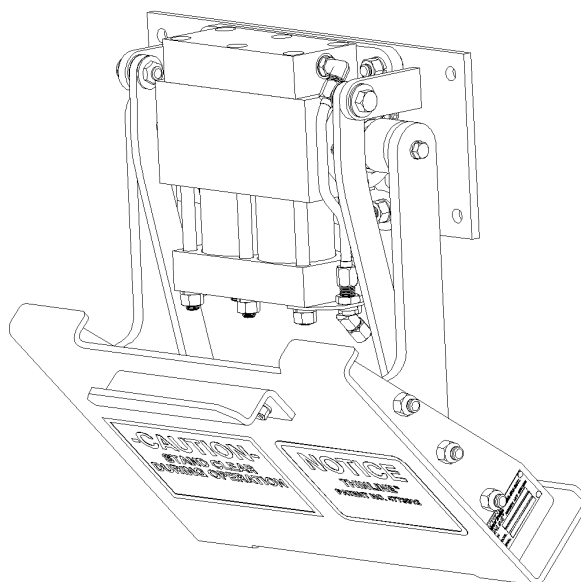




**Premium Lift Systems**

## **OPERATION AND PARTS MANUAL**



MODEL NUMBER : **MBTL 180**

PART NUMBER : **1999-0180**

SERIAL NUMBER : \_\_\_\_\_

**BAYNE MACHINE WORKS, INC.**  
910 FORK SHOALS ROAD  
GREENVILLE SC, 29605  
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LICENSED UNDER ONE OR MORE OF  
THE FOLLOWING U.S. AND CANADIAN PATENTS:

5,503,512	4,773,812	1,327,765	5,447,405
1,335,648	5,308,211	5,333,984	5,826,485

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SPECIFICATIONS ( WI-0083-B )  
Bayne **THINLINE**<sup>®</sup> Premium Lift Systems

- A. Rotary Actuator - rack and pinion style design.
- Rack, pinion, and shaft bearings are constantly lubricated by the hydraulic oil for extended life.
  - Body and caps are made of high quality ductile iron.
  - Pinion output shaft and racks are made of high tensile alloy steel.
  - The rotary actuator provides smooth motion throughout the lift cycle, which results in longer cart life with virtually no cart damage or abuse.
- B. The MBTL lift unit measures as little as 9 1/4” thick from the back of the mainframe to the front of the lift saddle in the down position. The MBTL lift unit also rotates underneath the hopper 45 degrees to allow for easy dumping of large commercial containers without interference.
- C. The MBTL faceplate is normally at 45 degrees in the dump position in order to completely eject all materials into the hopper. The faceplate remains outside the hopper opening in the dump position, therefore preventing any interference with the sweep of the packer blade.
- D. The MBTL lift unit operates at a cycle time of **6 to 8 seconds** for safe, fast, efficient service.

**Note :** *Cycle time is controlled by flowrate, as flowrate increases, cycle time decreases. In order to avoid injury and maintain manufacturer’s warranty never operate outside the cycle time listed above*

- E. Recommended flow rate is **2 to 2 1/2 GPM**.
- F. Hydraulic pressure requirements are as follows:
- **2000 to 2500 PSI** normal working pressure
  - **3000 PSI** maximum pressure
- G. MBTL lift units can be a bolt on type installation for easy, quick maintenance and less downtime.
- H. All parts are manufactured and kept in stock at Bayne Machine Works, Inc. for fast response to customer requests.
- I. One ( 1 ) year limited warranty from date of delivery on all units and models when properly maintained and operated within the recommended cycle time.

***All lift units and parts are inspected by our Quality Control Department before shipment to insure that you always receive the highest quality available in the lift business.***

For more information, please contact us at 1/800/535-2671 or by fax at 1/864/458-7519.

# INSTALLATION INSTRUCTIONS ( WI-0221-B)

## Bayne *THINLINE*<sup>®</sup> Premium Lift Systems

The following information is intended to be a **GENERAL GUIDE** to installing the Bayne *THINLINE*<sup>®</sup> lifter on a typical refuse truck. Before starting the installation, read these instructions completely. **ALWAYS** use the proper tools, lift devices, and personal protective equipment to prevent injury while performing the installation.

**NOTE:** If a Bayne *THINLINE*<sup>®</sup> Tap-In Kit was also acquired for this installation, refer to the installation instructions included in the Tap-In Kit manual for more detailed information.

### I. Mounting lifter(s) on the truck :

1. The truck should be emptied and cleaned before any installation. The truck should be parked on a level solid surface, a concrete floor if possible.
2. All lights, tags, steps, etc. that will interfere with the installation should be removed and/or relocated.
3. Position the lifter(s) on the sill of the truck per *figure I-1* and mounting height drawing (*Appendix A*) and tack weld in place. If using a mounting plate kit for bolt on applications, tack weld the mounting plate in place and attach the lifter to the mounting plate using the 1/2" studs. (*tack weld only at this time so that adjustments can be made if necessary.* ).

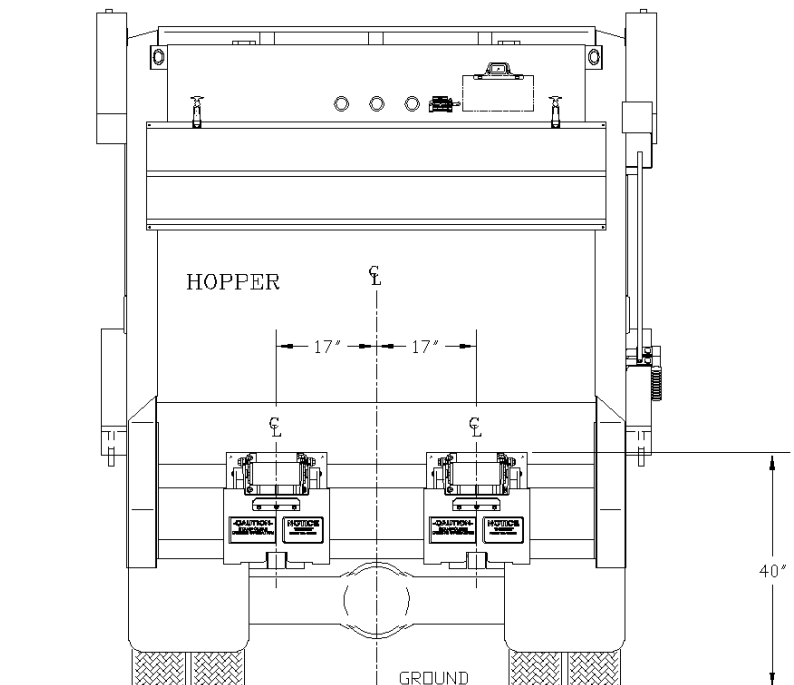
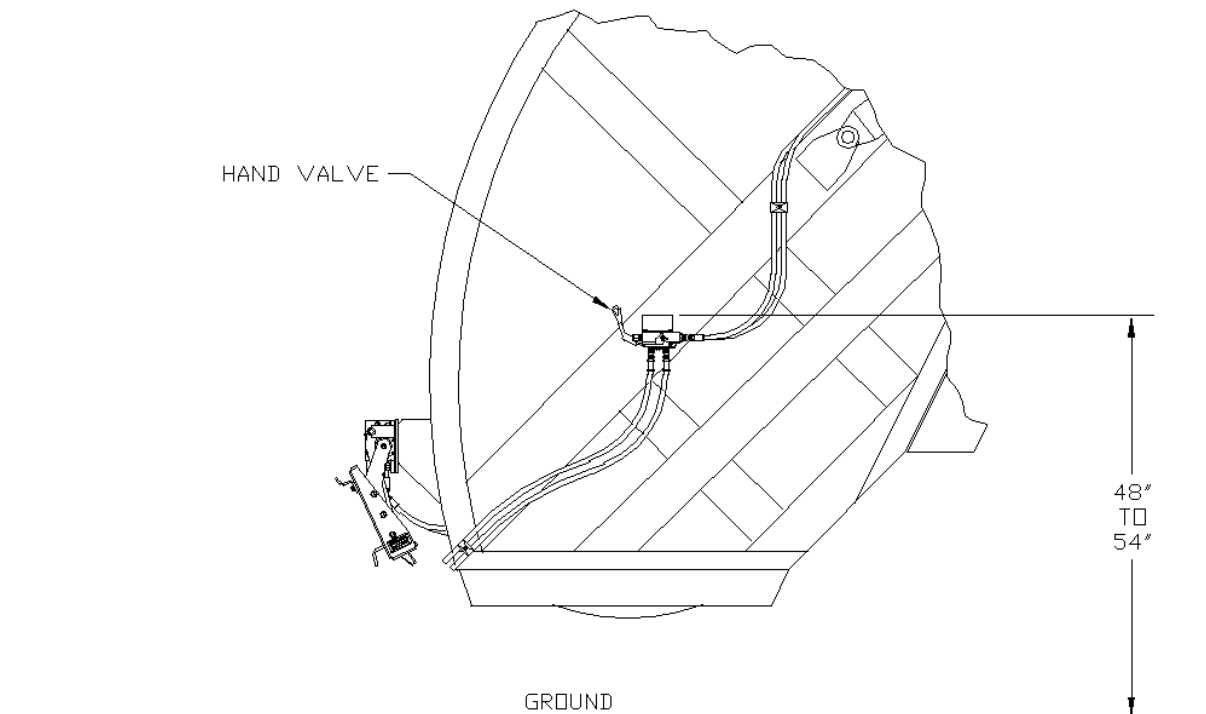


figure I-1

## II. Mounting hand valve(s) on the truck :

1. Choose and mark an acceptable location(s) on the side(s) of the truck to mount the hand valve assembly(s) (*figure I-2*).
2. Remove the mounting bracket(s) from the hand valve assembly(s) and weld to the truck.
3. After the weld has cooled, paint the mounting bracket(s) to match the truck color.
4. After the paint has dried, reassemble the hand valve assembly(s) on the mounting bracket(s).



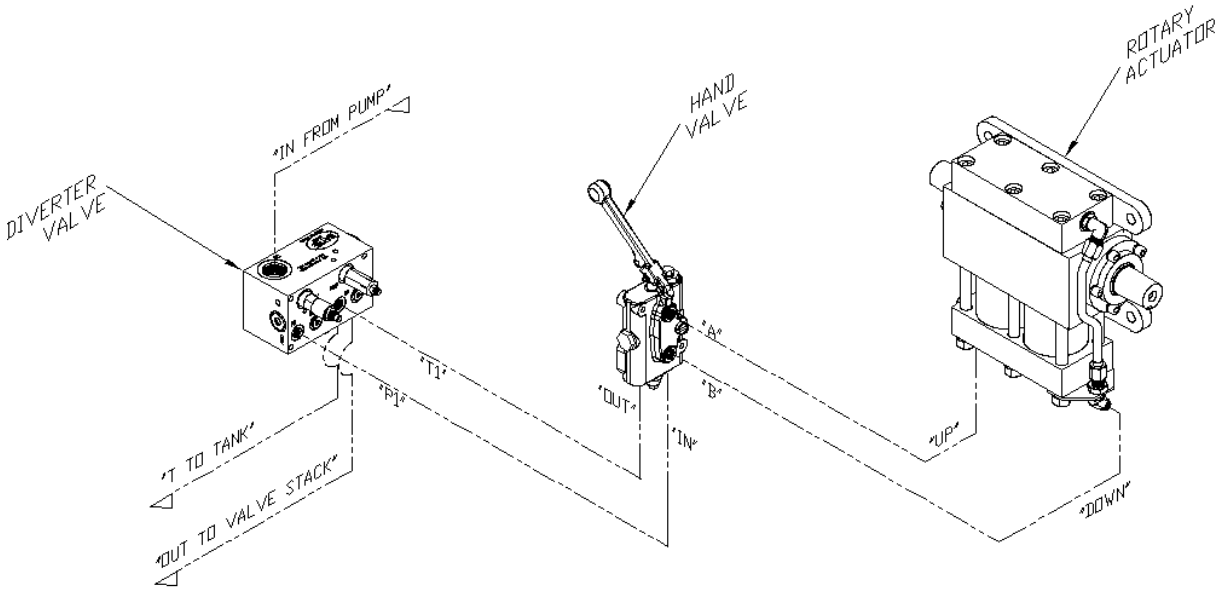
**figure I-2**

## III. Mounting diverter valve on the truck :

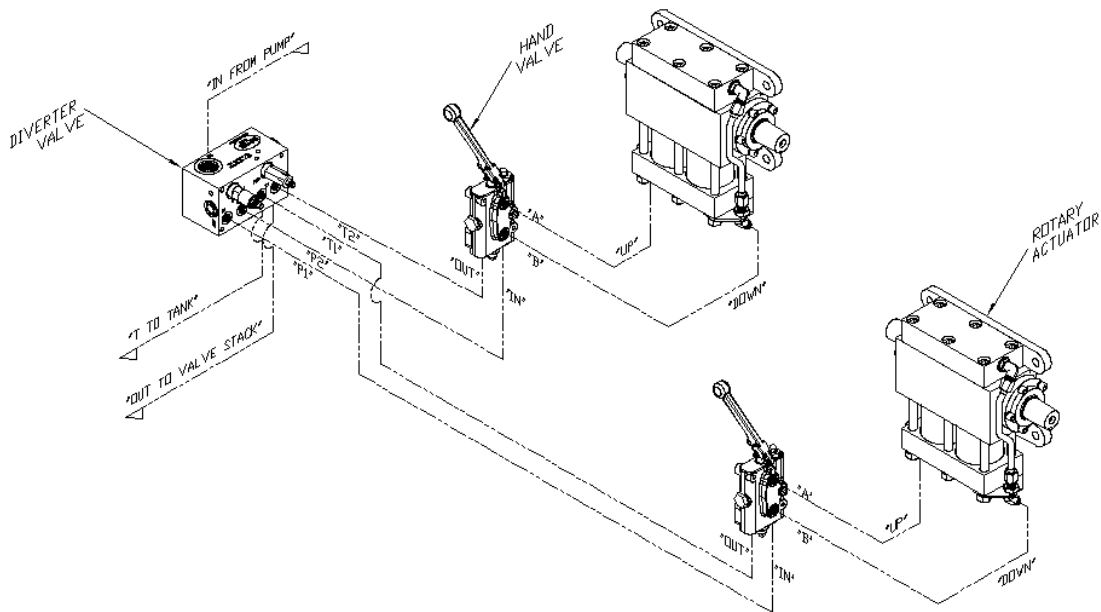
1. Choose and mark an acceptable location to mount the diverter valve assembly. This location should be near the truck's main hydraulic pressure and tank lines on the same area of the truck where the lifter is mounted.
2. Weld diverter valve mounting bracket to the truck.
3. After the weld has cooled, paint the mounting bracket to match the truck color.
4. After the paint has dried, bolt the diverter valve to the mounting bracket using the 1/4" bolts, washers, and elastic lock nuts.

#### IV. Making Hydraulic Connections :

*Before attempting any hydraulic connections, turn the truck's engine off and release all hydraulic pressure from the system. Refer to the hydraulic layouts (figure I-3) and hydraulic schematics (Appendix A) while performing the following steps. Always clean & lubricate fitting threads before installation.*



*Single Lifter Installation*



*Dual Lifter Installation*

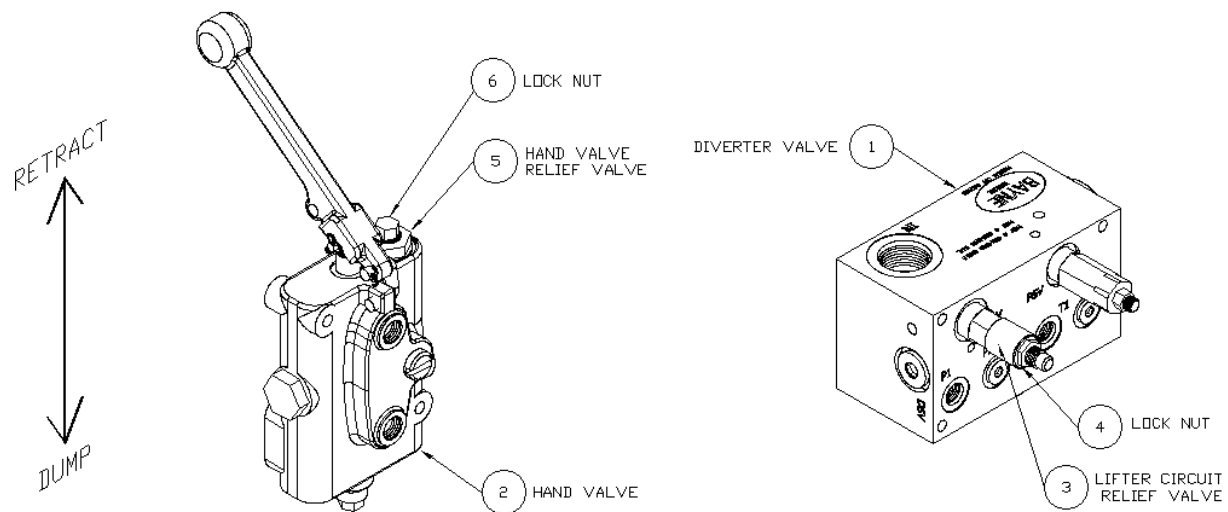
**figure I-3**

1. Cut or disconnect truck's main hydraulic pressure line and install the diverter valve in series using the "IN" and "OUT" ports.
2. Connect the "T" port on the diverter valve to the truck's hydraulic tank line with an appropriate size line to handle the full system flow.
3. Connect the "P1" port on the diverter valve to the "IN" port on the hand valve.  
*If installing dual lifters, connect the "P2" port on the diverter valve to the "IN" port on the other hand valve.*
4. Connect the "T1" port on the diverter valve to the "OUT" port on the hand valve.  
*If installing dual lifters, connect the "T2" port on the diverter valve to the "OUT" port on the other hand valve.*
5. Connect the "A" port on the hand valve(s) to the "UP" port of the rotary actuator(s).
6. Connect the "B" port of the hand valve(s) to the "DOWN" port of the rotary actuator(s).
7. Disassemble each hose clamp assembly and position weld plates where needed and weld in place.
8. After the weld has cooled, paint the weld plates to match the truck color.
9. After the paint has dried, reassemble the hose clamp assemblies around the hoses.

#### **V. Adjusting relief valve settings :**

*The diverter valve ( 1 ) ( figure I-4 ) supplies the cart lifter hydraulic system with approximately 2 GPM of oil flow. This diverter valve is equipped with a full system relief valve ( 4 ) set at 2500 psi, to protect the truck's hydraulic system from any blockages that may occur down stream of the diverter valve. The diverter valve also includes a lifter circuit relief valve ( 3 ) set at 2300 psi, to prevent the diverter valve from shutting down if a blockage occurs in the lifter circuit. There is also a relief valve ( 5 ) set at 1800 psi in the hand valve ( 2 ) to protect the lifter from excessive pressure. These relief valves are preset from the factory to operate properly on most trucks with a system pressure between 2300 and 2500 psi without any adjustment. However, if any adjustment is necessary, follow these instructions.*

**WARNING :** *Bayne equipment is rated for a maximum pressure of 3000 psi. Operation at pressures above 3000 psi may damage equipment and cause personal injury. In order to avoid injury and maintain manufacturer's warranty never operate above 3000 psi.*

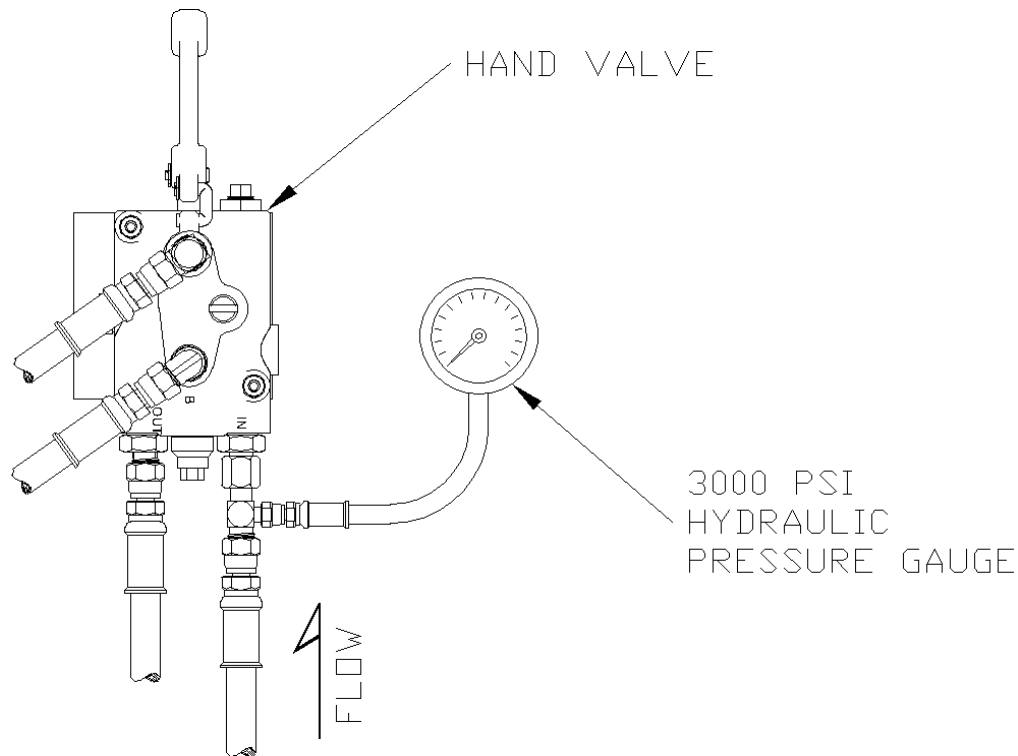


**figure I-4**

1. Determine the truck's system pressure setting.
2. Remove the cap nut(s) ( 8 ) (*figure I-4*) from the hand valve relief valve(s) ( 5 ) and turn the adjustment screw(s) clockwise until it bottoms out.
3. Loosen the lock nut ( 6 ) (*figure I-4*) on the lifter circuit relief valve ( 3 ) and turn the adjustment screw clockwise until it bottoms out.
4. Loosen the lock nut ( 7 ) (*figure I-4*) on the full system relief valve ( 4 ) and turn the adjustment screw counter-clockwise until it stops backing out.
5. Install a 3000 psi hydraulic pressure gauge with the necessary adapter in the "G" port of the diverter valve.
6. Start the truck's engine and engage the hydraulic system.
7. Operate the handle on the hand valve ( 2 ) (*figure I-4*) back and forth a few times to bleed all air from the lifter hydraulic system.
8. **Setting the diverter valve full system relief valve :**
  - a) Have an assistant hold the handle on the hand valve ( 2 ) (*figure I-4*) in the "retract" position. *If installing dual lifters hold the handle down on only one of the hand valves.*
  - b) Turn the pressure relief adjustment screw on the full system relief valve ( 4 ) clockwise until the pressure reading on the gauge is either 100 psi above truck system pressure, or if the pressure reaches a certain point and will not go any higher, set the adjustment screw 1/2 turn past that point.
  - c) Release the handle on the hand valve.



9. Turn the truck's engine off and release all hydraulic pressure from the system.
10. Remove the hydraulic pressure gauge from the "G" port of the diverter valve and reinstall the plug.
11. Install the 3000 psi hydraulic pressure gauge with the necessary adapter in the hydraulic line connected to the "IN" port of the hand valve as shown in figure I-5. *If installing dual lifters, install the hydraulic gauge at either one of the hand valves.*



**figure I-5**

12. Start the truck's engine and engage the hydraulic system.
13. **Setting the diverter valve lifter circuit relief valve :**
  - a) Have an assistant hold the handle on the hand valve ( 2 ) (*figure I-4*) ( *with pressure gauge installed at the "IN" port* ) in the "retract" position to show pressure on the gauge.
  - b) Turn the pressure relief adjusting screw on the lifter circuit relief valve ( 3 ) counter-clockwise until the pressure reading on the gauge is either 100 psi less than the truck system pressure or 2300 psi, which ever is the lowest.
  - c) Release the handle on the hand valve.

#### 14. Setting the hand valve relief valve(s) :

- a) Hold the handle on the hand valve ( 2 ) (*figure I-4*) ( *with pressure gauge installed at the “IN” port* ) in the “retract” position to show pressure on the gauge.
  - b) Turn the pressure relief adjusting screw on the hand valve relief valve ( 5 ) counter-clockwise until the pressure reading on the gauge is either 200 psi less than truck system pressure or 1800 psi, which ever is the lowest.
  - c) Release the handle on the hand valve.
  - d) Turn the truck’s engine off and release all hydraulic pressure from the system.
  - e) Remove the hydraulic pressure gauge from the hydraulic line connected to the “IN” port of the hand valve.
  - f) *For dual lifters, install the hydraulic pressure gauge in the “IN” port of the other hand valve as shown in figure I-5, start the truck’s engine, engage the hydraulic system, and repeat step 14.*
15. Reinstall the cap nut(s) ( 8 ) (*figure I-4*) on the hand valve relief valve(s) ( 5 ) to secure the correct pressure setting(s).
16. Tighten the lock nut ( 7 ) (*figure I-4*) on the full system relief valve ( 4 ) to secure the correct pressure setting.
17. Tighten the lock nut ( 6 ) (*figure I-4*) on the lifter circuit relief valve ( 3 ) to secure the correct pressure setting.
18. The hydraulic circuit pressures are now set for optimum performance.

#### VI. Final operation and mounting:

1. Start the truck’s engine and engage the hydraulic system.
2. Place a cart on each lifter and operate to make sure there are no clearance problems and that the lifter engages the cart properly. Make any adjustments to the mounting position of the lifter(s) to ensure correct operation.
3. After locating an acceptable mounting position, complete the welding of the lifter(s) to the truck.

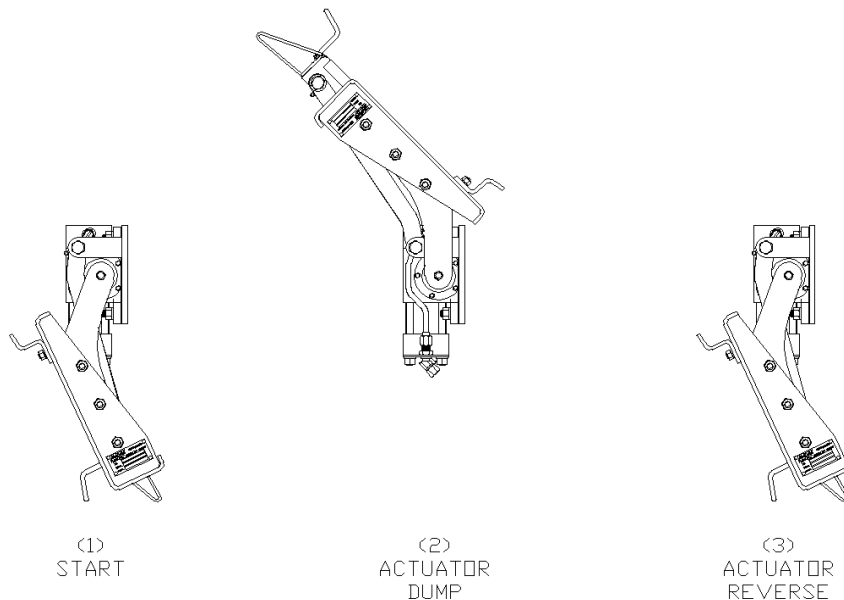
## OPERATION INSTRUCTIONS ( WI-0406-A )

### Bayne *THINLINE*<sup>®</sup> Premium Lift Systems

The Bayne *THINLINE*<sup>®</sup> Premium Lift System is a high quality durable cart lifter built to meet your industry's requirements. To insure the safety of all operators of this equipment, please read this manual carefully before operating the lifter. *FAILURE TO COMPLY WITH INSTRUCTIONS COULD RESULT IN PERSONAL INJURY AND/OR PROPERTY DAMAGE.*

The operating stages (*figure O-1*) in the cycle of the cart lifter are as follows:

- 1) **START** - The cart to be dumped is placed on the lifter.
- 2) **ACTUATOR DUMP** - The rotary actuator cycles to dump the contents of the cart into the box. During this cycle, the slider latch automatically extends to "lock" the cart to the lifter.
- 3) **ACTUATOR REVERSE** - The rotary actuator reverses its cycle returning the cart to the start position. The slider latch automatically retracts to "unlock" the cart from the lifter.



**figure O-1**

**Warning: Exceeding the 6 to 8 second cycle time will void the manufacturer's warranty**

The rotational motions of the cart lifter are controlled with the use of a hand valve. Moving the handle on the hand valve in one direction will cause the lifter to perform the actuator dump stage (*figure O-1*). Moving the handle in the opposite direction will cause the lifter to perform the actuator reverse stage.

6091/6092-0700 DIVERTER VALVE  
OPERATION AND INSTALLATION INFORMATION  
( WI-0026 )

Bayne *THINLINE*<sup>®</sup> Premium Lift Systems

The Bayne diverter valve establishes priority flow to the lifter circuit “P1” and “P2” ports and bypasses oil to the “OUT” port, which typically supplies flow to the remainder of the truck’s hydraulic circuit. This bypass occurs only after the lifter circuit is satisfied. The priority flow is controlled by the flow regulator cartridge (FR1) (and FR2 in dual applications) in combination with the differential pressure sensing valve (DPS). This allows the valve to maintain constant flow regardless of changes in load pressure or volume flow rate. Since both the lifter circuit and bypass flow can be utilized in the operation of the truck regardless of which pressure is greater, a single pump can be used to supply two circuits or operations.

The lifter circuit flow is regulated and maintained by the flow regulator cartridge (FR1) (and FR2 in dual applications). The differential pressure sensing valve (DPS), rated for 75 gpm of flow and 3000 psi of pressure, is operated by an internal spring and dampening orifice (OR) which establishes a pressure drop across the block sufficient to ensure the correct operation of the flow regulator (FR1). For a dual diverter valve, a second flow regulator cartridge (FR2) is installed in the “FR2” cavity and a shuttle valve (DSV) is installed in place of the SAE plug in the “DSV” cavity. Once the pressure drop is established, a precision metered flow is provided to the tipper circuit(s) with additional flow being bypassed to the “OUT” port.

The operation of the diverter valve does not require the use of a tank line to be run to the “T” port. However, the efficiency of the block will be significantly increased if a tank line is installed. The logic circuit of the block will manage the flow of oil returning from the tipper circuit to ensure optimum performance. This is primarily controlled with the sequence valve (PSV) which is factory set and should not be adjusted. All oil returning from the tipper circuit will normally be regenerated into the outgoing flow to ensure that the downstream functions are not slowed in any way. When the downstream backpressure rises to a predetermined pressure, the block will redirect the flow to the “T” port to increase the overall efficiency of the block and reduce the pressure drop through the block. If the “T” port is connected to a tank line, the oil will be dumped through the block at a lower pressure. This allows downstream functions to operate at the highest possible pressure when pressure is being required. If the “T” port is blocked, the oil will be redirected back into the outgoing flow through the check valve (CV).

A relief circuit for the tipper function is controlled by a relief valve (RV), which is preset to 2300 psi. This can be adjusted to limit pressure to the tipper(s). This relief valve is more efficient than the relief in the hand valve and will operate with less noise. It is recommended that it be adjusted to relieve before the hand valve relief. It may also be used to limit the weight the lifter can dump. This may be beneficial in avoiding damage to cans resulting from overloading. This should be the only adjustment that the block may require. Any other adjustments should only be made after close consultation with Bayne’s Engineering Department to ensure proper operation.

## POSSIBLE PROBLEMS

1. The most common cause of valve failure is dirty oil. If debris becomes lodged in the cartridge valves they will malfunction. Recommended filtration level is between 15 and 25 microns. Many systems filter the oil on the return side. This does not guarantee clean oil going into the system. It is important to ensure that the tank vent filtration element is properly maintained as well. Very small contaminants may not cause the valve to stop functioning, but can cause “stiction” in the cartridges between the body and the moving spool. This can cause improper operation. A slow moving tipper is most likely the result of contamination in the flow regulator cartridge. A pulsating noise may be the result of contamination in the differential pressure sensing valve causing it to stick. If any valve malfunctions, remove and thoroughly clean the valve, being extremely careful not to score or abrade the “o” ring seals or moving parts of the valve. Be sure that the spool moves freely in the valve body.
2. The flow regulator cartridges (FR1 and FR2) are designed to operate at a designated pressure of 80 psi. This means that in order for the valve to function properly, a minimum of 80 psi is required from the supply line through the “IN” port of the valve. This can present a problem on trucks with a dry valve pump system. Normally in the dry (off) mode of the pump, a flow of approximately 2 gpm at 20 psi is required to circulate through the open center system of the truck. This is for pump lubrication in the off mode. When the diverter valve is placed in the main pressure line of the truck, a blockage occurs because of the differential pressure sensing valve needing 80 psi to initially open and allow the flow regulators function. The path of the lubrication oil is therefore stopped because the valve does not open. When the oil is blocked, the pump will rotate and cavitate in the lubricating oil, causing heat to build up over an extended period of time, possibly leading to premature pump failure. To prevent this problem from occurring, a “bleed line” circuit needs be installed on the truck to allow passage of the lubricating oil back to tank.
3. On front load residential truck applications, several considerations need to be noted. The Bayne hand valve is an open center valve that allows for the lifter circuit to maintain flow through the hand valve and back to the diverter valve when the lifter is not being operated. If flow is not maintained through the hand valve, the oil will constantly be relieving over the lifter circuit relief valve (RV) in the diverter valve, which can cause an increase in operating temperature. Certain front load box designs allow for the hand valve to be located on the arms of the truck which keeps the hand valve in the lifter circuit at all times to maintain flow. Most problems occur with applications where the hand valve is located on the box itself. In this situation, when the operator disconnects the hydraulic lines to the box, a blocked condition occurs in the lifter circuit. To prevent this problem, the pump must be turned off prior to disconnecting the box hydraulic lines. Once the lines have been disconnected from the box, it is necessary to connect the two lines for the hand valve to each other to functionally complete the lifter circuit. It is recommended that male and female quick disconnects be used opposite each other on the truck to provide an uninterrupted circuit. Once the lines have been connected and the circuit continued, the pump could then be turned on to continue operations.

MAINTENANCE INSTRUCTIONS ( WI-0140-A )

Bayne ***THINLINE***<sup>®</sup> Premium Lift Systems

**NOTE:**

THE MOST COMMON CAUSE OF HYDRAULIC COMPONENT FAILURE IS CONTAMINATION OF THE HYDRAULIC FLUID ( WATER, CHIPS, DIRT, ETC. ) THE Bayne ***THINLINE***<sup>®</sup> LIFT SYSTEM COMES CLEAN FROM THE FACTORY. IF REMOVED, BE SURE THE HOSES, CYLINDER AND FITTINGS ARE CLEAN BEFORE RE-INSTALLING THEM ON THE UNIT.

Inspect your cart lifter on a weekly basis for loose bolts, fittings, oil leaks, etc. Tighten loose hardware as necessary and replace necessary seals to repair oil leaks.

In order to maintain warranty and for preventive maintenance, grease all points weekly with a good multi-purpose grease at points shown in the lubrication drawing ( *APPENDIX A* ).

# BAYNE

## PREMIUM LIFT SYSTEMS

### ASSEMBLY INSTRUCTIONS

### 1100 SERIES ROLLER BEARING ACTUATOR

PART NUMBER 1120-1025 ( WI-1109-D )

LICENSED UNDER ONE OR MORE OF THE FOLLOWING U.S. PATENTS:  
4,773,812    1,327,765    5,308,211    5,333,984

#### READ INSTRUCTIONS COMPLETELY BEFORE STARTING ASSEMBLY.

Before starting the assembly of the Rotary Actuator, refer to the exploded parts drawing and parts list (fig. A-13 found at the end of these instructions) to familiarize yourself with the individual components. Prepare a clean surface, in an area free of blowing dust and contaminants in which to assemble the Rotary Actuator. Be sure that all parts are thoroughly clean and dry before starting assembly.

**NOTE:** All torque values given apply to clean dry threads only. Follow these directions closely when repairing the Rotary Actuator.

1. Install the piston seal load ring (13) (fig. A-1) in the small groove on the head of the actuator rack (2). Place the “square” piston seal (17) over the load ring (13) in the same small groove (a small “blunt” flathead screwdriver may be used, taking care not to scratch or damage the seal). Install the wear ring (18) in the large groove on the head of the rack. Using a ring compressor, firmly seat the rings on the rack before setting it aside, this will help to reverse the effects of any stretching of the rings that occurred during installation. Repeat this procedure for the other rack.

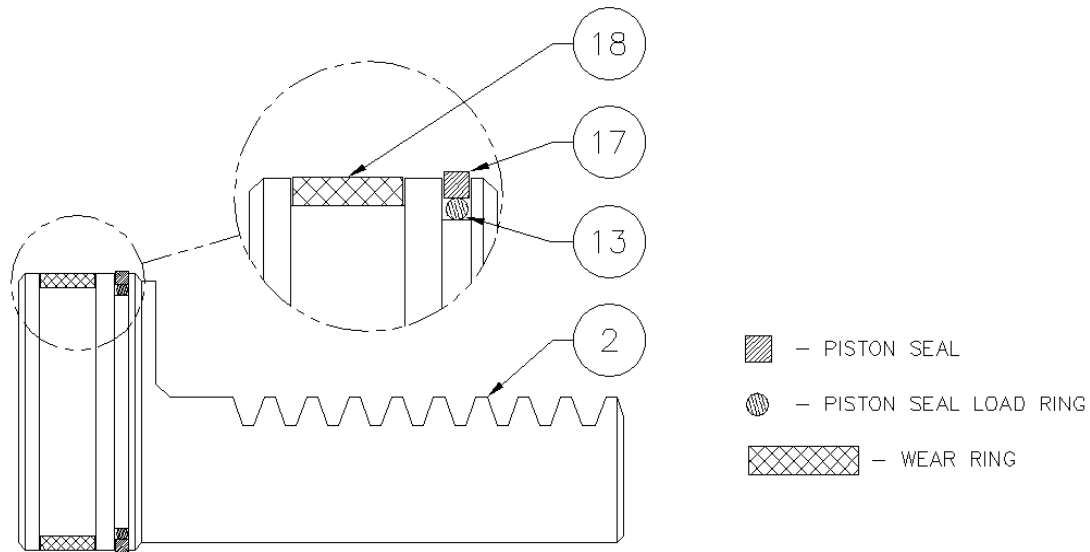
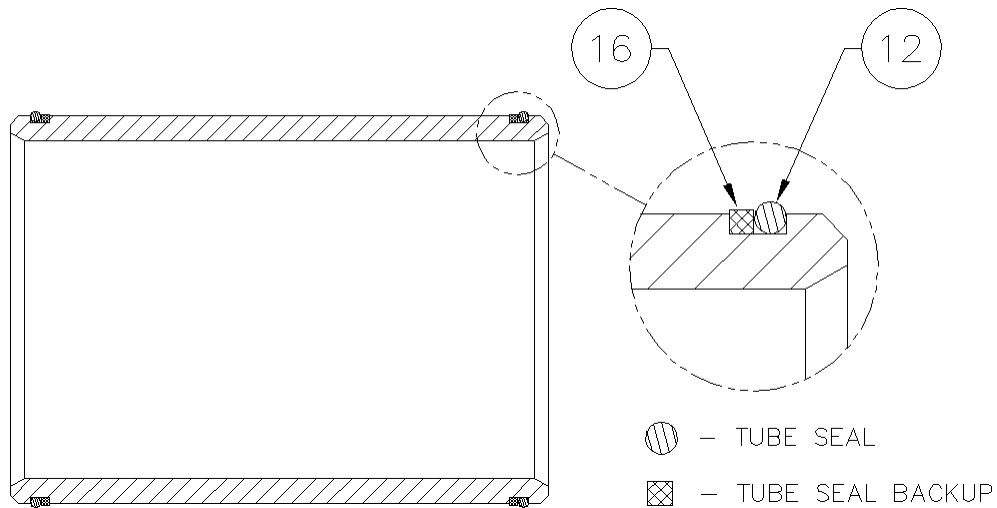


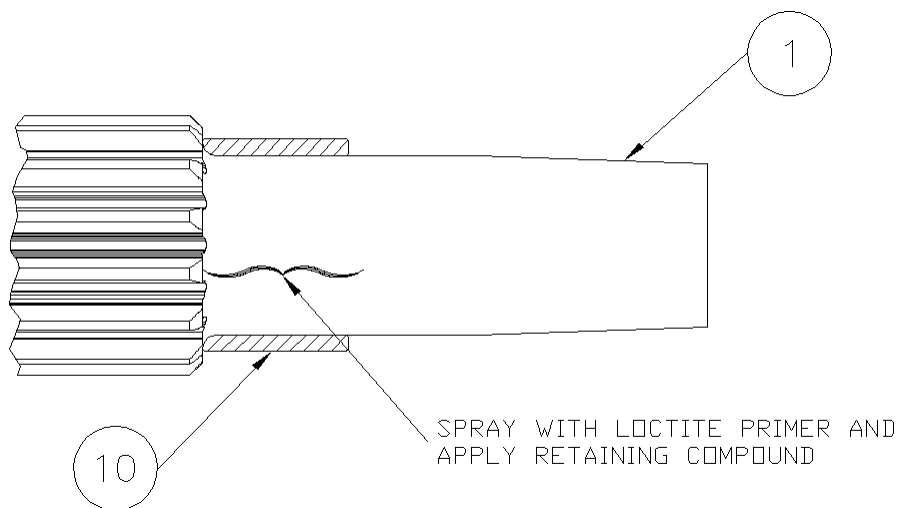
figure A-1

2. Install the tube seal (12) (fig. A-2) and “square” tube seal backup (16) on each end of the actuator tubes (3) (fig. A-13). Be sure that the “square” tube seal backup ring is toward the inside of the tubes at both ends as shown. Press all rings firmly into the grooves. Repeat this procedure for the other tube.



**figure A-2**

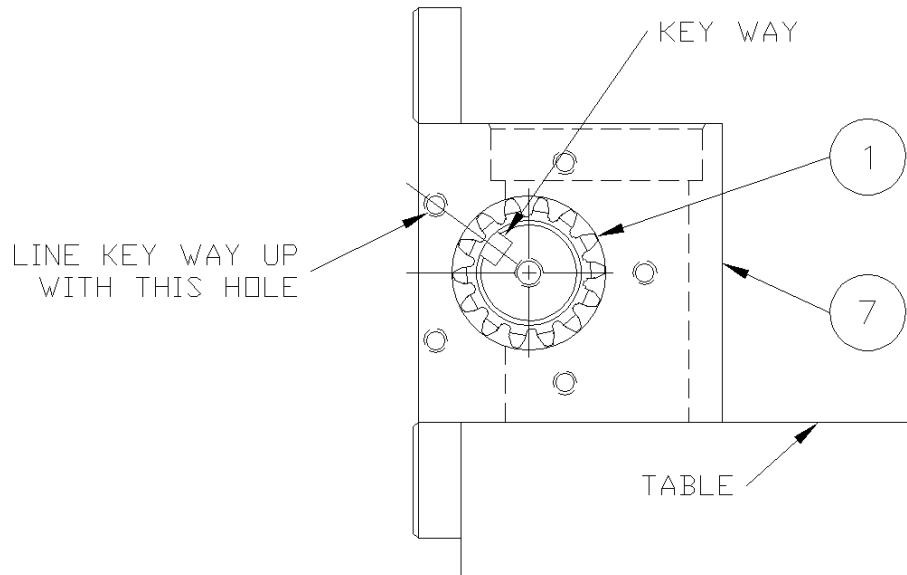
3. Thoroughly clean the pinion shaft (1) (fig. A-3) and inner races (10) with a mild solvent and dry completely. Spray the inner race contact area (shown in figure A-3) at each end of the pinion shaft and the inside diameter of the inner race thoroughly with *LOCTITE 7649 N PRIMER*. Apply *LOCTITE RETAINING COMPOUND 609* around the pinion shaft at contact area and the inside diameter of the inner races. Slide the inner races (10) on the pinion shaft (radius end first as shown in figure A-3) until the races seat against the gear teeth. After the races seat against the gear teeth, twist the races on the pinion 360° to spread the retaining compound evenly. Wipe off any excess retaining compound.



**figure A-3**

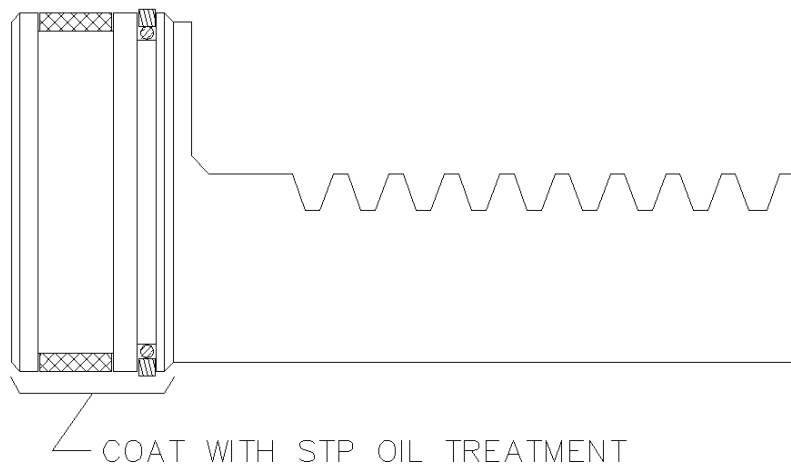


- Place the actuator body (7) (fig. A-4) on the edge of the table, mounting flanges closest to the assembler with the counter-bores facing up. Insert the pinion shaft (1) through the bore on either side of the actuator body with the key ways facing back toward the mounting flanges and up away from the table with the center line of the key ways pointing toward the center of the tapped hole shown in figure A-4. Center the pinion in the actuator body.



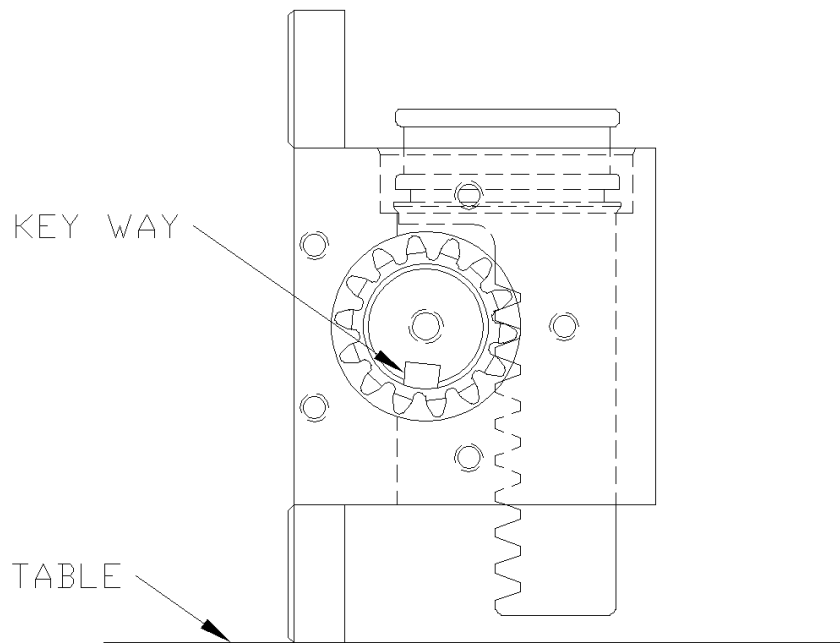
**figure A-4**

- Coat the head portion of the racks (2) (fig. A-13) with STP Oil Treatment. Install the racks, head portion up with the teeth facing the flanges of the actuator body, into the dual set of bores in the body. Simultaneously slide the racks into the bores so that the racks mesh with the pinion in the same position. Rotate the pinion shaft to engage the racks into the pinion.



**figure A-5**

6. Check the position of the racks in the pinion by making sure both racks seat against the actuator body at the same time and also when the racks are seated against the body, the key ways on the pinion shaft should be facing down toward the table and very slightly back toward the mounting flanges on the actuator body as shown in figure A-6.



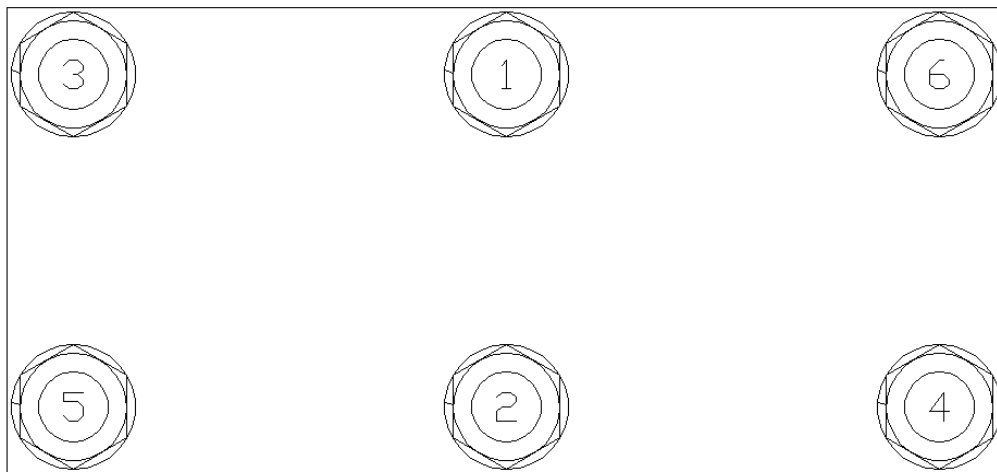
**figure A-6**

7. Coat one end of the actuator tubes (3) (fig. A-13) around the seal area with STP Oil Treatment as shown in figure A-7. Using a rubber mallet, drive the coated end of the tube onto the exposed rack until the tube end seats in the actuator body, making sure that the seals remain in place as the tube enters the counter-bore. Repeat this procedure for the other side.



**figure A-7**

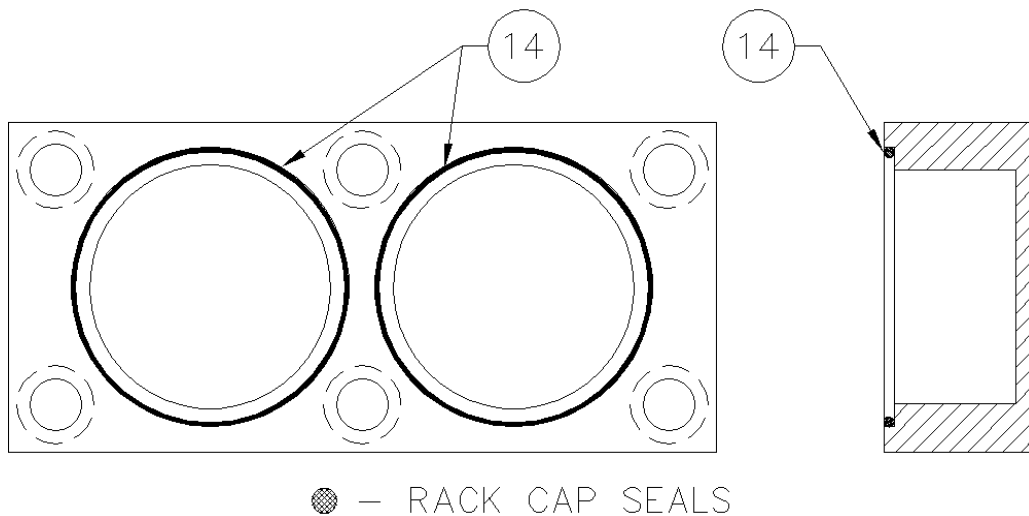
8. Install the six tie rod studs (6) (fig. A-13) by screwing the short threaded end into the actuator body. Hand tighten only at this time (the torque needed will be applied later in the procedure).
9. Place the tube cap (4) (fig. A-13) on the table. Coat the sides of the two bores in the tube cap with STP Oil Treatment. Install the cap over the tubes and rod studs with the oil port positioned to the left as shown in figure A-13. Using a rubber mallet, tap the tube cap over the tubes until the tubes seat in the cap, making sure that the seals remain in place.
10. Place the tube mounting bracket (30) (fig. A-13) over the two end rod studs opposite the oil port in the tube cap as shown in figure A-13.
11. Install the hex nuts (23) (fig. A-13) and lock washers (24) on the tie rod studs. Torque the nuts to 50 ft-lb. in the sequence shown in figure A-8.



TUBE CAP TORQUE SEQUENCE

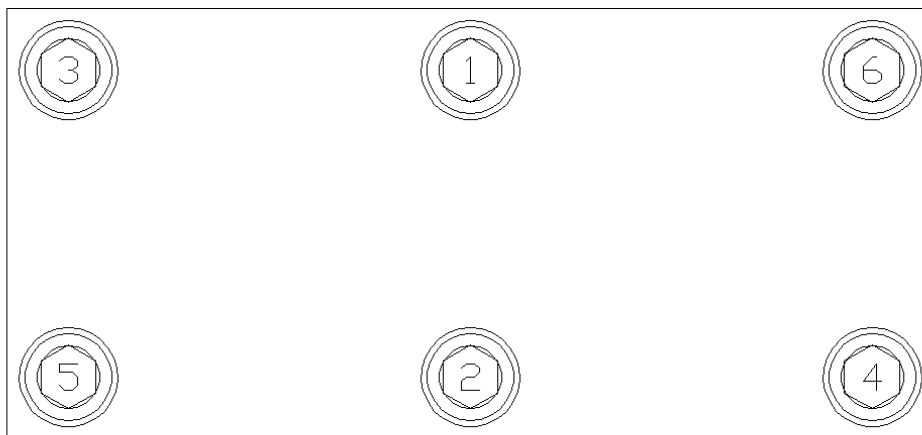
**figure A-8**

12. Place the rack cap (5) (fig. A-13) bore side up on the table and coat the edge of each bore with STP Oil Treatment. Install the rack cap seals (4) (fig. A-9) in the rack cap.



**figure A-9**

13. Reposition the actuator on the table mounting flanges down, and the lower tubes facing away from the assembler. Rotate the pinion shaft to allow 1" of the rack to protrude from the top of the actuator body. Install the rack cap with the oil port positioned to the left hand side of the actuator opposite the bottom oil port located in the tube cap as shown in figure A-13. Attach the rack cap to the actuator body using the socket head bolts (22) (fig. A-13) and lock washers (26). Torque the bolts to 90 ft-lb. in the sequence shown in figure A-10.

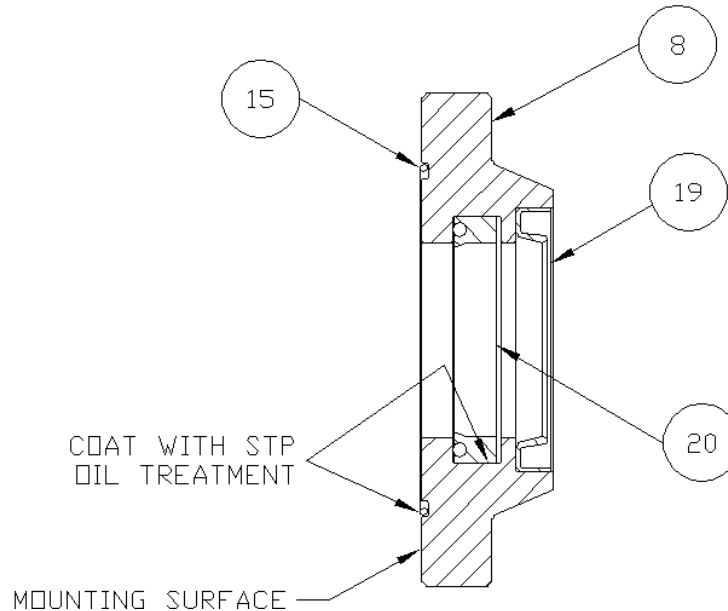


RACK CAP TORQUE SEQUENCE

**figure A-10**

14. Reposition the actuator so that the pinion shaft can be rotated with no obstacles. Rotate the pinion shaft to ensure that the racks move freely. Also make sure that the key ways point perfectly straight "up" toward the rack cap and "down" toward the tube cap at each end of the 180° stroke. If the assembly does not perform all of these functions correctly, it must be disassembled, cleaned, and reassembled.

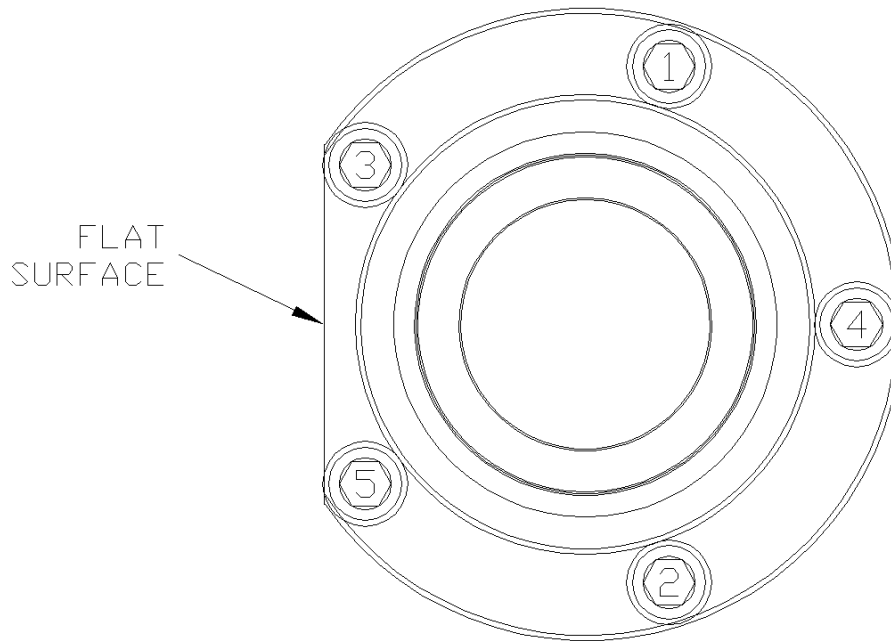
15. Re-center the actuator pinion in the actuator body by tapping on one end of the shaft with a rubber mallet. Install the roller bearing (9) (fig. A-13), over the pinion shaft and inner race, and into the actuator body. Repeat this procedure for the other bearing.
16. Thoroughly clean the bearing caps (8) (fig. A-11) with a mild solvent and lubricate all seal grooves with STP oil treatment. Place the bearing caps (8) on the table (mounting surface down) and install the wiper ring (19) in the outside groove using a rubber mallet or small press. ***(Avoid using tools that may damage seals or scratch bearing cap or bearing surfaces.)*** Turn the bearing cap (8) over. Collapse the pinion seal (20) and carefully work it into the groove. Use fingers to carefully press the seal completely into the groove as shown in figure A-11. ***Be careful not to score or scratch the sealing surface during the installation.*** Install the bearing cap seal (15) by pressing it firmly into the groove on the bearing cap mounting surface.
17. Coat the bearing cap seal area and pinion seal area shown in figure A-11 lightly with STP Oil Treatment.



**figure A-11**

18. Wrap masking tape or electrical tape around the pinion to cover the edges at the keyway. Slide the bearing cap assembly over the pinion shaft with the bearing cap seal facing toward the actuator body and the flat surface of the flange shown in figure A-12 facing toward the actuator mounting flanges. Press against the bearing cap until the shoulder seats against the actuator body, making sure that the seals remain in place. Install the bearing cap bolts (21) (fig. A-13) and lock washers (25). Hand tighten only at this time. Repeat this procedure for other bearing cap.

19. After both bearing caps have been installed, torque all bearing cap bolts to 30 ft-lb. in the sequence shown in figure A-12.



**figure A-12**

20. Install the 90° fitting (27) (fig. A-13) into the oil port on the side of the rack cap (5). Hand tighten only at this time.
21. Install the 45° bulk-head fitting (31) (fig. A-13) up through the hole in the tube mounting bracket (30) bolted to the tube cap as shown in figure A-13. The 45° end must be pointing down away from the rack cap (5) and back toward the mounting flanges on the actuator body. Hand tighten only at this time.
22. Install the rack cap extension tube assembly (29) (fig. A-13) between the 90° fitting in the rack cap and the 45° fitting in the tube mounting bracket as shown in figure A-13. Tighten all connections.
23. Install the orifice plug (11) (fig. A-13) into the oil port on the side of the tube cap (4), and install the 90° fitting (27) into the oil port over the orifice plug as shown in figure A-13. Turn the fitting so that it points down away from the rack cap (5) and back toward the mounting flanges on the actuator body and tighten.
24. Install the cap nuts (28) (fig. A-13) onto the open fittings to prevent contamination of the unit until the hoses are installed.

# ACTUATOR ASSEMBLY

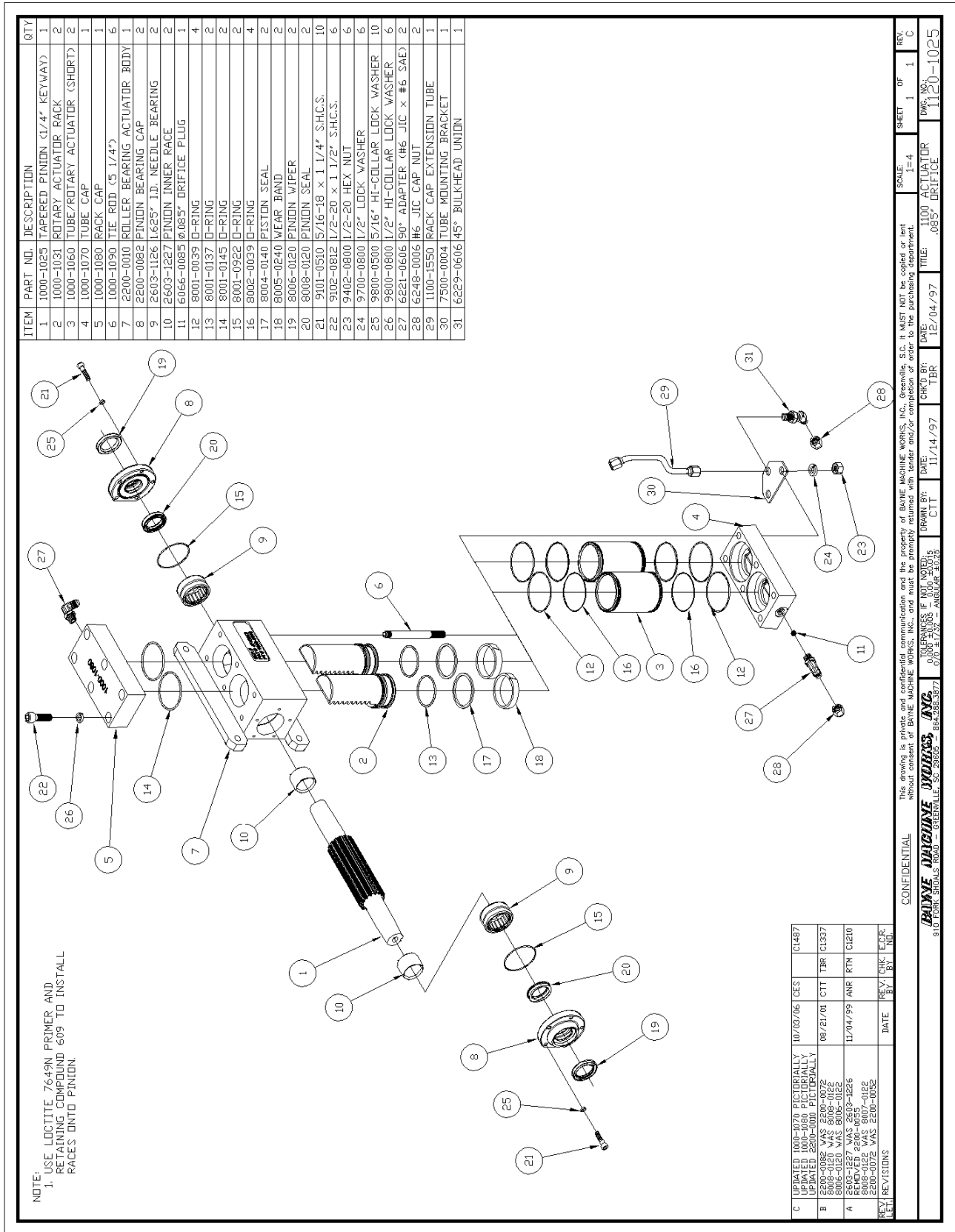


figure A-13

## TROUBLE-SHOOTING CHART ( WI-0310-A )

<i><b>SYMPTOM</b></i>	<i><b>POSSIBLE CAUSES</b></i>	<i><b>CORRECTIVE ACTION</b></i>
Lifter operation very erratic.	<ol style="list-style-type: none"> <li>1. Air trapped in system.</li> <li>2. Low oil level.</li> </ol>	<ol style="list-style-type: none"> <li>1. Bleed all air from lifter hydraulic system.</li> <li>2. Add oil to system.</li> </ol>
Cart lifter will not pick up carts.	<ol style="list-style-type: none"> <li>1. Cart overweight.</li> <li>2. Lifter system hydraulic pressure too low.</li> <li>3. Truck system hydraulic pressure too low.</li> <li>4. Faulty hand valve.</li> </ol>	<ol style="list-style-type: none"> <li>1. Reduce loaded weight of cart.</li> <li>2. Check and adjust pressure relief on hand valve and lifter circuit relief in diverter valve.</li> <li>3. Check and adjust pressure on truck system relief and full system relief in diverter valve.</li> <li>4. Replace hand valve.</li> </ol>
Lifter operates over recommended cycle time.	<ol style="list-style-type: none"> <li>1. Engine idle too low.</li> <li>2. Faulty hand valve.</li> <li>3. Faulty truck hydraulic pump.</li> <li>4. Trash in diverter valve.</li> <li>5. Orifice in diverter valve is too small.</li> </ol>	<ol style="list-style-type: none"> <li>1. Adjust engine idle.</li> <li>2. Replace hand valve.</li> <li>3. Consult truck maintenance manual.</li> <li>4. Remove orifice from diverter valve body and clean thoroughly.</li> <li>5. Remove orifice from diverter valve body and increase diameter.</li> </ol>
Lifter operates under recommended cycle time.	<ol style="list-style-type: none"> <li>1. Engine idle too high.</li> <li>2. Orifice in diverter valve is too large.</li> </ol>	<ol style="list-style-type: none"> <li>1. Adjust engine idle.</li> <li>2. Remove orifice from diverter valve body and replace with a smaller diameter.</li> </ol>



## TROUBLE-SHOOTING CHART ( WI-0310-A )

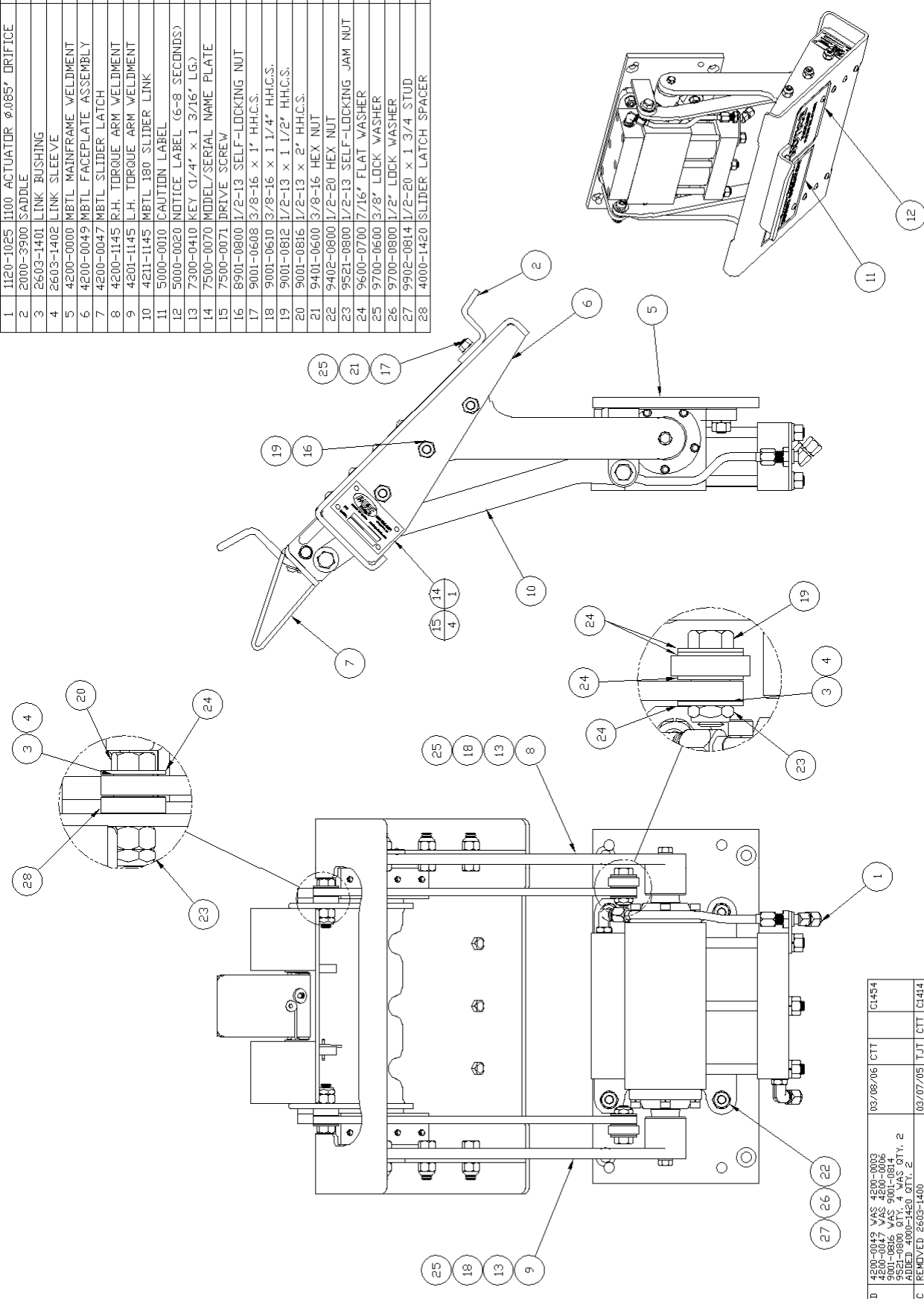
<i><b>SYMPTOM</b></i>	<i><b>POSSIBLE CAUSES</b></i>	<i><b>CORRECTIVE ACTION</b></i>
Hydraulic components down stream of diverter valve not operating or operating extremely slow.	<ol style="list-style-type: none"> <li>1. Truck system hydraulic pressure too low.</li> <li>2. Faulty full system relief valve cartridge in diverter valve.</li> <li>3. Faulty truck system relief valve.</li> <li>4. System flow is being restricted.</li> <li>5. Trash in flow regulator cartridge.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check and adjust pressure on truck system relief and full system relief in diverter valve.</li> <li>2. Replace full system relief valve cartridge in diverter valve.</li> <li>3. Consult truck maintenance manual.</li> <li>4. Ensure there is proper flow throughout the hydraulic system. Remove any restrictions.</li> <li>5. Remove flow regulator cartridge from diverter valve body and clean thoroughly.</li> </ol>
Diverter valve leaking oil around cartridges.	<ol style="list-style-type: none"> <li>1. Worn or damaged seals on cartridge valves.</li> </ol>	<ol style="list-style-type: none"> <li>1. Install diverter valve seal kit.</li> </ol>
Hand valve lever sticks in up or down position.	<ol style="list-style-type: none"> <li>1. Worn or broken spring center device.</li> <li>2. Trash in or around hand valve shift spool.</li> <li>3. Pressure ( IN ) and tank ( OUT ) ports are hooked up backwards.</li> </ol>	<ol style="list-style-type: none"> <li>1. Install spring center kit.</li> <li>2. Disassemble and clean spool and housing.</li> <li>3. Make sure all hoses are plumbed according to the hydraulic schematic.</li> </ol>
Hand valve leaking oil around shift spool.	<ol style="list-style-type: none"> <li>1. Worn or damaged seals.</li> <li>2. Worn spool.</li> </ol>	<ol style="list-style-type: none"> <li>1. Install hand valve seal kit.</li> <li>2. Replace hand valve.</li> </ol>

## TROUBLE-SHOOTING CHART ( WI-0310-A )

<i><b>SYMPTOM</b></i>	<i><b>POSSIBLE CAUSES</b></i>	<i><b>CORRECTIVE ACTION</b></i>
Slider latch connectors frequently breaking or bending.	<ol style="list-style-type: none"> <li>1. Lift bars on cart bent or spread apart.</li> <li>2. Broken spring on slider latch hook.</li> <li>3. Lower hinged hook not operating freely.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace cart or install new bars.</li> <li>2. Replace spring on slider latch hook.</li> <li>3. Clean and grease hook area.</li> </ol>
Lifter loses bar lift carts when dumping.	<ol style="list-style-type: none"> <li>1. Lift bars on cart bent or spread apart.</li> <li>2. Broken spring on slider latch hook.</li> <li>3. Lower hinged hook not operating freely.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace cart or install new bars.</li> <li>2. Replace spring on slider latch hook.</li> <li>3. Clean and grease hook area.</li> </ol>

**APPENDIX A**  
Assembly drawings and part numbers

ITEM	PART NO.	DESCRIPTION	QTY
1	1120-1025	1100 ACTUATOR Ø0.85" DRIFICE	1
2	2000-3900	SADDLE	1
3	2603-1401	LINK BUSHING	4
4	2603-1402	LINK SLEEVE	4
5	4200-0000	MBTL MAINFRAME WELDMENT	1
6	4200-0049	MBTL FACEPLATE ASSEMBLY	1
7	4200-0047	MBTL SLIDER LATCH	1
8	4200-1145	R.H. TORQUE ARM WELDMENT	1
9	4201-1145	L.H. TORQUE ARM WELDMENT	1
10	4211-1145	MBTL 180 SLIDER LINK	2
11	5000-0010	CAUTION LABEL	1
12	5000-0020	NOTICE LABEL (6-8 SECONDS)	1
13	7300-0410	KEY 3/4" x 1 3/16" LG.	2
14	7500-0070	MODEL/SERIAL NAME PLATE	1
15	7500-0071	DRIVE SCREW	4
16	8901-0800	1/2-13 SELF-LOCKING NUT	6
17	9001-0608	3/8-16 x 1" HH.C.S.	3
18	9001-0610	3/8-16 x 1 1/4" HH.C.S.	2
19	9001-0812	1/2-13 x 1 1/2" HH.C.S.	8
20	9001-0816	1/2-13 x 2" HH.C.S.	2
21	9401-0600	3/8-16 HEX NUT	3
22	9402-0600	1/2-20 HEX NUT	4
23	9521-0800	1/2-13 SELF-LOCKING JAM NUT	4
24	9600-0700	7/16" FLAT WASHER	10
25	9700-0600	3/8" LOCK WASHER	5
26	9700-0800	1/2" LOCK WASHER	4
27	9902-0814	1/2-20 x 1 3/4 STUD	4
28	4000-1420	SLIDER LATCH SPACER	2



REV.	REVISIONS	DATE	BY	CHK	BY	APP.
D	4200-0049 WAS 4200-0003 9001-0816 WAS 9001-0816 9521-0800 QTY. 4 WAS QTY. 2 ADDED 4000-1420 QTY. 2	03/08/06	CTT			CL454
C	REMOVED 2603-1400 ADDED 2603-1401 & 2603-1402	03/07/05	TJT	CTT		CL414

CONFIDENTIAL

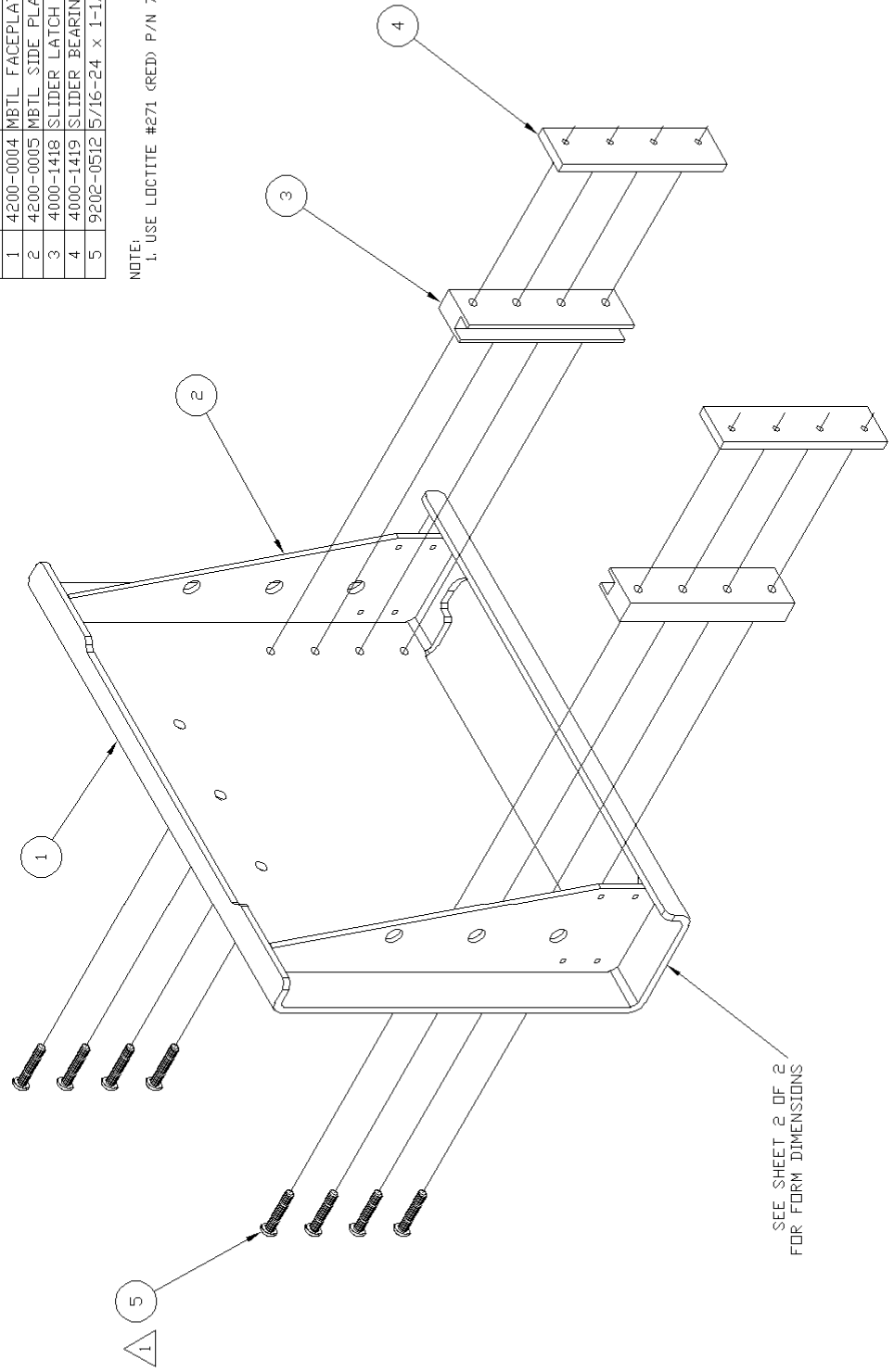
This drawing is private and confidential communication and the property of BAYNE MACHINE WORKS, INC., Greenville, S.C. It MUST NOT be copied or lent without consent of BAYNE MACHINE WORKS, INC., and must be promptly returned with tender and/or completion of order to the purchasing department.

**BAYNE MACHINE WORKS, INC.**  
914 POPE BIRDALE ROAD - GREENVILLE, SC 29605 - 864-255-5977

DATE:	01/28/03	CHKD. BY:	CTT	SCALE:	1=3	SHEET OF:	1 1
DATE:	01/28/03	CHKD. BY:	CTT	TITLE:	MBTL 180	DWG. NO.:	1999-0180
				LIFTER ASSEMBLY			

ITEM	PART NO.	DESCRIPTION	QTY
1	4200-0004	MBTL FACEPLATE BLANK	1
2	4200-0005	MBTL SIDE PLATE	2
3	4000-1418	SLIDER LATCH BEARING BLOCK	2
4	4000-1419	SLIDER BEARING BLOCK PLATE	2
5	9202-0512	5/16-24 x 1-1/2" B.H.C.S.	8

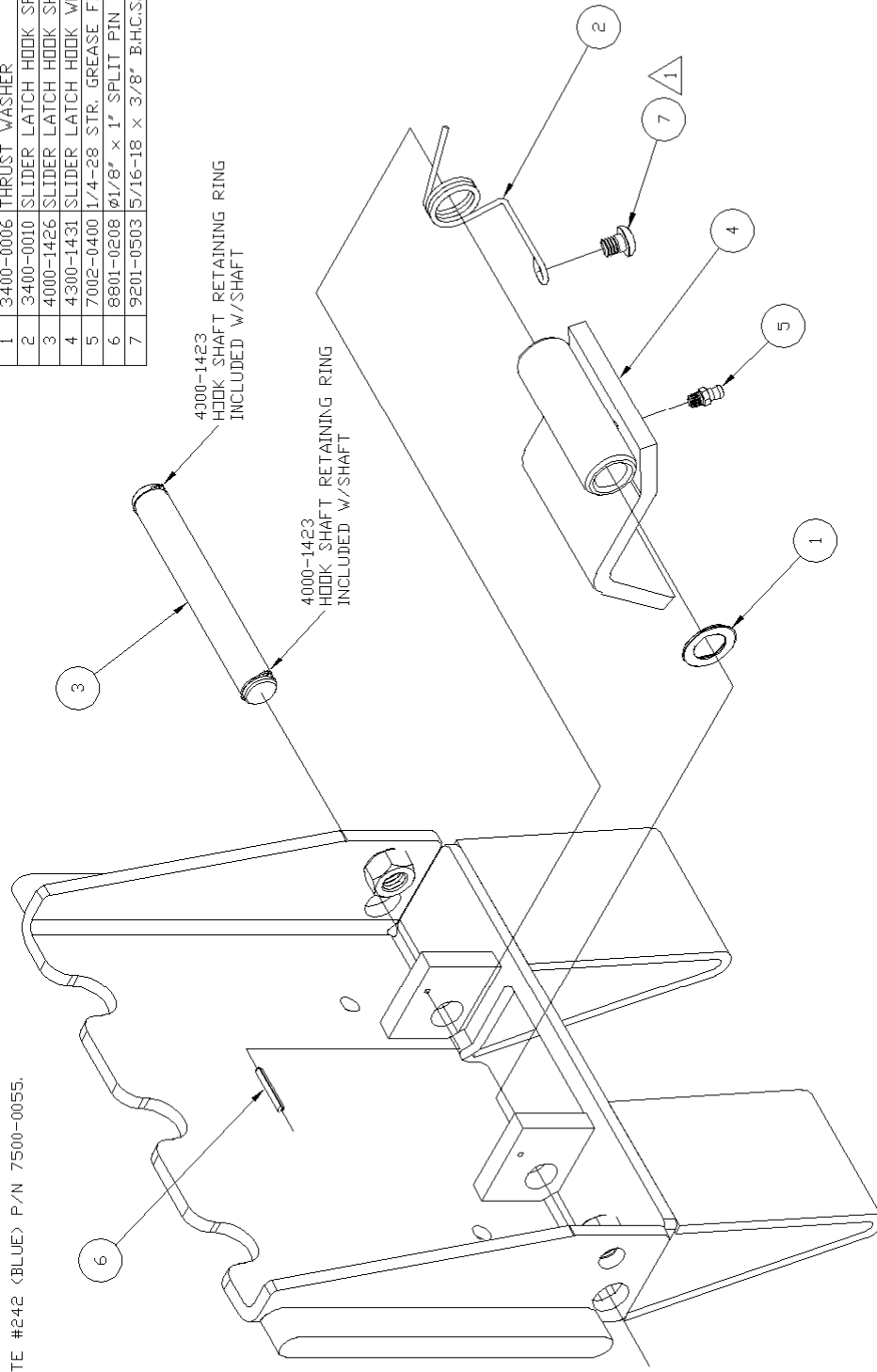
NOTE:  
1. USE LOCTITE #271 (RED) P/N 7500-0057.



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<b>BAYNE MACHINE WORKS, INC.</b> 910 FORK SHOALS ROAD - GREENVILLE, SC 29635 - 864-288-3877	TOLERANCES IF NOT NOTED: 0.000 ±0.005 - 0.00 ±0.015 Ø/Ø ±1/32 - ANGULAR ±0.25	DATE: 12/05/05	CHKD BY: CTT	DRAWN BY: DATE: 12/05/05
TITLE: MBTL FACEPLATE ASSEMBLY		DWG. NO.: 4200-0049		

ITEM	PART NO.	DESCRIPTION	QTY
1	3400-0006	THRUST WASHER	1
2	3400-0010	SLIDER LATCH HOOK SPRING	1
3	4000-1426	SLIDER LATCH HOOK SHAFT	1
4	4300-1431	SLIDER LATCH HOOK WELDMENT	1
5	7002-0400	1/4-28 STR. GREASE FITTING	1
6	6801-0208	Ø1/8" x 1" SPLIT PIN	1
7	9201-0503	5/16-18 x 3/8" BH.C.S.	1

NOTE:  
1. USE LOCTITE #242 (BLUE) P/N 7500-0055.



A	ADDED SHEET 2	01/23/06	CTT	C1459
REV.	REV.	CHK.	E.C.R.	
LET.	DATE	BY	BY	ND.

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**BAYNE MACHINE WORKS, INC.**  
910 FORK SHOALS ROAD - GREENVILLE, SC 29635 - 864-288-3877

SCALE: NONE SHEET 1 OF 2 REV. A

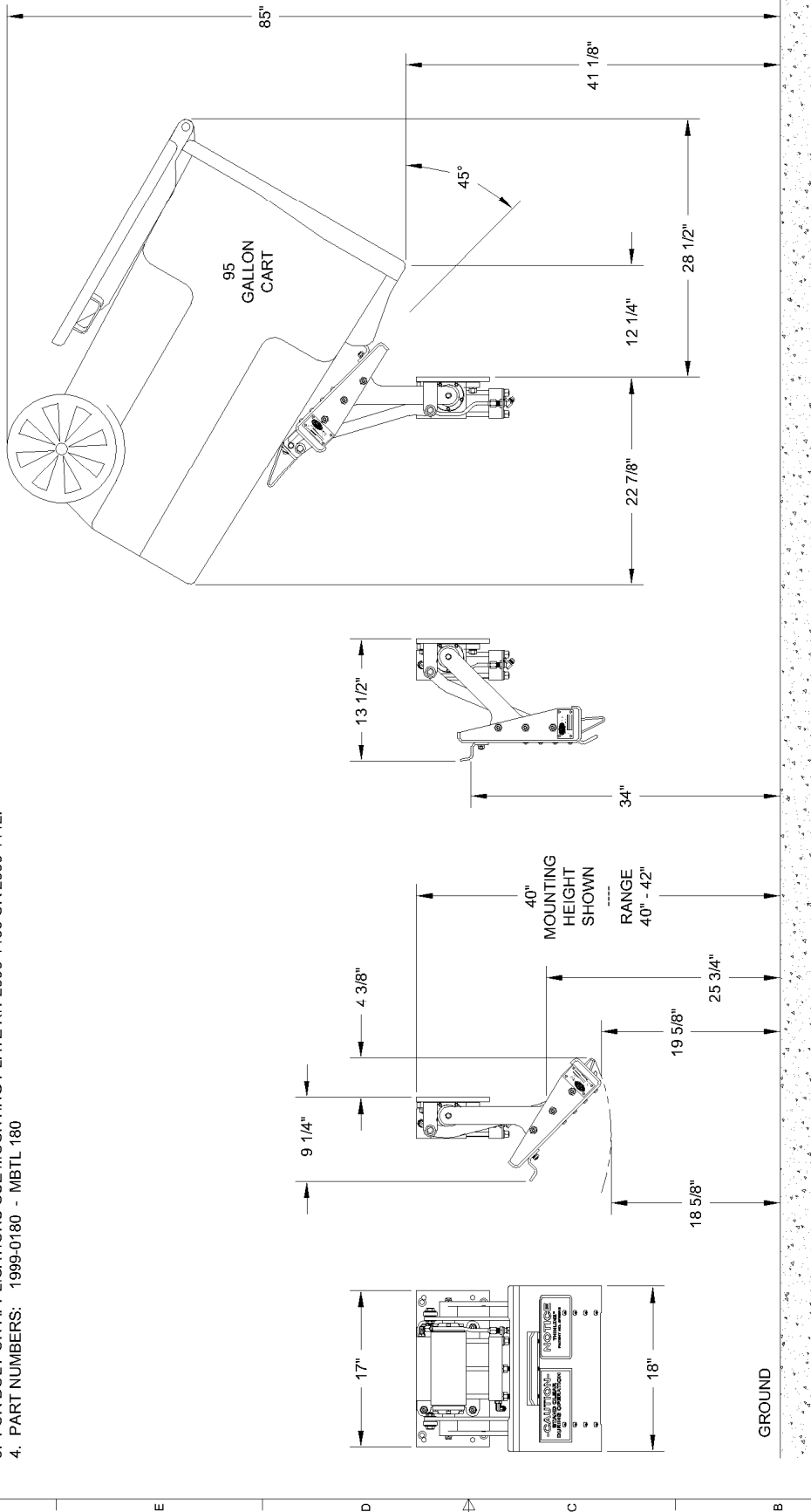
TOLERANCES IF NOT NOTED:  
0.000 ±0.005 - 0.00 ±0.015  
Ø/Ø ±1/32 - ANGULAR ±0.25

DATE: 12/05/05 DATE: - DATE: -  
CHKD BY: CTT DRAWN BY: CTT

TITLE: MBTL SLIDER LATCH DWG. NO.: 4200-0047

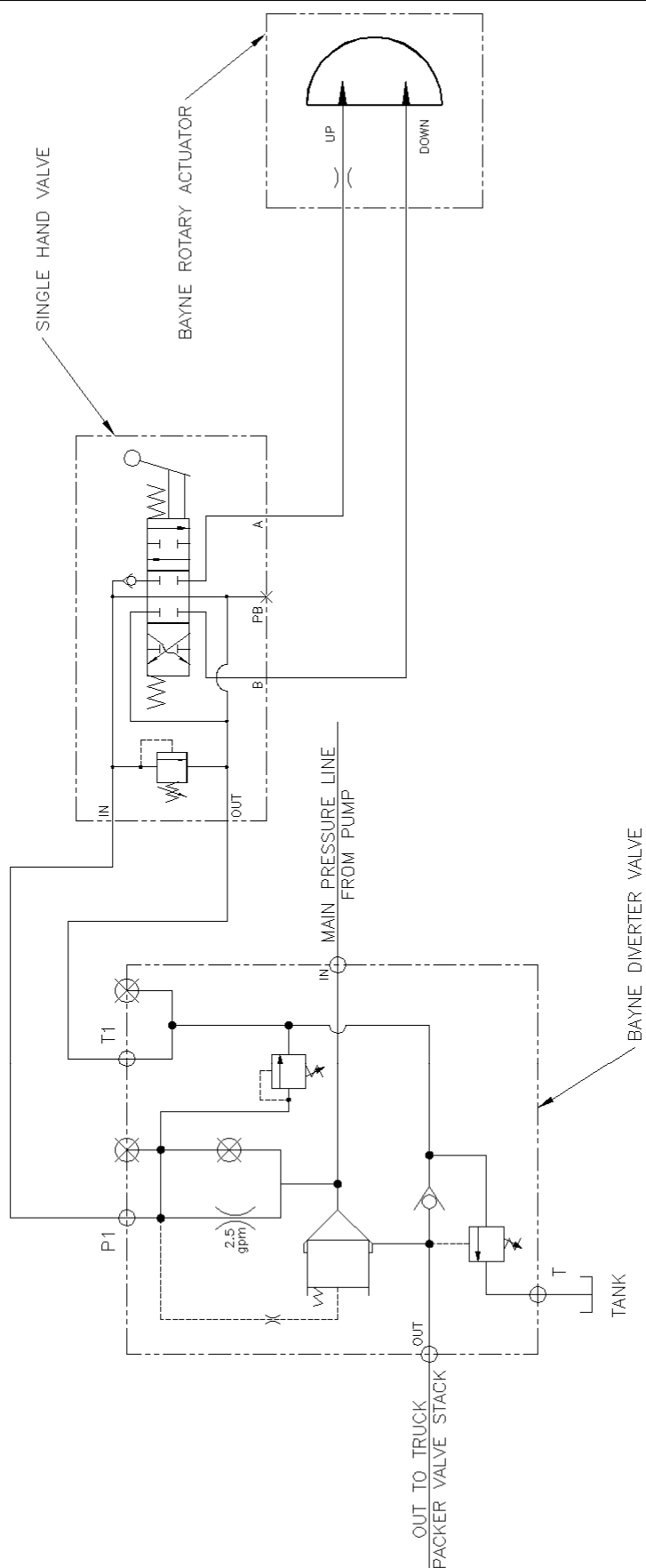
**NOTE:**

1. DIMENSIONS ACCOMMODATE ANSI Z245.60-2008 TYPE B CONTAINERS (DOMESTIC 2-BAR CARTS), BUT MAY VARY DUE TO CONTAINER SPECIFICATIONS OR APPLICATIONS.
2. ALL DIMENSIONS ARE APPROXIMATE.
3. FOR BOLT-ON APPLICATIONS USE MOUNTING PLATE KIT 2000-1136 OR 2000-1112.
4. PART NUMBERS: 1999-0180 - MBTL 180



<b>CONFIDENTIAL</b>		<b>UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES</b>	
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<b>MBTL 180 SPECIFICATIONS</b>			
DRAWN BY	DATE	SCALE	SHEET OF
CTT	10/20/2009	NONE	1 1
CHECKED BY	DATE	DWG NO	REV
		H5700003	-

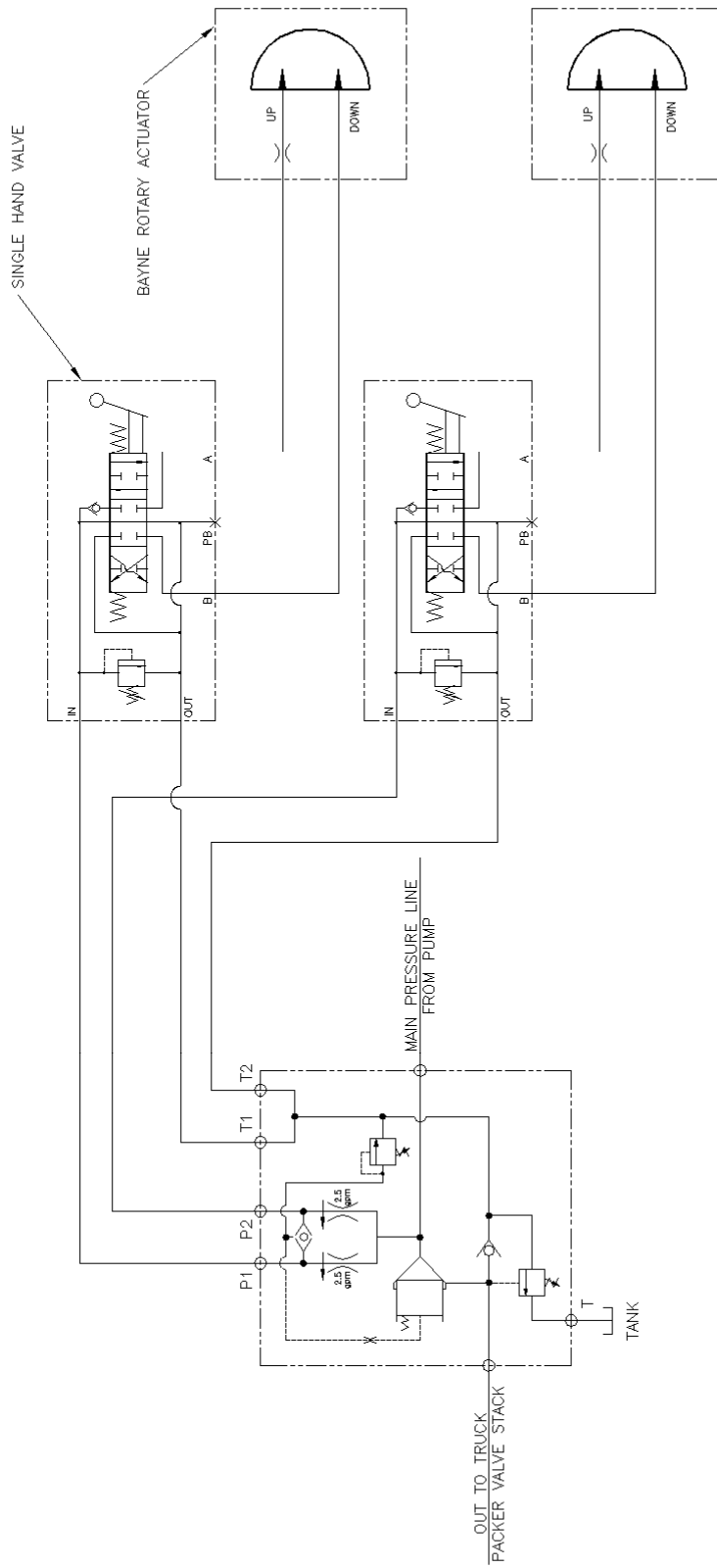
QTY	FINISH	WEIGHT	



THIS IS A TYPICAL HYDRAULIC SCHEMATIC FOR A SINGLE LIFTER WITHOUT A VERTICAL INSTALLED ON A REAR OR SIDE LOAD REFUSE TRUCK.

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<b>BAYNE MACHINE WORKS, INC.</b>	TOLERANCES IF NOT NOTED: 0.000 ±0.005 - 0.00 ±0.015 Ø/Ø ±1/32 - ANGULAR ±0.25	DATE: 10/14/04	CHKD BY: TJT	DRAWN BY: TJT
910 FORK SHOALS ROAD - GREENVILLE, SC 29605 - 864-288-3877	TITLE: HYDRAULIC SCHEMATIC	DWG. NO.: 6900-0700		





THIS IS A TYPICAL HYDRAULIC SCHEMATIC FOR A DUAL LIFTER WITHOUT A VERTICAL INSTALLED ON A REAR OR SIDE LOAD REFUSE TRUCK.

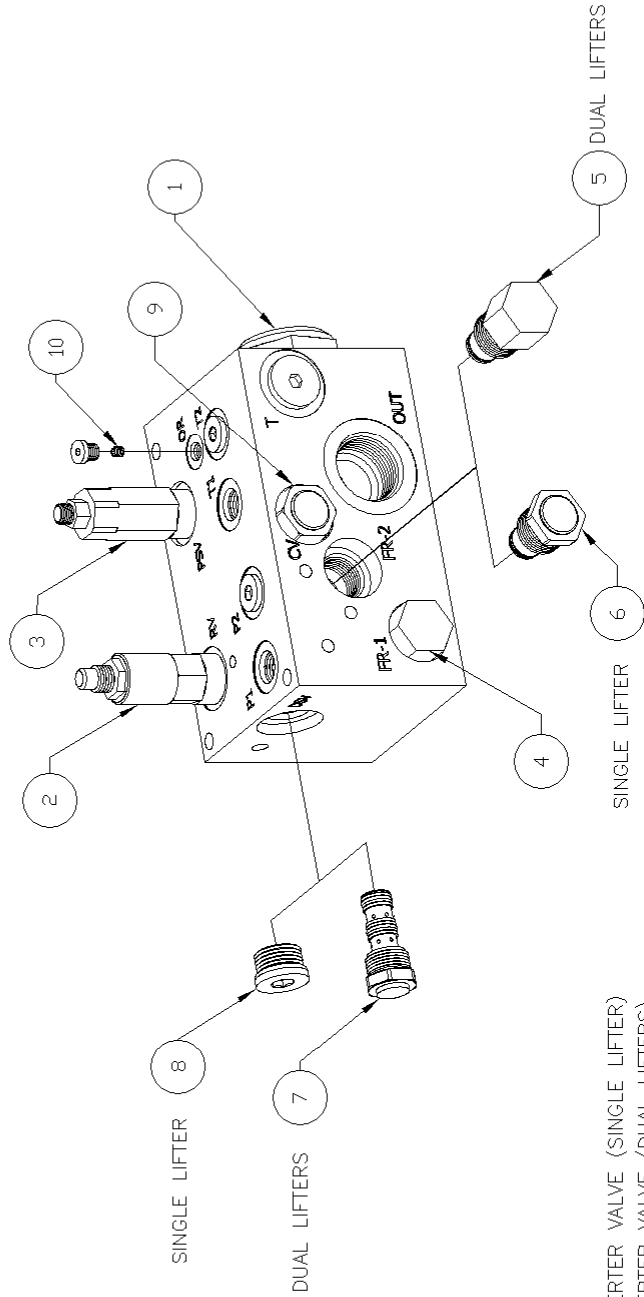
<b>CONFIDENTIAL</b>		This drawing is private and confidential communication and the property of BAYNE MACHINE WORKS, INC., Greenville, S.C. It MUST NOT be copied or lent without consent of BAYNE MACHINE WORKS, INC., and must be promptly returned with tender and/or completion of order to the purchasing department.		SCALE: NTS	SHEET 1 OF 1	REV. -	
<b>BAYNE MACHINE WORKS, INC.</b>		DRAWN BY: T.J.T.		DATE: 10/20/04	CHK'D BY:	DWG. NO.: 6900-0704	
910 FORK SHOALS ROAD - GREENVILLE, SC 29605 - 864-288-3877		TOLERANCES IF NOT NOTED: 0.000 ±0.005 - 0.00 ±0.015 Ø/Ø ±1/32 - ANGULAR ±0.25					

### SERVICE PARTS

ITEM	PORT	PART NO.	DESCRIPTION	SEAL KIT	APPLICATIONS
1	DPS	6091-0716	DIFF. PRESSURE SENSING VALVE	8000-0782	ALL
2	RV	6091-0712	RELIEF VALVE	8000-0784	ALL
3	PSV	6091-0713	PRESSURE SEQUENCE VALVE	8000-0781	ALL
4	FR-1	6091-0710	FLOW REGULATOR		ALL
5	FR-2	6091-0710	FLOW REGULATOR	8000-0784	FOR DUAL LIFTERS
6		6091-0715	CAVITY PLUG	8000-0783	FOR SINGLE LIFTER
7	DSV	6091-0720	SHUTTLE VALVE		FOR DUAL LIFTERS
8		6246-0008	INL. 8 SAE SOCKET HEAD PLUG		FOR SINGLE LIFTER
9	CV	6091-0714	CHECK VALVE	8000-0784	ALL
10	DR	6066-0028	Ø0.038" DRIFICE	-	ALL

**NOTE:**

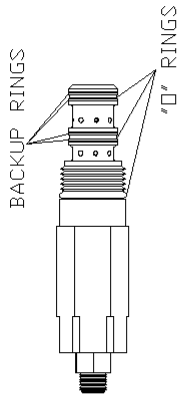
1. MAXIMUM WORKING PRESSURE 3000 PSI
2. MAXIMUM WORKING FLOW 50 GPM
3. TEMPERATURE RANGE = 160° MAXIMUM
4. PORT SIZES  
IN & OUT = #16 SAE  
T = #10 SAE  
T1, T2, P1 & P2 = #6 SAE
5. T2 & P2 ARE PLUGGED USING #6 SAE PLUGS IN SINGLE LIFTER APPLICATIONS



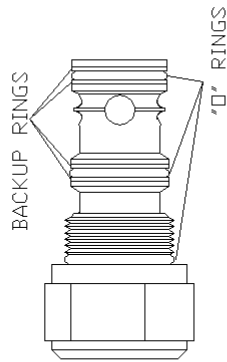
6091-0700 COMPLETE DIVERTER VALVE (SINGLE LIFTER)  
 6092-0700 COMPLETE DIVERTER VALVE (DUAL LIFTERS)

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<b>BAYNE MACHINE WORKS, INC.</b>		910 FORK SHOALS ROAD - GREENVILLE, SC 29605 - 864-288-3877		CHKD BY:	TJT	DATE:	09/24/04	1	
TOLERANCES IF NOT NOTED: 0.000 ±0.005 - 0.00 ±0.015 Ø/Ø ±1/32 - ANGULAR ±0.25		DRAWN BY:		TITLE:		SINGLE/DUAL		M3500005	
		DATE:		10/11/04		DIVERter VALVE PARTS		DWG. NO.:	

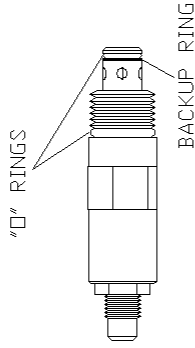
ITEM NO	PART NO.	DESCRIPTION	QTY
1	8000-0781	PRES. SEQUENCE VALVE SEAL KIT	1
2	8000-0782	PRESSURE SENSING VALVE SEAL KIT	1
3	8000-0783	SHUTTLE VALVE SEAL KIT	1
4		RELIEF VALVE SEAL KIT	1
5		FLOW REGULATOR SEAL KIT	1
6	8000-0784	FLOW REG. CAVITY PLUG SEAL KIT	1
7		CHECK VALVE SEAL KIT	1



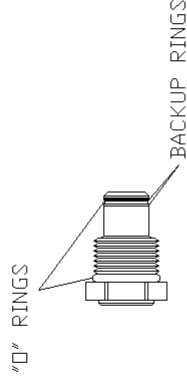
PRESSURE SEQUENCE VALVE SEAL KIT



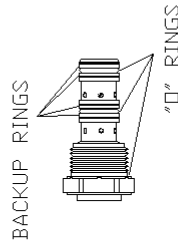
DIFFERENTIAL PRESSURE SENSING VALVE SEAL KIT



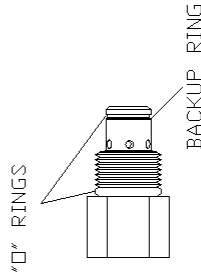
RELIEF VALVE SEAL KIT



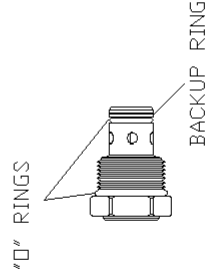
FLOW REGULATOR CAVITY PLUG SEAL KIT



SHUTTLE VALVE SEAL KIT



FLOW REGULATOR SEAL KIT



CHECK VALVE SEAL KIT

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**BAYNE MACHINE WORKS, INC.**  
 910 FORK SHOALS ROAD - GREENVILLE, SC 29605 - 864-288-3877

TOLERANCES IF NOT NOTED:  
 0.000  $\pm$ 0.005 - 0.00  $\pm$ 0.015  
 0.00  $\pm$ 1/32 - ANGULAR  $\pm$ 0.25

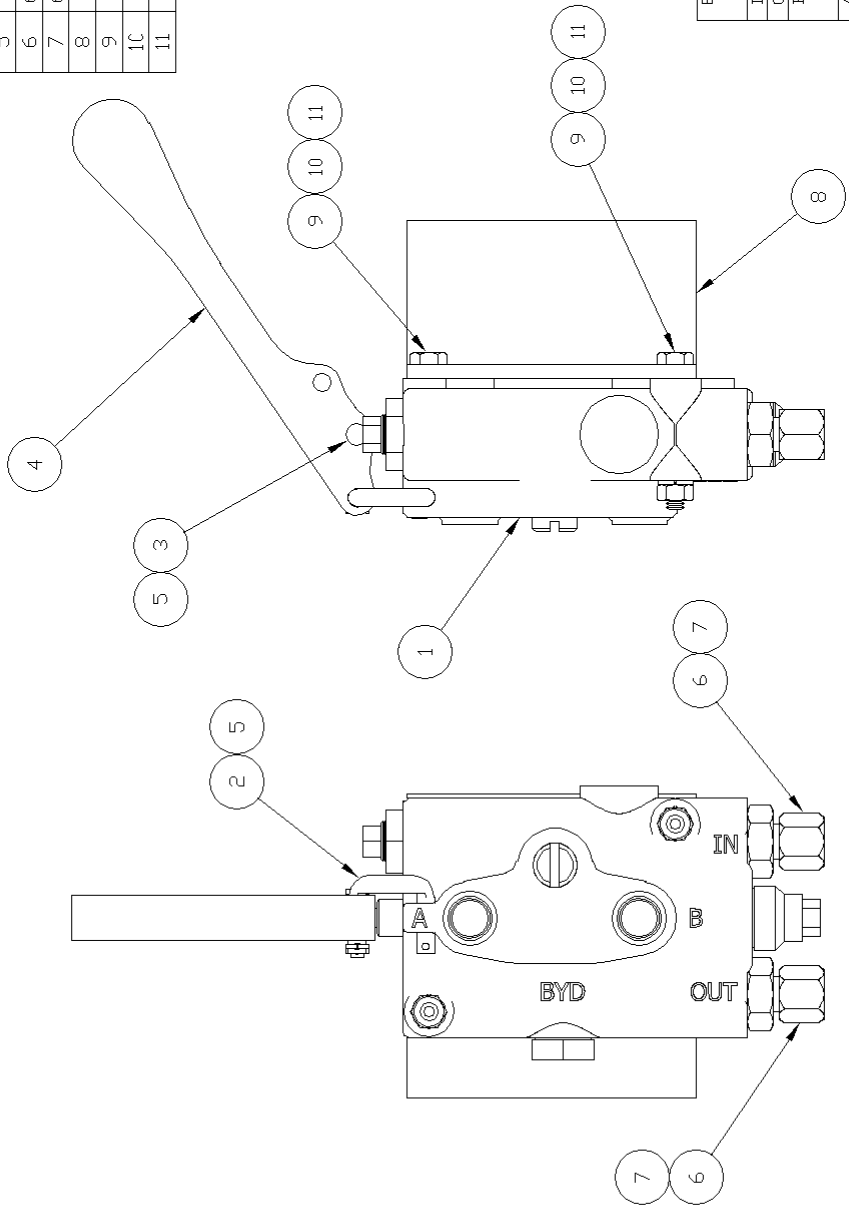
DRAWN BY: TJT DATE: 09/29/04  
 CHKD BY: DATE:

TITLE: DIVERTER VALVE SEAL KIT  
 DWG. NO.: 8000-0780

SCALE: 2=3 SHEET 1 OF 1 REV. -

ITEM	PART NO.	DESCRIPTION	QTY
1	6083-1025	HAND VALVE - 1750 PSI RELIEF	1
2	6083-1510	UNIVERSAL C-HOOK	1
3	6083-1511	CLEVIS PIN (ø3/16" x 7/8")	1
4	6083-1520	METRO/EATON H.V. HANDLE	1
5	8810-0303	COTTER PIN (1/16" x 1/2")	2
6	6220-0806	ST ADAPTER (#6 JIC x #6 SAE)	2
7	6248-0006	#6 JIC CAP NUT	2
8	7601-0003	HAND VALVE MOUNTING BRACKET	1
9	9001-0416	1/4-20 x 2" H.H.C.S.	2
10	9401-0400	1/4-20 HEX NUT	2
11	9700-0400	1/4" LOCK WASHER	2

NOTE:  
 1. SEAL REPAIR KIT P/N : 8000-0085  
 2. HANDLE REPLACEMENT KIT P/N : 6083-1501



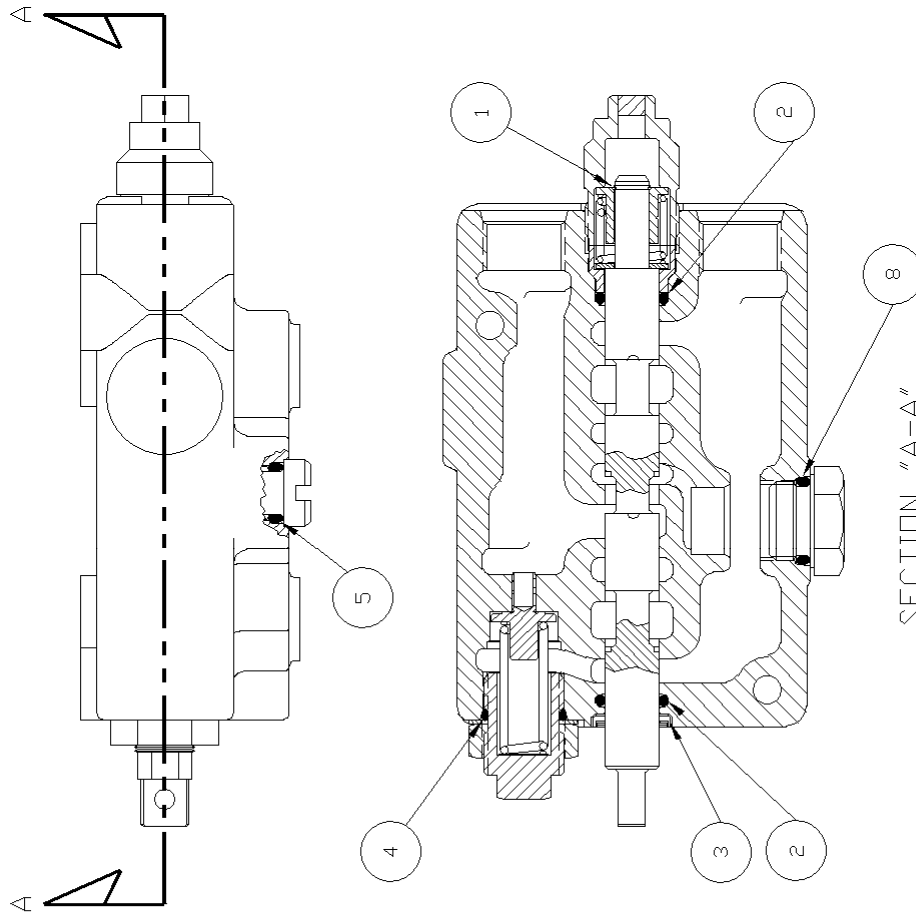
REV.	REV. DATE	CHK. BY	E.C.R. BY	DATE	REV. DATE	CHK. BY	E.C.R. BY	DATE
E	05/24/07	CTT			05/24/07	CTT		
D	07/13/05	TJT			07/13/05	TJT		
C	03/30/99	TBR			03/30/99	TBR		
B	05/15/98	CTT			05/15/98	CTT		
A	08/27/97	EFJ			08/27/97	EFJ		

LET. REVISIONS	SCALE: 2=3	SHEET 1 OF 1	REV. E
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CHKD BY: BKB	DATE: 06/11/96	TITLE: VALVE W/BRACKET	
DRAWN BY: TBR	DATE: 06/07/96		
TOLERANCES IF NOT NOTED: 0.000 ±0.005 - 0.00 ±0.015 0/0 ±1/32 - ANGULAR ±0.25			

CONFIDENTIAL

**BAYNE MACHINE WORKS, INC.**  
 910 FORK SHOALS ROAD - GREENVILLE, SC 29605 - 864-288-3877

ITEM NO.	DESCRIPTION	QTY
1	RETAINING RING	1
2	3/32" x 1/2" I.D. O-RING	2
3	WIPER SEAL	1
4	3/32" x 41/64" I.D. O-RING	1
5	3/32" x 3/8" I.D. O-RING	1
6	1/16" x 1/2" I.D. O-RING	1
7	1/16" x 1/2" BACK-UP WASHER	1
8	3/32" x 5/8" I.D. O-RING	1
9	5/64" x 15/32" I.D. O-RING	1

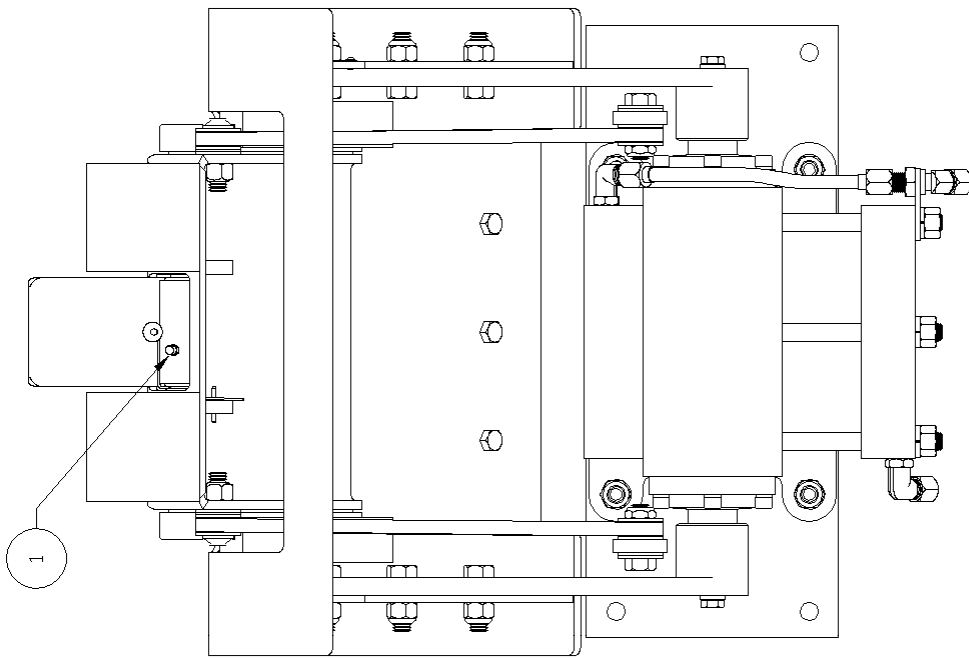


NOTES:

1. ASSEMBLY INSTRUCTIONS ARE INCLUDED WITH EACH KIT.
2. ITEMS 6,7 AND 9 ARE NOT USED WITH THIS HAND VALVE.

SECTION "A-A"

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BAYNE MACHINE WORKS, INC.		DATE:	DATE:	1=1	1	1	-
910 FORK SHOALS ROAD - GREENVILLE, SC 29605 - 864-288-3877		DRAWN BY:	CHKD BY:	TITLE:		DWG. NO.:	
		TJT	TJT	HAND VALVE SEAL REPAIR KIT		8000-0085	
		07/20/05	07/20/05				



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				1=3	1	1	A
<b>BAYNE MACHINE WORKS, INC.</b>		TOLERANCES IF NOT NOTED:		TITLE:		DWG. NO.:	
910 FORK SHOALS ROAD - GREENVILLE, SC 29635 - 864-288-3377		0.000 ±0.005 - 0.00 +0.015 0/0 ±1/32 - ANGULAR ±0.25		MBTL LUBRICATION POINTS		LUB4200	
		DATE:	CHKD BY:	DATE:			
		04/18/00	C.T.T.	04/18/00			