SwingMast®

Model SL-22-ESS

Technical Manual
for

Customer_____

Truck Serial No._____

OPERATION
PREVENTIVE MAINTENANCE
TROUBLESHOOTING
PARTS BREAKDOWN
MAINTENANCE
OPTIONAL EQUIPMENT

This technical manual contains information pertinent to the safety of both vehicle and operator. READ IT THOROUGHLY!

LANDOLL DREXEL

WARNING

OPERATING

THE OPERATOR MUST BE FAMILIAR WITH ALL OF THE FOLLOWING SAFETY PRECAUTIONS BEFORE OPERATING THIS VEHICLE.

This vehicle is equipped with safety features for the protection of the operator and personnel in the vicinity of the vehicle. Do not adjust, disconnect, or tamper in any way with these features.

Allow no one under or near the mast or forks, loaded or empty. Do not hold on to, reach through, or climb on any part of the mast. Keep feet, arms, and legs inside the confines of the operator's compartment.

This vehicle should be checked for proper operation prior to being placed in service. Refer to the Operator's Check Out List in the Operating section of this manual. If found to be in need of repair, or in any way unsafe, the matter should be reported to the proper authority and the truck removed from service until it has been restored to safe operating condition by a qualified serviceperson.

Be certain that all access/service panels, doors, and covers are closed securely. Do not operate vehicle with panels, doors, and covers open or unsecured.

This vehicle is equipped with an overhead guard and a load backrest extension. Do not remove or alter them.

Do not operate this vehicle unless the operator is in the proper operating position (in the driver's seat).

INTRODUCTION

Your Drexel SwingMast® counterbalanced front/side loading fork lift truck represents the greatest advancement in the state of the art in the powered industrial fork lift truck industry in the past twenty-five years.

Its name "Counterbalanced Front/Side Loading Fork Lift Truck" defines its versatility which can be described as follows:

1. When the mast is in the forward position, it operates as a conventional counterbalanced front loading truck. (Figure 1-1)

2. When the mast shift and pivot features are utilized, it permits the front loading unit to operate in storage aisles as narrow as 56 inches wide. The mast assembly pivot and shift features of the Drexel unit simulates the right angle turning of a conventional front loading truck in a wide storage aisle. (Figure 1-2).

3. When the mast assembly is pivoted out 90 degrees and shifted to the right, the truck operates as a side loader. (Figure 1-3).

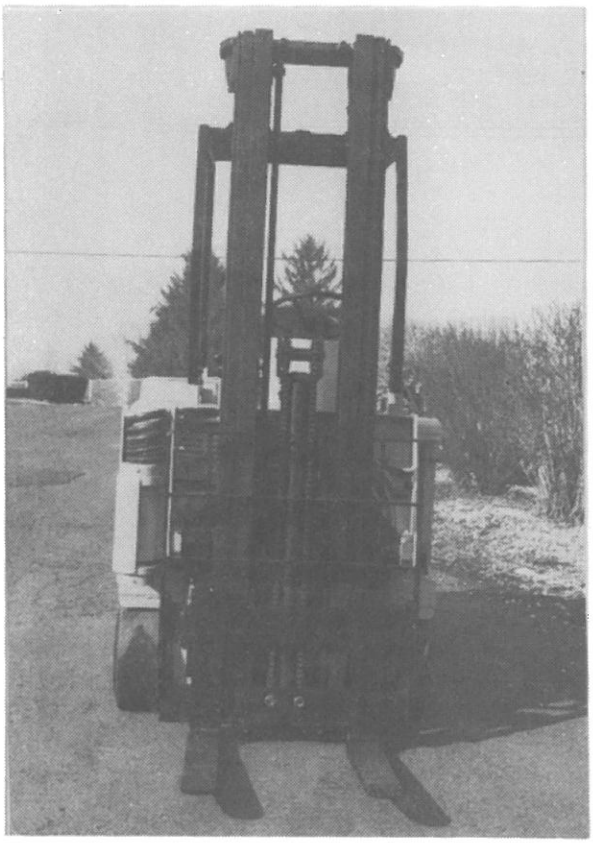

Figure 1-1

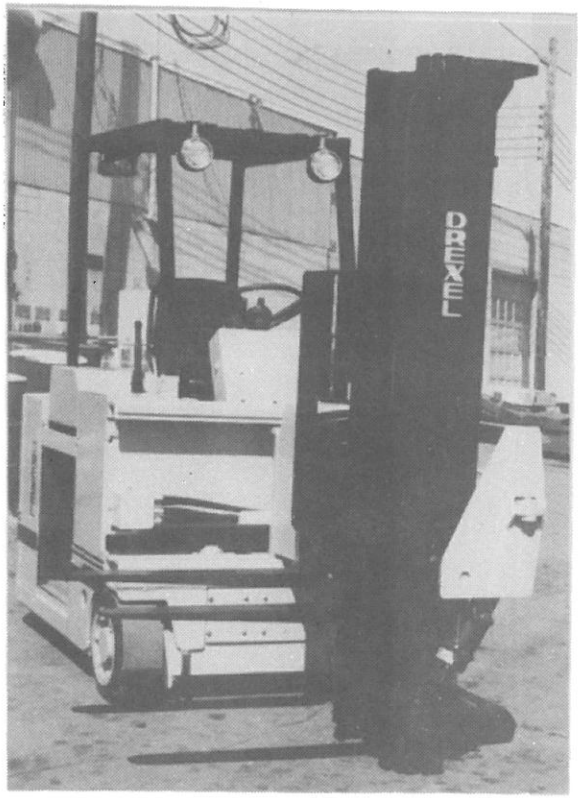

Figure 1-2

NOTES

Figure 1-3

OPERATORS SEAT ADJUSTMENT

The horizontal position of the operators seat may be adjusted in two ways, as follows:

1. Primary seat position adjustment, up to 4 inches, may be changed by the seated operator grasping the locking lever (Figure 1-16) with the left hand, pushing it outward and shifting body weight forward or rearward to reposition the seat. Release of the locking lever and slight movement of the seat should insure locking in position.

2. Secondary seat position adjustment, up to 3 inches, may be obtained as follows:

A. Raise the seat to a position over the steering wheel.

B. Loosen the three, 3/8 inch, hex head cap screws (Figure 1-17) using a 9/16 inch wrench.

C. Reposition the seat assembly and mounting plate and retighten the 3/8 inch hex head cap screws.

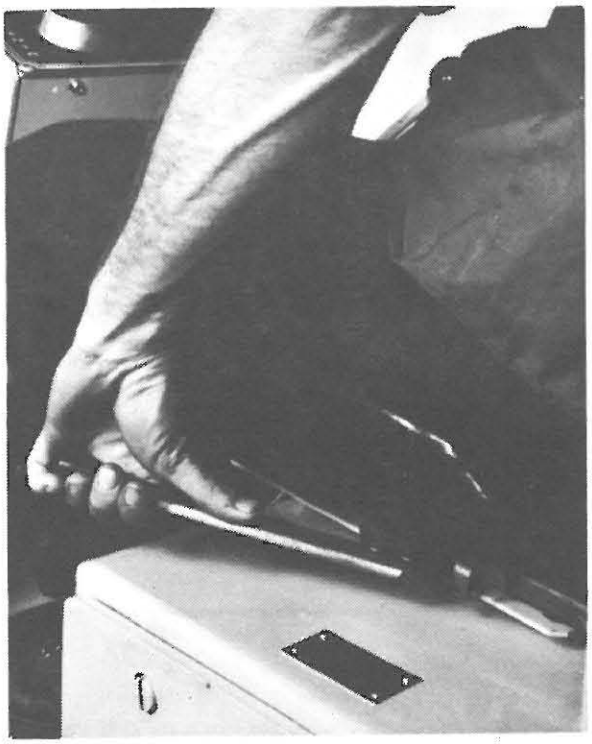

Figure 1-16

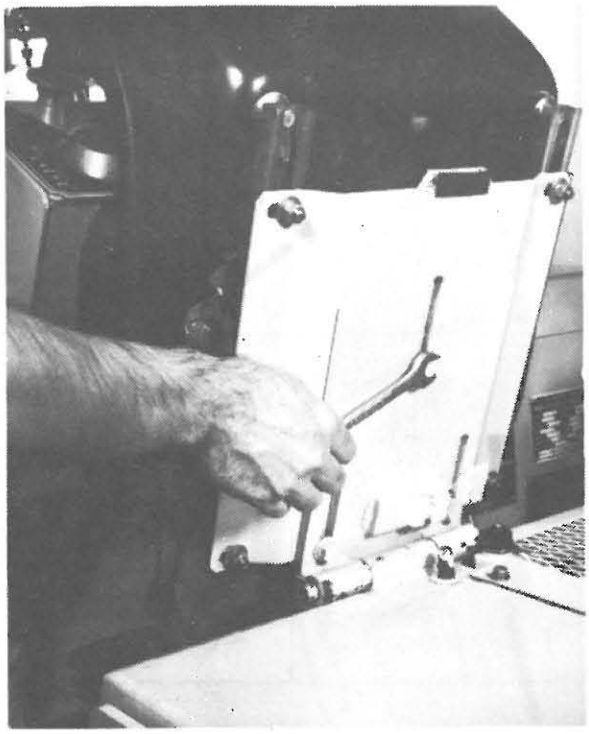

Figure 1-17

FORK ADJUSTMENT

Forks may be adjusted to obtain a maximum of 34 inches outside to outside dimension, or an 8 inch outside to outside minimum dimension.

Keep the forks spread to the maximum permissible position that the pallet or load will allow.

Position of the forks may be changed and the forks secured in the new location as follows:

1. Reach behind the top of each fork and pull the tip of the latch upward. This will lift the keeper pin out of the notch in the fork carriage bar (Fig. 1-18)

2. Push the top of the fork with the heel of your hand while pushing the fork tine with one foot. A stubborn fork may be dislodged by alternating a push at the top from the hand with a push at the bottom from the foot, producing a rocking motion.

3. Secure the fork position on the fork carriage bar by tipping the latch over and down. The keeper pin must fall into one of the notches on the top of the fork carriage bar (Fig. 1-19).

NOTES

ditions, it may be necessary to oil chains at more frequent intervals. In all cases, the external surface of the chain must be protected with a film of oil. Corroded chains should be inspected for cracked plates. Outside plates are particularly susceptable to stress-corrosion cracking. If chains are heavily rusted or corroded, they should be removed from the mast for a thorough inspection for cracked plates. If plates are cracked, all chains on the truck should be replaced. Oil chains when they are re-installed on the mast.

3. Cracked Plates - The most common cause of plate cracking is fatigue failure. Fatigue is a phenomenon that affects most metals and many plastics. After many repeated heavy loads, the plates may crack and the chains will eventually break.

Fatigue cracks are almost always found through the pitch holes perpendicular to the pitch line. Contrast this failure mode to the random failures caused by stress-corrosion cracking. If cracks are present, replace all chains on the truck. Many apparently sould plates are on the verge of cracking, making chain failure very likely.

4. Ultimate Strength Failure - This type of failure is caused by overloads far in excess of th truck design load.

5. Tight Joints - All joints in roller chain or lift chain should flex freely. Tight joints resist flexure, increase internal friction, thus increasing chain tension required to lift a given load. Increased tension accelerates wear and fatigue problems.

In roller chain, tight joints are usually caused by rust or inside plates moving outward on the bushings. Limber up rusty chains with a heavy application of oil.

Tap bushing plates inward to remedy a plate "walking" problem. If plate "walking" persists, replace the entire strand. This type of link plate displacement of roller chains with tight joints have been run with little or no lube.

Tight joints in lift chains can be cause by:

- **a.** Bent pins or plates.
- **b.** Rusty joints.
- **c.** Peened plate edges.

Oil rusty chains and replace chains with bent or peened components. Peening of plate edges may be caused by worn sheaves, unusually heavy loads, or chain sliding past a guide in the mast.

6. Protruding or Turned Pins - Heavily loaded chains operating with little lube generate tremendous friction between pin and plates (pin and bushing in roller chain) in extreme cases, the frictional torque in the joint can actually turn pins in the press-fit outside plates.

If chain is allowed to operate in this condition, the pins slowly work out of the chain causing chain failure. Turned pins can be quickly spotted because the flats on the "V" heads are no longer in line. Chains with turned or protruding pins should be replaced immediately.

Do not attempt to repair the chain by driving pins back into the chain.

7. Chain Side Wear - A wear pattern on pin heads and outside plates indicates misalignment. This condition damages chain and sheaves as well as increasing internal friction in the chain system.

8. Chain Anchors and Sheaves - An inspection of the chain system includes a close examination of chain anchors and sheaves.

Check chain anchors for wear, breakage, and misalignment. Anchors with worn or broken fingers should be replaced. Anchors should be adjusted to eliminate twisting or other misalignment in the chain. When chain is misaligned, load is not distributed uniformly between the plates. Prolonged operation will result in premature fatigue failure.

Sheaves with badly worn fingers and outside diameter should be replaced. Heavy flange wear indicates chain misalignment.

LUBRICATION

The most important consideration in field maintenance of lift chains is lubrication. Hard working, heavily loaded chains cannot be expected to give satisfactory wear lift without scheduled periodic re-lubrication. Like all bearing surfaces, the precision manufacturerd, hardened-steel, joint-wearing surfaces require a film of oil between mating parts to prevent rapid wear. Oil must penetrate the chain joint to prevent wear. Applying oil to external surfaces will prevent rust, but oil must flow into the live bearing surfaces for maximum wear life.

Frequency of re-lube will vary with operating conditions and environment. The best estimate of lube period is 200 hours. Trucks parked outdoors or trucks in extremely severe service, may require more frequent re-lube to maintain an oil film on all chain surfaces.

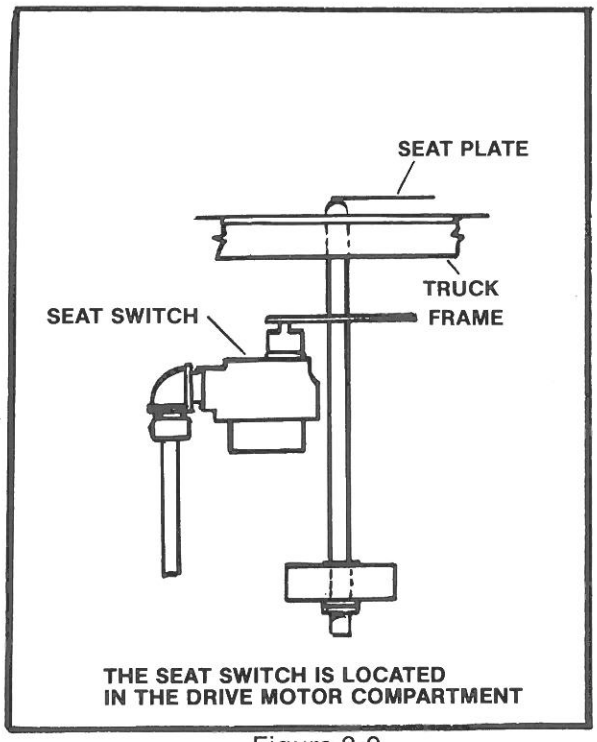

Figure 3-9

3.38.2 Place a volt-ohm-meter across terminals 24 and 25. The two terminals are located on terminal strip (TB-2) mounted in the electrical compartment intermediate panel (Refer to the Parts Breakdown Section for an illustration).

Select the R x 100 volt-ohm-meter resistance scale. With the seat switch released, the meter should read 10,000 ohms. With the seat switch depressed, the meter should read zero ohms. If there is no change in the volt-ohm-meter when the seat switch plunger is depressed, replace the seat switch.

3.39 The pump time delay control operates in two ways to prolong pump contactor service life.

3.39.1 First, **to assure that the pump contactor remains closed long enough for the pump motor to accelerate** and thus reduce the load current that the contactor must interrupt. Second, to permit a drop in hydraulic system pressure, reducing the power required by the pump motor, after a hydraulic control function has been used thus reducing the load current that the contactor must interrupt.

3.39.2 It is important to note that **the pump contactor is not directly energized by the lift, tilt, pivot and shift control valve switches.** These switches energize the time delay module which in turn energizes the contactor coil driver module, which then connects the contactor coil to battery negative.

3.39.3 A faulty time delay module may be the cause of the pump motor not operating. The time delay is shown on the Electric Door Module Assembly, Section IV. Attach a volt-ohm-meter to terminal 13 (negative) and terminal 28. Adjust the volt-ohm-meter for the 50 volt D.C. range. Connect the battery, turn the key switch to ON, actuate the seat switch, and pull back on the "TILT" control lever. Battery voltage should appear on the meter. No voltage indicates the problem is ahead of the module.

3.39.4 A second test must be conducted if battery voltage appears on wire 28 per 3.39.3. Attach the volt-ohm-meter to terminal 13 (negative) and to the No. 1 terminal, wire 30 on either the time delay module or coil driver module. Adjust the volt-ohm-meter for the 10 volt D.C. range. Pull back on the "TILT" handle as described in 3.39.3. Two volts should appear on the meter scale. No voltage indicates that the time delay is not energizing the coil driver module. Replace with a new delay module.

3.39.5 A third test must be conducted if 2 volts appears on wire 30 per 3.39.4.

(a) Remove wire 30 from terminal No. 1 on the coil drive module.

(b) Attach a switch and resistor as shown in

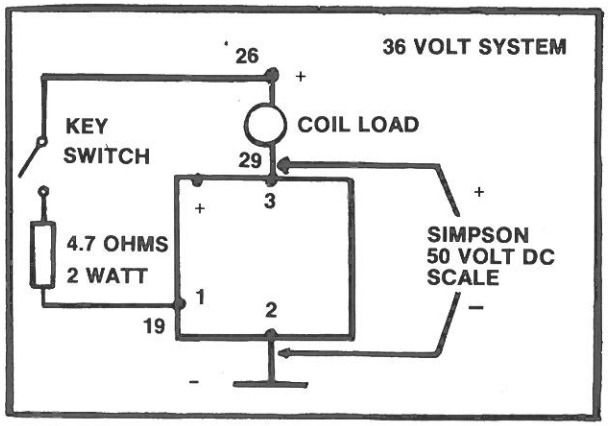

Figure 3-10.

(c) Attach voltmeter as shown in Figure 3-10. Battery must be connected with key switch and seat switch on. The voltmeter should read battery volts with switch open.

series with the motor power cable. Current draw while idling should be approximately 20 amps. Current draw at the relief pressure setting of 1750 psi should be approximately 75 amps. Significantly higher current draw will require servicing or replacement of the motor.

3.81 Sticking or misadjustment of the power steering hydraulic system pressure relief valve may cause slow steering response due to a reduction in system pressure.

The relief valve is built into the steering pump housing while the adjustment shaft, locking nut and protective cap are located externally on the side of the housing.

Decreased steering response may be due to failure of the ball to properly seat. Foreign material may be lodged between the ball and seat allowing oil to bypass to the reservoir and reduce available system pressure.

3.81.1 Determine power steering system hydraulic pressure before making any adjustments to the pressure relief valve or replacing the pump or orbitrol units. Attach a 3000 psi pressure gauge to the 1/8 NPTF port provided on the pump, 90 degree elbow, pressure fitting. Hydraulic pressure when the system is idling will be approximately 60 psi (Figure 3-15).

Pressure when the steering wheel is rotated to allow the steer axle to achieve the maximum turning angle must be 1750 psi; if not, adjustment must be reset.

3.81.2 Adjust the power steering relief pressure valve as follows:

CAUTION

All pressure relief valve adjustments must be made with a pressure gauge attached to the pump pressure line.

3.81.2.1 Remove the protective cap. **Raise system pressure** by turning the threaded shaft inward (clockwise). Recheck relief pressure per 3.81.1. (Figure 3-15).

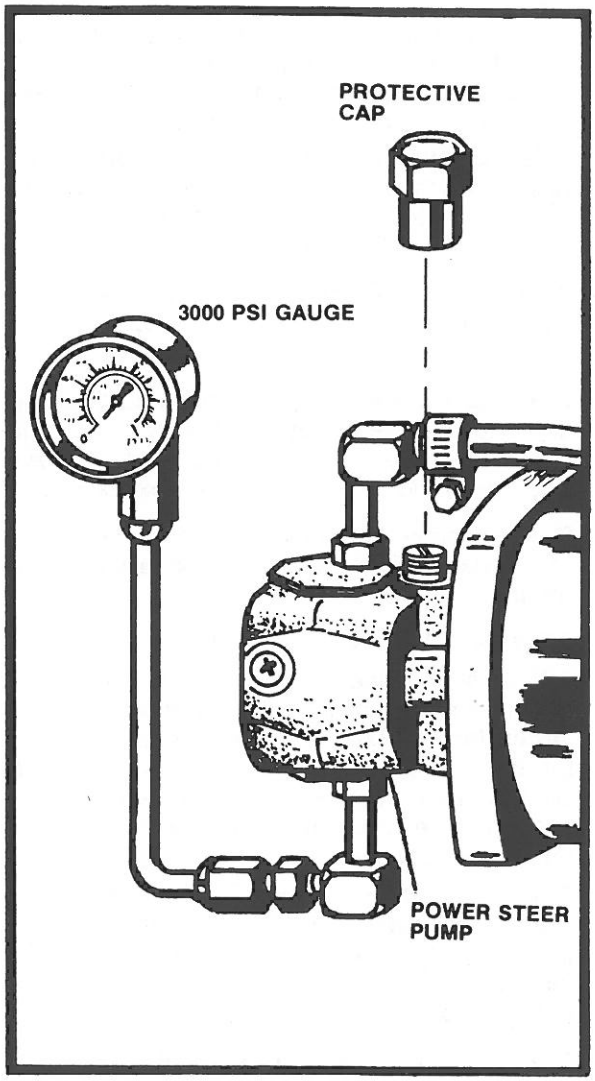

Figure 3-15

1. The lamp should not light. If the lamp does light, the SCR is shorted and must be replaced.

2. If check (1) was unsatisfactory, test the SCR for its ability to be turned on by the gate. Connect positive through two diodes to gate (point 2). If gate is operative, the lamp will come on and should remain on when the gate is removed. Some SCR's will operate correctly even if the lamp does not remain on, particularly with a weak battery.

3. If lamp cannot be lit under step (2), the SCR is open and must be replaced.

4. If the SCR is a stud-type device, check continuity between the red and black cathode leads.

If you do not have a test light to check the SCR's as described above, they may be checked for shorts or opens by use of the VOM.

A. Measure resistance from anode to cathode (R x 100 scale). If SCR is shorted (zero ohms), it must be replaced.

B. Measure resistance from gate lead (white lead) to cathode and then from cathode to gate lead (R x 1 scale). If resistance reads either zero ohms (shorted) or infinity ohms (open), replace the SCR.

When removing or installing SCR's refer to procedures in the Maintenance Section.

3.85.3 If TB2 (Pin 10) Voltage is Near Zero, check for a shorted 3 REC (Figure 3-25).

When checking diodes, disconnect battery and discharge capacity 1C to prevent burning out the ohmmeter. For 3 and 4 REC, disconnect one lead or flexible connection. 3 an 4 REC are diodes with about 7 to 12 ohms in the conducting direction (+ -) measured on the R x 1 scale, and 10,000 ohms or higher, in the non-conducting direction (-+) measured on the R x 10,000 scale.

Check to see the bottom of the heat sink is flat against the insulator.

Alternately tighten the two screws by 1/4 turn until firm.

Replace all connections removed above.

If the 3 REC requires replacement, refer to the Maintenance Section.

3.85.4 Directional Switches Inoperative can cause the contactors to be inoperative. To check for this condition, close seat, start switches (all switches needed to close F or R contactor except the Direction switch). Volts on L3, L5, L7 should be battery volts. Volts on L9 and L10 should be near zero. Wait for one second, then close FORWARD Direction switch. Volts at L10 should remain near zero. Volts at L9 and L9 side of F coil should be battery volts. If not, check wiring and switches. Refer to ELECTRICAL SYSTEM—DRIVE for detail on troubleshooting directional switches. The Drexel directional switch is located on the Dash Panel Module.

3.85.5 Inoperative Pulse Trip Monitor (PMT) Driver can cause contactors to be inoperative. To check for this connect milliammeter (10 ma scale) from R3 to R4. Should read 5-10 milliamps. If not, open Key switch, open lead from R3 to PMT driver, reclose all switches except Direction switch, wait over one second and close FORWARD Direction switch. If reading is not 5-10 milliamps, replace control card. If reading is good, the coil or wiring to the PMT driver is open or the PMT driver is defective. Check the (PMT) driver.

A. Connect circuit as shown (Figure 3-21).

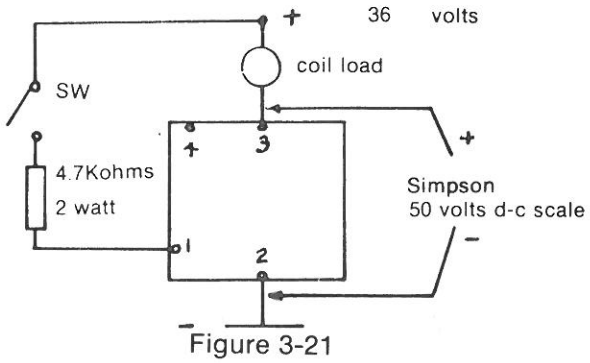

Figure 3-21

B. Voltmeter should read battery volts with switch open.

C. Close switch and meter reading should be 3 volts or less.

D. Move load to terminal 4 and repeat steps B and C.

3.86 CONTACTORS CLOSE—NO HUM IN SCR RANGE—NO POWER.

3.86.1 If voltage at T2 is Not Zero, check for open circuits to terminals S1, S2*, A1 or A2. Refer to the ELECTRICAL SCHEMATIC in the Maintenance Section.

a reading of near 8 volts when FS2 switch is open. If not, check wiring and FS2 switch.

3.100 FW CONTACTOR WILL NOT CLOSE AFTER 1A PICKUP

3.100.1 A Problem in FS2 Switch or Wiring can cause FW contactor to **NOT** close after 1A pickup. Check the volts at R6 after 1A closes for less than 2 volts. If the reading at R6 is not less than 2 volts, after 1A contactor closes, check FS2 switch and wiring. For accelerator troubleshooting procedures, refer to ELECTRICAL SYSTEM-DRIVE in this section of the manual.

3.100.2 FW-PU Trimpot Misadjustment can cause the FW contactor to NOT close after 1A pickup. Open the lead to R9 and connect a milliameter from R9 to R4. When the control card signals FW to pickup, reading should be 5-10 milliamps. If the reading remains at zero, turn the FW-PU trimpot fully Clockwise (CW) and recheck the milliamps. If the reading changes to between 5-10 milliamps, reset the FW-PU trimpot adjustment. If the milliamp reading remains zero, replace the control card.

3.100.3 A Problem in the FW Driver, Coil or Wiring may cause the FW contactor to NOT close after 1A pickup. With the lead connected at R9, check the volts at R9 when FW should be picking up. If the reading is near 8 volts, check the lead from R9 to terminal 1 of FW driver for an open. Check from R2 to negative for an open. If there are no open circuits, replace the driver.

If the reading at R9 is only about 2 volts, check the volts at terminal 3 of the FW driver. This test should show battery volts, dropping to 2 volts or less when FW should pickup. If this reading is near zero, check the wiring from Positive to the FW coil and from the FW to terminal 3 of the FW driver. If the voltage at terminal 3 remains greater than 4 volts when FW should pickup, then replace the FW driver.

3.101 NO FW CONTACTOR DROPOUT WITH INCREASED LOAD

3.101.1 A Misadjusted Card Dropout Setting can be the cause of no FW contactor dropout with increased load. Check the dropout setting FWDO on the control card panel. Refer to TUNE UP FOR NEW OR MISTUNED CARD, in the Maintenance Section for trimpot adjustment procedures.

3.101.2 A Malfunction in the Control Card could cause no dropout of the FW contactor with increasing load. If the trimpot adjustment does not correct the loss of FW dropout, then replace the control card. Refer to the Maintenance Section for procedures.

3.102 STIFF PLUG REVERSAL

3.102.1 A Misadjustment of Card Plug Setting could be the cause of stiff plug reversal. Check the Plug adjustment setting on the card. Refer to the Maintenance Section for procedures.

3.102.2 An Open in 4 REC can cause stiff plug reversal.

TESTING FOR AN OPEN IN 4 REC

When checking diodes, disconnect battery and discharge capacitor 1C to prevent burning out the ohmmeter. For 3 and 4 REC, disconnect one lead or flexible connection. 3 and 4 REC are diodes with about 7 to 12 ohms in the conduction direction (+ -) measured on the R x 1 scale, and 10,000 ohms or higher in the non-conducting direction (- +) measured on the R x 10,000 scale.

> **NOTE:**
>
> **Connect the ohmmeter positive lead to the Anode and the negative lead to the Cathode to measure the ohms in the conducting direction. Reverse this hookup to measure the non-conducting ohms (Figure 3-23).**

Check to see the bottom of the heat sink is flat against the insulator.

Alternately tighten the two screws by 1/4 turn until firm.

Replace all connections removed above.

If the 3 REC or 4 REC requires replacement, refer to the Maintenance Section.

3.102.3 A Malfunction in the Control Card could be the cause of stiff plug reversal. If adjusting the plug setting does not correct the problem and there is no open in 4 REC, then replace the control card.

3.103 VERY SOFT REVERSAL

3.103.1 A Misadjusted Plug Setting on Card could be the cause of very soft reversal. Refer to the Maintenance Section for adjustment procedures.

3.103.2 A Malfunction in the Control Card could be the cause of very soft reversal. If adjusting the plug setting does not correct the problem, replace the control card. Refer to the Mainte-

PARTS BREAKDOWN

TRUCK FEATURES

FIG./ ITEM	PART NUMBER	UNITS/ ASS'Y.	DESCRIPTION
-1	10840	1	Console Assembly, Operators
-2	30250	1	Drive Assembly
-3	30012	2	Wheel Assembly
-4	30014	1	Pump, Hydraulic, Motor Assembly
-5	30013	1	Hydraulic Assembly
-6	30016	1	Guard, Overhead
-7	30005	1	Pivot/Side Shift Assembly
-8	5806-24	2	Forks, Standard
-9	30206	1	Backrest, Load
-10	*	1	Mast, Triplex Modfication
-11	30216	1	Door, Electrical Compartment - Left
-12	30281	1	Door, Hydraulic, Compartment - Right
-13	30368	1	Plate Weld, Battery Restrainer
-14	14130	1	Battery, Quick Disconnect
-15	30011-01	1	Electrical Assembly (24V)
-16	30011-02	1	Electrical Assembly (36V)
-17	30336	1	Roller Tray, Battery
-18	30335	1	Power Steering Hydraulic Assembly
-19	50788-02	2	Decal, "Drexel" Yellow
-20	50788-01	2	Decal "Drexel" Black
-21	50687	1	Decal "Swing Mast"
-22	50756-1	36 Ft.	Tape-Stripe, Black (1/2")
-23	50756-2	19 Ft.	Tape-Stripe, Black (3")
-24	6719	2	Strap, Ground

***Refer to Specification Sheet in front of this section.**

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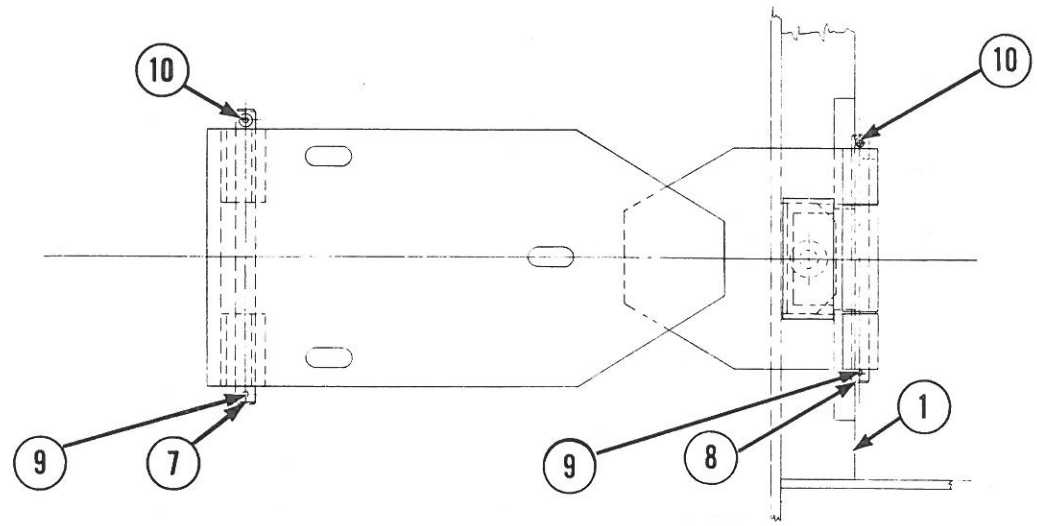
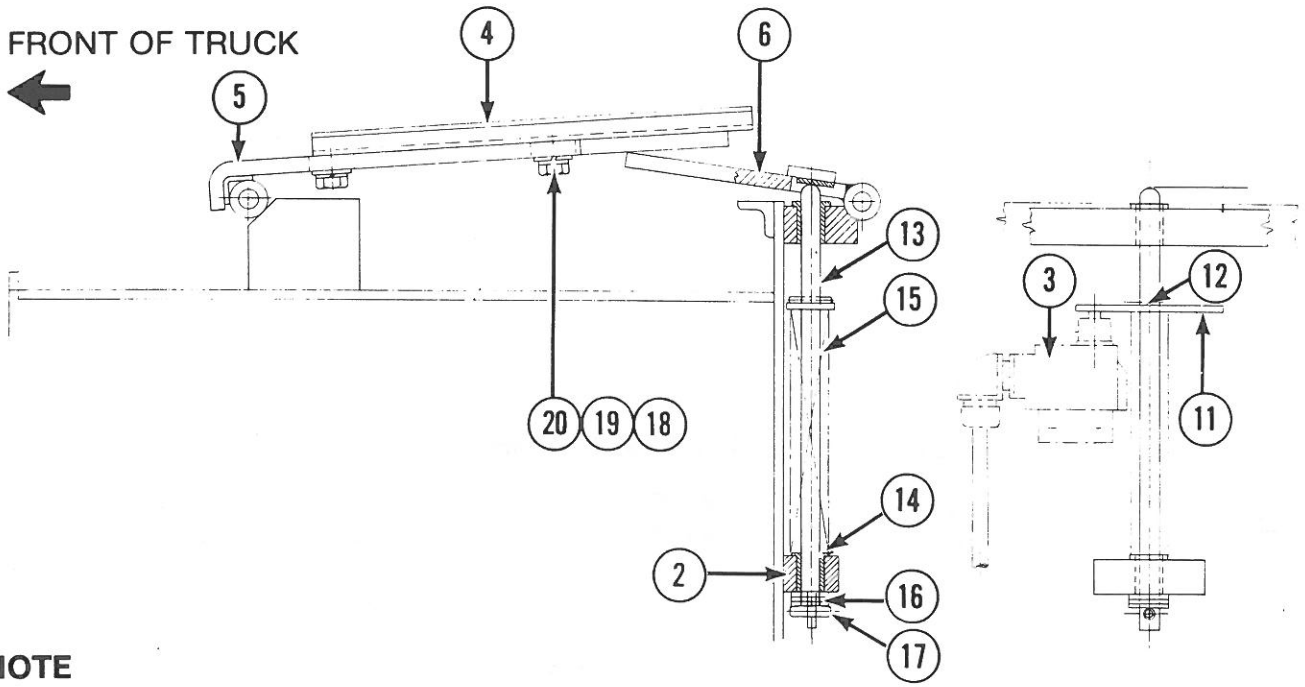
PARTS BREAKDOWN

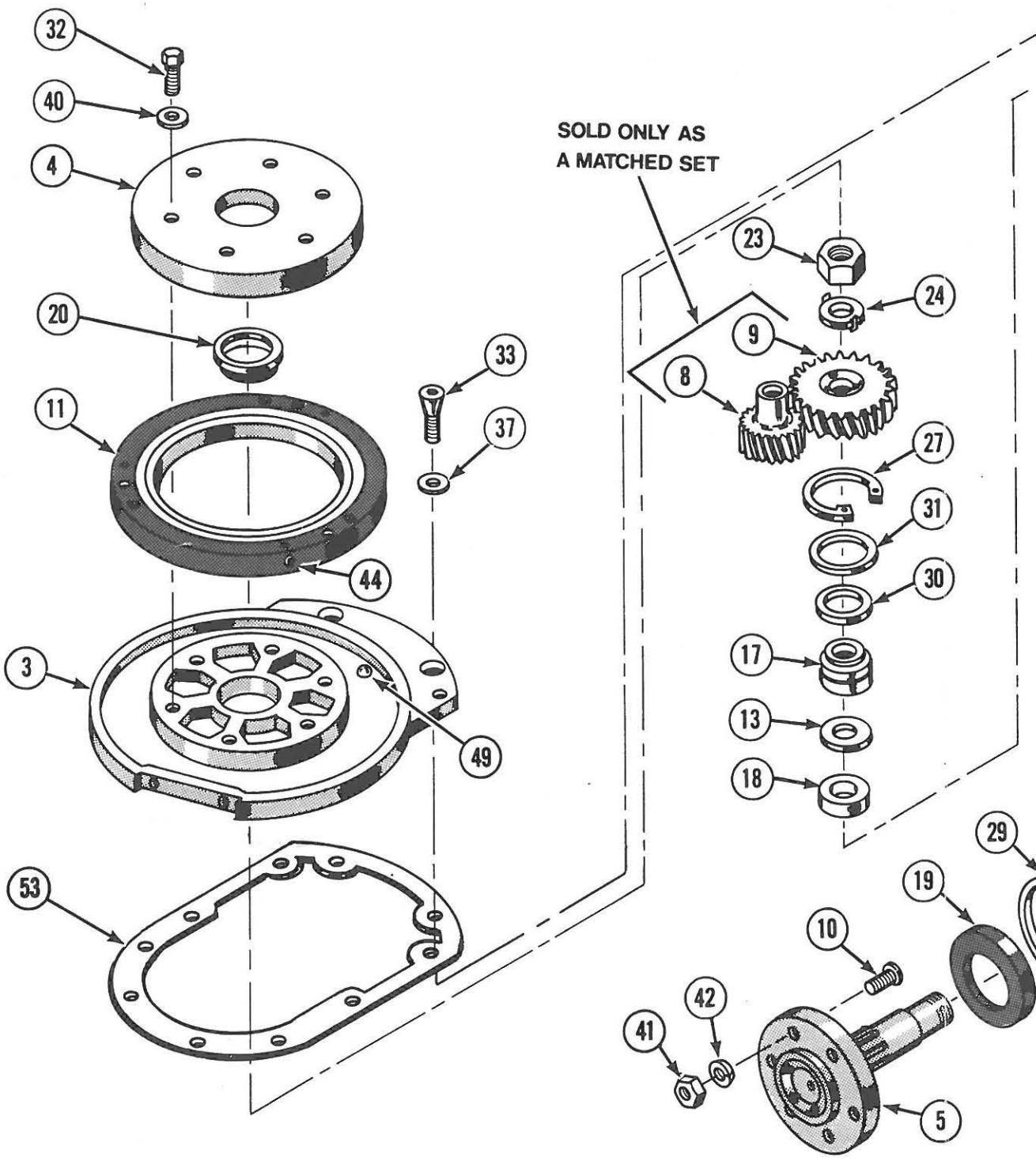




NOTE

Lubricate All Rotating and Sliding Points SAE No. 10 Oil

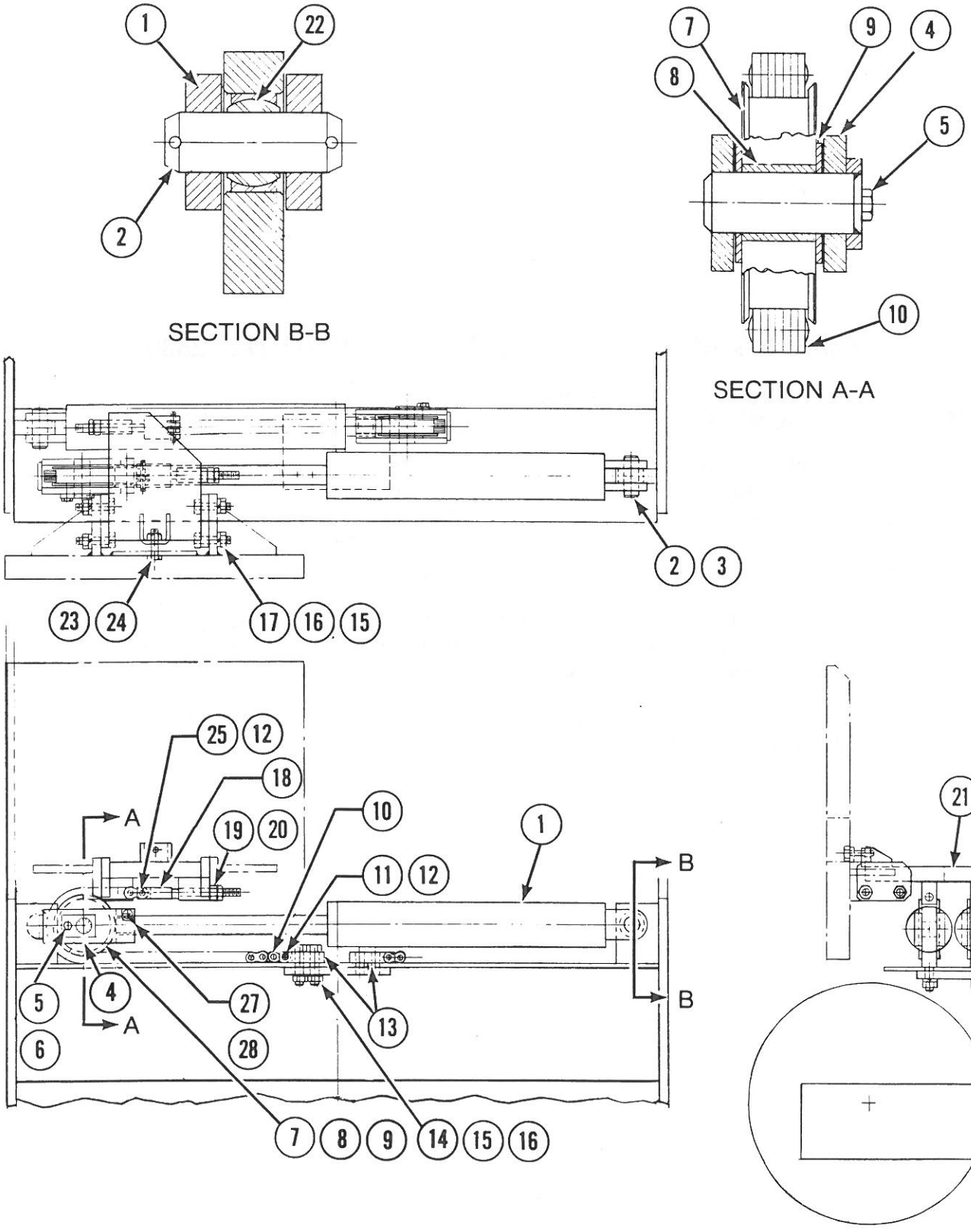
SUPPORT ASSEMBLY SEAT, PART NO. 30178



DREXEL INDUSTRIES INC

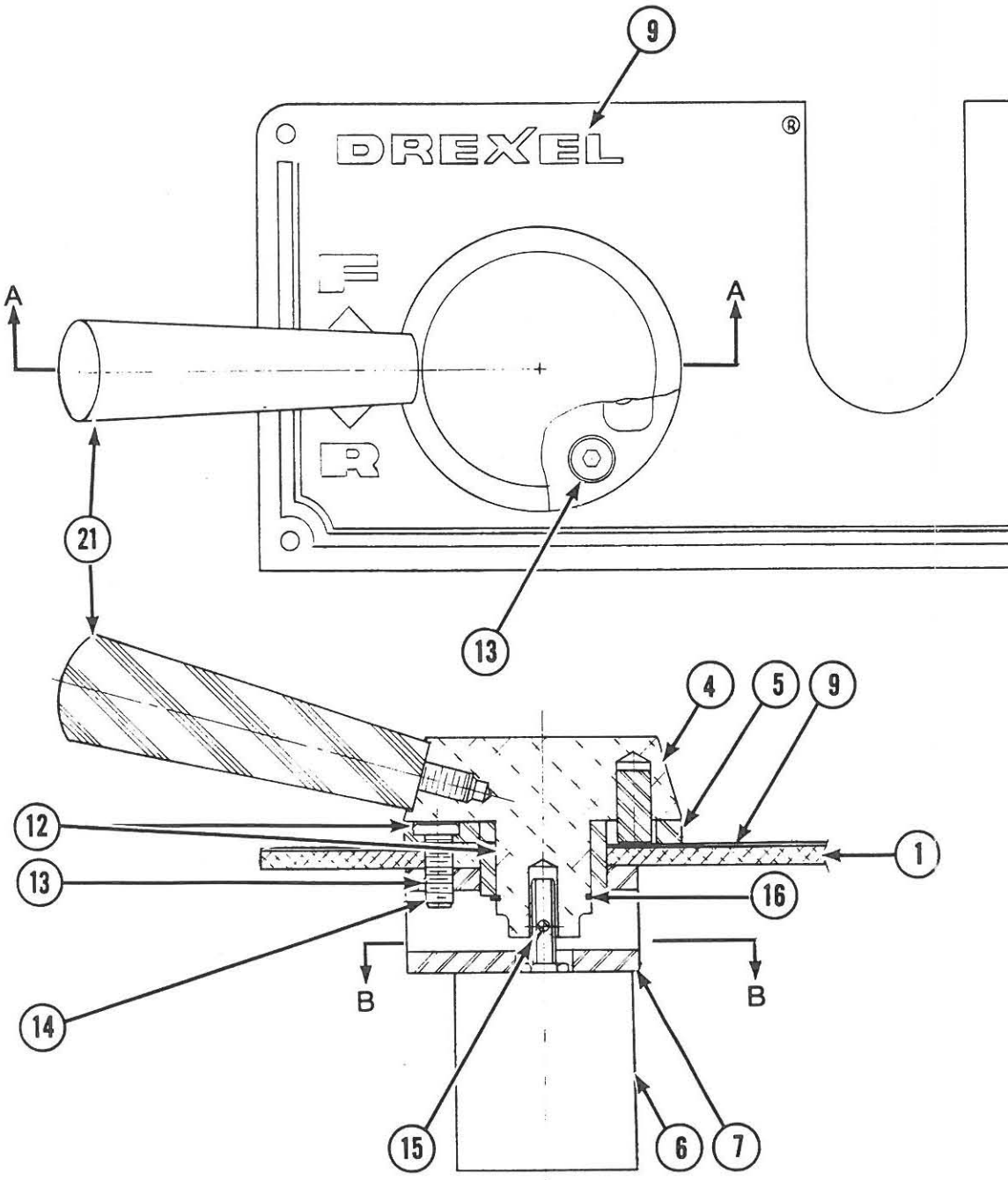
DRIVE ASSEMBLY PA

PARTS BREAKDOWN



SIDE SHIFT CHAIN & ANCHOR ASSEMBLY, PART NO. 30008

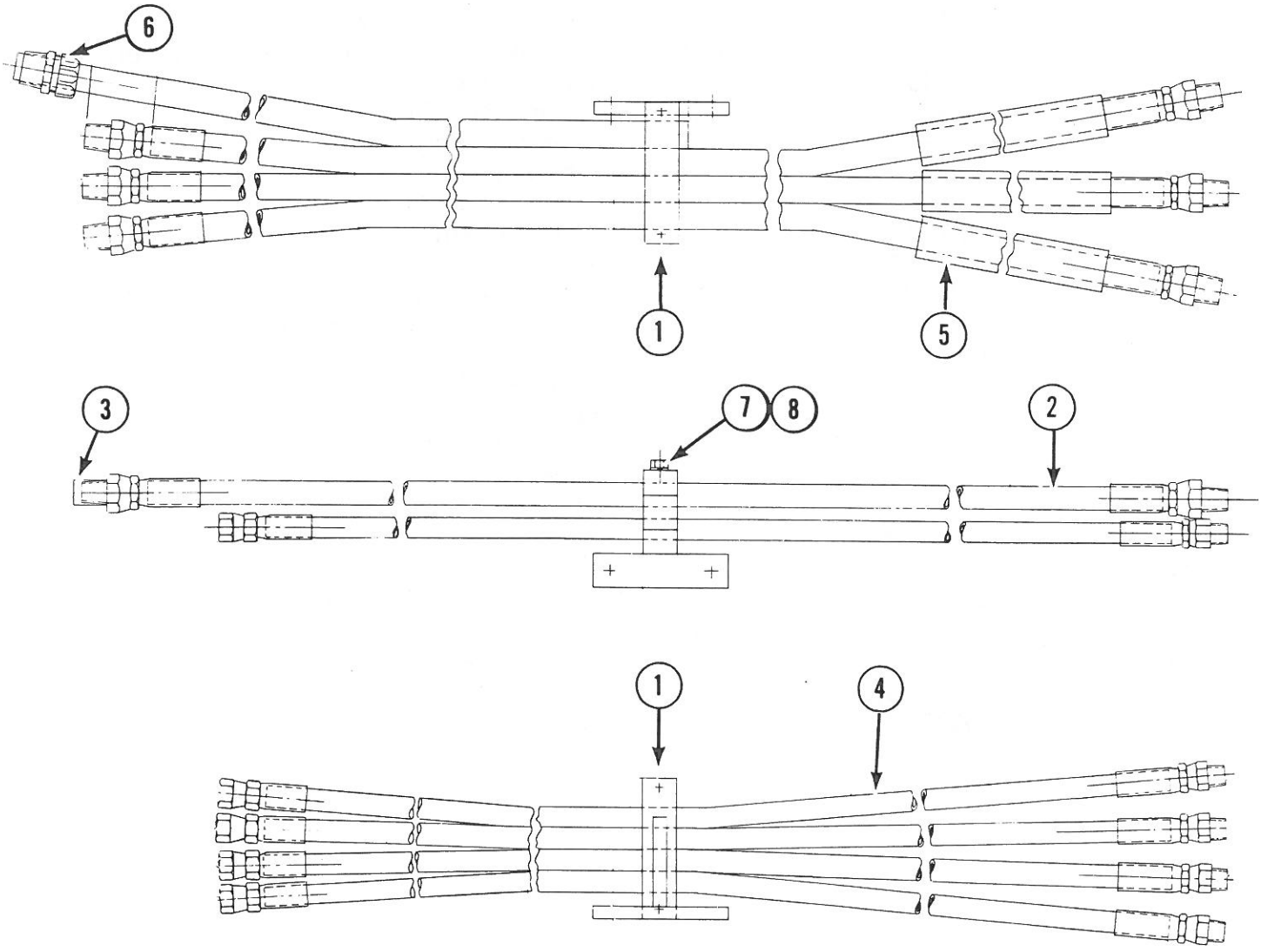
DREXEL INDUSTRIES INC



SECTION A-A

MODULE OPERATOR CONTROL P
MODULE OPERATOR CONTROL P

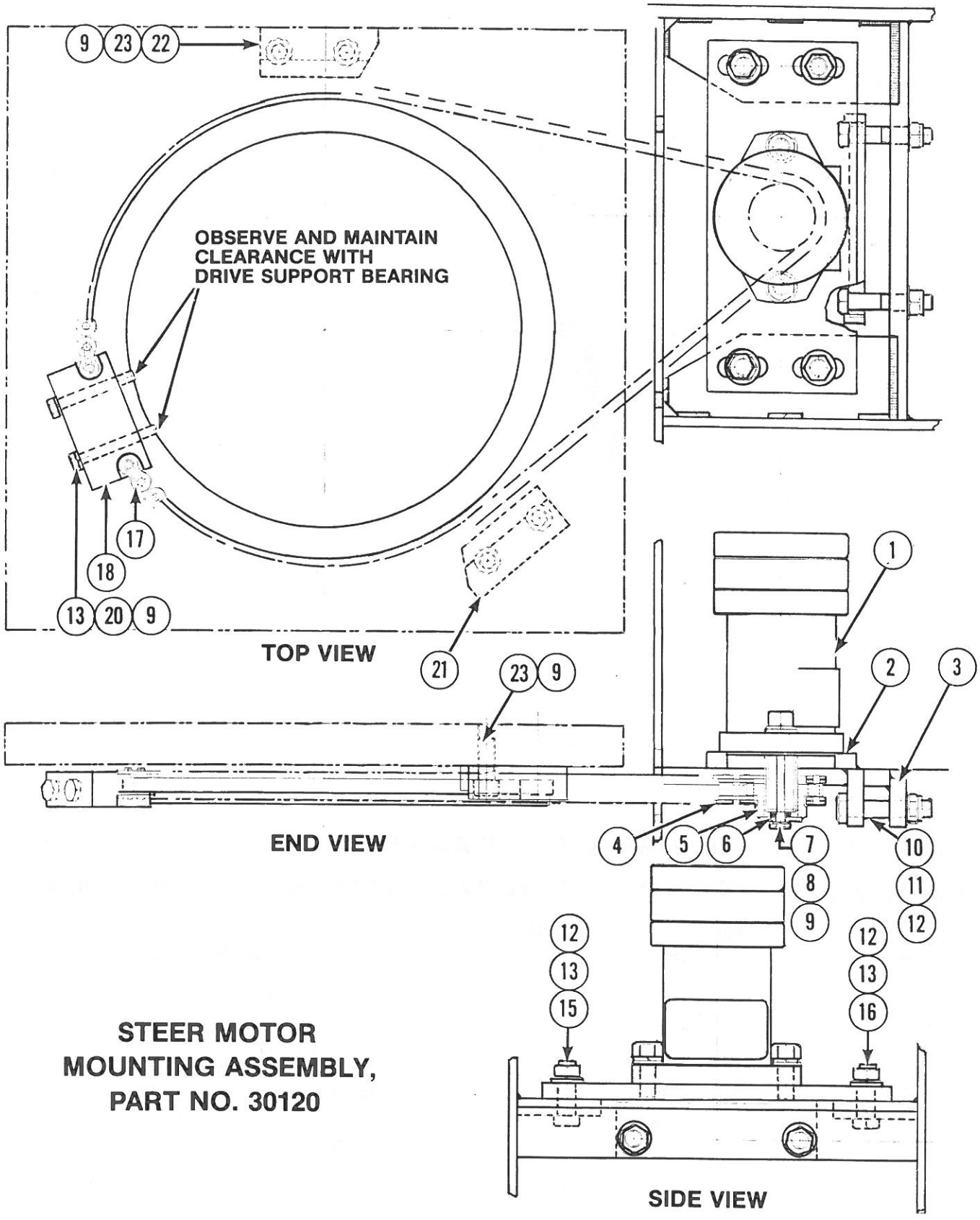
PARTS BREAKDOWN



HOSE ASSEMBLY, UMBILICAL, PART NO. 30280-01
HOSE ASSEMBLY, UMBILICAL, PART NO. 30280-02

DREXEL INDUSTRIES INC

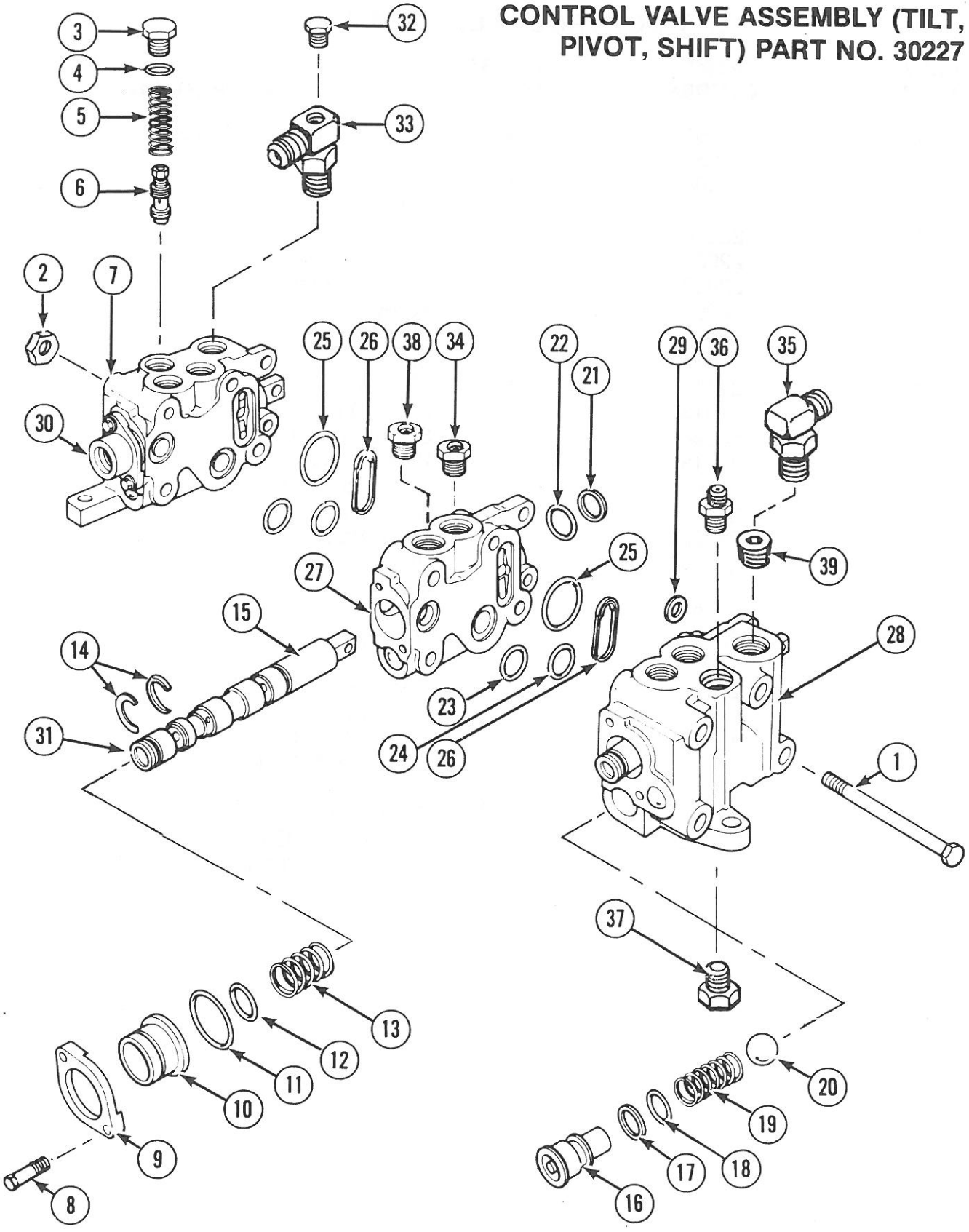
PARTS BREAKDOWN



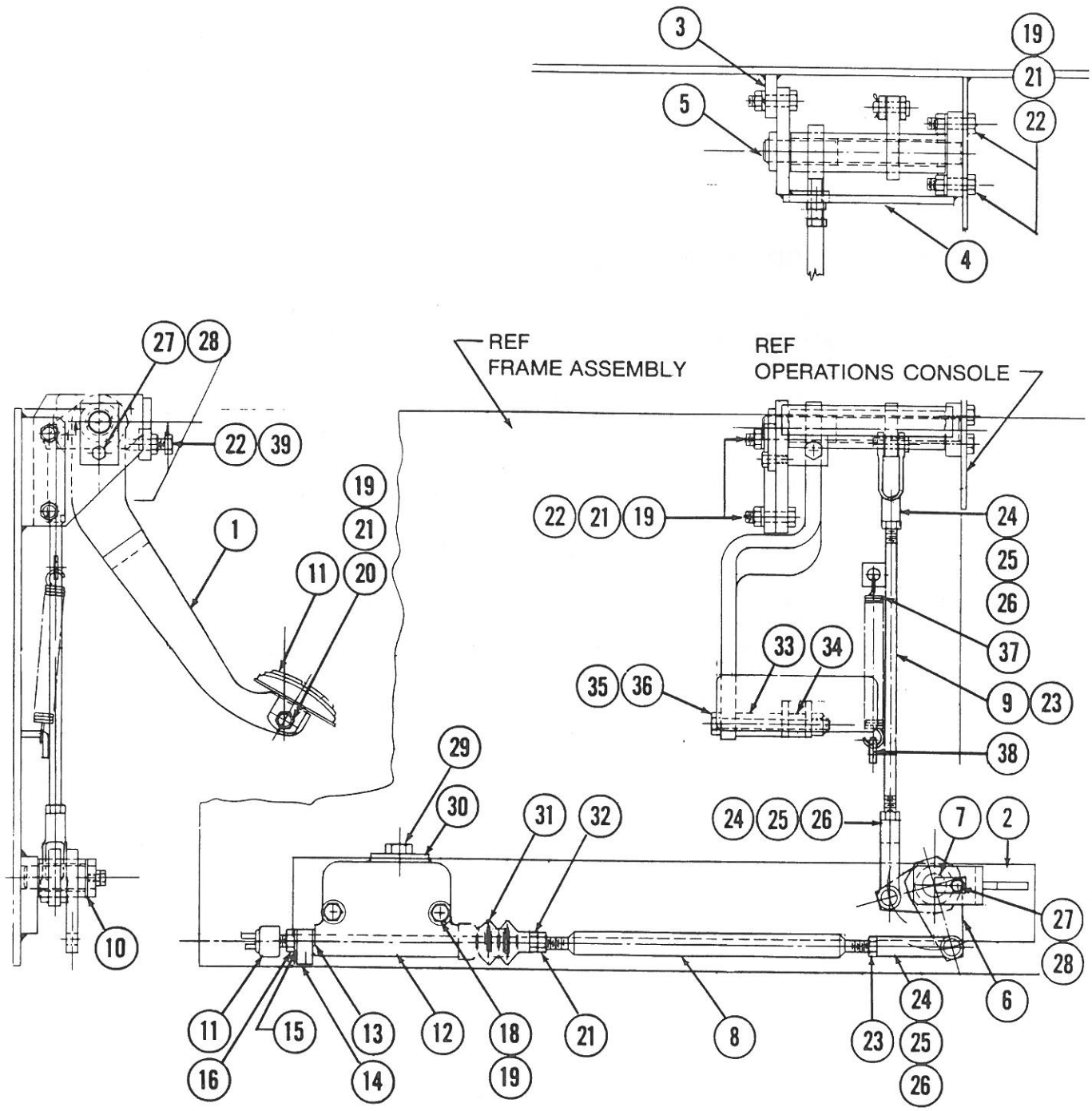
STEER MOTOR MOUNTING ASSEMBLY, PART NO. 30120

PARTS BREAKDOWN

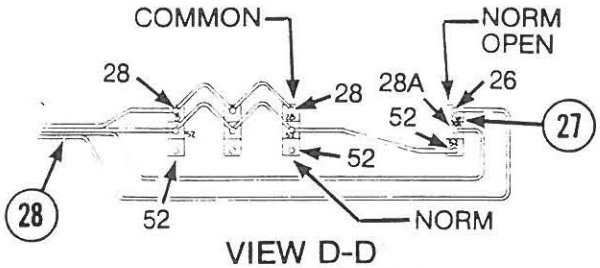
CONTROL VALVE ASSEMBLY (TILT, PIVOT, SHIFT) PART NO. 30227



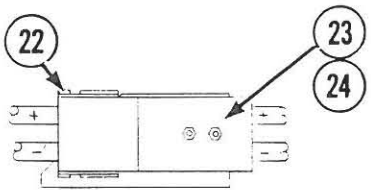
PARTS BREAKDOWN



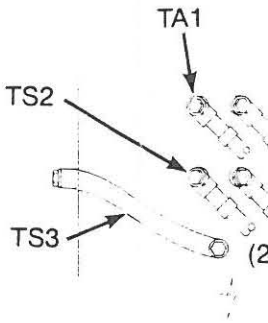
SERVICE BRAKE ASSEMBLY, PART NO. 30191



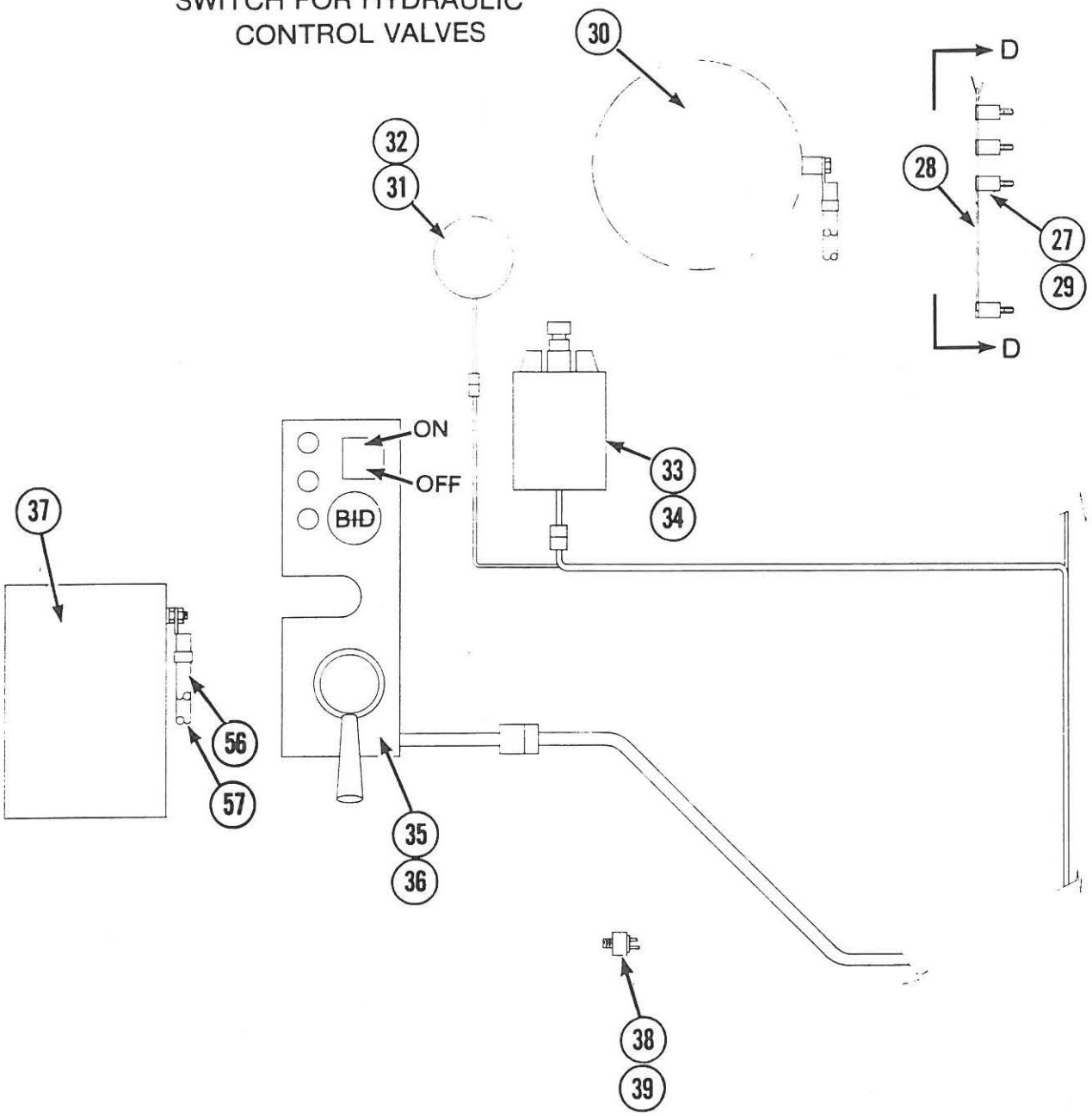
VIEW D-D
SWITCH FOR HYDRAULIC
CONTROL VALVES



VIEW C-C
BATTERY DISCONNECT



VIEW B-

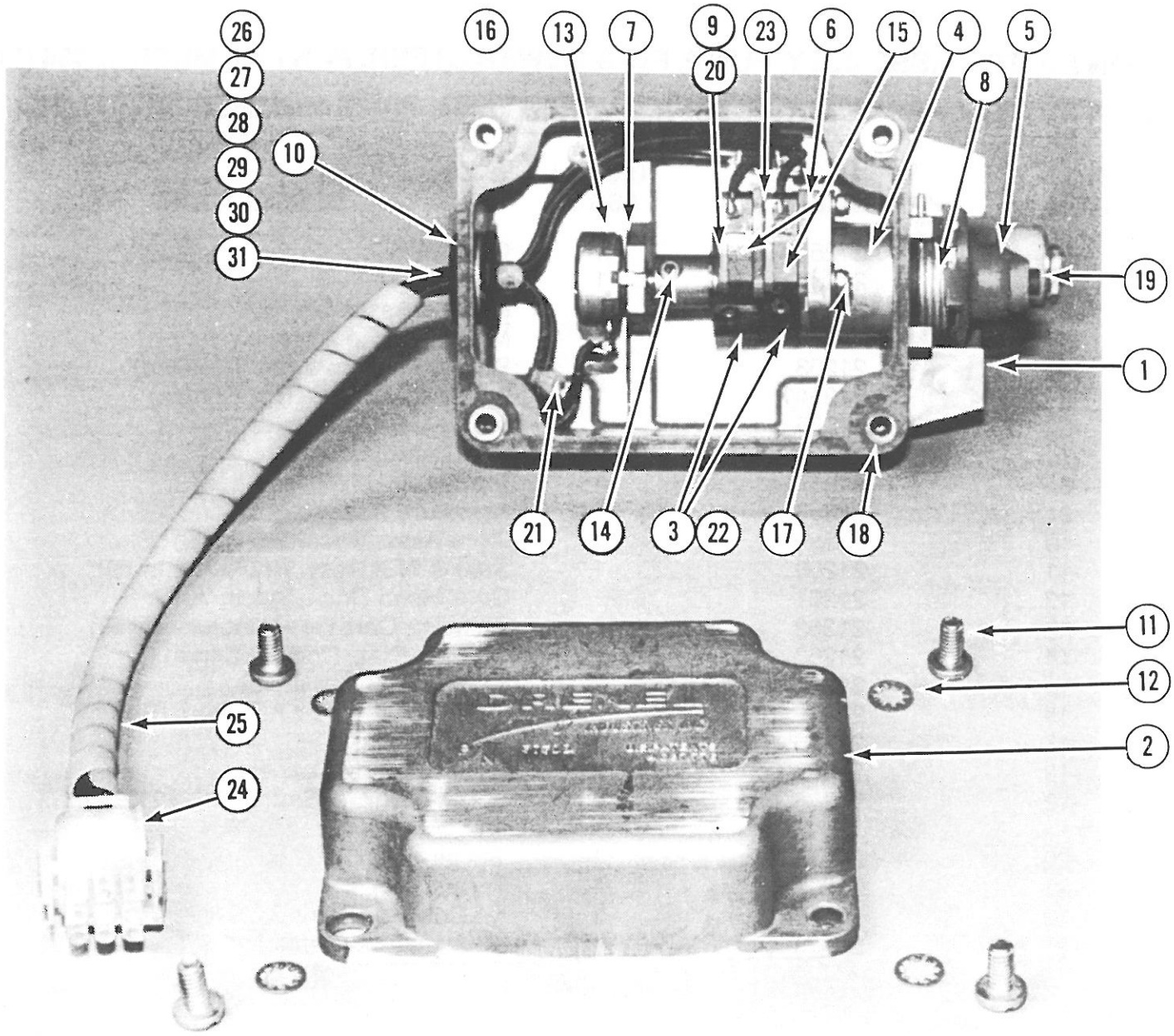


HOUR
METE

ELECTRICAL ASSEMBLY, PART N
ELECTRICAL ASSEMBLY, PART N

DREXEL INDUSTRIES INC

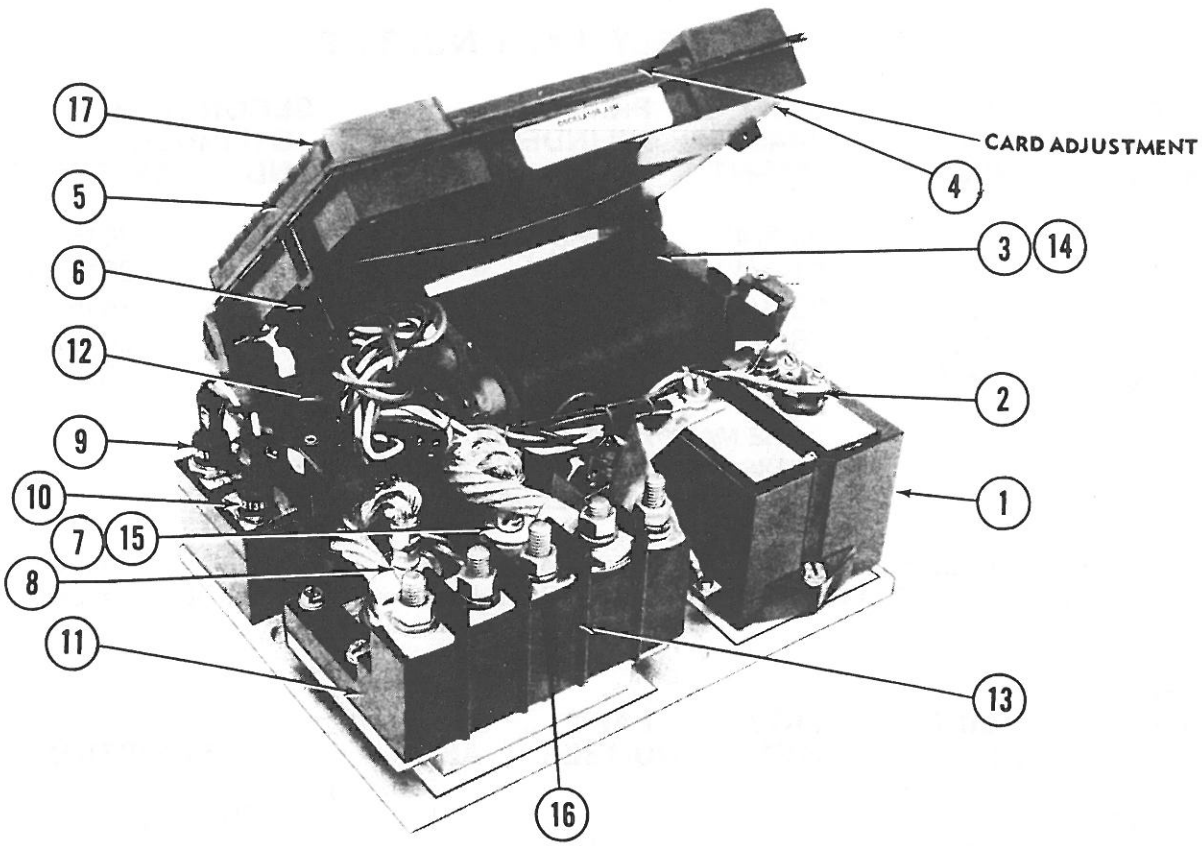
PARTS BREAKDOWN



ACCELERATOR SWITCH ASSEMBLY, PART NO. 30168

DREXEL INDUSTRIES INC

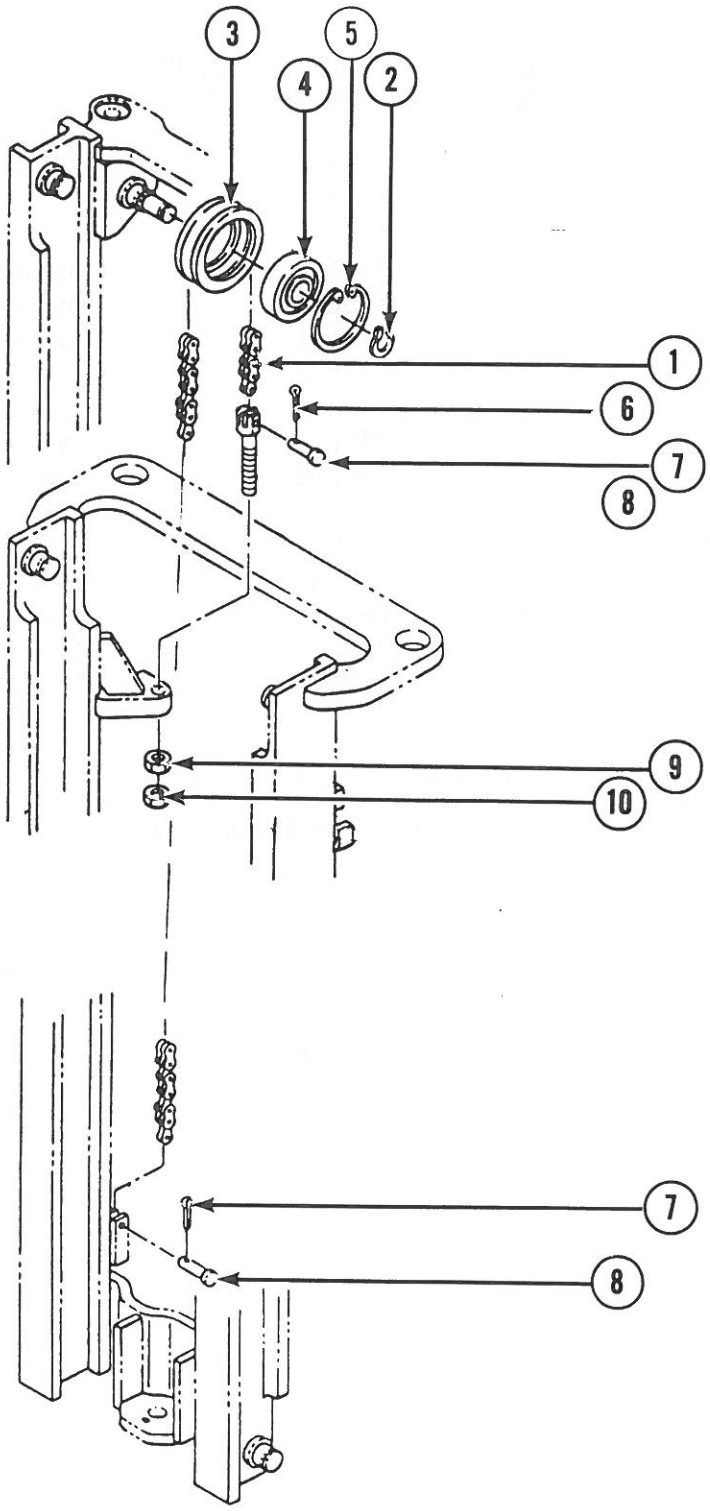
PARTS BREAKDOWN



SCR PANEL PART NUMBER 50339

FIG./ ITEM	PART NUMBER	UNITS/ ASS'Y.	DESCRIPTION
-1	50339-1	1	#1 Rec (Main SCR)
-2	50339-2	1	Thermal Protector
-3	50339-3	1	Commutating Capacitor
-4	50339-4	1	Oscillator Card
-5	50339-7	2	Card Connection Block
-6	50339-8	1	Card Connector
-7	50339-9	1	#3 Rec (Flyback Diode)
-8	50339-10	1	#4 Rec (Plugging Diode)
-9	50339-11	1	#2 Rec (Turn-Off SCR)
-10	50339-12	1	#5 Rec (Charging SCR)
-11	50339-13	1	Power Connection Block
-12	50339-14	2	#22 Rec & #25 Rec (Filters for 2 & 5 Rec)
-13	50339-15	1	Motor Current Sensor
-14	50339-16	1	Transformer & Choke
-15	50339-17	1	3 Rec Filter
-16	50339-20	1	Shunt
-17	50339-22	4	Sems Unit, Pan Hd. (#6-32 x 1-1/8 LG. With Lockwasher)

PARTS BREAKDOWN



REAR CHAIN GROUP PART NO. 26176

MAINTENANCE SECTION

TABLE OF CONTENTS

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As all bevel pinions are ground to size, normally a correction of the contact pattern by grinding off the adjusting ring or by adding a corresponding amount of shim rings is not necessary.

GENERAL INSTRUCTIONS

for installing Spiral Bevel Gears

1. Principle:
Install always according to **correct fit of the flanks** without considering whether the tooth ends are aligned or not.

2. Correct flank fit:
In unloaded state: At the forward flank (v): bearing face in the center. At the reverse flank (r): bearing face nearer to the large diameter. **Never tooth contact at the small diameter!**

3. Motion of the flank fit:
The **greater** the load the **greater** the displacements and deviations and the **stronger** the flank engagement will be displaced towards the small diameter.

Consequently:
Weak supporting requires **short** bearing faces strongly inclined to the **large** diameter in unloaded state.

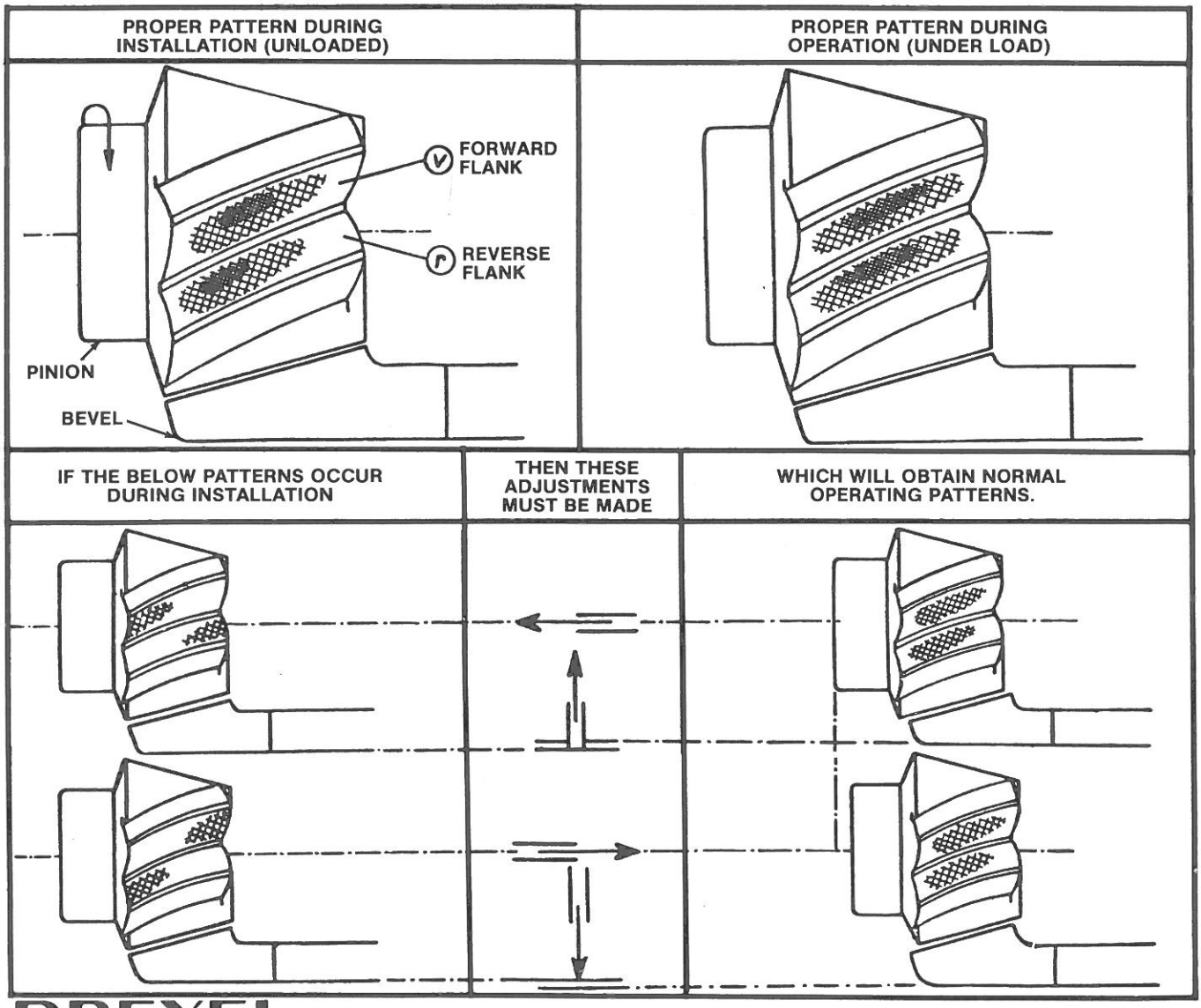
Care! Too short supporting faces **reduce** resistance and **promote** formation of noise!

Consequently, not shorter than 50% of tooth length or reinforce supports.

4. Testing of flank fit:
Tooth flanks of the larger wheel to be thickly coated with thick oil paint, have gear turn some revolutions in operation direction.

The bearing faces will become visible as bright places.

The twist side play (tooth-play) may normally not exceed .006 in. to .008 in.



CHECKING STATE-OF-CHARGE

Daily, or at least weekly, certain pilot cells should be checked with a hydrometer. This is done when the battery is discharged, and will give a good idea of battery condition, possibly preventing damage due to overdischarge. Check at least three cells. These should be the weakest ones-which will be determined by monthly readings when all the cells are checked.

A high quality hydrometer in good condition should always be used. Be certain to wear rubber gloves and safety goggles or a face shield during the procedure. Take care when assembling the hydrometer, as the glass syringe could break. Washing the syringe to remove impurities before the check is recommended.

Hold the hydrometer at eye level. The electrolyte will curve upwards slightly where it meets the glass of the barrel and the float. This should be ignored. Read the true level.

Specific gravity readings should be corrected for electrolyte temperature. add 0.003 to the actual specific gravity for each 10°F. above 77°F. Remember that this is electrolyte temperature, not air temperature.

After the check, return the electrolyte to the same cell from which it was taken.

Never continue to discharge a battery beyond the point where the specific gravity is less than 1.125.

WATERING

Check electrolyte level daily. This is one of the most important factors in battery life

Check every cell. Never allow the level to fall below the top of the battery plates. If the battery is being charged, add just enough water to cover the tops of the cells. Adding too much may cause losses due to expansion and splashing during the charging process. After charging has been completed, recheck the level of each cell and top up, if necessary, to the proper level. Never fill the cells above the bottom of the vent well.

Wear rubber gloves when adding water to the battery. An automatic cell-filler or a plastic container should be used. Never use metal or glass containers. Glass can break and metal can cause a short circuit between intercell connectors if carelessly handled.

Never add acid to a battery during routine maintenance. Add water only. The water should be approved for battery use and should be as free of impurities as possible. Impurities in the water will remain in the battery and will increase with each filling: this will shorten battery life.

Excessive water requirements indicate that the battery is being overcharged.

Check each cell with a hydrometer after charging as outlined above. After watering, replace all vent plugs and be sure they are tight to prevent loss of electrolyte

CHARGING

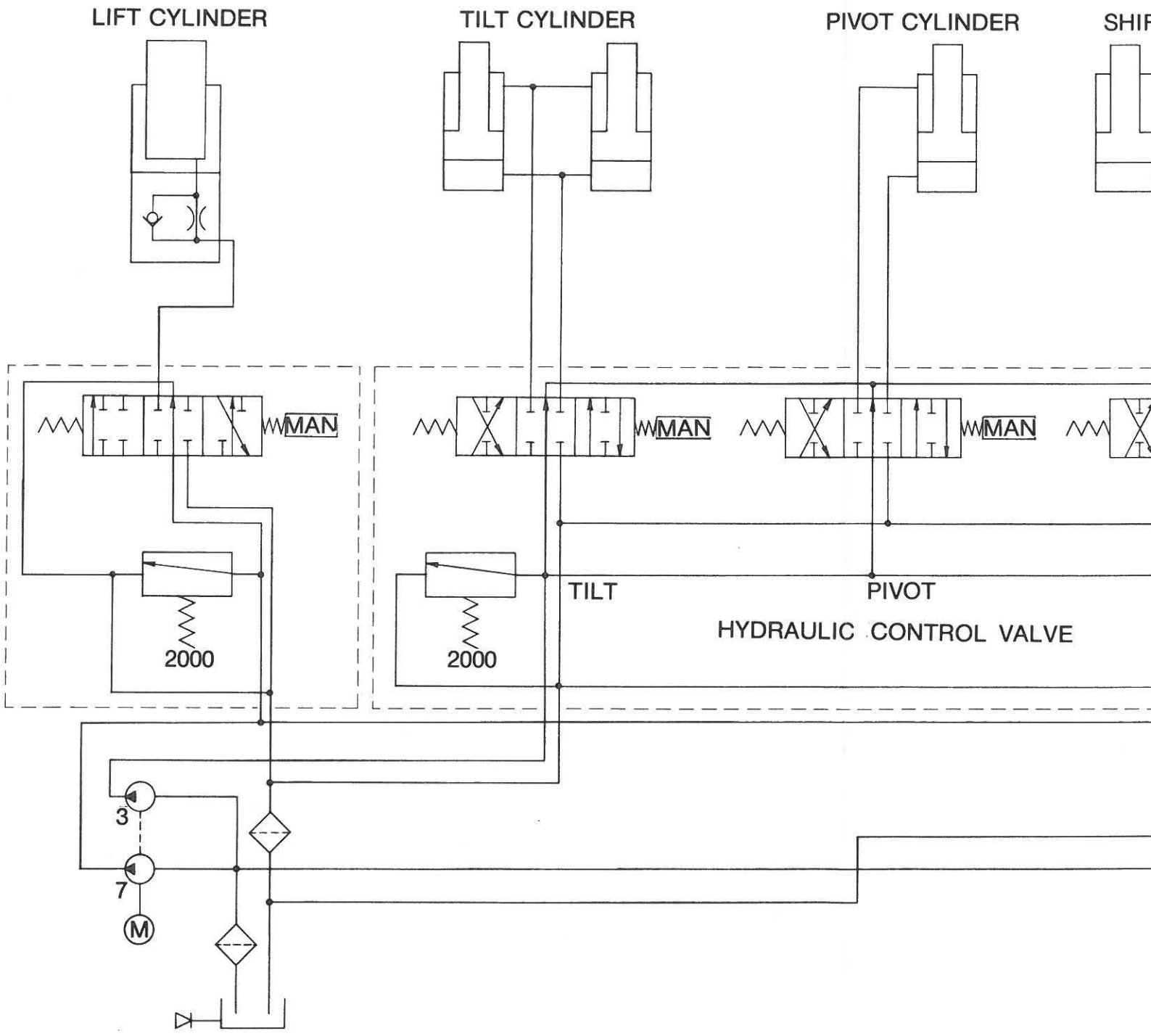
Before the battery is removed from the truck, cables should be tagged for polarity to prevent possible reversal of connections. If there is any doubt, check polarity with a meter.

This vehicle is equipped with battery restraints which prevent verticle movement of the battery. When the battery is exchanged, these restraints must be reinstalled for safe operation of the truck.

Battery charging must be done in a well-ventilated area removed from flames, sparks, and naked lights. An emergency eye-wash bottle or fountain should be close by. No smoking is permitted in the charging area. Check electrolyte level in each cell before charging.

In general, a storage battery may be charged at any current rate that does not produce excessive gassing or bubbling of the electrolyte or result in temperatures above 110°F. (125°F. for short periods). During a normal recharge, the temperature would not be expected to rise more than 15°-20°F. Excessive temperature rise should be avoided as any rise in temperature decreases the battery voltage on charge. This allows a higher current to flow, thus further raising the temperature and compounding the effect.

Every effort should be made to ensure that the battery receives the proper amount of charge: neither too little nor too much. Consistant "undercharge"-failing to recharge the battery completely at reasonable intervals-will cause gradual sulfation of the negative plates with possible shedding of the active material, loss of capacity, and shortened life. "Overcharge"-higher than proper current rates or failure to stop the charge when complete-will cause high electrolyte temperatures, loss of material from positive plates, and "formation" (corrosion) of the positive grid stucture.



HYDRAULIC SCHEMATIC

DREXEL INDUSTRIES INC

Reassembly

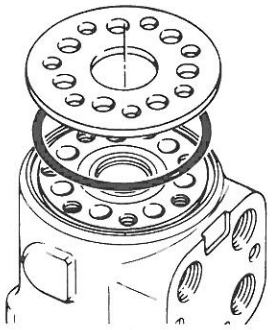


Figure 21

19 Install 3" diameter seal in housing, see Fig. 21.

20 Install spacer plate. Align bolts holes in spacer plate with tapped holes in housing.

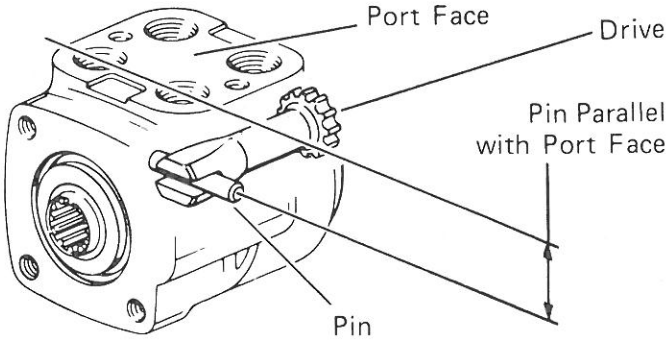


Figure 22

21 Rotate spool and sleeve assembly until pin is parrallel with port face, see Fig. 22. Install drive, make sure you engage drive with pin, To assure proper alignment, mark drive as shown in Fig. 24 (ref. B). Note relationship between slotted end of drive to splined end of drive when marking.

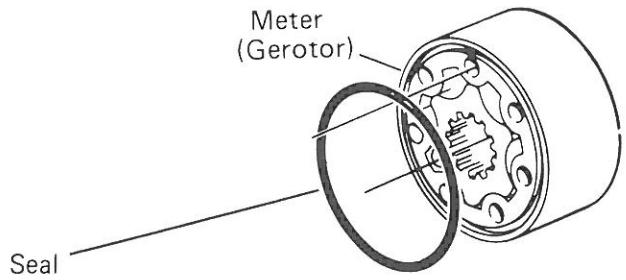


Figure 23

22 Install 3" diameter seal in meter.

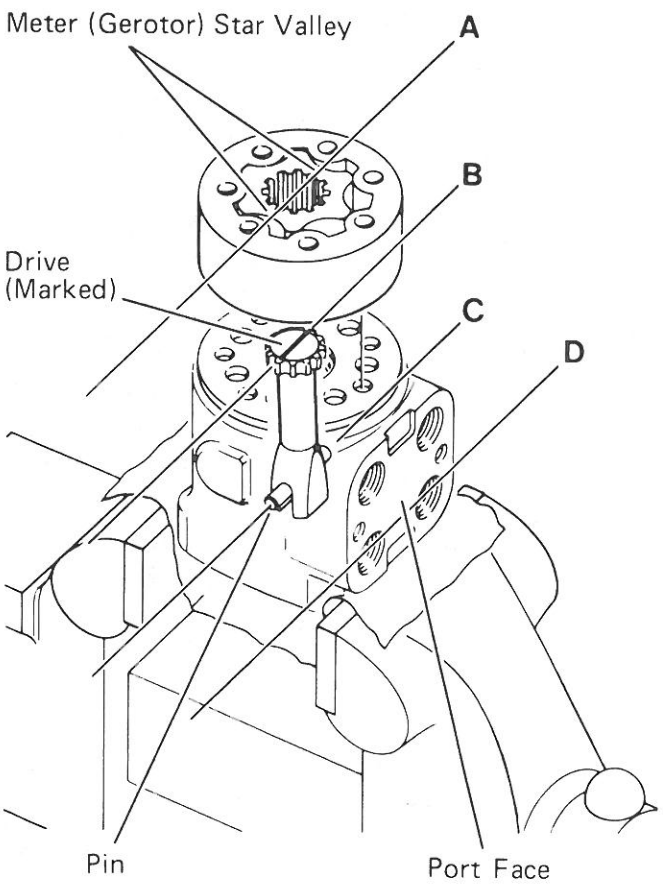
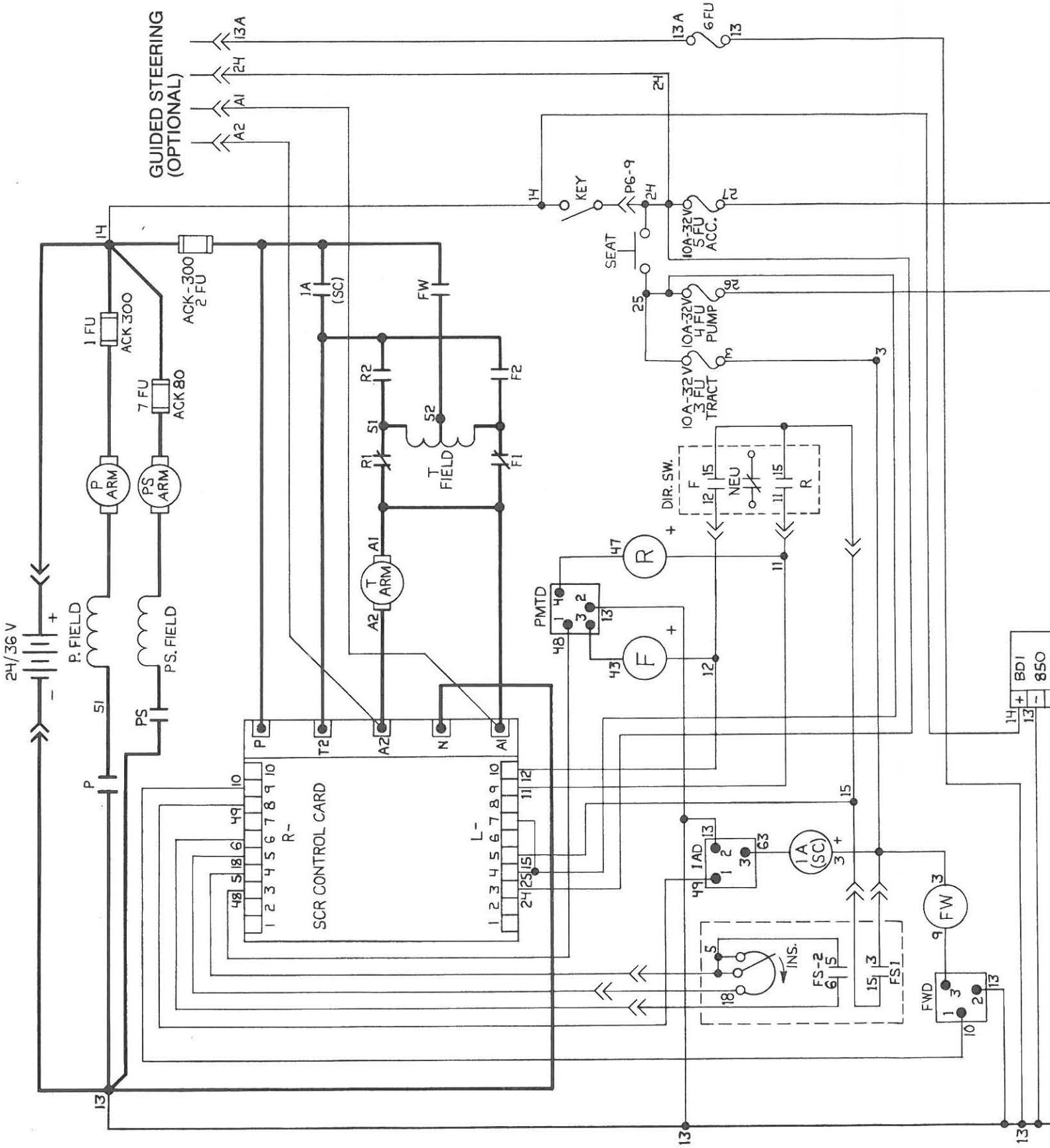


Figure 24

23 With seal side of meter toward spacer plate, align star valleys (ref. A) on drive (ref. B). Note the parallel relationship of reference lines A, B, C, and D— Fig. 24. Align bolt holes without disengaging meter from drive.



DREXEL INDUSTRIES INC

ELECTRIC SCHEMAT

c. Remove snap rings securing load rollers to roller brackets. Pry load roller assembly off each roller bracket.

d. Thoroughly clean, inspect and replace all worn or damaged parts. Retap setscrew holes in roller brackets to remove excess paint, dirt, etc.

e. Reverse the above procedure to assemble. Refer to Carriage Roller Wear Plug Adjustment paragraphs. Make sure wear plugs are properly lubricated.

CARRIAGE LOAD ROLLER WEAR PLUG ADJUSTMENT (ALL MODELS)

a. Once carriage is properly installed, loosen jam nuts and adjust setscrews, (if not already done) allowing carriage to be centered in the elevating mast.

b. Adjust wear plug by tightening setscrew until wear plug just makes contact with mast. Back off approximately 1/8 turn (1/64" total clearance) on setscrew and tighten jam nut to lock setscrew in place.

c. Run carriage up and down the elevating mast to be sure the carriage has free movement and does not stick. Also, make sure chains are properly adjusted. Refer to Chain Adjustment paragraph in this manual.

Make adjustment when necessary and recheck operation of the carriage.

Figure 10—Carriage Wear Plug Adjusting Screw

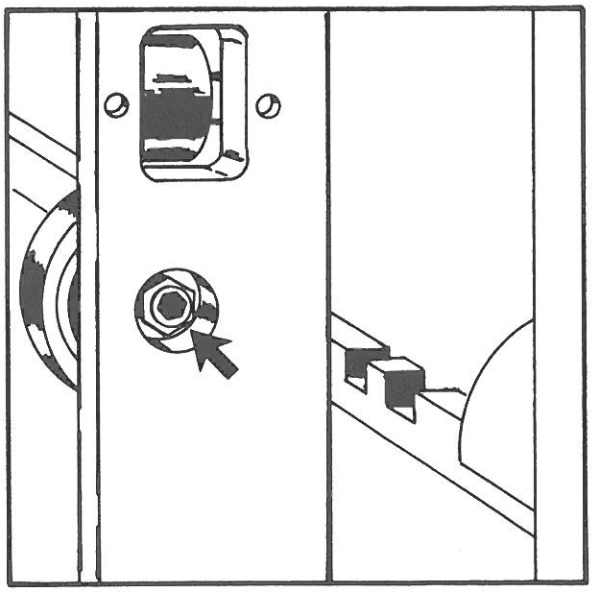


Figure 10 — Carriage Wear Plug Adjusting Screw

WEAR PLUG ADJUSTMENT

Since all uprights are not tapered, wear plug adjustments can be made with the upright in a comfortable working position.

After each stage has been adjusted, test the operation by raising and lowering the mast assembly first without a load. That way, if the mast binds or hangs up, the binding area can be pinpointed immediately. If the mast binds, never loosen the wear plugs without first raising the mast again to take the slack out of the chains. Failure to do this will allow a sudden drop of the binding upright member which may cause injury. Next, test with a load.

(Figure 14 - Typical Load Roller & Wear Plug Assembly)

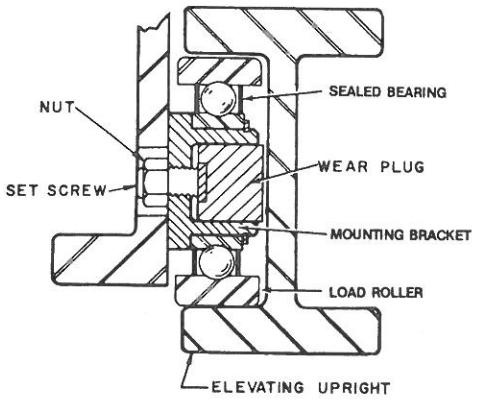


Figure 14 — Typical Load Roller & Wear Plug Assembly

a. Loosen all jam nuts on wear plugs, if not already done.

b. Adjust wear plugs to center the elevating upright and provide zero clearance between wear plug and corresponding upright.

c. Back off each wear plug 1/8 turn. To allow for approximately 1/64" total clearance.

d. Tighten jam nuts.

e. Test operation.

f. Repeat this procedure for each upright.

CARRIAGE LOAD CHAIN REMOVAL AND INSTALLATION

a. Place a sling around carriage front plate and attach to overhead hoist. Lift and secure carriage high enough so that cotter and chain anchor pins on fork carriage can easily be removed. Remove chain anchor pins from carriage and drape chains out over carriage.

b. Place wooden blocks under carriage (this will keep carriage rollers from coming out of elevating mast section when lowered). Lower carriage back down onto blocks.