Helping-Hand™ Arm

Supplement to the Automizer Manual Series

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May 2025

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THANKS FOR YOUR HELP!

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Part # 208142 (rev.00.05.2025)

1

Introduction

About This Manual

This manual contains information regarding the correct maintenance of the HELPING-HAND™ arm. Maintenance personnel should read and understand this information before doing repairs and maintenance on the arm. For information on how to safely and efficiently operate your side loader, please refer to the related *Operator's Manual* that is provided with your unit. For information on how to adequately service the various systems of your side loader's body, please refer to the appropriate *Maintenance Manual* (focusing either on TTD or full-eject vehicle).

NOTE: Maintenance and operation of the HELPING-HAND™ LONG REACH arm are the same as those of the HELPING-HAND™ arm. Only minor differences can be found between both arms.

IMPORTANT: Before servicing the HELPING-HAND™ arm or the HELPING-HAND™ LONG REACH arm, maintenance personnel MUST have completely read and understood not only this booklet, but also the Expert *Operator* and *Maintenance Manuals*.

Topics Not Included in This Manual

Maintenance of the chassis

This is dealt with in the chassis manufacturer's service manual.

Cameras and backing-accident prevention systems

For these options, refer to the appropriate manufacturer's service manual.

Operating your side loader

For procedures related to the operation of your side loader, please refer to the related *Operator's Manual*. (A copy of this manual is provided with the truck.)

Parts and assemblies

For parts and assemblies that make up your side loader, and for their respective part number for ordering purposes, please refer to the appropriate *Parts Manual*.

General maintenance, system adjustments, troubleshooting related to the body of your side loader

For these topics, refer to the *Maintenance Manual* included in the USB key. This key is found inside the plastic pouch located in the cab.

About the Illustrations in This Manual

Because Labrie Environmental Group is constantly updating its products, illustrations used in this manual may differ from those of the actual product and accessories, depending on the model or options that come with your vehicle.

Schematics

For schematics related to body and arm parts, refer to the appropriate *Parts Manual*;

For electrical schematics, refer to the schematics provided with your side loader unit;

As for pneumatic and hydraulic schematics, they are available from Labrie*Plus* Service Department.

NOTE: A number of system schematics are included in this manual.

Warranty Registration Form

Do not forget to complete the owner registration form and to send it to Labrie Environmental Group. Make sure to fill out the in-service date. This date will be used as the start date of the warranty period. If the in-service date is not indicated, the warranty period will start 30 days after the delivery date.

Introducing the HELPING-HAND™ Arm

The HELPING-HAND™ arm is a strong, precise and reliable loading arm that can reach positions of up to 10 feet from the hopper and lift up to 400 pounds fully extended. The HELPING-HAND™ arm is easy to operate with an electric over hydraulic joystick control, and the Zero-Grab low swing-out makes it easy to collect refuse in narrow spaces.

Figure 1-1 HELPING-HAND™ arm

Service and Maintenance on the HELPING-HAND™ Arm

Maintenance on the HELPING-HAND™ arm is of paramount importance to ensure long-lasting durability of all its moving parts as well as optimum performance in heavy work. Maintenance has to be done on almost every system involved in the operation of the HELPING-HAND™ arm, such as the hydraulic, electrical and mechanical systems. Some parts are subjected to more wear and tear than others. Therefore, these parts need regular maintenance and routine check-up to prevent signs of deterioration as soon as possible.

NOTE: Any time you have a problem with a Labrie unit, you should contact your Labrie authorized dealer first. They should be able to provide you with the proper help that you need, whether it is for parts or technical service.

In this manual you will find the most common maintenance and inspection procedures required for the HELPING-HAND™ automated arm.

Parts

Labrie refuse vehicle parts are offered exclusively through Labrie*Plus* and Labrie*Plus* authorized dealers. The quality and reliability of Labrie parts are second to none in the industry.

Warning

The HELPING-HAND™ arm MUST BE COMPLETELY LUBRICATED before its first use. Refer to the arm lube chart near the hopper on the curbside to know where the lubrication points are located on the arm and how often the parts should be lubricated.

Initial lubrication carried out by Labrie Environmental Group is sufficient for production and transport purposes ONLY.

With your safety in mind, we would like to remind you that ONLY QUALIFIED MECHANICS should service the hydraulic, electrical, and pneumatic systems on your side loader. In addition, they should also be fully knowledgeable in the operation of this unit, including its loading arm. Please read the *Operator Manual* prior to attempting any maintenance work on the HELPING-HAND™ arm.

HELPING-HAND™ Arm Basic Maintenance

The HELPING-HAND™ arm requires routine maintenance to ensure product longevity as well as dependability. Various components have specific needs. A detailed portion of these items is listed below:

1) **Lubrication**

The HELPING-HAND™ arm MUST BE COMPLETELY LUBRICATED before its first use.

All moving parts require lubrication for continued operation, longevity and dependability.

Maintenance intervals should be adjusted according to the truck's route or duty cycle. Proper greasing ensures the maximum life from the moving parts as it flushes out water and contaminants from the joint.

When greasing it is important to understand that providing the proper amount of grease is a delicate balance between over greasing, which can result in seal damage as well as wasted lubricant. Only pump enough grease until the air purges from the joint. Commonly, a "popping" sound can be heard as the old grease begins to evacuate the seal. Equally important is to remove the excess grease from the component you are maintaining. Leaving the excess grease will attract dirt and contaminants which could work themselves into the joint causing potential future issues.

2) **Hydraulic Fluid and Filter**

Hydraulic fluid is the lifeblood of your side loader. Regular maintenance of the hydraulics will ensure long, trouble-free life.

As directed in all service training, the hydraulic filter needs to be replaced **after the initial 50 hours of new truck operation and then again every 6 months**, or when the filter restriction gauge is in the yellow. **The hydraulic fluid needs to be replaced once a year** along with the suction screen being removed, inspected, cleaned and/or replaced.

3) **Hardware**

Hardware needs to be verified that it is present and tight. Loose or missing hardware can cause severe damage and/or unsafe operational conditions.

4) **Limit and Proximity Switches**

Limit and proximity switches are used to limit travel of moving parts and/or to ensure conditions are safe for operation.

If these switches are not adjusted properly, damage to the equipment may occur as well as poor or dangerous functionality.

5) **Leaks**

Verify that there are not any leaking hydraulic cylinders, hoses, tubes, valves, or pumps. Leaks in the hydraulic system are an indicator of possibly overheating hydraulics, damage to a seal, over-pressurization, or general wear. To avoid costly and premature replacement of parts, ensure all leaks are addressed properly and timely.

2

Safety

Safety comes first and Labrie Environmental Group is committed to your safety. Ultimately, safety is everyone's responsibility when operating or maintaining a side loader. Make it your first priority! Be aware and apply the safety practices and features detailed in this manual.

Maintenance personnel should not perform any maintenance on the automated arm if they are not well acquainted with the operations of this equipment as well as all safety precautions related to such operations.

Labrie Environmental Group will not accept any responsibility for failures and/or injuries caused by repairs done by the user and/or any persons other than authorized Labrie Environmental Group representatives.

Safety Decals

Recognizing and understanding safety decals can prevent damage and could prevent injury or even death.

See the following recommendations regarding safety decals:

- These decals must be obeyed at all times.
- These decals must be in place at all times. Report any damaged or missing decals to the proper authority at once.

Replacement decals can be ordered free of charge from Labrie*Plus* during the warranty period.

When ordering replacement decals, use the part number as printed on the bottom of each decal.

Bilingual decals are available in English/Spanish or English/French versions.

Safety decals fall into three main categories (see the following illustration).

Figure 2-1 Safety decal categories

Keep your decals clean and in good condition at all times. For a list of safety and informative decals, refer to the *Parts Manual* of your Labrie side loader.

NOTE: Decals may vary from one unit to another depending on the options and features installed on the unit.

Conventions

Throughout this manual "**DANGER**" "**WARNING**" and "**CAUTION**" notations accompanied by an exclamation mark inside a triangle (an International Hazard Symbol) are used to alert the operator and mechanics to special instructions concerning a particular operation or service that may be hazardous if performed incorrectly or carelessly.

Danger!

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

Warning!

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

Caution!

Indicates a hazardous situation which, if not avoided, may result in ***minor or moderate injury or property/product damage.***

Strict compliance to these "safety alerts" combined with "common sense" operations are important accident-prevention measures.

The word "NOTE" is also used throughout the manual. It precedes information that provides special emphasis or clarification on a specific operation or procedure.

Basic Safety Notions

The following safety notions are related to the use of a Labrie side loader. It is important to point out that the safe use of the vehicle remains the user's responsibility. He must heed all safety notions outlined in this manual and on the decals on the vehicle.

Danger!

Always be aware of the vehicle's surroundings to make sure that no pedestrians, passersby, bystanders, or other people or vehicles are in any way exposed to any danger while you operate the side loader.

Danger!

Never get in the hopper area when the engine is running.
Only authorized personnel may do so following a lockout/tagout procedure (see *Locking Out and Tagging Out the Vehicle* on page 14).

Warning!

With your safety in mind, Labrie Environmental Group would like to remind you that ONLY qualified personnel should service the hydraulic, electrical and pneumatic systems on your refuse truck. They must also be knowledgeable about how to operate the truck and installed equipment. Please read the *Operator's Manual* prior to attempting any maintenance or repair on your side loader.

Warning!

When servicing the truck, all post-repair functional tests must be carried out when no one is in the danger zone of the packer. It is also forbidden to be in the packer's danger zone without the truck being locked out and tagged out. Failure to do so could result in serious injury or death.

Warning!

Never put a truck back into service if one or more interlocks have been deactivated. Failure to do so could result in serious injury or death.

Warning!

A truck should not be put back into service if any part, safety device or hardware is missing as it may compromise workers' safety and violate the labor standards legislation. Failure to do so could result in serious injury or death.

Warning!

Inspect hydraulic hose crimps. Replace hoses if they show signs of rust, cracks, abrasion or wear. Failure to do so could result in spills, burns, or serious injury.

Warning!

Inspect hydraulic lines and bushings. Replace lines if rust, cracks or abrasion are present. Failure to do so could result in spills, burns, or serious injury.

Warning!

The EMERGENCY STOP button must *always* be in working order. Never operate a truck with a defective EMERGENCY STOP button. Failure to do so could result in serious injury or death.

Responsibilities

Safety is everybody's responsibility. Both the employer and employees must play their part to ensure safe working conditions in, on, and around the truck and to promote and enforce safe work practices and procedures to prevent injuries and incidents as well as property/equipment damages.

Employer Responsibilities

It is the responsibility of the employer:

- To ensure that the side loader is operated in accordance with all applicable regulations, including all safety requirements and codes set by the Occupational Safety and Health Administration (OSHA) and by the American National Standards Institute (ANSI).
- To ensure that employees are qualified for operating or maintaining the vehicle and its equipment, and that they all take safety measures before working in, on, and around them.
- To properly maintain all mobile equipment to meet all state/provincial and federal safety standards.
- To supply adequate safe vehicle/equipment instructions and training to employees before allowing them to operate or maintain refuse vehicles or equipment.
- To keep the automated arm maintained and properly adjusted to meet the manufacturer's standards and recommendations. For help or for more information, please contact the manufacturer or any of its authorized representatives.
- To keep records of all vehicle breakdowns and malfunctions, as well as any inspection and maintenance.
- To ensure that all failures or malfunctions that may be affecting the safe use of the vehicle are repaired before the vehicle is put back into operation.
- To take necessary measures if an employee reports arm damage or malfunction.

- To establish and ensure the application of a "lockout/tagout" procedure (see page 14) any time inspection, repair or maintenance is performed on the arm, regardless of whether it takes place on the road or in the garage.

Employee Responsibilities

It is the responsibility of the employee:

- To enforce all safety measures to meet the requirements set by the employer.
- To operate the HELPING-HAND™ arm only after having received instructions and training.
- To immediately report any damage or malfunction to the vehicle or equipment to the employer or supervisor.
- To make sure that no one is near the vehicle before activating any of the controls, and to be prepared to stop at any indication of possible danger.

Do's

- Make sure that the area is clear of people or possible obstructions.
- Inspect for overhead hazards (power lines) prior to using the arm.
- Obey all warning and operation stickers.

Don'ts

- Do not operate this vehicle or any of its equipment while under the influence of alcohol, narcotics or other intoxicants.
- Do not talk on a cell phone or listen to loud music while driving.
- Do not wear jewelry or loose clothing.
- Do not leave the vehicle before it is brought to a complete stop and the work or parking brake is engaged.
- Do not enter the hopper or main body unless the engine is shut off, the key is removed and there is an out-of-service tag on the steering wheel. Refer to "Locking Out and Tagging Out the Vehicle" on page 14.

Warning!

Prior to its first use, your side loader *must be completely lubricated*, as shown on the Lube Chart sticker located on the body curbside, near the hopper.
Initial lubrication carried out by Labrie Environmental Group is sufficient for production and transport purposes *only*.

Only qualified personnel should service the hydraulic, electrical, and pneumatic systems of this vehicle. They should also be knowledgeable about the operation of the vehicle.

General Precautions

Danger!

Maintenance personnel must adhere to the following precautions *at all times*. Failure to do so may result in vehicle and/or property damage, personal injury, or even death.

- Read and make sure that you fully understand this manual and all safety decals before performing maintenance on the vehicle. Maintenance personnel must also read and understand the *Operator's Manual* of the vehicle. In case of doubt, ask a supervisor for clarifications.
- When driving the vehicle, keep both hands on the steering wheel at all times.
- Always put on the parking brake when exiting the cab.
- When the vehicle is parked, the parking brake *must* be applied.
- To prevent injury to nearby people, and damage to property and/or to the lifting arm itself, maintenance personnel must be able to stop arm movement at any time.
- Before activating the lifting arm, maintenance personnel shall make sure that people and obstructions are far away from the vehicle.
- Do not operate this vehicle if there are any signs of damage or incomplete repairs.
- Report any doubts that you might have regarding this vehicle to a supervisor.
- Never place head, body, fingers or any limbs into a scissors point or pinch point on the equipment.
- Start the engine following the manufacturer's recommended procedure.
- When driving, wear your seat belt.
- *Never* drive this vehicle with the tailgate unlocked.
- Hopper door must be maintained and latched in place while operating equipment.
- Ensure all co-workers are in view before operating or moving the unit or any of its controls.
- When removing nylon locknuts, *always* replace them by new ones.
- Before opening and closing the tailgate(s) and/or raising the body, make sure that there is no one behind the vehicle.
- Before operating the vehicle the driver must be thoroughly familiar with the employer's safety program concerning traffic rules, warning devices and hand signals.
- Be sure to know where to get assistance in the event of an emergency.
- Know the location and function of all controls, gauges, instruments and protective devices.
- Maintenance personnel must read and understand this manual before doing any repair work. In case of doubt, ask a supervisor for clarifications.
- *Never* stand underneath a raised arm/grabber. Should a hydraulic component break, such as a hydraulic hose, failure to stay away from the arm may result in personal injury or even death.
- Keep handrails and steps clean and free of grease or debris.
- Follow all safety directions listed in both *Operator* and *Maintenance Manuals* under SAFETY.

- *Never, under any circumstances* (maintenance or otherwise), stand underneath a *loaded* body.

Caution!

Maintenance and repairs carried out on this vehicle must only be done by qualified mechanics who are familiar with the equipment.

Hydraulics

- Hydraulic fluid operates under high temperatures. Avoid contact with piping, hoses or cylinders to prevent burns.
- Never use hands to check for leaks. Hydraulic fluid escaping under pressure may cause injury.

Fire Protection

- The employer must inform and train all personnel on the measures that must be taken in case of a vehicle and/or loaded body catching fire.
- Anytime a loaded vehicle is *brought inside a garage,* fire extinguishers shall be close at hand.

Danger!

Do not perform any repair or maintenance on a vehicle that has not been unloaded.

- The employer must also inform employees of an appropriate place to unload the body near the maintenance facility (preferably away from traffic, surface drains, and ditches).
- Keep a fire extinguisher accessible at all times.
- Never use lighted smoking materials, open flame or sparks around when working with flammable materials such as fuel tanks or storage batteries.
- Never have an open flame as a light source.

NOTE: Labrie side loader vehicles are equipped with a 5-lb fire extinguisher, which is located inside the cab. A 20-lb fire extinguisher may also be installed as an option. Each fire extinguisher must be checked regularly by qualified personnel.

NOTE: A first-aid kit and a triangle kit are provided with the truck.

Locking Out and Tagging Out the Vehicle

For any inspection, repair or general maintenance being done on the vehicle, whether on the road or at the shop, it is the employer's responsibility to establish and see to the application of a proper lockout and tagout procedure.

To lock out and tag out your side loader unit:

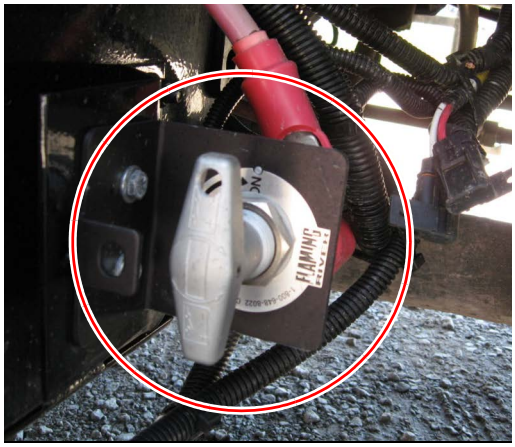
1. Park the vehicle on safe, level ground and apply the parking brake (see Figure 2-2).

Figure 2-2 PARKING BRAKE button

2. Make sure that the body is completely unloaded.
3. Switch off the hydraulic pump.
4. Turn off the engine, remove the key from the ignition, store it in a safe and controlled area (preferably on yourself), and tape over the ignition switch.
5. Turn off and lock the master switch.
6. Chock all wheels.

IMPORTANT: Depending on the chassis model, the battery set of your side loader may be equipped with a master switch (see Figure 2-3) that must be turned off.

Figure 2-3 Master switch



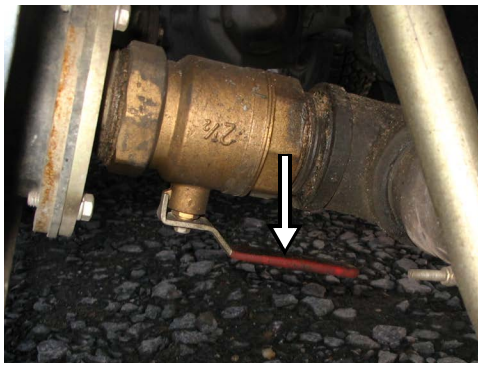
7. Put an "OFF SERVICE" tag on the driver's wheel and on the front windshield.
8. Use safety props to block any system that could move by gravity (open tailgate, raised body, etc.).
9. Drain all air tanks.
10. Verify and inspect any security device and/or mechanism to make sure that there is no bypass and that they are all functional.

Prior to Start Up

Before starting the vehicle:

1. Make sure no system will engage and/or start to operate as you start the engine.
2. Make sure the shut-off valve on the hydraulic tank is fully open before starting the vehicle (see Figure 2-4).

Figure 2-4 Shut-off valve



NOTE: The hydraulic tank model may vary according to the options installed on the vehicle.

Warning!

Failure to fully open the shut-off valve will cause immediate damage to the pump, even if the pump is turned off.

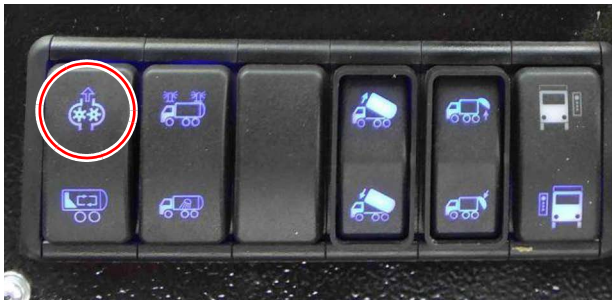
3. Once the engine is started, wait for the air pressure to build up to *at least* 70 psi.

Figure 2-5 Air pressure indicator

IMPORTANT: Do not operate or move the vehicle until the air pressure has reached 70 psi.

4. Engage the hydraulic system by turning ON the PUMP switch on the in-cab control panel (see Figure 2-6).

Figure 2-6 PUMP switch



- A green switch means the pump is active.
- A blue switch means the pump is not active.

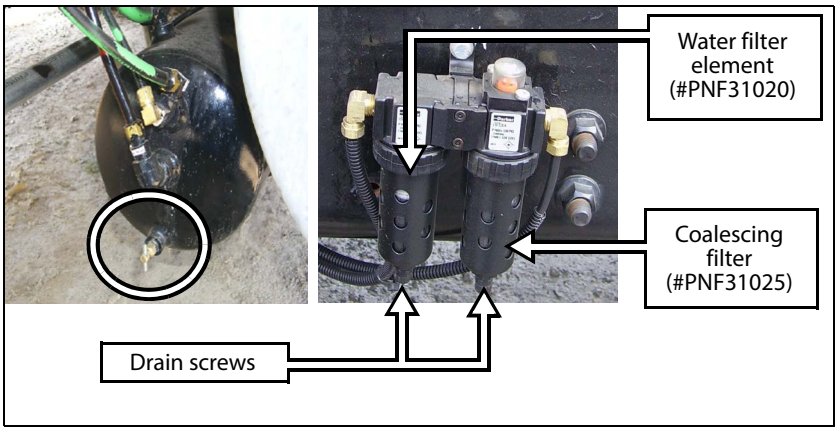
Shutting Down the Vehicle

If the vehicle has to be stored for an extended period of time, follow the chassis manufacturer's shutdown and maintenance requirements.

Also:

1. Park the vehicle on a hard, level surface and apply the parking brake.
2. Make sure that all moving parts are in their home position (tailgate, arm, body, crusher panel, packer, etc.).
3. Turn OFF, in sequence, the hydraulic pump, the electrical system, the engine and (if installed) the master switch.
4. Drain all air tanks, including the water and coalescing filters of the air filter assembly.

Figure 2-7 Drain valve on air tank (left), air filter assembly (right)



NOTE: Both filters of the air filter assembly (#PNF31000) [see Figure 2-7] must be changed twice a year.

3

The HELPING-HAND™ Arm

To keep the arm in good working order and to reduce the amount of down time and the risk of accidents, a preventive maintenance program must be implemented and followed thoroughly.

Maintenance personnel must be familiar with the operation of the arm, the safety around it and the maintenance procedures described in this chapter.

Daily Inspection

Danger!

Always lock out and tag out the vehicle during inspection and maintenance (see *Locking Out and Tagging Out the Vehicle* on page 14)

On a daily basis, perform a visual inspection of the arm, looking for leaks, cracks or premature wear of the moving parts. For location of the grease zerks on the automated arm, see chart on page 68.

To perform the daily inspection:

1. Start the engine and engage the hydraulic pump (pump switch ON).
2. Fully extend the arm.

Danger!

Do not stand directly in the path of the arm while performing the inspection.

NOTE: If the vehicle is equipped with an auxiliary arm control panel under the right-hand side seat just next to the cab door, you will have to push the deadman switch first in order to enable this auxiliary control panel.

3. Turn off the hydraulic pump and the engine.
4. Perform a visual inspection of the following items:

Figure 3-1 Mounting bolts

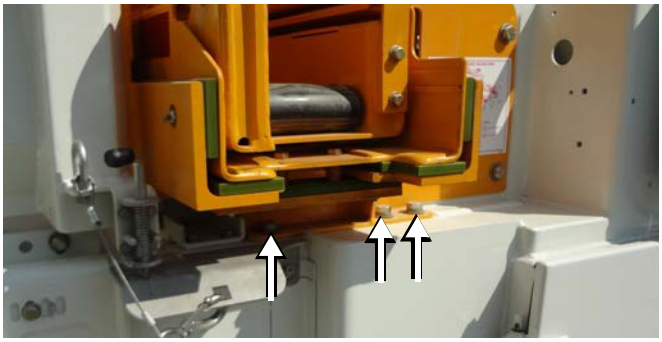


Figure 3-2 Wear pads

Figure 3-3 Helping-Hand™ grabber

Figure 3-4 Hoses and connections

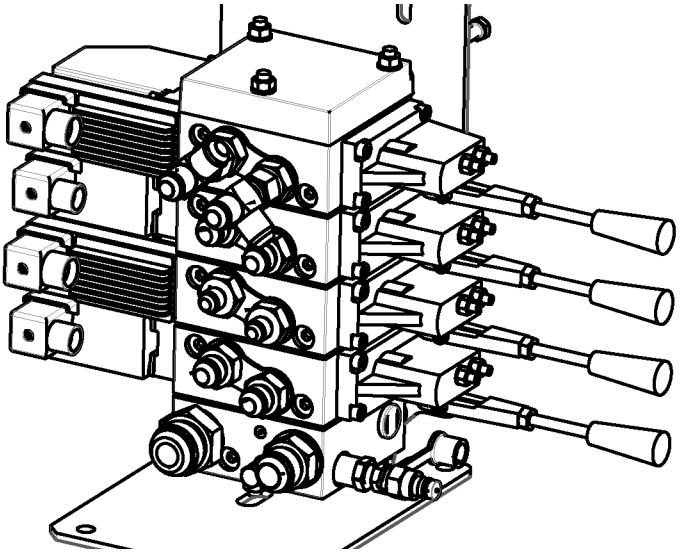
NOTE: The preceding photos are for illustrative purposes only and may not reflect the actual unit.

5. Check for loose nuts and bolts.
6. Check the arm stowed limit switch.
   For more information, see *Arm Limit Switches* on page 31.
7. Lubricate the arm moving parts as per the arm lubrication chart on page 68.
8. Lock out and tag out the vehicle (see *Locking Out and Tagging Out the Vehicle* on page 14).

Arm Hydraulic System

The side loader equipped with the HELPING-HAND™ automated arm uses an independent hydraulic valve to control all arm functions. This valve is of the proportional type, meaning that the amount of flow coming out of it will be according to the position of the spool[1].

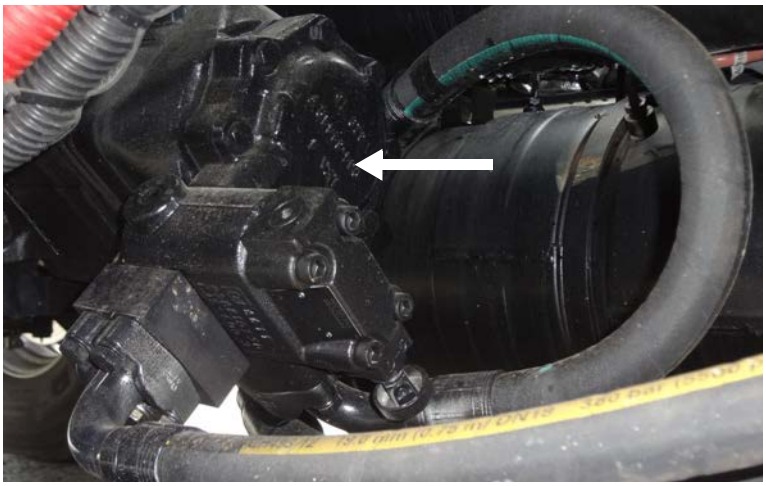
Figure 3-5 Proportional valve



Arm in/out	Out: lever to left - In: lever to right
Arm up/ down	Down: lever to left Up: lever to right
Grabber open/close	Close: lever to left Open: lever to right

The hydraulic flow required to feed the valve comes from the dual vane pump.

Figure 3-6 Dual vane pump



1. **Except for the grabber, crusher and chute sections of the valve which do not modulate the hydraulic flow into the grabber cylinder.**

Adjusting Valve Pressure

The following pressure adjustment procedure explains how to adjust the pressure of each function of the HELPING-HAND™ automated arm.

The lockout/tagout procedure must be performed each time maintenance has to be done on the vehicle. See *Locking Out and Tagging Out the Vehicle* on page 14.

Before adjusting the valve pressure, make sure to identify each section of the valve (see Figure 3-5) and its adjustment screws.

NOTE: Extra personnel may be needed to adjust arm pressure correctly.

IMPORTANT: Always use safety precautions when performing maintenance tasks.

Warning! Stay out of the path of the arm while manually moving the HELPING-HAND™ lifting arm. Serious injury or even death may result.

Pressure Adjustment Table		
Arm Function	**Pressure Setting**	**Cycle Time[a]**
Arm Extend	System Pressure	3.7 - 4.2
Arm Retract	System Pressure	2.8 - 3.3
Arm Up	System Pressure	2,5 - 3,0
Arm Down	System Pressure	2.5 - 3.0
Grabber Close	1200 psi (±50 psi)	1.0 - 1.5
Grabber Open	1200 psi (±50 psi)	1.3 - 1.8

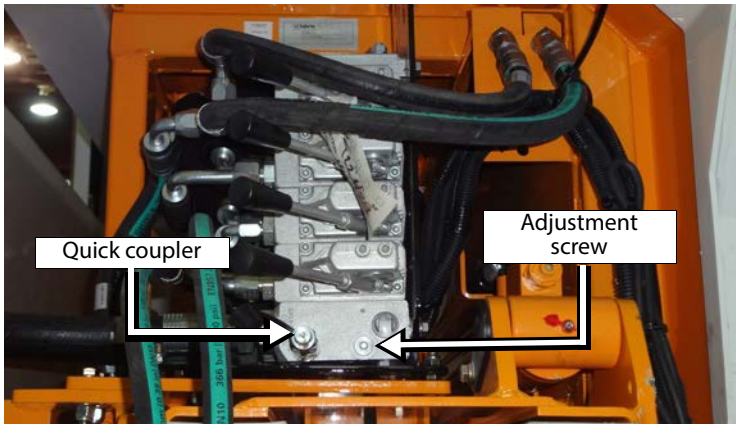
a. **Cycle time is defined as the time required for a function to complete a full back and forth movement. Cycle time may vary depending on weather conditions**

Warning! Before making any adjustments, secure the arm working area using safety tape or barricades.

Main Relief Valve Adjustment Procedure:

1. Remove any residual hydraulic pressure in the system by moving the levers back and forth.
2. Connect a 0-4000 psi gauge to the quick coupler located on the valve (see Figure 3-7).
3. Make sure the transmission is in neutral.
4. Start the engine.
5. Engage the hydraulic system.
6. Retract and maintain the arm to the end of its stroke in order to make the pressure rise on the gauge.
7. Adjust the main relief valve to 2000 psi using the adjustment screw (see Figure 3-7). Turn the hex key clockwise or counterclockwise to adjust the pressure properly.

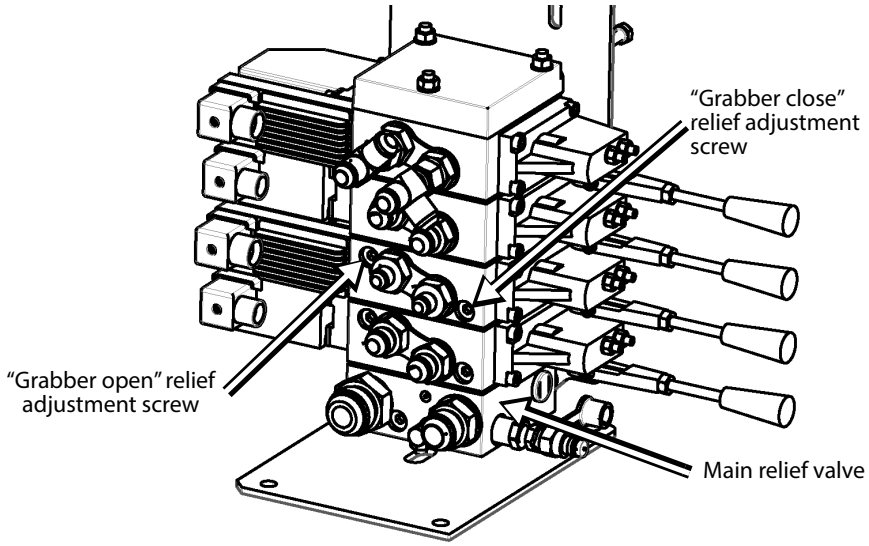
Figure 3-7 Main relief valve



Arm Function Adjustment Procedure

The operating pressure of the arm (retract/extend) and the grabber (up/down) depends on the pressure that is generated by the hydraulic system. No adjustment is required for these functions. Only the grabber closing and opening pressures require adjustment to prevent crushing roller carts and damaging the grabber. Apply the following procedure to adjust the relief valves on the grabber section (refer to *Pressure Adjustment Table* on page 28).

Figure 3-8 Grabber relief adjustment screws



Warning! Do not stand directly in the path of the arm while carrying out these adjustments.

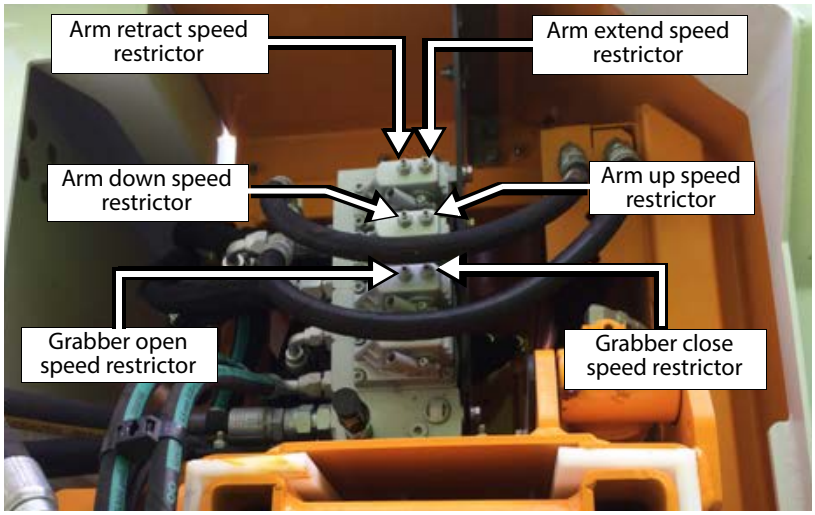
Grabber Closing/Opening Pressure Adjustment Procedure:

1. Secure the arm working area using safety tape or barricades.
2. Remove any residual hydraulic pressure in the system by moving the levers back and forth.
3. Connect a 0-4000 psi pressure gauge to the quick coupler located on the hydraulic valve.
4. Put the transmission in neutral.
5. Start the engine.
6. Engage the hydraulic pump.
7. Close the grabber using the appropriate lever on the valve (see Figure 3-5).
8. Adjust the relief valve for the "grabber close" side of the valve section to 1200 psi (screw or unscrew depending on the gauge reading).
9. Open the grabber and adjust the relief valve for the "grabber open" side of the valve section to 1200 psi (screw or unscrew depending on the gauge reading).

Arm/Grabber Speed Adjustment

The arm/grabber speed depends on the amount of hydraulic fluid that is being sent to the arm cylinder. The valve spool can let through up to 28 gallons of hydraulic oil per minute (gpm), depending on the valve section. The flow is also limited by a mechanical movement restrictor (or stopper).

Figure 3-9 Movement restrictors



NOTE: The arm movements (extension/retraction, up/down) have been preset in factory to the maximum speed. The grabber movements (opening/closing) have also been set in factory to their optimal value in order to allow for smoother grabbing of carts.

Speed Adjustment Procedure:

1. Secure the arm working area using barrier tape or barricades.
2. Put the transmission in neutral.
3. Start the engine and engage the hydraulic system.
4. Clearly identify the restrictor screw on the valve that corresponds to the proper function (boom extension/retraction, grabber opening/closing, etc.) [see Figure 3-9]. Move the lever to evaluate the speed of the arm/grabber, then let go of it.

Caution! When adjusting the arm up/down speed, make sure the auto-closing feature allows the grabber to close sufficiently to avoid the grabber hitting the hopper walls.

5. Loosen the locknut.
6. Turn the restrictor adjustment screw only one-eighth (1/8) of a turn at a time to see if the arm/grabber speed has changed significantly.
7. Move the lever again to evaluate the arm/grabber speed.

8. Repeat until cycle times are properly set.
9. Once the adjustment is completed, tighten the locknut.

IMPORTANT: The speed of the grabber must be fast enough so that the latter does not come in contact with the body during the auto-closing stage when the grabber reaches the mid-height position.

NOTE: Limiting the stroke of the spools is limiting the amount of oil (flow) going through them. Controlling the oil flow means controlling the arm/grabber speed.

Adjusting Pressure on the Grabber Cylinder Holding Valve

The grabber cylinder holding valve (see Figure 3-10) is used to prevent the grabber from closing unexpectedly. An adjustable cartridge is directly mounted on the cylinder.

To adjust the grabber holding valve pressure:

1. Apply all safety measures to ensure safety around the vehicle at all times.
2. Make sure that the parking brake is applied.
3. Locate the grabber holding valve (see Figure 3-10).
4. Connect a pressure gauge to the arm valve quick coupler (see Figure 3-11).

Figure 3-10 Grabber cylinder holding valve

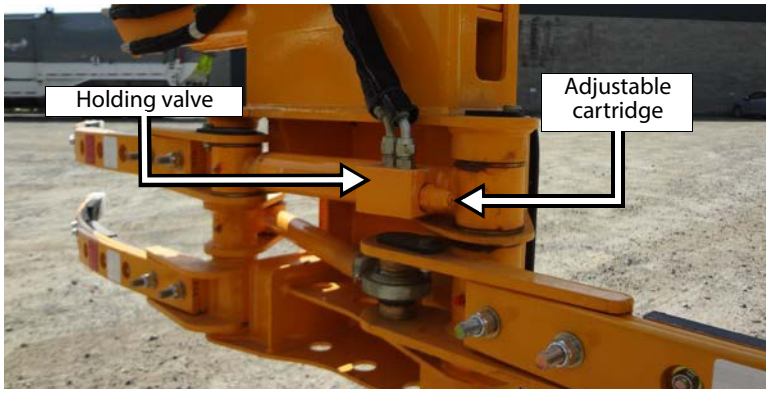
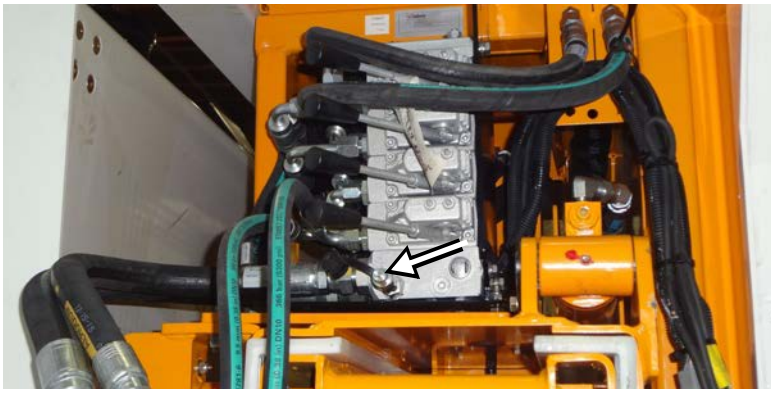


Figure 3-11 Quick coupler for pressure gauge



5. Start the engine and engage the hydraulic pump.
6. Slowly move the lever on the grabber section of the arm valve (see Figure 3-5) and read the pressure on the pressure gauge at the time the grabber starts closing.

   The closing movement must begin when the pressure reaches 550 psi.
7. If the pressure is below or over that value when the grabber starts closing, adjust the holding valve pressure accordingly using the adjustable cartridge (see Figure 3-10).

NOTE: Turn the screw counter-clockwise to increase pressure or clockwise to reduce pressure.

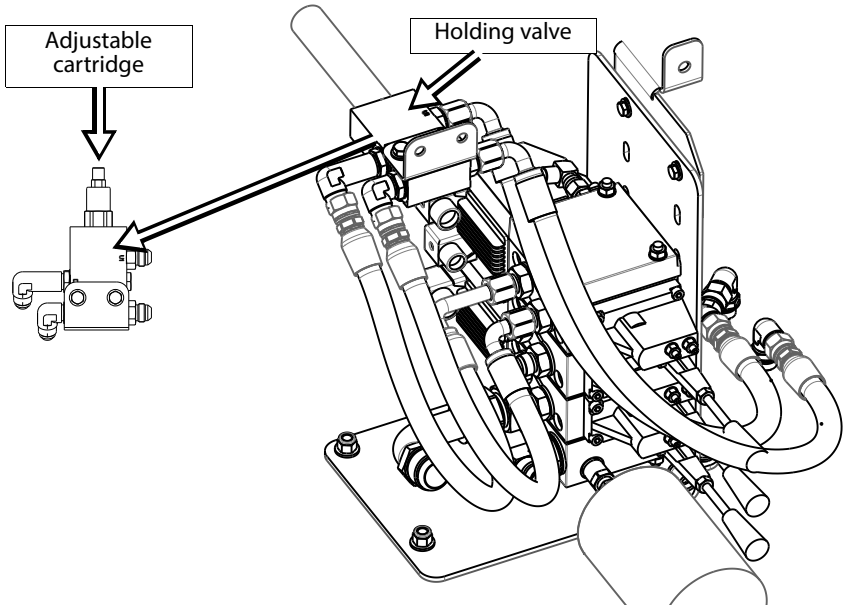
Adjusting Arm In/Out Holding Valve Pressure

NOTE: The following procedure applies only to side loader units equipped with 2 HELPING-HAND™ arms.

On a 2-HELPING-HAND™ arm equipped side loader unit, there are 2 holding valves, one for each automated arm. These valves (see Figure 3-12) are used to prevent one arm from extending suddenly while the other is being used. An adjustable cartridge is assembled on each holding valve and can be used to adjust the valve pressure.

NOTE: The following procedure can be used to adjust the pressure of both holding valves.

Figure 3-12 Arm in/out holding valve



To adjust the arm in/out holding valve pressure:

1. Apply all safety measures to ensure safety around the vehicle at all times.
2. Make sure that the parking brake is applied.
3. Locate one of the arm in/out holding valves (see Figure 3-12).

   Each of the automated arms has its own arm valve to which a holding valve is attached.
4. Connect a pressure gauge to the quick coupler (see Figure 3-11) of the arm valve that controls the right arm or the left arm.

   Proceed with one arm at the time.
5. Slowly move the lever on the arm in/out section of the arm valve (see Figure 3-5) and read the pressure on the pressure gauge at the time the arm starts extending.

   The extending movement must begin when the pressure reaches 650 psi.
6. If the pressure is below or over that value when the arm starts extending, adjust the holding valve pressure accordingly using the adjustable cartridge (see Figure 3-12).

NOTE: Turn the screw counter-clockwise to increase pressure or clockwise to reduce pressure.

7. Repeat same procedure for the other arm.

Adjusting the Arm Vane Pump Relief Valve

Usually, there is no arm vane pump relief valve on a side loader unit. However, if your side loader is equipped with such a valve, it would be located on the front of the pump.

Tighten the relief valve completely on the pump.

The arm (retract/extend) and grabber (up/down) operating pressures are the same as the main relief valve. Table 1 lists the operating pressure and cycle time for each arm function. No adjustments are required for these functions. Only "grabber close" requires proper adjustment to prevent crushing roller carts. See *Lubrication Chart and Hydraulic Schematic* on page 68 to adjust the grabber load sense relief valve.

Table 1 Arm operating pressures and cycle times

Arm function	Pressure setting (psi)	Cycle time (sec.)
Extension/retraction	2000	2.8/4.2
Grabber up	2000	3.0
Grabber down	2000	3.0
Grabber close	1200	1.5
Grabber open	1200	1.8

Bypassing a Dump Valve for Diagnostic Purposes

This procedure explains how to bypass the arm dump valve off of a front-mounted pump for a side loader.

When arm cycle times and pressures are not able to be achieved, typically there are 2 components that cause this: the dump (or recirculation) valve or the pump. The first step in troubleshooting is to verify that the electrical system is operating correctly. If the dump valve is receiving proper power and ground, causing the coil to magnetize, then we can continue with bypassing the arm dump valve.

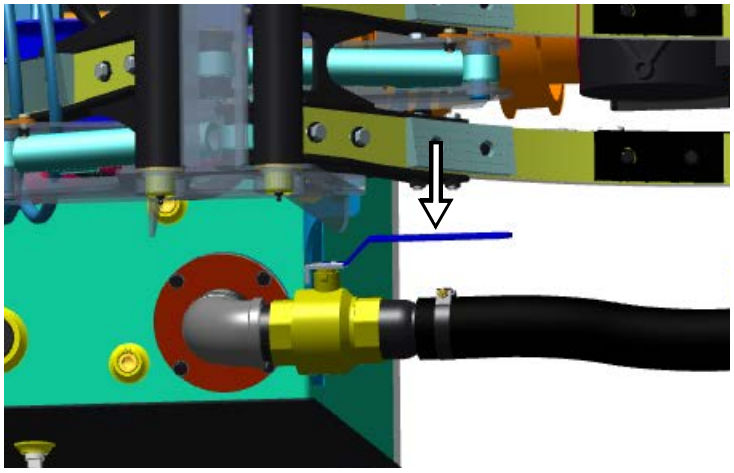
Next step is to remove the dump valve all together and verify operation. If the arm operates with the correct cycle times and pressures, then we can conclude that the dump valve is faulty and needs to be replaced.

However, should the arm continue to have slow cycle times and low pressures, then the fault more than likely is with the pump.

To bypass the arm pump dump valve on a front-mounted pump, apply this procedure:

1. The truck should be off and locked out/tagged out following all required procedures.
2. Relieve the air pressure from the hydraulic tank.
3. Close the shut-off valve on the suction line, which is on the right side of the hydraulic tank.

Figure 3-13 Shut-off valve



4. Unplug the arm pump dump valve electrical connector and stow the harness safely out of the way.
5. Remove the recirculation hose from the body pump and cap off both the disconnected hose end and the port at the body pump.

Figure 3-14 Recirculation hose

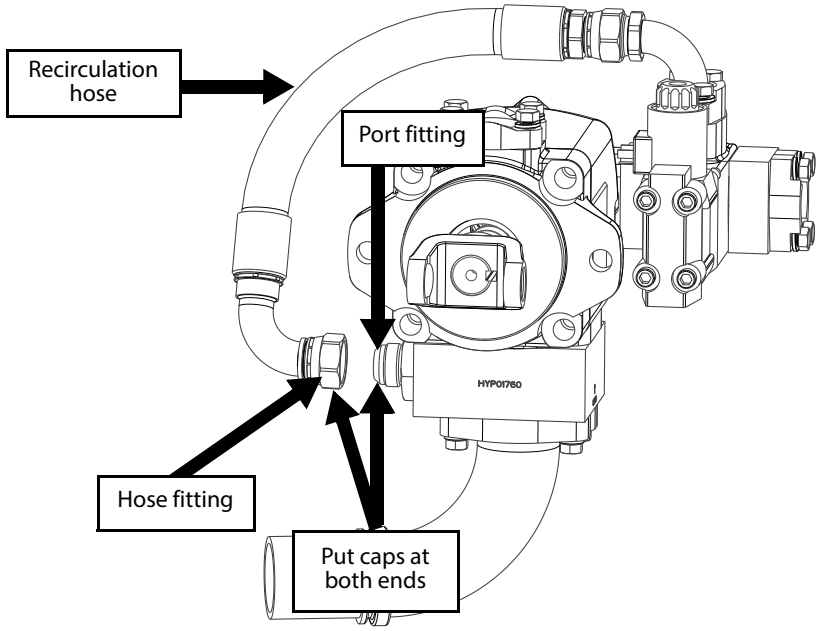
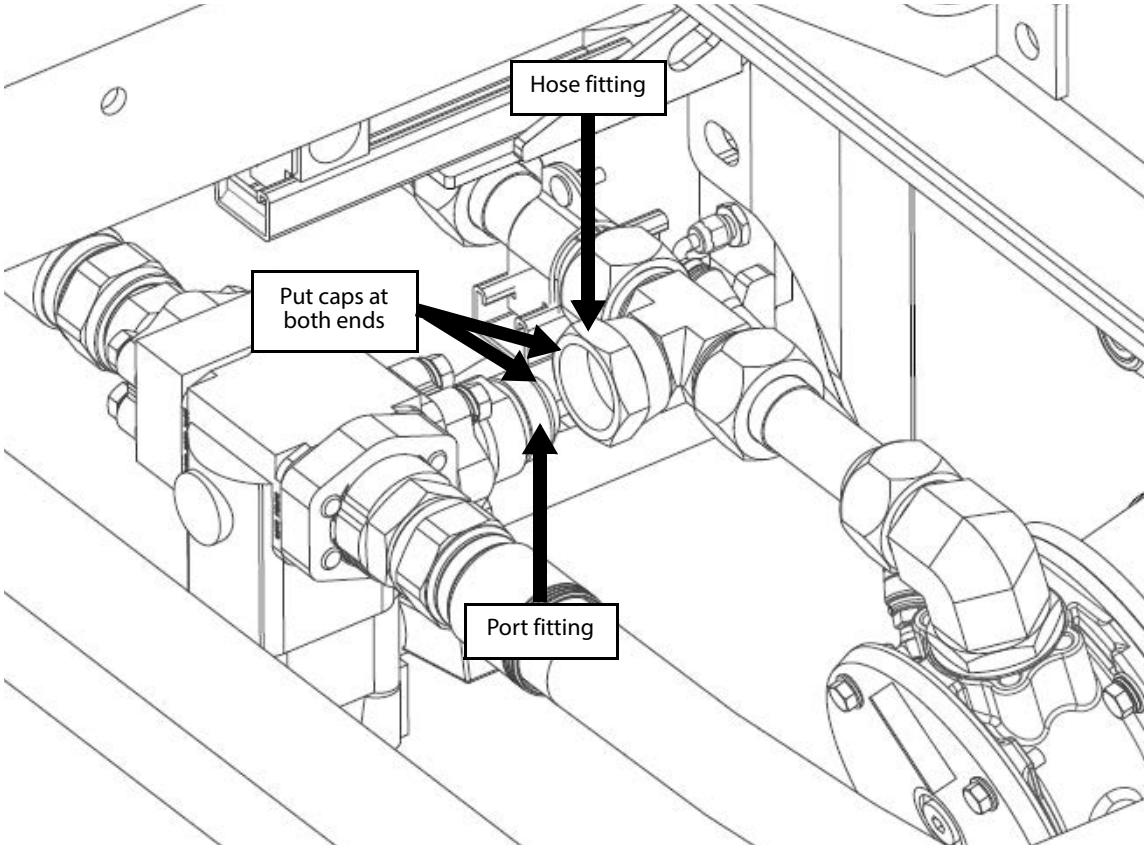


Figure 3-15 Dump valve assembly inside chassis



6. Open the shut-off valve that was closed in step 3.
7. Start the truck.

Warning!

Note that the second the truck is running there will be hydraulic fluid going to the arm valve assembly. The Emergency Stop will not stop the hydraulics from working, only turning the truck off will. Ensure everyone, and everything, is out of the way of the arm in case it moves on its own should there be an electrical short or a catastrophic failure internal to the valve assembly. Never operate the truck without the dump valve being functional. The truck must remain at idle speed. The pump is always running and, in addition, there is no flow limitation. Always use caution when bypassing a dump valve.

Now that the arm dump valve is bypassed, we will be able to identify if the arm pump or arm dump valve is faulty. Simply go to the arm valve assembly and operate the arm manually.

- If the cycle times and pressures are correct, then the arm dump valve is faulty.
- If the cycle times and pressures are still not correct, then the arm pump is faulty.

8. Assembly in the opposite of disassembly.

Arm Limit Switches

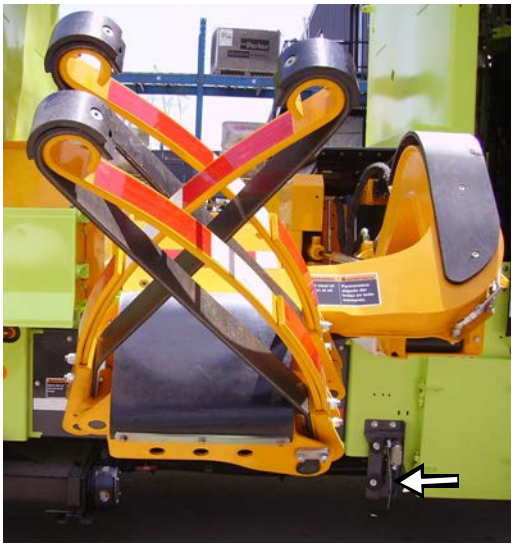
Limit switches act as remote electrical on/off switches and must be adjusted properly.

Warning

Limit switches must function properly. Serious damage to the equipment, injuries or death may occur if you operate the machinery with improperly adjusted limit switches.

Adjusting Arm Stowed Limit Switch

The arm stowed limit switch illuminates the ARM OUT warning lights on the dashboard when the operator extends the arm or closes the grabber. If this limit switch is misaligned, the warning lights on the dashboard may continue to flash even if the grabber is fully open and the arm fully retracted. The arm stowed limit switch also activates an audible alarm when the arm is out and the vehicle speed is greater than about 3 mph (5 km/h).



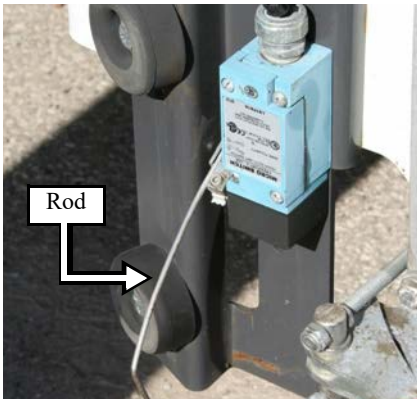
NOTE: This photo is for illustrative purposes only and may not reflect the actual unit.

This limit switch is located behind the grabber's right side fingers (see photo above). On dual HELPING-HAND™ units, the arm stowed limit switch on the street side is behind the grabber's left side finger.

To adjust the arm stowed limit switch:

1. Park the vehicle on safe, level ground.
2. Fully open the grabber and retract the arm alongside the body.
3. Adjust the limit switch in such a way that the ARM OUT warning lights stop flashing when the grabber is fully open and the arm is fully retracted. To do this:
   - **3 a.** Loosen the limit switch nut.

3 b. Adjust the rod so that the grabber's fingers will trigger the limit switch (click sound) and turn off the warning lights.



3 c. Retighten the nut.

4. Slightly close the grabber or extend the arm out (about 1 inch). The ARM OUT warning lights should start flashing.

5. Repeat the procedure until the limit switch is properly adjusted.

Danger!

This limit switch MUST be working at all times. Otherwise, the operator may not be aware that the arm is not fully retracted or that the grabber is open or closed. This may cause accidents, injuries and/or property damage.

Caution!

This procedure must be done correctly before adjusting the grabber auto-closing system.

Adjusting Arm Parked Limit Switch

Centrally located inside the Helping-Hand™ arm assembly, near the top cover, the arm parked limit switch (see Figure 3-16) sends a signal to the controller module that the automated arm is in the parked travel position inside the hopper and turns off the ARM EXTENDED warning light on the dashboard (see Figure 3-19).

To adjust this limit switch apply the following procedure:

1. Take down the gripper completely by using the joystick.
2. Fully extend the arm.

Danger! Do not stand directly in the path of the arm while carrying out these tasks.

3. Turn OFF the engine.
4. Proceed with the tagout/lockout procedure. Refer to "Locking Out and Tagging Out the Vehicle" on page 14.
5. Open the black plastic spring-equipped retracting cover that is on top of the arm base (see Figure 3-17).

   Use a stepladder for easy access to that section of the arm.
6. Unscrew the screws that hold the limit switch lever in place (see Figure 3-18).
7. Raise or lower the detection lever a little bit and tighten up the screws (see Figure 3-18).

   The detection lever or actuator must touch the black curved plastic cover when the arm is in the hopper for the switch to be triggered.

Warning Injury or death may occur if you attempt to enter the body while the packer or arm is in motion.

8. Close the black plastic springed cover.
9. Start the engine and engage the hydraulic pump.

Caution Make sure the ball valve on the suction line is fully open before starting the vehicle.

10. Test the operation.
11. Repeat the procedure until the limit switch is properly adjusted.

The ARM EXTENDED warning light (see Figure 3-19) should turn off when the arm is in the parked travel position.

Figure 3-16 Arm parked limit switch

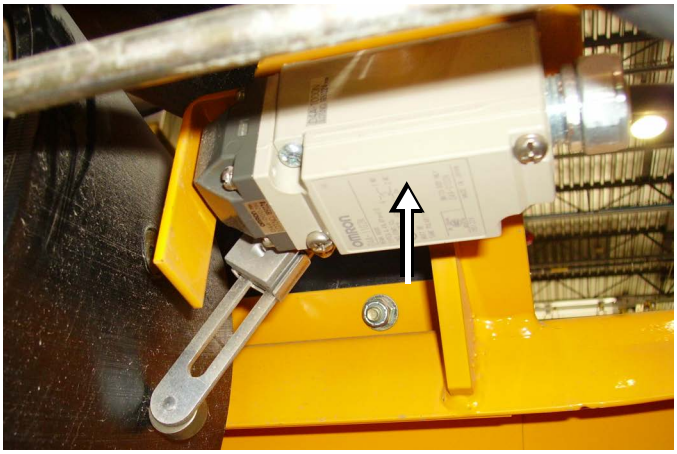


Figure 3-17 Helping-Hand™ arm base

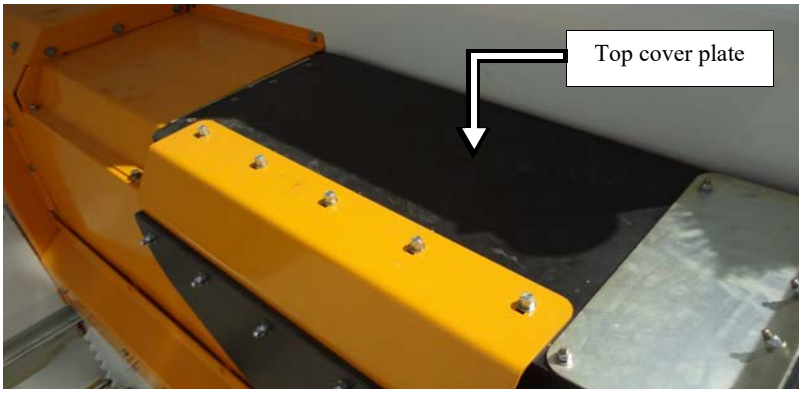


Figure 3-18 Arm parked limit switch adjustment

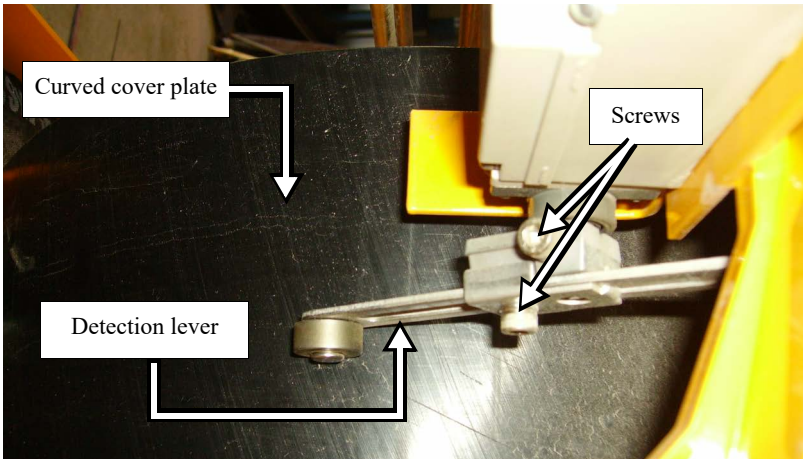
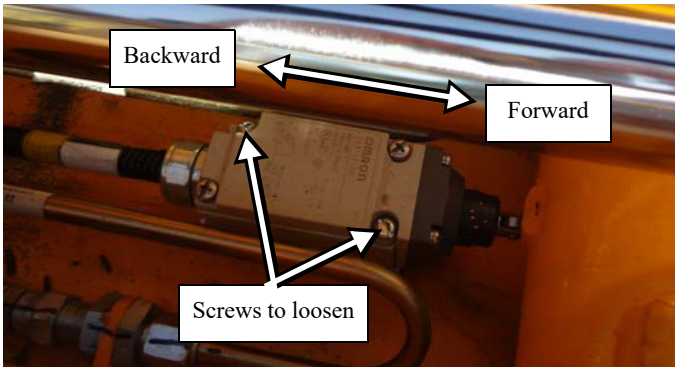


Figure 3-19 Arm extended warning light

Adjusting Mid-Height Limit Switch

The mid-height limit switch is located at the base of the Helping-Hand™ automated arm (Figure 3-20). This limit switch is part of the gripper auto-closing system. Each time the gripper reaches a certain height, it closes automatically in order not to hit the vehicle.

Figure 3-20 Mid-height limit switch



To adjust the mid-height limit switch:

1. Fully extend the arm.

Danger! Do not stand directly in the path of the arm while carrying out these tasks.

2. If not already done, raise the gripper to 90 degrees.
3. Turn OFF the engine.
4. Proceed with the lockout/tagout procedure. Refer to “Locking Out and Tagging Out the Vehicle” on page 14.
5. Locate the mid-height limit switch at the base of the Helping-Hand™ arm.

6. Loosen the two screws indicated in Figure 3-20.
7. Slide the limit switch forward or backward to achieve proper contact with the target.
8. Once done, retighten the screws.
9. Test the operation.
10. Repeat the procedure until the limit switch is properly adjusted.

NOTE: The roller located at the front end of the limit switch must be vertically positioned. In case it is not, you will have to unscrew all 4 screws that secure the front end to the rest of the switch, and turn the front end either clockwise or counterclockwise in order to position the roller vertically. Then replace all 4 screws and tighten them up.

IMPORTANT: All limit switches MUST be working at all times. Otherwise, the operator may not be aware that the arm is not fully retracted or that the gripper is open or closed. This may cause an accident, injuries or property damages.

Cylinder Cushion Adjustment

The up/down and in/out cylinders are cushioned at the end of their strokes to give a smoother movement. The cushioning speed is adjustable directly on the cylinders using two adjustment screws. If the grabber or the arm hits hard at the end of its strokes, apply the following procedure.

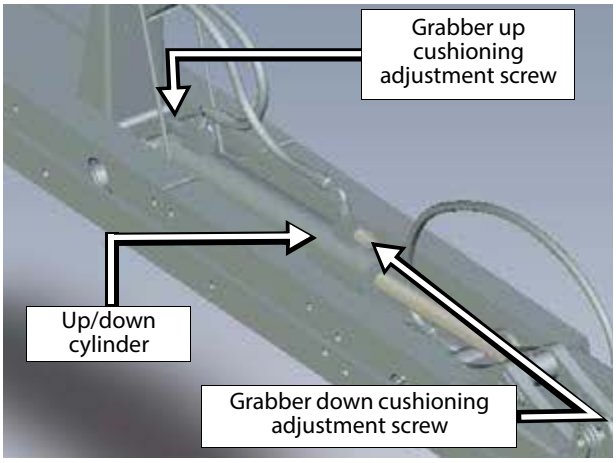
Up/down Cylinder Cushioning Adjustment:

1. Secure the arm working area using barrier tape or barricades.
2. Put the transmission in neutral.
3. Start the engine and engage the hydraulic pump.
4. Fully extend the automated arm to access the arm up/down cylinder from the top (see Figure 3-21).
5. Run the grabber arm for a full up/down cycle to determine if the amount of cushioning has to be adjusted.
6. If an adjustment is necessary, stop the hydraulic pump and turn OFF the engine.

NOTE: To be able to make the necessary adjustment, the temperature of the hydraulic oil must be around 140° F.

7. Tighten the corresponding adjustment screw to obtain a smoother movement at the end of the stroke or loosen the screw if the movement is too slow (no shock should occur).

Figure 3-21 Cushioning adjustment screws (up/down cylinder)



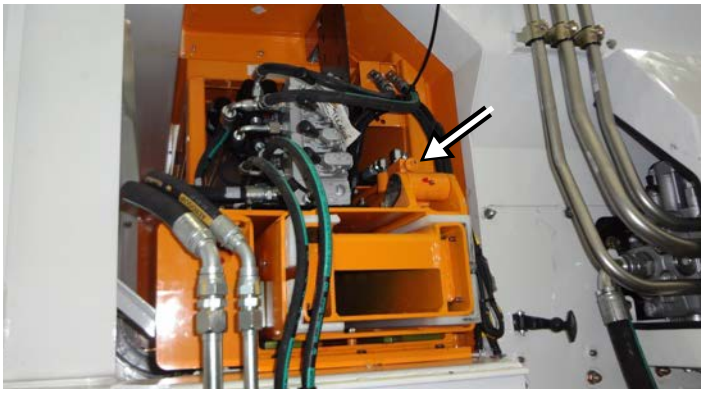
In/out cylinder cushioning adjustment:

1. Secure the arm working area using barrier tape or barricades.
2. Put the transmission in neutral.
3. Start the engine and engage the hydraulic pump.
4. Run the arm for a full extent/retract cycle to determine if the amount of cushioning has to be adjusted.
5. If an adjustment is necessary, stop the hydraulic pump and turn OFF the engine.

NOTE: To be able to make the necessary adjustment, the temperature of the hydraulic oil must be around 140° F.

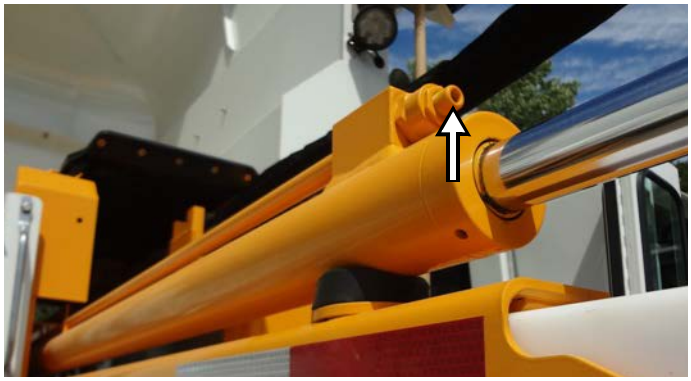
6. To adjust the retraction movement cushioning, open the doghouse door. Tighten the retraction cushioning adjustment screw to obtain a smoother movement at the end of the stroke or loosen it if the movement is too slow (no shock shall occur).

Figure 3-22 Cushioning adjustment screw (retraction movement)



7. To adjust the extension movement cushioning, tighten the extension cushioning adjustment screw to obtain a smoother movement at the end of the stroke or loosen it if the movement is too slow (no shock shall occur).

Figure 3-23 Cushioning adjustment screw (extension movement)



Warning! Do not stand directly in the path of the arm while carrying out these adjustments.

NOTE: On the optional long reach HELPING-HAND™ automated arm, there are 2 in/out cylinders, an inner and an outer cylinders. Adjusting the inner in/out cylinder is the same as above. See steps 8 and 9 for the outer in/out cylinder.

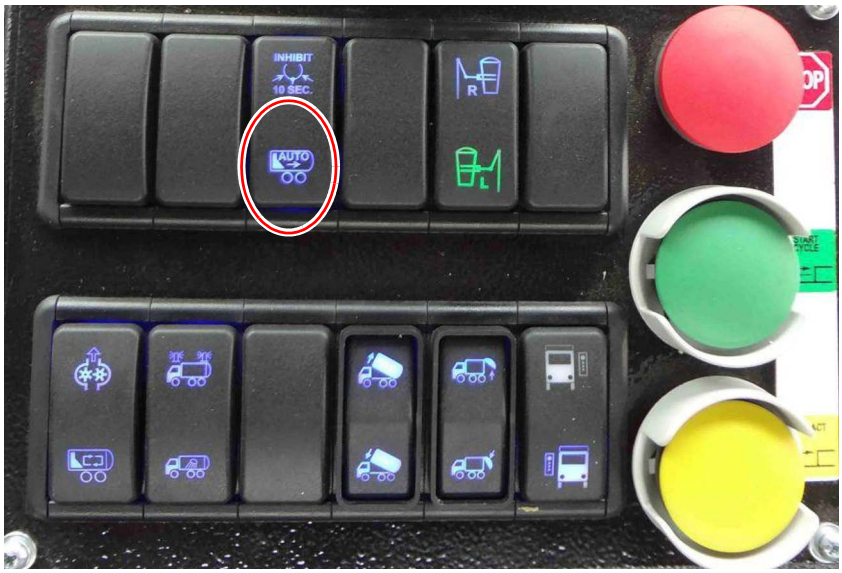
8. To adjust the retraction movement cushioning of the outer cylinder, open the doghouse door. Tighten the retraction cushioning adjustment screw (if equipped) to obtain a smoother movement at the end of the stroke or loosen it if the movement is too slow (no shock shall occur).
9. To adjust the extension movement cushioning of the outer cylinder, tighten the extension cushioning adjustment screw (if equipped) to obtain a smoother movement at the end of the stroke or loosen it if the movement is too slow (no shock shall occur).

IMPORTANT: Since 2 cylinders are involved in the extension and retraction of the optional long reach HELPING-HAND™ automated arm, make sure to identify the problematic cylinder before adjusting cushioning.

Auto-Packing

The Auto-Packing switch (see Figure 3-24) enables the packer to automatically start cycling about 2 seconds after the grabber reached the mid-height position on its way up. If the packer is performing a cycle while the lifting arm carries a rolling cart towards the hopper, the packer will immediately stop and return to its home position, no matter where it was in the hopper. This is to prevent refuse from falling directly on the packer. However, there is one exception to this: if, after 3 consecutive packing cycles, the packer fully extend proximity switch has not been activated, the packer will not return to its home position.

Figure 3-24 Auto-Packing switch



When the Auto-Packing feature is used simultaneously with the Multicycle feature, the packer will then perform a preset number of cycles unless a new rolling cart is carried towards the hopper by the automated arm. In such a case, the Multicycle feature will then be reset to zero.

When a packing cycle has been interrupted and the packer has returned to its home position, a new cycle will begin 2 seconds after the grabber reached the mid-height position on its way up.

Proportional Coil Signals

The up/down and in/out movements of the HELPING-HAND™ arm depend on a type of signals that varies according to the position of the joystick. Those signals are called proportional signals, meaning that the more you move the joystick from its neutral position, the faster the arm moves, whether up-and-down or in-and-out.

A movement of the joystick sends a signal via the CAN bus wire to the PWM adapter. The frequency of this signal is expressed in Hertz. The PWM adapter automatically converts it to a voltage proportional to the duty cycle[1]. The new signal is then forwarded directly via the signal wire to the proportional coil located on the arm valve.

When the converted signal reaches the proportional coil, it has a voltage of between 3V and 9V (6V being called the neutral signal or mid-range signal). An input signal having a range of 6V-3V moves the in/out section spool to one side and an input signal having a range of 6V-9V moves the in/out section spool to the other side. The same goes for the up/down section of the proportional valve.

NOTE: Only the in/out and up/down sections of the arm valve have proportional coils which allows the section spool to move to one side or the other depending on the input signal coming from the PWM adapter.

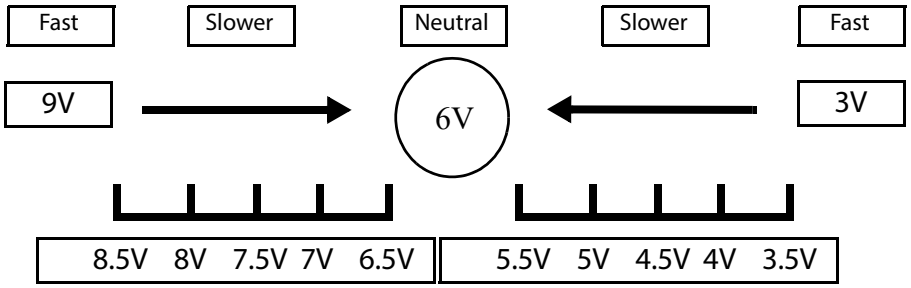
Attached to the proportional coil is a connector to which three wires are connected: the ground wire, the 12V wire and the signal wire.

The incoming signal traveling to the proportional coil via the signal wire causes the section spool to move to one direction or the other. The speed by which the spool moves, and incidentally the arm, depends on how far the joystick goes from its neutral position. The further away the joystick goes from the neutral position, the faster the arm moves, either up and down or in and out.

As a benchmark, an input signal of 3V or 9V traveling along the signal wire and entering the proportional coil will cause the section spool to move very swiftly in either direction (3V signal in one direction, 9V signal in the other direction with similar speed). If the voltage value of the input signal gets closer to the neutral signal value (that is 6V), the speed by which the spool moves will decrease. For example, a signal with a voltage of 7.5 or 4.5 will induce a speed loss, meaning the arm will move slower, either during in/out or up/down cycles.

1. **Measured in percentage, the duty cycle represents the percentage of time a signal is ON over a period of time. If a signal is ON 50% of the time and OFF 50% of the time, the signal has a duty cycle of 50%. If this signal is ON more than 50% of the time or less than 50% of the time over a specific interval, the duty cycle of the signal will vary accordingly, more or less than 50%. The duty cycle is a concept that is part of the pulse-width modulation (or PWM) which relates to a type of digital signal.**

Figure 3-25 Signal voltage



NOTE: As far as the proportional input signal is concerned, a voltage of 3V is by no means slower than 5V. It is rather the following principle that must be taken into account: the further the voltage value is from the mid-range value (that is 6V), the higher the speed increases.

The proportional coil, receiving the electric signal from the joystick via the PWM adapter, provides a finer gradation of speed of the HELPING-HAND™ arm in both in/out and up/down cycles. The position of the joystick determines the speed by which the arm moves. The coil reacts to the position of the joystick with the right level of voltage for pushing the spool accordingly. The achieved speed or the strength of the signal current must match the exact position of the joystick.

Case of a HELPING-HAND™ arm moving very slowly or not moving at all in one direction

If the HELPING-HAND™ arm of your side loader unit is moving up/down or in/out very slowly or not moving at all in one direction or the other, chances are it may be due to low voltage proportional signals.

NOTE: The following procedure may also be used to correct other problems with the lift arm such as the arm moving by itself.

To resolve this problem proceed this way:

1. Identify the wires connected to the coil on the proportional valve via the connector (see Figure 3-27).
2. Secure the arm working area using barrier tape or barricades.
3. Remove the connector from the coil.
4. Start the engine.
5. Engage the hydraulic pump.
6. Using a voltmeter or multimeter, check the voltage status of the 12V wire (806A or 806B) with the ground wire (105B) to make sure it is at the correct voltage.

   This is the first test (see Figure 3-26).

NOTE: The input voltage should be at 12V for the arm to work properly.

7. Check the mid-range signal by depressing the deadman switch on the arm joystick.

   Do not move the joystick.

   The mid-range signal voltage should be around 6V and the lift arm should not move.

8. Using a voltmeter or multimeter, check the voltage status of the signal wire (811B or 807B) with the ground wire (105B) to make sure it is at the correct voltage.

   This is the second test (see Figure 3-26).

   The correct signal voltage should be between 3V and 9V, with the mid-range signal voltage at 6V.

NOTE: The voltage values of 3V and 9V are theoretical values and may slightly differ from the actual values.

For this test, you need to move the joystick with the deadman switch depressed:

8 a. Activate the up/down function by moving the joystick in one direction, then the other.

The further away the joystick is from its neutral position, the faster the arm moves.

When you move the joystick to the maximum in one direction, the signal voltage should be either 3V or 9V. If it is 3V in one direction, it would be 9V in the other. The speed by which the arm moves when the joystick is pushed to the fullest is the same, no matter which direction the arm travels.

When the joystick gets closer to its neutral position, the arm slows down and when it returns to its neutral position, the arm stops completely (see Figure 3-25).

8 b. Activate the in/out function by moving the joystick in one direction, then the other.

The further away the joystick is from its neutral position, the faster the arm moves.

When you move the joystick to the maximum in one direction, the signal voltage should be either 3V or 9V. If it is 3V in one direction, it would be 9V in the other. The speed by which the arm moves when the joystick is pushed to the fullest is the same, no matter which direction the arm travels.

When the joystick gets closer to its neutral position, the arm slows down and when it returns to its neutral position, the arm stops completely (see Figure 3-25).

The proportional signal is faulty when one of the following occurs: voltage is lower than 3V, higher than 9V, no voltage at all or it is unstable.

If the signal voltage is lower than 3V the cause may be electrical: broken wire, faulty PWM adapter (see Figure 3-28), corroded/damaged connector (see Figure 3-28), defective arm-controlling module or mechanical: faulty coil, improperly adjusted hydraulic pressures, hydraulic bypass, pinched lines, out-of-spec hydraulic requirements.

Figure 3-26 Testing voltage with a multimeter

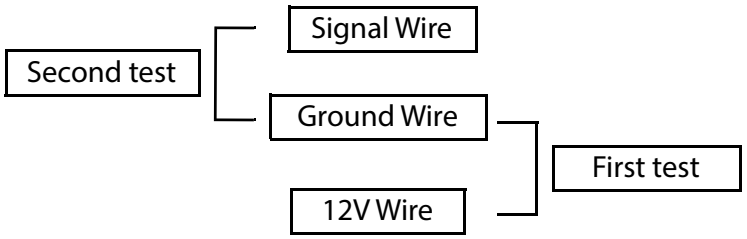


Figure 3-27 Identifying wires on coil

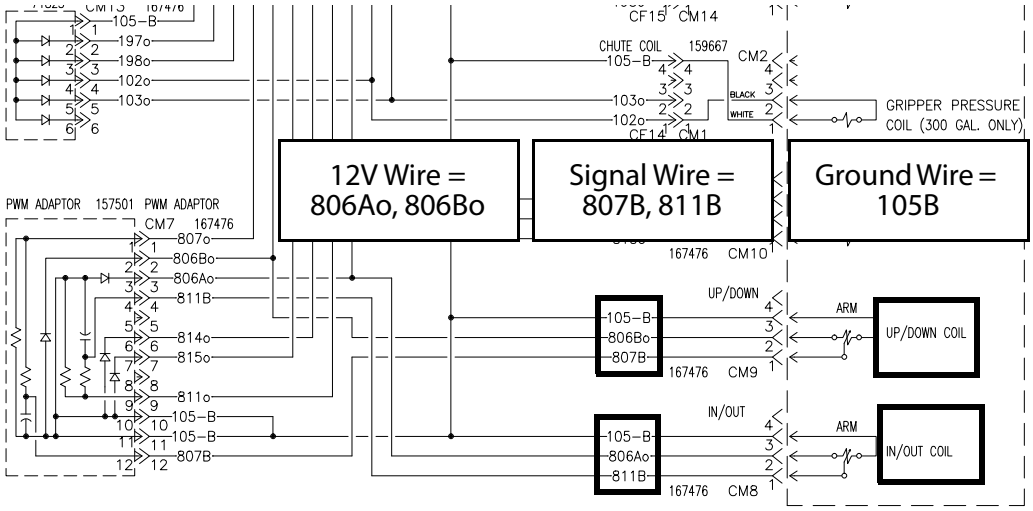
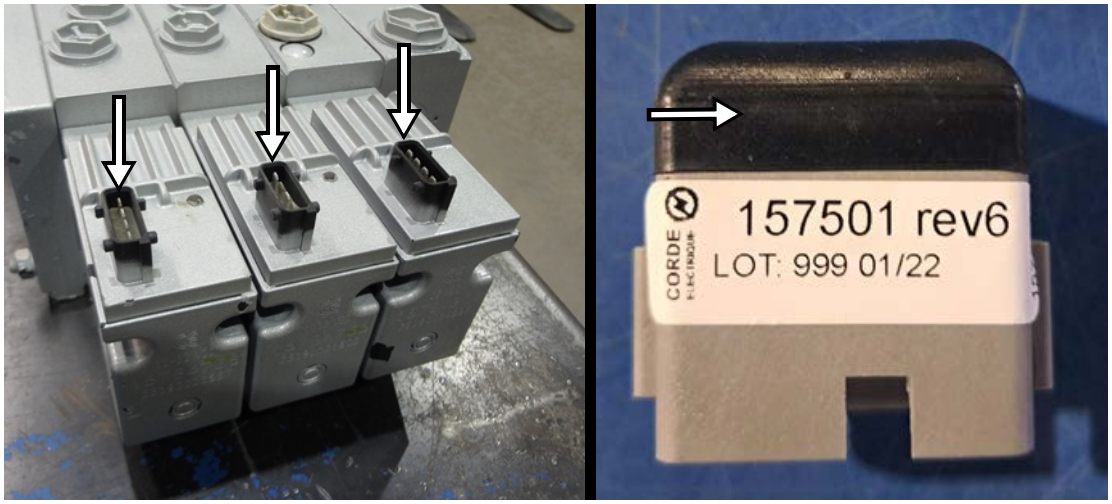


Figure 3-28 Connectors on coils (left) and PWM adapter (right)



Grabber

Grabber Auto-Closing System

The HELPING-HAND™ automated arm is equipped with a safety system that closes the grabber automatically when the arm is returning to the hopper. The auto-closing system prevents the grabber from hitting the hopper walls, thus avoiding potential damage to the grabber.

If the operator raises the arm without closing the grabber, the auto-closing system will automatically close the grabber when it reaches a preset height.

NOTE: If the vehicle is parked for a long period of time with the grabber inside the hopper, the grabber cylinder may leak pressure, causing the grabber to open by itself. But as soon as the hydraulic system is brought online (PUMP switch "ON"), the auto-closing system closes the grabber automatically before the operator can move the arm. In this, the system acts as though the operator had pushed the CLOSE GRABBER button on the joystick.

The auto-closing system is controlled by a non-adjustable limit switch located inside the arm slide (see Figure 3-29).

Figure 3-29 Grabber Auto-Closing limit switch

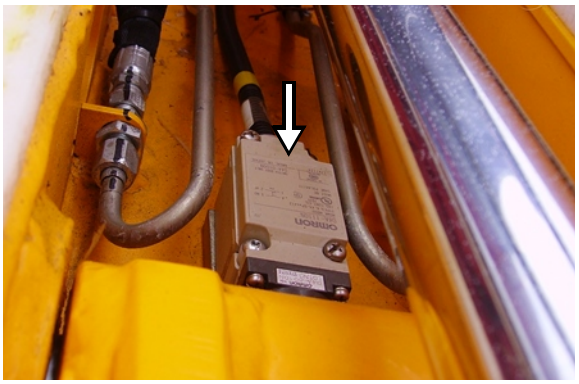
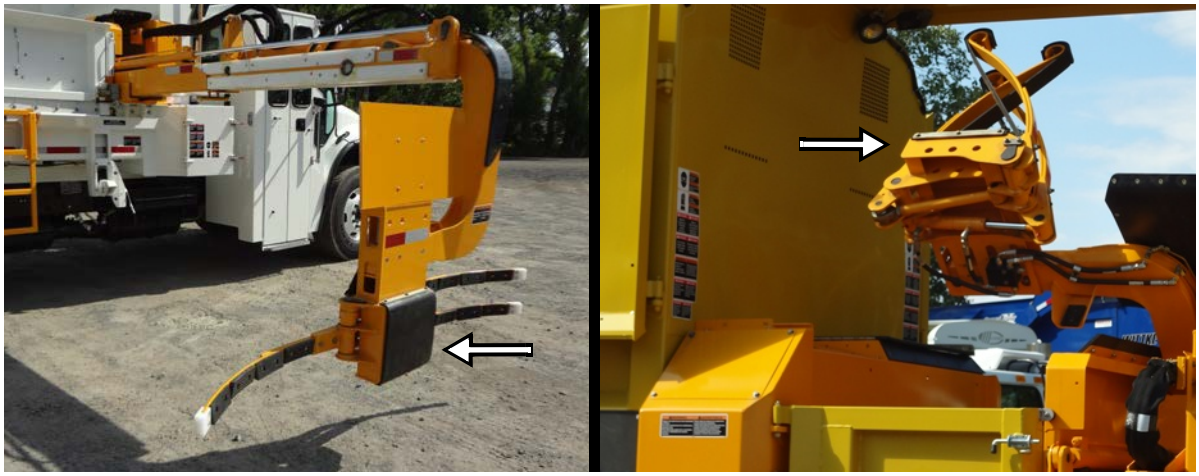


Figure 3-30 Grabber open (left), closed (right)



NOTE: The preceding photos are for illustrative purposes only and may not reflect the actual unit.

How it works:
When the lifting arm is moved up with the grabber open, the limit switch located inside the slide sends an electrical signal to the solenoid mounted on the valve making the grabber close (works the same as pressing the grabber-closing button on the joystick). Then, the hydraulic pressure is sent to the cylinder, closing the grabber before it collides with the hopper walls.

Testing the Auto-Closing System

To test the auto-closing system:

1. Make sure that the vehicle is parked on safe, level ground.
2. Secure the area around the path of the arm with barrier tape or barricades.
3. Start the engine and engage the hydraulic pump.
4. If it is not already done, lower and fully open the grabber.

Warning! Stay out of the way of the arm while manually moving the HELPING-HAND™ lifting arm. Serious injury or even death may result.

5. Close the grabber a few inches (away from the arm stowed limit switch) and lift the grabber to see if it closes automatically.

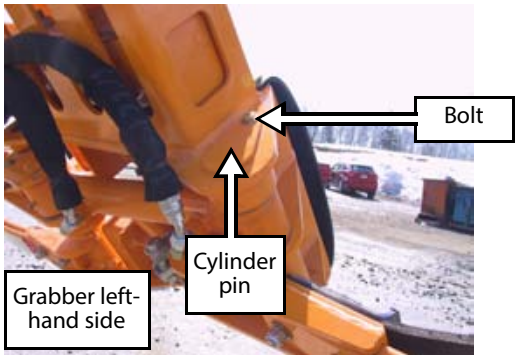
Caution! Before performing pressure adjustments on the valve, make sure the arm dump valve is properly set (if adjustable).

Grabber Cylinder Bushing Maintenance

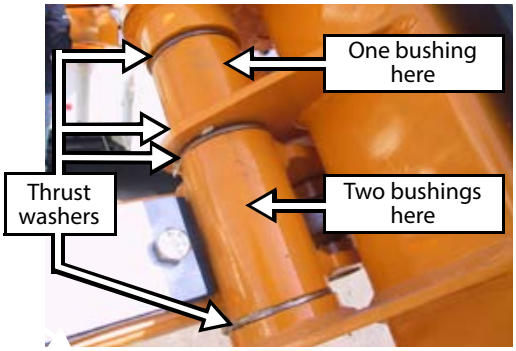
Visual inspection of grabber bushings must be performed at least once a year.

When left-hand side grabber bushings need to be replaced, perform the following procedure:

1. Remove bolt.
2. Pull out the cylinder pin.



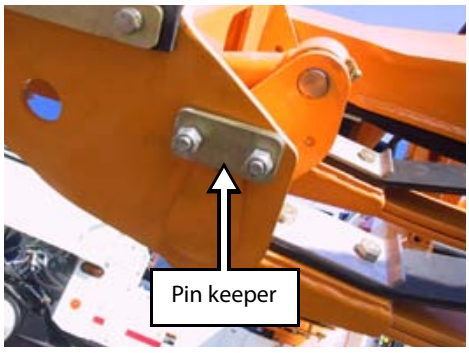
3. Inspect the bushings and thrust washers and replace if necessary.



4. Perform the reverse procedure to reinstall bushings, thrust washers and pin.

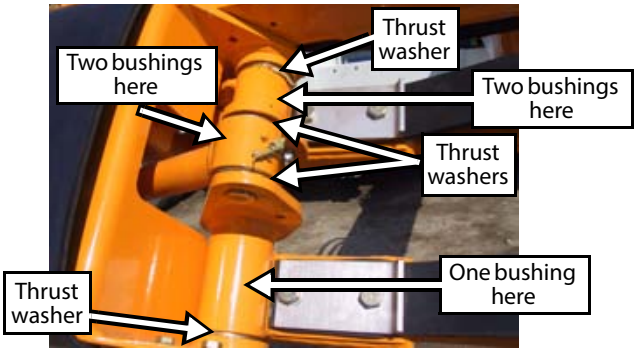
When right-hand side grabber bushings need to be replaced, perform the following procedure:

1. Remove the pin keeper.



2. Pull out the pin.

3. Inspect the bushings and thrust washers and replace if necessary.

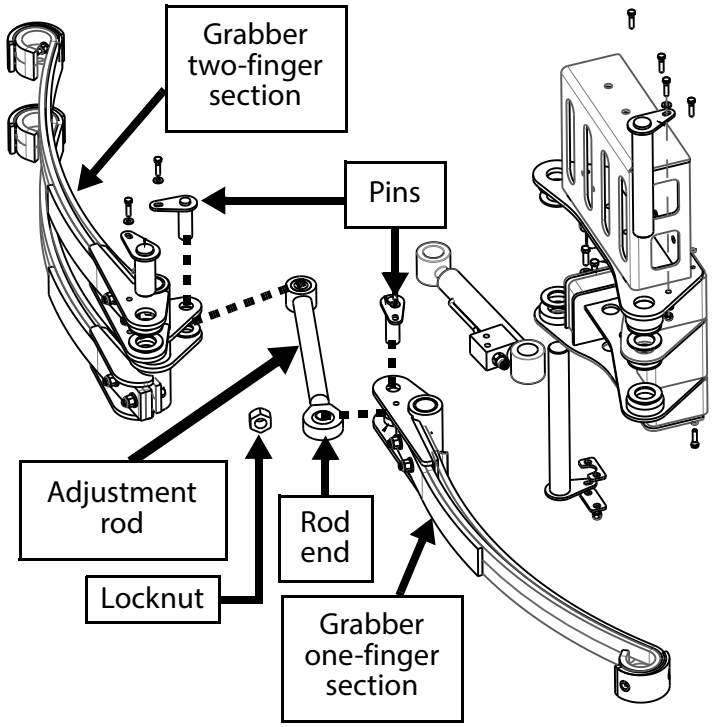


4. Perform the reverse procedure to reinstall bushings, thrust washers, pin and keeper.

Grabber Adjustment Rod

The grabber adjustment rod performs the same movement as the grabber cylinder and allows the grabber to close and open symmetrically. The grabber cylinder moves the side of the grabber to which it is linked while the adjustment rod moves the other side of the grabber. In case the grabber does not close correctly (one side of the grabber is more extended than the other) or does not fully open correctly (only one side of the grabber is fully retracted), an adjustment of this rod is then required.

Figure 3-31 Grabber adjustment rod and related parts



To adjust the grabber adjustment rod, proceed as follows:

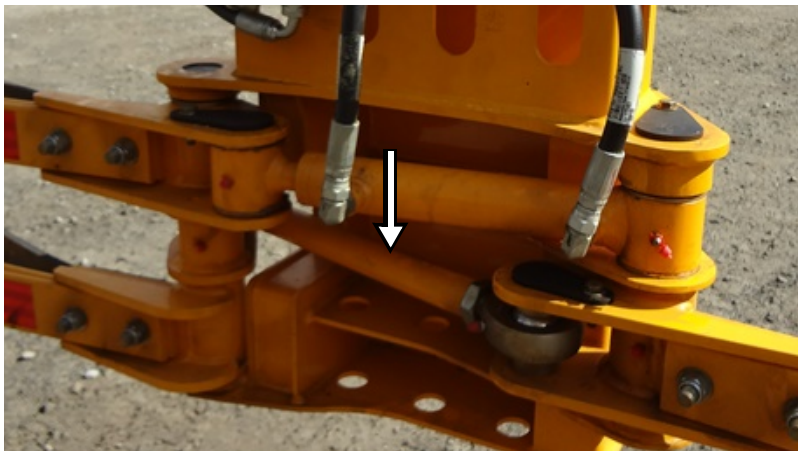
1. Apply all safety measures to ensure safety around the vehicle at all times.
2. Start the engine.
3. Engage the hydraulic pump.
4. Using the arm joystick, extend the arm to gain access to the rear of the grabber.
5. If not already done, partially close the grabber.

   Stop the grabber when it reaches the three-quarter closed position.
6. Disengage the pump.
7. Turn OFF the engine.
8. Make sure the parking brake is applied and the vehicle is tagged out for maintenance purposes (refer to "Locking Out and Tagging Out the Vehicle" on page 14).
9. Locate the grabber adjustment rod (see Figure 3-32).
10. Remove the pin holding the rod end to the one-finger section of the grabber (see Figure 3-31).

The pin is held in place by a bolt.

11. Pull the adjustment rod towards you.
12. With a wrench, loosen the locknut (see Figure 3-31).

Figure 3-32 Location of grabber adjustment rod



13. Turn the rod end clockwise or counter-clockwise as desired for the grabber adjustment rod to reach the correct length (not too long, not too short).

    If you are installing a new adjustment rod, take the old one and measure the thread length between its rod end and main part, then adjust the new one according to that length.
14. Once done, retighten the locknut and push the adjustment rod into place.

    If the spacers are worn or damaged, replace them.
15. Reinstall the pin with the bolt.
16. Tighten the bolt properly.
17. Lubricate the rod end using the grease fitting.
18. Test the adjustment to make sure the grabber opens and closes properly. Repeat the procedure if necessary.

If, during the adjustment of the grabber adjustment rod, the mechanic notices that there is some up-and-down play at the opposite end of that part (the one that is attached to the two-finger section of the grabber [see Figure 3-31]), it may be necessary to replace the bushings (see Figure 3-34) that are found inside the circular end of the adjustment rod.

To replace the bushings of the grabber adjustment rod, proceed as follows:

1. Apply all safety measures to ensure safety around the vehicle at all times.
2. If it is not already done, uninstall the adjustment rod end connected to the one-finger section of the grabber (refer to steps 2-11 of the previous procedure).
3. Locate the other adjustment rod end where the bushings are mounted (see Figure 3-33).
4. Remove the pin that holds the adjustment rod to the grabber base.

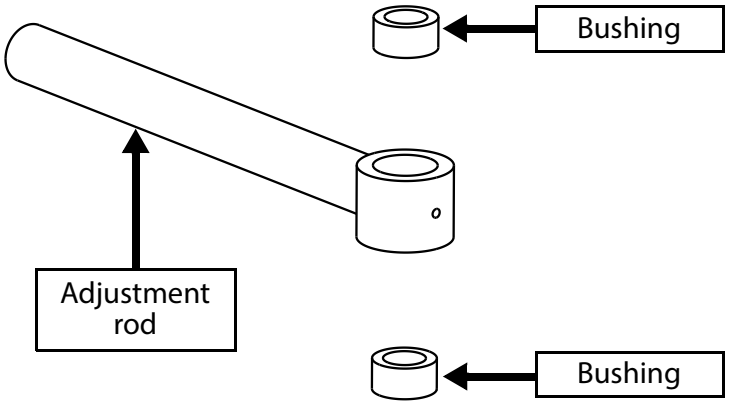
   The pin is held in place by a bolt.

If the grabber is still closed, you will need to manually push the two-finger section of the grabber since the other end of the adjustment rod is loose. Push the grabber fingers far enough back so that you can lift the pin.

Figure 3-33 Pin securing right end of grabber adjustment rod

5. Remove the adjustment rod completely.
6. Remove and replace both bushings.

Figure 3-34 Bushings



7. Once done, reinstall the grabber adjustment rod. To do so:
   - **7 a.** Reinstall the end section of the adjustment rod that contains the bushings.
   - **7 b.** Reinstall the pin with the bolt to secure the rod to the grabber base.
   - **7 c.** Tighten the bolt properly.
   - **7 d.** Move the two-finger section of the grabber to the position it was in before step 4.
   - **7 e.** If needed, adjust the length of the adjustment rod (see steps 12-13).
   - **7 f.** Once done, retighten the locknut and push the grabber adjustment rod end into place.
   - **7 g.** Reinstall the pin with the bolt.
   - **7 h.** Tighten the bolt properly.
8. Lubricate both adjustment rod ends using the grease fittings.
9. Test the adjustment to make sure the grabber opens and closes properly. Repeat the adjustment procedure if necessary.

Grabber Arm Pivot Bushing Installation

When installing replacement bushings into HELPING-HAND™ grabber arm pivots, the replacement bushing will slightly compress when pressed into the grabber pivot weldment.

It is normal practice that new bushings may require honing of the inside diameter to allow the pin to pass through freely. When honing, please keep in mind that the suggested clearance between the bushing and pin is 0.002" – do not hone the bushings excessively.

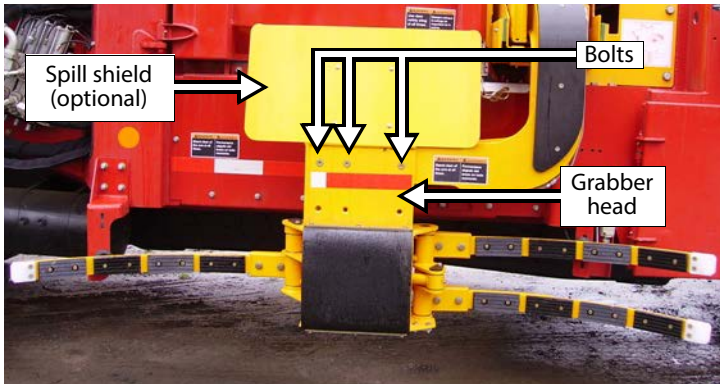
Grabber Height Setting

Grabber height is preset in factory; however, there are two possible height settings: lower and upper positions.

To move the grabber to **upper/lower position**, do the following:

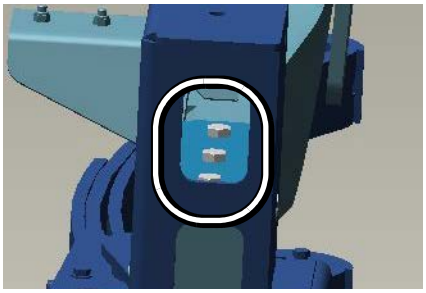
1. Use appropriate hardware to secure the grabber.
2. Remove all 3 horizontal bolts from the grabber head (see Figure 3-35).

Figure 3-35 Grabber head



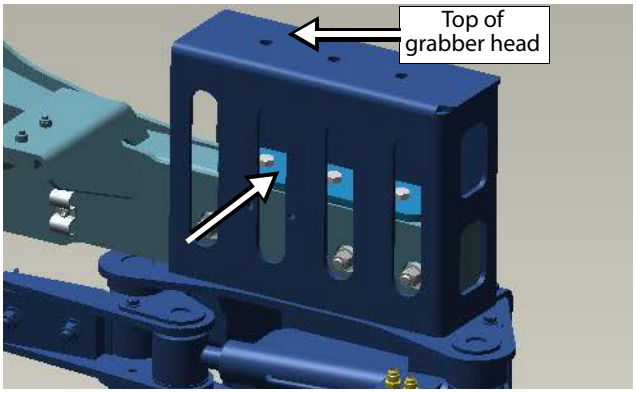
3. Remove all 3 vertical bolts.

Figure 3-36 Vertical bolts



4. Raise or lower the grabber (depending on the current grabber position).
5. Reposition the plate correctly (see Figure 3-37).

Figure 3-37 Plate



Position the plate on the top of the grabber head when the grabber is at its lower position or inside the grabber head (see Figure 3-37) when the grabber is at its upper position.

6. Secure the plate to the arm lever using all 3 vertical bolts.
7. Reinstall all 3 horizontal bolts. Tighten them back.

   Bolts in upper row if the grabber have been moved to the lower position (see Figure 3-38).

   Bolts in lower row if the grabber have been moved to the upper position (see Figure 3-39).

Figure 3-38 Bolts in upper row

Figure 3-39 Bolts in lower row

Keyless Locking Devices

The HELPING-HAND™ arm utilizes keyless locking devices to retain certain pins. Proper inspection and maintenance procedures are essential for trouble-free operation of these arms. The procedures outlined below will cover the proper inspection, disassembly and assembly procedures.

During the daily arm inspection, pay particular attention to the pins. The pins should not move and should be centered equally between both keyless locking devices. If any movement has been detected, the keyless locking device should be disassembled and inspected for wear or damage.

The illustration below shows the location of the keyless locking devices on the HELPING-HAND™ arm.

Figure 3-40 Keyless locking devices on HELPING-HAND™ arm

The disassembly and assembly procedures differ some depending on the part number you are working with. Refer to the correct procedure and specifications listed in the table below.

Labrie P/N	Bolt Torque (Qty x Size)	Bore Diameter	Pin Diameter	Page
QUB00495	13 ft-lbs (8 x M6)	2.362" - 2.364"	1.250"	See page 54
QUB00498	30 ft-lbs (8 x M8)	3.150" - 3.152"	2.000"	See page 56

Here are some important notes to remember for all applications:

- Do not use any oil with Molybdenum Bisulphide, high pressure additives, or grease. These substances notably reduce the coefficient of friction.
- Do not use an impact wrench or power tools to loosen or tighten any of the tightening screws.
- Use a torque wrench to verify tightening torque value on each screw.

IMPORTANT: Be sure to follow all appropriate lockout/tagout procedures (see *Locking Out and Tagging Out the Vehicle* on page 14) as well as your standard shop/facility procedures before attempting this procedure.

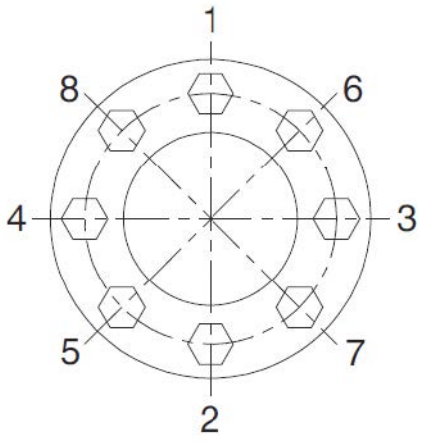
Keyless Locking Devices - QUB00495

These locking devices are used on HELPING-HAND™ lift cylinder pin.

Procedure for disassembly

1. Loosen locking screws gradually in a cross sequence, shown in Figure 3-41.

Figure 3-41 Loosening screws in a cross sequence



2. Remove all locking screws and ensure there is no damage to push-off threads of the front collar.
3. Transfer required number of screws into all push-off threads in the front collar (see Figure 3-42).

Figure 3-42 Transferring screws into push-off threads (1)

4. Release front collar by progressively tightening all push-off screws.

   Typically, the push-off screws appear to be completely tight after just one pass of tightening without any noticeable separation of clamp collars. Although it seems that the screws cannot be tightened further, several more rounds of torqueing in a cross sequence will increase the push-off force in the system and ultimately release the front collar.
5. Remove the front collar and transfer screws into all push-off threads in center collar (see Figure 3-43).

Figure 3-43 Transferring screws into push-off threads (2)

6. Release rear collar by repeating step 4.

Procedure for Inspection

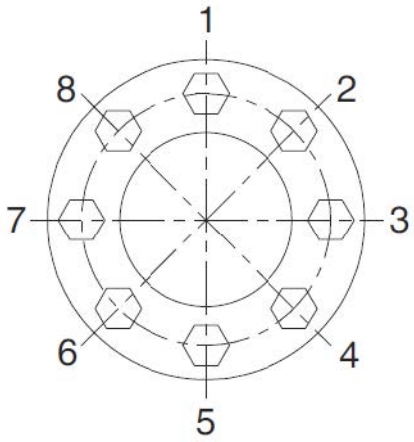
1. Inspect pin and bore surfaces for damage or galling.
2. Measure outside diameter of pin and inside diameter of bore and compare measurements to the table on page 53. Replace any worn or damaged parts.
3. If keyless locking device is to be re-used, thoroughly clean all the surfaces and lubricate both screws and treads with a thin film of light-weight oil.

Procedure for Assembly

1. Carefully clean the bore and shaft contact surfaces and apply a thin film of light-weight oil.
2. Ensure that all slits are aligned and that the front and rear collars are disengaged from the center collar before inserting into the bore and onto the shaft.
3. Verify the shaft is centered equally between both keyless locking devices.
4. Tighten all locking screws gradually in a cross pattern (see Figure 3-41).
5. During the first round of tightening all locking screws, apply up to 50% of the tightening torque listed in the table above.
6. Repeat steps 4 and 5; however, this time apply 100% of the tightening torque listed in the table on page 53.
7. Apply 100% of the tightening torque in a continuous sequence (see Figure 3-44).

   Perform this step twice.

Figure 3-44 Tightening screws in a continuous sequence



Keyless Locking Devices - QUB00498

These locking devices are used on HELPING-HAND™ lift arm pivot pin.

Procedure for disassembly

1. Loosen locking screws gradually in a cross sequence, shown in Figure 3-41.
2. Remove all locking screws and ensure there is no damage to push-off threads of the front collar.
3. Transfer required number of screws into all push-off threads in the front collar (see Figure 3-45).

Figure 3-45 Transferring screws into push-off threads (3)

4. Release front collar by progressively tightening all push-off screws.

   Typically, the push-off screws appear to be completely tight after just one pass of tightening without any noticeable separation of clamp collars. Although it seems that the screws cannot be tightened further, several more rounds of torqueing in a cross sequence will increase the push-off force in the system and ultimately release the front collar.
5. To release the rear collar, continue tightening the screws in the front collar.
6. Repeat step 4 until the rear collar releases.

Procedure for Inspection

1. Inspect pin and bore surfaces for damage or galling.
2. Measure outside diameter of pin and inside diameter of bore and compare measurements to the table on page 53. Replace any worn or damaged parts.
3. If keyless locking device is to be re-used, thoroughly clean all the surfaces and lubricate both screws and treads with a thin film of light-weight oil.

Procedure for Assembly

1. Carefully clean the bore and shaft contact surfaces and apply a thin film of light-weight oil.
2. Ensure that all slits are aligned and that the front and rear collars are disengaged from the center collar before inserting into the bore and onto the shaft.
3. Verify the shaft is centered equally between both keyless locking devices.
4. Tighten all locking screws gradually in a cross pattern (see Figure 3-41).
5. During the first round of tightening all locking screws, apply up to 50% of the tightening torque listed in the table above.
6. Repeat steps 4 and 5; however, this time apply 100% of the tightening torque listed in the table on page 53.
7. Apply 100% of the tightening torque in a continuous sequence (see Figure 3-44).

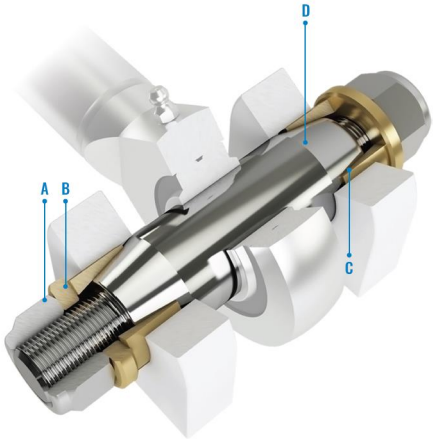
   Perform this step twice.

Expander System® Pivot Pin Assembly

The dump arm pivot and up/down cylinder pivot pins on the HELPING-HAND™ arm have been updated to a new design. The existing straight pin and keyless locking devices have been replaced by an Expander System® pivot pin assembly. The expansion sleeves used on the Expander System® pins are more robust and will allow for a wider tolerance in the mounting lug. The new pivot pins will work on all previous versions of the HELPING-HAND™ arm without any modifications. Another benefit is they are quick and easy to install and remove compared to the prior keyless locking devices.

The following assemblies will replace the previous keyless locking devices and straight pins.

New P/N	Replaces P/N
Qty. 1 **QUB07500** – Dump Arm Pivot	Qty. 2 **QUB00498** & Qty. 1 **64507**
Qty. 1 **QUB07510** – Up/Down Cylinder Pivot	Qty. 2 **QUB00495** & Qty. 1 **64504**



The Expander System® pin consists of four main parts:

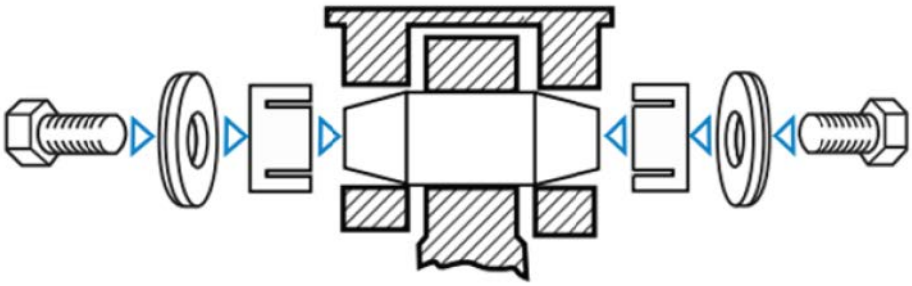
A. Fasteners
B. Tension Washers
C. Sleeves
D. Tapered Pin

Installation

1. Grease the sleeves and tapered pin. Do not grease the threads!
2. Insert the tapered pin and center it between the bores.
3. Install the sleeves, then tension washers and fasteners (see Figure 3-46).
4. Cross-tighten the fasteners to the specified torque.
5. Grease the pivot.
6. After the initial torque, move the arm through full range of motion several times and recheck torque.
7. Check the torque after 10 hours, 40 hours and at regular service intervals to ensure proper seating of the sleeves..

Part Number	Torque
QUB07500	258 lb-ft / 350 Nm
QUB07510	184 lb-ft / 250 Nm

Figure 3-46 Sleeves, tension washers and fasteners



Removal

1. Unscrew the fasteners from both sides and remove the tension washers (see Figure 3-47).
2. Tap the axle alternatively on left and right sides until the tension on the sleeves is released (use a piece of pipe between the axle and the mallet/hammer to prevent damage to the threads) [see Figure 3-48]
3. Remove the sleeves and tapered pin.

Figure 3-47 Unscrewing fasteners and removing tension washers

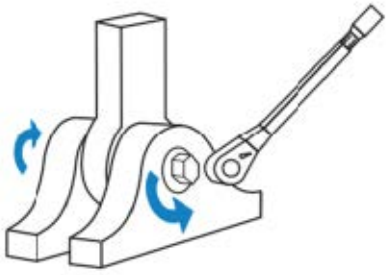
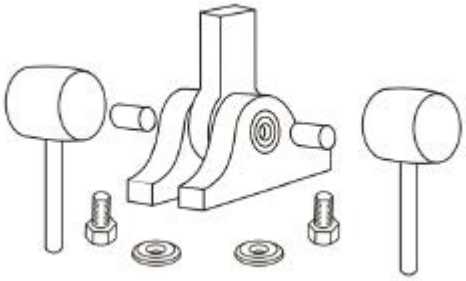


Figure 3-48 Tapping the axle



Wear Pads

Replacing Green Wear Pads

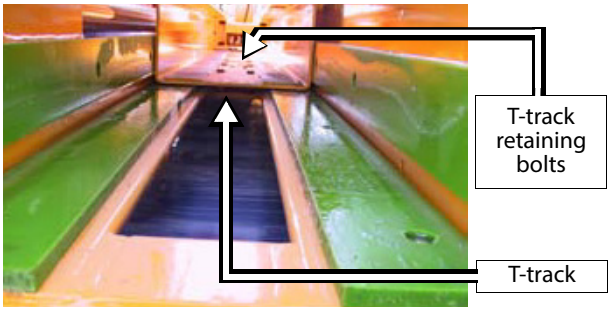
NOTE: For units equipped with a long reach HELPING-HAND™ arm only.

When green wear pads are worn out, they have to be replaced.

To replace worn-out green wear pads, carry out the following procedure:

1. Fully extend the HELPING-HAND™ automated arm.
2. Use an appropriate device to secure the arm.
3. Remove the packer scraper (or lower wear pad) to access the T-track retaining bolts (8).
   See the *Lower Wear Page* section in the *Automizer Maintenance Manual*.
4. Remove the T-track bolts and take the T-track out through the opening created by the removal of the packer scraper.

Figure 3-49 T-track

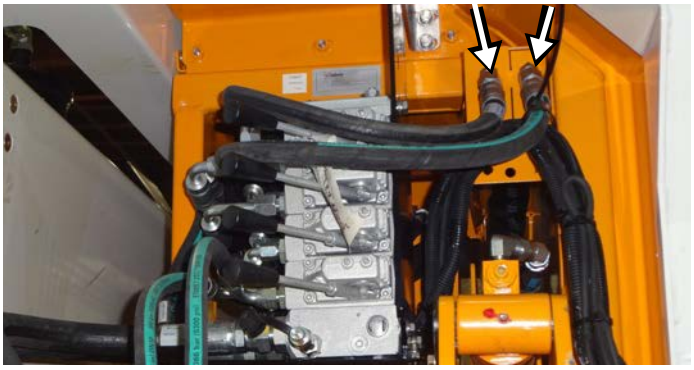


5. Replace the T-track wear pads.

IMPORTANT: As dust particles and sand stick to grease, never lubricate the HELPING-HAND™ automated arm wear pads with petroleum-based lubricants. If you do, this may jam the moving parts and/or cause premature wear. Instead, use specially formulated Max EP lubricant. For more information, see *Slide Wear Pad Lubrication* on page 66.

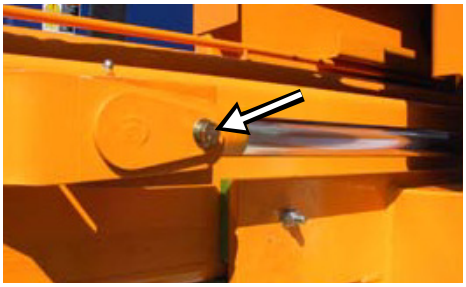
6. Open the doghouse on the streetside.
7. Remove both hydraulic hoses from the inner rail cylinder (see Figure 3-50).

Figure 3-50 Inner rail cylinder hydraulic hoses



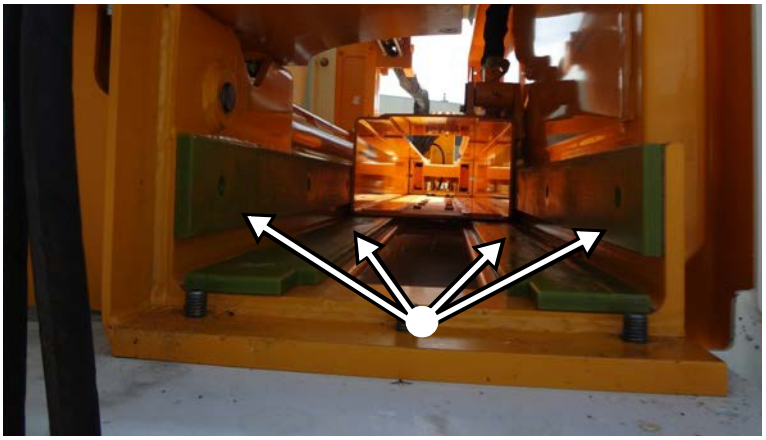
8. To avoid oil leaks, cap each hose and fitting as soon as the hoses are removed.
9. Clearly identify the disconnected hoses and fittings to avoid any mix up during reinstallation.
10. Remove the outer rail cylinder bolt and pull out the pin (see Figure 3-51).

Figure 3-51 Outer rail cylinder bolt



11. Using an appropriate lifting device, pull the automated arm inner assembly out of the hopper.
12. Replace the green wear pads on the automated arm base (see Figure 3-52).

Figure 3-52 Wear pads on arm base



13. Once all wear pads have been replaced, use same procedure in reverse order to reinstall the parts that have been removed.

Replacing White Wear Pads

To replace the white wear pads, proceed with the following procedure:

1. Fully retract the HELPING-HAND™ automated arm.
2. Open the doghouse located on the streetside and remove the 2 wear pad retaining bolts that are exposed on each side of the sliding rail (see Figure 3-53).

   These bolts are only accessible when the arm is completely retracted.

Figure 3-53 Wear pad retaining bolts (2 on each side)

3. Fully extend the HELPING-HAND™ automated arm.
4. Remove wear pads A and B (3 bolts each).

   Do not install the new wear pads at this time.

Figure 3-54 Wear pad A

Figure 3-55 Wear pad B

NOTE: The preceding photos are for illustrative purposes only and may not reflect the actual unit.

5. Remove wear pad C (2 bolts) and replace it by a new one.

Figure 3-56 Wear pad C

IMPORTANT: As dust particles and sand stick to grease, never lubricate the HELPING-HAND™ automated arm wear pads with petroleum-based lubricants. If you do, this may jam the moving parts and/or cause premature wear. Instead, use specially formulated Max EP lubricant. For more information, see *Slide Wear Pad Lubrication* on page 66.

6. Remove wear pad D (2 bolts) and replace it by a new one.

Figure 3-57 Wear pad D

7. Remove wear pad E (4 bolts) and replace it by a new one.

Figure 3-58 Wear pad E

NOTE: The preceding photos are for illustrative purposes only and may not reflect the actual unit.

8. Remove wear pad F (4 bolts) and replace it by a new one.

Figure 3-59 Wear pad F

9. Now you may install new wear pads A and B.

NOTE: There may be shims installed between the pads and the arm structure. These shims are used to fill space between these parts, and usually they should be kept. However, their number may vary after the installation of new wear pads.

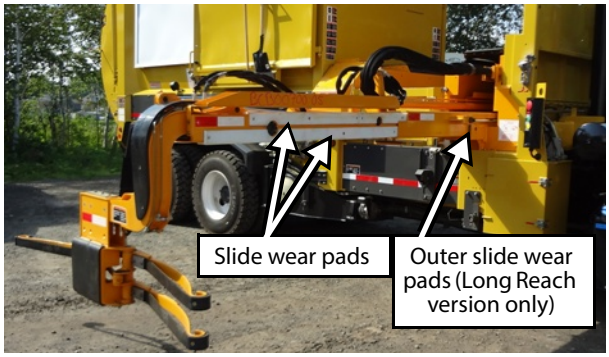
10. Fully retract the HELPING-HAND™ automated arm.
11. Put the remaining 4 wear pad retaining bolts back in (2 on each side of the sliding rail) [see Figure 3-53].

    These bolts can only be screwed in when the arm is completely retracted.

Slide Wear Pad Lubrication

The wear pads on the HELPING-HAND™ arm are made of UHMW (Ultra High Molecular Weight) material, designed to operate in severe environments with superior performance at a low noise level.

Figure 3-60 Wear pads



NOTE: The preceding photo is for illustrative purposes only and may not reflect the actual unit.

This UHMW plastic is a wear item of the arm and requires routine planned maintenance and replacement. It should be thoroughly cleaned, inspected and lubricated weekly. Since UHMW is a petroleum-based product, it is intended to operate dry or with non-petroleum-based lubricant. Petroleum-based lubricants will be absorbed by the wear pads, causing swelling and potential binding.

Max EP lubricant may be applied to any UHMW wear pad surface during the performance of routine planned maintenance. Max EP dries to leave a protective lubricant film that will not damage or be absorbed by the UHMW material. Labrie*Plus* offers Max EP lubricant in three sizes:

- **Labrie*Plus* part number FOL01061:** Aerosol 12 Oz (340 g)
- **Labrie*Plus* part number FOL01062:** Bottle 18 Oz (540 ml), with hand pump
- **Labrie*Plus* part number FOL01065:** Bulk 5 Gal (20 l)

If arm in/out functions become slow or erratic and the hydraulic system is in good working order and operating within specifications, the UHMW wear pads should be checked for binding, usually evident by a "washboard" wear pattern on their surfaces. In this condition, the UHMW wear pads must be removed, the contacting surfaces completely cleaned, and new wear pads installed.

Figure 3-61 Wear pads (std. HH slide and HH Long Reach inner slide)

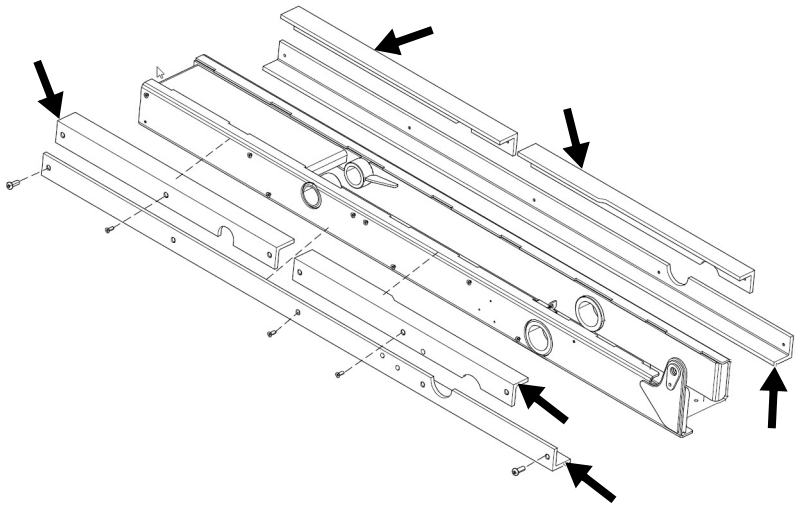
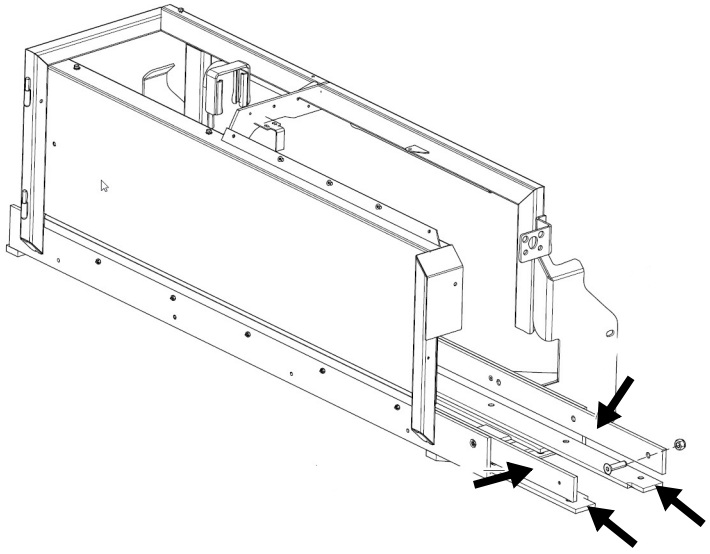
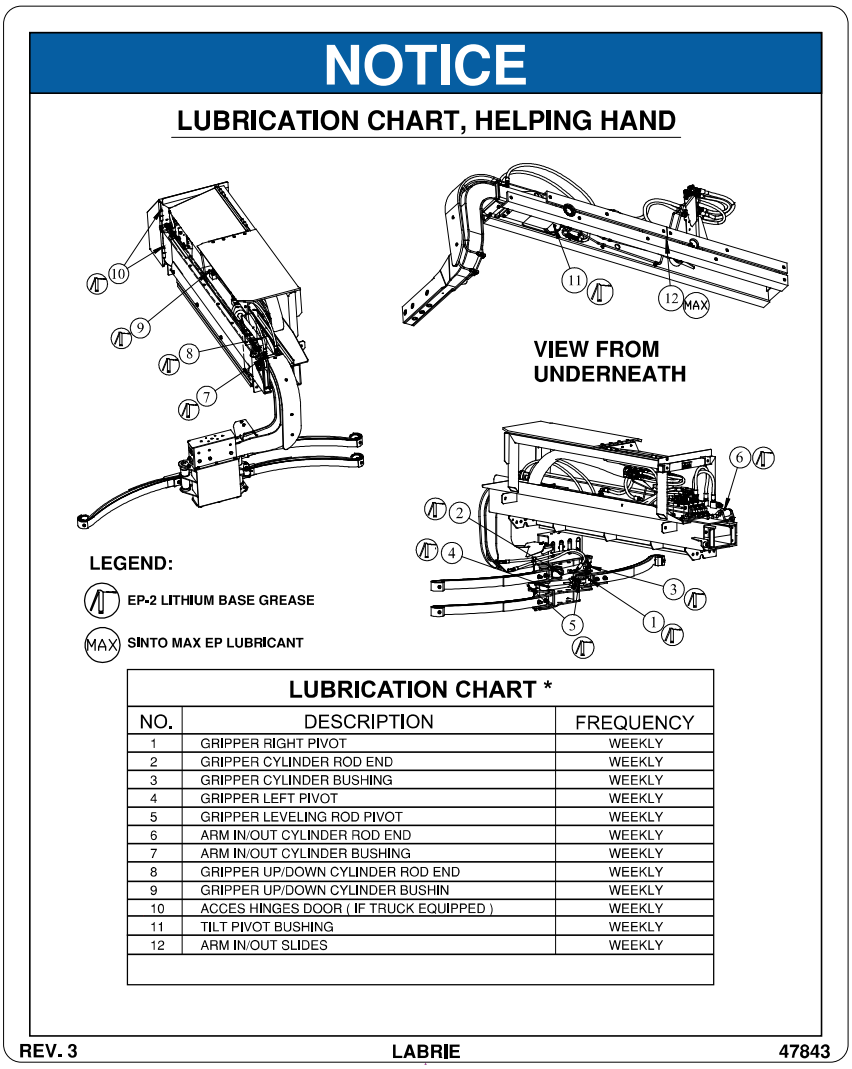


Figure 3-62 Wear pads (HH Long Reach base)



Lubrication Chart and Hydraulic Schematic

The following are examples of lubrication chart and hydraulic schematic for the HELPING-HAND™ lifting arm. Please note that these documents are for reference purposes only. The lubrication chart is based on a 40-hour-a-week truck operation.



NOTICE

LUBRICATION CHART, HELPING HAND

VIEW FROM UNDERNEATH

LEGEND:

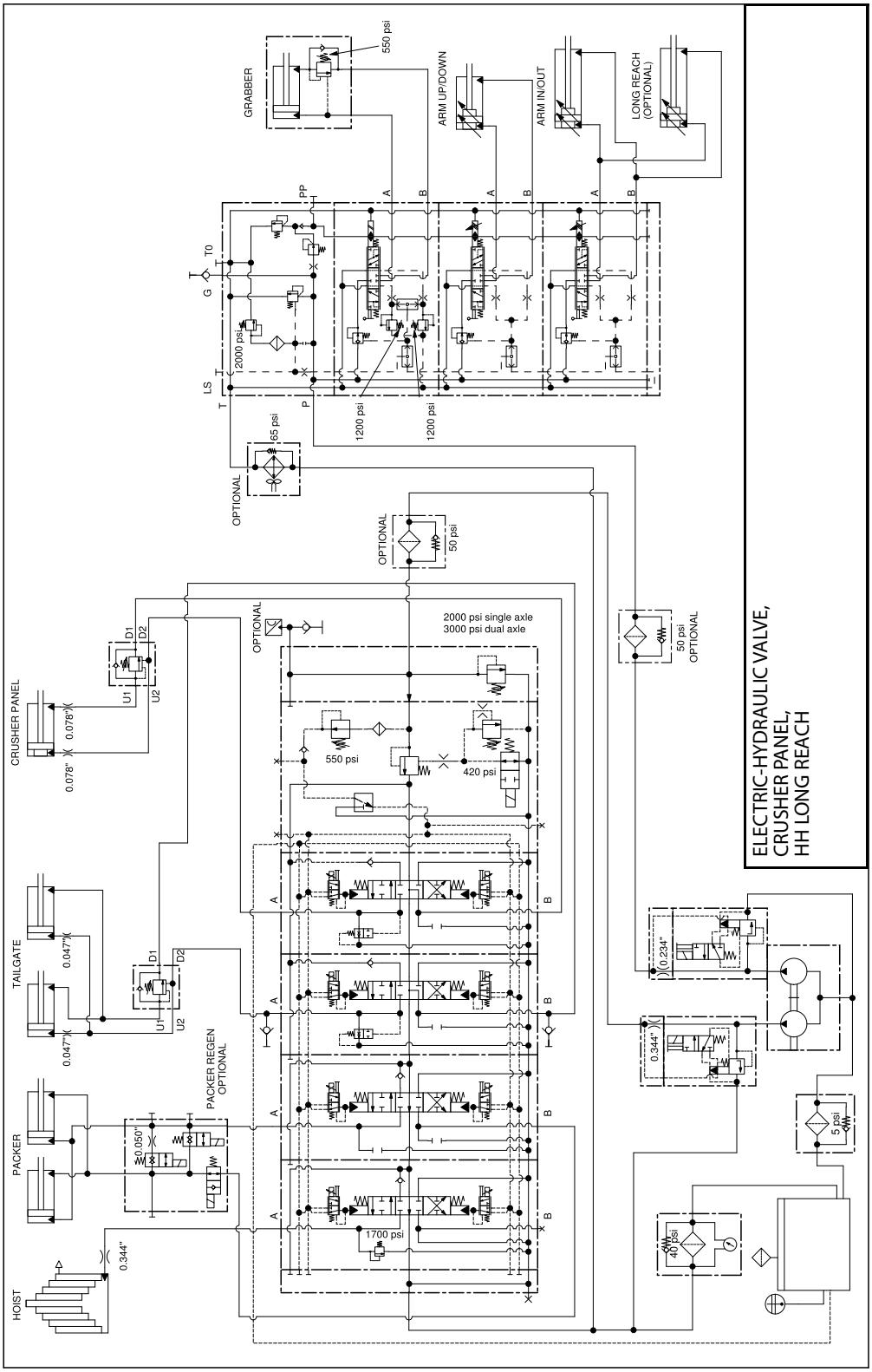
EP-2 LITHIUM BASE GREASE

SINTO MAX EP LUBRICANT

LUBRICATION CHART *

NO.	DESCRIPTION	FREQUENCY
1	GRIPPER RIGHT PIVOT	WEEKLY
2	GRIPPER CYLINDER ROD END	WEEKLY
3	GRIPPER CYLINDER BUSHING	WEEKLY
4	GRIPPER LEFT PIVOT	WEEKLY
5	GRIPPER LEVELING ROD PIVOT	WEEKLY
6	ARM IN/OUT CYLINDER ROD END	WEEKLY
7	ARM IN/OUT CYLINDER BUSHING	WEEKLY
8	GRIPPER UP/DOWN CYLINDER ROD END	WEEKLY
9	GRIPPER UP/DOWN CYLINDER BUSHIN	WEEKLY
10	ACCES HINGES DOOR (IF TRUCK EQUIPPED)	WEEKLY
11	TILT PIVOT BUSHING	WEEKLY
12	ARM IN/OUT SLIDES	WEEKLY

REV. 3 LABRIE 47843


ELECTRIC-HYDRAULIC VALVE,
CRUSHER PANEL,
HH LONG REACH
GRABBER
550 psi
ARM UP/DOWN
ARM IN/OUT
LONG REACH
(OPTIONAL)
PP
T0
G
LS
T
P
A
B
2000 psi
1200 psi
1200 psi
65 psi
OPTIONAL
OPTIONAL
50 psi
OPTIONAL
50 psi
OPTIONAL
2000 psi single axle
3000 psi dual axle
550 psi
420 psi
1700 psi
CRUSHER PANEL
D1
D2
U1
U2
0.078"
0.078"
TAILGATE
0.047"
0.047"
PACKER
PACKER REGEN
OPTIONAL
0.050"
HOIST
0.344"
0.234"
0.344"
40 psi
5 psi

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email: labriepluswarranty@labriegroup.com

For technical support and parts ordering, the body serial number of your vehicle is required. LabriePlus recommends keeping record of the information found on the body serial number stickers located in the cab doorjamb and street side front corner of the body.

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