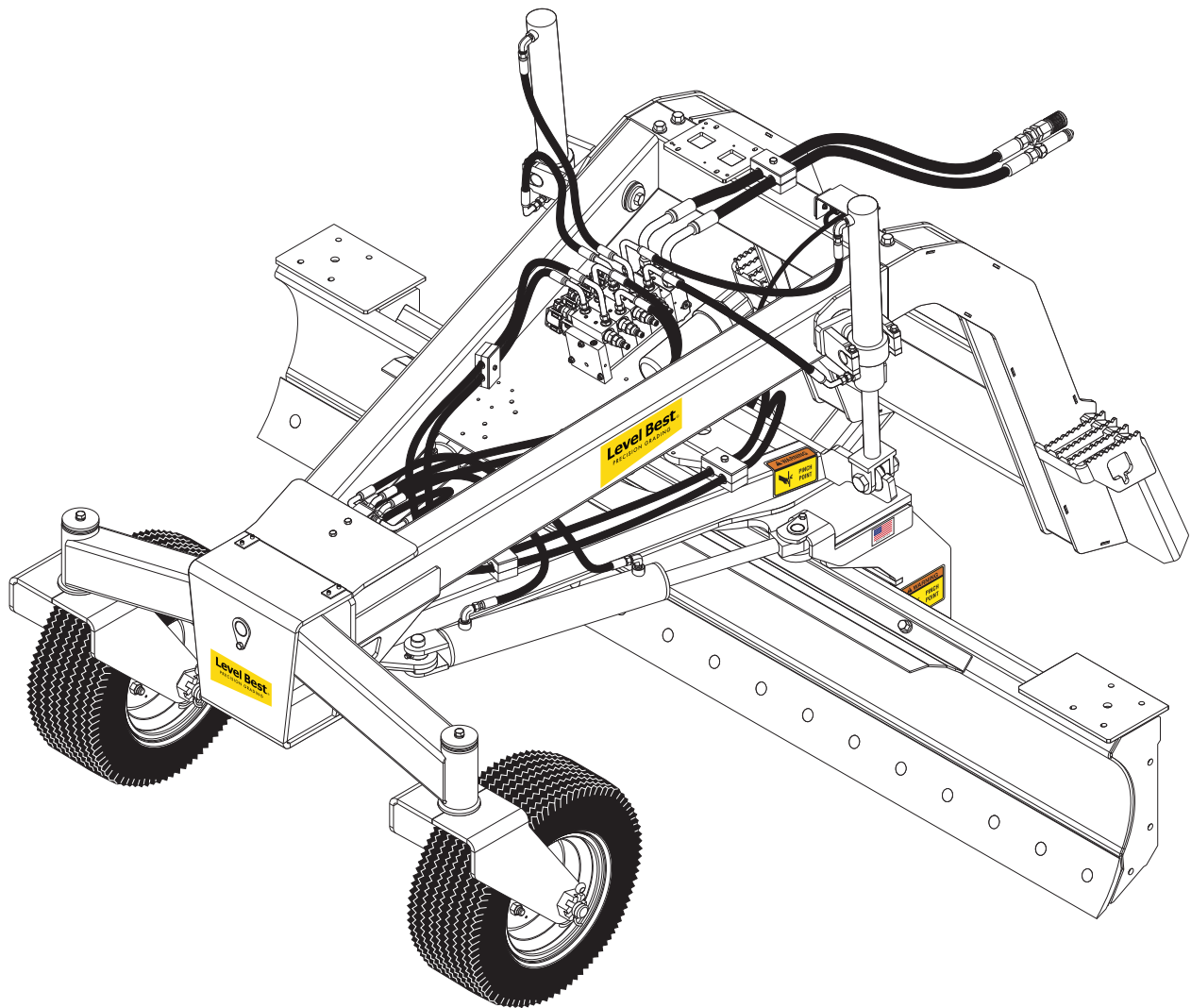


# OPERATORS & PARTS MANUAL

## LEVEL BEST GRADER BLADE ASN 4109



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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.

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## WARRANTY

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This Level Best Grading System is designed and manufactured to high standards. ATI Corporation, therefore, guarantees this Level Best product to be free from defect in workmanship and materials for three (3) years from purchase date. If the machine is to be used for rental purposes the warranty is limited to ninety (90) days.

Components supplied by outside vendors (e.g. cylinders, hydraulic valves and components, electronic modules, and machine control technology systems) are warranted separately by their respective manufacturers. The warranty periods of these components are generally one (1) year from date of purchase.

**Neither Level Best nor hydraulic component manufacturers will cover normal wear or failure due to hydraulic oil contamination from the power source. ALWAYS start with clean oil and filters prior to installation and operation.**

Misuse, abuse, misapplication, and unauthorized alterations will void this warranty.

**All warranty work must be performed by an authorized Level Best dealer and authorized by ATI Corporation. All Level Best parts suspected of failure must be returned to ATI Corporation for warranty analysis prior to any credit being issued.**

# SAFETY INFORMATION

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

Before attempting to operate the Grading Box, 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 Corporation 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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(for future use)

# SYSTEMS FEATURES AND BASIC OPERATION

## PURPOSE

The Level Best Grader Blade (GB-108) 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 108

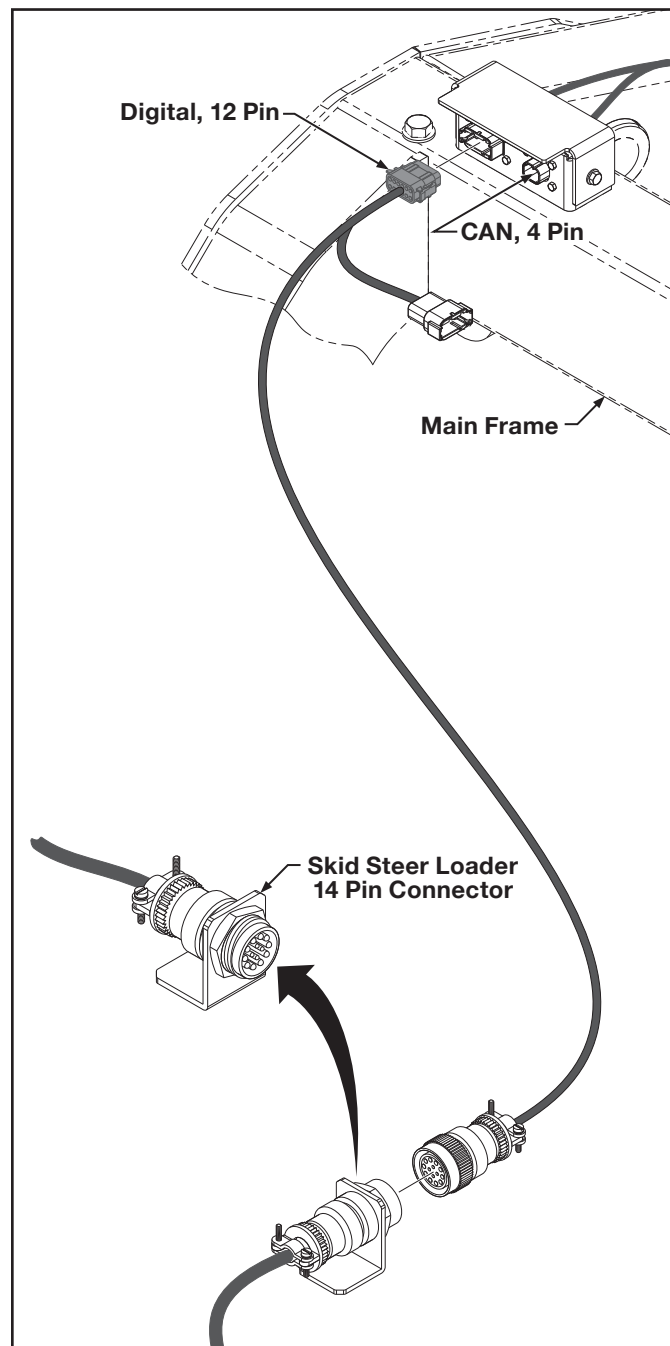


Figure 1-1. Harness Connections

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](#).)

# SYSTEMS FEATURES AND BASIC OPERATION

## 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.*

### **⚠ 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.*

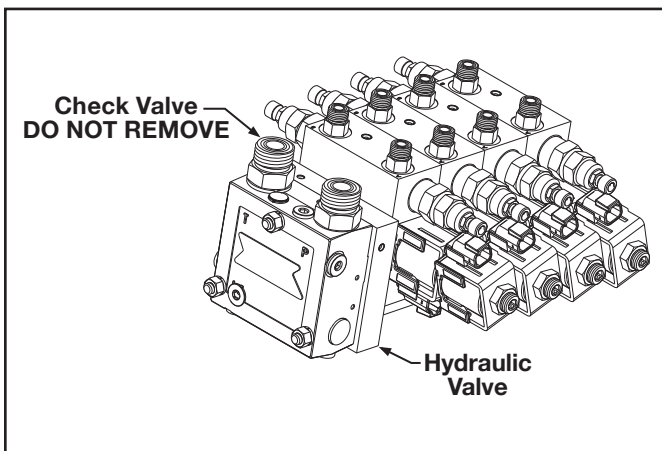


Figure 1-2. Hydraulic Valve (Danfoss MVB10).

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

### Hydraulic Hose Connections

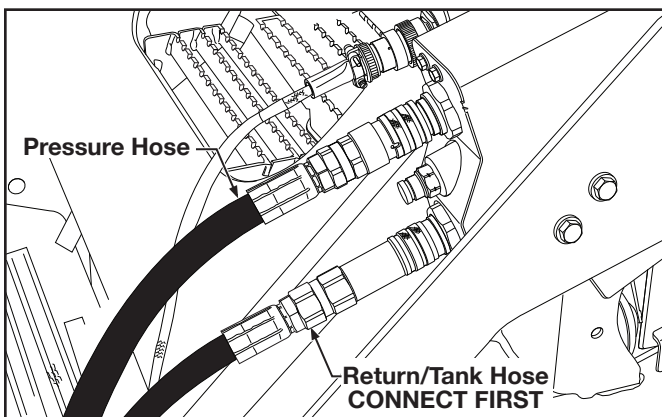


Figure 1-3. Hydraulic Hose Connections to Skid Steer



## LEVEL BEST HMR (OPTIONAL)

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 1-4](#).

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.

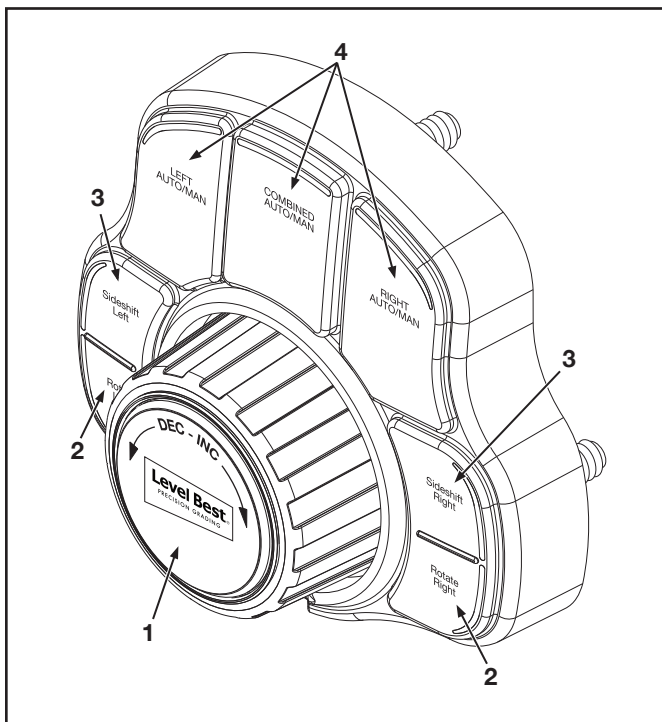


Figure 1-4. HMR Controls

## Increment/decrement Controls

1. Rotating the knob to the right (CW) increments, 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. Backlighting will change from red to green when pressed.

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 Level Best Joystick.
4. The three auto manual buttons have back lighting. Green means automatics are engaged and Red means the machine is running in manual

## LEVEL BEST JOYSTICK (OPTIONAL)

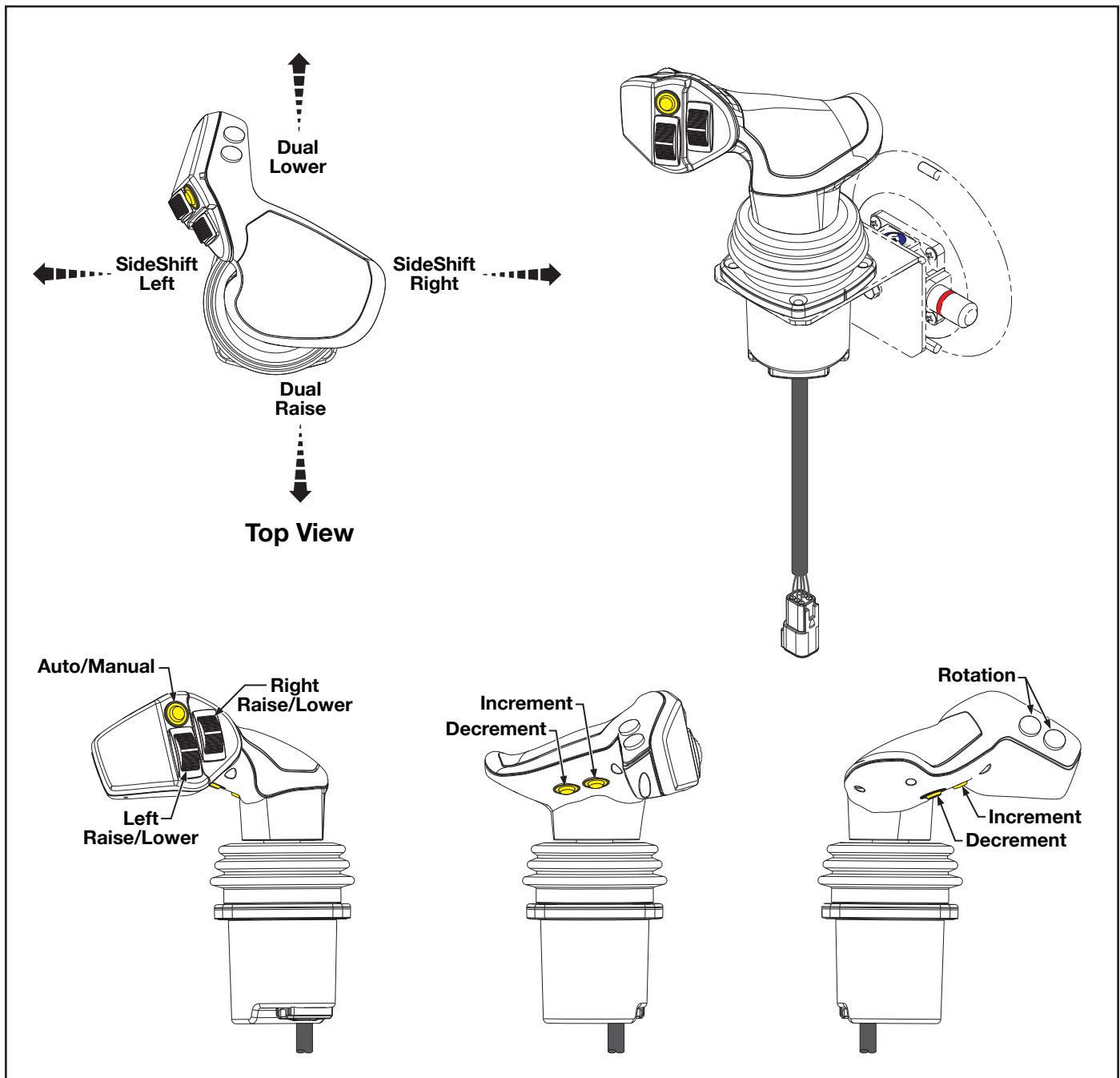


Figure 1-5. Joystick Assembly

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.

# SYSTEMS FEATURES AND BASIC OPERATION

## 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](http://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.



**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.



**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.

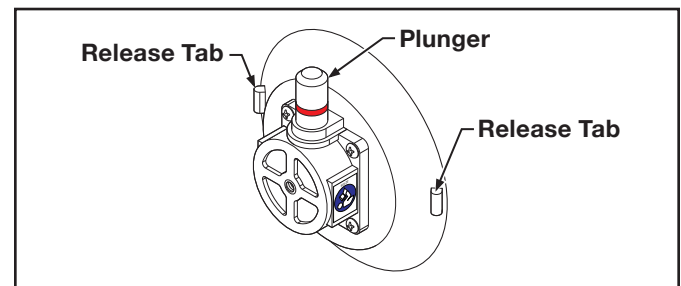


Figure 1-6. Vacuum Cup

# SYSTEMS FEATURES AND BASIC OPERATION

## LOADER JOYSTICK FUNCTIONS

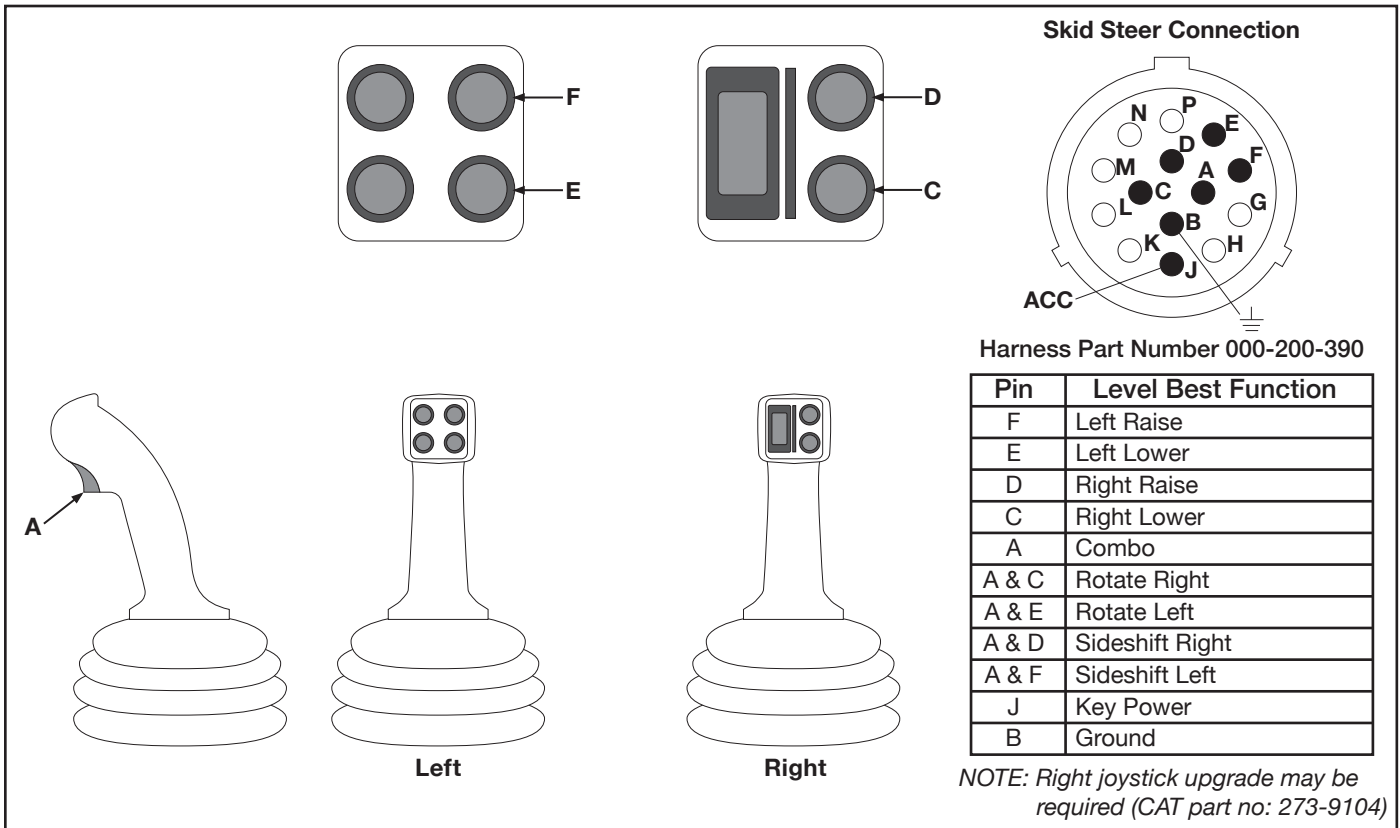


Figure 1-7. Cat D-Series Joystick Functions

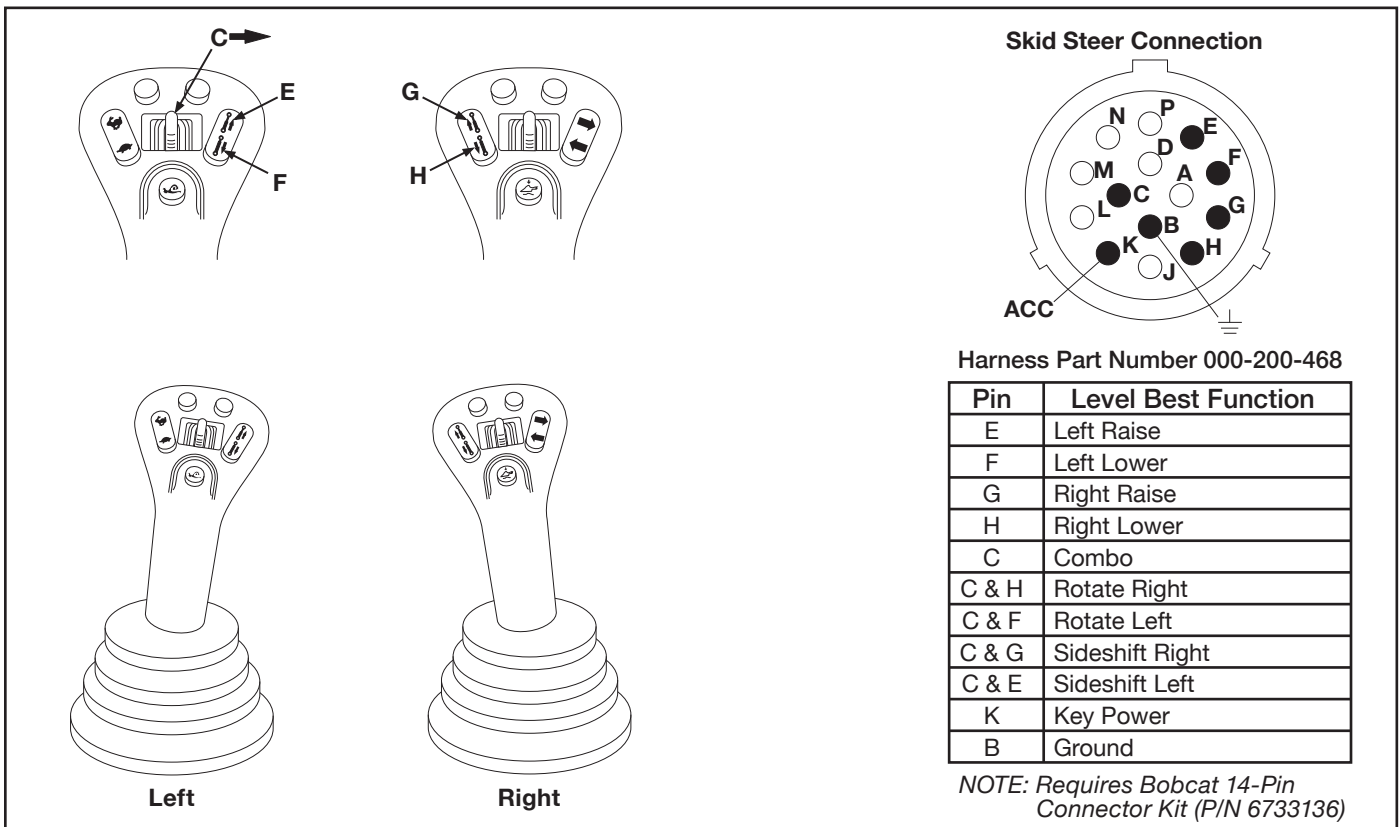


Figure 1-8. Bobcat Joystick Functions

# SYSTEMS FEATURES AND BASIC OPERATION

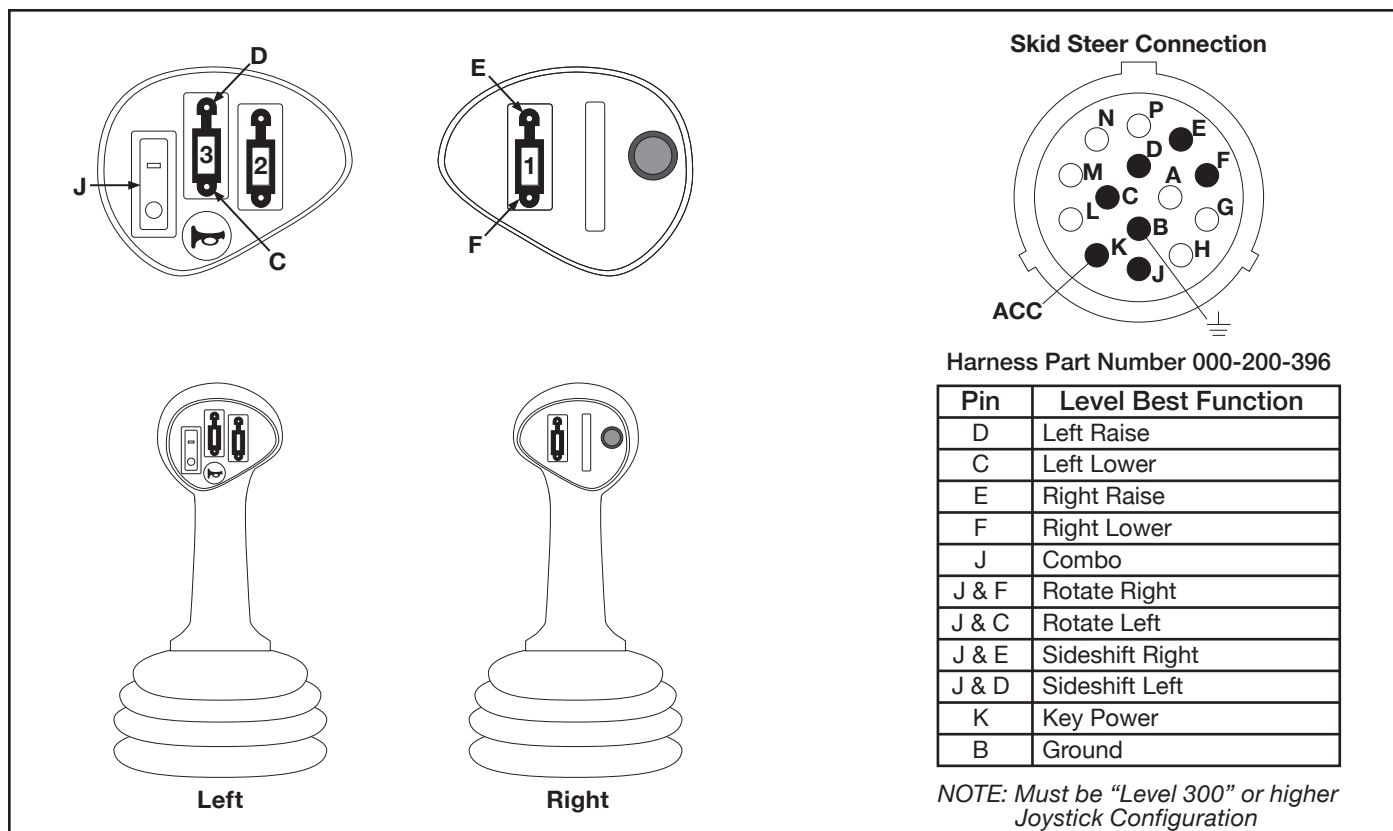


Figure 1-9. Case Joystick Functions

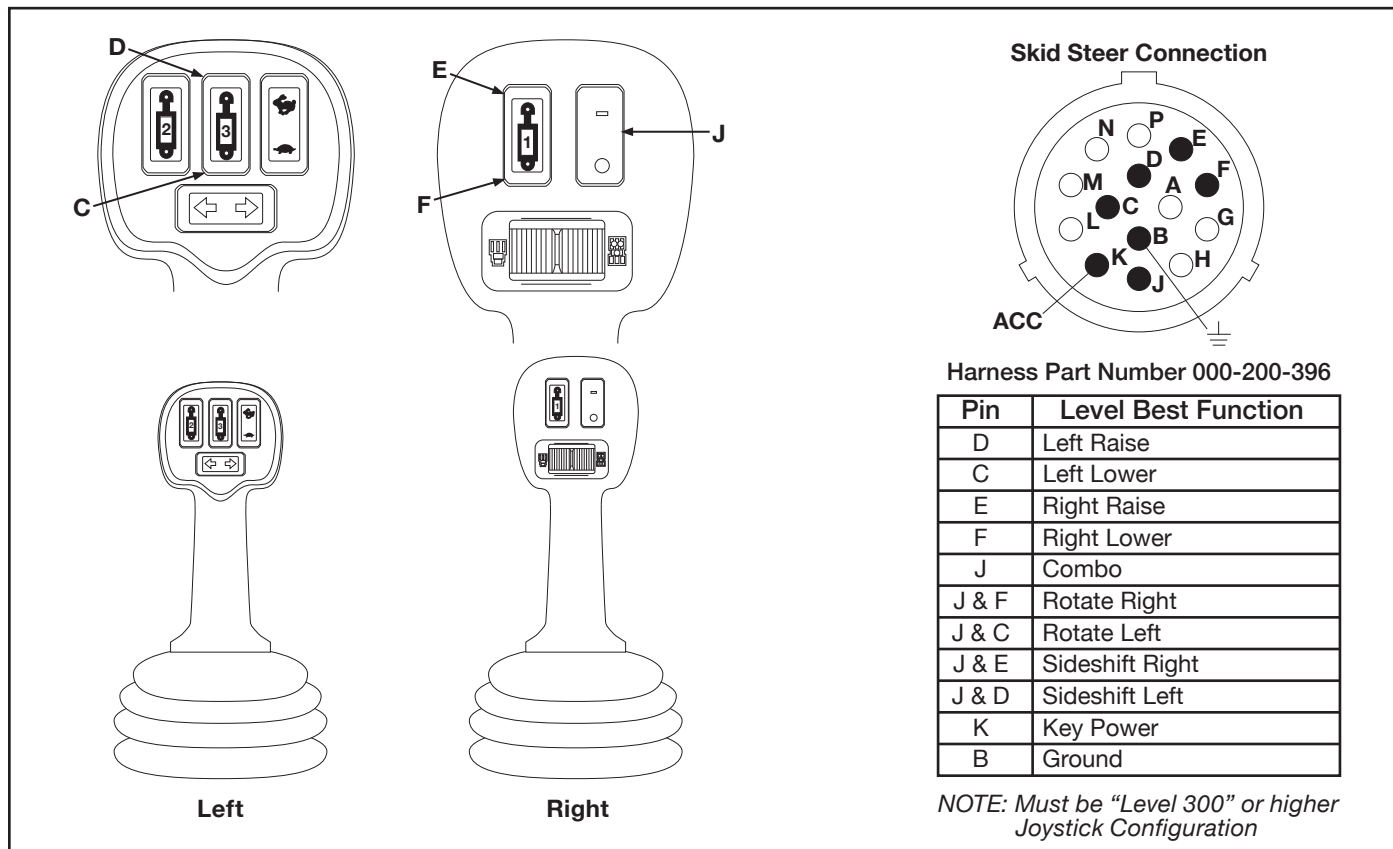


Figure 1-10. New Holland Joystick Functions

# SYSTEMS FEATURES AND BASIC OPERATION

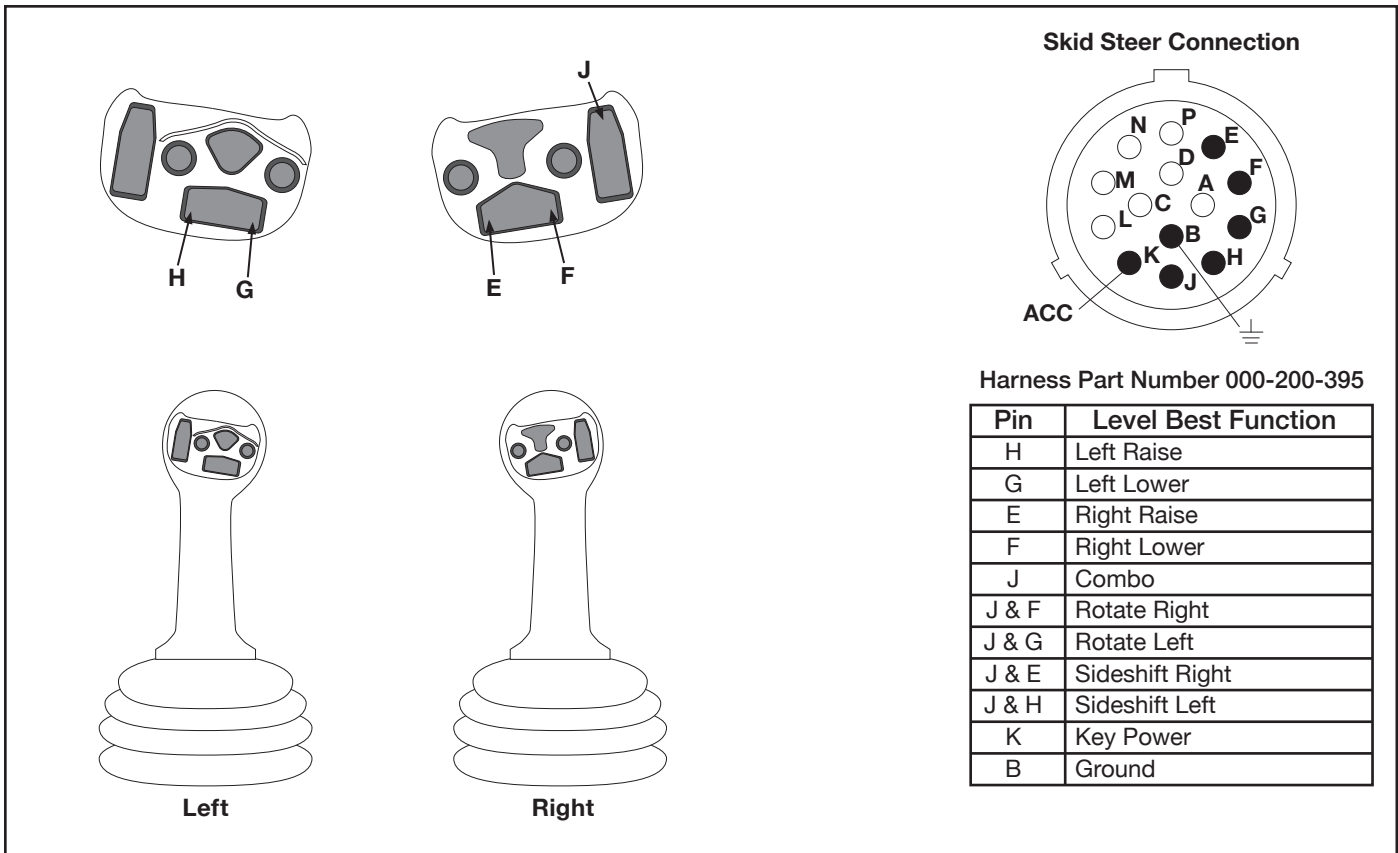


Figure 1-11. Kubota SSV65 & 75 Joystick Functions

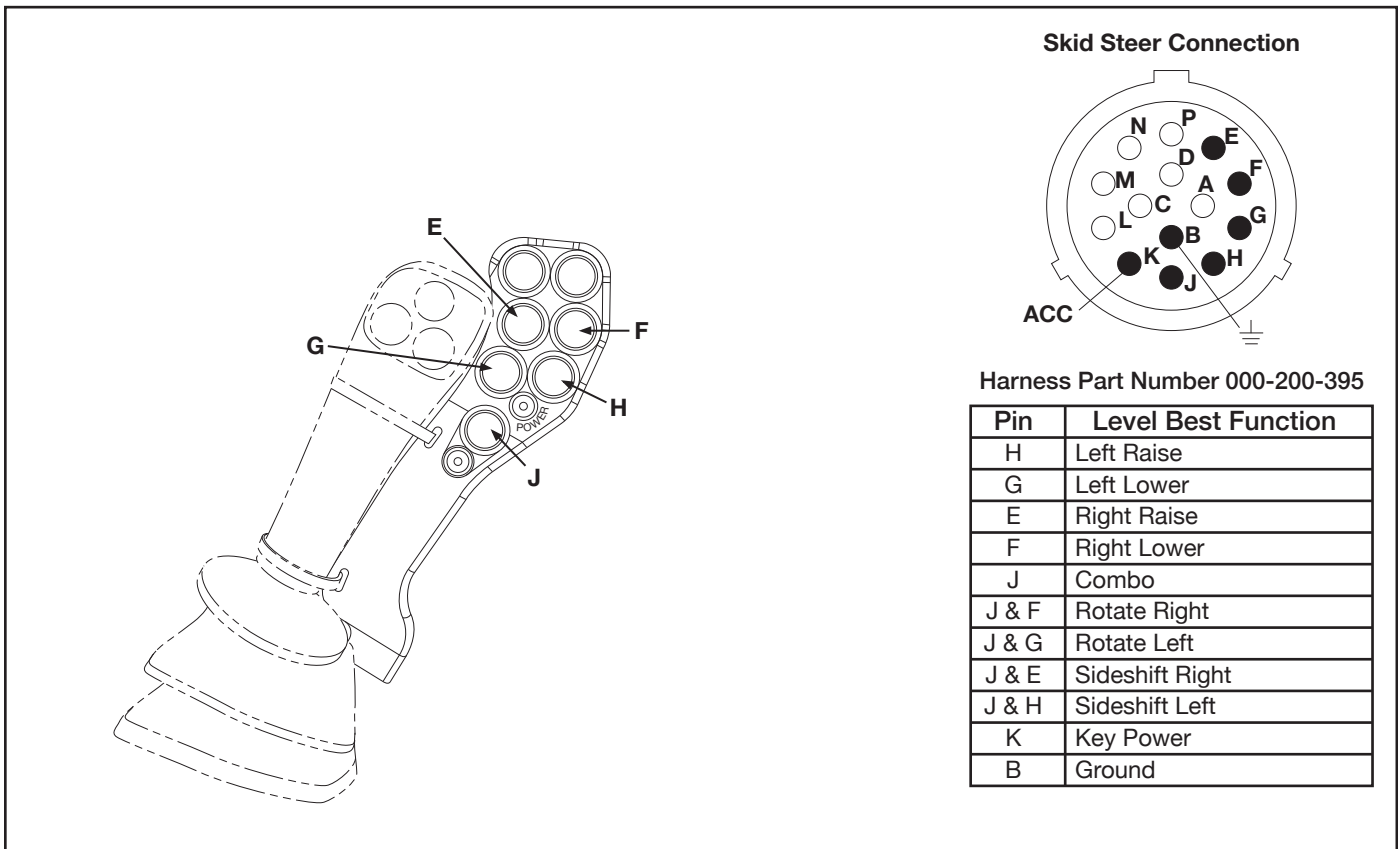


Figure 1-12. Kubota SVL 95 S6699 Multifunction Controller Kit

# SYSTEMS FEATURES AND BASIC OPERATION

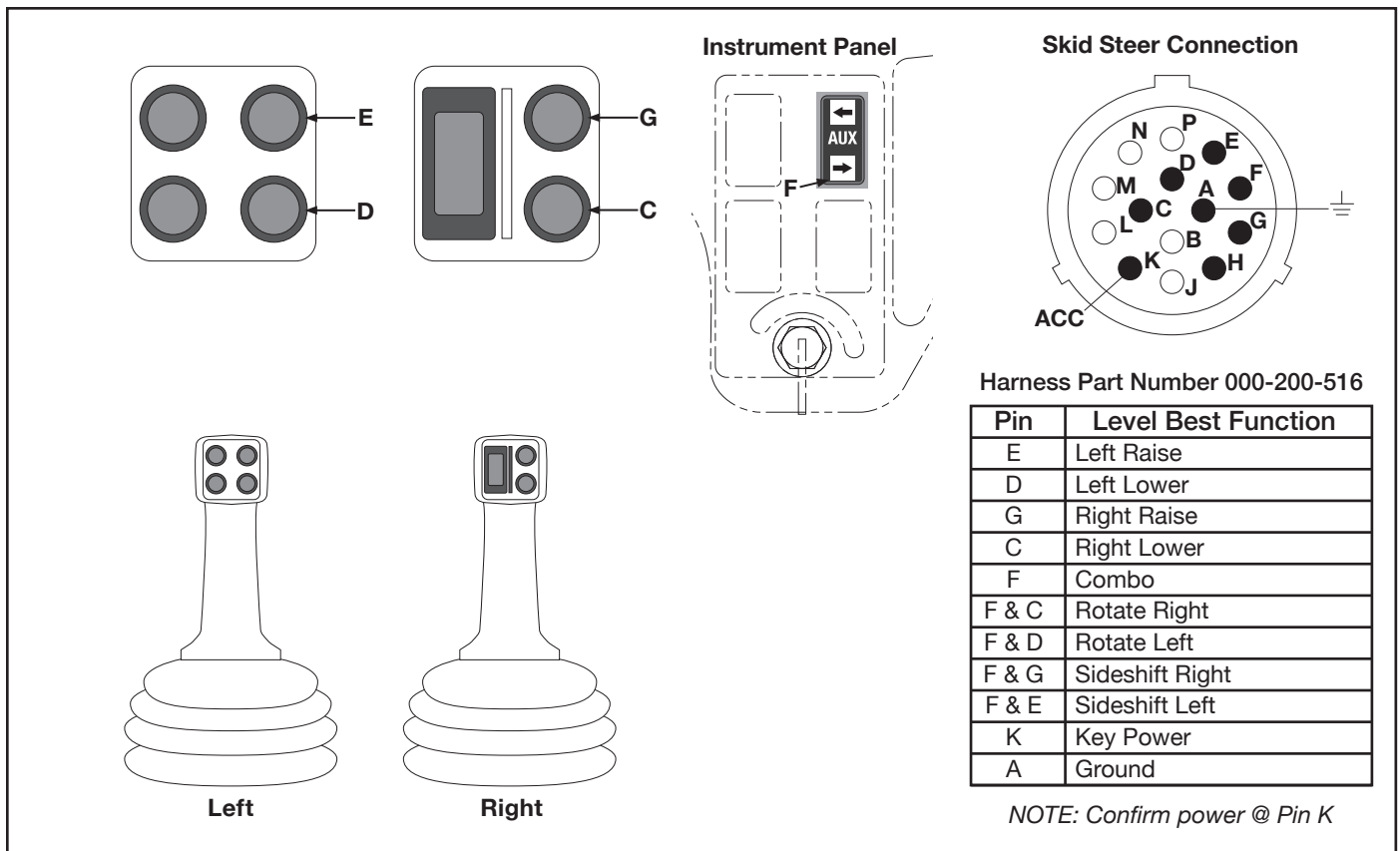


Figure 1-13. John Deere G-Series Joystick Functions

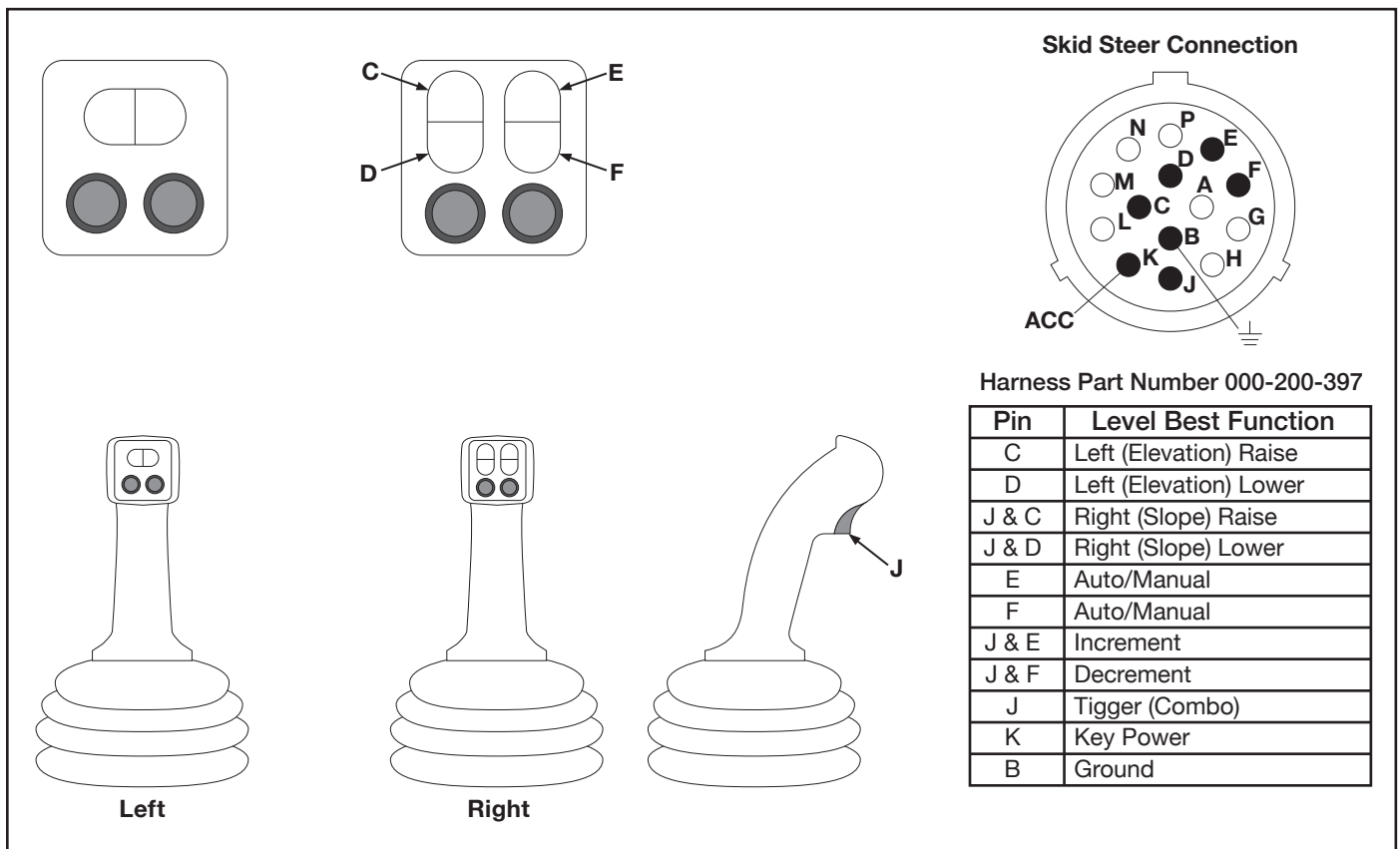


Figure 1-14. Takeuchi Joystick Functions



# SYSTEMS FEATURES AND BASIC OPERATION

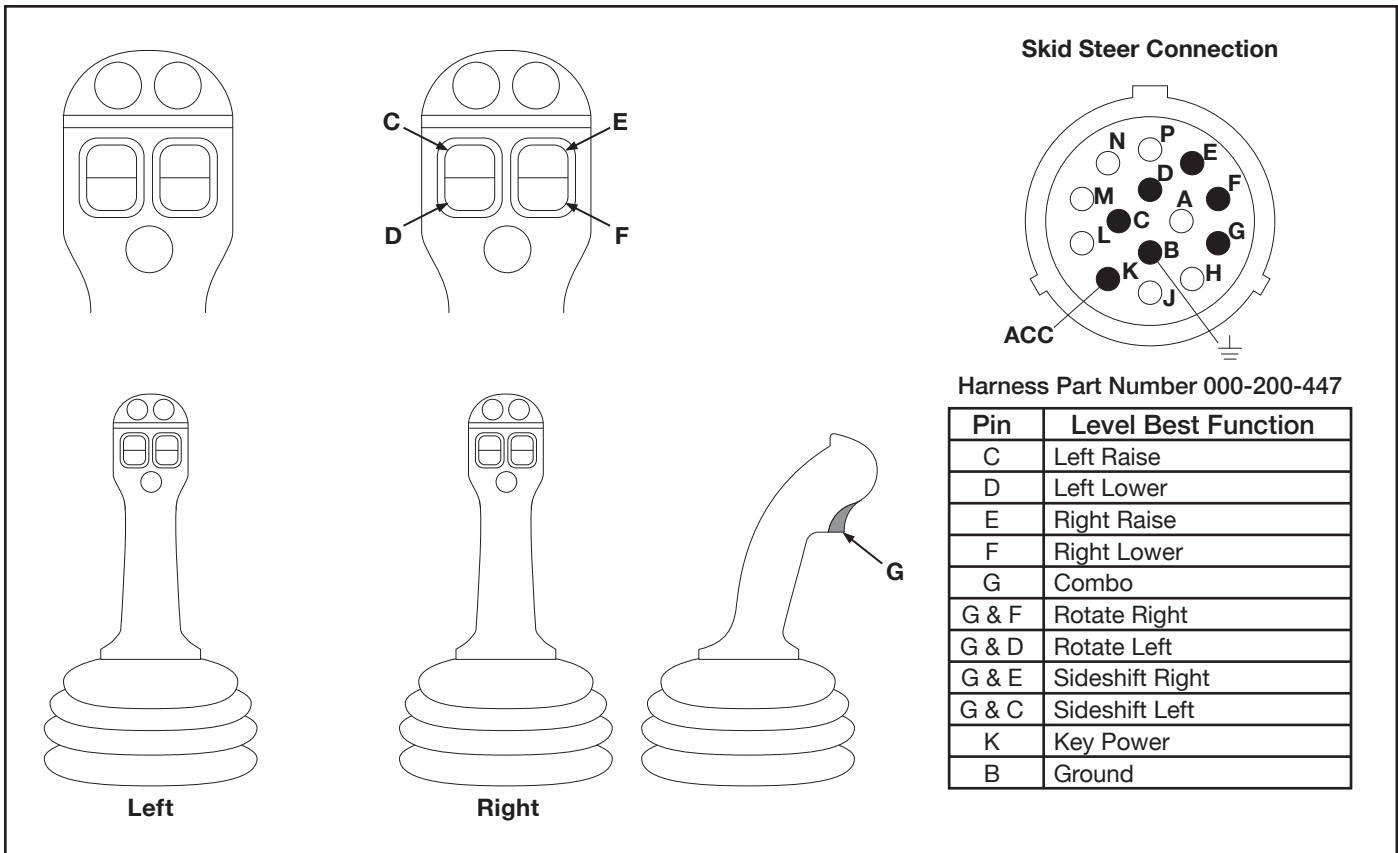


Figure 1-15. JCB/Volvo Joystick Functions

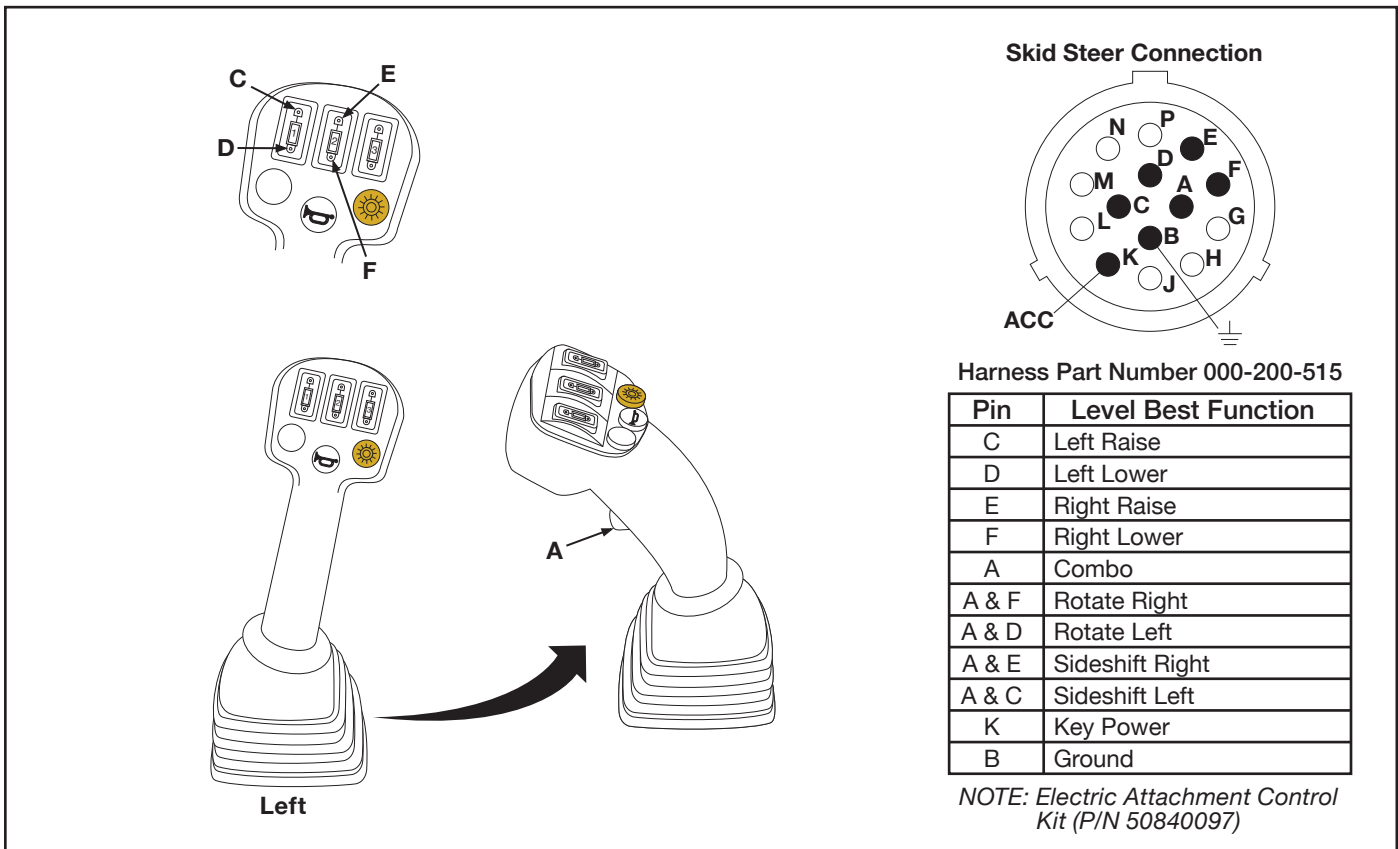


Figure 1-16. Mustang/Gehl Joystick Functions



# SYSTEMS FEATURES AND BASIC OPERATION

## 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.

*NOTE: Red wire is positive and black is negative.*

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 and the bucket cylinders set 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 1-3.)*

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: If using Laser Guidance, proceed to next steps.*

4. If applicable insert the two Mast Poles in the holders, one on the left and one on the right side, until they rest at the bottom of the tube. Tighten the tee handles to secure the masts. Clamp a Laser Receiver near the top

of each mast so it is higher than any local obstructions including the loader cab or fall protection devices.

*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.*

## 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.**

## BENCHING AND OPERATING

Before benching, the plane of laser light must be set at its proper slope. Benching is the process of setting the relationship between the Laser Receiver and the Rotating Laser or benchmark. Failure to properly bench the system before grading will result in an unacceptable grade.

The goal is to have the Grader Blade approximately 1/2 full during operation. If, during rough grading, a lot of material needs to be removed from a site, the elevation offset feature can be used to rough-in the grade. As material is removed, the elevation offset can be reduced and the site regraded. This may need to be repeated several times until finished grade is achieved.

### Benching

*NOTE: Finish grade can be checked several times during the grade process to "zero" in on final grade.*

1. Turn the system on using the Power switch.
2. Ensure the system is in manual control and dual elevation mode (default).
3. Turn the Rotating Laser ON and set to 0.0% slope.

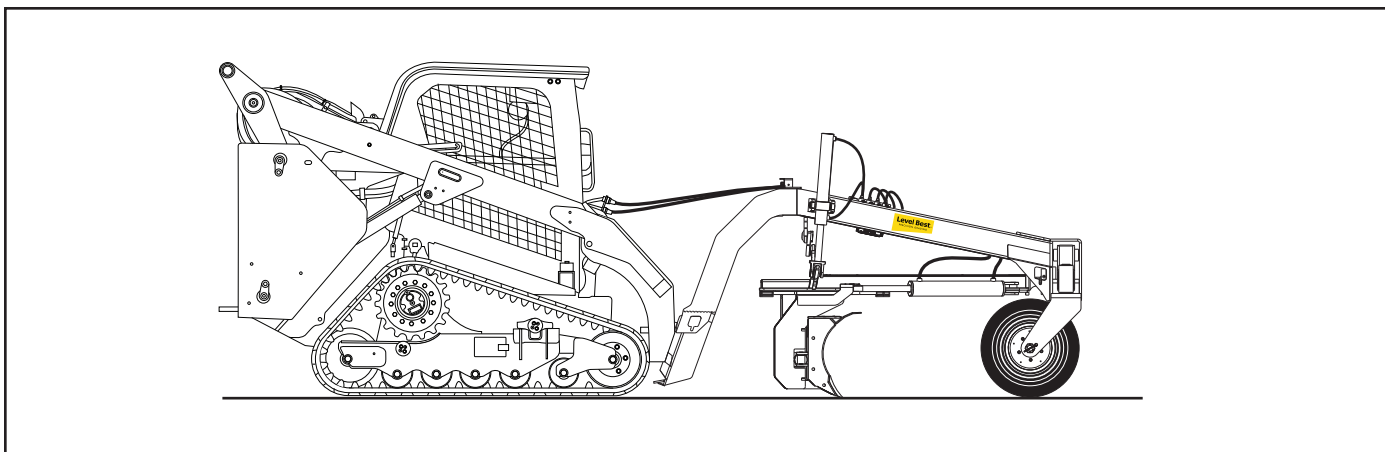


Figure 1-17. GB-108 on a Loader.

4. Move the machine to an area to be graded. Using the system controls, lower the cutting edge to finished grade. This is normally done close to the Rotating Laser.

*NOTE: If necessary, a small area may need to be manually graded to obtain sufficient space for benching.*

5. Use a bubble level to level the Grader Blade. Re-check the cutting edge to ensure it remains at the finished grade.
6. Select an appropriate deadband for the job and conditions.
7. Adjust the height of each Laser Receiver until the appropriate center Grade Position LED cluster is lit, indicating it is “on grade.” Tighten the mounting knobs on each Laser Receiver securely after adjustment.

For grading to level, skip to step 14. For grading on a slope, continue from step 11.

8. For sloped grades, the Rotating Beacon can now be adjusted to the proper slope.
9. With the Grader Blade remaining at finished grade, raise or lower the Rotating Beacon on the tripod until the Laser Receiver on the center mast indicates the Elevation is “on grade.”

## **WARNING**

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

10. Both elevations should now indicate 0.0. Slope offset and other adjustments for rough grading can be made and grading can begin.
11. After grading a small area, check the grade using a grade rod. If required, adjust the Grader Blade using this procedure.

*NOTE: Most materials graded must later be compacted. To compensate for the compacting distance, raise the Rotating Beacon. This raises the cutting edge by the same distance. The distance the Rotating Beacon is raised depends on the material.*

## **Benching with a Rod Eye**

To bench the Laser Receiver follow the process listed below:

1. Turn on the Rotating Beacon. Attach a Rod Eye to a measuring pole and turn on. Set the base of the measuring pole on the benchmark and adjust the measuring pole so the Rod Eye emits a solid “On Grade” tone (compensate for slab thickness and compaction if needed).
2. Find an area to be graded that is close to specified grade. Making sure the control system is in manual mode, start the loader, engage the auxiliary hydraulics and move the unit to that location. Manually raise or lower the Grader Blade’s cutting edge until it is even with the bottom of the measuring pole when the Rod Eye is emitting the “On Grade” tone or resting on the ground if already at grade.

## SYSTEMS FEATURES AND BASIC OPERATION

*NOTE: The elevation measurement must be made as close to the Laser Receiver as possible, i.e., in the middle or on the right-side.*

3. With the control system deadband set as required for the job, move the Laser Receiver to a height on the mast pole where it indicates the beam in the “On Grade” position and is unobstructed by any object.

*NOTE: Operator may prefer to turn the face of the Laser Receiver towards the operator for easy viewing.*

4. Move the Rod Eye to the right side of the blade. Using the tilt function (right-side joystick), manually raise or lower the Grader Blade’s cutting edge until it is even with the bottom of the measuring pole while the Rod Eye is emitting the “On Grade” tone or resting on the ground if already on grade. Repeat step 3.

### Operation

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

The operational goal is to drive over the area to be graded with the box 1/2 full of material and the green LEDs on the grade indicators always illuminated.

1. When seated in the Operator’s seat, start the loader. Turn the control system on and set the system to automatic control. For initial or rough-cut situations, use a higher deadband setting.

*NOTE: Most materials graded must later be compacted. To compensate for the compacting distance, raise the Rotating Beacon. This raises the cutting edge by the same distance. The distance the Rotating Beacon is raised depends on the material.*

2. Drive the machine forward. The Automatic Control System constantly senses the plane of laser light to maintain the cutting edge of the box at the required elevation.

*NOTE: The following during operation:*

- 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.
- If one of the Control Panel or Laser Receiver grade lights are blinking, it indicates the direction of the last elevation prior to passing out of the laser beam. If necessary, do the rough grading and then bench the Grader Blade again.

*NOTE: In rough grading situations, use the Automatic Control System as an “Indicate Only” system and operate the machine under manual control. After the area has been rough graded, switch to automatic control.*

### 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 Deadband (Accuracy) may be changed to a narrower setting as required to meet the job tolerance requirements. With a tighter deadband, the speed of the loader needs to be decreased for optimum finish.

# TROUBLESHOOTING

| 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.<br>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.<br>Ensure auxiliary hydraulics are ON or in continuous flow mode.   |
|  | Cables not connected correctly.               | Check Valve cable, valve and valve solenoids for visible damage.   |
|  |   | <div style="background-color: orange; text-align: center; padding: 5px;"><b>⚠ WARNING</b></div> <p><b>Be sure to stay clear of any moving parts of the Grader Blade.</b></p> <p>If the Grader Blade moves, refer to Electrical problems. If the Grader Blade does not move, refer to Hydraulic problems.</p> <p>Check Valve cable, valve and valve solenoids for visible damage.</p> <p>Use an Ohm meter to check cable for continuity.</p> <p>Confirm hydraulic flow through the manifold and returning to the power source through the "T" hose.</p> <p>Contact ATI Corporation for help troubleshooting the hydraulic manifold.</p> |
|  | Electrical Problems                           |  |
|  | Hydraulic Problems                            |  |

# SPECIFICATIONS AND MAINTENANCE

## SPECIFICATIONS

### GB-108 Specifications

|   |   |
|---|---|
| Operating Weight                              | 2,620 lbs. (1,188kg)                              |
| Width   | 108.0" (2.74m)                                    |
| Width Fully Angled                            | 97.5" (2.48m)                                     |
| Length  | 99.9" (2.54m)                                     |
| Height  | 60.0" (1.52m)                                     |
| Blade Height                                  | 16.9" (0.43m)                                     |
| Maximum Blade Lift                            | 7.3" (0.19m)                                      |
| Maximum Blade Cut                             | 7.7" (0.20m)                                      |
| Hydraulic Blade Side Shift<br>(Left or Right) | +/-13" (+/- 0.33m)                                |
| Moldboard Angle (Left or Right)               | +/- 30°   |
| Cutting Edge Size                             | 5/8" x 6" Bolt-on, Reversible Double-Bevel Curved |

### GB-108 Hydraulic Valve

|                            |                      |
|----------------------------|----------------------|
| Valve Type                 | 4-Spool Proportional |
| Minimal Flow Rate          | 12 GPM (45.4 LPM)    |
| Maximum Flow Rate          | 28 GPM (106 LPM)     |
| Maximum Hydraulic Pressure | 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 GB-108 attachment. Always ensure that your attachment is properly secured via the DOT protocols of your area.

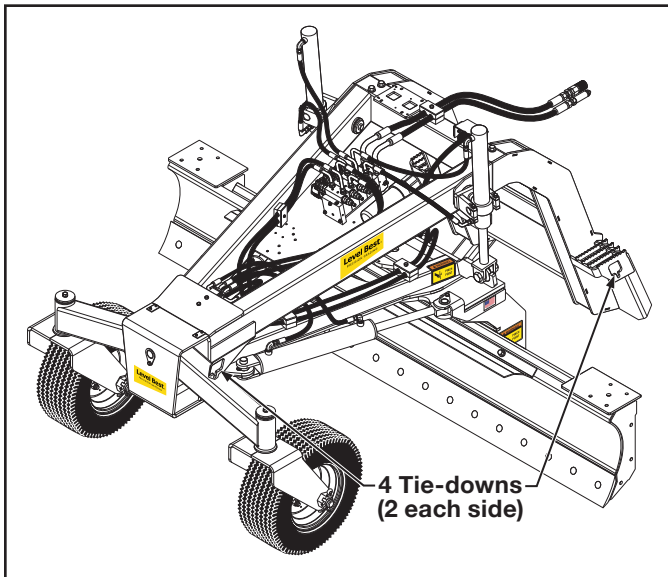


Figure 1-18. GB-108 Tie-Downs

### 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 1-19](#)). 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.



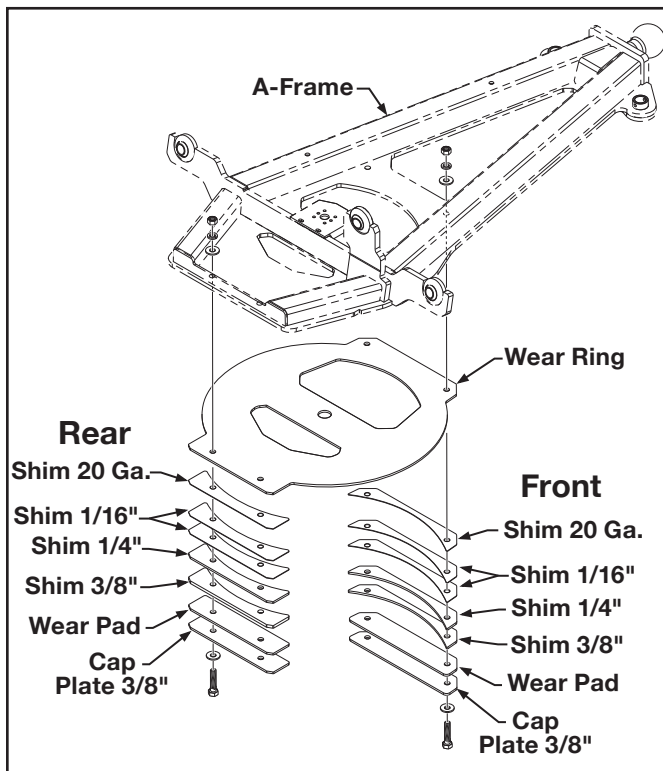


Figure 1-19. Wear Ring, Shims and Wear Pads.

## 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

If all shims have been removed (**do not discard**) and/or the rails look to be touching the metal portion of the clasps, then it is time to replace the pads and add the shims back on.

### How to Adjust Shims / Replace 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 and replace the clasp and wear pads, making sure the pads are seating in the pockets machined into the clasps. Use a dab of grease on the back of the wear pad to hold it onto the clasp until install is complete. Once the first side is complete and tightened, repeat the process on the opposite side. Only the top clasps contain shims, but there are wear pads on all top and bottom clasps.

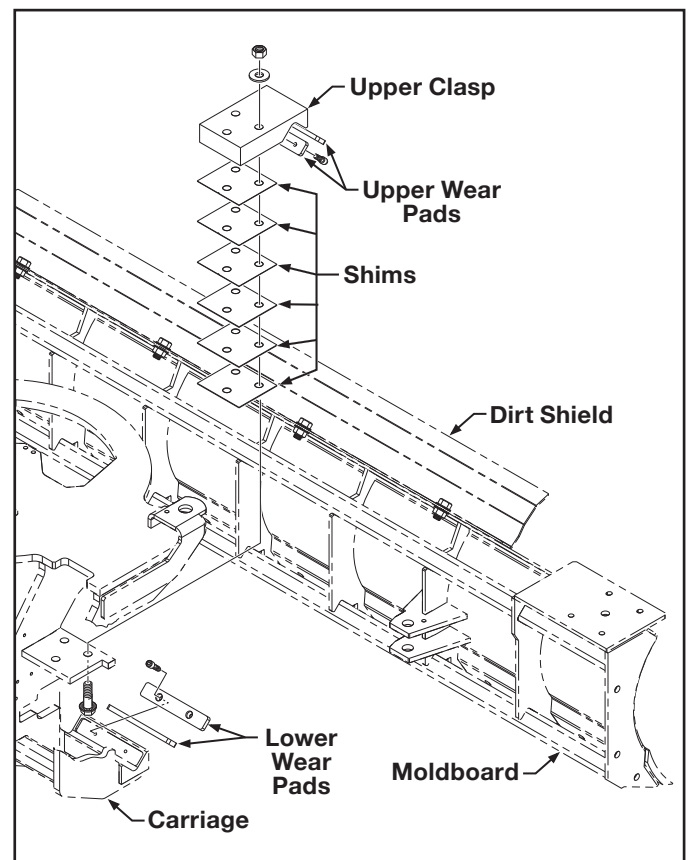


Figure 1-20. Wear Pad Maintenance

### 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 tear-down 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 tear-down 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. Lube and Maintenance.*



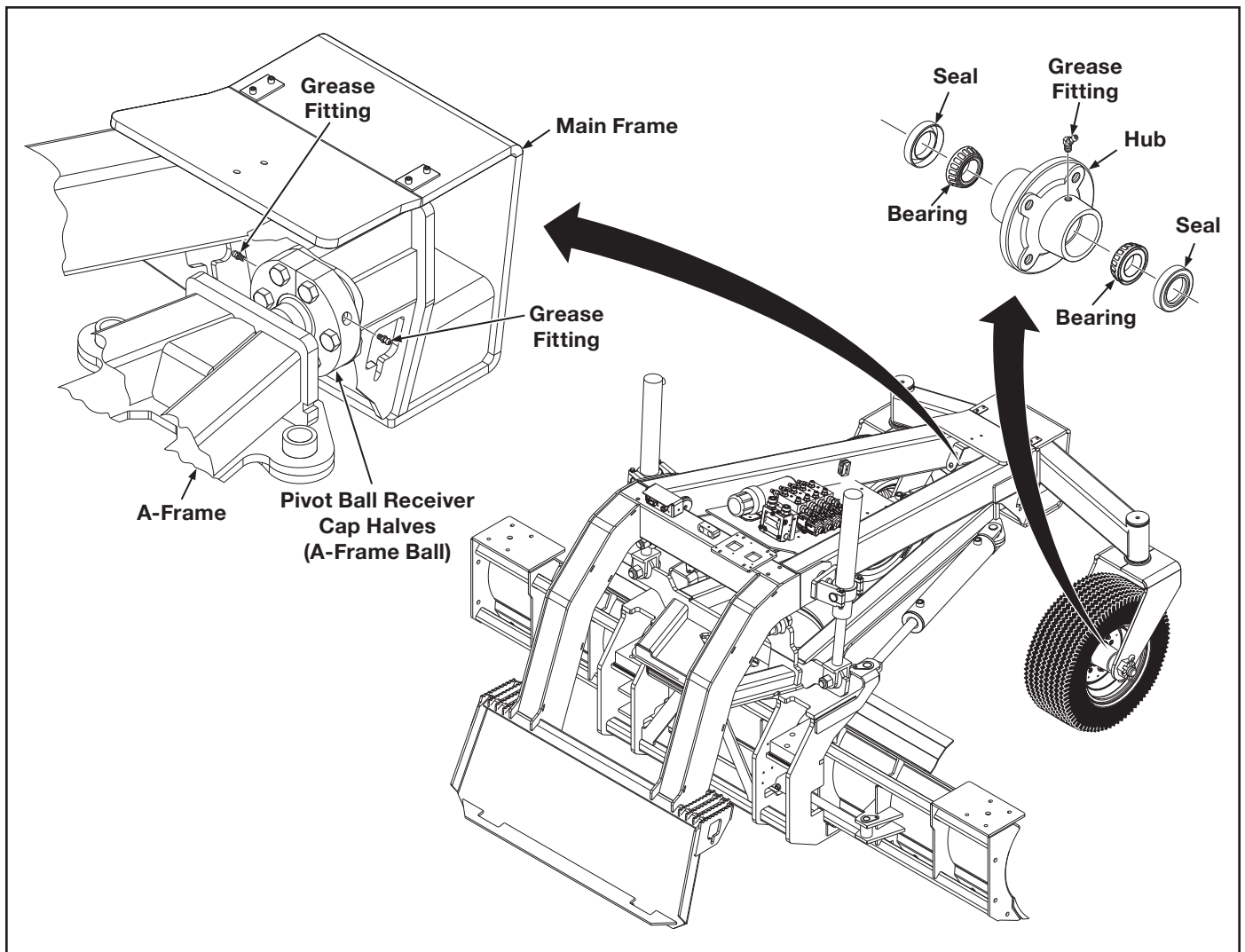


Figure 1-21. Lube and Maintenance.

## SERVITIZATION RECORD

[illegible]

# SERVICE RECORD

[illegible]

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(for future use)

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## PARTS ILLUSTRATIONS

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| Serial Number Information .....      | 2.2 |
| Where To Get Parts And Service ..... | 2.2 |
| How To Order Parts .....             | 2.2 |
| List Of Parts Illustrations .....    | 2.3 |

### 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 Box in the space provided below in case the plate on your Para-Level Grading Box 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 Corporation 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 Corporation 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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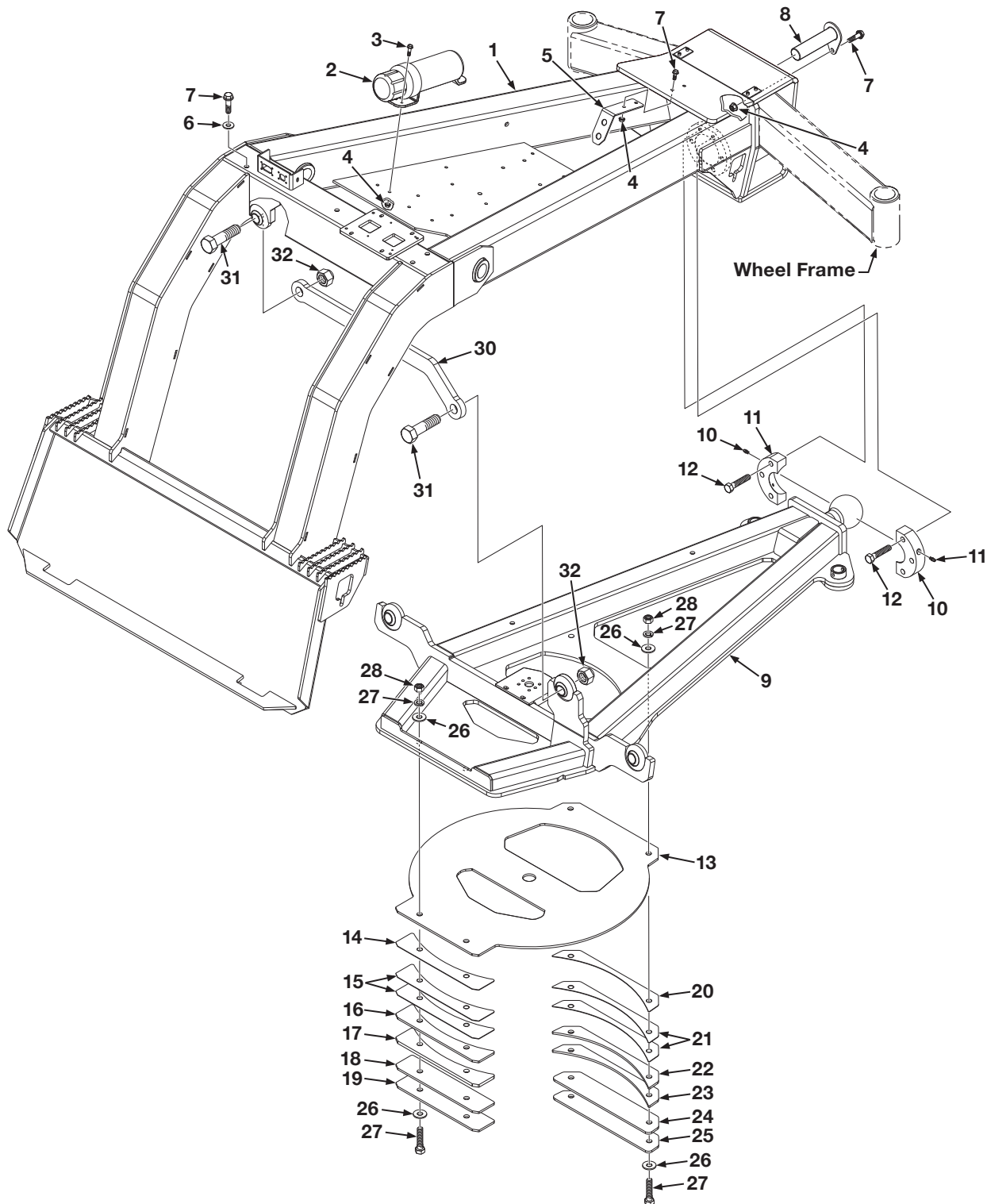
## PARTS ILLUSTRATIONS

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# PARTS ILLUSTRATIONS

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





## PARTS ILLUSTRATIONS

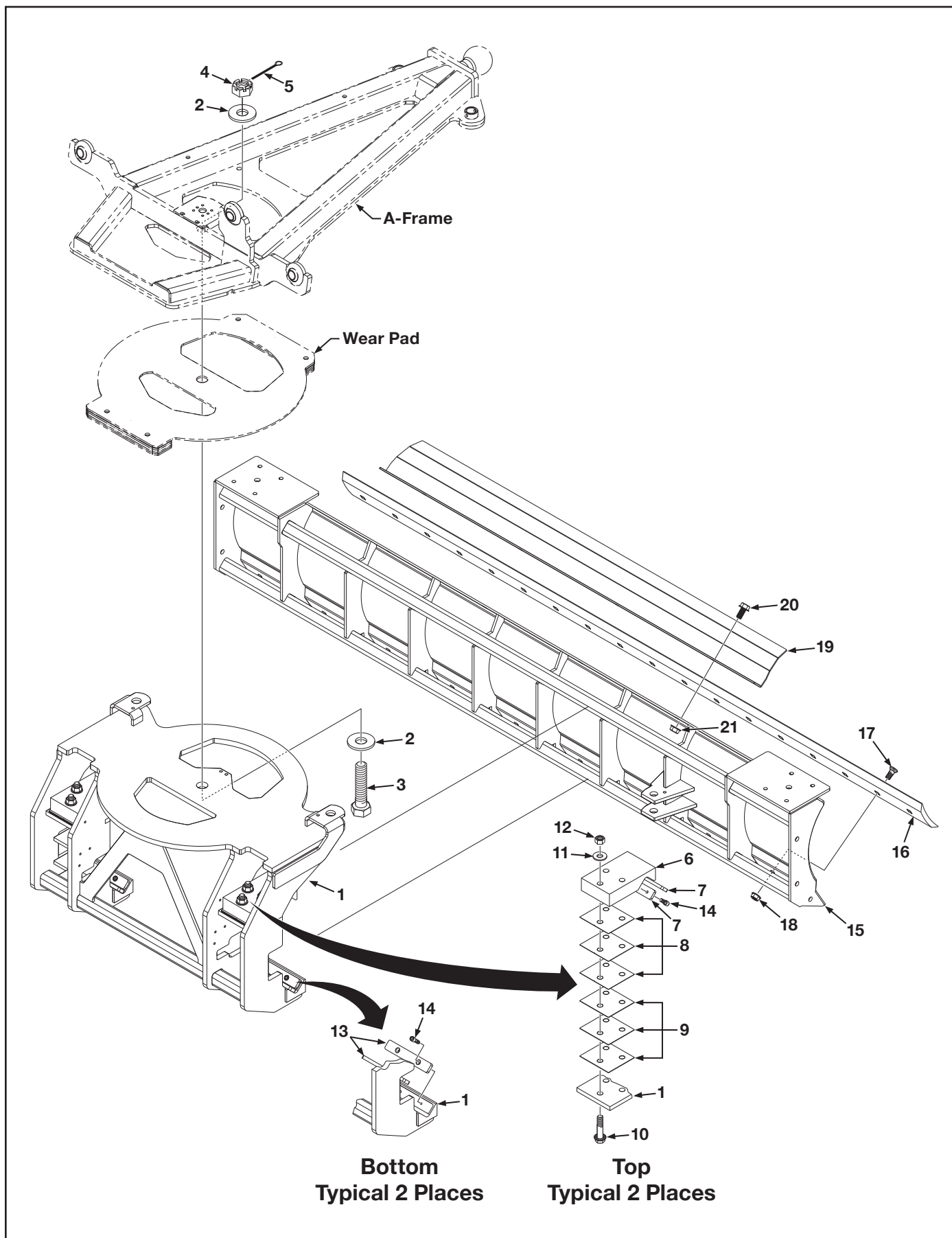
**Figure 2-1. Main Frame, A-Frame and Related Parts**

| 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    | 000-158-233 | 6     | Nut, Flange, Nylon Lock, 5/16"-18UNC                             |
| 5    | 316-001-530 | 1     | Plate, Support, Hydraulic Hose, Bolt-On, Front                   |
| 6    | 000-155-020 | 4     | Washer, Flat, 1/4" SAE   |
| 7    | 000-150-410 | 7     | Bolt, Serrated Flange, 5/16"-18UNC x 1-1/4" Long                 |
| 8    | 000-161-166 | 1     | Pin, Pivot, 1-1/2" Dia. x 8" Long w/Tab                          |
| 9    | 316-001-500 | 1     | A-Frame, Grader Blade  |
| 10   | 316-001-555 | 1 Set | Cap, Half, Pivot Ball Receiver, Includes Item 11                 |
| 11   | 000-166-149 | 2     | Fitting, Grease, Straight, 1/4"-28UNF                            |
| 12   | 000-150-382 | 6     | Bolt, Hex Head, Gr. 8, 5/8"-18UNF x 3" Long, <b>(204 ft-lbs)</b> |
| 13   | 316-001-540 | 1     | Wear Ring, A-Frame   |
| 14   | 316-001-572 | AR    | Shim, 20 Ga, Back, A-Frame                                       |
| 15   | 316-001-562 | 2     | Shim, 16 Ga, Back, A-Frame                                       |
| 16   | 316-001-564 | 1     | Shim, 1/4", Back, A-Frame  |
| 17   | 316-001-566 | 1     | Shim, 3/8", Back, A-Frame  |
| 18   | 316-001-544 | 1     | Wear Pad, Back, A-Frame  |
| 19   | 316-001-568 | 1     | Plate, Cap, Back, A-Frame, 3/8"                                  |
| 20   | 316-001-570 | AR    | Shim, 20 Ga, Front, A-Frame                                      |
| 21   | 316-001-546 | 2     | Shim, 16 Ga, Front, A-Frame                                      |
| 22   | 316-001-560 | 1     | Shim, 1/4", Front, A-Frame                                       |
| 23   | 316-001-542 | 1     | Shim, 3/8", Front, A-Frame                                       |
| 24   | 316-001-541 | 1     | Wear Pad, Front, A-Frame   |
| 25   | 316-001-548 | 1     | Plate, Cap, Front, A-Frame, 3/8"                                 |
| 26   | 000-155-075 | 8     | Washer, Flat, 5/8" SAE   |
| 27   | 000-150-403 | 4     | Bolt, Hex Head, Gr. 8, 5/8"-18UNF x 3-1/4" Long                  |
| 28   | 000-155-077 | 4     | Washer, Lock, 5/8"   |
| 29   | 000-158-197 | 4     | Nut, Hex, 5/8"-18UNF   |
| 30   | 316-001-260 | 1     | Arm, Pan, Hardrod  |
| 31   | 000-150-385 | 2     | Bolt, Hex Head, Gr. 8, 1-1/8"-12UNF x 4" Long                    |
| 32   | 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

## PARTS ILLUSTRATIONS

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



## PARTS ILLUSTRATIONS

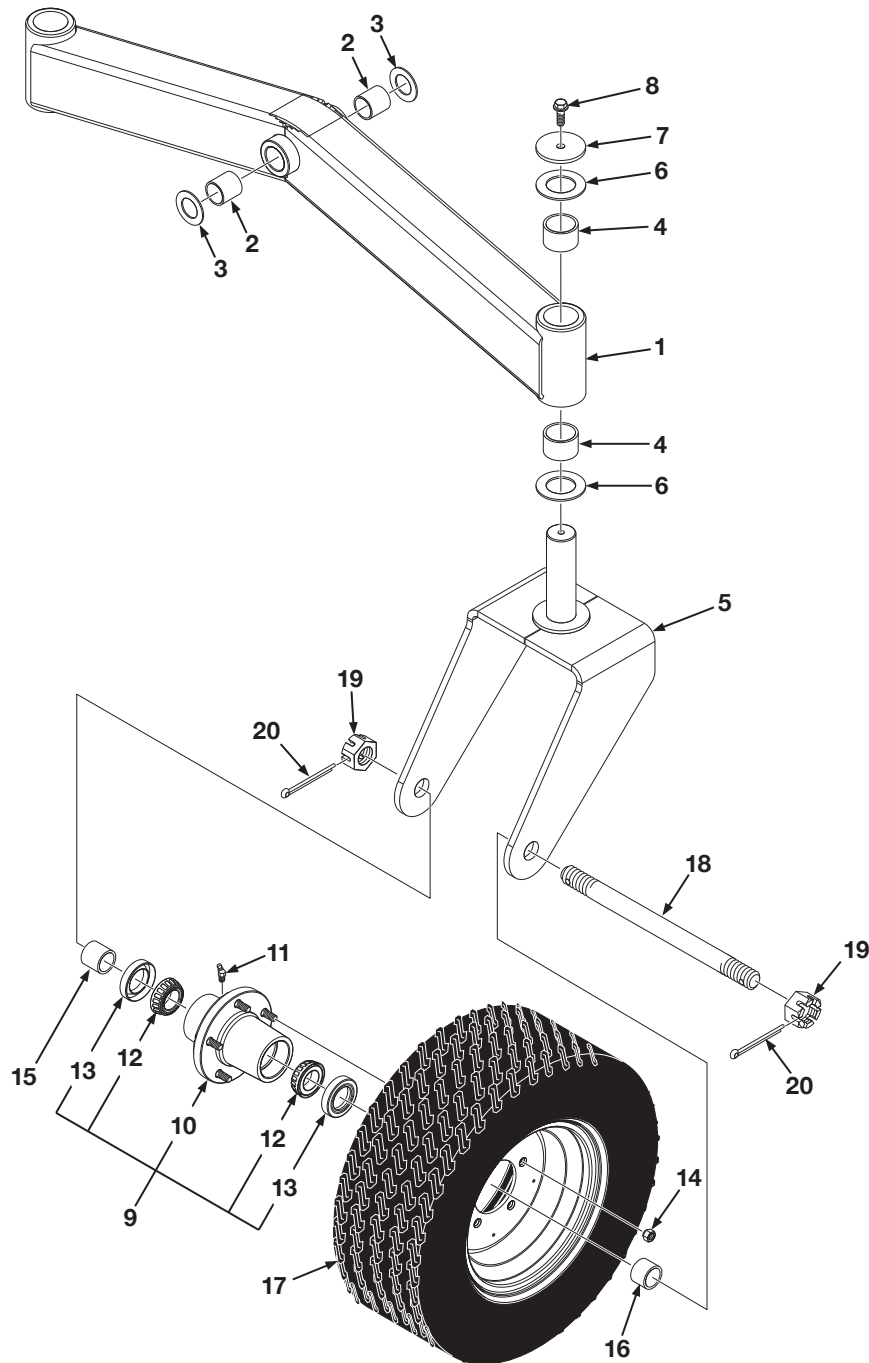
**Figure 2-2. Carriage, Moldboard, Blade and Related Parts**

| Item | Part No.    | Qty | Description  |
|------|-------------|-----|--|
| 1    | 316-001-460 | 1   | Carriage, Grader Blade, GB-108   |
| 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, <b>(282 ft-lbs red Loctite)</b>                        |
| 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, <b>(17 ft-lbs blue Loctite)</b> |
| 15   | 316-001-100 | 1   | Moldboard, Grader Blade, GB-108  |
| 16   | 000-190-202 | 1   | Edge, Cut, Bolt-On, Curved, DBC, 3/4" x 6" x 108" Long                       |
| 17   | 000-150-258 | 18  | Bolt, Plow, 5/8"-11UNC x 1-3/4" Long   |
| 18   | 000-158-142 | 18  | Nut, Serrated Flange, 5/8"-11UNC, <b>(128 ft-lbs)</b>                        |
| 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   |

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

## PARTS ILLUSTRATIONS

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



## PARTS ILLUSTRATIONS

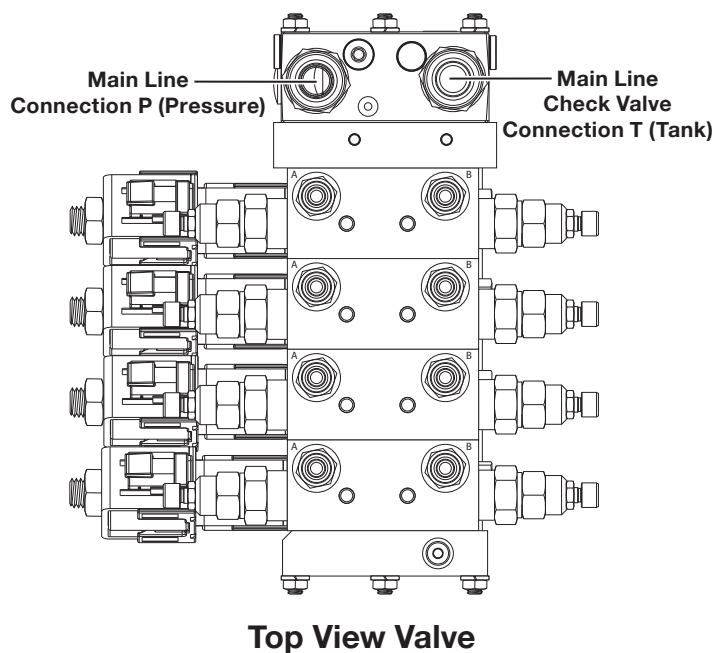
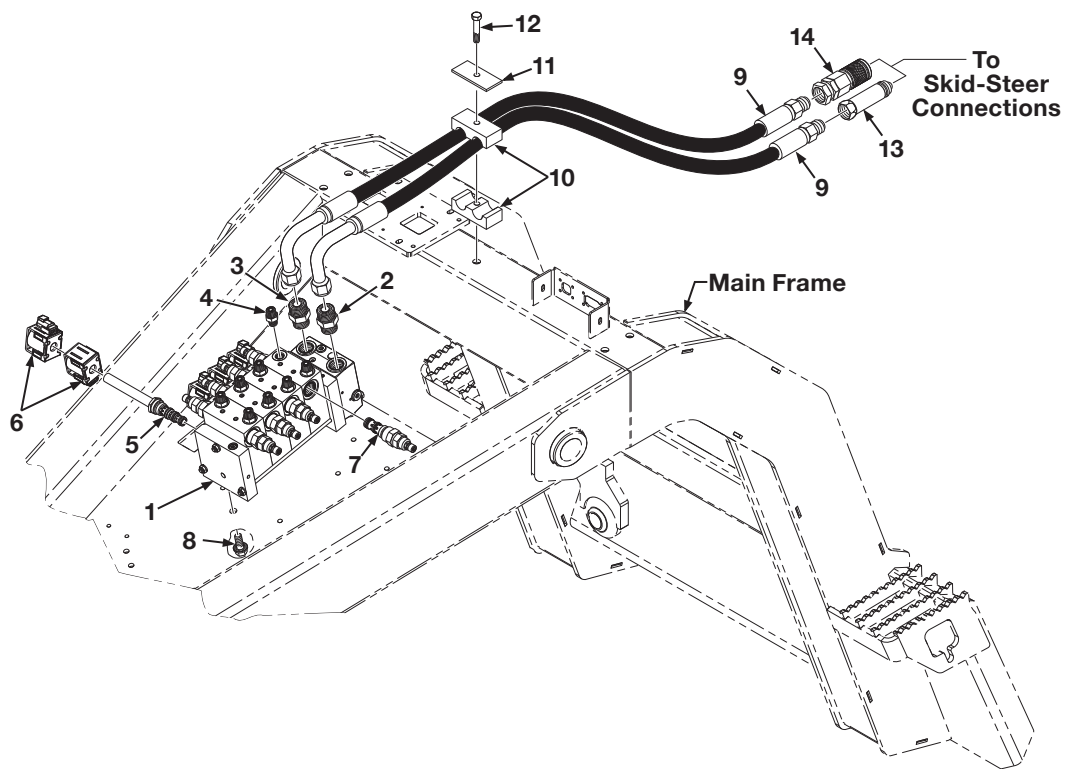
**Figure 2-3. Wheel Frame, Caster Fork and Related Parts**

| 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    | 000-155-113 | 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    | 000-155-002 | 2   | Washer, Flat, 3-3/8" OD x .555" ID x 1/4" Thick                                  |
| 8    | 000-150-375 | 2   | Bolt, Serrated Flange, 1/2"-13UNC x 1-1/4" Long, <b>(57 ft-lbs blue Loctite)</b> |
| 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 | 2   | Bearing, Roller, Tapered, 1.3750" ID, 1.0520" Width                              |
| 13   | 000-166-838 | 2   | Seal, 2.718 " OD x 1.750 " ID x .359 " Thick                                     |
| 14   | 000-158-120 | 4   | 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   |

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

## PARTS ILLUSTRATIONS

Figure 2-4. Valve Assembly & Related Parts



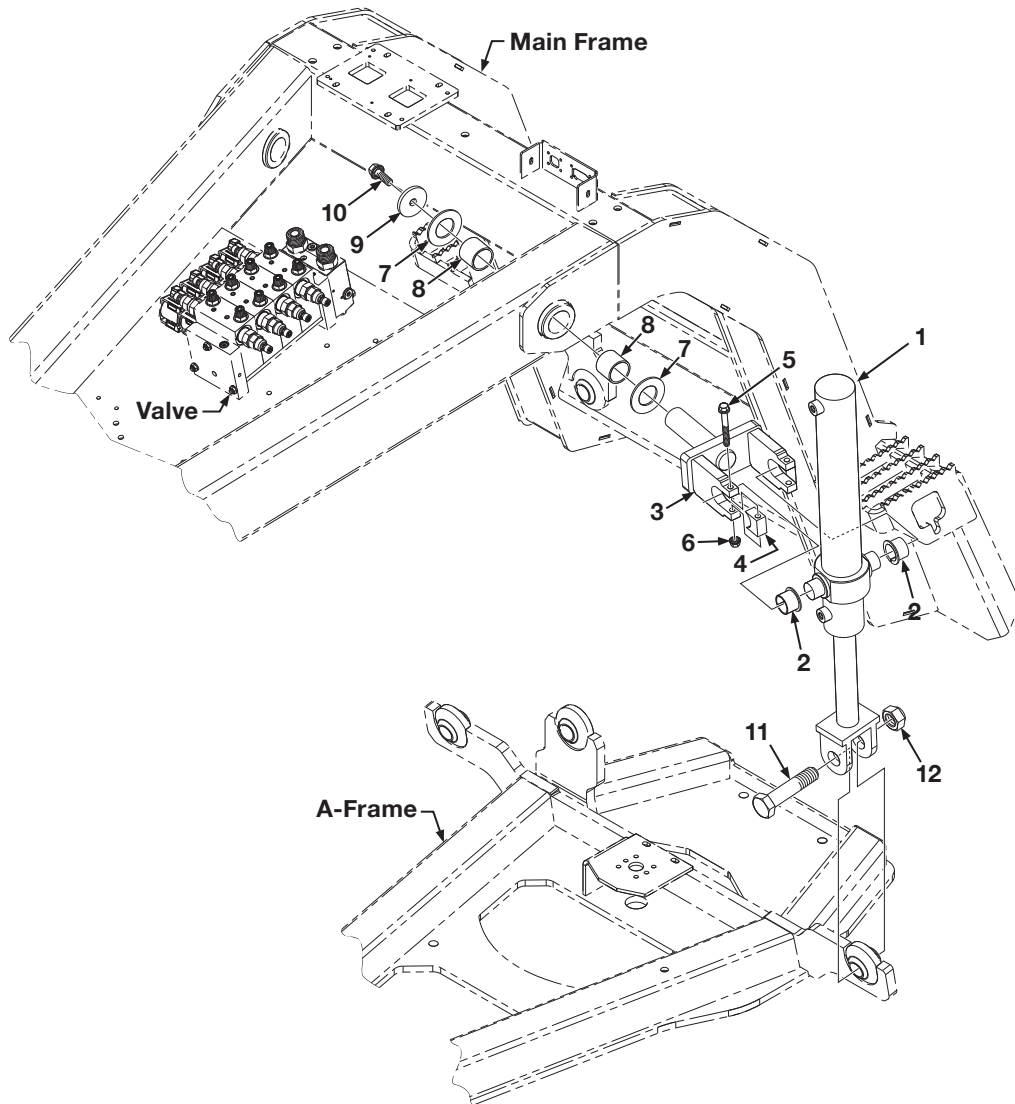
## PARTS ILLUSTRATIONS

**Figure 2-4. 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, <b>(DO NOT REMOVE FROM ITEM 1)</b>   |
| 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 | 3   | Bolt. Serrated Flange, 3/8"-16UNC x 3/4" Long  |
| 9    | 000-166-810 | 2   | Hose, 5/8" Dia x 80" Long, 10MORB x 12FFORX90  |
| 10   | 000-166-862 | 1   | Clamp, Hose Set  |
| 11   | 000-166-861 | 1   | Plate, Top Hose Clamp  |
| 12   | 000-150-104 | 2   | Bolt, Hex Head, 5/16"-18UNC x 3-1/4" Long  |
| 13   | 000-166-859 | 1   | Coupler, Quick Disconnect, Flat Face, Male (Tank Line)   |
| 14   | 000-166-860 | 1   | Coupler, Quick Disconnect, Flat Face, Female (Pressure Line)   |
|      |             |     | BH-Bulkhead<br>MP-Male Pipe<br>FP-Female Pipe<br>FPX-Female Pipe Swivel<br>FFX- Female O-Ring Flat Face Swivel<br>MB-Male O-Ring Boss<br>FB-Female O-Ring Boss<br>MJ-Male JIC<br>FJ-Female JIC<br>FJX-Female JIC Swivel<br>OFS-O-Ring Face Seal<br>OFSBH-O-Ring Face Seal Bulkhead |

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

### Figure 2-5. Lift Cylinders & Related Parts





## PARTS ILLUSTRATIONS

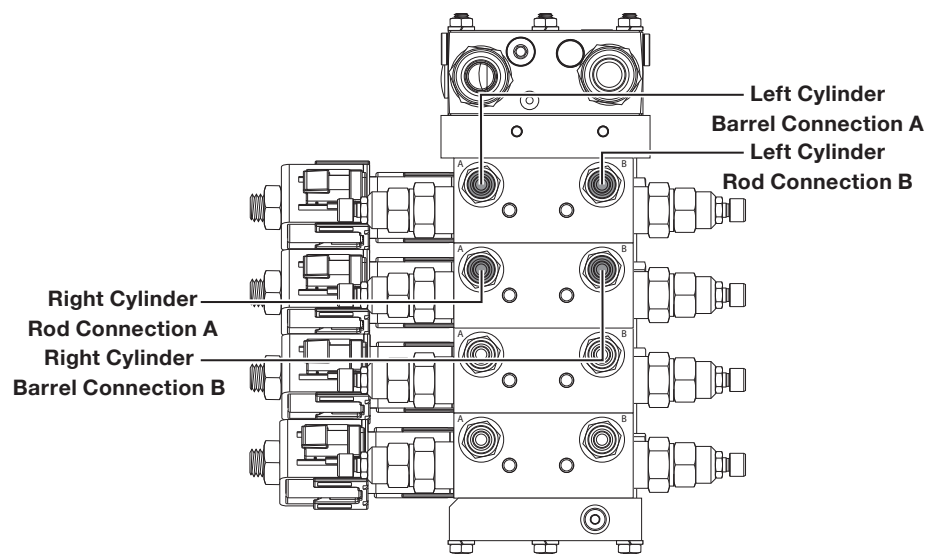
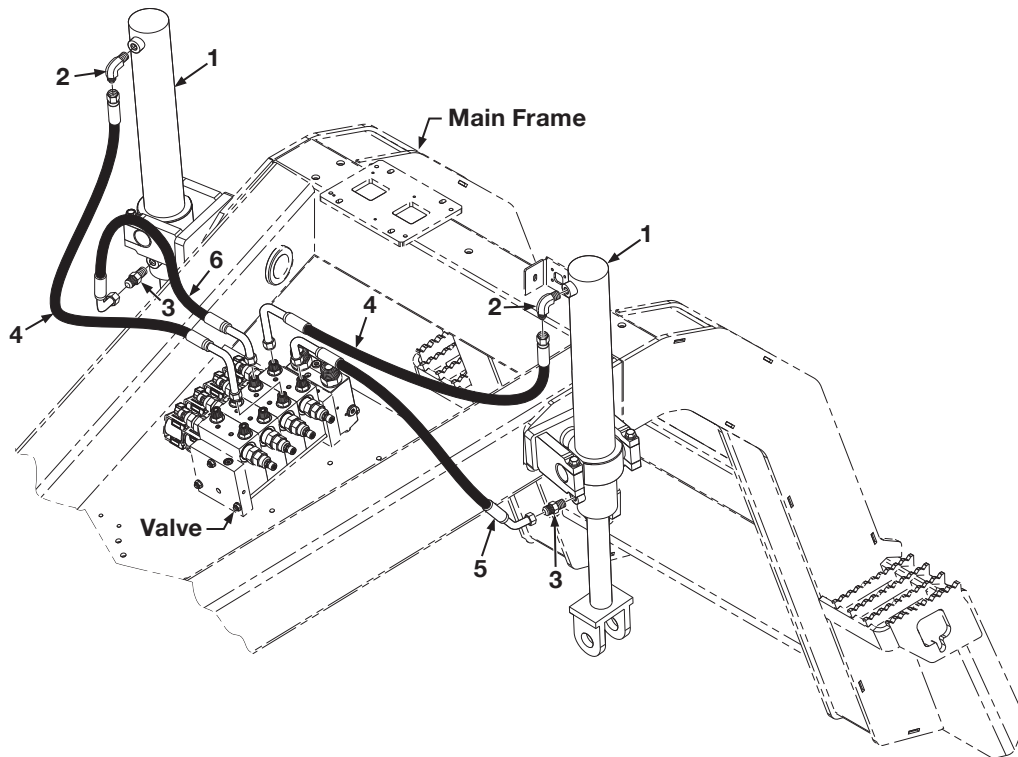
**Figure 2-5. Lift Cylinders & Related Parts**

| 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, <b>(26 ft-lbs blue Loctite)</b>            |
| 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, 2-1/4" OD x 17/32" ID x 1/4" Thick                             |
| 10   | 000-150-396 | 2   | Bolt, Serrated Flange, 1/2"-13UNC x 1" Long, <b>(57 ft-lbs blue Loctite)</b> |
| 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   |

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

## PARTS ILLUSTRATIONS

Figure 2-6. Lift Cylinder Hydraulics



Top View Valve  
Lift Cylinder  
Connections

## PARTS ILLUSTRATIONS

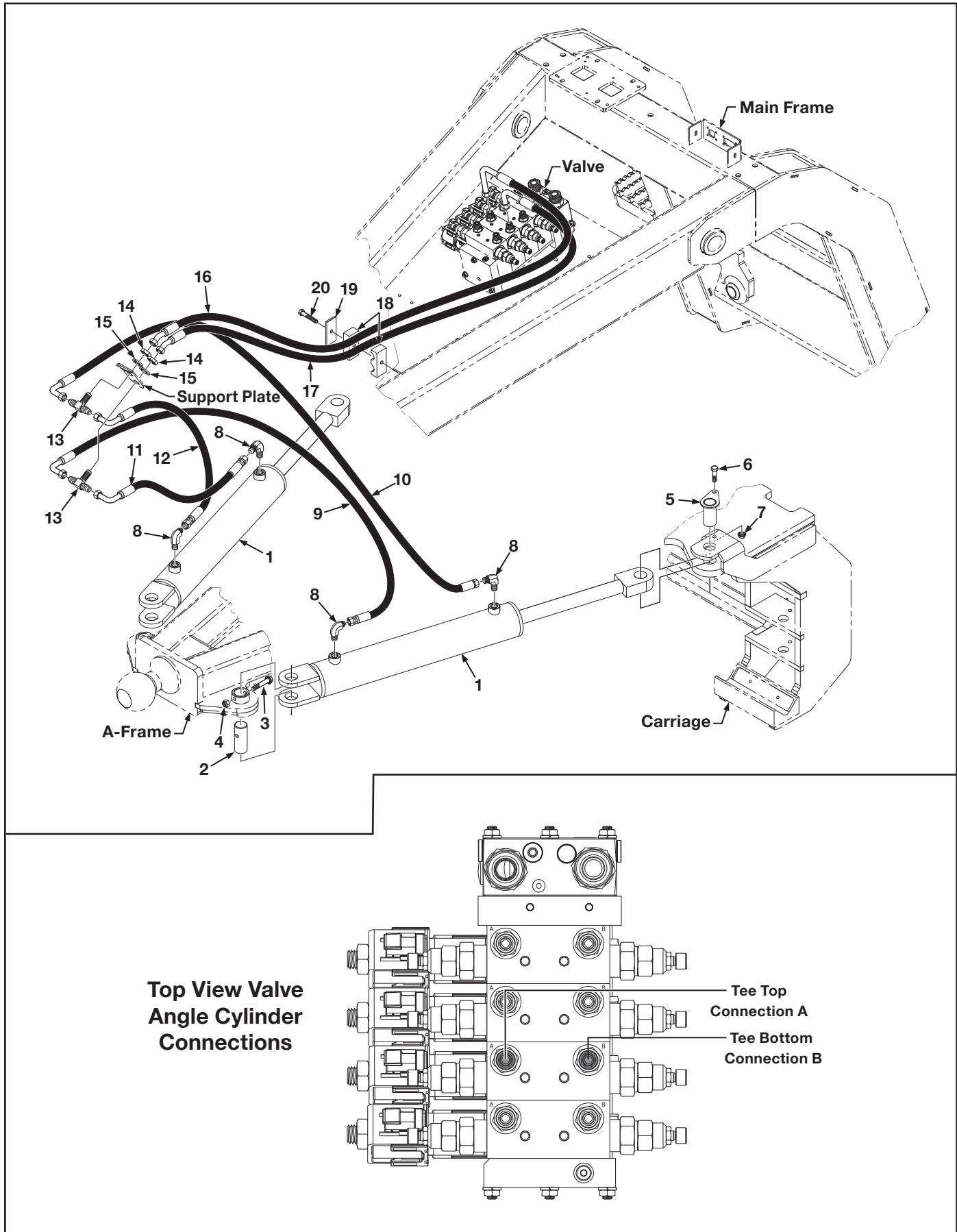
**Figure 2-6. Lift Cylinder Hydraulics**

| 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 <ul style="list-style-type: none"> <li>BH-Bulkhead</li> <li>MP-Male Pipe</li> <li>FP-Female Pipe</li> <li>FPX-Female Pipe Swivel</li> <li>FFX- Female O-Ring Flat Face Swivel</li> <li>MB-Male O-Ring Boss</li> <li>FB-Female O-Ring Boss</li> <li>MJ-Male JIC</li> <li>FJ-Female JIC</li> <li>FJX-Female JIC Swivel</li> <li>OFS-O-Ring Face Seal</li> <li>OFSBH-O-Ring Face Seal Bulkhead</li> </ul> |

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

## PARTS ILLUSTRATIONS

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



## PARTS ILLUSTRATIONS

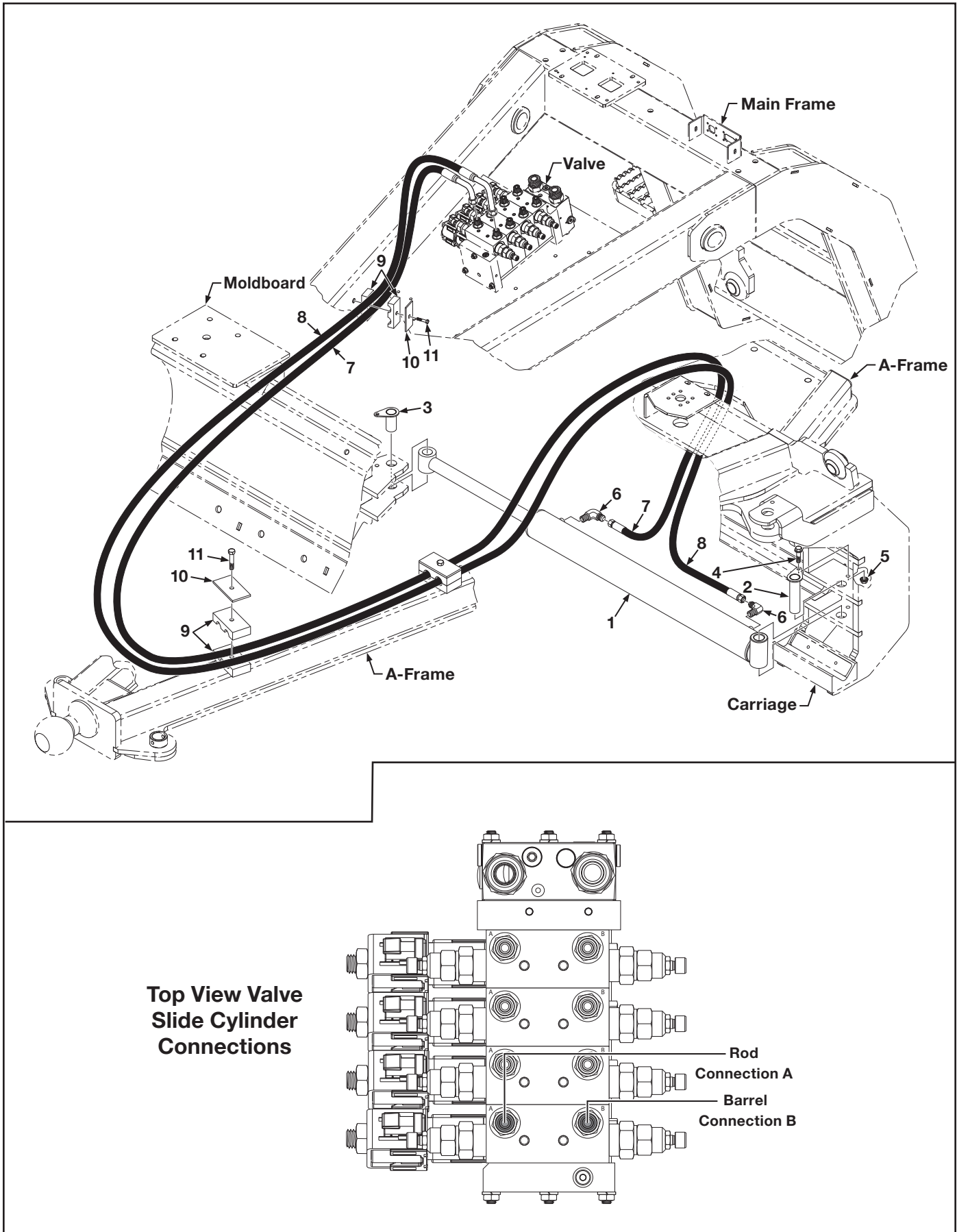
**Figure 2-7. Angle Cylinders, Hydraulics & Related Parts**

| 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 4-5/8" 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 <ul style="list-style-type: none"> <li>BH-Bulkhead</li> <li>MP-Male Pipe</li> <li>FP-Female Pipe</li> <li>FPX-Female Pipe Swivel</li> <li>FFX- Female O-Ring Flat Face Swivel</li> <li>MB-Male O-Ring Boss</li> <li>FB-Female O-Ring Boss</li> <li>MJ-Male JIC</li> <li>FJ-Female JIC</li> <li>FJX-Female JIC Swivel</li> <li>OFS-O-Ring Face Seal</li> <li>OFSBH-O-Ring Face Seal Bulkhead</li> </ul> |

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

## PARTS ILLUSTRATIONS

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



## PARTS ILLUSTRATIONS

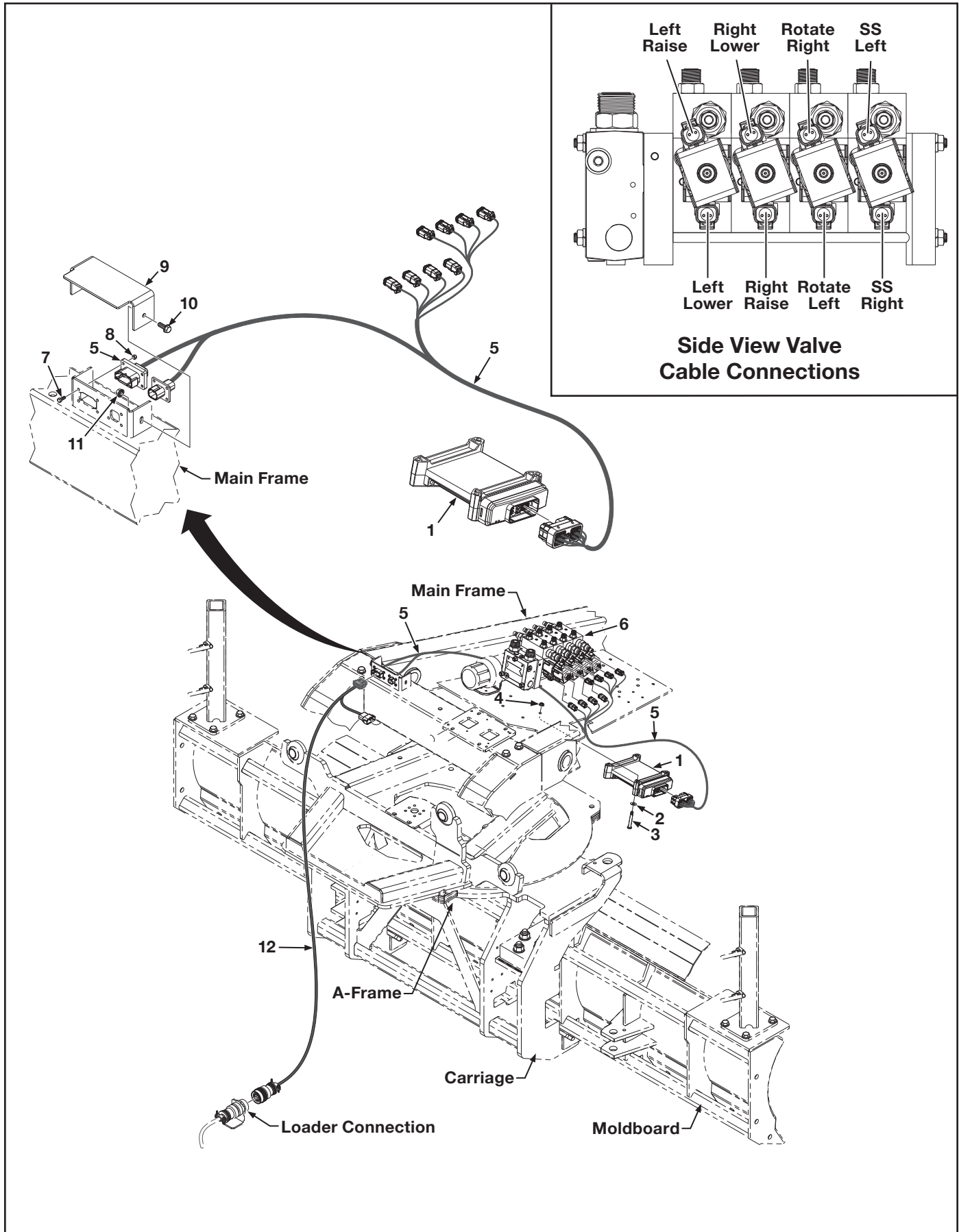
**Figure 2-8. Shift Cylinders, Hydraulics & Related Parts**

| Item | Part No.     | Qty | Description   |
|------|--------------|-----|---|
| 1    | 000--166-793 | 1   | Cylinder Assembly, Shift, 2-1/2" Bore x 26" Stroke, 3000 PSI  |
| 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 <ul style="list-style-type: none"> <li>BH-Bulkhead</li> <li>MP-Male Pipe</li> <li>FP-Female Pipe</li> <li>FPX-Female Pipe Swivel</li> <li>FFX- Female O-Ring Flat Face Swivel</li> <li>MB-Male O-Ring Boss</li> <li>FB-Female O-Ring Boss</li> <li>MJ-Male JIC</li> <li>FJ-Female JIC</li> <li>FJX-Female JIC Swivel</li> <li>OFS-O-Ring Face Seal</li> <li>OFSBH-O-Ring Face Seal Bulkhead</li> </ul> |

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

## PARTS ILLUSTRATIONS

**Figure 2-9. Laser Controls and Related Parts - Trimble Earthworks Go!**





## PARTS ILLUSTRATIONS

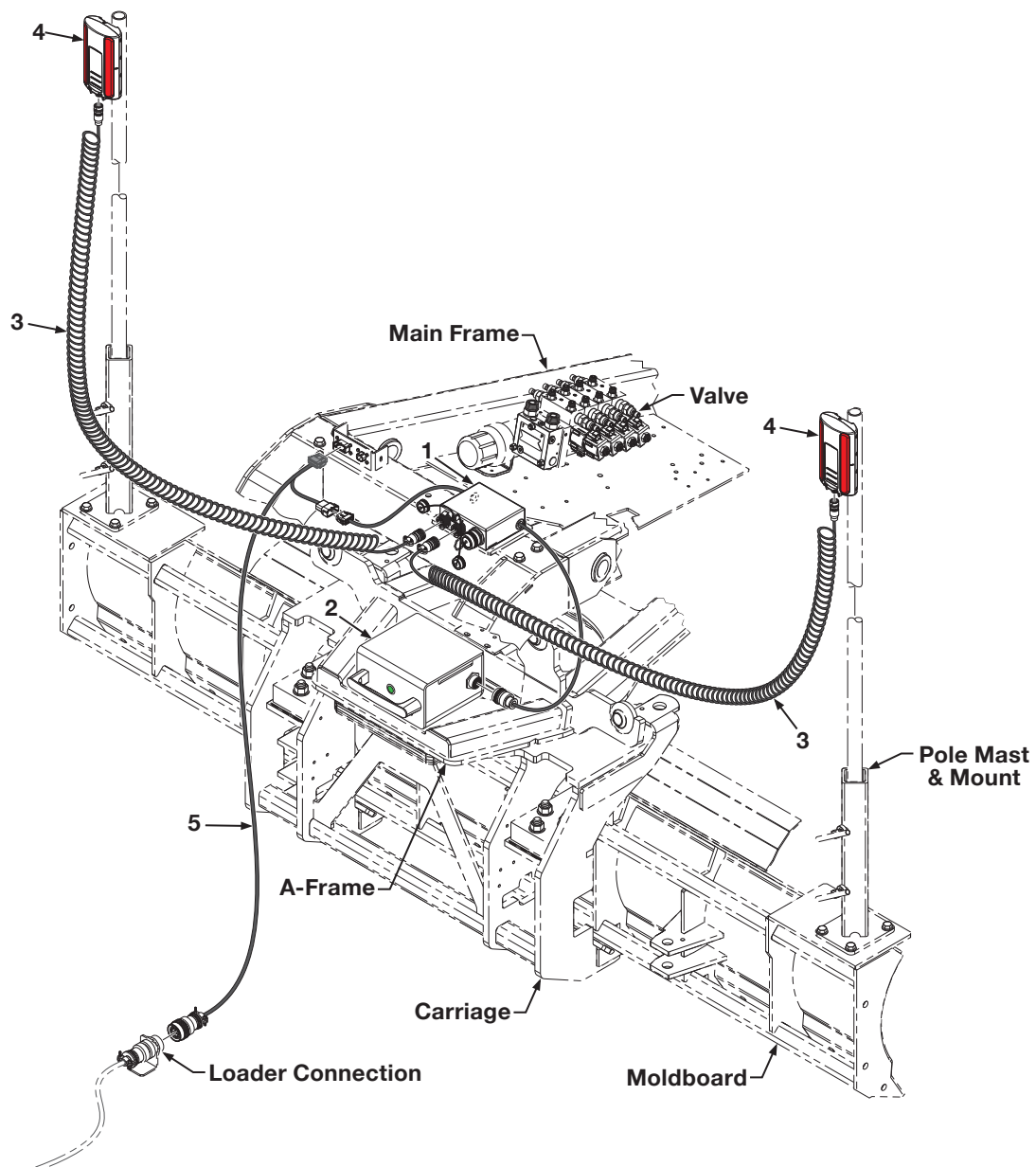
**Figure 2-9. Laser Controls and Related Parts - Trimble Earthworks Go!**

| Item | Part No.    | Qty | Description  |
|------|-------------|-----|--|
| 1    | 000-200-490 | 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 <a href="#">page 1.6</a> |

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

## PARTS ILLUSTRATIONS

Figure 2-10. Go! Box, Laser Receiver 360°, Cables - Trimble Earthworks Go!



## PARTS ILLUSTRATIONS

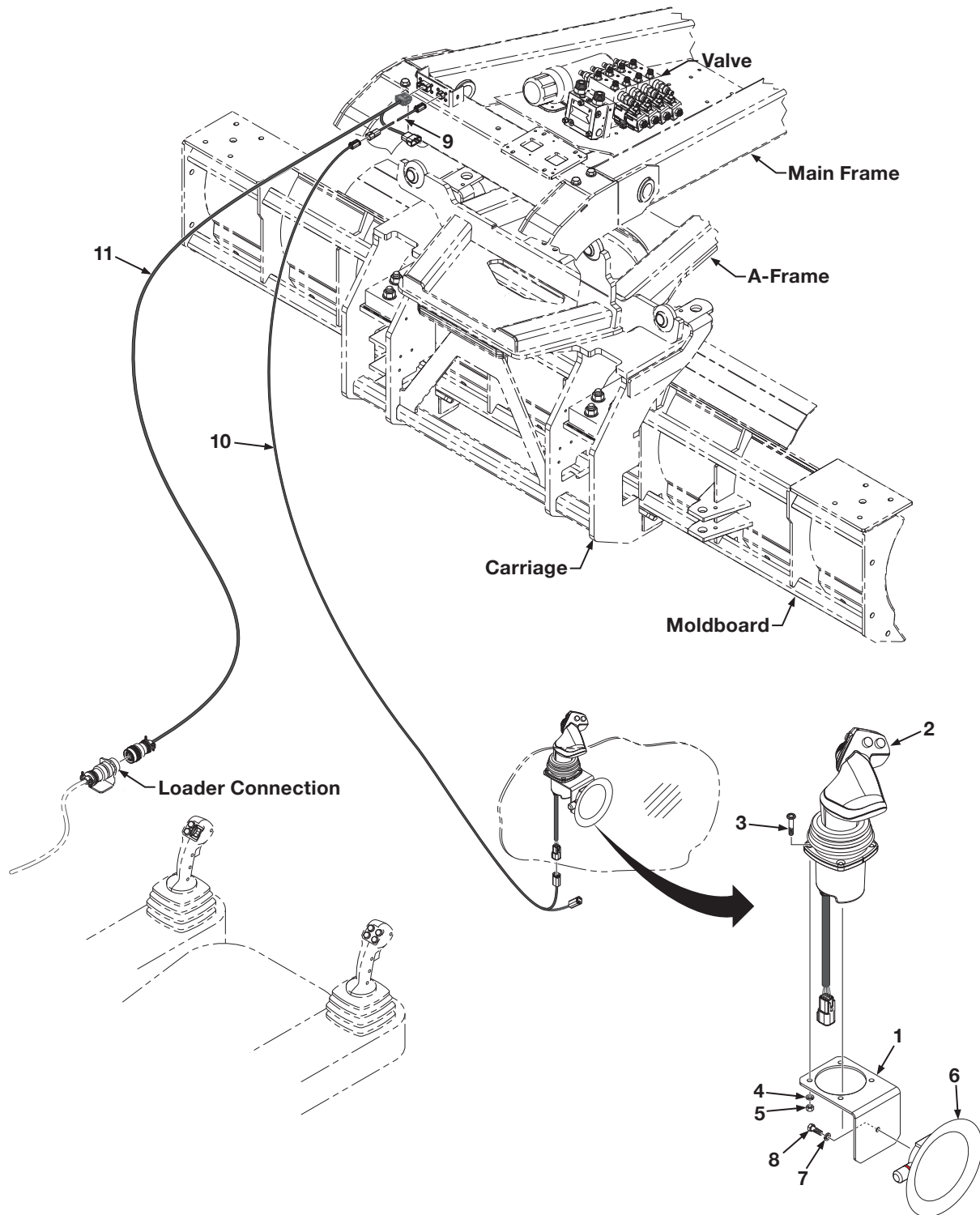
**Figure 2-10. Go! Box, Laser Receiver 360°, Cables - Trimble Earthworks Go!**

| 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 <a href="#">page 1.6</a> |

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

## PARTS ILLUSTRATIONS

Figure 2-11. Joystick, Harness & Related Parts



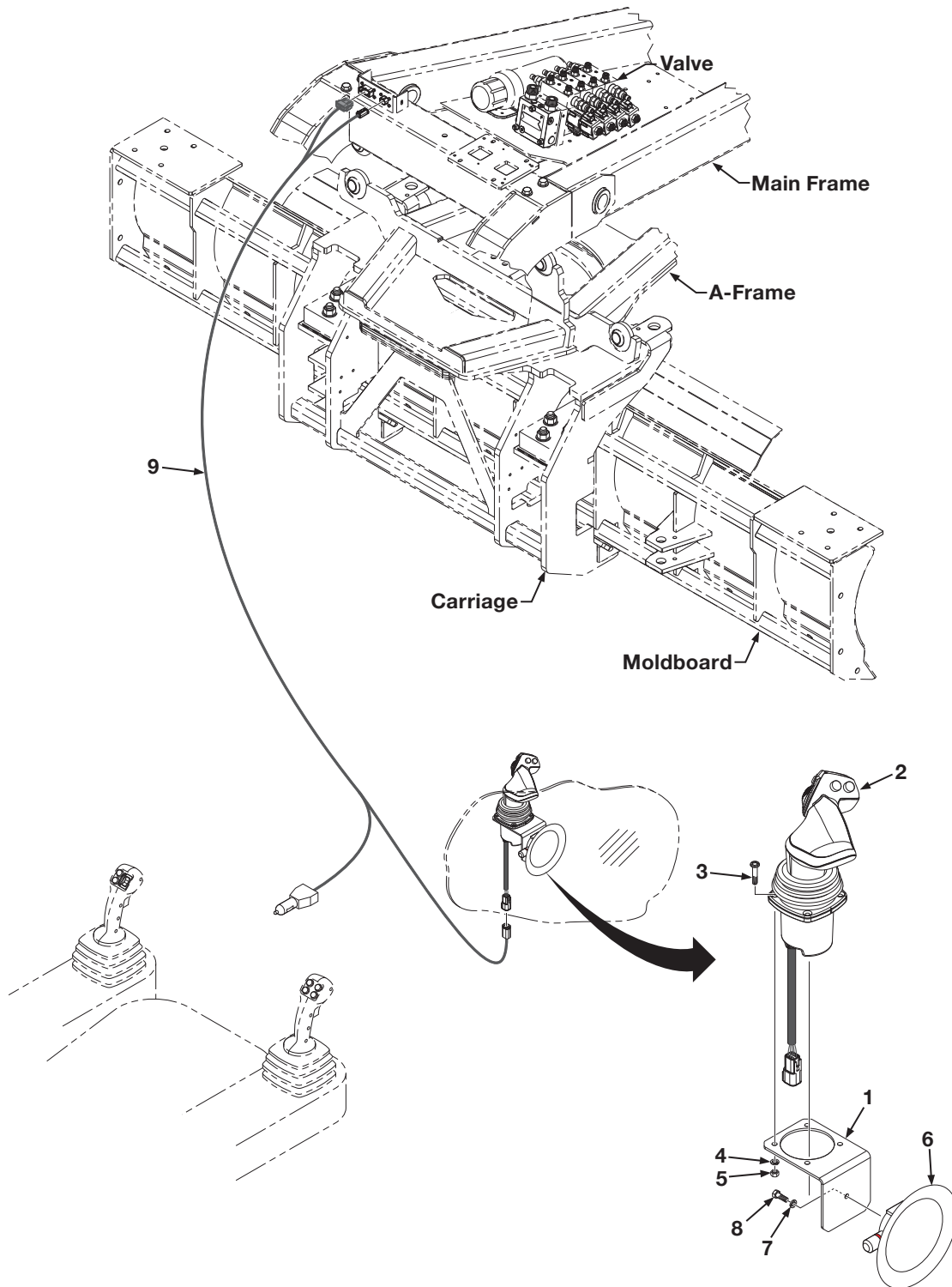
## PARTS ILLUSTRATIONS

**Figure 2-11. 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 <a href="#">page 1.6</a> |

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

**Figure 2-12. Joystick, Harness & Related Parts (Rental)**

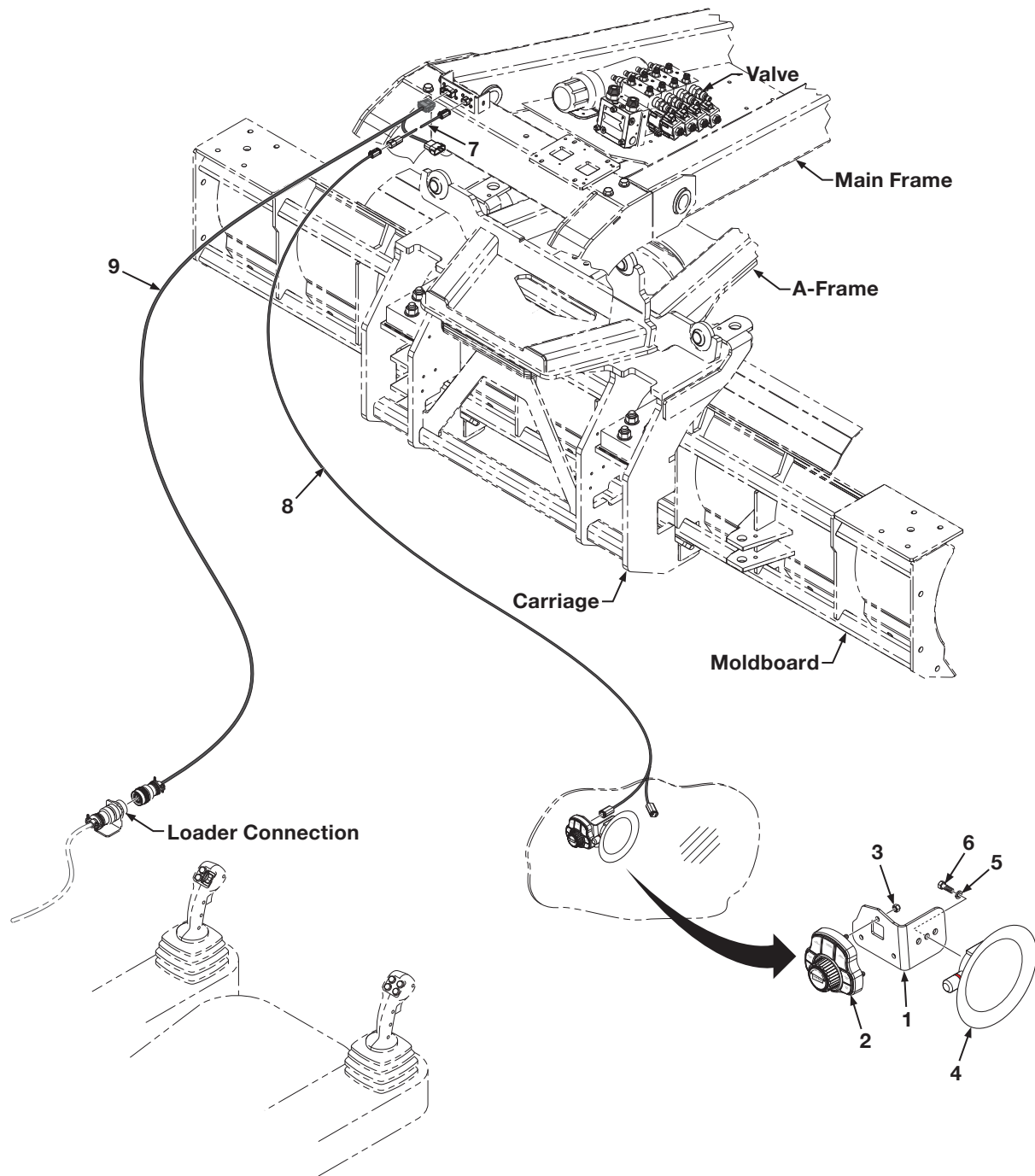


**Figure 2-12. Joystick, Harness & Related Parts (Rental)**

| 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                           |

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

**Figure 2-13. HMR, Harness & Related Parts**





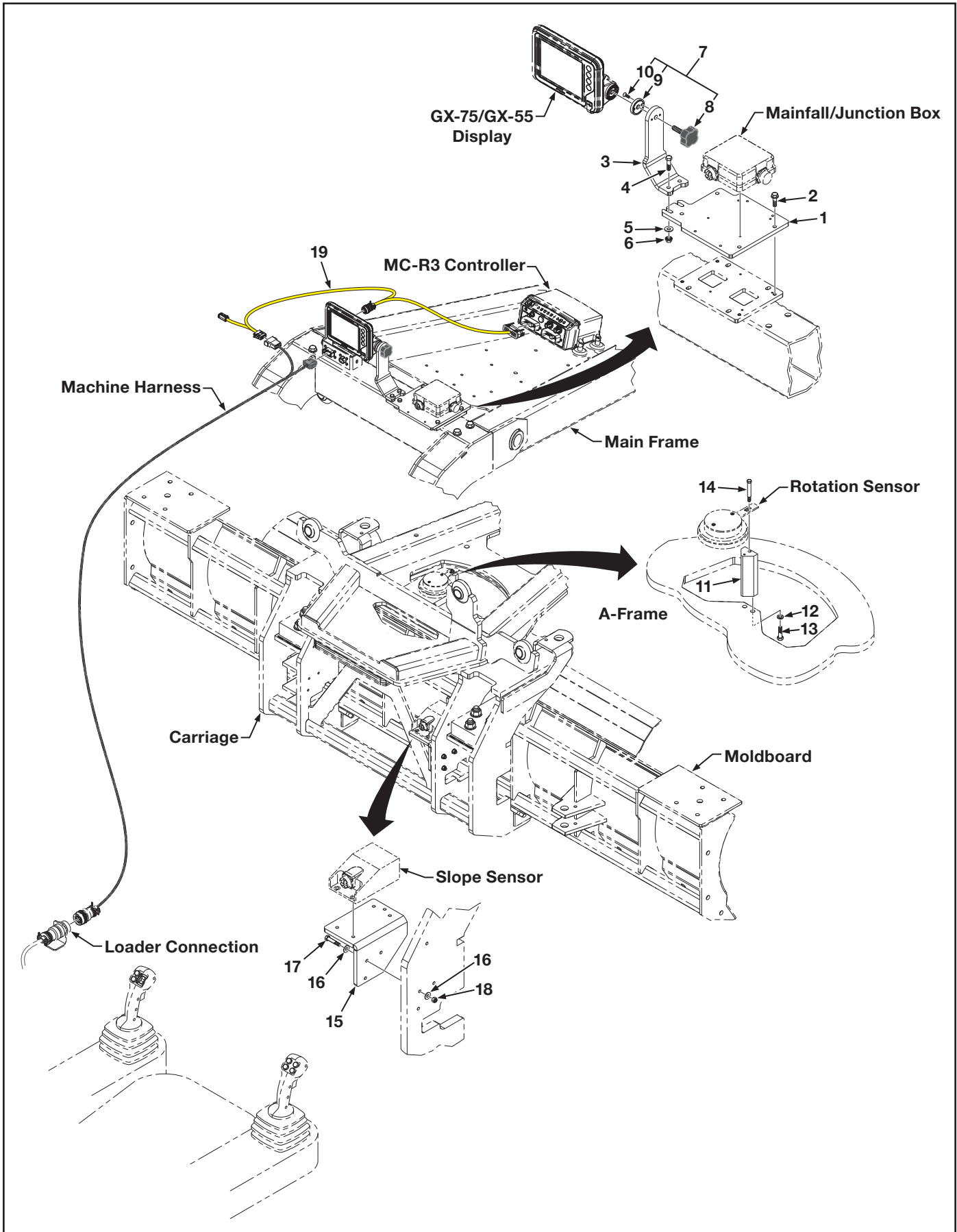
## PARTS ILLUSTRATIONS

**Figure 2-13. 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 <a href="#">page 1.6</a> |

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

**Figure 2-14. Topcon 3DMC W/Display on Attachment**

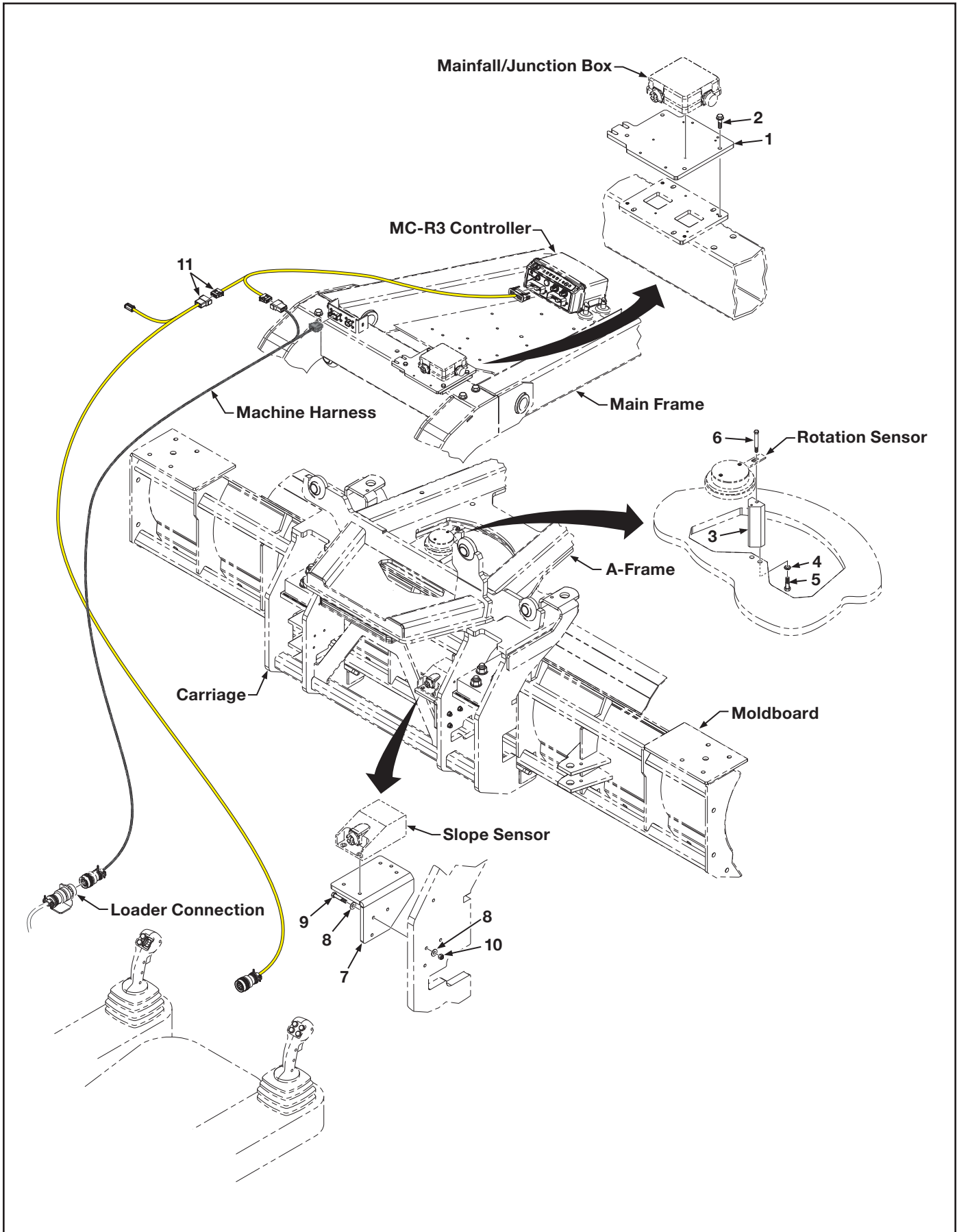


**Figure 2-14. Topcon 3DMC W/Display on Attachment**

| 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

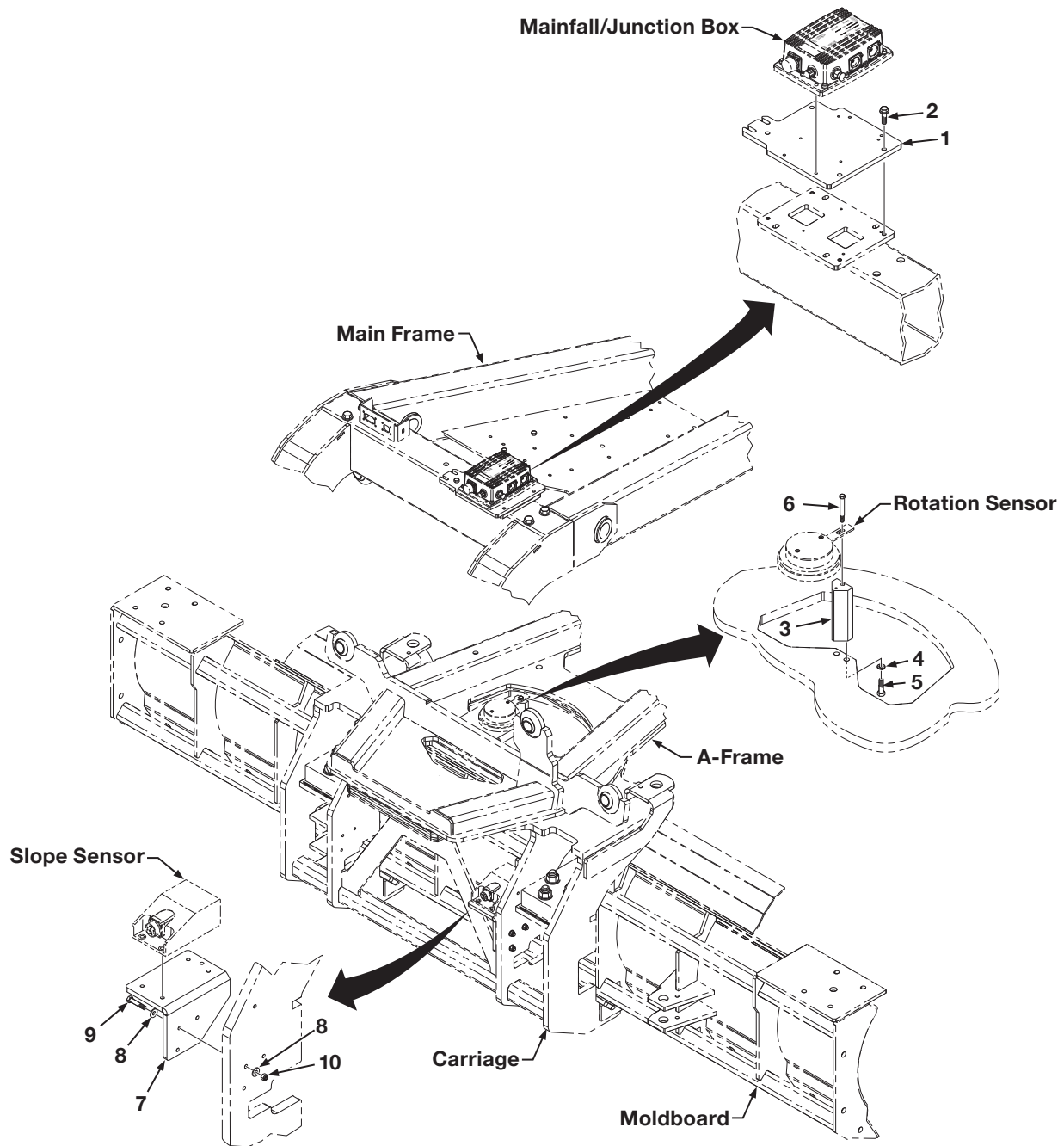
**Figure 2-15. Topcon 3DMC W/Display in Cab**



**Figure 2-15. 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                 |

Figure 2-16. Leica 3D



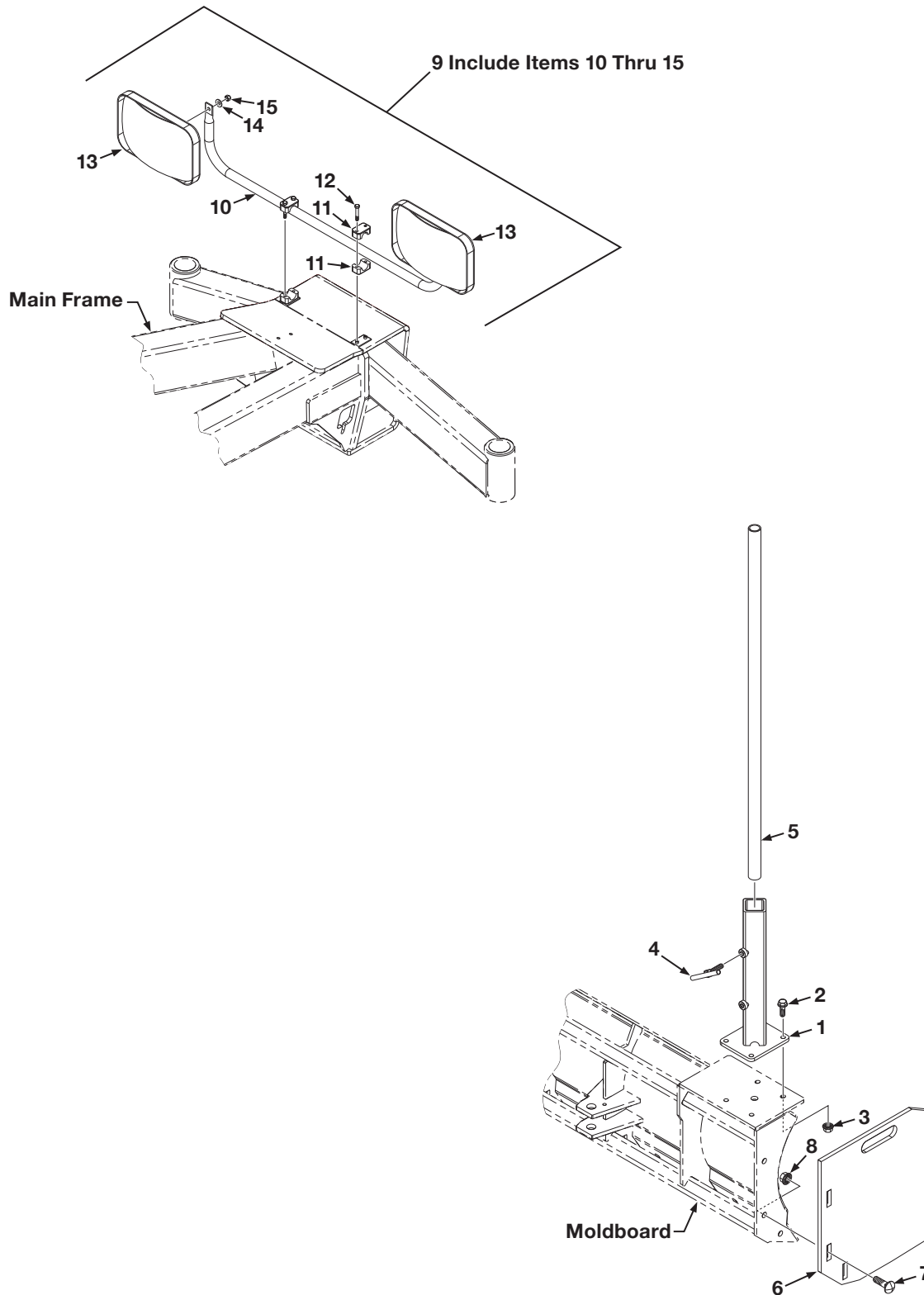
**Figure 2-16. Leica 3D**

| Item | Part No.    | Qty | Description   |
|------|-------------|-----|---|
|      | 000-201-290 | 1   | Kit, Leica 3D, Includes Items 1 thru 10               |
| 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                      |

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

## PARTS ILLUSTRATIONS

Figure 2-17. Optional Equipment





## PARTS ILLUSTRATIONS

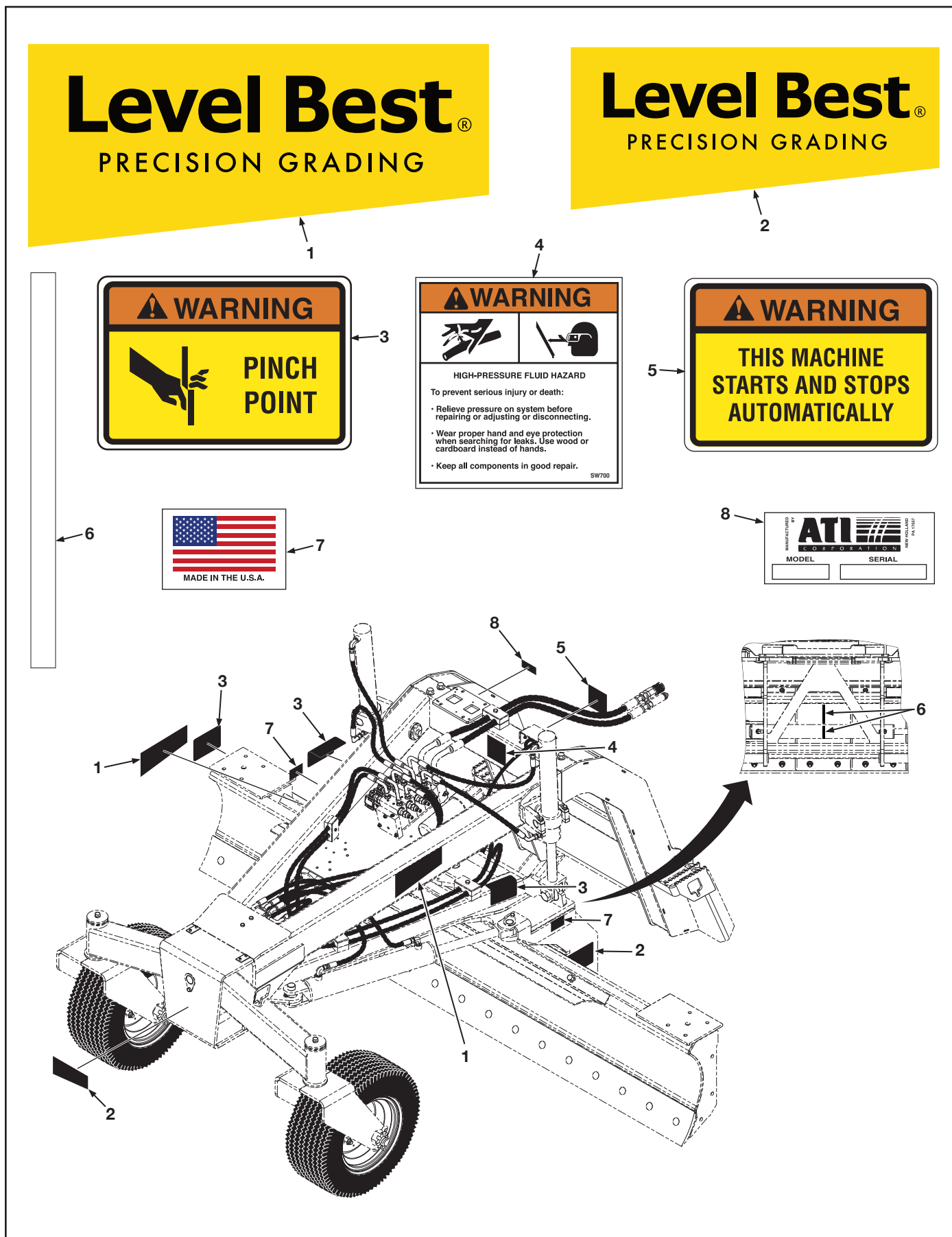
**Figure 2-17. Optional Equipment**

| 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  |
| 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    | 316-001-700  | 2   | Plate, End, Moldboard                            |
| 7    | 000-150-256  | 6   | Bolt, Carriage, 5/8"-11UNC x 1-1/2" Long         |
| 8    | 000-158-142  | 6   | Nut, Serrated Flange, 5/8"-11UNC                 |
| 9    | 3126-001-723 | 1   | Kit, Mirror, Includes Items 10 thru 15           |
| 10   | 316-001-727  | 1   | Bracket, Tube, Bent, Mirror                      |
| 11   | 001-001-077  | 2   | Clamp Assembly, Mirror Bracket, Included Item 12 |
| 12   | LP           | 4   | Bolt, Hex Head, 1/4"-20UNC x 1-1/2" Long         |
| 13   | 001-001-179  | 2   | Mirror, Safety, 8" x 12", W/12" Radius           |
| 14   | 000-155-032  | 2   | Washer, Flat, 3/8" SAE                           |
| 15   | 000-158-084  | 2   | Nut, Hex, Nylon Lock, 3/8"-16UNC                 |

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

## PARTS ILLUSTRATIONS

Figure 2-18. Decals



## PARTS ILLUSTRATIONS

**Figure 2-18. 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    | 000-186-035 | 1   | Plate, Model/Serial, Adhesive Back                       |

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

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(for future use)

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