



TECHNICAL MANUAL

FOR

30" w x 72" h

ELECTRO-HYDRAULIC SLIDING WATERTIGHT DOORS

SUPPLIED FOR

Canadian Coast Guard

FOR

CCGS Cape Roger

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SECTION I - GENERAL INFORMATION

- A. The basic use of this type of door is to seal off bulkheads in case of emergency. It has the following characteristics:

POWER OPERATED DOOR

1. It is flametight and watertight.
2. It can be operated electrically from a remote position and from local positions each side of the bulkhead.
3. In case of power failure, it can be operated manually from local positions each side of the bulkhead and from a remote position above the door.
4. It conforms to Canadian Coast Guard regulations for Class III doors.

SECTION II - DESCRIPTION AND PRINCIPLES OF OPERATION

A. MECHANICAL EQUIPMENT

1. The power-operated door moves in a horizontal direction and is guided by guide rail assemblies. The top and bottom edges of the door and frame are machined flat with an O-ring seal. Wedge surfaces on the door and frame force the machined surfaces together and compress the O-ring when the door is closed.
2. Door is 30" w x 72"h, and is designed to seal against a 35 foot head of water.

B. HYDRUALIC EQUIPMENT

1. One double-acting hydraulic cylinder, page 48, actuates the door. Pressure is normally supplied to the cylinder by a motor driven pump. In the absence of electrical power or in the case of emergency, pressure is supplied by a rotary hand pump locally or remotely.
2. The local hand pumps are high-capacity, low speed, gear type, positive displacement reversible pump. It is located beside the door, and is reversible to permit opening or closing the door.
3. The remote hand pump station consists of a non-reversing hand pump, a mechanical indicator showing the position of the door, and a 2 gallon oil supply tank. Refer to ship's arrangement drawing for location of the remote hand pump station. The pump allows for closing of the door only.
4. The motor, pump, and hydraulic control valves are mounted on a common base to be mounted beside the door. The motor pump is a reversing pump driven by a torque type motor. The pressure switch that stops the door is set to 750 psi at the factory. There is an additional pressure switch that activates the warning horn when there is pressure from the remote pump station.
5. Local hydraulic shut-off valves are provided at the door. The valves are provided so that oil from the remote tank may be shut-off in the event of leakage, or if repairs are necessary. The door must never be operated with these valves closed.

SECTION II (continued)

C. ELECTRIC EQUIPMENT

1. A motor controller starts and stops the motor pump unit.
2. The controller is energized by two local control switches mounted one on each side of the bulkhead in close proximity to the door. There is a 5 to 10 second delay between the start of the warning horn and the start of the door closing.
3. During emergencies, the door may also be closed only by remote signal from the bridge control/indication station. The local control switches can override the close signal from the bridge. However, when the local control switch is released, the closing sequence will begin.
4. The door position indication circuit is separate from the control circuit. Red and green lights, located at the bridge control/indication station and at the remote indication station, and energized by limit switches mounted at each end of the door travel, indicate door position as follows:

Red light	-	Door Open
Green light	-	Door Closed
Flashing red light	-	Door in Intermediate Position
5. The door may be opened or closed from the local station but closed only from the bridge station.

SECTION III - INSTALLATION PROCEDURE

A. GENERAL INFORMATION FOR HYDRAULIC WELDED TYPE DOOR

The Walz & Krenzer sliding watertight door and frame is a precision piece of machinery. Each door and frame assembly is stress relieved prior to machining. After assembly, each door is hydro-statically tested to full design head pressure prior to leaving our shop.

These doors have O-ring seals, so it is important to minimize distortion of the door frame during installation. These doors should allow zero leakage when the O-ring is intact and minimal leakage after a fire.

The following precautions shall be noted:

1. NEVER completely weld frame into position until most of the heavy ship's structure in the vicinity of the bulkhead, overhead decks and superstructure is welded in place. Additional welding in the area and additional weight or superstructure could cause distortion of the door and frame, making it necessary to cut the frame free and re-weld.
2. It is wise to leave the door frame tacked in place until most of the work in the area is completed. These tacks can be easily broken permitting the door and frame to align itself freely before final welding.

WARNING

Due to the size and weight of the door and frame assembly extreme safety precautions should be taken to ensure personnel safety when transporting this equipment. Support assembly with crane or chainfalls at all times to avoid chance of injury to personnel.

3. Lifting eyes are provided at the top of the frame to ensure safer transportation.

B. FRAME

1. Lay out the opening in the bulkhead and cut with an acetylene torch. Following the flame with a small stream of water approximately 6" behind torch may prevent warping.

SECTION III (continued)

2. After cutting is complete, locate and tack the frame to the bulkhead. Do not attempt to draw the bulkhead into alignment with the frame.
3. Tack weld frame to bulkhead at contact points. Carefully pack shims into all open spaces between the bulkhead and frame.
4. Weld one bead upwards approximately 12" long on the operator's left from the door side of the bulkhead.
5. Change to opposite side of bulkhead and weld one bead upwards approximately 12" from the bottom of the operator's left.
6. On the same side of the bulkhead, weld one bead upwards approximately 12" long on the operator's right.
7. Change to door side of bulkhead and weld one bead approximately 12" long on the operator's right.
8. Repeat steps 5 through 8 until frame is completely welded on both sides, forward and aft, of bulkhead. The above should not be interpreted as a definite requirement, but as a procedure that has been tried and found to work satisfactorily. In any case, every effort should be made to keep the heat at a minimum and distributed as evenly as possible.
9. Check door seat and frame seat to see that they are free from damage. A reasonable amount of grease should be applied to the seat of the frame and the O-ring on the door-sealing surface.
10. Install and weld support brackets (furnished by shipyard) as shown on assembly drawing. Ensure that guide rails are properly aligned with the frame before welding.
11. Install cylinder mounting bracket, as shown on door assembly drawing and secure accordingly. Reinforce bulkhead in way of cylinder mounting bracket to ensure sufficient rigidity. Finally, install cylinder.

C. HYDRAULIC TUBING & CONNECTIONS

1. Bleed valves should be installed where high points occur in the piping.

SECTION III (continued)

2. It is most important that all hydraulic lines be cleaned and flushed before connecting to any of the pumps, valve blocks, cylinders, etc. Due to the nature of the hydraulic circuit, it may be necessary to disassemble all components in the system if the system becomes contaminated.
3. Do not remove the plugs from any of the components until ready to make connections.
4. Prior to operating the door, regulations require all new piping subject to pressure be hydrostatically tested to 1-1/2 times the maximum design system pressure. Some of the operating equipment will need to be isolated during the test to protect them from damage. Refer to the pipe test procedure on drawing D-WK-859-86, page 31, for instructions on testing the piping.

We will not attempt to make fitting recommendations except that they should be of a class satisfactory for the pressure shown and acceptable to regulatory agencies. All lines are subject to high pressure except the 3/4" line between the supply tank and the low-pressure shut-off valve. The tubing sizes specified on the installation drawing, page 22, and hydraulic schematic, page 26, allow for a reasonable number of bends and fittings, and in no case should a smaller size be used.

NOTE

In the event that the tube runs exceed 60 feet or excessive bends are used, tubing sizes must be increased accordingly.

Use a bending tool to maintain maximum tube area. Tubing should be carefully and properly fitted, making sure that no burrs, chips or other foreign matter are allowed in the system. Tubing should be installed at a slight pitch, with vent valves placed at the high point.

When installation is complete, fill tank with a good grade of petroleum base hydraulic fluid having a viscosity of 250-325 SSU at 100° F. Open shut-off valves.

CAUTION

Do not operate door with the shut-off valves closed as this will back pressure the local hand pump and cause the shaft seals to blow.

SECTION III (continued)

D. ELECTRICAL EQUIPMENT

Electrical equipment is to be installed and wired in accordance with the electrical schematics and electric connection diagram, pages 27 and 30.

When mounting the local control switches, the following should be observed:

1. The distance from switch to deck should be at least 48" .
2. Important – switches must be located such that one person can hold both switches in the open position when passing through the doorway. This is to prevent physical harm to the operator when door is in "close" mode.
3. The two local control switches are supplied with switch rotation and instruction plates opposite hand of each other. Each should be mounted on the side of the bulkhead such that the direction of rotation of the selector switch will coincide with the open and close direction of the door movement.

CAUTION

When connecting conduit or cable to any equipment below the bulkhead deck, use only U.L. listed or recognized fittings that have the same environmental type rating as the enclosure, NEMA-6.

The electrical equipment does not require any special attention. Therefore, normal procedures can be used.

SECTION IV - TEST PROCEDURE

A. PREPARATION

1. BLEEDING OF SYSTEM

- a) It is assumed that the door is in an open position at this point. Open the vent on the rod end of the upper cylinder. Rotate crank on remote pump until oil flows freely from the vent. Close the vent and continue to pump the handle until the door closes.
- b) Open vent at cap end of upper cylinder. Rotate crank on local pump in opening direction until all air is emitted. Close vent and rotate crank until door is opened. Open vent at rod end of upper cylinder. Rotate crank on local pump in closing direction until all air is emitted. Close vent and rotate crank until door is closed. Repeat until system is free of air. It is imperative that all air is out of the system to ensure proper operation.
- c) If the door does not close properly, foreign matter will undoubtedly be found in one of the control valves. The valve may be sticking due to contamination of oil, allowing oil to escape from the closing side of the circuit. A similar condition in the opening side of the line would affect the opening of the door. Refer to drawing on page 34.
- d) When the above is complete, actuate motor with power and check rotation with local control. The shaft rotation of the motor should correspond with the arrow on the motor pump adapter. If required, reverse armature leads at reversing controller. Close door from the local station, checking pressure. Pressure switch should open circuit at approximately 750 psi. Adjust only if necessary.
- e) After the motor has been operated, it may be necessary to bleed the system again, following the procedures above.

2. LIMIT SWITCH ADJUSTMENT

- a) Check closing limit switch for proper adjustment. The limit switch should be actuated 1/16" to 1/8" before the door reaches fully closed position with the door against the stop screws. The pressure switch stops the motor when the door hits the stop screws.
- b) Open the door and check the adjustment of the open switch. Door should be clear of frame opening before the switch is actuated, but the cylinder should not be fully retracted.

SECTION IV – TEST PROCEDURE (continued)

3. STOP SCREW SETTING

- a) After adjusting the limit switches, close the door by power and check to make sure that the door is able to open by using the hand pumps. If the door is unable to open, then it is going too far into the wedge plates. The stop screws, pc. 25 on drawing D-W/K-859-89 page 24, controls how far the door closes into the wedge plates.
- b) Adjust the stop screws to stop the door sooner. Both of the screws should be set to the same distance so that the door closes evenly. After adjusting the screws, close the door by power and check to make sure that it is able to open by the hand pumps, repeat as necessary.
- c) The door should be set so that it covers the o-ring, activates the limit switch and pressure switch to stop the motor, and is able to open by the hand pumps. When opening the door with the hand pumps, there should be a considerable amount of resistance until the door “pops” out of the wedge.

B. TESTING

1. All hydraulic components have been factory tested. The working pressure for this system is 1000 psi. Relief valves are set at or slightly below this.
2. Due to circuit design, it is necessary to disconnect all components and plug ends of piping if test pressure from an exterior source is used. If this is not done, damage can result to the relief valve, pressure switch, and to the pump seals.
3. Operate the door in all modes as described in Section V – Operating procedure (local power, remote power, local manual, and remote manual). For each operation, verify that remote indication stations show proper location of the door. Verify that remote operation closes the door as required. The door is required to close by power in 20 to 40 seconds from the start of door movement. It is required to close by hand from any of the pumps in the system in no more than 90 seconds.

SECTION V – OPERATING INSTRUCTIONS

A. LOCAL POWER OPERATION

1. To Open: Move local control switch handle to “open” position and hold until door is open and motor stops. Upon releasing, handle will return to neutral.
2. To Close: Move local control switch handle to “close” position. Handle will stay in this position. Warning horn will sound for 5-10 seconds and then door will automatically close and motor will shut off. Handle must be returned to neutral manually.

NOTE

If handle is left in close position, door may be opened from opposite side of bulkhead, but will automatically close after warning horn sounds for 5-10 seconds.

B. REMOTE POWER OPERATION

To Close: Move door control switch to “close”. Door will automatically close and green indicator light will remain lit at end of cycle.

NOTE

If switch is left in “close” position, door may be opened locally, but will automatically close when control switch returns to neutral.

NOTE

Door may not be opened from the remote position.

C. LOCAL HAND OPERATION

Rotate hand pump as shown on rotation plate mounted just above the pump. This rotation plate indicates the direction the pump must rotate to either open or close the door.

D. REMOTE HAND OPERATION

Actuate the pump with the supplied lever. The remote indication station will show the progress of the door closing. The indication station will show that the door is closed and there will be an increase in pumping resistance when the closed position is reached.

SECTION V – OPERATING INSTRUCTIONS (continued)

NOTE

Door may be closed only from the remote pump station.

CAUTION

Do not operate door with shut-off valves closed. This will back-pressure the hand pump and cause damage to the seals.

SECTION VI – MAINTENANCE

A. MECHANICAL

See lubrication chart for type and frequency of lubrication for mechanical parts.

LUBRICATION CHART

PART	LUBRICANT	AMOUNT	APPLICATION	FREQUENCY
Sealing surfaces around periphery of door	Light petroleum based grease	Thin Film	Apply with brush or rag	Every two weeks

B. HYDRAULIC

1. Open-Close Cylinder - Page 48

Maintenance is very seldom necessary on this item, but in case of severe leakage, repair should be undertaken by a technician under shop conditions. Rod and bore seal kits are available and the seals may be replaces following instructions supplied with the seal kits.

2. Motor Pump and Hand Pumps – Pages 32, 40, 41

It is suggested that, in case of malfunction, the pump be sent back to Walz & Krenzer for overhaul. However, seals may be replaced in case of leakage around the shaft. This should be undertaken only by qualified technicians under shop conditions.

3. Valve Block – Page 34, 49-53

The valve block is set at the factory and should not need adjustment for several years. However, if adjustment is required, the following procedure shall be used.

WARNING

When adjusting the valve block, oil leakage will undoubtedly occur, place a drop catcher under the assembly.

SECTION VI (continued)

- a) Start with the door open and place a 2000 PSI hydraulic pressure gauge in each end of the hydraulic cylinder or on the open and close ports at the end of the valve block.
- b) Remove the 3/8-16UNC dome nuts from the adjusting screws on the dual relief valve and the pressure switch.
- c) Remove the Stato-Seal washers and loosen the jam nuts on these adjusting screws.
- d) Remove the #10-32UNF acorn nuts from the small needle valves, one on the pressure switch, item 14 and two on the shuttle unit, item 10.
- e) Remove the Stato-Seal washers and loosen the jam nuts on these needle valves.
- f) Using an allen wrench, gently screw the #10-32UNF needle valve on the pressure switch clockwise until it bottoms out.

CAUTION

Over tightening can damage the valve seat.

Back off the needle valve counter-clockwise $\frac{1}{4}$ turn and lock it in place with the jam nut.

- g) Gently turn both of the #10-32UNF needle valves clockwise on the shuttle unit, until they bottom out.
- h) With an allen wrench, turn the 3/8-16UNC adjusting screw on the pressure switch clockwise approximately three complete turns.
- i) Loosen the limit switch arms on both sides of the door so that they can not actuate when operating the door.
- j) Turn the local control switch to "close." Watching the gauge, adjust the 3/8-16UNC adjusting screw on the "close" side of the dual relief valve so that oil flows over it at 950 to 1000 PSI. If the pump cuts off before you can set this pressure, turn the large needle clockwise on the pressure switch a few more turns.
- k) Turn the "close" needle valve on the shuttle valve counter-clockwise until the pressure gauge is back to zero. Now gently turn it clockwise to bottom it out again.

SECTION VI (continued)

NOTE

On drawing C-WK-471-49 (page 34) zone 4-C, the needle valve on the right controls shuttle time from "open" door movement to "close" door movement and the needle valve on the left controls shuttle time from "close" door movement to "open" door movement. The assembly is usually mounted rotated 90° counter-clockwise from the position shown on the drawing, so that the lower needle valve controls the time from "open" to "close" and the upper needle valve controls time from "close" to "open".

l) Turn the switch to "open" and hold. After the door is opened completely, build the pressure up and adjust the 3/8-16UNC adjusting screw on the "close" side of the dual relief valve so that oil flows over it at 950 to 1000 PSI. Tighten the jam nuts on both of the dual relief valve adjusting screws.

m) Turn the "open" needle on the shuttle valve counter-clockwise until the pressure gauge is back to zero. Now gently turn it clockwise to bottom it out again.

NOTE

When the needles on the shuttle unit are bottomed out, clockwise, the valve will hold hydraulic pressure until you physically open the needles. When you close the door, open the "close" needle and re-bottom it out. When you open the door, open the "open" needle valve and re-bottom it out. This is done until the final shuttle valve settings are made.

n) Turn the local control switch to "close" and close the door. When the door is closed the motor should still be running and oil should be dumping over the close side relief valve between 950 and 1000 PSI. Turn the 3/8-16UNC adjusting screw on the pressure switch counter-clockwise until the pressure switch cuts off the motor at approximately 750 PSI. You may have to do this several times to obtain the correct shut-off pressure. The pressure switch will only shut the motor off for approximately 4 seconds and then the motor will start again. We call this hunting. To stop the hunting pressure switch, set the arm on the "door closed" limit switch so that the limit switch actuates approximately 1/8" before the pressure switch stops the motor. Tighten the jam nut on the 3/8-16UNC adjusting screw.

SECTION VI (continued)

- o) Next, adjust the two #10-32UNF needle valves on the shuttle unit. These needles are very sensitive. Slight turns can make quite a difference in the operation of the door system.

If the needles are turned too far counter-clockwise, there will be a very short shuttle time (the time it takes to reverse direction), but it will not be possible to achieve sufficient hydraulic pressure with the hand pumps. The object is to adjust these needle valves so that you can achieve 750 PSI closing and 800 PSI opening with the hand pumps and have the shuttle times between 3 and 7 seconds. You can do this in the following manner:

Close the door electrically. Crank the local hand pump very hard in the "close" direction and observe the hydraulic pressure on the gauge. If the pressure is well over 750 PSI, turn the "close" needle valve counter-clockwise very slightly. Look at the gauge to see if the pressure has shuttled back to zero. If so, hand crank the pump again until you achieve 750 PSI and the pressure drops to zero between 3 and 7 seconds.

Now, open the door electrically and proceed to perform the same function on the open side.

When the required pressures can be achieved and the shuttle times are between 3 and 7 seconds, tighten the jam nuts. Be sure to hold the settings with an allen wrench when tightening the jam nuts so that you don't lose the settings.

Operate the door back and forth electrically. Recheck the pressure switch to make sure that the motor shuts off at 750 PSI. You may have to readjust the pressure switch at this time.

The valve block is now set. Reinstall the Stato-Seal washers, dome nuts, and acorn nuts. Reset the limit switch arm on the open side so that the door stops clear of the opening but before the cylinder fully retracts.

SECTION VI (continued)

C. ELECTRICAL EQUIPMENT

1. Baldor Electric Motor - Page 33

Due to the short operating cycle and the fact that the bearings are pre-lubricated, little or no maintenance is required. If repair is necessary, the motor should be sent back to Walz & Krenzer so that the watertight integrity can be maintained.

2. Controller – Page 35

Normal maintenance to the controller would be occasional replacement of a blown control circuit fuse. The enclosure may be opened by loosening the hold-down bolts and swinging open the cover.

WARNING

Electric shock can cause serious injury or death. Disconnect all power sources before performing maintenance on the motor controller, motor, or any control equipment.

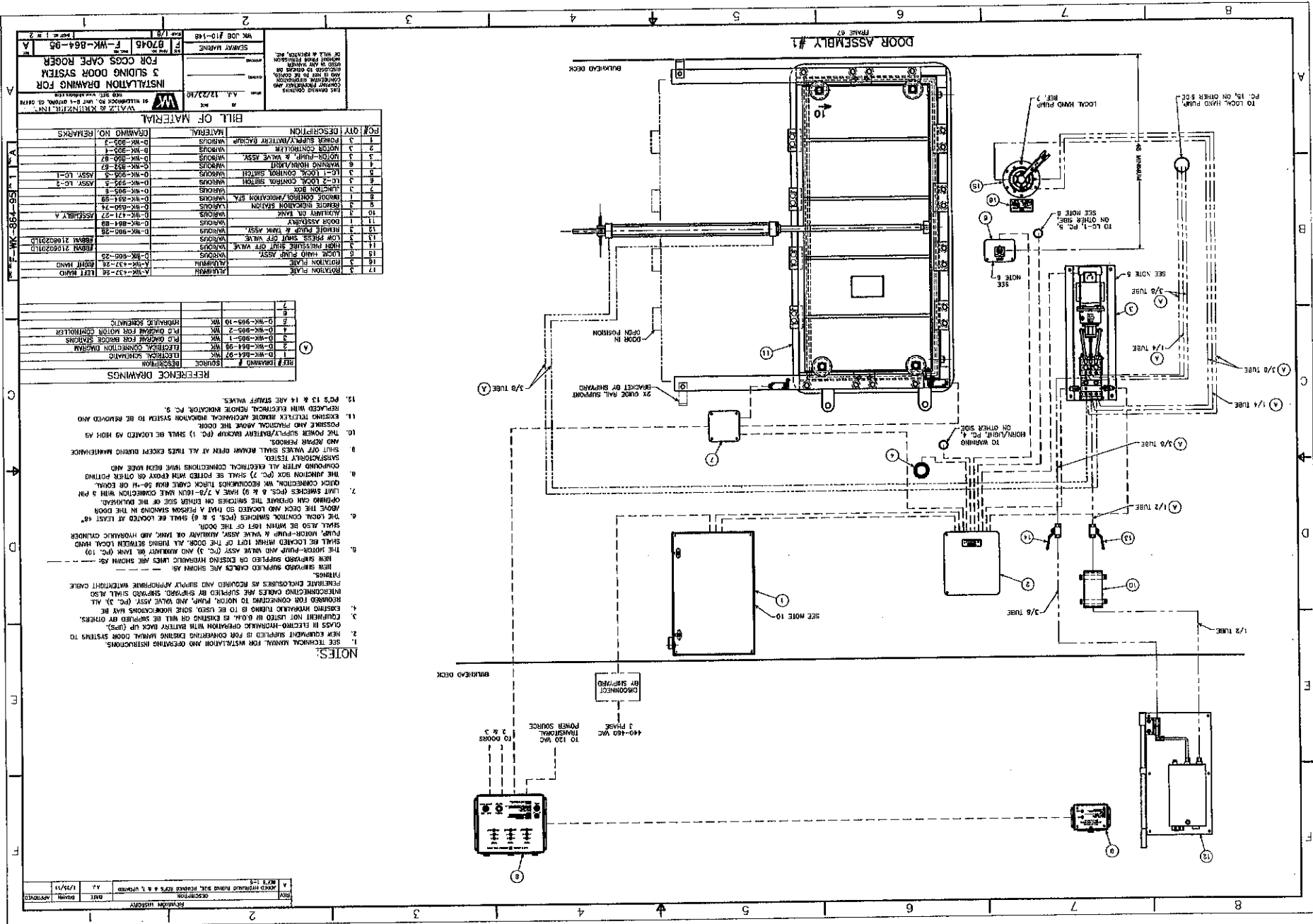
Only a qualified technician should undertake replacement of electrical equipment.

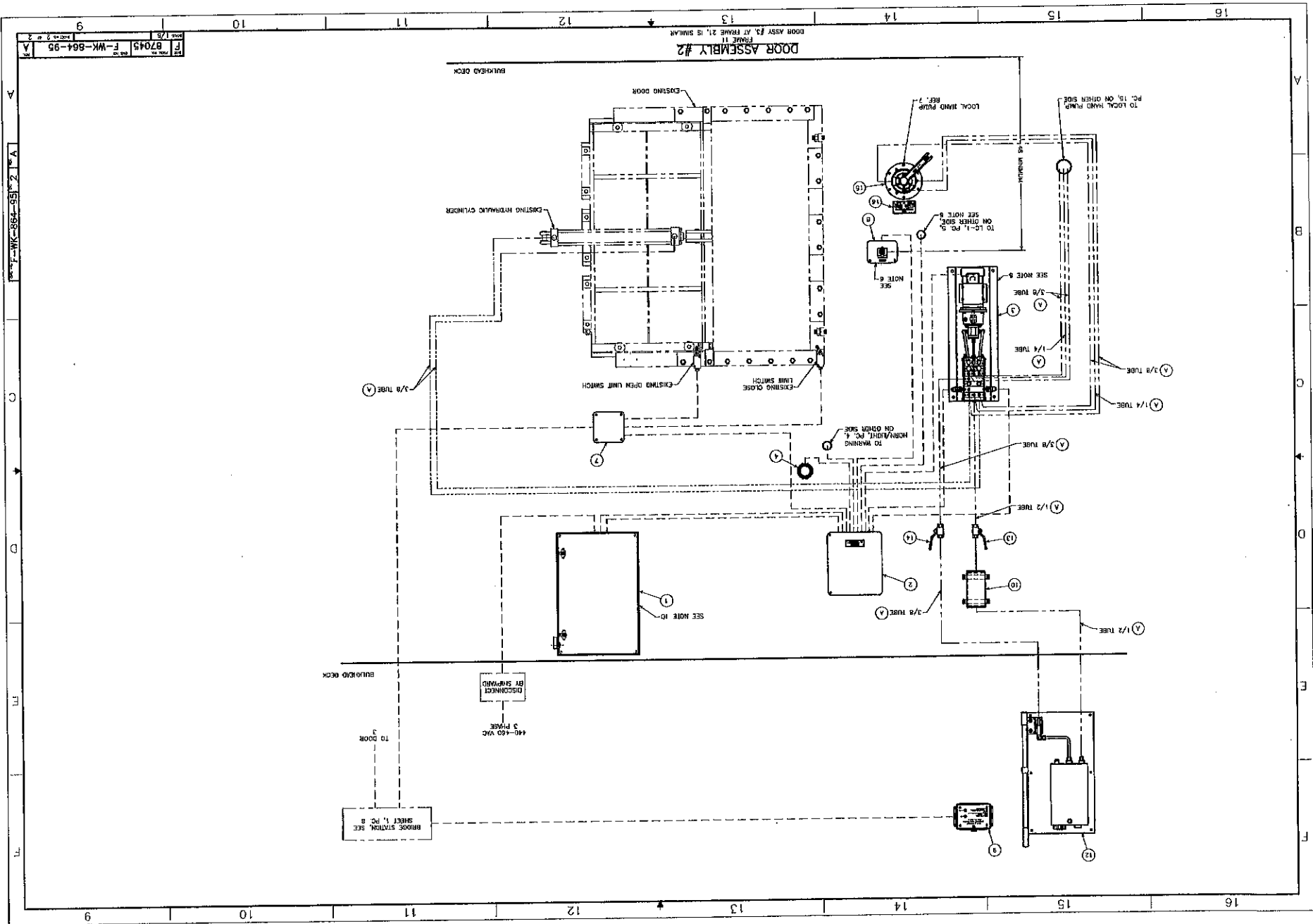
SECTION VII – TROUBLE SHOOTING

TROUBLE SHOOTING GUIDE

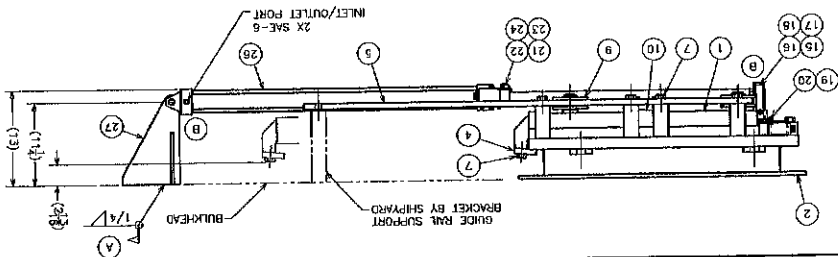
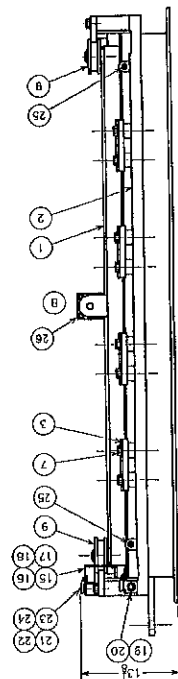
PROBLEM	PROBABLE CAUSE	REMEDY
Motor shutting off before door is completely closed	Pressure switch set too low	Set pressure switch to shut off between 725 & 775 psi
Motor will not shut off at end of cycle	Relief valve setting too low.	Set relief valves to between 950 & 1000 psi (67 & 70 Kg/sq. cm)
Motor repeatedly shuts off and starts up again at end of close cycle	"Close" limit switch arm not adjusted properly	Set limit switch arm so it actuates just prior to pressure switch shutting off the motor
Motor will not shut off at end of open cycle	"Open" limit switch arm not adjusted properly	Adjust limit switch arm so it will actuate and stop motor
Door will not open under full power	Door closing too far into tapered seat	Set stop bolts so door consistently opens
Door moving very slow and with jerky motion	1. Relief valve set too low 2. Air in hydraulic system	1. Adjust relief valve setting as above 2. Check level of oil in expansion tank. Add oil if necessary. Bleed off air at all high points
Power unit not starting	1. Overload relay may have activated 2. Fuses in controller may be blown. 3. Contacts in local control switch may be defective	1. Press reset button inside controller. 2. Replace bad fuse 3. Replace contact block.

SECTION VII – DRAWINGS





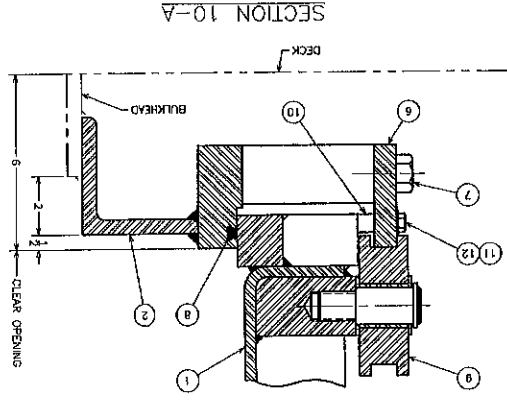
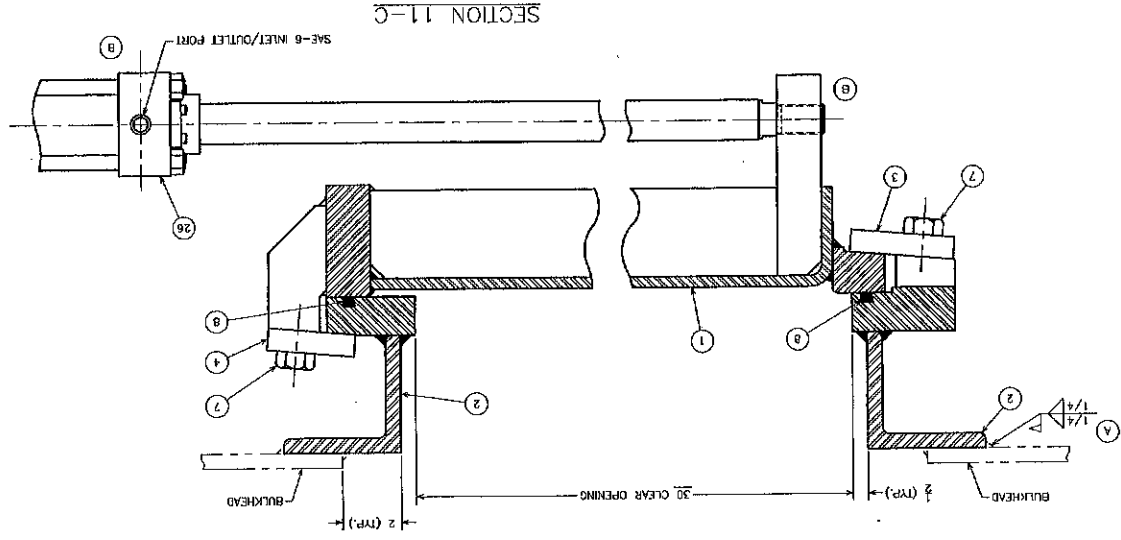
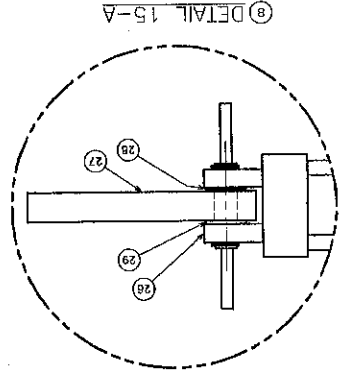
PC	QTY	DESCRIPTION	MATERIAL	DRAWING NO.	REMARKS
1	1	WASHER, THRUST	OUTLE BRONZE	B-WK-664-93	
2	1	WASHER, THRUST	OUTLE BRONZE	B-WK-664-93	
3	1	CANDLER P/NO	VARIOUS	D-WK-664-93	
4	1	HYDRAULIC CYLINDER ASSY.	VARIOUS	D-WK-664-93	
5	2	SET SCREW, FLAT PL	S.S. W/ NILON	D-WK-664-93	
6	24	WASHER	STAINLESS STEEL	D-WK-664-93	
7	23	HEX HEAD LOCKWASH	STAINLESS STEEL	D-WK-664-93	
8	23	RD. HEAD MACHINE SCREW	STAINLESS STEEL	D-WK-664-93	
9	23	RD. HEAD MACHINE SCREW	STAINLESS STEEL	D-WK-664-93	
10	23	OPEN LIMIT SWITCH ASSY.	VARIOUS	D-WK-664-93	
11	20	RD. HEAD MACHINE SCREW	STAINLESS STEEL	D-WK-664-93	
12	1	CLOSE LIMIT SWITCH ASSY.	VARIOUS	D-WK-664-93	
13	18	WASHER, WIDE	STAINLESS STEEL	D-WK-664-93	
14	17	HEX NUT	STAINLESS STEEL	D-WK-664-93	
15	2	RD. HEAD MACHINE SCREW	STAINLESS STEEL	D-WK-664-93	
16	2	RD. HEAD MACHINE SCREW	STAINLESS STEEL	D-WK-664-93	
17	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
18	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
19	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
20	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
21	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
22	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
23	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
24	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
25	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
26	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
27	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
28	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
29	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
30	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
31	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
32	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
33	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
34	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
35	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
36	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
37	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
38	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
39	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
40	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
41	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
42	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
43	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
44	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
45	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
46	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
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49	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
50	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
51	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
52	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
53	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
54	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
55	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
56	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
57	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
58	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
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61	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
62	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
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65	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
66	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
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71	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
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73	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
74	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
75	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
76	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
77	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
78	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
79	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
80	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
81	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
82	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
83	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
84	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
85	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
86	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
87	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
88	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
89	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
90	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
91	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
92	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
93	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
94	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
95	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
96	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
97	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
98	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
99	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	
100	1/4	1/4-20 UNC X 1	STAINLESS STEEL	D-WK-664-93	



REFERENCE DRAWINGS			
REF#	DRAWING #	SOURCE	DESCRIPTION
1	D-WK-864-95	WK	DOOR SYSTEM INSTALLATION DRAWING

NOTES:

(V) 1. DOOR IS DESIGNED FOR A 35FT HEAD, DOOR MEETS ALL REQUIREMENTS.
2. FINISH: STEEL SURFACES TO BE BLASTED TO SSPC-10 AND COATED WITH INORGANIC ZINC PRIMER.
3. FINISH: STEEL SURFACES TO BE BLASTED TO SSPC-10 AND COATED WITH 1/2" ABS.
4. ALL FASTENERS THAT DO NOT HAVE LOCK NUTS SHALL BE INSTALLED WITH LOCOTE 242 (GENERAL PURPOSE). HAND TOOL REMOVABLE. MEDIUM STRENGTH).



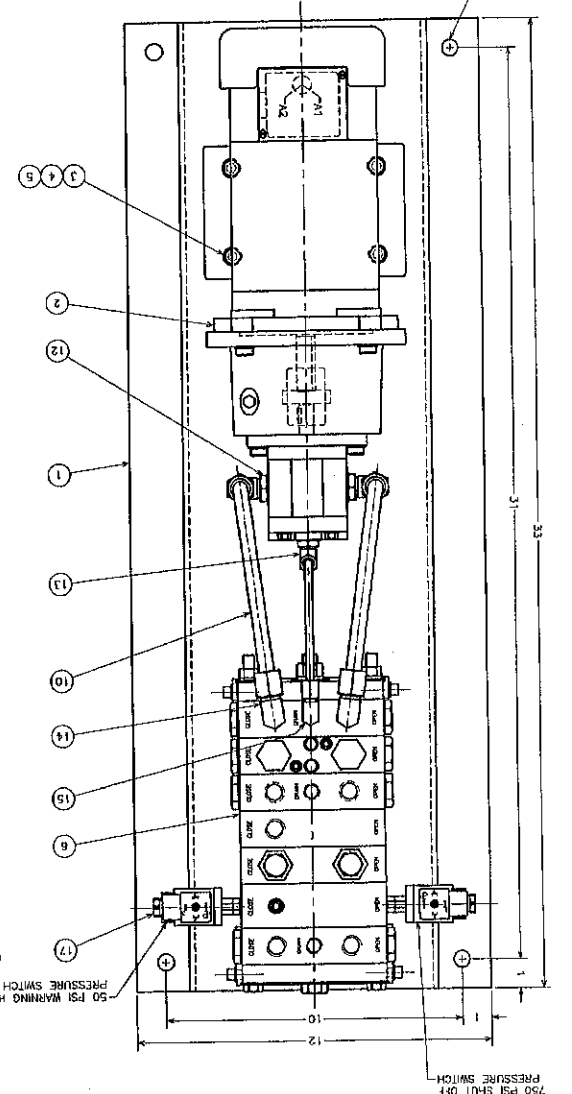
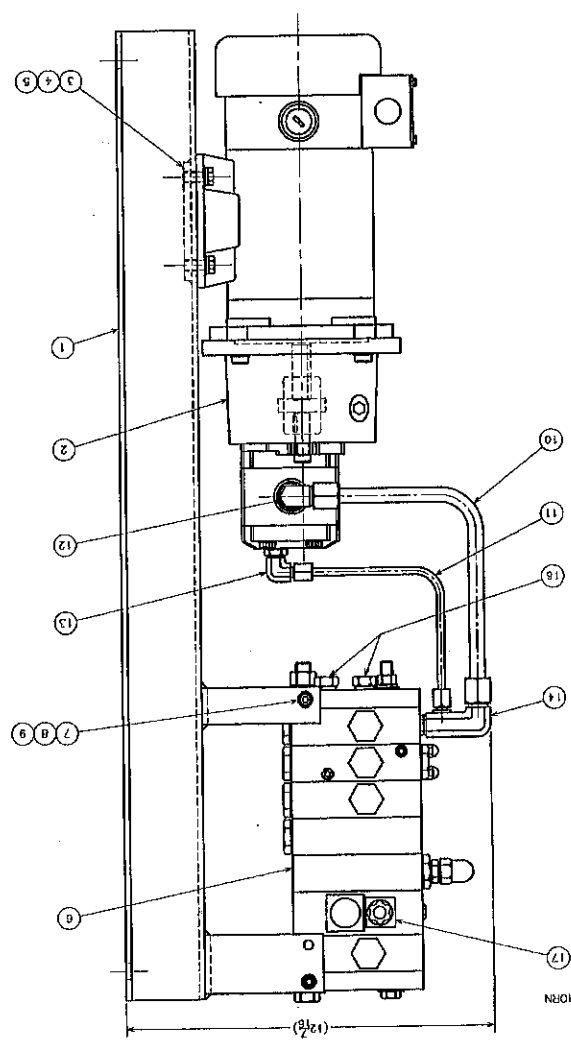
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REV. NO. 95
REV. NO. 96
REV. NO. 97
REV. NO. 98
REV. NO. 99
REV. NO. 100

D 87045 D-WK-860-87 WITH 2 LOCAL HANDPUMPS FOR 24 VDC SLIDING DOORS MOTOR-PUMP & VALVE ASSY.		DATE 6/23/10 M.D. 6/23/10 C.K. 6/15/10
WATZ & REINERZ, INC. 81 WILMINGTON BLVD. UNIT B-4 DORSET, CT 06470 860-860-87		THIS DRAWING CONTAINS COMPANY PROPRIETARY AND CONFIDENTIAL INFORMATION AND IS NOT TO BE COPIED, REPRODUCED OR DISCLOSED WITHOUT PRIOR PERMISSION OF WATZ & REINERZ, INC.

PC#	QTY	DESCRIPTION	MATERIAL	DRAWING NO.	REMARKS
1	1	MOUNTING BASE ASSEMBLY	A-38 STEEL	D-WK-862-44	
2	1	MOTOR-PUMP ASSEMBLY	VARIOUS	D-WK-892-45	
3	4	HEX HEAD CAP SCREW	STAINLESS STEEL	5/16-18UNC X 5/8 L	
4	4	WASHER	STAINLESS STEEL	5/16 NOMINAL	
5	4	LOCK WASHER	STAINLESS STEEL	5/16 NOMINAL	
6	1	VALVE BLOCK ASSEMBLY	VARIOUS	D-WK-471-50	
7	4	SOCKET HEAD CAP SCREW	STAINLESS STEEL	1/4-20UNC X 3/4 L	
8	4	WASHER	STAINLESS STEEL	1/4 NOMINAL	
9	4	LOCK WASHER	STAINLESS STEEL	1/4 NOMINAL	
10	2	HIGH PRESSURE TUBE ASSY.	VARIOUS	D-WK-852-69	
11	1	LOW PRESSURE TUBE ASSY.	VARIOUS	D-WK-852-69	
12	2	MALE ELBOW, PUMP INLET/OUTLET	ZINC PLATED STEEL	PARSER# 8 C50X-5	
13	1	MALE ELBOW, PUMP DRAIN	ZINC PLATED STEEL	PARSER# 4-6 C50X-5	
14	2	MALE ELBOW, VALVE INLET/OUTLET	ZINC PLATED STEEL	PARSER# 8 C50X-5	
15	1	MALE ELBOW, VALVE DRAIN	ZINC PLATED STEEL	PARSER# 4-4 C1X-5	
16	3	HEX HEAD PLUG	ZINC PLATED STEEL	PARSER# 3/8 HP-5	
17	2	CABLE CONNECTOR	VARIOUS	SEE NOTE 4	

NOTES:


- VALVE BLOCK ASSY. PC. 6, IS FOR DOOR SYSTEMS WITH TWO LOCAL HAND PUMPS AND ONE REMOTE HAND PUMP.
- ASSEMBLY AND TUBING FROM VALVE BLOCK TO HYDRAULIC CYLINDER TO BE LOCATED WITHIN 10 FEET OF THE DOOR.
- ESTIMATED ASSY. WEIGHT: 90 LBS.
- CABLE CONNECTOR, PC. 17, FOR PRESSURE SWITCHES IS TUBING #3-AW, DN 43650, TYPE A, WITH 3 CONDUCTS PLUS A GROUND. EQUIVALENT SUBSTITUTE MAY BE USED.
- PRESSURE SWITCH CONNECTIONS:
 - COMMON
 - NORMALLY CLOSED
 - NORMALLY OPEN



REV	DESCRIPTION	DATE	DRAWN	APPROVED

PC.#		QTY.	DESCRIPTION	MATERIAL	REMARKS
3	1	GASKET	RUBBER	SUPPLIED WITH PC. 2	
2	1	DEEP BASE	VARIOUS	FEDERAL SIGNAL #DLR2	
1	2	SOUNDER/STROBE	VARIOUS	FEDERAL SIGNAL #P7-18-30A	

BILL OF MATERIAL	
REMARKS	

WALZ & KRUBNER, INC.	
91 WILLOWBROOK RD., SUITE 3-4, DANBURY, CT 06426	
WEB SITE: www.wdkusa.com	
	
DATE	ADJ. 11/30/07
ORDER	C.K. 11/26/07
APPROVED	T.T. 5/26/10

THIS DRAWING CONTAINS COMPUTER GENERATED CONSTRUCTION INFORMATION AND IS NOT TO BE USED EXCEPT TO THE EXTENT PERMITTED BY THE OWNER OR HIS REGISTERED PROFESSIONAL ENGINEER OR ARCHITECT OR BY THE REGISTERED PROFESSIONAL ENGINEER OR ARCHITECT OF WALZ & KRUBNER, INC.	
DATE	8/7/04
DRAWN BY	C
CHECKED BY	87045
PROJECT NO.	C-WK-852-67
SHEET NO. 1 OF 1	

1	D-WK-437-75	1/2	1
2	D-WK-437-75	1/2	1
3	D-WK-437-75	1/2	1
4	D-WK-437-75	1/2	1
5	D-WK-437-75	1/2	1
6	D-WK-437-75	1/2	1
7	D-WK-437-75	1/2	1
8	D-WK-437-75	1/2	1

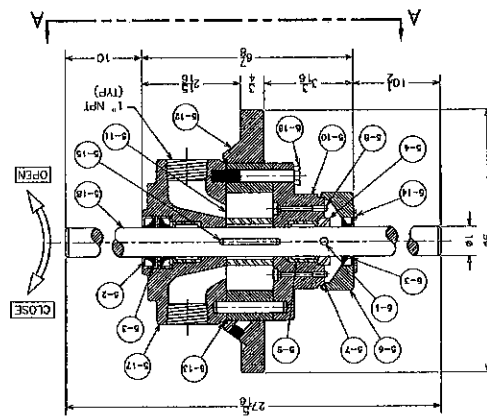
PC#	QTY/ASM	DESCRIPTION	MATERIAL	REMARKS
5-1	1	LOCAL PUMP WITH SINGLE SHAFT	VARIOUS	
5A-1	1	LOCAL PUMP WITH THRU SHAFT	VARIOUS	
5-2	1	COLLAR PIN	STEEL	3/16x1-1/2
5-3	1	SEAL RETAINERS	STEEL	
5-4	1	SHAFT SEALS	VARIOUS	
5-5	1	THRUST COLLAR	STEEL	A-WK-437-41
5-6	1	END CAP, THRU	VARIOUS	
5-7	1	END CAP GASKET	YELLOWOID	
5-8	2	DRAIN PLUG	STEEL	10-32x3/8 LG BUTT HD
5-9	2	BEARINGS	VARIOUS	
5-10	1	HEAD	STEEL	
5-11	1	ROTOR	STEEL	
5-12	1	FLANGE	STEEL	B-WK-437-17
5-13	1	FLANGE O-RING	NEOPRENE	
5-14	4	HEX HEAD SCREW	STEEL	1/4-20x1-1/2
5-15	1	KEY	STEEL	
5-16	8	HEX HEAD SCREW	STEEL	3/8-16x2-3/4
5-17	1	BODY	STEEL	
5-18	1	SHAFT, THRU	STEEL	1" DIA. A-WK-437-21-B
5-19	1	END CAP, SOLID	STEEL	
5-20	1	SHAFT, SINGLE	STEEL	1" DIA. 3/8 LG. A-WK-437-22
6	1	REMOTE HAND PUMP	VARIOUS	
6-1	1	KEY	STEEL	
6-2	1	ROLL PIN	STEEL	3/16x1-1/2
6-3	1	END CAP, SOLID	STEEL	
6-4	1	SHAFT	STEEL	1" DIA. 3/8 LG. A-WK-437-22
6-5	1	THRUST COLLAR	STEEL	A-WK-437-41
6-6	1	GASKET, END CAP	YELLOWOID	
6-7	1	DRAIN PLUG	STEEL	10-32x3/8 LG BUTT HD
6-8	1	BEARINGS	VARIOUS	
6-9	1	HEAD	STEEL	
6-10	1	FLANGE	STEEL	B-WK-437-17
6-11	1	FLANGE O-RING	NEOPRENE	
6-12	8	HEX HEAD SCREW	STEEL	3/8-16x2-3/4
6-13	1	ROTOR	STEEL	
6-14	1	BODY	STEEL	
6-15	4	HEX HEAD SCREW	STEEL	1/4-20x1-1/2
6-16	2	SHAFT SEAL	VARIOUS	
6-17	1	SEAL RETAINER	STEEL	

1	3/21/02	S.M.S.
2	1/17/00	C.D.B.
3	11/29/05	C.D.B.
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5		
6		
7		
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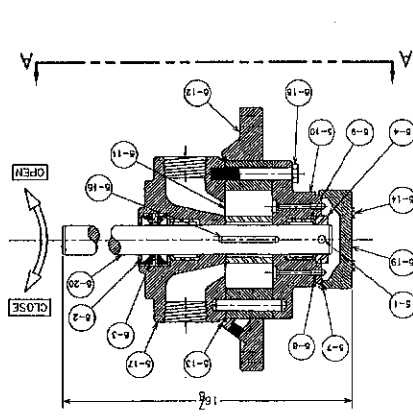
NOTES:

1. FLANGE MOUNTED REVERSIBLE HYDRAULIC PUMP.
2. CENTER MOUNTING FLANGE, PC. 5-12, WILL BE SUPPLIED UNLESS OTHERWISE SPECIFIED.
3. PUMP CAPACITY IS 0.85 G.P.M. @600 P.S.I., ROTATION SPEED IS 80 R.P.M.
4. DRAIN PORT MUST BE CONNECTED TO WASTE RETURN.
5. REMOTE HAND CRANK, PC. 3 ON REF. 1, WILL BE SUPPLIED UNLESS OTHERWISE SPECIFIED.
6. IF INSTALLATION PERMITS ONE (1) LOCAL HAND PUMP WITH THRU SHAFT, THEN 1 (ONE) WITH SINGLE SHAFTS, THEN TWO (2) QUAD CHECK VALVES ARE REQUIRED.
7. QUAD CHECK VALVE IS REQUIRED, IF INSTALLATION PERMITS TWO (2) LOCAL HAND PUMPS.
8. REMOTE HAND CRANK, PC. 2 ON REF. 1, WILL BE SUPPLIED UNLESS OTHERWISE SPECIFIED.
9. HINGED HAND CRANK, PC. 2 ON REF. 1, WILL BE SUPPLIED UNLESS OTHERWISE SPECIFIED.

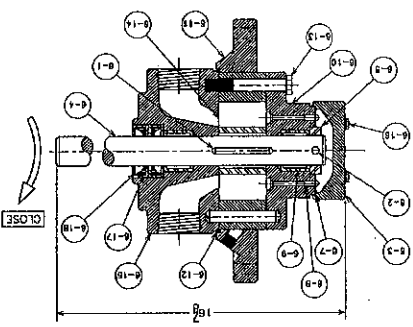
LOCAL PUMP THRU SHAFT, (PC. 5A)



LOCAL PUMP SINGLE SHAFT, (PC. 5)



REMOTE HAND PUMP (PC. 6)



NOTES:

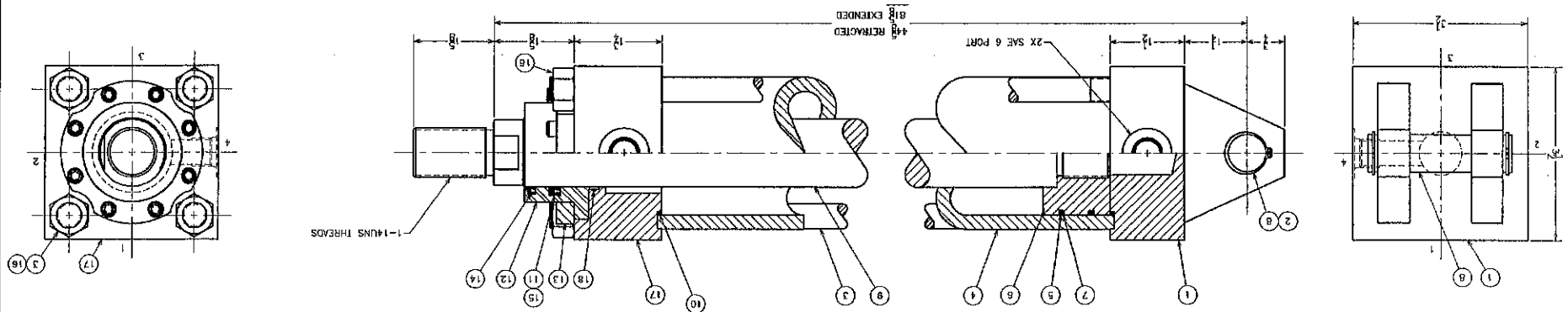
1. CYLINDER IS MILLETT HV2 SERIES, PART #HY2-44B2N-02.50-37.000-0138-5-44T-9 WITH PLISTON LIP SEALS (STD), HV2-6-0-RING POTS AT POSITION 4 AT BOTH ENDS.
2. CYLINDER TO BE 2-1/2" BORE X 37" STROKE.
3. USE DESCRIPTION AND SERIAL # WITH ORDERING SPARE PARTS.
4. SEE REG. 1 FOR OIL REQ'D.
5. WEIGHT IS APPROXIMATELY 84# (120kg).
6. THE ROD NUTS TO BE TORQUED TO 45-49 FT-LB. THE ROD NUTS TO BE EVENTUALLY TORQUED.
7. NUMBERS IDENTIFIED WITH #REF CORRESPOND TO MANUFACTURER'S CATALOG PART IDENTIFICATION. CYLINDER IS RATED TO 3000 PSI MAX. OPERATING PRESSURE.

NOTES:

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DATE	BY	DATE	BY
8/26/10	A.J.	08/31/10	S.Y.
		9/2/10	B.B.

QTY	DESCRIPTION	MATERIAL	REMARKS
18	1 WASHER TO HEAD O-RING	STEEL	
17	1 HEAD	STEEL	
16	14 ROD SEAL BEACH RP WASHER	STEEL	
15	14 ROD WIPER	POLYURETHANE	
14	13 REMANENT	STEEL	
13	12 BUSHING	BRONZE	
12	11 ROD SEAL	POLYURETHANE	
11	10 O-RING, C/T, USED TO HEAD & C/P	HPF	
10	9 PISTON ROD, SMOKE ROD TYPE	CHROME PLATED STEEL	
9	8 PISTON RING	STEEL	
8	7 SHOCK UP WASHER, PISTON	ALUM-N	
7	6 SHOCK UP SEAL TYPE	ALUM-N	
6	5 LUBRICANT PISTON	ALUM-N	
5	4 CYLINDER RING	STEEL	
4	3 TIE ROD	STEEL	
3	2 RETAINING RING, EXTERNAL	STAINLESS STEEL	
2	1 CAP	STEEL	
1			



REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
1	DRAWING WAS APPROVED	9/3/10	BR