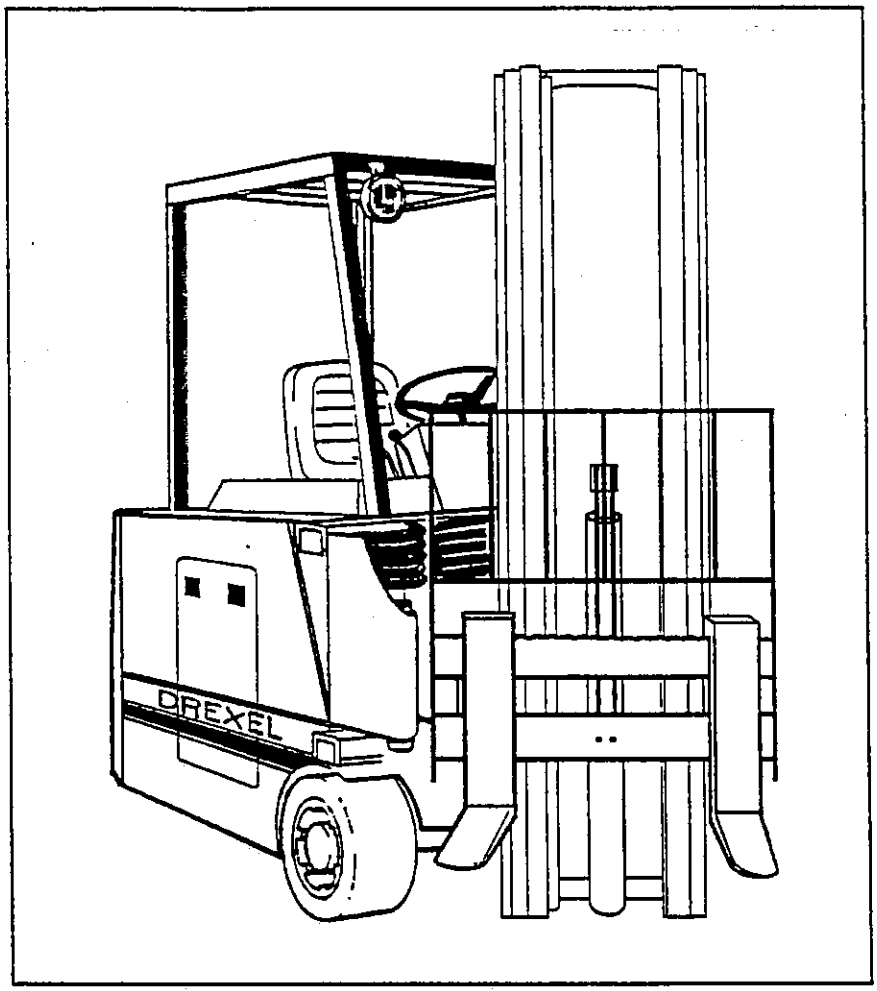
DREXEL INDUSTRIES, INC.

SwingMast® Lift Truck Models SLT22 and SLT30

Operation and Maintenance Manual



January 1996

Truck Serial No._____

MANUAL # 1404706 (Hi-Lo)

Section 1 DESCRIPTION AND SPECIFICATIONS

1.1. INTRODUCTION

This manual provides operating and maintenance instructions for Drexel Industries' SwingMast® Model SLT22 and SLT30 lift trucks. These trucks provide the functionality of both conventional front loading trucks and side loading trucks. As shown in Fig. 1-1, when a SwingMast truck is operated as a side-loader, the mast pivots 90° and shifts across the front of the truck. The pivot and shift capabilities eliminate the right angle turning requirements of conventional trucks, and permit operation in storage aisles as small as 56 inches wide.

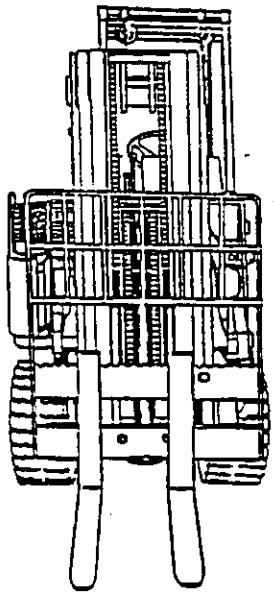
Table 1-1 provides a summary of characteristics of the two truck models. This table is a generalized summary. Because of varying customer requirements, your truck may differ somewhat from the general specifications. This manual should contain a specification sheet for your fork truck. Table 1-2 shows the dimensions of standard masts available for the trucks.

1.2. OPERATION

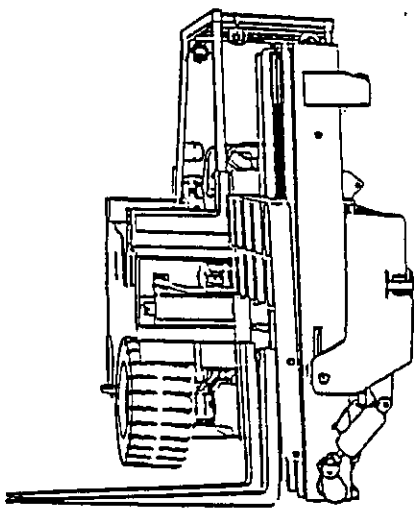
The truck is three-wheeled, with two load support wheels in the front and one steerable wheel in the rear. Motive power is provided to the steerable wheel from an electric motor and gear reducer. Additional electric motors drive hydraulic pumps which, in turn, drive a power steering motor and the various cylinders used to control the lift, shift and tilt functions. Primary power is provided by lead-acid batteries.

Both a keylock switch and an operator's seat switch must be activated before the truck can move. The seat switch is activated when the operator is seated.

The operator controls direction and speed by means of a forward-neutral-reverse lever and an accelerator pedal. If the operator leaves the seat for more than 1½ seconds, power is removed from the drive motor; the direction lever must be returned to neutral and then reset to the desired direction in order to resume movement.



a. Front Loading Mode



b. Side Loading Mode

Figure 1-1. Fork Lift Truck Operational Modes

Chapter II PREPARATION FOR USE

2.1. RECEIVING INSPECTION

a. Inspect the truck for signs of physical damage. Note any apparent damage on the bill of lading, and request the delivery agent to sign it. Report the damage to your distributor.

b. Verify that the truck configuration and options match the purchase order. Report any discrepancies to your distributor.

c. To prepare the truck for use, follow the procedures described in paragraph 2.2 below.

2.2. PREPARATION FOR USE

a. Remove the shipping bag.

b. The key is wired to the steering column. Cut the wire securing the key.

c. Check the hydraulic oil level (see Chapter 2).

d. Check the fluid level in the brake master cylinder. (See paragraph 5.3.2 in Chapter 5.)

e. If the truck has been shipped with batteries installed, remove the batteries from the truck.

f. If the batteries have been shipped with electrolyte installed, check the specific gravity of the electrolyte. If it is below 1.260, charge the battery as described in paragraph 2.3.

g. If the batteries have been shipped dry, prepare as described in paragraph 2.4.

2.3. CHARGING BATTERIES

WARNING

Lead-acid batteries generate hydrogen when they are being charged. Keep open flames and sparks away from the battery.

WARNING

The electrolyte used in lead-acid batteries is a strong solution of sulfuric acid. Protect your eyes with a face shield and wear rubber gloves when adding water to a cell. Use a plastic container or an automatic cell filler. Neutralize any spills immediately with a bicarbonate of soda solution. Never add acid to a battery during routine maintenance.

a. Remove each vent cap and check electrolyte levels. Ambient temperature should be 77°F (25°C) to get a proper reading. In cold weather, batteries may look dry. Do not add water until an accurate level is obtained. If water must be added, use distilled water only.

b. Make sure the electrolyte level is at the level indicator.

c. Charge the battery, using a constant current charger set to 5% of the six-hour battery capacity (e.g., 55 amps for an 1100 AH (ampere-hour) battery). Vent caps should be secured in place during charging. Ordinarily, the charge should take about 3 to 5 hours to complete.

d. Water approved for use in lead-acid storage batteries should be added if the electrolyte level falls below the level indicator. If the cell tempera-

unit has been in operation (i.e., the number of hours that the truck has been in forward or reverse motion). (A pictograph of an hourglass is illuminated to signal the type of data being displayed.)

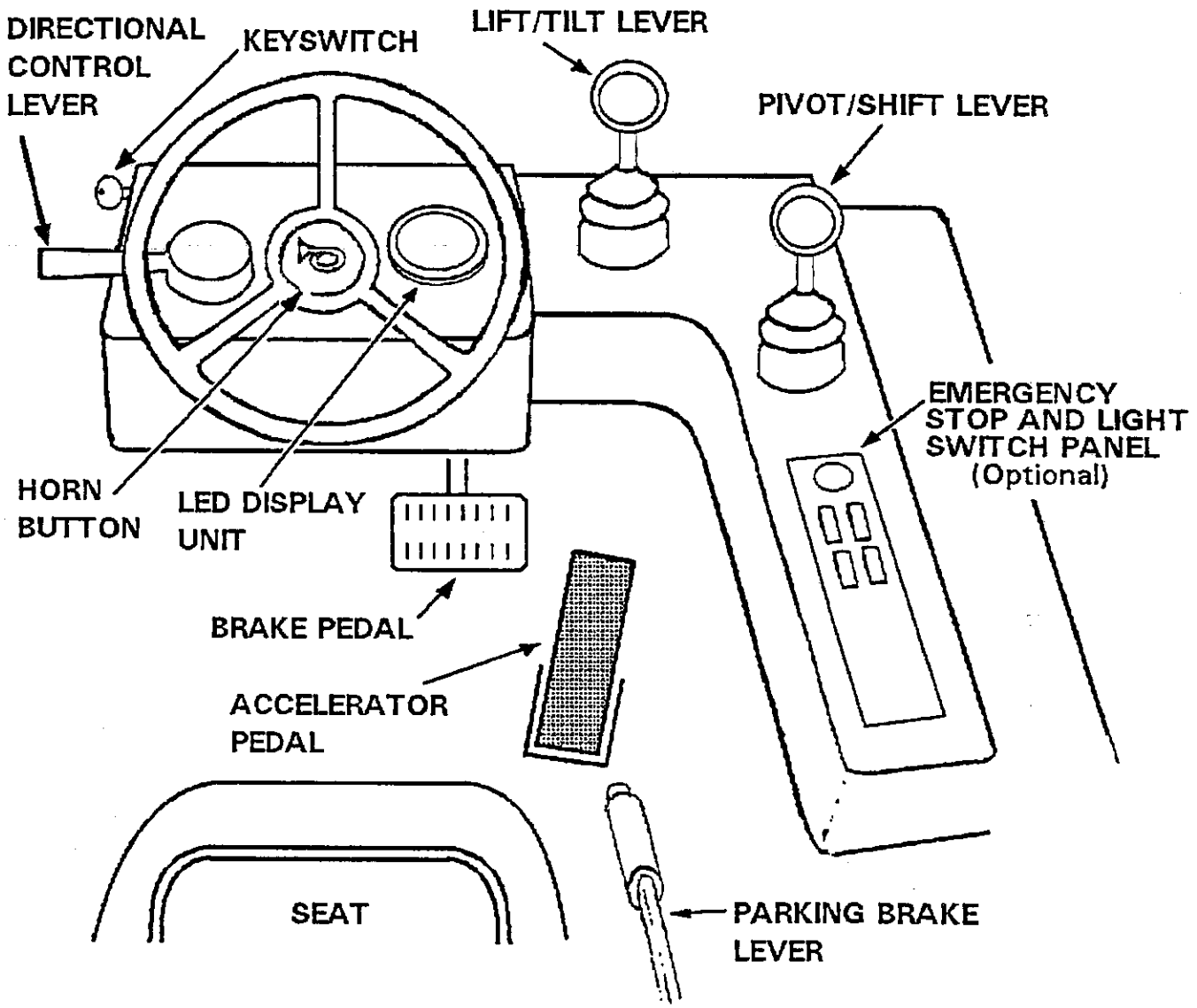


Figure 3-1. Location of Operating Controls.

Keyswitch - Two-position on-off switch; must be on to operate the truck.

Brake pedal - Activates hydraulic brakes in front wheels.

Accelerator pedal - Controls the speed of the truck: the more it is pressed, the faster the truck moves.

Parking brake lever - Engage the brake by pulling the lever up. Release the brake by pressing the button at the end of the lever, then lower the lever.

Seat switch - Prevents the truck from operating unless you sit on the seat (not shown in Fig. 3-1).

spikes or surges are captured and used efficiently to power the motor.

* An oversimplification. The function of a "Start" contactor is actually handled by a "Start" switch coupled to the accelerator, and the forward and reverse contactors which are shown in Fig. 4-9.

4.3.3 Plugging

If the direction is switched while the truck is moving, the motor armature will continue to turn. The motor will now function as a generator and current will flow through the loop formed by the armature, diode 4REC and the current sensor. This current is used to regulate the pulses provided by the control card so as to provide a small braking ("plugging") current to bring the motor to a smooth stop and reversal.

4.3.4 Accelerator Operation

The accelerator pedal controls a variable resistor which, in turn, controls the pulses that determine SCR on time. At low speeds, the accelerator resistance is high, and the ON interval is very short (about 0.8 ms at creep speed, vs. an OFF time of about 20 ms). As the accelerator is pressed further, the ON time increases. At mid-range, the ON time and OFF time will both be about 1.8 ms, and at zero accelerator resistance, the ON time will be about 20 ms vs. an OFF time of about 0.8 ms. The control card is programmable, and the rate at which the ON time can increase is determined by an acceleration setting (variable from about 0.1 second to 22 seconds from creep to maximum). The card may also be programmed to limit the maximum motor current (detected by the current sensor).

4.3.5 Power Bypass

The SCR circuit can deliver about 95% of full battery power to the traction motor. When the control card detects that this level has been reached (by means of the current sensor), it energizes relay 1A which bypasses the SCRs and applies full battery power to the motor windings.

4.3.6 Direction Control

Direction is switched by reversing the current through the field winding as shown in the simplified diagram of Fig. 4-9.

4.3.7 Interlocks

Battery power is connected to the SCR control system through Line contactor L (Figure 4-10). This contactor is picked only when the keyswitch, the seat switch, and the emergency off switch are all closed. (The emergency off switch is an optional item.)

As long as the battery remains charged to more than 20% of capacity, signal PA2 from the SCR module will keep relay RY1 picked through a driver. As long as relay RY1 is picked, the main pump can be turned on when the LIFT switch is closed (assuming the optional interlock is closed). The Tilt, Shift, and Pivot switches bypass the RY1 contacts, so the main pump can be turned on whenever any of these switches is closed, provided the Lift switch is not closed.

Operation of the hand brake opens the hand brake switch which drops out both the main pump and the steering pump.

In some mast configurations, it is hazardous to lift beyond a certain height when the mast is pivoted or shifted. In these situations, the optional interlock is provided. It is usually a combination of limit switches which sense a pivot or lift condition along with a particular height. When the switches open, the main pump is shut off, thus limiting the height.

The main pump time delay (Figure 4-10) allows the main pump motor to run for about a half-second after all control levers have been released to their neutral positions. This allows hydraulic pressure to drop while the main pump is running. As the pressure drops, the load on the motor drops, and the pump motor current drops accordingly. Consequently, when the pump contactor finally drops out, the amount of current that the contacts have to break is minimal, and arcing across the contacts is considerably diminished.

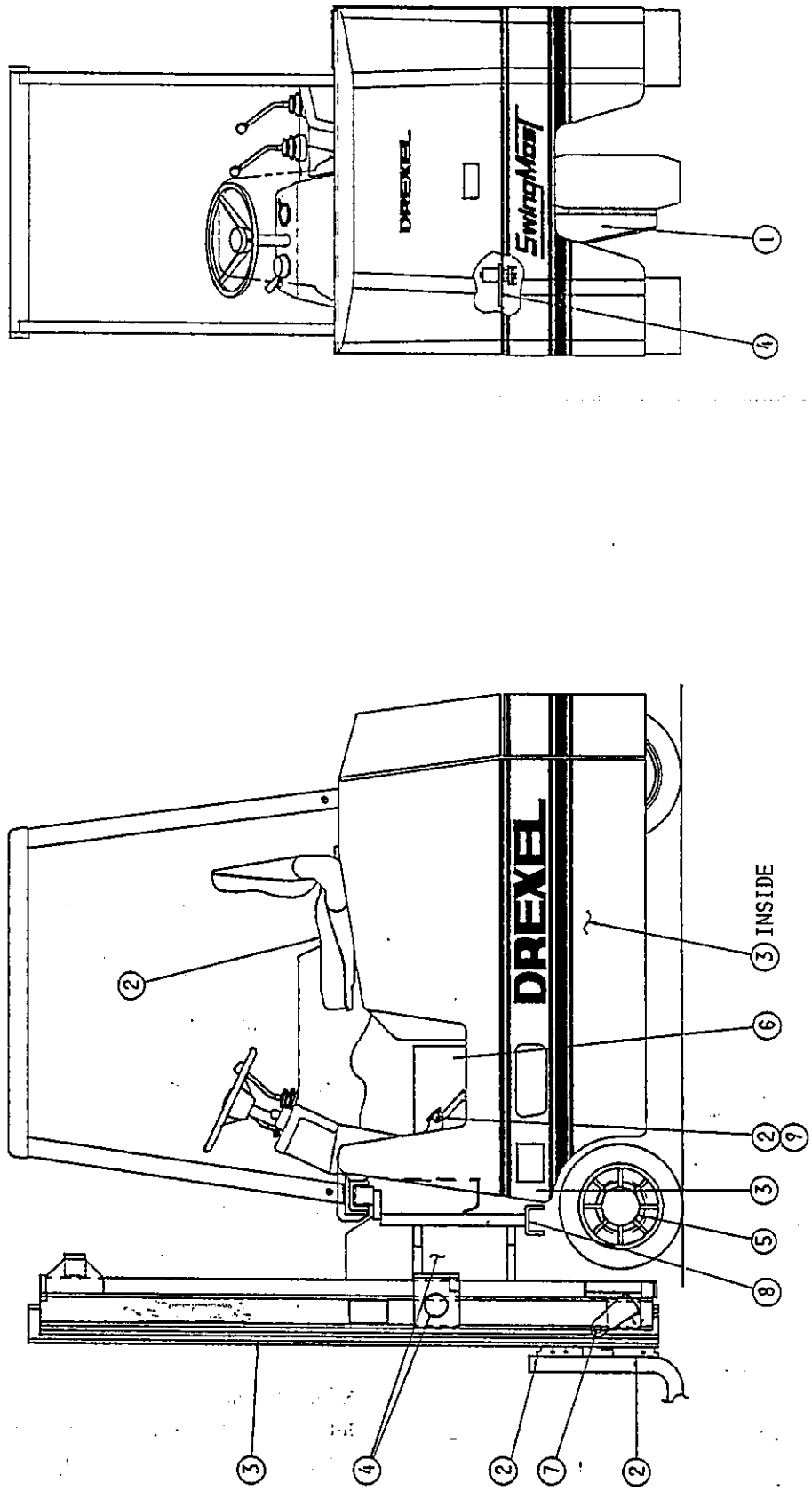


Figure 5-1. Truck Lubrication Points

Chapter VI TROUBLESHOOTING

6.1 GENERAL

This chapter contains troubleshooting procedures for an inoperative truck. Once the problem is located, refer to chapter 7 for corrective maintenance instructions. Troubleshooting procedures are arranged as Visible Problems, Audible Problems, and Operational Problems.

6.2 PRELIMINARY PROCEDURES

a. Review the complaint with the operator.

b. Check the operator's operating procedures. If they are incorrect, refer to Chapter 3 for the proper procedures. Return the truck to service.

c. Check the preventive maintenance log to make sure that the log is up-to-date. If it is not, or if there is no log, perform the preventive maintenance.

d. Check for visible problems. (See paragraph 6.3).

e. Try to operate the truck per Chapter 3. Check for audible problems (paragraph 6.4) and operating problems (paragraph 6.5). If the problem cannot be identified, call a Drexel representative for help.

f. After the problem is corrected, operate the truck again to verify the repair and to ensure that no other problems exist. If no other problems exist, return the truck to service. If other problems are found, troubleshoot them using the above procedures.

6.3 VISIBLE PROBLEMS

6.3.1 Cracks in Forks

a. Usually caused by metal fatigue. Replace the forks.

6.3.2 Leaking Fluid

a. Cracked or cut hoses. Replace hoses as necessary.

b. Loose or faulty hose clamps. Tighten or replace hose clamps as necessary.

c. Loose or faulty hydraulic fittings. Tighten or replace fittings as necessary.

6.3.3 Fluid Puddled Near Drive Wheel

a. Loose plug or bad seals in drive assembly. Check to make sure fluid is coming from drive assembly. Drain fluid and detach cover and inspect for bad gasket. Remove drive assembly and rebuild as necessary.

6.3.4 Fluid Puddled Near Front Wheels

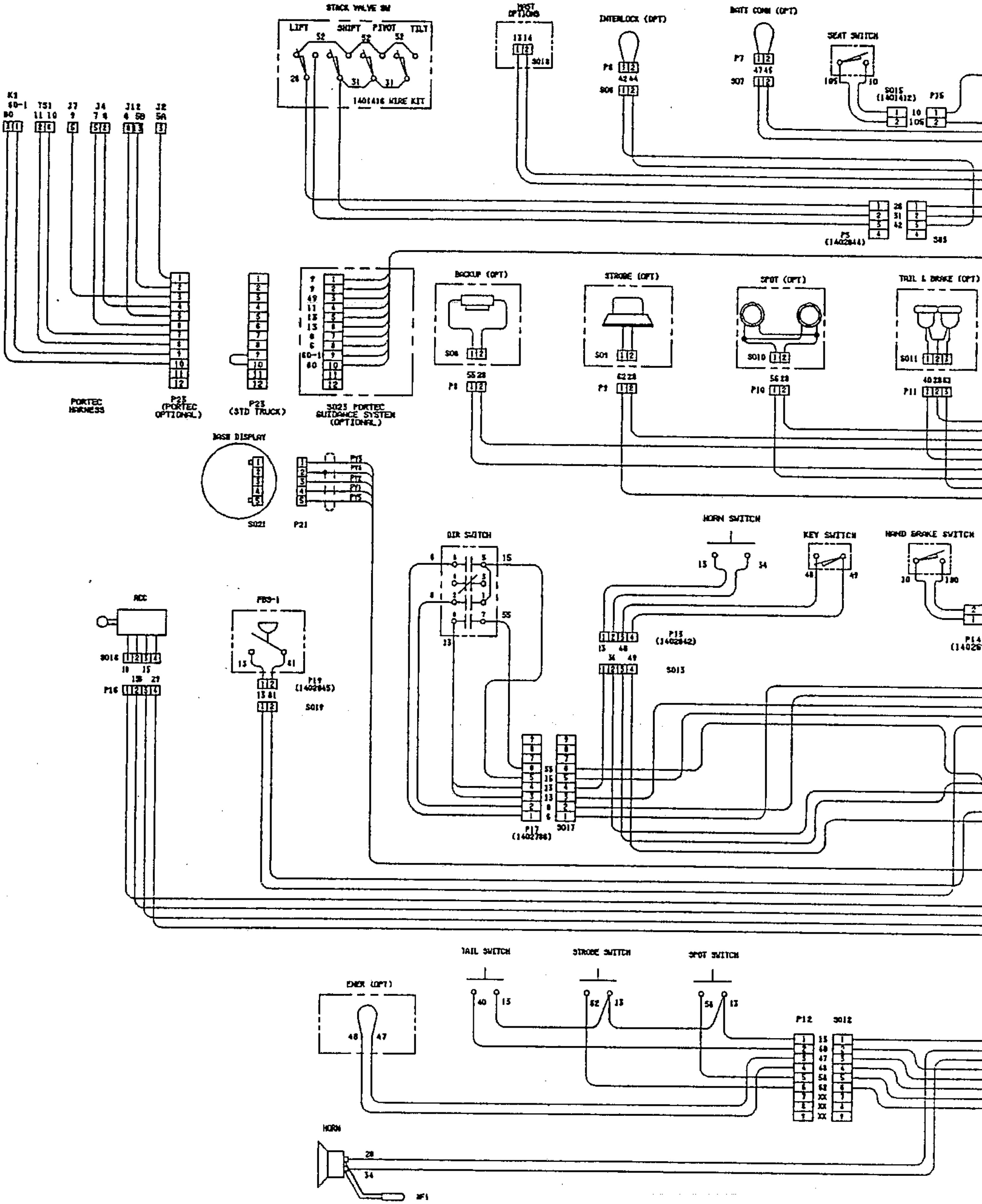
a. Check brake lines coming into front wheels for leakage. Tighten or replace fittings as necessary.

b. Check wheel cylinders for leakage of brake fluid. Rebuild as necessary.

6.3.5 Fluid Puddled Near Mast

a. Leaking hoses or hydraulic fittings. Tighten or replace as necessary.

b. Leaking lift cylinder. Rebuild cylinder as necessary.


STACK VALVE SW
LIFT
SHIFT
PIVOT
TILT
1401416 WIRE KIT
MAST OPTIONS
INTERLOCK (OPT)
BATT CONN (OPT)
SEAT SWITCH
PORTEC HARNESS
P22 (PORTEC OPTIONAL)
P23 (STD TRUCK)
S023 PORTEC GUIDANCE SYSTEM (OPTIONAL)
BACKUP (OPT)
STROBE (OPT)
SPOT (OPT)
TAIL & BRAKE (OPT)
BASE DISPLAY
S021
P21
HORN SWITCH
KEY SWITCH
HAND BRAKE SWITCH
DIR SWITCH
ACC
FB3-1
P19 (1402845)
S019
P13 (1402842)
S013
P17 (1402786)
S017
P16
S016
TAIL SWITCH
STROBE SWITCH
SPOT SWITCH
EMER (OPT)
P12
S012
HORN

STATUS CODE	DESCRIPTION	MEMORY RECALL	
-02	Forward directional switch is closed on initial power up.	CIRCUIT	Traction

SYMPTOM

Forward contactor will not pick up static return to off (SRO) lock out.

POSSIBLE CAUSE

Forward directional switch closed on initial power up (closure of battery plug, key switch or seat switch).

- Return directional switch lever to neutral and then select a direction.

Forward directional switch is welded closed or mis-adjusted to be held closed.

- Replace or adjust directional switch to insure that it opens when directional switch is returned to neutral.

Short circuit between TB2 and TB5.

- Disconnect wire from TB5 and check for short circuit between TB2 and wire.

Defective card

- Disconnect wire at TB5; Measure voltage at TB5, should be less than 60% of battery volts.

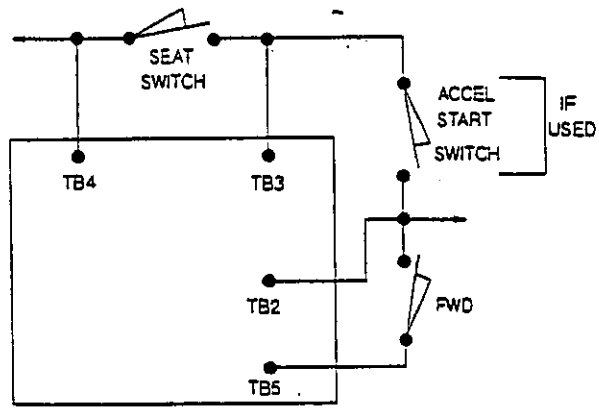


Figure 1.

STATUS INDICATION CRITERIA

This status code will be displayed when TB5 is greater than 60% battery volts at initial power up.

STATUS CODE	DESCRIPTION	MEMORY RECALL	
-03	Reverse directional switch is closed on initial power up.	CIRCUIT	Traction

SYMPTOM

Reverse contactor will not pick up static return to off (SRO) lock out.

POSSIBLE CAUSE

Reverse directional switch closed on initial power up (closure of battery plug, key switch or seat switch).

- Return directional switch lever to neutral and then select a direction.

Reverse directional switch is welded closed or misaligned to be held closed.

- Replace or adjust directional switch to insure that it opens when directional switch is returned to neutral.

Short circuit between TB2 and TB6.

- Disconnect wire from TB6 and check for short circuit between TB2 and wire.

Defective card

- Disconnect wire at TB6; Measure voltage at TB6, should be less than 60% of battery volts.

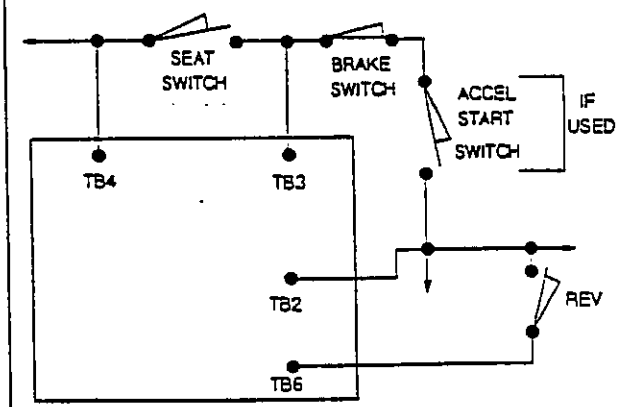


Figure 1.

STATUS INDICATION CRITERIA

This status code will be displayed when TB6 is greater than 60% battery volts at initial power up.

STATUS CODE -46	DESCRIPTION	MEMORY RECALL	No
	Look ahead test for T2 volts. (Greater than 85% of battery volts)	CIRCUIT	Traction

SYMPTOM

Forward or reverse contactor will not pick up.

POSSIBLE CAUSE

Defective 1 REC.

- Check for shorted 1 REC.
- Check for defective 1 REC insulator (co-therm) that may short 1 REC heat sink to base plate.

Defective 1A contactor.

- Check for welded 1A contactor power tips.

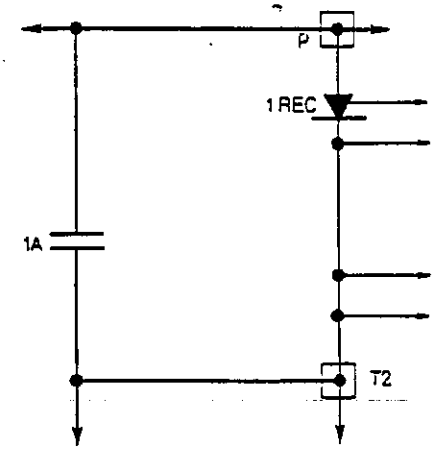


Figure 1.

STATUS INDICATION CRITERIA

This status code is displayed when the voltage at T2 is greater than 85% of battery volts.

STATUS CODE -47	DESCRIPTION	MEMORY RECALL	Yes
	2 REC does not turn on properly.	CIRCUIT	Traction

SYMPTOM

Forward or reverse contactor will open and close, then open and then can only be closed by opening and closing the key switch.

POSSIBLE CAUSE

Defective 2 REC circuit.

- Check that 2 REC will gate on.
- Check for open circuit or loose connection between 2 REC gate and PZ10. (white/red wire)
- Check for open circuit or loose connection 1 REC and 1C through the 2 REC circuit.

F or R contactor or power tips bouncing open.

- Check that power tips on F and R contactor power tips do not bounce open during operation (ie: travel over speed bumps or dockplates).

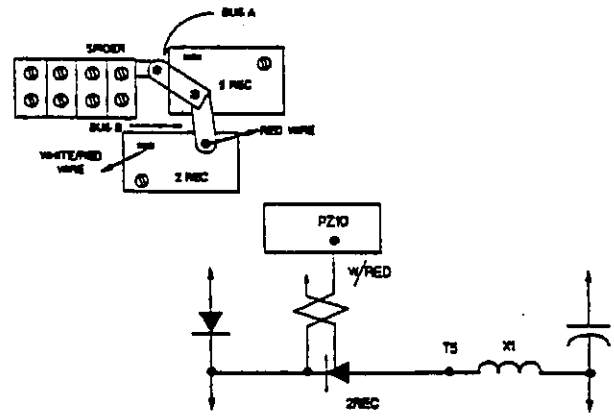


Figure 1.

STATUS INDICATION CRITERIA

This status code is displayed when the 2 REC fails to turn on.

STATUS CODE	DESCRIPTION	MEMORY RECALL	No
-93	User defined status code - see OEM instruction manual.	CIRCUIT	TMM1

SYMPTOM

Status code flashes on and off. Vehicle speed may or may not be reduced

POSSIBLE CAUSE

User defined status code is displayed by switch closure or motor brush sensor closure to negative.

- See OEM instruction manual for corrective action required.

Other Causes:

- Terminal 5 or 6 shorted to negative.
- Defective input switch (shorted).
- Defective TMM1 card.

NOTE:When SCR pump control is used with interal TMM1 functions, input terminal is PA1 and PA2 on the pump logic card.

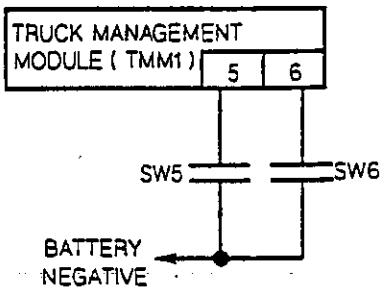


Figure 1.

STATUS INDICATION CRITERIA

This status code is displayed when the voltage at terminal 5 or 6 of TMM1 is at zero volts.

STATUS CODE	DESCRIPTION	MEMORY RECALL	No
-94	User defined status code - see OEM instruction manual.	CIRCUIT	TMM1

SYMPTOM

Status code flashes on and off.

POSSIBLE CAUSE

User defined status code is displayed by switch closure or motor brush sensor closure to negative.

- See OEM instruction manual for corrective action required.

Other Causes:

- Terminal 8 or 10 shorted to negative.
- Defective input switch (shorted).
- Defective TMM1 card.

NOTE:When SCR pump control is used with internal TMM1 functions, input terminal is PA4 and PA5 on the pump logic card.

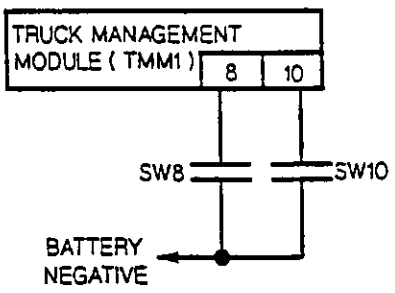


Figure 1.

STATUS INDICATION CRITERIA

This status code is displayed when the voltage at terminal 8 or 10 of TMM1 is at zero volts.

-157	Current sensor output voltage polarity check.	RECALL	Yes
		CIRCUIT	Pump

SYMPTOM

Pump contactor open and close, then can only be closed by opening and closing the key switch.

POSSIBLE CAUSE

Reversed yellow and green current senors wires

- Insure that the: -green wire connects to PZ4 with no open circuits.
  -yellow wire connects to PZ3 with no open circuits or loose connections.

Reversed power cable connection.

- Insure that the battery negitive cable connects to SCR NEG and the motor A2 cable connects to SCR A2.

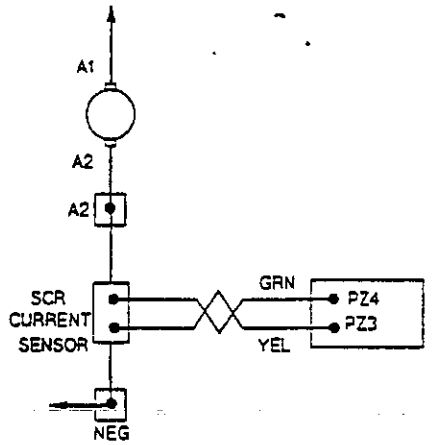


Figure 1.

STATUS INDICATION CRITERIA

This status code is displayed when the voltage input to PZ4 and PZ3 is the wrong polarity.

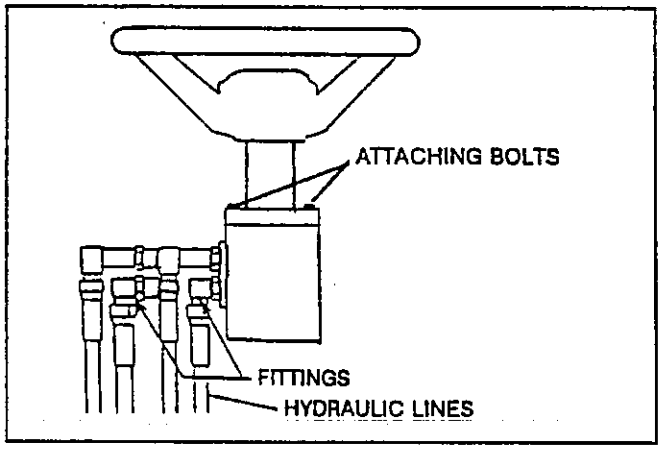


Figure 7-7. Steering Head Hydraulic Lines

b. Open the rear access door.

c. Remove the two electrical cables from the motor, and the two hydraulic hoses from the pump. Plug the suction hose and keep it above the level of the hydraulic reservoir.

d. Unscrew the four bolts from the support bracket, and detach the pump from the bracket.

e. To separate the pump from the motor, remove the four screws holding the pump to the motor, and tap the pump with a soft tip mallet.

7.3.11 Tilt Cylinder Removal

a. Rotate the mast completely to the left and tilt it toward the truck. Secure the mast to the overhead guard with a sling.

b. Disconnect the battery.

c. Work the hydraulic levers to relieve the system pressure.

d. Disconnect the hydraulic hoses from the cylinders; plug each hose to prevent leakage, and tag each hose for identification.

e. Remove the outside cotter pin from each clevis pin; remove the pins.

f. Remove the two cylinders. Tag them to mark the left and right cylinder.

7.3.12 Traction Motor Removal

a. Disconnect the battery.

b. Lift the rear access cover and detach the support struts from the truck. The struts are held in place by clamps and can be popped out of the clamps using a narrow bladed screwdriver.

WARNING

Support the access cover by means of a safety line attached to the overhead guard. The cover is heavy (approximately 80 lb [36 kg]) and will drop when the supporting struts are removed.

c. Remove the mounting hardware and detach the access cover from the truck.

WARNING

Enlist the aid of another service person to help in detaching the access cover. The cover is heavy and (even if supported by a safety line) may swing against your body or produce an unexpected force on your arms or hands.

d. Remove the four electric cables from the motor.

e. Remove the upper and lower motor screens.

f. Attach a sling and lifting device as shown in figure 7-8.

g. Remove the four motor attaching nuts.

h. Using a crane or another fork truck as a lifting mechanism, swing the motor out of the truck.

WARNING

Enlist the aid of another service person when attempting to swing the motor out of the truck. The motor is extremely heavy and may overpower an individual attempting to restrain its swing. Be careful not to get your hands or fingers pinched between the motor and the compartment lip. The motor should be sup-

over the end of the piston and continue to tap the driver so that the seal is pushed off the cone and snaps into the piston groove.

c. After all seals and packings are replaced, reassemble the piston into the cylinder barrel. Install the gland cap and torque to 55 lbf-ft.

7.6.5 Main Pump Assembly

Ensure that all parts are perfectly clean, and lubricate bushings and gears with clean hydraulic fluid. (Make sure that the O-Ring recess and end faces of the body remain dry.) This will aid the assembly of components into the body bores. See Figure 9-13.

a. Assemble bushings and gears into front unit body and fit seals to flange end.

b. Fit mylar assembly sleeve onto drive shaft and turn unit on its side. (The mylar assembly sleeve protects the shaft seal from damage during assembly.)

c. Fit mounting flange to front unit body ensuring that seals do not become misplaced or pinched.

d. Stand unit on mounting flange (5), ensuring it is not supported on the drive shaft.

e. Assemble rear unit, using spacer plate (20) in place of normal mounting flange.

f. Fit seals to open end of front unit, fit splined coupling (21), and then complete rear section assembly, turning drive shaft to align splines in splined coupling.

g. Attach end cover and tighten nuts to 49 ±2 Nm (36 ±2 lbf-ft).

h. If the unit has been reassembled with new bushings, gears, or bodies, it should be run in at zero pressure for one minute, then in stages with the pressure increased by 500 psi every minute until maximum pressure is attained. System temperature must be held below 80°C (175°F). If the temperature rises above the specified limit, shut down the pump or operate it at zero pressure until the temperature drops. It is recommended that the pump be run in a test fixture where any metallic shavings will be trapped by the fluid filter, and where pressure can be easily regulated.

7.6.6 Mast Assembly

Assemble the mast reversing the procedure in 7.5.6.

7.6.7 Steering Head Assembly

a. Before assembly, clean all metal parts in a solvent and blow dry with compressed air. **Do not wipe dry with a cloth or paper towel.** Lubricate all of the seals, except the quad ring seal, with petroleum jelly.

b. Lower the retainer into the housing using needle nose pliers. Make sure that the retainer is straight in the housing.

c. Put the ball in the housing.

d. Lubricate the seals for the seat; install as shown in Figure 7-16. When installing the seat, be sure not to twist or damage the seals. Insert the open end of the seat first.

e. Tighten the set screw to 100 inch-pounds (11.5 Nm). Make sure that the top of the screw is below the housing surface.

f. Put the spool into the sleeve with the spring slots lining up. Some spool and sleeve assemblies have identification marks that must line up. The spool must rotate freely inside of the sleeve.

g. Place a spring installation tool through the sleeve assembly. Position three pairs of centering springs on a bench with the extended edge down and the arched center together. Insert one end of the springs into the installation tool (Figure 7-17).

h. Compress the free end of the springs. Push the springs into the sleeve assembly and remove the installation tool. Center the springs so they are flush with the upper surface of the spool and sleeve.

i. Push the pin into the sleeve assembly until it is flush with the sides of the sleeve.

right of the operator. To replace any of the rocker switches, proceed as follows:

a. Disconnect the battery.

b. The switch panel is held in place by two spring-loaded latches hidden below the panel, one at the front and one at the rear. Gently pry up the panel with a medium size screwdriver enough to grasp it with the fingers and pop it free. (Do not pry too far with the screwdriver or you may damage the latches or mar the panel.)

c. Detach the wires from the back of the switch.

d. The switch is held in its slot by plastic wings. Compress the wings with a large pair of long-nose pliers to release the switch body and pop it out of the slot.

e. Place the new switch in the slot and compress the wings as necessary to allow it to pop into place.

f. Reconnect the wires to the new switch and replace the switch panel.

7.7.22 Seat Switch Replacement

a. Extending from the seat switch is a wire harness with a quick disconnect. Disconnect the wire harness from the truck harness.

b. Remove the two screws holding the seat switch to the mounting plate. Remove the switch.

c. To replace the switch, reverse steps a through b.

7.7.23 Wheel Cylinder Replacement

a. Remove front wheel (paragraph 7.7.12, steps a through d).

b. Remove brake shoes.

c. Remove brake line and bleeder fitting from inside of brake backing plate.

d. Remove the two screws holding the wheel cylinder to the backing plate. Remove the wheel cylinder.

e. To replace the wheel cylinder, follow steps a through d in reverse order.

7.7.24 Valve Stack Replacement

a. Disconnect the battery.

b. Relieve the system pressure by working the control handles.

c. Remove the two covers at the right of the operator's compartment to access the valve stack.

d. Detach the control lines from the valve stack (Figure 9-11).

e. Disconnect the hoses from the valve stack and plug them. Tag the hoses for identification.

f. Disconnect wires from valve switches.

g. Remove the bolts that hold the valve stack to the truck. Remove the valve stack.

h. To replace the valve stack, perform steps a through f in reverse order.

PART NUMBERS AND DESCRIPTIONS (continued)

Part Number	Description
1401129	Bearing Strip Piston
1401131	Head
1401132	Back-Up Tube Seal
1401144	Decal, Arrow Mast Indicator
1401149	Schematic, Hydraulic
1401151	Clamp Hose
1401152	Elbow, 90° Extra Lg .88-14 "O" to .75 -16 JIC
1401154	Clevis, Modified
1401155	Trim Seal
1401205	End, Spool Cam, Tilt
1401206	End, Spool Cam, Lift
1401207	End, Spool Cam, Shift & Pivot
1401216	Bushing Vibration
1401225	Cap & Tube Weld
1401226	Piston Rod
1401229	Bracket, Mounting, Cable
1401239	Idler Assembly for Steer Chain
1401248	Standoff Insulator
1401259	Washer, Snubbing .450ID X 2.00 OD X .125 Thick
1401260	Washer, Snubbing .532ID X 2.13 OD X .134 Thick
1401293	Nut, Hex Hd, Jam M12-1.25
1401295	Retainer
1401297	Extension, Master Cylinder R Threaded
1401302	Equalizer, Park Brake
1401308	Weldment Hand Brake Support
1401378	Battery Door Assembly
1401398	Power Cable, (Bat-)
1401405	Exclusion Seal
1401406	Back-up Ring
1401407	Pressure Seal
1401408	Seal, Flange
1401409	Bearing Race
1401410	Lower Shell Cover
1401412	Wire Assembly, Seat Switch
1401414	Wire Assembly, Console Panel Connector
1401416	Wire Kit, Stack Valve
1401417	Wire Kit, Switches
1401420	Nut, special
1401421	"O" ring
1401422	Nut, special
1401423	"O" ring
1401424	Plug, SAE
1401425	Machine screw, rd. Hd.
1401426	"O" ring

PART NUMBERS AND DESCRIPTIONS (continued)

Part Number	Description
1402198	Spacer
1402199	Housing
1402200	Spacer
1402201	Spacer
1402202	Spacer
1402203	Spacer
1402204	Roller Bearing, Race
1402205	Roller Bearing, Tapered
1402206	Bevel Gear Set
1402207	Plug
1402208	Washer, Din7603
1402209	Cover
1402225	Base Assembly
1402228	Nameplate (G.E. Contactor Panel)
1402294	Load Tire Installation
1402304	Elbow, 90° Extra Long .875-14 "O"- .875-14 JIC
1402324	Non-Slip Cover RH Floor Plate
1402362	Cable Assy SCR Control to Dash Display
1402365	Needle Bearing Kit
1402366	Check Ball
1402367	Check Ball Retainer
1402368	Control Parts Assembly
1402369	Center Spring Kit (6 Springs)
1402370	Seal, 2.89" (73.5 Mm) ID
1402371	Gerotor
1402372	Spacer
1402373	Capscrew
1402447	Shim .031 Thick
1402448	Shim .063 Thick
1402487	Contactor Kit, Steer Pump
1402488	Contactor Kit, Forward-Reverse
1402507	Screw, M6 X 1.0 X 12 (Thread Rolling)
1402508	Screw, M4 X 0.7 X 86mm
1402509	Screw, Flat Head, M3.5 X 0.6 X 8 Mm
1402510	Screw, M3.5 X 0.6 X 14mm
1402511	Screw, M3 X 0, 5 X 10mm
1402540	Bumper #6070
1402554	Steering Pump, Service Breakdown
1402586	Parallel Pin, 10mm Dia. X 16 Mm , M6 Tol.
1402689	Bracket, Hand Brake Switch
1402698	Wire Assembly, Parking Brake
1402715	Wire Harness
1402731	Cylinder, Shift RH 10.13 Stroke (Assy 1401786)
1402733	Rod Piston (Right Hand)

PART NUMBERS AND DESCRIPTIONS (continued)

Part Number	Description
23749	Primer, Loctite Grade T
2389132	Connector, Straight,Lg. 3/4-16 "O" to 9/16-18
23896	Relay, Base Hc2-Sf
23905	Nut, Flexnut 5/16-24
23911	Ring Retaining Tru-Arc (Weldes) 1.00 Dia Shaft
23926	Cone, Roller Bearing
23927	Cup, Roller Bearing
23935	Nut, Hex, Flex Lock 3/8-16
23942	Pad, Brake Pedal
23951	Element, Air Filter
23963	Seal, 7.7mm ID
23964	Seal, 9.3 Mm ID
23965	Trim Lok, 3/16
23993	Loctite, Blue, #242
23995	Grease, Lithium #2 "E.P." Extreme Pressure
23GM1035ER	Screw, M10 X 1.5-35 Socket Hex Hd Csk Flat Class 8.8
23GM820	Screw Flat Hd.M8 X 1.25-20 Socket Cl. 10.9
24146	Boot (Master Cylinder)
24K7	Plug, Hex Hd .875-14 "O" ring
25000	End, Yoke, 3/8-24 Thread
25001	Clevis Pin .312 Dia X .781 Eff Lgth
25002	Clevis Pin .375 Dia X .891 Eff Lgth
25021	Spring, Ext.
25023	Switch, Brake, 1/8
25024	Fitting, Swivel
25025	Seal, Washer
25026	Seal, Washer
25028	Fitting, Swivel
25031	Wheel, Sheave
25036	Switch, Key
25043	Brush Assembly
25045	Button Assembly, Horn
25070	Horn, 36v w/bracket
25080	Ty-Rap, W-0.184, L-7.31
25090	Screw, Soc Hd-Low-Hd Type #72531-5c-12 or Equal
25151	Cone, Bearing
25152	Cup, Bearing
25154	Nut, Lock
25155	Washer, Lock
25165	Connector, Battery, Grey Sb-350 2/0 Cable 36 Volt
25170	Relay, Sealed
25229	Switch, Basic Sealed Cover
25414	Diode, 4 Rec B Dl
25602	Base Plate

PART NUMBERS AND DESCRIPTIONS (continued)

Part Number	Description
51735	Motor, Electric Steer Pump
51919	Loctite Red, Stud Lock
52001	Seal Kit
52511	"LX" SCR Control Panel
52517	"LX" SCR Control Card
52661	Plate Backing Assembly
52692	Tp Asm
52714-2	Washer, Lock M3.5
52869	Grease Freezer (Hi-Lo)
52940	Seal, Tube
52942	Packing Piston
52943	Expand Ring - P.P.
52944	Seal, Piston I.D.
52948	Back Up Water Seal
52949	Shear Ring
52950	External Retaining Ring
52951	Tube End Spacer
52952	Clevis, Rod Female
52953	Socket, Hd. Screw
52954	Nut
53026	Plate
53027	Grooved Pin
53029	Parking Brake A2 (Left)
53030	Parking Brake A1 (Right)
53039-01	Hose, Assembly Suction 1.25 ID 34 Ola
53060	Handle, Ratchet, Brake with Lock Release
53080-9	Screw, Socket Hd Cl 12.9 M12 X 1.175-65
53085	Grease, Lithium Hp Synthetic, Gredag
5423	Shaft, Pivot
5438	Gasket, Pivot Arm
5442	Decal, Hyd. Oil
5510-2	Cover, Dust
61D4ER	Nut, Hex Hd Gr 5 .250-20
61D5ER	Nut, Hex Hd Gr 5 .312-18
61D6ER	Nut, Hex Hd Gr 5 .375-16
62D4ER	Nut, Hex Hd Gr 5 .250-18
62D5ER	Nut, Hex Hd GR5.312-24
62D6ER	Nut, Hex Hd Gr 5 .375-24
664880	Nut, Handwheel
667287	Connector, Str
6719	Strap, Ground
6840	Clip, Retaining, Cable
6EM100ER	Lockwasher, M10
6EM120ER	Washer, Lock Spring M12

9.5 PARTS OUTLINE

An indented outline of the items contained herein follows:

BASE UNIT PART NO. 1404706 Rev.B

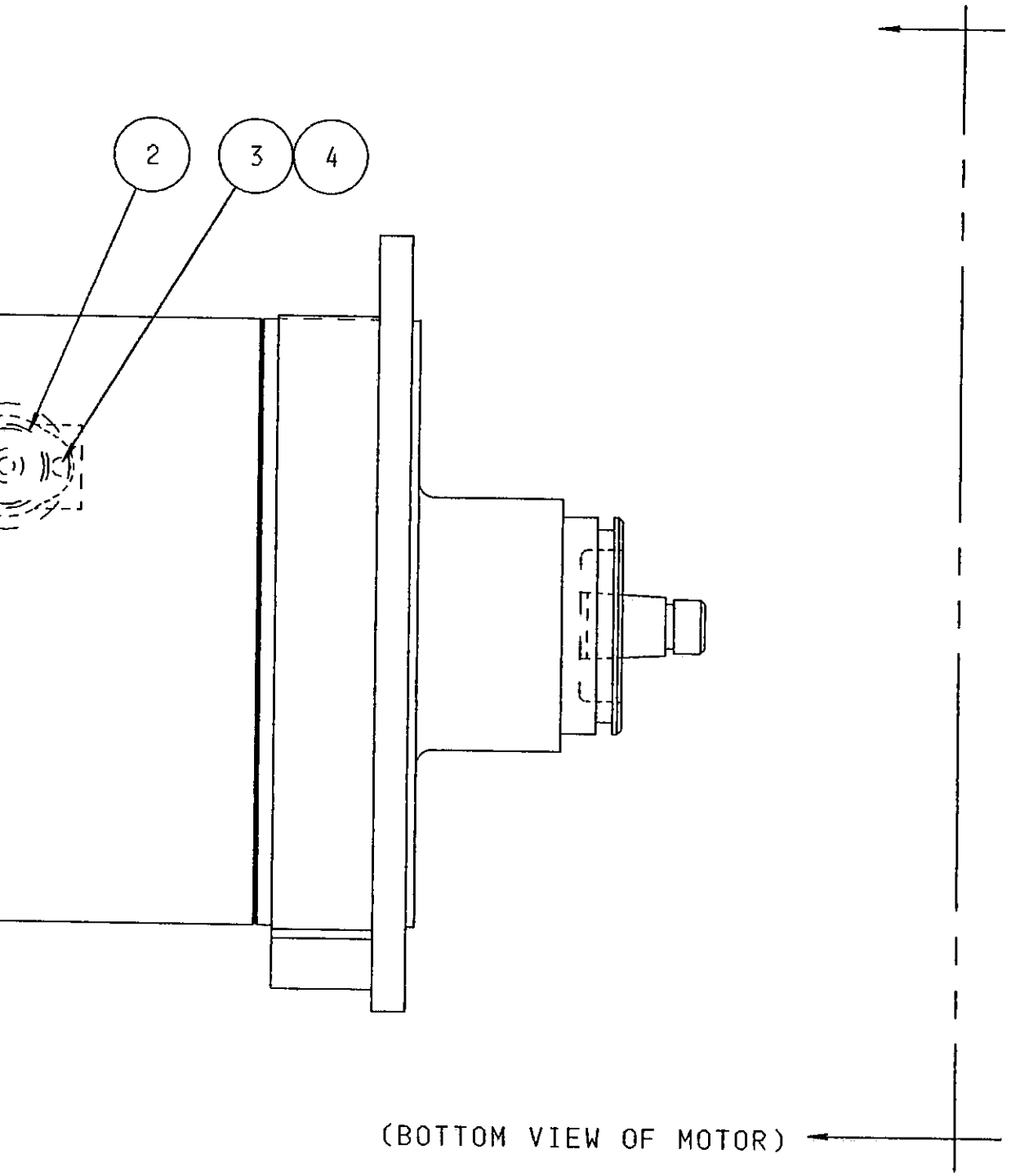
1404726 SLT-30 Frame Group (Reference only)

1404492 Drive Group
- 1404415 Traction Motor Assembly
- 1401239 Idler Assembly for Steer Chain
- 1400645 Drive Assembly
  - 1400109 Chain Assembly
  - 1400695 Drive Unit

1404493 Hydraulic Group
- 1400642 Hydraulic Spool Valve Assembly
  - 1400270 Valve Stack
- 1404416 Pump Motor Assembly
  - 1400269 Gear Pump
- 37506 Pump & Motor Assembly, Power Steering
  - 51735 Steering Pump Motor, Electric
    - 1402553 Service Parts
  - 51734 Steering Pump, Hydraulic
    - 1402554 Service Parts
- 1400258 Hydraulic Reservoir Assembly
- 1400646 Oil Filter Assembly
- 1400649 Hydraulic Assembly, Power Steering
  - 25950 Steering Motor
- 1402869 Manifold Assembly
- 1405392 Umbilical Hose Assembly

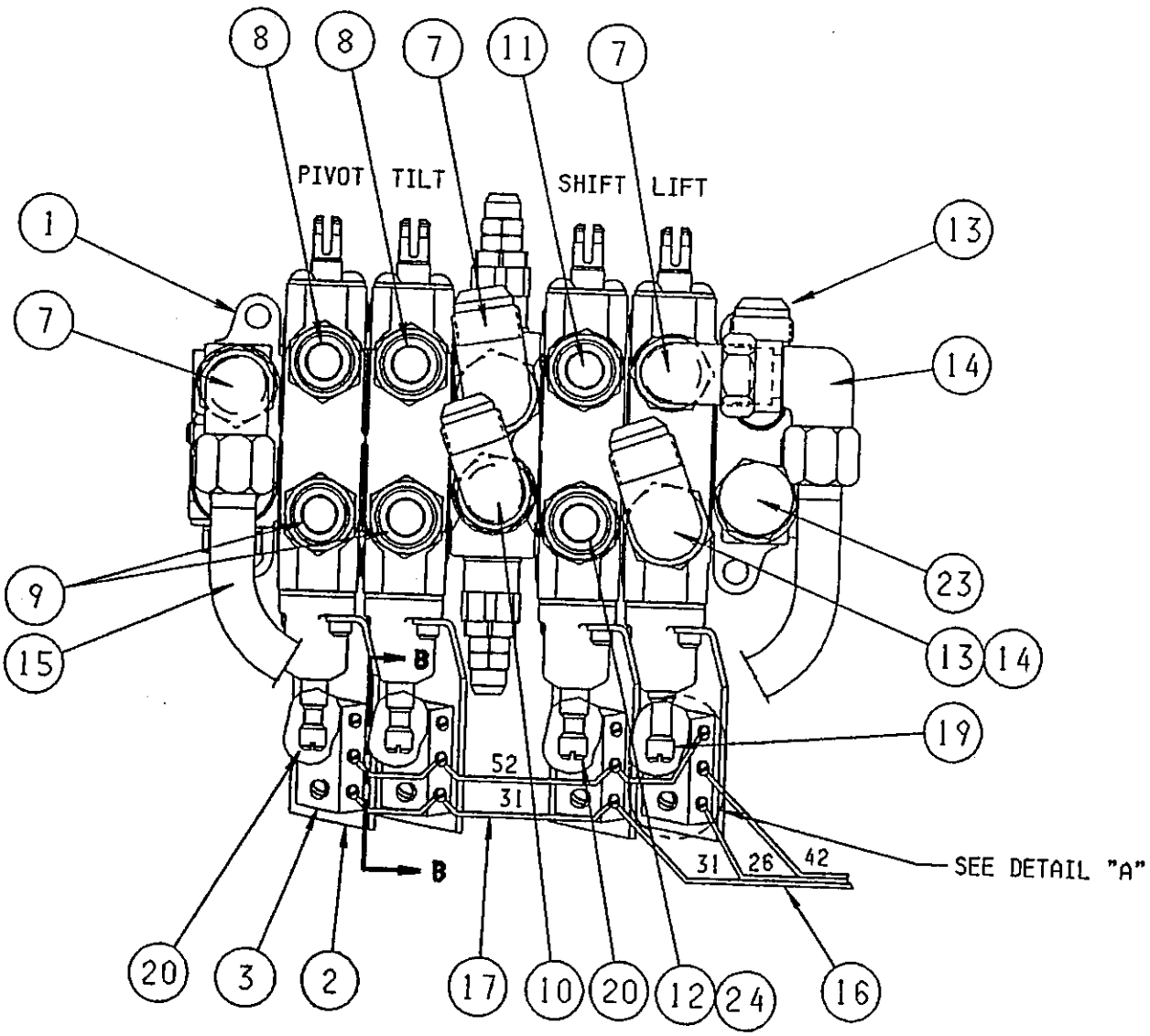
1404163 Operator Console Group
- 1400498 Console Panel Assembly
  - 1400648 Service Brake Components
    - 20210 Master Brake Cylinder
  - 1400650 Steering Components
    - 1400968 Steering Column
    - 25975 Steering Control Unit
  - 1401464 Electrical Components (Console Group)
- 1404539 Instrument Panel Assembly
- 1404068 Side Console Assembly
  - 1406119 Joystick Control, Pivot & Shift
  - 1406120 Joystick Control, Lift & Tilt
  - 1401860 Console Cover Assembly

TRACTION MOTOR ASSEMBLY, PART NO. 1404415 Rev.C (Sheet 1 of 2)



DRIVE UNIT, DUAL CHAIN, PART NO. 1400695 Rev.A

Item	Part Number	Qty	Description
1	1402586	1	Parallel Pin, 10mm Dia. X 16 Mm , M6 Tol.
2	3GM1050ER	4	Screw, Socket Hd Cl 12.9 M10 X 1.5-50
3	3GM1250ER	4	Screw, Socket Hd Cl 12.9 M12 X 1.75-50
4	3GM1265ER	6	Screw, Socket Hd Cl 12.9 M12 X 1.75-65
5	3GM1030ER	2	Screw, Socket Hd Cl 12.9 M10 X 1.5-30
6	7GM1020ER	15	Screw, Skt.Hd., M10 X 1.5 X 20, Class 8.8
7	1402164	1	Spacer, Din988
8	1402167	1	Centering Ring
9	1402168	1	Supporting Ring
10	1402169	1	Trunnion Bearing
11	3GM1075ER	2	Screw, Socket Hd Cl 12.9 M10 X 1.5-75
12	1402170	1	Breather
13	1402171	2	Nut, Hex Din934
14	1402172	1	Plug, Din908
15	1402173	1	Washer, Din7603
16	1402174	1	Housing
17	1402175	1	Wheel Shaft
18	1402176	12	Wheel Bolt
19	1402177	1	Thread Protective Shield
20	1402178	1	Sealing Ring 120 X 140
21	1402179	2	Roller Bearing, Tapered
22	1402180	AR	Spacer, 0.5 Mm
22	1402181	AR	Spacer, 0.2 Mm
22	1402182	AR	Spacer, 0.15 Mm
22	1402183	AR	Spacer, 0.1 Mm
23	1402184	AR	Spacer, Din988
23	1402185	AR	Spacer, Din988
23	1402186	AR	Spacer, Din988
23	1402187	AR	Spacer, Din988
24	1402188	1	Nut, Grooved
25	1402189	1	Identification Plate
26	1402190	1	Pinion
27	1402191	1	Nut
28	1402192	1	Helical Gear
29	1402193	1	Roller Bearing, Tapered
30	1402194	1	Roller Bearing Race
31	1402195	AR	Spacer
31	1402196	AR	Spacer
31	1402197	AR	Spacer
31	1402198	AR	Spacer
32	1402199	1	Housing
33	1402200	AR	Spacer
33	1402201	AR	Spacer
33	1402202	AR	Spacer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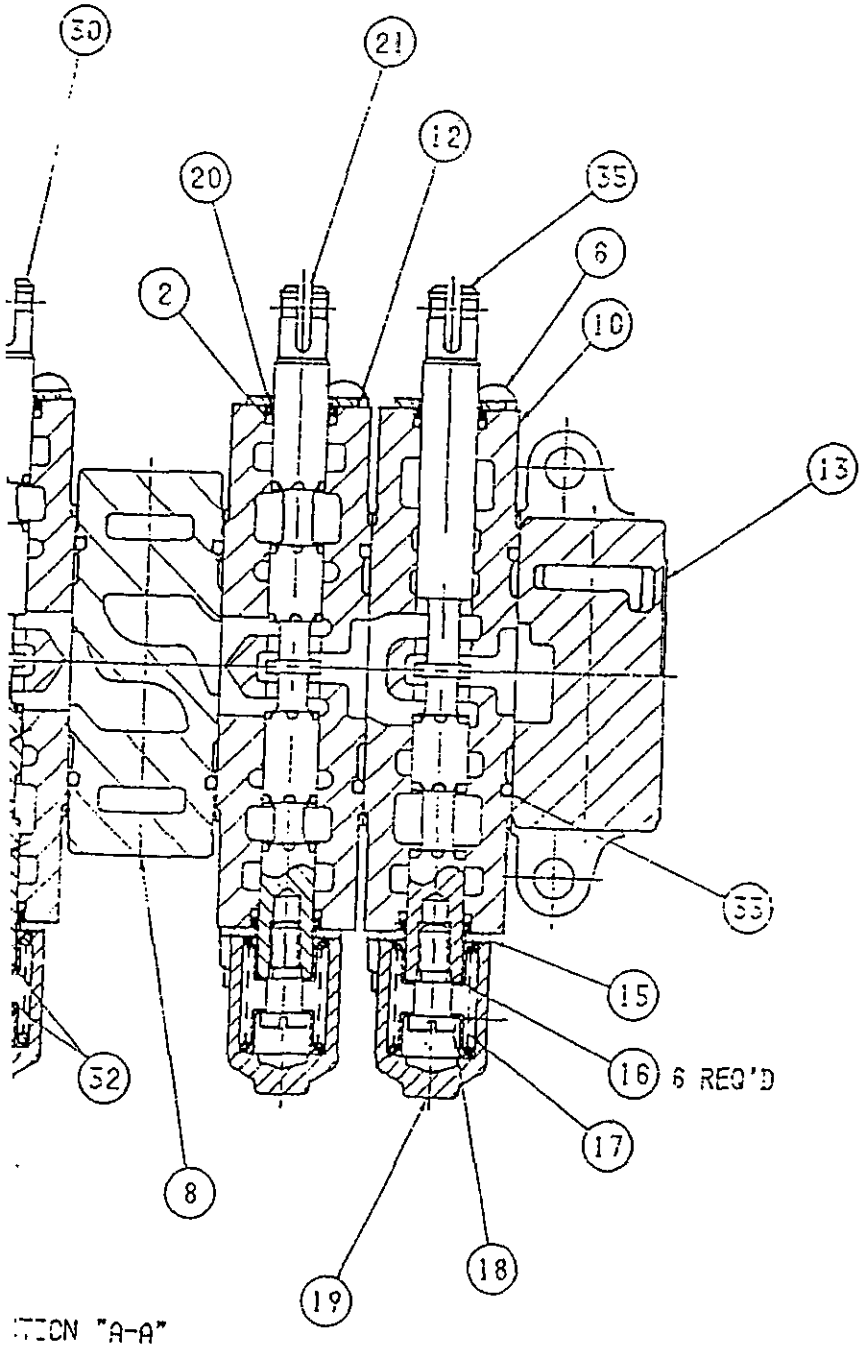
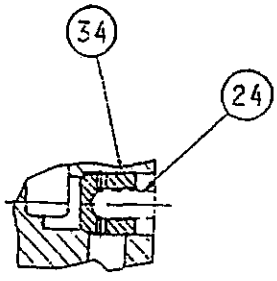
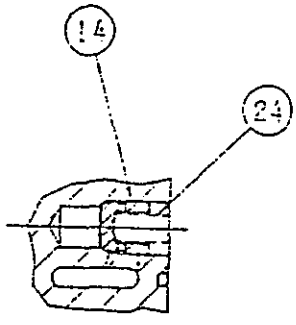
STACK VALVE, PART NO. 1400270 Rev.A (Sheet 2 of 2)





SECTION "C-C"
(SPOOL SECTION NO. 4)



SECTION "B-B"
(SPOOL SECTION NO.S 1, 2, & 3)

RELIEF VALV
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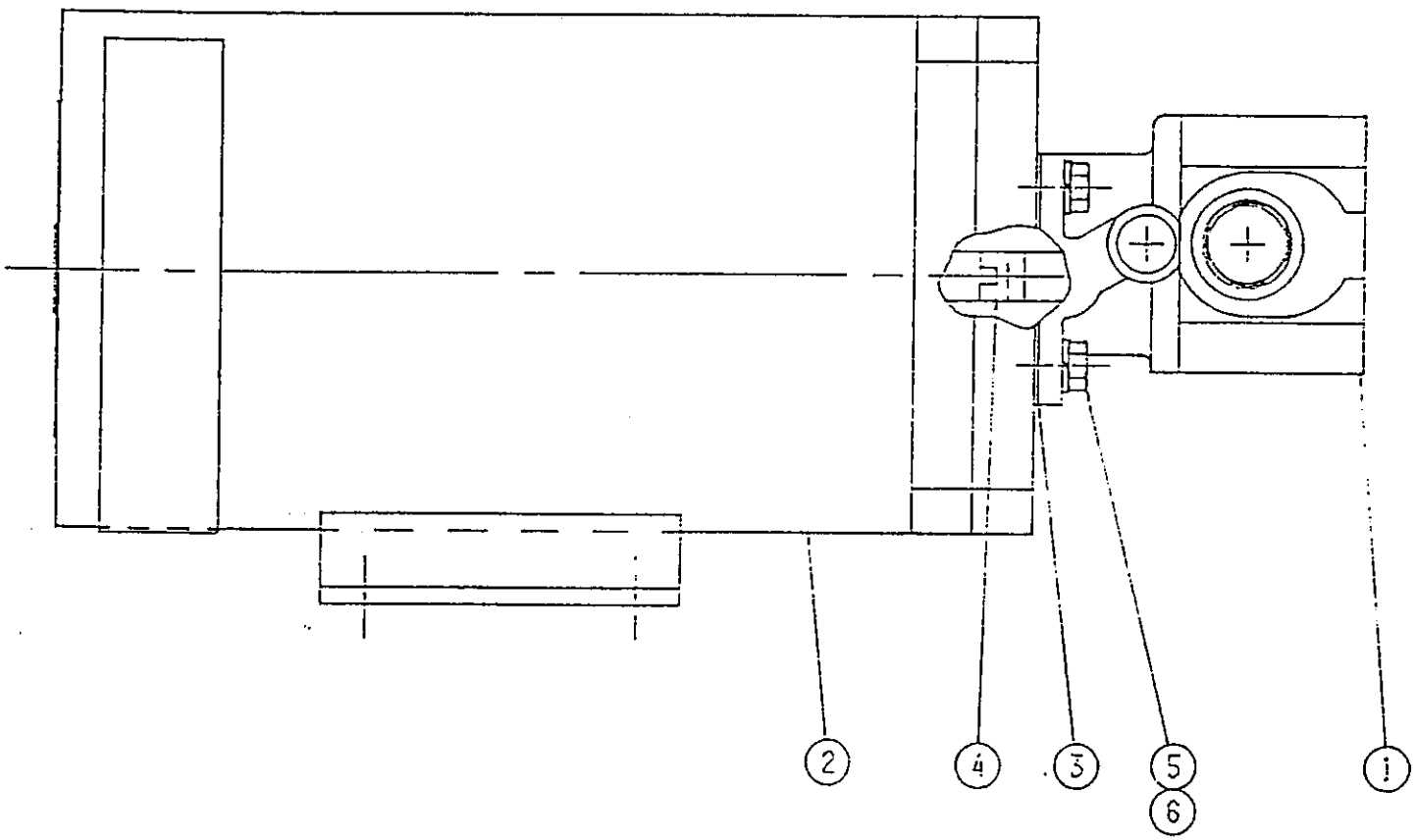
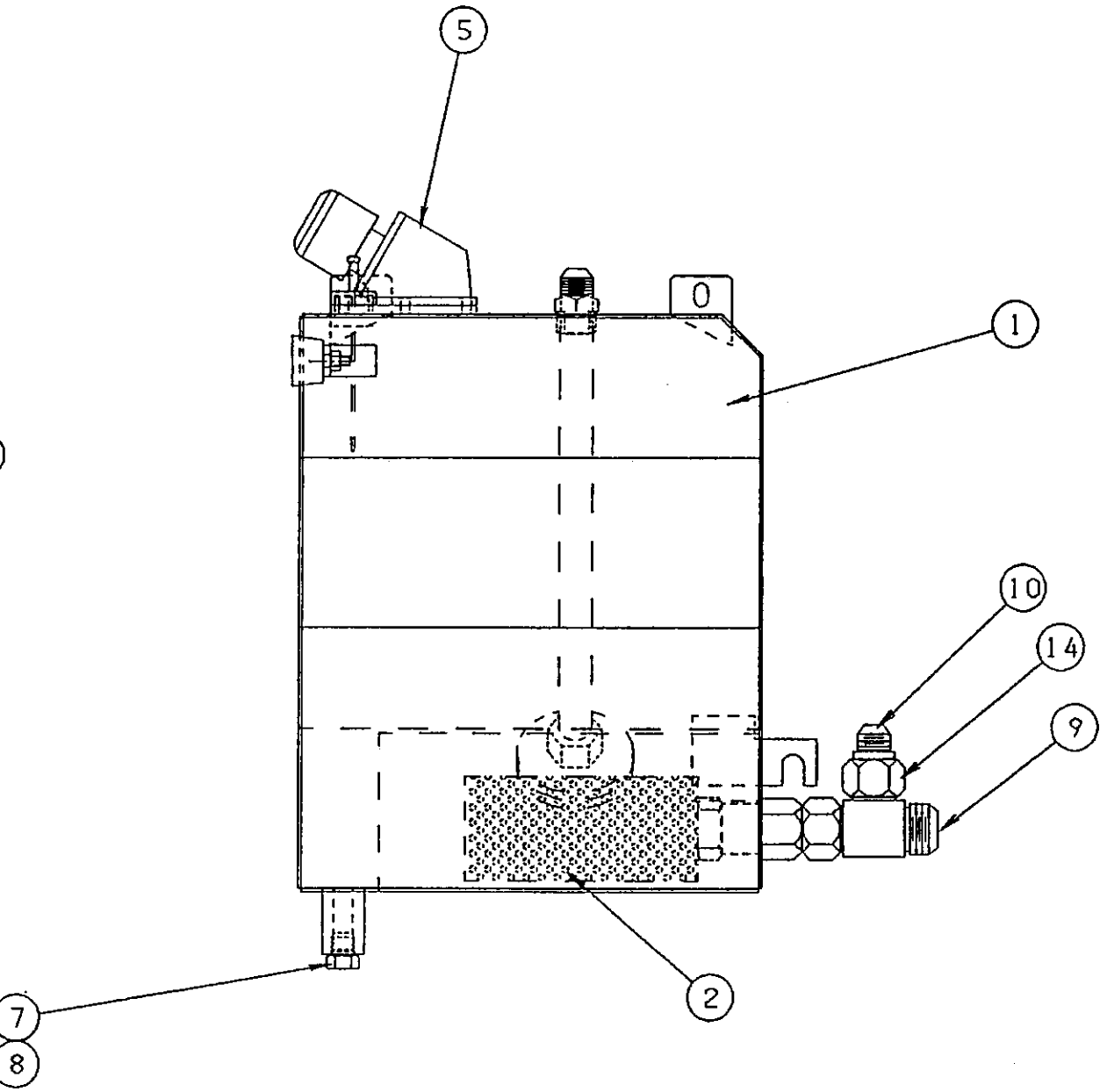
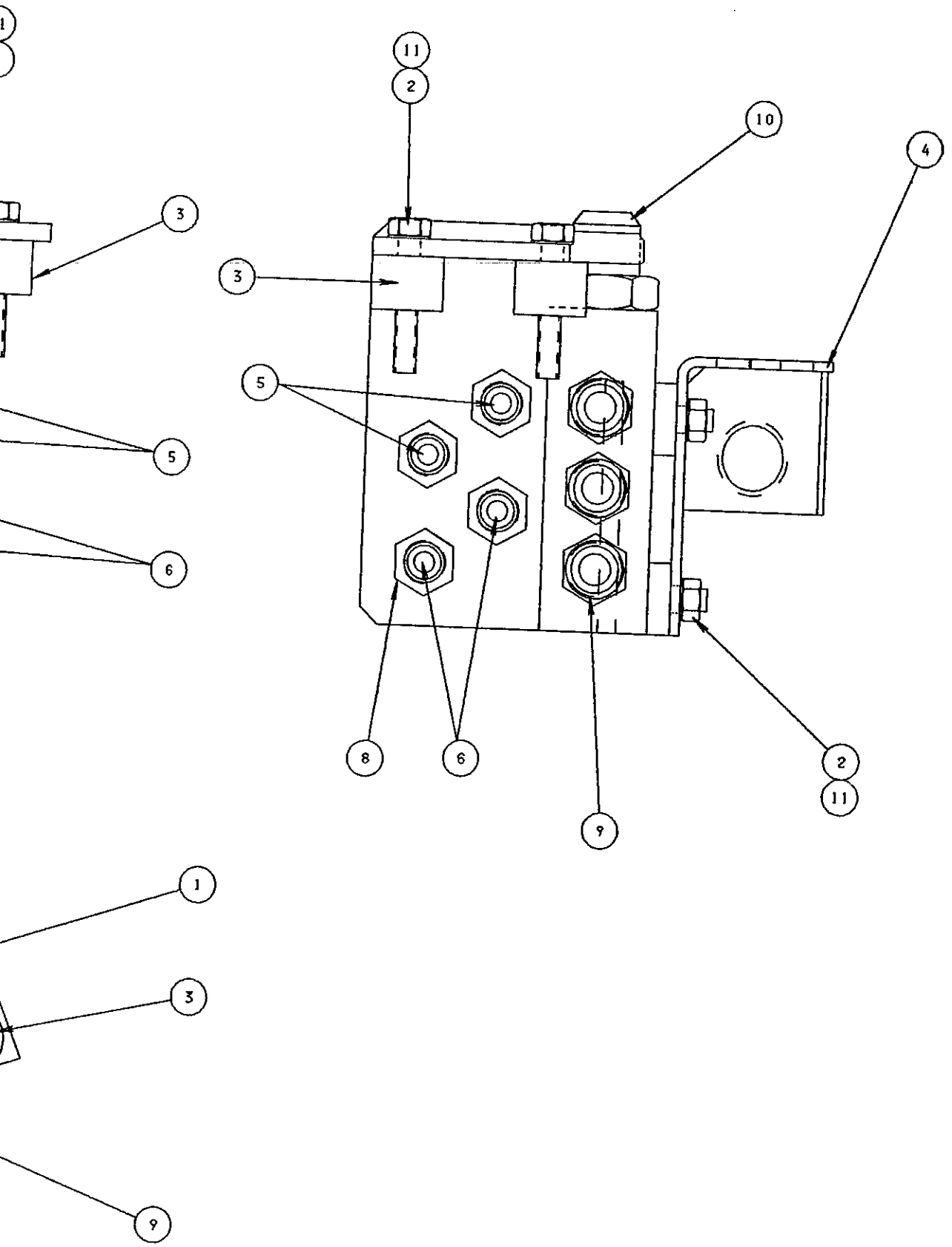
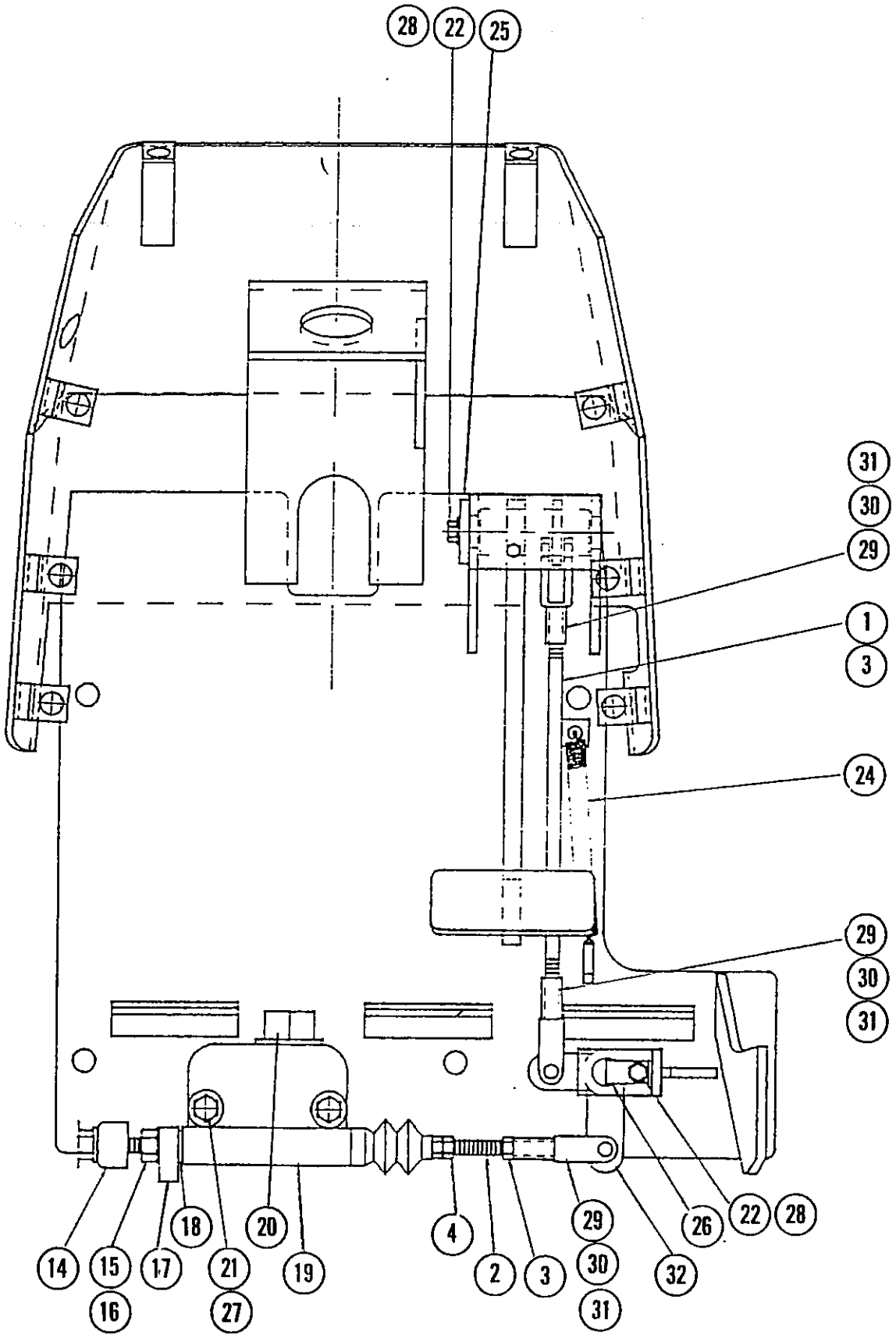


HYDRAULIC RESERVOIR ASSEMBLY, PART NO. 1400258 Rev.E



MANIFOLD ASSEMBLY, PART NO. 1402869 Rev.B

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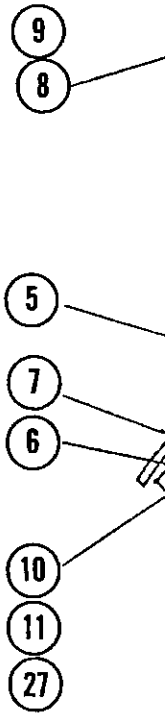
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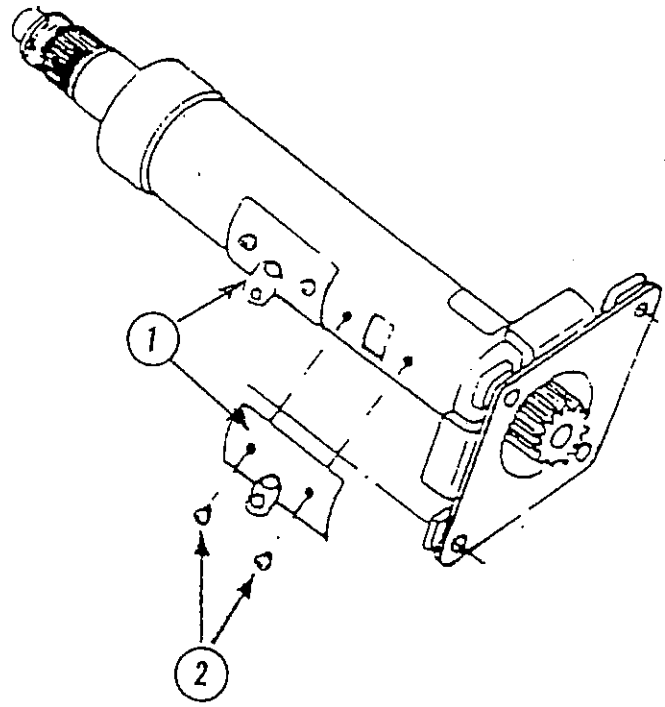
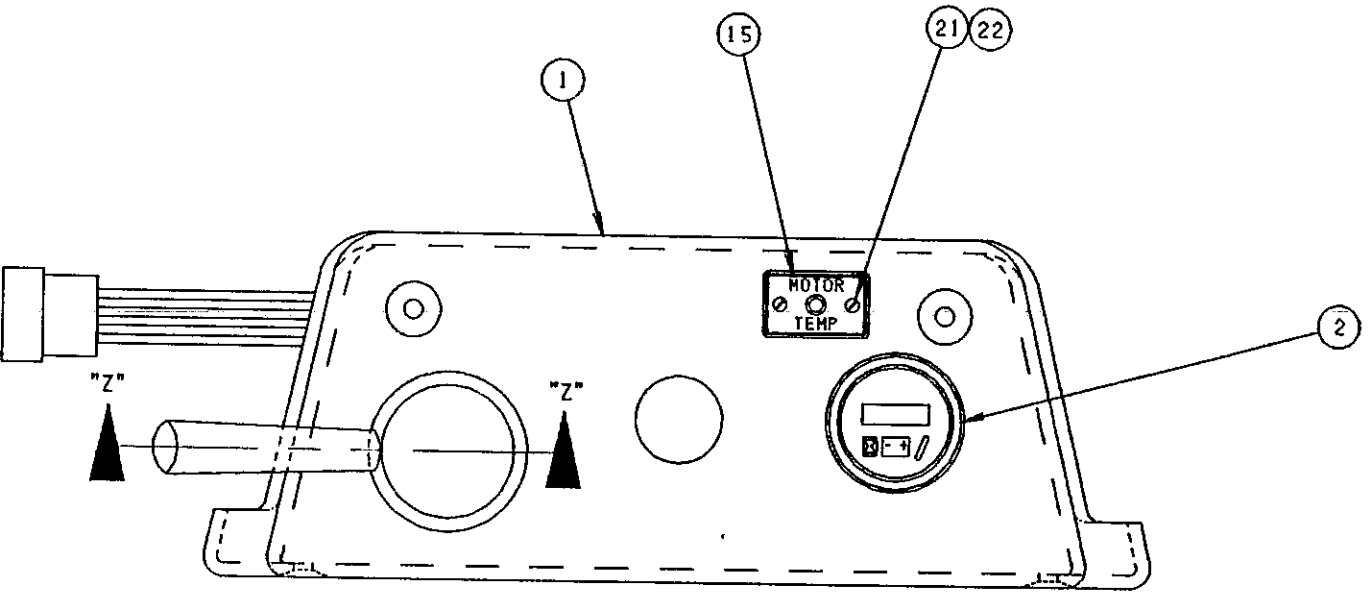
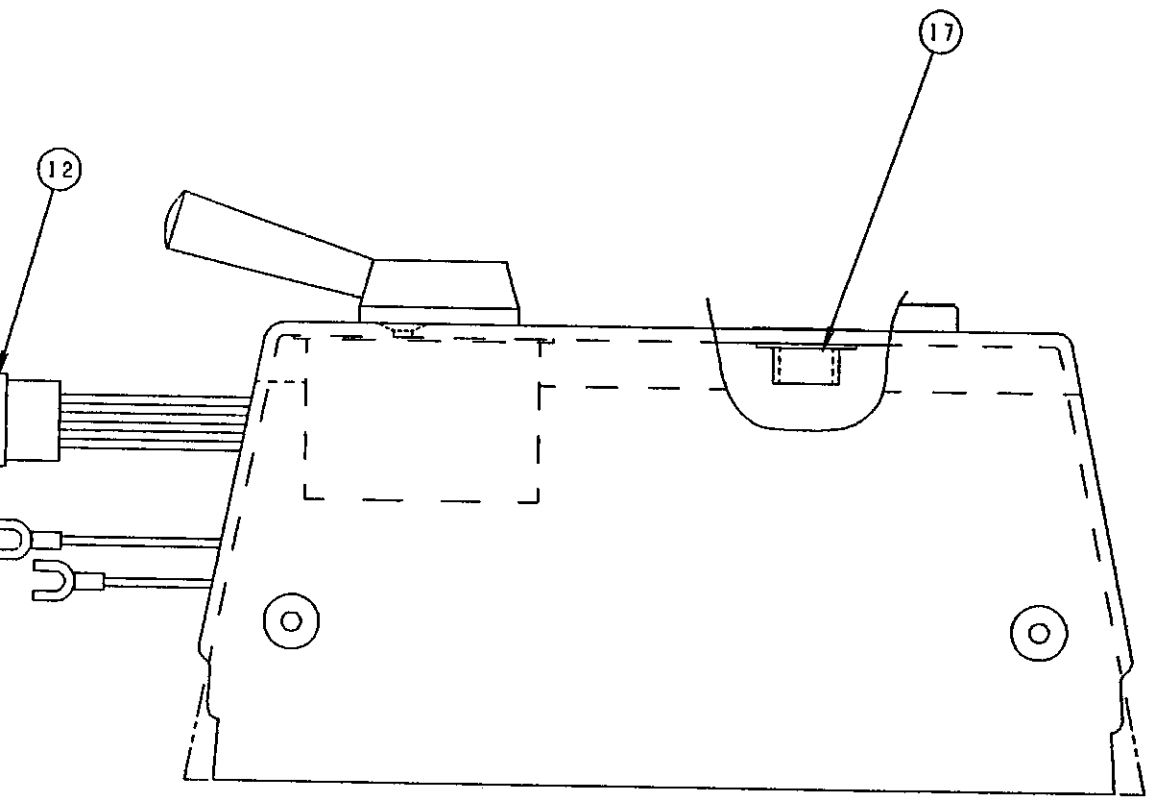
STEERING COLUMN, 10", PART NO. 1400968 Rev.A

Item	Part Number	Qty	Description
1	25043	2	Brush Assembly
2	25641	4	Screw



INSTRUMENT PANEL ASSEMBLY, HI-LO, PART NO. 1404539 Rev.B





REAR COMPARTMENT GROUP, PART NO. 1401994 Rev.H

Item	Part Number	Qty	Description
Ref	1F416E	2	Cotter Pin .13 Dia X 1.00
1	1408542	Pht 1	Rear Cover Assy High-Low
2	1405981	1	Latch Door Retainer
3	1401778	1	Spacer, Hinge
4	1410120	2	Gas Spring Assembly
5	1401756	2	Ball Stud 10mm, .312-18 Unc
6	1DM8ER	4	Nut, Hex Hd Cl 8.8 M8 X 1.25
7	1CM825ER	10	Screw, Hex Hd M8 X 1.25-25 Class 8.8
8	1401155	10 FT	Trim Seal
9	23965	.5 FT	Trim Lok, 3/16
10	6EM80ER	6	Washer, Lock Spring M8
11	18EM816ER	14	Washer, Flat M8
12	1404226	1	Support, Seal, Rear Cover
13	25618	12 FT	Strip, Rubber, 1/8 Adhesive Back
14	1404228	1	Clamp, Hose, Split
15	1404227	1	Clamp, Wire, Split
16	1404469	2	Cover, Drain Baffle
17	1404379	1	Box Weldment, Cable Cover
18	1409275	1	Insulator Plate Assembly
19	1404390	Pht 1	Boot, Modification
20	51443	10 OZ	Sealant, Rtv, Silicone Clear
21	25002	2	Clevis Pin .375 Dia X .891 Eff Lgth
22	15EM100ER	2	Washer, Flat M10
23	1F312E	2	Pin, Cotter 3/32 X 3/4
24	1CM635ER	3	Screw, Hex Hd Cl 8.8 M6 X 1.0-35
25	15EM60ER	6	Washer, Flat M6
26	1CM616ER	4	Screw, Hex Hd Cl 8.8 M6 X 1.0-16
27	3FM52	1	Cap, Sealing, 52mm
28	51464	Ref	Varnish, Spray, Moisture & Fungus Proof Mil-V-173-B
29	1407863	1	Resistor Plate Assembly
30	1407965	1	Tile, Floor, Open Grid
31	1407970	8	Grease, Silicone Dow Corning No. 4
32	1408547	1	Gasket, Hi-Lo Overhead Guard
33	1407675	2	Clamp Half, 20mm Group 3
34	1407691	1	Cover Plate Group 3
35	1CM650ER	2	Screw, Hex Cap M6 X 1-50 Class 8.8
36	6EM60ER	2	Washer, Lock Spring M6

CONTACTOR, MAIN PUMP SPNO, 300A, 36VDC COIL, PART NO. 28889 Rev.D

Item	Part Number	Qty	Description
1	28889-1	1	Base Assembbly
2	28888-2	1	Coil
3	28888-3	1	Armature Assembly
4	28888-4	1	Bushing
5	28889-5	1	Spring, Movable, Gold
6	28889-6	1	Spring, Return, Blue
7	28888-7	1	Seat, Spring
8	28889-8	1	Retainer, Tip Spring
9	28888-9	1	Bus Base
10	28889-10	1	Bus Base
11	28889-11	1	Buss Clamp
12	28889-12	2	Buss Assembly
13	28888-14	1	Tip
14	28889-15	1	Tip Assembly
15	28889-16	1	Bolt
16	28889-25	1	Kit, Contactor

PARKING BRAKE GROUP, PART NO. 1400633 Rev.K

Item	Part Number	Qty	Description
1	53060	1	Handle, Ratchet, Brake with Lock Release
2	1C624ER	1	Screw, Hex Hd Gr 5 .375-16 X 1.50
3	23935	1	Nut, Hex, Flex Lock 3/8-16
4	1401791	1	Modification, Cable Parking Brake
5	25031	1	Wheel, Sheave
6	6840	1	Clip, Retaining, Cable
7	1401302	1	Equalizer, Park Brake
8	1400696	1	Cable Assembly Brake 113 OAL 1500# Series
9	1400697	1	Cable Assembly Brake 135 OAL 1500# Series
10	23905	1	Nut, Flexnut 5/16-24
11	1CM825ER	4	Screw, Hex Hd M8 X 1.25-25 Class 8.8
12	18EM816ER	4	Washer, Flat M8
13	6EM80ER	8	Washer, Lock Spring M8
14	1DM8ER	8	Nut, Hex Hd Cl 8.8 M8 X 1.25
15	1400619	Pht 1	Clamp Block Assembly
16	1400620	2	Clamp Cable Brake (Formed)
17	1401229	2	Bracket, Mounting, Cable
18	1CM620ER	4	Screw, Hex Hd Cl 8.8 M6 X 1.0-20
19	6EM60ER	4	Washer, Lock Spring M6
20	1CM820ER	4	Screw, Hex Hd Cl 8.8 M8 X 1.25-20
21	1401308	1	Weldment Hand Brake Support
22	1405945	4	Clevis Pin .375 Dia X .594 Eff Lgth
23	25001	1	Clevis Pin .312 Dia X .781 Eff Lgth
24	1F312E	5	Pin, Cotter 3/32 X 3/4
25	1400621	2	Clamp (Flat)
26	25229	1	Switch , Basic Sealed Cover
27	4281-02	1	Retainer
28	4281-01	1	Retainer
29	10977	1	Insulator, Stack Switch
30	85G620E	2	Screw, Pan Hd #6-32 X 1 1/4
31	12D6E	2	Nut, Hex, No. 6-32
32	13E6ER	2	Washer, Lock #6 Internal Tooth
33	13GM5010E	1	Screw, Cheese Head M5 X 0.8 - 10
34	6EM50ER	1	Washer, Lock M5
35	1DM5ER	1	Nut, Hex Hd Cl 8.8 M5 X 0.8
36	25080	1	Ty-Rap, W-0.184, L-7.31
37	1402698	1	Wire Assembly, Parking Brake
38	28878	3 FT	Loom Split Plastic 3/8 ID Black Tubing
39	1402689	1	Bracket, Hand Brake Switch

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SHIFT CYLINDER COMPONENTS, PART NO. 1405452 Rev.D

Item	Part Number	Qty	Description
2	1408517	2	Anchor Chain Casting & Machining
3	3GM1235ER	4	Screw, Socket Hd Cl 12.9 M12 X 1.75-35
4	30125-01	2	Chain, Leaf Bl634 Modif. 35 Pitches
5	1408516	2	Clevis Pin, Special .303 Dia.X 1.656 Eff Lgth
6	1F412E	4	Pin, Cotter
7	1408077	2	Chain Anchor
8	1408084	2	Clevis Pin, Special .312 Dia X1.281 Eff Lgth
8	1408515	2	Clevis Pin, Special .303 Dia.X .969 Eff Lgth
9	3DM12ER	2	Nut, Hex, M12-1.25
10	1401293	2	Nut, Hex Hd, Jam M12-1.25
11	1400241	1	Chain Anchor (Mach.)
12	1CM1655ER	6	Screw, Hex Hd M16 X 2.0-55 Class 8.8
13	6EM160ER	6	Washer, Lock M16
14	18EM613ER	4	Washer, Flat M6
15	51919	AR	Loctite Red, Stud Lock
16	18K5	3	Connector, Male 45° Elbow .562-18
17	17K5	1	Elbow, 90° 9/16-18 O-Ring to 9/16 -18 JIC
18	30130	2	Clevis Pin Weldment
19	1CM620ER	2	Screw, Hex Hd Cl 8.8 M6 X 1.0-20
20	1401785	Pht 1	Shift Cylinder Assembly [1]
21	1401786	Pht 1	Shift Cylinder Assembly [2]

[1] Used on left side of Triplex Mast, right side for Quad Mast.
[2] Used on right side for Triplex Mast, left side for Quad Mast.

PIVOT CYLINDER, PART NO. 1400601 Rev.A

Item	Part Number	Qty	Description
1	1401104	1	Cap & Tube Weld
2	1401105	1	Piston Rod
3	1405509	1	Piston with Cushioning Ring
4	1401107	1	Locknut, Piston
5	1401108	1	Head
6	1401109	1	Spacer, Tube End
7	1401110	1	External Retaining Ring
8	1401111	1	Packing Rod
9	1401112	1	Wiper Rod
10	1401113	1	Seal, Water
11	1401114	1	Seal, Back-Up Water
12	1401115	1	Seal, Tube
13	1401116	1	Seal, Back-Up Tube
14	1401117	1	Ring, Shear
15	1401118	1	Packing, Piston
16	1401119	1	Expand Ring P.P.
17	1401120	1	Seal, Piston ID
18	52952	1	Clevis, Rod Female
19	52953	1	Socket, Hd. Screw
20	52954	1	Nut
21	1401102	Ref	Seal Kit
22	1405510	1	Cushioning Ring, Piston

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