



*Premium Lift Systems*

## **OPERATION AND PARTS MANUAL**



MODEL NUMBER : **ETL208-48 LIFTER / ROLLER BEARINGS**

PART NUMBER : **1999-0249**

SERIAL NUMBER :



Environmental Solutions Group  
201 W. Main Street, Ste 300  
Chattanooga, TN 37408  
Bayne Customer Care: 800.535.2671

# **Cart Lifter General Operation Guidelines**

Always adhere to your company's safety guidelines when using this lifter. This includes wearing appropriate clothing and personal protective equipment, including reflective gear. Keep in mind that you are operating the lifter on public roads or alleys with moving traffic. Stay vigilant and watch out for vehicles and pedestrians.

The lifter should only be used for lifting ANSI-approved carts that are in good condition. It is not designed to be used as a step, to assist in lifting commercial containers, or to crush or break down items. Use with non-approved carts or misuse can result in serious injury or damage and will void the warranty.

Make sure the area around the lifter is free of personnel before operation. Always maintain a safe distance from the lifter to avoid pinch points that can cause serious injury.

Cart lifters can hang very low to the ground at certain points in the lift cycle. It is the operator's responsibility to move the lifter to a safe position, such as raising the lifter fully or placing the lifter in the storage position before driving. Lifters left hanging low risk bottoming out on the street, road, or alley. This can cause serious damage. Damages from bottoming out are not covered by the warranty.

It is the operator's responsibility to position the cart lifter safely before approaching any obstacles. Damages from collisions are not covered by the warranty.

# ***TABLE OF CONTENTS***

|  | Page |
|--|------|
| I. <b><i>THINLINE</i></b> <sup>®</sup> Specifications _____                  | 3    |
| II. <b><i>THINLINE</i></b> <sup>®</sup> Installation Instructions _____      | 4    |
| III. <b><i>THINLINE</i></b> <sup>®</sup> Operation Instructions _____        | 11   |
| IV. <b><i>THINLINE</i></b> <sup>®</sup> Diverter Valve Information _____     | 13   |
| V. <b><i>THINLINE</i></b> <sup>®</sup> Maintenance Instructions _____        | 15   |
| VI. <b><i>THINLINE</i></b> <sup>®</sup> Actuator Assembly Instructions _____ | 16   |
| VII. Trouble-shooting Chart _____  | 25   |
| VIII. Appendix A   |      |
| 1. Unit Assembly Drawings _____  | 29   |
| 2. Mounting Height Drawing _____   | 35   |
| 3. Hydraulic Schematic Drawings _____  | 36   |
| 4. Diverter Valve Drawings _____   | 38   |
| 5. Hand Valve Drawings _____   | 40   |
| 6. Lubrication Drawing _____   | 42   |

SPECIFICATIONS ( WI-0098-A )  
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 ETL 208 lift unit measures as little as 8 7/16” thick from the back of the mainframe to clamp in the down position. The unit also rotates underneath the hopper to allow for easy dumping of large commercial containers without interference.
- C.** The ETL 208 faceplate is normally at 45 degrees in the dump position in order to completely eject all materials into the hopper.
- D.** The ETL 208 lift unit operates at a cycle time of **8 to 10 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 **1 1/2 to 2 GPM**.
- F.** Hydraulic pressure requirements are as follows:
- **2000 to 2500 PSI** normal working pressure
  - **3000 PSI** maximum pressure
- G.** ETL 208 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.** Two ( 2 ) 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-0253-A)

### Bayne *THINLINE*® Premium Lift Systems

The following information is intended to be a **GENERAL GUIDE** to installing the **Bayne *THINLINE*®** 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*®** 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 an “S” unit 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.* ).

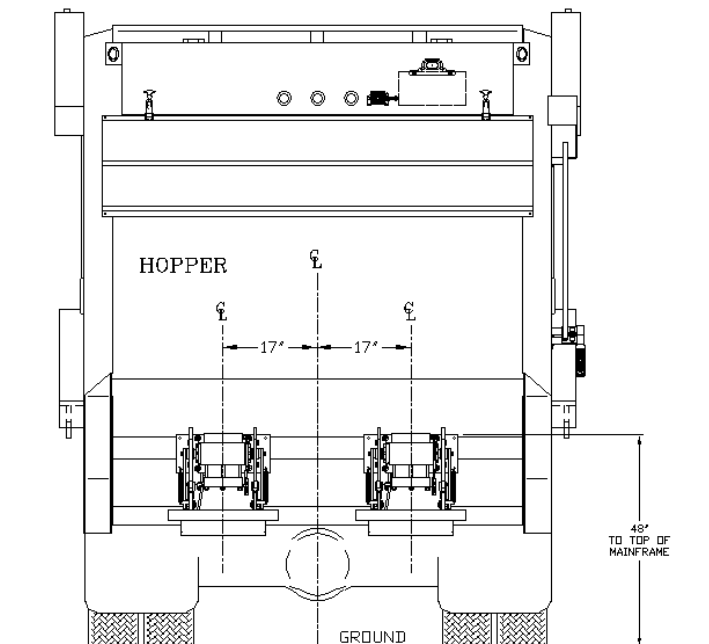
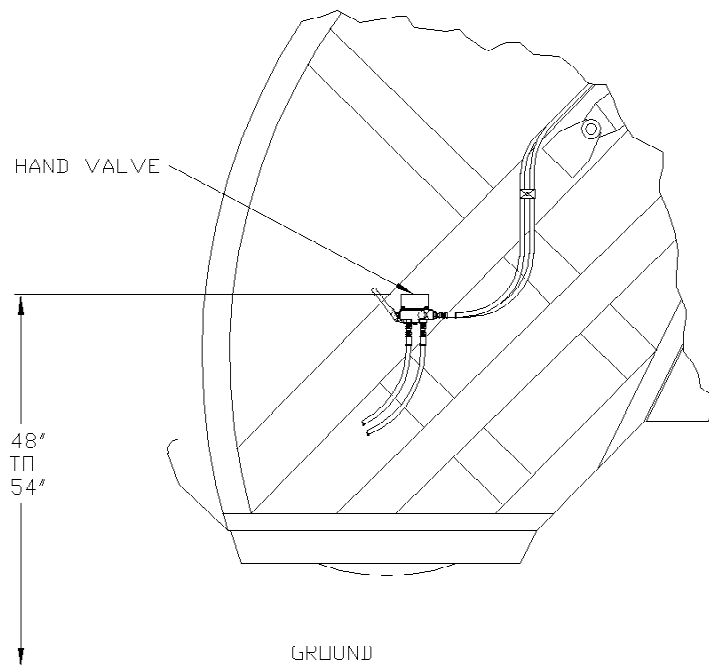


figure I-1

## 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).



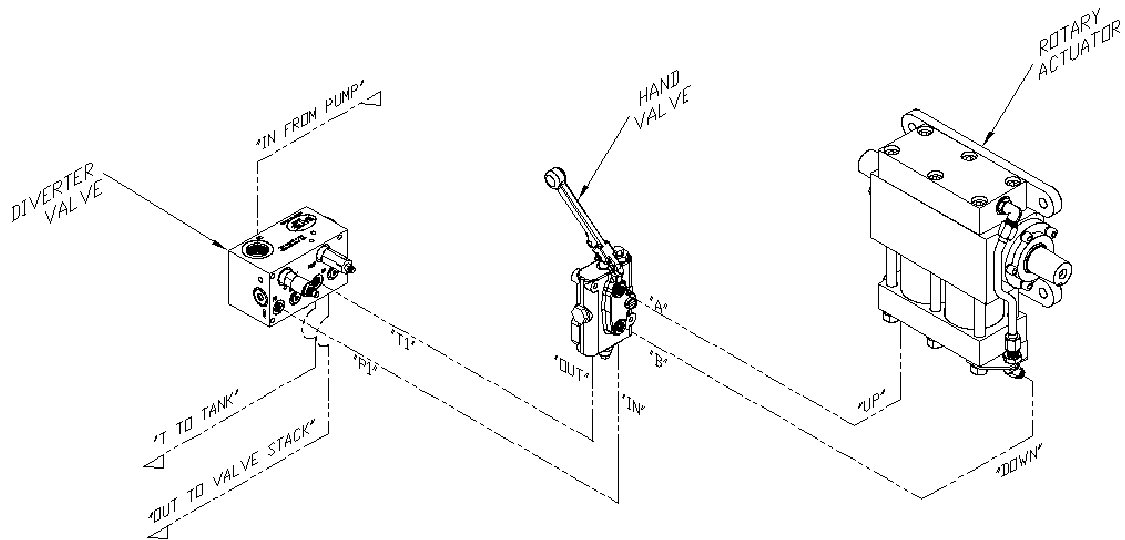
**figure I-2**

## III. Mounting diverter valve on the truck :

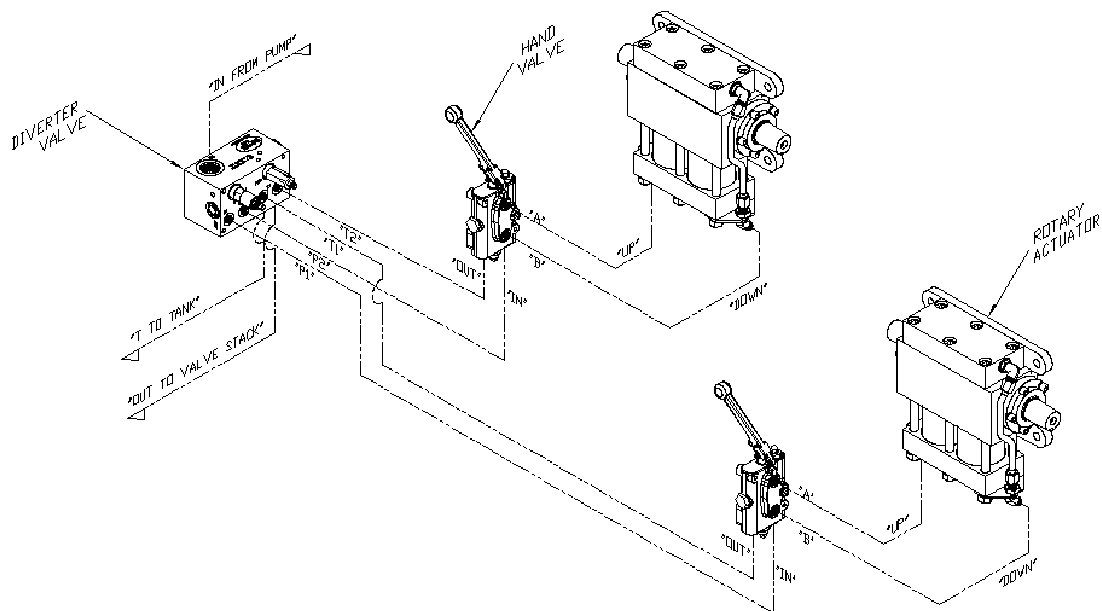
1. Choose and mark an acceptable location to mount the diverter valve assembly. This location should be near the truck's main hydraulic pressure and tank lines on the same area of the truck where the lifter is mounted.
2. Weld diverter valve mounting bracket to the truck.
3. After the weld has cooled, 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*

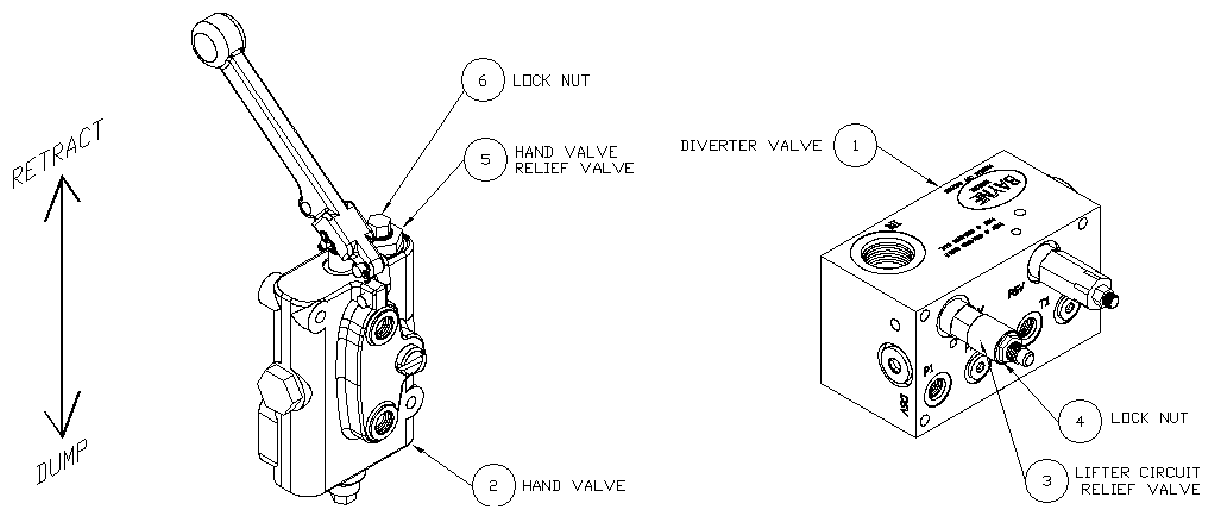
**figure I-3**

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 :**

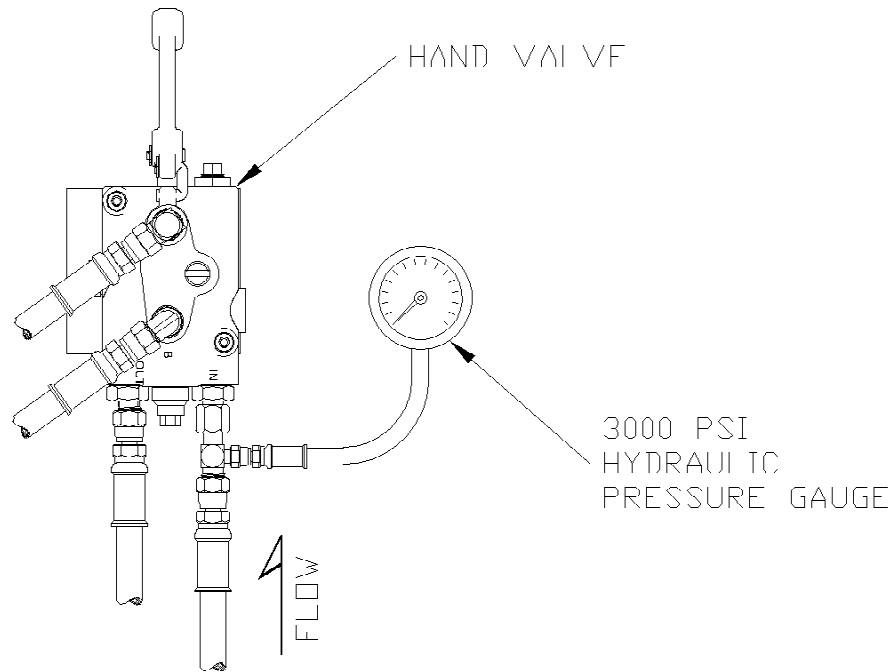
*The diverter valve ( 1 ) ( figure I-4 ) supplies the cart lifter hydraulic system with approximately 2 GPM of oil flow. This diverter valve is equipped with a lifter circuit relief valve ( 3 ) set at 2500 psi, to prevent the diverter valve from shutting down if a blockage occurs in the lifter circuit. 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. Loosen the lock nut ( 6 ) ( *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 ( 4 ) ( *figure I-4* ) on the lifter circuit relief valve ( 3 ) and turn the adjustment screw clockwise until it bottoms out.
4. Start the truck's engine and engage the hydraulic system.
5. 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.
6. Turn the truck's engine off and release all hydraulic pressure from the system.
7. Install a 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**

8. Start the truck's engine and engage the hydraulic system.

**9. 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.

**10. 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 10.*
11. Tighten the lock nut ( 6 ) ( *figure I-4* ) on the hand valve relief valve(s) ( 5 ) to secure the correct pressure setting(s).
  12. Tighten the lock nut ( 4 ) ( *figure I-4* ) on the lifter circuit relief valve ( 3 ) to secure the correct pressure setting.
  13. 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.

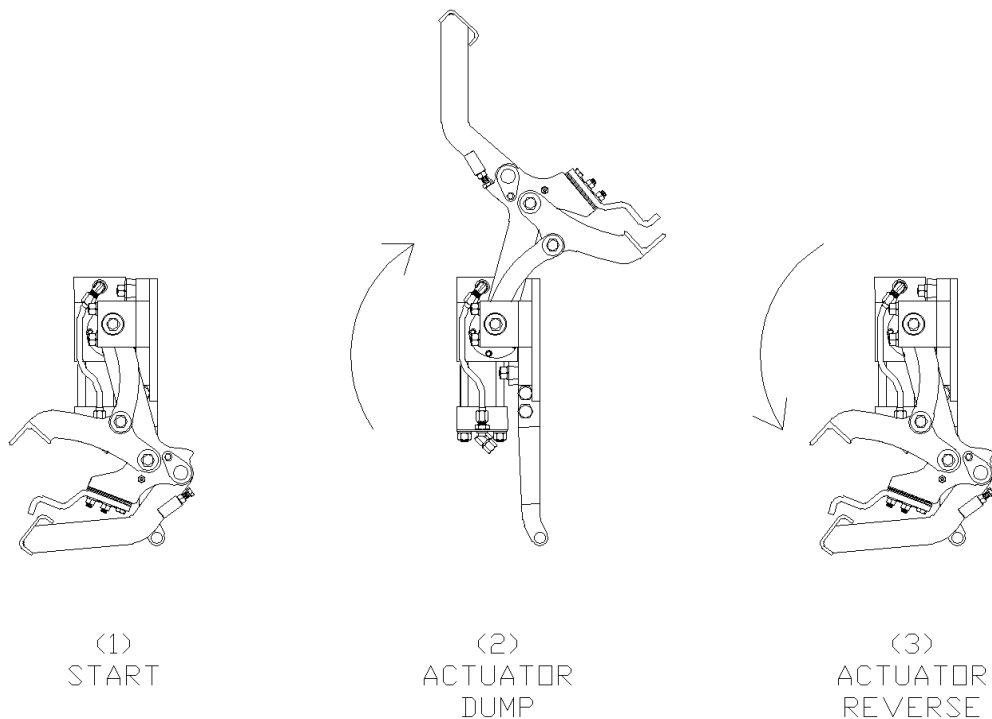
## OPERATION INSTRUCTIONS ( WI-0429-A )

### 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 clamp bar automatically rotates to "lock" the cart to the lifter.
- 3) ***ACTUATOR REVERSE*** - The rotary actuator reverses its cycle returning the cart to the start position. The clamp bar automatically retracts to "unlock" the cart from the lifter.



**figure O-1**

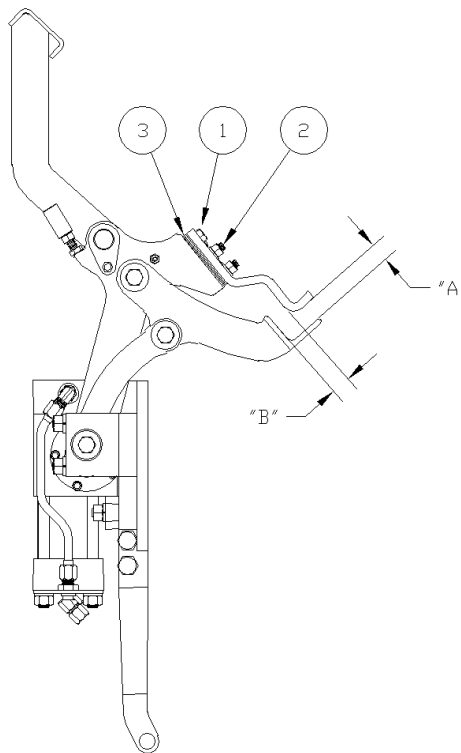
**Warning: Exceeding the 8 to 10 second cycle time on any lifter will void the manufacturer's warranty.**



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.

## CLAMP BAR ADJUSTMENT

Check the distances (*figure O-2*) between the finger bar and the clamp bar when the lifter faceplate is in the **FULL DUMP** position. Maintain these dimensions at approximately 7/8" for the proper "locking" of the cart to the lifter. To adjust these settings, remove the nuts ( 1 ) and bolts ( 2 ) that hold finger bar. Add or remove finger bar shims ( 3 ) to obtain the correct dimension of approximately 7/8" at ( **B** ). Use the slots in the finger bar to obtain the correct dimension of approximately 7/8" at ( **A** ). Replace the bolts ( 2 ) and tighten the nuts ( 1 ). The object of these adjustments is to properly hold container without excessive force.



**figure O-2**

**CAUTION:** *The distance in figure O-2 is an arbitrary figure based on information furnished by cart manufacturers. It is the responsibility of the owner / operator of this equipment to adjust these dimensions to be compatible with his specific application.*

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 1120-1045 ( WI-1135-B )**

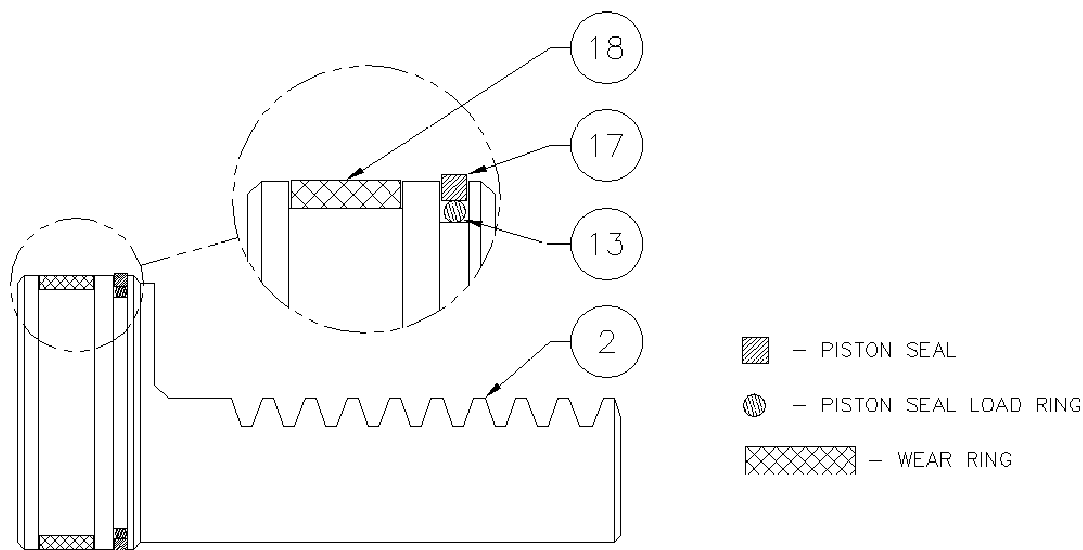
**LICENSED UNDER ONE OR MORE OF THE FOLLOWING U.S. PATENTS:**  
**4,773,812    1,327,765    5,308,211    5,333,984**

#### **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.

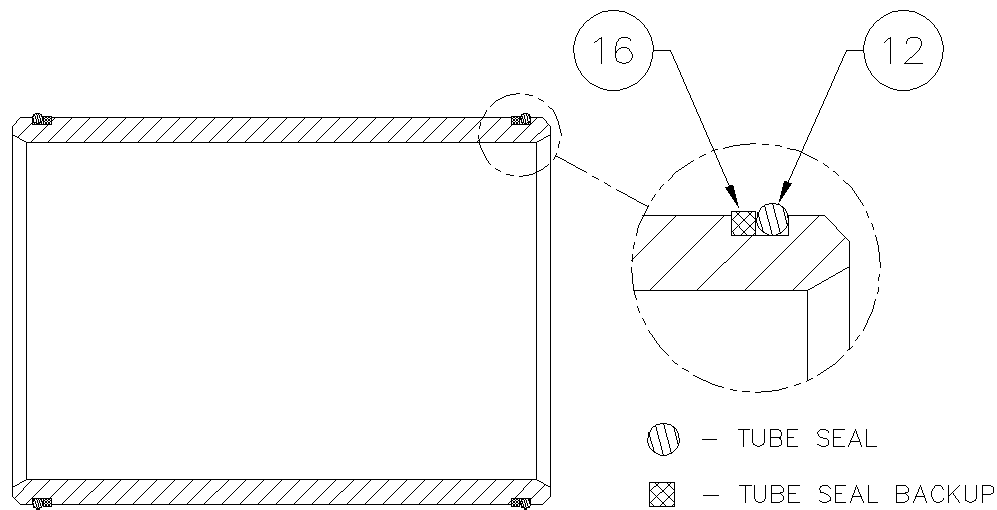
**NOTE:** All torque values given apply to clean dry threads only. Follow these directions closely when repairing the Rotary Actuator.

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.



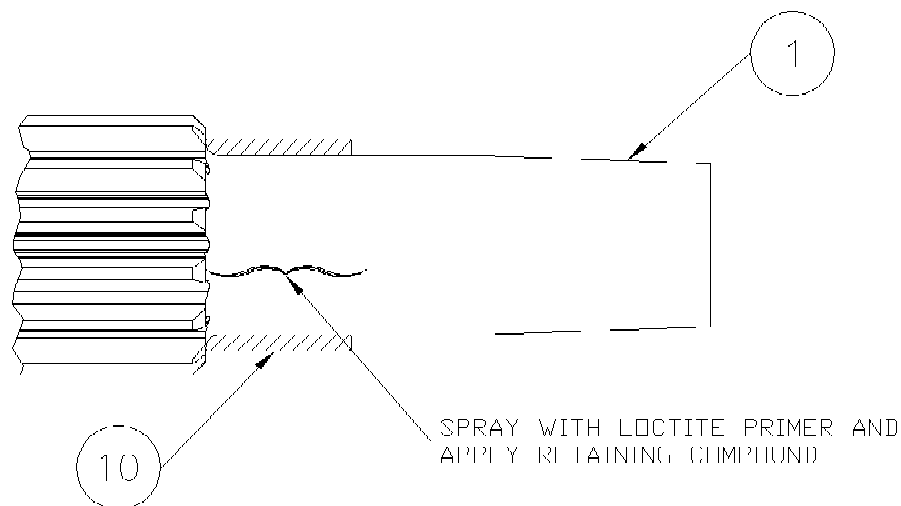
**figure A-1**

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.



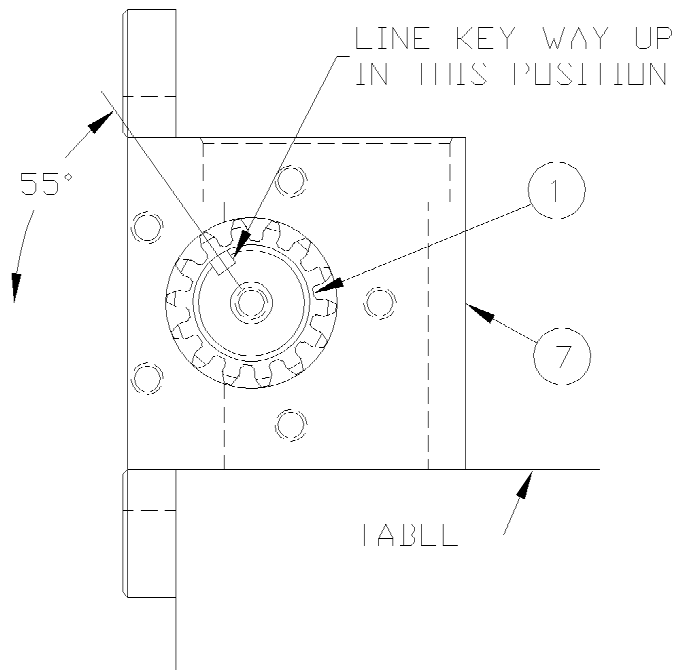
**figure A-2**

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.



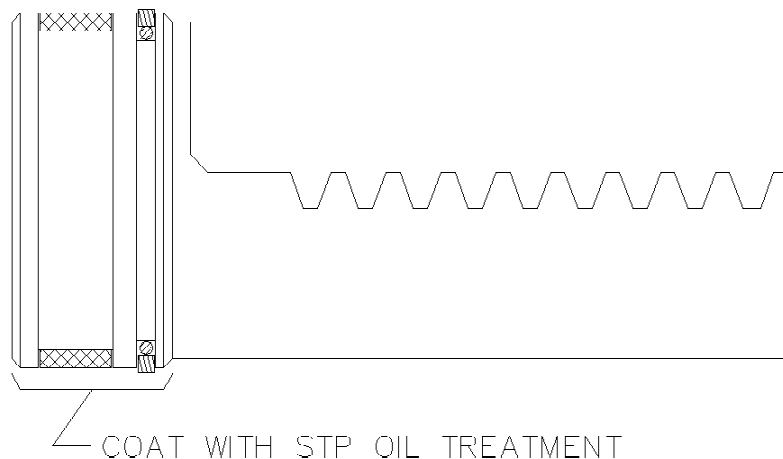
**figure A-3**

4. 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 in the position as shown in figure A-4. Center the pinion in the actuator body.



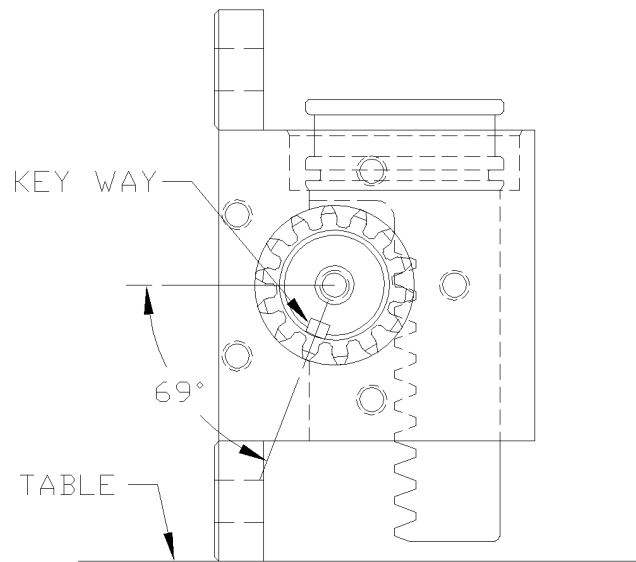
**figure A-4**

5. 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 mounting flanges on the actuator body as shown in figure A-6.



**figure A-6**

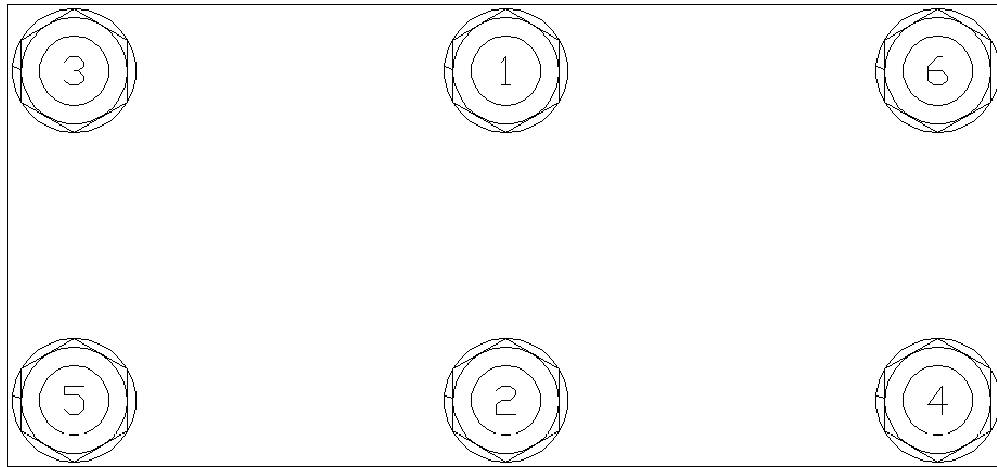
7. Coat one end of the actuator tubes (3) (fig. A-13) around the seal area with STP Oil Treatment as shown in figure A-7. Using a rubber mallet, drive the coated end of the tube onto the exposed rack until the tube end seats in the actuator body, making sure that the seals remain in place as the tube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



**figure A-7**



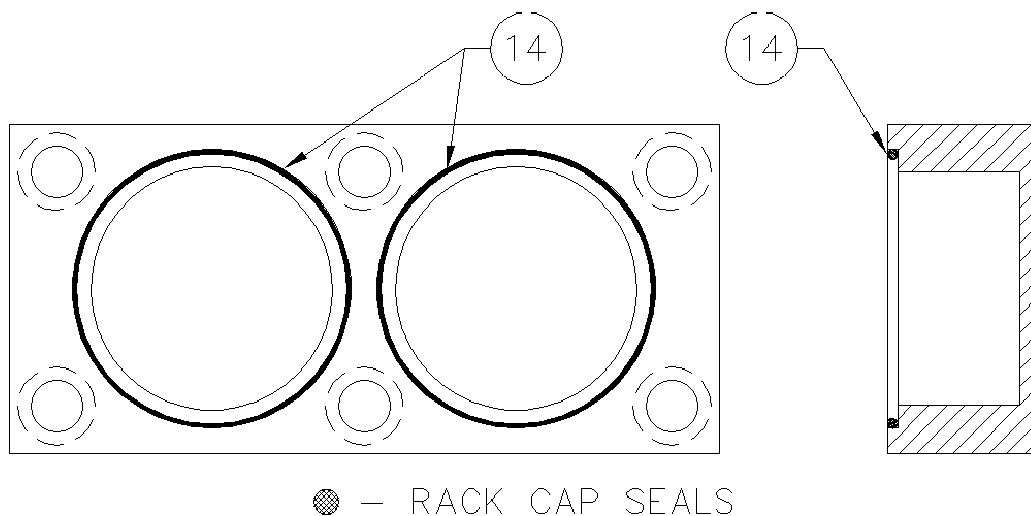
8. Install the four tie rod studs (6) and two tie rod studs (33) (fig. A-13) by screwing the short threaded end into the actuator body. Hand tighten only at this time (the torque needed will be applied later in the procedure).
9. Place the tube cap (4) (fig. A-13) on the table. Coat the sides of the 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

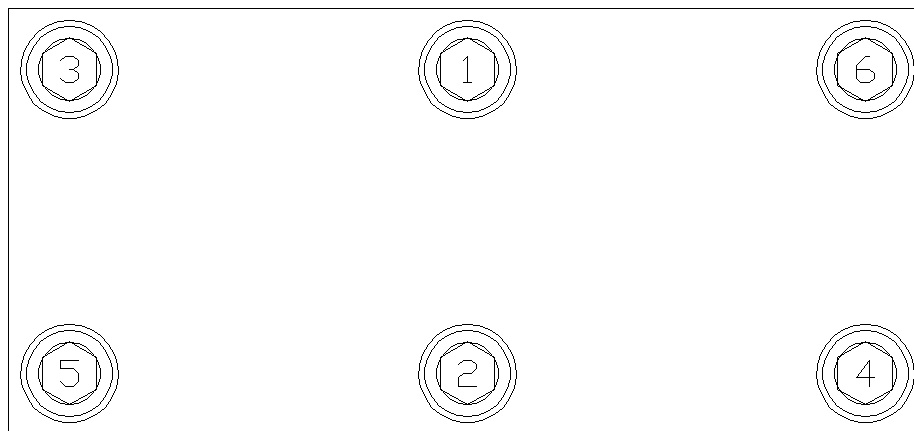
**figure A-8**

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 (14) (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.

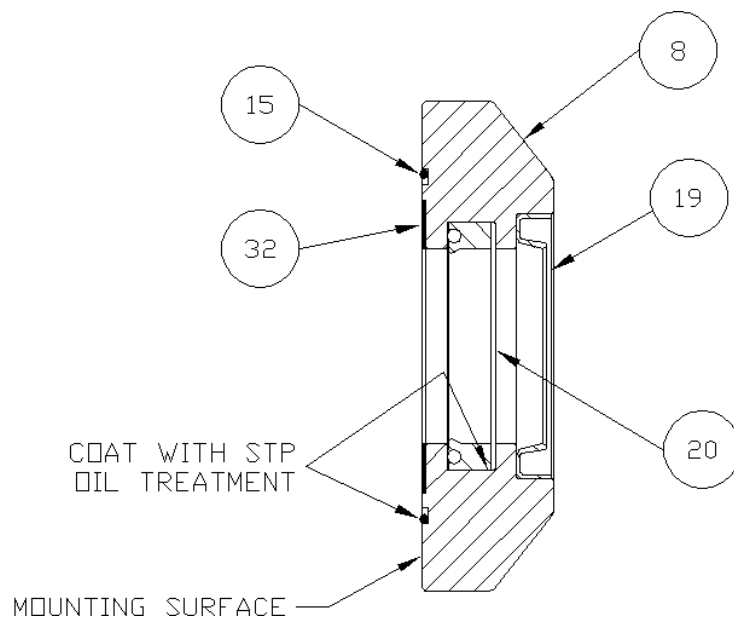


RACK CAP TORQUE SEQUENCE

**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 15° past "straight up" toward the rack cap and 15° past "straight down" toward the tube cap at each end of the 210° stroke. If the assembly does not perform all of these functions correctly, it must be disassembled, cleaned, and reassembled.

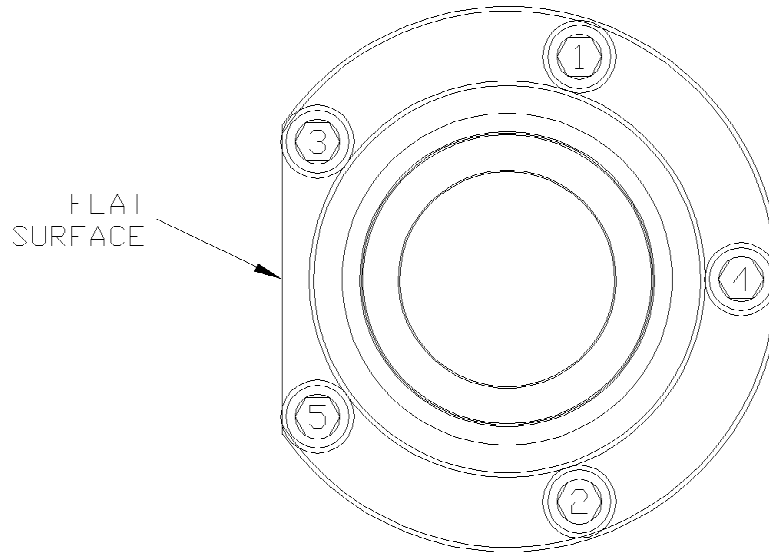
15. Re-center the actuator pinion in the actuator body by tapping on one end of the shaft with a rubber mallet. Install the roller bearing (9) (fig. A-13), over the pinion shaft and inner race, and into the actuator body. Repeat this procedure for the other bearing.
16. Thoroughly clean the bearing caps (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) and thrust washer (32) into their respective grooves on the bearing cap mounting surface as shown in figure A-11.
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 90° 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 90° end must be pointing 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 fitting in the rack cap and the bulk-head 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. Install the flow regulator (34) and necessary fittings (35) and (36) as shown 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

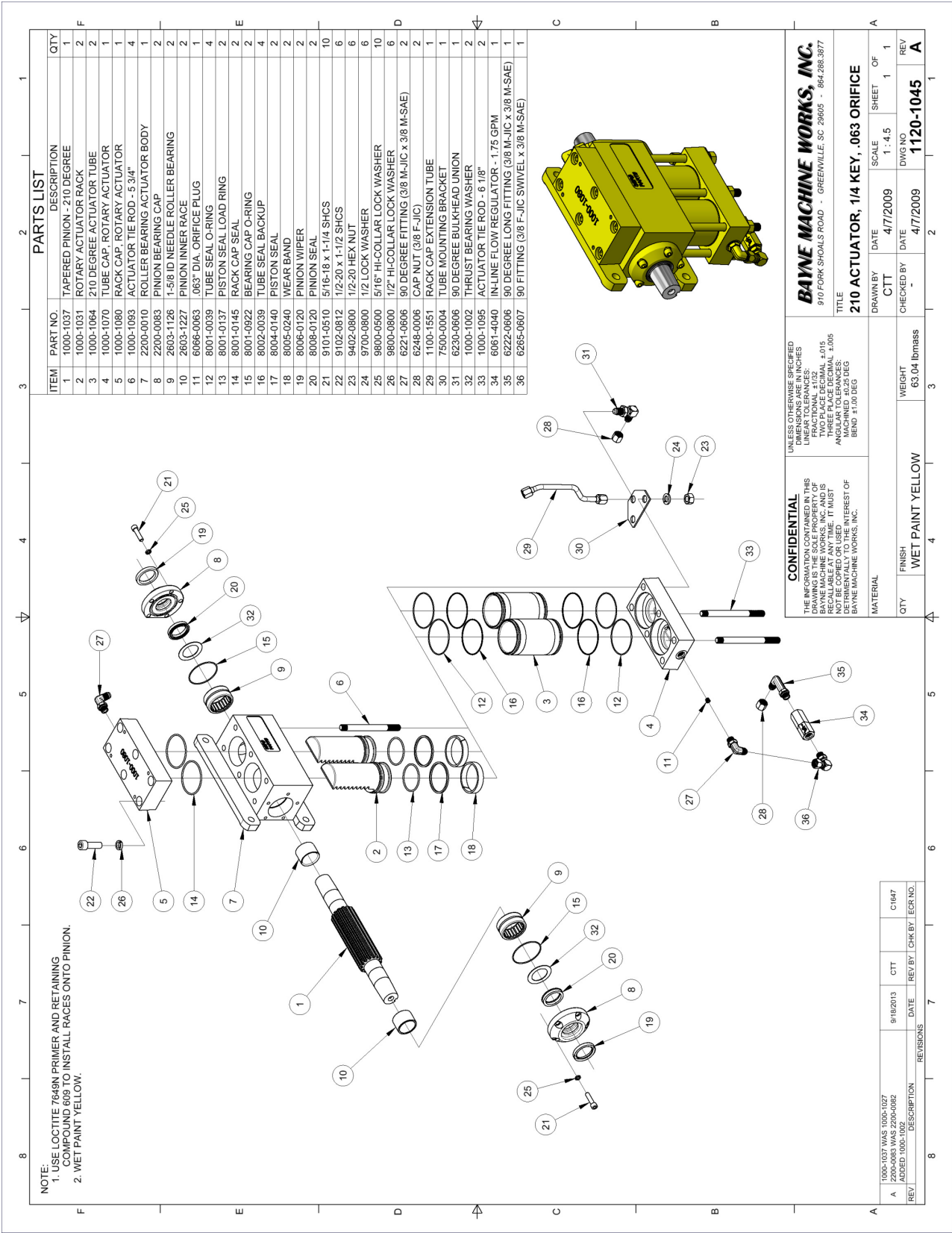


figure A-13

## TROUBLE-SHOOTING CHART ( WI-0051 )

| <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 full system relief in diverter valve.</li> <li>4. Replace hand valve.</li> </ol>   |
| Lifter operates extremely slow.               | <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-0051 )

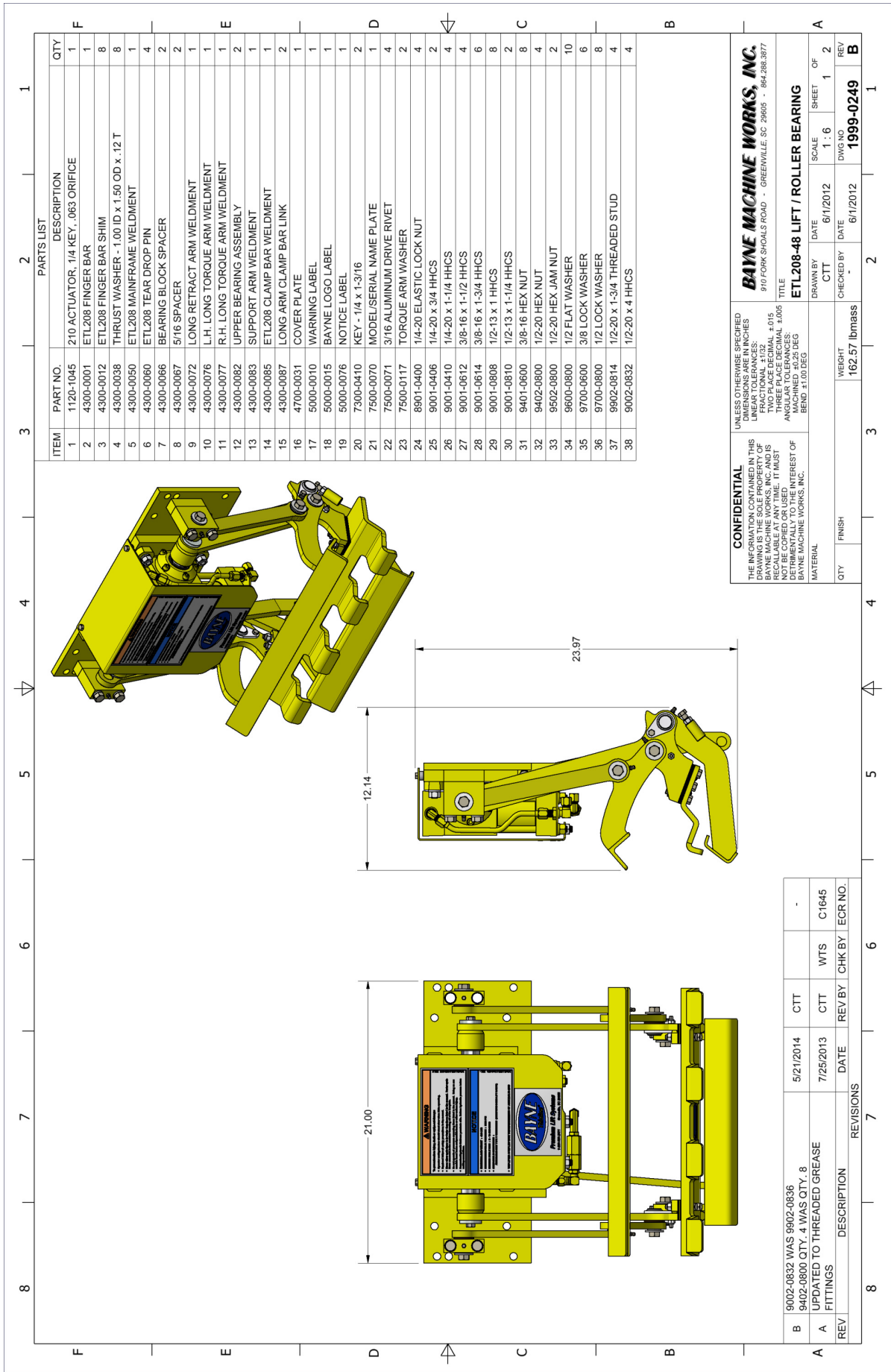
| <i><b>SYMPTOM</b></i>   | <i><b>POSSIBLE CAUSES</b></i>  | <i><b>CORRECTIVE ACTION</b></i>  |
|---|--|--|
| Hydraulic components down stream of diverter valve not operating or operating extremely slow. | <ol style="list-style-type: none"> <li>1. Truck system hydraulic pressure too low.</li> <li>2. 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 o-rings.</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-0051 )

| <i><b>SYMPTOM</b></i>                                     | <i><b>POSSIBLE CAUSES</b></i>   | <i><b>CORRECTIVE ACTION</b></i>   |
|---|---|---|
| Clamp bar connecting rods frequently breaking or bending. | 1. Clamp bar to finger dimension out of adjustment.   | 1. Adjust clamp bar to finger dimension as described in the Operation Instructions of this manual.  |
| Lifter looses carts when dumping.                         | 1. Clamp bar to finger dimension out of adjustment.<br><br>2. Loose saddle box assembly on faceplate. | 1. Adjust clamp bar to finger dimension as described in the Operation Instructions of this manual.<br><br>2. Tighten all bolts on saddle box. |
| Top of carts being scored or damaged in clamp bar area.   | 1. Clamp bar to finger dimension out of adjustment.   | 1. Adjust clamp bar to finger dimension as described in the Operation Instructions of this manual.  |

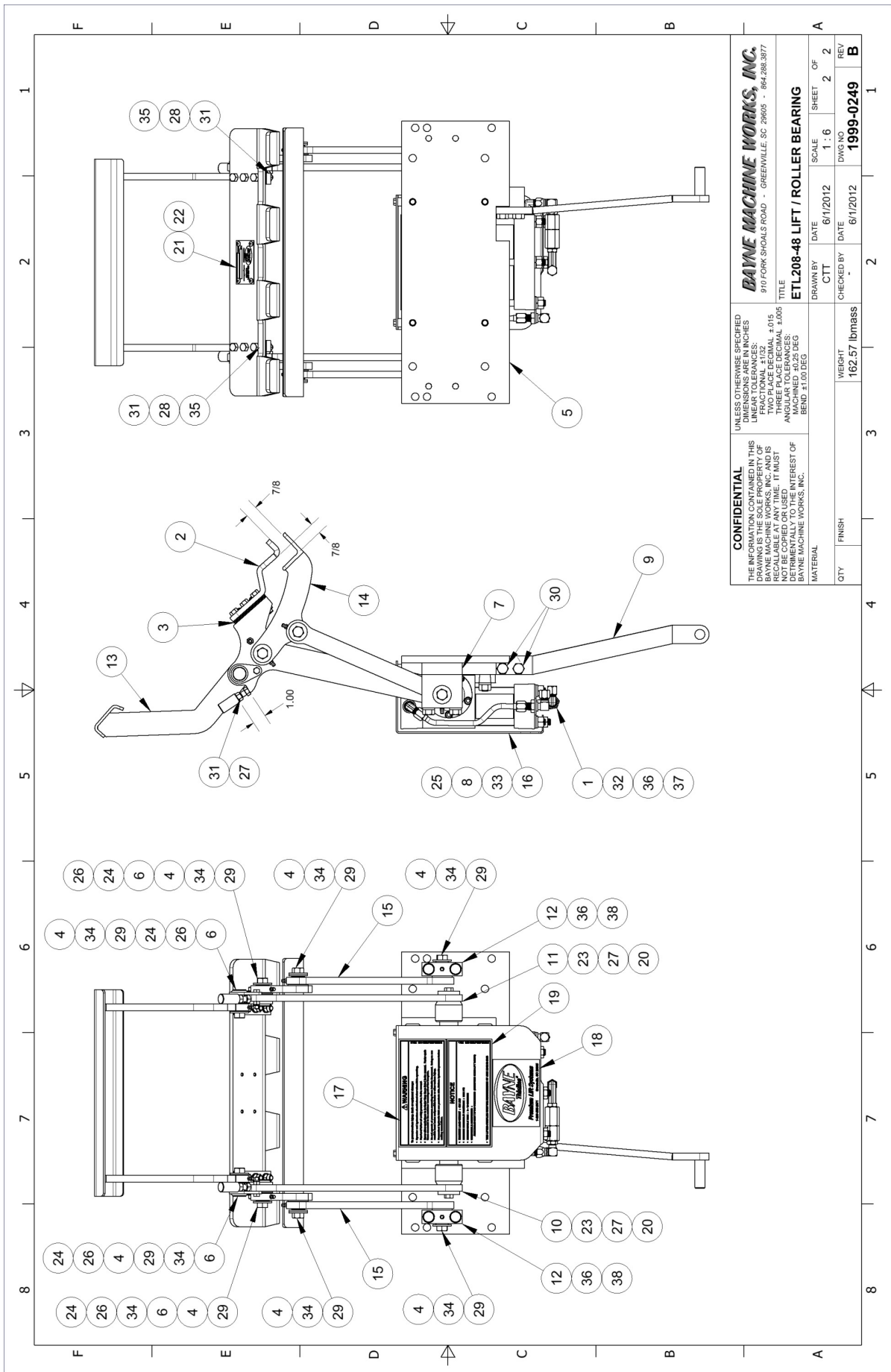


**APPENDIX A**  
Assembly drawings and part numbers

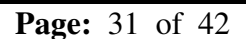


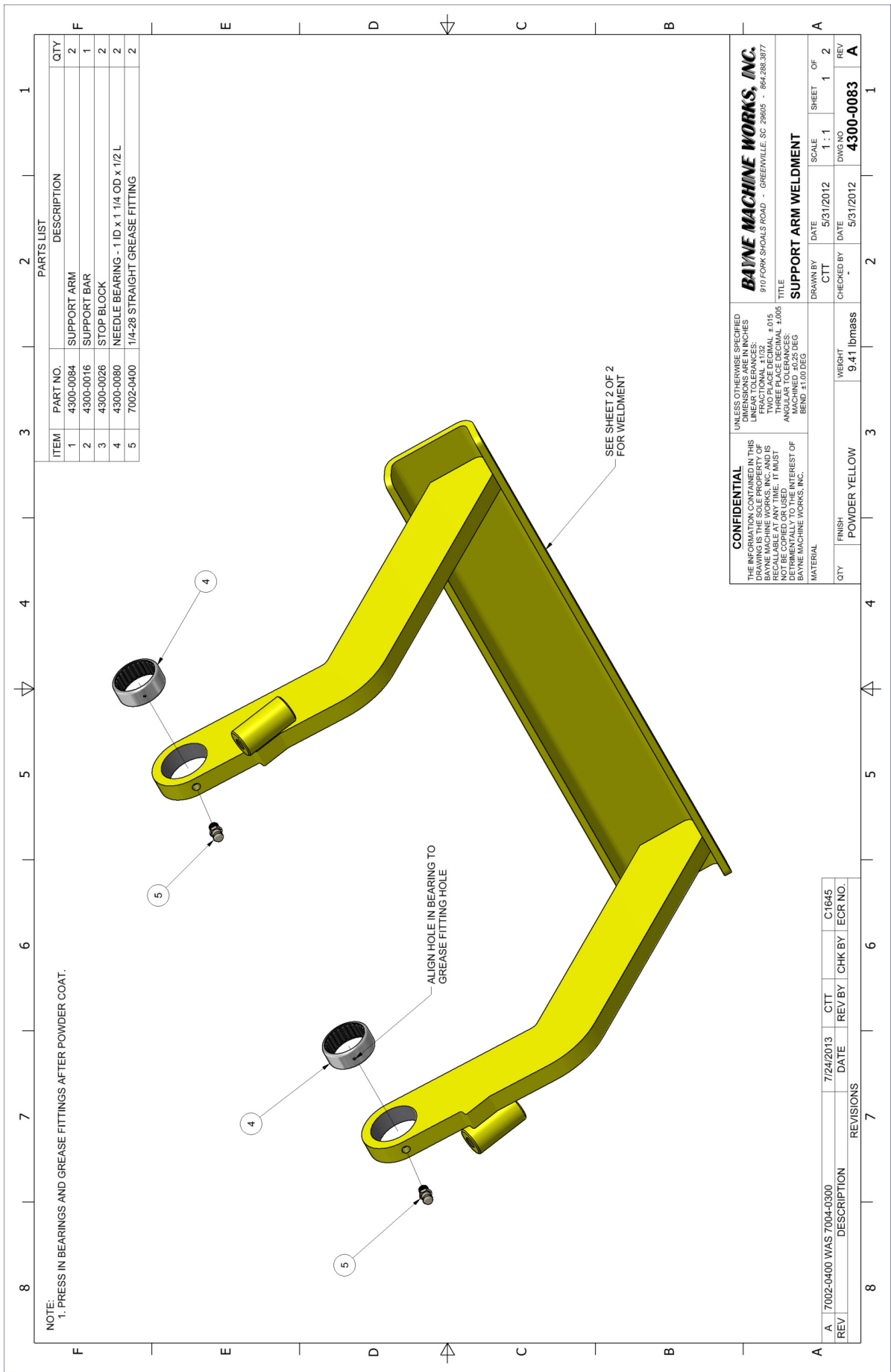
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| BAYNE MACHINE WORKS, INC.<br>910 FORK SHOALS ROAD - GREENVILLE, SC 29605 - 864-286-3877   |                        | TITLE<br><b>ETL208-48 LIFT / ROLLER BEARING</b>   |                 |
| DRAWN BY<br>CTT   | DATE<br>6/12/2012      | SCALE<br>1 : 6  | SHEET<br>1      |
| CHECKED BY<br>-   | DATE<br>6/12/2012      | DWG NO<br><b>1999-0249</b>  | REV<br><b>B</b> |
| QTY<br>162.57 lbmss   | WEIGHT<br>162.57 lbmss |   |                 |

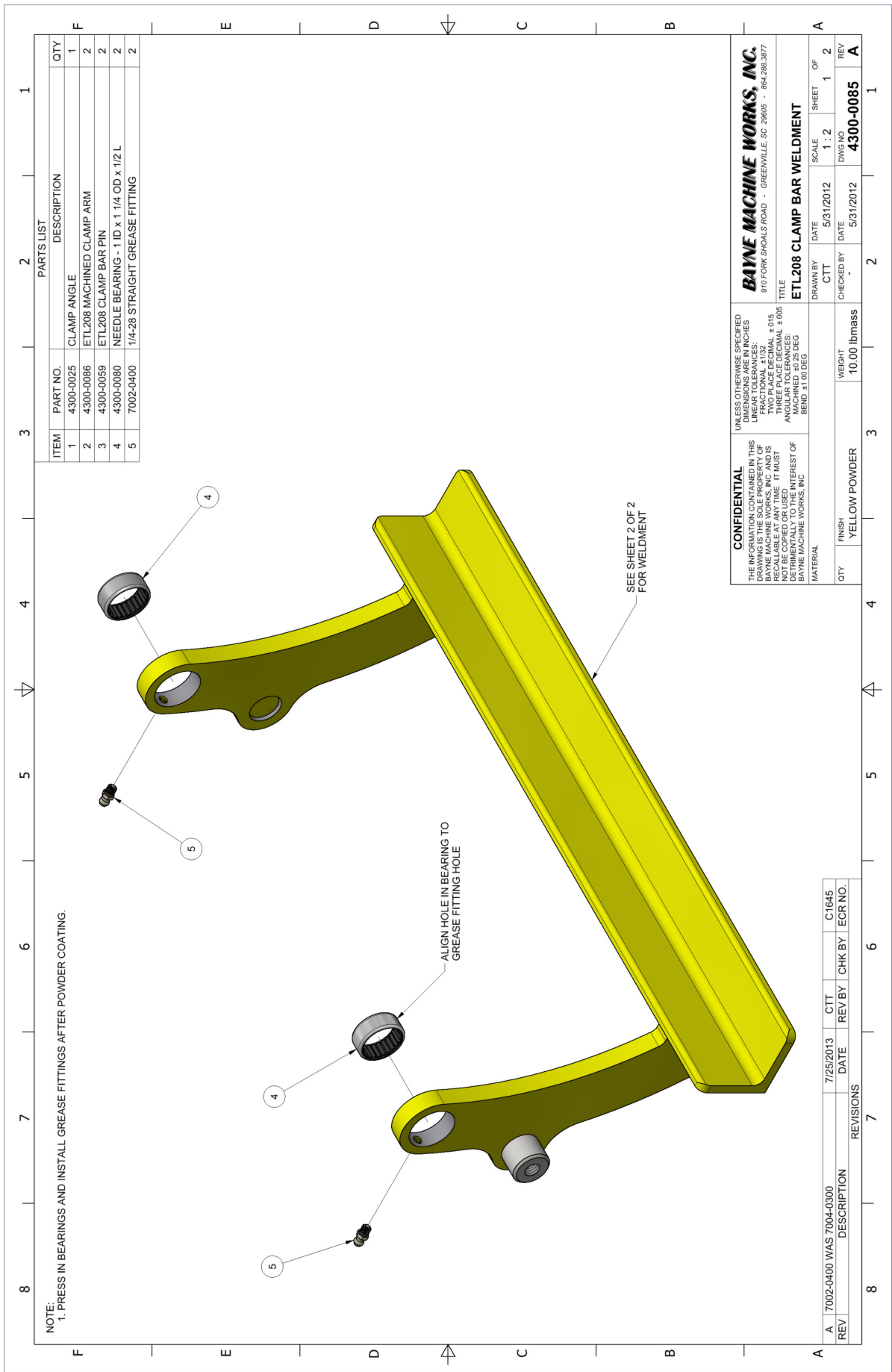
| REV | DESCRIPTION                         | DATE      | REV BY | CHK BY | ECR NO. |
|-----|-------------------------------------|-----------|--------|--------|---------|
| B   | 9902-0832 WAS 9902-0836             | 5/21/2014 | CTT    |        | -       |
| A   | 9402-0800 QTY. 4 WAS QTY. 8         | 7/25/2013 | CTT    | WTS    | C1645   |
|     | UPDATED TO THREADED GREASE FITTINGS |           |        |        |         |

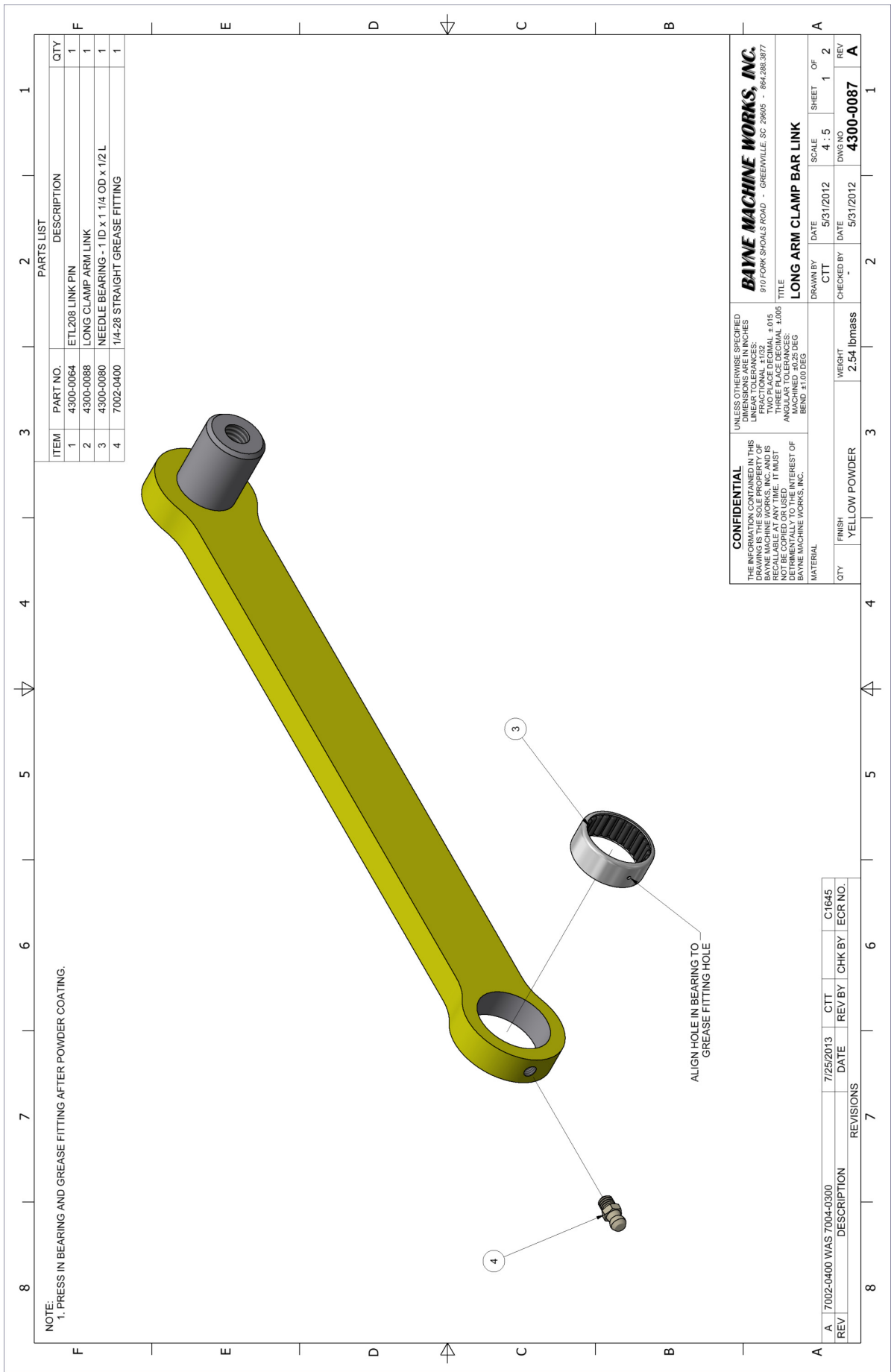


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| <b>CONFIDENTIAL</b> |        | UNLESS OTHERWISE SPECIFIED<br>DIMENSIONS ARE IN INCHES<br>FRACTIONAL - 1/32<br>DECIMAL - 0.005<br>THREE PLACE DECIMAL - 0.005<br>ANGLES - 0.005 DEG<br>BEND - 1.00 DEG |            | <b>BAYNE MACHINE WORKS, INC.</b><br>910 FORK SHOALS ROAD - GREENVILLE, SC 29605 - 864.286.3877<br>TITLE<br><b>ETL208-48 LIFT / ROLLER BEARING</b> |           |       |    |
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|                     |        | 162.57 lbmass  | CTT        | 6/12/2012   | 1 : 6     | 2     | 2  |
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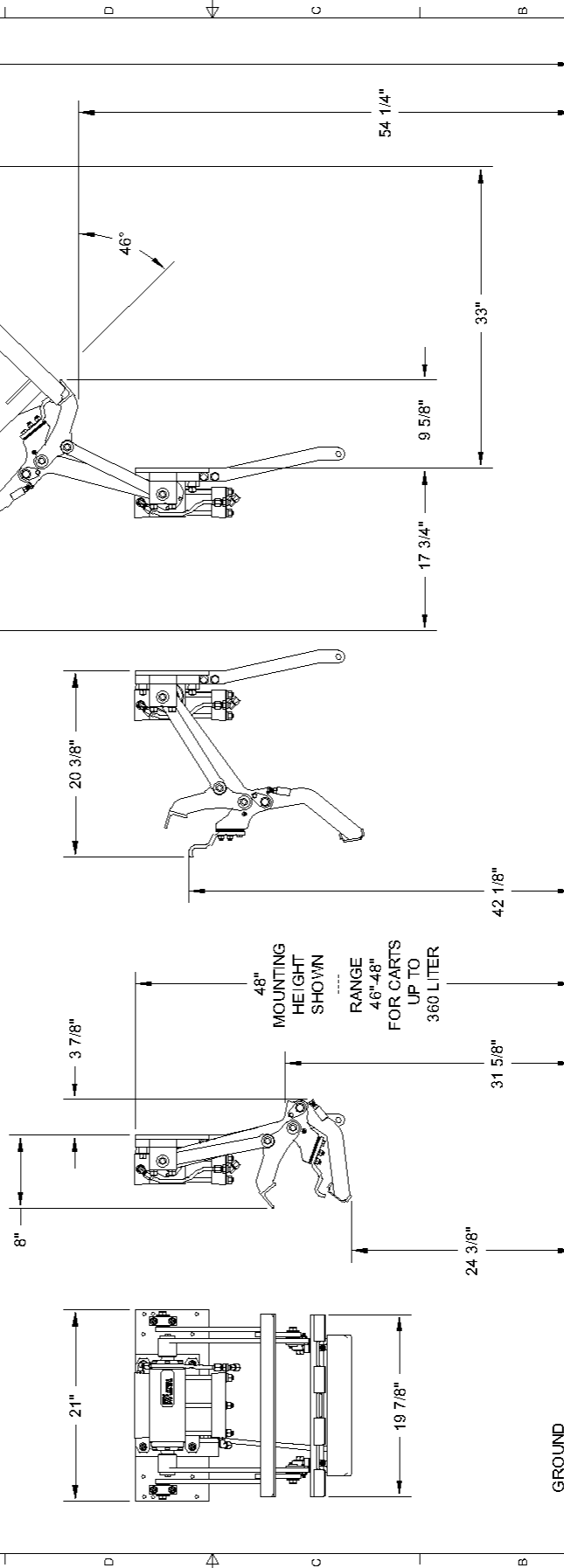






NOTE:

1. DIMENSIONS ACCOMMODATE MOST ANSI Z245.60-2008 TYPE C CONTAINERS (EUROPEAN COMB-LIFT CARTS), BUT MAY VARY DUE TO CONTAINER SPECIFICATIONS OR APPLICATIONS.
2. ALL DIMENSIONS ARE APPROXIMATE.
3. FOR BOLT-ON APPLICATIONS USE MOUNTING PLATE KIT 2000-1112.
4. PART NUMBERS: 1999-0248 - ETL 208-48"  
1999-0249 - ETL 208-48" W/ROLLER BEARINGS



**BAYNE MACHINE WORKS, INC.**  
910 FORK SHOALS ROAD - GREENVILLE, SC 29605 - 864-286-3877

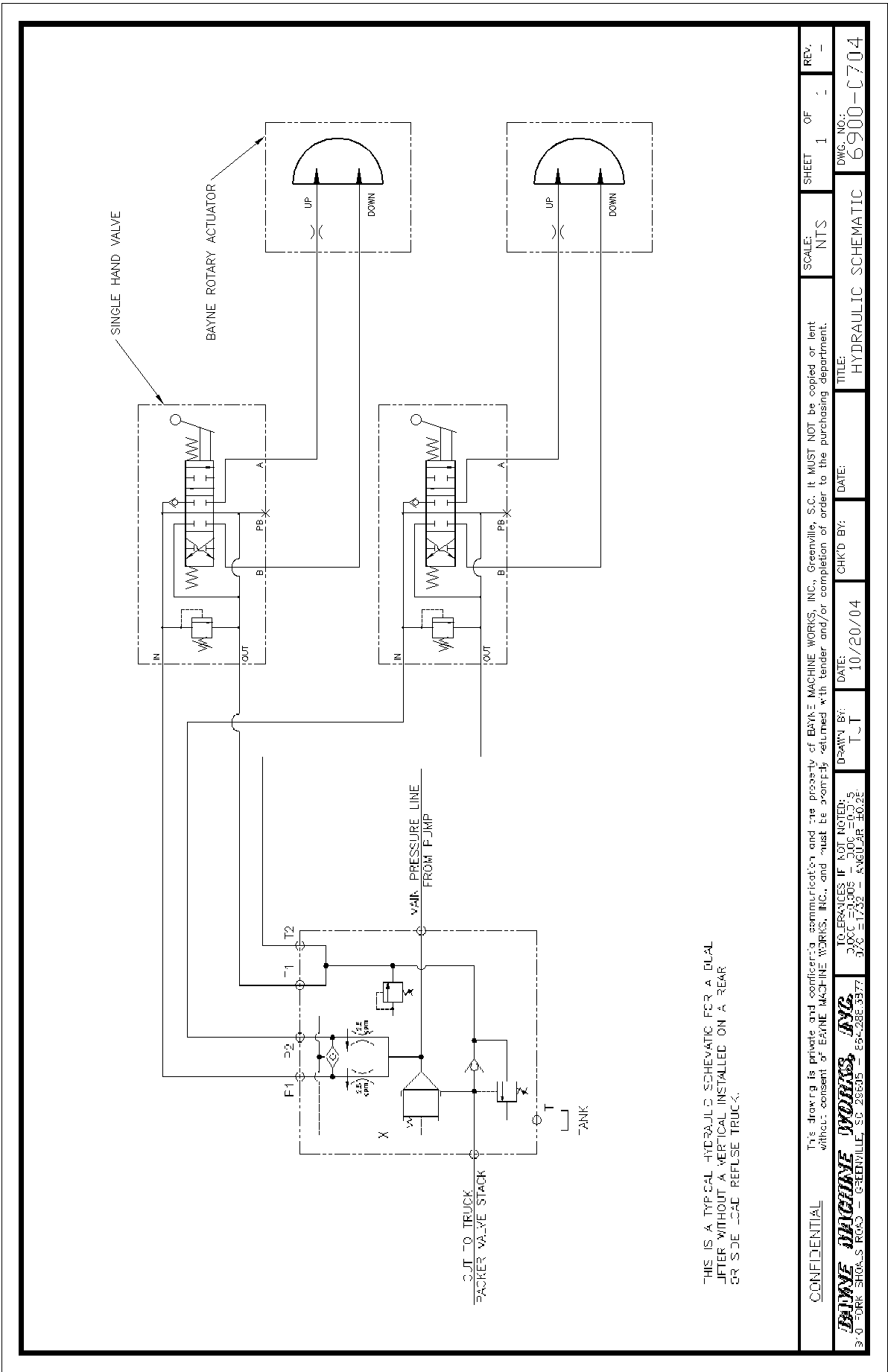
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UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES.  
LINEAR TOLERANCES:  
FRACTIONS DECIMALS  
TWO PLACE DECIMAL .005  
THREE PLACE DECIMAL .006  
ANGULAR TOLERANCES:  
MACHINED SURFACES  
BEND ±1.00 DEG

**ETL 208-48" SPECIFICATIONS**

|          |        |          |            |       |          |     |
|----------|--------|----------|------------|-------|----------|-----|
| MATERIAL |        | DRAWN BY | DATE       | SCALE | SHEET    | OF  |
|          |        | CTT      | 10/20/2009 | NONE  | 1        | 1   |
| QTY      | FINISH | WEIGHT   | CHECKED BY | DATE  | DWG NO   | REV |
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THIS IS A TYPICAL HYDRAULIC SCHEMATIC FOR A DUAL JIFTER WITHOUT A VERTICAL INSTALLED ON A REAR OR SIDE LOAD REFUSE TRUCK.

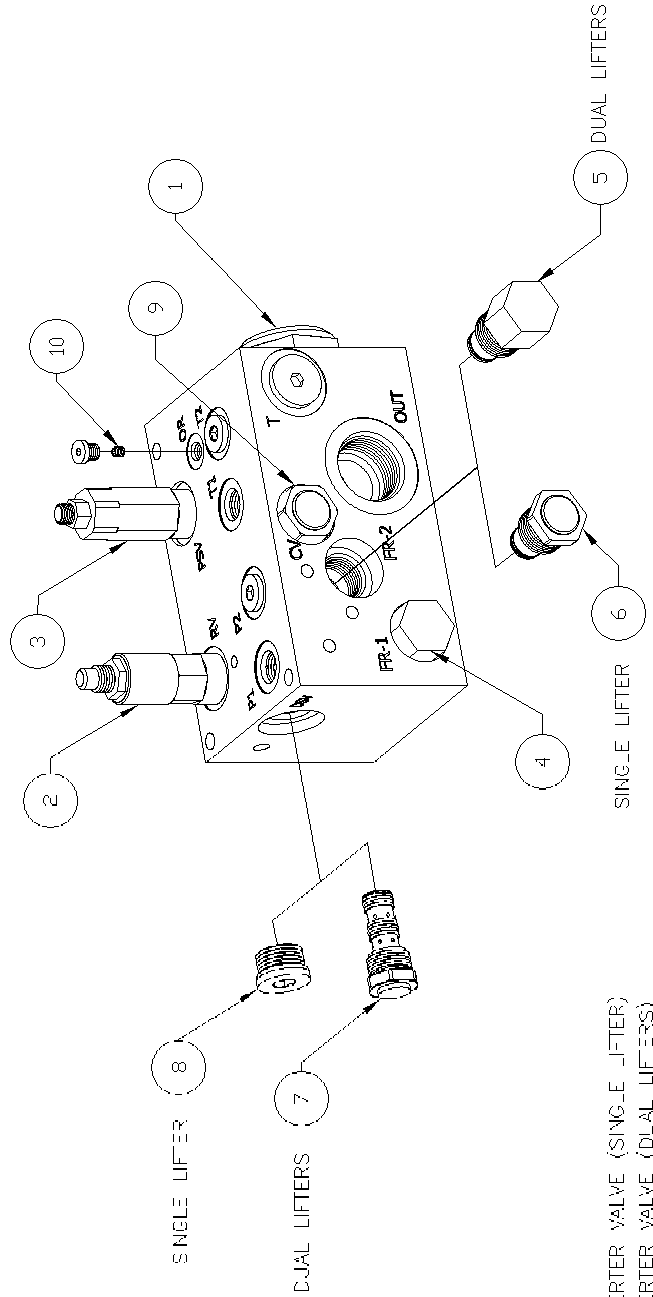
|  |   |                |                  |                            |
|--|---|----------------|------------------|----------------------------|
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| <b>BAYNE MACHINE WORKS, INC.</b><br>301 DORR SHOULS ROAD - GREENVILLE, SC 29635 - 864-286-3377 | TOLERANCES IF NOT NOTED:<br>300°C = 0.3005 - 0.0005<br>0.75°C = 1.753 - 1.752   | DATE: 10/20/04 | CHK'D BY: T.J.T. | DWG. NO.: 6900-C704        |
|  |   |                |                  | TITLE: HYDRAULIC SCHEMATIC |

# SERVICE PARTS

|      |      |           |                              |           |                   |
|------|------|-----------|------------------------------|-----------|-------------------|
| 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               | 8000-0784 | 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                | 8000-0784 | ALL               |
| 8    |      | 6246-0008 | NO. 8 SAE SOCKET HEAD PLUG   | 8000-0784 | ALL               |
| 9    | CV   | 6091-0714 | CHECK VALVE                  | 8000-0784 | ALL               |
| 10   | DR   | 6066-0028 | Ø028" DRIFTER                | -         | ALL               |
| ITEM | PORT | PART NO.  | DESCRIPTION                  | SEAL KIT  | APPLICATIONS      |

## NOTE:

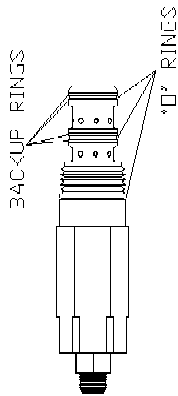
1. MAXIMUM WORKING PRESSURE 3000 PSI
2. MAXIMUM WORKING FLOW 50 GPM
3. TEMPERATURE RANGE = 160° MAXIMUM
4. PORT SIZES  
IN & OUT = #16 SAE  
T = #10 SAE  
T1, T2, P1 & P2 = #6 SAE
5. T2 & P2 ARE PLUGGED USING #6 SAE PLUGS IN SINGLE LIFTER APPLICATIONS



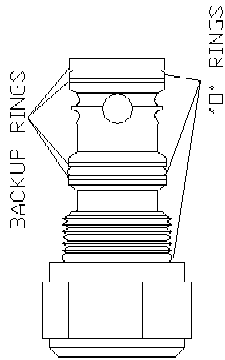
- 6091-0700 COMPLETE DIVERTER VALVE (SINGLE LIFTER)
- 6092-0700 COMPLETE DIVERTER VALVE (DUAL LIFTERS)

|   |  |                |   |                   |
|---|--|----------------|---|-------------------|
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| BAYNE MACHINE WORKS, INC.<br>8 CARR SHOLLS ROAD - GREENVILLE, SC 29635 - 664-286-3377 | TOLERANCES IF NOT NOTED:<br>3000 ±0.005 - 3000 ±0.005<br>Ø/2 ±0.003 - ANGULAR ±0.02  | DATE: 09/24/04 | CHKD BY: T.J.T.                         | CIT               |
|   |  | DATE: 10/11/04 | TITLE: SINGLE/DUAL DIVERTER VALVE PARTS | DWG. NO: M3500J05 |

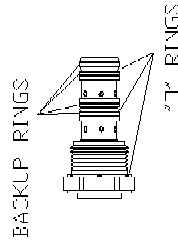
| ITEM NO. | PART NO.  | DESCRIPTION                     | QTY |
|----------|-----------|---------------------------------|-----|
| 1        | 8000-0781 | PRES. SEQUENCE VALVE SEAL KIT   | 1   |
| 2        | 8000-0782 | PRESSURE SENSING VALVE SEAL KIT | 1   |
| 3        | 8000-0783 | SHUTTLE VALVE SEAL 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   |



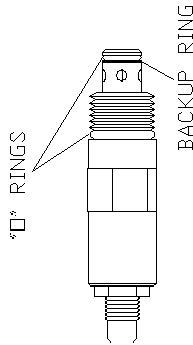
PRESSURE SEQUENCE VALVE SEAL KIT



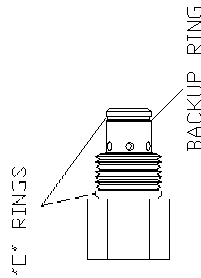
DIFFERENTIAL PRESSURE SENSING VALVE SEAL KIT



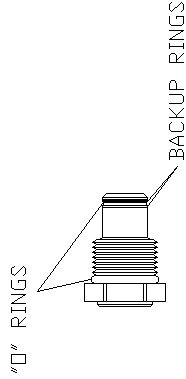
SHUTTLE VALVE SEAL KIT



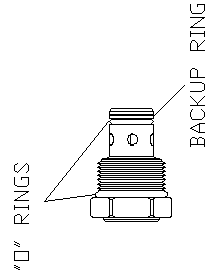
RELIEF VALVE SEAL KIT



FLOW REGULATOR SEAL KIT



FLOW REGULATOR CAVITY PLUG SEAL KIT

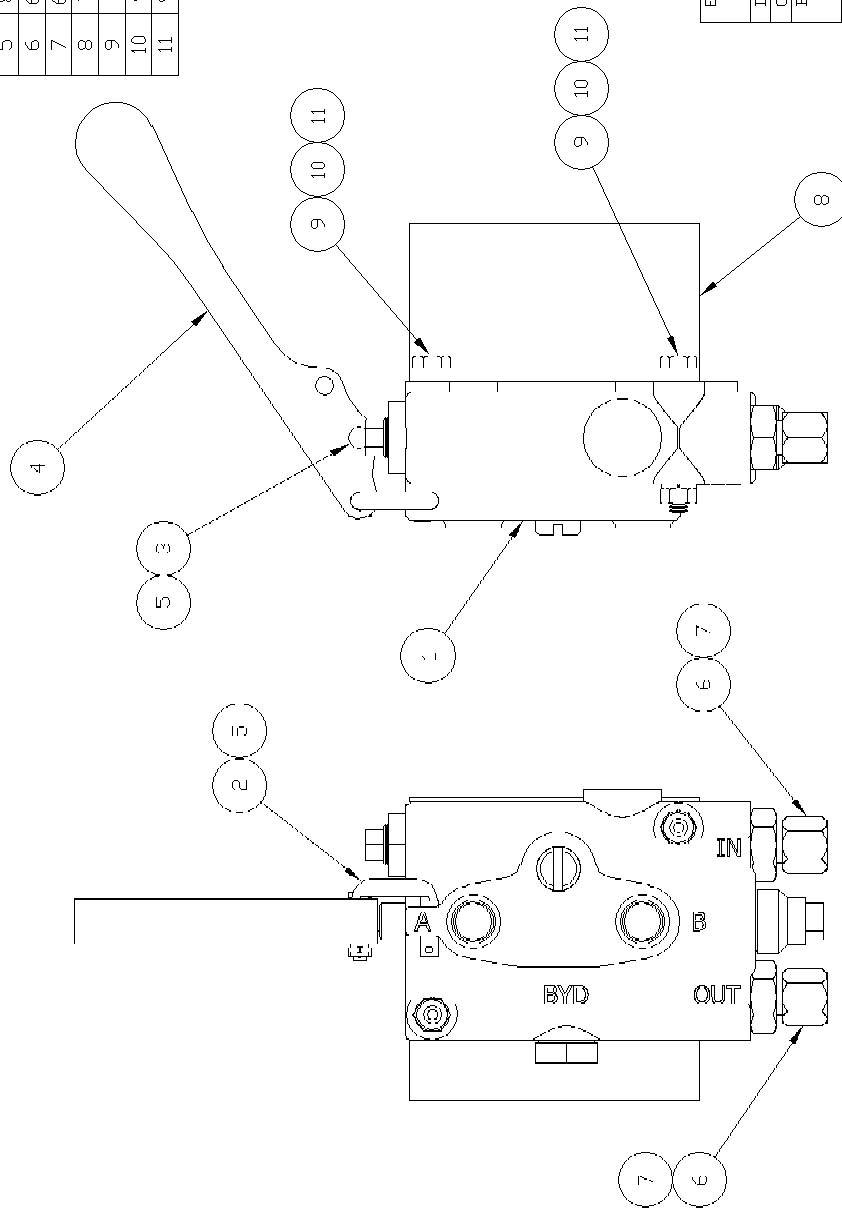


CHECK VALVE SEAL KIT

|  |   |                  |                                |                     |
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| <b>BAYNE MACHINE WORKS, INC.</b><br>301 DORR SHOULS ROAD - GREENVILLE, SC 29635 - 864-288-3377 | TOLERANCES IF NOT NOTED:<br>FRACTIONS = 1/32" - 1/16" = 1/32" - ANGULAR ±0.02°  | DRAWN BY: T.C.T. | DATE: 09/29/04                 | CHK'D BY:           |
|  |   |                  | TITLE: DIVERter VALVE SEAL KIT | DWG. NO.: 8000-0780 |

| 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" HH.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 : 8003-C085  
 2. HANDLE REPAIR KIT P/N : 5083-1501



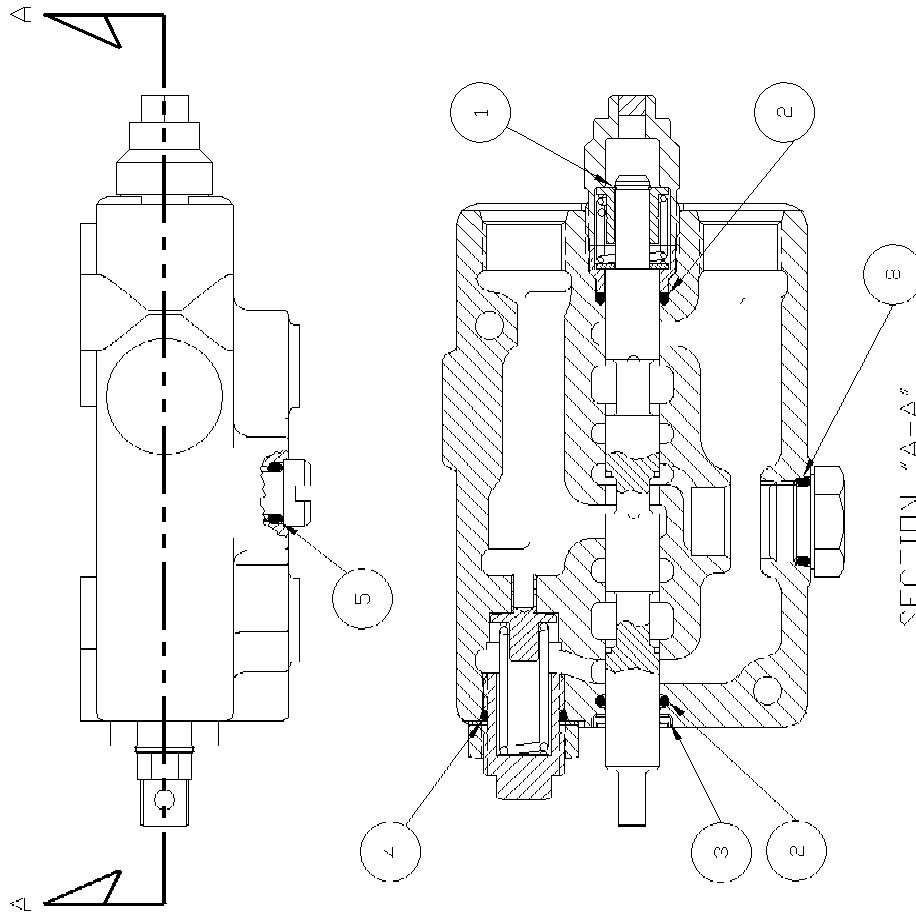
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|-----------|---|----------|--------------|------|--------------|
| E         | 6083-1025 WAS 6083-1020<br>ADDED 6083-1510 & 6083-1511<br>ADDED 6083-1520 & 8810-0303   | 05/24/07 | CTT          |      | CL515        |
| D         | REVISED 6083-1020 PICTORIALY  | 07/13/05 | TJT          | CTT  | CL45         |
| C         | REVISED 6083-1020 PICTORIALY  | 03/30/99 | TBR          | RTA  | CL67         |
| B         | 6083-1020 WAS 6083-0420<br>ADDED 6220-0806 & 6248-0006<br>UPDATED DRAWING & TITLE BLOCK | 05/15/98 | CTT          | RTA  | C049         |
| A         | REVISED 7601-0003 PICTORIALY  | 08/27/97 | EFJ          | RTA  | C0525        |
| REV. LET. | REV. CHK. BY  | DATE     | REV. CHK. BY | DATE | REV. CHK. BY |

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DATE: 06/07/96 CHK'D BY: BKB DATE: 06/11/96 TITLE: VALVE W/BRACKET DWG. NO.: 6083-1020

DATE: 06/07/96 CHK'D BY: BKB DATE: 06/11/96 TITLE: VALVE W/BRACKET DWG. NO.: 6083-1020

| 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.

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**BAYK'S MACHINE WORKS, INC.**  
301 DORR SHOULS ROAD - GREENVILLE, SC 29635 - 864-286-3377

TO: ERACLES IF NOT NOTED:  
200C = 20.005 ± .0005  
300C = 17.005 ± .0005

DRAWN BY: T.J.T.

DATE: 07/20/05

CHKD BY:

DATE:

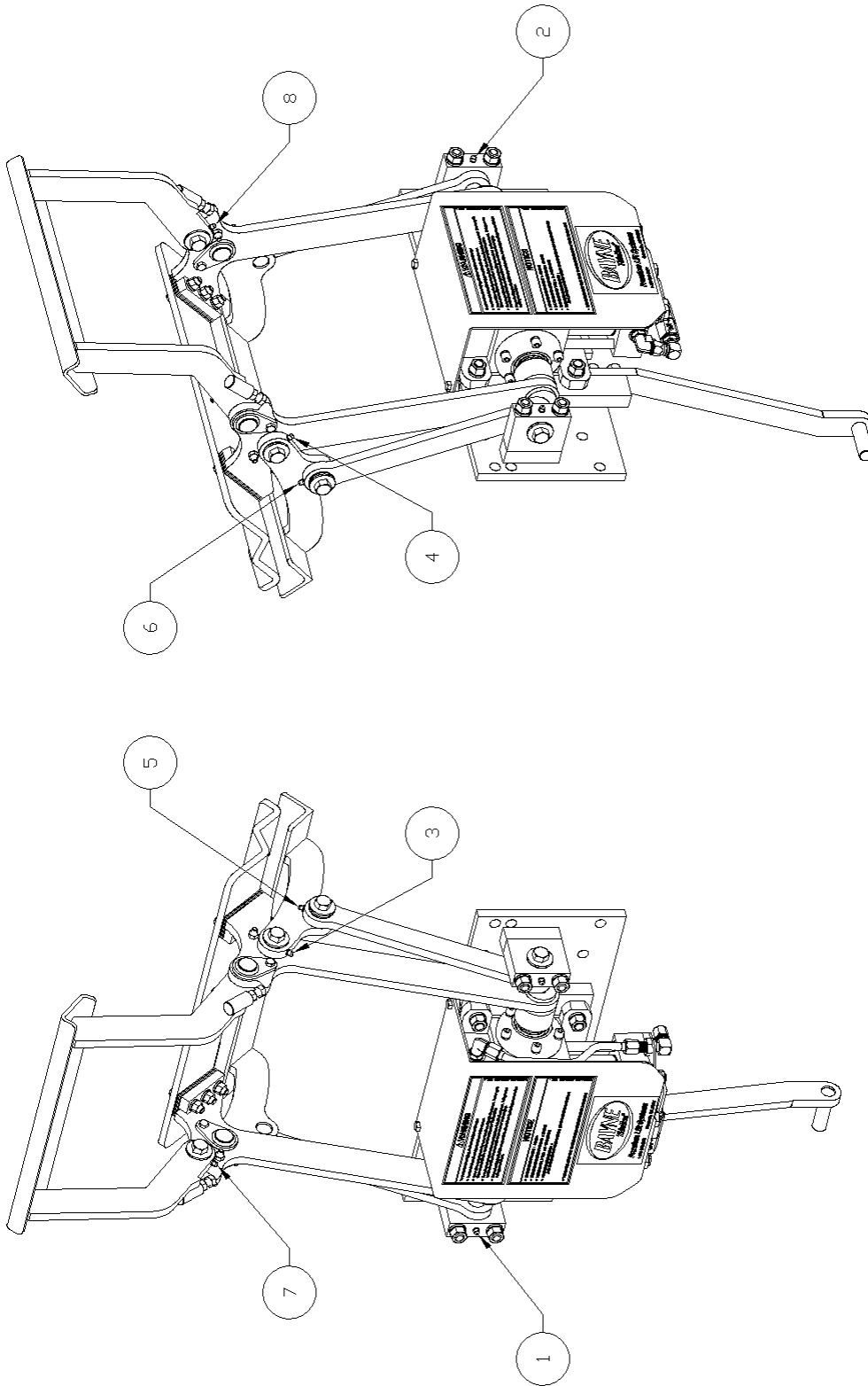
TITLE: HAND VALVE SEAL REPAIR KIT

SCALE: 1=1

SHEET 1 OF 1

REV. -

DWG. NO.: 8000-3085



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SCALE: NTS  
SHEET 1 OF 1  
REV. -

**BAYNE MACHINE WORKS, INC.**  
910 FORK SHOALS ROAD - GREENVILLE, SC 29605 - 864.288.3877  
TOLERANCES IF NOT NOTED:  
0.000  $\pm$ 0.005 - 0.000  $\pm$ 0.015  
0/0  $\pm$ 1/32 - ANGULAR  $\pm$ 0.25  
DRAWN BY: CTT  
DATE: 06/01/12  
CHK'D BY:  
TITLE: ETL 208-48" LUBRICATION POINTS  
DWG. NO.: LUB2550G



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