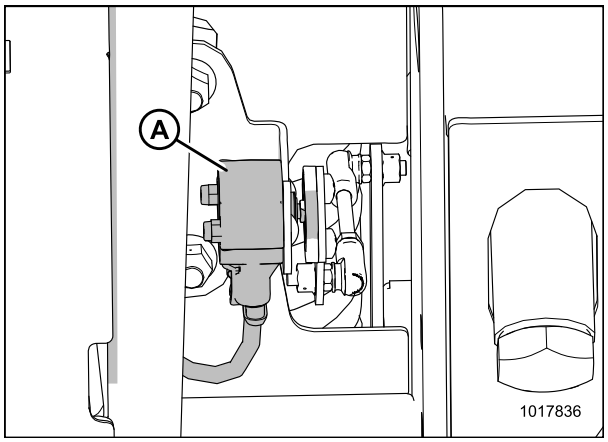


Figure 6.11: Optional Two-Sensor Kit – Right Sensor

6. Fully lower the combine feeder house, and float the header up off the down stops (float indicator [A] should be at 4, and the float module should be fully separated from the header).

   NOTE:
   You may need to hold the HEADER DOWN switch for a few seconds to ensure the feeder house is fully lowered.

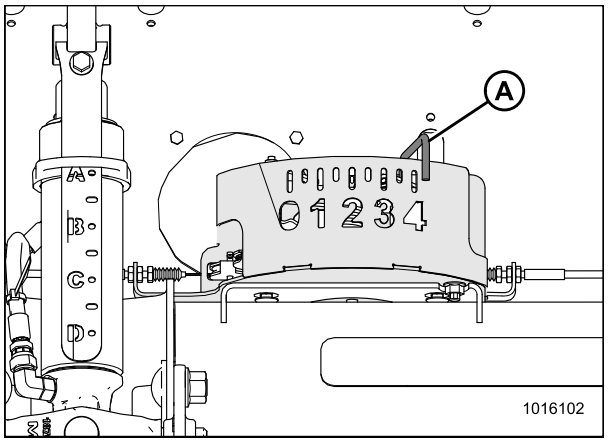


Figure 6.12: Float Indicator Box

7. Using a voltmeter, measure the voltage between the ground (Pin 2) and signal (Pin 3) wires of the AHHC sensor (A) at the back of the side frame. Ensure it is at the high voltage limit for the combine. Refer to Table *6.1 Combine Voltage Limits, page 141*.

   NOTE:
   The wiring harness connector must be attached to the sensor. Do NOT disconnect it.

8. If the sensor voltage is not within the low and high limits, or if the range between the low and high limits is insufficient, adjust the voltage limits. Refer to *Adjusting Voltage Limits: Two-Sensor System, page 149*.
9. Repeat at the opposite side.

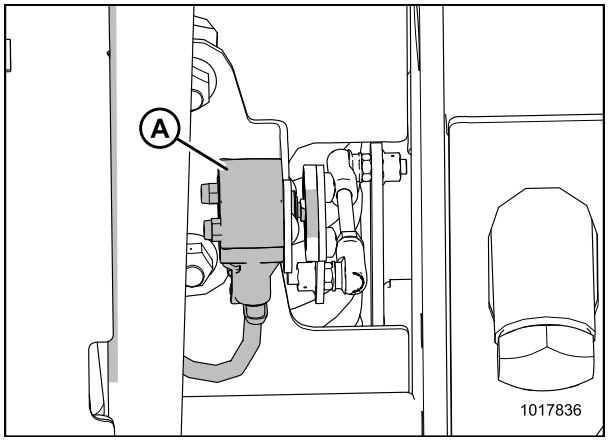


Figure 6.13: Optional Two-Sensor Kit – Right Sensor

Adjusting Voltage Limits: One-Sensor System

Follow this procedure if you have checked the voltage range (either manually or from the cab) and found that the sensor voltage is not within the low and high limits or that the range between the low and high limits is insufficient.

DANGER

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

1. Follow these steps to adjust the upper voltage limit:
   a. Extend guard angle fully; the header angle indicator should be at D.
   b. Position header 152–254 mm (6–10 in.) above the ground; the float indicator should be at 0.
   c. Check the upper voltage limit using the combine display or voltmeter. Refer to Table *6.1 Combine Voltage Limits, page 141*.
   d. Loosen sensor mounting nuts (A).
   e. Rotate sensor (B) counterclockwise to increase high voltage limit and clockwise to decrease it.
   f. Tighten sensor mounting nuts (A).
2. Follow these steps to adjust the lower voltage limit:
   a. Extend guard angle fully; the header angle indicator should be at D.
   b. Fully lower header on the ground; the float indicator should be at 4.
   c. Check the lower voltage limit using the combine display or voltmeter. Refer to Table *6.1 Combine Voltage Limits, page 141*.
   d. Loosen sensor mounting nuts (A).
   e. Rotate sensor (B) counterclockwise to increase low voltage limit and clockwise to decrease it.
   f. Tighten sensor mounting nuts (A).
3. After making adjustments, recheck both the upper and lower voltage limits to make sure they are within the required range according to Table *6.1 Combine Voltage Limits, page 141*.
4. If unable to get the voltage within the required range, loosen mounting bolts (A) and shift sensor assembly (B) inboard as shown.

   NOTE:
   If sensor assembly is shifted right or left, it may be necessary to repeat Steps *1., page 148* and *2., page 148* to achieve the proper voltage limits.

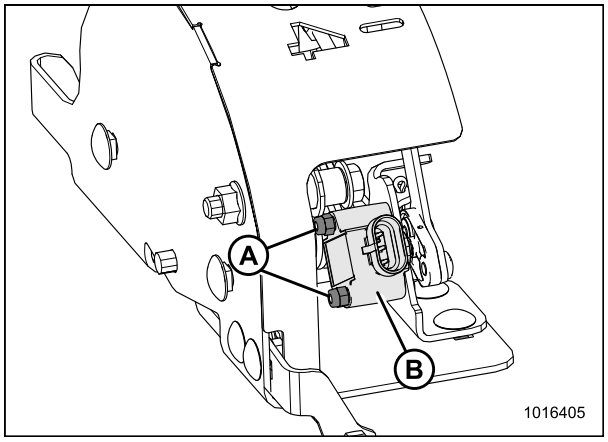


Figure 6.14: AHHC Sensor Assembly

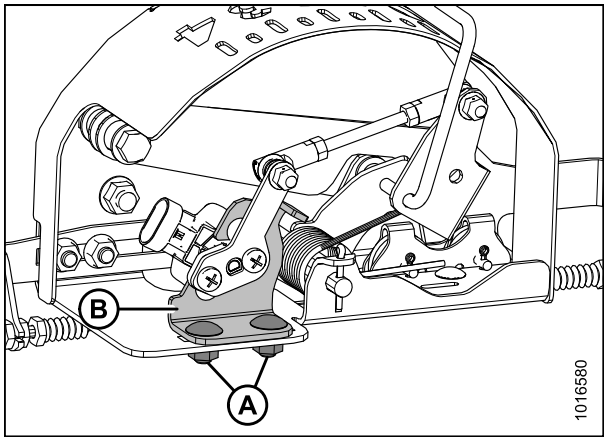


Figure 6.15: AHHC Sensor Assembly

Adjusting Voltage Limits: Two-Sensor System

DANGER

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

1. Extend guard angle fully; the header angle indicator should be at D.
2. Position header 150–254 mm (6–10 in.) above the ground; the float indicator should be at 0.
3. Adjust left sensor voltage:
   a. Loosen sensor mounting nuts (A).
   b. Rotate sensor (B) counterclockwise to lower the voltage. Rotate sensor clockwise to raise the voltage.
   c. Check that the left sensor is at the correct upper voltage limit according to Table *6.1 Combine Voltage Limits, page 141*.
   d. Tighten sensor mounting nuts (A).

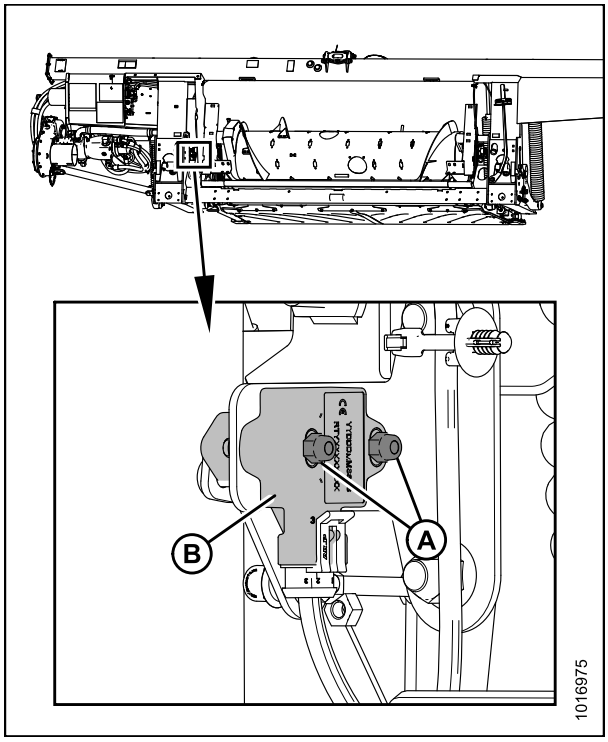


Figure 6.16: Optional Two-Sensor Kit – Left Sensor

4. Adjust right sensor voltage:
   a. Loosen sensor mounting nuts (A).
   b. Rotate sensor (B) clockwise to lower the voltage. Rotate sensor counterclockwise to raise the voltage.
   c. Check that the right sensor is at the correct upper voltage limit according to Table *6.1 Combine Voltage Limits, page 141*.
   d. Tighten sensor mounting nuts (A).

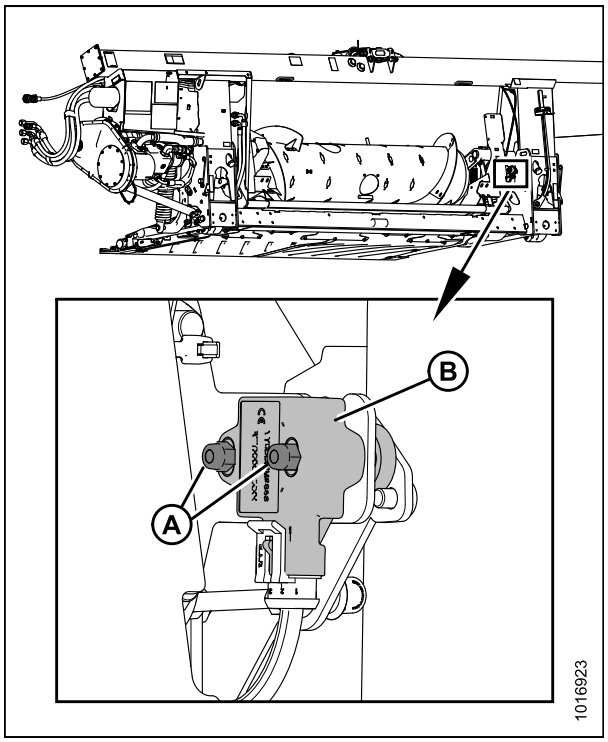


Figure 6.17: Optional Two-Sensor Kit – Right Sensor

5. Fully lower the header; the float indicator should be at 4.
6. Check that both sensors are at the correct lower voltage limit according to Table *6.1 Combine Voltage Limits, page 141*.

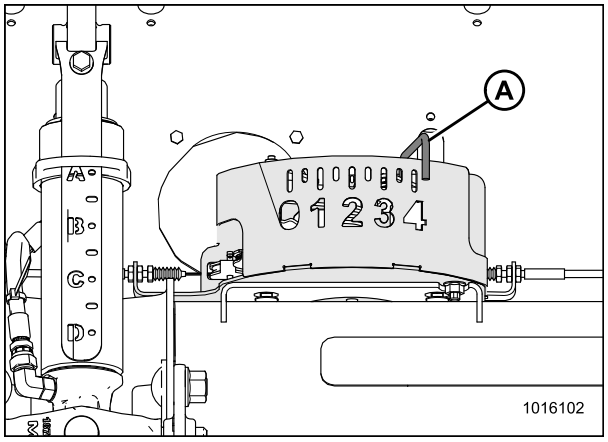


Figure 6.18: Float Indicator Box

6.1.2 Case IH 5088/6088/7088 Combines

Calibrating the Auto Header Height Control (Case IH 5088/6088/7088)

For best performance of the auto header height control (AHHC) system, perform ground calibration with center-link set to D. When calibration is complete, adjust the center-link back to desired header angle. Refer to Header Angle in the header operator's manual for instructions.

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

1. Ensure center-link is set to D.
2. Set the flotation on the header. Refer to operator's manual for instructions. Position fore-aft in mid span.
3. Start the combine engine, but do NOT have separator or feeder house engaged.
4. Locate header control switch (A) on the right console, and set to HT (this is AHHC mode).

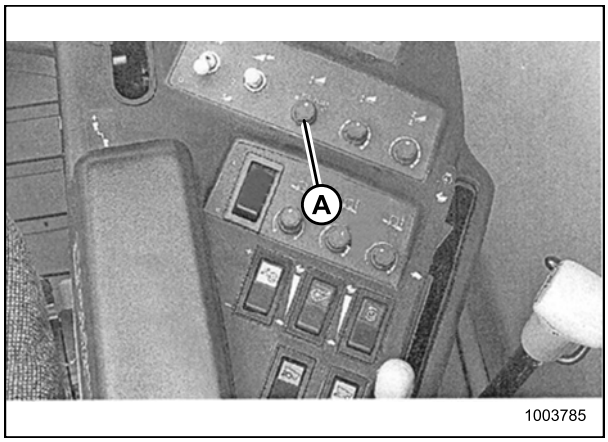


Figure 6.19: Right Console

5. Press the header lower switch (A) on the joystick lever until the float module and header are fully lowered. You may need to hold the switch for several seconds.
6. Press the header raise switch (A) on the joystick lever. The header should stop at about the halfway point. Continue holding the header raise switch, and the header will rise until the feeder house reaches its upper limit. The AHHC system is now calibrated.

   NOTE:
   If float was set heavier to complete the ground calibration procedure, adjust to recommended operating float after the calibration is complete.

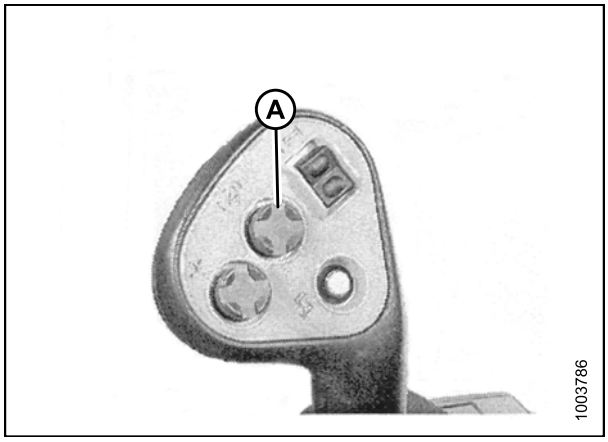


Figure 6.20: Joystick (Case IH 2300/2500)

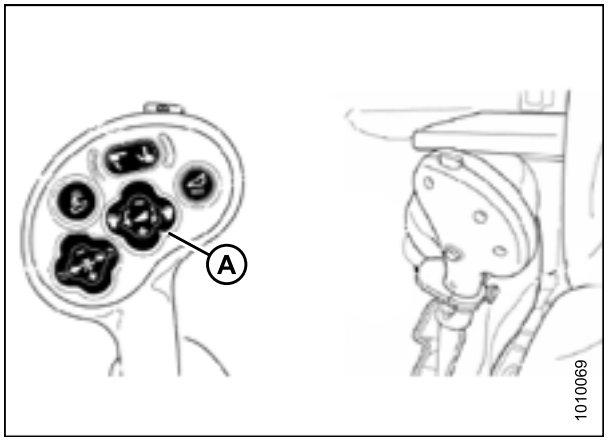


Figure 6.21: Joystick (Case IH 5088/6088/7088)

Setting the Sensitivity of the Auto Header Height (Case IH 5088/6088/7088)

The sensitivity adjustment controls the distance the cutterbar must travel up or down before the auto header height control (AHHC) reacts and raises or lowers the feeder house. When the sensitivity is set to maximum, only small changes in ground height are needed to cause the feeder house to raise or lower. When the sensitivity is set to minimum, large changes in the ground height are needed to cause the feeder house to raise or lower.

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

1. Use the HEADER SETTINGS key (M) to display the HEADER SENSITIVITY CHANGE screen.
2. Use the UP or DOWN keys (E) and (H) to adjust the highlighted item. The height sensitivity setting range is 0 (least sensitive) to 250 (most sensitive) in increments of 10.

   NOTE:
   Adjustments take effect immediately. Use the CANCEL key to return to the original settings.

3. Use the HEADER SETTINGS key (M) to highlight the next changeable item.
4. Use the ENTER key (D) to save changes and return to the monitor screen. If there are no changes, the screen will return to the monitor screen after 5 seconds.

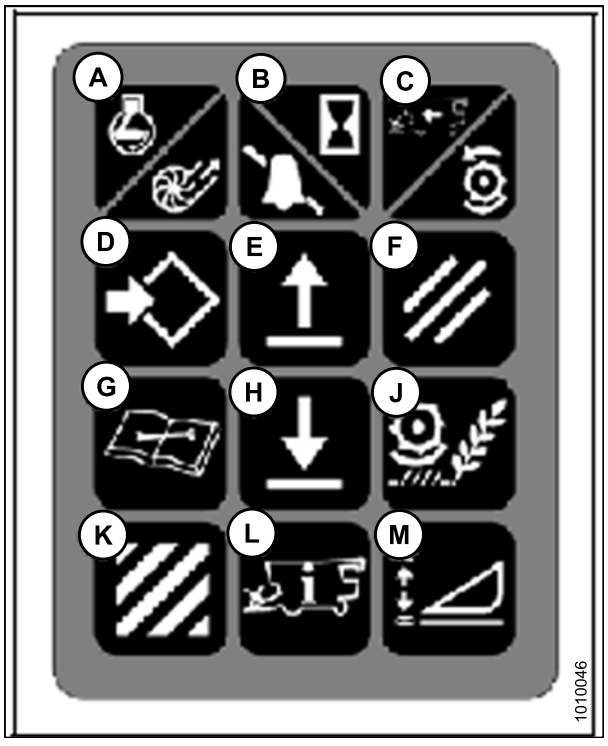


Figure 6.22: Combine Controls

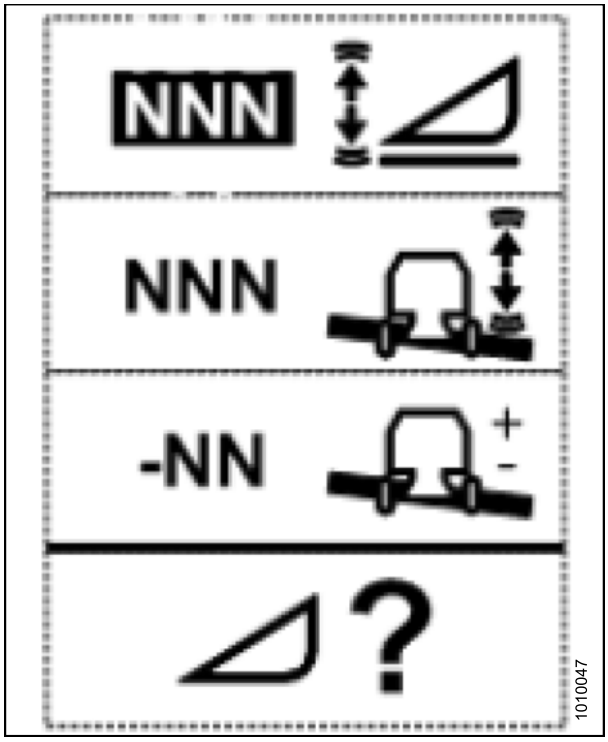


Figure 6.23: Height Sensitivity Change Page

6.1.3 Case IH 5130/6130/7130, 7010/8010, 7120/8120/9120, 7230/8230/9230 and 7240/8240/9240 Combines

Checking Voltage Range from the Combine Cab (Case 8010)

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

⚠ CAUTION

Check to be sure all bystanders have cleared the area.

1. Position the header 150 mm (6 in.) above the ground, and unlock the float module float.

2. Check that float lock linkage is on down stops (washer [A] cannot be moved) at both locations.

   NOTE:
   If the header is not on down stops during the next two steps, the voltage may go out of range during operation causing a malfunction of the AHHC system.

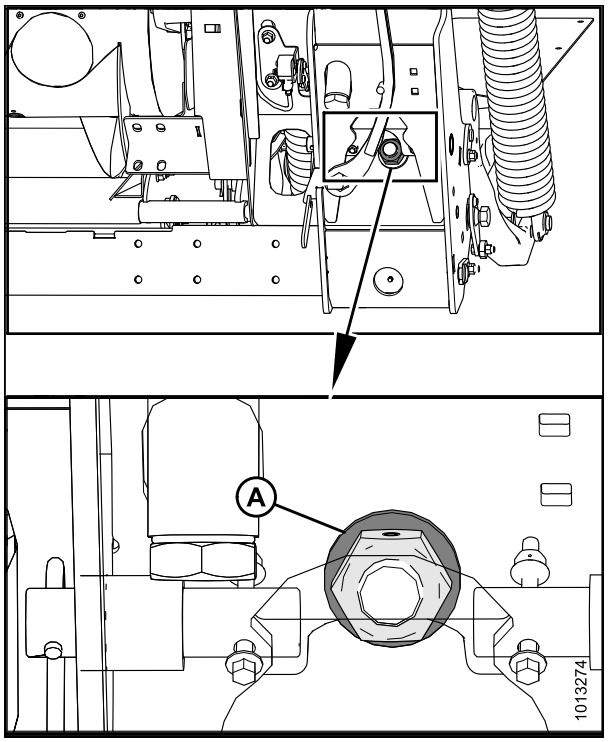


Figure 6.24: Float Lock

3. Adjust cable take-up bracket (B) (if necessary) until pointer (A) on float indicator is on 0.

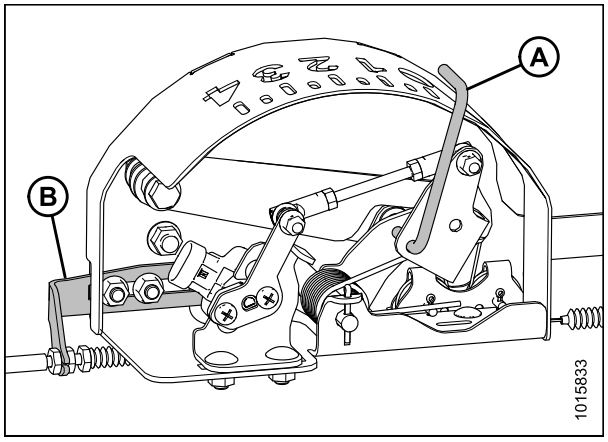


Figure 6.25: Float Indicator box

4. Ensure header float is unlocked.
5. Select DIAG (A) on the Universal display MAIN screen. The DIAG screen displays.

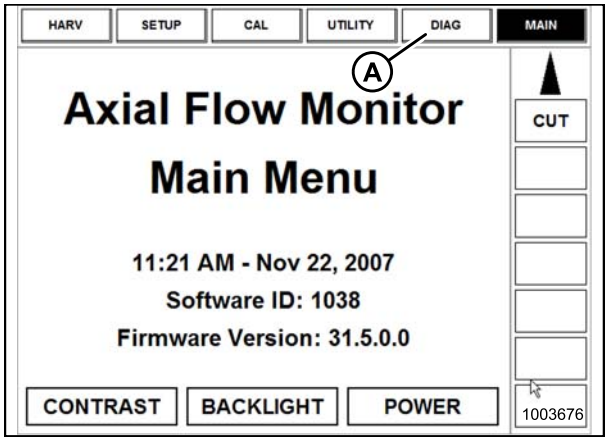


Figure 6.26: Case 8010 Combine Display

6. Select SUB SYSTEM (A). The SUB SYSTEM screen displays.

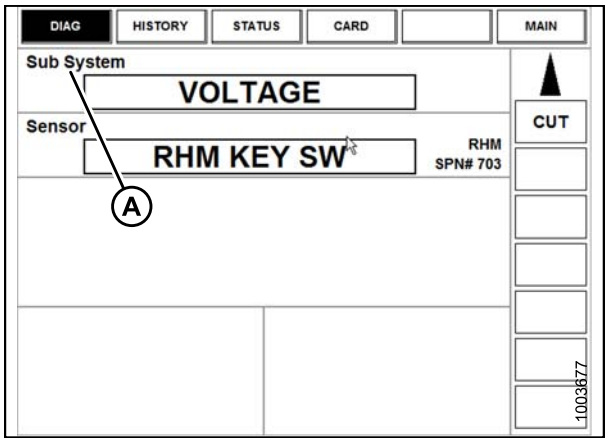


Figure 6.27: Case 8010 Combine Display

7. Select HDR HEIGHT/TILT (A). The SENSOR screen displays.

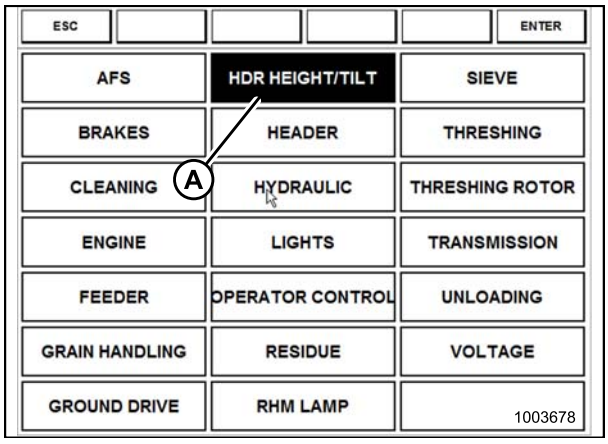


Figure 6.28: Case 8010 Combine Display

8. Select LEFT SEN (A). The exact voltage is displayed. Raise and lower the header to see the full range of voltage readings.

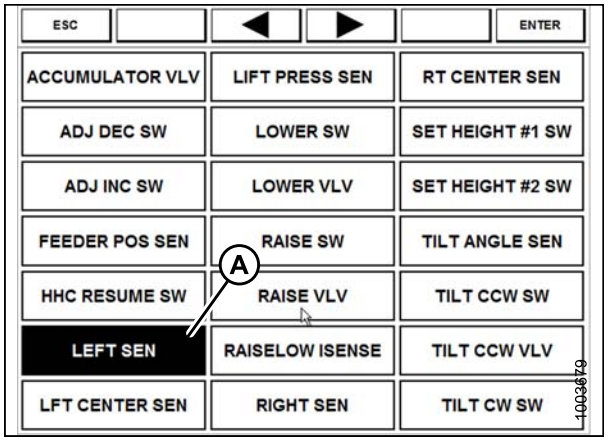


Figure 6.29: Case 8010 Combine Display

9. If the sensor voltage is not within the low and high limits, or if the range between the low and high limits is insufficient, adjust the voltage limits. Refer to *Adjusting Voltage Limits: One-Sensor System, page 147*.

Figure 6.30: Case 8010 Combine Display

Checking Voltage Range from the Combine Cab (Case IH 5130/6130/7130, 7010/8010; 7120/8120/9120; 7230/8230/9230)

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

⚠ CAUTION

Check to be sure all bystanders have cleared the area.

1. Position the header 150 mm (6 in.) above the ground, and unlock the float module float.

2. Check that float lock linkage is on down stops (washer [A] cannot be moved) at both locations.

   NOTE:
   If the header is not on down stops during the next two steps, the voltage may go out of range during operation causing a malfunction of the AHHC system.

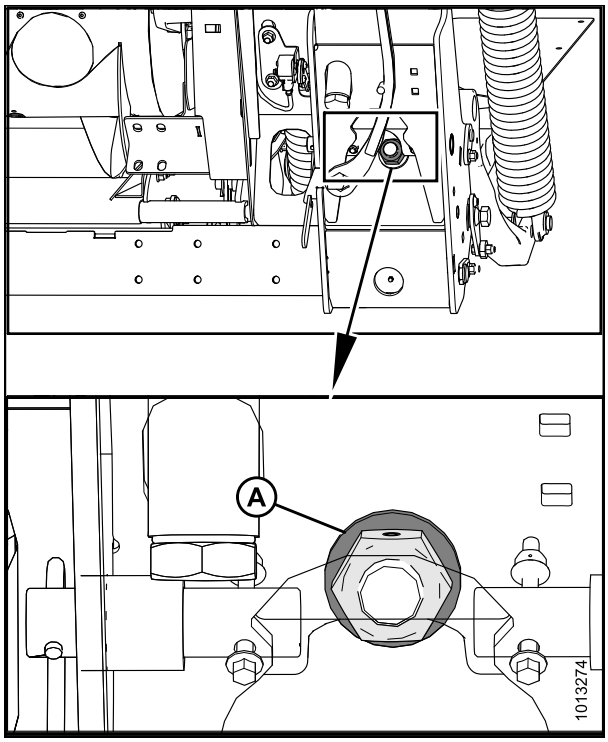


Figure 6.31: Float Lock

3. Adjust cable take-up bracket (B) (if necessary) until pointer (A) on float indicator is on 0.

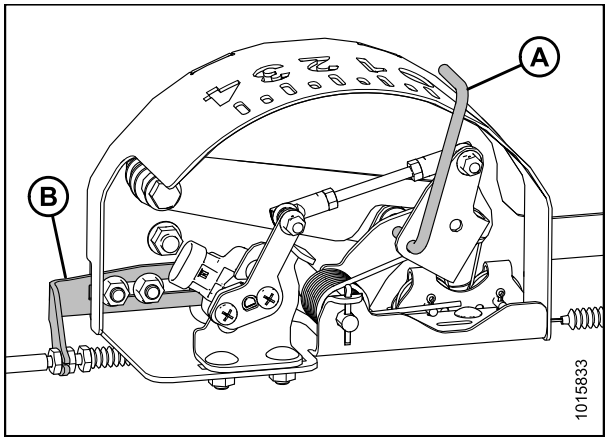


Figure 6.32: Float Indicator box

4. Ensure header float is unlocked.
5. Select DIAGNOSTICS (A) on the MAIN screen. The DIAGNOSTICS screen opens.
6. Select SETTINGS. The SETTINGS screen opens.

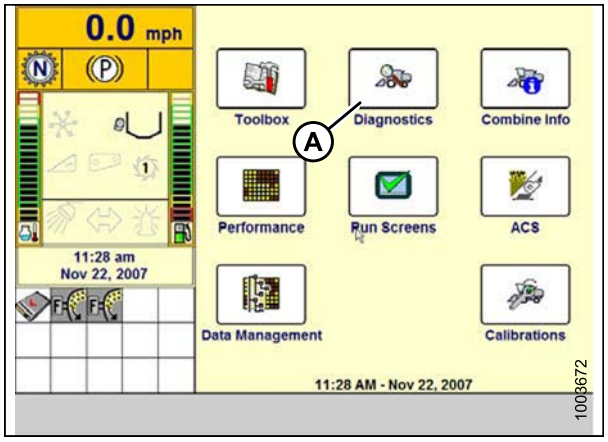


Figure 6.33: Case IH Combine Display

7. Select the GROUP arrow (A). The GROUP dialog box opens.

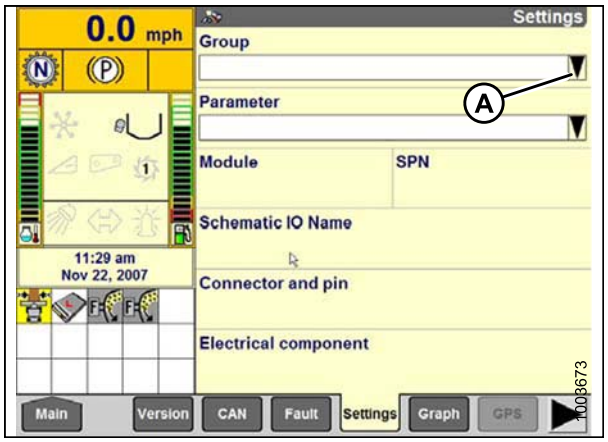


Figure 6.34: Case IH Combine Display

8. Select HEADER HEIGHT/TILT (A). The PARAMETER screen opens.

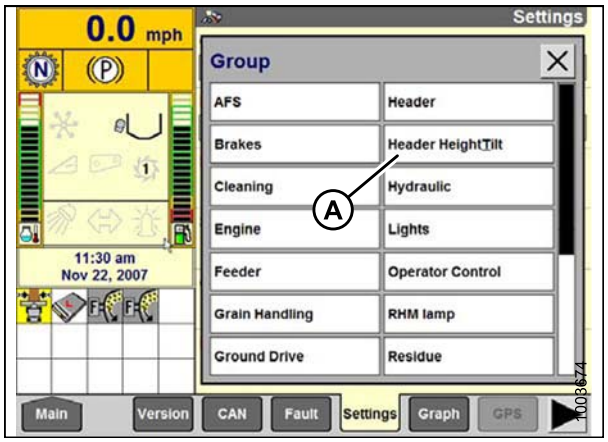


Figure 6.35: Case IH Combine Display

9. Select LEFT HEADER HEIGHT SEN (A), and then select the GRAPH button (B). The exact voltage is displayed at top of screen. Raise and lower the header to see the full range of voltage readings.
10. If the sensor voltage is not within the low and high limits or, if the range between the low and high limits is insufficient, adjust the voltage limits. Refer to *Adjusting Voltage Limits: One-Sensor System, page 147*.

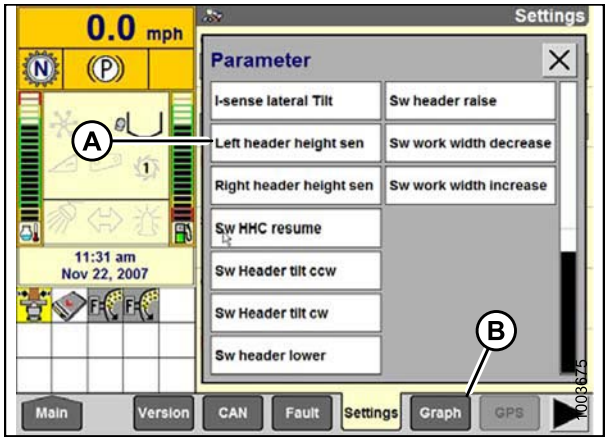


Figure 6.36: Case IH Combine Display

Calibrating the Auto Header Height Control (Case IH 5130/6130/7130, 7010/8010; 7120/8120/9120; 7230/8230/9230)

For best performance from the auto header height control (AHHC), perform these procedures with the center-link set to D. When setup and calibration are complete, adjust the center-link back to desired header angle. Refer to Header Angle in the header operator's manual for instructions.

NOTE:
This procedure applies to combines with a software version below 28.00. For instructions on calibrating the AHHC for combines with software version 28.00 or above, refer to *Calibrating the Auto Header Height Control (Case Combines with Version 28.00 or Higher Software), page 161*.

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

1. Ensure center-link is set to D.
2. Ensure all header and float module electrical and hydraulic connections are made.
3. Select TOOLBOX on the MAIN screen, and then select HEADER.
4. Set appropriate HEADER STYLE.

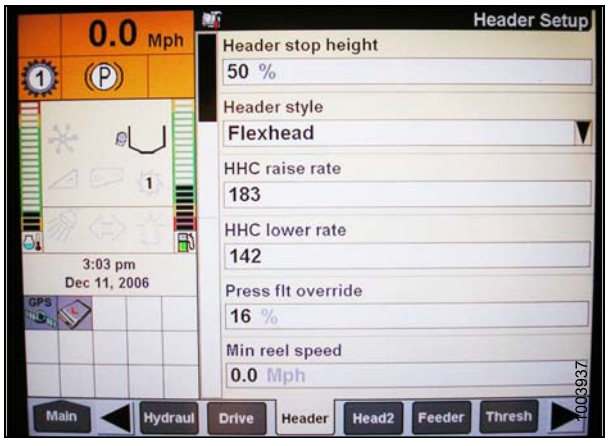


Figure 6.37: Case IH Combine Display

5. Set AUTO REEL SPEED SLOPE.
6. Set HEADER PRESSURE FLOAT to NO if equipped, and ensure REEL DRIVE is HYDRAULIC.

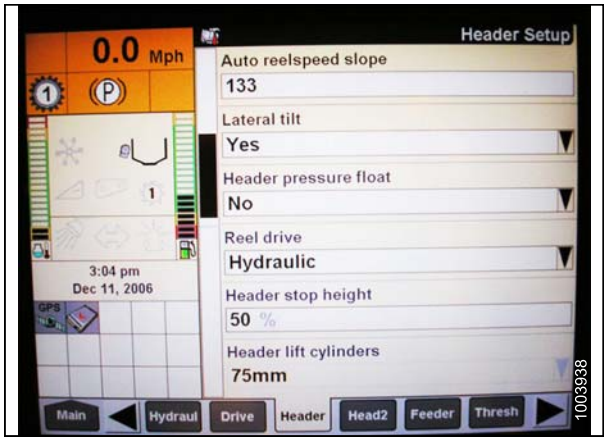


Figure 6.38: Case IH Combine Display

7. Install REEL FORE-BACK (if applicable).
8. Set HEIGHT SENSITIVITY to desired value. The recommended starting point is 180.

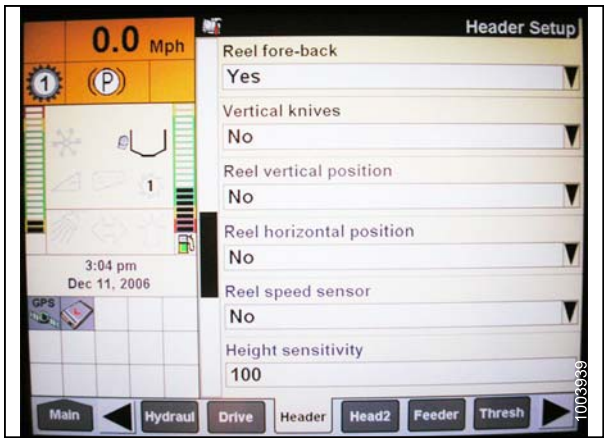


Figure 6.39: Case IH Combine Display

9. Install FORE-AFT CONTROL and HDR FORE-AFT TILT (if applicable).

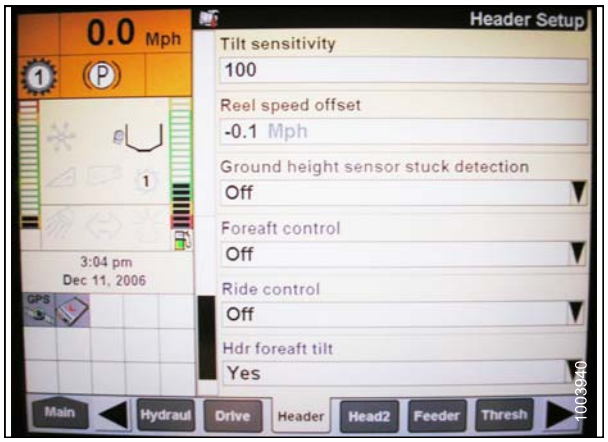


Figure 6.40: Case IH Combine Display

10. Press HEAD2 at bottom of screen.
11. Ensure HEADER TYPE is DRAPER.

    NOTE:
    If recognition resistor is plugged in to header harness, you will not be able to change this.

12. Set cutting type to PLATFORM.
13. Set appropriate HEADER WIDTH and HEADER USAGE.

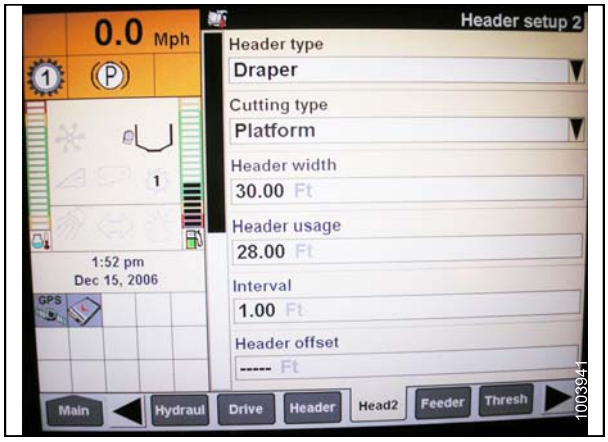


Figure 6.41: Case IH Combine Display

Calibrating the Auto Header Height Control (Case Combines with Version 28.00 or Higher Software)

For best performance of the auto header height control (AHHC), perform these procedures with the center-link set to D. When setup and calibration are complete, adjust the center-link back to desired header angle. Refer to Header Angle in the header operator's manual for instructions.

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

1. Ensure center-link is set to D.
2. Select TOOLBOX on the MAIN screen, and then select HEADER SETUP.
3. Locate the HEADER SUB TYPE field. It will be located on either the HEAD 1 or the HEAD 2 tab.
4. Select 2000 (A).

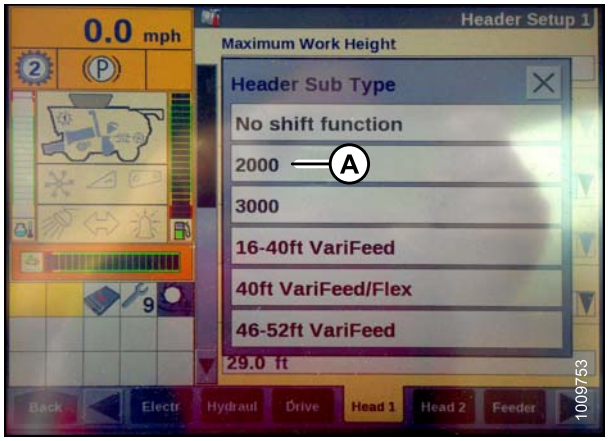


Figure 6.42: Case IH Combine Display

5. Locate the HEADER SENSORS and HEADER PRESSURE FLOAT fields. They will be located on either the HEAD 1 or the HEAD 2 tab.
6. Select ENABLE (A) in the HEADER SENSORS field.
7. Select NO (B) in the HEADER PRESSURE FLOAT field.

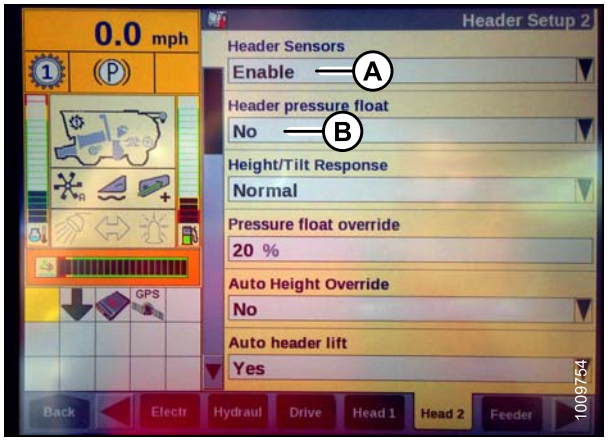


Figure 6.43: Case IH Combine Display

8. Ensure AUTO HEIGHT icon (A) appears on the monitor and is displayed as shown at location (B). When the header is set for cutting on the ground, this verifies that the combine is correctly using the potentiometer on the header to sense ground pressure.

   NOTE:
   AUTO HEIGHT field (B) may appear on any of the RUN tabs and not necessarily on the RUN 1 tab.

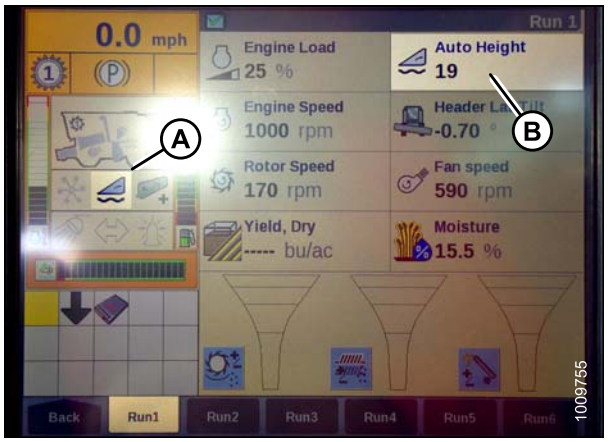


Figure 6.44: Case IH Combine Display

9. Select CALIBRATION on the combine display, and press the right arrow navigation key to enter the information box.
10. Select HEADER (A), and press ENTER. The CALIBRATION dialog box opens.

    NOTE:
    You can use the up and down navigation keys to move between options.

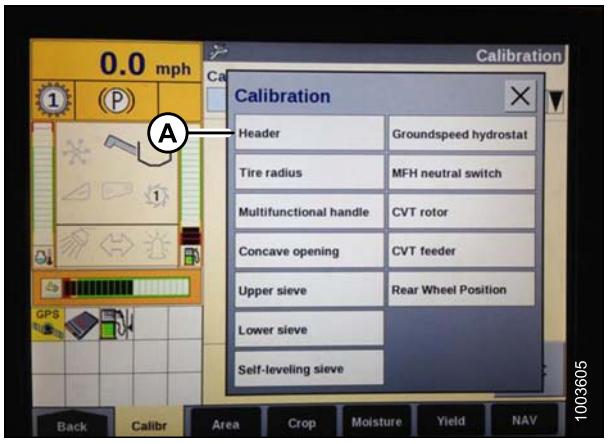


Figure 6.45: Case IH Combine Display

11. Follow the calibration steps in the order in which they appear in the dialog box. As you proceed through the calibration process, the display will automatically update to show the next step.

    NOTE:
    Pressing the ESC key during any of the steps or letting the system sit idle for more than 3 minutes will cause the calibration procedure to stop.

    NOTE:
    Refer to your combine operator's manual for an explanation of any error codes.

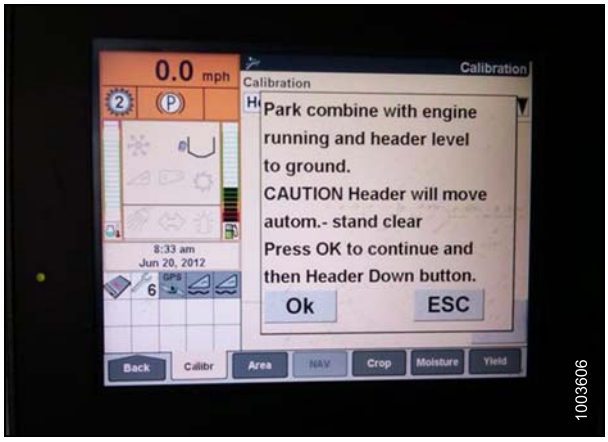


Figure 6.46: Case IH Combine Display

12. When all steps have been completed, CALIBRATION SUCCESSFUL message is displayed on the screen. Exit the CALIBRATION menu by pressing the ENTER or ESC key.

    NOTE:
    If float was set heavier to complete ground calibration procedure, adjust to recommended operating float after the calibration is complete.

13. If the unit does not function properly, conduct the maximum stubble height calibration.

Setting Preset Cutting Height (Case 7010/8010, 7120/8120/9120, 7230/8230/9230)

To set the preset cutting height, follow these steps:

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

1. Engage separator and header.
2. Manually raise or lower the header to the desired cutting height.
3. Press the SET #1 switch (A). The HEADER HEIGHT MODE lamp (C), next to the SET #1 switch, turns on.
4. Manually raise or lower the header to a second desired cutting height.
5. Press the SET #2 switch (B). The HEADER HEIGHT MODE lamp (D), next to the SET #2 switch, turns on.

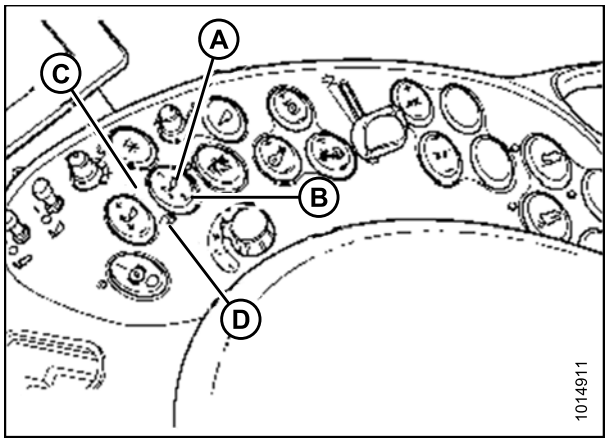


Figure 6.47: Case Combine Controls

6. To swap between set points, press HEADER RESUME (A).
7. To pick up header at headlands, press HEADER RESUME (A) twice. To lower, press HEADER RESUME (A).

NOTE:
You can fine adjust these set points by using the FINE ADJUST switch (A).

NOTE:
Pressing the HEADER RAISE/LOWER switch will disengage AUTO HEIGHT mode. Press HEADER RESUME to reengage.

NOTE:
The indicator reading with the header off the ground 152 mm (6 in.) should be at 0 (B). If not, refer to Step *3., page 143*. Ground and crop conditions will dictate what number you will need to be set at. A reading at 1 (A) is set to light and 4 is set to heavy. The ideal setting is as light as possible without bouncing or missing crop. Operating with heavier pressures can wear the cutterbar wearplate prematurely.

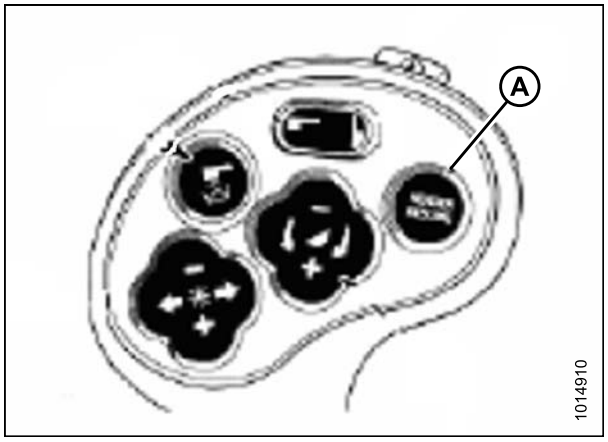


Figure 6.48: Case Combine Controls

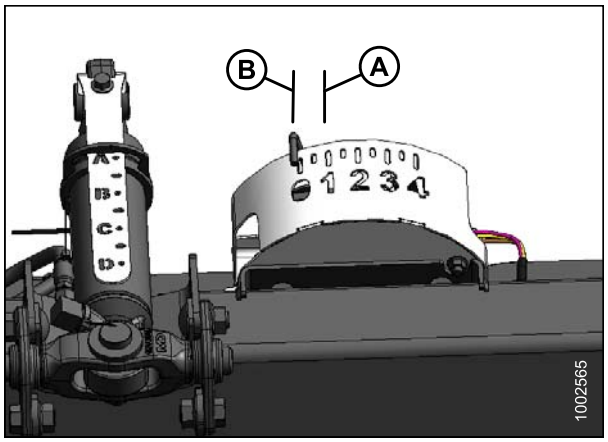


Figure 6.49: Float Indicator Box

6.1.4 Challenger and Massey Ferguson Combines

Checking Voltage Range from the Combine Cab (Challenger and Massey Ferguson)

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

1. Position the header 150 mm (6 in.) above the ground, and unlock the float module float.
2. Check that float lock linkage is on down stops (washer [A] cannot be moved) at both locations.

   NOTE:
   If the header is not on down stops during the next two steps, the voltage may go out of range during operation causing a malfunction of the auto header height control (AHHC) system.

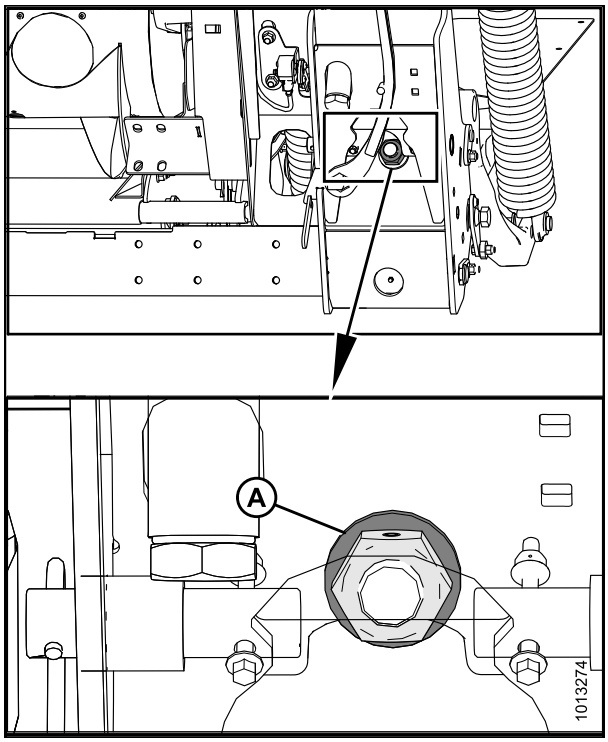


Figure 6.50: Float Lock

3. Adjust the cable take-up bracket (B) (if necessary) until the pointer (A) on the float indicator is on 0.

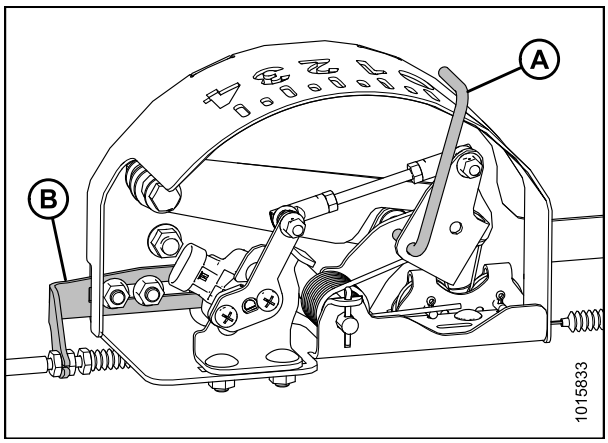


Figure 6.51: Float Indicator Box

4. Go to the FIELD screen on the combine monitor, and then press the diagnostics icon. The MISCELLANEOUS screen displays.
5. Press the VMM DIAGNOSTIC button (A). The VMM DIAGNOSTIC screen displays.

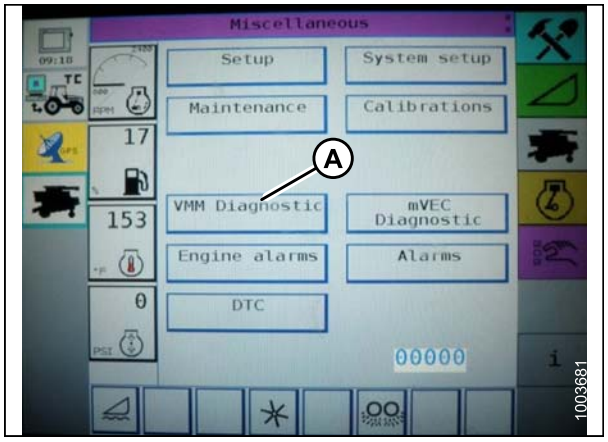


Figure 6.52: Challenger Combine Display

6. Go to the ANALOG IN tab (A), and then select VMM MODULE 3 by pressing the text box below the four tabs. The voltage from the AHHC sensor is now displayed on screen as HEADER HEIGHT RIGHT POT and HEADER HEIGHT LEFT POT. The readings may be slightly different.

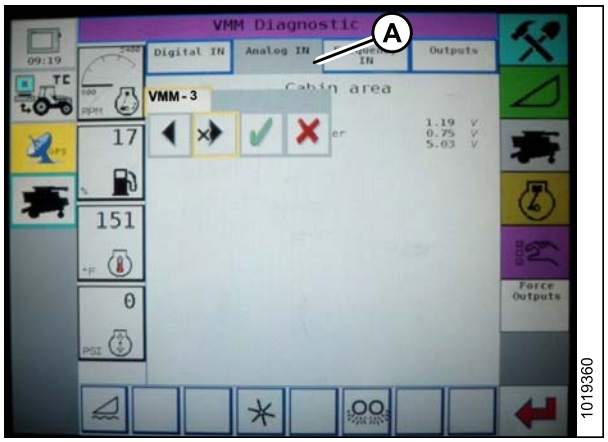


Figure 6.53: Challenger Combine Display

7. Fully lower the combine feeder house (float module should be fully separated from the header).

   NOTE:
   You may need to hold the HEADER DOWN switch for a few seconds to ensure the feeder house is fully lowered.

8. Read voltage.
9. Raise header so cutterbar is 150 mm (6 in.) off the ground.
10. Read voltage.
11. If the sensor voltage is not within the low and high limits, or if the range between the low and high limits is insufficient, adjust the voltage limits. Refer to *Adjusting Voltage Limits: One-Sensor System, page 147* or *Adjusting Voltage Limits: Two-Sensor System, page 149*.

Figure 6.54: Challenger Combine Display

Engaging the Auto Header Height Control (Challenger and Massey Ferguson)

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

The following system components are required in order for the auto header height control (AHHC) to work:

- Main module (PCB board) and header driver module (PCB board) mounted in card box in fuse panel module (FP)
- Multi-function control handle operator inputs
- Operator inputs mounted in the control console module (CC) panel

NOTE:
In addition to the above components, the electrohydraulic header lift control valve is an integral part of the system.

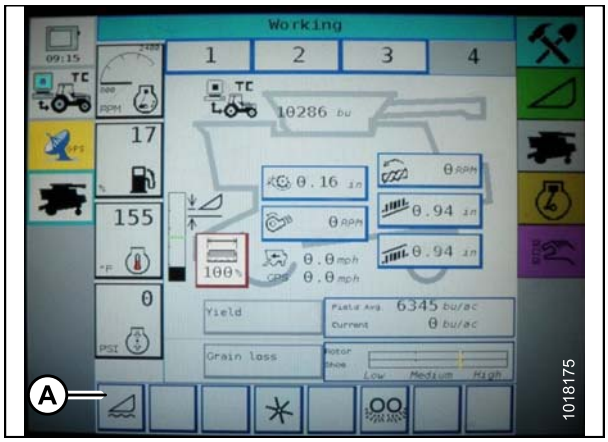


Figure 6.55: Challenger Combine Display

Engage the AHHC as follows:

1. Scroll through the header control options on the combine display using the header control switch until the AHHC icon (A) is displayed in the first message box. The AHHC will adjust the header height in relation to the ground according to the height setting and sensitivity setting.

Calibrating the Auto Header Height Control (Challenger and Massey Ferguson)

NOTE:
For best performance of the auto header height control (AHHC) system, perform these procedures with the center-link set to D. When setup and calibration are complete, adjust the center-link back to desired header angle. Refer to Header Angle in the header operator's manual.

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

1. Ensure center-link is set to D.

2. On the FIELD screen, press the DIAGNOSTICS icon (A). The MISCELLANEOUS screen appears.

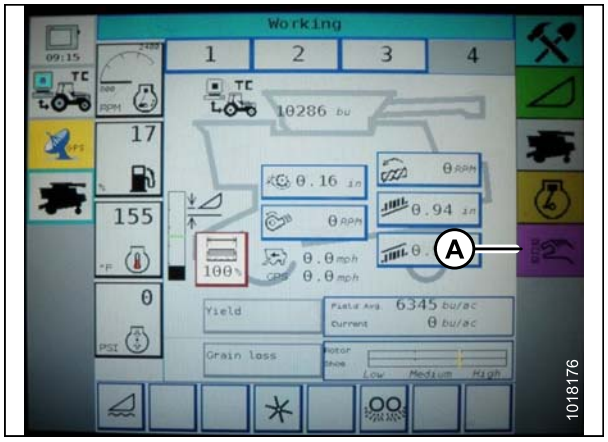


Figure 6.56: Challenger Combine Display

3. Press the CALIBRATIONS button (A). The CALIBRATIONS screen appears.

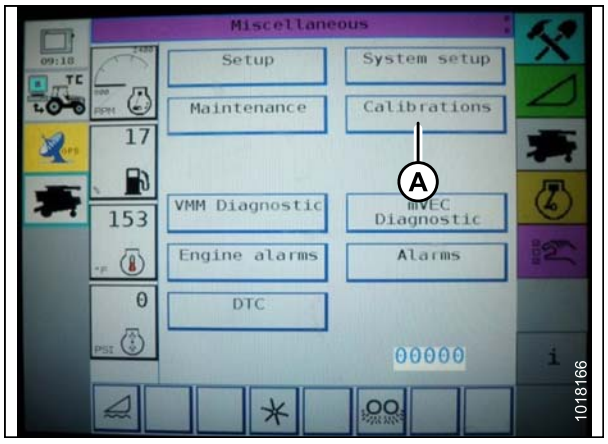


Figure 6.57: Challenger Combine Display

4. Press the HEADER button (A). The HEADER CALIBRATION screen displays a warning.

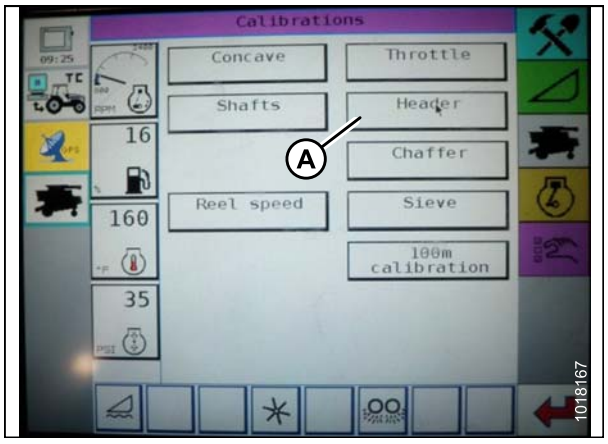


Figure 6.58: Challenger Combine Display

5. Read the warning message, and then press the green check mark button.

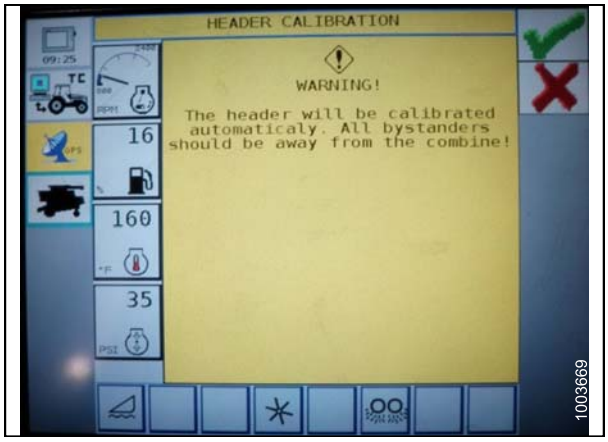


Figure 6.59: Challenger Combine Display

6. Follow the on-screen prompts to complete calibration.

NOTE:
The calibration procedure can be cancelled at anytime by pressing the cancel button in the bottom right corner of the screen. While the header calibration is running, the calibration can also be canceled by using the up, down, tilt right, or tilt left buttons on the control handle.

NOTE:
If the combine does not have header tilt installed or if it is inoperable, you may receive warnings during calibration. Press the green check mark if these warnings appear. This will not affect the AHHC calibration.

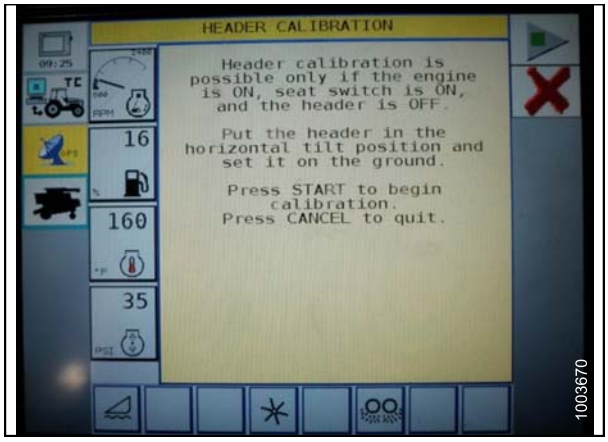


Figure 6.60: Challenger Combine Display

Adjusting the Header Height (Challenger and Massey Ferguson)

Once the auto header height control (AHHC) is activated, press and release the HEADER LOWER button on the control handle. The AHHC will automatically lower the header to the selected height setting.

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

You can adjust the selected AHHC height using the HEIGHT ADJUSTMENT knob (A) on the control console. Turning the knob clockwise increases the selected height, and turning the knob counterclockwise decreases the selected height.

Figure 6.61: Height Adjustment Knob on the Combine Control Console

Adjusting the Header Raise/Lower Rate (Challenger and Massey Ferguson)

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

1. Press the Header icon (A) on the FIELD screen. The HEADER screen displays.

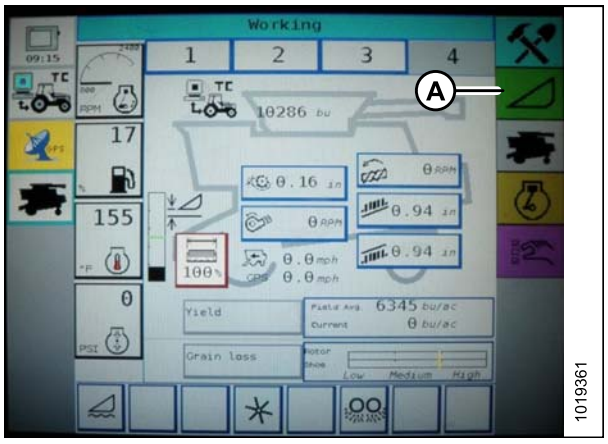


Figure 6.62: Challenger Combine Display

2. Press HEADER CONTROL (A). The HEADER CONTROL screen displays.

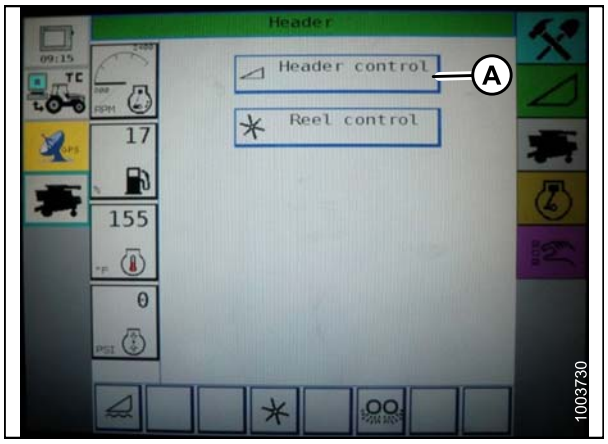


Figure 6.63: Challenger Combine Display

3. Go to the TABLE SETTINGS tab.
4. Press up arrow on MAX UP PWM to increase percentage number and increase raise speed; Press down arrow on MAX UP PWM to decrease percentage number and decrease raise speed.
5. Press up arrow on MAX DOWN PWM to increase percentage number and increase lower speed. Press down arrow on MAX DOWN PWM to decrease percentage number and decrease lower speed.

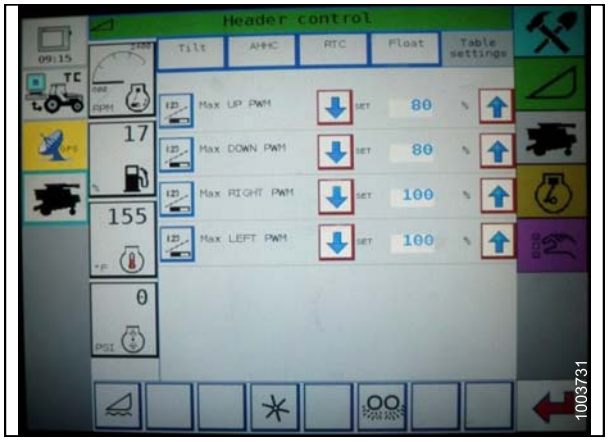


Figure 6.64: Challenger Combine Display

Setting the Sensitivity of the Auto Header Height Control (Challenger and Massey Ferguson)

The sensitivity adjustment controls the distance the cutterbar must travel up or down before the auto header height control (AHHC) reacts and raises or lowers the feeder house. When the sensitivity is set to maximum, only small changes in ground height are needed to cause the feeder house to raise or lower. When the sensitivity is set to minimum, large changes in the ground height are needed to cause the feeder house to raise or lower.

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

1. Press the HEADER icon on the FIELD screen. The HEADER screen appears.
2. Press the HEADER CONTROL button (A). The HEADER CONTROL screen appears. You can adjust sensitivity on this screen using the up and down arrows.

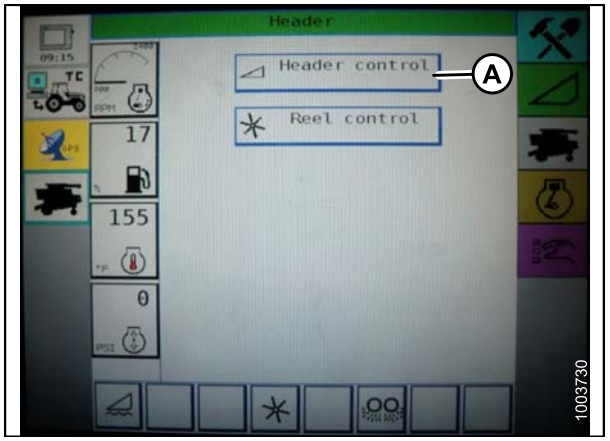


Figure 6.65: Challenger Combine Display

3. Adjust the sensitivity to the maximum setting.
4. Activate the AHHC, and press the HEADER LOWER button on the control handle.
5. Decrease the sensitivity until the feeder house remains steady and does not bounce up and down.

NOTE:
This is the maximum sensitivity and is only an initial setting. The final setting must be made in the field as the system reaction will vary with changing surfaces and operating conditions.

NOTE:
If maximum sensitivity is not needed, a less sensitive setting will reduce the frequency of header height corrections and component wear. Partially opening the accumulator valve will cushion the action of the header lift cylinders and reduce header hunting.

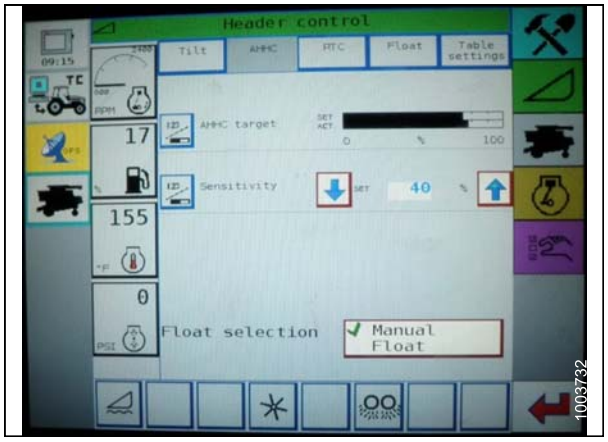


Figure 6.66: Challenger Combine Display

6.1.5 Gleaner R65/R66/R75/R76 and S Series Combines

Checking Voltage Range from the Combine Cab (Gleaner R65/R66/R75/R76 and Pre-2016 S Series)

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

1. Position the header 150 mm (6 in.) above the ground, and unlock the float module float.
2. Check that float lock linkage is on down stops (washer [A] cannot be moved) at both locations.

   NOTE:
   If the header is not on down stops during the next two steps, the voltage may go out of range during operation causing a malfunction of the AHHC system.

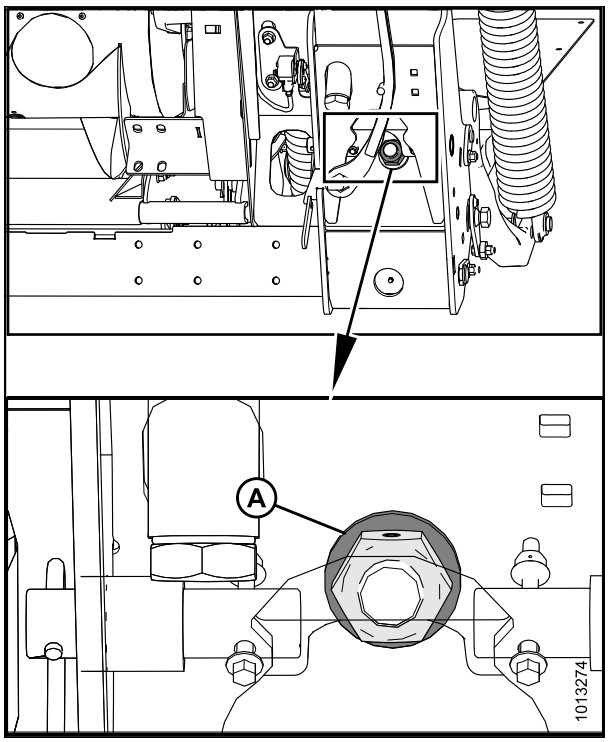


Figure 6.67: Float Lock

3. Ensure pointer (A) on the float indicator box is on 0. If necessary, adjust the cable take-up bracket (B) until pointer is on 0.

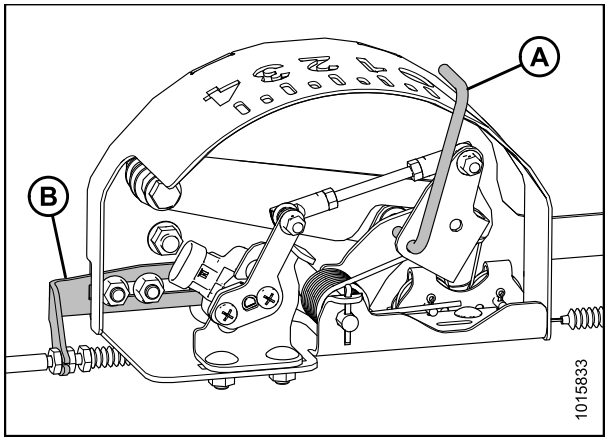


Figure 6.68: Float Indicator Box

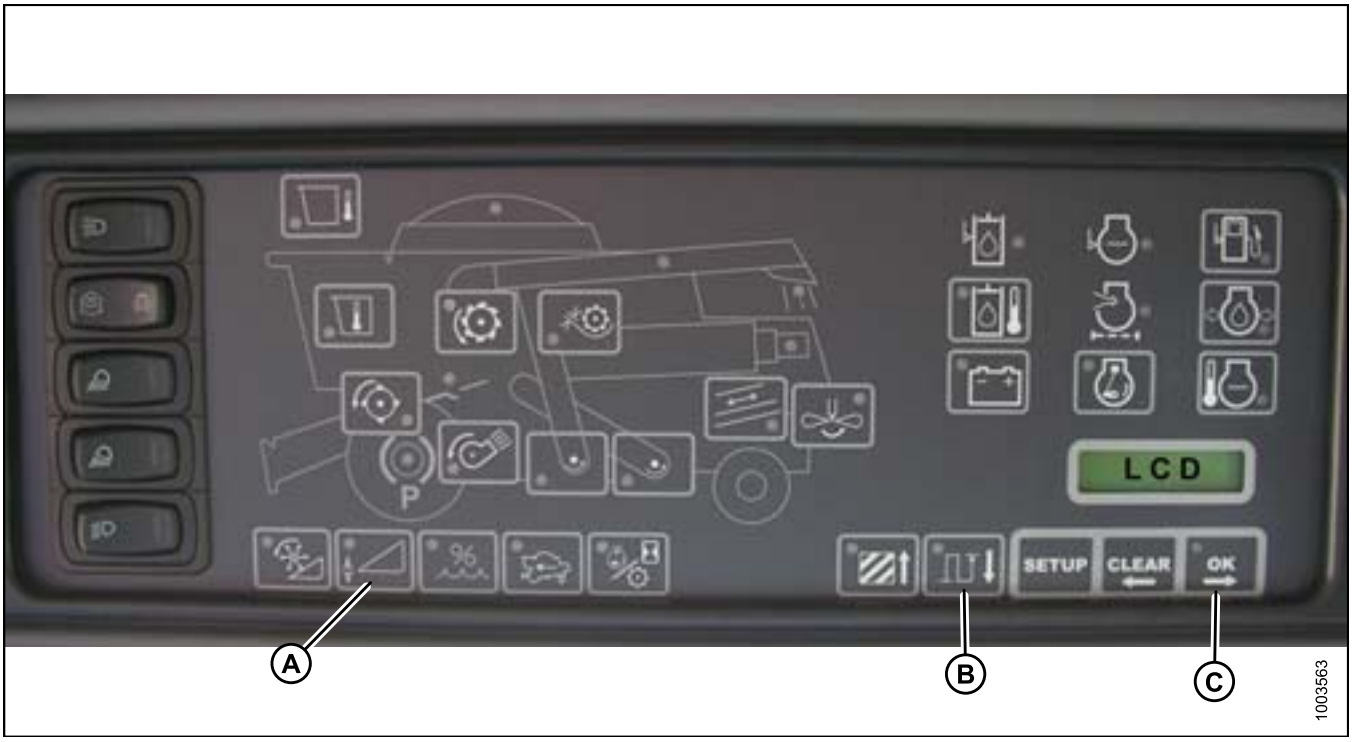


Figure 6.69: Combine Heads–Up Display

4. Ensure header float is unlocked.
5. Press and hold button (A) on the heads-up display for 3 seconds to enter diagnostic mode.
6. Scroll down using button (B) until LEFT is displayed on the LCD screen.
7. Press the OK button (C). The number indicated on the LCD screen is the voltage reading from the sensor of the AHHC. Raise and lower the header to see the full range of voltage readings.

Engaging the Auto Header Height Control (Gleaner R65/R66/R75/R76 and Pre-2016 S Series)

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

The following system components are required in order for the auto header height control (AHHC) to work:

- Main module (PCB board) and header driver module (PCB board) mounted in card box in fuse pane module (FP).
- Multi-Function Control Handle operator inputs.
- Operator inputs mounted in the control console module (CC) panel.

NOTE:
In addition to the above components, the electrohydraulic header lift control valve also is an integral part of the system.

Figure 6.70: Combine Auto Header Height Controls

1. Press the AUTO MODE (A) button until the AHHC LED light (B) begins flashing. If the RTC light is flashing, press the AUTO MODE (A) button again until it switches to AHHC.
2. Briefly press button (A) on the control handle. The AHHC light should change from flashing to solid. The header also should drop toward the ground. The AHHC is now engaged and can be adjusted for height and sensitivity.
3. Use controls to adjust height and sensitivity to changing ground conditions such as shallow gullies and field drainage trenches.

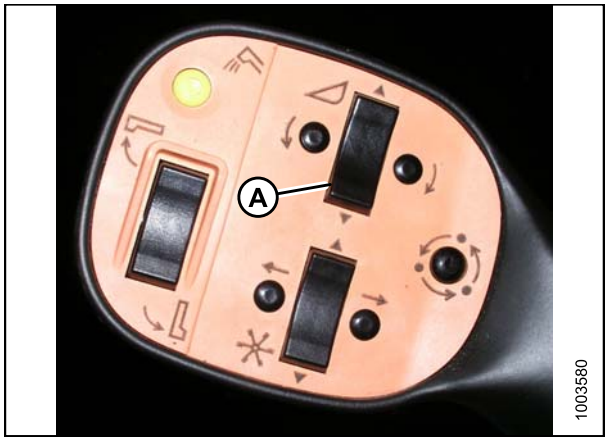


Figure 6.71: Control Handle

Calibrating the Auto Header Height Control (Gleaner R65/R66/R75/R76 and Pre-2016 S Series)

Calibration should be done on flat, level ground without the header clutches engaged. Header height and header tilt must not be in auto or standby modes. The engine rpm must be above 2000 rpm. The header tilt option on 2004 and earlier model combines does not work with MacDon headers. This system will have to be removed and disabled in order to calibrate the auto header height control (AHHC). Refer to combine manual for instructions.

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

Figure 6.72: Combine Auto Header Height Controls

A - AUTO MODE Button
B - AHHC Light
C - CAL1 Button
D - Raise Header
E - Lower Header
F - AUTO Mode
G - CAL2 Button

NOTE:
For best performance of the auto header height control (AHHC), perform these procedures with the center-link set to D. When setup and calibration are complete, adjust the center-link back to desired header angle. Refer to Header Angle in the header operator's manual for instructions.

1. Ensure center-link is set to D.
2. Press AUTO MODE button (A) until the AHHC light (B) is illuminated.
3. Press and hold CAL1 button (C) until you see the following lights flash: raise header (D), lower header (E), tilt auto mode (F), and AHHC (B).
4. Fully lower the header, and continue to hold the HEADER LOWER button for 5–8 seconds to ensure float module has separated from header.

5. Press CAL2 button (G) until lower header light (E) stops flashing, and release it when the raise header light (D) begins flashing.
6. Raise header to its maximum height (ensure the header is resting on the down-stop pads).
7. Press CAL2 button (G) until the raise header light (D) turns off.

   NOTE:
   The following steps are applicable only to 2005 and newer combines with the Smartrac feeder house.

8. Wait for the HEADER TILT LEFT light (not shown) to start flashing, and then tilt header to the maximum left position.
9. Press CAL2 button (G) until the HEADER TILT LEFT light (not shown) stops flashing, and release button when the HEADER TILT RIGHT light (not shown) begins flashing.
10. Tilt the header to the maximum right position.
11. Press CAL2 button (G) until all of the following lights flash: raise header (D), lower header (E), height auto mode (A), right header and left header (not shown), and tilt auto mode (F).
12. Center the header.
13. Press CAL1 button (C) to exit calibration and save all values to the memory. All lights should stop flashing.

Turning off the Accumulator (Gleaner R65/R66/R75/R76 and Pre-2016 S Series)

The accumulator will affect the combine's reaction time and greatly inhibit the auto header height control's performance.

Refer to the combine operator's manual for proper procedure when turning accumulator off and on. For best performance, turn the feeder house accumulator off.

NOTE:
The accumulator is located in front of the front left axle beam.

Figure 6.73: Combine Accumulator On/Off Switch

A - Accumulator Lever (Off Position)

Adjusting the Header Raise/Lower Rate (Gleaner R65/R66/R75/R76 and Pre-2016 S Series)

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

The auto header height control (AHHC) system's stability is affected by hydraulic flow rates. Ensure that the header raise (A) and header lower (B) adjustable restrictors in the hydraulic valve block are adjusted so that it takes approximately 6 seconds to raise the header from ground level to maximum height (hydraulic cylinders fully extended), and approximately 6 seconds to lower the header from maximum height to ground level.

If there is too much header movement (for example, hunting) when the header is on the ground, adjust the lower rate to a slower rate of drop: 7 or 8 seconds.

NOTE:
Make this adjustment with the hydraulic system at normal operating temperature (54.4°C [130°F]) and the engine running at full throttle.

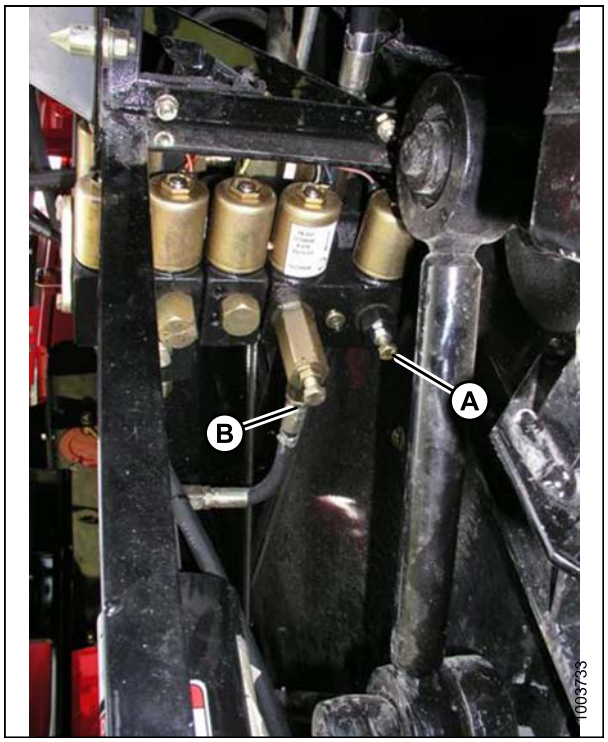


Figure 6.74: Header Raise and Lower Adjustable Restrictors

Adjusting Ground Pressure (Gleaner R65/R66/R75/R76 and Pre-2016 S Series)

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

To adjust header height, ensure the header is in auto header height control (AHHC) mode. This is indicated by the AUTO MODE LED light (A) displaying a continuous, solid light. The header will lower to the height (ground pressure) corresponding to the position selected with the height control knob (B).

Turn the knob counterclockwise for minimum ground pressure, and clockwise for maximum ground pressure.

Figure 6.75: AHHC Console

NOTE:
The indicator reading with the header off the ground (152 mm [6 in.]) should be at 0 (B). If not, refer to Step *3., page 143*. Ground and crop conditions will dictate what number you will need to be set at. A reading at 1 (A) is set to light and 4 is set to heavy. The ideal setting is as light as possible without bouncing or missing crop. Operating with heavier pressures can wear the cutterbar wearplate prematurely.

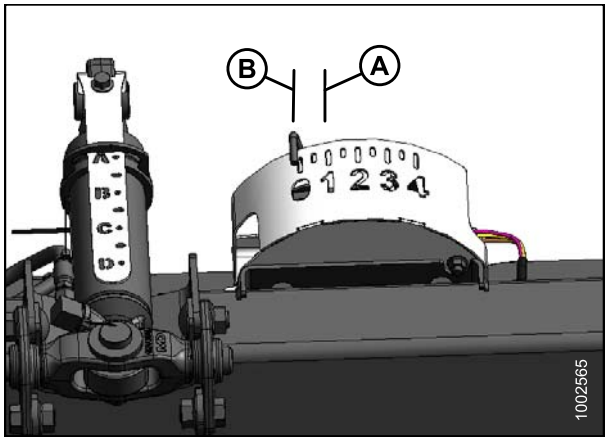


Figure 6.76: Float Indicator Box

Adjusting the Sensitivity of the Auto Header Height Control (AHHC) (Gleaner R65/R66/R75/R76 and Pre-2016 S Series)

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

Figure 6.77: Auto Header Height Control Console

The SENSITIVITY ADJUSTMENT dial (A) controls the distance the cutterbar must travel up or down before the AHHC reacts and raises or lowers the feeder house.

When the SENSITIVITY ADJUSTMENT dial (A) is set to maximum (turned completely clockwise), only small changes in ground height are needed to cause the feeder house to raise or lower. In this position, the cutterbar moves up and down approximately 19 mm (3/4 in.) before the control module signals the hydraulic control valve to raise or lower the header frame.

When the SENSITIVITY ADJUSTMENT dial (A) is set to minimum (turned completely counterclockwise), large changes in ground height are needed to cause the feeder house to raise or lower. In this position, the cutterbar moves up and down approximately 51 mm (2 in.) before the control module signals the hydraulic control valve to raise or lower the header frame.

The HEADER SENSE LINE input also changes the range of the sensitivity. When connected to a draper, the counterclockwise position (least sensitive) allows for approximately 102 mm (4 in.) of vertical travel before correction is made.

Troubleshooting Alarms and Diagnostic Faults (Gleaner R65/R66/R75/R76 and Pre-2016 S Series)

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

Display type:

Displayed on tachometer (A) as XX or XXX.

Figure 6.78: Tachometer

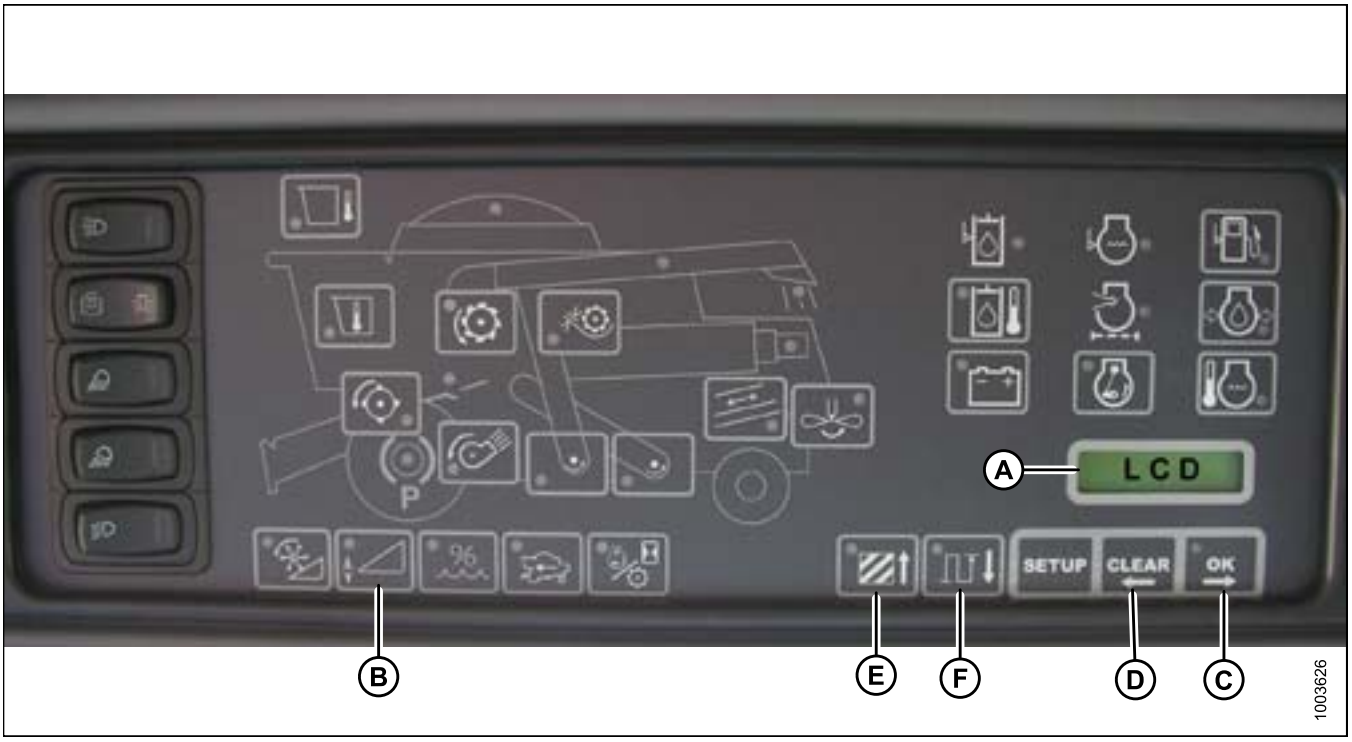


Figure 6.79: Combine Heads–Up Display

NOTE:
Displayed on LCD (A) as XX in. or XXX cm.

Alarm conditions:

If an error message is received from the fuse panel, an audible alarm sounds. The LCD on the electronic instrument panel (EIP) indicates the header system in error as HDR CTRL followed by HGT ERR for height, and HDR CTRL followed by TILT ERR for tilt. The header height LED flashes yellow two times every second.

The alarm also is noted by the buzzer sounding five times every 10 seconds.

When an alarm condition occurs, a green LED flashes on and off (green, yellow, or red depending on the input). In addition, a message is displayed on the LCD to identify the nature of the alarm. For example, HYD TEMP, OPEN, SHRT will be flashed alternately.

Diagnostic fault failures: Refer to Figure *6.79: Combine Heads–Up Display, page 181*.

Pressing the header height switch (B) for a minimum of 5 seconds will put the EIP in header diagnostic mode. The LCD (shown on previous screen) will display the message HDR DIAG when the EIP has entered header diagnostic mode.

In this mode, after 3 seconds, header fault parameter labels are displayed on the EIP LCD. All the information displayed is read-only.

The OK (C) and CLEAR (D) buttons allow you to scroll through the list of parameters. If there are no active fault codes, the EIP LCD will display NO CODE.

When a parameter is displayed, its label is displayed for 3 seconds, after which its value is automatically displayed.

Pressing the OK button (C) while the value is displayed will advance to the next parameter and display its label.

When a parameter label is displayed and the OK button (C) is pressed before 3 seconds, the parameter's value will be displayed.

Pressing AREA (E) will cycle through the options. When LEFT is displayed on the LCD, press the OK button (C), and the auto header height control (AHHC) voltage will be shown on the display.

Press the DIST button (F) to cycle back through the table.

Press the CLEAR button (D) to exit header diagnostics and return to normal mode.

Refer to *6.1.14 Sensor Operation, page 259*.

6.1.6 Gleaner S9 Series Combines

Setting up the Header (Gleaner S9 Series)

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

The AGCO Tyton terminal (A) is used to set up and manage a MacDon draper header on a Gleaner S9 combine. Use the touch screen display to select the desired item on the screen.

Figure 6.80: Gleaner S9

A - Tyton Terminal **B - Hydro Handle / Ground Speed Lever**
C - Throttle Lever **D - Header Control Cluster**

1. On the top right quadrant of the home screen, touch the COMBINE icon (A). The COMBINE MAIN MENU opens.

Figure 6.81: Combine Icon on Home Page

2. On the COMBINE MAIN MENU, touch HEADER SETTINGS (A). The HEADER SETTINGS screen opens.

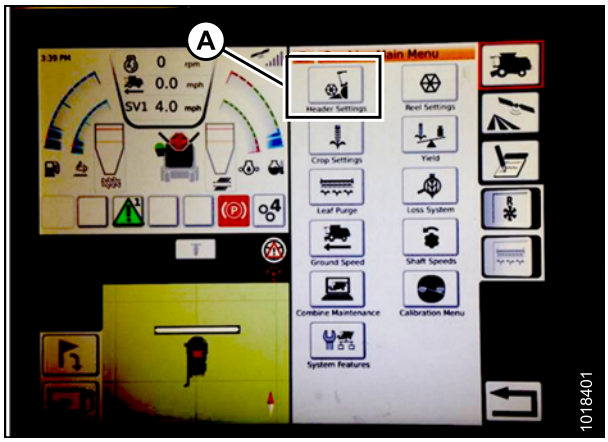


Figure 6.82: Header Settings in Combine Main Menu

3. Touch the HEADER CONFIGURATION field (A). A screen showing predefined headers opens.
   - If your MacDon header is already set up, it appears on the header list. Touch the MacDon header title (B) to highlight the selection in blue, and then touch the green check mark (E) to continue.
   - If only the default header (D) is shown, touch the ABC button (C), and use the on-screen keyboard to enter the MacDon header information. When complete, select one of the following options to return to the HEADER SETTINGS screen:
     – The green check mark (E) saves the settings
     – The garbage can icon (F) deletes the highlighted header from the list
     – The red X (G) cancels the change(s)

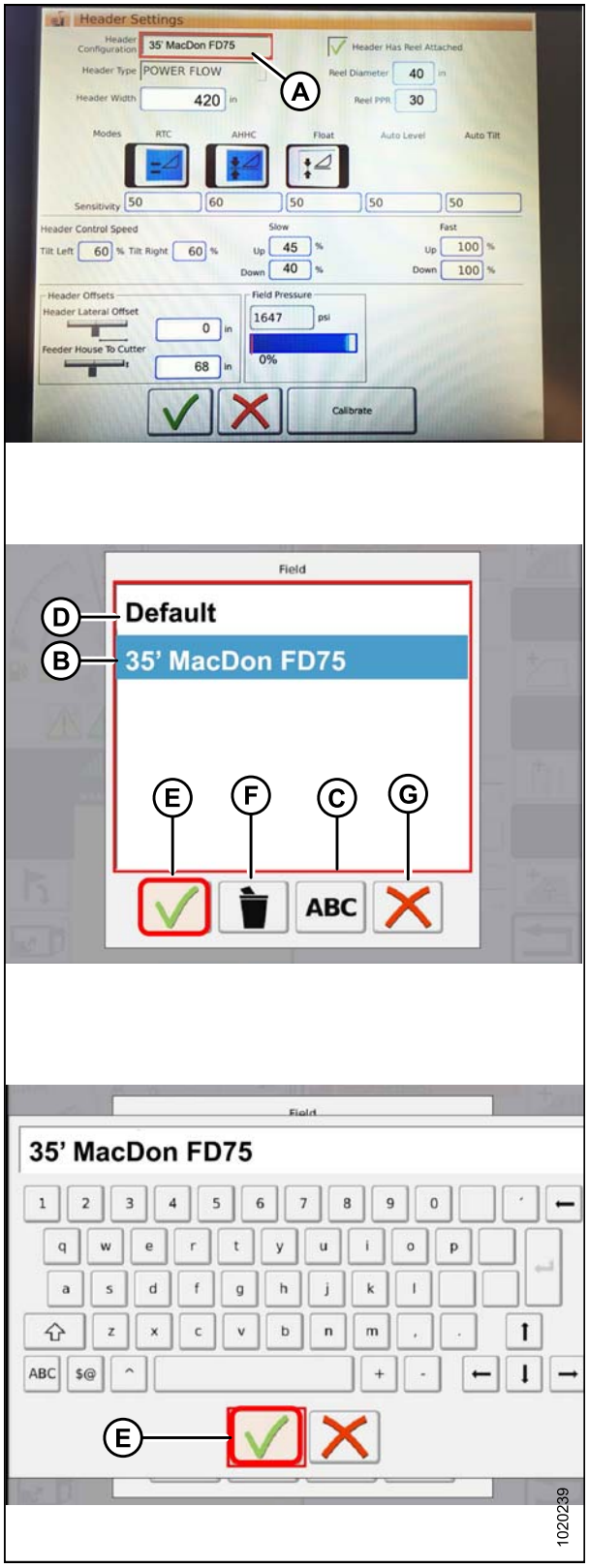


Figure 6.83: Header Configuration Menu on Header Settings Page

4. To specify the type of header installed on the machine, touch the HEADER TYPE field (A).

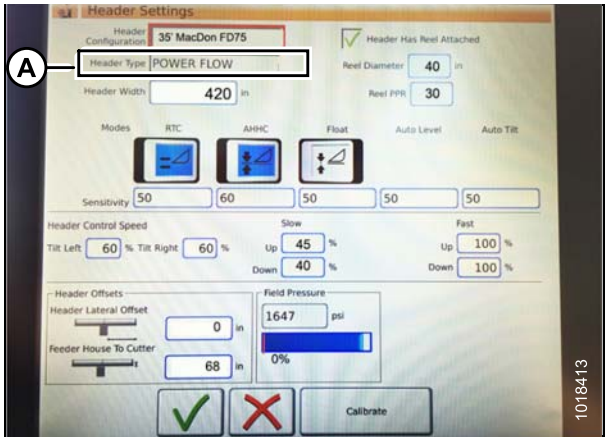


Figure 6.84: Header Settings

5. A list of predefined header types appears.
   - For MacDon D1 Series Draper and FD1 Series FlexDraper headers, touch POWER FLOW (A)
   - Touch the green check mark (B) to save the selection and continue

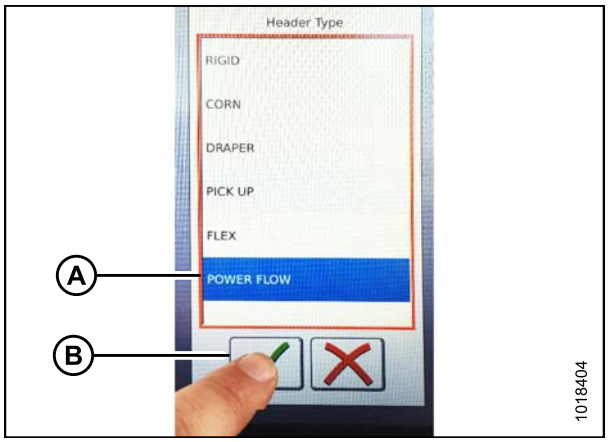


Figure 6.85: Header Type

6. Make sure that the HEADER HAS REEL ATTACHED check box (A) is checked.

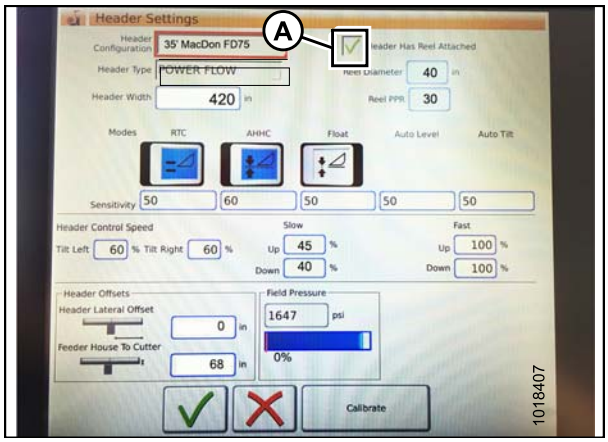


Figure 6.86: Header Settings

7. Touch the REEL DIAMETER field (A) and a numeric keypad displays. Enter **40** for a MacDon reel.
8. Touch the REEL PPR (Pulses Per Revolution) field (B) and enter **30** as the value for your MacDon header. (PPR is determined by the number of teeth on the reel speed sprocket).

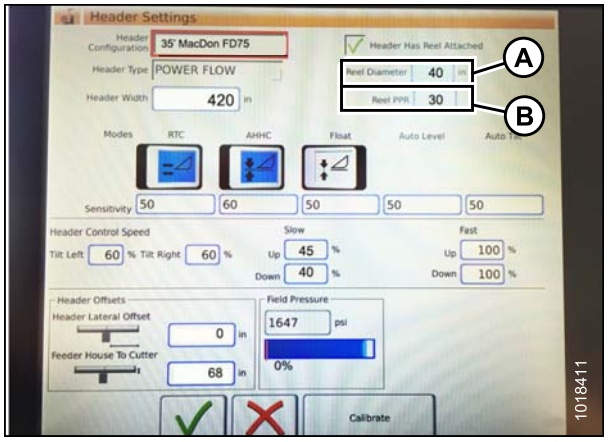


Figure 6.87: Header Settings

9. Touch the green check mark (B) at the bottom of the numeric keypad (A) when complete, or the red X to cancel.

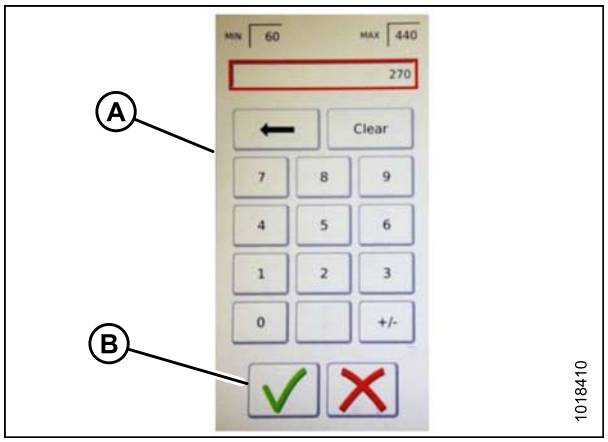


Figure 6.88: Numeric Keypad

10. When complete, touch the green check mark (A) at the bottom of the HEADER SETTINGS screen.

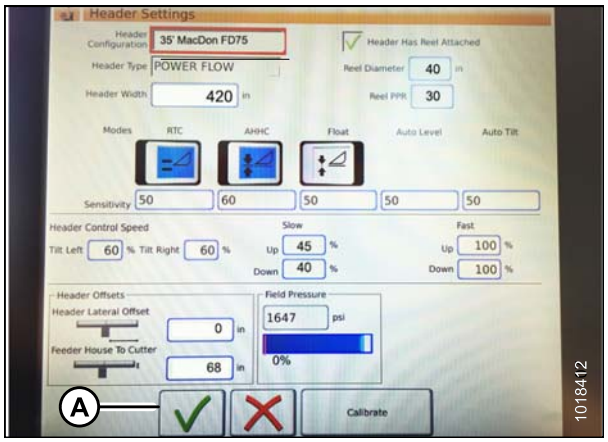


Figure 6.89: Header Settings Page

Setting up Reel Settings (Gleaner S9 Series)

⚠ CAUTION

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

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

1. From the COMBINE MAIN MENU, touch REEL SETTINGS (A) to open the REEL SETTINGS screen.

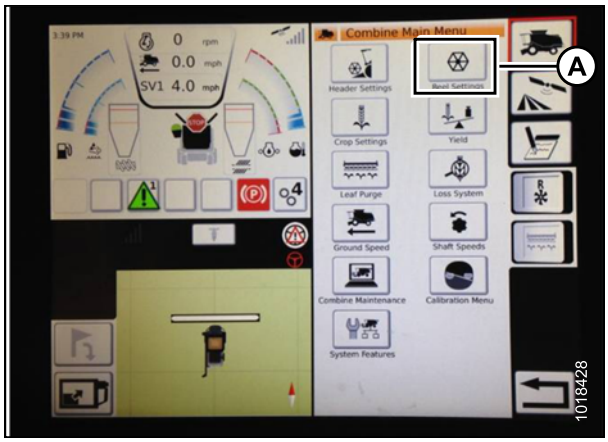


Figure 6.90: Reel Settings on Combine Main Menu

2. To set minimum reel speed, touch the SPEED MINIMUM FIELD (B). The on-screen keyboard displays. Enter the desired value. Touch the green check mark to accept the new value, or the red X to cancel. The reel speed (in mph) and rpm are shown.

   NOTE:
   At the bottom of the REEL SETTINGS screen, the reel diameter and reel pulses per revolution (PPR) are displayed. These values have already been set in the HEADER SETTINGS screen.

3. Reel speed is calibrated in the REEL SETTINGS screen by touching the CALIBRATE button (A) in the top right of the screen.

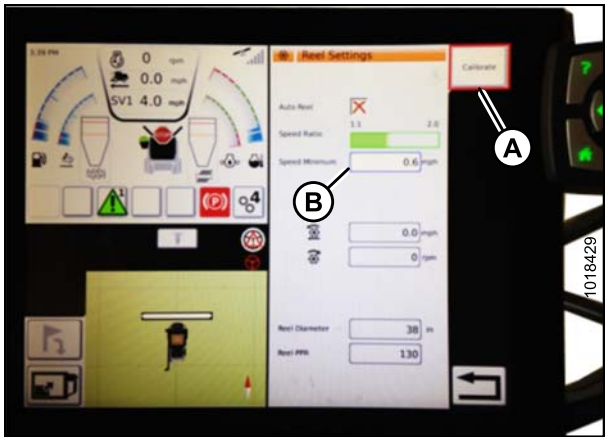


Figure 6.91: Reel Settings Calibration

4. The CALIBRATION WIZARD opens and displays a hazard message warning screen.

5. Make sure to meet all the conditions listed on the CALIBRATION WIZARD warning screen. Press the green check mark to accept and start reel calibration. Pressing the red X will cancel the calibration procedure.

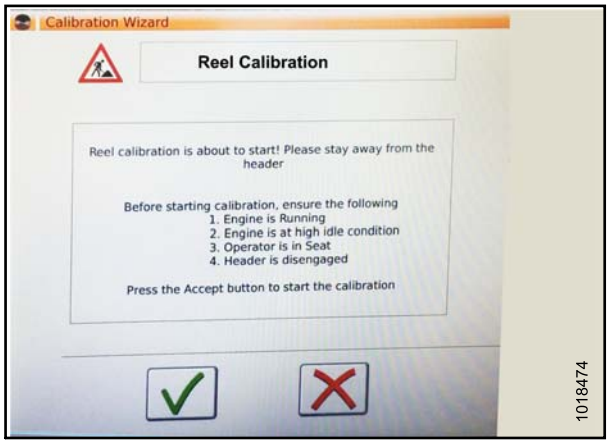


Figure 6.92: Calibration Wizard

6. An informational message appears in the CALIBRATION WIZARD that reel calibration has started. The reel will begin turning slowly and increase to high speed. A progress bar is provided. If necessary, touch the red X to cancel. Otherwise, wait for the message that reel calibration has completed successfully. Touch the green check mark to save the calibrated settings.

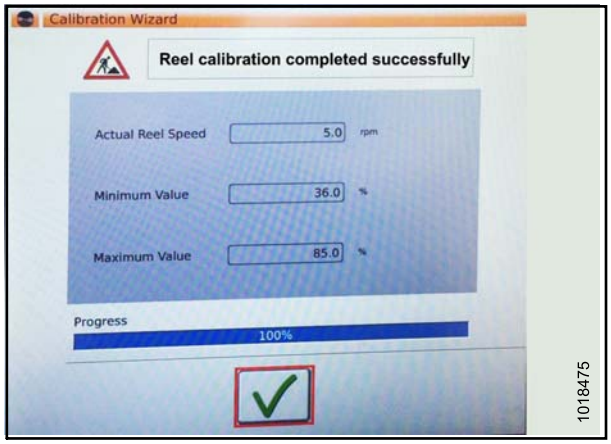


Figure 6.93: Calibration Progress

Setting up Automatic Header Controls (Gleaner S9 Series)

Automatic header functions are configured on the HEADER SETTINGS screen.

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

1. **Automatic Control Functions:** There are toggle (OFF/ON) switches on the HEADER SETTINGS screen for the automatic control functions. For MacDon headers, ensure the following two functions are enabled as shown:
   - RTC (return to cut) (A)
   - AHHC (automatic header height control) (B)

   All other switches are disabled (not highlighted).
2. The **Sensitivity** setting (C) controls how responsive a control (RTC or AHHC) is to a given change in sensor feedback. The setting fields are located directly below the toggle switches. To enter a new sensitivity setting, touch the setting field below the specific toggle switch, and enter the new value in the on-screen keyboard.
   - Increase sensitivity if the combine does not change the feeder position quickly enough when in Auto Mode.
   - Decrease sensitivity if the combine hunts for a position in Auto Mode.

   NOTE:
   Recommended sensitivity starting points for MacDon headers are:
   - **50** for RTC (A)
   - **60** for AHHC (B)

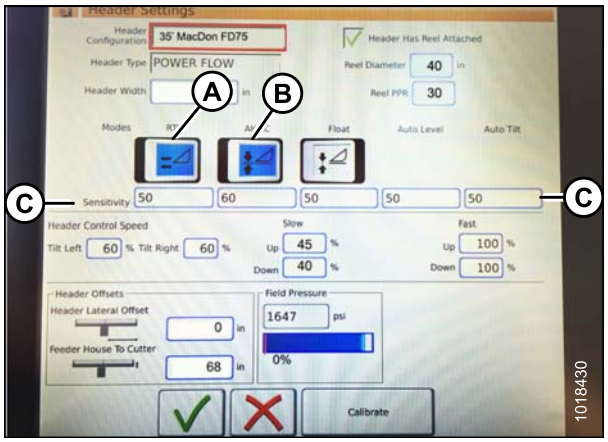


Figure 6.94: Automatic Controls and Sensitivity Settings

3. **Header Speed:** The HEADER CONTROL SPEED area (A) on the HEADER SETTINGS screen is used to adjust the following speeds:

   - Tilt left and right is the lateral tilt of the combine faceplate
   - Header up and down (slow and fast speeds) is a two-stage button with slow speed on the first detent and fast on the second

   NOTE:
   Recommended header control speed starting points

   - Slow: 45 up / 40 down
   - Fast: 100 up / 100 down

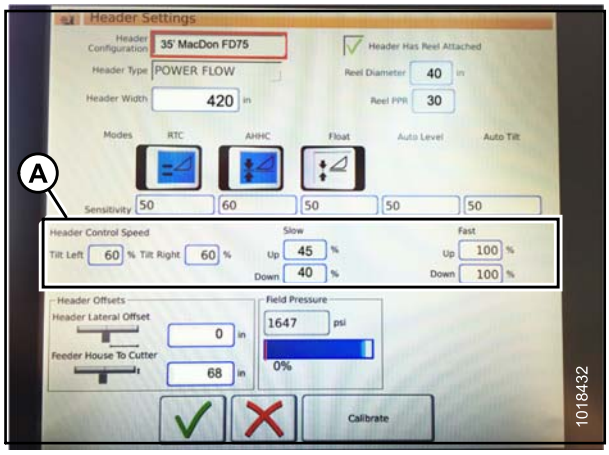


Figure 6.95: Header Speed Control Settings

4. **Header Offsets (A):** Offset distances are important for yield mapping. There are two adjustable dimensions on the HEADER SETTINGS screen:

   - Header Lateral Offset: the distance between the centerline of the header and the centerline of the machine. This should be set at **0** for a MacDon header.
   - Feeder House to Cutter: the distance from the machine interface to the cutterbar. This should be set at **68** for a MacDon header.

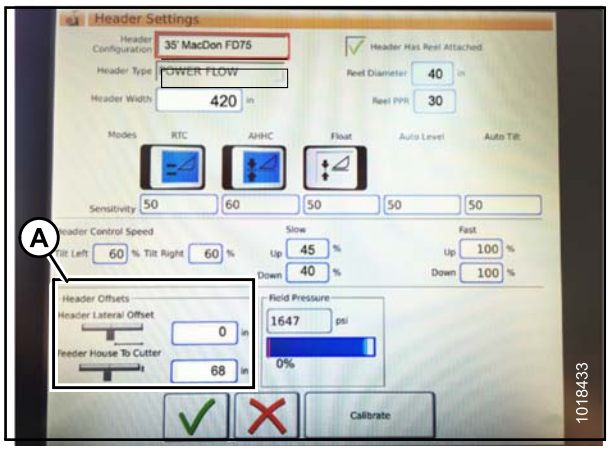


Figure 6.96: Header Offset Settings

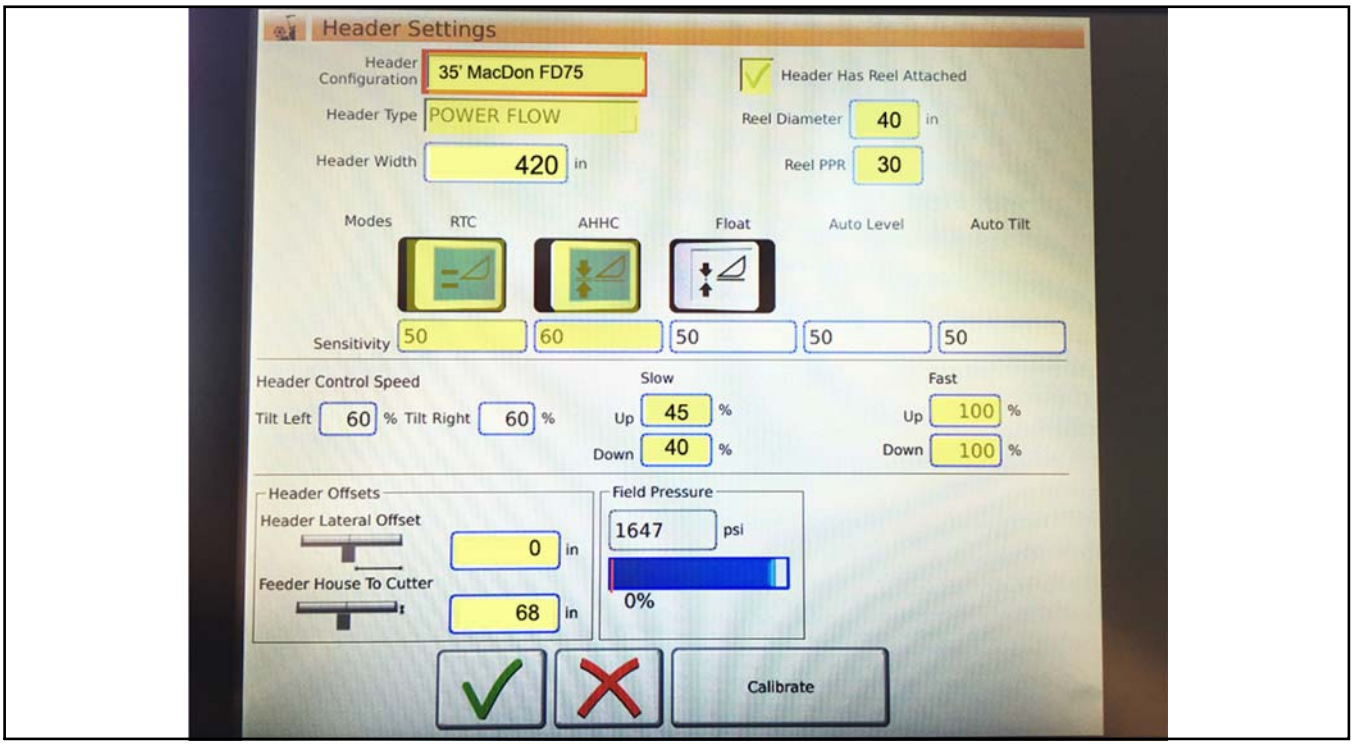


Figure 6.97: MacDon Header Settings Inputs

Calibrating the Header (Gleaner S9 Series)

The auto header control functions are configured on the HEADER SETTINGS screen.

⚠ CAUTION

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

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

1. On the COMBINE MAIN MENU, touch HEADER SETTINGS (A).

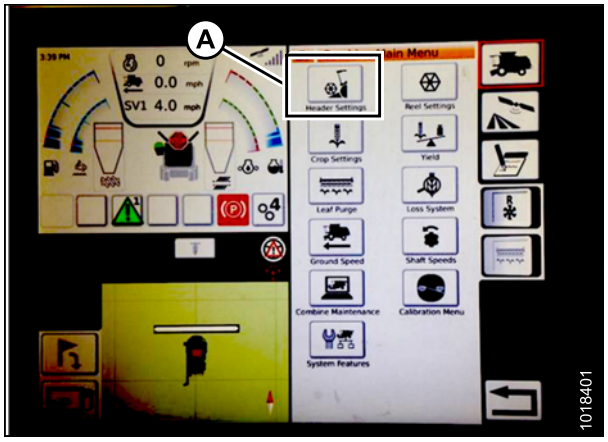


Figure 6.98: Combine Main Menu

2. Touch CALIBRATE (A) at the bottom right of the screen. The HEADER CALIBRATION screen displays.

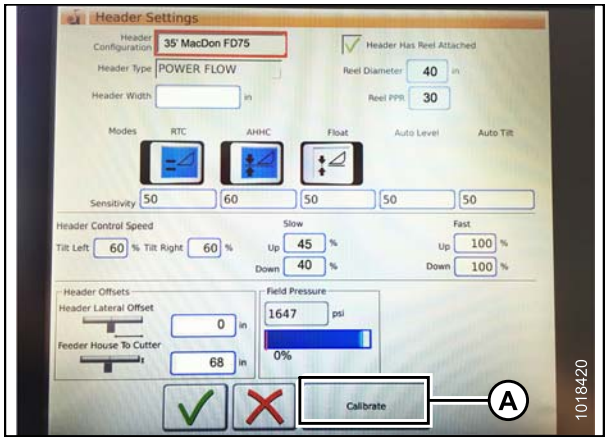


Figure 6.99: Calibration

The right side of the screen shows the Header Calibration information (A). Results are shown for a variety of sensors (B)

- Left and right header sensor (voltage) (values will be the same with MacDon headers)
- Header height sensor (mA)
- Tilt position sensor (mA)

The following valid modes are shown with check marks (C) below the sensor values (B):

- Return to cut
- Automatic header height control

Figure 6.100: Header Calibration Page

CAUTION

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

3. On the ground speed lever (GSL), touch the HEADER DOWN button (A). Sensor values start changing on the HEADER CALIBRATION screen as the header lowers.

   NOTE:
   The header needs to be lowered all the way, and then raised off the ground. The range should be between **0.5 and 4.5 V**. If the value is not in that range, the sensor needs to be adjusted. Refer to *Adjusting Voltage Limits: One-Sensor System, page 147* or *Adjusting Voltage Limits: Two-Sensor System, page 149*.

Figure 6.101: Header Down Switch

4. When the sensor values are stable, touch the CALIBRATE icon (A).

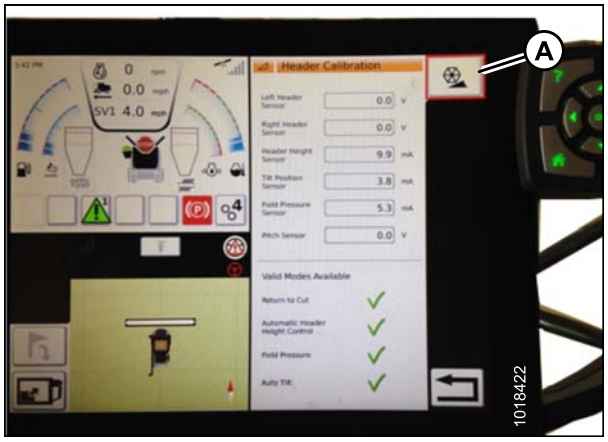


Figure 6.102: Header Calibration

5. The hazard message warning screen for HEADER CALIBRATION appears. Make sure that all conditions are met.
6. Touch the green check mark at the bottom of the screen to start the CALIBRATION WIZARD.

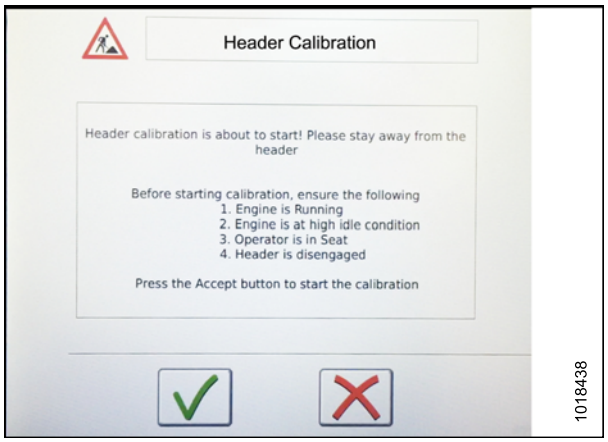


Figure 6.103: Header Calibration Warning

A progress bar is provided and the wizard can be stopped at any time by touching the red X. The header moves automatically and erratically during this process.

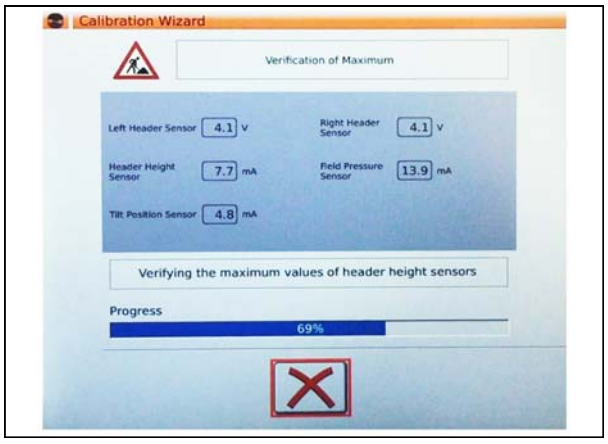


Figure 6.104: Calibration In Progress

7. When the calibration is complete, a message displays, and summary information (A) is shown. Green check marks confirm the functions have been calibrated (B). Touch the bottom green check mark (C) to save.

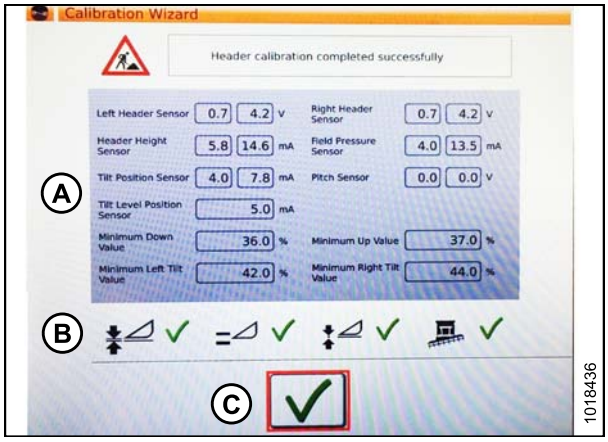


Figure 6.105: Completed Calibration Page

TIP:
Touch the CALIBRATION icon (A) on the COMBINE MAIN MENU screen to open the CALIBRATION MENU where you can choose from a variety of calibrations including header and reel calibration.

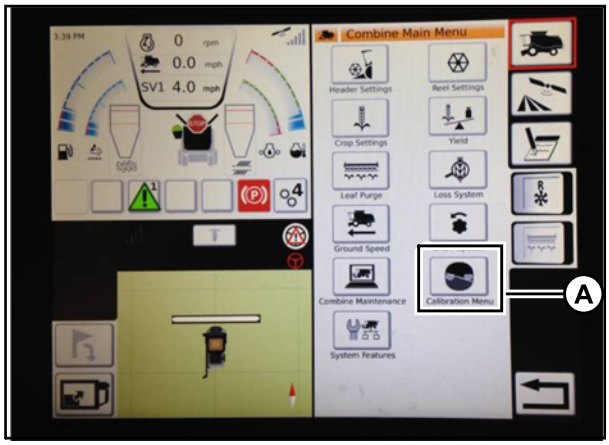


Figure 6.106: Direct Calibration Menu

Operating with a Gleaner S9 Series Combine

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

The following controls are used to operate the auto header height control (AHHC) functions:

- Tyton Terminal (A)
- Hydro Handle / Ground Speed Lever (B)
- Throttle Lever (C)
- Header Control Cluster (D)

Use the combine operator's manual to familiarize yourself with the controls.

Figure 6.107: Gleaner S9

1. With the header running, set lateral tilt switch (A) to MANUAL.
2. Engage the AHHC by pressing the switch (B) upward to the **I** position.

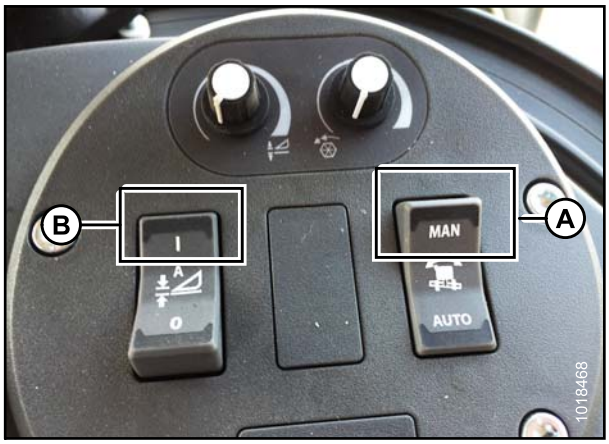


Figure 6.108: Header Control Cluster

3. Press the AHHC control switch (A) on the ground speed lever (GSL) to engage the AHHC. The header moves to the current setpoint position.

Figure 6.109: AHHC on GSL

4. Use the HEADER HEIGHT SETPOINT control dial (A) as necessary to fine-tune the position.

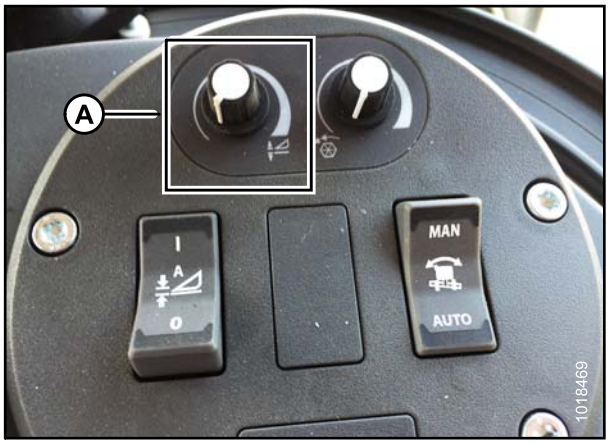


Figure 6.110: Header Control Cluster

Header In-Field Settings

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

1. To view header group settings, touch the HEADER icon (A) on the right side of the home screen.
2. The following information is displayed:
   - Current position of the header (B).
   - Setpoint cut-off position (C) (indicated by red line)
   - HEADER symbol (D) – touch to adjust the setpoint cut-off position using the scroll wheel on the right side of the Tyton terminal.
   - Cut height for the AHHC (E) – fine-tune with the header height setpoint control dial on the header control cluster.
   - Header working width (F)
   - Header pitch (G)
3. Touching a field opens the on-screen keyboard so that values can be adjusted. Enter the new value and touch the green check mark when complete.

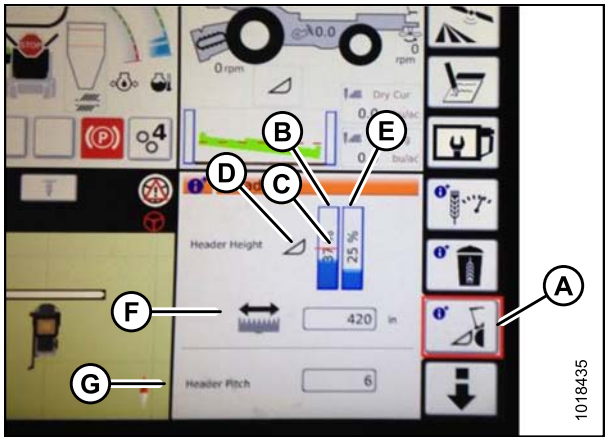


Figure 6.111: Header Groups

NOTE:
The scroll wheel (A) is located on the right side of the Tyton terminal.

Figure 6.112: Scroll Wheel for Adjustments

NOTE:
Header height setpoint control dial (A) is on the header control cluster.

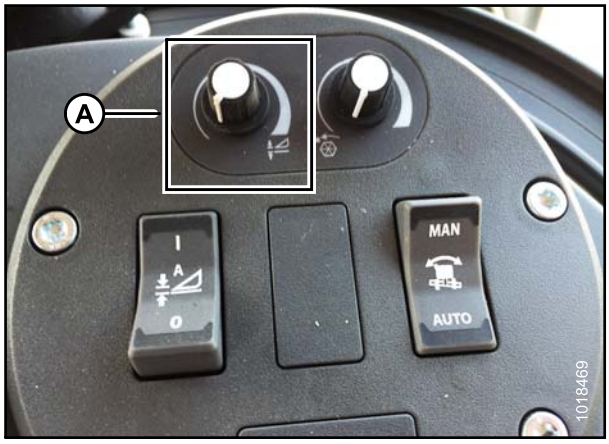


Figure 6.113: Header Control Cluster

6.1.7 John Deere 60 Series Combines

Checking Voltage Range from the Combine Cab (John Deere 60 Series)

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

CAUTION

Check to be sure all bystanders have cleared the area.

1. Position the header 150 mm (6 in.) above the ground, and unlock the float module float.
2. Check that float lock linkage is on down stops (washer [A] cannot be moved) at both locations.

   NOTE:
   If the header is not on down stops during the next two steps, the voltage may go out of range during operation causing a malfunction of the AHHC system.

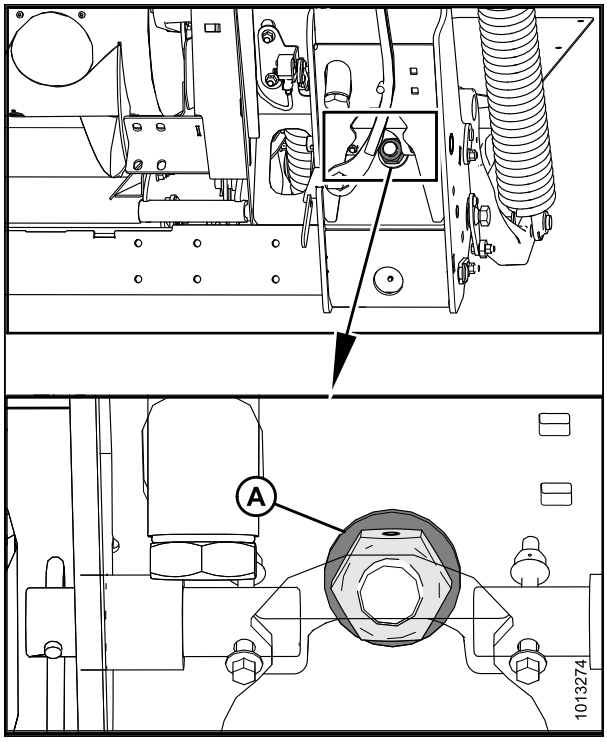


Figure 6.114: Float Lock

3. Adjust the cable take-up bracket (B) (if necessary) until the pointer (A) on the float indicator is on 0.

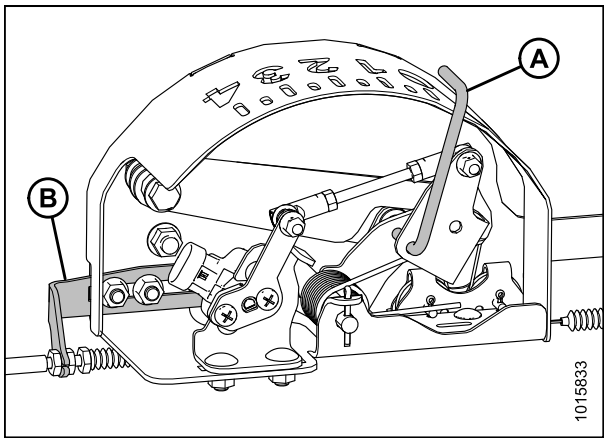


Figure 6.115: Float Indicator box

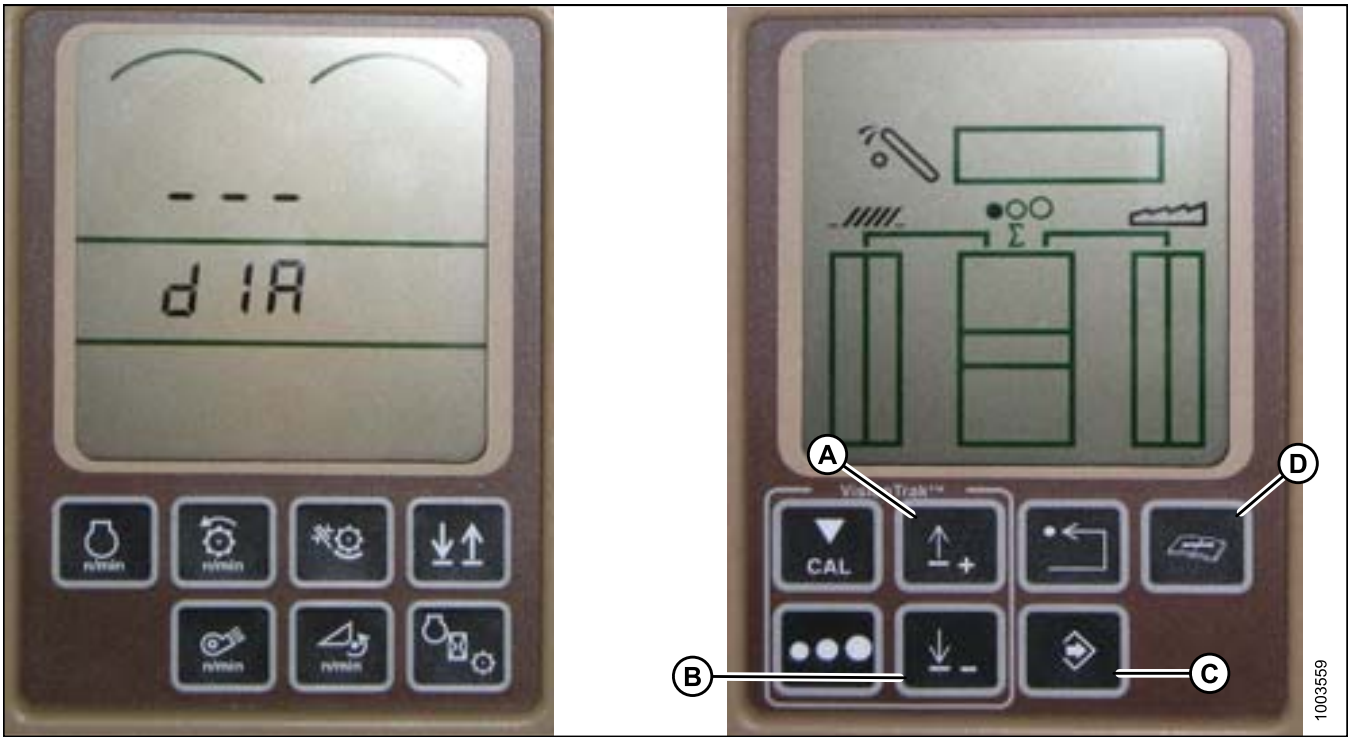


Figure 6.116: John Deere Combine Display

4. Press the DIAGNOSTIC button (D) on the monitor—DIA appears on the monitor.
5. Press the UP button (A) until EO1 appears on the monitor—this is the header adjustments.
6. Press the ENTER button (C).
7. Press the UP (A) or DOWN button (B) until 24 is displayed on the top portion of the monitor—this is the voltage reading for the sensor.
8. Ensure header float is unlocked.
9. Start the combine, and fully lower feeder house to the ground.

   NOTE:
   You may need to hold the HEADER DOWN switch for a few seconds to ensure the feeder house is fully lowered.

10. Check the sensor reading on the monitor. The reading should be above 0.5 volts.
11. Raise the header so it is just off the ground. The reading on the monitor should read below 4.5 volts.
12. If the sensor voltage is not within the low and high limits or if the range between the low and high limits is insufficient, refer to *Adjusting Voltage Limits: One-Sensor System, page 147*.

Calibrating the Auto Header Height Control (John Deere 60 Series)

For best performance of the auto header height control (AHHC), perform these procedures with the center-link set to D. When setup and calibration are complete, adjust the center-link back to desired header angle. Refer to Header Angle in the header operator's manual for instructions.

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

⚠ CAUTION

Check to be sure all bystanders have cleared the area.

1. Ensure center-link is set to D.
2. Rest header on down stops, and unlock float module float.
3. Put wings in locked position.
4. Start the combine.
5. Press the DIAGNOSTIC button (A) on the monitor. DIA appears on the monitor.
6. Press the CAL button (B). DIA-CAL appears on the monitor.

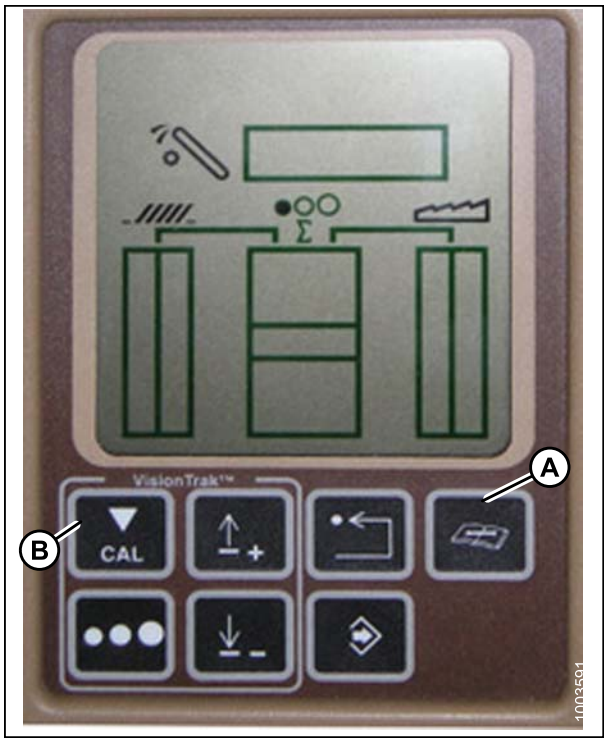


Figure 6.117: John Deere Combine Display

7. Press the UP or DOWN buttons until HDR appears on the monitor.
8. Press the ENTER button. HDR H-DN appears on the monitor.

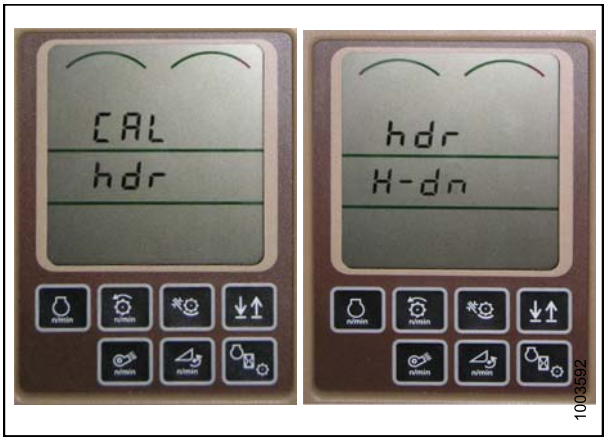


Figure 6.118: John Deere Combine Display

9. Fully lower feeder house to the ground.

NOTE:
You may need to hold the HEADER DOWN switch for a few seconds to ensure the feeder house is fully lowered.

10. Press the CAL button (A) to save the calibration of the header. HDR H-UP appears on the monitor.
11. Raise the header 3 feet off the ground and press the CAL (A) button. EOC appears on the monitor.
12. Press the ENTER button (B) to save the calibration of the header. Your AHHC is now calibrated.

NOTE:
If an error code appears during calibration, the sensor is out of voltage range and will require adjustment. Refer to *Checking Voltage Range from the Combine Cab (John Deere 60 Series), page 196*.

NOTE:
After the calibration is complete, adjust combine operation settings to ensure proper field operation.

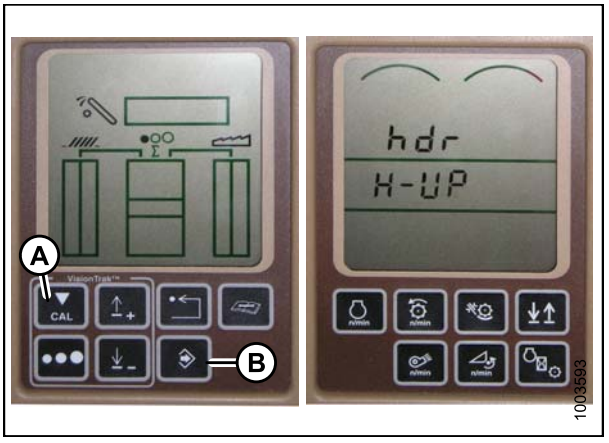


Figure 6.119: John Deere Combine Display

Turning the Accumulator Off (John Deere 60 Series)

The accumulator is a hydraulic device used to cushion the shock of hydraulic fluid when installing a heavy header onto the combine.

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

1. Press the DIAGNOSTIC button (A) on the monitor. DIA appears on the monitor.
2. Press the UP button (B) until EO1 appears on the monitor, and press ENTER (D). This is the header adjustment.
3. Press the UP (B) or DOWN (C) button until 132 is displayed on the top portion of the monitor. This is the reading for the accumulator.
4. Press ENTER (D) to select 132 as the accumulator reading (this will allow you to change the display to a three-digit number so it has a 0 in it, for example, x0x).
5. Press the UP (B) or DOWN (C) button until the desired number is displayed, and press the CAL (E) button.
6. Press ENTER (D) to save the changes. The accumulator is now deactivated.

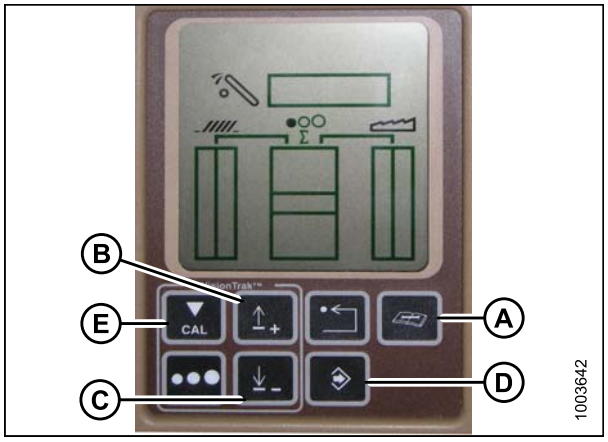


Figure 6.120: John Deere Combine Display

Setting the Sensing Grain Header Height to 50 (John Deere 60 Series)

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

To set the sensing grain header height, follow these steps:

1. Press the DIAGNOSTIC button (A) on the monitor. DIA appears on the monitor.
2. Press the UP button (B) until EO1 appears on the monitor, and press ENTER (D). This is the header adjustment.
3. Press the UP (B) or DOWN (C) button until 128 is displayed on the top portion of the monitor. This is the reading for the sensor.
4. Press ENTER (D) to select 128 as the sensor reading (this will allow you to change the display to a three-digit number so it has a 50 in it).
5. Press the UP (B) or DOWN (C) button until the desired number is displayed, and press the CAL (E) button.
6. Press ENTER (D) to save the changes. The height is now set.

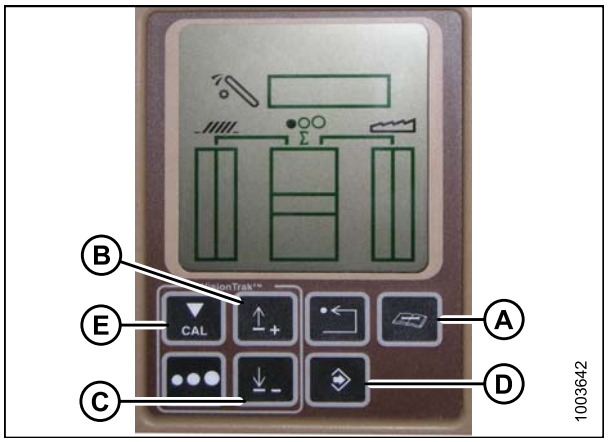


Figure 6.121: John Deere Combine Display

NOTE:
Do **NOT** use the active header float function (A) in combination with the MacDon auto header height control (AHHC)—the two systems will counteract one another. The header symbol (B) on the display should NOT have a wavy line under it and should appear exactly as shown on the Active Header Control Display in Figure *6.122: John Deere Combine Display, page 201*.

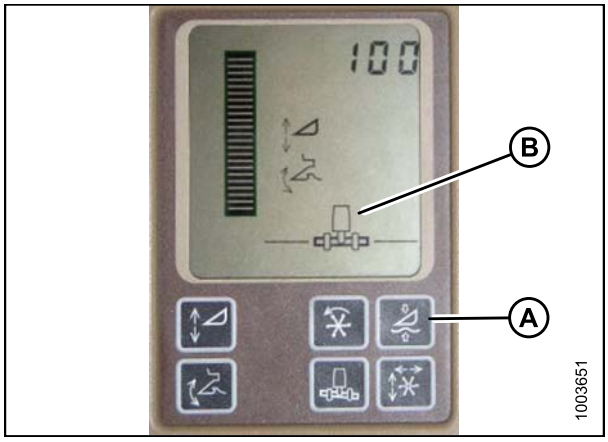


Figure 6.122: John Deere Combine Display

Setting the Sensitivity of the Auto Header Height Control (John Deere 60 Series)

The sensitivity adjustment controls the distance the cutterbar must travel up or down before the auto header height control (AHHC) reacts and raises or lowers the feeder house. When the sensitivity is set to maximum, only small changes in ground height are needed to cause the feeder house to raise or lower. When the sensitivity is set to minimum, large changes in the ground height are needed to cause the feeder house to raise or lower.

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

1. Press the DIAGNOSTIC button (A) on the monitor. DIA appears on the monitor.
2. Press the UP button (B) until EO1 appears on the monitor, and press ENTER (D). This is the header adjustment.
3. Press the UP (B) or DOWN (C) button until 112 is displayed on the monitor. This is your sensitivity setting.

   NOTE:
   The lower the reading, the higher the sensitivity. Ideal operating range is typically between 50 and 80.

4. Press ENTER (D) to select 112 as the sensitivity setting (this will allow you to change the first digit of the number sequence).
5. Press UP (B) or DOWN (C) until the desired number is displayed, then press the CAL (E) button. This will bring you to the second digit. Repeat this procedure until the desired setting is achieved.
6. Press ENTER (D) to save changes.

   NOTE:
   The numbers depicted on the displays in these illustrations are for reference purposes only; they are not intended to represent the specific settings for your equipment.

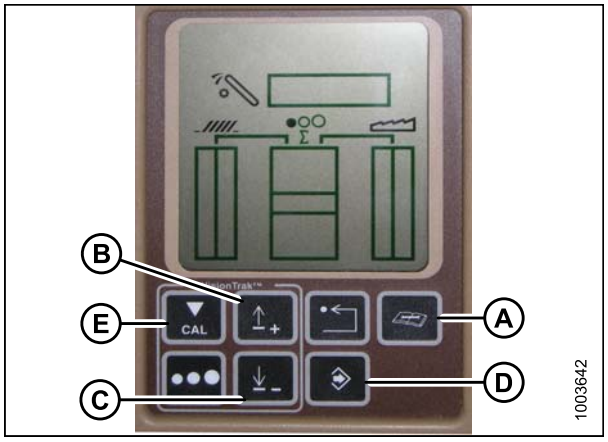


Figure 6.123: John Deere Combine Display

Adjusting the Threshold for the Drop Rate Valve (John Deere 60 Series)

This procedure explains how to adjust the point at which the restrictor valve opens allowing full flow to the lift cylinders.

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

1. Press the DIAGNOSTIC button (A) on the monitor. DIA appears on the monitor.
2. Press the UP button (B) until EO1 appears on the monitor and press ENTER (C). This is the header adjustment.
3. Press the UP (B) or DOWN button until 114 is displayed on the top portion of the monitor. This is the setting that adjusts when the fast drop rate starts with respect to the dead band.

   NOTE:
   The default setting is 100. Ideal operating range is typically between 60 and 85.

4. Press ENTER (C) to select 114 as the fast drop rate (this will allow you to change the first digit of the number sequence).
5. Press UP (B) or DOWN (E) until the desired number is displayed, then press the CAL button (D). This will bring you to the second digit. Repeat this procedure until the desired setting is achieved.
6. Press ENTER (C) to save changes.

   NOTE:
   The numbers depicted on the displays in these illustrations are for reference purposes only; they are not intended to represent the specific settings for your equipment.

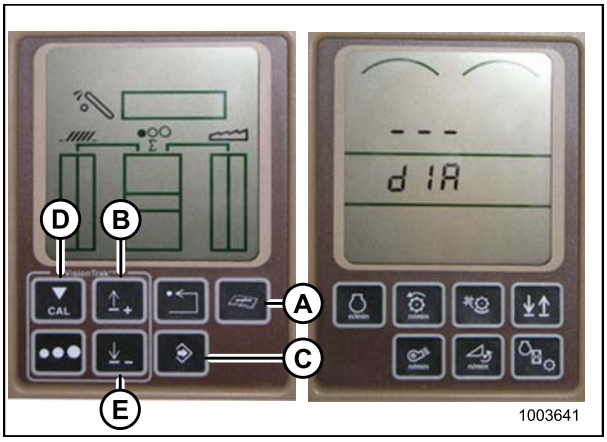


Figure 6.124: John Deere Combine Display

6.1.8 John Deere 70 Series Combines

Checking Voltage Range from the Combine Cab (John Deere 70 Series)

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

CAUTION

Check to be sure all bystanders have cleared the area.

1. Position the header 150 mm (6 in.) above the ground, and unlock the float module float.
2. Check that float lock linkage is on down stops (washer [A] cannot be moved) at both locations.

   NOTE:
   If the header is not on down stops during the next two steps, the voltage may go out of range during operation causing a malfunction of the AHHC system.

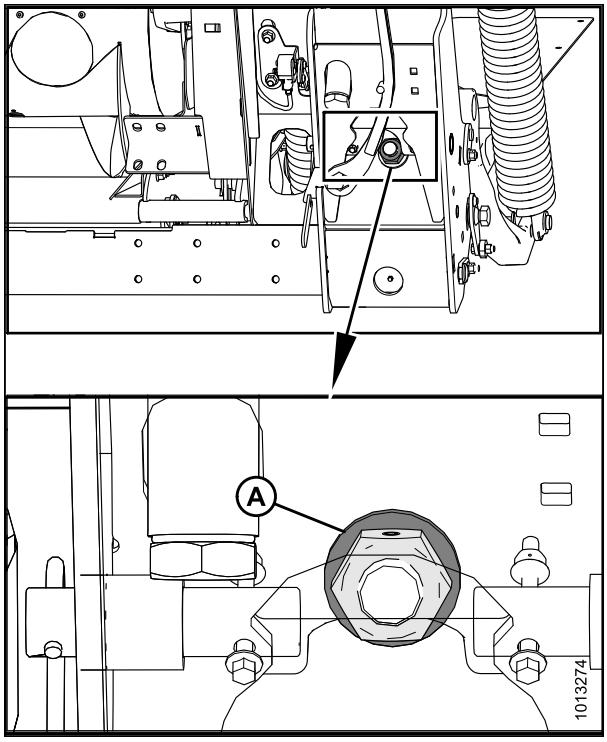


Figure 6.125: Float Lock

3. Adjust the cable take-up bracket (B) (if necessary) until the pointer (A) on the float indicator is on 0.

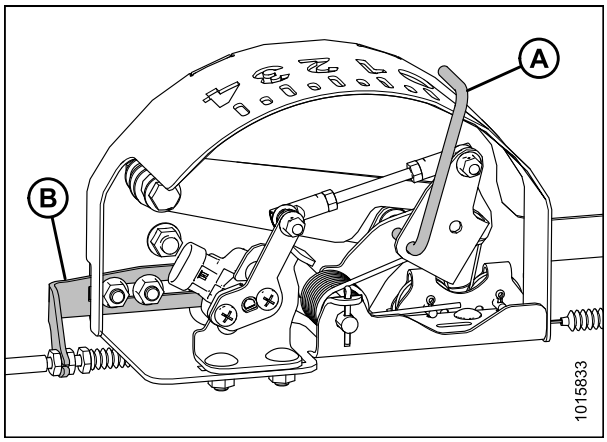


Figure 6.126: Float Indicator box

4. Press the HOME PAGE button (A) on the main screen of the monitor.

Figure 6.127: John Deere Combine Display

5. Ensure the three icons (A) depicted in the illustration at right appear on the monitor.

Figure 6.128: John Deere Combine Display

6. Use scroll knob (A) to highlight the middle icon (the green i) and press the check mark button (B) to select it. This will bring up the Message Center.

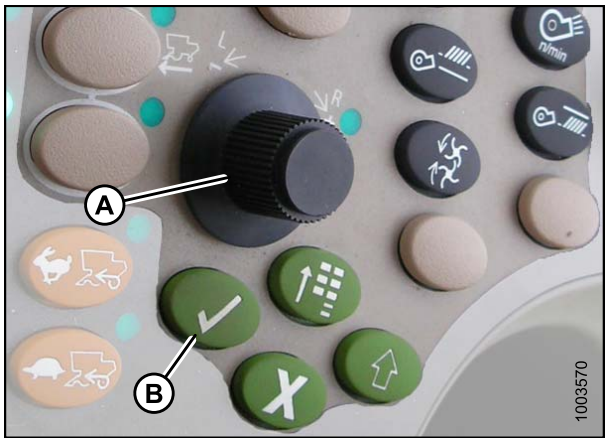


Figure 6.129: John Deere Combine Control Console

7. Use the scroll knob to highlight DIAGNOSTIC ADDRESSES (A) from the right column and select it by pressing the check mark button.
8. Use the scroll knob to highlight the drop-down box (B) and press the check mark button to select it.

Figure 6.130: John Deere Combine Display

9. Use the scroll knob to highlight LC 1.001 VEHICLE (A) and press the check mark button to select it.

Figure 6.131: John Deere Combine Display

10. Use the scroll knob to highlight the down arrow (A) and press the check mark button to scroll through the list until 029 DATA (B) is displayed and voltage reading (C) appears on the monitor.

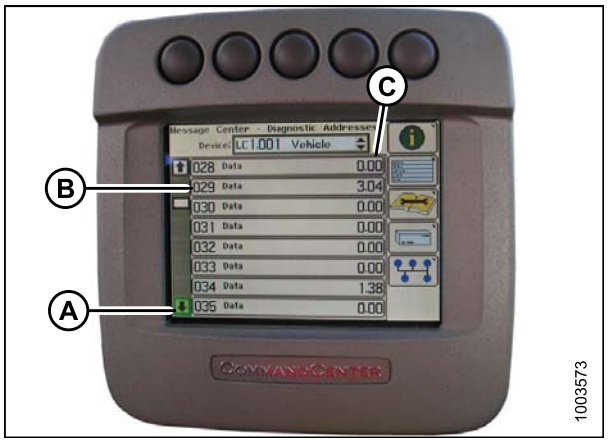


Figure 6.132: John Deere Combine Display

11. Ensure header float is unlocked.
12. Start the combine and fully lower feeder house to the ground.

NOTE:
You may need to hold the HEADER DOWN switch for a few seconds to ensure the feeder house is fully lowered.

13. Check the sensor reading on the monitor.
14. Raise the header so it is just off the ground and recheck the sensor reading.
15. If the sensor voltage is not within the low and high limits or if the range between the low and high limits is insufficient, refer to *Adjusting Voltage Limits: One-Sensor System, page 147*.

Calibrating Feeder House Speed (John Deere 70 Series)

The feeder house speed must be calibrated before you calibrate the auto header height control (AHHC) system. Refer to the combine operator's manual for instructions.

Calibrating the Auto Header Height Control (John Deere 70 Series)

For best performance of the auto header height control (AHHC), perform these procedures with the center-link set to D. When setup and calibration are complete, adjust the center-link back to desired header angle. Refer to Header Angle in the header operator's manual for instructions.

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

⚠ CAUTION

Check to be sure all bystanders have cleared the area.

1. Ensure center-link is set to D.
2. Rest header on down stops and unlock float module float.
3. Place wings in locked position.
4. Start the combine.
5. Press the button located fourth from the left along the top of the monitor (A) to select the icon that resembles an open book with a wrench on it (B).
6. Press the top button (A) a second time to enter diagnostics and calibration mode.

Figure 6.133: John Deere Combine Display

7. Select HEADER in box (A) by scrolling down to the box using the scroll knob, and then pressing the check mark button (knob and button are shown in Figure *6.135: John Deere Combine Control Console, page 208*).
8. Scroll down to the lower right icon that resembles an arrow in a diamond (B) and press the check mark button to select it.

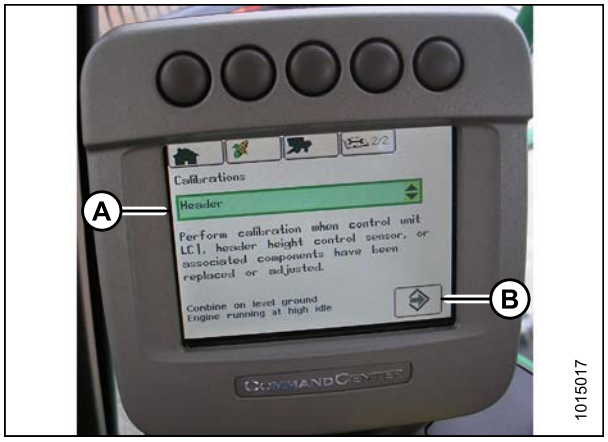


Figure 6.134: John Deere Combine Display

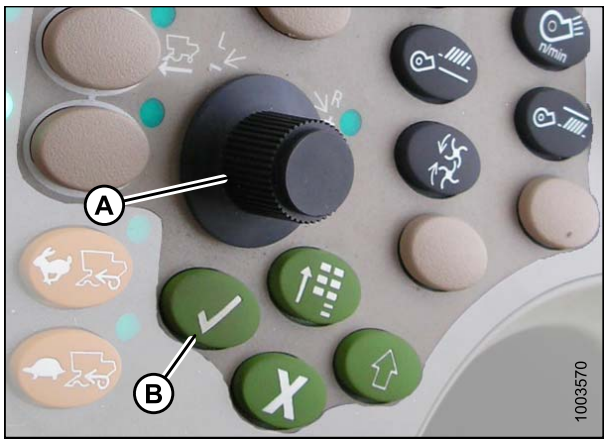


Figure 6.135: John Deere Combine Control Console

A - Scroll Knob **B - Check Mark Button**

9. Follow the steps listed on the monitor to perform the calibration.

   NOTE:
   If an error code appears on screen, the sensor is not in the correct working range. Refer to *Checking Voltage Range from the Combine Cab (John Deere S and T Series), page 211* to check and adjust the range.

Setting the Sensitivity of the Auto Header Height Control (John Deere 70 Series)

The sensitivity adjustment controls the distance the cutterbar must travel up or down before the auto header height control (AHHC) reacts and raises or lowers the feeder house. When the sensitivity is set to maximum, only small changes in ground height are needed to cause the feeder house to raise or lower. When the sensitivity is set to minimum, large changes in the ground height are needed to cause the feeder house to raise or lower.

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

1. Press button (A) twice and the current sensitivity setting will appear on the monitor (the lower the reading, the lower the sensitivity).
2. Use scroll knob (B) to adjust the sensitivity setting. The adjustment will be saved automatically.

   NOTE:
   If the screen remains idle for a short period of time, it will automatically return to the previous screen. Pressing the check mark button (C) also will return the monitor to the previous screen.

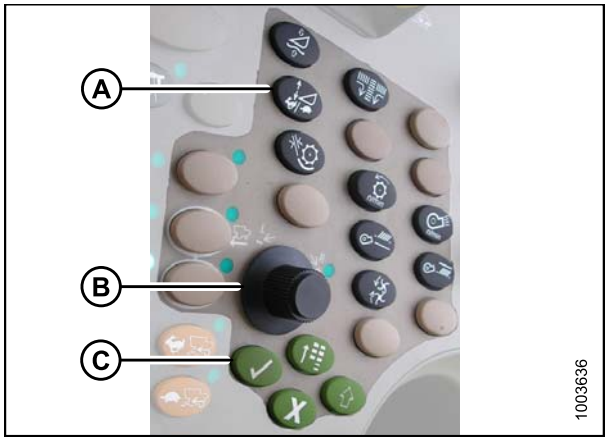


Figure 6.136: John Deere Combine Control Console

NOTE:
The numbers depicted on the displays in these illustrations are for reference purposes only; they are not intended to represent the specific settings for your equipment.

Figure 6.137: John Deere Combine Display

Adjusting the Manual Header Raise/Lower Rate (John Deere 70 Series)

The weight of the header will dictate the rate at which the header can be raised or lowered during operation.

To manually adjust the header raise/lower rate, do the following steps:

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

1. Press button (A) and the current raise/lower rate setting will appear on the monitor (the lower the reading, the slower the rate).
2. Use scroll knob (B) to adjust the rate. The adjustment will be saved automatically.

NOTE:
If the screen remains idle for a short period of time, it will automatically return to the previous screen. Pressing the check mark button (C) will also return the monitor to the previous screen.

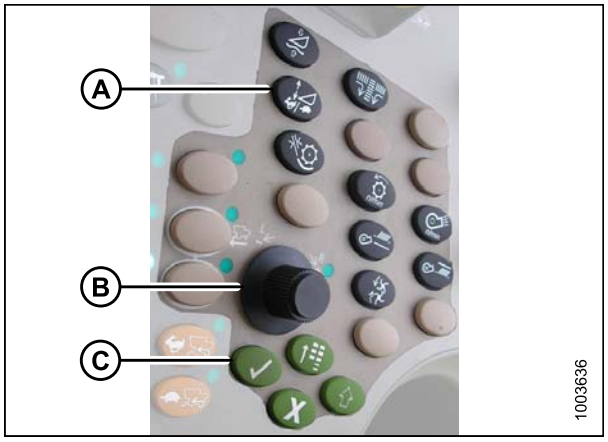


Figure 6.138: John Deere Combine Control Console

NOTE:
The numbers depicted on the displays in these illustrations are for reference purposes only; they are not intended to represent the specific settings for your equipment.

Figure 6.139: John Deere Combine Display

6.1.9 John Deere S and T Series Combines

Checking Voltage Range from the Combine Cab (John Deere S and T Series)

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

CAUTION

Check to be sure all bystanders have cleared the area.

1. Position the header 150 mm (6 in.) above the ground, and unlock the float module float.
2. Check that float lock linkage is on down stops (washer [A] cannot be moved) at both locations.

   NOTE:
   If the header is not on down stops during the next two steps, the voltage may go out of range during operation causing a malfunction of the AHHC system.

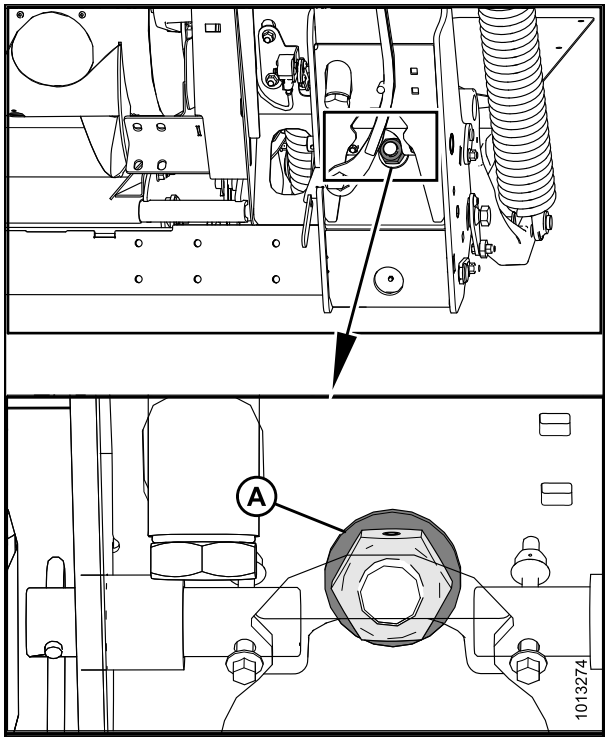


Figure 6.140: Float Lock

3. Adjust the cable take-up bracket (B) (if necessary) until the pointer (A) on the float indicator is on 0.

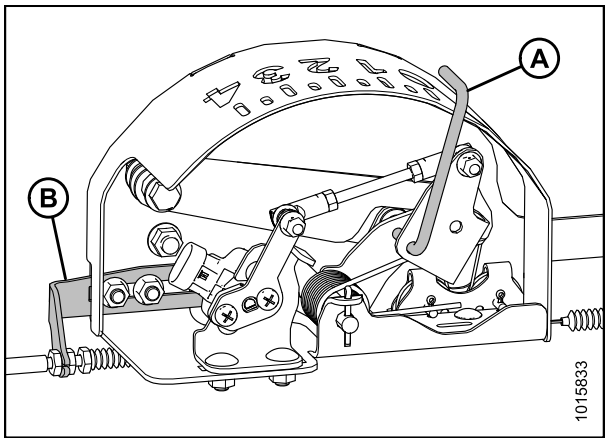


Figure 6.141: Float Indicator Box

4. Press the CALIBRATION icon (A) on the main screen of the monitor. The CALIBRATION screen appears.

Figure 6.142: John Deere Combine Display

5. Press the DIAGNOSTIC READINGS icon (A) on the CALIBRATION screen. The DIAGNOSTIC READINGS screen appears. This screen provides access to calibrations, header options, and diagnostic information.

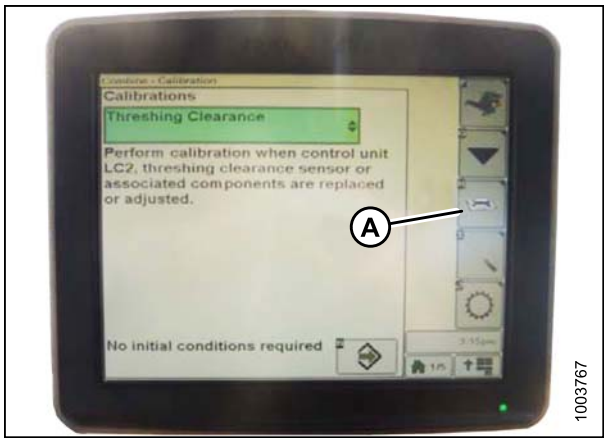


Figure 6.143: John Deere Combine Display

6. Select AHHC RESUME (A) and a list of calibration options appears.

Figure 6.144: John Deere Combine Display

7. Select the AHHC SENSING option.
8. Press the icon that resembles an arrow in a box (A). The AHHC SENSING menu appears and five screens of information are displayed.

Figure 6.145: John Deere Combine Display

9. Press icon (A) until it reads Page 5 near the top of the screen and the following sensor readings appear:
   - LEFT HEADER HEIGHT
   - CENTER HEADER HEIGHT
   - RIGHT HEADER HEIGHT

   A reading is displayed for both left and right sensors. On the MacDon header, there may be one sensor located in the float indicator box (standard) or two sensors located at the back of the float module side frame (optional).

Figure 6.146: John Deere Combine Display

10. Ensure header float is unlocked.
11. Start the combine and fully lower feeder house to the ground.

    NOTE:
    You may need to hold the HEADER DOWN switch for a few seconds to ensure the feeder house is fully lowered.

12. Check the sensor reading on the monitor.
13. If the sensor voltage is not within the low and high limits or if the range between the low and high limits is insufficient. Refer to *Adjusting Voltage Limits: One-Sensor System, page 147*.

Calibrating the Auto Header Height Control (John Deere S and T Series)

For best performance of the auto header height control (AHHC), perform these procedures with the center-link set to D. When setup and calibration are complete, adjust the center-link back to desired header angle. Refer to Header Angle in the header operator's manual for instructions.

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

1. Ensure center-link is set to D.
2. Rest header on down stops and unlock float module float.
3. Place wings in locked position.
4. Press the DIAGNOSTIC icon (A) on the main screen of the monitor. The CALIBRATION screen appears.

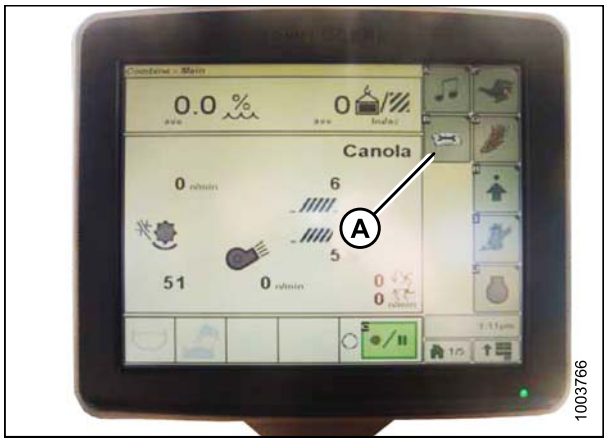


Figure 6.147: John Deere Combine Display

5. Select THRESHING CLEARANCE (A) and a list of calibration options appears.

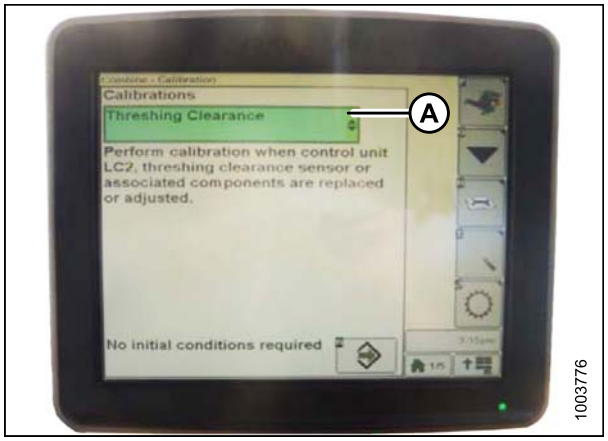


Figure 6.148: John Deere Combine Display

6. Select FEEDER HOUSE SPEED (A) and calibrate.
7. Select HEADER (B) and calibrate.

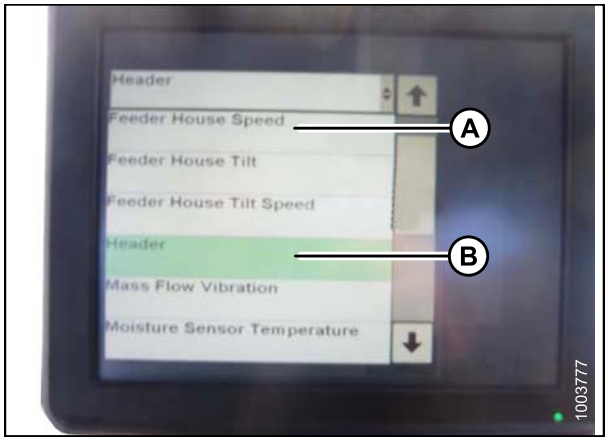


Figure 6.149: John Deere Combine Display

8. Press icon (A) with either FEEDER HOUSE SPEED or HEADER selected and the icon will turn green.

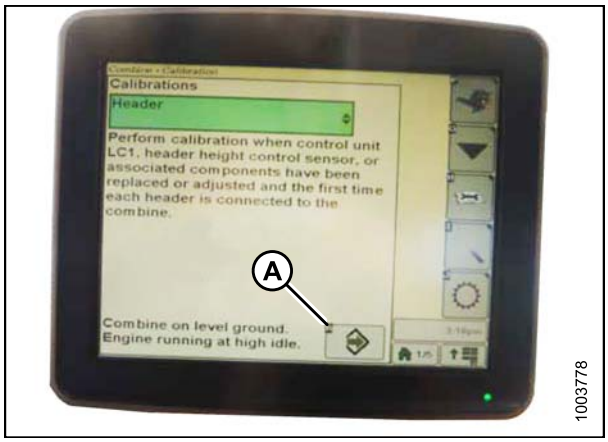


Figure 6.150: John Deere Combine Display

9. Click button (A) and instructions will appear on screen to guide you through the remaining calibration steps.

   NOTE:
   If an error code appears during calibration, the sensor is out of voltage range and will require adjustment. Refer to *Checking Voltage Range from the Combine Cab (John Deere S and T Series), page 211*.

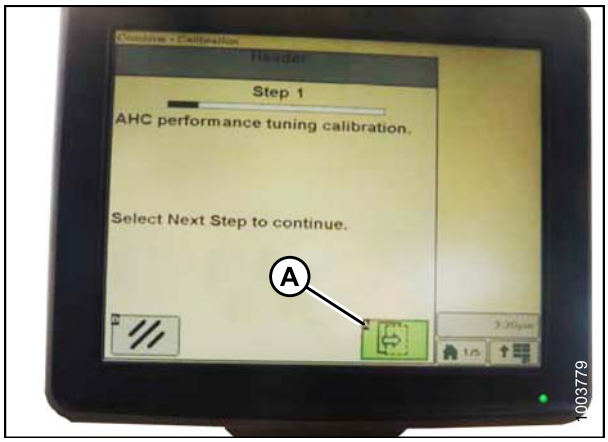


Figure 6.151: John Deere Combine Display

Setting the Sensitivity of the Auto Header Height Control (John Deere S and T Series)

The sensitivity adjustment controls the distance the cutterbar must travel up or down before the auto header height control (AHHC) reacts and raises or lowers the feeder house. When the sensitivity is set to maximum, only small changes in ground height are needed to cause the feeder house to raise or lower. When the sensitivity is set to minimum, large changes in the ground height are needed to cause the feeder house to raise or lower.

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

1. Press button (A) twice and the current sensitivity setting will appear on the monitor.

Figure 6.152: John Deere Combine Command Center

2. Press the – or + icon (A) to adjust rates.

   NOTE:
   The numbers depicted on the displays in these illustrations are for reference purposes only; they are not intended to represent the specific settings for your equipment.

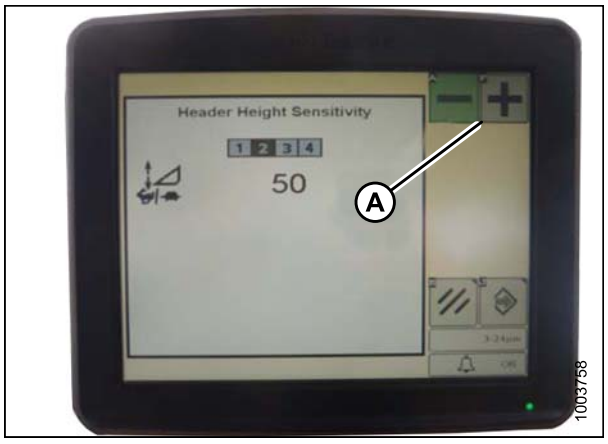


Figure 6.153: John Deere Combine Display

Adjusting the Manual Header Raise/Lower Rate (John Deere S and T Series)

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

1. Press button (A) and the current sensitivity setting will appear on the monitor.

Figure 6.154: John Deere Combine Command Center

2. Press the – or + icon (A) to adjust rates.

NOTE:
The numbers depicted on the displays in these illustrations are for reference purposes only; they are not intended to represent the specific settings for your equipment.

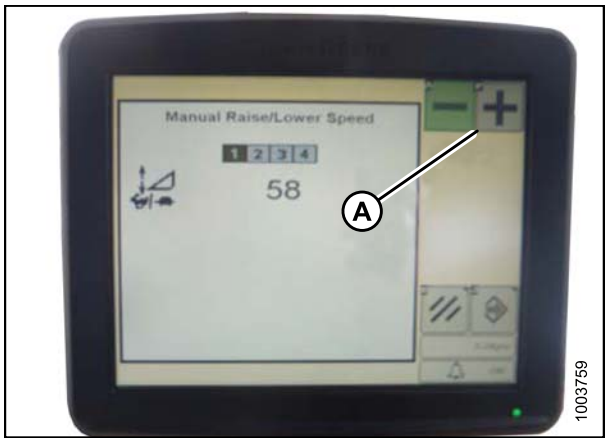


Figure 6.155: John Deere Combine Display

NOTE:
The indicator reading with the header off the ground [152 mm (6 in.)] should be at 0 (B). If not, refer to Step *3., page 143*. Ground and crop conditions will dictate what number you will need to be set at. A reading at 1 (A) is set to light and 4 is set to heavy. The ideal setting is as light as possible without bouncing or missing crop. Operating with heavier pressures can wear the cutterbar wearplate prematurely.

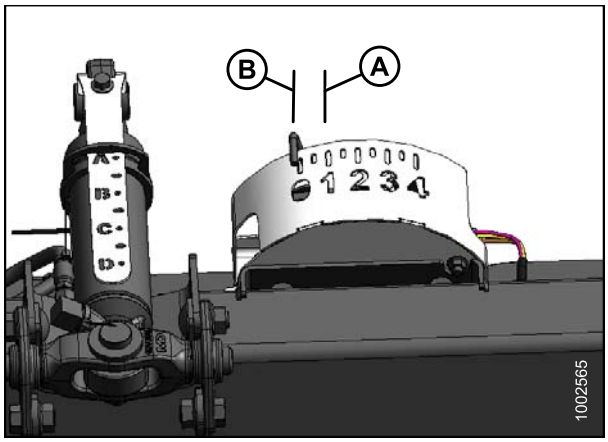


Figure 6.156: Float Indicator Box

Setting Preset Cutting Height (John Deere S Series)

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

1. Press the COMBINE – HEADER SETUP icon (A) on the main screen. The COMBINE – HEADER SETUP screen appears. This screen is used to set various header settings such as reel speed, header width, and height of feeder house for acre counter engagement.

Figure 6.157: Combine Display

2. Select the COMBINE – HEADER SETUP AHC icon (A). The COMBINE – HEADER SETUP AHC screen appears.

Figure 6.158: Combine Display

3. Select the top-left and top-center icons for auto height sensing and return to cut.

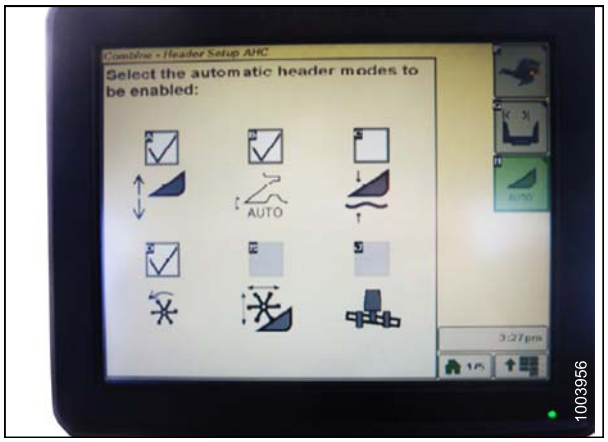


Figure 6.159: Combine Display

4. Select an appropriate ground pressure setting. Preset button 2 (B) on the joystick for a light ground pressure setting in muddy or soft soil conditions, or preset button 3 (C) for a heavy ground pressure setting in harder soil conditions and a faster ground speed.

   NOTE:
   Preset button 1 (A) is reserved for header lift on the headland and is not used for ground cutting.

Figure 6.160: Joystick Buttons

   NOTE:
   The indicator reading with the header off the ground (152 mm [6 in.]) should be at 0 (A). If not, refer to Step *Manually Checking Voltage Range: One-Sensor System, page 142*. Ground and crop conditions will dictate what number you will need to be set at. A reading at 1 is set to light and 4 is set to heavy. The ideal setting is as light as possible without bouncing or missing crop. Operating with heavier pressures can wear the cutterbar wearplate prematurely.

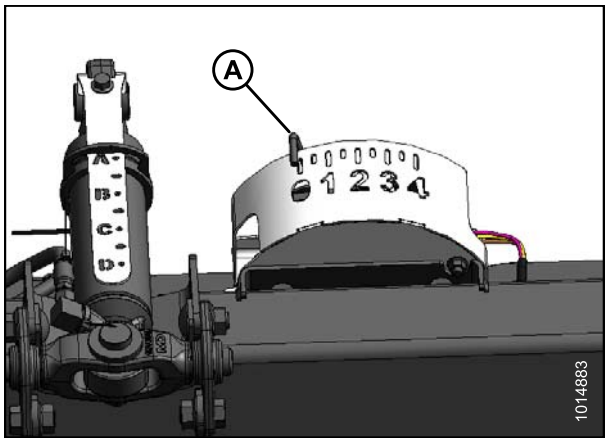


Figure 6.161: Float Indicator Box

5. Use control knob (A) to scroll through the different button options.

Figure 6.162: Combine Control Console

NOTE:
When the AHHC is engaged, the AHHC icon (A) appears on the monitor and the number indicating which button was pressed (B) is displayed on the screen.

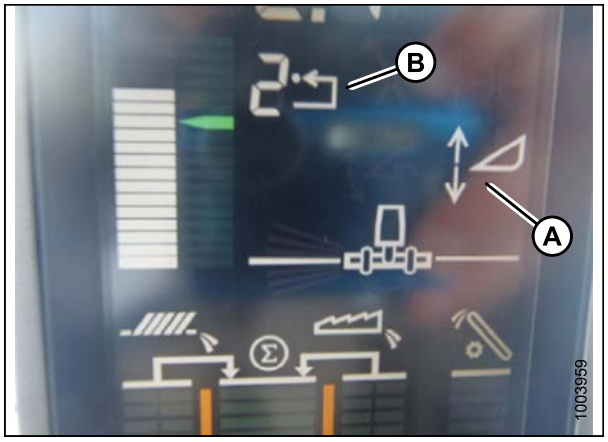


Figure 6.163: Combine Display

Calibrating Feeder House Fore/Aft Tilt Range (John Deere S and T Series)

For best performance of the auto header height control (AHHC), perform these procedures with the center-link set to D. When setup and calibration are complete, adjust the center-link back to desired header angle. Refer to Header Angle in the header operator's manual for instructions.

This procedure applies only to model year 2015 and later John Deere S and T Series combines.

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

The feeder house fore/aft tilt is controlled by buttons (C) and (D) at the back of the hydro handle.

Figure 6.164: John Deere Hydro Handle

NOTE:
The feeder house fore/aft tilt controls can be changed to work with buttons E and F by pressing the hydro handle icon (A) and then selecting FEEDER HOUSE FORE/AFT TILT from the drop-down menu (B).

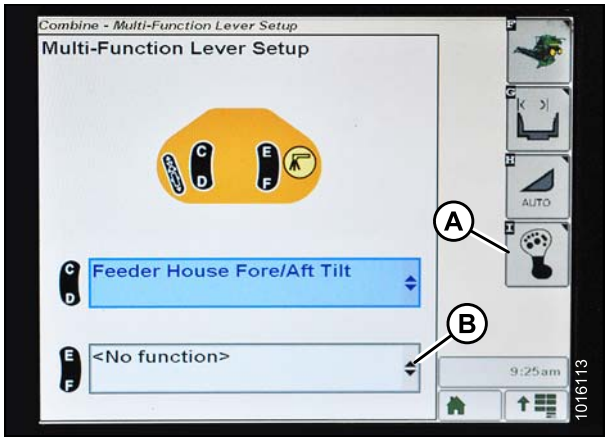


Figure 6.165: John Deere Combine Display

To calibrate the feeder house fore/aft tilt range, follow these steps:

1. Ensure center-link is set to D.
2. Rest header on down stops and unlock float module float.
3. Place wings in locked position.
4. Press the DIAGNOSTIC icon (A) on the main screen of the monitor. The CALIBRATION screen displays.

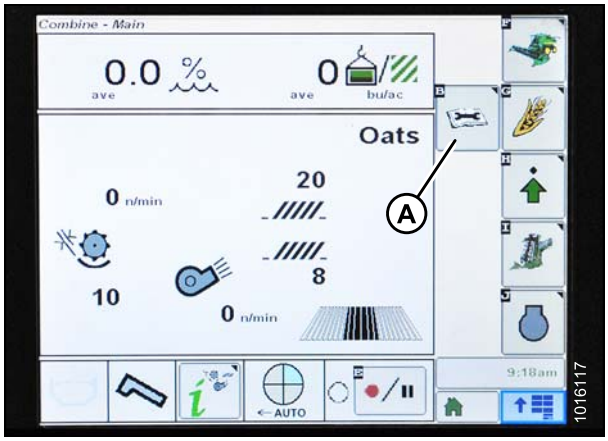


Figure 6.166: John Deere Combine Display

5. Select the CALIBRATIONS drop-down menu (A) to view the list of calibration options.

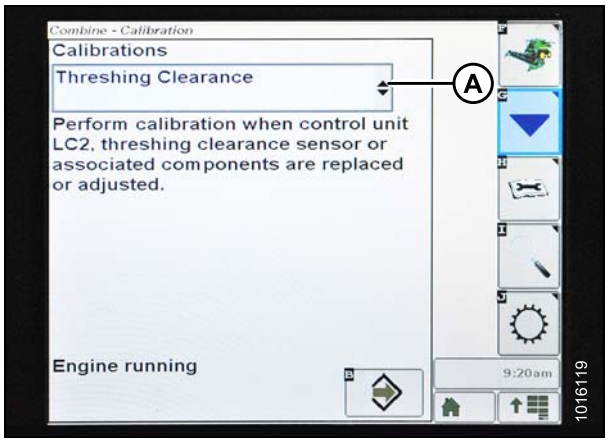


Figure 6.167: John Deere Combine Display

6. Press the arrow (A) to cycle up though the calibration options and select FEEDER HOUSE FORE/AFT TILT RANGE.

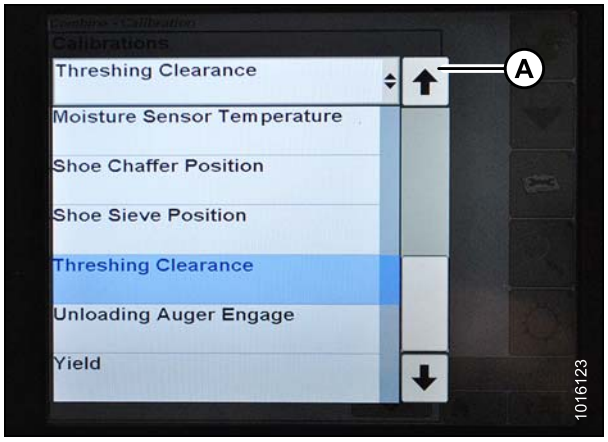


Figure 6.168: John Deere Combine Display

7. Press the ENTER icon (A).

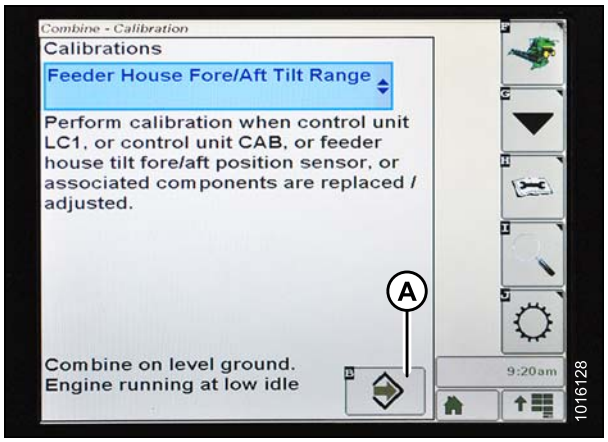


Figure 6.169: John Deere Combine Display

8. Follow the instructions that appear on the screen. As you proceed through the calibration process, the display will automatically update to show the next step.

   NOTE:
   If an error code appears during calibration, the sensor is out of voltage range and will require adjustment. Refer to *Checking Voltage Range from the Combine Cab (John Deere S and T Series), page 211*.

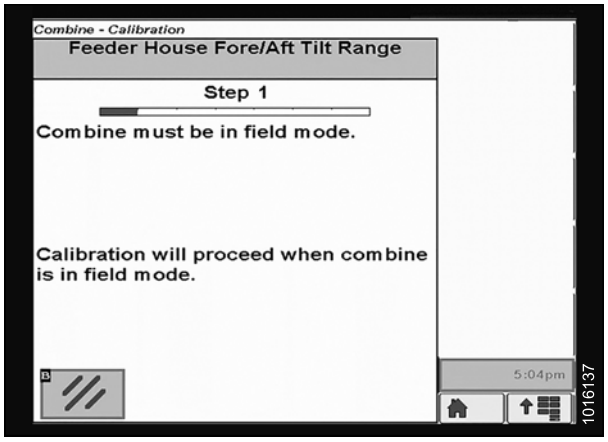


Figure 6.170: John Deere Combine Display

6.1.10 CLAAS 500 Series Combines

Calibrating the Auto Header Height Control (CLAAS 500 Series)

For best performance of the auto header height control (AHHC), perform these procedures with the center-link set to D. When setup and calibration are complete, adjust the center-link back to desired header angle. Refer to Header Angle in the header operator's manual for instructions.

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

1. Ensure center-link is set to D.
2. Use the < key (A) or > key (B) to select AUTO HEADER, and press the OK key (C). The E5 screen displays whether the automatic header height is on or off.

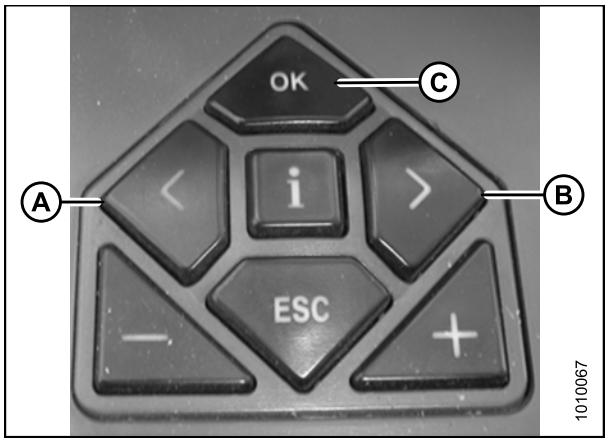


Figure 6.171: CLAAS Combine Controls

3. Use the – key (A) or the + key (B) to turn the AHHC on, and press the OK key (C).
4. Engage the threshing mechanism and the header.

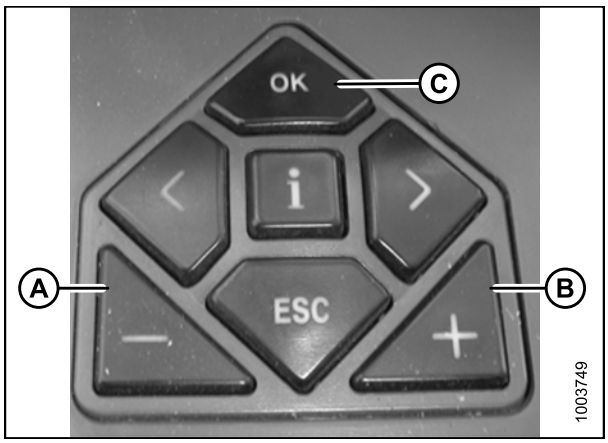


Figure 6.172: CLAAS Combine Controls

5. Use the < or > key to select CUTT.HEIGHT LIMITS, and press the OK key (C).
6. Follow the procedure displayed on the screen to program the upper and lower limits of the header into the CEBIS.

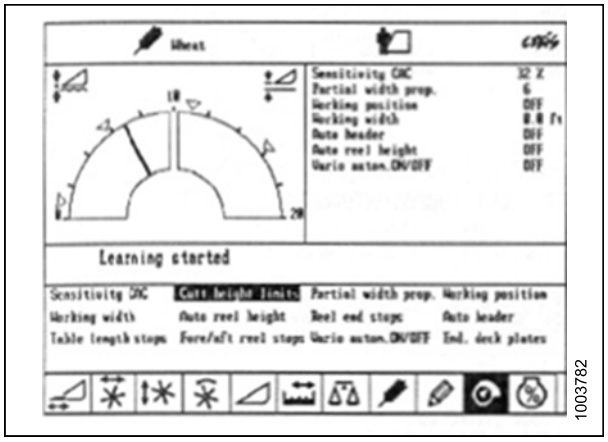


Figure 6.173: CLAAS Combine Display

7. Use the < or > key to select SENSITIVITY CAC, and press the OK key (C).

   NOTE:
   Setting the sensitivity of the AHHC system impacts the reaction speed of the AHHC on the header.

8. Use the – key or the + key to change the setting of the reaction speed, and press the OK key (C).

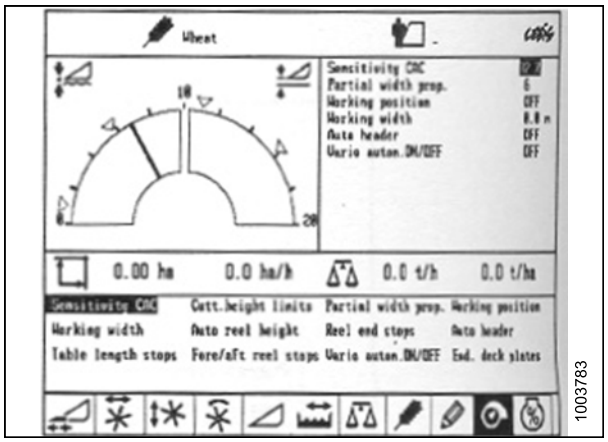


Figure 6.174: CLAAS Combine Display

9. Use line (A) or value (B) to determine the sensitivity setting.

   NOTE:
   The setting can be adjusted from 0–100%. When sensitivity is adjusted to 0%, the signals from the sensing bands have no effect on the automatic cutting height adjustment. When sensitivity is adjusted to 100%, the signals from the sensing bands have maximum effect on the automatic cutting height adjustment. The recommended starting point is 50%.

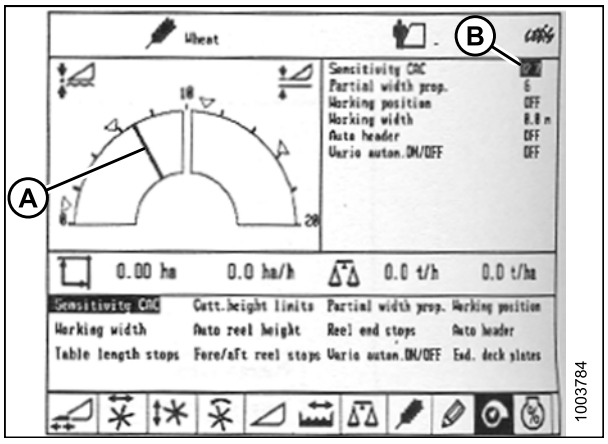


Figure 6.175: CLAAS Combine Display

Setting Cutting Height (CLAAS 500 Series)

Cutting heights can be programmed into the preset cutting height and auto contour systems. Use the preset cutting height system for cutting heights above 150 mm (6 in.), and use the auto contour system for cutting heights below 150 mm (6 in.).

Setting Preset Cutting Height (CLAAS 500 Series)

CAUTION

Check to be sure all bystanders have cleared the area.

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

1. Start the engine.
2. Activate the machine enable switch.
3. Engage the threshing mechanism.
4. Engage the header.
5. Briefly press button (A) in order to activate the auto contour system, or briefly press button (B) in order to activate the preset cutting height system.

   NOTE:
   Button (A) is used only with auto header height control (AHHC) function. Button (B) is used only with the return to cut function.

Figure 6.176: Joystick Buttons

6. Use the < key (C) or > key (D) to select the CUTTING HEIGHT screen, and press the OK key (E).
7. Use the – key (A) or the + key (B) to set the desired cutting height. An arrow indicates the selected cutting height on the scale.

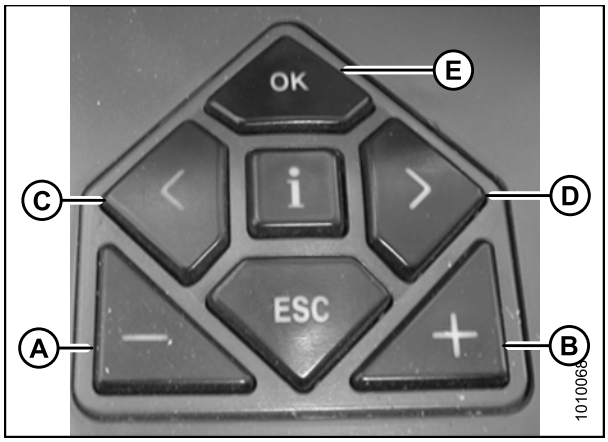


Figure 6.177: CLAAS Combine Controls

8. Briefly press button (A) or button (B) in order to select the set point.
9. Repeat Step *7., page 225* for the set point.

Figure 6.178: Joystick Buttons

Setting Cutting Height Manually (CLAAS 500 Series)

CAUTION

Check to be sure all bystanders have cleared the area.

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

1. Use button (A) to raise the header or button (B) to lower the header to the desired cutting height.
2. Press and hold button (C) for 3 seconds to store the cutting height into the CEBIS (an alarm will sound when the new setting has been stored).
3. Program a second set point, if desired, by using button (A) to raise the header or button (B) to lower the header to the desired cutting height, and briefly press button (C) to store the second set point into the CEBIS (an alarm will sound when the new setting has been stored).

   NOTE:
   For above the ground cutting, repeat Step *1., page 226*, and use button (D) instead of button (C) while repeating Step *2., page 226*.

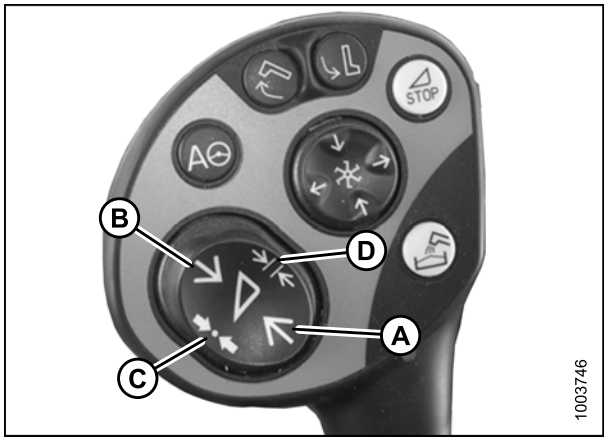


Figure 6.179: Joystick Buttons

Setting the Sensitivity of the Auto Header Height Control (CLAAS 500 Series)

The sensitivity adjustment controls the distance the cutterbar must travel up or down before the auto header height control (AHHC) reacts and raises or lowers the feeder house. When the sensitivity is set to maximum, only small changes in ground height are needed to cause the feeder house to raise or lower. When the sensitivity is set to minimum, large changes in the ground height are needed to cause the feeder house to raise or lower.

NOTE:
The upper and lower limits of the header must be programmed into the CEBIS before adjusting the sensitivity of the AHHC system. The setting can be adjusted from 0–100%. When sensitivity is adjusted to 0%, the signals from the sensing bands have no effect on the automatic cutting height adjustment. When sensitivity is adjusted to 100%, the signals from the sensing bands have maximum effect on the automatic cutting height adjustment. The recommended starting point is 50%.

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

1. Use the < key (C) or the > key (D) to select SENSITIVITY CAC, and press the OK key (E).
2. Use the – key (A) or the + (B) key to change the reaction speed setting, and press the OK key (E).

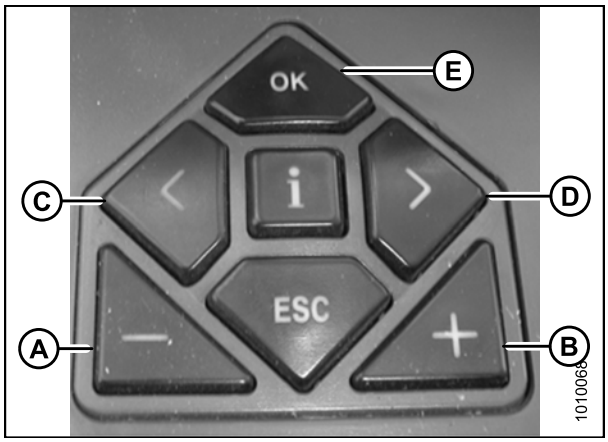


Figure 6.180: CLAAS Combine Controls

3. Use line (A) or value (B) to determine the sensitivity setting.

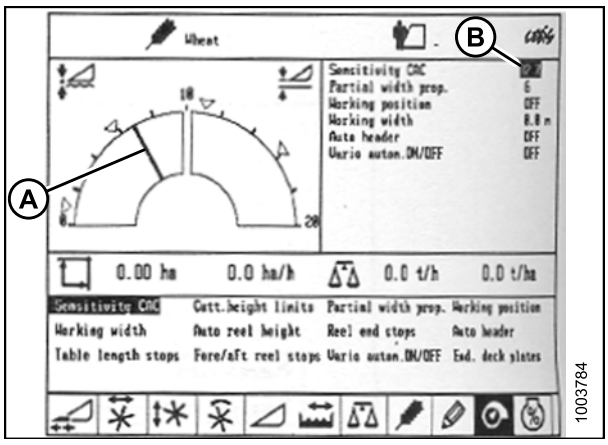


Figure 6.181: CLAAS Combine Display

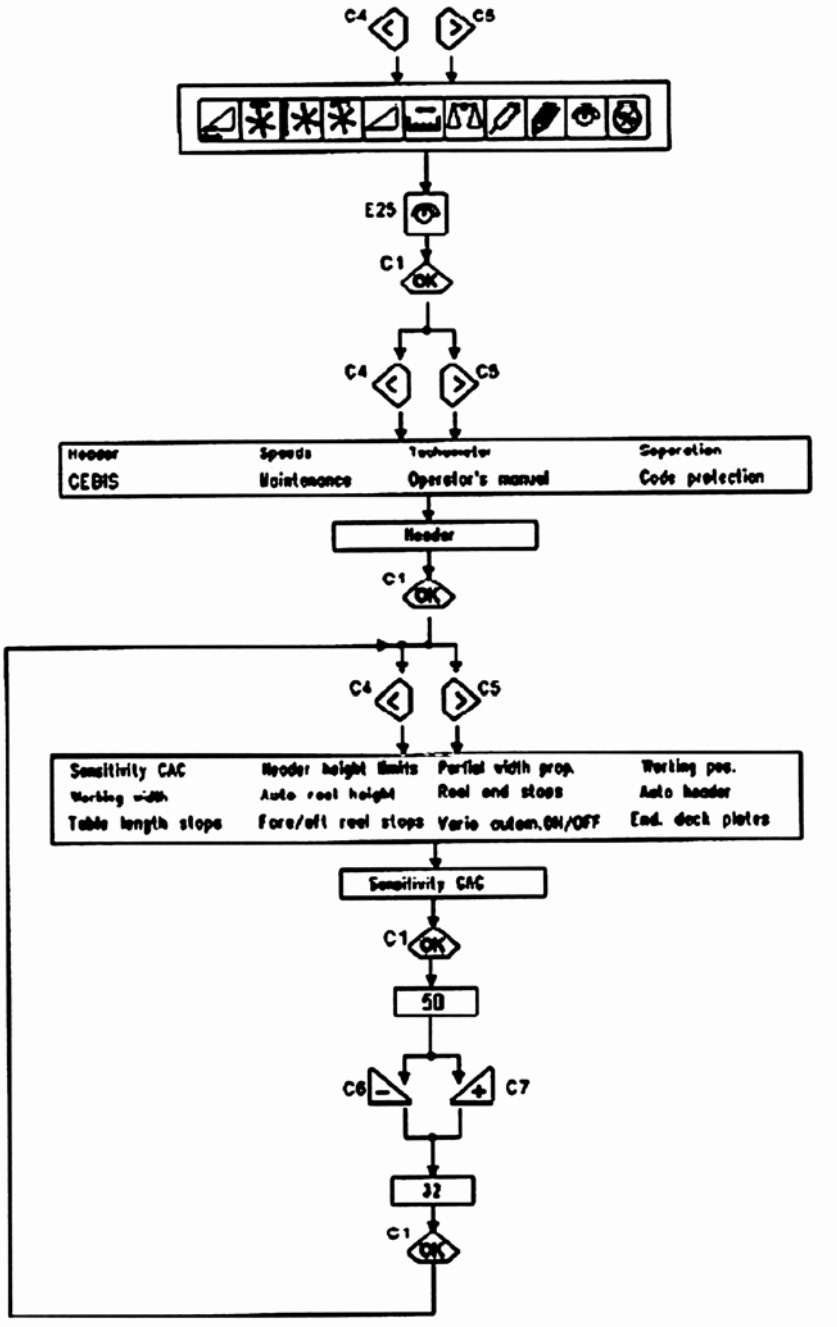


Figure 6.182: Flow Chart for Setting the Sensitivity of the Float Optimizer

Adjusting Auto Reel Speed (CLAAS 500 Series)

The preset reel speed can be set when the automatic header functions are activated.

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

1. Use the < or > key to select REEL WINDOW. Window E15 will display the current advance or retard speed of the reel in relation to the ground speed.

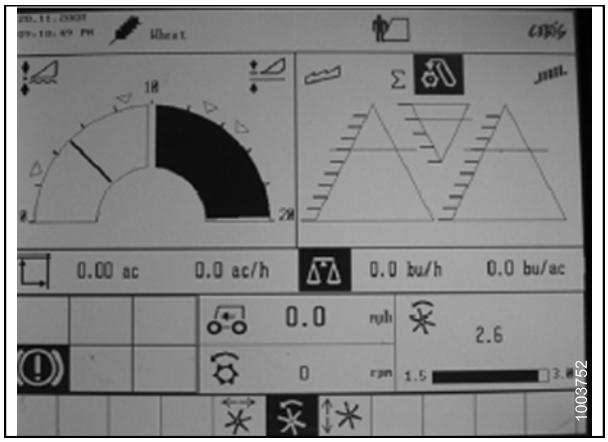


Figure 6.183: CLAAS Combine Display

2. Press the OK key (C) to open the REEL SPEED window.
3. Use the – key (A) or the + key (B) to set the reel speed in relation to the current ground speed. Window E15 will display the selected reel speed.

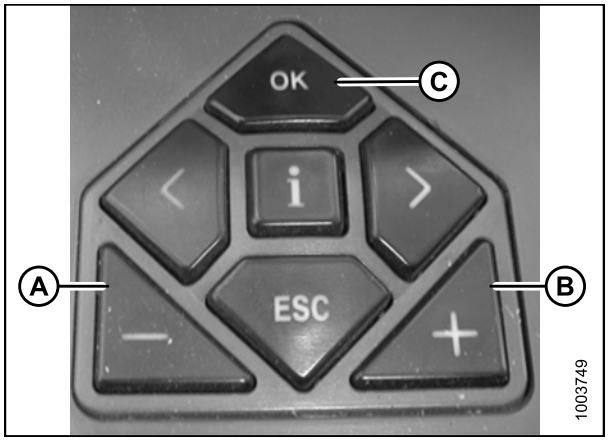


Figure 6.184: CLAAS Combine Controls

4. Manually adjust the reel speed by rotating the rotary switch to the reel position (A), and then use the – or + key to set the reel speed.

Figure 6.185: CLAAS Combine Rotary Switch

5. Press and hold button (A) or button (B) for 3 seconds to store the setting into the CEBIS (an alarm will sound when the new setting has been stored).

   NOTE:
   Whenever button (A) or button (B) is pressed for 3 seconds, the current positions for reel speed and cutting height are stored.

Figure 6.186: CLAAS Joystick Buttons

6. Use the < or > key to select the REEL WINDOW. Window E15 will display the current advance or retard speed of the reel in relation to the ground speed.

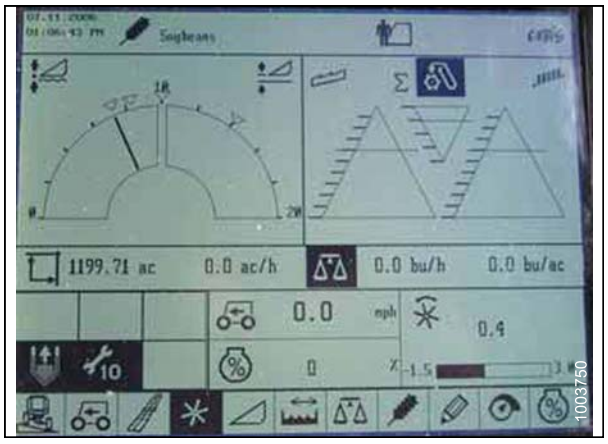


Figure 6.187: CLAAS Combine Display

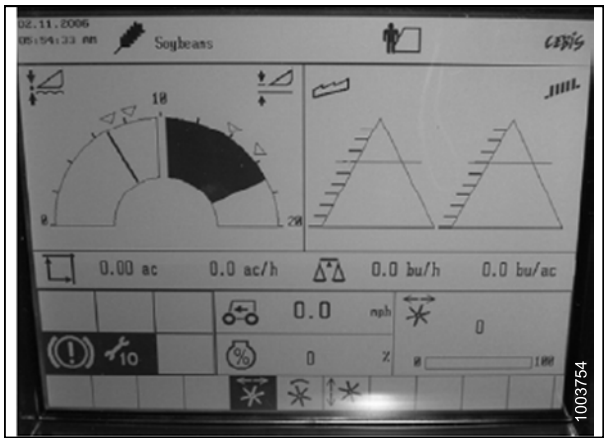


Figure 6.188: CLAAS Combine Display

7. Press the OK key (E), and use the < key (C) or the > key (D) to select the REEL FORE AND AFT window.
8. Use the – key (A) or the + key (B) to set the reel fore-aft position.

   NOTE:
   Joystick button (A) or button (B) also can be used to set the reel fore-aft position.

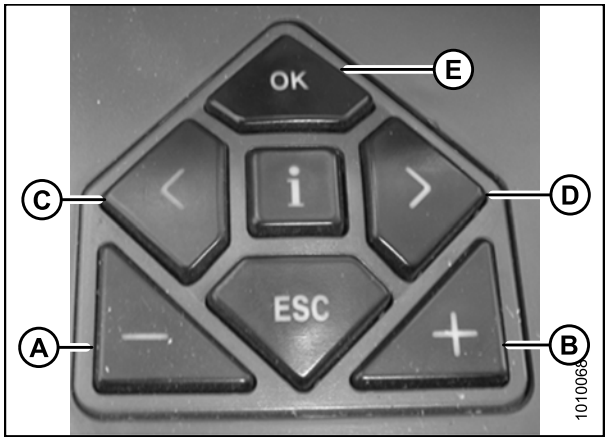


Figure 6.189: CLAAS Combine Controls

9. Press and hold button (C) or button (D) for 3 seconds to store the setting into the CEBIS (an alarm will sound when the new setting has been stored).

   NOTE:
   Whenever button (C) or button (D) is pressed for 3 seconds, the current positions for reel speed and cutting height are stored.

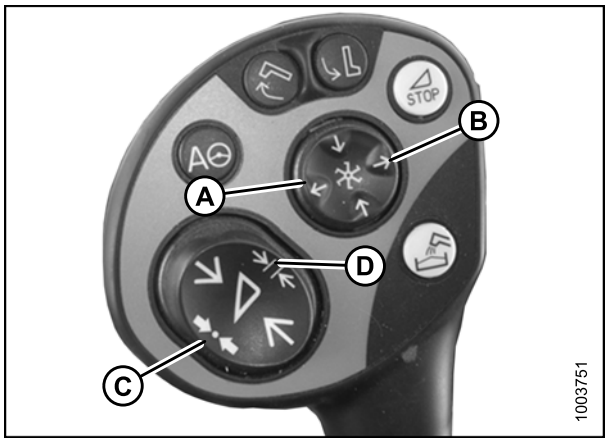


Figure 6.190: CLAAS Joystick Buttons

6.1.11 CLAAS 600 and 700 Series Combines

Calibrating the Auto Header Height Control (CLAAS 600 and 700 Series)

For best performance of the auto header height control (AHHC), perform these procedures with the center-link set to D. When setup and calibration are complete, adjust the center-link back to desired header angle. Refer to Header Angle in the header operator's manual for instructions.

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

1. Ensure center-link is set to D.
2. Ensure that the header float is unlocked (A).
3. Use control knob (A) to highlight the AUTO CONTOUR icon (B) and press control knob (A) to select it.

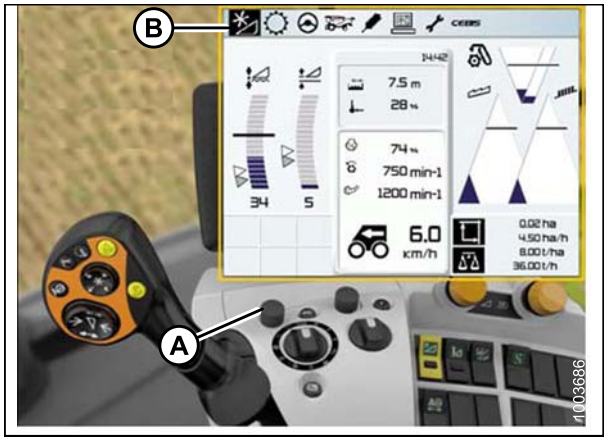


Figure 6.191: CLAAS Combine Display, Console, and Joystick Lever

4. Use control knob (A) to highlight the icon that resembles a header with up and down arrows (not shown), and press control knob (A) to select it. The highlighted header icon (B) will be displayed on the screen.

Figure 6.192: CLAAS Combine Display, Console, and Joystick Lever

5. Use control knob (A) to highlight the icon that resembles a header with up and down arrows (C), and press control knob (A) to select it.

Figure 6.193: CLAAS Combine Display, Console, and Joystick Lever

6. Use control knob (A) to highlight the icon that resembles a screwdriver (B).
7. Engage the combine separator and feeder house.
8. Press control knob (A) and a progress bar chart will appear.

Figure 6.194: CLAAS Combine Display, Console, and Joystick Lever

9. Fully raise the feeder house. The progress bar chart will advance to 25% (A).
10. Fully lower the feeder house. The progress bar chart will advance to 50%.
11. Fully raise the feeder house. The progress bar chart will advance to 75%.
12. Fully lower the feeder house. The progress bar chart will advance to 100%.

Figure 6.195: CLAAS Combine Display, Console, and Joystick Lever

13. Ensure the progress bar chart displays 100% (A). The calibration procedure is now complete.

NOTE:
If the voltage is not within the range of 0.5–4.5 volts at any time throughout the calibration process, the monitor will indicate learning procedure not concluded.

NOTE:
If header float is set too light, an error message will appear. Back float off three full-turns of the adjuster bolts to adjust float to approximately 45–57 kg (100–125 lb.).

Figure 6.196: CLAAS Combine Display, Console, and Joystick Lever

Setting Cutting Height (CLAAS 600 and 700 Series)

CAUTION

Check to be sure all bystanders have cleared the area.

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

1. Lower the header to desired cutting height or ground pressure setting. The float indicator box should be set to 1.5.
2. Hold the left side of the header raise and lower switch (A) until you hear a ping.

NOTE:
You can set two different cutting heights.

Figure 6.197: CLAAS Combine Display, Console, and Joystick Lever

Setting the Sensitivity of the Auto Header Height Control (CLAAS 600 and 700 Series)

The sensitivity adjustment controls the distance the cutterbar must travel up or down before the auto header height control (AHHC) reacts and raises or lowers the feeder house. When the sensitivity is set to maximum, only small changes in ground height are needed to cause the feeder house to raise or lower. When the sensitivity is set to minimum, large changes in the ground height are needed to cause the feeder house to raise or lower.

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

1. Use control knob (A) to highlight the HEADER/REEL icon (B), and press control knob (A) to select it. The HEADER/REEL dialog box opens.
2. Select HEADER icon.

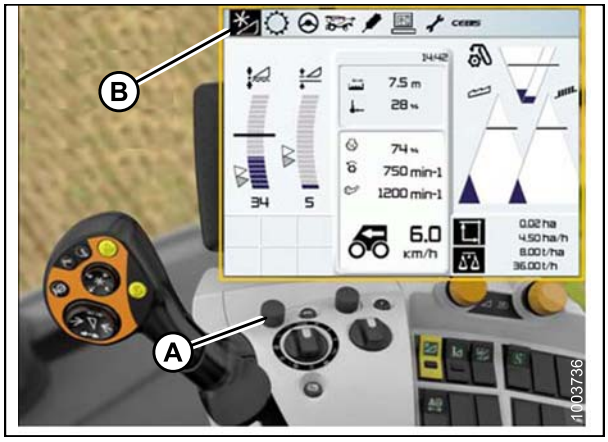


Figure 6.198: CLAAS Combine Display, Console, and Joystick Lever

3. Select the FRONT ATTACHMENT PARAMETER SETTINGS icon (A). A list of settings appears.
4. Select SENSITIVITY CAC (B) from the list.

Figure 6.199: CLAAS Combine Display, Console, and Joystick Lever

5. Select the SENSITIVITY CAC icon (A).

   NOTE:
   To set the sensitivity, you will have to change the CUTTING HEIGHT ADJUSTMENT (B) from the 0 default. The settings from 1–50 provide a faster response, whereas the settings from -1 to -50 provide a slower response. For best results, make adjustments in increments of five.

6. Increase the CUTTING HEIGHT ADJUSTMENT setting if the reaction time between the header and the float module is too slow while cutting on the ground, and decrease the CUTTING HEIGHT ADJUSTMENT setting if the reaction time between the header and the float module is too fast.
7. Increase the sensitivity if the header is lowered too slowly, and decrease the sensitivity if the header hits the ground too hard or is lowered too quickly.

Figure 6.200: CLAAS Combine Display

Adjusting Auto Reel Speed (CLAAS 600 and 700 Series)

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

1. Use control knob (A) to highlight the HEADER/REEL icon (B), and press control knob (A) to select it. The HEADER/REEL dialog box opens.

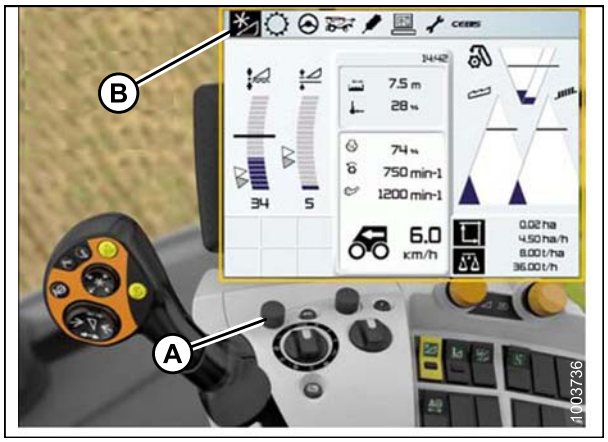


Figure 6.201: CLAAS Combine Display, Console, and Joystick Lever

2. Use control knob (A) to select REEL SPEED (B), and adjust the reel speed (if you are NOT using Auto Reel Speed). A graph displays in the dialog box.

Figure 6.202: CLAAS Combine Display, Console, and Joystick Lever

3. Select ACTUAL VALUE (A) from the AUTO REEL SPEED dialog box (if you are using Auto Reel Speed). The ACTUAL VALUE dialog box indicates the auto reel speed.

Figure 6.203: CLAAS Combine Display, Console, and Joystick Lever

4. Use control knob (A) to raise or lower the reel speed.

NOTE:
This option is only available at full throttle.

Figure 6.204: CLAAS Combine Display, Console, and Joystick Lever

NOTE:
The indicator reading with the header off the ground (152 mm [6 in.]) should be at 0 (B). If not, refer to Step *3., page 143*. Ground and crop conditions will dictate what number you will need to be set at. A reading at 1 (A) is set to light and 4 is set to heavy. The ideal setting is as light as possible without bouncing or missing crop. Operating with heavier pressures can wear the cutterbar wearplate prematurely.

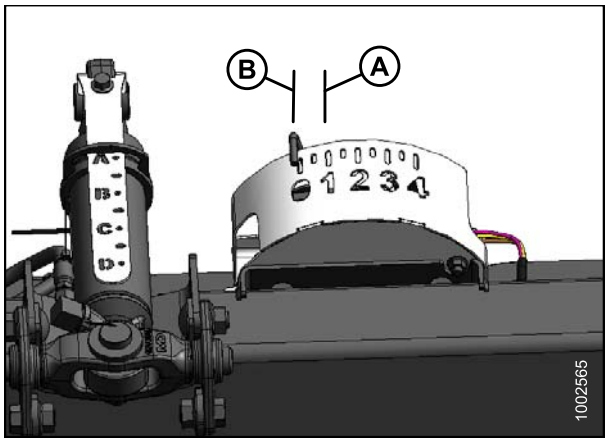


Figure 6.205: Float Indicator Box

6.1.12 New Holland Combines

This section applies only to pre-2015 CR/CX models. For New Holland CR models 6.80, 6.90, 7.90, 8.90, 9.90, and 10.90, refer to *6.1.13 New Holland Combines (CR Series—Model Year 2015 and Later), page 248*.

Checking Voltage Range from the Combine Cab (New Holland)

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

NOTE:
For New Holland CR models 6.80, 6.90, 7.90, 8.90, 9.90, and 10.90, refer to *6.1.13 New Holland Combines (CR Series—Model Year 2015 and Later), page 248*.

⚠ CAUTION

Check to be sure all bystanders have cleared the area.

1. Position the header 150 mm (6 in.) above the ground, and unlock the float module float.
2. Check that float lock linkage is on down stops (washer [A] cannot be moved) at both locations.

   NOTE:
   If the header is not on down stops during the next two steps, the voltage may go out of range during operation causing a malfunction of the AHHC system.

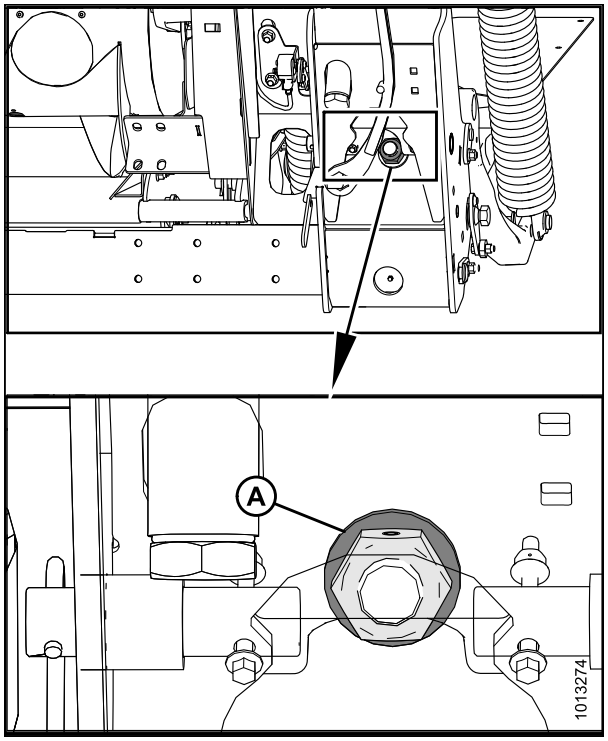


Figure 6.206: Float Lock

3. Adjust the cable take-up bracket (B) (if necessary) until the pointer (A) on the float indicator is on 0.

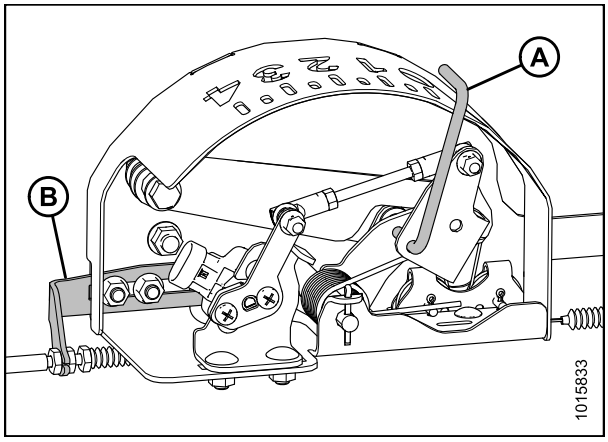


Figure 6.207: Float Indicator box

4. Ensure header float is unlocked.
5. Select DIAGNOSTICS (A) on the main screen. The DIAGNOSTICS screen displays.
6. Select SETTINGS. The SETTINGS screen displays.

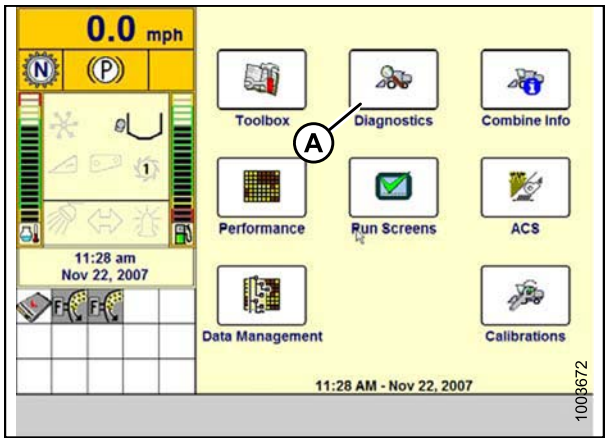


Figure 6.208: New Holland Combine Display

7. Select the GROUP drop-down arrow (A). The GROUP dialog box displays.

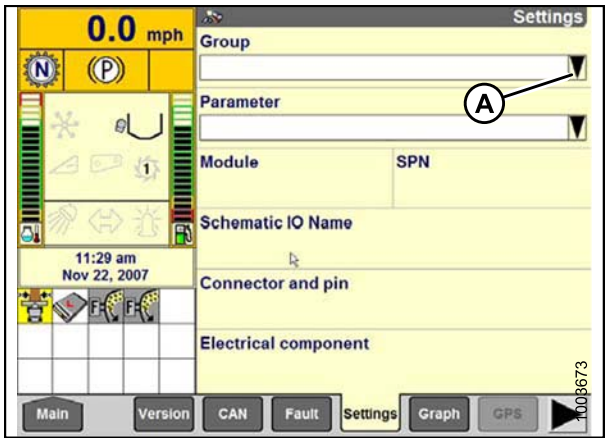


Figure 6.209: New Holland Combine Display

8. Select HEADER HEIGHT/TILT (A). The PARAMETER screen displays.

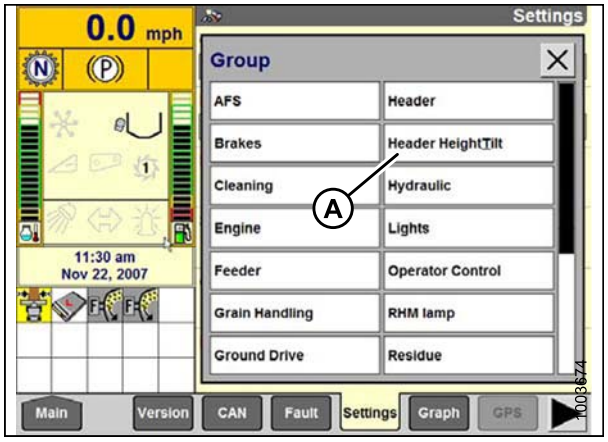


Figure 6.210: New Holland Combine Display

9. Select LEFT HEADER HEIGHT SEN (A), and then select GRAPH button (B). The exact voltage is displayed at the top of the screen.
10. Raise and lower the header to see the full range of voltage readings.
11. If the sensor voltage is not within the low and high limits, or if the range between the low and high limits is insufficient, adjust the voltage limits. Refer to *Adjusting Voltage Limits: One-Sensor System, page 147*.

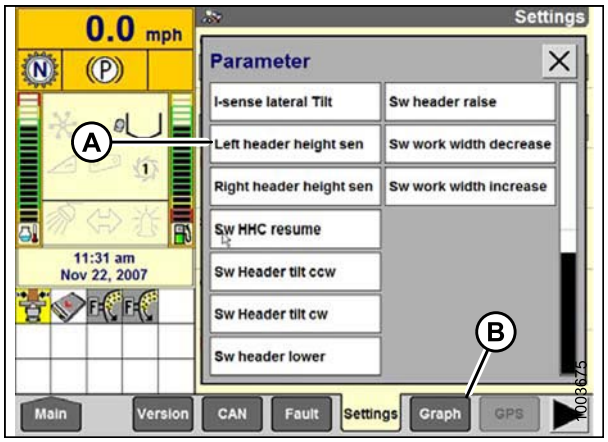


Figure 6.211: New Holland Combine Display

Engaging the Auto Header Height Control (New Holland CR/CX Series)

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

NOTE:
For New Holland CR models 6.80, 6.90, 7.90, 8.90, 9.90, and 10.90, refer to *6.1.13 New Holland Combines (CR Series—Model Year 2015 and Later), page 248*.

1. Select HEADER LATERAL FLOAT on the combine display, and press ENTER.
2. Use the up and down navigation keys to move between options, and select INSTALLED.

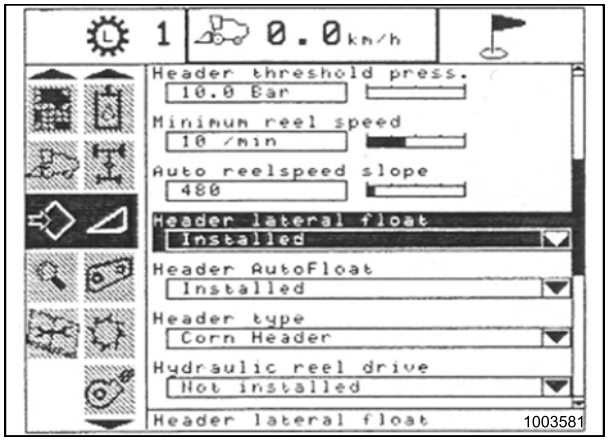


Figure 6.212: New Holland Combine Display

3. Select HEADER AUTOFLOAT, and press ENTER.
4. Use the up and down navigation keys to move between options, and select INSTALLED.

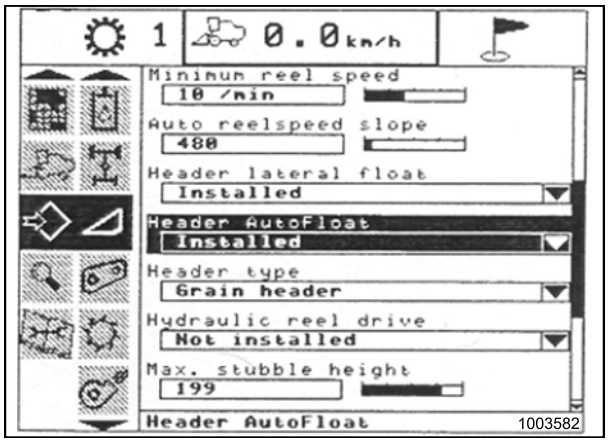


Figure 6.213: New Holland Combine Display

Calibrating the Auto Header Height Control (New Holland CR/CX Series)

For best performance of the auto header height control (AHHC), perform these procedures with the center-link set to D. When setup and calibration are complete, adjust the center-link back to desired header angle. Refer to Header Angle in the header operator's manual for instructions.

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

NOTE:
For New Holland CR models 6.80, 6.90, 7.90, 8.90, 9.90, and 10.90, refer to *6.1.13 New Holland Combines (CR Series—Model Year 2015 and Later), page 248*.

CAUTION

Check to be sure all bystanders have cleared the area.

Check the following conditions before starting the header calibration procedure:

- The header is attached to the combine.
- The combine is on level ground, with the header level to the ground.
- The header is on down stops, and the center-link is set to D.
- The engine is running.
- The combine is not moving.
- No faults have been received from the Header Height Controller (HHC) module.
- Header/feeder is disengaged.
- Lateral flotation buttons are NOT pressed.
- ESC key is NOT pressed.

To calibrate the AHHC, follow these steps:

1. Select CALIBRATION on the combine display, and press the right arrow navigation key to enter the information box.
2. Select HEADER (A), and press ENTER. The CALIBRATION dialog box opens.

   NOTE:
   You can use the up and down navigation keys to move between options.

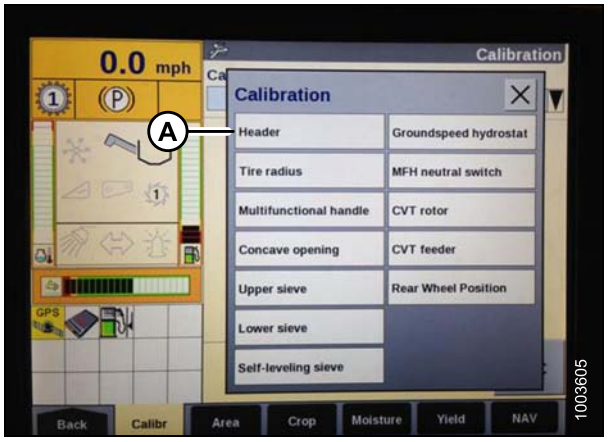


Figure 6.214: New Holland Combine Display

3. Follow the calibration steps in the order in which they appear in the dialog box. As you proceed through the calibration process, the display will automatically update to show the next step.

   NOTE:
   Pressing the ESC key during any of the steps or letting the system sit idle for more than 3 minutes will cause the calibration procedure to stop.

   NOTE:
   Refer to your combine operator's manual for an explanation of any error codes.

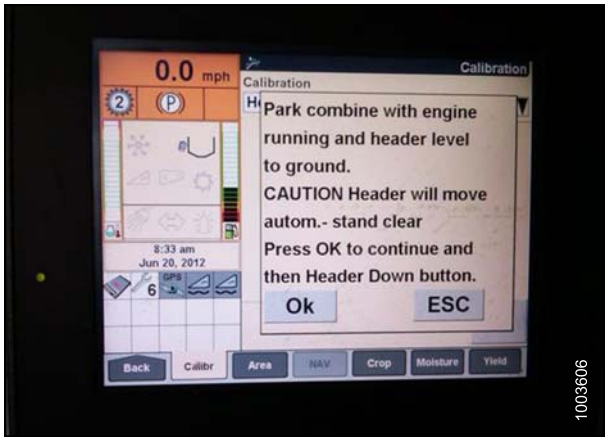


Figure 6.215: New Holland Combine Display

4. When all steps have been completed, CALIBRATION SUCCESSFUL message is displayed on the screen. Exit the CALIBRATION menu by pressing the ENTER or ESC key.

   NOTE:
   If float was set heavier to complete ground calibration procedure, adjust to recommended operating float after the calibration is complete.

5. If the unit does not function properly, conduct the maximum stubble height calibration.

Calibrating Maximum Stubble Height

This procedure describes how to calibrate the area counter to stop or start counting at the correct height. Program the header to a height that will never be reached while cutting. The area counter will stop counting when the header is above the programmed height, and will begin counting when the header is below the programmed height.

Select the height of the header that corresponds to the description above.

IMPORTANT:

- If the value is set too low, area may NOT be counted since the header is sometimes raised above this threshold although the combine is still cutting.
- If the value is set too high, the area counter will keep counting even when the header is raised (but below this threshold) and the combine is no longer cutting crop.

CAUTION

Check to be sure all bystanders have cleared the area.

1. Select the MAXIMUM STUBBLE HEIGHT calibration dialog box. As you proceed through the calibration process, the display will automatically update to show the next step.

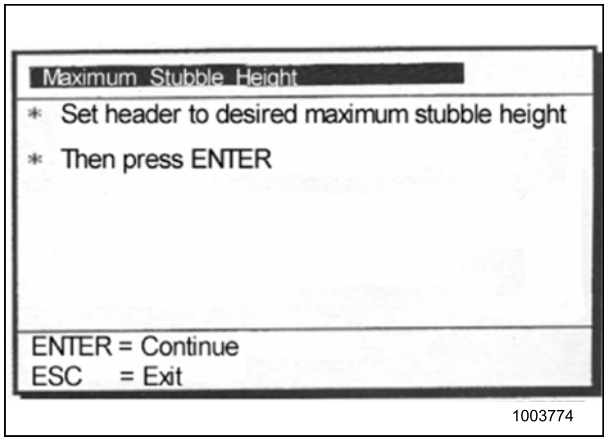


Figure 6.216: New Holland Calibration Dialog Box

2. Move header to the correct position using the header up or down control switch on the multifunction handle.
3. Press ENTER to continue. As you proceed through the calibration process, the display will automatically update to show the next step.
4. Press ENTER or ESC to close the calibration screen. The calibration is now complete.

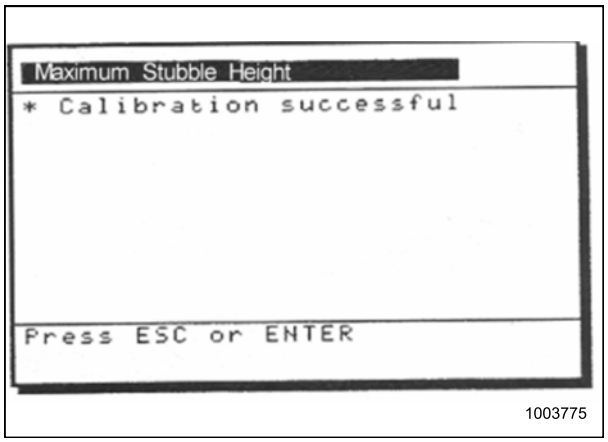


Figure 6.217: New Holland Calibration Dialog Box

Adjusting Header Raise Rate (New Holland CR/CX Series)

If necessary, the header raise rate (the first speed on the HEADER HEIGHT rocker switch of the multifunctional handle) can be adjusted.

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

NOTE:
For New Holland CR models 6.80, 6.90, 7.90, 8.90, 9.90, and 10.90, refer to *6.1.13 New Holland Combines (CR Series—Model Year 2015 and Later), page 248*.

1. Select HEADER RAISE RATE on the combine display.
2. Use the + or – buttons to change the setting.
3. Press ENTER to save the new setting.

NOTE:
The raise rate can be changed from 32–236 in steps of 34. The factory setting is 100.

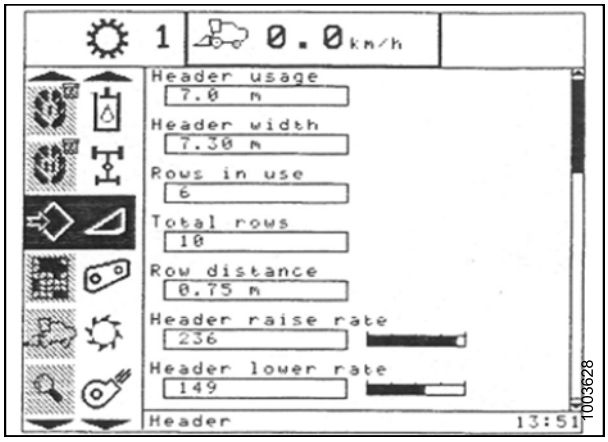


Figure 6.218: New Holland Combine Display

Setting the Header Lower Rate (New Holland CR/CX Series)

If necessary, the header lower rate (the automatic header height control button or second speed on the header height rocker switch of the multi-function handle) can be adjusted.

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

NOTE:
For New Holland CR models 6.80, 6.90, 7.90, 8.90, 9.90, and 10.90, refer to *6.1.13 New Holland Combines (CR Series—Model Year 2015 and Later), page 248*.

1. Select HEADER LOWER RATE on the combine display.
2. Use the + or – buttons to change the setting to 50.
3. Press ENTER to save the new setting.

NOTE:
The lower rate can be changed from 2–247 in steps of 7. It is factory-set to 100.

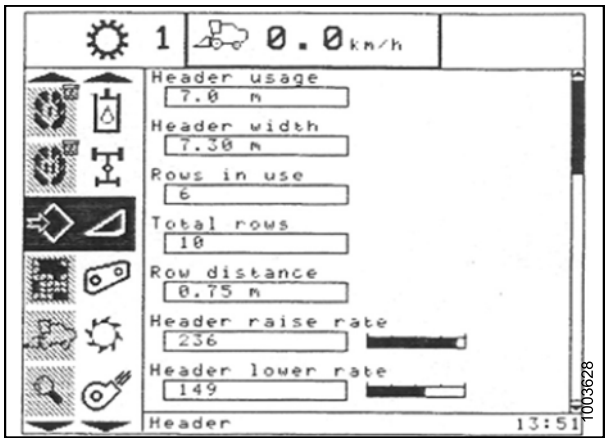


Figure 6.219: New Holland Combine Display

Setting the Sensitivity of the Auto Header Height Control (New Holland CR/CX Series)

The sensitivity adjustment controls the distance the cutterbar must travel up or down before the auto header height control (AHHC) reacts and raises or lowers the feeder house. When the sensitivity is set to maximum, only small changes in ground height are needed to cause the feeder house to raise or lower. When the sensitivity is set to minimum, large changes in the ground height are needed to cause the feeder house to raise or lower.

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

NOTE:
For New Holland CR models 6.80, 6.90, 7.90, 8.90, 9.90, and 10.90, refer to *6.1.13 New Holland Combines (CR Series—Model Year 2015 and Later), page 248*.

⚠ CAUTION

Check to be sure all bystanders have cleared the area.

1. Engage threshing and feeder house.
2. Select HEIGHT SENSITIVITY on the combine display screen.
3. Use the + or – buttons to change the setting to 200.
4. Press ENTER to save the new setting.

   NOTE:
   The sensitivity can be changed from 10–250 in steps of 10. It is factory-set to 100.

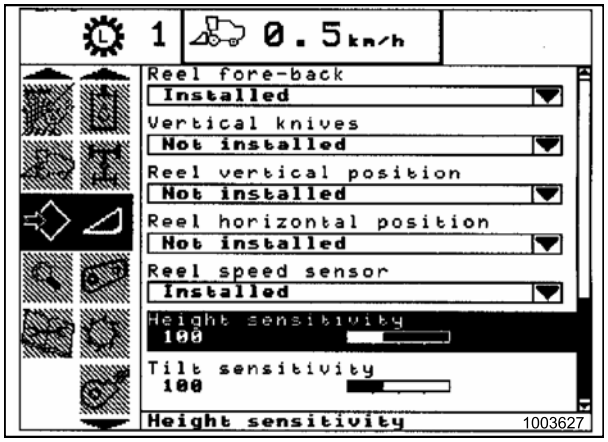


Figure 6.220: New Holland Combine Display

Setting Preset Cutting Height (New Holland CR/CX Series)

To set the preset cutting height, follow these steps:

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

NOTE:
For New Holland CR models 6.80, 6.90, 7.90, 8.90, 9.90, and 10.90, refer to *6.1.13 New Holland Combines (CR Series—Model Year 2015 and Later), page 248*.

1. Engage the threshing mechanism and the feeder with switches (A) and (B).
2. Set HEADER MEMORY rocker switch (D) in STUBBLE HEIGHT/AUTOFLOAT MODE position (A) or (B).
3. Lower the header to the desired cutting height using the HEADER HEIGHT AND HEADER LATERAL FLOTATION rocker switch (C).
4. Press AUTOMATIC HEADER HEIGHT CONTROL button (E) for a minimum of 2 seconds to store the height position. A beep will confirm the setting.

   NOTE:
   It is possible to store two different header height values by using HEADER MEMORY rocker switch (D) in STUBBLE HEIGHT/AUTOFLOAT MODE position (A) or (B).

5. To change one of the memorized header height set points while the combine is in use, use the HEADER HEIGHT AND HEADER LATERAL FLOTATION rocker switch (C) (slow up/down) to raise or lower header to the desired value. Press the AUTOMATIC HEADER HEIGHT CONTROL button (E) for a minimum of 2 seconds to store the new height position. A beep will confirm setting.

   NOTE:
   Do not press too hard on AUTOMATIC HEADER HEIGHT CONTROL button (E), or float mode will be disengaged.

   NOTE:
   It is not necessary to press rocker switch (D) again after adjusting.

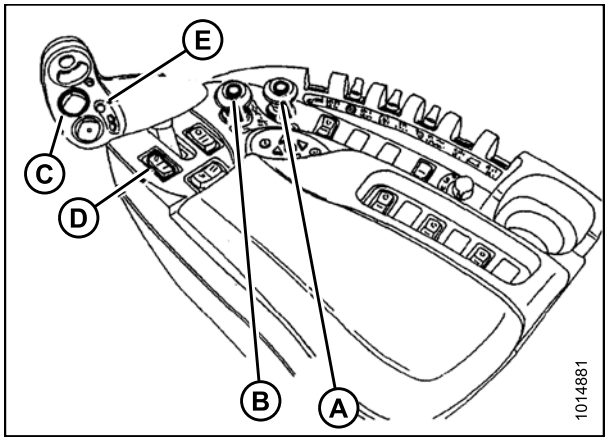


Figure 6.221: New Holland Combine Controls

NOTE:
The indicator reading with the header off the ground (152 mm [6 in.]) should be at 0 (B). If not, refer to Step *3., page 143*. Ground and crop conditions will dictate what number you will need to be set at. A reading at 1 (A) is set to light and 4 is set to heavy. The ideal setting is as light as possible without bouncing or missing crop. Operating with heavier pressures can wear the cutterbar wearplate prematurely.

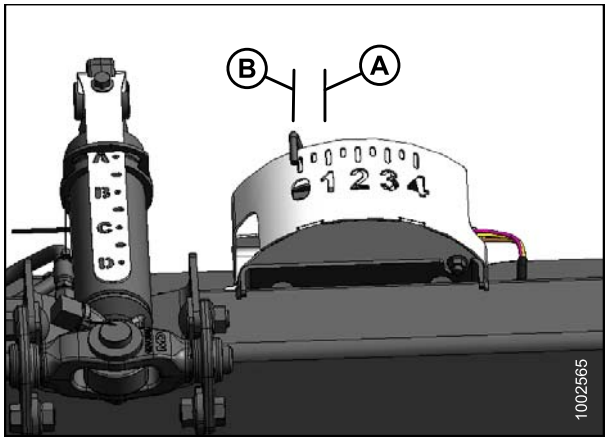


Figure 6.222: Float Indicator Box

6.1.13 New Holland Combines (CR Series—Model Year 2015 and Later)

This section applies only to 2015 and later CR models (6.80, 6.90, 7.90, 8.90, 9.90, and 10.90). For other pre-2015 New Holland combine models, refer to *6.1.12 New Holland Combines, page 238*.

Checking Voltage Range from the Combine Cab (New Holland CR Series)

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

NOTE:
This section applies only to 2015 and later CR models (6.80, 6.90, 7.90, 8.90, 9.90, and 10.90). For other pre-2015 New Holland combine models, refer to *6.1.12 New Holland Combines, page 238*.

⚠ CAUTION

Check to be sure all bystanders have cleared the area.

1. Position the header 150 mm (6 in.) above the ground, and unlock the float module float.
2. Check that float lock linkage is on down stops (washer [A] cannot be moved) at both locations.

   NOTE:
   If the header is not on down stops during the next two steps, the voltage may go out of range during operation causing a malfunction of the AHHC system.

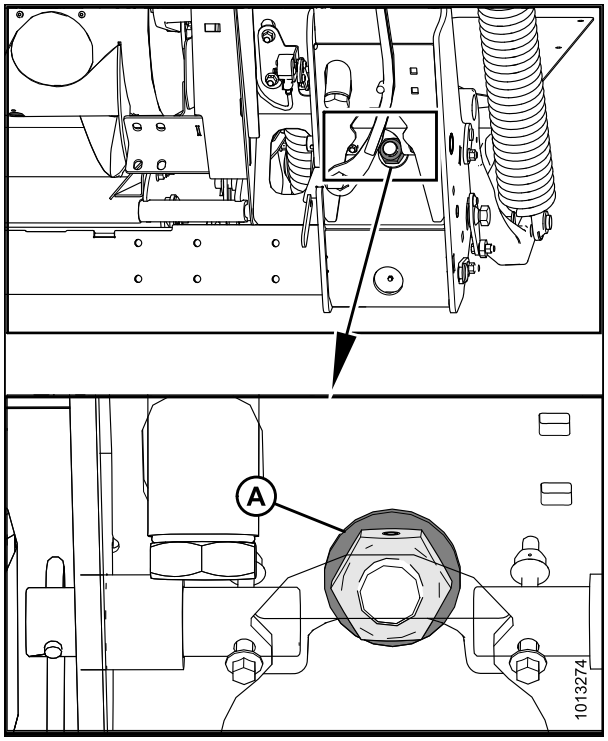


Figure 6.223: Float Lock

3. Adjust the cable take-up bracket (B) (if necessary) until the pointer (A) on the float indicator is on 0.

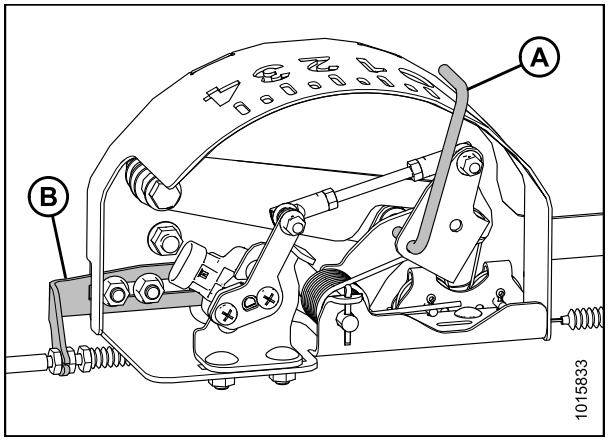


Figure 6.224: Float Indicator box

4. Ensure header float is unlocked.
5. Select DIAGNOSTICS (A) on the main screen. The DIAGNOSTICS screen displays.

Figure 6.225: New Holland Combine Display

6. Select SETTINGS (A). The SETTINGS screen displays.

Figure 6.226: New Holland Combine Display

7. Select HEADER HEIGHT/TILT (A) from the GROUP drop-down menu.
8. Select HEADER HEIGHT SENS. L (B) from the PARAMETER drop-down menu.

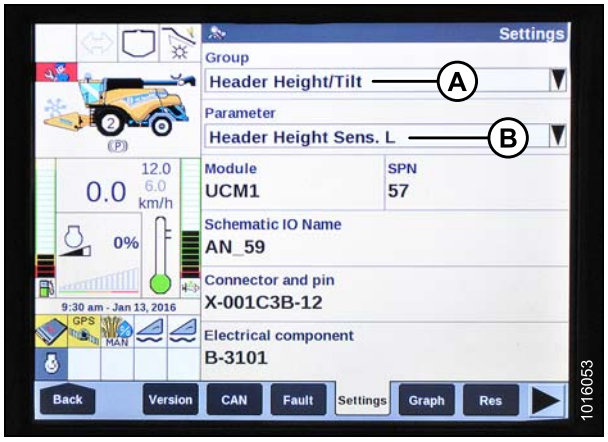


Figure 6.227: New Holland Combine Display

9. Select GRAPH (A). The exact voltage (B) is displayed at the top of the screen.
10. Raise and lower the header to see the full range of voltage readings.
11. If the sensor voltage is not within the low and high limits, or if the range between the low and high limits is insufficient, adjust the voltage limits. Refer to *Adjusting Voltage Limits: One-Sensor System, page 147*.

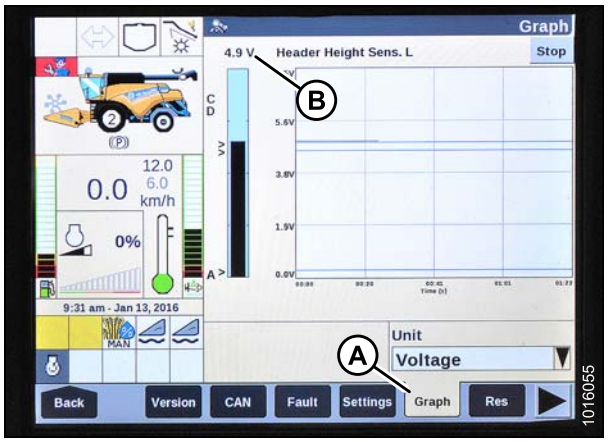


Figure 6.228: New Holland Combine Display

Engaging the Auto Header Height Control (New Holland CR Series)

For best performance of the auto header height control (AHHC), perform these procedures with the center-link set to D. When setup and calibration are complete, adjust the center-link back to desired header angle.

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

NOTE:
This section applies only to 2015 and later CR models (6.80, 6.90, 7.90, 8.90, 9.90, and 10.90). For other pre-2015 New Holland combine models, refer to *6.1.12 New Holland Combines, page 238*.

1. Ensure center-link is set to D.
2. Select TOOLBOX (A) on the main screen. The TOOLBOX screen displays.

Figure 6.229: New Holland Combine Display

3. Simultaneously press both the UNLOAD (A) and RESUME (B) buttons on the hydro handle.

Figure 6.230: New Holland Combine Controls

4. Select HEAD 1 (A). The HEADER SETUP 1 screen displays.
5. Select the CUTTING TYPE drop-down arrow (B) and change the CUTTING TYPE to PLATFORM (C).

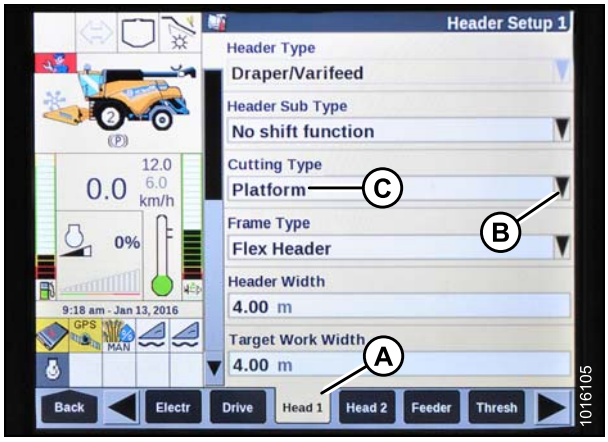


Figure 6.231: New Holland Combine Display

6. Select the HEADER SUB TYPE drop-down arrow (A). The HEADER SUB TYPE dialog box displays.

Figure 6.232: New Holland Combine Display

7. Select HEAD 2 (A). The HEADER SETUP 2 screen displays.

Figure 6.233: New Holland Combine Display

8. Select the AUTOFLOAT drop-down arrow and set AUTOFLOAT to INSTALLED (A).
9. Select the AUTO HEADER LIFT drop-down arrow and set AUTO HEADER LIFT to INSTALLED (B).

   NOTE:
   With AUTO HEADER LIFT installed and AHHC engaged, the header will lift up automatically when you pull back on the ground speed lever (GSL).

10. Set the values for MANUAL HHC RAISE RATE (C) and MANUAL HHC LOWER RATE (D) for best performance according to ground conditions.

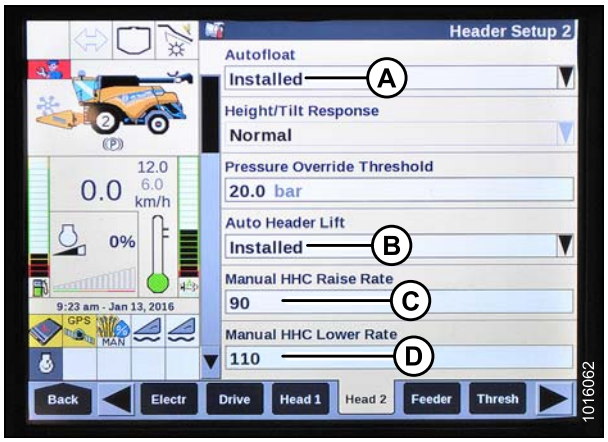


Figure 6.234: New Holland Combine Display

11. Set the values for HHC HEIGHT SENSITIVITY (A) and HHC TILT SENSITIVITY (B) for best performance according to ground conditions.

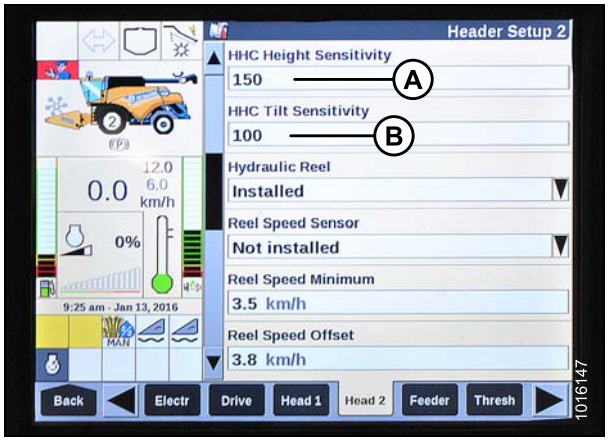


Figure 6.235: New Holland Combine Display

Calibrating the Auto Header Height Control (New Holland CR Series)

For best performance of the auto header height control (AHHC), perform these procedures with the center-link set to D. When setup and calibration are complete, adjust the center-link back to desired header angle. Refer to Header Angle in the header operator's manual for instructions.

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

NOTE:
This section applies only to 2015 and later CR models (6.80, 6.90, 7.90, 8.90, 9.90, and 10.90). For other pre-2015 New Holland combine models, refer to *6.1.12 New Holland Combines, page 238*.

⚠ CAUTION

Check to be sure all bystanders have cleared the area.

Check the following conditions before starting the header calibration procedure:

- The header is attached to the combine.
- The combine is on level ground, with the header level to the ground.
- The header is on down stops, and the center-link is set to D.
- The engine is running.
- The combine is not moving.
- No faults have been received from the header height controller (HHC) module.
- Header/feeder is disengaged.
- Lateral flotation buttons are NOT pressed.
- ESC key is NOT pressed.

To calibrate the AHHC, follow these steps:

1. Select CALIBRATIONS (A) on the main screen. The CALIBRATION screen displays.

Figure 6.236: New Holland Combine Display

2. Select the CALIBRATION drop-down arrow (A).

Figure 6.237: New Holland Combine Display

3. Select HEADER (A) from the list of calibration options.

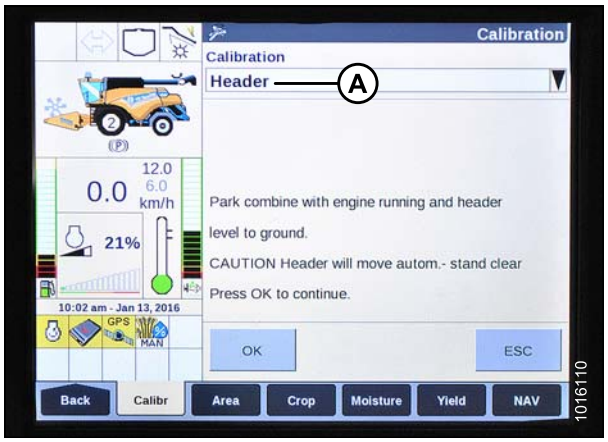


Figure 6.238: New Holland Combine Display

4. Follow the calibration steps in the order in which they appear on the screen. As you proceed through the calibration process, the display will automatically update to show the next step.

   NOTE:
   Pressing the ESC key during any of the steps or letting the system sit idle for more than 3 minutes will cause the calibration procedure to stop.

   NOTE:
   Refer to your combine operator's manual for an explanation of any error codes.

Figure 6.239: New Holland Combine Display

5. When all steps have been completed, CALIBRATION COMPLETED message is displayed on the screen.

   NOTE:
   If float was set heavier to complete ground calibration procedure, adjust to recommended operating float after the calibration is complete.

Figure 6.240: New Holland Combine Display

Setting Auto Height (New Holland CR Series)

NOTE:
This section applies only to 2015 and later CR models (6.80, 6.90, 7.90, 8.90, 9.90, and 10.90). For other pre-2015 New Holland combine models, refer to *6.1.12 New Holland Combines, page 238*.

The console has two buttons used for auto height presets. The toggle switch that was present on previous models is now configured as shown at right. MacDon headers only require the first two buttons (A) and (B). The third button (C) is not configured.

CAUTION

Check to be sure all bystanders have cleared the area.

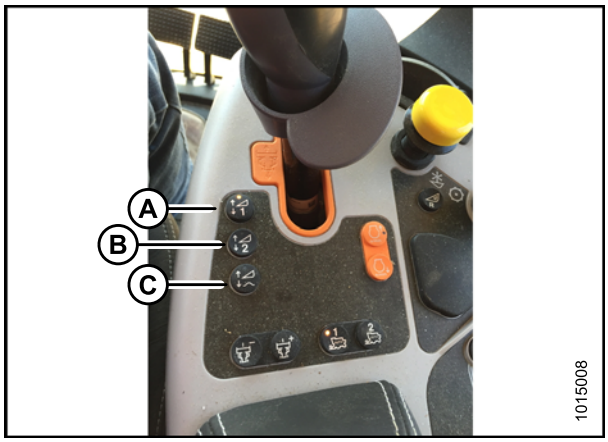


Figure 6.241: New Holland Combine Controls

To set the auto height, follow these steps:

1. Engage separator and header.
2. Select RUN SCREENS (A) on the main screen.

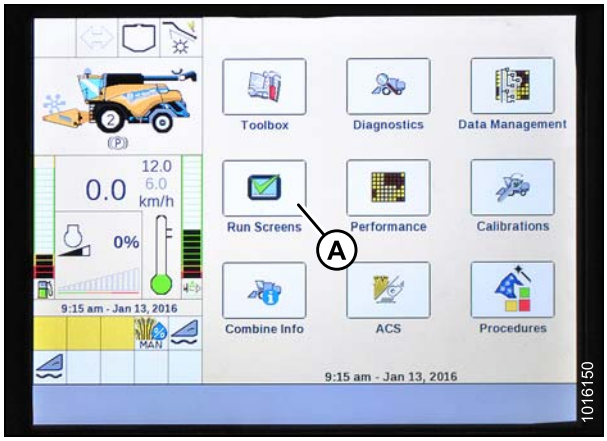


Figure 6.242: New Holland Combine Display

3. Select the RUN tab that shows MANUAL HEIGHT.

   NOTE:
   The MANUAL HEIGHT field may appear on any of the RUN tabs. When an auto height set point button is pressed, the display will change to AUTO HEIGHT (A).

4. Lower the header to the ground.
5. Select one of the auto height set point buttons shown in Figure *6.241: New Holland Combine Controls, page 255*.
   - Press the SET 1 button for a light ground setting (1 on the float indicator box).
   - Press the SET 2 button for a heavier ground setting (2 on the float indicator box).

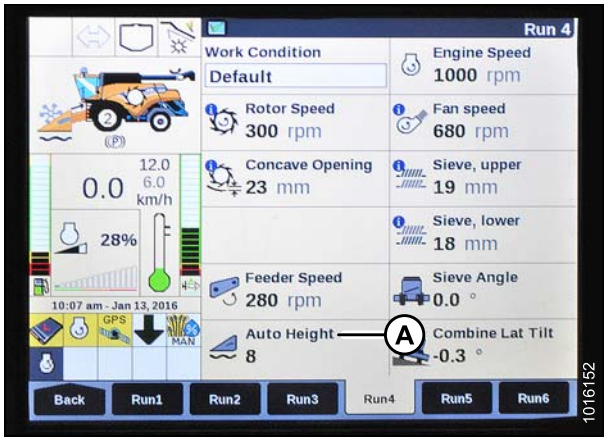


Figure 6.243: New Holland Combine Display

Setting Maximum Work Height (New Holland CR Series)

This procedure applies only to 2015 and later CR models (6.80, 6.90, 7.90, 8.90, 9.90, and 10.90).

NOTE:
This section applies only to 2015 and later CR models (6.80, 6.90, 7.90, 8.90, 9.90, and 10.90). For other pre-2015 New Holland combine models, refer to *6.1.12 New Holland Combines, page 238*.

1. Select TOOLBOX (A) on the main screen. The TOOLBOX screen displays.

Figure 6.244: New Holland Combine Display

2. Select FEEDER (A). The FEEDER SETUP screen displays.
3. Select the MAXIMUM WORK HEIGHT field (B).

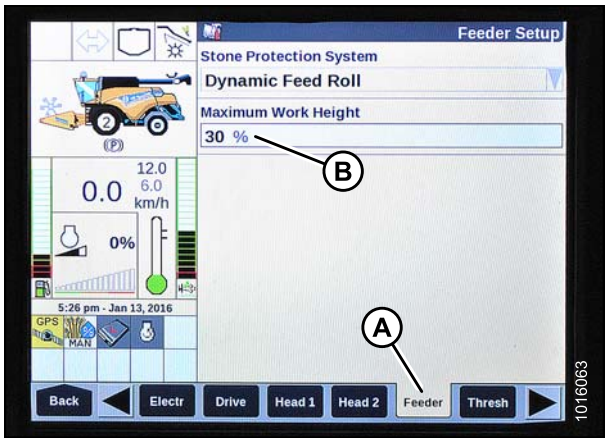


Figure 6.245: New Holland Combine Display

4. Set MAXIMUM WORK HEIGHT to desired value.
5. Press SET and then press ENTER.

Figure 6.246: New Holland Combine Display

Configuring Reel Fore-Aft, Header Tilt, and Header Type (New Holland CR Series)

This procedure applies only to 2016 New Holland CR models 6.90, 7.90, 8.90, and 9.90.

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

1. Simultaneously press both the UNLOAD (A) and RESUME (B) buttons on the hydro handle.

Figure 6.247: New Holland Combine Controls

2. On the HEAD 1 screen, change the CUTTING TYPE from FLEX to PLATFORM as shown at location (A).

Figure 6.248: New Holland Combine Display

3. On the HEAD 2 screen, change HEADER SUB TYPE from DEFAULT to 80/90 as shown at location (A).

Figure 6.249: New Holland Combine Display

There are now two different buttons for ON GROUND presets. The toggle switch that was present on previous models is now configured as shown at right. MacDon headers only require the first two buttons (A) and (B). The third button down (C) is not configured.

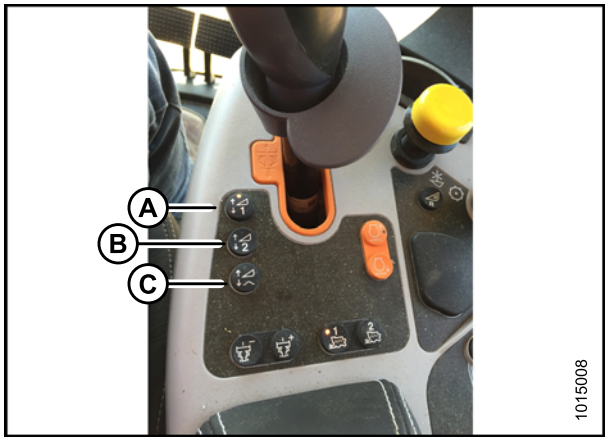


Figure 6.250: New Holland Combine Controls

6.1.14 Sensor Operation

The position sensors supplied with the auto header height control (AHHC) system are hall-effect sensors containing sealed connectors. Normal operating signal voltages for the sensors fall between 10% (0.5VDC) and 90% (4.5VDC). An increase in sensor voltage correlates to an increase in header height.

Any sensor error results in a 0 V signal, which indicates either a faulty sensor or lack of proper supply voltage.

6.1.15 Replacing the Auto Header Height Control (AHHC) Sensor (One-Sensor System)

1. Disconnect the wiring harness (A) from the existing sensor (B).
2. Remove the two screws (C) that secure the sensor (B) to the sensor arm (D).

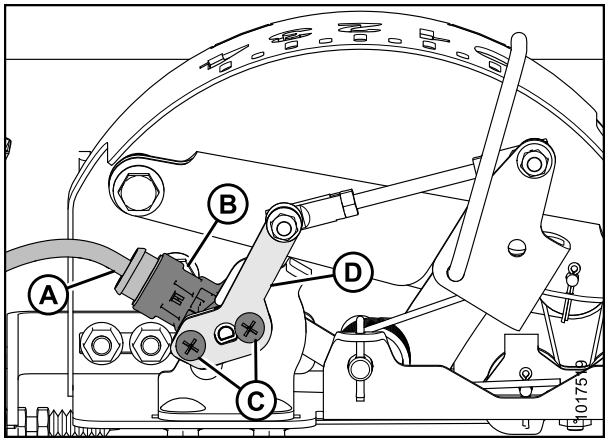


Figure 6.251: AHHC Sensor

3. Swing the sensor arm (A) upwards to gain access to the two bolts (B) securing the sensor (C) to the bracket (D).
4. Remove the two bolts and nuts (B) that secure the sensor (B) to the bracket (D).
5. Pull sensor (B) away from the bracket (D).

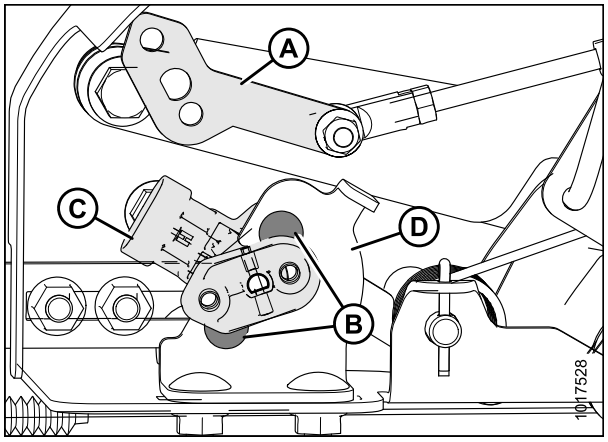


Figure 6.252: AHHC Sensor

IMPORTANT:
To avoid damaging the new sensor, install sensor as follows:

6. Position the new sensor (A) on the bracket (B).
7. Secure with two bolts (C) and nuts (D).

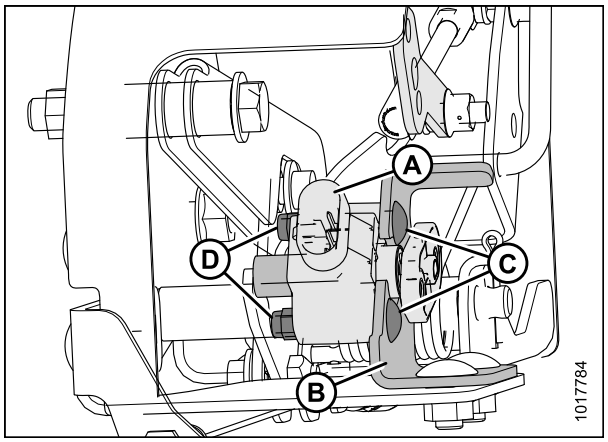


Figure 6.253: AHHC Sensor

8. Attach sensor arm (A) to the sensor (B) and secure with two screws (C).
9. Reconnect the wiring harness to the plug (B) on the sensor.
10. Check the voltage range of the new sensor, and adjust if necessary. Refer to:
    - *Manually Checking Voltage Range: One-Sensor System, page 142*
    - *Adjusting Voltage Limits: One-Sensor System, page 147*

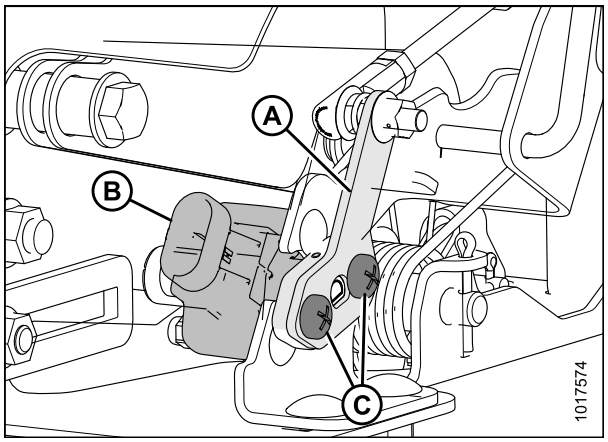


Figure 6.254: AHHC Sensor

7 Checking and Adjusting Reel Height Sensor

The output voltage range of the auto reel height sensor can be checked from inside the combine or manually at the sensor. For in-cab instructions, refer to the combine operator's manual. To check the voltage range manually, refer to the procedure below.

DANGER

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

CAUTION

Check to be sure all bystanders have cleared the area.

IMPORTANT:
Ensure reel height is properly set before adjusting reel height sensor. Refer to *5.12 Measuring and Adjusting Reel Clearance to Cutterbar, page 115*.

IMPORTANT:
To measure the output voltage of the reel height sensor, the combine needs to be turned ON and supplying power to the sensor. Always engage the combine parking brake and stay away from the reel.

Table 7.1 Reel Height Sensor Voltage Limits

Combine Type	Voltage Range	
	X Voltage	Y Voltage
Case New Holland	0.5–0.9 V	4.1–4.5 V
John Deere	4.1–4.5 V	0.5–0.9 V
CLAAS	4.1–4.5 V	0.5–0.9 V

NOTE:
For CLAAS Combines: To avoid a collision of the reel with the cab, the machine is equipped with an automatic reel height limitation. Some CLAAS combines have an automatic shutoff feature that engages when the automatic reel height limitation is reached. When raising the header by more then 80 percent, the reel is automatically lowered. The automatic lowering of the reel can be manually overridden, and a warning will appear on the CEBIS terminal.

1. Engage the combine parking brake.
2. Start the combine engine and lower reel fully.

3. Use the combine display or a voltmeter (if measuring the sensor manually) to measure voltage range X. Refer to Table *7.1 Reel Height Sensor Voltage Limits, page 261* for range requirements.
4. If using a voltmeter, measure the voltage between the ground (Pin 2 wire) and the signal (Pin 3 wire) at the reel height sensor (B).
5. Stop the combine engine and remove key.
6. Adjust length of threaded rod (A) to modify voltage range X.
7. Repeat checking and adjusting until voltage range X is within the range specified.

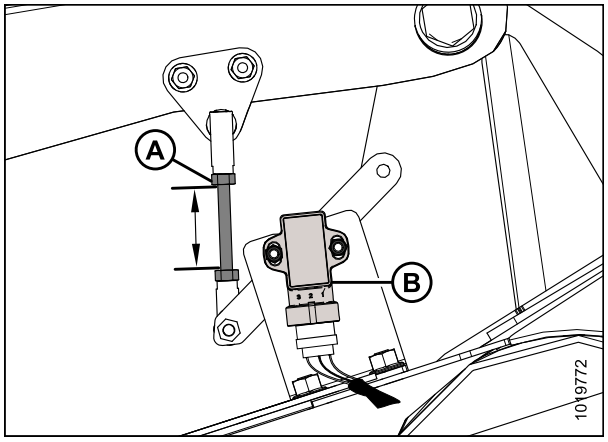


Figure 7.1: Reel Height Sensor – Right Reel Arm (Reel Down)

8. Start the combine engine, and raise the reel fully.
9. Use the combine display or a voltmeter (if measuring the sensor manually), to measure voltage range Y. Refer to Table *7.1 Reel Height Sensor Voltage Limits, page 261* for range requirements.
10. If using a voltmeter, measure the voltage between the ground (Pin 2 wire) and the signal (Pin 3 wire) at the reel height sensor (A).
11. Stop the combine engine and remove key.
12. Loosen two M5 hex nuts (B) and rotate sensor (A) to achieve voltage range Y.
13. Repeat checking and adjusting until voltage range Y is within the range specified.
14. Start the combine engine and lower reel fully.
15. Recheck voltage range X and ensure it is still within the range specified. Adjust if required.

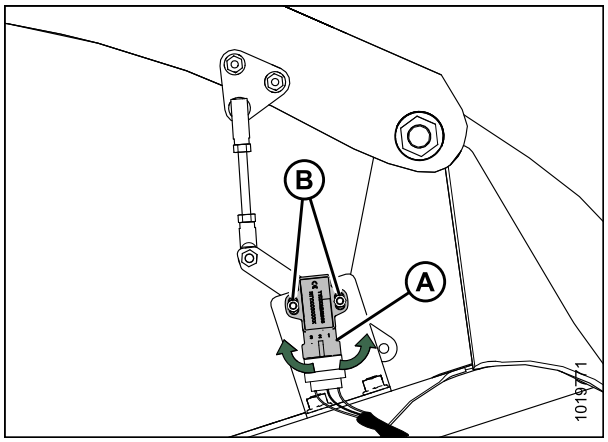


Figure 7.2: Reel Height Sensor – Right Reel Arm (Reel Up)

8 Running up Header

To run up the header, follow these steps:

DANGER

Engage header safety props and reel props before working under header or reel.

DANGER

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

CAUTION

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

1. Start combine, raise header fully, and engage header lift cylinder locks.
2. Stop engine and remove key.
3. Lower plastic pan under float module and check for shipping materials/debris that may have fallen under float module draper.
4. Rotate latches (A) to unlock handles (B).
5. Hold pan (C) and rotate handles (B) to release pan. Lower pan to expose draper.

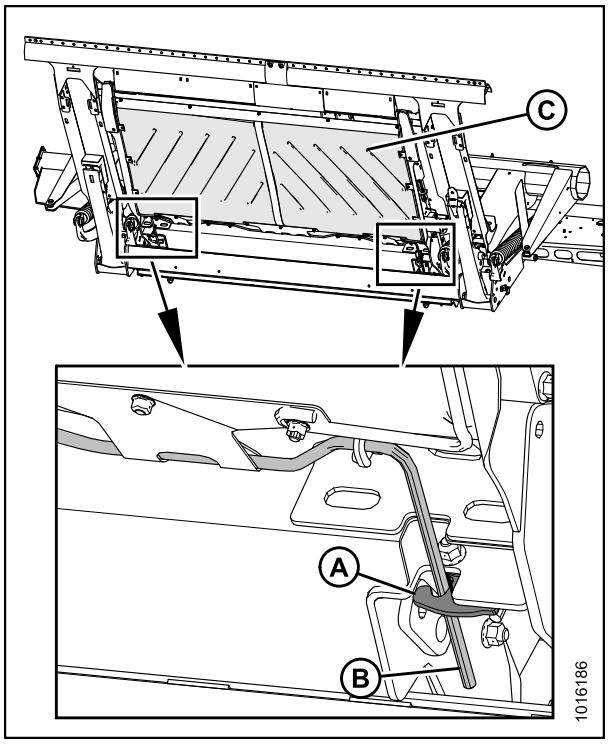


Figure 8.1: Float Module Plastic Pan

6. Check and remove debris from pan (A) and draper.

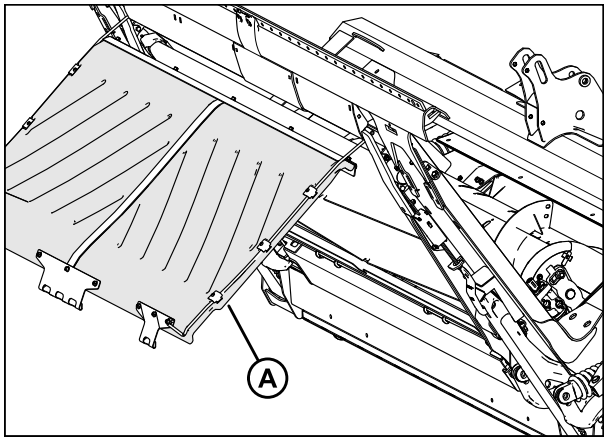


Figure 8.2: Float Module Plastic Pan

7. Raise pan and rotate handle (A) so that rod engages clips (B) on pan.

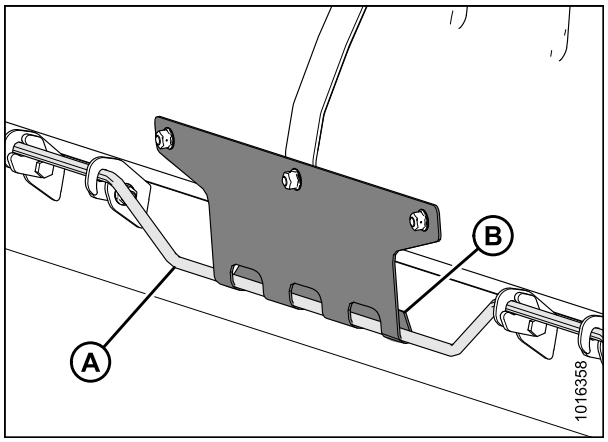


Figure 8.3: Clips Engaged

8. Push handle (B) into slot and secure it with latches (A).
9. Open left endshield.

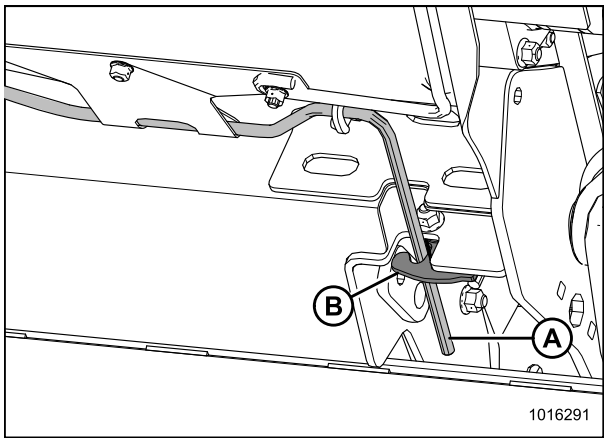


Figure 8.4: Latches Secured

10. Ensure flow control (A) is set to position 6.
11. Ensure feeder house variable speed is set to MINIMUM.

CAUTION

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

12. Start combine and run the machine slowly for 5 minutes while watching and listening **FROM THE OPERATOR'S SEAT** for binding or interfering parts.

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

13. Run the machine at operating speed for 15 minutes. Listen for any unusual sounds or abnormal vibration.
14. Perform run-up check as listed on *Predelivery Checklist, page 285* (yellow sheet attached to this instruction) to ensure the machine is field-ready.

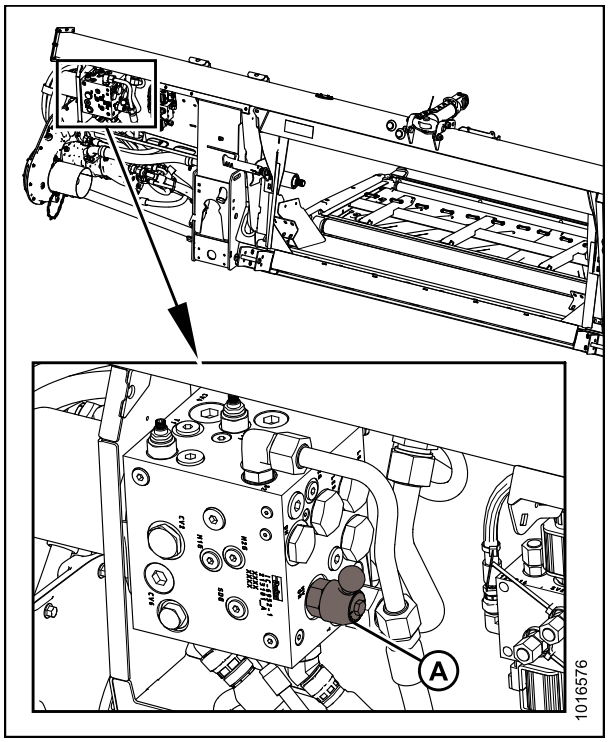


Figure 8.5: Flow Control

8.1 Performing Post Run-Up Adjustments

Perform post run-up check as listed on the Predelivery Checklist (yellow sheet attached to this instruction *Predelivery Checklist, page 285*) to ensure machine is field-ready.

WARNING

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

Some adjustments may be necessary after the run-up. Refer to the following:

- *8.1.1 Adjusting Knife, page 265*
- *8.1.2 Adjusting Knife Speed, page 267*

8.1.1 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.

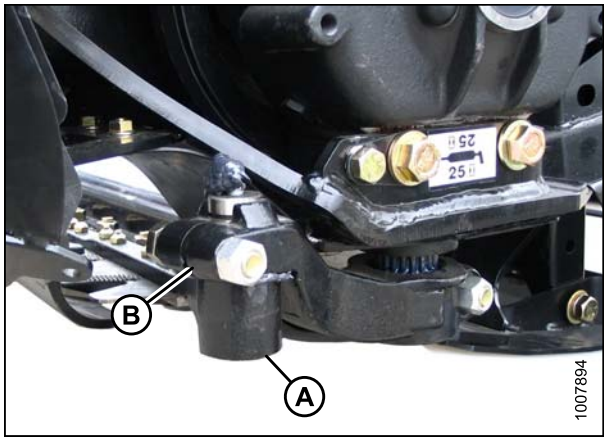


Figure 8.6: Knifehead and Pitman Arm

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 8.7: Guard Tips – Upward Adjustment

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

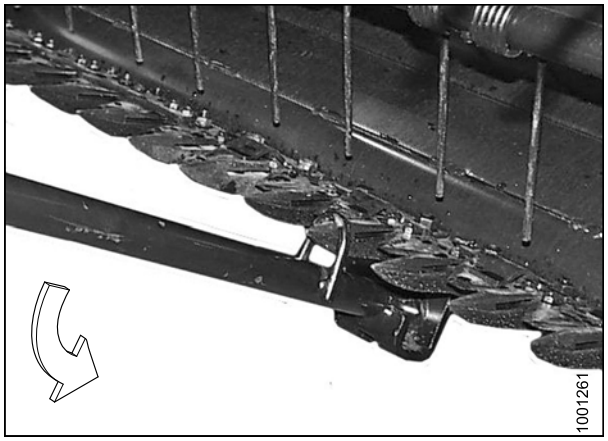


Figure 8.8: Guard Tips – Downward Adjustment

8.1.2 Adjusting Knife Speed

The header knife drive is driven by the hydraulic pump mounted on the float module. The following speeds are factory-set for the combine feeder house:

- AGCO: 625 rpm (includes Challenger, Gleaner, and Massey Ferguson)
- Case: 580 rpm
- John Deere: 490 rpm
- CLAAS: 750 rpm (420 on combine display)
- New Holland: 580 rpm

DANGER

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

IMPORTANT:
This is the **minimum** speed setting for variable speed feeder houses. To avoid damage to the header, do NOT operate at speeds higher than the minimum speed settings.

1. Stop combine engine and remove key.
2. Push release lever (A) located on the backside of the endshield to unlock the shield.
3. Pull endshield open using handle depression (B).

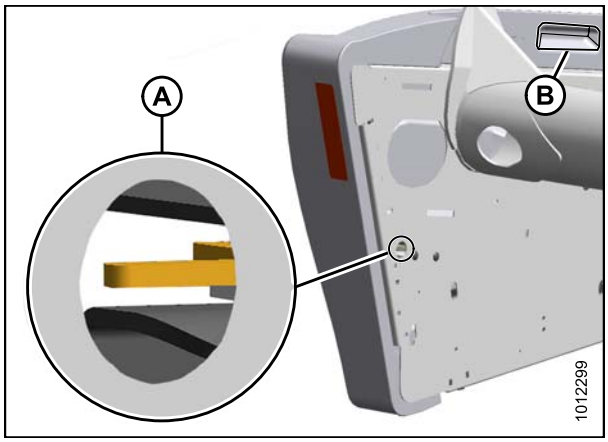


Figure 8.9: Endshield Latch Access

4. Pull endshield at handle depression (A). Endshield is retained by a hinge tab (B) and will open in direction (C).

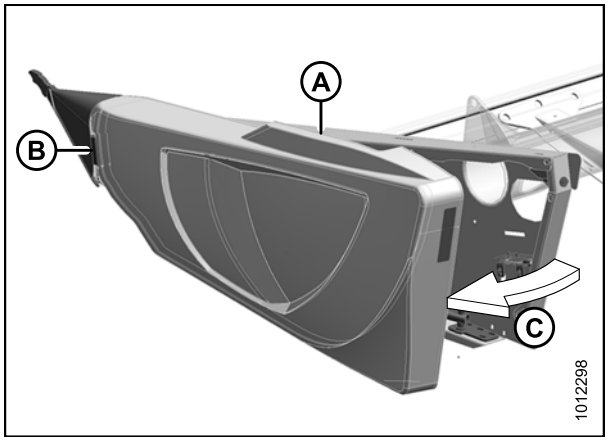


Figure 8.10: left Endshield

5. Pull the endshield free of hinge tab (A) if additional clearance is required, and swing shield towards the rear of the header.
6. Engage safety catch (B) on hinge arm to secure the shield in fully-open position.

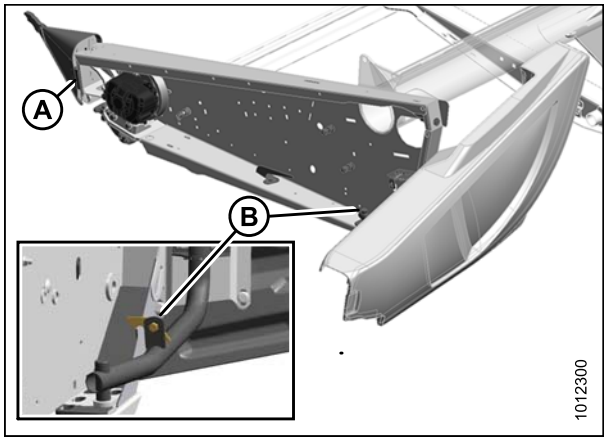


Figure 8.11: Left Endshield

CAUTION

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

7. Start engine, engage header drive, and run combine at operating rpm.
8. Check the rpm of knife drive box pulley using a handheld tachometer.
9. Stop engine, remove key, and close endshield.

Figure 8.12: Knife Drive Box

10. Compare actual pulley rpm with values in the following chart:

Table 8.1 Recommended Knife Drive Speed (rpm)

Header Size	Recommended Knife Drive Speed Range (rpm)	
	Single Knife	Double Knife
30 ft.	550–650	—
35 ft.	550–600	—
40 ft.	525–600	550–650
45 ft.	N/A	

11. If adjustment to knife drive box pulley rpm is necessary, refer to the header technical manual.

9 Reference

9.1 Torque Specifications

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

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

Jam Nuts

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

Self-Tapping Screws

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

9.1.1 Metric Bolt Specifications

Table 9.1 Metric Class 8.8 Bolts and Class 9 Free Spinning Nut

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

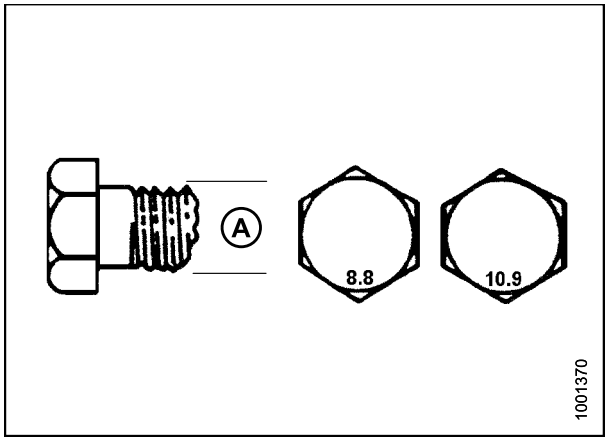


Figure 9.1: Bolt Grades

Table 9.2 Metric Class 8.8 Bolts and Class 9 Distorted Thread Nut

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

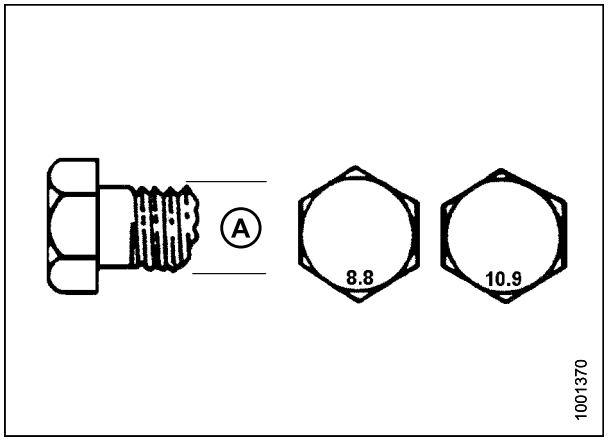


Figure 9.2: Bolt Grades

Table 9.3 Metric Class 10.9 Bolts and Class 10 Free Spinning Nut

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

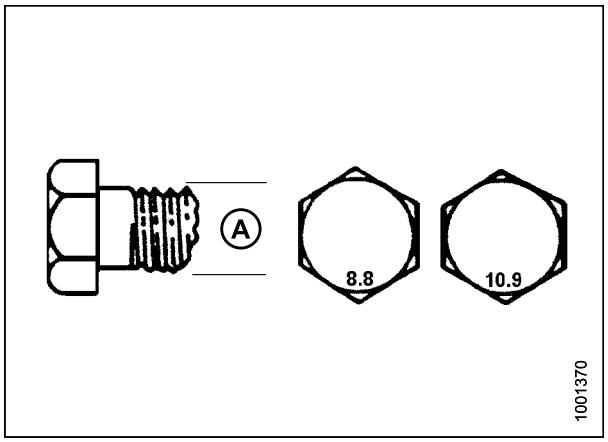


Figure 9.3: Bolt Grades

Table 9.4 Metric Class 10.9 Bolts and Class 10 Distorted Thread Nut

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

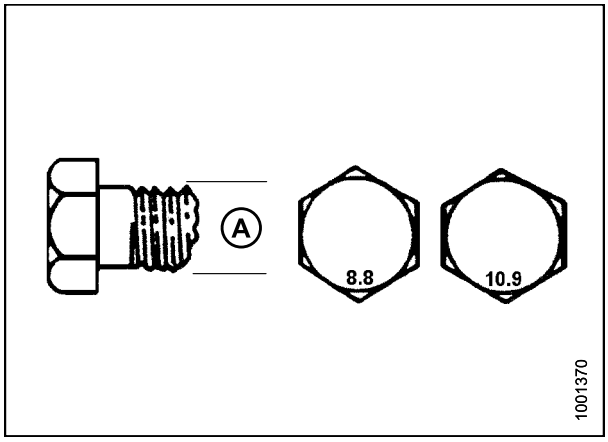


Figure 9.4: Bolt Grades

9.1.2 Metric Bolt Specifications Bolting into Cast Aluminum

Table 9.5 Metric Bolt Bolting into Cast Aluminum

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

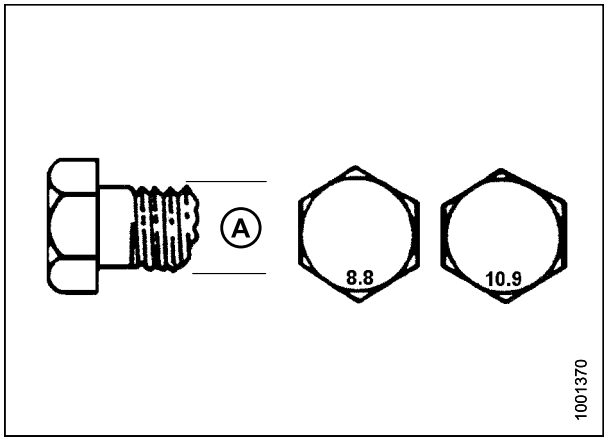


Figure 9.5: Bolt Grades

9.1.3 Flare-Type Hydraulic Fittings

1. Check flare (A) and flare seat (B) for defects that might cause leakage.
2. Align tube (C) with fitting (D) and thread nut (E) onto fitting without lubrication until contact has been made between flared surfaces.
3. Torque fitting nut (E) to specified number of flats from finger tight (FFFT) or to a given torque value in Table *9.6 Flare-Type Hydraulic Tube Fittings, page 273*.
4. Use two wrenches to prevent fitting (D) from rotating. Place one wrench on fitting body (D), and tighten nut (E) with other wrench to torque shown.
5. Assess final condition of connection.

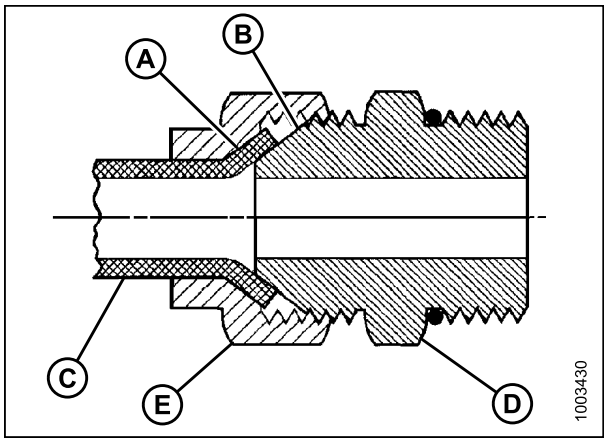


Figure 9.6: Hydraulic Fitting

Table 9.6 Flare-Type Hydraulic Tube Fittings

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

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

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

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

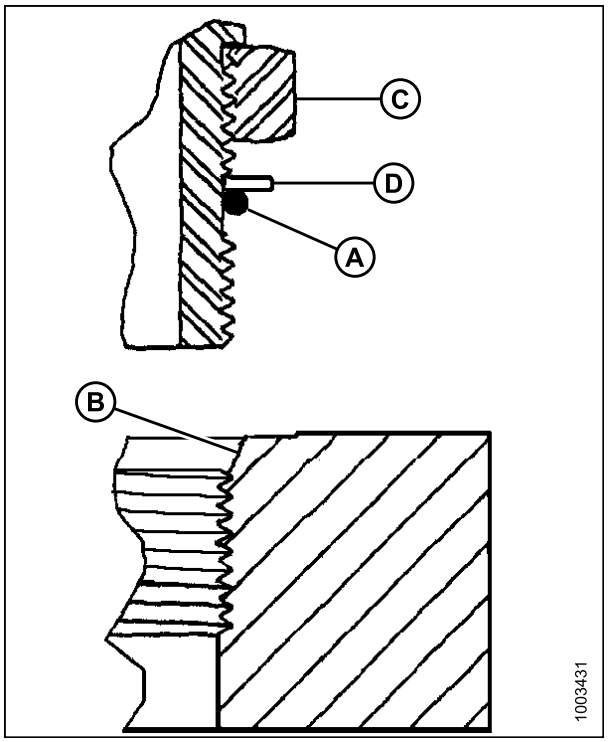


Figure 9.7: Hydraulic Fitting

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

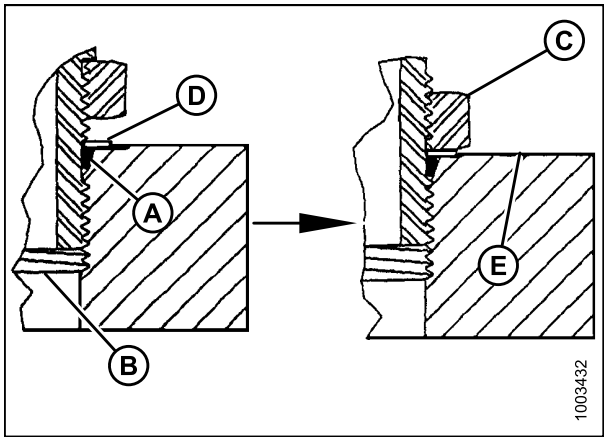


Figure 9.8: Hydraulic Fitting

Table 9.7 O-Ring Boss (ORB) Hydraulic Fittings (Adjustable)

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

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

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

1. Inspect O-ring (A) and seat (B) for dirt or obvious defects.
2. Check that O-ring (A) is **NOT** on threads and adjust if necessary.
3. Apply hydraulic system oil to O-ring.
4. Install fitting (C) into port until fitting is hand tight.
5. Torque fitting (C) according to values in Table *9.8 O-Ring Boss (ORB) Hydraulic Fittings (Non-Adjustable), page 276*.
6. Check final condition of fitting.

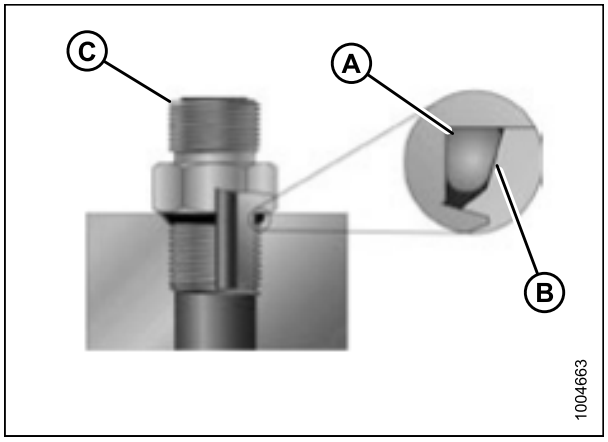


Figure 9.9: Hydraulic Fitting

Table 9.8 O-Ring Boss (ORB) Hydraulic Fittings (Non-Adjustable)

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

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

9.1.6 O-Ring Face Seal (ORFS) Hydraulic Fittings

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

Figure 9.10: Hydraulic Fitting

2. Apply hydraulic system oil to O-ring (B).
3. Align tube or hose assembly so that flat face of sleeve (A) or (C) comes in full contact with O-ring (B).
4. Thread tube or hose nut (D) until hand-tight. The nut should turn freely until it is bottomed out.
5. Torque fittings according to values in Table *9.9 O-Ring Face Seal (ORFS) Hydraulic Fittings, page 278*.

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

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

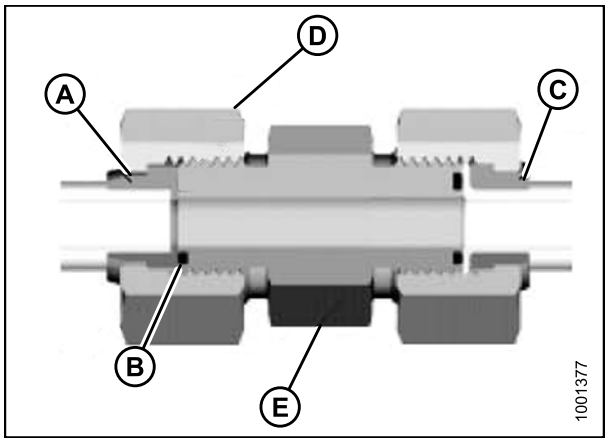


Figure 9.11: Hydraulic Fitting

Table 9.9 O-Ring Face Seal (ORFS) Hydraulic Fittings

SAE Dash Size	Thread Size (in.)	Tube O.D. (in.)	Torque Value[6]	
			Nm	lbf·ft
-3	Note[7]	3/16	–	–
-4	9/16	1/4	25–28	18–21
-5	Note[7]	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[7]	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

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

9.1.7 Tapered Pipe Thread Fittings

Assemble pipe fittings as follows:

1. Check components to ensure that fitting and port threads are free of burrs, nicks and scratches, or any form of contamination.
2. Apply pipe thread sealant (paste type) to external pipe threads.
3. Thread fitting into port until hand-tight.
4. Torque connector to appropriate torque angle. The Turns From Finger Tight (T.F.F.T.) values are shown in Table *9.10 Hydraulic Fitting Pipe Thread, page 279*. Make sure that tube end of a shaped connector (typically 45º or 90º) is aligned to receive incoming tube or hose assembly. Always finish alignment of fitting in tightening direction. Never back off (loosen) pipe threaded connectors to achieve alignment.
5. Clean all residue and any excess thread conditioner with appropriate cleaner.
6. Assess final condition of fitting. Pay special attention to possibility of cracks to port opening.
7. Mark final position of fitting. If a fitting leaks, disassemble fitting and check for damage.

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

Table 9.10 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

9.2 Lifting Equipment Requirements

The following topic describes the minimum equipment requirements for lifting headers.

CAUTION

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

CAUTION

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

NOTE:
When a header and float module are ordered together, they are shipped with the float module already installed in the header.

IMPORTANT:
Forklifts are normally rated for a load center 610 mm (24 in.) ahead of back end of the forks. To obtain the forklift capacity for a load center (A) at 1220 mm (48 in.) (B), check with your forklift distributor. The minimum fork length (C) is 1981 mm (78 in.).

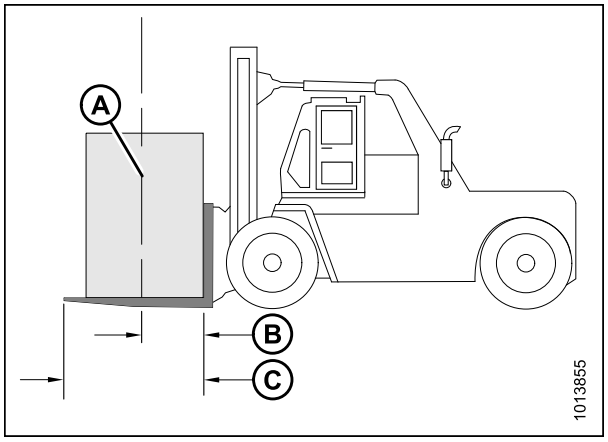


Figure 9.12: Minimum Lifting Capacity

A - Load Center of Gravity
B - Load Center 1220 mm (48 in.) from Back of Forks
C - Minimum Fork Length 1981 mm (78 in.)

Table 9.11 Lifting Chain Requirements

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

9.3 Conversion Chart

Table 9.12 Conversion Chart

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

9.4 Definitions

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

Term	Definition
AHHC	Automatic Header Height Control
API	American Petroleum Institute
ASTM	American Society of Testing and Materials
Bolt	A headed and externally threaded fastener that is designed to be paired with a nut
Center-link	A hydraulic cylinder link between header and machine used to change header angle
CGVW	Combined vehicle gross weight
D1 Series header	MacDon D120, D125, D130, D135, D140, or D145 combine draper header from D1 model number series
DK	Double knife
DKD	Double-knife drive
DDD	Double-draper drive
DR	Double reel
FD1 Series header	MacDon FD130, FD135, FD140, or FD145 combine FlexDraper® header from the FD1 Series model number series
Finger tight	Finger tight is a reference position where sealing surfaces or components are making contact with each other and fitting has been tightened to a point where fitting is no longer loose
FFFT	Flats from finger tight
GVW	Gross vehicle weight
Hard joint	A joint made with use of a fastener where joining materials are highly incompressible
Header	A machine that cuts and lays crop into a windrow and is attached to a self-propelled windrower
Hex key	A tool of hexagonal cross-section used to drive bolts and screws that have a hexagonal socket in head (internal-wrenching hexagon drive); also known as an Allen key and various other synonyms
HDS	Hydraulic deck shift
hp	Horsepower
JIC	Joint Industrial Council: A standards body that developed standard sizing and shape for original 37° flared fitting
Knife	A cutting device which uses a reciprocating cutter (also called a sickle)
MDS	Mechanical deck shift
n/a	Not applicable
Nut	An internally threaded fastener that is designed to be paired with a bolt
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

Term	Definition
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 use of certain hazardous substances (such as hexavalent chromium used in some yellow zinc platings)
SAE	Society of Automotive Engineers
Screw	A headed and externally threaded fastener that threads into preformed threads or forms its own thread into a mating part
SDD	Single-draper drive
Soft joint	A joint made with use of a fastener where joining materials are compressible or experience relaxation over a period of time
spm	Strokes per minute
Truck	A four-wheel highway/road vehicle weighing no less than 3400 kg (7500 lb.)
Tension	Axial load placed on a bolt or screw, usually measured in Newtons (N) or pounds (lb.)
TFFT	Turns from finger tight
Torque	The product of a force X lever arm length, usually measured in Newton-meters (N·m) or foot-pounds (lbf·ft)
Torque angle	A tightening procedure where fitting is assembled to a precondition (finger tight) and then nut is turned farther a number of degrees to achieve its final position
Torque-tension	The relationship between assembly torque applied to a piece of hardware and axial load it induces in bolt or screw
UCA	Upper cross auger
Untimed knife drive	Unsynchronized motion applied at 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

Predelivery Checklist

Perform these checks and adjustments prior to delivery to your Customer. **Adjustments are normally not required as the machine is factory-assembled and adjusted.** 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: **Float Module Serial Number:**

Table 1 FD1 Series FlexDraper® / FM100 Float Module Predelivery Checklist – North America

✓	Item	Reference
	Check for shipping damage or missing parts. Be sure all shipping dunnage is removed.	—
	Check for loose hardware. Tighten to required torque.	*9.1 Torque Specifications, page 269*
	Check tire pressure (Transport/Stabilizer Option).	*5.2 Checking Tire Pressure: Transport and Stabilizer Wheels, page 91*
	Check wheel bolt torque (Transport/Stabilizer Option).	*5.3 Checking Wheel Bolt Torque, page 92*
	Check knife drive box breather position.	*5.4 Checking Knife Drive Box, page 93*
	Check knife drive box lube level.	*5.4 Checking Knife Drive Box, page 93*
	Check float module gearbox lube level.	*5.5 Checking Oil Level in Header Drive Gearbox, page 95*
	Check hydraulic reservoir lube level before and after run-up.	*5.6 Checking Oil Level in Hydraulic Reservoir, page 96*
	Check knife drive belt(s) tension.	*5.7 Checking Knife Drive Belt Tension, page 97*
	Check if reel is centered between header endsheets (with header in full smile).	*5.9 Centering Reel, page 100*
	Grease all bearings and drivelines.	*5.18 Lubricating the Header, page 128*
	Check side draper tension.	*5.15 Checking and Adjusting Side Draper Tension, page 123*
	Check draper seal.	*5.17 Checking Draper Seal, page 126*
	Check wing balance.	*5.11.1 Checking Wing Balance, page 106*
	Check header float.	*5.10 Checking and Adjusting Header Float, page 101*
	Check reel tine to cutterbar clearance.	*5.12.1 Measuring Reel Clearance, page 115*
	Check auger flighting to feed pan clearance.	*5.13 Adjusting Auger to Pan Clearance, page 119*
	Check the knife hold-down adjustment.	*5.8 Checking Knife Hold-Downs, page 98*

PREDELIVERY CHECKLIST

✓	Item	Reference
	Check fitment of endshields.	*5.19 Checking and Adjusting Endshields, page 135*
	Check skid shoes are evenly adjusted at a setting appropriate for first crop.	—
	Ensure feeder house variable speed is set to minimum.	—
	Ensure auto header height is calibrated and functioning correctly.	*6.1 Auto Header Height Control (AHHC), page 139*
Run-up procedure		*8 Running up Header, page 263*
	Check hydraulic hose and wiring harness routing for clearance when raising or lowering header and reel.	—
	Check lights are functional.	—
	Check knife speed.	*8.1.2 Adjusting Knife Speed, page 267*
Post run-up check. Stop engine.		*8.1 Performing Post Run-Up Adjustments, page 265*
	Check knife sections for discoloration caused by misalignment of components.	*8.1.1 Adjusting Knife, page 265*
	Check for hydraulic leaks.	—
	Check that the manual storage case contains all of the required manuals.	*5.20 Checking Manuals, page 138*

Date Checked: **Checked by:**

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