

HELPING HAND

EXPERT 2000

HELPING HAND AUTOMATED ARM

EXPERT 2000

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2.0 HELPING HAND MAINTENANCE

2.1 HYDRAULIC SYSTEM MAINTENANCE

2.1.1 HYDRAULIC SYSTEM GENERAL DESCRIPTION

NOTE:

Refer to the “[General Maintenance section](#)” for information related to the hydraulic system of the body, such as the body hoist, the tailgate, crusher panel and the packer. This section will outline the Helping Hand Arm maintenance and its adjustments.

The Labrie Expert 2000 side loader equipped with the Helping Hand automated arm, uses an independent hydraulic valve (Figure 2.2) to control all arm functions. This valve is a proportional type valve that allows very precise movements of the arm and the grabber when moving the joystick.

The hydraulic flow required to feed the valve comes from the dual vane pump mounted at the front of the vehicle (Figure 2.3). Refer to the hydraulic schematics for more information.

Helping Hand Arm



Figure 2.1

Arm Control Valve



Figure 2.2

Hydraulic pump

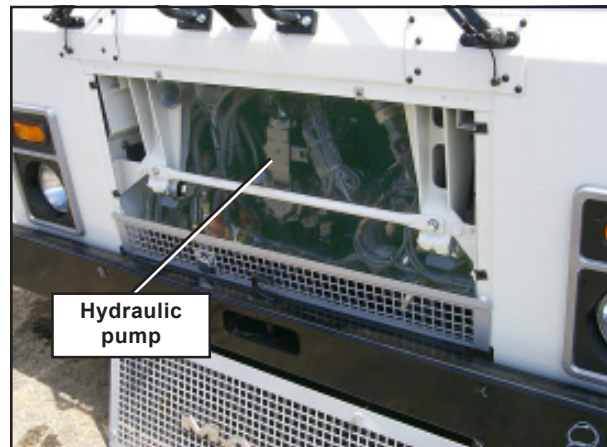


Figure 2.3

2.1.2 DUMP VALVE

This unit is equipped with two dump valves mounted on the pump. When the pump switch on the console is turned ON, the dump valves allow the flow of the pump to reach hydraulic functions on the vehicle.

The first dump valve located on the right-hand side of the pump (Figure 2.5) controls the flow to the body control valve. The adjustment procedure for this dump valve is outline in [section 1.15.1](#) of the General Maintenance section.

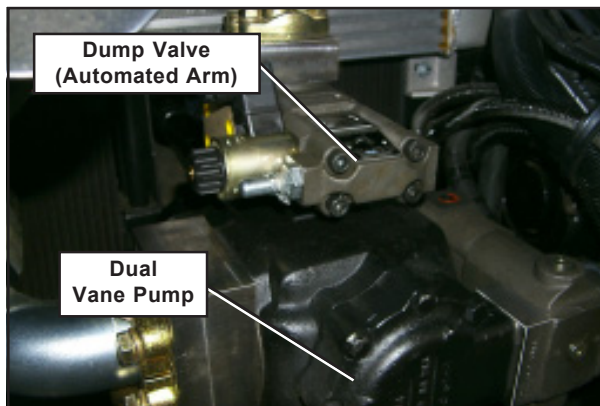


Figure 2.4

The second dump valve is located at the top of the pump (Figure 2.5) and will provide the flow to operate the arm. Refer to [section 1.15.2](#) of the General Maintenance section for hydraulic pressure adjustment of this dump valve.

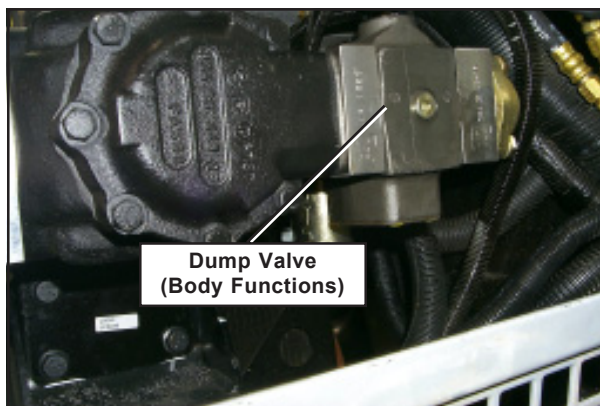


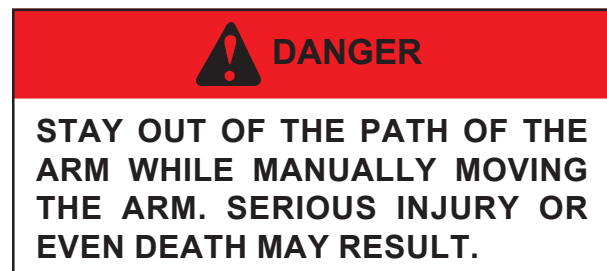
Figure 2.5

2.1.3 PROPORTIONAL VALVE PRESSURE ADJUSTMENT

The following step by step pressure adjustment procedure explains how to adjust the pressure of each function of the Helping Hand arm. Note that the dump valve pressure must be set properly before making any adjustments to the proportional valve of the Helping Hand arm. Refer to [section 1.15](#) of the General Maintenance section for adjustment procedure of the dump the 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 (see figure 2.6).

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.



PROPORTIONAL VALVE LEVERS

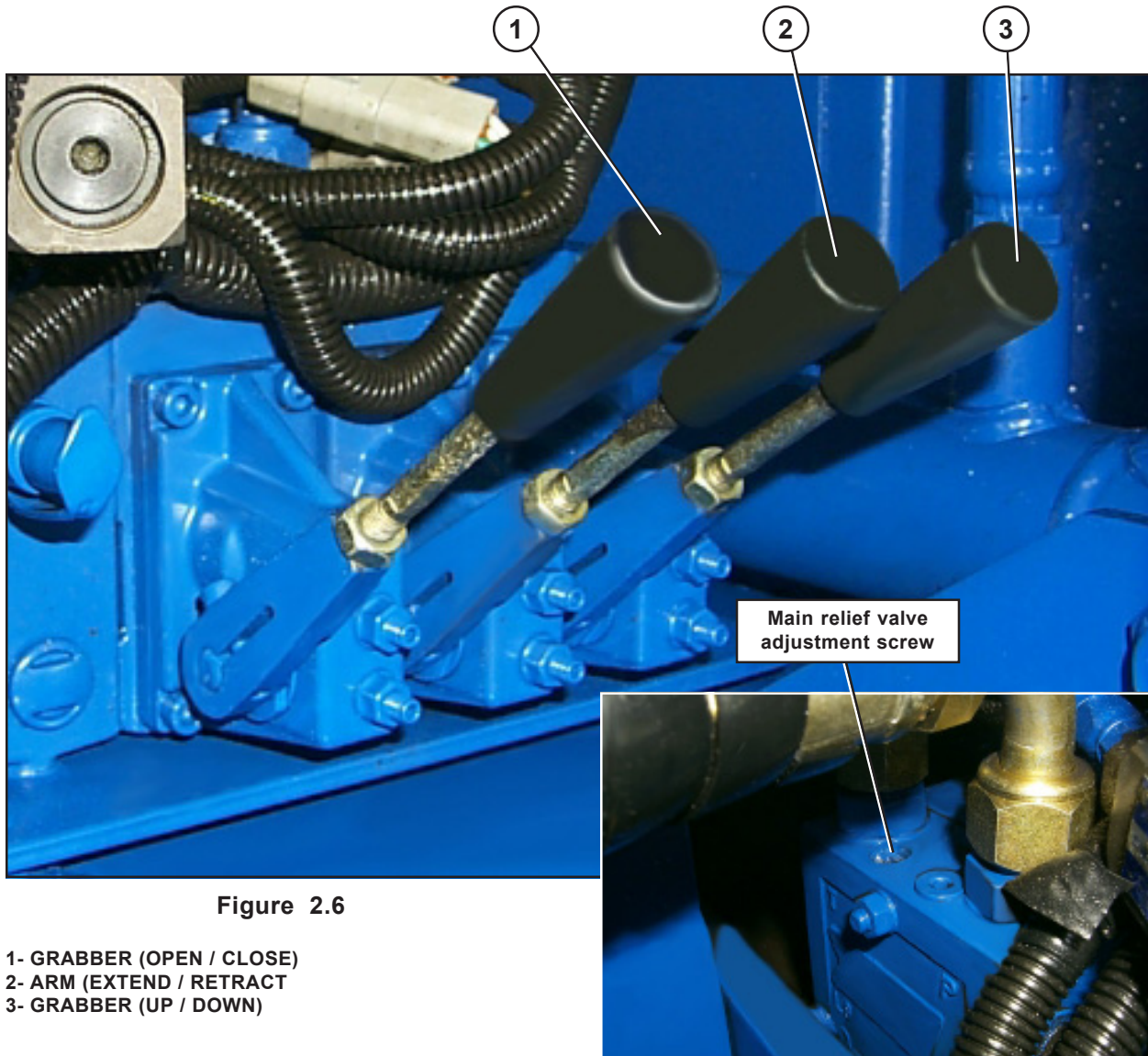


Figure 2.6

- 1- GRABBER (OPEN / CLOSE)
- 2- ARM (EXTEND / RETRACT)
- 3- GRABBER (UP / DOWN)

PRESSURE ADJUSTMENT TABLE		
ARM FUNCTION	PRESSURE SETTING	CYCLE TIME*
ARM EXTEND / RETRACT	2000 PSI	~10 sec.
GRABBER UP / DOWN	2000 PSI	~8 sec.
GRABBER CLOSE	1200 PSI	Less than 2 sec.
GRABBER OPEN	~2100 PSI (2000psi +1/4 of a turn of the relief)	Less than 2 sec.

* CYCLE TIME IS DEFINED AS THE TIME REQUIRED FOR A FUNCTION TO COMPLETE A FULL BACK AND FORTH MOVEMENT.
NOTE: CYCLE TIME MAY VARY BY COLD WEATHER

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 gauge on the quick coupler located on the proportional valve (Figure 2.7).
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 lever no.:2 (Figure 2.8) in order to make the hydraulic pressure to rise on the pressure gauge.
9. Adjust the main relief valve to 2000 PSI using the adjustment screw (Figure 2.8) turning the hex key clockwise or counter clockwise.



0-4000PSI PRESSURE GAUGE
(Part# HYF00910)

QUICK COUPLER
(Part# HYF10195)

0-4000PSI PRESSURE GAUGE ASSEMBLY

QUICK COUPLER

CONTROL LEVER

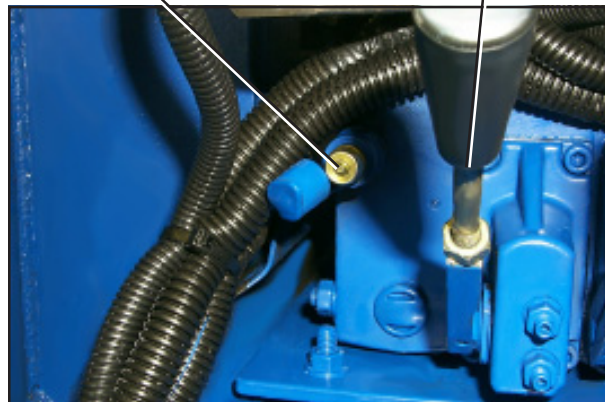


Figure 2.7

Main relief valve adjustment screw

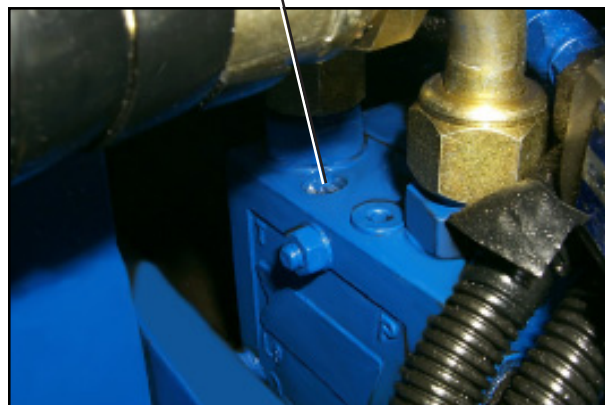


Figure 2.8

2.1.4 ARM FUNCTIONS ADJUSTMENTS 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. No adjustment is required for these functions. Only the grabber (close) requires proper adjustments to prevent crushing the roller carts.

Apply the following procedure to adjust the relief valves on the valve section of the grabber. Refer to the pressure table adjustment found in section 2.1.3.

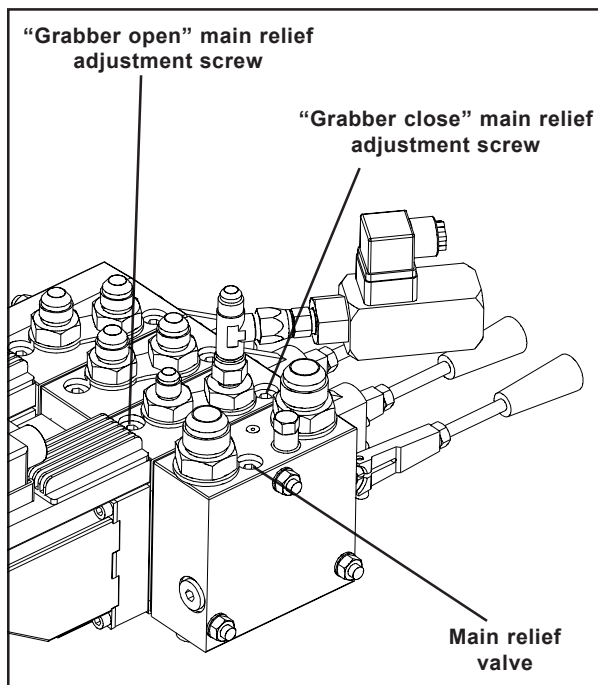



Figure 2.9

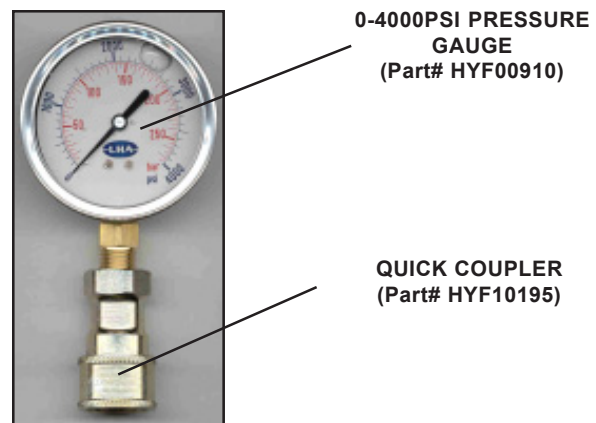

DANGER

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

GRABBER ADJUSTMENT PROCEDURE

1. Apply the lockout / tagout procedure.
2. 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 pressure gauge on the quick coupler of the proportional valve (Figure 2.10).

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QUICK COUPLER

CONTROL LEVER

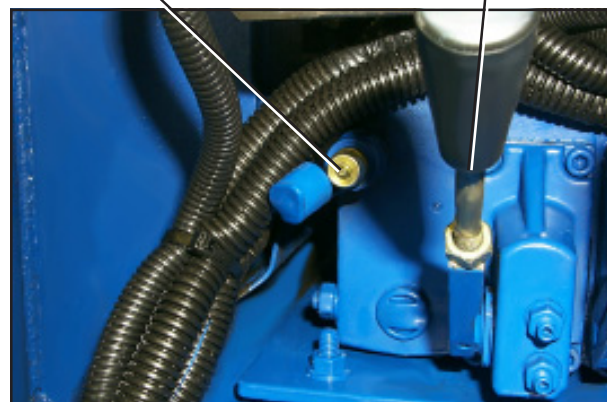


Figure 2.10

GRABBER ADJUSTMENT PROCEDURE (cont'd)

5. Put the transmission in Neutral.
6. Start the engine.
7. Engage the hydraulic pump (PTO switch "ON").
8. Close the grabber using the first lever on the left-hand side of the valve (Figure 2.6).
9. Adjust the relief valve for the "grabber close" side of the valve section (Figure 2.9) at 1200PSI (screw or unscrew depending on the gauge readout).
10. Open the grabber and adjust the relief valve for the "grabber open" side of the valve section (Figure 2.11) to 2100PSI.

Note:

When adjusting the relief valve for the "grabber open" side, the pressure gauge will not reach 2100PSI because the main relief valve is set at 2000 PSI. After the pressure gauge indicates 2000PSI, in order to reach a pressure above 2000PSI, the relief valve screw for the "grabber open" side requires to be tightened about 1/4 of a turn more.

2.1.5 GRABBER AUTO-CLOSING SYSTEM

The Helping Hand Automated Arm is equipped with a safety system that closes the grabber automatically when the arm is returning to the hopper. The "Auto-Closing" system will prevent the grabber from hitting the hopper walls, causing damage to the grabber.

The grabber "Auto-Closing" system works only during collection. If the operator raises the arm without closing the grabber, the system will automatically close the grabber when the grabber arm reaches a certain height.

Note:

If the arm is stored inside the hopper for a certain period of time, the grabber may open by itself due to pressure loss in the system. The "Auto-Closing" system will close the grabber automatically as soon as the joystick is moved out of its center (or neutral position).

The "Auto-Closing" system is controlled by a limit switch located under the grabber arm (Figure 2.10) and a pressure switch on the proportional valve (Figure 2.11).

If the joystick rests in neutral position, no signal from the limit switch is sent to the proportional valve coil to close the grabber.

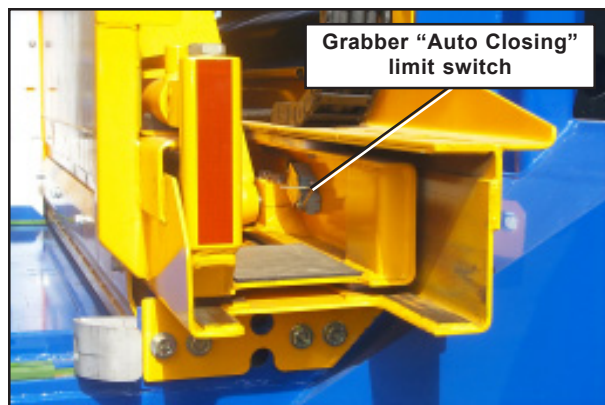


Figure 2.11

How it works :

When the grabber arm is moved up (without closing the grabber), the limit switch located under the arm sends an electric signal to the solenoid mounted on the proportional valve making the grabber to close (works the same as pressing the “grabber close” button on the joystick).

Then, the hydraulic pressure is sent to the cylinder, closing the grabber before it collides with the hopper walls. In order to prevent pressure build up in the system, a pressure switch (Figure 2.11) was added on the proportional valve to cut the signal from the limit switch. The pressure switch is set to cut the signal when the hydraulic pressure reaches approximately 800 PSI inside the cylinder.



DANGER

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



CAUTION

BEFORE PERFORMING PRESSURE ADJUSTMENTS ON THE PROPORTIONAL VALVE, MAKE SURE THAT THE ARM DUMP VALVE IS PROPERLY SET.

PROPORTIONAL VALVE

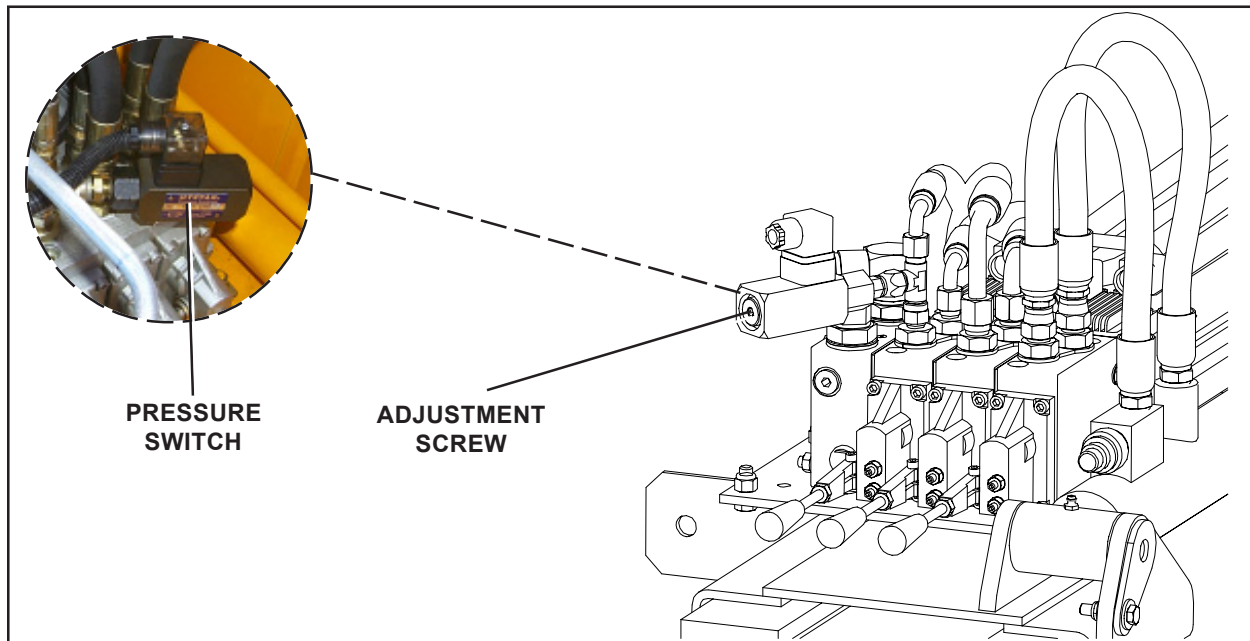


Figure 2.12

2.1.6 AUTO-CLOSING PRESSURE SWITCH ADJUSTMENT

PRESSURE SWITCH ADJUSTMENT PROCEDURE

1. Apply the lockout / tagout procedure.
2. Secure the arm's working area using barrier tape or barricades.
3. Put the transmission in Neutral.
4. Start the engine.
5. Engage the hydraulic pump (Pump switch "ON").
6. Have a helper retract the arm to the side of the vehicle using the joystick. Then have him move the joystick slightly to the left and hold it in that position.
7. At the valve, loosen the pressure switch adjustment screw (Figure 2.12).
8. Open the grabber clamps.
9. Raise the grabber arm half way up (Figure 2.13) using lever no.:3 (refer to Figure 2.6).
10. Tighten the pressure switch adjustment until the grabber closes by itself.
11. Bring the arm back down and raise it again to verify that the grabber will close by itself each time the grabber arm is raised.

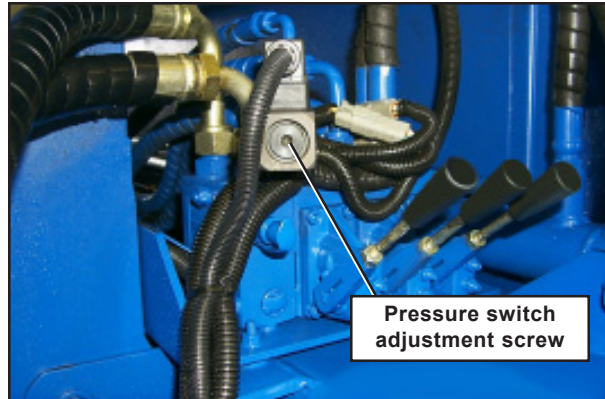


Figure 2.13



DANGER

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

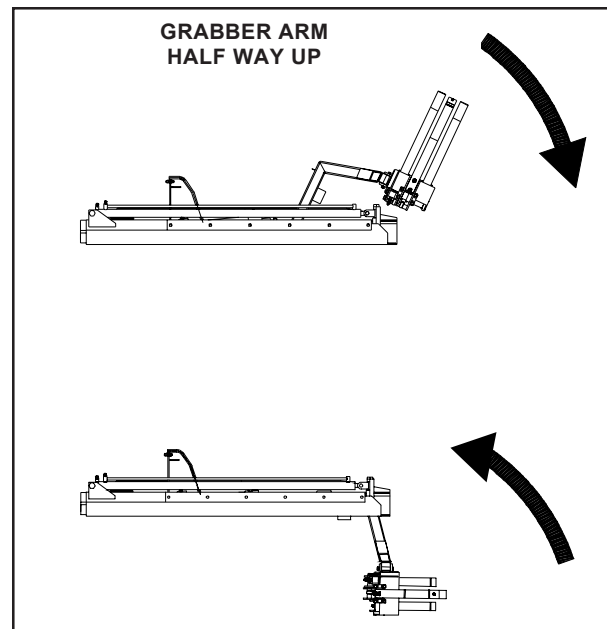


Figure 2.14

2.1.7 ARM SPEED ADJUSTMENT

The arm speed is controlled by the amount of hydraulic fluid that is being sent to the arm's cylinder. The proportional valve spools can let through 6 to 10 gallons per minute (G.P.M.) of hydraulic oil, depending on section of the valve*. The flow is limited by a mechanical movement restrictor (Stopper) (Figure 2.15).

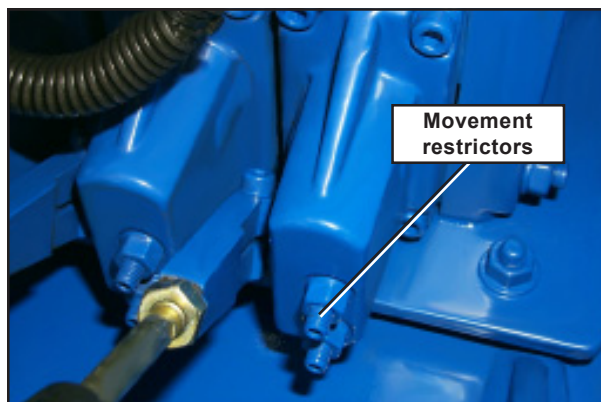


Figure 2.15


WARNING

**USE THE APPROPRIATE
“LOCKOUT/TAGOUT” PROCEDURE
AT ALL TIMES.**

Note:

The arm movements, extension / retraction and tilt are factory set to the maximum speed. Only the grabber open/close speed is reduced to have a smoother grabbing of the cart.

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.

Note:

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

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2.1.8 CYLINDER CUSHION ADJUSTMENT

The grabber arm is cushioned at the end of the cylinder stroke to give a smoother retracting movement. The cushioning speed is adjustable directly on the cylinder using an adjustment screw (Figure 2.16). If the grabber arm hits hard at the end of the stroke when retracting, apply the following procedure.

CUSHION 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 pump (Pump switch "ON").
5. Fully extend the arm to have access to the arm tipping cylinder from the top.
6. Make the grabber arm to tip up and down for a full cycle to evaluate the amount of cushion.
7. Tighten the screw to obtain a smoother movement at the end of the stroke when retracting or loosen the screw if the movement is too slow (No shock should occur).

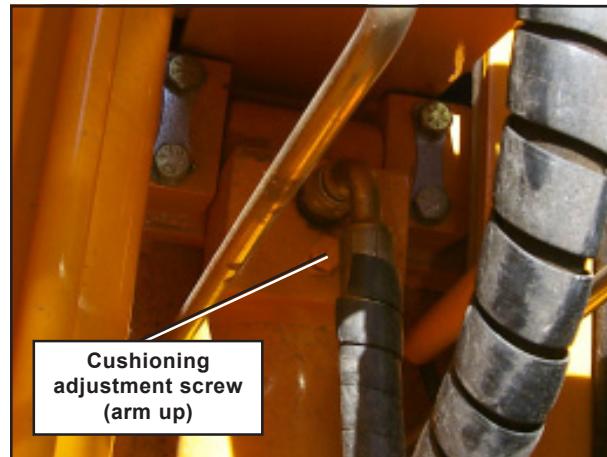


Figure 2.16

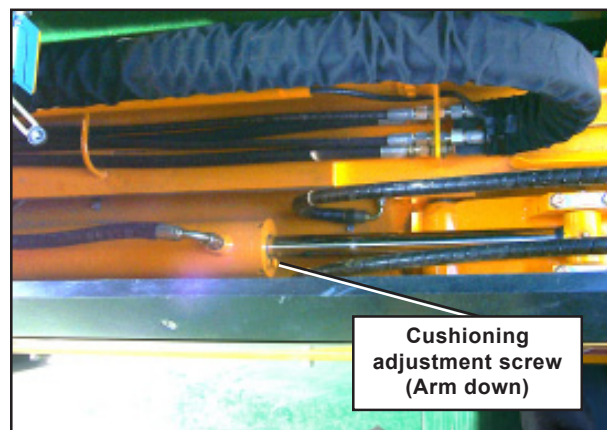
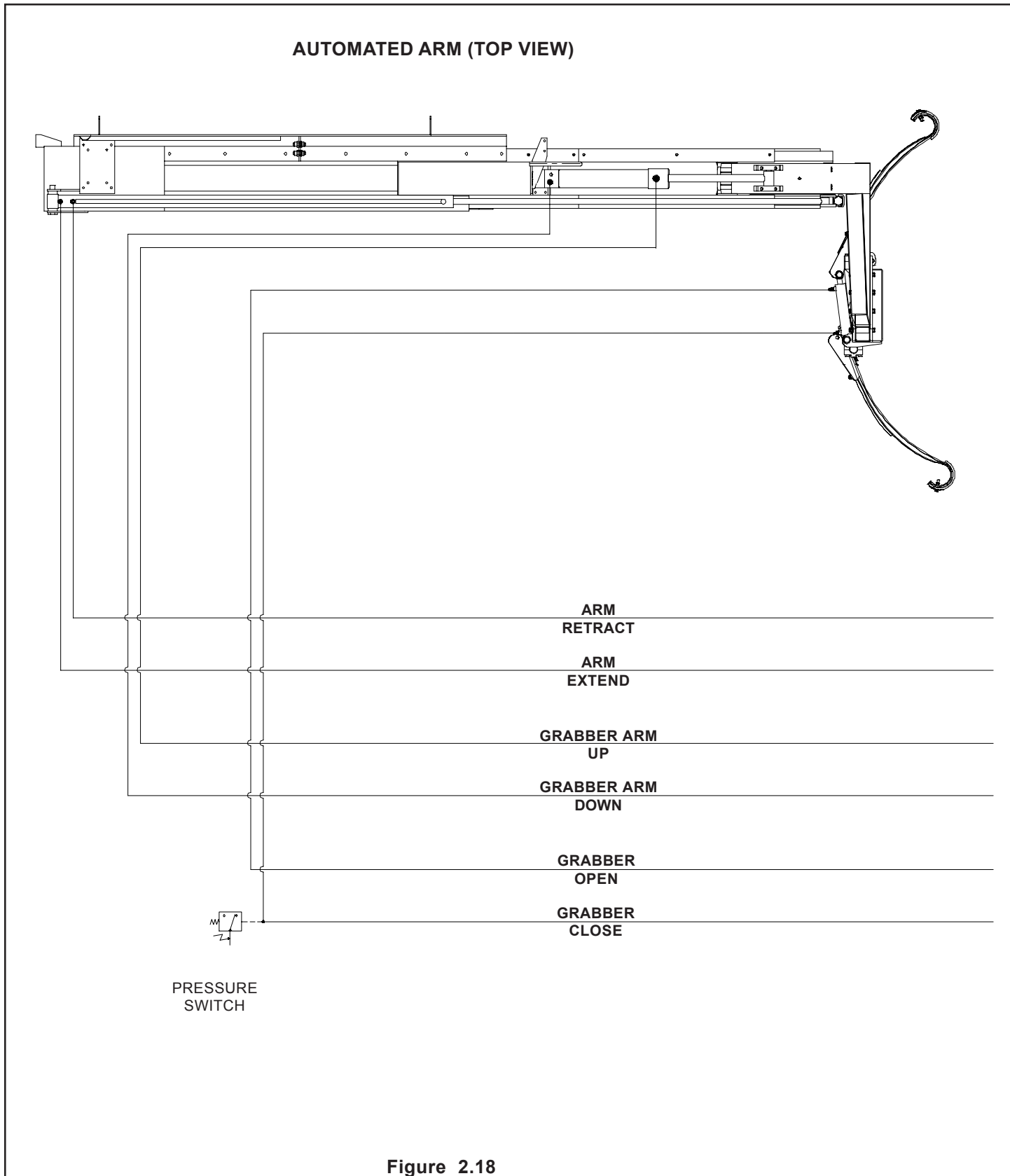
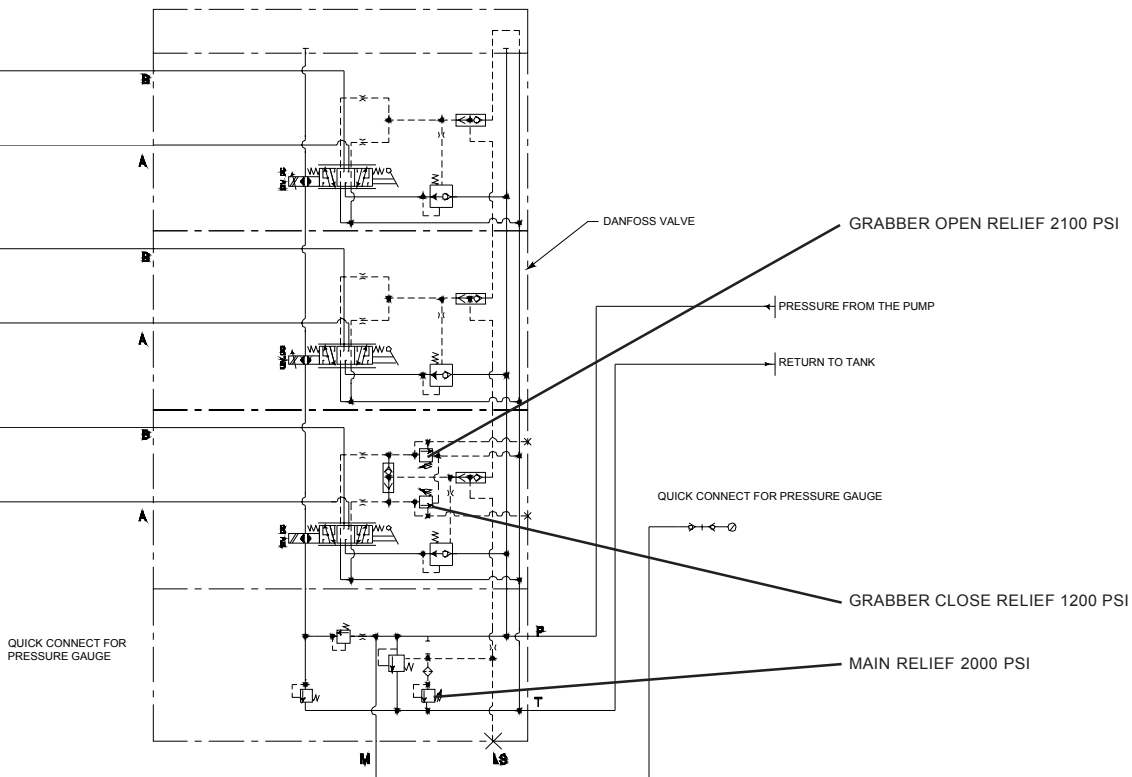
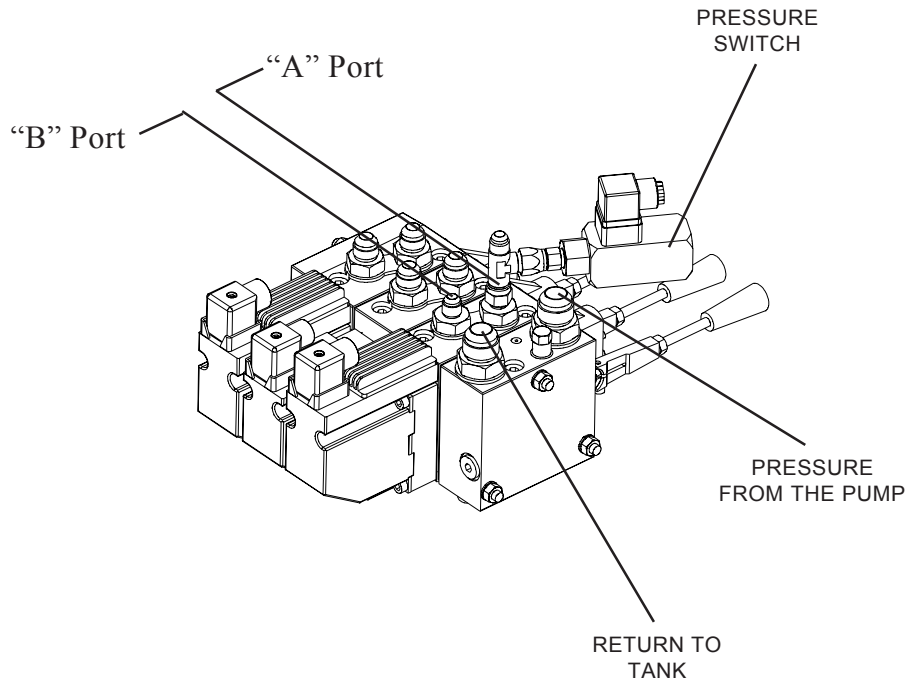


Figure 2.17

2.2 HYDRAULIC SCHEMATIC (Arm section)



PROPORTIONAL VALVE



2.3 HYDRAULIC SCHEMATIC (Body section)

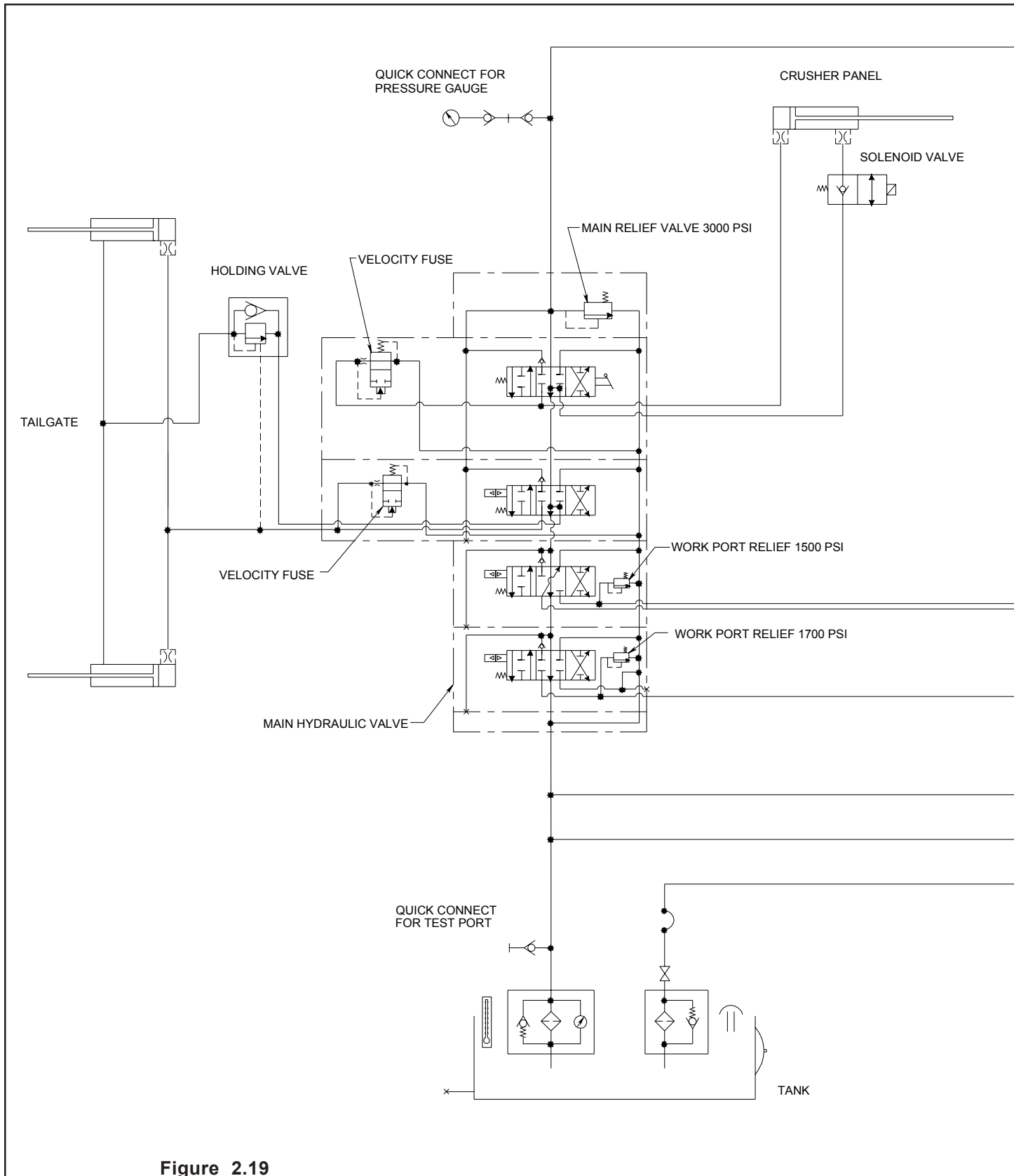


Figure 2.19

