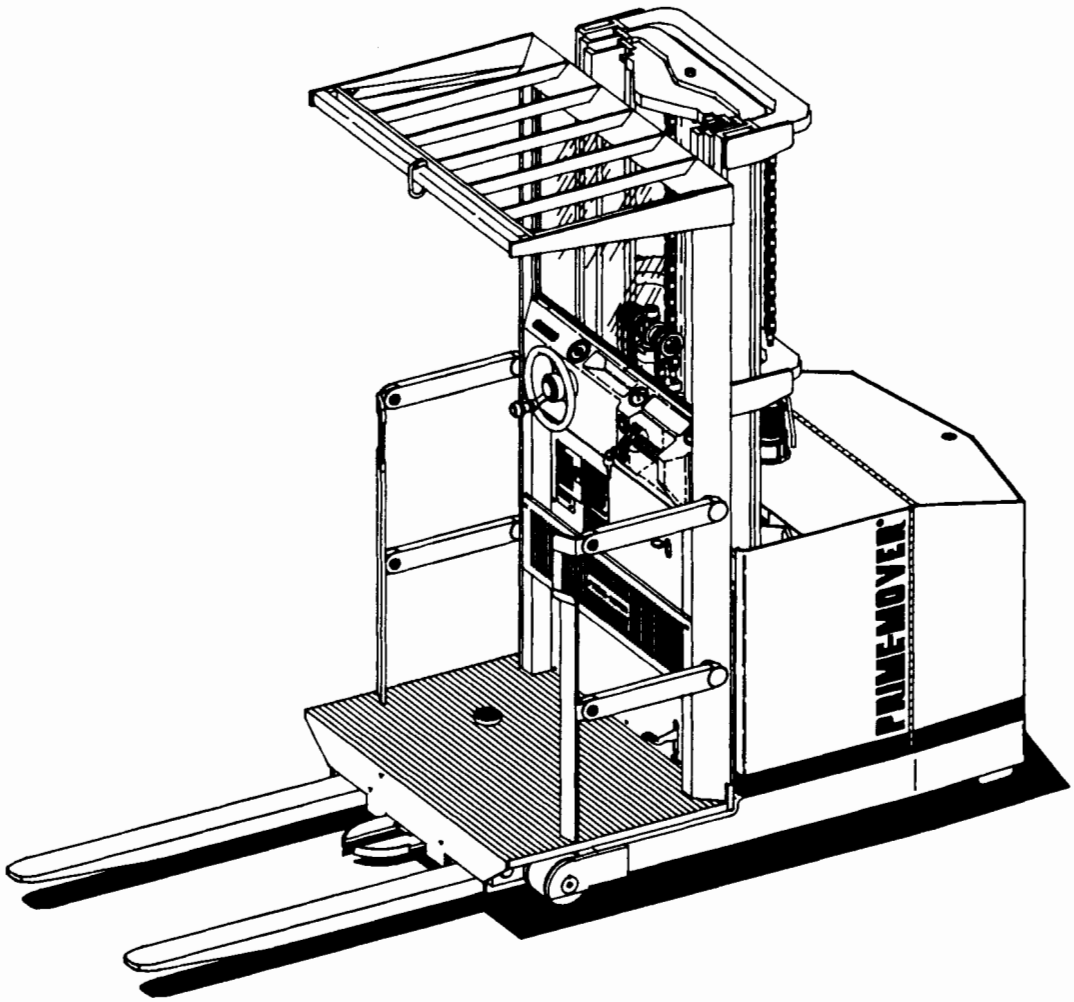
REPAIR MANUAL

Manual Number OE35R8912
Manual Part Number 300116-000

OE-35 ELECTRIC ORDER SELECTOR



WARNING Read and observe all warnings on the unit before operating it. Do not operate this equipment unless all factory installed guards and shields are properly secured in place.

ISSUED DECEMBER 1989

PRIME-MOVER®

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5.4 Adjust steering cable in mast.

Raise carriage so that cable tensioner springs and turn buckles are visible. Both turn buckles must be adjusted an equal amount so that the steering remains centered.

Adjust turn buckles so that tensioner springs are collapsed all but one full coil.

6.0 Lift Chains

6.1 Three Stage

6.11 Stage cylinder chains
The chains should be adjusted until the tops of the mast channels are flush within 3/8". The chains should be equal tension.

6.12 Free lift chains.
The chains should be adjusted until the platform is 1" from the straddle arms.

6.2 Two Stage LFL
The chains should be adjusted until the platform is 1" from the straddle arms.

6.3 Two Stage FFL
The chains should be adjusted until the platform is 1" from the straddle arms.

11.0 Speed limiting switch

Loosen switch on the bracket and slide switch toward lug on inner channel until it clicks, then slide approximately 1/32" further.

12.0 SCR Card Trimpots

See Electrical Section 7.4 of this manual. Handset must be used.

18.0 Gate switch

18.1 Remove panel from rear of operator platform.

18.2 Place gate in lower position.

18.3 Loosen switch on the bracket and slide toward the cam until it clicks, then slide approximately 1/32" further.

19.0 Potentiometer

19.1 Connect VOM to wire #29 and wire #13 of the potentiometer.

19.2 Loosen mounting screws rotation to the highest reading on the VOM.

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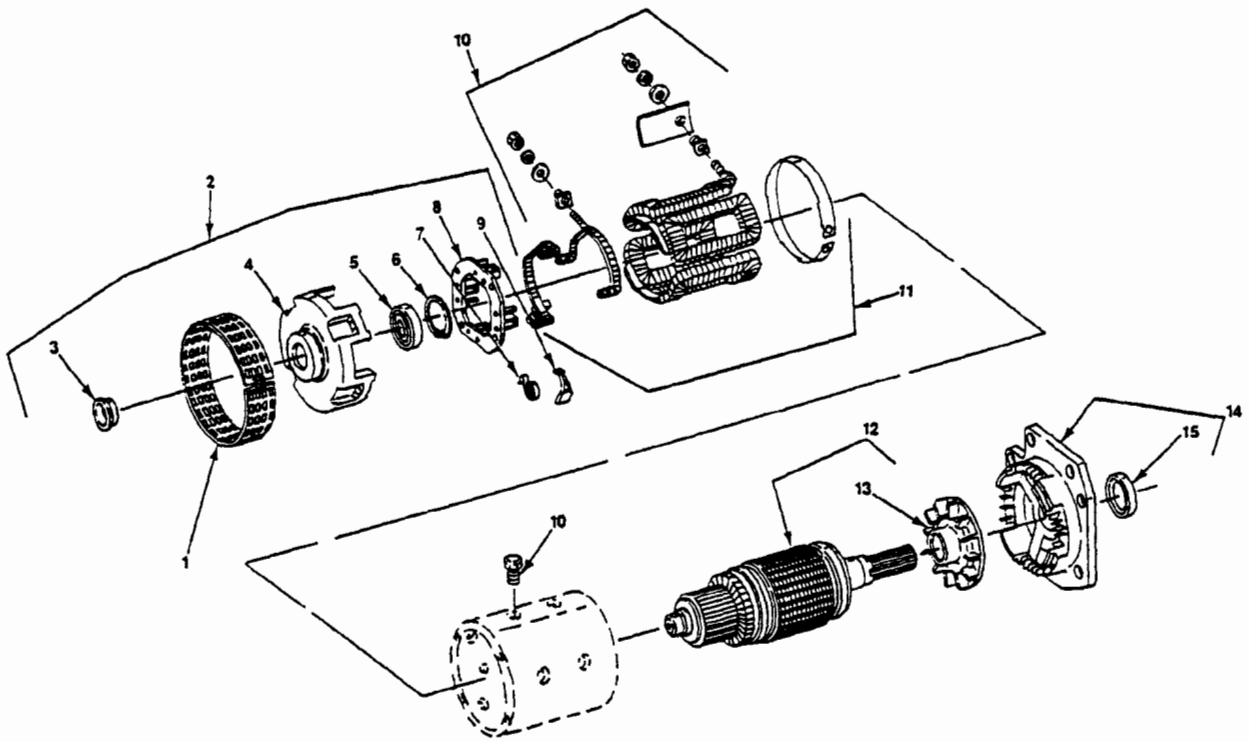
DRIVE MOTOR ASSEMBLY 26570-00



Item #	Name	# for Assy.
1	Band, cover	1
2	Head, communicator	1
3	Cover, bearing	1
4	Head	1
5	Bearing	1
6	Retainer (#N5002-244)	1
7	Spring set, brush	1
8	Plate assembly, brush	1
9	Brush set	1
10	Terminal stud package	1
11	Field, coil package	1
12	Armature and fan assembly	1
13	Fan	1
14	Head, drive	1
15	Seal, oil	1

NSS - Not Sold Separately

PLUGGING - Slow down is accomplished when reversing by providing a small amount of retarding torque for deceleration. If the vehicle is moving and the directional lever is moved from one direction to the other, the motor field is reversed. The plug signal is initiated by the fact that the directional switch has moved from one direction to the other. The motor armature, driven by the inertia of the vehicle, acts as generator. This generated current passes through 4REC and the sensor. The oscillator circuit regulates at a plug current limit level as set by the Handset. This controls the pulse rate of lREC to regulate the generated motor current and bring the truck to a smooth stop and reversal. With the accelerator potentiometer is at minimum resistance, function 5 will enable adjustment of plugging current from max to min. current level for plug current limit.

PEDAL POSITION PLUG - This feature will allow for plugging distance based on pedal position. Pedal position will reduce the plugging current to the current value set by this function as the accelerator is returned to the creep speed position. Maximum plug current is obtained with the accelerator in the top speed position. This feature is adjustable by using function 16 on the handset.

RAMP START - This feature provides full SCR torque to restart a vehicle on an incline. The memory for this function is the directional switch. When stopping on an incline, the directional switch must be left in its original or neutral position to allow the control to assure full power when restarted.

FULL POWER TRANSITION - this built-in feature provides smooth transition from SCR to 1A bypass. This is accomplished by the SCR continuing to pulse until the 1A contactor power tips close.

CONTROL ACCELERATION AND 1A TIME - This feature allows for adjustment of the rate of time it takes for the control to accelerate to 96% applied battery voltage to the motor on hard acceleration. The 1A contactor will automatically close .2 seconds after the controlled acceleration stops and the accelerator input is less than .5 volts or less than 50 ohms. C/A is adjusted by function 3 from .1 to 22 seconds.

1A CURRENT DROP OUT - This adjustable feature can be set to open the 1A contactor if the traction motor is subject to excessive currents. The dropout is adjustable with function 6 of the handset. Once the control has dropped out the 1A contactor due to excess current, the directional or accelerator switch must be returned to neutral to unlock the dropout circuit to allow the control to pick up the 1A contactor again. Using this feature will reduce the 1A contactor tip life, thus it should be used only where needed to protect the motor.

STATIC RETURN TO OFF - This built-in feature of the control is set up to make the driver return the directional lever to neutral anytime he leaves the vehicle and returns. If the seat switch or key switch is opened, the control will shut off and cannot be restarted until directional lever is returned to neutral. A time delay of approximately 1.5 seconds is built into the seat switch input to allow momentary opening of the seat switch if a bump is encountered.

ACCELERATOR VOLTS HOLD-OFF This feature checks the voltage level at the accelerator input when ever the key switch or seat switch is activated. If the voltage is less than 2.5 volts the

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7.4 Travel

7.41 No travel, lift-lower okay, steering pump motor runs

7.411 Conditions for test: Battery plugged in, key switch in run position, emergency disconnect contactor closed, foot pedal switch closed, gate switches closed, platform raised minimum of 4 inches, brake switch closed, directional switch closed.

Test for battery voltage at:

1. Positive side of brake switch
   0 volts, repair open wire #17 from staging chain tension to brake switch

2. Negative side of brake switch
   0 volts, replace brake switch

3. Positive side of directional switches
   0 volts, repair open wiring from brake switch to directional switches

4. Negative side of directional switches with wire disconnect
   0 volts, repair directional switch

5. Positive side of directional contactor coil
   0 volts, repair open wiring from brake switch to contactor coil

6. Negative side of directional contactor coil with wire disconnect
   0 volts, replace contactor coil

7. Test all limit switches for proper operation

8. Refer to EV-100 handset instructions

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STATUS CODE - 01

DESCRIPTION
No foot switch input.

MEMORY RECALL
NO

CIRCUIT
Traction

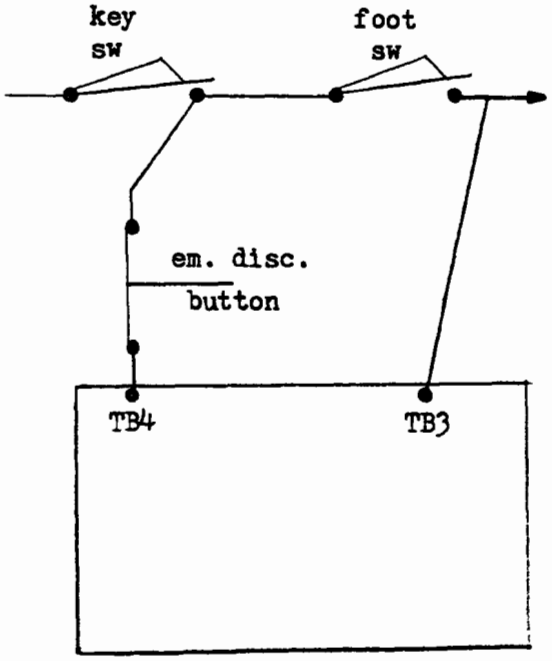
SYMPTOM
Forward or reverse contactor will not pick up.

POSSIBLE CAUSE
Mis-adjusted or defective foot switch.
Check seat switch to insure proper switch.

Open circuit between battery positive TB3.

Check for loose connections or broken wire between foot switch and TB3 and between key switch and positive side of the foot switch and key switch to TB4.

STATUS INDICATION CRITERIA
This status code will be displayed when TB3 is less than 50% battery volts.



STATUS CODE	DESCRIPTION	MEMORY RECALL	Yes
-26	Shorted coil driver for RB, SP or FW contactor.	CIRCUIT	Traction

SYMPTOM

RB, SP or FW contactor picks up immediately when key switch is closed.

POSSIBLE CAUSE

Defective coil driver internal to logic card.

- Replace logic card.

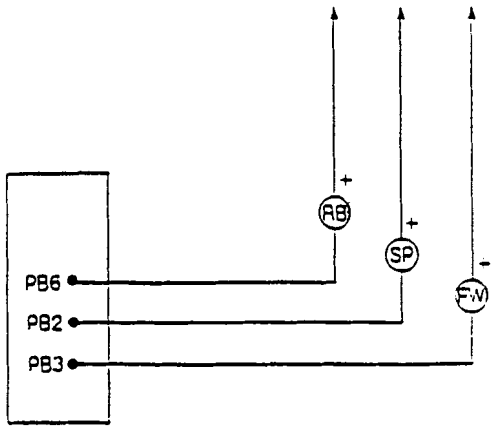


Figure 1.

STATUS INDICATION CRITERIA

This status code is displayed when there is a shorted RB, SP or FW coil driver.

STATUS CODE	DESCRIPTION	MEMORY RECALL	No
-41	Open thermal protector or control over temperature.	CIRCUIT	Traction

SYMPTOM

Reduced or no power to traction motor in SCR range.

POSSIBLE CAUSE

Open thermal protector circuit.

- Check for loose connection or broken wire between:
  Black wire-Thermal proctor and PZ1.
  Gray wire-Thermal proctor and PZ5.

Defective thermal protector.

- Disconnect wires from PZ1 and PZ5. At room temperature (25°C or 75°F) measure resistance between black and gray wire. Replace TP if ohmic value is greater than 300 ohms.

SCR is in thermal cut-back.

- Allow control to cool, status code should disappear.

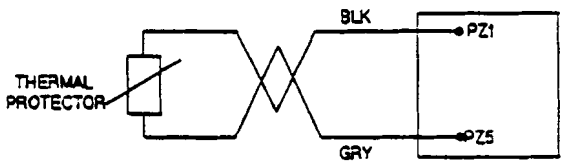


Figure 1.

STATUS INDICATION CRITERIA

This status code is displayed when the voltage between PZ1 and PZ5 is greater than 1.8 volts.

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

(2). If check (1) was satisfactory, test the SCR for its ability to be turned on by the gate. Connect positive through two diodes to the gate terminal. If the gate is operative, the lamp will come on and 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 the lamp cannot be lit under step (2) the SCR is open and must be replaced.

NOTE:

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

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

Measure resistance from the gate terminal to the cathode and then from the cathode to the gate terminal (R x100 scale). If resistance reads either zero ohms (short) or infinity ohms (open), replace the SCR. When reassembling SCR's, refer to TABLE 5.

Rectifiers (3REC, 4REC, Diode Blocks)

When checking diodes, disconnect battery and discharge capacitor 1C. When replacing rectifiers, refer to TABLE 5. For 3REC and 4REC, disconnect one lead or flexible connection.

3REC and 4REC are diodes with about 7 to 12 ohms in the conducting direction (anode to cathode) measure on the R x 100 scale, and 10,000 ohms or higher, in the non-conducting direction (cathode to anode) measured on the R x 10,000 scale.

Thermal Protector (TP)

Remove both the GRAY and BLACK wires from the "Z" plug that connects to the

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5) Scribe match marks on side of pump bodies to assure proper alignment during reassembly.

6) Remove eight (8) bolts that hold pump housings together.

7) Separate end body from intermediate body.

8) Remove lower pump gears and pins (keys) from shafts.

9) Remove intermediate body from front housing.

The driven shaft and gear may come out with intermediate body.

10) Remove retaining ring, drive gear, woodruff key, and second retaining ring from drive shaft.

11) Remove drive shaft from front housing by pulling it out the front side of the housing.

12) Remove seal from front housing.

13) Clean all pump pieces in safety solvent and dry with compressed air.

!WARNING! The use of flamable solvents can be extremely dangerous.

!WARNING! Use a regulated air supply that complies with OSHA and other applicable safety regulations.

2.3.3 Inspection

1) Parts must be kept clean and dry for inspection.

2) Inspect gears, pump bodies, and shafts for excessive wear.

There should be no wear, scratches, or grooves greater than .005".

Clearance between shafts and bushings should not exceed .0005".

3) If excessive wear is indicated, pump replacement is in order.

2.3.4 Assembly

Caution: Assemble pump only in a clean work area. Any amount of dirt or contamination will cause excessive wear and premature failure in the hydraulic system.

1) Install drive shaft through front side of front housing.

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Mast

1.0 Shimming

1.1 Two stage mast
Shimming mast on truck.

1.1.1 Shimming the lift platform.

1) Disconnect the battery and remove battery from truck.

2) The truck will have to hoisted and blocked a foot off floor (see Hoisting Instructions in this manual) before work can begin.

!WARNING! Always make sure unit is on level surface before work can begin.

3) Attach a hoist to top of lift platform and hoist to loosen lift chains. This will allow removal of lift chain anchor pins, steering wheel chain, and electrical cable.

4) Determining the amount of shims required by prying the rear of lift frame to one side and slipping shims between the bearings and web on column. Add shims by hand until no more may be added.

5) Divide shims as equally as possible between the two (2) bearings and install under bearings.

6) Hoist lift platform up inner column to expose the two (2) top bearings. Remove bearings to install shims behind bearings.

7) Lower lift platform down inner column to expose the two (2) lower bearings. Remove bearings to install shims behind bearings.

8) Raise lift platform up inner column as far as it will go under normal operation. Check bearing shimming as lift platform is raised. Remove shims as required if tight spots are encountered where assembler cannot roll platform smoothly. Check for excessive bearing clearance with platform in lowered position by prying platform to one side and checking with a .030" shim. Maximum clearance must not exceed .030".

9) Lower lift platform to install lift chain anchor pins, steering wheel chain, and electrical cable. When installing lift chains, chains are to be free of twists and adjusted for equal tension with adjusting nuts and locknuts torqued to 200 ft./lbs. Chains are to be centered on sheave within 1/32".

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3) Connect electrical cable to unit.

4) Connect steering cables to unit.

5) Hoist lift platform and slide down intermediate column.

6) Connect lift chain anchor pins, steering wheel chain, and electrical cable to lift platform.

7) Loosen locking nuts on chain anchors. Adjust nuts until both chains are free of twists and of equal tension. Tension is correct if you can force lift chain sideways approximately ½" to 1" before lift platform raises slightly.

8) Grease all chain sheaves.

9) Bleed air from cylinders.

10) Install and connect battery and test operation of mast and unit.

2.2.3 Disassembly

1) Lower mast assembly to a horizontal position before work can begin.

2) Remove lift chain anchors, lift chain, steering cables, and electrical cable from mast.

3) Remove four (4) screws and nuts from inner column and remove free lift cylinder assembly by pulling straight up.

NOTE: Lift cylinder can be repaired at this time, if needed.

4) Remove chain sheaves and cable sheaves from all columns.

5) Remove column stops from outer column.

6) Pull inner column straight forward until it stops (hits bearings) and then 90° straight up from intermediate column.

7) Remove cap screw from top of intermediate column and remove staging cylinder assembly by pushing intermediate column forward.

NOTE: Lift cylinder can be repaired at this time, if needed.

8) Pull intermediate column straight forward until it stops (hits bearings) and then 90° straight up from outer column.

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