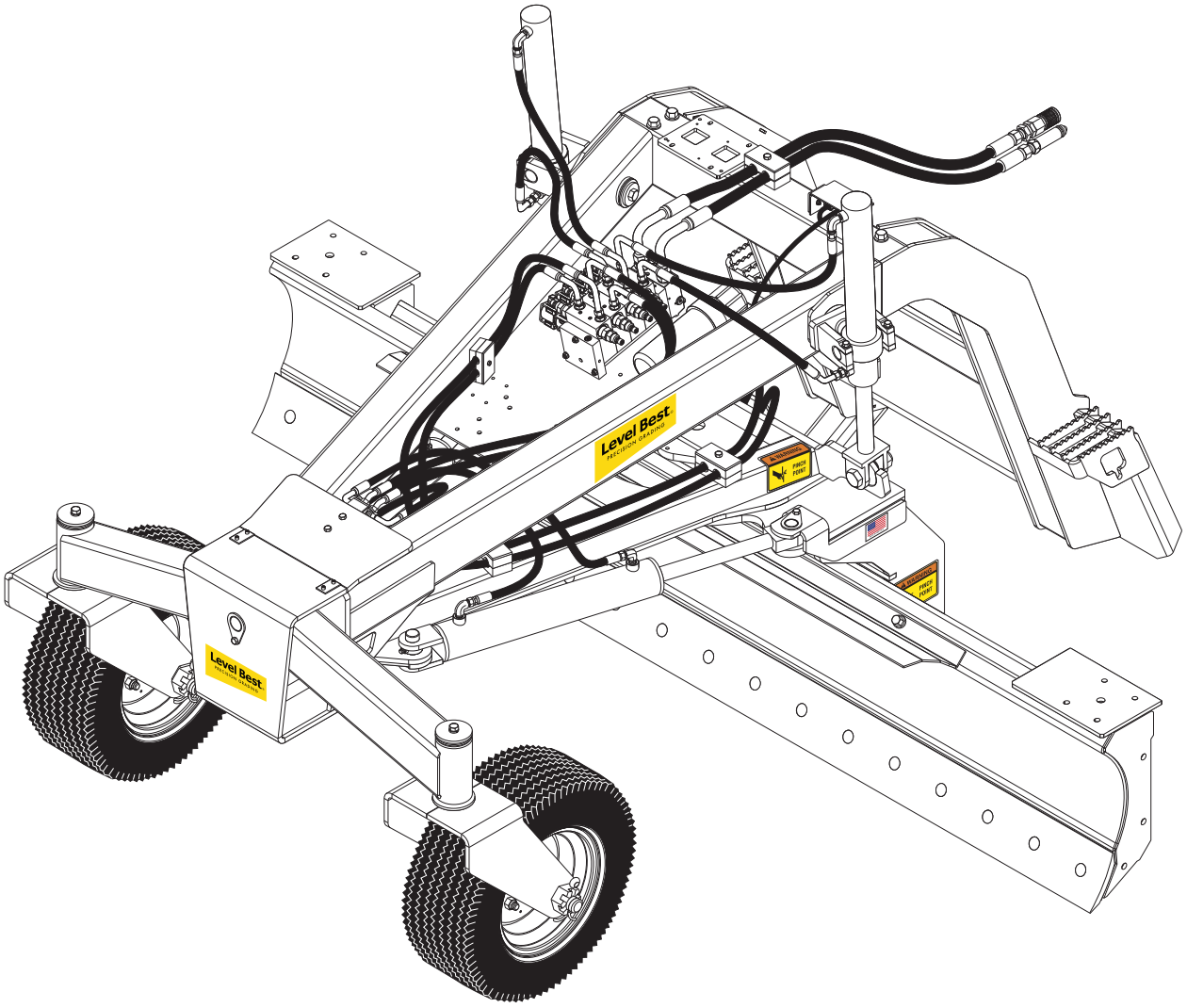
Level Best®
PRECISION GRADING

OPERATORS & PARTS MANUAL

GRADER BLADE ATTACHMENT



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DISCLAIMER

THE INFORMATION IN THIS MANUAL IS PROVIDED TO PROMOTE THE SAFE USE OF, AND ASSIST THE OPERATOR IN ACHIEVING THE BEST PERFORMANCE FROM, PARA-LEVEL GRADING BOX DESCRIBED HEREIN, FOR THEIR INTENDED APPLICATIONS.

USING THIS DOCUMENT

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WARRANTY

General Provisions. The warranties described below are provided by ATI Group LLC ("ATI") to the original purchaser of new Level Best grading equipment ("Equipment") from an authorized Level Best dealer. Under these warranties, ATI will repair or replace, at its option, any covered part which is found to be defective in material or workmanship during the applicable warranty term. Warranty service must be performed by a dealer or service center authorized by ATI to sell and/or service the type of Equipment involved, which will use only new or remanufactured parts or components furnished by ATI. Warranty service will be performed without charge to the purchaser for parts or labor. The purchaser will be responsible, however, for any service call and/or transportation of product to and from the dealer's or service center's place of business, for any premium charged for overtime labor requested by the purchaser, and for any service and/or maintenance not directly related to any defect covered under the warranties below.

What Is Warranted. All parts of any new Level Best grading equipment are warranted for 36 months except for the following: (1) wear parts, and (2) third-party machine guidance systems (which are warranted under their respective manufacturer's warranty). The warranty term for all coverage begins at the time that any person, dealer, or agent first places a unit into service. At the latest, a unit is considered placed into service when delivered to an initial retail purchaser.

What Is Not Warranted. ATI is not responsible for the following:

(1) Used Equipment;

(2) Any Equipment that has been altered or modified in ways not approved by ATI;

(3) Depreciation or damage caused by normal wear, lack of reasonable and proper maintenance, failure to follow operating instructions, misuse, lack of proper protection during storage, or accident;

(4) Normal maintenance parts and service;

(5) Economic loss including lost profit, equipment rental, or other expenses.

Securing Warranty Service. To secure warranty service, the purchaser must (1) Report the product defect to an authorized dealer and request repair within the applicable warranty term, (2) Present evidence of the warranty start date, and (3) Make the equipment available to an authorized dealer or service center within a reasonable time.

Limitation Of Implied Warranties and Other Remedies. To the extent permitted by law, neither ATI nor any company affiliated with it makes any warranties, representations or promises as to the quality, performance or freedom from defect of the Level Best Equipment covered by this warranty. IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, TO THE EXTENT APPLICABLE, SHALL BE LIMITED IN DURATION TO THE APPLICABLE PERIOD OF WARRANTY SET FORTH ON THIS PAGE. THE PURCHASER'S ONLY REMEDIES IN CONNECTION WITH THE BREACH OR PERFORMANCE OF ANY WARRANTY ON THE LEVEL BEST EQUIPMENT ARE THOSE SET FORTH ON THIS PAGE. IN NO EVENT WILL THE DEALER, ATI, OR ANY COMPANY AFFILIATED WITH ATI, BE LIABLE FOR INCIDNTAL OR CONSEQUENTIAL DAMAGES.

No Dealer Warranty. The selling dealer makes no warranty of its own and the dealer has no authority to make any representation or promise on behalf of ATI, or to modify the terms or limitations of this warranty in any way.

SAFETY INFORMATION

This manual is furnished to you, the owner/operator, as a guide to get the greatest benefit from your Grading Attachment. ATI Group, LLC wants you to be able to get the most use out of your Grading Attachment through safe and efficient operation.

Before attempting to operate the Grading Attachment, carefully read all sections of this manual. Be sure that you thoroughly understand all of the safety information and operating procedures.

SAFETY PRECAUTION DEFINITIONS

Dangers, **Warnings**, **Cautions**, and **Notes** are strategically placed throughout this manual to further emphasize the importance of personal safety, qualifications of operating personnel, and proper use of the grading box in its intended application. These precautions supplement and/or complement the safety information decals affixed to the unit and include headings that are defined as follows:

⚠ DANGER

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

⚠ WARNING

Indicates a potentially hazardous situation or practice which, if not avoided, could result in death or serious injury.

⚠ CAUTION

Indicates a potentially hazardous situation or practice which, if not avoided, will result in damage to equipment and/or minor injury.

NOTE: Indicates an operating procedure, practice. etc., or portion thereof, which is essential to highlight.

- Always use caution and safe operating practices when operating this equipment.
- Always set the Automatic/Manual Switch on the Control Panel to MANUAL before leaving the operator's seat or whenever the machine is not moving.
- Always allow for clearance under the cutting edge of the machine when tuning the system or when switching to automatic control. Insufficient clearance could cause the machine to lift itself off the ground as its cutting edge attempts to achieve the programmed slope.
- Never adjust the position of the Laser Receiver when the system is in automatic control.
- Never perform service work on your machine or the Automatic Control System when the system is in automatic control.
- Install all safety panels and guards before operating your equipment.
- Stay clear of all moving parts when the machine is in operation.
- Keep all people clear of the machine when it is running.
- Keep feet and other body parts from under the cutting edges of the machine at all times.
- Read and comply with all safety recommendations of your Tractor/Skid Steer manufacturer, as outlined in its operator and service manuals.

NOTE: References made to left, right, front, and rear are those directions viewed from behind the power unit and grading box.

NOTE: Some equipment depicted in illustrations may not reflect exact production model configurations.

NOTE: All safety, operating, and servicing information reflects current production models at the time of publication of this manual.

NOTE: ATI Group, LLC reserves the right to discontinue models at any time, change specifications, and improve design without notice and without incurring obligation on goods previously purchased and to discontinue supplying any part listed, when the demand does not warrant production.

PURPOSE

The Level Best Grader Blade is a cost-efficient method for fine grading. This manual is for compact track loaders with Level Best Grader Blade systems.

Power and Controlling the Grader Blade

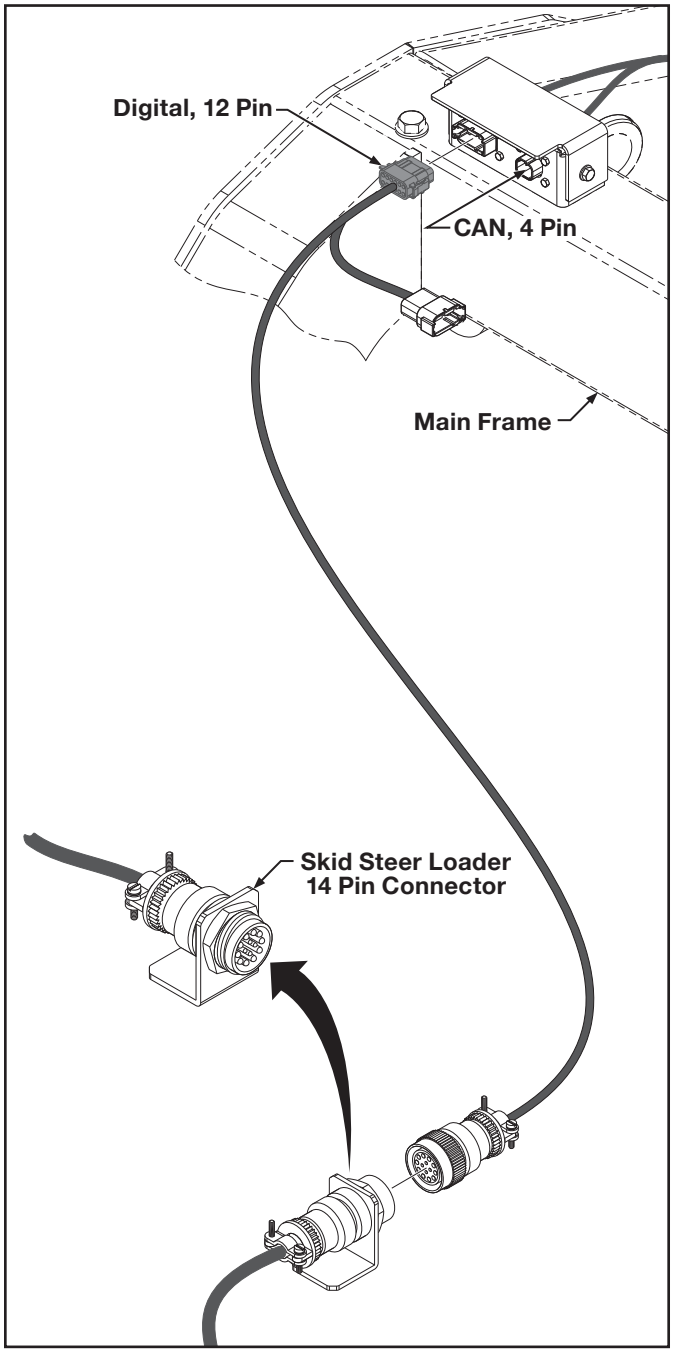


Figure 1-1. Harness Connections

Every attachment needs a Level Best sourced harness to attach a skid-loader's 14-pin to the Grader's 12 pin in **Figure 1-1**.

This connection provides 12-volt power and full or partial manual control depending on skid-loader manufacturer.

NOTE: Each 14-pin harness is brand and model-specific.

The Level Best Grader harness is interchangeable with the PD series harness except for John Deere applications. (See Figures 1-7 through 1-15 **page 1.6.**)

HYDRAULICS

Danfoss MVB10 Hydraulic Valve

The hydraulic valve is setup at the factory and should not need any adjustments. If there are any changes required, they should be done by an authorized factory technician.

NOTE: The hydraulics system of any Level Best product is highly complicated and sensitive. DO NOT be tempted to make adjustments yourself. Any unauthorized adjustments or tampering WILL void the warranty.

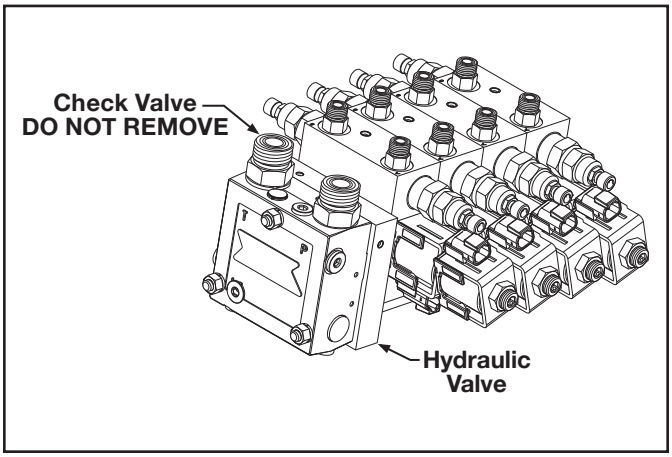


Figure 1-2. Hydraulic Valve (Danfoss MVB10)

NOTE: DO NOT REMOVE THE CHECK VALVE. REMOVAL OR TAMPERING WILL VOID THE WARRANTY ON ALL HYDRAULIC COMPONENTS.

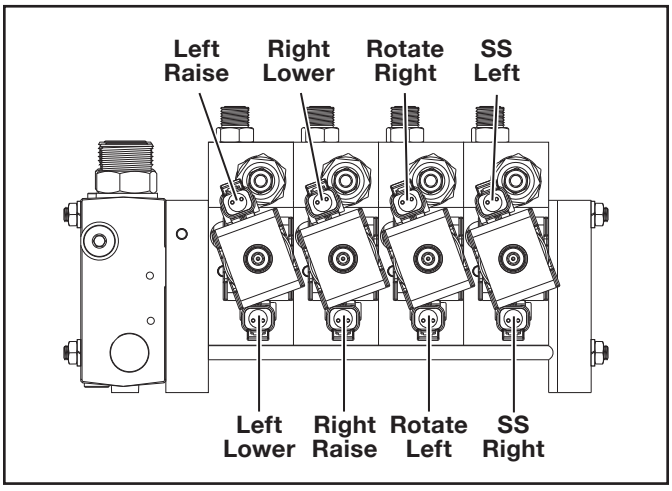


Figure 1-3. Side View Valve Cable Connection

Hydraulic Hose Connections

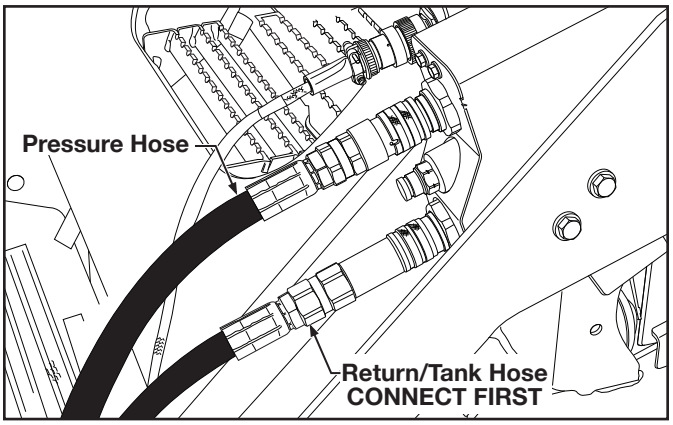


Figure 1-4. Hydraulic Hose Connections to Skid Steer

⚠ CAUTION

The return line must be connected before the pressure line. Pressurizing the valve without an outlet will damage the valve and void the valve warranty.

NOTE: Check the manufacture of your loader for the correct hose connections.

LEVEL BEST HMR (OPTIONAL)

This cab mounted control option **Figure 1-5** needs a Level Best PN 000-200-513 harness to power and communicate with the attachment control module through the 4-pin Deutsch connector shown in **Figure 1-1**.

This device will be popular for any machine guidance system interaction, especially those that need individual auto/manual. Also, it will be a great option for skid loaders with limited buttons for manual control. (E.g. John Deere).

The device adds manual control for rotation and side shift. Manual lift control will still be through in cab joysticks.

The device adds the maximum amount of machine guidance interface with individual and combined auto/manual buttons, as well as a rotary knob for individual or combined increment/decrement.

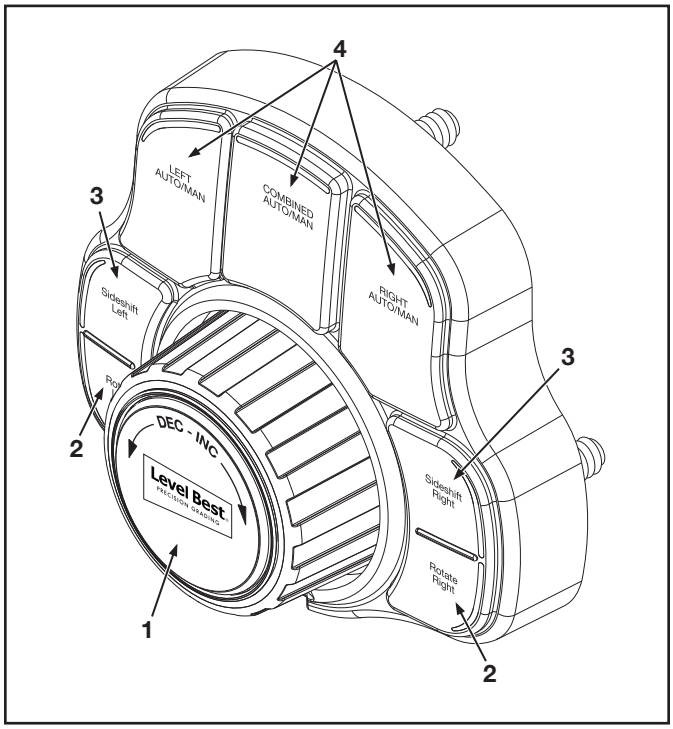


Figure 1-5. HMR Control 000-200-510

Increment/Decrement Controls

1. Rotating the knob to the right (CW) will increment, rotating to the left (CCW) will decrement, as shown.

Increment/Decrement Rotary Dial Color	
Blue	Both Left & Right
Red	Right
Green	Left

In order to tell if you are incrementing or decrementing for right, left, or combined you need to take notice of the backlight color of the rotary dial. The color code is blue for both, red for right, and green for left. To change color, press the face of the rotary where the Level Best logo is, it is a button. Rotation for manual control.

2. Rotation for manual control. Backlighting will change from red to green when pressed.
3. Side shift for manual control. Backlighting will change from red to green when pressed.
4. The three auto/manual buttons have back lighting. Green means automatics are engaged and Red means the machine is running in manual.

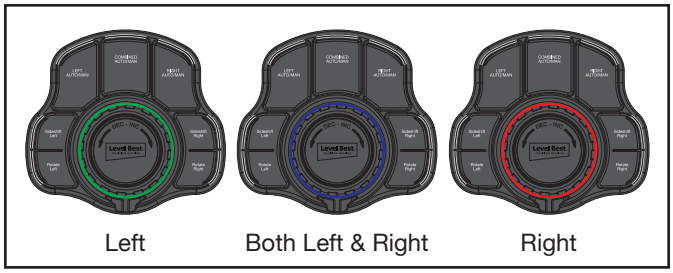


Figure 1-6. HMR Face View

LEVEL BEST JOYSTICK (OPTIONAL)

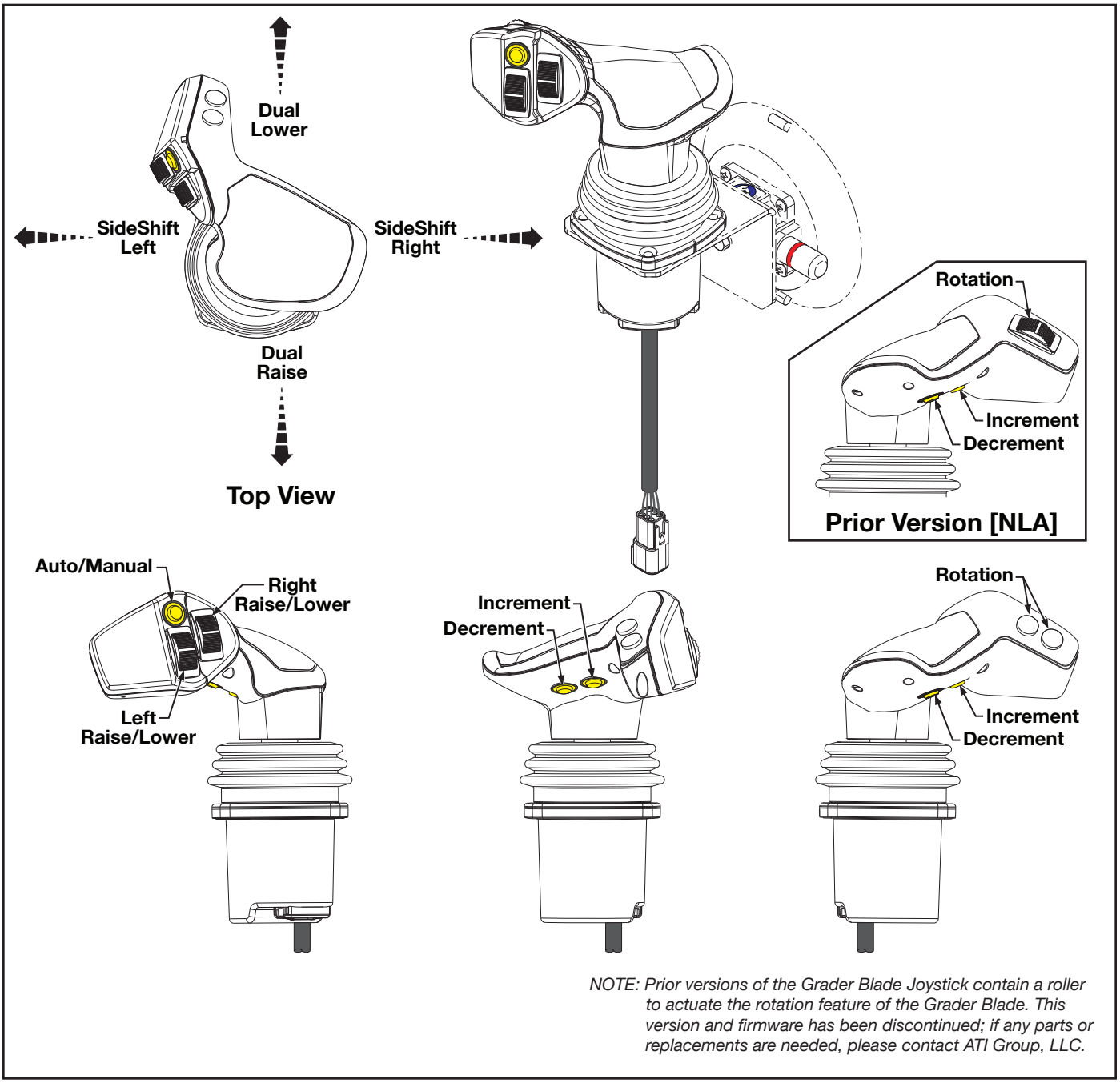


Figure 1-7. Joystick Assembly 000-200-528

This cab mounted control needs a Level Best PN 000-200-513 harness to power and communicate with the grader's ECM through the 4 pin Deutsch connector shown in **Figure 1-1**.

The device gives maximum manual control with individual and dual raise/lower control as well as side shift and rotation controls.

The device has machine guidance interface with an auto/manual button and increment/decrements buttons.

This joystick will be useful for skid loaders that provide few or no in cab buttons limiting manual control.

VACUUM CUP

WARNING: This product can expose you to chemicals including diethylhexyl phthalate (DEHP), which is known to the State of California to cause cancer and birth defects or other reproductive harm.

For more information go to www.P65Warnings.ca.gov.

Installation

1. Clean the mounting surface and, if needed, the face of the vacuum cup (see cleaning).
2. Position the cup on the mounting surface so the plunger is accessible and visible to the operator.
3. Pump the plunger until the cup attaches completely. When the red line on the plunger is hidden, the cup is ready for use.
4. Check the plunger frequently to make sure the cup remains securely attached. If the red line appears, pump the plunger until the red line is hidden again.

Release

1. Grasp and hold the joystick and cup assembly.
2. Pull one of the release tabs until the cup disengages completely.

⚠ CAUTION

Remove the cup when not in use. If the cup remains attached to a hot surface (e.g,. in direct sunlight) for an extended period, the rubber pad could bond to the mounting surface, resulting in damage to the surface or to the pad when it is removed.

Maintenance Service

Regularly make sure the vacuum cup's air filter is in place. If not, discontinue use until the filter is replaced.

Since aging and water reduce the capacity of the rubber pad, it should be replaced at least once every 2 years or whenever damage is discovered.

If the cup does not function normally, the cup face may be dirty or damaged, or the pump may require service. First clean the cup face as directed.

Cleaning

1. Remove the air filter from the cup face.
2. Use a clean sponge or lint-free cloth to apply soapy water or another mild cleanser to cup face.

⚠ CAUTION

To prevent liquid from contaminating the pump, hold the cup face-down or cover the suction hole in the filter recess while using any liquid.

3. Wipe all residue from the cup face.
4. Allow the cup to dry and reinstall the air filter.

NOTE: You can order replacement filters from Wood's Powr-Grip stock # 90501 (10-pack) https://www.wpg.com/catalog/90501

Storage

Store in a clean, dry location out of direct sunlight. Protect the cup face from damage using the pad cover (when supplied) or another appropriate means.

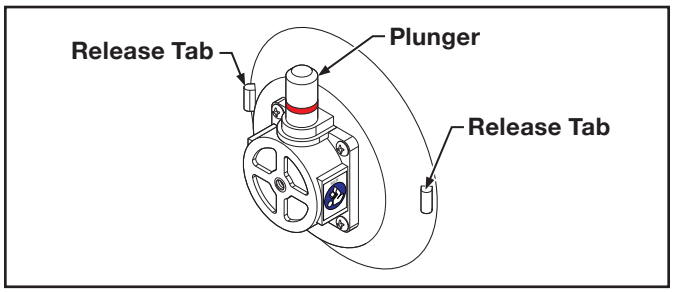
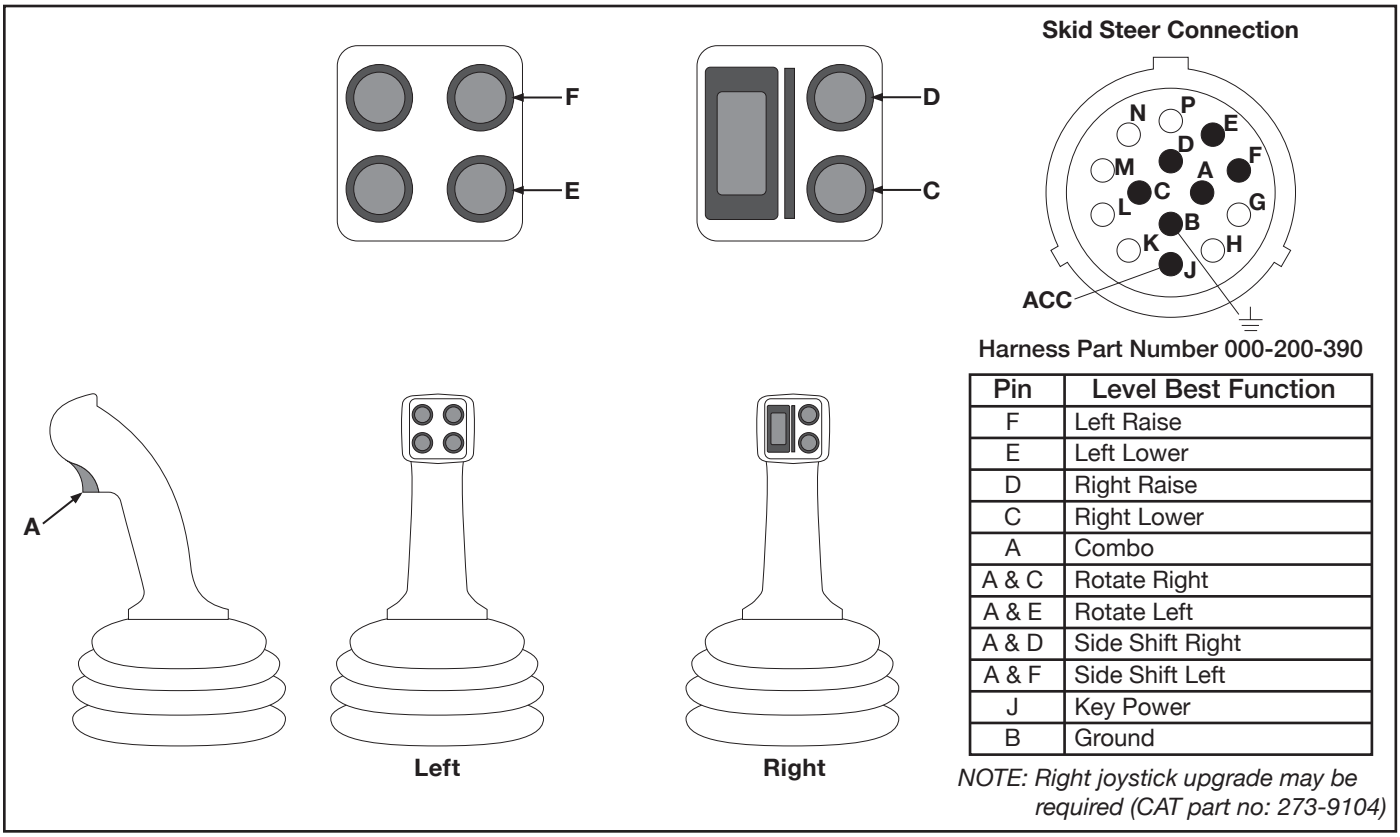


Figure 1-8. Vacuum Cup

LOADER JOYSTICK FUNCTIONS

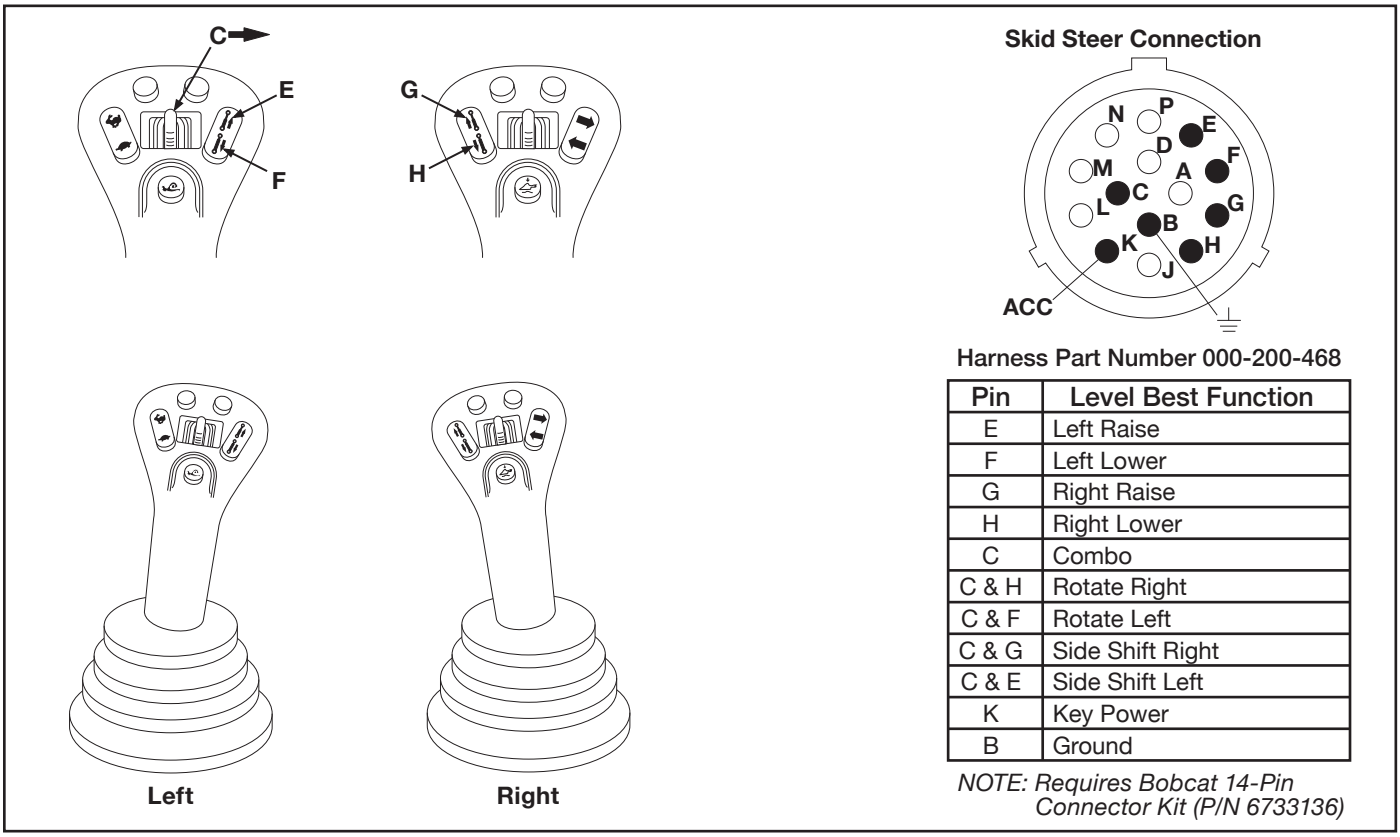


Harness Part Number 000-200-390

Pin	Level Best Function
F	Left Raise
E	Left Lower
D	Right Raise
C	Right Lower
A	Combo
A & C	Rotate Right
A & E	Rotate Left
A & D	Side Shift Right
A & F	Side Shift Left
J	Key Power
B	Ground

NOTE: Right joystick upgrade may be required (CAT part no: 273-9104)

Figure 1-9. Cat D-Series Joystick Functions

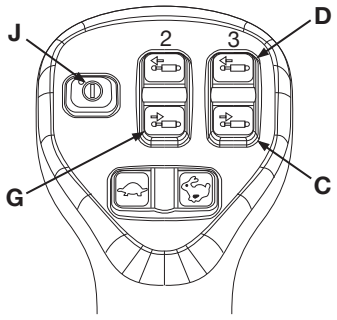


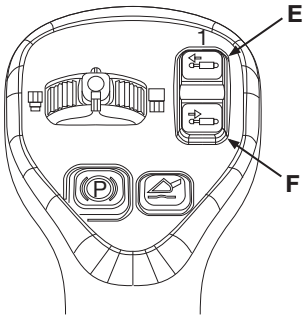
Harness Part Number 000-200-468

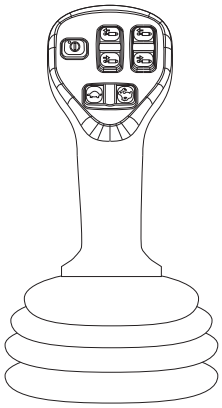
Pin	Level Best Function
E	Left Raise
F	Left Lower
G	Right Raise
H	Right Lower
C	Combo
C & H	Rotate Right
C & F	Rotate Left
C & G	Side Shift Right
C & E	Side Shift Left
K	Key Power
B	Ground

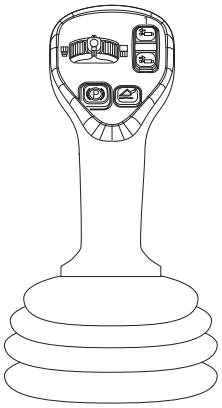
NOTE: Requires Bobcat 14-Pin Connector Kit (P/N 6733136)

Figure 1-10. Bobcat Joystick Functions



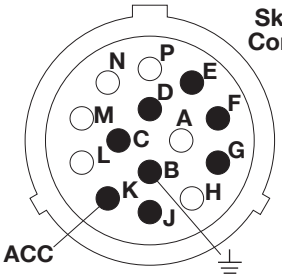






Left

Right

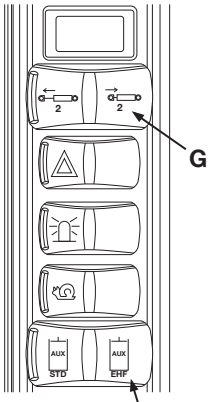


Harness Part Number 000-200-396

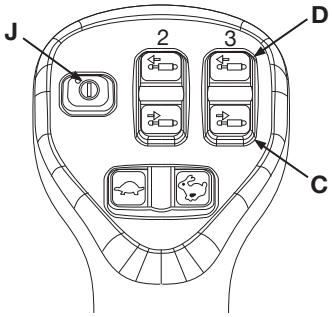
Pin	Level Best Function
D	Left Raise
C	Left Lower
E	Right Raise
F	Right Lower
J	Combo
J & F	Rotate Right
J & C	Rotate Left
J & E	Sideshift Right
J & D	Sideshift Left
G	Auto/Manual
K	Key Power
B	Ground

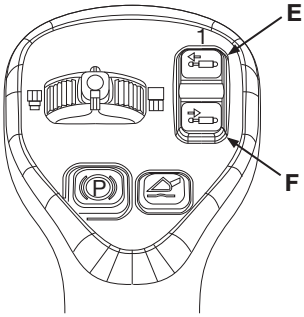
NOTE: Must be "Level 300" or higher Joystick Configuration CNH Style B Equipped Machines

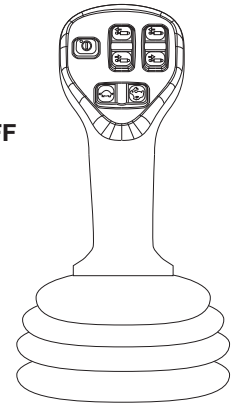
Figure 1-11. CNH Joystick Functions B-Series

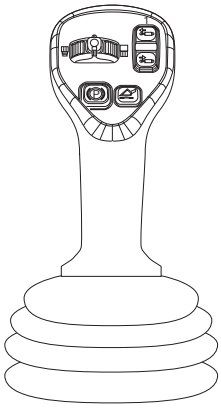


EHF should be OFF



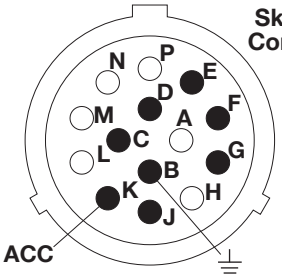






Left

Right

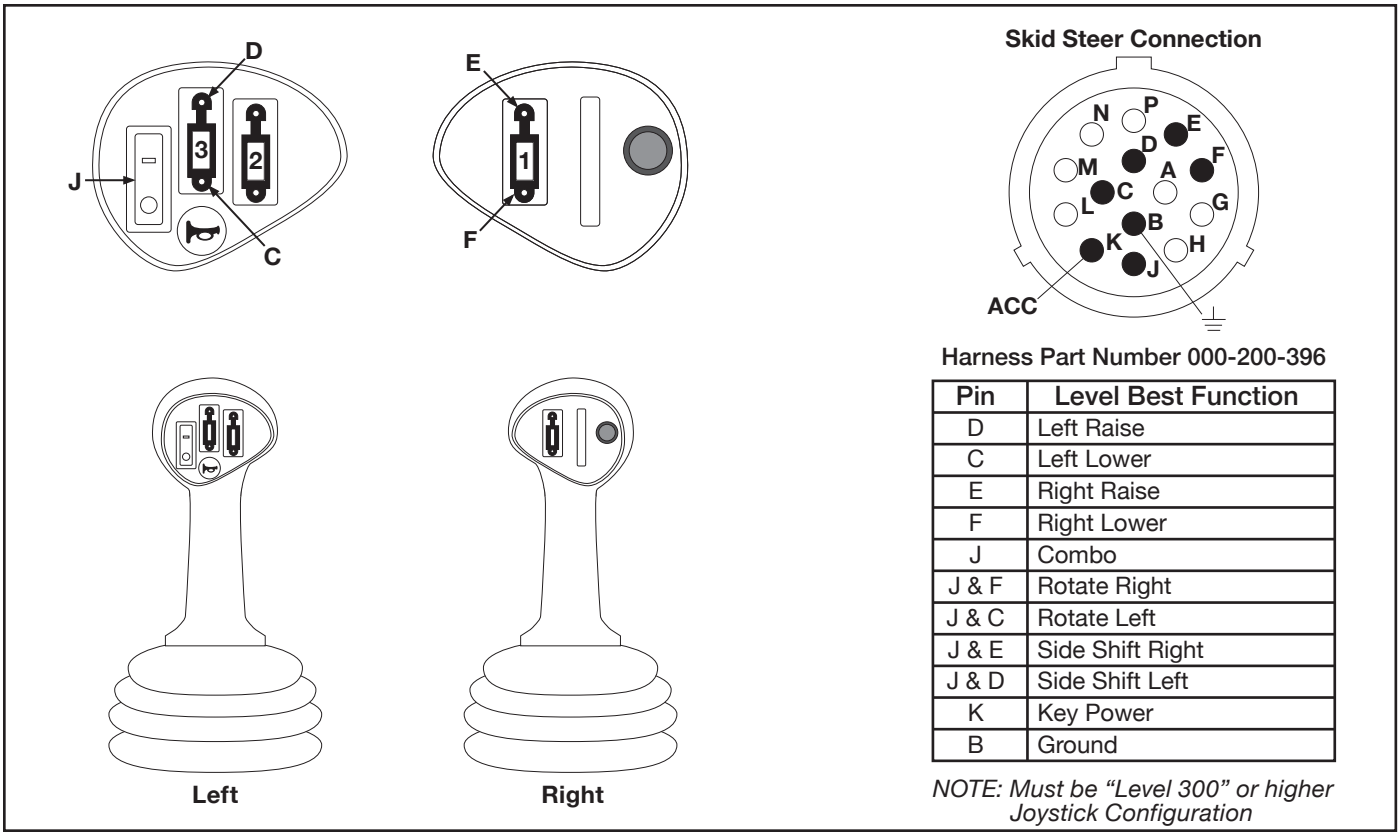


Harness Part Number 000-200-396

Pin	Level Best Function
D	Left Raise
C	Left Lower
E	Right Raise
F	Right Lower
J	Combo
J & F	Rotate Right
J & C	Rotate Left
J & E	Sideshift Right
J & D	Sideshift Left
G	Auto/Manual
K	Key Power
B	Ground

NOTE: Must be "Level 300" or higher Joystick Configuration EHF Equipped Machines

Figure 1-12. CNH Joystick Functions 550-Series

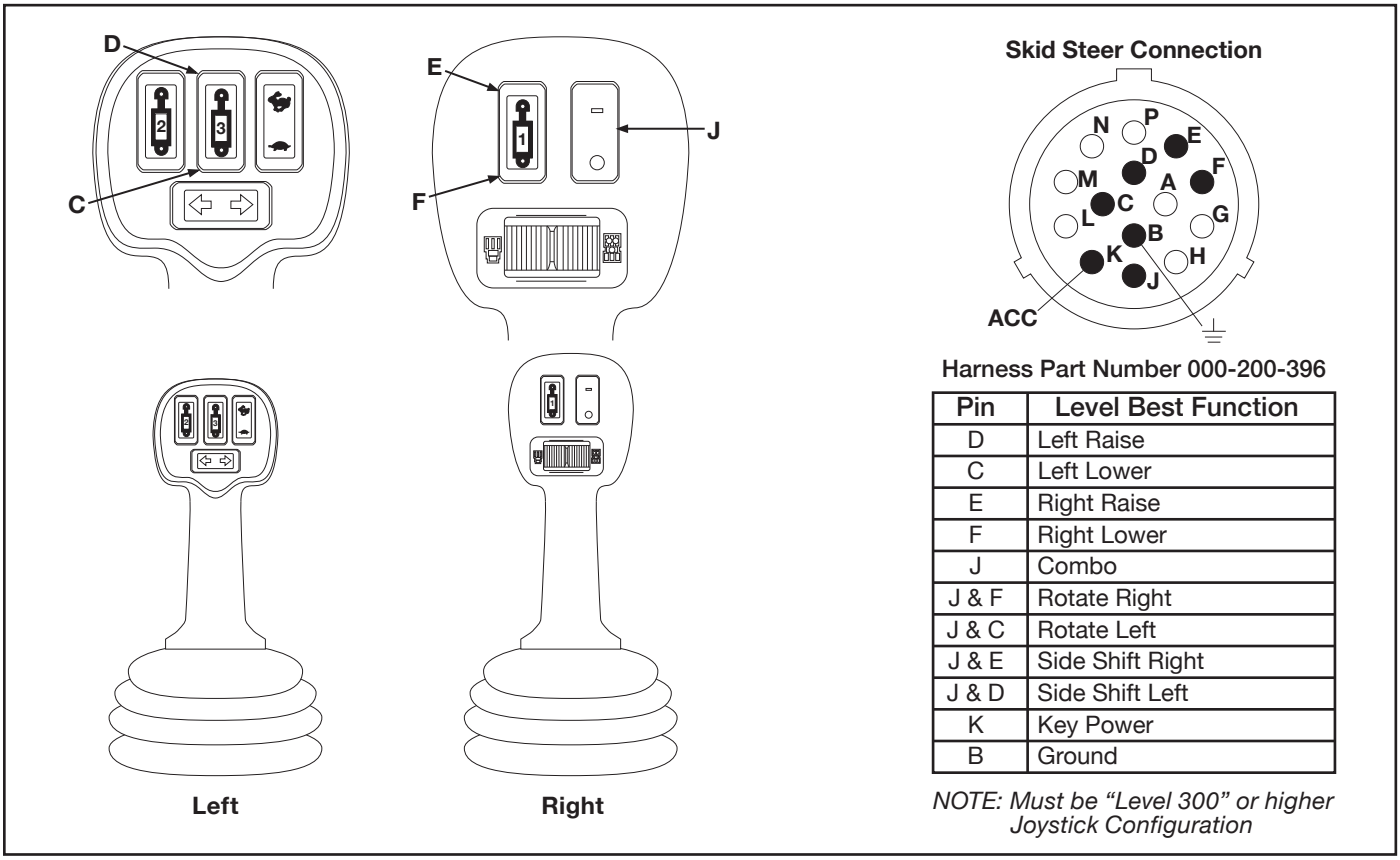


Harness Part Number 000-200-396

Pin	Level Best Function
D	Left Raise
C	Left Lower
E	Right Raise
F	Right Lower
J	Combo
J & F	Rotate Right
J & C	Rotate Left
J & E	Side Shift Right
J & D	Side Shift Left
K	Key Power
B	Ground

NOTE: Must be "Level 300" or higher Joystick Configuration

Figure 1-13. Case Joystick Functions

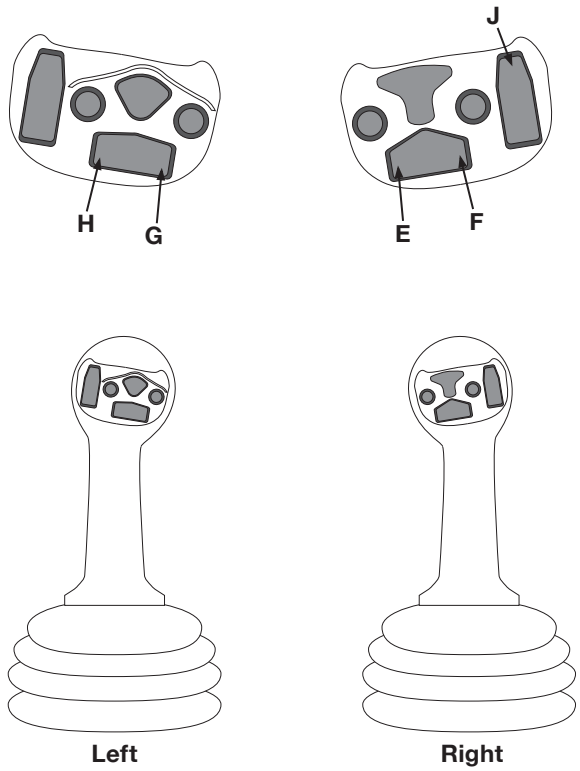


Harness Part Number 000-200-396

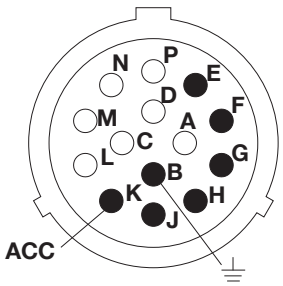
Pin	Level Best Function
D	Left Raise
C	Left Lower
E	Right Raise
F	Right Lower
J	Combo
J & F	Rotate Right
J & C	Rotate Left
J & E	Side Shift Right
J & D	Side Shift Left
K	Key Power
B	Ground

NOTE: Must be "Level 300" or higher Joystick Configuration

Figure 1-14. New Holland Joystick Functions



Skid Steer Connection

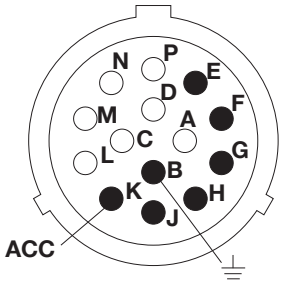


Harness Part Number 000-200-395

Pin	Level Best Function
H	Left Raise
G	Left Lower
E	Right Raise
F	Right Lower
J	Combo
J & F	Rotate Right
J & G	Rotate Left
J & E	Side Shift Right
J & H	Side Shift Left
K	Key Power
B	Ground

Figure 1-15. Kubota SSV65 & 75 Joystick Functions

Skid Steer Connection



Harness Part Number 000-200-395

Pin	Level Best Function
H	Left Raise
G	Left Lower
E	Right Raise
F	Right Lower
J	Combo
J & F	Rotate Right
J & G	Rotate Left
J & E	Side Shift Right
J & H	Side Shift Left
K	Key Power
B	Ground

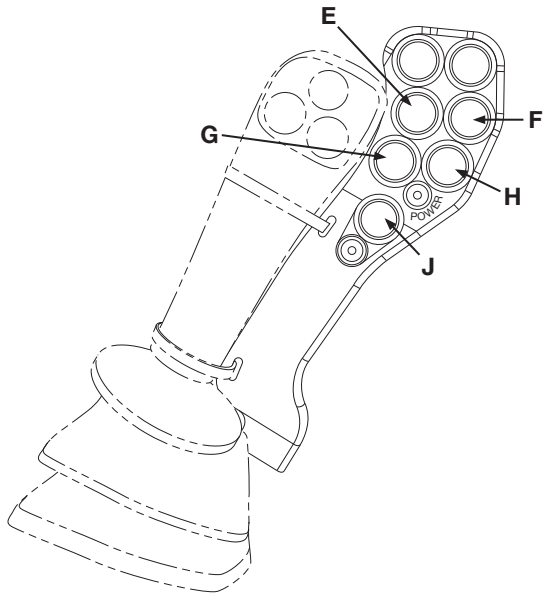
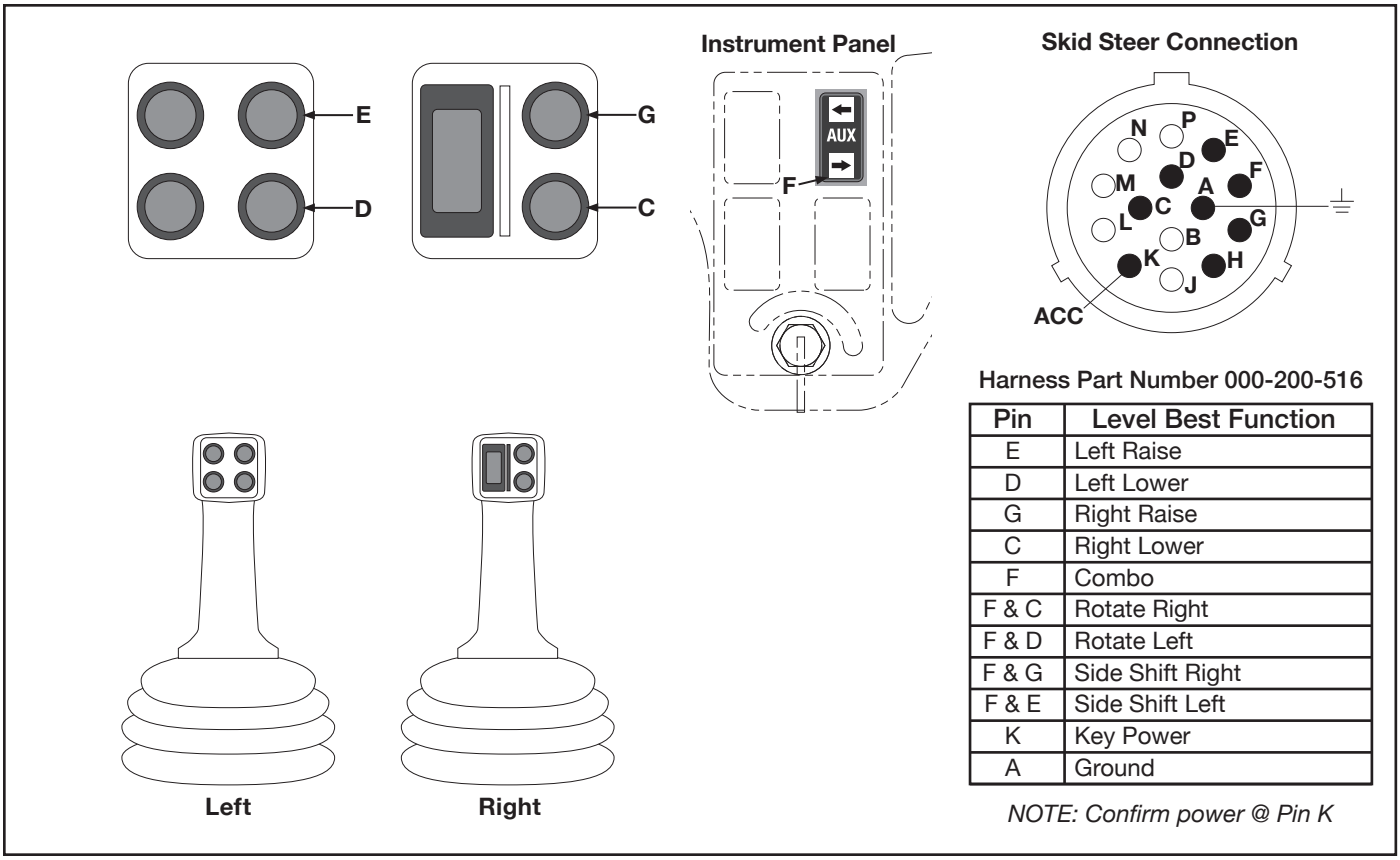


Figure 1-16. Kubota SVL 95 S6699 Multifunction Controller Kit

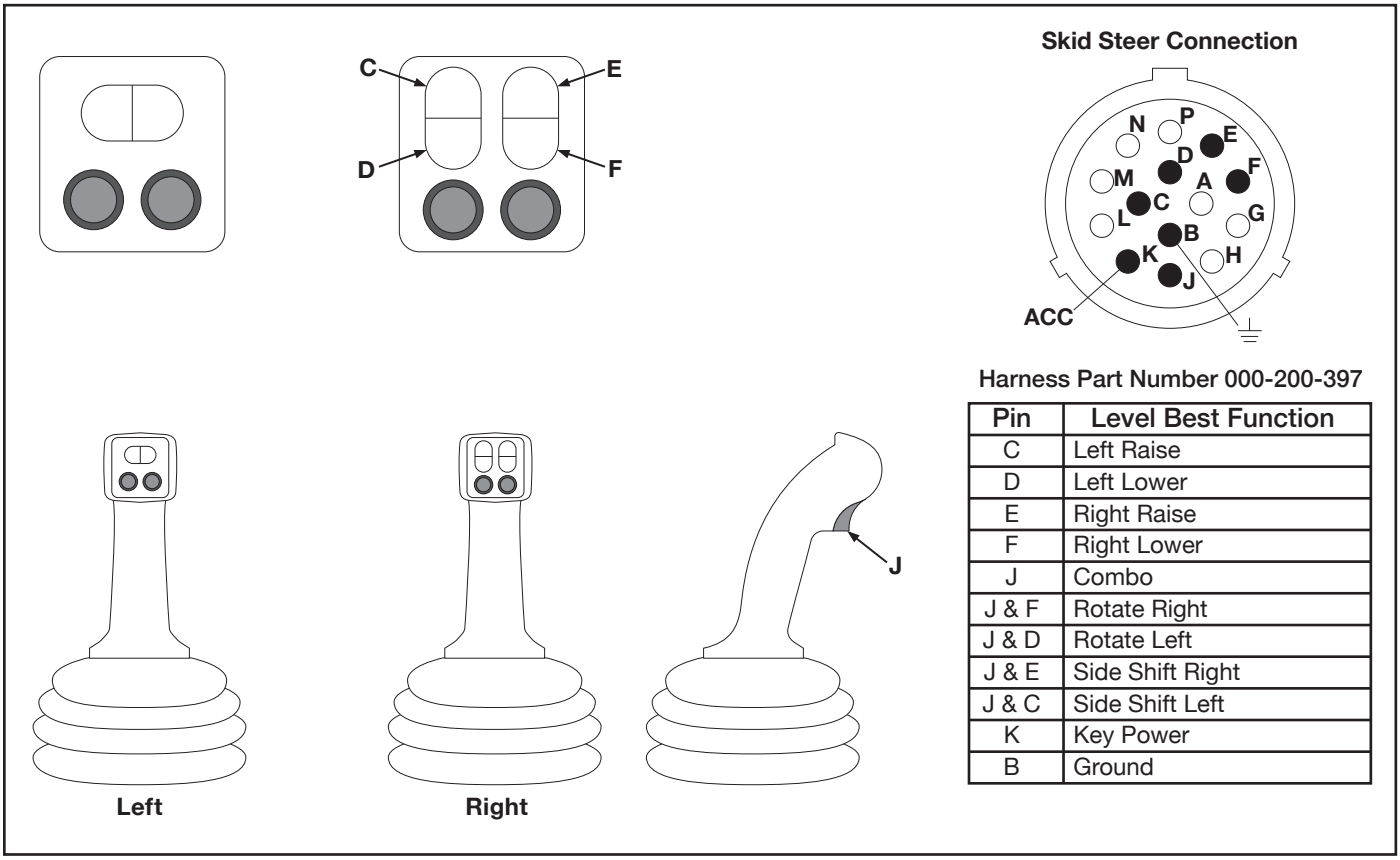


Harness Part Number 000-200-516

Pin	Level Best Function
E	Left Raise
D	Left Lower
G	Right Raise
C	Right Lower
F	Combo
F & C	Rotate Right
F & D	Rotate Left
F & G	Side Shift Right
F & E	Side Shift Left
K	Key Power
A	Ground

NOTE: Confirm power @ Pin K

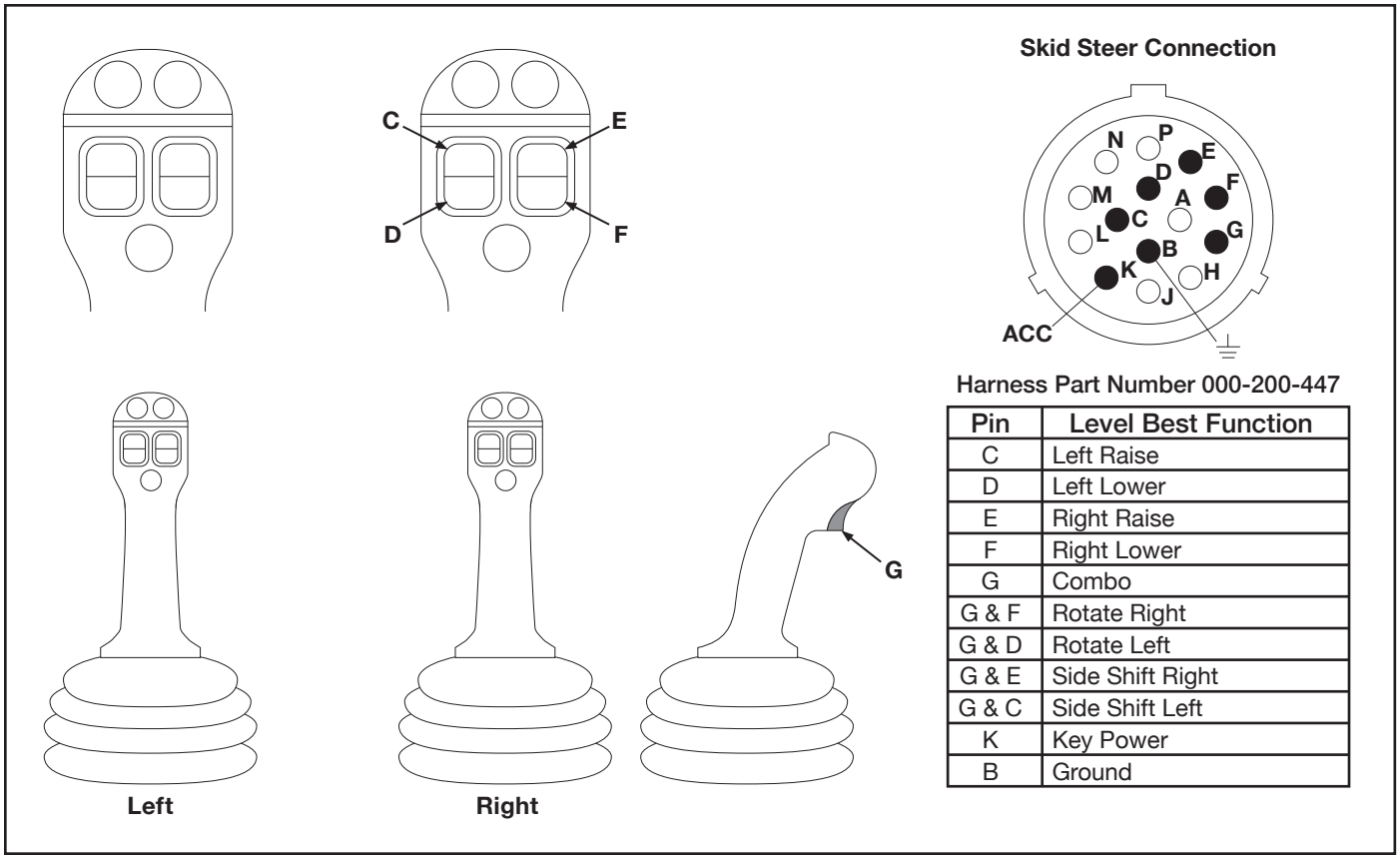
Figure 1-17. John Deere G-Series Joystick Functions



Harness Part Number 000-200-397

Pin	Level Best Function
C	Left Raise
D	Left Lower
E	Right Raise
F	Right Lower
J	Combo
J & F	Rotate Right
J & D	Rotate Left
J & E	Side Shift Right
J & C	Side Shift Left
K	Key Power
B	Ground

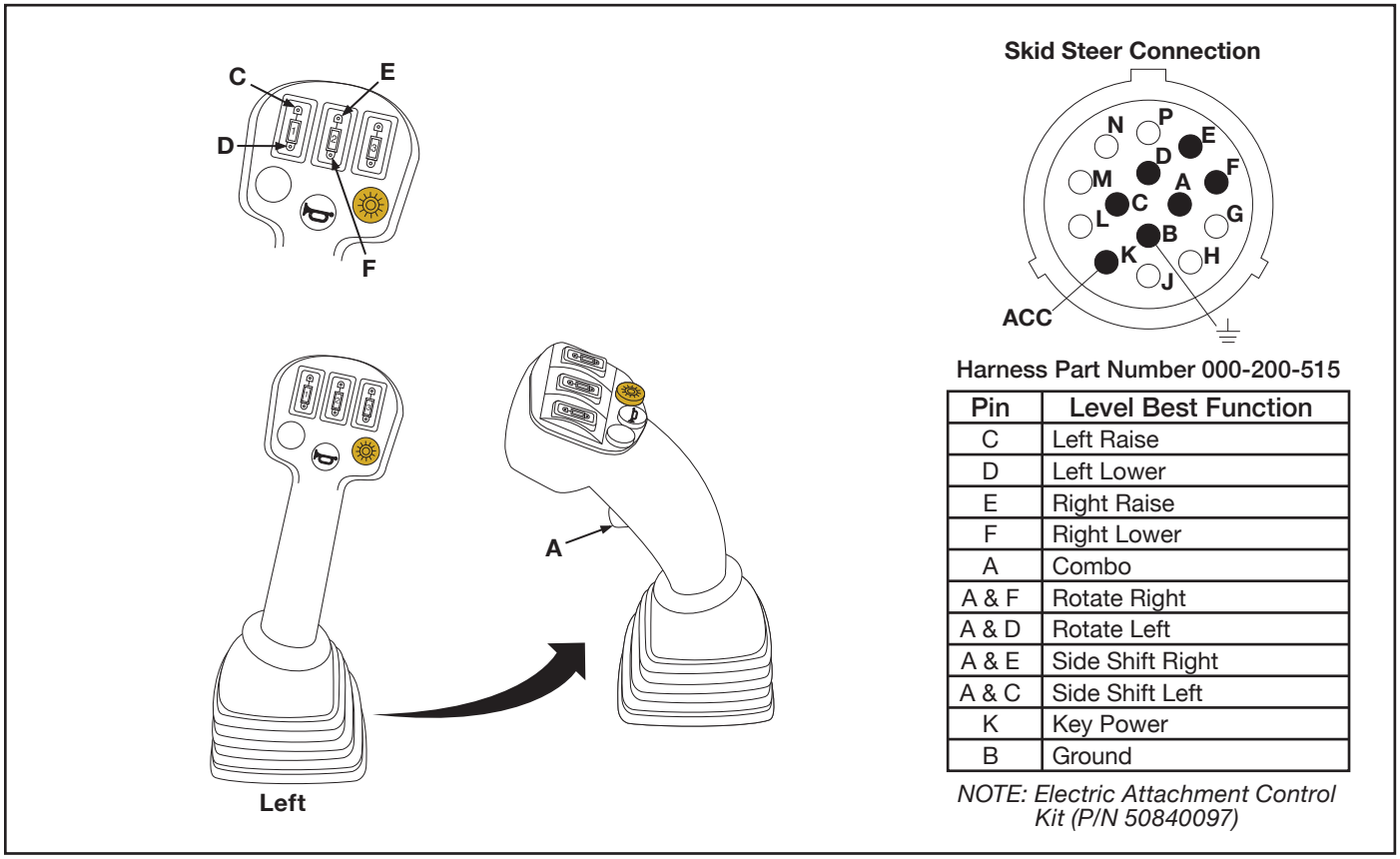
Figure 1-18. Takeuchi Joystick Functions



Harness Part Number 000-200-447

Pin	Level Best Function
C	Left Raise
D	Left Lower
E	Right Raise
F	Right Lower
G	Combo
G & F	Rotate Right
G & D	Rotate Left
G & E	Side Shift Right
G & C	Side Shift Left
K	Key Power
B	Ground

Figure 1-19. JCB/Volvo Joystick Functions



Harness Part Number 000-200-515

Pin	Level Best Function
C	Left Raise
D	Left Lower
E	Right Raise
F	Right Lower
A	Combo
A & F	Rotate Right
A & D	Rotate Left
A & E	Side Shift Right
A & C	Side Shift Left
K	Key Power
B	Ground

NOTE: Electric Attachment Control Kit (P/N 50840097)

Figure 1-20. Mustang/Gehl Joystick Functions

EQUIPMENT SETUP

Some of the following setup procedures may already be completed. However, it is recommended that the operator be familiar with the various system components and how they interconnect.

1. The Grader Blade should be positioned on a level area for attaching to the loader. Start the loader, drive up to the attachment plate and secure per the loader manufacturer's directions. The Level Best quick-attach plate is designed to be universal.

NOTE: If the loader's pins do not fit securely into the rectangular holes at the base of the attachment plate, these holes can be notched larger to accept the pins.

2. After installation, ensure that the Grader Blade is level. The loader arms must be completely lowered against the stops. Adjust the bucket cylinders so the tires of the Grader Blade are on the ground.

   Verify that the Grader Blade is level by observing that the cutting edge is evenly horizontal to the ground. Turn the loader engine OFF when connected.

*NOTE: Most loaders have the ability to reverse the hydraulic flow to the quick couplers. Care must be taken that the flow is always engaged the correct direction. (Refer to **Figure 1-4**.)*

3. Connect the Grader Blade's hydraulic hoses with quick couplers to the auxiliary hydraulic ports of the loader. The Grader Blade's hydraulic manifold is marked "P" and "T" where the pressure and return (tank) hoses connect.

NOTE: "P" means pressure (supply) and "T" means tank (return). Refer to the loader Owner's Manual for identifying the "P" and "T" Auxiliary Hydraulic Ports.

4. Connect the auxiliary electrical connections to the loader's 14-pin connector on the loader boom. Connect the other end of the specific loader harness to the bulkhead on the attachment.

*NOTE: For button layouts of the various brand loaders (see **Figure 1-9** thru **Figure 1-20**).*

If no 14-pin connector is present on your loader, contact your Level Best representative for further information.

5. When utilizing machine control on the Grader Blade you will need to install either a Level Best Joystick or HMR input device. Install these devices via the cable provided. Plug the cable into the bulkhead on the attachment. (Extensions are available via Level Best.)
6. If applicable, install machine control mast poles and/or sensors (see **page 2.28**).
7. Bench and calibrate your machine control system per the manufacturer's recommendations.

⚠ CAUTION

Cables must be securely fastened and pinch/rubpoints eliminated. Do not fasten to hydraulic lines which may operate at high temperatures. Ensure sufficient cable length to allow movement of the machine.

OPERATING THE GRADER BLADE

After the Grader Blade is connected and the Automatic Control System is calibrated, operation can begin.

1. When seated in the Operator's seat, start the loader. Turn on the auxiliary hydraulics to continuous flow. Confirm you have hydraulic flow by moving the blade via the joystick buttons. (see **Figure 1-9** thru **Figure 1-20**),

NOTE: If you are not using any machine control you are now ready to operate! If using machine control proceed to the next steps.

2. Toggle the Machine Control System to 'Automatic' mode. Drive the machine forward. The Automatic Machine Control System will keep the cutting edge on the desired plane as you move about the jobsite.

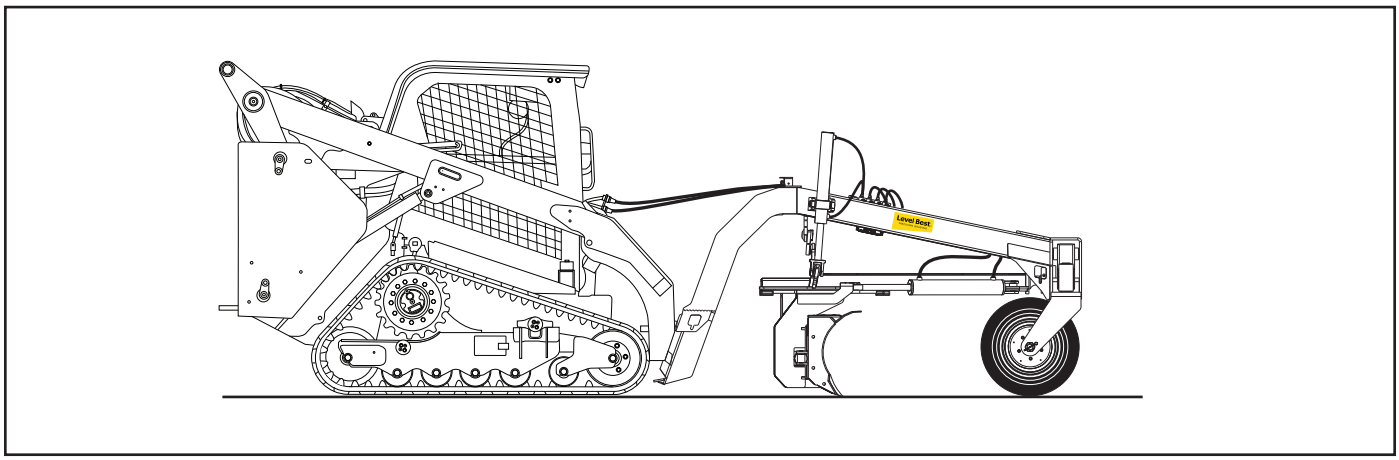


Figure 1-21. Grader Blade on a Loader

NOTE: In some situations, the Automatic Control System may require a cut deeper than the machine can handle. The machine may lose traction, stall the engine, or the wheel frame will be lifted off the ground to the maximum stroke of the cylinder as the cutting edge tries to reach finished grade. If this occurs, set the system to manual control, and use the joysticks to raise the cutting edge until the machine can move the material. Make multiple passes to cut the area closer to finished grade and then go back to automatic control. This allows the high spots to be gradually removed.

⚠WARNING

Always have system in Manual setting when not operating the loader.

3. After several passes with the Grader Blade, stop and turn off the loader. Place the base of the measuring pole on the graded area and check grade elevation.
4. After a rough grade is achieved, the dead-band (Accuracy) may be changed to a narrower setting as required to meet the job tolerance requirements. With a tighter dead-band, the speed of the loader needs to be decreased for optimum finish.

Symptom	Potential Cause	Remedy
Grader Blade has trouble staying on grade.	Rotating Laser out of range.	Ensure Laser Receiver is within specified operating range of Rotating Laser.
	Laser beam being reflected.	Ensure Rotating Laser's light is not reflecting off other surfaces (windows, windshields, mirrors, etc.) causing multiple readings by the Laser Receiver.
	Multiple laser beams.	Ensure that there are no other lasers operating on the job site or nearby.
	Laser deadband set too narrow.	Ensure the Deadband (Accuracy) setting is appropriate for rough grading.
	Travel speed is too fast for grade tolerance.	Slow down.
	Hydraulic response too quick.	Decrease the Valve Speed setting.
		Confirm the pressure is going in the "P" port.
Grader Blade does not raise or lower.	Control Panel not turned on.	Push the Power switch.
	No hydraulic flow to Grader Blade.	Ensure hydraulic flow of loader is in correct direction.
		Ensure auxiliary hydraulics are ON or in continuous flow mode.
	Cables not connected correctly.	Check Valve cable, valve and valve solenoids for visible damage.
		⚠ WARNING **Be sure to stay clear of any moving parts of the Grader Blade.**
		If the Grader Blade moves, refer to Electrical problems. If the Grader Blade does not move, refer to Hydraulic problems.
	Electrical Problems	Check Valve cable, valve and valve solenoids for visible damage.
		Use an Ohm meter to check cable for continuity.
	Hydraulic Problems	Confirm hydraulic flow through the manifold and returning to the power source through the "T" hose.
		Contact ATI Group, LLC for help troubleshooting the hydraulic manifold.

SPECIFICATIONS

Specifications

Models	GB-96	GB-108
Operating Weight	2,570 lbs. (1,165g)	2,620 lbs. (1,188kg)
Width	96" (2.43)	108.0" (2.74m)
Width Fully Angled	87.5" (2.22)	97.5" (2.48m)
Length	99.9" (2.54m)	99.9" (2.54m)
Height	60.0" (1.52m)	60.0" (1.52m)
Blade Height	16.9" (0.43m)	16.9" (0.43m)
Maximum Blade Lift	7.3" (0.19m)	7.3" (0.19m)
Maximum Blade Cut	7.7" (0.20m)	7.7" (0.20m)
Hydraulic Blade Side Shift (Left or Right)	+/-10" (+/- 0.25m)	+/-13" (+/- 0.33m)
Moldboard Angle (Left or Right)	+/- 30°	+/- 30°
Cutting Edge Size	3/4" x 6" Bolt-on, Reversible Double-Bevel Curved	3/4" x 6" Bolt-on, Reversible Double-Bevel Curved

Hydraulic Valve

Models	GB-96	GB-108
Valve Type	4-Spool Proportional	4-Spool Proportional
Minimal Flow Rate	12 GPM (45.4 LPM)	12 GPM (45.4 LPM)
Maximum Flow Rate	28 GPM (106 LPM)	28 GPM (106 LPM)
Maximum Hydraulic Pressure	4060 psi (280 bar)	4060 psi (280 bar)

MAINTENANCE

The rugged and durable Level Best Grader Blade is built to last, but as with all equipment, a few minutes of routine care, maintenance, and cleaning can extend the life of the attachment.

Transport

Various tie-down locations are built into the Grader Blade attachment. Always ensure that your attachment is properly secured via the DOT protocols of your area.

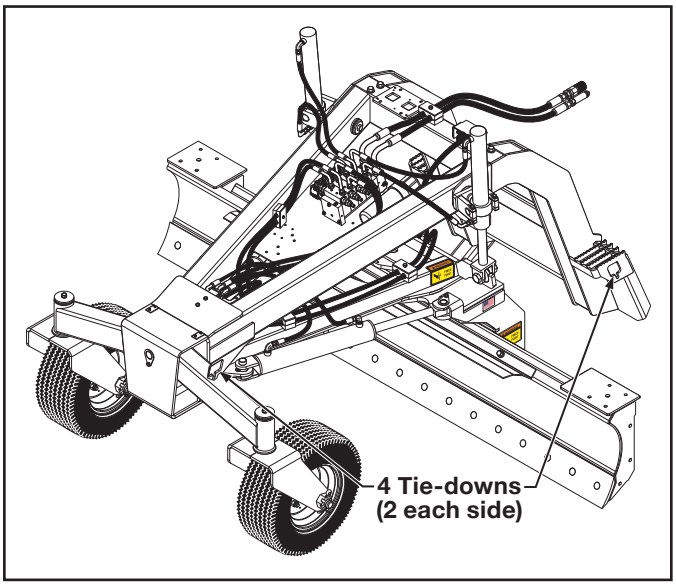


Figure 1-22. Grader Blade Tie-Downs

Cables and Hoses

Check all cables and hoses regularly for signs of wear and damage. Keep cable connections clean and free from dirt and corrosion. If a cable has been damaged, replace it-do not attempt to repair. Incorrect or poor connections can cause damage to your electronics or attachment.

When applicable, check the hydraulic hoses. Look for areas where the hoses could rub against each other or another object as they expand and contract under pressure. Check the hydraulic fittings for tightness.

Machine

Check areas that affect the Automatic Control system function and accuracy, such as looseness or play in the cylinders or wear on the box's cutting edge. Looseness in the connection to the loader, such as in the adaptor plate will cause inaccurate depth positioning.

Calibration

Perform periodic calibration checks of the Rotating Laser System as outlined in its Operation Manual to ensure accurate performance.

SERVICE

If the Automatic Control System is not functioning properly, the first step is to determine the problem component. Use the Troubleshooting Chart to determine possible causes and remedies. The following test equipment is needed:

- Voltage/Ohm Meter
- Rotating Laser or Laser Simulator

Cable Wiring Diagrams and troubleshoot electrical problems contact your local Machine Control Dealer.

Wear Ring, Shims and Wear Pads

The main rotation portion of the Level Best Grader Blade rides on a non-greaseable oil-impregnated plastic ring. This ring may wear over time and shims may need to be removed to ensure a tight fit (see **Figure 1-23**). Periodically check the pads and main ring for signs of wear or gaps between the pad and the metal A-Frame. If any are present remove the 1/16 inch shim **(do not discard)** by removing the bolts shown. Do the front and the back, one at a time ensuring that the bolts are tight before moving to the other side.

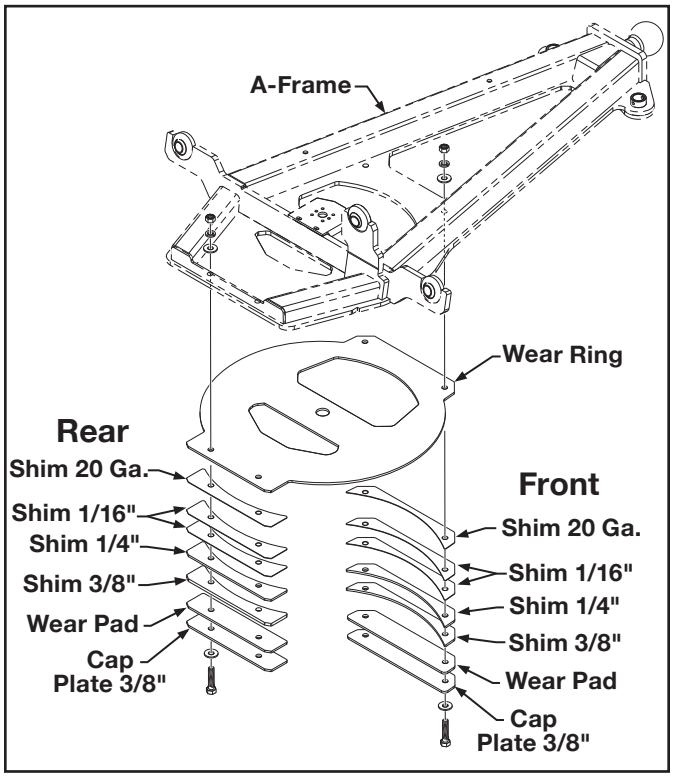


Figure 1-23. Wear Ring, Shims and Wear Pads.

Wear Pad Maintenance

The Level Best Grader Blade contains 8 oil-impregnated plastic wear pads that allow the blade to sideshift smoothly without any grease needed! These pads may wear down over time and need to be checked periodically to ensure the moldboard stays tightly attached to the carriage. The top clasps also include a set of shims to accommodate this wear and allow you to get the maximum use of the pads on your Level best Grader Blade before the pads need to be replaced.

How to Check for Wear

Periodically, you will need to examine the Grader Blade moldboard where the rails run through the clasps. If there is a gap between the rail and the pad or there is movement/wobble in the blade while operating, then there may need to be a shim removed from either side.

When to Replace the Wear Pads

With the blade slightly above the ground, remove one top clasp. ONLY REMOVE ONE SIDE AT A TIME. Remove the appropriate number of shims from beneath the clasp to create a close tolerance on the moldboard.

NOTE: There should be very little-to-zero play between the moldboard and the wear pads. Conversely, the bottom of the clasp should be square and firmly against the carriage with no gaps present.

Once the appropriate combination of shims have been removed from the bottom of the clasp to create the desired tolerance, move the unused shims to the top of the clasp prior to replacing the clasp nuts. This will capture the clasps for future use when new wear pads are installed. Apply red threadlocker to the threads of each clasp bolt and tighten the three nuts evenly to 250 ft-lbs.

To replace the wear pads, simply turn over the clasp and remove the retaining bolts with a 3/16 inch Allen bit then pry out the worn pads. Replace with new wear pads and verify they are seated squarely in the machined pockets, then apply blue thread-locker prior to tightening to 17 ft-lbs. Check clasp tolerance and adjust according to instructions listed in prior paragraph.

Once the first side is complete and tightened, repeat the process on the opposite side.

NOTE: Only the top clasps contain shims, but there are wear pads in all top and bottom clasps.

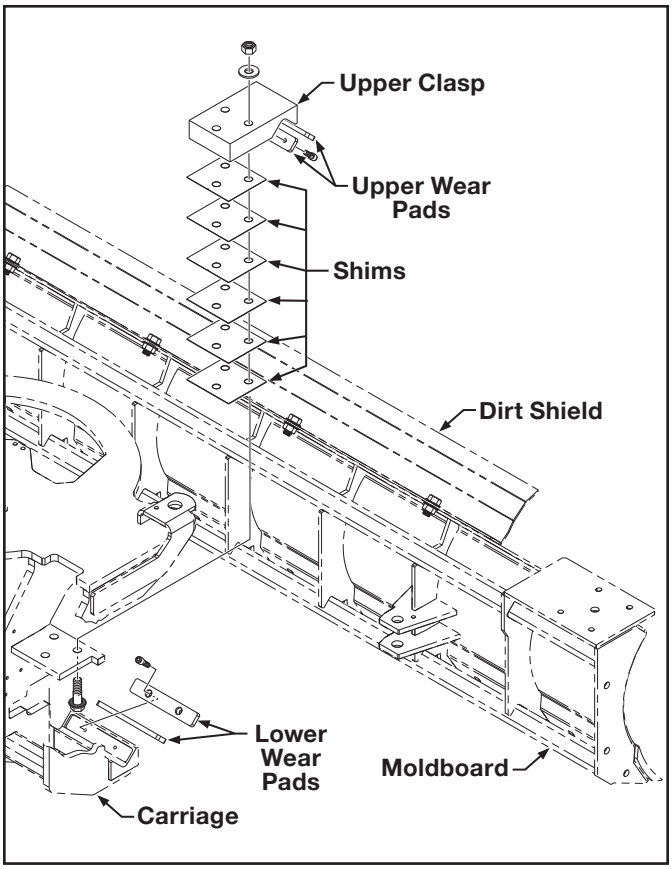


Figure 1-24. Wear Pad Maintenance

LUBRICATION INSTRUCTIONS

The hub bearings on Level Best products are pre-greased from factory for a long service life. However, it is strongly suggested that the axle and hub assembly be removed and disassembled annually to repack with grease and inspect the bearings for wear or damage.

The hubs now have an option to add grease through a zerk during routine maintenance. When greasing the hubs with this method please adhere to the following guidelines:

1. DO NOT OVER GREASE the bearings. One or two shots of grease every 100 operating hours is sufficient to keep the bearings lubricated. Forcing excessive amounts of grease into the hub will push the seals off their seats and expose the bearings to external dirt, use a Multi-Purpose grease.

   Adding external grease is no replacement for proper maintenance practices. Annual teardown and repacking of the bearings is still required to ensure a long life of the machine and minimal downtime.

2. The pivot ball and socket of the A-frame are of robust design and construction and have been heat-treated for long life; however, some maintenance is required to ensure a life as long as intended. Grease Pivot Ball Receiver every 40 hours of operation or sooner, if needed. Grease zerks are located on the ball-mount cap halves on both sides of the A-Frame ball.

   Adding external grease is no replacement for proper maintenance practices. Annual teardown and repacking of the bearings is still required to ensure a long life of the machine and minimal downtime.

NOTE: Check Hydraulic System Components for wear and/or leaks.

Check and tighten all bolts and nuts for scraper blade weekly.

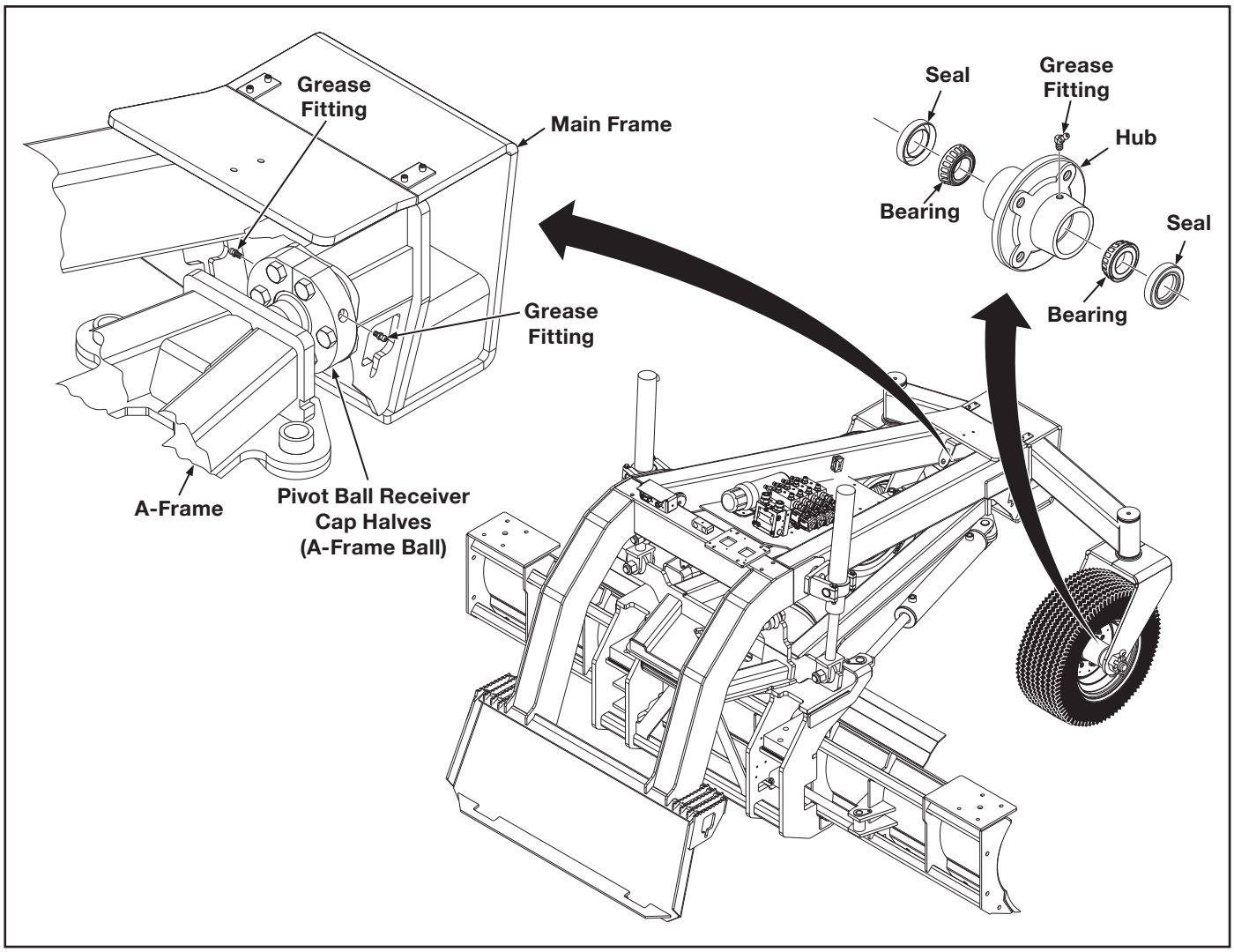


Figure 1-25. Lube and Maintenance.

SERVICE RECORD

DATE	SERVICE	NOTES

SERVICE RECORD

DATE	SERVICE	NOTES

(for future use)

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How To Order Parts 2.2

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Serial Number Information

It is very important that the correct serial number is provided when ordering parts. The serial number plate is located on the main frame. Please mark the model and serial number of your Para-Level Grading Attachment in the space provided below in case the plate on your Para-Level Grading Attachment gets lost or damaged.

Model..... Serial Number .....

Dealer Name ..... Dealer Phone Number .....

Where To Get Parts And Service

When replacement parts and service are required, ATI Group, LLC recommends returning to the dealer from which the product or optional kit was purchased. By going to the dealer, you are dealing with people that understand and know ATI products. Our dealers have the experience servicing these machines and stock the most common parts required to keep your equipment in top working condition.

How To Order Parts

Parts lists contained in this book have been prepared to help you when ordering spare and/or replacement parts. Your order will be filled promptly and accurately when the following information is provided:

1. Model and serial number of the unit. (This specifically identifies the equipment you have and permits us to verify the part numbers in your order.)
2. The parts list page number and catalog number. Include catalog revision number, if applicable.
3. The **Item** number for each part. **Item** numbers on the parts list page correspond with the numbers shown on the illustration.
4. **Part Number** as it appears in the parts list. In most cases this will be a nine-digit number; for example: 315-005-000.
5. The **Description** for the part as it appears on the parts list page.

When a complete assembly is needed, use the assembly number given in the parts list. If no assembly number is given, order by main assembly title and list only the item numbers you want. For example: “Wheel Frame Assembly per 315-509-000, Items 2 through 8, inclusive”.

The part ordered may have a new part number, or the part may have been replaced by a newer design with a different part number. In these cases your acknowledgement, shipping papers and invoices will be written listing the current part number first; the old part number you referred to will follow the part description.

Our purpose in doing this is to tell you that the parts are fully interchangeable. This will avoid any unnecessary correspondence or delay in processing your order. We suggest that you add any new number to your parts lists for future use.

NOTE: ATI Group, LLC reserves the right to discontinue models at any time, change specifications, and improve design without notice and without incurring obligation on goods previously purchased and to discontinue supplying any part listed, when the demand does not warrant production.

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Figure 2-1. Main Frame, A-Frame and Related Parts

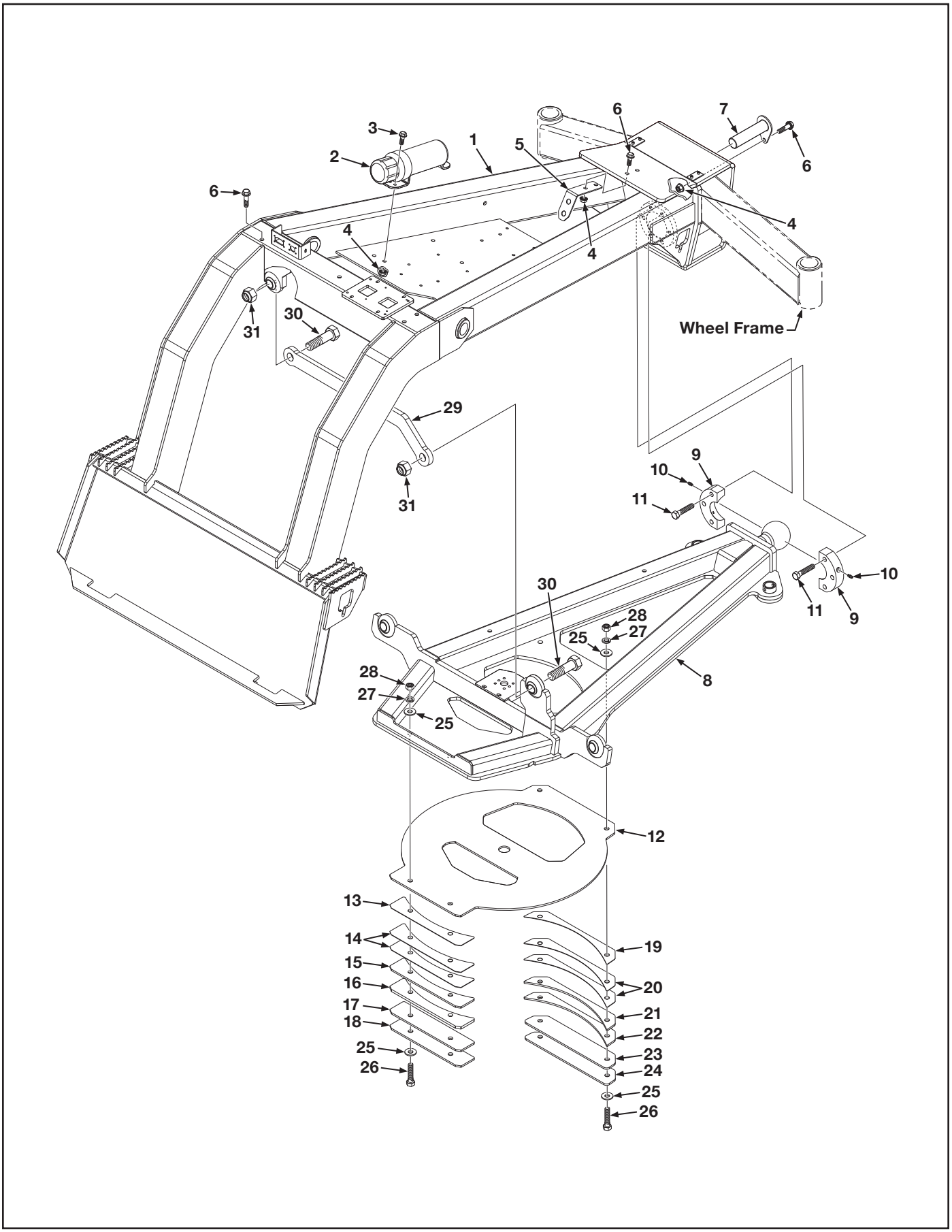

Figure 2-1. Main Frame, A-Frame and Related Parts

Item	Part No.	Qty	Description
1	316-001-200	1	Frame, Main, Grade Blade
2	001-001-083	1	Canister, Operators Manual
3	000-150-074	3	Bolt, Serrated Flange, 5/16"-18UNC x 3/4" Long
4	000-158-223	6	Nut, Flange, Nylon Lock, 5/16"-18UNC
5	316-001-530	1	Plate, Support, Hydraulic Hose, Bolt-On, Front
6	000-150-410	7	Bolt, Serrated Flange, 5/16"-18UNC x 1-1/4" Long
7	000-161-166	1	Pin, Pivot, 1-1/2" Dia. x 8" Long w/Tab
8	316-001-500	1	A-Frame, Grader Blade
9	316-001-555	1 Set	Cap, Half, Pivot Ball Receiver, Includes Item 10
10	000-166-149	2	Fitting, Grease, Straight, 1/4"-28UNF
11	000-150-382	6	Bolt, Hex Head, Gr. 8, 5/8"-18UNF x 3" Long, **(204 ft-lbs)**
12	316-001-540	1	Wear Ring, A-Frame
13	316-001-572	AR	Shim, 20 Ga, Back, A-Frame
14	316-001-562	2	Shim, 16 Ga, Back, A-Frame
15	316-001-564	1	Shim, 1/4", Back, A-Frame
16	316-001-566	1	Shim, 3/8", Back, A-Frame
17	316-001-544	1	Wear Pad, Back, A-Frame
18	316-001-568	1	Plate, Cap, Back, A-Frame, 3/8"
19	316-001-570	AR	Shim, 20 Ga, Front, A-Frame
20	316-001-546	2	Shim, 16 Ga, Front, A-Frame
21	316-001-560	1	Shim, 1/4", Front, A-Frame
22	316-001-542	1	Shim, 3/8", Front, A-Frame
23	316-001-541	1	Wear Pad, Front, A-Frame
24	316-001-548	1	Plate, Cap, Front, A-Frame, 3/8"
25	000-155-075	8	Washer, Flat, 5/8" SAE
26	000-150-403	4	Bolt, Hex Head, Gr. 8, 5/8"-18UNF x 3-1/4" Long
27	000-155-077	4	Washer, Lock, 5/8"
28	000-158-197	4	Nut, Hex, 5/8"-18UNF **(120 ft-lbs)**
29	316-001-260	1	Arm, Pan, Hardrod
30	000-150-385	2	Bolt, Hex Head, Gr. 8, 1-1/8"-12UNF x 4" Long
31	000-158-215	2	Nut, Hex, Nylon Lock, 1-1/8"-12UNF

AR - As Required NSS - Not Serviced Separately ASN - After Serial No. BSN - Before Serial No. LP - Local Purchase

Figure 2-2. Carriage, Moldboard, Blade and Related Parts

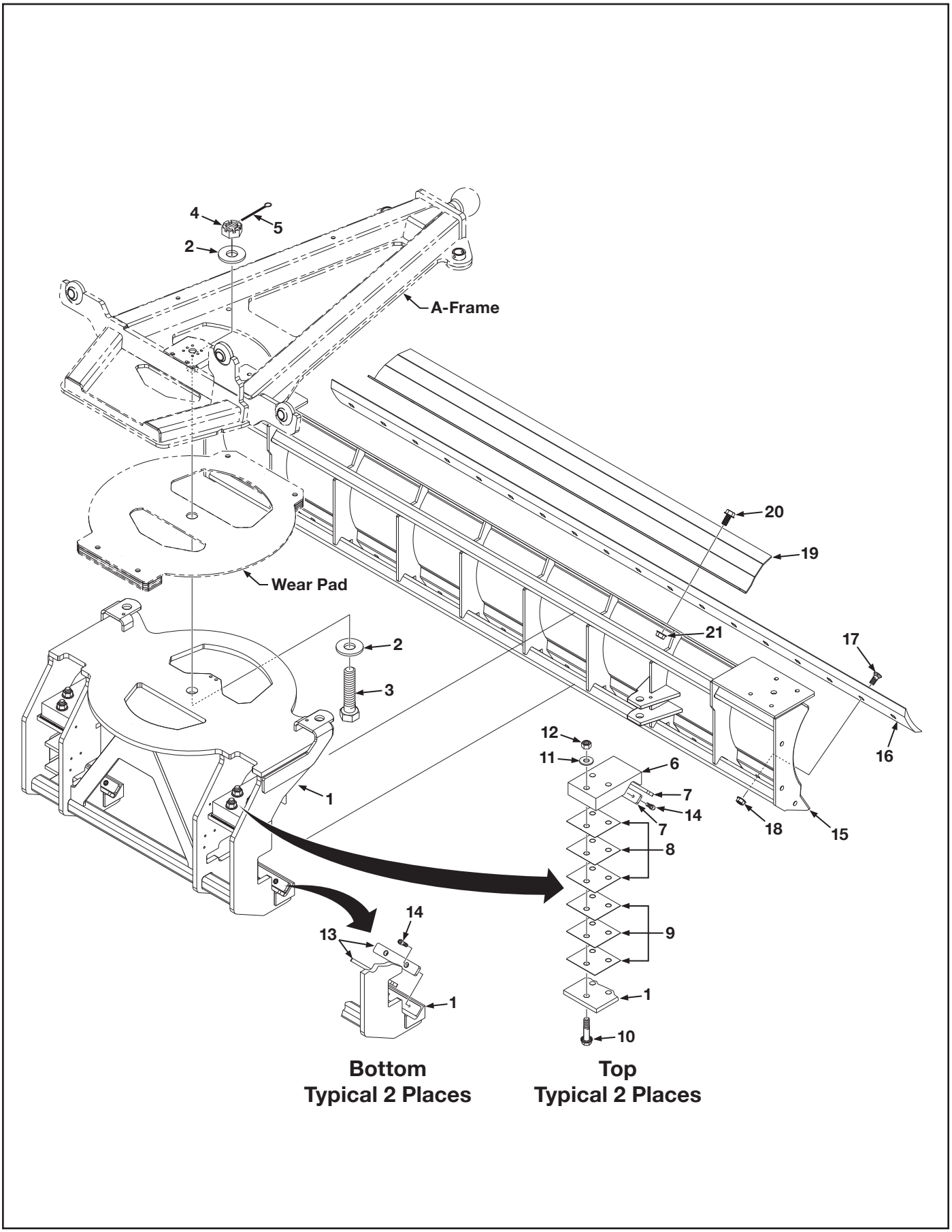

Figure 2-2. Carriage, Moldboard, Blade and Related Parts

Item	Part No.	Qty	Description
1	316-001-460	1	Carriage, Grader Blade
2	000-155-104	2	Washer, Flat, 1-1/2", SAE Std,
3	000-150-389	1	Bolt, Hex Head, Gr. 8, 1-1/2"-12UNF x 3" Long
4	000-158-213	1	Nut, Castle, Jam, 1-1/2"-12 UNF
5	000-161-202	1	Pin, Cotter, 1/4" Dia. x 3" Long
6	316-001-440	2	Clasp, Carriage, Bolt On
7	316-001-443	4	Pad, Wear, Clasp, Carriage, Bolt-On
8	316-001-444	AR	Shim, Clasp, Carriage, Bolt-On, 16 Ga.
9	316-001-446	AR	Shim, Clasp, Carriage, Bolt-On, 20 Ga.
10	000-150-401	6	Bolt, Flange, 3/4"-10UNC x 3-3/4" Long
11	000-155-115	6	Washer, Flat, Gr. 8, 3/4"
12	000-158-221	8	Nut, Hex, 3/4"-10UNC, **(250 ft-lbs red Loctite)**
13	316-001-439	4	Pad, Wear, Clasp, Carriage, Bolt-On
14	000-150-404	16	Screw, Socket Head, 5/16"-18UNC x 5/8" Long
15	316-002-100	1	Moldboard, Grader Blade, GB-96
	316-001-100	1	Moldboard, Grader Blade, GB-108
16	000-190-256	1	Edge, Cut, Bolt-On, Curved, DBC, 3/4" x 6" x 96" Long, GB-96
	000-190-202	1	Edge, Cut, Bolt-On, Curved, DBC, 3/4" x 6" x 108" Long, GB-108
17	000-150-258	AR	Bolt, Plow, 5/8"-11UNC x 1-3/4" Long
18	000-158-142	AR	Nut, Serrated Flange, 5/8"-11UNC
19	316-001-120	1	Shield, Dirt, Moldboard
20	000-150-396	4	Bolt, Serrated Flange, 1/2"-13UNC x 1" Long
21	000-158-111	4	Nut, Serrated Flange, 1/2"-13UNC

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Figure 2-3. Wheel Frame, Caster Fork and Related Parts

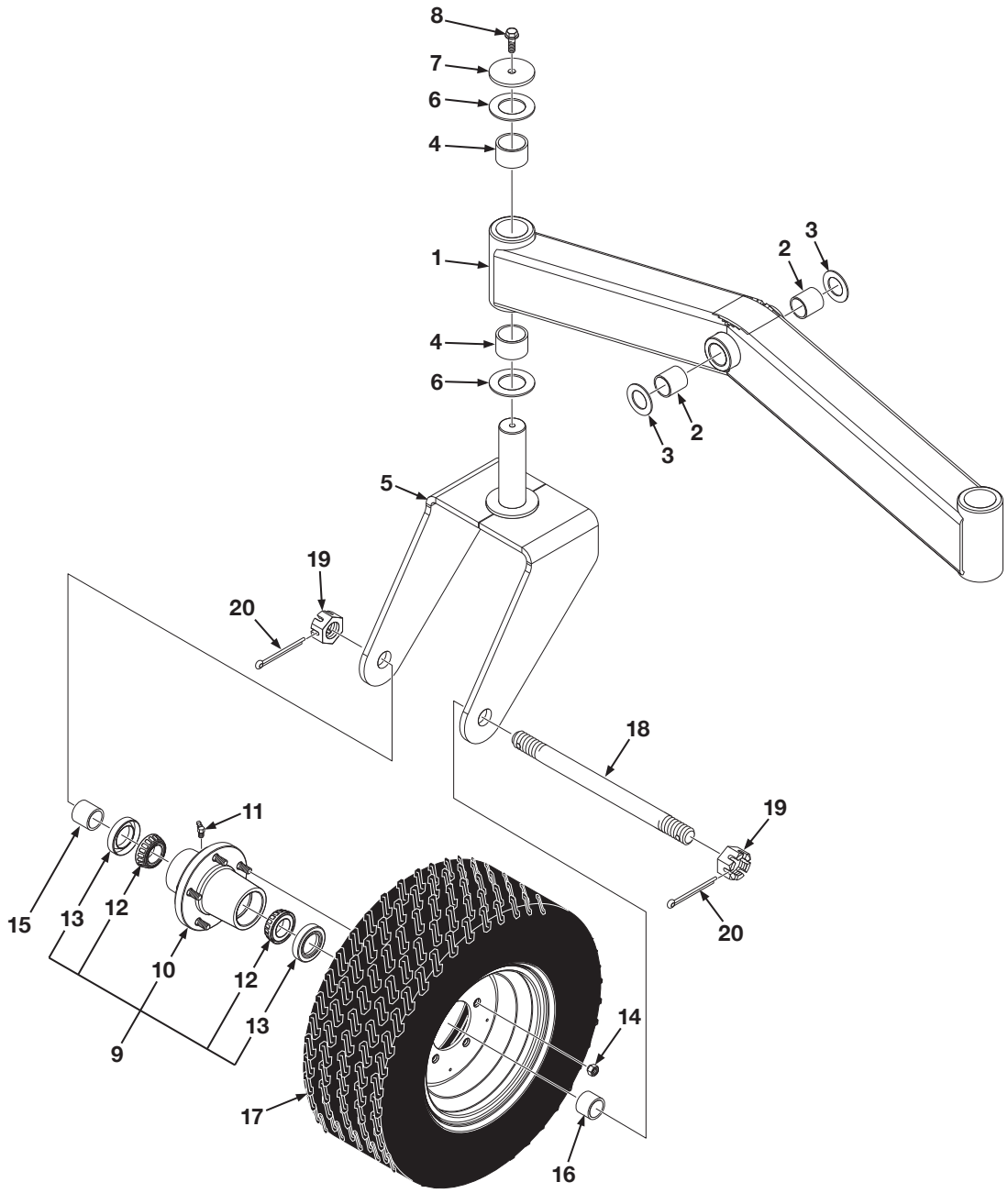

Figure 2-3. Wheel Frame, Caster Fork and Related Parts

Item	Part No.	Qty	Description
1	316-001-300	1	Pivot, Axle Grader
2	000-176-171	2	Bushing, 1-3/4" OD x 1-1/2" ID x 1-1/2" Long
3	000-155-013	2	Washer, Flat, 2-3/4" OD x 1-1/2" ID x 10 Ga.
4	000-176-267	4	Bushing, 2.3705" OD X 2.008" ID
5	316-001-610	2	Fork, Caster
6	000-155-100	4	Bushing, Washer, 3-3/8" OD x 2.015" ID x 10 Gauge
7	000-155-102	2	Washer, Flat, 3-38" OD x .555" ID x 1/4" Thick
8	000-150-375	2	Bolt, Serrated Flange, 1/2"-13UNC x 1-1/4" Long, **(57 ft-lbs blue Loctite)**
9	001-001-158	2	Hub Assembly, Includes Items 10 thru 14
10	NSS	1	Hub, Wheel, Includes Item 11
11	000-166-865	1	Fitting, Grease, 65°
12	000-176-270	4	Bearing, Roller, Tapered, 1.3750" ID, 1.0520" Width
13	000-166-838	4	Seal, 2.718 " OD x 1.750 " ID x .359 " Thick
14	000-158-120	10	Nut, Lug, Hex, 1/2"-20UNF
15	316-001-630	2	Spacer, Wheel Hub, Long
16	316-001-620	2	Spacer, Wheel Hub, Short
17	001-001-155	2	Wheel/Tire, Foam Filled , 23/8.50-12
18	316-001-640	2	Axle, Caster, 1-3/8" -12UNF x 13-1/2" Long
19	000-158-212	4	Nut, Castle, 1-3/8"-12UNF
20	000-161-202	4	Pin, Cotter, 1/4" Dia. x 3" Long

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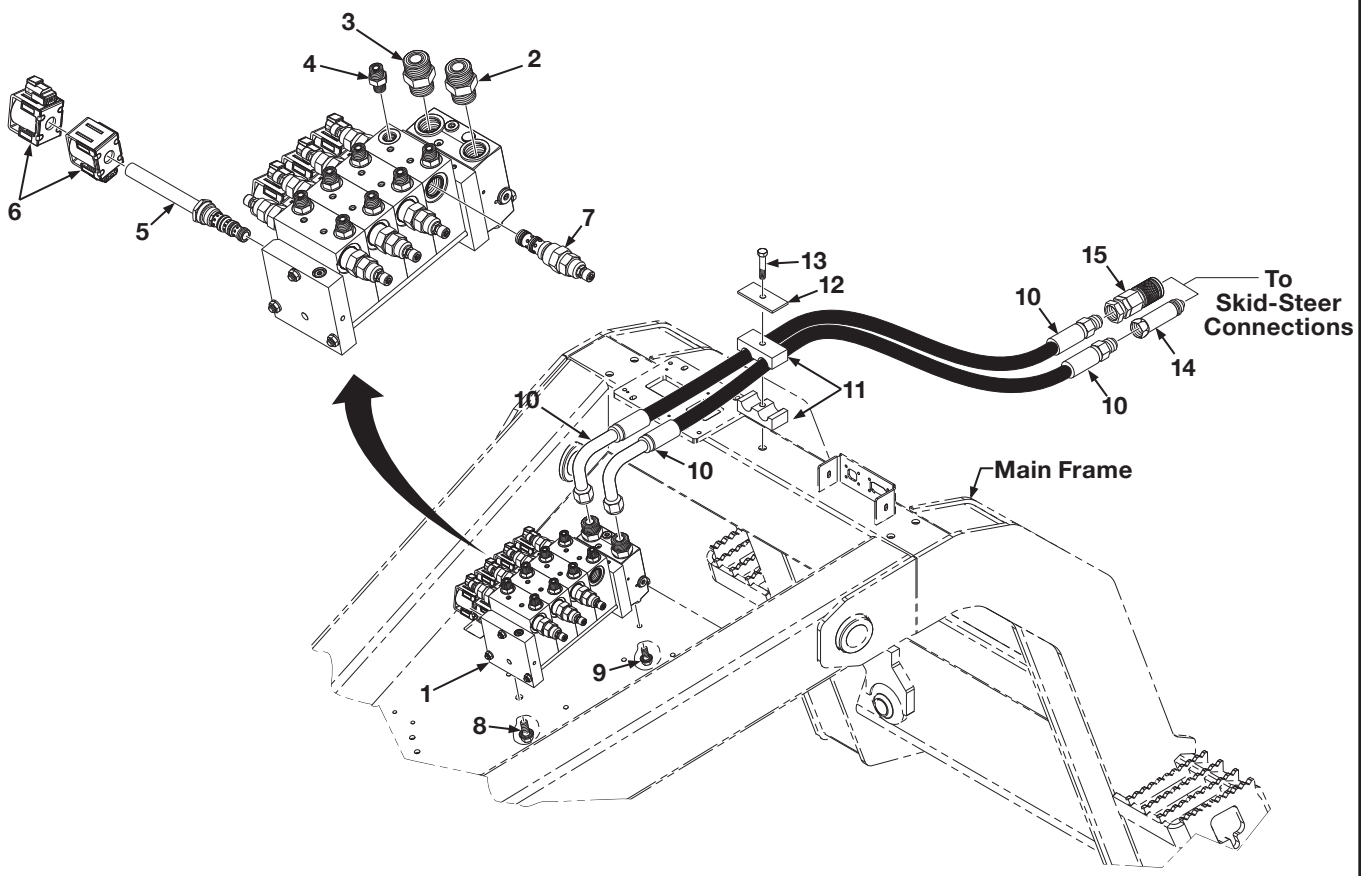
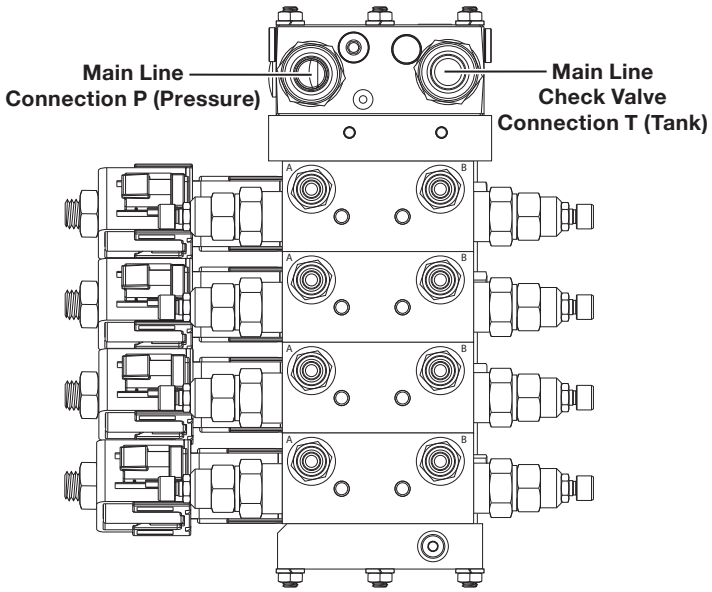
Figure 2-4. Hydraulic Valve Assembly & Related Parts





Top View Hydraulic Valve

Figure 2-4. Hydraulic Valve Assembly & Related Parts

Item	Part No.	Qty	Description
1	000-166-868	1	Valve Assembly, Hydraulic, MVB10, Includes Items 2 thru 7
2	000-166-824	1	Valve, Check, 12OFS x 12MB, **(DO NOT REMOVE FROM ITEM 1)**
3	000-166-694	1	Fitting, Adapter, 12OFS x 12MB
4	000-166-685	8	Fitting, Adapter, 6OFS x 6MB
5	NSS	4	Stem
6	000-166-843	8	Coil
7	000-166-844	8	Valve, Counter Balance
8	000-150-119	1	Bolt. Serrated Flange, 3/8"-16UNC x 3/4" Long
9	000-150-074	2	Bolt, Serrated Flange, 5/16"-18UNC x 3/4" Long
10	000-166-810	2	Hose, 5/8" Dia x 80" Long, 10MORB x 12FFORX90
11	000-166-862	1	Clamp, Hose Set
12	000-166-861	1	Plate, Top Hose Clamp
13	000-150-103	2	Bolt, Hex Head, 5/16"-18UNC x 3" Long
14	000-166-859	1	Coupler, Quick Disconnect, Flat Face, Male (Tank Line)
15	000-166-860	1	Coupler, Quick Disconnect, Flat Face, Female (Pressure Line)
			BH-Bulkhead MP-Male Pipe FP-Female Pipe FPX-Female Pipe Swivel FFX- Female O-Ring Flat Face Swivel MB-Male O-Ring Boss FB-Female O-Ring Boss MJ-Male JIC FJ-Female JIC FJX-Female JIC Swivel OFS-O-Ring Face Seal OFSBH-O-Ring Face Seal Bulkhead

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Figure 2-5. Lift Cylinders & Related Parts

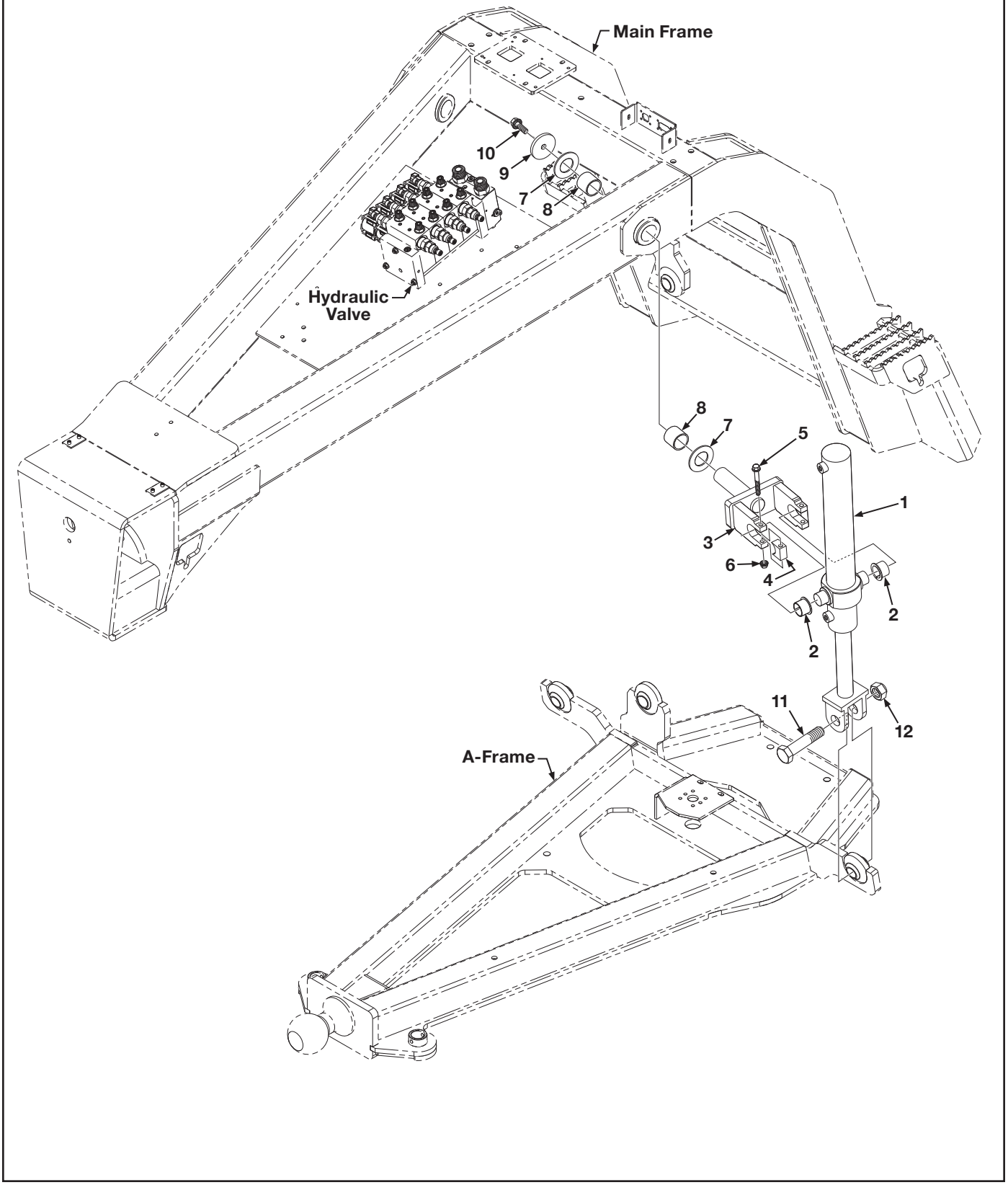

Figure 2-5. Lift Cylinders & Related Parts

Item	Part No.	Qty	Description
1	000-166-792	2	Cylinder Assembly, Lift, 2-1/4" Bore x 16-3/4" Stroke, 3,000 PSI
2	000-176-268	4	Bushing, Flange, Cylinder Yoke
3	316-001-295	2	Yoke Weldment, Lift Cylinder
4	316-001-277	4	Spacer, Trunion, Lift Cylinder
5	000-150-393	4	Bolt, Serrated Flange, 3/8"-16UNC x 3" Long
6	000-158-217	4	Nut, Serrated Flange, 3/8"-16UNC, **(26 ft-lbs blue Loctite)**
7	000-155-013	4	Washer, 2-3/4" OD x 1-1/2" ID x 10 Gauge
8	000-176-171	4	Bushing, 1-3/4" OD x 1-1/2" ID x 1-1/2" Long
9	000-155-004	2	Washer, Flat, 2-3/4" OD x 17/32" ID x 1/4" Thick
10	000-150-396	2	Bolt, Serrated Flange, 1/2"-13UNC x 1" Long, **(57 ft-lbs blue Loctite)**
11	000-150-383	2	Bolt, Hex Head, Gr. 8, 1-1/8"-12UNF x 4-1/2" Long
12	000-158-215	2	Nut, Hex, Nylon Lock, 1-1/8"-12UNF
	000-166-836	1	Kit, Cylinder Repair BSN 4548 (Beiler Hydraulics)
	000-166-891	1	Kit, Cylinder Repair ASN 4547 (Tusker)

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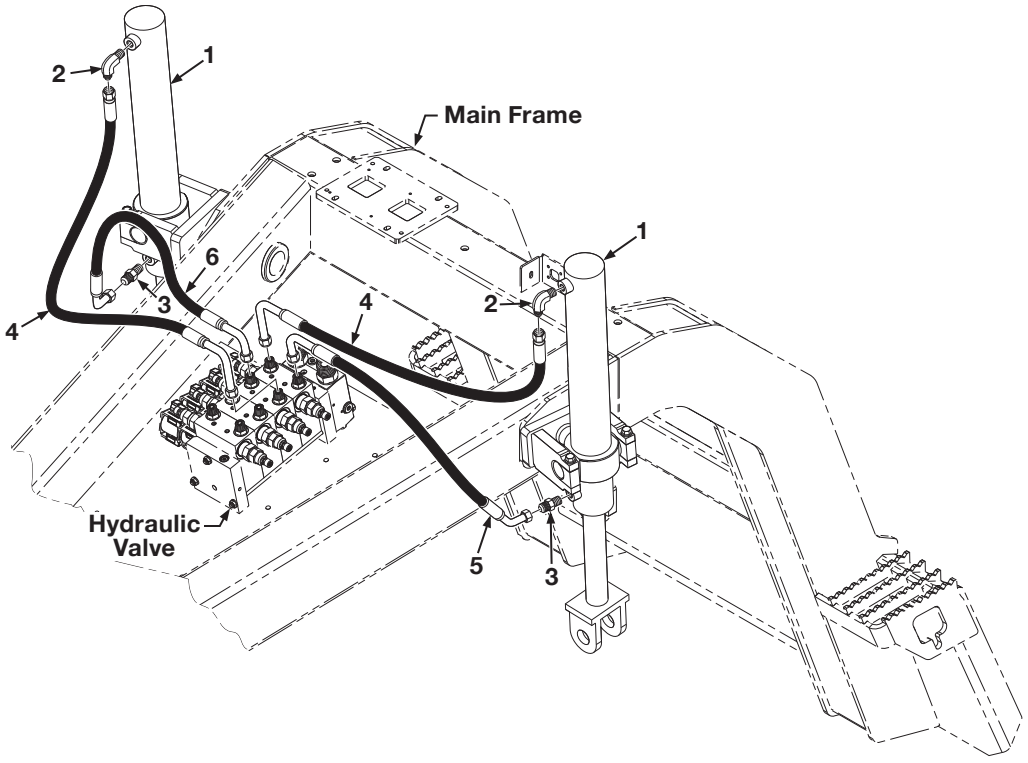
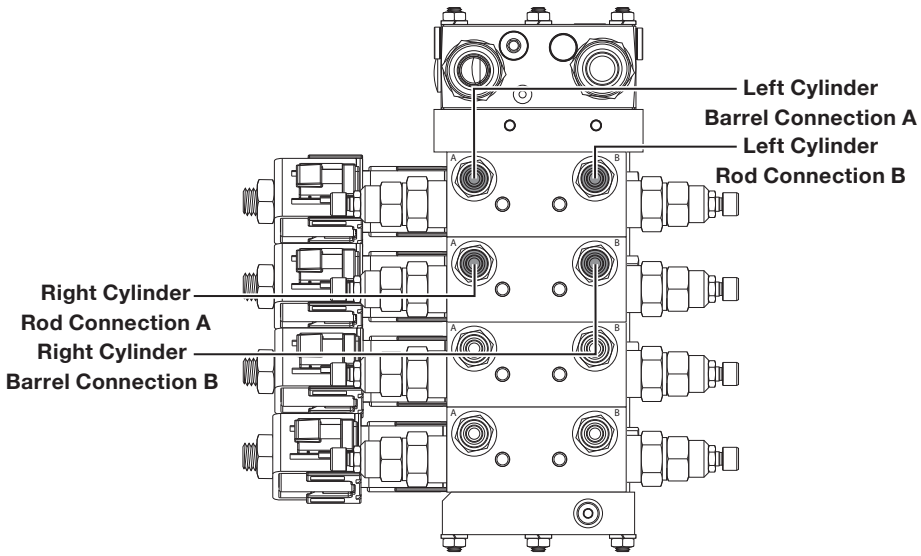
Figure 2-6. Lift Cylinder Hydraulics





**Top View Hydraulic Valve
Lift Cylinder
Connections**

Figure 2-6. Lift Cylinder Hydraulics

Item	Part No.	Qty	Description
1	000-166-792	2	Cylinder Assembly, Lift, 2-1/4" Bore x 16-3/4" Stroke, 3,000 PSI
2	000-166-697	2	Fitting, Elbow, 90°, 6OFS x 6MB
3	000-166-685	2	Fitting, Adapter, Straight, 06OFS x 06MB
4	000-166-802	2	Hose, 3/8" Dia x 33" Long, 6FFORX x 6FFORX90L
5	000-166-803	1	Hose, 3/8" Dia x 27" Long, 6FFORX45 x 6FFORX90, 190 Orientation
6	000-166-804	1	Hose, 3/8" Dia x 27" Long, 6FFORX45 x 6FFORX90, 130 Orientation
	000-166-836	1	Kit, Cylinder Repair BSN 4548 (Beiler Hydraulics)
	000-166-891	1	Kit, Cylinder Repair ASN 4547 (Tusker)
			BH-Bulkhead MP-Male Pipe FP-Female Pipe FPX-Female Pipe Swivel FFX- Female O-Ring Flat Face Swivel MB-Male O-Ring Boss FB-Female O-Ring Boss MJ-Male JIC FJ-Female JIC FJX-Female JIC Swivel OFS-O-Ring Face Seal OFSBH-O-Ring Face Seal Bulkhead

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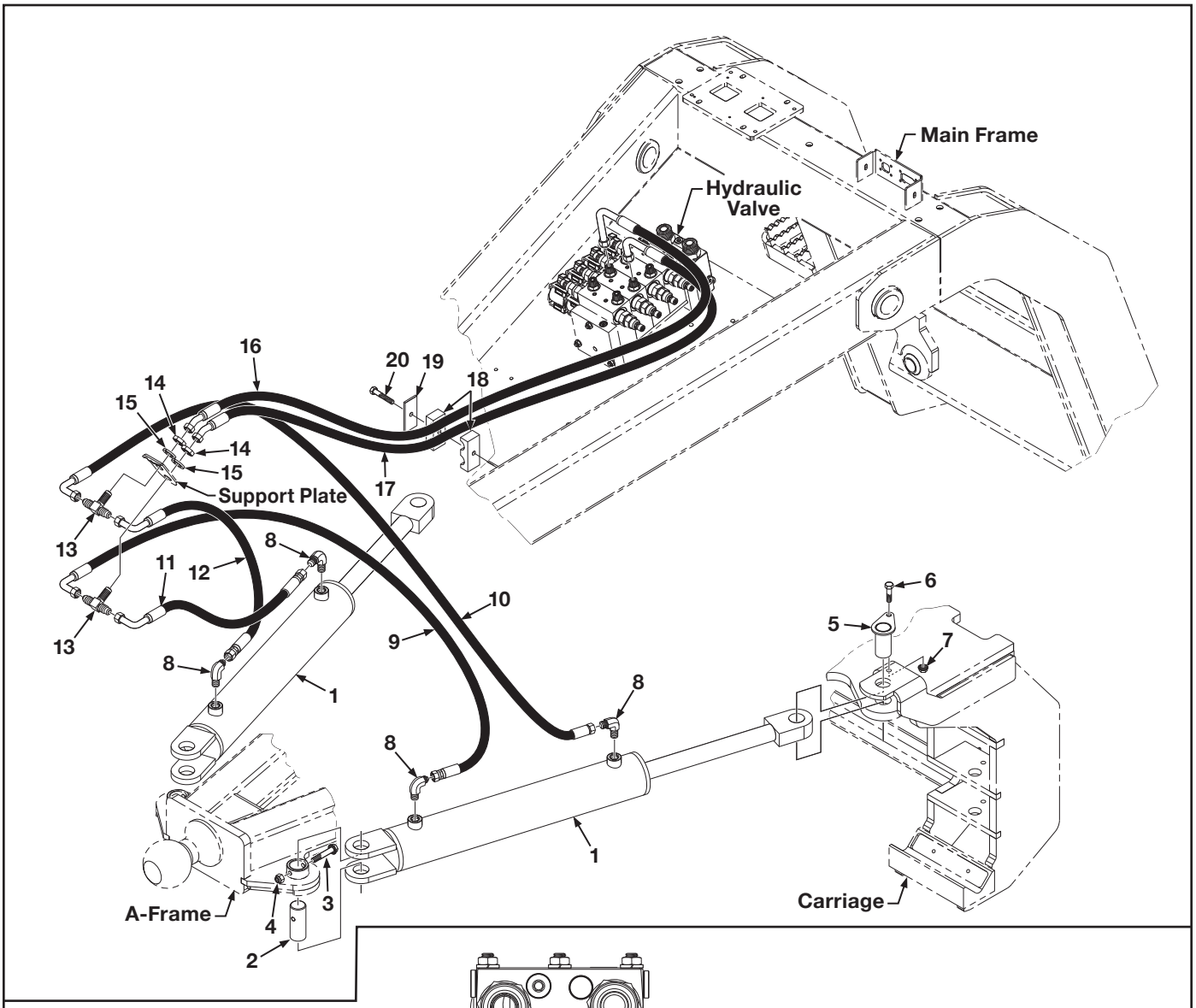
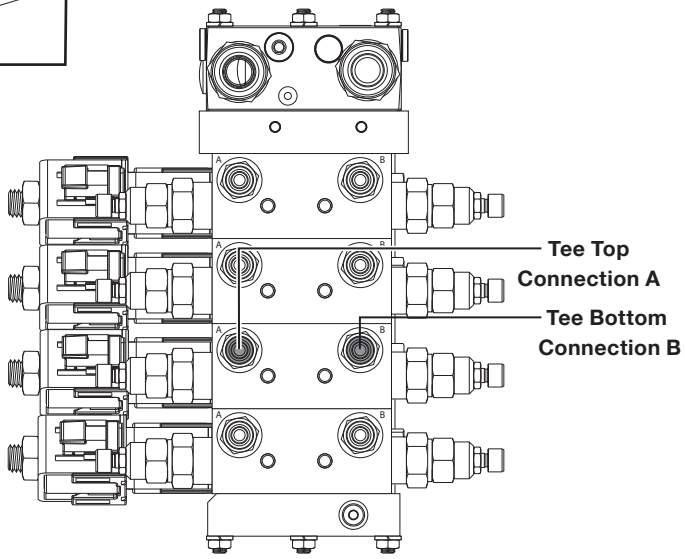
Figure 2-7. Angle Cylinders, Hydraulics & Related Parts





Top View Hydraulic Valve Angle Cylinder Connections

Figure 2-7. Angle Cylinders, Hydraulics & Related Parts

Item	Part No.	Qty	Description
1	000-166-791	2	Cylinder Assembly, Angle, 3" Bore x 19" Stroke, 3000 PSI
2	000-161-211	2	Pin, Link, 1-1/4" Dia x 3-1/8" Long
3	000-150-097	2	Bolt, Hex Head, 5/16"-18UNC x 2-1/4" Long
4	000-158-066	2	Nut, Hex, Nylon Lock, 5/16"-18UNC
5	000-161-192	2	Pin, Link, 1-1/4" Dia. x 2-5/8" Long, w/Tab
6	000-150-077	2	Bolt, Hex Head, 5/16"-18UNC x 1" Long
7	000-158-223	2	Nut, Flange, Nylon Lock, 5/16"-18UNC
8	000-166-697	4	Fitting, Elbow, 90°, 6OFS x 6MB
9	000-166-857	1	Hose, 3/8" Dia x 29" Long, 6FFORX x 6FFORX90, 270 Orientation
10	000-166-802	1	Hose, 3/8" Dia x 33" Long, 6FFORX x 6FFORX90L
11	000-166-858	1	Hose, 3/8" Dia x 33" Long, 6FFORX x 6FFORX90
12	000-166-809	1	Hose, 3/8" Dia x 36" Long, 6FFORX x 6FFORX90L, 130 Orientation
13	000-166-695	2	Fitting, Tee, Bulkhead Branch, 6OFS x 6OFS x 6OFSBH, Includes Item 14
14	NSS	2	Nut, Hex, Lock
15	000-155-093	2	Washer, Lock, 3/4"
16	000-166-805	1	Hose, 3/8" Dia x 42" Long, 6FFORX45 x 6FFORX90L, 270 Orientation
17	000-166-806	1	Hose, 3/8" Dia x 39" Long, 6FFORX45 x 6FFORX90, 270 Orientation
18	000-166-864	3	Clamp, Hose Set, 5/8" Dia.
19	000-166-863	3	Plate, Top Hose Set
20	000-150-097	3	Bolt, Hex Head, 5/16"-18UNC x 2-1/4" Long
	000-166-835	1	Kit, Cylinder Repair BSN 4548 (Beiler Hydraulics)
	000-166-890	1	Kit, Cylinder Repair ASN 4547 (Tusker)
			BH-Bulkhead MP-Male Pipe FP-Female Pipe FPX-Female Pipe Swivel FFX- Female O-Ring Flat Face Swivel MB-Male O-Ring Boss FB-Female O-Ring Boss MJ-Male JIC FJ-Female JIC FJX-Female JIC Swivel OFS-O-Ring Face Seal OFSBH-O-Ring Face Seal Bulkhead

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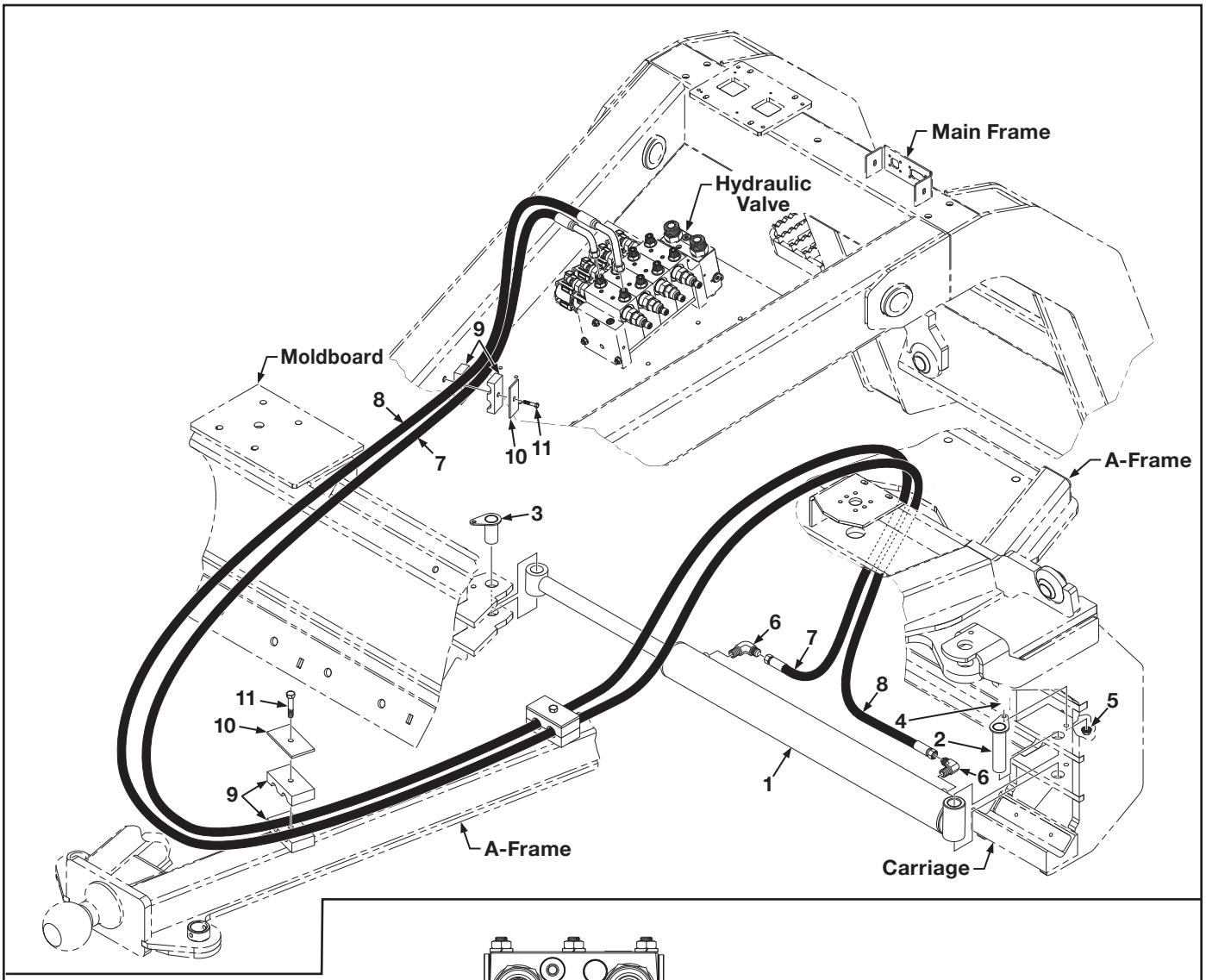
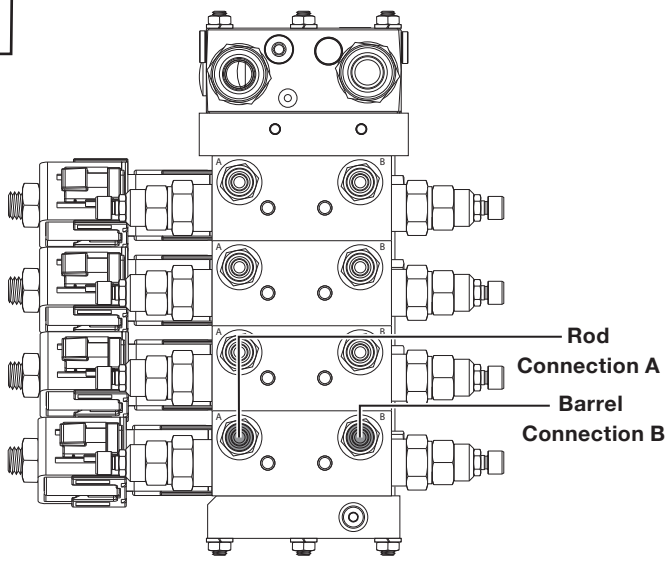
Figure 2-8. Side Shift Cylinders, Hydraulics & Related Parts





Top View Hydraulic Valve Slide Cylinder Connections

Figure 2-8. Side Shift Cylinders, Hydraulics & Related Parts

Item	Part No.	Qty	Description
1	000-166-914	1	Cylinder Assembly, Side Shift, 2-1/2" Bore x 20" Stroke, 3000 PSI, GB-96
	000-166-793	1	Cylinder Assembly, Side Shift, 2-1/2" Bore x 26" Stroke, 3000 PSI, GB-108
2	000-161-168	1	Pin, Link, 1" Dia. x 4-5/8" Long, w/Tab
3	000-161-204	1	Pin, Link, 1" Dia. x 3-3/8" Long, w/Tab
4	000-150-078	2	Bolt, Serrated Flange, 5/16"-18UNC x 1" Long
5	000-158-233	2	Nut, Flange, Nylon Lock, 5/16"-18UNC
6	000-166-697	2	Fitting, Elbow, 90°, 6OFS x 6MB
7	000-166-807	1	Hose, 3/8" Dia x 122" Long, 6FFORX x 6FFORX90
8	000-166-808	1	Hose, 3/8" Dia x 130" Long, 6FFORX x 6FFORX90L
9	000-166-864	3	Clamp, Hose Set, 5/8" Dia.
10	000-166-863	3	Plate, Top Hose Set
11	000-150-097	3	Bolt, Hex Head, 5/16"-18UNC x 2-1/4" Long
	000-166-837	1	Kit, Cylinder Repair BSN 4548 (Beiler Hydraulics)
	000-166-892	1	Kit, Cylinder Repair ASN 4547 (Tusker)
			BH-Bulkhead MP-Male Pipe FP-Female Pipe FPX-Female Pipe Swivel FFX- Female O-Ring Flat Face Swivel MB-Male O-Ring Boss FB-Female O-Ring Boss MJ-Male JIC FJ-Female JIC FJX-Female JIC Swivel OFS-O-Ring Face Seal OFSBH-O-Ring Face Seal Bulkhead

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Figure 2-9. Valve Module and Related Harnessing

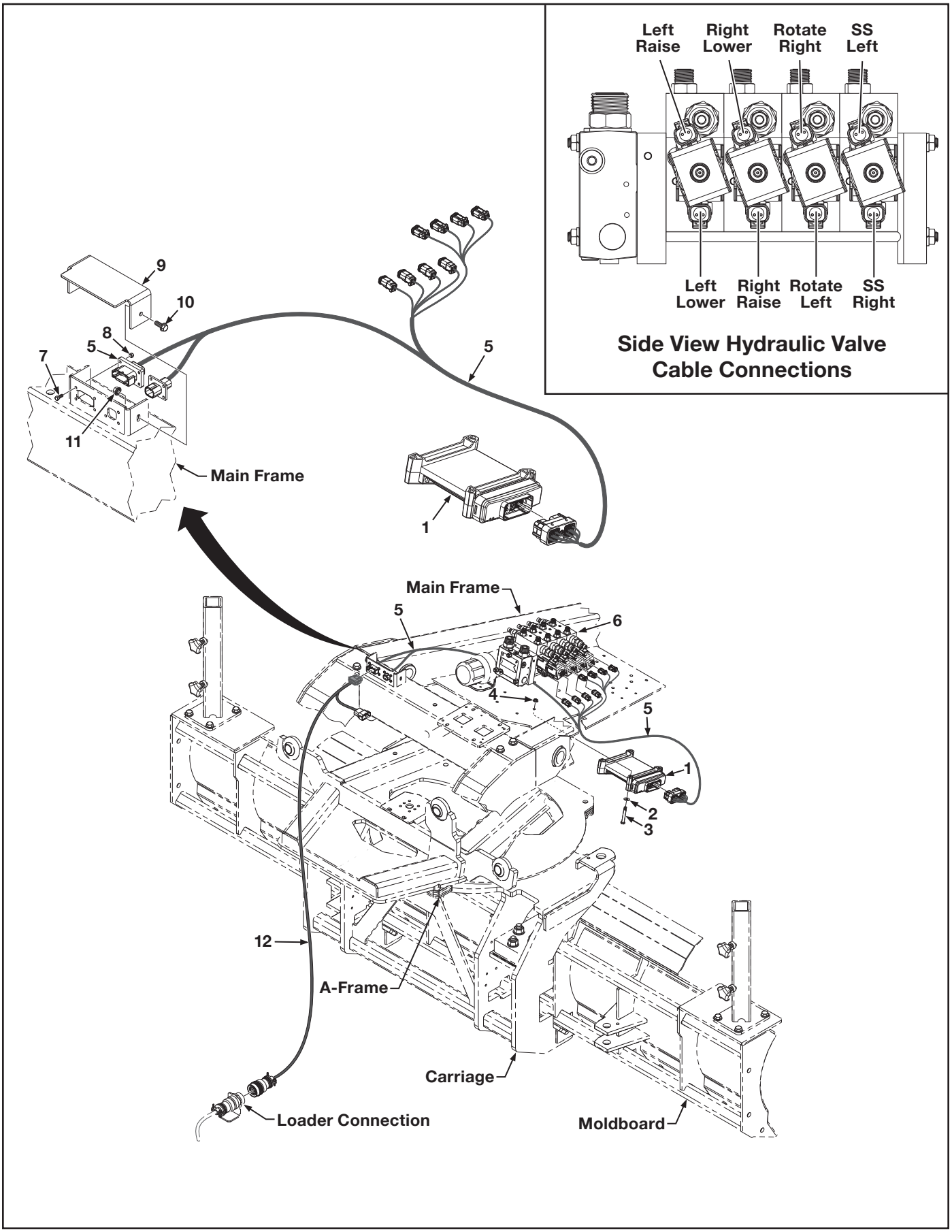

Figure 2-9. Valve Module and Related Harnessing

Item	Part No.	Qty	Description
1	000-200-500	1	Module, Valve Control
2	000-155-020	2	Washer, Flat, 1/4"
3	000-150-080	2	Bolt, Socket Head, 1/4"-20UNC x 2-1/2" Long
4	000-158-048	2	Nut, Serrated Flange, 1/4"-20UNC
5	000-200-514	1	Harness, Grade Blade
6	000-166-794	1	Valve Assembly, Hydraulic, MVB10
7	000-150-395	8	Screw, Hex Head, #8-32UNC x 3/4" Long
8	000-158-219	8	Nut, Hex, Nylon Lock, #8-32UNC
9	316-001-231	1	Plate, Cover, Brace, Bulkhead, Mount
10	000-150-046	2	Bolt, Serrated Flange, 1/4"-20UNC x 1/2" Long
11	000-158-048	2	Nut, Serrated Flange, 1/4"-20UNC
12		1	Harness, Loader (Machine Specific) Refer to **page 1.6**

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Figure 2-10. Joystick, Harness & Related Parts

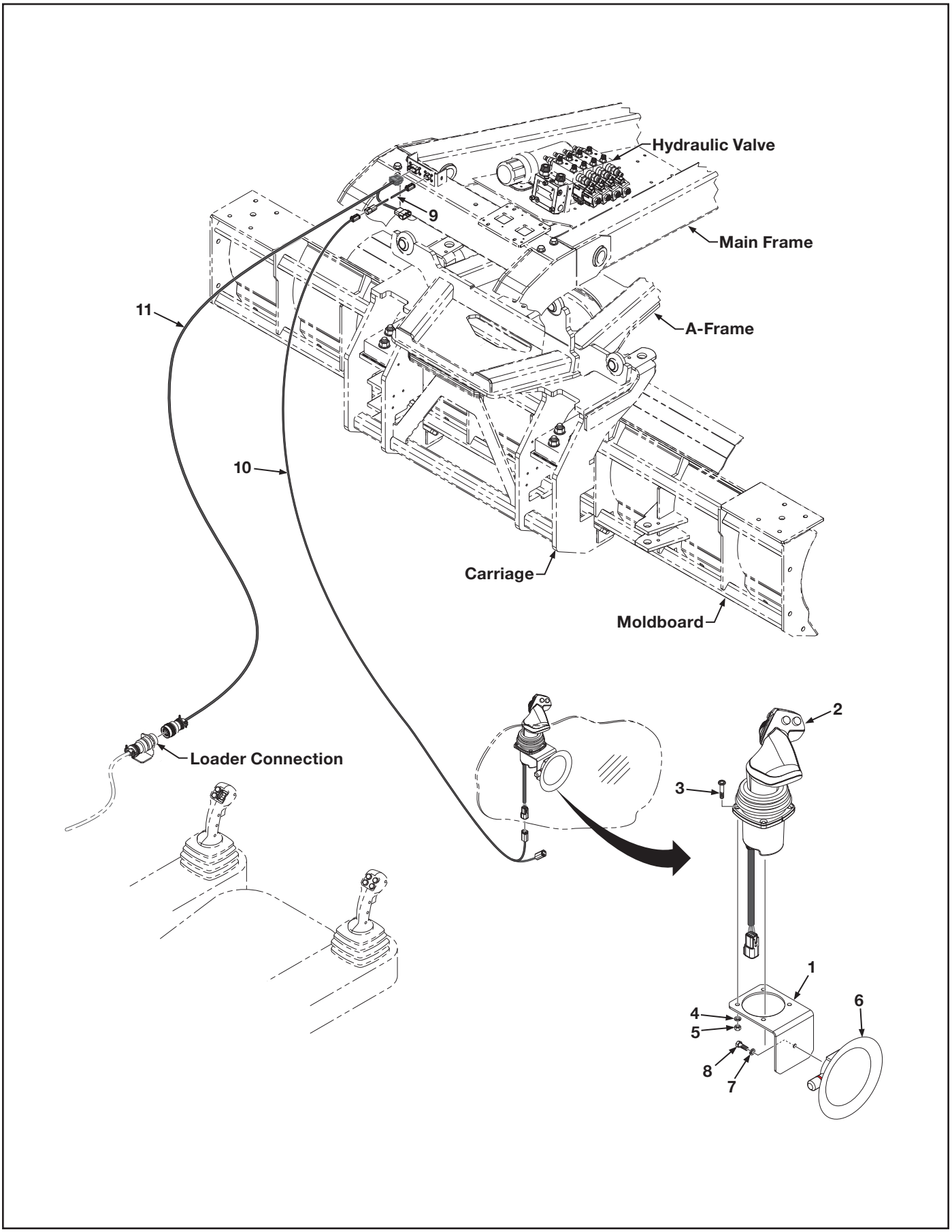

Figure 2-10. Joystick, Harness & Related Parts

Item	Part No.	Qty	Description
1	001-001-168	1	Bracket, Joystick
2	000-200-528	1	Joystick Assembly, Includes Items 3 thru 5
3	NSS	4	Bolt, Flange Head Socket
4	NSS	4	Washer, Lock
5	NSS	4	Nut, Hex
6	001-001-129	1	Cup, Vacuum
7	000-155-021	1	Washer, Lock, 1/4"
8	000-150-045	1	Bolt, Hex Head, 1/4"-20UNC x 1/2" Long
9	000-200-527	1	Harness, Extension, 4 Pin
10	000-200-513	1	Harness Assembly
11		1	Harness, Loader (Machine Specific) Refer to **page 1.6**

AR - As Required NSS - Not Serviced Separately ASN - After Serial No. BSN - Before Serial No. LP - Local Purchase

Figure 2-11. Joystick, Harness & Related Parts (Rental)

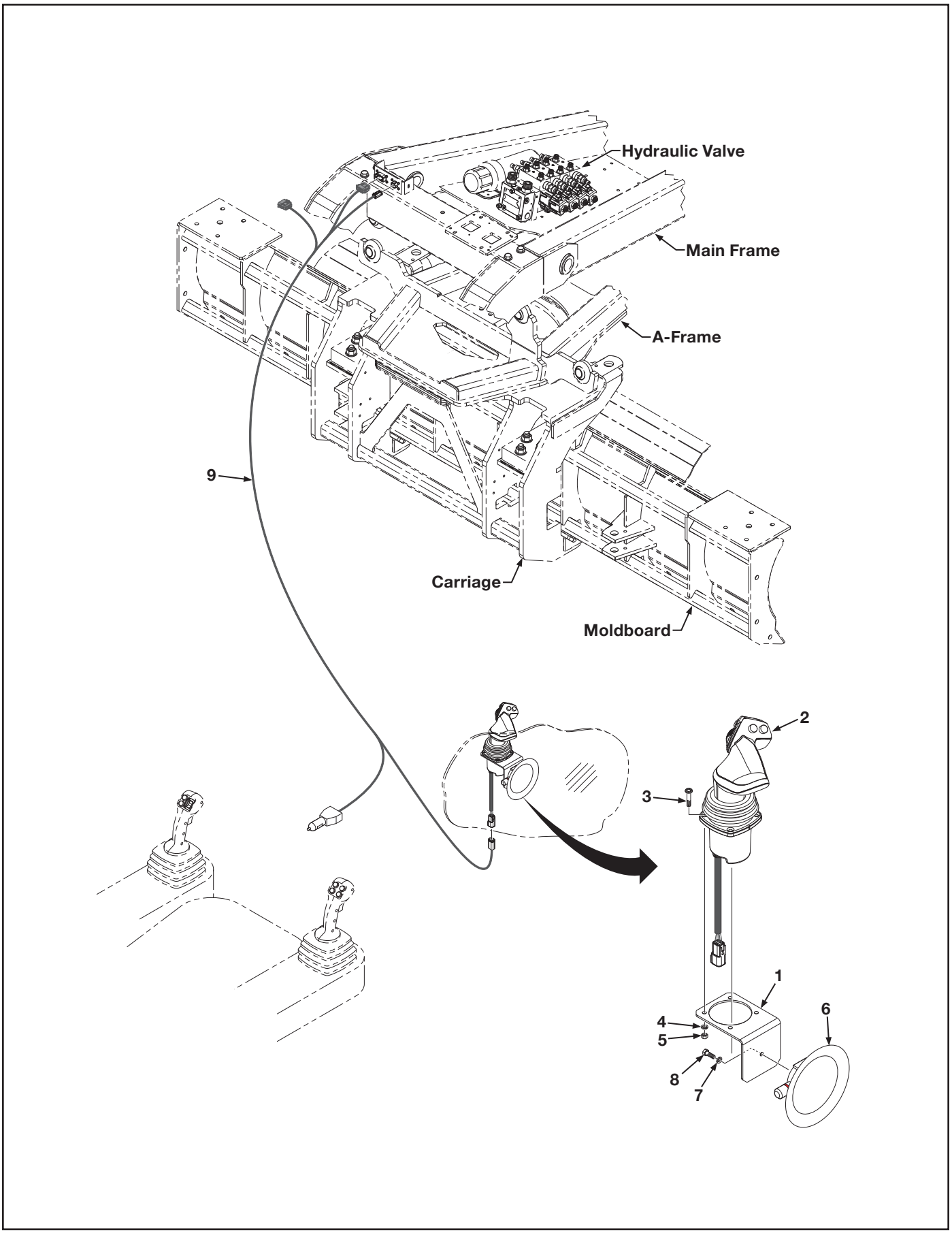

Figure 2-11. Joystick, Harness & Related Parts (Rental)

Item	Part No.	Qty	Description
1	001-001-168	1	Bracket, Joystick
2	000-200-528	1	Joystick Assembly, Includes Items 3 thru 5
3	NSS	4	Bolt, Flange Head Socket
4	NSS	4	Washer, Lock
5	NSS	4	Nut, Hex
6	001-001-129	1	Cup, Vacuum
7	000-155-021	1	Washer, Lock, 1/4"
8	000-150-045	1	Bolt, Hex Head, 1/4"-20UNC x 1/2" Long
9	000-200-524	1	Harness Assembly

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Figure 2-12. HMR, Harness & Related Parts

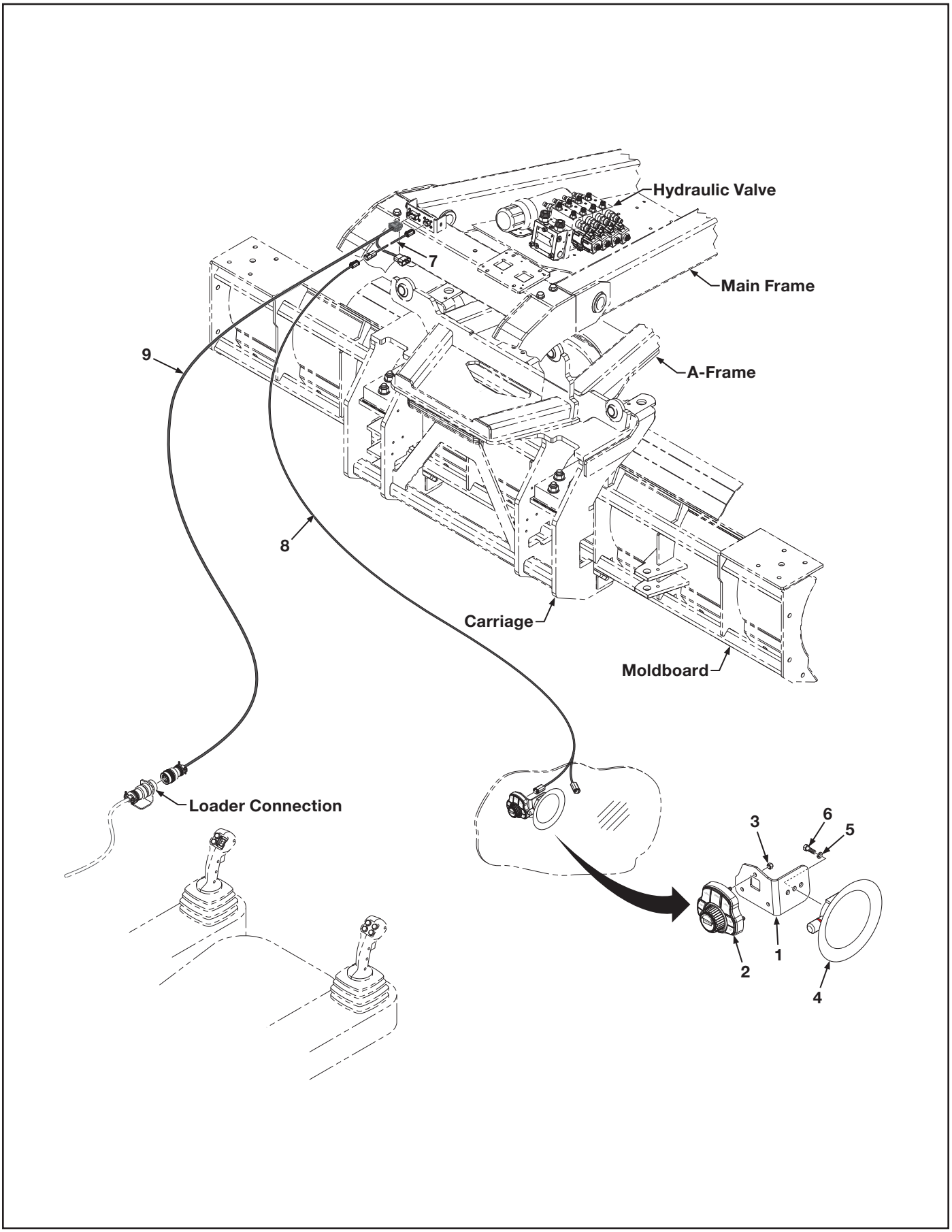


Figure 2-12. HMR, Harness & Related Parts

Item	Part No.	Qty	Description
1	001-001-165	1	Bracket, HMR
2	000-200-510	1	HMR Assembly, Includes Items 3
3	000-158-220	3	Nut, Hex, Nylon Lock, M6
4	001-001-129	1	Cup, Vacuum
5	000-155-021	1	Washer, Lock, 1/4"
6	000-150-045	1	Bolt, Hex Head, 1/4"-20UNC x 1/2" Long
7	000-200-527	1	Harness, Extension, 4 Pin
8	000-200-513	1	Harness Assembly
9		1	Harness, Loader (Machine Specific) Refer to **page 1.6**

AR - As Required NSS - Not Serviced Separately ASN - After Serial No. BSN - Before Serial No. LP - Local Purchase

Figure 2-13. Optional Equipment

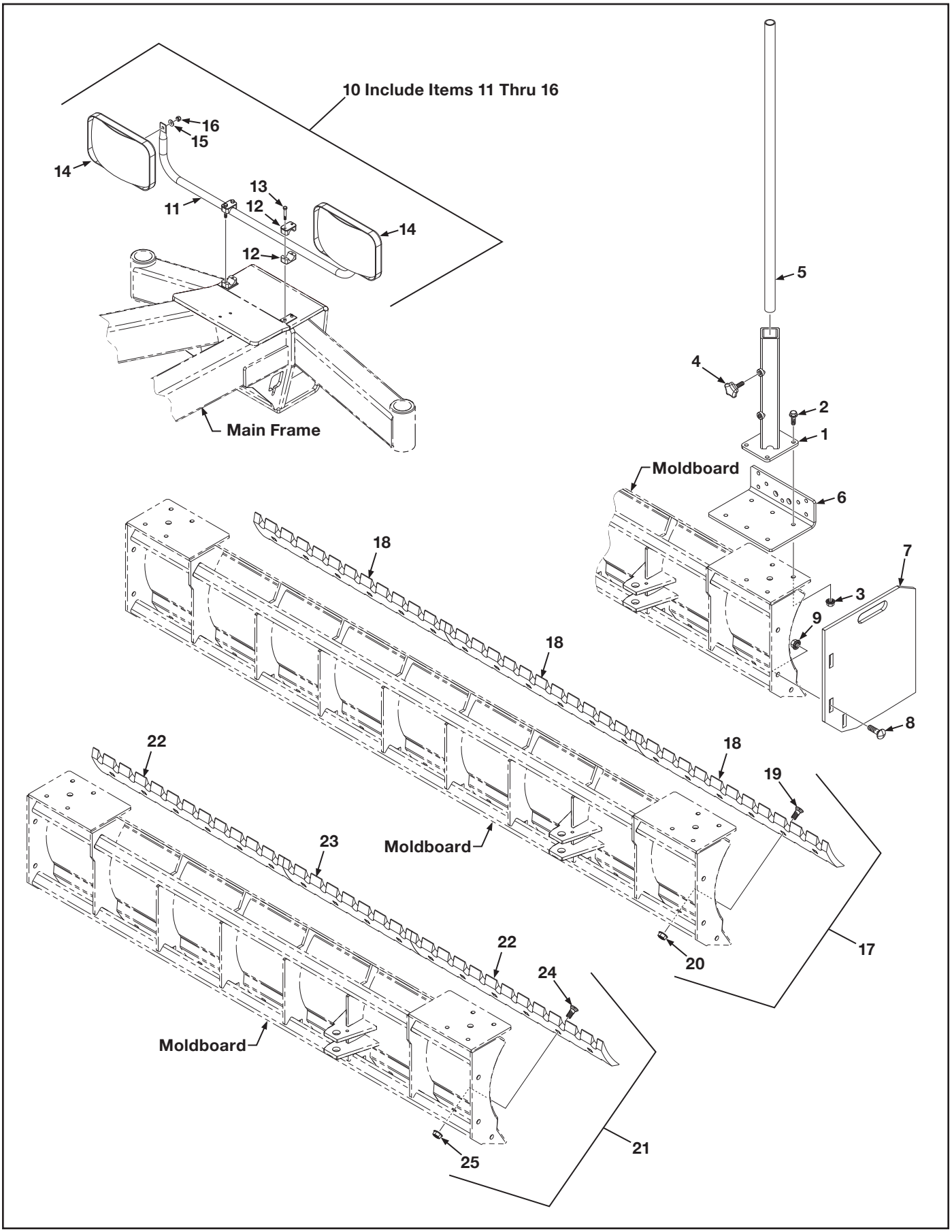


Figure 2-13. Optional Equipment

Item	Part No.	Qty	Description
1	315-101-700	2	Mount, Mast Pole
2	000-150-375	8	Bolt, Serrated Flange, 1/2"-13UNC x 1-1/4" Long
	000-150-376	8	Bolt, Serrated Flange, 1/2"-13UNC x 2" Long, used with Item 6
3	000-158-111	8	Nut, Serrated Flange, 1/2"-13UNC
4	001-001-053	4	Handle, Tee
5	001-001-146	2	Pole, Mast, Black, 1-3/4" Dia x 7' Long
6	316-001-733	2	Bracket, Sonic
7	316-001-700	2	Plate, End, Moldboard
8	000-150-256	6	Bolt, Carriage, 5/8"-11UNC x 1-1/2" Long
9	000-158-142	6	Nut, Serrated Flange, 5/8"-11UNC
10	316-001-723	1	Kit, Mirror, Includes Items 11 thru 16
11	316-001-727	1	Bracket, Tube, Bent, Mirror
12	001-001-077	2	Clamp Assembly, Mirror Bracket, Included Item 13
13	LP	4	Bolt, Hex Head, 1/4"-20UNC x 1-1/2" Long
14	001-001-179	2	Mirror, Safety, 8" x 12", W/12" Radius
15	000-155-032	2	Washer, Flat, 3/8" SAE
16	000-158-084	2	Nut, Hex, Nylon Lock, 3/8"-16UNC
17	000-190-221	1	Kit, Serrated Edges, GB-108, Includes 18, 22 & 23
18	000-190-226	3	Edge, Serrated, 36" Long
19	000-150-258	18	Bolt, Plow, 5/8"-11UNC x 1-3/4" Long
20	000-158-142	18	Nut, Serrated Flange, 5/8"-11UNC, **(128 ft-lbs)**
21	000-190-238	1	Kit, Serrated Edges, GB-96, Include, Includes 20 thru 23
22	000-190-216	2	Edge, Serrated, 36" Long
23	000-190-237	1	Edge, Serrated, 24" Long
24	000-150-258	16	Bolt, Plow, 5/8"-11UNC x 1-3/4" Long
25	000-158-142	16	Nut, Serrated Flange, 5/8"-11UNC, **(128 ft-lbs)**

AR - As Required NSS - Not Serviced Separately ASN - After Serial No. BSN - Before Serial No. LP - Local Purchase

Figure 2-14. Decals

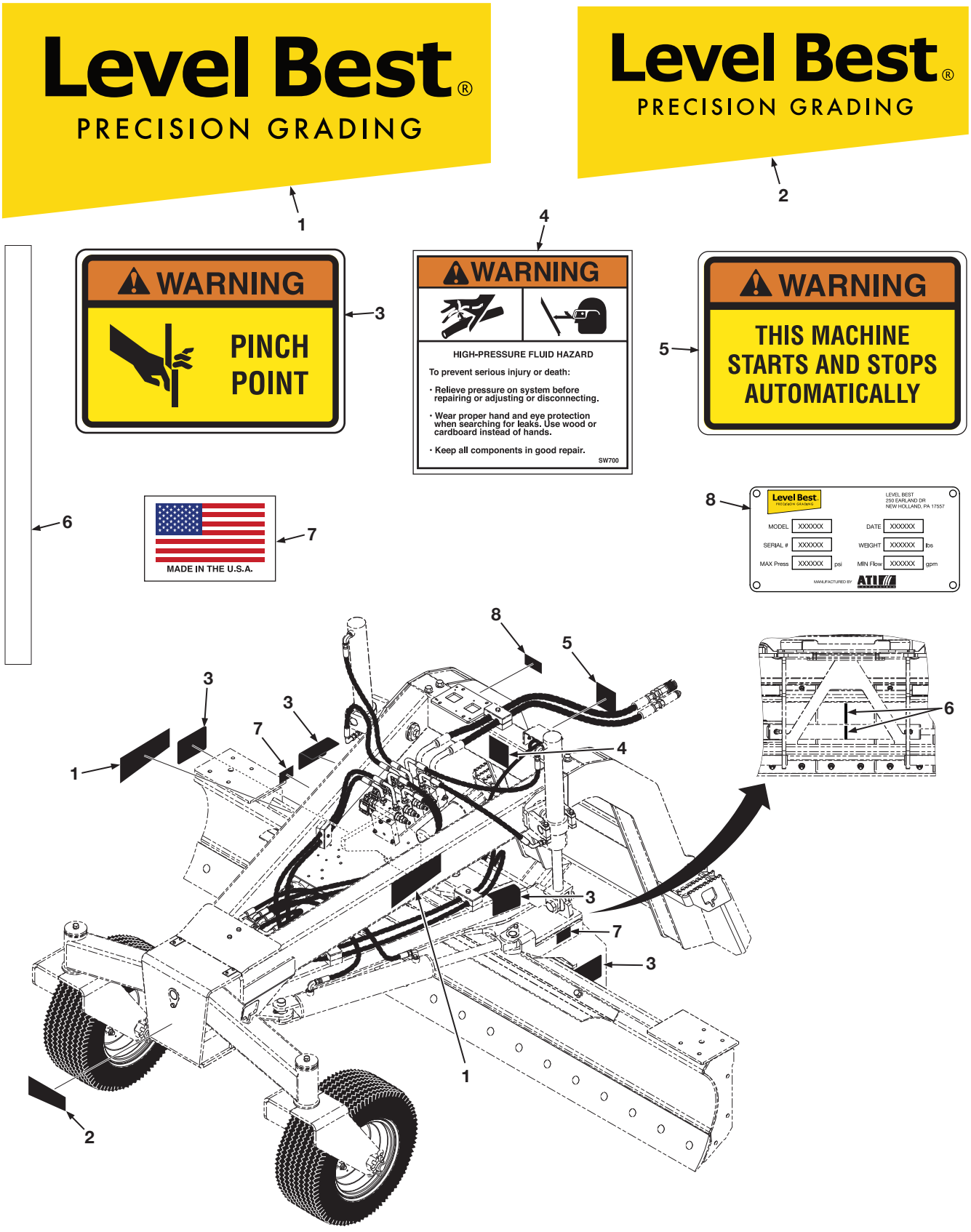


Figure 2-14. Decals

Item	Part No.	Qty	Description
1	000-186-101	2	Decal, Level Best Logo, Yellow, 10"
2	000-186-110	1	Decal, Level Best Logo, Yellow, 8"
3	000-186-055	4	Decal, Danger, Pinch Point
4	000-186-041	1	Decal, Warning, High-Pressure
5	000-186-094	2	Decal, Danger, This Machine Starts & Stops Automatically
6	000-186-112	2	Decal, Centering Blade, 1/2" x 8" Long
7	000-186-092	2	Decal, Made in U.S.A.
8	000-186-111	1	Plate, Model/Serial

Figure 2-15. Go! Box, Laser Receiver 360°, Cables - Trimble Earthworks Go!

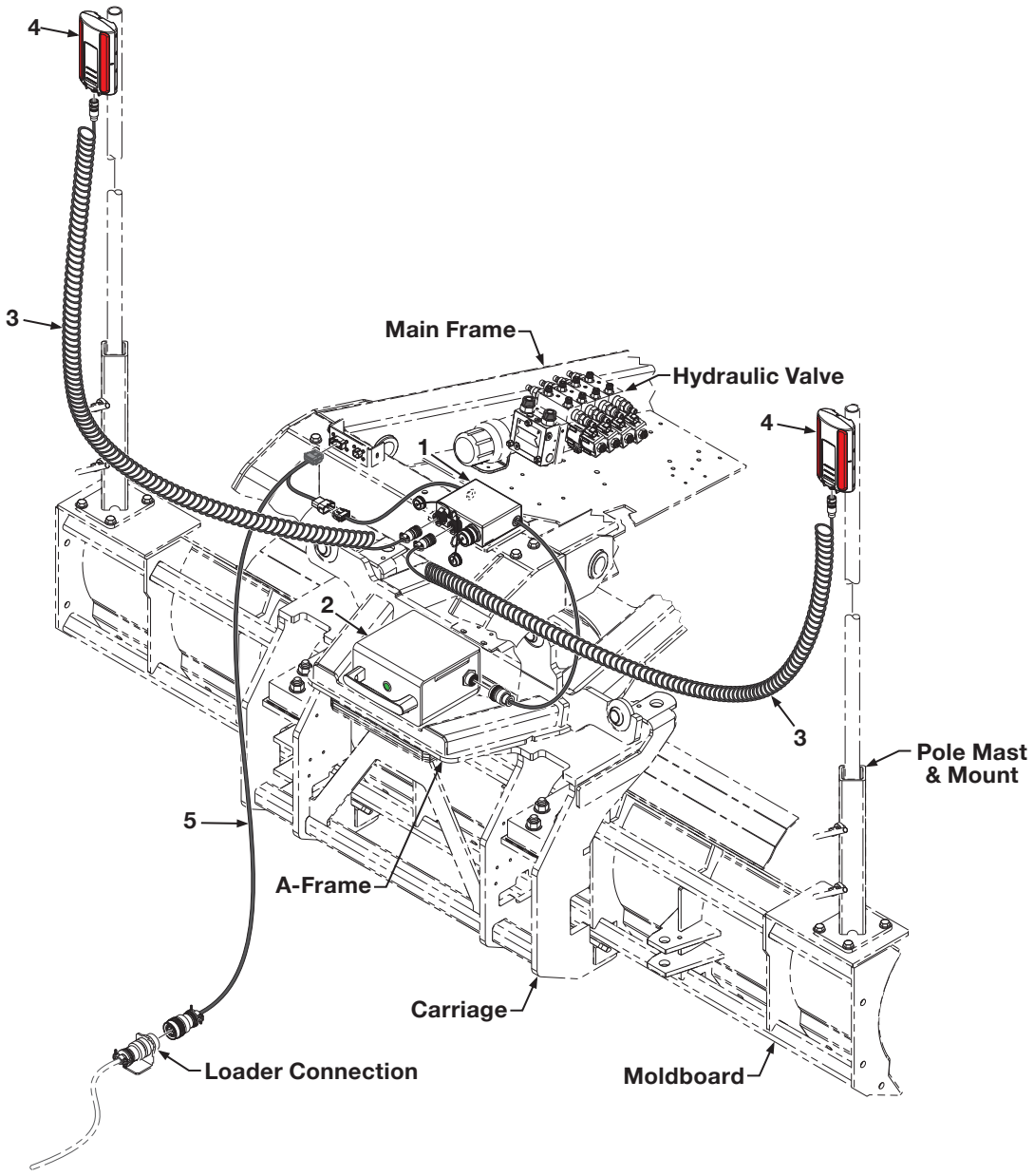
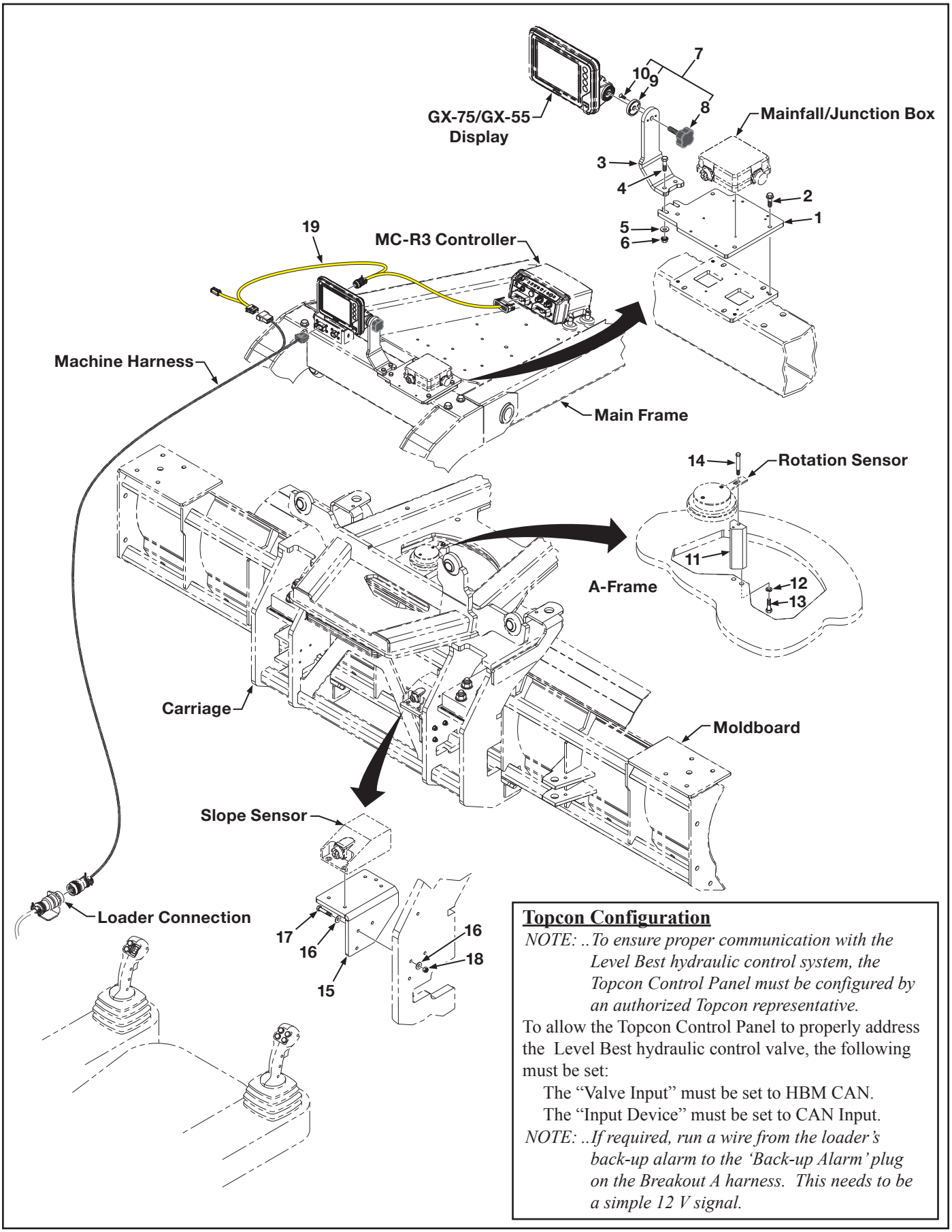


Figure 2-15. Go! Box, Laser Receiver 360°, Cables - Trimble Earthworks Go!

Item	Part No.	Qty	Description
1	000-200-506	1	Go! Box, Trimble Earthworks, Includes Item 2
2	000-200-504	1	Box, Junction & Harness
3	000-200-505	2	Cable, Receiver, Coiled
4	000-200-472	2	Receiver, Laser 360°, Trimble
5		1	Harness, Loader (Machine Specific) Refer to **page 1.6**

Figure 2-16. Topcon 3DMC W/Display on Attachment



Topcon Configuration

NOTE: ..To ensure proper communication with the Level Best hydraulic control system, the Topcon Control Panel must be configured by an authorized Topcon representative.

To allow the Topcon Control Panel to properly address the Level Best hydraulic control valve, the following must be set:

The "Valve Input" must be set to HBM CAN.

The "Input Device" must be set to CAN Input.

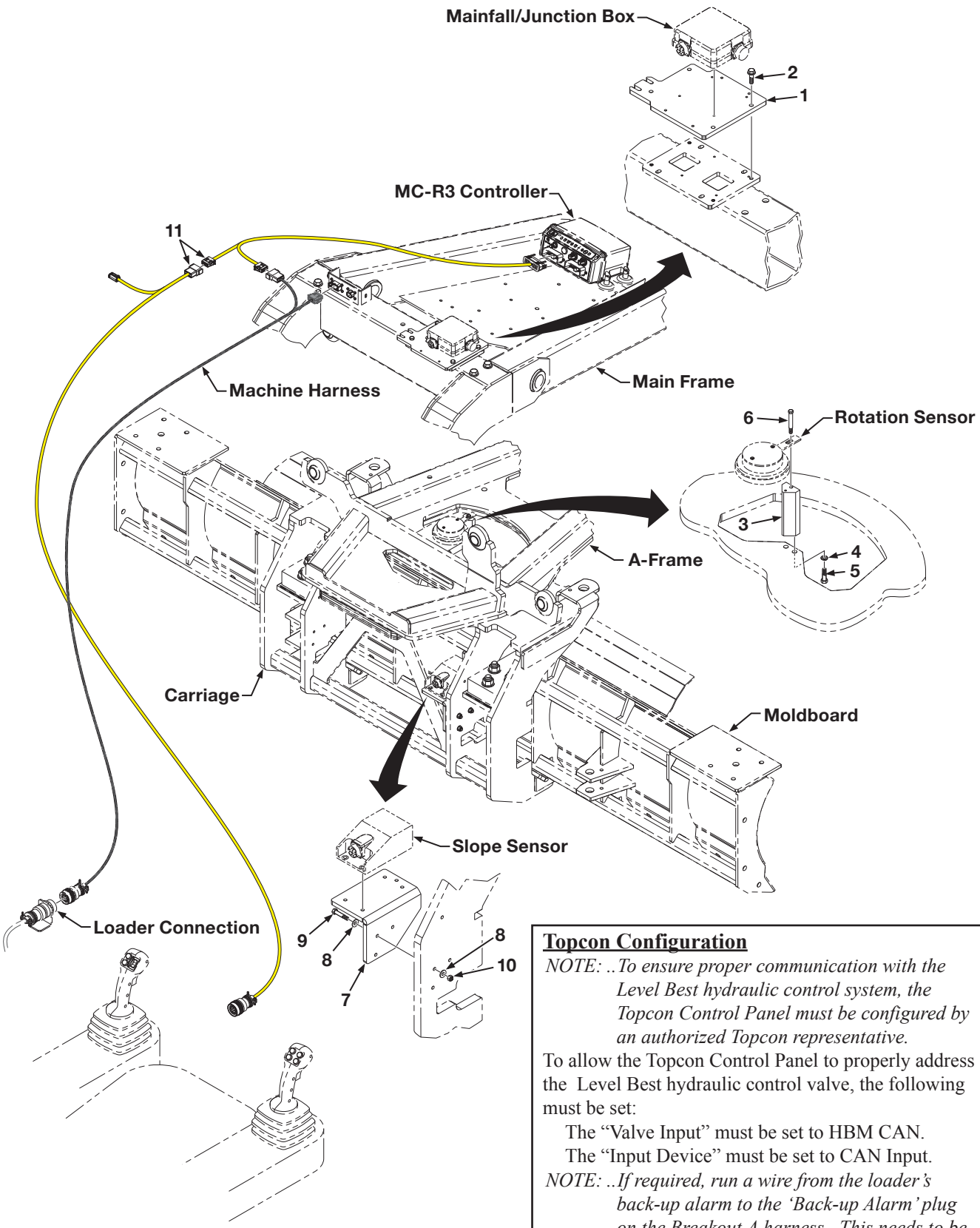
NOTE: ..If required, run a wire from the loader's back-up alarm to the 'Back-up Alarm' plug on the Breakout A harness. This needs to be a simple 12 V signal.

Figure 2-16. Topcon 3DMC W/Display on Attachment

Item	Part No.	Qty	Description
	000-201-288	1	Kit, Topcon 3DMC W/ Screen on Attachment, Includes Items 1 thru 19
1	316-001-710	1	Plate
2	000-150-409	4	Bolt, Flange, Gr. 10.9, M8-1.25 x 16mm
3	316-001-713	1	Bracket, Topcon, Screen Mount
4	000-150-082	2	Bolt, Hex Head, 5/16"-18UNC x 1-1/4" Long
5	000-155-030	2	Washer, Flat, 5/16" SAE
6	000-158-223	2	Nut, Serrated Flange, Nylon Lock, 5/16"-18UNC
7	001-001-162	1	Jaw, Mounting Bracket, Control Panel, Topcon, Includes Items 8 thru 10
8	NSS	1	Knob
9	NSS	1	Disc
10	NSS	2	Screw
11	001-001-072	1	Stand Off
12	000-155-034	2	Washer, Lock, 3/8"
13	000-150-131	2	Bolt, Hex Head, 3/8"-16UNC x 1-1/2" Long
14	000-150-405	1	Bolt, Shoulder, 3/8" Dia. x 2" Shoulder x 5/16"-18UNC
15	316-001-730	1	Bracket, Slope
16	000-155-020	6	Washer, Flat, 1/4"
17	000-150-053	3	Bolt, Hex Head, 1/4"-20UNC x 1-3/4" Long
18	000-158-050	3	Nut, Hex, Nylon Lock, 1/4"-20UNC
19	000-200-436	1	Harness, Breakout A, Topcon 3D-MC, 5' Long

AR - As Required NSS - Not Serviced Separately ASN - After Serial No. BSN - Before Serial No. LP - Local Purchase

Figure 2-17. Topcon 3DMC W/Display in Cab



Topcon Configuration

NOTE: ..To ensure proper communication with the Level Best hydraulic control system, the Topcon Control Panel must be configured by an authorized Topcon representative.

To allow the Topcon Control Panel to properly address the Level Best hydraulic control valve, the following must be set:

The "Valve Input" must be set to HBM CAN.

The "Input Device" must be set to CAN Input.

NOTE: ..If required, run a wire from the loader's back-up alarm to the 'Back-up Alarm' plug on the Breakout A harness. This needs to be a simple 12 V signal.

Figure 2-17. Topcon 3DMC W/Display in Cab

Item	Part No.	Qty	Description
	000-201-289	1	Kit, Topcon 3DMC W/ Screen on Cab, Includes Items 1 thru 11
1	316-001-710	1	Plate
2	000-150-409	4	Bolt, Flange, Gr. 10.9, M8-1.25 x 16mm
3	001-001-072	1	Stand Off
4	000-155-034	2	Washer, Lock, 3/8"
5	000-150-131	2	Bolt, Hex Head, 3/8"-16UNC x 1-1/2" Long
6	000-150-405	1	Bolt, Shoulder, 3/8" Dia. x 2" Shoulder x 5/16"-18UNC
7	316-001-730	1	Bracket, Slope
8	000-155-020	6	Washer, Flat, 1/4"
9	000-150-053	3	Bolt, Hex Head, 1/4"-20UNC x 1-3/4" Long
10	000-158-050	3	Nut, Hex, Nylon Lock, 1/4"-20UNC
11	000-200-522	1	Harness, Breakout A, Topcon 3D-MC, 40' Long

(for future use)

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