GENERAL MAINTENANCE

AUTOMIZER VERSA HAND™

LabriePlus™

Parts, Service and Warranty

(during business hours)

Technical Support Service

(24 hours)

1-800-231-2771

3630 Stearns Drive

Oshkosh, WI 54904

Release date: March 2007 Part #90337

FOREWORD

Here is the new Labrie Parts and Service manual for the AUTOMIZER™ side-loading unit. We sincerely hope that you will find it easy to use.

We have designed it in a way that will allow you to easily make it available to drivers, mechanics, and to Parts Department personnel.

Any time that you have a problem with a Labrie unit, you should contact your local distributor first. He should be able to provide you with the proper help required (parts or technical advice).

FIRST THINGS FIRST:

DO NOT FORGET TO COMPLETE THE OWNER REGISTRATION FORM AND TO SEND IT TO LABRIE EQUIPMENT, MAKING SURE TO INDICATE THE "IN SERVICE DATE". THIS DATE WILL BE USED TO START THE WARRANTY PERIOD. OTHERWISE, THE DATE OF DELIVERY FROM THE FACTORY WILL BE USED.

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1.0 GENERAL MAINTENANCE

DANGER, WARNING, CAUTION notations appear throughout this manual and on labels on and inside of the vehicle.

DANGER

The word **DANGER** precedes information, which indicates an hazardous situation, which if not avoided, **WILL** result in death or serious injury of the user or others.

WARNING

The word **WARNING** precedes information, which indicates a potentially hazardous situation, which if not avoided, **COULD** result in personal injury or death of the user or others.

CAUTION

The word **CAUTION** precedes information, which indicates a potentially hazardous situation or unsafe practice, which if not avoided, **MAY** result in minor to moderate injury to user or damage to the equipment.

The word **NOTE** also appears in this manual and precedes information, which is vital to the proper operation and maintenance of the vehicle equipment.

In spite of our efforts to build a vehicle that is as safe as possible, the operator's safety certainly depends on the precautionary measures taken while operating or servicing the vehicle. If in doubt,ask your supervisor or contact the Labrie Service and Warranty Department for any technical support you may require.

For maintenance of the chassis itself, refer to the chassis manufacturer's service manual. Only body and packer components are outlined in this manual.

Establish and apply a periodic inspection program to keep moving parts in good working order, properly adjusted and safe. It is recommended that a brief inspection be done by the operator **EVERY DAY** and any detected malfunctions must be reported for correction **BEFORE** using the equipment.

Once a month, inspect the chassis and the body for breaks, cracks or any potential problems. Any defects found must be repaired without delay. To ensure the good working order of the equipment, particular attention should be paid to structural components in order to prevent deterioration due to corrosion; touch-ups and/or complete paint jobs should be done when necessary.

1.1 GENERAL PRECAUTIONS

It is the employer's responsibility to be assured that their employees are qualified and capable of operating this equipment.

THE FOLLOWING IS GENERAL SAFETY AND OPERATIONAL PRECAUTIONS, WHICH SHOULD BE ADHERED TO BY OPERATORS (AND/OR MAINTENANCE PERSONNEL) AT ALL TIMES.

1. Do not operate this vehicle before having read and completely understood this manual and the safety labels on the vehicle. Maintenance personnel must also read and understand the Maintenance Manual for this vehicle (and the maintenance related information in this manual). In case of any doubt, see your supervisor for clarification.

2. The Automizer™ units equipped with the Versa Hand™ Lifting Arm are primarily designed to be operated by only one person.

3. The operator of the unit must have a clear view of the operation of the lifting arm at all times. The operator must be able to stop the motion of the arm at any time, in order to prevent injury to surrounding people, damage to property or to the lifting arm itself.

4. The operator of the Versa Hand™ Lifting Arm shall make sure that any people or obstructions are far away from the arm before moving it. **Failure to do so may result in unit and / or property damages, personal injury or even death.**

4. (cont'd)

   If, however, Labrie's customer elects to operate the unit with more than one worker, the following safety items shall be installed to protect the co-worker from hazardous situations.

   For example, an additional set of sustained manual pressure controls for each additional worker shall be provided. The actuation of the controls shall take place concurrently in order to operate the Versa Hand™ Lifting Arm. The sustained manual pressure control shall be located so that the co-worker pressing it, is not in the path of the arm and has a clear and full view of the point of operation.

   In such a case, **Labrie must be informed** of every and all units with a Versa Hand™ Lifting Arm operated by more than one worker. Labrie will then determine and supply, at the customer's expense, the required safety items.

   For additional information, please contact LabriePlus at **1-800-231-2771**.

   Failure to do so may result in unit and / or property damages, personal injury or even death.

5. At the beginning of every working day,

inspect the body, the packing system and any system that might endanger the safety of the public and/or the operator.

6. Verify that the mirrors, brakes, accelerator pedal, steering wheel and turn signals are in good working order.

7. Do not operate this equipment if there are any signs of damage or incomplete repairs.

8. Report any doubts and any equipment safety service requirements to your supervisor.

9. Keep both hands on the steering wheel at all times for better control.

10. Do not leave the driving position until the vehicle is completely stopped and the parking brake applied.

11. When the vehicle is parked, the parking brake must be applied.

12. For any work, cleaning or inspecting being done between the body and the chassis, the body safety prop MUST be used. The vehicle must also be on level ground.

13. Watch and be sure that there are no people at the rear of the vehicle when opening and closing the tailgate(s) and/or when raising the body.

DANGER

14. Do not get into the hopper compartment or try to repair anything behind the packer when it is working or when the hydraulic pump is still running. Personnel authorized to get into the hopper MUST first complete the lockout/tagout procedures required by the employer.

15. NEVER stand underneath a raised arm/grabber, since no arm cylinder is equipped with a holding valve. Should a hydraulic component break, such as an hydraulic hose, failure to stay away from the arm may result in personal injury or even death.

1.2 GENERAL RESPONSIBILITIES OF THE EMPLOYER

(Ref. ANSI Z 245.1 1999 Standards).

It is the employer's responsibility to be familiar with and ensure that operation is in accordance with safety requirements and codes including all applicable regulations, including the Occupational Safety and Health Act (OSHA) and the American National Standards Institute (ANSI).

It is also the employer's responsibility to properly maintain all mobile equipment to meet provincial/state and federal safety standards. The employer also has the following responsibilities:

1. Supply adequate instructions and training for the safe use of the vehicle before assigning the employee to such equipment.

2. The employer must keep the vehicle maintained and properly adjusted to meet the manufacturer's standards and recommendations. If in doubt, contact the manufacturer or any authorized representative.

3. The employer must keep a record of any breakdowns, malfunctions of the vehicle, records of inspection and maintenance.

4. Any breaks or malfunctions that can affect the safe usage of the vehicle must be repaired before the vehicle is to be used again.

5. Meet the appropriate lighting requirements for working at night (if permitted).

6. On a regular basis, accompany the operator of the vehicle and take measures to insure the smooth and safe operation of the vehicle. Respect all safety measures.

7. Make sure that the backup alarm works properly while vehicle is in reverse, while the body is rising or while the tailgate is opening.

1.3 GENERAL RESPONSIBILITIES OF THE EMPLOYEE

1. The employee must enforce all of the safety requirements for mobile equipment supplied by the employer.

2. Equipment is to be operated only after having received instructions and training in accordance to Operator Manual.

3. The employee has the responsibility to report any damages or malfunctions of the vehicle to his employer or his supervisor without any delay. The employer will then take the necessary measures prior to the re-operation of the vehicle to insure its safe operation.

4. The employee must make sure that there is nobody near the vehicle before activating any of the controls and must be prepared to stop anything in case of danger.

CAUTION

MAINTENANCE PERSONNEL SHALL NOT DO ANY MAINTENANCE ON THE EQUIPMENT IF THEY ARE NOT WELL ACQUAINTED WITH THE OPERATIONS OF THE EQUIPMENT AS WELL AS ALL SAFETY PRECAUTIONS OF SUCH OPERATIONS. REFER TO THE OPERATOR MANUAL BEFORE ATTEMPTING TO PERFORM ANY TYPE OF WORK ON THE UNIT.

WARNING

BEFORE DOING ANY MAINTENANCE ON THE VEHICLE, ALL SAFETY REGULATIONS MENTIONED IN THE OPERATOR MANUAL, SECTION 2.0, MUST BE RESPECTED, ESPECIALLY THE "LOCKOUT/TAGOUT" PROCEDURE (ANSI Z 245.1 1999).

CAUTION

MAINTENANCE AND REPAIRS CARRIED OUT ON THIS VEHICLE MUST ONLY BE DONE BY QUALIFIED PERSONNEL WHO IS FAMILIAR WITH THE EQUIPMENT. LABRIE EQUIPMENT DECLINES ANY RESPONSIBILITY FOR FAILURES RESULTING UNPROPER REPAIRS PERFORMED BY THE END USER.

1.4 FIRE HAZARD

If, for any reason, the maintenance personnel has to work on equipment that has not been unloaded, for any type of work, a fire extinguisher (Figure #1.1) should be made readily available and close to this vehicle. Anytime a loaded vehicle is inside a garage, there shall be a fire extinguisher very close nearby.

The employer must inform and train all personnel about the measures to be taken in case of a truck and/or a loaded body catching on fire. The employer must also inform its employees of an appropriate place to drop the load near the maintenance facility (Preferably away from traffic, surface drains and ditches).

FIGURE #1.1

DANGER

DO NOT PERFORM ANY REPAIR OR MAINTENANCE ON A VEHICLE THAT HAS NOT BEEN UNLOADED.

1.5 "LOCKOUT/TAGOUT" PROCEDURE

It is the employer's responsibility to establish and apply a "lockout/tagout procedure" for any inspection, repairs or maintenance being done on the vehicle, whether it is on the road or at the shop. Before the "lockout/tagout" procedure is applied, the body **must be unloaded.**

SUGGESTED "LOCKOUT / TAGOUT" PROCEDURE

1. **Apply the parking brake (Figure #1.2).**
2. **Turn off the pump switch on the console (PTO switch).**
3. **Shut off the engine.**
4. **Remove the key from the ignition switch.**
5. **Put the key in a safe controlled area.**
6. **Put adhesive tape on the ignition switch keyhole.**
7. **If installed, turn off the master switch (Figure #1.3).**
8. **Put an "Off Service" tag on steering wheel.**
9. **Put an "Off service" sign in the windshield.**
10. **Block any system that could move by gravity with a proper and visible safety prop (open tailgate, raised body, etc.).**
11. **Release any residual pressure in the hydraulic and pneumatic system.**
12. **Block wheels on both sides to prevent movement of vehicle.**
13. **Disconnect the following items if any type of welding is required:**

- **Battery*;**
- **ABS* (Anti-lock brake system);**
- **Electronic transmission (ECU)*;**
- **Electronic engine module (ECM)*;**
- **Intermittent wiper module*;**
- **All multiplex modules.**

FIGURE #1.2

FIGURE #1.3

* Refer to the chassis manufacturer service manual to locate electronic components.

1.6 BODY SAFETY PROP

BODY SAFETY PROP INSTALLATION PROCEDURE

1. Make sure the body is empty.
2. Lift the body until the safety prop is clear to be tilted under the body.
3. Pull the handle (Figure #1.5) to release the safety prop, then pull down the safety prop.
4. Slowly lower the body so it rests properly on the prop (Figure #1.6).
5. Once finished with repairs or inspection, slightly raise the body and bring back the safety prop to its vertical position then lower the body.

DANGER

DO NOT USE PROP WITH A LOADED BODY. NEVER STAND UNDER A RAISED AND LOADED BODY.

FIGURE #1.5

FIGURE #1.6

1.7 TAILGATE SAFETY PROP

The tailgate safety prop is used to support and keep the tailgate open during inspection or when maintenance is carried out on the vehicle. It is mandatory to install the safety prop each time the tailgate is open for such purpose.

The safety prop can be easily installed when the tailgate is slightly open. Apply the following procedure to install the safety prop.

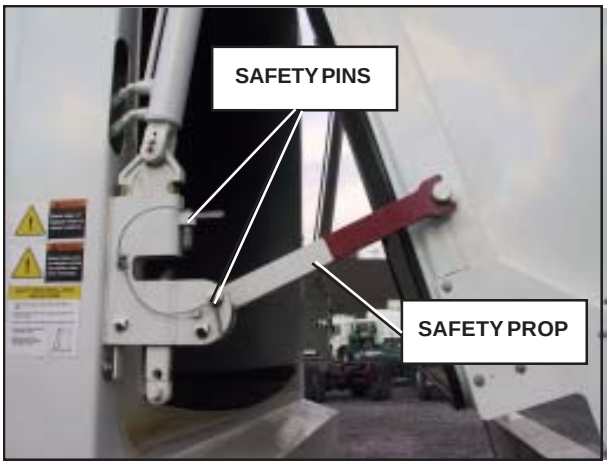


FIGURE #1.7

TAILGATE SAFETY PROP INSTALLATION PROCEDURE

1. **Make sure there is no garbage inside the body.**
2. **Remove both the tailgate safety pins.**
3. **Start the engine.**
4. **Turn the PTO switch ON and open the tailgate about 3 feet high.**
5. **Remove the safety prop lock pin and raise the prop in a position where both locking holes are aligned together (Figure #1.7).**
6. **Insert the lock pin to maintain the safety prop in place.**
7. **Lower the tailgate so it rests on the safety prop.**

DANGER

ALWAYS USE THE TAILGATE SAFETY PROP WHEN WORKING UNDER A RAISED TAILGATE. THE SAFETY PROP MUST BE INSTALLED EVEN IF THE TAILGATE IS IN THE FULLY RAISED POSITION.

DANGER

ENSURE THAT NO ONE IS STANDING BEHIND THE TRUCK AND THERE IS NO WASTE MATERIAL IN THE BODY.

1.8 SHUTDOWN PROCEDURE

If the vehicle has to be stored for an extended period; follow the chassis manufacturer shutdown requirements as well as the maintenance requirements and perform the following procedure.

SHUTDOWN PROCEDURE

1. **Park on a hard level surface.**
2. **Apply the parking brake.**
3. **Make sure all moving parts are in the stored position (tailgate, arm, body, crusher panel, packer, etc.).**
4. **Turn hydraulics, electrical and engine "OFF".**
5. **Turn off the master switch.**
6. **Drain the air tanks (Figure #1.8).**

AIR TANK

FIGURE #1.8

1.9 PRIOR TO START UP

Before starting the vehicle, ensure that no system will engage and start to operate as you are starting the engine. All electrical components should be turned OFF and the hydraulic pump disengaged (Figure #1.9). **The main valve on the hydraulic tank should be open (Figure #1.10 & #1.11).** Refer to section 3.1.8 "Engaging the hydraulic system" in the Operator Manual.

Once the engine is started, wait for the air pressure to build up to at least 70 PSI. **Do not operate or move the vehicle until the air pressure has reached 70 PSI.**

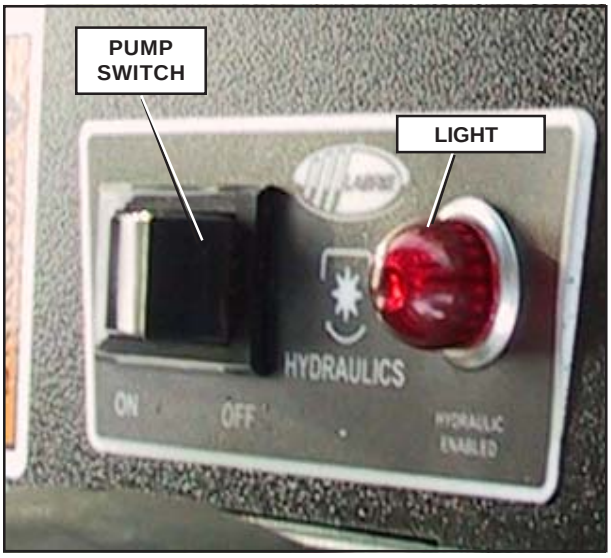


FIGURE #1.9

MAIN HYDRAULIC TANK (2 DIFFERENT TYPES)

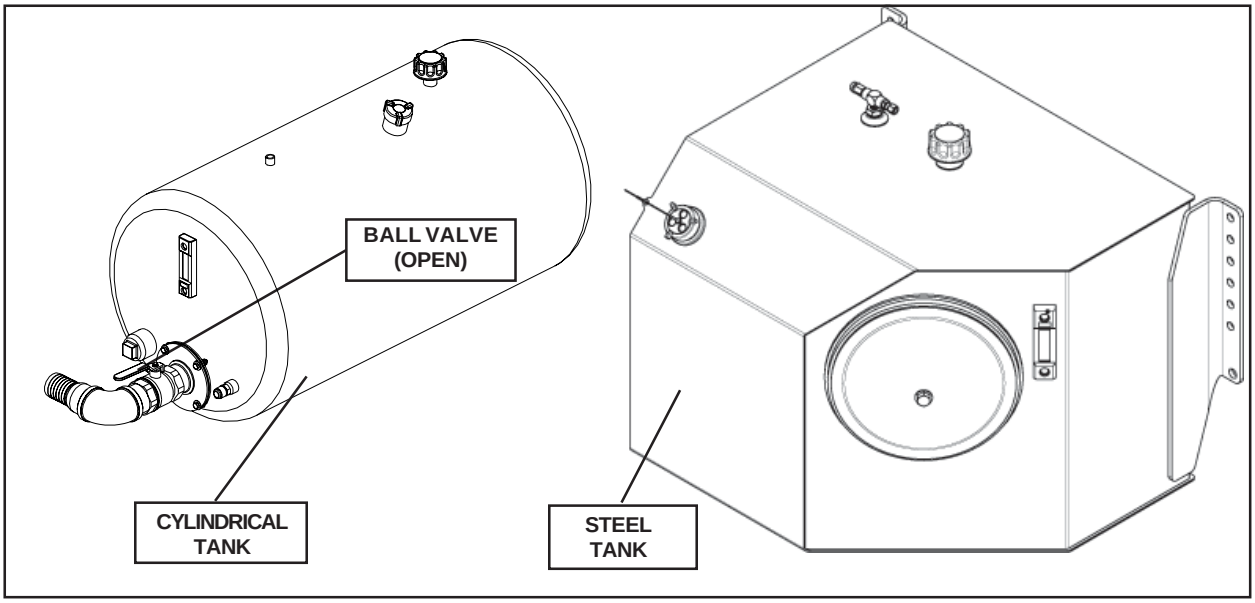


FIGURE #1.10

NOTE: The hydraulic tank model can vary according to the options installed on the truck.

SUCTION LINE MOUNTED VALVE (STEEL TANK)

FIGURE #1.11

SUCTION LINE MOUNTED VALVE (CYLINDRICAL TANK)

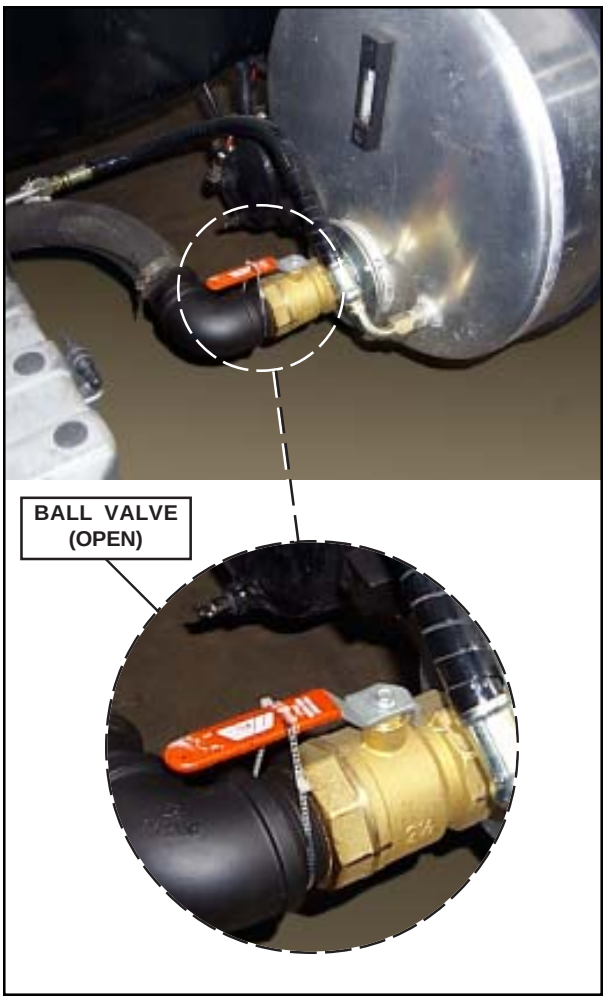


FIGURE #1.11A

CAUTION

MAKE SURE THE MAIN VALVE ON THE HYDRAULIC TANK IS FULLY OPEN BEFORE STARTING THE ENGINE (FIGURE #1.10 & #1.11). IF NOT OPEN, IMMEDIATE DAMAGE WILL OCCUR TO THE PUMP EVEN IF THE PUMP SWITCH IS TURNED "OFF".

1.10 GENERAL CLEANLINESS

Cleanliness is part of the safety. Ensure the equipment will work properly by removing any stacked garbage in the hopper area. Clean all truck lights, warning lights and safety stickers, so you and the surrounding pedestrians and vehicles will be safe around the truck at all times.

Keep clean the contact surface between the body and chassis. Labrie recommends to clean the chassis after every unloading.

Make sure that the side step and/or the hopper step (if installed) are clean and free of any slippery material.

WARNING

KEEP THE RIGHT AND LEFT-HAND SIDE CAB FLOOR DRY AND CLEAN TO PREVENT ANY RISK OF SLIPPING AND ACCIDENT.

DANGER

USE A STEPLADDER TO WORK ON HIGHER PARTS OF THE VEHICLE. REMEMBER THAT THE ROOF IS NOT MEANT TO BE WALKED ON. BE VERY CAUTIOUS IF YOU HAVE TO WORK ON THE ROOF AREA.

1.11 CLEANING THE HOPPER AREA

The area behind the packer should be cleaned out every day. The packer will not work properly if waste accumulates in this area; it could even cause severe damage to the packer and other related parts.

This section indicates the cleaning procedure of the hopper section.

DANGER

APPLY THE "LOCKOUT/TAGOUT" PROCEDURE TO PREVENT ANY ENGINE START-UP.

HOPPER CLEANING PROCEDURE

1. **Park the vehicle in a proper place, where the vehicle can be cleaned out. Make sure to park the vehicle on a safe and level ground.**
2. **Ensure that the parking brake is applied and the vehicle is tagged out for maintenance purposes (refer to the section 1.5 "Lockout/ Tagout procedure").**
3. **Start the engine and engage the hydraulic pump (PTO ON).**
4. **Extend the arm, fully extend the packer (Figure #1.12) and push on the red button (Figure #1.13) to stop the packer in this position. The hopper door MUST be closed in order to move the packer.**
5. **Turn off the hydraulic pump and the engine.**

FIGURE #1.12

FIGURE #1.13

Continued on next page. . .

1.11 CLEANING THE HOPPER AREA (cont'd)

HOPPER CLEANING PROCEDURE

6. Open the clean out traps on each side of the hopper (Figure #1.15).

7. Climb inside the hopper using the step-ladder (Figure #1.14).

8. Tilt down the floating panel over the packer to gain access to the rear area of the packer (Figure #1.17).

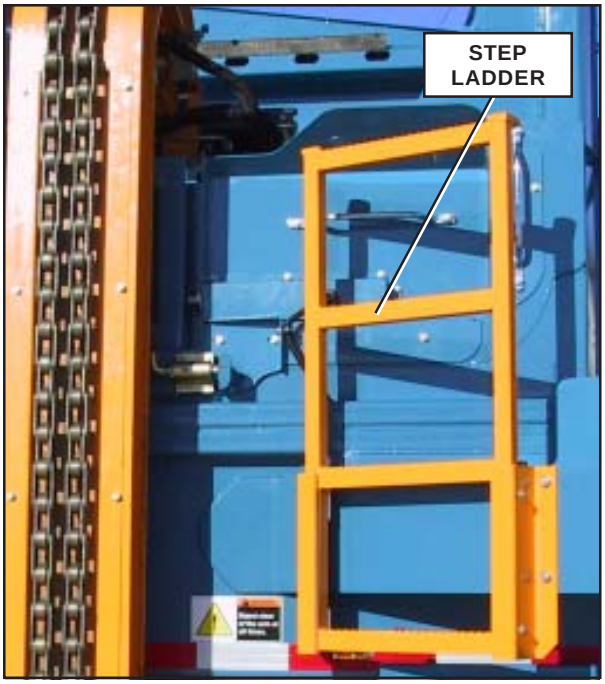


FIGURE #1.14

WARNING

PREVENT HANDS OR FINGERS FROM BEING CAUGHT AT THE PINCH POINT OF THE FLOATING PANEL. INSTALL THE SAFETY PIN.

FIGURE #1.15

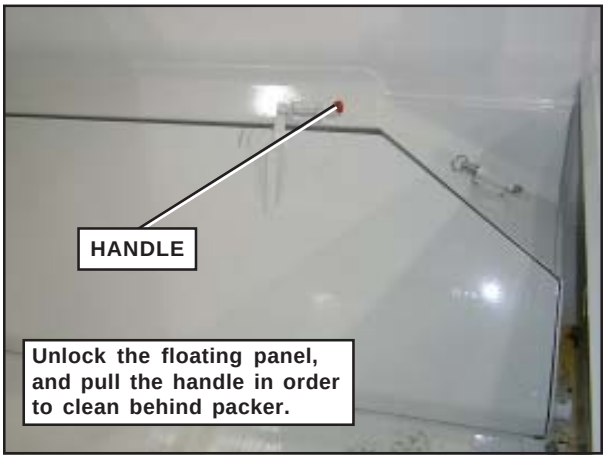


FIGURE #1.16

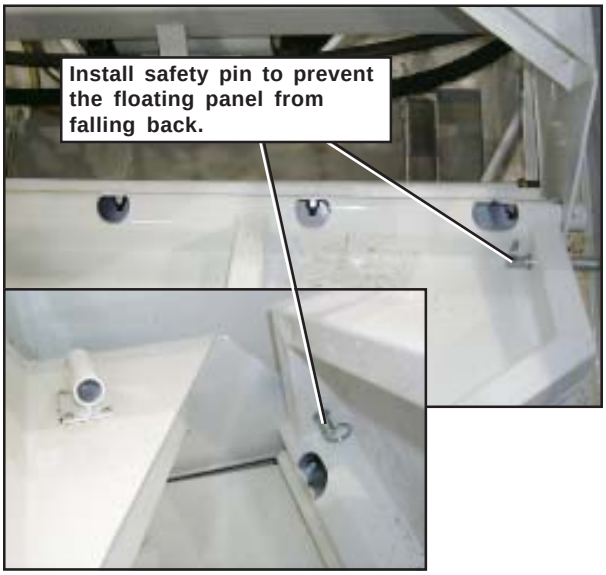


FIGURE #1.17

HOPPER CLEANING PROCEDURE

9. Remove all accumulated dirt under the cylinder brackets and side rails (Figure #1.18) using a scraper or pressurized water.

10. Rake small piece of garbage towards the clean out traps (Figure #1.19). Finish cleaning the area with pressurized water.

11. Perform a visual inspection of the following components, checking for proper working order and/or alignment:

- Rollers;
- Cylinders pins;
- Hoses, pipes and connections;
- Proper tightness of bolts;
- Check for excessive wear of the floor and sidewalls of the hopper;
- Check cylinders and hoses for leaks;

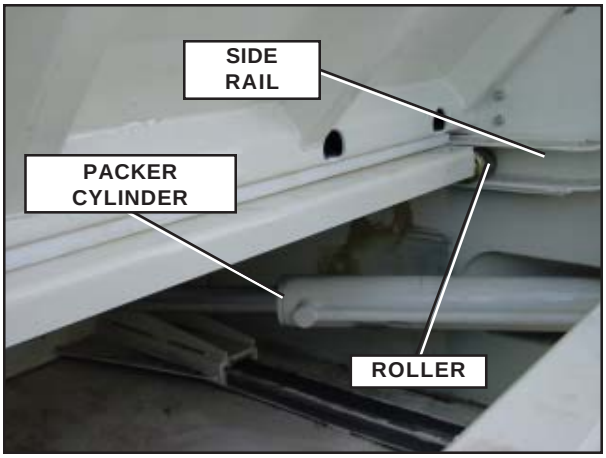


FIGURE #1.18

FIGURE #1.19

HOPPER CLEANING PROCEDURE

12. After cleaning and inspecting, raise the floating panel.

13. Exit the hopper, retract the step ladder.

14. Start the engine, engage the hydraulic system and fully retract the packer.

15. Retract the arm along the truck.

1.12 PACKER MAINTENANCE

1.12.1 GENERAL MAINTENANCE

The Automizer™ packing system has a heavy-duty guiding system using high strength steel wear plates. Because of the intensive use of the packer, (1000 to 3000 cycles per day), Labrie recommends that a visual inspection of the packer and its components to be performed daily by the operator. A weekly inspection and maintenance done by maintenance personnel is also mandatory.

Greasing all moving parts on a daily basis is very important and the proper adjustment of the limit switches is imperative, especially on units equipped with multi-cycle options. Refer to the "Lubrication" section for detailed diagrams of greasing points and lubrication schedule.

DO NOT GREASE THE SIDE RAILS: Abrasive material sticks to the grease and can cause premature wear of the rollers and/or the side rails.

DANGER

APPLY THE LOCKOUT / TAGOUT PROCEDURE AT ALL TIMES WHEN MAINTENANCE OR INSPECTION IS CARRIED OUT ON THE VEHICLE.

Any problems found on the packing system must be corrected immediately.

Labrie's Service Department is available for any type of technical support. Apply the following step-by-step inspection procedure to prevent breakdowns and to reduce maintenance expenses.

PACKER INSPECTION PROCEDURE

1. **Ensure that the parking brake is applied and the vehicle is tagged out for maintenance purposes (refer to the section 1.5 "Lockout/ Tagout procedure").**
2. **Start the engine, engage the hydraulic system.**
3. **Fully extend the packer and stop it using the emergency red button.**
4. **Check the follower panel hinges and see if there is no wear on the panel's surface (Figure #1.20).**
5. **Inspect the wear pad (nylon strip) at the bottom of the floating panel (Figure #1.20). This wear pad wipes out dirt each time the packer goes back and forth. Replace this wear pad before it is worn down to the top of its holding screw.**

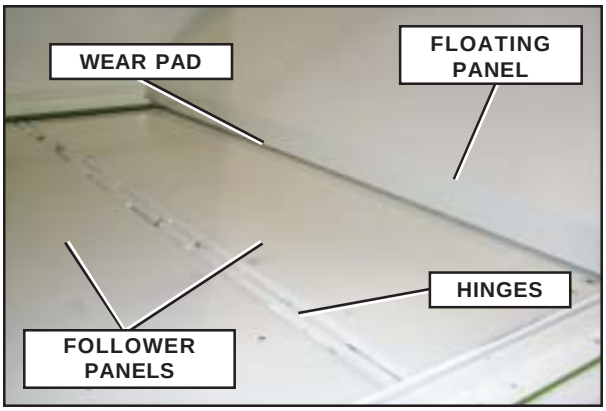


FIGURE #1.20

PACKER INSPECTION PROCEDURE (cont'd)

6. Visually inspect both hopper side rails and packer rollers (Figure #1.21 & #1.22) for premature wear. If necessary, refer to section 1.12.8 "Packer Roller Replacement" or section 1.12.5 "Wear pad replacement.

7. See that there are no leaks on hydraulic hoses and pipes. Tighten leaking connections and/or replace the defective hose.

8. Cylinder rod ends must be clear of any dirt.

FIGURE #1.21

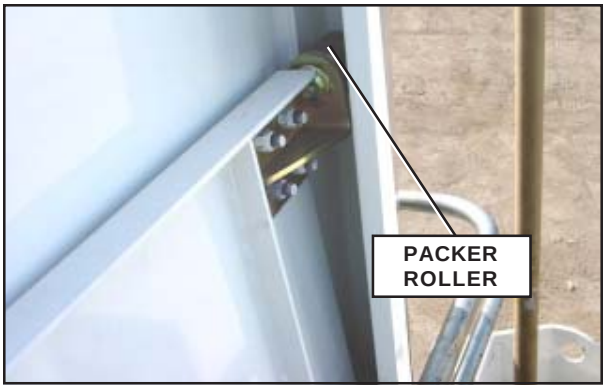


FIGURE #1.22

PACKER INSPECTION PROCEDURE (cont'd)

9. Verify cylinder rods for scratches that may cause the cylinder to leak oil. In this case, the cylinder must be replaced immediately. DURING THE WARRANTY PERIOD; DO NOT ATTEMPT TO CHANGE CYLINDER SEALS AND PACKING.

10. Check for vertical and horizontal movement of the packer. If the packer seems to play sideways or even up and down, the packer wear pads need to be replaced. Extensive wear of the hopper floor also suggests that the sliding shoes require immediate replacement. Refer to section 1.12.3 to section 1.12.5.

11. Make sure there is no knocking noise when the packer reaches the end of the cylinder's stroke. A knocking noise will indicate that both limit switches require adjustment. Refer to section 1.12.2 "Limit switch adjustment".

12. In order to verify if hydraulic cylinders are internally leaking, (insufficient packing force) refer to troubleshooting; section 3.19 "Internal Leak Detection".

1.12.2 LIMIT SWITCH ADJUSTMENT

The packer limit switches were properly adjusted at the factory for optimal operation of the packer. If a daily cleaning is not properly done behind the packer, it is possible that the limit switches will no longer stop the packer, creating a knocking noise when the packer reaches the end of a stroke (bottoming out). The packer may also not retract far enough to touch the limit switch preventing the automatic cycle to work properly.

After a certain period of time, a misalignment of the components may occur due to the frequent back and forth movement of the packer. An adjustment might be necessary to prevent the cylinders from completely extending and retracting to the end of their strokes.

There are two limit switches that control the packer's extension and the retraction limits. Both limit switches are located at the front end of the body, between the cab and the body (Figure #1.23 & #1.24). The limit switch that stops the packer during extension (packer extend) is located on the left-hand side (Figure #1.23). The other limit switch, (packer retract) is located on the right-hand side of the vehicle (Figure #1.24).

DANGER

APPLY THE LOCKOUT / TAGOUT PROCEDURE AT ALL TIMES WHEN MAINTENANCE OR INSPECTION IS CARRIED OUT ON THE VEHICLE.

NOTE : Optional proximity switches can also be installed on the vehicle but the adjustment procedure remains the same (see Figure # 1.24A).

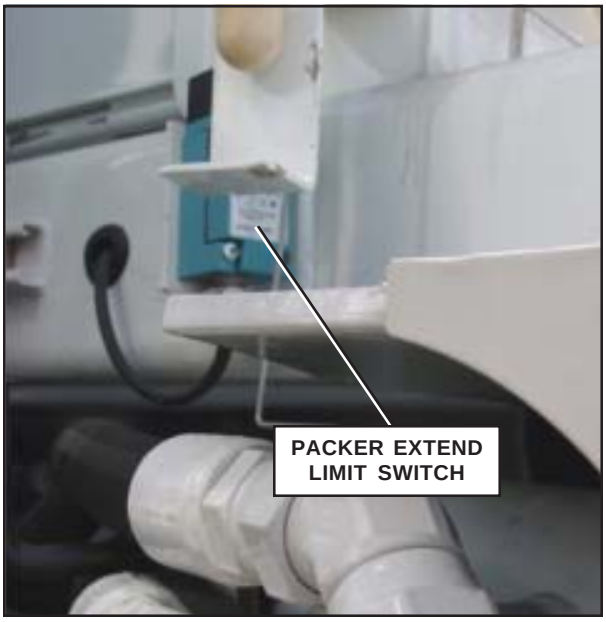


FIGURE #1.23

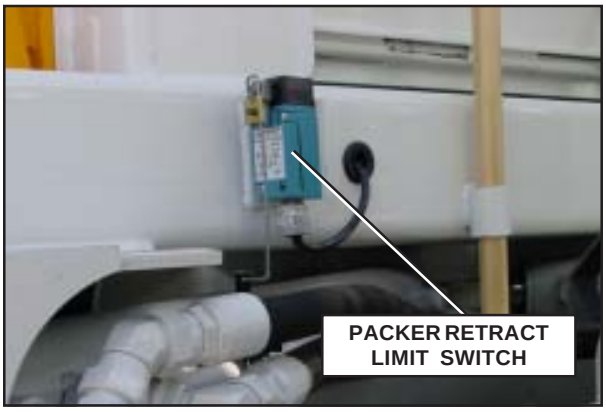


FIGURE #1.24

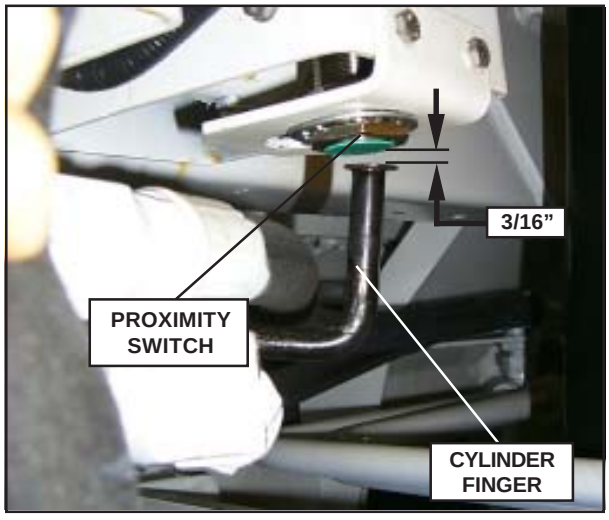


FIGURE #1.24A

1.12.2 LIMIT SWITCH ADJUSTMENT (Cont'd)

PACKER LIMIT SWITCH ADJUSTMENT PROCEDURE

1. **Ensure that the parking brake is applied and the vehicle is tagged out for maintenance purposes (refer to the section 1.5 "Lockout/ Tagout procedure").**

2. **Start the engine, engage the hydraulic pump.**

3. **Press the green button on the packer control station in order to extend the packer about 1 inch back from the fully extended position (Figure #1.25).**

4. **Push the red button when the packer reaches the proper position. The red button ensures there will be no accidental start up of the packer when adjusting the limit switch.**

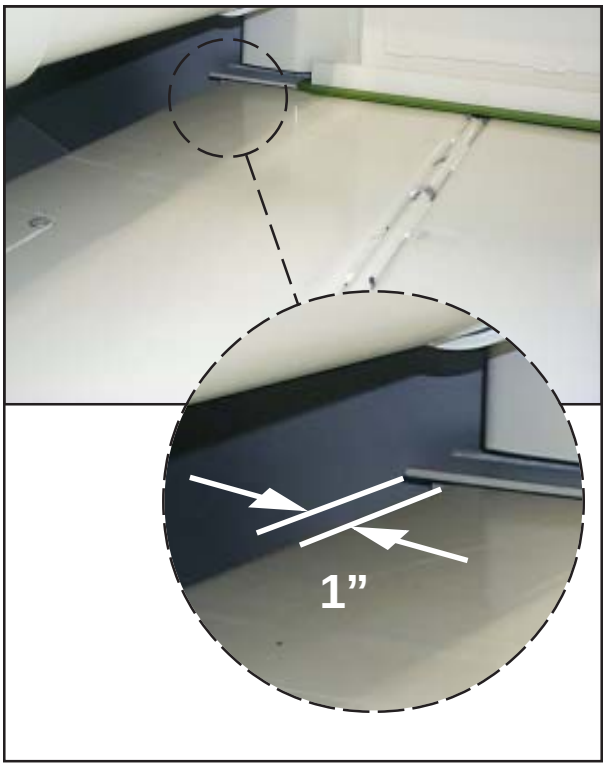


FIGURE #1.25

DANGER

DO NOT CLIMB INTO THE HOPPER WHILE THE PACKER IS MOVING.

Continued on next page. . .

1.12.2 LIMIT SWITCH ADJUSTMENT (Cont'd)

PACKER LIMIT SWITCH ADJUSTMENT PROCEDURE

5. **Locate the limit switch on the left-hand side of the vehicle (Figure #1.26).**

6. **Adjust the limit switch lever so it is "active" when the packer cylinder finger is in the position shown on figure #1.27 (Limit switch is "clicked"). The lever may require to be bent or twisted to properly activate the limit switch at this exact position.**

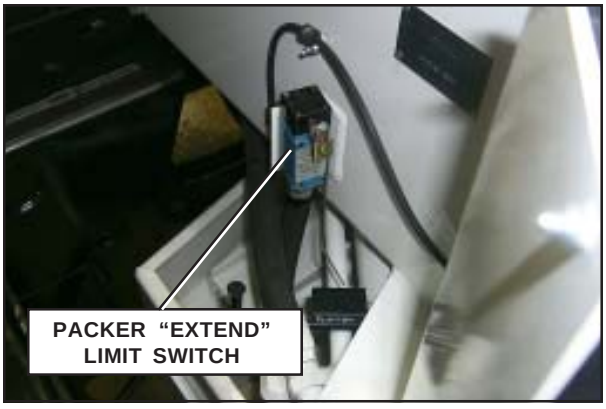


FIGURE #1.26

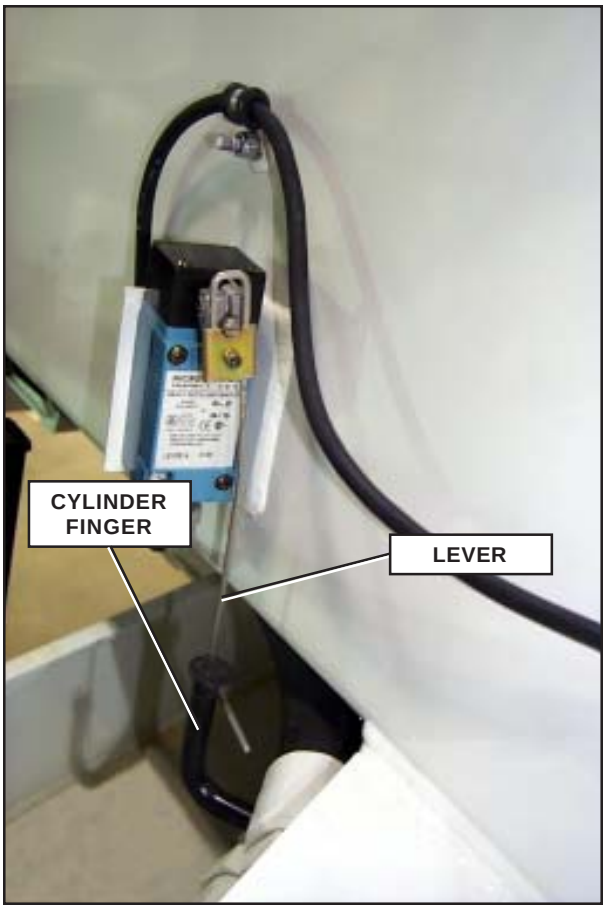


FIGURE #1.27

1.12.2 LIMIT SWITCH ADJUSTMENT (Cont'd)

PACKER LIMIT SWITCH ADJUSTMENT PROCEDURE

7. **To adjust the "packer retract" limit switch, retract the packer to 1" before the fully retracted position (Figure #1.28), using the yellow button on the packer control station.**

8. **Push the red button when the packer reaches the right position.**

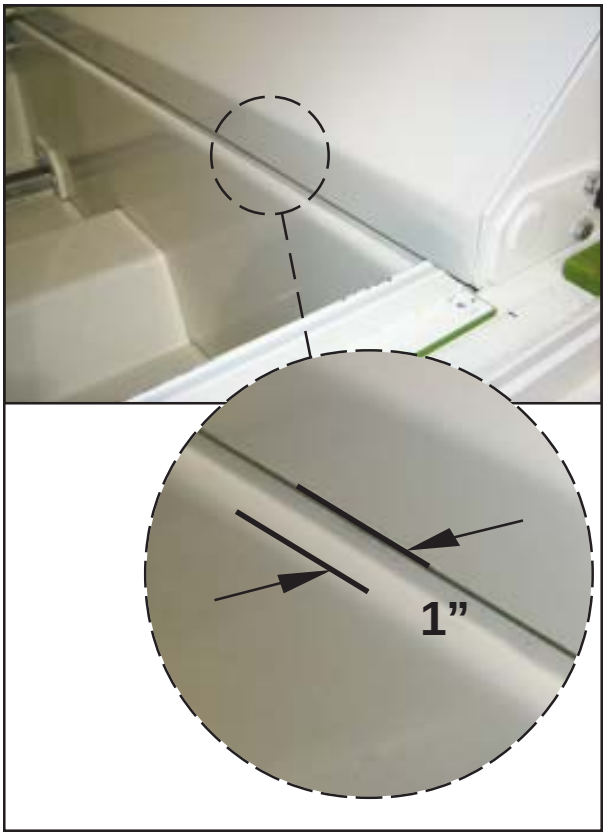


FIGURE #1.28

PACKER LIMIT SWITCH ADJUSTMENT PROCEDURE

9. **Locate the limit switch on the right-hand side of the vehicle (Figure #1.29).**

10. **Adjust the limit switch lever so it is "active" when cylinder finger is in the position shown on figure #1.29 (Limit switch is "clicked"). The lever may require to be bent or twisted to properly activate the limit switch at this exact position.**

11. **Test the packer for a full cycle. Make sure that there is no knocking noise at both ends of the packer cylinder stroke.**

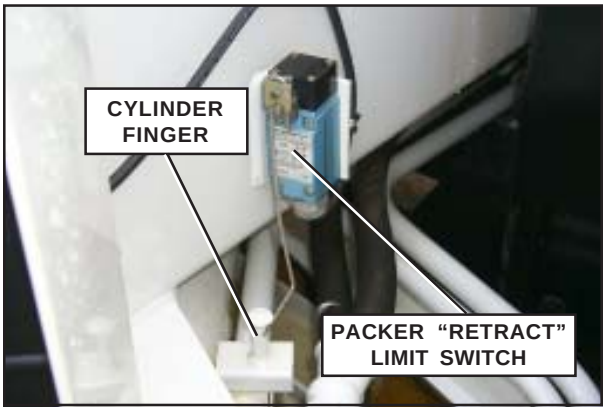


FIGURE #1.29

NOTE: If the vehicle is equipped with proximity switches, loosen the proximity switch on the bracket and move it over the trigger lever to get the yellow light found on the proximity switch to turn ON (Figure #1.24A). The green light on the proximity switch must be ON too.The gap between the proximity switchand the trigger lever must beadjusted to 3/16 of an inch.

1.12.3 REPLACING SLIDING SHOES AND WEAR PAD

Use a pry bar to move the packer up and down and from side to side and if the packer has a vertical movement greater than 3/16" or a side movement greater than 1/8", verify both packer's sliding shoes as well as wear pads (Figure #1.30) under the side rails.

Two different types of steel are used on the packer guiding system: the AR-425 and the AR-500 type steel. The sliding shoes are made of AR-425 type steel to wear out before the floor guides, which are made of AR-500. Refer to Body Parts section for replacement part numbers.

To keep the packer in good working order and to prevent breakdowns, replace the sliding shoes and wear pads before extensive wear or damage appears on the hopper floor and walls.

DANGER

SECURE THE AREA AROUND THE PATH OF THE ARM WHEN PERFORMING MAINTENANCE OR REPAIR.

1.12.4 SLIDING SHOE REPLACEMENT

SLIDING SHOE REPLACEMENT PROCEDURE

1. **Note that it is not necessary to remove the packer to perform this procedure.**
2. **Ensure that the parking brake is applied and the vehicle is tagged out for maintenance purposes (refer to the section 1.5 "Lockout/ Tagout procedure").**
3. **Start the engine and engage the hydraulic system.**
4. **Then using the joystick, extend the automated arm to give a better access to the hopper area.**

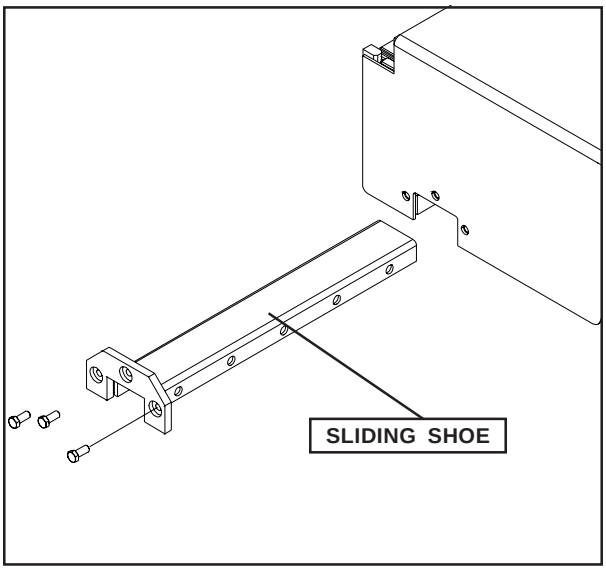


FIGURE #1.30

1.12.4 SLIDING SHOE REPLACEMENT (cont'd)

SLIDING SHOE REPLACEMENT PROCEDURE

5. **If the packer is not fully retracted, press the yellow button on the packer control station to retract it.**

6. **Turn the hydraulic pump and the engine off.**

7. **Behind the packer, remove the welds from both wear shoes (Figure #1.31), using a grinder or cutting tools.**

8. **Start the engine; engage the hydraulic pump and extend the packer about 18 inches before the end of the stroke (Figure #1.31).**

9. **Turn the hydraulic pump and the engine off.**

10. **Remove all retaining bolts (3) from each sliding shoe (Figure #1.33).**

View from behind the packer (packer fully retracted)

FIGURE #1.31

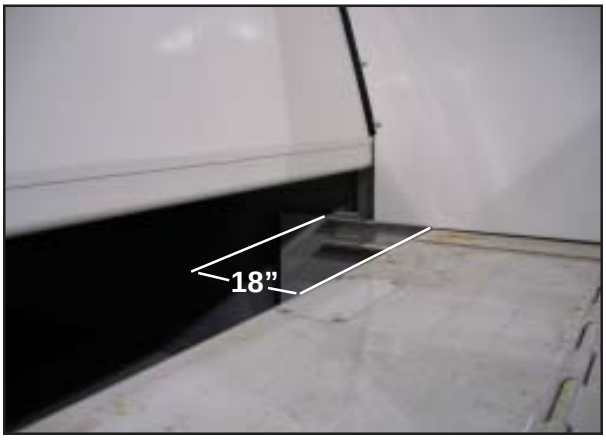


FIGURE #1.32

NOTE:
In order to move the packer (retract or extend) for a short distance, press on the green (or yellow) button and then push immediately the red button to stop the packer. Pull out the red button and repeat the process until the packer reaches the desired position.

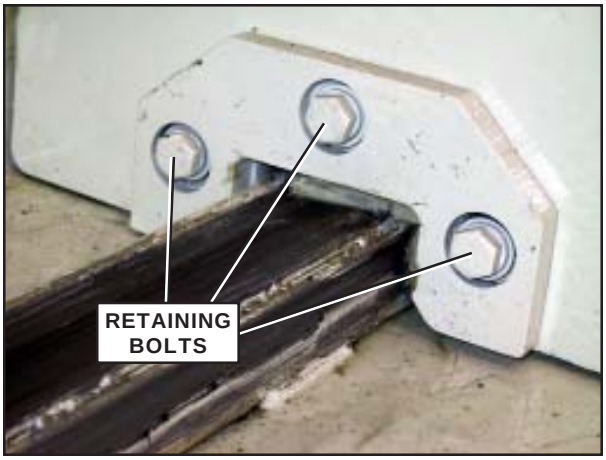


FIGURE #1.33

Continued next page. . .

1.12.4 SLIDING SHOE REPLACEMENT (cont'd)

SLIDING SHOE REPLACEMENT PROCEDURE

11. Tack weld a piece of steel tubing to the floor rail and to the front of the both sliding shoes (Figure #1.34).

12. Then start the engine, engage the hydraulic pump and slowly retract the packer by pressing the yellow button and the red button.

13. The sliding shoes will come out from under the packer as it is retracting (Figure #1.35).

14. Remove the old sliding shoe and tubing. Make sure to remove the welds on the floor guide using a grinder.

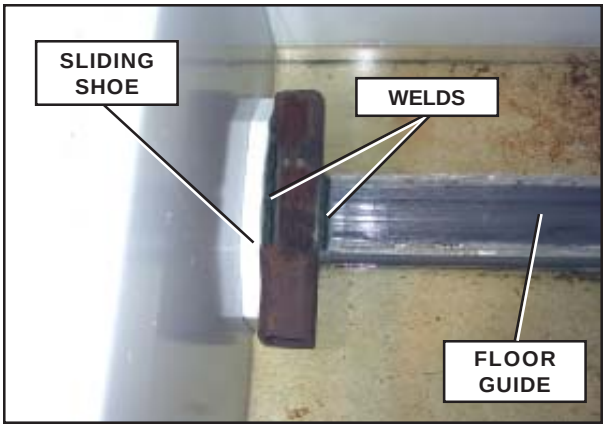


FIGURE #1.34

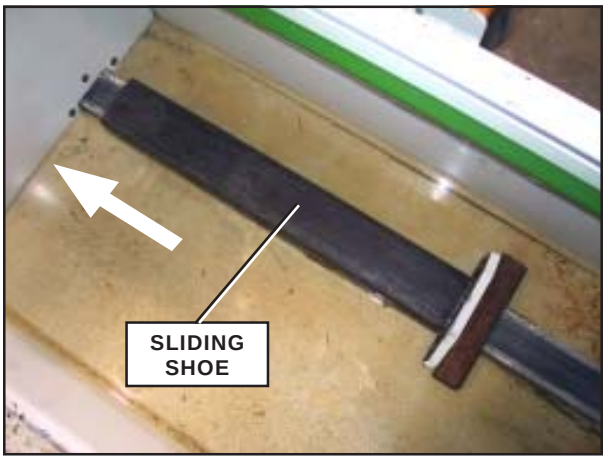


FIGURE #1.35

DANGER

DO NOT CLIMB INTO THE HOPPER WHILE THE PACKER IS MOVING.

1.12.4 SLIDING SHOE REPLACEMENT (cont'd)

SLIDING SHOE REPLACEMENT PROCEDURE

15. Align the new sliding shoe in front of the packer and slowly extend the packer to make the sliding shoe go under the packer.

16. When the sliding shoes are back in place, tighten all retaining bolts (Figure #1.36).

17. If the wear pads at the top of the packer need to be replaced, refer to section 1.12.5 "Wear Pad Replacement".

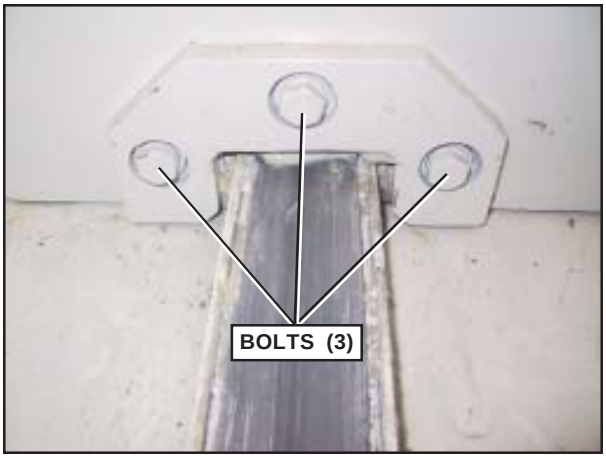


FIGURE #1.36

SLIDING SHOE REPLACEMENT PROCEDURE

18. Retract the packer.

19. Weld both sliding shoes to the packer (Figure #1.37).

20. Test the packer for proper operation.

21. If the packer is binding, to find out where the interference is, apply primer paint on the floor guide.

22. Run the packer a few times .

23. The location where the paint comes off indicate the surface to be ground.

View from behind the packer (packer fully retracted)

FIGURE #1.37

1.12.5 WEAR PAD REPLACEMENT

Replacement of the wear pads at the top of the packer (Figure #1.38) is required when vertical movement of the packer is greater than 3/16” (Check with a pry bar).

This section will provide the full procedure to remove and change both wear pads at the top of the packer.

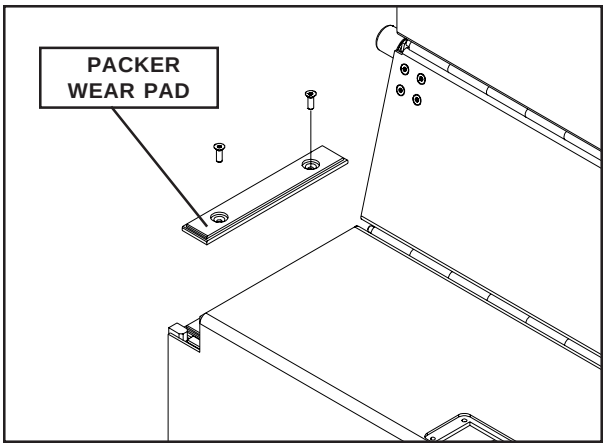


FIGURE #1.38

DANGER

DO NOT CLIMB INTO THE HOPPER WHILE THE PACKER IS MOVING.

DANGER

SECURE THE AREA AROUND THE PATH OF THE ARM WHEN PERFORMING MAINTENANCE OR REPAIR.

Apply the following procedure to remove and change the wear pads.

WEAR PAD REPLACEMENT PROCEDURE

1. **Ensure that the parking brake is applied and the vehicle is tagged out for maintenance purposes (refer to the section 1.5 “Lockout/ Tagout procedure”).**
2. **Start the engine and engage the hydraulic pump.**
3. **Then using the joystick, extend the automated arm to give a better access to the hopper area.**
4. **If the packer is not fully retracted, press the yellow button on the packer control station to retract it.**
5. **Turn the hydraulic and the engine off.**
6. **Remove the hopper side panel (Figure #1.39).**
7. **Remove both side rail shields.**
8. **Remove the lower bolts (4) of left side wall to be able to remove the left side rail (Figure #1.42-43).**

1.12.5 WEAR PAD REPLACEMENT (cont'd)

WEAR PAD REPLACEMENT PROCEDURE

9. **Remove stitch welds to release the side rails.**

10. **Remove both side rails.**

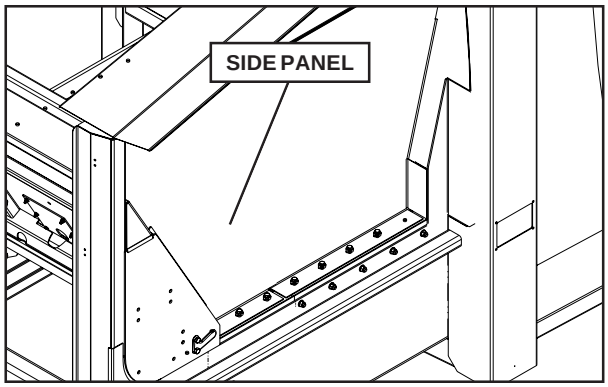


FIGURE #1.39

Note : The model of the side panel varies according to the options installed.

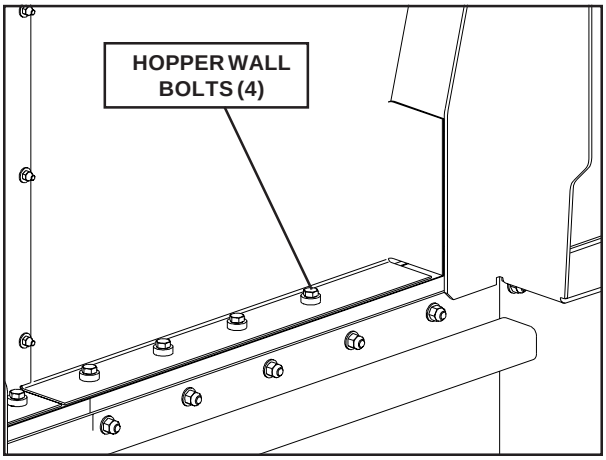


FIGURE #1.42

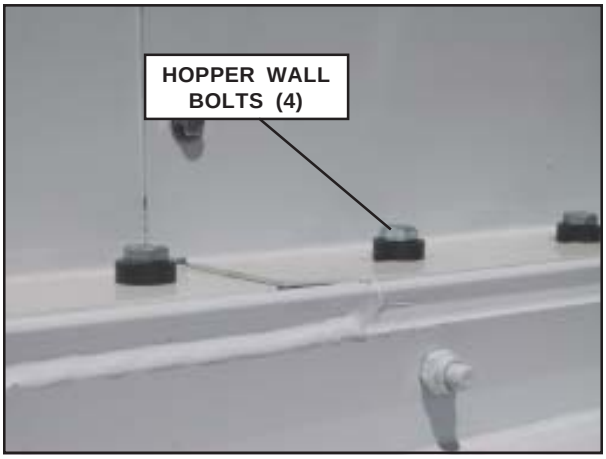


FIGURE #1.43

Continued next page. . .

1.12.5 WEAR PAD REPLACEMENT (cont'd)

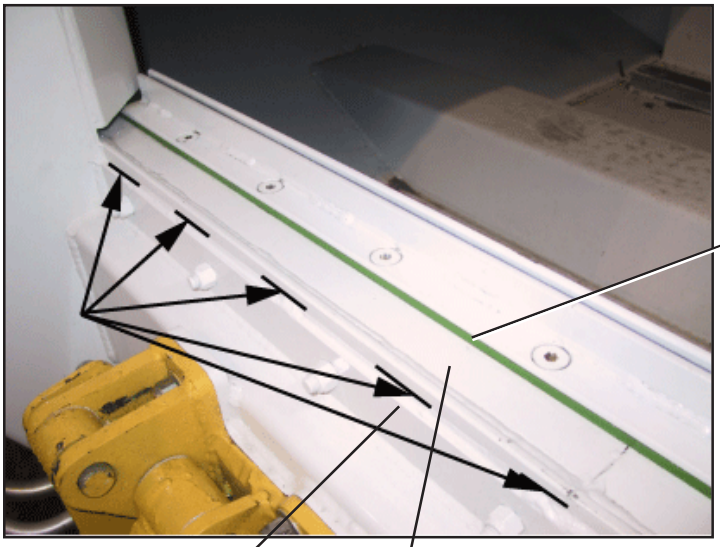


FIGURE #1.44

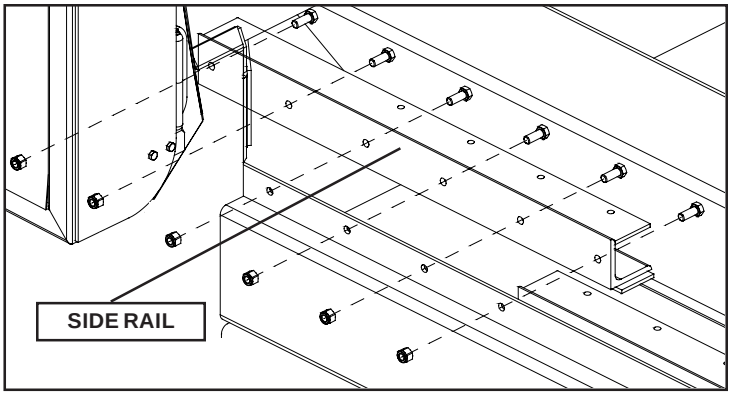


FIGURE #1.45

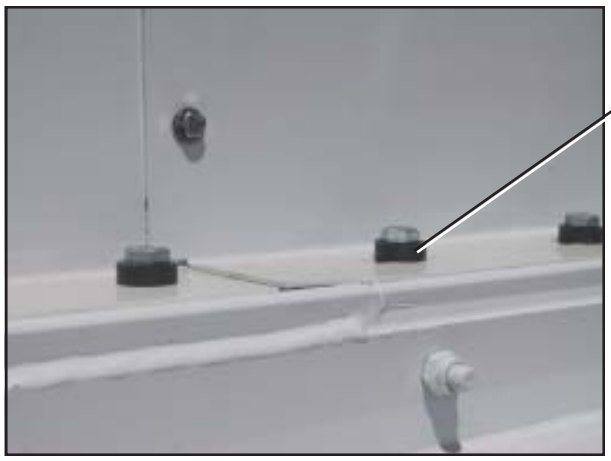


FIGURE #1.46

1.12.5 WEAR PAD REPLACEMENT (cont'd)

WEAR PAD REPLACEMENT PROCEDURE

11. **When both side rails are removed, start the engine and engage the hydraulic pump.**

12. **Extend the packer about 12 inches before the end of the stroke (Figure #1.47).**

13. **Turn the hydraulic pump and the engine off.**

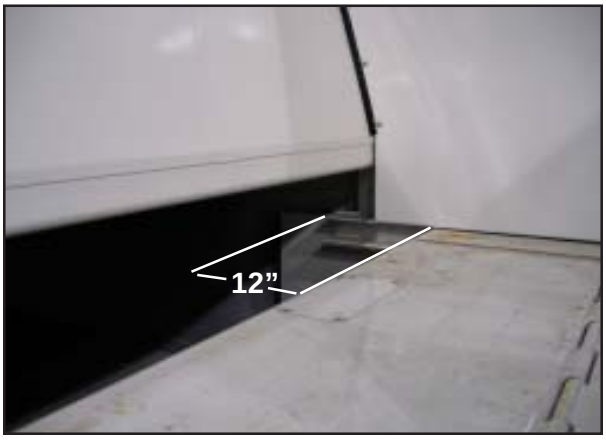


FIGURE #1.47

NOTE:
In order to move the packer (retract or extend) for a short distance, press on the green (or yellow) button then immediately push the red button to stop the packer. Pull the red button and repeat the process until the packer reaches the desired position.

DANGER

DO NOT CLIMB INTO THE HOPPER WHILE THE PACKER IS MOVING.

WEAR PAD REPLACEMENT PROCEDURE

14. **Remove and replace both wear pads (Figure #1.45) and retract the packer.**

15. **Reinstall the side rails.**

16. **Stitch weld the rails along the top edge of the hopper wall (Figure #1.44).**

17. **Reinstall the side rail shields.**

18. **Reinstall the hopper side wall**

19. **Reinstall the deflector cover back in place.**

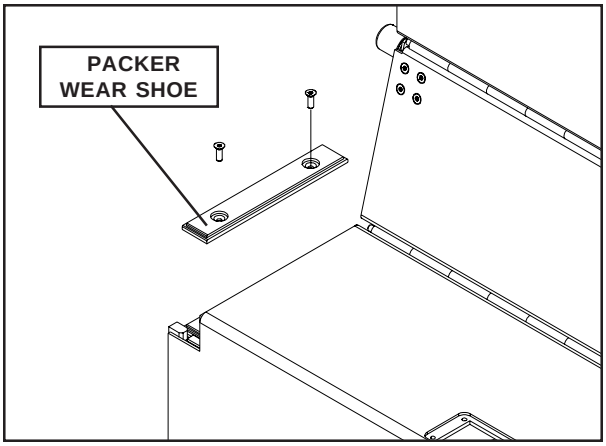


FIGURE #1.48

DANGER

SECURE THE AREA AROUND THE PATH OF THE ARM WHEN PERFORMING MAINTENANCE OR REPAIR.

1.12.6 PACKER REMOVAL

PACKER REMOVAL PROCEDURE

1. Ensure that the parking brake is applied and the vehicle is tagged out for maintenance purposes (refer to the section 1.5 “Lockout/ Tagout procedure”).
2. Start the engine and engage the hydraulic pump.
3. Then using the joystick, extend the automated arm to give a better access to the hopper area.
4. If the packer is not fully retracted, press the yellow button on the packer control station to retract it.
5. Turn the hydraulic and the engine off.
6. Remove the hopper side panel (Figure #1.49).
7. Remove both side rail shields.
8. Remove the lower bolts (4) of left side wall to be able to remove the left side rail (Figure #1.52-53).

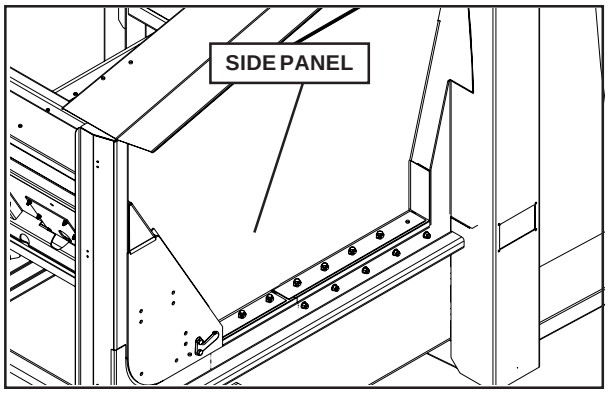


FIGURE #1.49

Note : The model of the side panel varies according to the options installed.

DANGER

APPLY THE LOCKOUT / TAGOUT PROCEDURE AT ALL TIMES WHEN MAINTENANCE OR INSPECTION IS CARRIED OUT ON THE VEHICLE.

1.12.6 PACKER REMOVAL (Cont'd)

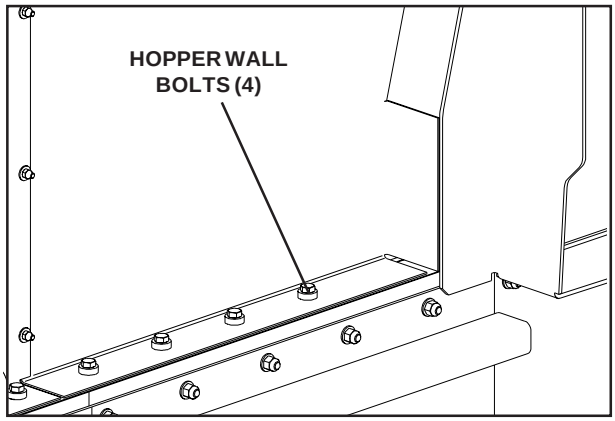


FIGURE #1.52

FIGURE #1.53

DANGER

DO NOT CLIMB INTO THE HOPPER WHILE THE PACKER IS MOVING.

NOTE:
In order to move the packer (retract or extend) for a short distance, press on the green (or yellow) button then immediately push the red button to stop the packer. Pull the red button and repeat the process until the packer reaches the desired position.

PACKER REMOVAL PROCEDURE (cont'd)

9. **Remove stitch welds to release the side rails.**

10. **Remove both side rails.**

11. **When both side rails are removed, start the engine and engage the hydraulic pump.**

12. **Extend the packer about 12 inches before the end of the stroke (Figure #1.54).**

13. **Turn the hydraulic pump and the engine off.**

14. **Remove the floating panel from the hopper. Refer to section 1.12.9 "Floating Panel Removal Procedure".**

15. **Remove the access cover to reach the cylinder pins (Figure #1.54).**

FIGURE #1.54

Continued next page. . .

1.12.6 PACKER REMOVAL (Cont'd)

PACKER REMOVAL PROCEDURE

16. **Remove both cylinder pins (Figure #1.56). Note that the greasing hoses must be disconnected from the cylinder pins.**

    The cylinder pins top plate are provided with two (2) threaded holes to be used as a puller by inserting two (2) 1/2 NC bolts.

17. **After removing the two cylinder pins, start the engine and retract the hydraulic cylinders (see Figure #1.44).**

18. **Remove all packer roller assemblies from the follower panels (Figure #1.55).**

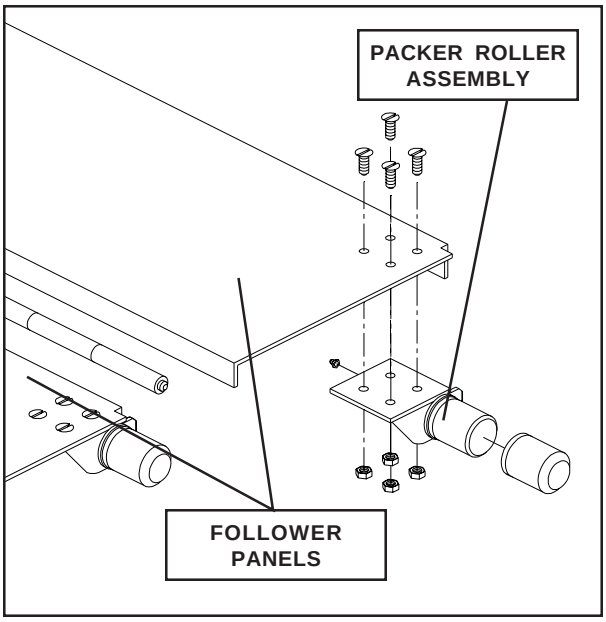


FIGURE #1.55

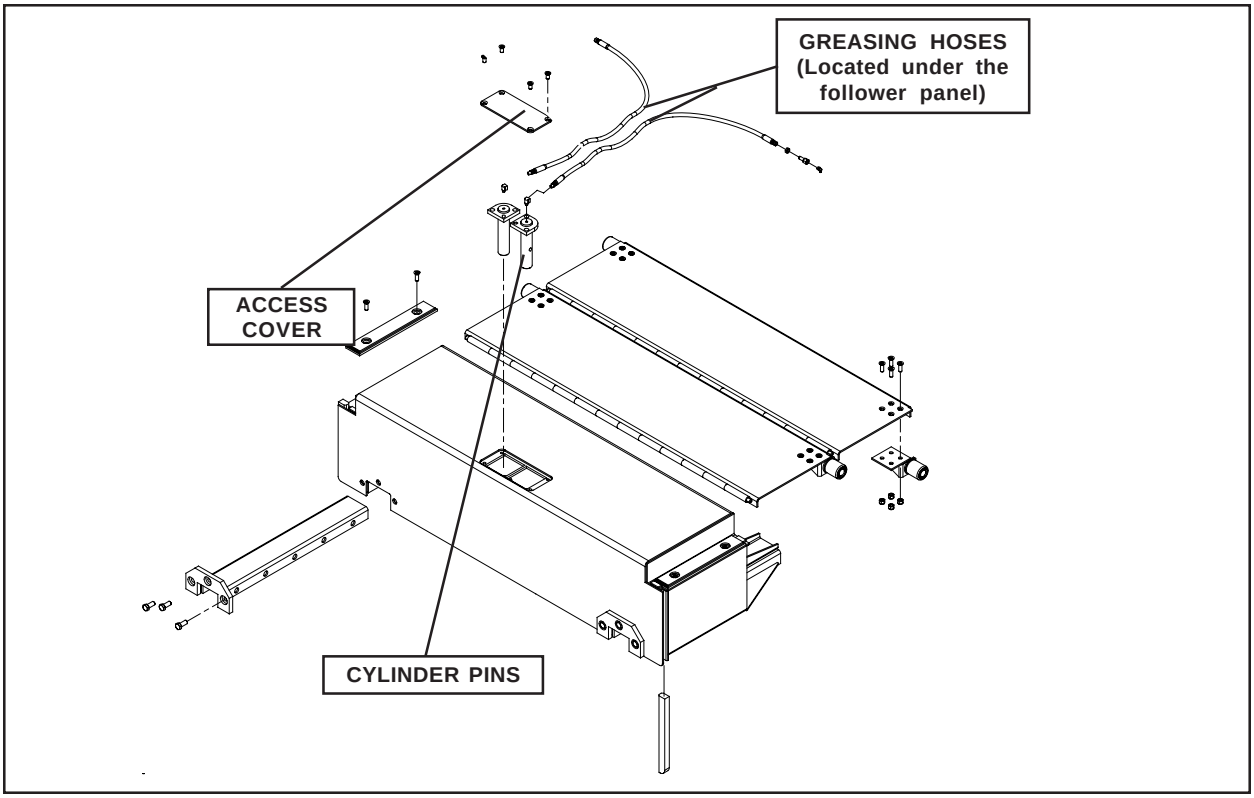


FIGURE #1.56

1.12.6 PACKER REMOVAL (cont'd)

PACKER REMOVAL PROCEDURE

19. Fold the follower panels over the packer.

20. Weld the follower panels to the packer.

21. Attach the packer to a lifting device (Fork lift) in order to extract it from the hopper.

22. Re-install the new packer into the hopper checking the alignment of the packer with the floor guides.

23. Install a new wiper blade on each side of the packer (Figure #1.58). These wiper blades may require to be adjusted to fit between the new packer and the hopper walls.

24. Once the packer is installed in the hopper, install roller assemblies and reverse the procedure to reconnect the hydraulic cylinders and re-install both side rails.

25. Stitch weld the rails along the top edge of the hopper wall (Figure #1.44).

26. Once finished re-assembling the removed components, lubricate and check for proper operation of the packer.

DANGER

APPLY THE LOCKOUT / TAGOUT PROCEDURE AT ALL TIMES WHEN MAINTENANCE OR INSPECTION IS CARRIED OUT ON THE VEHICLE.

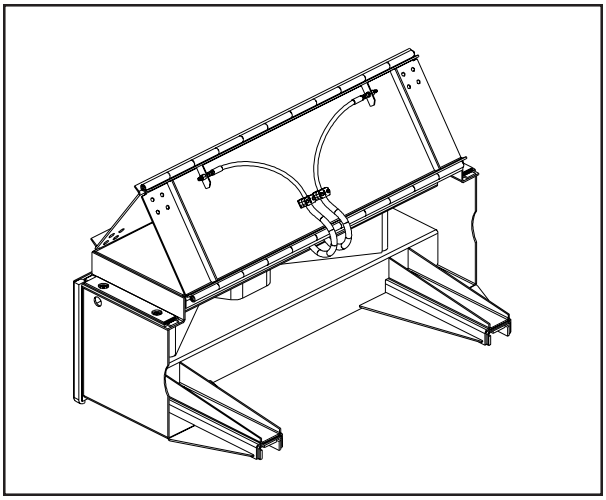


FIGURE #1.57

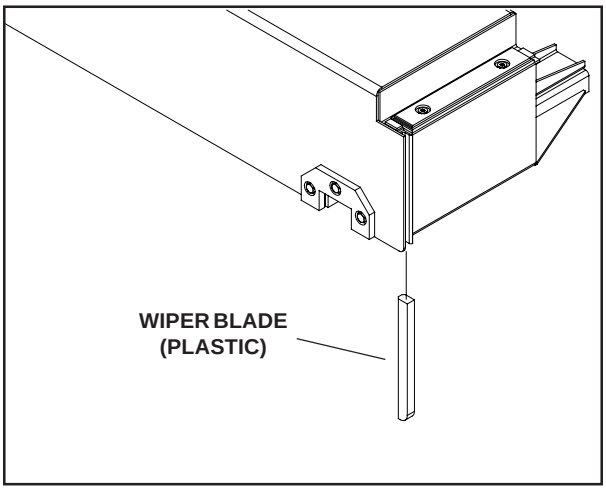


FIGURE #1.58

DANGER

DO NOT CLIMB INTO THE HOPPER WHILE THE PACKER IS MOVING.

DANGER

SECURE THE AREA AROUND THE PATH OF THE ARM WHEN PERFORMING MAINTENANCE OR REPAIR.

1.12.7 FLOOR GUIDE REPLACEMENT PROCEDURE

After years of hard work, the floor guides inside the hopper may require replacement. The following step-by-step procedure will help removing and replacing the floor guides inside the hopper.

FLOOR GUIDE REPLACEMENT PROCEDURE

1. **Ensure that the parking brake is applied and the vehicle is tagged out for maintenance purposes (refer to the section 1.5 "Lockout/ Tagout procedure").**

2. **Start the engine and engage the hydraulic system.**

3. **Then using the joystick, extend the automated arm to give a better access to the hopper area.**

4. **Remove the packer from the hopper (refer to section 1.12.6 "Packer Removal Procedure").**

5. **Retract the hydraulic cylinders and move them out of the way.**

6. **Mark the exact location of both floor guides to ensure the proper positioning of the new ones.**

7. **Using a grinder or cutting tool, remove the floor guides by cutting the stitch welds (Figure #1.59).**

1.12.7 FLOOR GUIDE REPLACEMENT PROCEDURE (Cont'd)

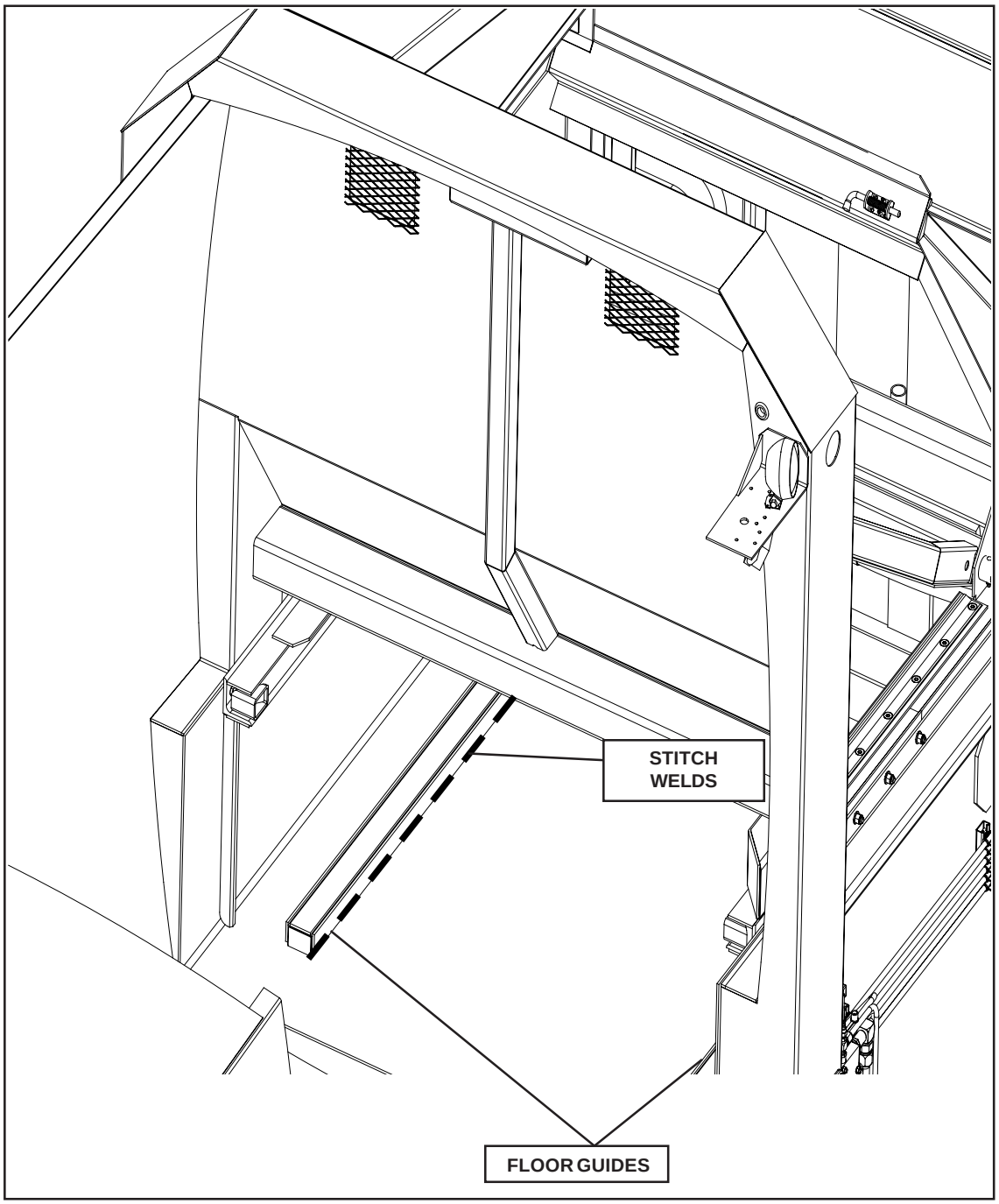


FIGURE #1.59

1.12.7 FLOOR GUIDE REPLACEMENT PROCEDURE (Cont'd)

FLOOR GUIDE REPLACEMENT PROCEDURE

8. Clean the hopper floor and wall surfaces.

9. Position new guides onto the hopper floor (Do not tack or weld yet).

10. Bring the packer over the hopper, using a proper lifting device.

11. Lower the packer on the floor guides, and align them with the packer.

12. Once the packer sits on the floor guides, center the packer (and the floor guides) in the hopper making sure they are parallel to the hopper wall (Figure #1.60).

13. Tack weld the floor guides to the hopper floor (Figure #1.61).

14. Adjust the packer wipers on both sides (UHMW plastic).

15. Connect the packer cylinders (refer to section 1.12.6 "Packer Removal Procedure").

16. Retract slowly the packer under the rails until the end of the packer stroke. Keep the packer centered with the hopper, re-install the side rails then tack the floor guides to the hopper floor (Figure #1.62).

View from behind the packer (packer fully extended)

FIGURE #1.60

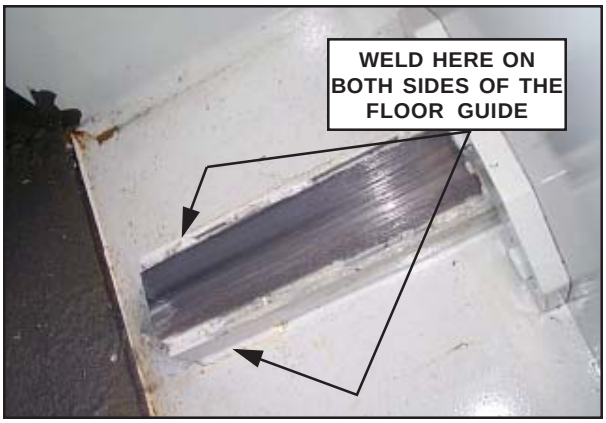


FIGURE #1.61

FIGURE #1.62

1.12.7 FLOOR GUIDE REPLACEMENT PROCEDURE (Cont'd)

FLOOR GUIDE REPLACEMENT PROCEDURE

17. **Extend the packer to the middle of the hopper; verify the alignment with the hopper side rails.**
18. **Stitch weld the floor guides going towards the back of the vehicle (Figure #1.63).**
19. **Then fully extend the packer to finish welding under the packer (Figure #1.64).**
20. **Check for proper operation.**

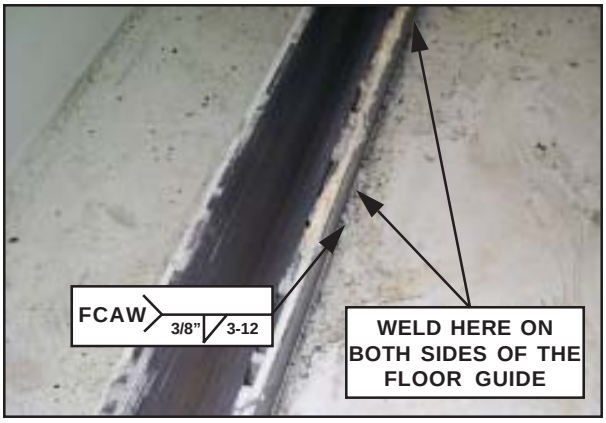


FIGURE #1.63

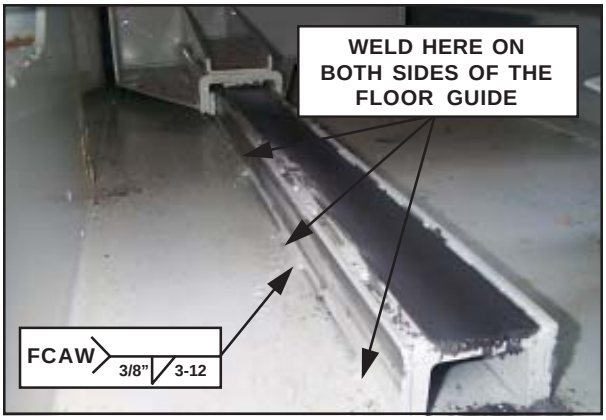


FIGURE #1.64

1.12.8 PACKER ROLLER REPLACEMENT

Packer rollers need to be replaced when damaged, showing excessive wear or flat spots.

PACKER ROLLER REPLACEMENT PROCEDURE

1. **Lower the floating panel.**
2. **Unbolt the roller assembly (Figure #1.65).**
3. **Clean the roller axle.**
4. **Install a new roller.**
5. **Bolt assembly in place.**
6. **Check full cycle for smooth operation.**

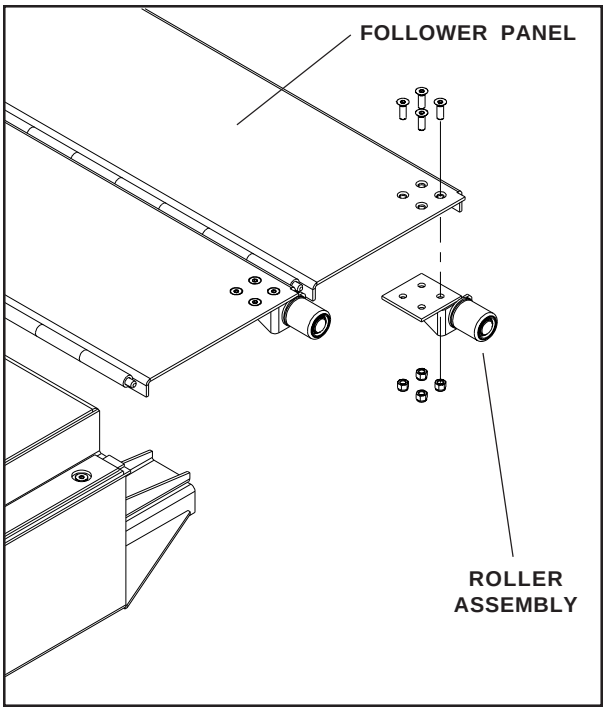


FIGURE #1.65

1.12.9 FLOATING PANEL REMOVAL AND WEAR PAD REPLACEMENT

FLOATING PANEL REMOVAL AND WEAR PAD REPLACEMENT PROCEDURE

1. **Ensure that the parking brake is applied and the vehicle is tagged out for maintenance purposes (refer to the section 1.5 "Lockout/ Tagout procedure").**

2. **Start the engine and engage the hydraulic system.**

3. **Then using the joystick, extend the automated arm to give a better access to the hopper area.**

4. **Fully extend the packer then press the red emergency stop button to keep it at this position.**

5. **Disengage the hydraulic pump and shut the engine "OFF".**

6. **Remove the floating panel axis pin on both side of the hopper (Figure #1.67).**

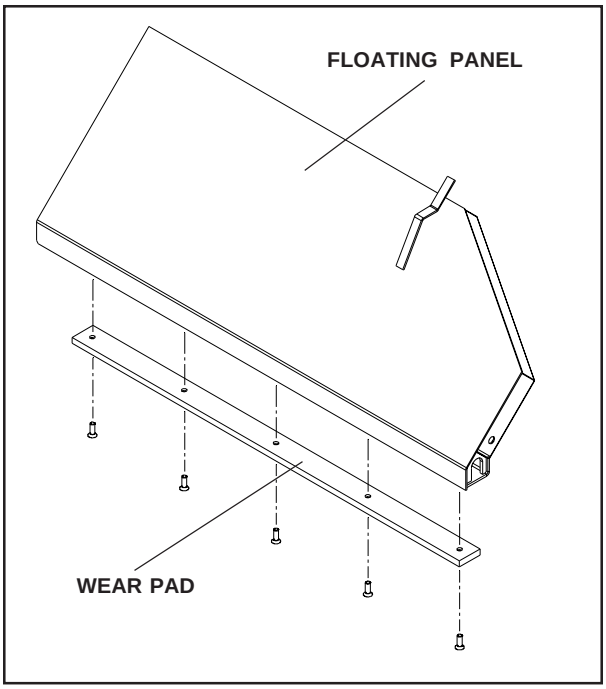


FIGURE #1.66

DANGER

SECURE THE AREA AROUND THE PATH OF THE ARM WHEN PERFORMING MAINTENANCE OR REPAIR.

Continued next page. . .

1.12.9 FLOATING PANEL REMOVAL AND WEAR PAD REPLACEMENT (Cont'd)

WARNING

PREVENT HANDS OR FINGERS FROM BEING CAUGHT AT THE PINCH POINT OF THE FLOATING PANEL.

DANGER

APPLY THE LOCKOUT / TAGOUT PROCEDURE AT ALL TIMES WHEN MAINTENANCE OR INSPECTION IS CARRIED OUT ON THE VEHICLE.

FLOATING PANEL REMOVAL AND WEAR PAD REPLACEMENT PROCEDURE

7. Remove the floating panel from the hopper using a lifting device.
8. Remove retaining screws holding the nylon wear pad (Figure #1.66).
9. Install the new wear pad and bring back the floating panel in place.
10. Check for even contact of wear pad with packer blade and the follower panels.

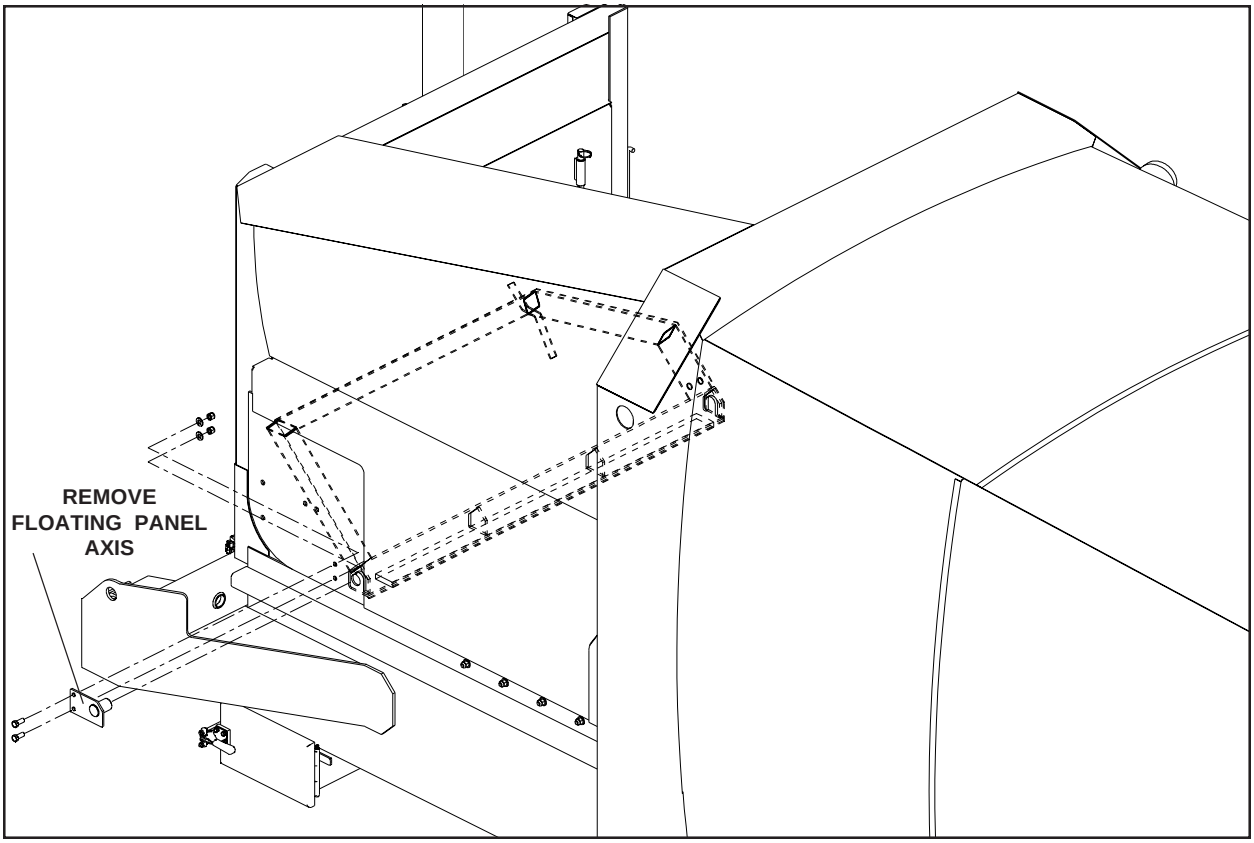


FIGURE #1.67

1.12.10 PACKER CYLINDER REPLACEMENT

PACKER CYLINDER REPLACEMENT PROCEDURE

1. Ensure that the parking brake is applied and the vehicle is tagged out for maintenance purposes (refer to the section 1.5 "Lockout/ Tagout procedure").
2. Start the engine, engage the hydraulic pump.
3. Then using the joystick, extend the automated arm to give a better access to the hopper area.
4. Fully extend the packer.
5. Disengage the pump and stop the engine.
6. Remove the floating panel (refer to section 1.12.9).
7. Open the access cover (Figure #1.68), remove both cylinder pins and retract the packer.
8. Remove the roller assemblies on the follower panels (See section 1.12.8).

DANGER

SECURE THE AREA AROUND THE PATH OF THE ARM WHEN PERFORMING MAINTENANCE OR REPAIR.

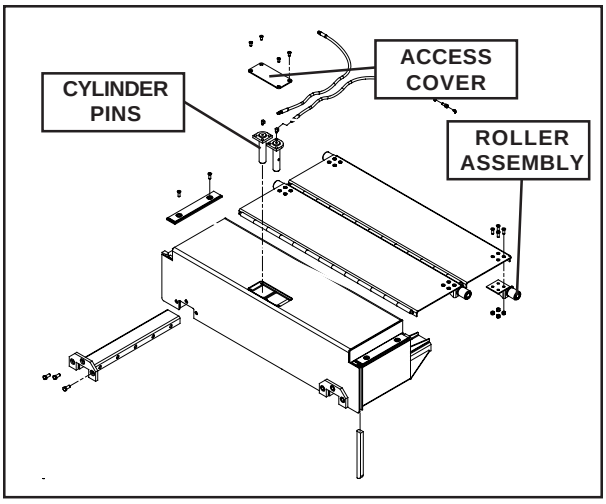


FIGURE #1.68

DANGER

DO NOT CLIMB INTO THE HOPPER WHILE THE PACKER IS MOVING.

1.12.10 PACKER CYLINDER REPLACEMENT (Cont'd)

PACKER CYLINDER REPLACEMENT PROCEDURE

9. Fold the follower panels over the packer (Figure #1.69).

10. Retract the cylinders.

11. Remove the hydraulic hoses from the cylinders (Use absorbent material to catch oil spills).

12. Go in the hopper to attach and secure the cylinder to a lifting device.

13. Remove the piston side pin that holds the cylinder in front of the body. Protect the limit switch during the removal of the cylinder.

14. Remove cylinder fingers used for the limit switches installed on both cylinders and keep them for the new cylinder.

15. Replace the faulty cylinder with a new one. Contact the Labrie's Service Department for replacement under warranty.

16. Install the cylinder fingers on the new cylinders. The limit switches may require to be re-adjusted afterwards; refer to section 1.12.2 "Limit switch adjustment".

17. Reinstall the piston pin, then the hydraulic hoses.

18. Extend the cylinders, install the pins and the roller assemblies and unfold the follower panels.

19. Grease the cylinder pins and check for proper operation.

CAUTION

PACKER CYLINDERS MUST BE REMOVED WITH A LIFTING DEVICE.

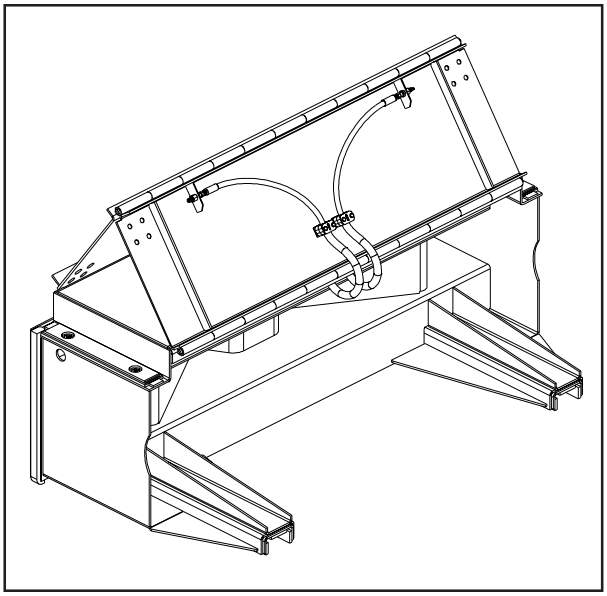


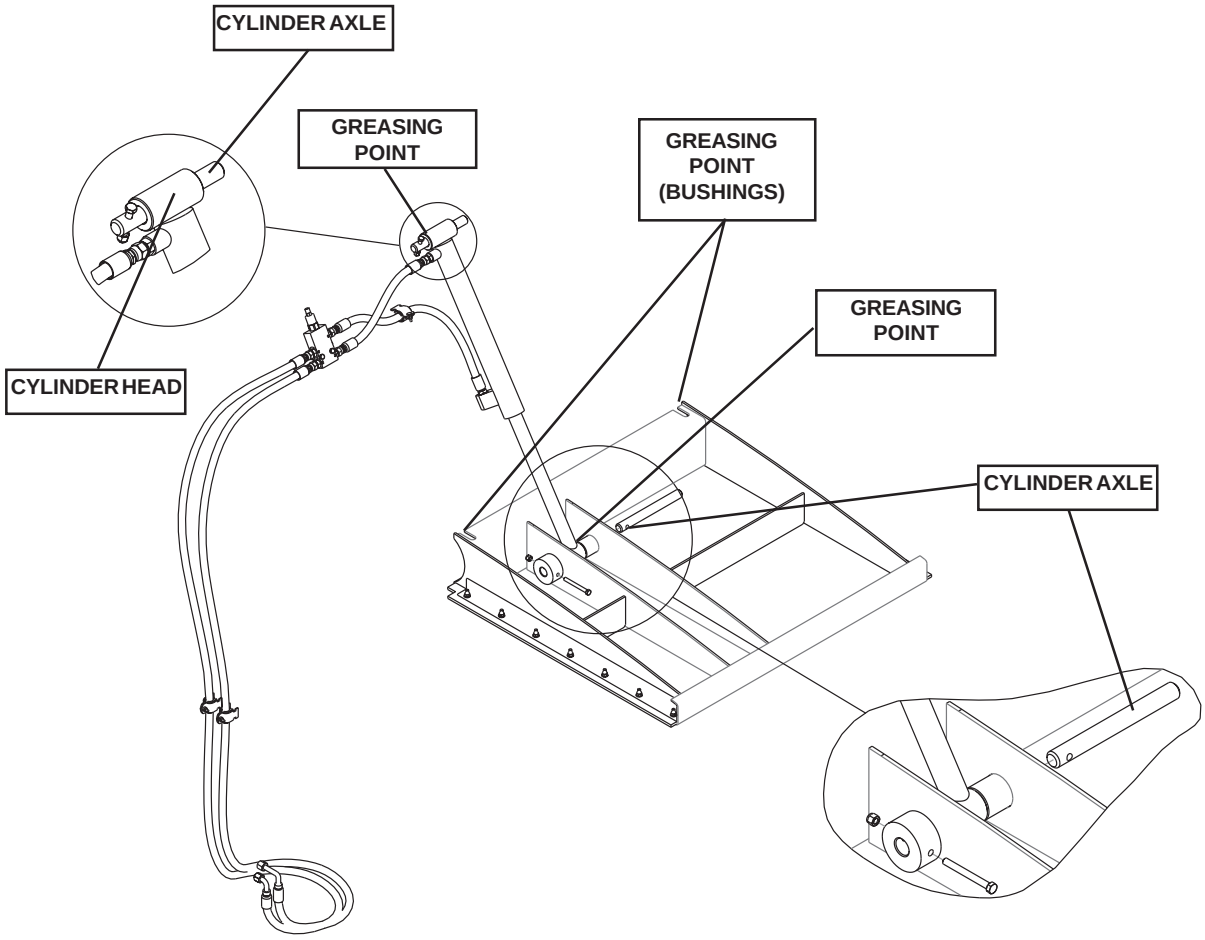
FIGURE #1.69

1.12.11 CRUSHER PANEL MAINTENANCE

CRUSHER PANEL MAINTENANCE PROCEDURE

1. **Grease the cylinder heads of the crusher panel by using the greasing points.**

2. **Grease also the crusher panel bushings.**



NOTE : The crusher panel is optional.

1.13 TAILGATE AND BODY HINGES MAINTENANCE

1.13.1 TAILGATE LOCKING MECHANISM

It is important to lubricate the tailgate hinges and the locking mechanism with multipurpose grease as per the lubricating schedule (Refer to section 2.1 "Recommended Lubricants").

Also, inspect the welds around hinges. The proper working order of the following components is also to be checked: (Figures #1.70 to #1.73)

- Tailgate hydraulic cylinders
- Cylinder pins and circlips
- Tailgate hinges and pins
- Wear on the locking mechanism
- Wear on the tailgate lock pins
- Tailgate rubber seal

CAUTION

EXCESSIVE WEAR MIGHT BE DANGEROUS AND HARMFUL TO THE PROPER WORKING ORDER OF THE TAILGATE.

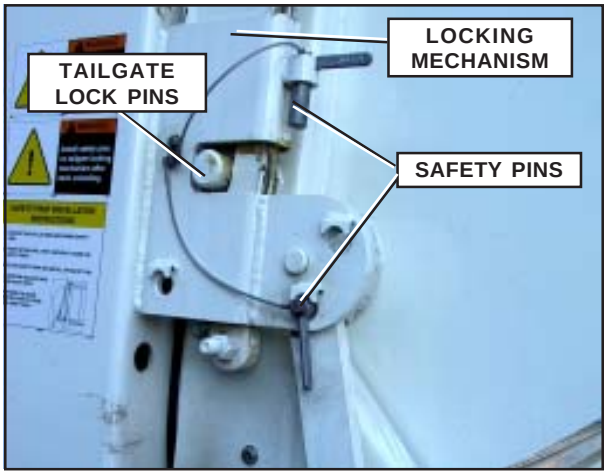


FIGURE #1.70

1.13.2 TAILGATE SEAL AND HINGES INSPECTION

Tailgate hinge pins must not have any sign of wear or metal fatigue. The retaining bolts must be kept tight (Figure #1.71). The tailgate rubber seal must not show any sign of damage. Replace the seal if necessary.

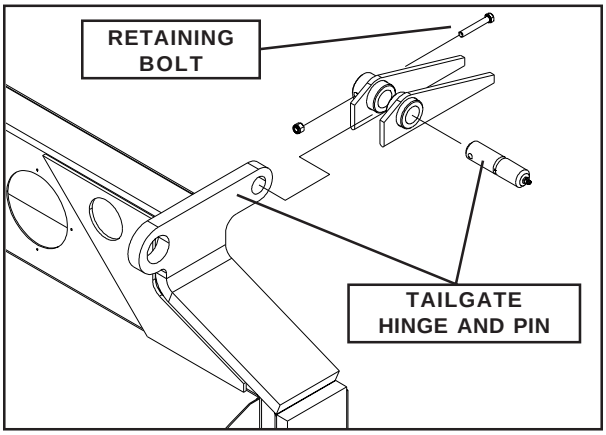


FIGURE #1.71

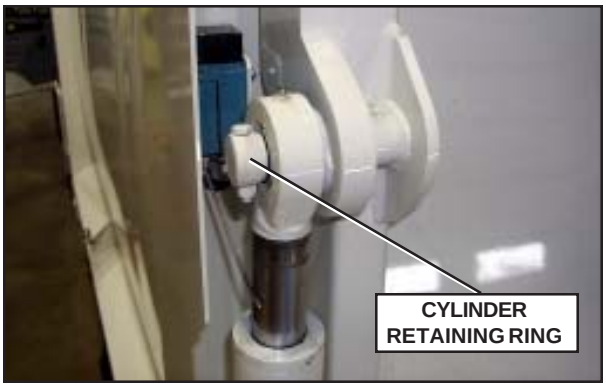


FIGURE #1.72

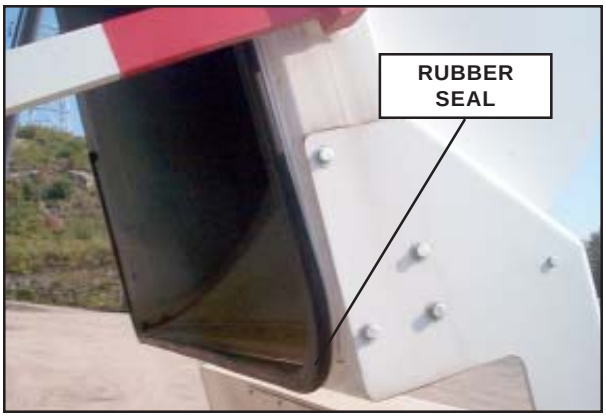


FIGURE #1.73

1.13.3 BODY/CHASSIS HINGES INSPECTION

Monthly lubrication of the body-chassis hinges should be done. Also, inspect for cracks or corrosion. Any crack must be reported, and repaired by QUALIFIED personnel. Contact the Labrie Service Department for technical support, if required.

VIEW FROM BEHIND THE REAR MUD GUARD

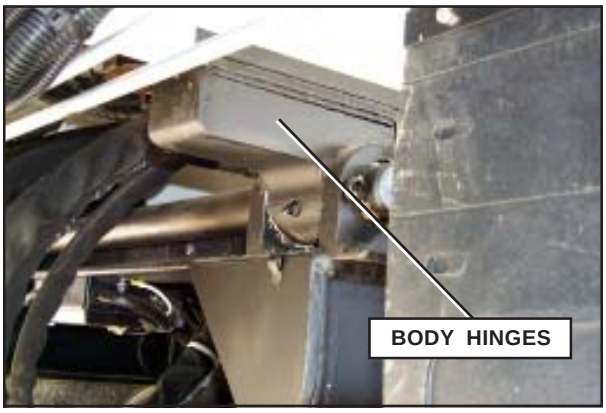


FIGURE #1.74

DANGER

DO NOT OPERATE THIS EQUIPMENT IF THERE IS ANY SIGN OF DAMAGE OR INCOMPLETE REPAIRS.

FIGURE #1.75

1.13.4 BODY RAISED LIMIT SWITCH

A limit switch located on the truck chassis (Figure #1.76) activates the backup alarm and a warning buzzer sounds as soon as the body is about one foot above the chassis. Adjust the limit switch accordingly.

This safety feature is provided to warn people around, that the truck is unloading and to tell the operator that the body is still raised.

DANGER

APPLY THE LOCKOUT / TAGOUT PROCEDURE AT ALL TIMES WHEN MAINTENANCE OR INSPECTION IS CARRIED OUT ON THE VEHICLE.

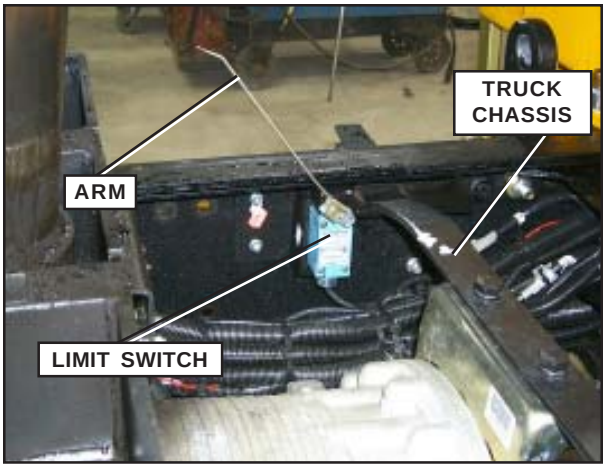


FIGURE #1.76

1.13.5 TAILGATE LIMIT SWITCH ADJUSTMENT

Automizer™ units are equipped with a limit switch located at the top of the left-hand side tailgate cylinder (Figure #1.77. When the tailgate is unlocked, the cylinder releases the limit switch lever that activates the backup alarm and a warning buzzer inside the cab.

As the cylinder head is moving down, the limit switch trigger lever is released and the warning buzzer and the backup alarm should be heard.

FIGURE #1.77

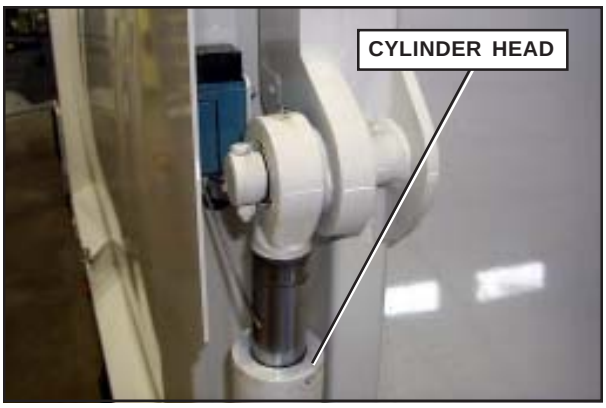


FIGURE #1.78

Apply the following procedure to adjust the limit switch located next to hydraulic cylinder (tailgate unlocked).

LIMIT SWITCH ADJUSTMENT PROCEDURE (Tailgate unlocked)

1. **Ensure that the parking brake is applied and the vehicle is tagged out for maintenance purposes (refer to the section 1.5 "Lockout/Tagout procedure").**
2. **Start the engine and engage the hydraulic system.**
3. **Open the tailgate using the lever on the console and listen if the warning buzzer and the backup alarm start to beep as you move the lever.**
4. **Adjust the trigger lever of the limit switch so the limit switch will "click", as the cylinder head is moving down (Figure #1.77 & #1.78).**

WARNING

ENSURE THAT NO ONE IS STANDING BEHIND OR NEAR THE TAILGATE WHEN ADJUSTMENT PROCEDURE IS CARRIED OUT.

1.14 HYDRAULIC SYSTEM MAINTENANCE

1.14.1 GENERAL MAINTENANCE

In order to keep the hydraulic system efficient and reliable, the following care must be taken:

HYDRAULIC SYSTEM GENERAL INSPECTION PROCEDURE

1) **For new vehicle, change the return filter element after 50 hours of use, and twice a year afterwards (See section 1.14.7 "Filter replacement procedure").**

2) **Clean the strainer inside the tank after the first 50 hours of use, and once a year afterwards. (See section 1.14.8 "Strainer cleaning procedure").**

3) **Hydraulic oil must be replaced at least once a year or when contaminated. (See section 1.14.6 "Hydraulic oil replacement procedure").**

4) **When maintenance is carried out, protect all hoses, fittings and pipes or any other holes from dirt that would eventually get into the oil. Use plugs to block hoses that are not connected.**

5) **Monthly inspect and adjust (If necessary) the oil pressure of the hydraulic system. (See section 1.15 "Hydraulic pressure adjustment).**

6) **On a daily basis, inspect the hydraulic lines and connections for leaks, and correct if necessary;**

7) **Inspect the pump for leaks or unusual noise;**

8) **The ball valve on the hydraulic tank must be completely open before engaging the pump or starting the engine (See section 1.9 "Prior to Start up").**

Labrie Equipment Ltd. requires that the hydraulic fluid and return oil filter be changed and the strainer cleaned before changing the hydraulic pump.

Manufacturer's warranty on hydraulic pumps provided or sold by Labrie Equipment Ltd. could be declared void if the hydraulic fluid and return oil filter are not changed and if the strainer is not cleaned prior to replacing the hydraulic pump.

Therefore, it is mandatory to change the return oil filter and clean the strainer after the first 50 hours of use and then once a year. The hydraulic fluid must be changed annually. Hydraulic fluid contamination can cause severe damage to the hydraulic components.

It is recommended to have the hydraulic fluid tested and analyzed by a lab to prevent hydraulic system or pump breakdown. This will also optimize the hydraulic fluid change frequency. Labrie trucks are now equipped with an "oil sampler coupler". See section 2.1.6 of the Lubrication manual.

Note that proofs of maintenance and/or fluid samples could be requested when filing warranty claims concerning the hydraulic system or pump.

1.14.2 HYDRAULIC CYLINDER INSPECTION PROCEDURES

To maintain proper working order and extend cylinder life, it is essential to inspect the hydraulic cylinders at least once a month. Make sure that connections between all hoses and pipes are tightened, and there are no oil leaks.

DANGER

APPLY THE LOCKOUT / TAGOUT PROCEDURE AT ALL TIMES WHEN MAINTENANCE OR INSPECTION IS CARRIED OUT ON THE VEHICLE.

Check that all cylinder caps are firmly tightened and there are no leaks. All leaks must be repaired immediately by replacing damaged or faulty cylinders. Lubricate and inspect all cylinders' mounting points (pins, retaining bolts, etc.).

WARNING

VERIFY THAT THE BALL VALVE ON THE SUCTION LINE IS COMPLETELY OPEN BEFORE STARTING THE ENGINE.

1.14.3 MAIN HYDRAULIC VALVE

The Automizer™ side-loading unit is equipped with a directional control valve which is assembled as follows, from top to bottom (Figure #1.79).

For further details, refer to the hydraulic system Parts and Diagram section, or see the simplified diagram for the packing system in the troubleshooting section. The pressure adjustment procedure is outlined in section 1.15 “Hydraulic Pressure Adjustment”.

VALVE SECTION DESCRIPTION:

Body hoist: 3 way, 3 position, operated with an air actuator.
Packer: 4 way, 3 position, operated with an air actuator.
Tailgate: 4 way, 3 position, operated with an air actuator.
NOTE: An electro-hydraulic actuator is also available.

To get more information regarding specific options, refer to the proper section of the manual included with the vehicle documentation or contact the Labrie Service Department.

MAIN HYDRAULIC VALVE

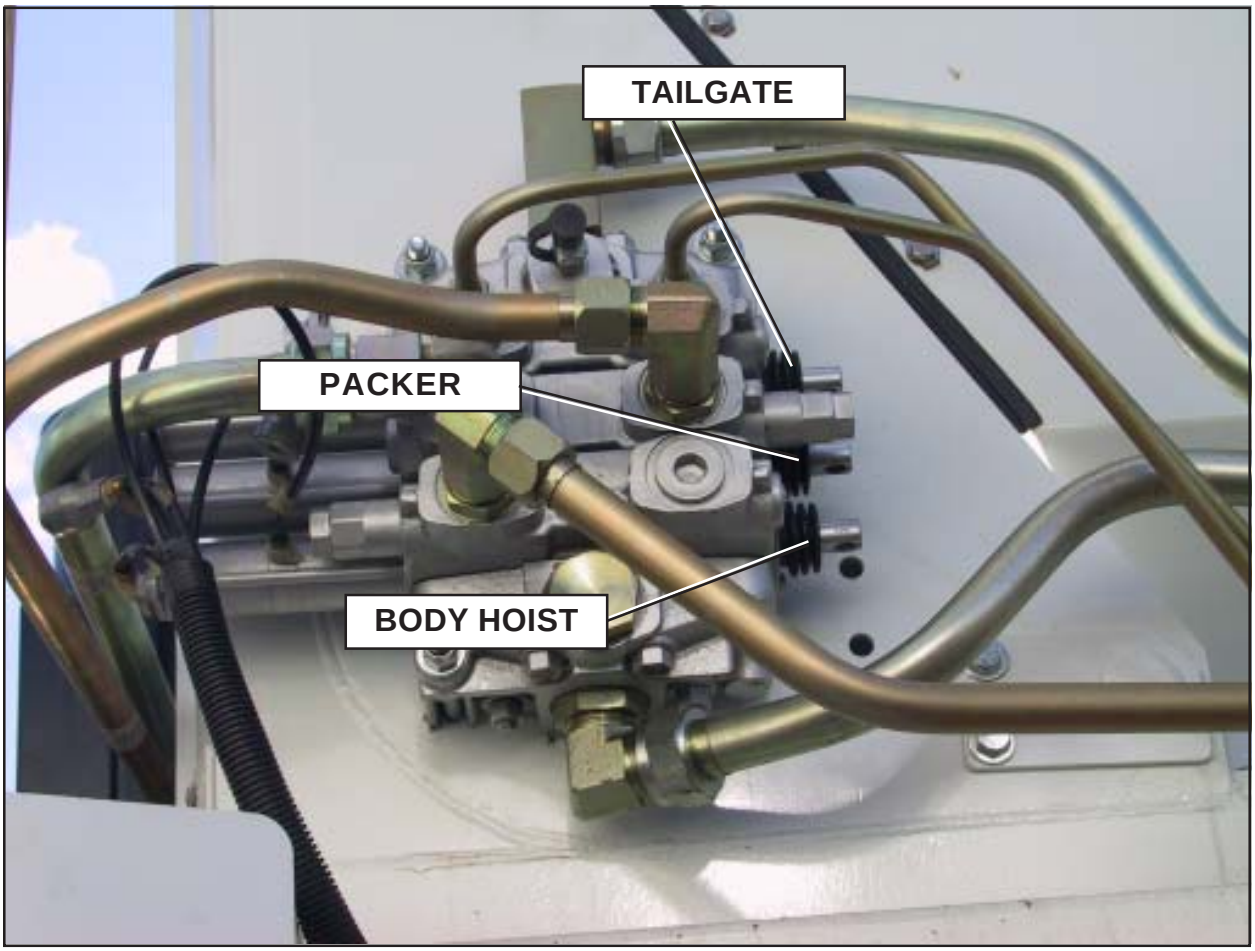


FIGURE #1.79

1.14.4 PROPORTIONAL VALVE

Automizer™ units use an extra valve stack to control the arm, the chute and the crusher panel (if equipped) (Figure #1.80). This valve is on/off or proportional type, meaning that the amount of flow coming out of it will be according to the position of the spool.

This feature (proportional control) allows infinite control of the speed and the movement of the arm. The arm is powered by a dual vane pump (see section 1.14.9 "Dual Vane Pump").

Each section of the valve is actuated by an electrical coil, located under the valve. The proportional valve sections are described as follow from top to bottom on figure #1.81.

VALVE SECTION DESCRIPTION:

- **Input/Output cover:**
  (Provided with main relief valve)
- **Crusher panel section (optional; not shown):**
  (Not proportional, with load sense relief)
- **Grabber section (Open/Close):**
  (Not proportional, with load sense relief)
- **Grabber section (Up/Down):**
  (Proportional, no load sense relief)
- **Telescopic arm section (Extend/ Retract):**
  (Proportional, no load sense relief)

PROPORTIONAL VALVE

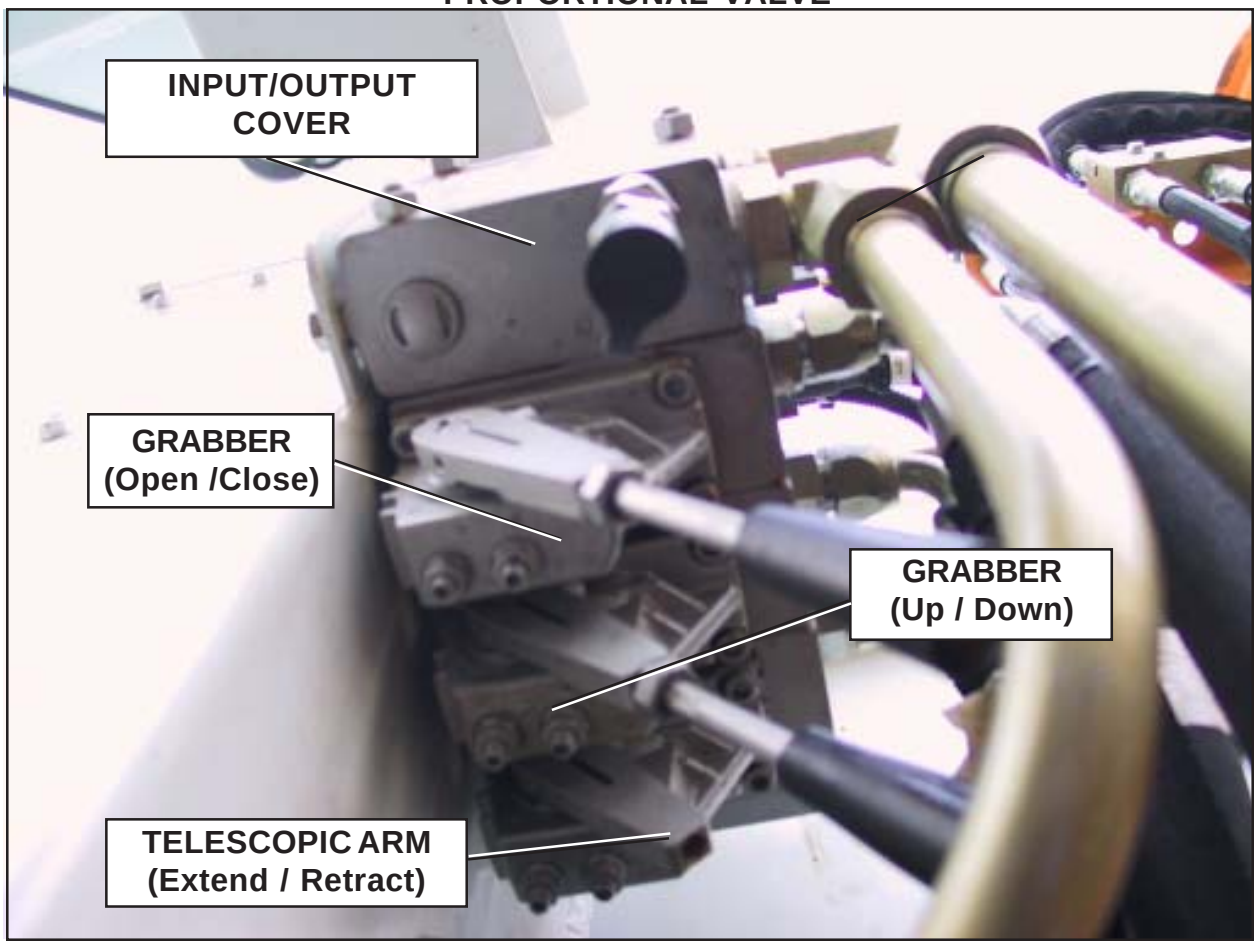


FIGURE #1.80

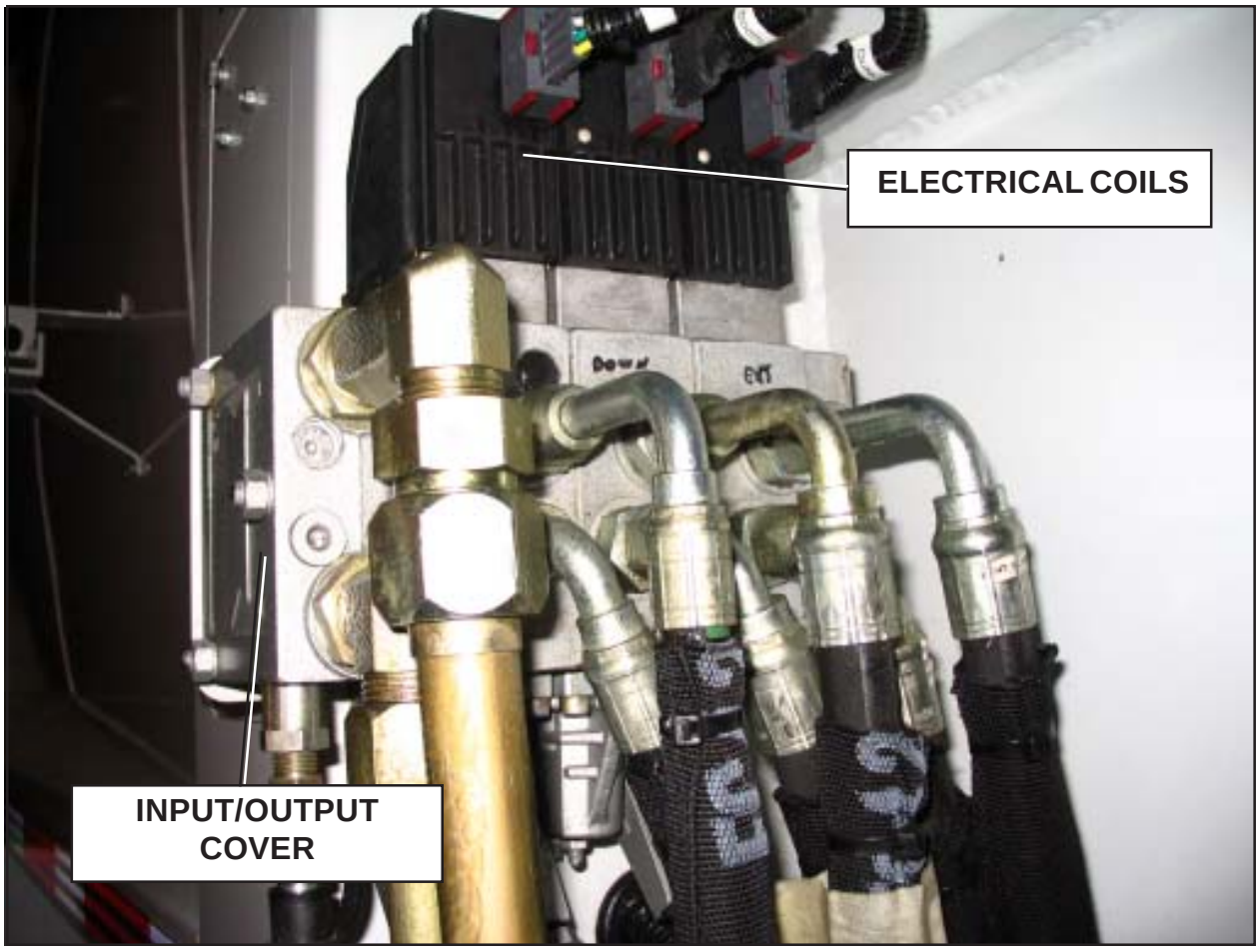


FIGURE #1.81

1.14.4A PROPORTIONAL VALVE PRESSURE ADJUSTMENT

The following step by step pressure adjustment procedure explains how to adjust the pressure of each function of the Versa Hand™ arm. Note that the dump valve pressure (if equipped) must be set properly before making any adjustments to the proportional valve of the Versa Hand™ Lifting Arm. Refer to section 1.15 of the General Maintenance section for adjustment procedure of the dump valve.

The lockout/tagout procedure explained in section 1.5 of the General Maintenance section will apply each time maintenance has to be done on the vehicle. Also, refer to the hydraulic pressure table to adjust each function of the arm. Make sure to identify all function levers on the valve and its adjustment screw before performing the procedure.

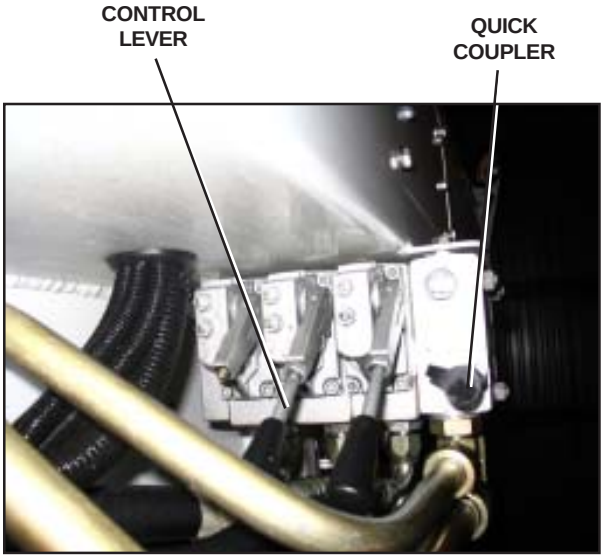
Note that a helper may be needed to perform the pressure adjustment of the arm. Use any precaution necessary around the vehicle to work safely at all times. Secure the arm's working area using barrier tape or barricades.

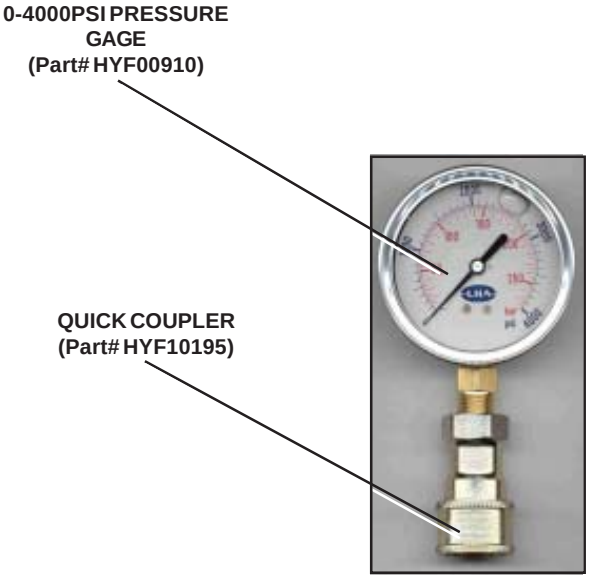
DANGER

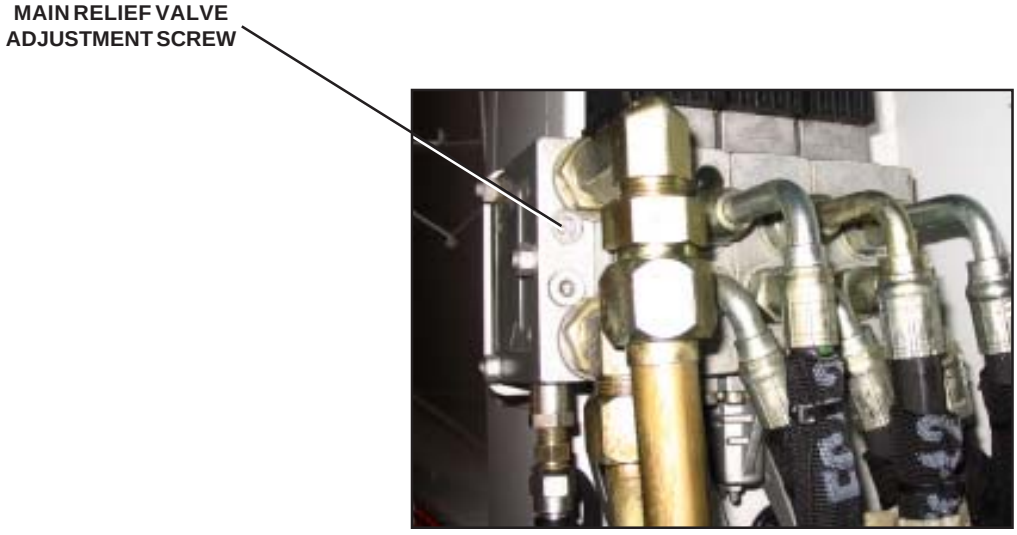
STAY OUT OF THE PATH OF THE ARM WHILE MANUALLY MOVING THE ARM. SERIOUS INJURY OR EVEN DEATH MAY RESULT.

PROPORTIONAL VALVE MAIN RELIEF ADJUSTMENT PROCEDURE

1. **Apply the lockout / tagout procedure.**
2. **Before making any adjustments, secure the arm's working area using safety tape or barricades.**
3. **Remove any residual hydraulic pressure in the system by moving the levers back and forth.**
4. **Connect a 0-4000PSI gage on the quick coupler located on the proportional valve (see pictures on next page).**
5. **Make sure the transmission is in Neutral.**
6. **Start the engine.**
7. **Engage the hydraulic system (Pump switch "ON").**
8. **Retract and maintain the arm to the end of its stroke using the corresponding lever in order to make the hydraulic pressure to rise on the pressure gage.**
9. **Adjust the main relief valve to 2000 PSI using the adjustment screw (see pictures on next page) turning the hex key clockwise or counter clockwise.**


CONTROL
LEVER
QUICK
COUPLER


0-4000PSI PRESSURE
GAGE
(Part# HYF00910)
QUICK COUPLER
(Part# HYF10195)


MAIN RELIEF VALVE
ADJUSTMENT SCREW

1.14.5 HYDRAULIC TANK INSPECTION PROCEDURE

Verify that the oil in the reservoir is **clean** and always at the **appropriate level.** The oil must be clean and **not colored.**

CAUTION

MAXIMUM TEMPERATURE FOR HYDRAULIC OIL IS 180°F.

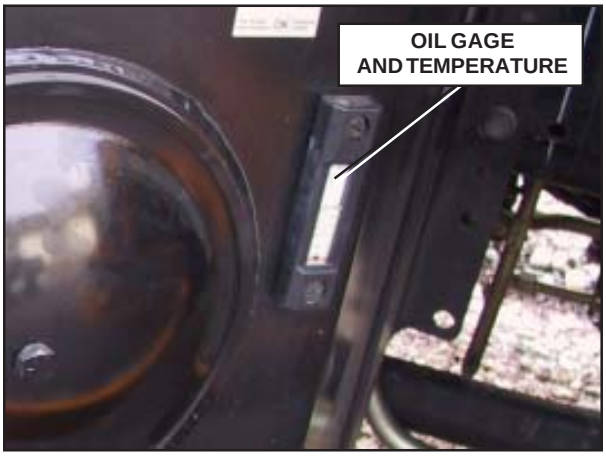


FIGURE #1.82

HYDRAULIC TANK INSPECTION PROCEDURE

1. **Ensure that the parking brake is applied and the vehicle is tagged out for maintenance purposes (refer to the section 1.5 "Lockout/ Tagout procedure").**

2. **Clean the strainer and replace the filter element inside the tank after the first 50 hours of service. Refer to section 1.14.8 "Strainer cleaning procedure".**

3. **Change the return filter element, twice a year (after the first 50 hours). Refer to section section 1.14.7 "Filter element replacement procedure".**

4. **Ensure the proper operation of the filler cap (Figure #1.83). See that the filler cap has no obstruction.**

5. **The hydraulic oil must be clean and not colored as well as in sufficient quantity (level at 3/4 of the oil level gage, with all cylinders retracted).**

6. **NOTE: The whole system requires between 50 to 60 gallons of oil.**

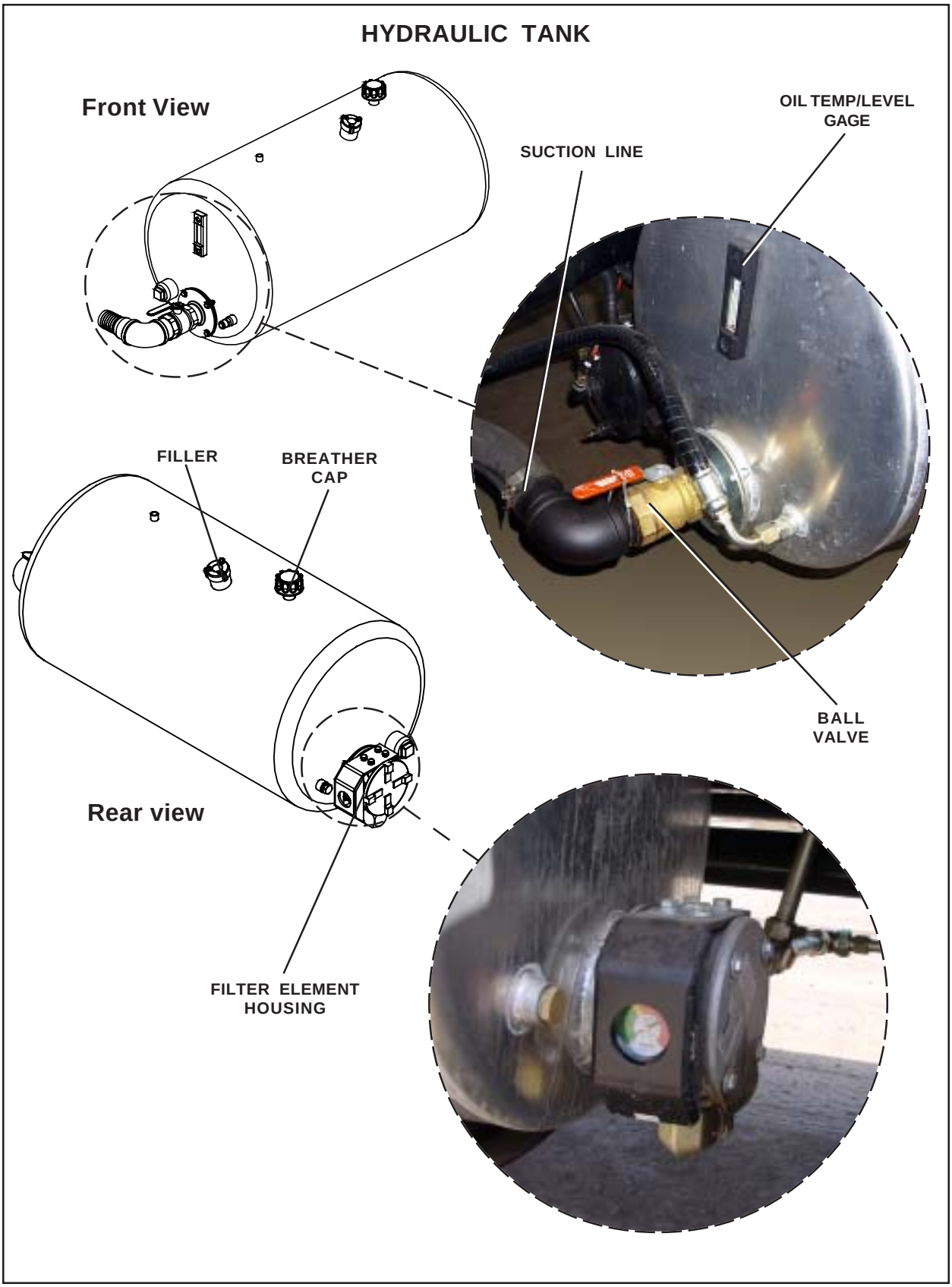

HYDRAULIC TANK
Front View
OIL TEMP/LEVEL GAGE
SUCTION LINE
FILLER
BREATHER CAP
BALL VALVE
Rear view
FILTER ELEMENT HOUSING

FIGURE #1.83

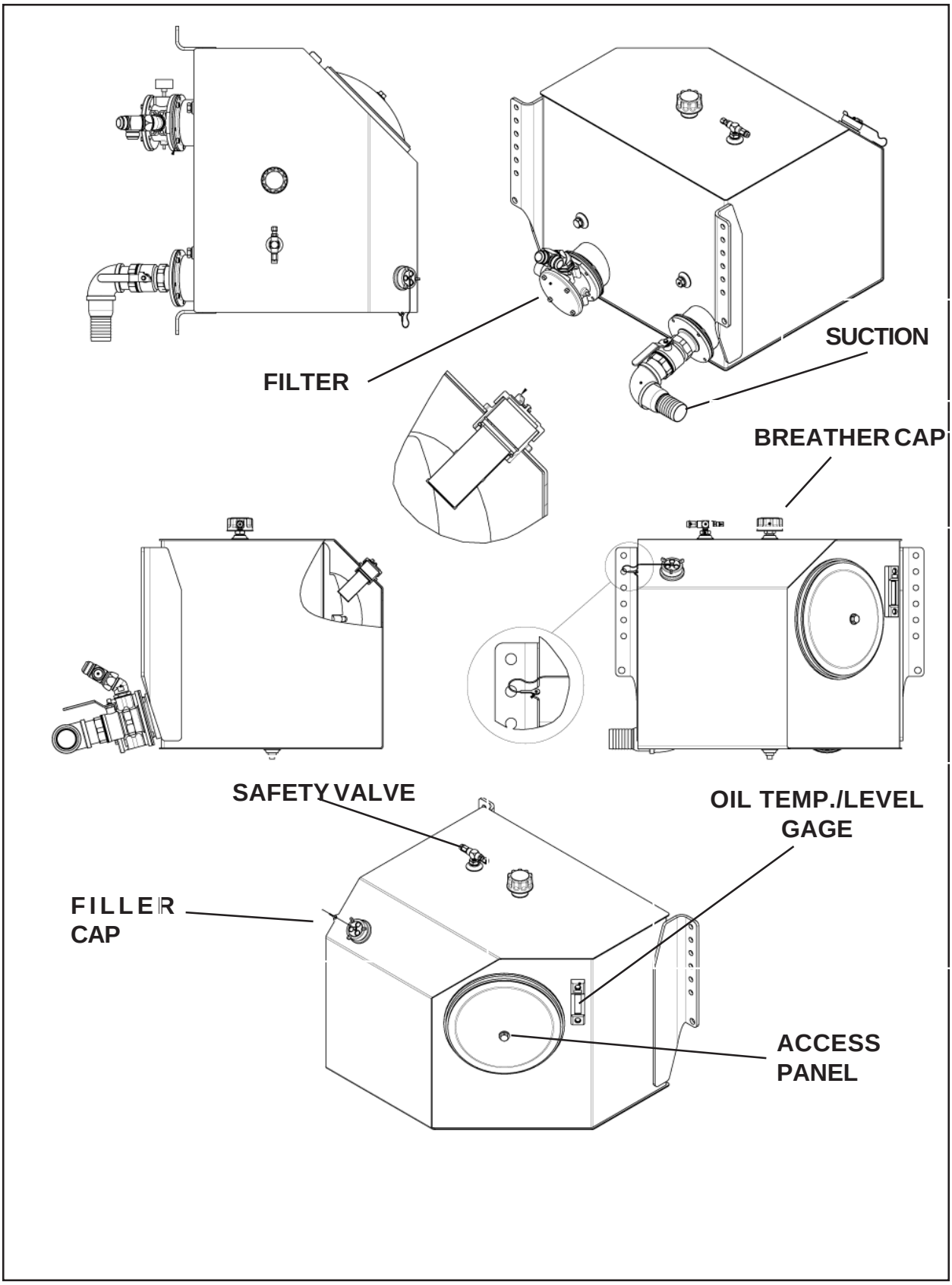

FILTER
SUCTION
BREATHER CAP
SAFETY VALVE
OIL TEMP./LEVEL GAGE
FILLER CAP
ACCESS PANEL

FIGURE #1.83A

1.14.6 HYDRAULIC OIL REPLACEMENT PROCEDURE

HYDRAULIC OIL REPLACEMENT PROCEDURE

1. Ensure that the parking brake is applied and the vehicle is tagged out for maintenance purposes (refer to the section 1.5 "Lockout/ Tagout procedure").
2. Start the engine, engage the hydraulic pump and disable the speed-up system.
3. Retract all cylinders (Packer, crusher panel, tailgate etc.).
4. Disengage the hydraulic pump and stop the engine.
5. Clean around the filler cap and remove it. Be cautious; some hydraulic tanks are pressurized (3 to 5 PSI). Open slowly.

WARNING

HIGHLY CONTAMINATED HYDRAULIC FLUID MUST BE CHANGED PROMPLY TO AVOID ANY DAMAGE ON THE HYDRAULIC SYSTEM.

WARNING

IT IS NOT RECOMMENDED TO MIX DIFFERENT BRAND NAMES AND/ OR GRADES OF OIL IN THE SAME RESERVOIR.

HYDRAULIC FLUID REPLACEMENT PROCEDURE

6. Use a clean container of at least 60 gallons to drop the old oil into.
7. To drop the oil, close the ball valve and remove the drain plug under the tank. Use a container with a minimum capacity of 60 US gallons to collect the oil.
8. Completely drain the tank.
9. Once emptied, reinstall the drain plug.
10. Remove the strainer by removing the bolts (see Figure 1.89) and clean it (once a year, see section 1.14.8).
11. Clean inside the hydraulic tank with a clean and dry cloth in order to remove any metal particles or debris accumulated at the bottom

    • To clean the interior of the an aluminum tank (see Figure #1.83), insert the hand in the hole where the strainer was fixed. This allows to clean one half of the tank. To clean the other half, remove the entire filter at the rear side of the tank (see Rear view of Figure #1.83), insert the hand inside, and clean with the cloth.

    • To clean the steel tank (see Figure #1.83A), remove the access panel by removing the retaining screw. Insert the hand inside and clean the interior with the dry and clean cloth.

HYDRAULIC FLUID REPLACEMENT PROCEDURE (Cont'd)

12. **Change the return filter element (twice a year).**

13. **Refill the tank until oil reaches the 3/4 of the oil gage. Use a high quality oil, that has good performance in cold weather(if applicable), such as SHELL TELLUS T32 or equivalent (See the Lubrication section for specifications). The whole system will require between 50 and 60 gallons.**

14. **The oil must be clean and free of any dirt, metallic particles or sand etc.) The use of a filtering screen is strongly recommended while filling the tank with new oil.**

15. **If the suction line has been replaced, fill the line until the oil reaches the pump to avoid cavitation (see section 3.5 of Troubleshooting).**

16. **Start the engine and check again.**

1.14.7 FILTER ELEMENT REPLACEMENT PROCEDURE

To protect new components of the hydraulic system, the return filter element must be changed after the **first 50 hours** of operation of the vehicle. Then, change the element twice a year (see the preventive maintenance chart at the end of this section).

The filter restriction indicator (Figure #1.84) will indicate, when the engine is running, if the filter requires to be changed. Replace the filter when the indicator is in the yellow zone, before it reaches the red zone. This will keep the oil clean, extend component life expectancy and reduce breakdowns.

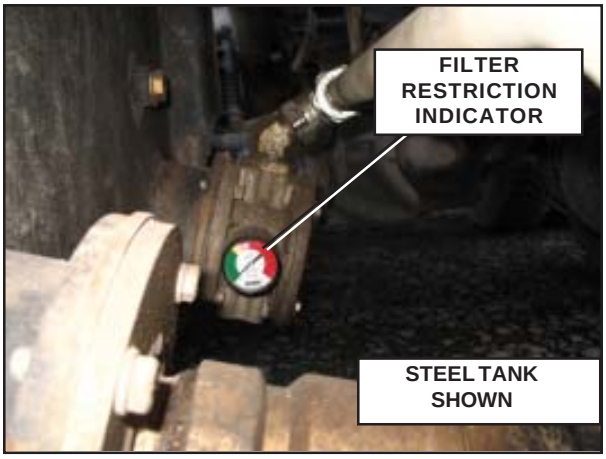


FIGURE #1.84

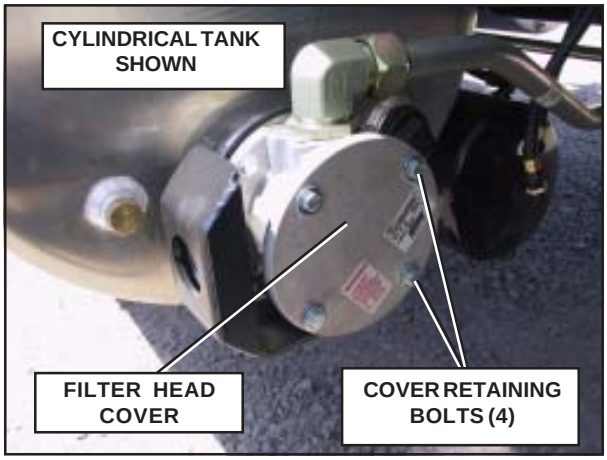


FIGURE #1.85

HYDRAULIC FILTER REPLACEMENT PROCEDURE

1. **Ensure that the parking brake is applied and the vehicle is tagged out for maintenance purposes (refer to the section 1.5 "Lockout/ Tagout procedure").**
2. **Prepare a pan or a bucket to recuperate oil that will spill out of the filter housing (2 gallons of oil).**
3. **Remove the four (4) bolts of the filter head cover of the hydraulic tank (Figure #1.85); This in-tank return filter system has a self-closing trap that is closing as you remove the cartridge therefore preventing the whole tank to empty itself.**
4. **Change the filter element with a new one (Figure #1.86).**
5. **Reinstall the filter head cover.**

WARNING

CHANGE RETURN FILTER ELEMENT AFTER THE FIRST 50 HOURS OF OPERATION.

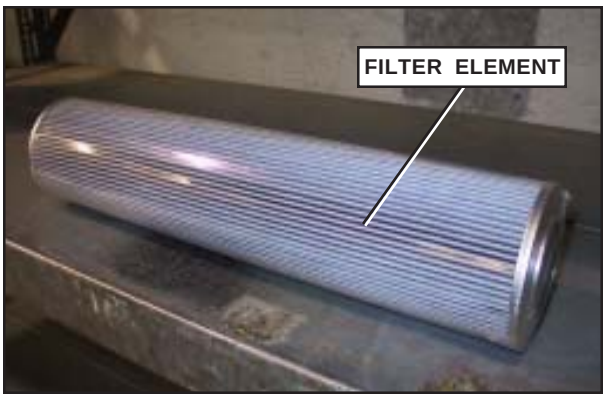


FIGURE #1.86

1.14.8 STRAINER CLEANING PROCEDURE

STRAINER CLEANING PROCEDURE

1. Ensure that the parking brake is applied and the vehicle is tagged out for maintenance purposes (refer to the section 1.5 "Lockout/ Tagout procedure").
2. Start the engine, engage the hydraulic pump.
3. Retract all cylinders (packer, crusher panel, tailgate etc.).
4. Raise the body and install the safety prop.

STRAINER CLEANING PROCEDURE

5. Disengage the hydraulic pump and turn off the engine.
6. Clean around the filler cap and remove it. Be cautious; some hydraulic tanks are pressurized (3 to 5 PSI). Open slowly.
7. Drain the hydraulic tank using the drain plug under the tank (Refer to section 1.14.6 "Hydraulic oil replacement procedure").
8. Once emptied, reinstall the drain plug.

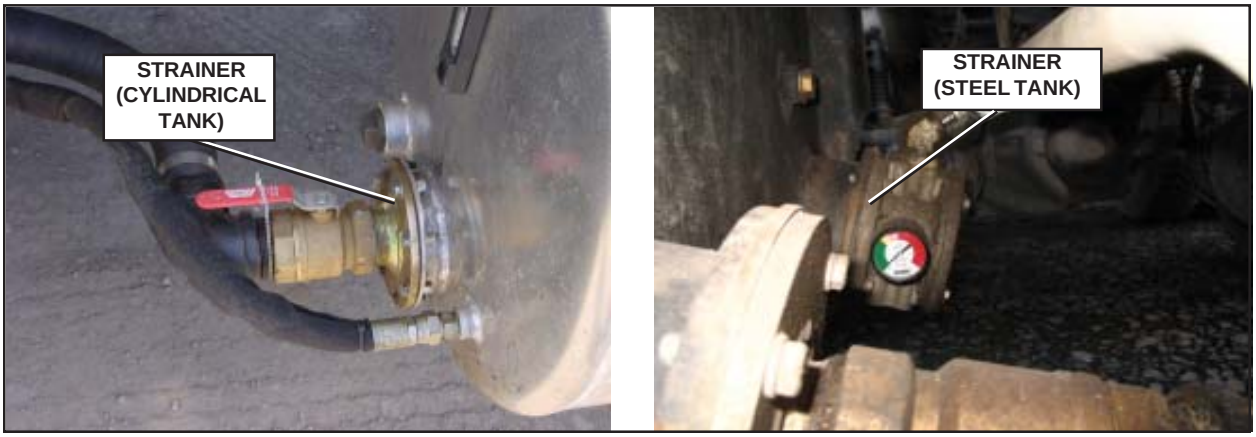


FIGURE #1.87

1.14.8 STRAINER CLEANING PROCEDURE (Cont'd)

STRAINER CLEANING PROCEDURE

9. **Remove the hose clamp from the suction hose (Figure #1.88) and slide the hose over the pipe until it clears the ball valve (slide towards the frame of the vehicle).**

10. **Remove the strainer from the tank port (Figure #1.89 and 1.89A).**

11. **Once the strainer is removed, clean it using solvent, and inspect for damage; replace if necessary.**

12. **Replace the seal if necessary and re-install the strainer.**

13. **Refer to the hydraulic fluid replacement procedure for filling up the tank and ensure there is no leak.**

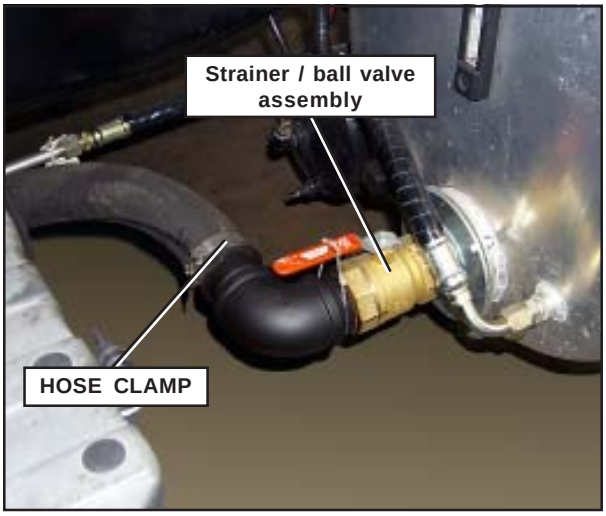
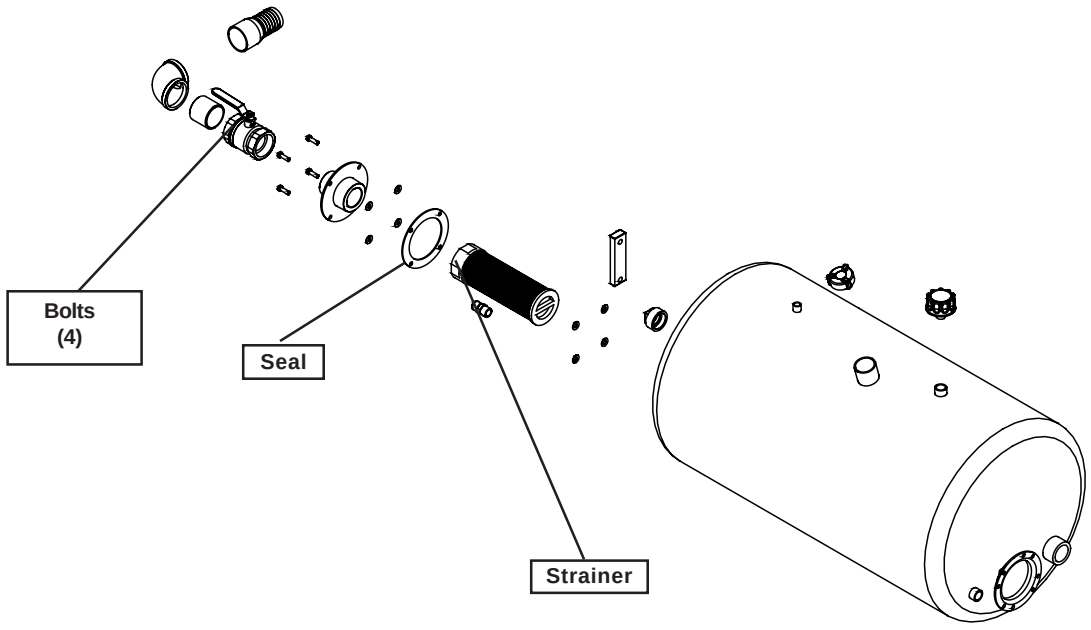


FIGURE #1.88 (Cylindrical tank)

FIGURE #1.89

***Cylindrical tank shown**



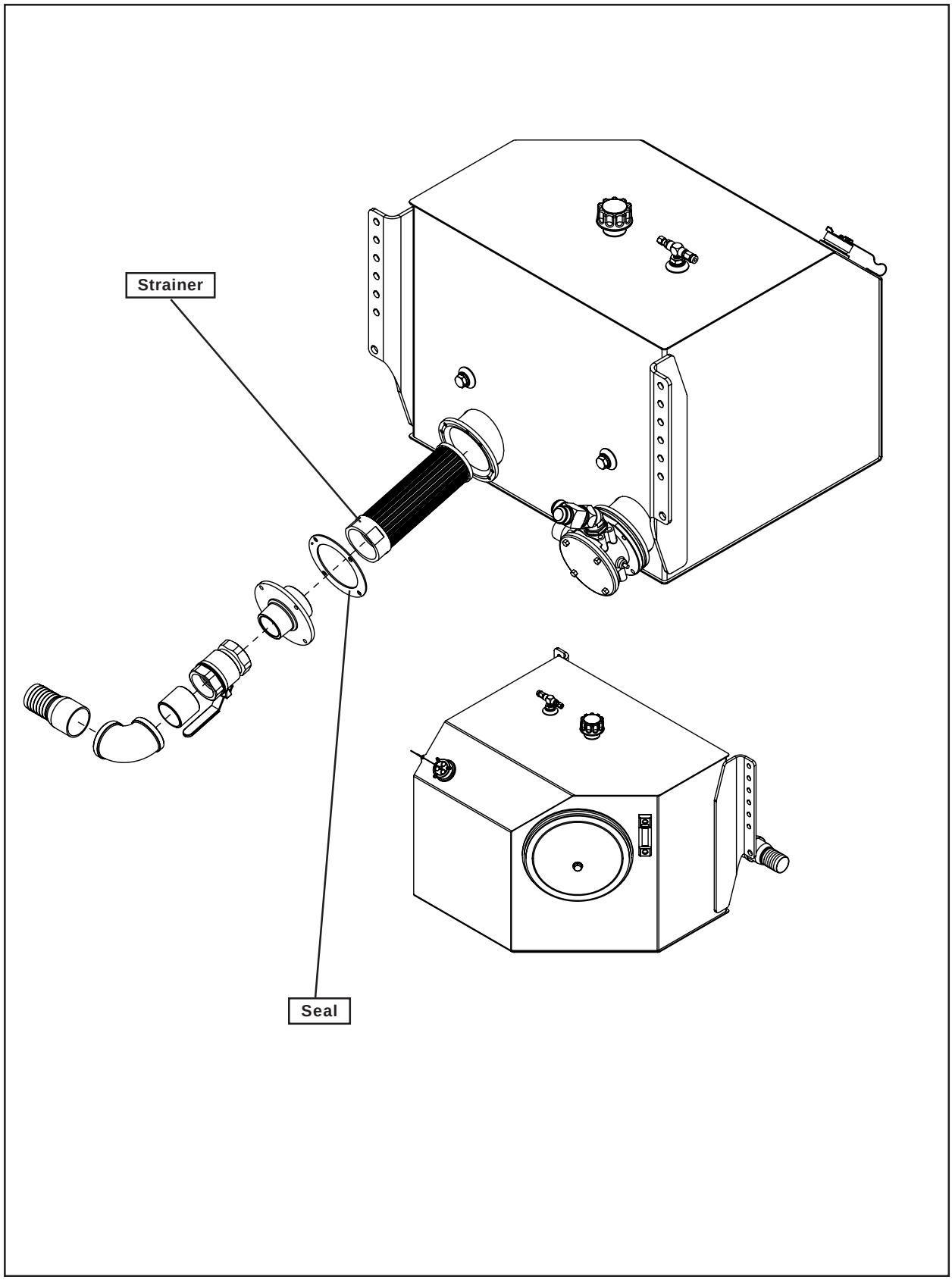


FIGURE #1.89A

1.14.9 DUAL VANE PUMP

The Automizer™ is equipped with a dual vane pump. One of the vane pump sections, known as the body vane pump, powers all the body functions (i.e.: tailgate, body hoist, packer, etc.) through the directional control valve.

The second vane pump section, known as the arm vane pump, powers the automated arm functions and some other options through the proportional valve.

DUAL VANE PUMP

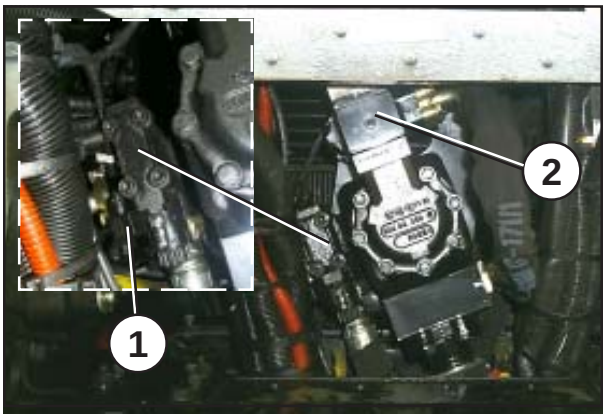


FIGURE #1.90

1: VANE PUMP SOLENOID VALVE
2: FLOW REGULATOR

PUMP SWITCH

FIGURE #1.91

The dual vane pump is activated by two electric solenoid valves (one for each section) mounted on the pump (Figure #1.90). The electric signal, which activates the solenoid, is sent by the pump switch on the console (Figure #1.91).

When the pump switch is turned “ON”, the transmission electronic control unit (ECU), monitors the vehicle speed and the engine RPM and then allows (or not) the vane pump to engage. The air pressure MUST be at least of 70 PSI in order to engage the pump. If the vehicle is exceeding 15 mph (25 km/h) or if the engine speed exceeds 900 RPM , the vane pump will not engage.

After the pump is engaged, it will stay engaged at any engine speed under 2300 RPM. Refer to section 1.19 “Allison Transmission Programming Parameters”.

The arm vane pump is capable of delivering a flow of 15 gallons per minute at 900 RPM (idle speed). A flow regulator at the pump outlet limits the flow to the valve at 15 GPM. All excess flow is sent back directly to the pump inlet. When the pump is not engaged, all the oil returns to the inlet.

The body vane pump is capable of delivering a flow of 23 GPM at 900 RPM (idle). A flow regulator at the pump outlet limits the flow to the valve at 45 GPM. All excess flow is sent back to the hydraulic tank. When the pump is not engaged, all the oil returns to the hydraulic tank.

1.14.10 PRESSURIZING THE TANK SYSTEM

Cavitation is defined as the formation of air pockets in a moving fluid. The presence of air in the hydraulic oil produces cavitation inside the pump, generating excessive wear and noise. Cavitation forms after replacing hydraulic components or after flushing the hydraulic system.

To prevent cavitation in the hydraulic system, air pressure of 3 to 3.5 PSI is applied to the hydraulic tank. A gage and a pressure regulator are installed to adjust the air pressure inside the tank. This gage is located inside the frame rail on the curbside of the chassis (Figure #1.92). This gage can be accessed only when body is raised. To adjust the pressure regulator, turn it's knob until the pressure reaches 3 to 3.5 PSI.

The hydraulic tank is also equipped with a 5-PSI relief valve (Figure #1.93) and a 5-PSI pressurized screw on filler cap.

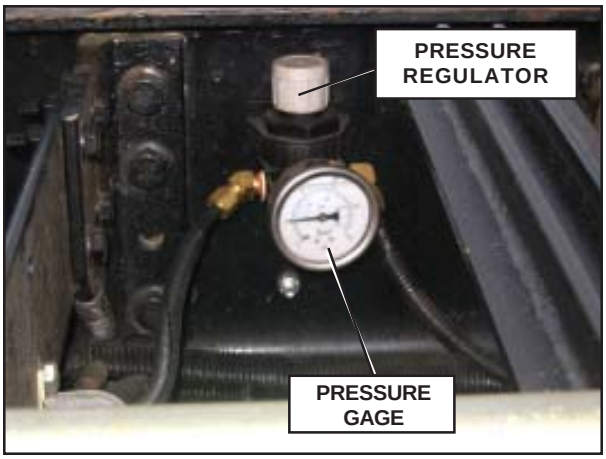


FIGURE #1.92

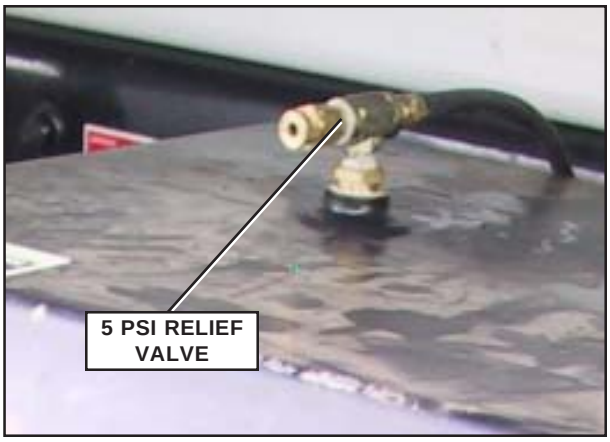


FIGURE #1.93

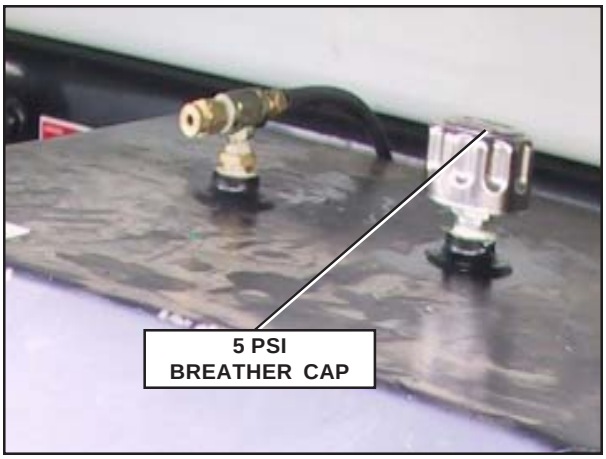


FIGURE #1.94

DANGER

INSTALL BODY SAFETY PROP BEFORE PERFORMING ANY WORK UNDER BODY.

WARNING

DO NOT EXCEED 5 PSI OF AIR PRESSURE INSIDE THE TANK.

1.14.11 PUMP INSPECTION

The hydraulic pump (Figure #1.95) is powered by the truck's engine through a drive shaft. On a daily basis, the pump should be visually inspected. Follow this procedure.

PUMP INSPECTION PROCEDURE

1. **Ensure that the parking brake is applied and the vehicle is tagged out for maintenance purposes (refer to section 1.5 "lockout/ tagout procedure").**
2. **Start the engine, engage the hydraulic pump.**
3. **The pump should turn freely without any excessive noise or vibrations.**
4. **Open the cab grille (if necessary).**
5. **Inspect the pump (under) and connections for any oil leak.**
6. **If an electrical problem occurs with the pump, refer to section 3.3 "Troubleshooting guide.**

WARNING

IF THE UNIT HAS TO BE DRIVEN AWAY FOR REPAIRS ON THE HYDRAULIC SYSTEM, REMOVE THE DRIVE SHAFT BETWEEN THE ENGINE AND THE PUMP BEFORE RESTARTING THE ENGINE.

HYDRAULIC PUMP

FIGURE #1.95

1.15 HYDRAULIC PRESSURE ADJUSTMENT

1.15.1 BODY FUNCTION MAIN RELIEF VALVE ADJUSTMENT

The vane pump that controls the body function may have its own relief valve. This relief valve has to be set before the main relief valve on the directionnal control valve. The pressure chart below gives the proper adjustment pressure for body function. Use this chart to adjust the relief of the pump. A 0-4000 pressure gage (Figure #1.96) as well as a set of ball-end Hex key (Figure #1.97) is required to perform the pressure adjustment procedure.

FIGURE #1.96

Ball-end Hex Key (Metric & SAE)

FIGURE #1.97

PRESSURE CHART FOR 27/21 CU.YD BODY with 4-inch dia. packer cylinders

1. **Body vane pump relief valve (if equipped) is set at *3300* PSI (2200 PSI FOR 21 CU.YD Body) at idle speed.**

2. **Body function main relief valve is set at *3000* PSI (2000 PSI FOR 21 CU.YD Body) at idle speed.**

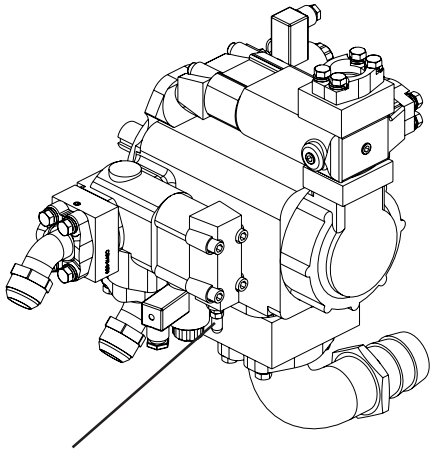


FIGURE #1.98

1.15.1 BODY FUNCTION MAIN RELIEF VALVE ADJUSTMENT(cont'd)

Apply the following procedure in order to adjust the vane pump relief valve.

BODY VANE PUMP RELIEF VALVE (IF EQUIPPED) ADJUSTMENT PROCEDURE

1. **Apply the lockout/tagout procedure.**
2. **Ensure safety around the vehicle at all times.**
3. **Install the 0-4000 PSI pressure gage on the quick connect fitting located on the body functions valve (Figure #1.99).**
4. **Start the engine and engage the hydraulic system (Pump switch "ON").**
5. **Release the vane pump relief (if equipped).**
6. **Tighten the main relief valve adjustment screw to be able to adjust the vane pump relief valve (if equipped).**
7. **Activate the tailgate until the cylinder reaches the end of its stroke (close the tailgate).**
8. **Adjust the vane pump relief valve[1] (if equipped) according to the pressure chart.**
9. **Once the body vane pump relief valve is adjusted, back out the Main Relief .**

When the vane pump is adjusted to the proper pressure, adjust the relief of the body function valve according to the pressure chart.

[1]The flow control that controls the flow for all body functions is the one on the closest section of the input shaft.

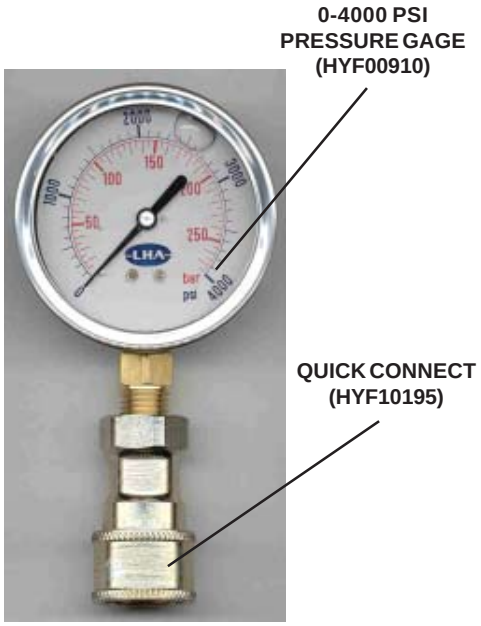


FIGURE #1.99

FIGURE #1.100

MAIN RELIEF VALVE PRESSURE ADJUSTMENT

1. Make sure the parking brake is applied and the vehicle is tagged out for maintenance purposes (refer to the Lockout/Tagout procedure).
2. Start the engine.
3. Engage the hydraulic system.
4. Hook a 0-4000 PSI pressure gage on the quick connect located on the hydraulic valve.
5. Back out the main relief and close the tailgate completely. Hold the lever in order to make the pressure build up in the system.
6. At the same time, check the pressure on the gage.
7. Adjust the main relief as needed by loosening the lock nut and turning the adjustment screw.

PRESSURE ADJUSTMENT TABLE

PUMP	CHASSIS	CYLINDER BORE(PACKER)	MAIN RELIEF PRESSURE (± 50 PSI)	DUMP VALVE PRESSURE (IF EQUIPPED) (± 50 PSI)
VANE PUMP	6X4	4 INCHES	3000 PSI@ IDLE	3300 PSI@ IDLE
	4X2	4 INCHES	2000 PSI@ IDLE	2200 PSI@ IDLE

BODY RELIEF VALVE ADJUSTMENT (ELECTRO-HYDRAULIC VALVE)

1. **Once the body vane pump relief valve is adjusted, back out the Main Relief (F).**
2. **Install the pressure gage at the valve inlet cover (E).**
3. **Activate the "close tailgate" function.**
4. **If it doesn't work, adjust the utility section of the valve.**
5. **Set the pressure at IDLE to 2000 PSI for a single axle or to 3000 PSI for tandem chassis.**

UTILITY SECTION ADJUSTMENT

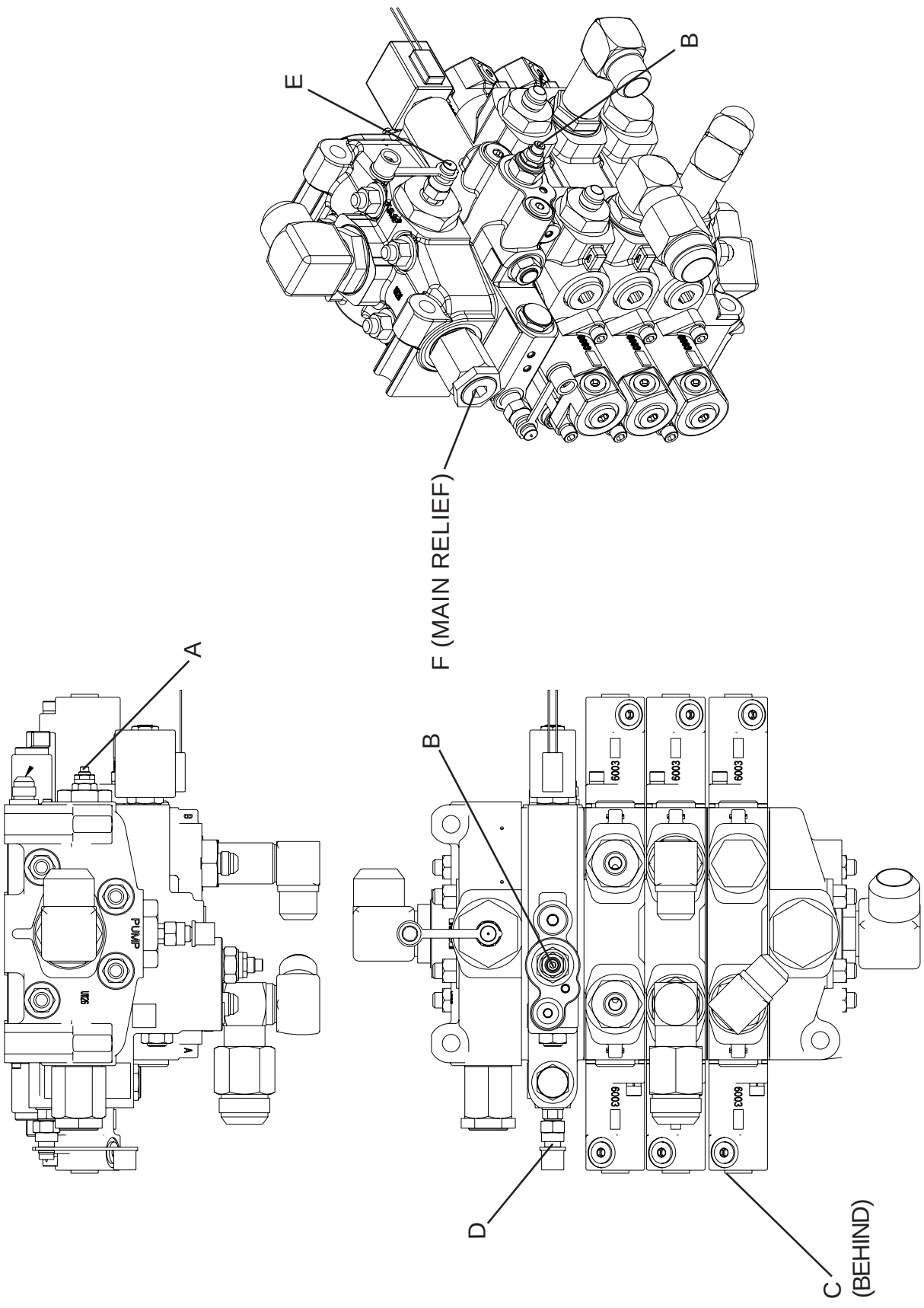
6. **Install a pressure gage at the valve inlet cover (letter E on the schematic).**
7. **Back out the Pilot Generation Relief Valve (A) as well as the Pressure Reducing Valve (B)**
8. **Disconnect the BODY UP coil (C).**
9. **Activate the BODY UP hydraulic function in order to energize the Build-Up solenoid.**
10. **Set the Pilot Generation Relief Valve (A) that is located on the right-hand side of the valve bank, behind the coil, to 420 PSI (plus or minus 30 PSI) with the engine at IDLE. If you're not able to do so, turn the main relief (F) on 1 turn.**
11. **Reconnect the BODY UP coil.**
12. **Remove the pressure gage from the valve inlet cover and install it on the UTILITY VALVE SECTION TEST PORT (D).**
13. **Activate the TAILGATE CLOSE (B) function and hold. Set the Pressure Reducing Valve at 550 PSI (plus or minus 50 PSI) with the engine at MAX RPM.**
14. **Test the valve. The valve should shift sharply.**

NOTE: Refer to the schematic on the next page to identify the valve parts.

1.15.2 ARM VANE PUMP RELIEF VALVE ADJUSTMENT (cont'd)

Usually, there is no arm vane pump relief valve. If there's one on your truck, raise the pressure to it's maximum by tightening completely the relief valve.

NOTE: The arm vane pump is located at the front of the pump.


E
B
F (MAIN RELIEF)
A
B
D
C (BEHIND)
PUMP
6003

PROPORTIONAL VALVE

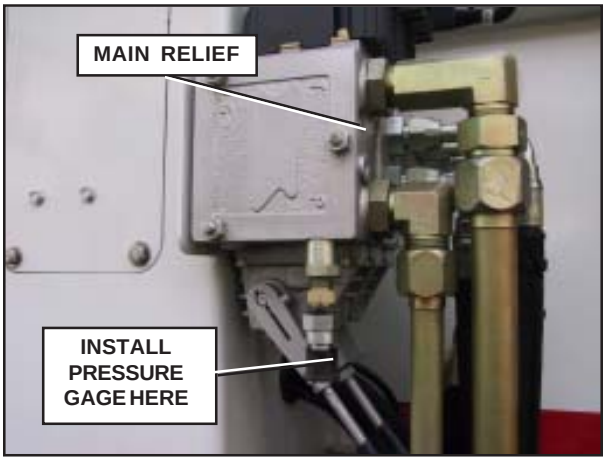


FIGURE #1.101

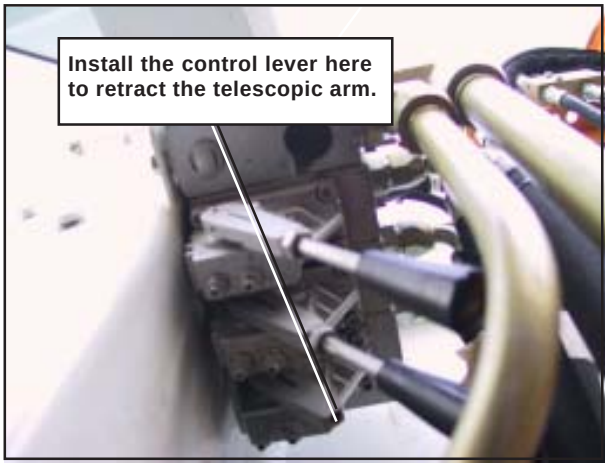


FIGURE #1.102

1.15.3 ARM FUNCTIONS ADJUSTMENT PROCEDURE

The operating pressure of the arm (retract / extend) and the grabber (up and down movement) are the same as the main relief: 2000 PSI (refer to section 1.14.4A). No adjustment is required for these functions. Only the grabber closing requires proper adjustment to prevent crushing the roller carts. Refer to section 1.15.4 to adjust the grabber's load sense relief valve.

The table on the next page presents the operating pressure and the cycle times for each function of the arm. Note that speed of the arm is controlled by the amount of hydraulic fluid (flow) sent to the cylinder.

The flow is limited mechanically by two movement restrictors located on each section. To adjust the cycle time of the arm refer to section 1.15.5 "Arm Speed Adjustment Procedure".

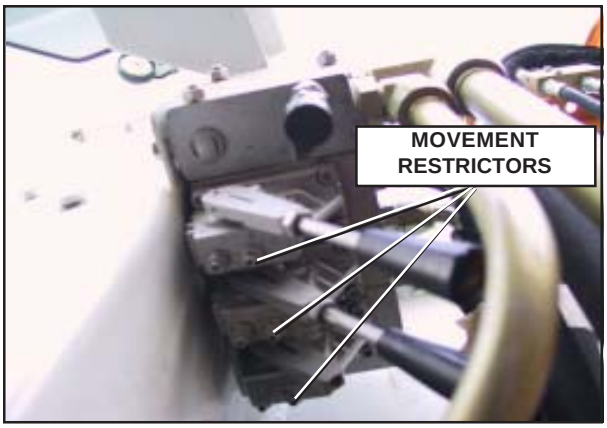


FIGURE #1.103

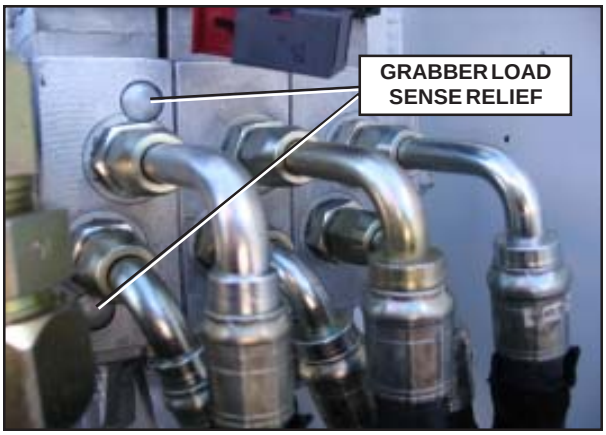


FIGURE #1.104

ARM OPERATING PRESSURE AND CYCLE TIMES		
Arm function	**Pressure setting**	**Cycle Time**
Arm Extend / Retract	2000 PSI	5.2/4.2 sec.
Grabber Up / Down	2000 PSI	4.5/3.5 sec.
Grabber Close	1200 PSI (load sense)[1]	Less than 3 sec.
Grabber Open	2000 PSI + ¼ turn	Less than 2 sec.

Table 1

[1] Reference value that varies according to use. This pressure can be adjusted according to client's needs.

1.15.4 GRABBER LOAD SENSE RELIEF

The section of the proportional valve that controls the grabber is located on the right-hand side of the valve and it is equipped with a load sense relief valve that allows pressure adjustment of the grabber. To adjust the load sense relief apply the following procedure.

DANGER

DO NOT STAND DIRECTLY IN THE PATH OF THE ARM WHILE CARRYING OUT THESE ADJUSTMENTS.

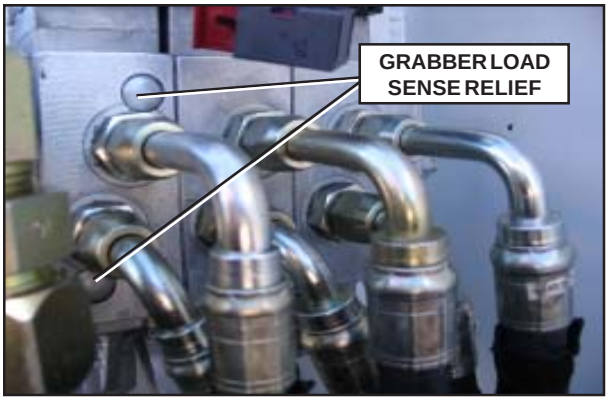


FIGURE #1.105

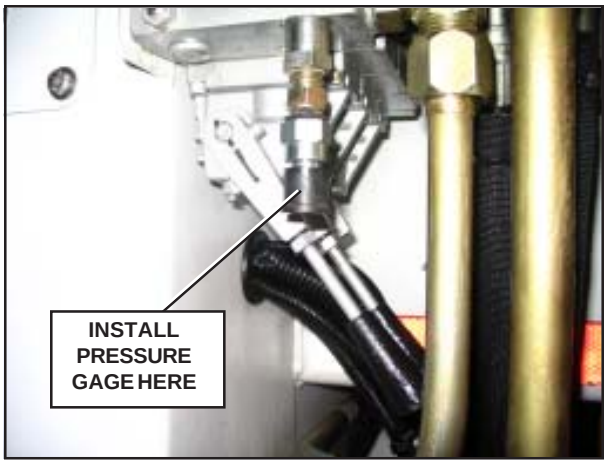
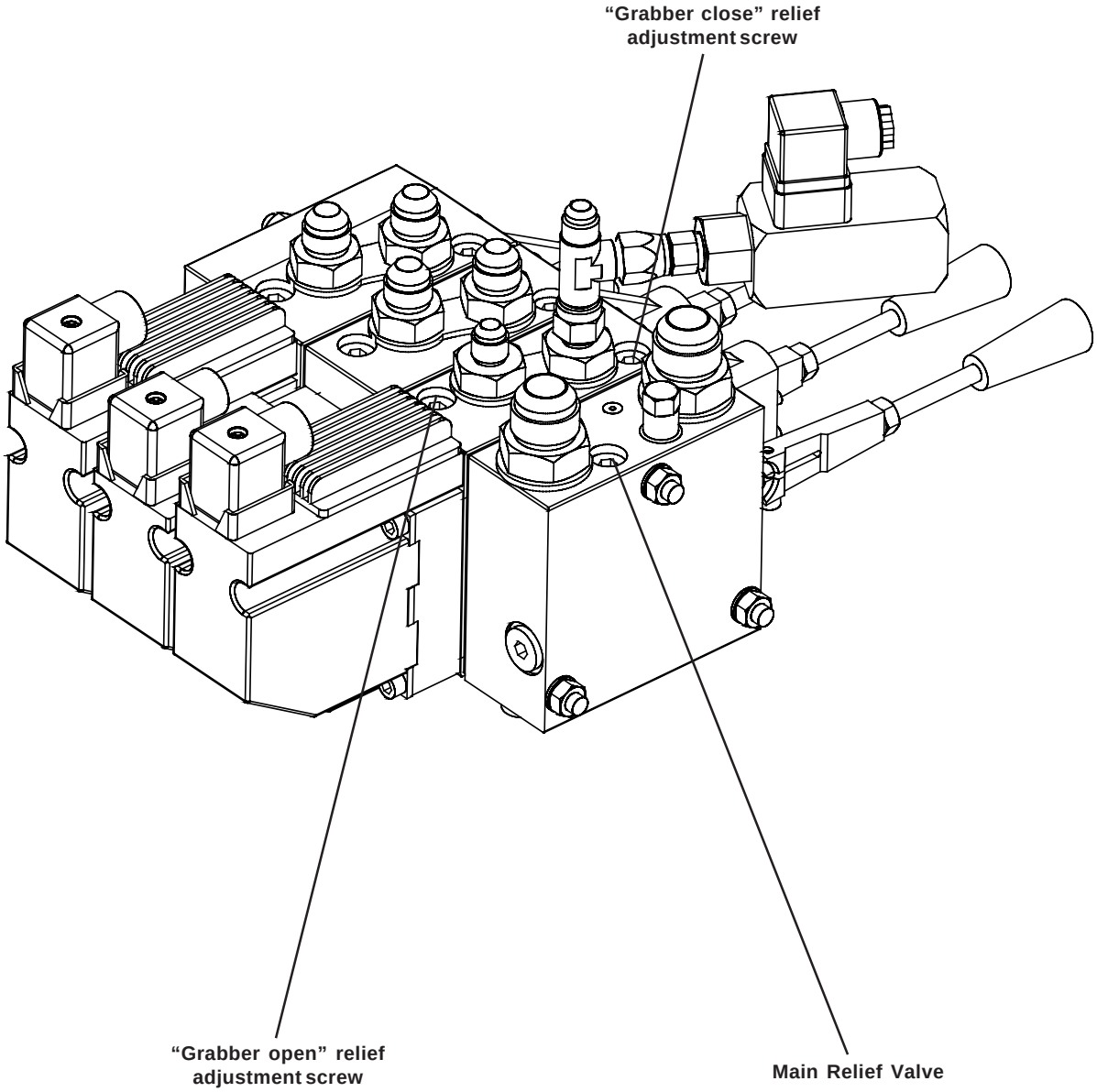


FIGURE #1.106

GRABBER LOAD SENSE RELIEF ADJUSTMENT PROCEDURE

1. **Apply the lockout / tagout procedure.**
2. **Before making any adjustments, secure the area around the path of the arm.**
3. **Remove all residual hydraulic pressure in the system by moving the manual levers back and forth.**
4. **Make sure that all hoses are tight and not leaking.**
5. **Connect a pressure gage (0-4000PSI) to the quick connect on proportional valve.**
6. **Put the transmission in Neutral.**
7. **Start the engine, and engage the hydraulic pump.**
8. **Using the first lever on the left-hand side of the proportional valve, close the grabber .**
9. **Adjust the relief valve of the "grabber close" side of the valve section at 1200PSI[1](screw or unscrew depending on the gage readout).**
10. **Open the grabber and adjust the pressure of the "grabber open" load sense relief valve at 2000 PSI + ¼ turn**

[1] Reference value that varies according to use. This pressure can be adjusted according to client's needs.


"Grabber close" relief adjustment screw
"Grabber open" relief adjustment screw
Main Relief Valve

1.15.5 ARM SPEED ADJUSTMENT

The arm speed is controlled by the amount of hydraulic fluid that is being sent to the arm's cylinder. The arm control valve spools can let a certain flow of hydraulic oil, depending on the section of the valve*. The flow is limited by a mechanical movement restrictor or stopper (Figure #1.107).

Note:
No arm speed adjustment is required unless replacing the valve or a section of it.

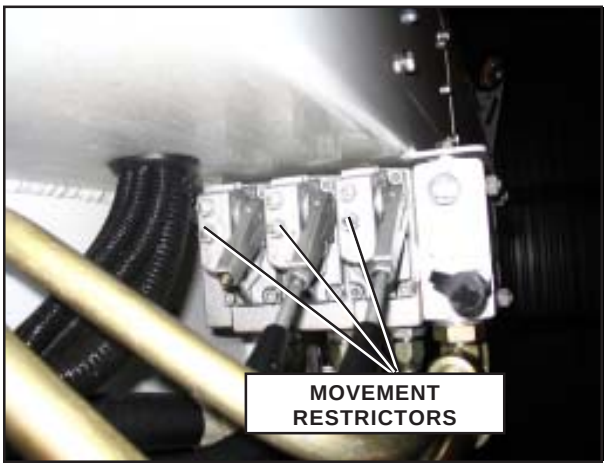


FIGURE #1.107

DANGER

APPLY THE "LOCKOUT/TAGOUT" PROCEDURE AT ALL TIMES.

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

SPEED ADJUSTMENT PROCEDURE

1. **Apply the lockout/tagout procedure.**
2. **Secure the arm's working area using barrier tape or barricades.**
3. **Put the transmission to neutral.**
4. **Start the engine and engage the hydraulic system (Pump switch "ON").**
5. **Clearly identify the stopper screw on the valve that corresponds to the proper function (boom extension/retraction, grabber open/close). Move the lever to evaluate the speed of the arm then release the lever.**
6. **Loosen the lock nut.**
7. **Screw in the restrictor adjustment only one eighth (1/8th) of a turn at a time to see a significant change of the arm's speed.**
8. **Move the lever again to evaluate the arm's speed. Repeat until cycle times are properly set (see cycle time on page 7).**
9. **Tighten the lock nut.**

DANGER

DO NOT STAND DIRECTLY IN THE PATH OF THE ARM WHILE CARRYING OUT THESE ADJUSTMENTS.

1.16 BODY HOIST INSPECTION AND REPLACEMENT PROCEDURE

Because of its frequent use, the body hoist needs to be inspected to ensure the proper operation at all times. The following section presents a typical inspection procedure of the body lifting cylinder.

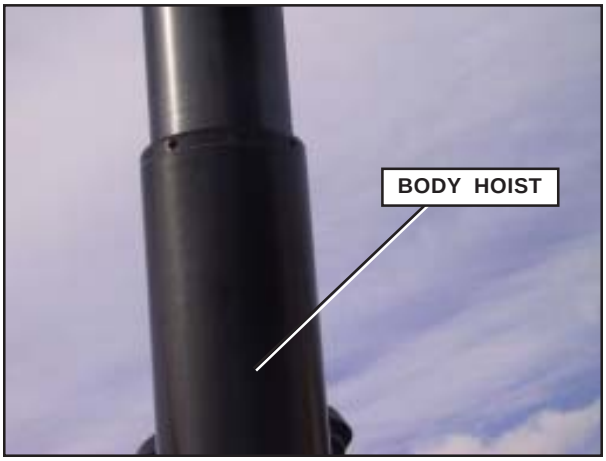


FIGURE #1.108

DANGER

APPLY THE "LOCKOUT/TAGOUT" PROCEDURE AT ALL TIMES.

1.16.1 BODY HOIST INSPECTION

The body hoist should be visually inspected every week as part of regular maintenance.

Check for leaks, cracks and loose parts that could cause breakdown. When the body is raised, at the top of each cylinder's section, you will see a steel gland (figure #1.109) which must be inspected as well. Apply the following procedure for complete inspection of the hoist.

BODY HOIST INSPECTION PROCEDURE

1. **Park the vehicle on a safe and level ground.**
2. **Check the overhead clearance and fully raised the body.**
3. **Install the body safety prop.**
4. **Apply the lockout/tag out procedure.**
5. **Check the cylinder for scratch or leaks.**
6. **At the cylinder base, make sure that the pivots are greased and the bolts are tight.**

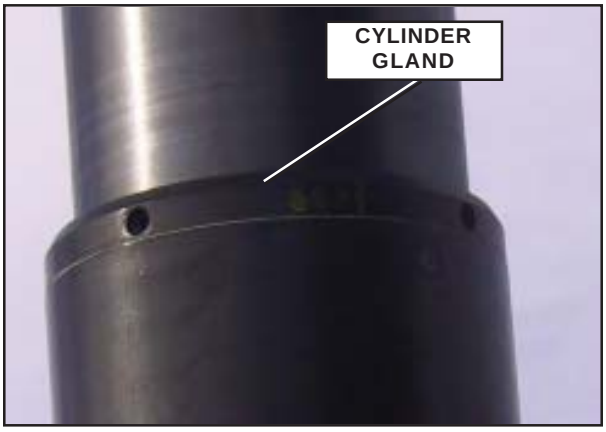


FIGURE #1.109

1.16.1 BODY HOIST INSPECTION (cont'd)

BODY HOIST INSPECTION PROCEDURE

7. **Check the gland on each stage of the cylinder.**

8. **If the gap between the gland and the tube is higher than 1/8 inch:**

   You must call Labrie Equipment's Service & Warranty Department immediately at 1-877-4LABRIE.

9. **In the event that the gap between the tube and the gland is bigger than 1 inch:**

   You must stop using the vehicle immediately and repair the cylinder. Refer to section 1.16.2 "Body hoist replacement".

10. **Make sure that the gland safety pins are in place.**

11. **When the inspection is completed, retract the safety prop and lower the body.**

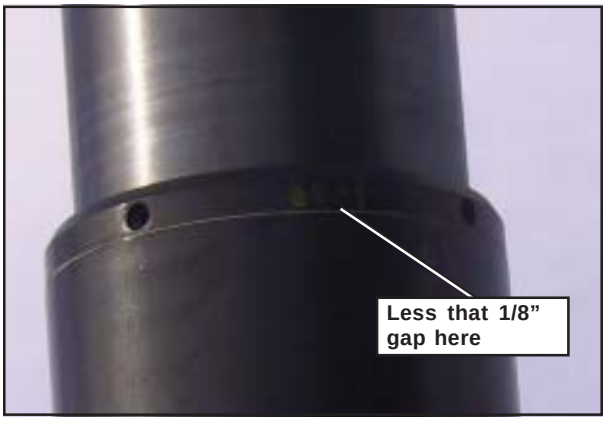


FIGURE #1.110

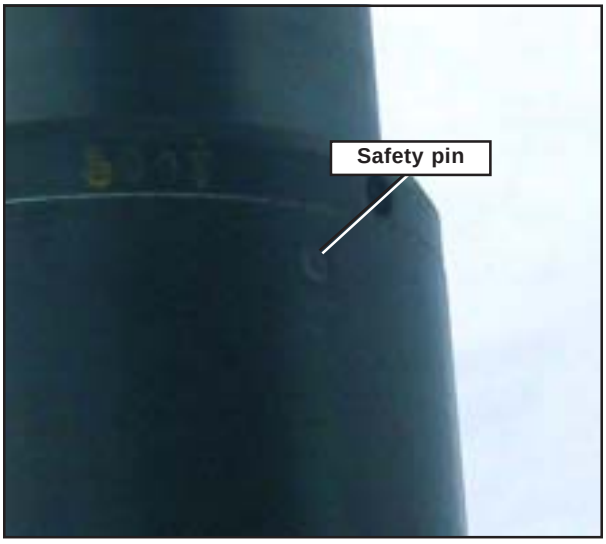


FIGURE #1.111

DANGER

INSPECTION OF THE CYLINDER GLAND EVERY WEEK IS MANDATORY. UNSCREWED GLAND FROM THE BODY HOIST WILL CAUSE THE SEPARATION OF THE HYDRAULIC CYLINDER AND A SUDDEN DROP OF THE BODY. THIS TYPE OF ACCIDENT CAN LEAD TO SERIOUS INJURIES AND/ OR IMPORTANT DAMAGES OR EVEN DEATH.

1.16.2 BODY HOIST REPLACEMENT

BODY HOIST REPLACEMENT PROCEDURE

1. Ensure that the parking brake is applied and the vehicle is tagged out for maintenance purposes (refer to the section 1.5 "Lockout/ Tagout procedure").
2. Remove the locknut at the top of the cylinder cover (Figure #1.112).
3. Start the engine and engage the hydraulic pump.
4. Lift the body to get enough space to lower the safety prop under the body (Figure #1.113).
5. Install the safety prop and using a lifting device secure the cylinder to prevent the cylinder from tilting on the cab or falling onto the chassis.
6. Start the engine, engage the hydraulic system and lower the body cylinder using the lever on the console.
7. Disengage the hydraulic system and stop the engine.

DANGER

DO NOT USE THE SAFETY PROP WITH A LOADED BODY. UNLOAD THE BODY PRIOR DOING ANY REPAIRS.

TOP OF THE BODY HOIST

FIGURE #1.112

FIGURE #1.113

1.16.2 BODY HOIST REPLACEMENT (cont'd)

BODY HOIST REPLACEMENT PROCEDURE

8. Disconnect the hydraulic hose and fitting (Figure #1.114).

9. Remove the cylinder base pillow blocks (Figure #1.115).

10. Replace the cylinder.

11. Reinstall the cylinder base pillow blocks on both sides and reconnect the hydraulic hose.

12. Start the engine and engage the hydraulic pump.

13. Slowly raise the cylinder until it reaches the top of the cover where the lock nut will be tightened. Note that the cover must be aligned with the threaded rod at the top end of the cylinder.

14. When the threaded rod passes through the cover, install the locknut.

15. Lubricate the cover and the base pillow blocks (Figure #1.115 & #1.116).

16. Lift the body, store the safety prop and check for proper operation.

FIGURE #1.114

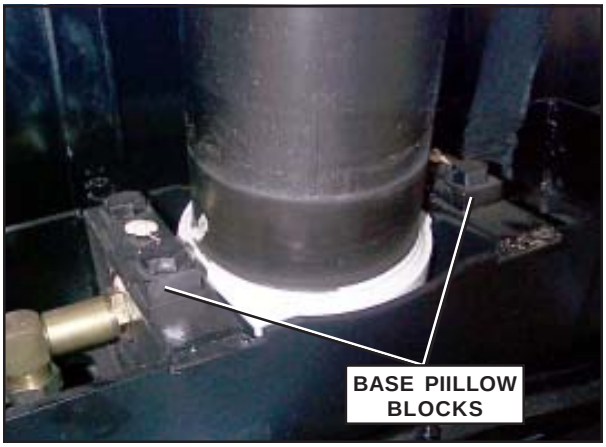


FIGURE #1.115

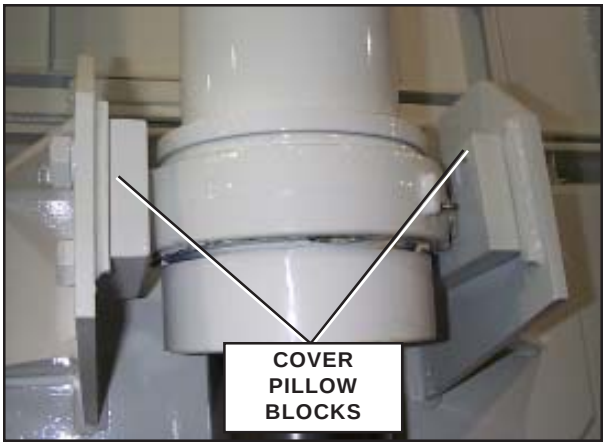


FIGURE #1.116

1.17 ARM GENERAL MAINTENANCE

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

Maintenance personel must be familiar with the operation of the arm, the safety around it and the maintenance procedures described in this section as well.

1.17.1 DAILY INSPECTION

On a daily basis, perform a visual inspection of the arm, looking for leaks, cracks or premature wear of the moving parts. REFER TO LUBRICATION SECTION FOR DETAILED GREASING POINTS.

DANGER

DO NOT STAND DIRECTLY IN THE PATH OF THE ARM WHILE CARRYING OUT THESE ADJUSTMENTS.

DANGER

APPLY THE "LOCKOUT/TAGOUT" PROCEDURE AT ALL TIMES

Apply the following inspection procedure:

ARM INSPECTION PROCEDURE

1. **Make sure to park the vehicle on a safe and level ground.**
2. **Ensure that the parking brake is applied and the vehicle is tagged out for maintenance purposes (refer to the section 1.5 "Lockout/ Tagout procedure").**
3. **Start the engine and engage the hydraulic pump (PTO ON).**
4. **Fully extend the arm.**
5. **Turn off the hydraulic pump and the engine.**
6. **Perform a visual inspection of the following items.**

- **Mounting bolts (Fig. 1.117);**
- **Rollers and bearings (Fig. 1.119);**
- **Bolt locks (Fig. 1.120);**
- **Pivots;**
- **Chains and gears (Fig. 1.118);**
- **Grabber arm;**
- **Hoses and connections (Fig. 1.121);**
- **Cylinders;**

7. **Check for loose nuts and bolts.**
8. **Check limit switches. See section 1.17.2 "Limit switch adjustment procedure".**
9. **Lubricate moving parts as per the lubrication chart. See Lubrication section.**

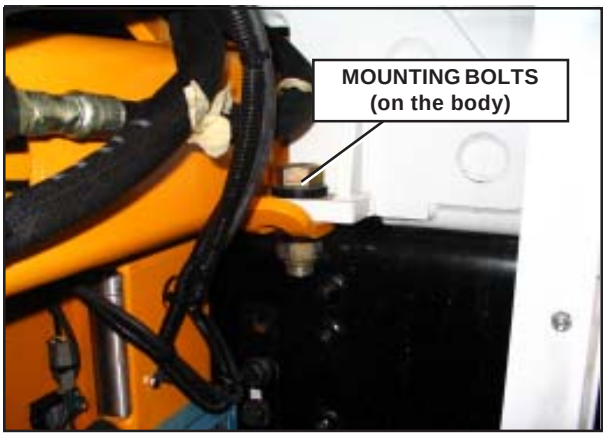


FIGURE #1.117

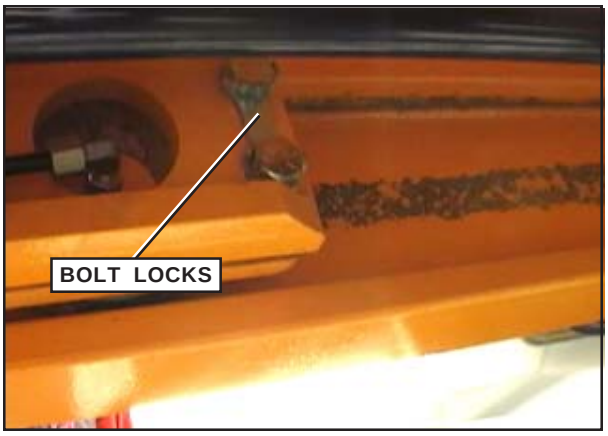


FIGURE #1.120

FIGURE #1.118

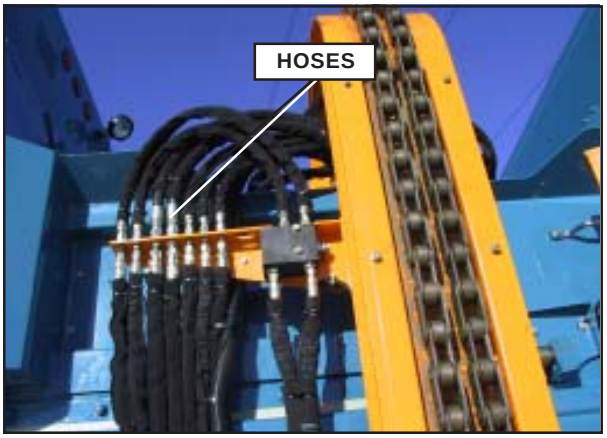


FIGURE #1.121

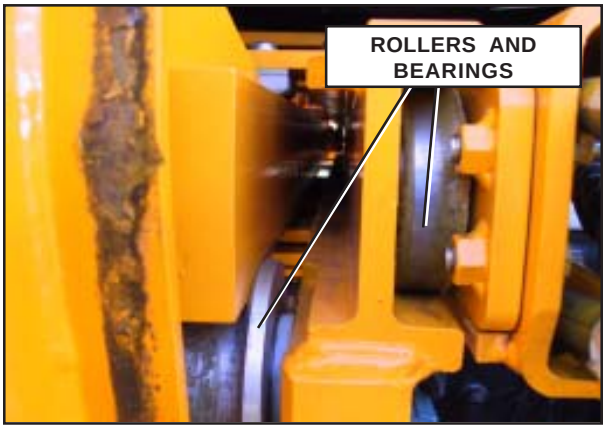


FIGURE #1.119

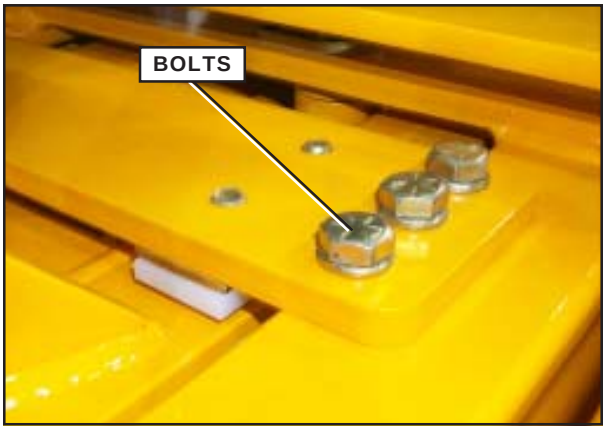
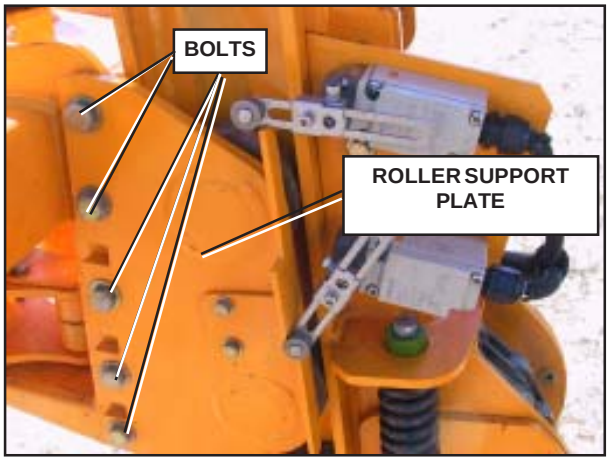


FIGURE #1.122

The rollers of the grabber trolley are equipped with wear pads. When the gap between both wear pads and the guide totals ¼ inch or more, they have to be replaced. For example: if there's a 0,125-inch gap between the right wear pad and the guide and there's a 0,125-inch gap between the left wear pad and the guide, the total gap is 0,250 or ¼ inch. In this case, the wear pads MUST be replaced.To do so, perform the following procedure.

GRABBER TROLLEY WEAR PADS REPLACEMENT PROCEDURE

1. **Support the right-hand side of the grabber first to prevent the grabber from falling.**
2. **Remove the bolts that retain the roller support plate.**
3. **Unscrew the wear pad screws and replace it.**
4. **Reinstall the plate and the bolts.**
5. **Repeat the procedure for the left-hand side of the grabber.**



1.17.2 GRABBER AND ARM LIMIT SWITCHES

On the truck, behind the grabber, you will find a limit switch (Figure 1.123) that triggers 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.

To adjust this limit switch (Figure # 1.123), apply the following procedure:

ADJUSTMENT PROCEDURE FOR THE LIMIT SWITCH THAT DETECT THE ARM EXTENSION AND THE GRABBER OPENING

1. **Park the vehicle on a safe and level ground.**
2. **Fully retract the arm.**
3. **Fully open the grabber.**
4. **See if the warning lights on the dashboard are flashing; if they are still flashing at that point, unscrew the limit switch lever screws and adjust it in such way that the grabber finger will trigger the limit switch (click sound) and stop the warning lights. One or both levers may require to be bent to stop warning lights.**
5. **Extend the arm (or close the grabber) and see if the warning lights start to flash when the arm is moving out. If not, adjust the lever accordingly.**

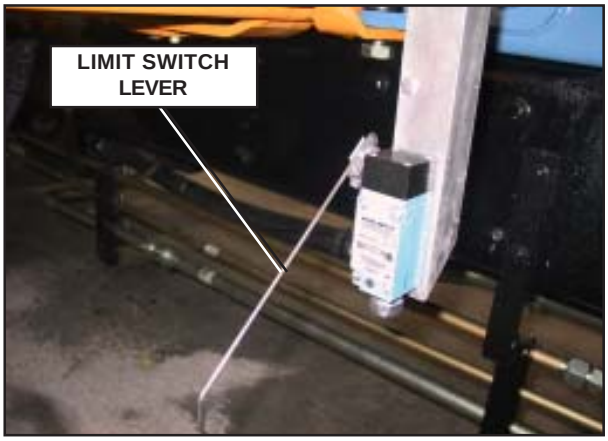


FIGURE #1.123

WARNING

THIS PROCEDURE MUST BE DONE CORRECTLY BEFORE ADJUSTING THE GRABBER AUTO-CLOSING SYSTEM

Another limit switch is located near one of the grabber cylinder (Figure #1.124 A). When the grabber is completely open, this limit switch prevents the arm to be lifted up. This way, there's no chance for the grabber to hit the truck when a cart is collected near it (zero grab). All the 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 grabber is open or closed. This may cause an accident, injuries or property damages.

NOTE:There's no adjustment procedure for this limit switch.

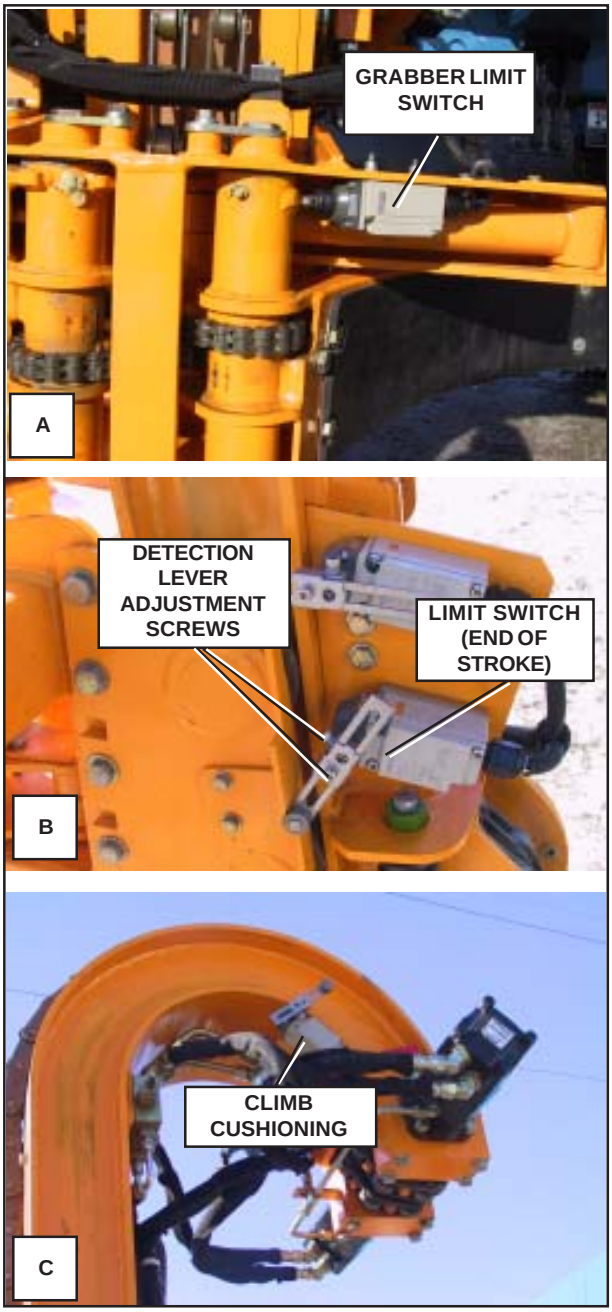


FIGURE #1.124

DANGER

DO NOT STAND DIRECTLY IN THE PATH OF THE ARM WHILE CARRYING OUT THESE ADJUSTMENTS.

There's also a limit switch located at the bottom of the arm (Figure #1.124 B). This allows the arm motor(s) to stop when the grabber is down and ensure that the tension of the chains is adequate. To adjust this limit switch, apply the following procedure:

STROKE END LIMIT SWITCH ADJUSTMENT

1. **By using the joystick, take down the grabber completely.**
2. **Turn off the engine.**
3. **Unscrew the lever screws of the limit switch (B).**
4. **Rise the detection lever a little bit and tighten up the screws.**
5. **Repeat the procedure until the chains still flat when the grabber reach the end of it's stroke. the chains shall not be loose.**

1.17.3 GRABBER AUTO-CLOSING

The automated arm is equipped with a system that will close the grabber if the operator raises the grabber without closing it. The “Grabber Auto-Closing System” will automatically close the grabber at a preset height, preventing collision between the grabber and the hopper wall or the truck.

In addition, 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 itself by gravity. As soon as the hydraulic system is brought online (pump switch On), the system will close the grabber automatically before the operator can move the arm.

How it works:

The system acts as though the operator would press the “Close Grabber” button on the joystick.

The “Auto-Closing System” is activated by a limit switch located on the side of the arm (Figure #1.125). When the grabber passes the Auto-closing limit switch (Figure #1.126), a signal is sent to the On/Off valve coil to close the grabber.

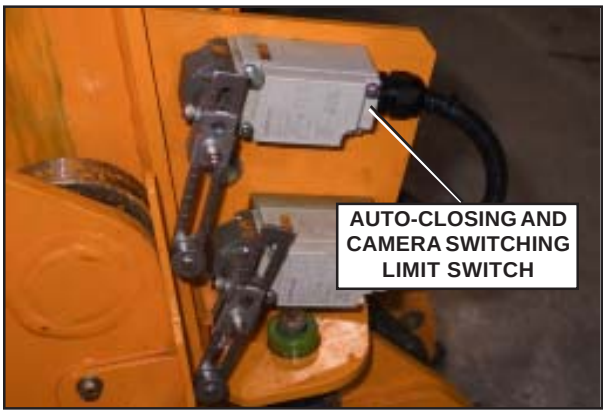


FIGURE #1.125

FIGURE #1.126

1.17.3 GRABBER AUTO-CLOSING (cont'd)

To make sure the "Grabber Auto-Closing" is working properly, apply the following procedure.

GRABBER AUTO-CLOSING INSPECTION PROCEDURE

1. **Make sure the vehicle is parked on a safe and level ground.**
2. **Secure the area around the path of the arm.**
3. **Start the engine and engage the hydraulic pump.**
4. **Lower the grabber arm and fully open the grabber.**
5. **Close the grabber a few inches or extend the arm in order to release the limit switch (Figure # 1.123). Lift the arm and see if the grabber closes automatically. If the grabber does not close, refer to section 1.17.4 "Adjusting The Grabber Auto-Closing System".**

DANGER

APPLY THE "LOCKOUT/TAGOUT" PROCEDURE AT ALL TIMES.

DANGER

DO NOT STAND DIRECTLY IN THE PATH OF THE ARM WHILE CARRYING OUT THESE ADJUSTMENTS.

1.17.4 ADJUSTING THE GRABBER AUTO-CLOSING SYSTEM

The Grabber Auto-Closing system is controlled by a limit switch located on the side of the arm (figure 1.128). To adjust the system apply the following procedure.

GRABBER AUTO-CLOSING ADJUSTMENT PROCEDURE

1. **Make sure the vehicle is parked on a safe and level ground.**
2. **Secure the area around the path of the arm.**
3. **Start the engine and engage the hydraulic pump.**
4. **Lower the grabber arm and fully open the grabber.**
5. **Close the grabber a few inches or extend the arm in order to release the limit switch (Figure #1.123).**
6. **The arm lever on the grabber should release the roller of the limit switch (Figure #1.128). At this point, a 12-volt signal should reach the coil on the proportional valve to close the grabber.**

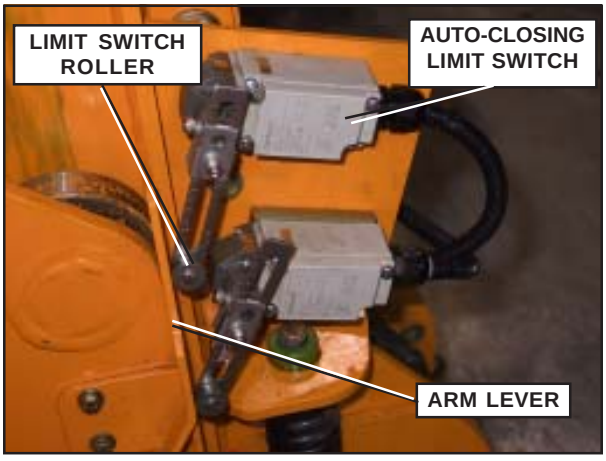


FIGURE #1.128

1.17.4 ADJUSTING THE GRABBER AUTO-CLOSING SYSTEM (cont'd)

GRABBER AUTO-CLOSING ADJUSTMENT PROCEDURE

7. **If the grabber does not close, adjust the roller on the limit switch accordingly (click sound). Loosen the screws on the roller arm (Figure #1.129).**

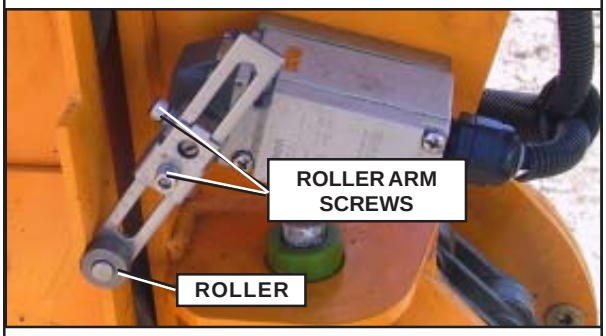


FIGURE #1.129

8. **When the grabber is closing, tighten the screws and perform a few up and down cycles of the grabber. Each time the grabber is raised, the grabber fingers should close automatically so the grabber will not hit the truck.**

1.17.5 GRAB PACK

The Grab Pack switch (see Figure #3.33 of Operator Manual) enables the packer to automatically start cycling about 4 seconds after the grabber is closed. This will give the arm enough time to reach the hopper and dump the cart before the packer starts to pack.

With a multi-cycle system, if the packer is set to perform 3 cycles (set in factory to 3 cycles, adjustable from 2 to 8; see section 3.2.5 Multi-Cycle Control of Operator Manual), the packer will complete all its cycles until the next time the operator closes the grabber. When theoperator closes the grabber, the multi-cycle function is reset.

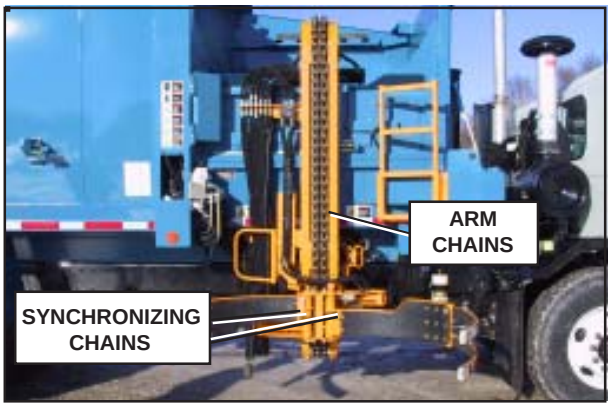
IIf the grabber is closed in the middle of a cycle, the packer will interrupt its current cycle, return to its fully retracted position, and then restart the next cycle. When a cycle is interrupted and the packer has returned, there is no delay before the packer restarts the next cycle. The four-second reset will apply only when the packer has completed all its cycles (2 to 8) and when it has returned to its fully retracted position.

Interrupting a cycle prevents dumping carts directly over the packer. Piled material over the packer could reduce it's efficiency.

1.17.6 ARM CHAINS

The Versa Hand™ Arm is equipped with chains that lift and synchronize the grabber.

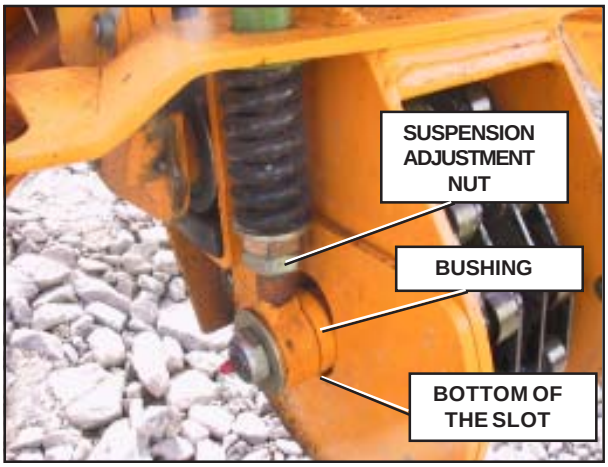
It is essential to grease the chains once a week. Also, it may be necessary to adjust the arm chains when they are not centered on the bottom roller. To do so, perform the following procedure:

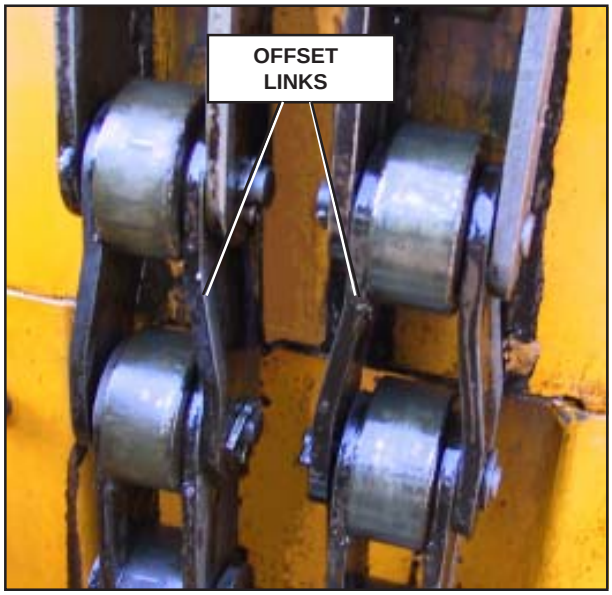


ARM CHAINS ADJUSTMENT PROCEDURE

1. **If the chains are not centered on the bottom roller, tighten the suspension adjustment nut until the chains return at the right place.**

2. **When no more suspension adjustment is possible because the bushing is touching the bottom of the slot, remove the offset link on each side of the chain.**



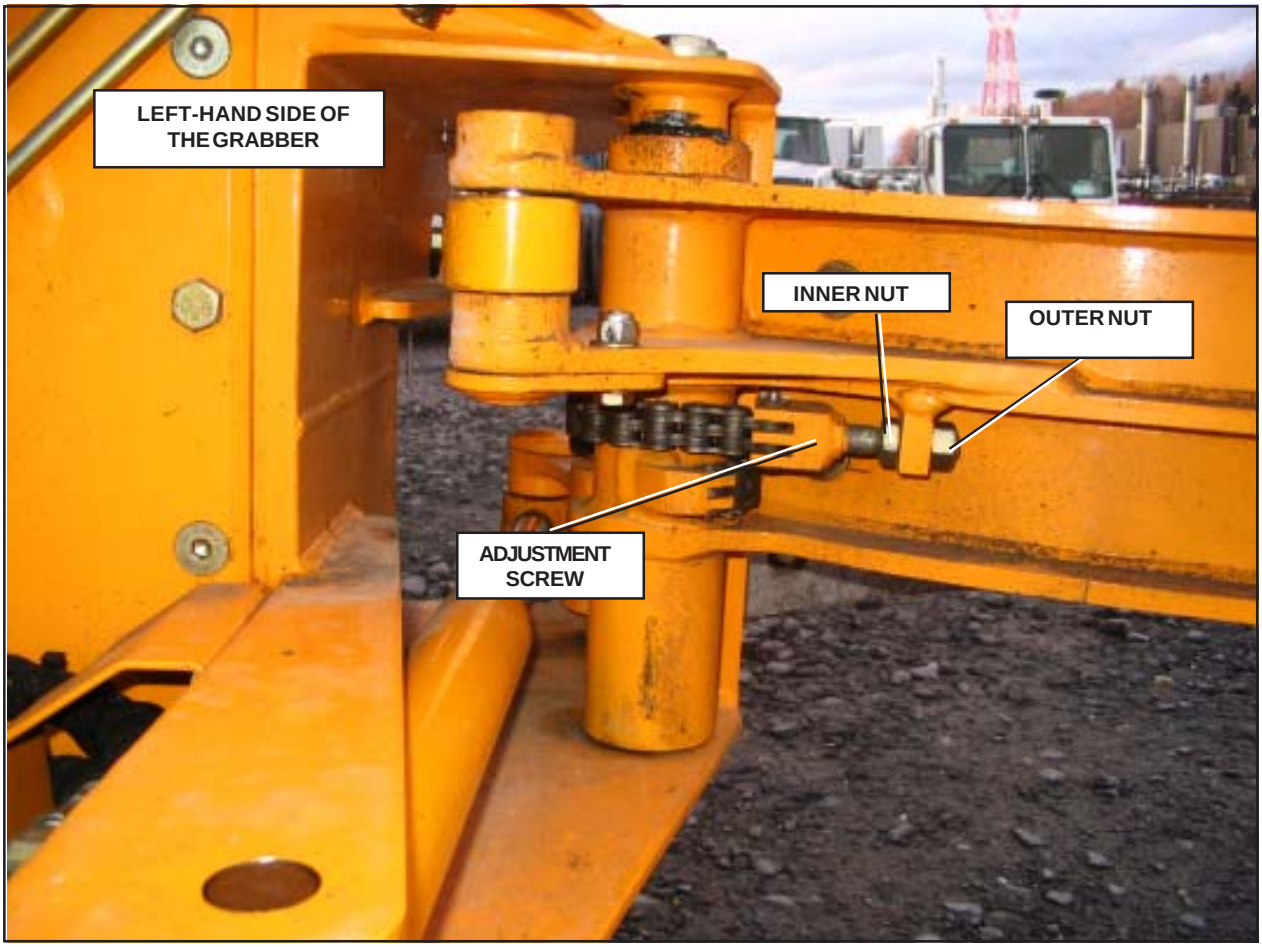


It may be also necessary to adjust the grabber chains when the grabber is not centered with the arm.

GRABBER CHAINS ADJUSTMENT PROCEDURE

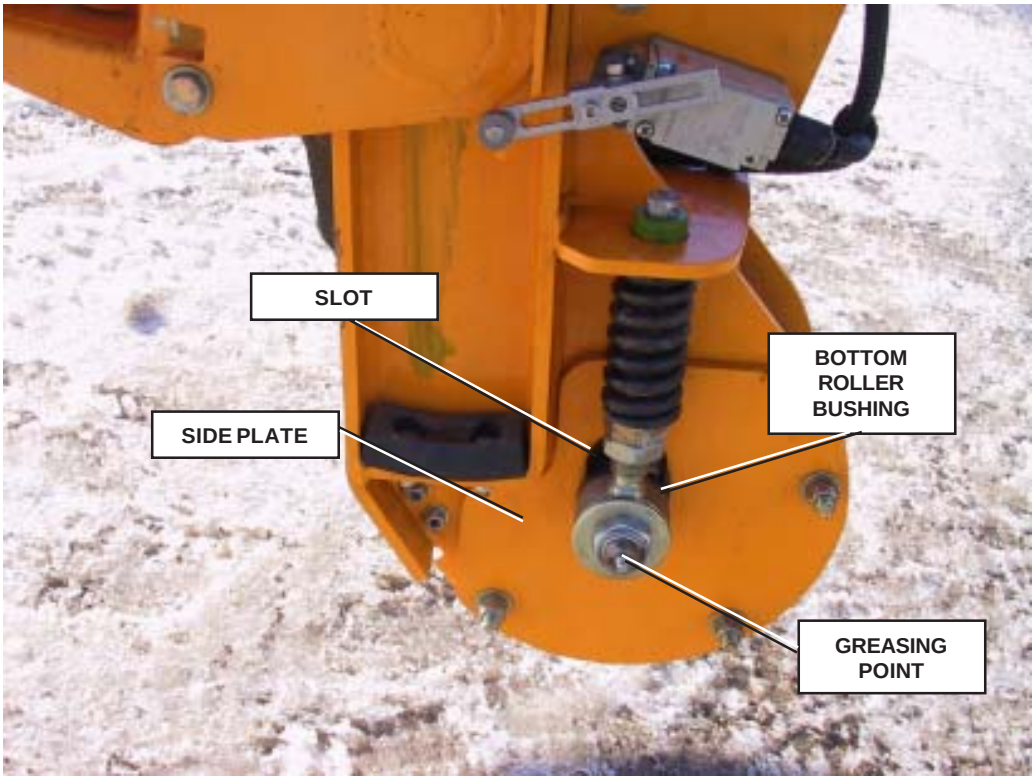
1. **Fully open the grabber.**
2. **Make sure that the grabber cylinders are completely retracted.**
3. **Unscrew the nuts of the adjustment screws on both sides of the grabber.**
4. **Adjust the chains until the grabber is symmetrical. To loosen a chain, screw the inner nut and unscrew the outer one. To tighten up a chain, screw the outer nut and unscrew the inner one. Don't tighten up the chains too much.**
5. **Close the grabber completely and make sure that the cylinders are fully deployed. The chains MUST not be too tight. If so, loosen the chains as decribed at the step 4.**

NOTE: Make sure that the adjustment screw doesn't turn to avoid twisting the chains.



1.17.7 ARM BOTTOM ROLLER

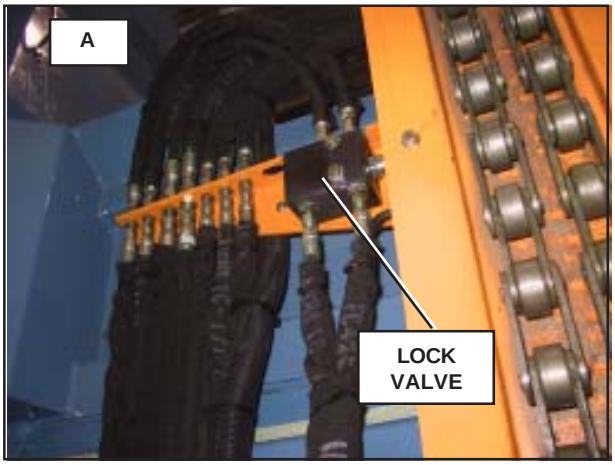
It is very important to perform the inspection and maintenance of the arm bottom roller to avoid premature wear and malfunction. This part follows the suspension movement by rolling in the slot. In consequence, it is crucial to verify if the bottom roller bushing are rolling. If it is not the case, the bushing can wear the slot and when the slot is worn, it is necesary to replace the side plates with new ones. To avoid this situation, apply the proper lubricant to the greasing point once a week. For more information, see the Lubrication section.

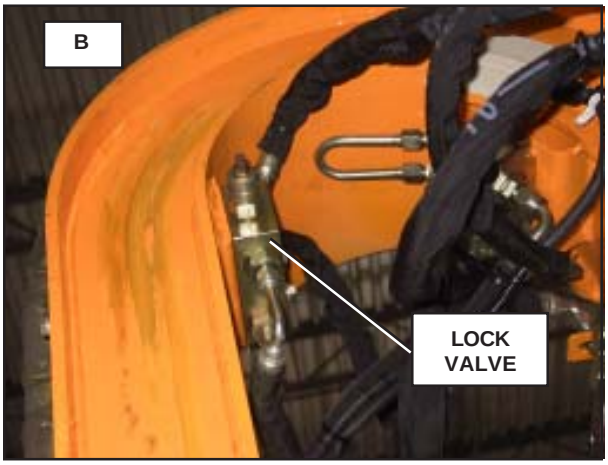


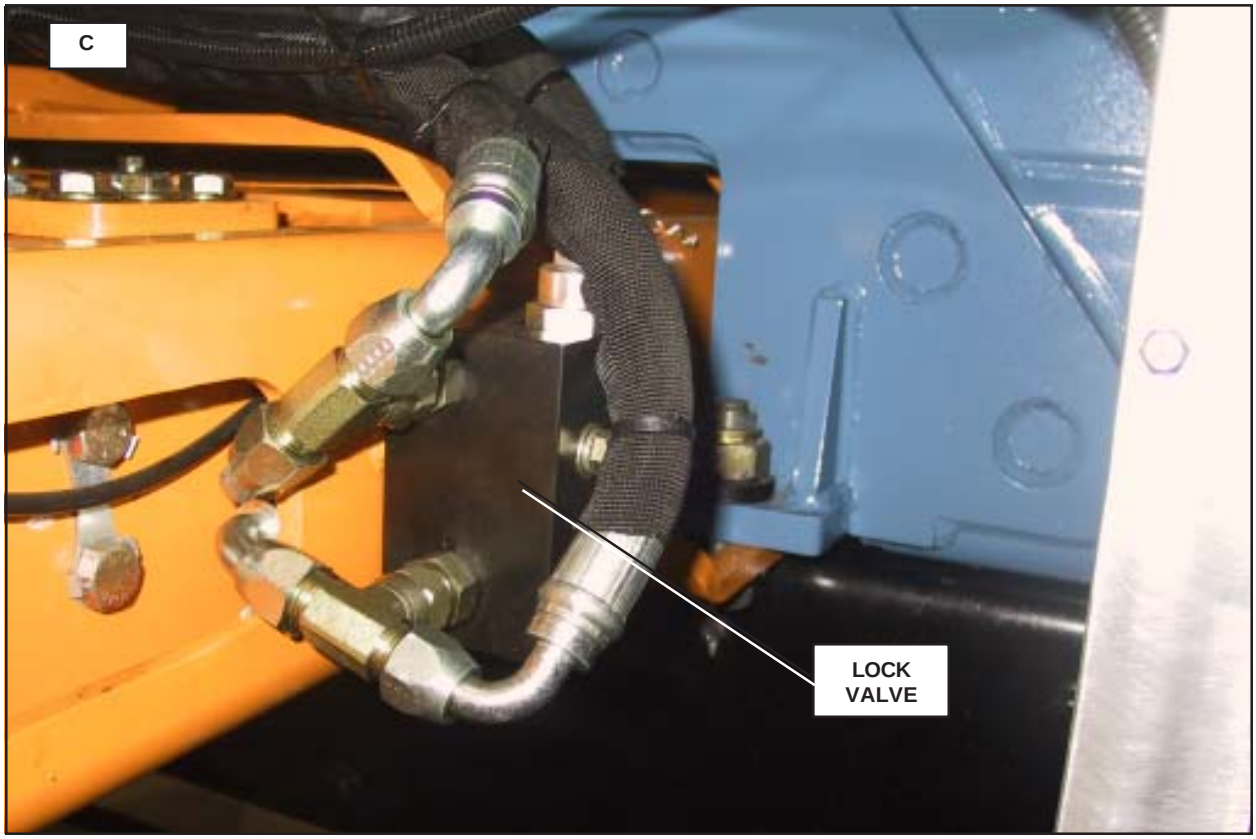
1.17.8 ARM AND GRABBER LOCK VALVES

The Versa Hand™ arm is equipped with three lock valves. The one on the hose support prevents the grabber from closing by itself (A), the one on the top of the arm prevent the grabber going down by itself (B) and the one on the right-hand side of the arm, near the rail, prevents the arm to extend by itself (C).

These lock valves are preset in factory. For any problems, please call LabriePlus™.







1.18 AIR SYSTEM MAINTENANCE

Air system is crucial for the brakes to operate with maximum efficiency. All air tanks on the chassis must be drained after each working day.

AIR TANK

FIGURE #1.131

Some units are equipped with an air dryer and/or alcohol evaporator (Figure #1.138). These devices are used to reduce water in the air system, preventing air components to corrode or to freeze in cold weather.

To perform maintenance on the air dryer and alcohol evaporator, refer to the chassis manufacturer maintenance manual.

The main hydraulic valve which controls the body functions, is activated by air actuators (Figure #1.132). When the tailgate or body lever on the console is moved, air pressure passing through the lever will activate the corresponding air actuator on the main valve; resulting in a movement of the hydraulic spool inside the valve.

The same thing occurs when the packer is activated; when pressing the green button on the packer control station, an electric signal is sent to the air-valve that controls the actuator on the main hydraulic valve. Refer to Air System section for air diagrams.

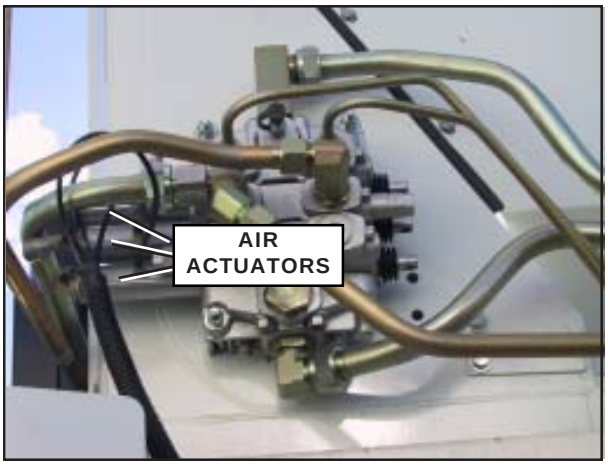


FIGURE #1.132

At the end of each day, bleed the water from the air filter bowl located on the cab console (Figure #1.133). Unscrew the drain cock and using a small rag in hand, collect the water that will come out. This water trap helps keep residual moisture out of the air system.

FIGURE #1.133

1.18 AIR SYSTEM MAINTENANCE (cont'd)

To avoid affecting control of packer or other system on the vehicle (especially under cold weather conditions), Apply the following procedure:

AIR SYSTEM MAINTENANCE PROCEDURE

1. **Ensure that the parking brake is applied and the vehicle is tagged out for maintenance purposes (refer to the section 1.5 "Lockout/ Tagout procedure").**

2. **Drain all air tanks daily.**

3. **Pay a particular attention to the dryer cartridge. On this type of equipment the compressor works all the time (frequent use of the brake system). As a consequence, a lot of moisture is injected into the air system. See chassis manufacturer recommendations.**

4. **Twice a year lubricate the air actuators found on the main control valve with light oil (low temperature). See section 3.6 "Packer air system troubleshooting".**

NOTE:
For vehicle equipped with alcohol evaporator, please refer to the chassis manufacturer dealer for proper maintenance.

DANGER

USE APPROPRIATE "LOCKOUT/ TAGOUT" PROCEDURE AT ALL TIMES.

FIGURE #1.134

1.19 SURFACE FINISHING AND PAINTING

Type of surface finishing recommended:

PAINTING PROCEDURE

- **SURFACE PREPARATION: Sandblasting.**
- **PRIMARY COAT: Anticorrosive epoxy primer.**
- **FINISHING COAT: Two (2) coats industrial type paint (or equivalent).**

1.20 ALLISON TRANSMISSION PROGRAMMING PARAMETERS

The Allison transmission electronic control unit (ECU) controls several systems of the automated unit; it prevents the pump from over speeding (2300 RPM maximum). The ECU also prevents the pump engagement if the engine speed is any higher than 900 RPM. It will also shut off the pump and the joystick (of the arm) if the vehicle is moving faster than 15 MPH (25Km/h). The transmission ECU also controls the auto-neutral system (if equipped).

If the vehicle requires having the ECU repaired or replaced, or a specific programming parameters, refer to section 3.17 “Allison Transmission Programming Parameters”.

A “Pro-link” keypad interface (Figure #1.139) may be used to program the Allison ECU and verify if the signals are properly reaching the computer and verify the fault code. To tap onto the ECU, Labrie uses the following wires on the Allison connector:

FIGURE #1.139

INPUT:

#117: PUMP PACK ENABLE: Active when the brakes are used, and when the PTO and auto-neutral switch is “ON”(ground signal).

#118: PTO ENABLE: Active when the PTO switch is “ON”(+12V. signal).

#153: AUTO-NEUTRAL PACK INPUT: Active when the brakes are used, and when the PTO and auto-neutral switches are “ON” (ground signal).

OUTPUT:

#112: PTO ENABLE OUTPUT: Active when the PTO switch is “ON” and when all engine and vehicle speed criteria are respected (+12V. signal). Refer to the programming parameter chart. “Troubleshooting” tab, section 3.17 “Allison Transmission Programming Parameters”.

#114: NEUTRAL SIGNAL OUTPUT: Active when the transmission is in neutral. This signal (ground signal) is used to allow the fast idle engagement. For more details, refer to the electrical schematic.

1.21 AUTOMIZER PREVENTIVE MAINTENANCE CHART

AUTOMIZER™ PREVENTIVE MAINTENANCE CHART						
COMPONENT / SYSTEM	DAILY	WEEKLY	MONTHLY	EACH YEAR	VERIFICATION	SECTION
Hydraulic system	✓				– Check oil level in tank and refill if necessary.	1.14.5
	✓				– Check if the ball valve is open on main tank.	1.9
	✓				– Check on ground for overnight leaks.	
		✓			– Check cylinders, pump, control valve and system for leaks. Repair or replace if required.	1.14
				TWICE A YEAR	– Replace hydraulic filter.*	1.14.7
				✓	– Drain, flush, clean and refill strainer.	1.14.8
			✓		– Check pressure.	1.15
Hopper area	✓				– Clean traps on each side.	1.11
	✓				– Tilt down the floating panel and clean dirt under or behind the packer.	1.11
Visual inspection of the following components:	✓				– Rollers, hydraulic cylinders and cylinder pins, hoses, pipes and connections, wear of floor and side of hopper.	1.11
Body and chassis			✓		– Check for corrosion.	
	✓				– Keep the contact surfaces clean, between the body and chassis.	1.10

* Also replace the return filter after the first 50 hours of operation

1.21 AUTOMIZER PREVENTIVE MAINTENANCE CHART (cont'd)

AUTOMIZER PREVENTIVE MAINTENANCE CHART						
COMPONENT / SYSTEM	DAILY	WEEKLY	MONTHLY	EACH YEAR	VERIFICATION	SECTION
Limit switches		✓			– Proper adjustment of the limit switches is imperative.	1.12.2
	✓				– Check and clean area around switches	
Lubrication	✓				– Lubricate packer and its accessories.	
					– See lubrication chart on side of the truck	
Wiring system				✓	– Check for damaged harnesses and/or bad connections.	
Operator control	✓				– Check for proper operation.	
Air tanks	✓				– Drain.	1.17
Air system		✓			– Check for leaks.	1.17
Safety systems		✓			– Check for proper operation (tailgate alarm and special devices).	1.6 1.7 1.13.4 1.13.5
Automated Arm	✓				– Check all pivots. – Check hydraulic pressure.	1.17

NOTES