LPT50BRD

(8x8x4 Enclosure)

TROUBLESHOOTING AND REPAIR MANUAL

ALL REPAIRS SHOULD BE PERFORMED BY A QUALIFIED ELECTRICIAN

The LPT50BRD is a field repairable switch. Warranty covers defective parts only. Do not return the complete switch unless instructed to do so. The tools needed are straight blade & Phillips screwdrivers, flexible nut driver and AC/DC (Volt, Ohm) meter. These tools are available at most hardware stores. If technical support or repair parts are needed, please call your OEM or ESCO at (574) 264-4156. All warranty claims must be directed back to the OEM.

ALWAYS BE SURE POWER IS OFF AND DISCONNECTED

Disconnect shore cord, turn breakers off at the generator and disconnect the inverter if installed. Remove the lid from the enclosure and check for AC voltage at all terminals to be sure that power is disconnected. Refer to the wiring diagram at the end of this manual for test points. Check connections to make sure all wires are secured and not broken off or burned. Be sure there is no debris inside enclosure.

I. NO SHORE POWER TO COACH

The design of the LPT50BRD allows shore power to be run through the normally closed contacts of the relay. This means whenever the shore cord is plugged in, power goes through the relay to the load panel. The relay does not have to be energized. If you are having problems with incoming power from the shore cord, make sure there is nothing preventing the relay from returning to the normally closed position – for example: a wire routed directly over the relay pushing down on the relay armature.

A. Check wiring of transfer switch. See procedure IV below or refer to the wiring diagram on the inside surface of the LPT50BRD cover.

B. Check wire connections to make sure there are no loose wires in the terminal blocks or on the relays.

II. NO GENERATOR POWER TO COACH

A. **WARNING: HAZARDOUS VOLTAGES.** If the transfer switch does not switch to generator power within 90 seconds of generator startup, check for proper AC voltage input using an AC voltmeter. Refer to the wiring diagram below. The screws on the terminal block are a good point to test for these voltages. Use the numbers on the terminal block or the label placed in front of the block to locate the generator NEUTRAL (6), HOT ONE (4) and HOT TWO (5) points. The meter should read 90 to 120VAC between generator NEUTRAL & HOT ONE and generator NEUTRAL & HOT TWO. For 120 VAC generator input, HOT ONE should be jumpered to HOT TWO.

B. If proper voltage is present, check the status of the green LED on the pc board. If the LED is illuminated, then the pc board has gone through the time delay and the transfer switch should transfer from shoreline to the generator power.

C. If the green LED did not light, then the time delay board is not getting the proper voltage from the generator (see procedure II.A above) or the time delay pc board is bad. Replace the time delay pc board if the proper voltage is present from the generator and the time delay is not working.

D. If the green LED did light, and the switch does not transfer from shore power to generator power, then check the DC coil voltage on each relay. Set the DC voltmeter to the 200 VDC, or equivalent, range. With the terminal block facing the bottom of the enclosure, the NEUTRAL relay is on the left and the HOT relay is on the right. Individually check each relay at terminals 1 and 2. The voltmeter should read between 105 and 170 VDC. If it does not, replace the time delay pc board.

   If the proper DC voltage was present in the previous step, check the coil resistance using an Ohmmeter. **MAKE SURE ALL POWER COMING INTO THE TRANSFER SWITCH IS OFF.** Refer to the wiring diagram below. Individually check each relay at terminals 1 and 2. The resistance of each coil should be in the 5.5 K ohm to 6.5K ohms range. If either relay fails the resistance check, replace that relay.

E. If just the NEUTRAL relay engages and the HOT relay does not, the auxiliary switch on the back of the NEUTRAL relay could be bad or out of alignment. This switch senses the position of the NEUTRAL relay. The plunger of the auxiliary switch is actuated by a tab connected to the armature of the relay. One side of the HOT relay coil is run through this switch. If this is out of alignment, the HOT relay can not engage.

NOTE: If the coil on the NEUTRAL relay is defective and it does not engage, then the HOT relay can not engage either.

To check the switch, refer to the wiring diagram and connect an Ohmmeter to the wires coming from points S1 and S2. Push down on the armature of the NEUTRAL relay. The Ohmmeter should read close to zero Ohms. Release the armature so the NEUTRAL relay returns to the normally closed state. The Ohmmeter should read open circuit. If the auxiliary switch does not have continuity when the NEUTRAL relay armature is pushed down, then it is either out of alignment or does not work properly.

If it is out of alignment, loosen the nut on the bottom of the auxiliary switch and move it either toward or away from the relay. Push down on the relay armature and check the Ohmmeter as described above. Repeat this process until the switch works properly. Retighten the nut on the auxiliary switch.

III. RELAY CHATTERING

Relay chattering is primarily caused by insufficient voltage from the generator. Check the voltages coming in from the generator. If the voltage starts to drop below 90VAC, the relays may begin to chatter. Also check for debris in the enclosure.

IV. WIRING OF THE LPT50BRD

Refer to the drawing at the end of this document.

SHORELINE

A. From the terminal block Shoreline Neutral location (3) to the NEUTRAL relay location #8 and #7 (2 -10 AWG WHITE wires)

B. From the terminal block Shoreline Hot Two location (2) to the HOT relay location #8 (single 10 AWG BLACK wire)

C. From the terminal block Hot One location (1) to the HOT relay location #7 (single 10 AWG BLACK wire)

GENERATOR

A. From the terminal block Generator Neutral location (6) to the relay location #6 and #5 (2 -10 AWG WHITE wires).

B. From terminal block Generator Hot Two location (5) to the HOT relay location #6 (single 10 AWG BLACK wire)

C. From terminal block Generator Hot One location (4) to the HOT relay location #5 (single 10 AWG BLACK wire)

LOAD PANEL

A. From terminal block Load Panel Neutral location (9) to the NEUTRAL relay location #4 and #3 (2 -10 AWG WHITE wires).

B. From terminal block Hot Two location (8) to the HOT relay location #4 (single 10 AWG BLACK wire).

C. From terminal block Hot One location (7) to the HOT relay location #3 (single 10 AWG BLACK wire)

COIL AND TIME DELAY CONNECTIONS

The connections are made using 16 AWG blue wires as follows:

A. One wire of a double wire set is connected from point A on the time delay pc board to point S2 on the auxiliary switch located on the back of the NEUTRAL relay. The second wire from the set is connected from S2 to terminal # 1 on the NEUTRAL relay.

B. A single wire from point S1 on the auxiliary switch connects to terminal #2 on the HOT relay.

C. One wire of another double set connects point B on the time delay pc board to terminal #2 on the NEUTRAL relay. The second wire from the set connects terminal #2 on the NEUTRAL relay to terminal #1 on the HOT relay.

D. A single wire from terminal C on the time delay pc board to terminal #5 of the HOT relay.

E. A single wire from terminal D on the time delay pc board to terminal #6 of the NEUTRAL relay.

COMMON REASONS FOR FAILURE*:

(1) LOW VOLTAGE ON SHORE CORD -

Reasons: Bad connection at park box, extension cord too long, defective adapters, operating too much load for power available.
Potential Damage: burned out coils and pitted contacts.

(2) DIRTY POWER AND SPIKES -

Reasons: Storms (lightening), unbalance load at park, utility service at park is undersized or located next to an industrial environment.
Potential Damage: burned out coils, pc board damage, pitted contacts.

(3) DEBRIS IN ENCLOSURE -

Reasons: Metal shavings, knock outs, saw dust caused by poor production control, moisture or dirt inside enclosure, transfer switch not installed in an airtight compartment.

Potential Damage: Chattering relays, burned out coils, damage to pc board. Metal particles could cause a fire.

(4) GENERATOR OVERRUNS -

Reasons: Generator needs to be serviced, manual override of governor or throttle control, generator is undersized or is not properly installed.
Potential Damage: burned out coils, pc board damage, pitted contacts.

*All of the above reasons can cause damage to the R.V.

REPLACEMENT PARTS

PART #	DESCRIPTION	QUANTITY
21082-84	Neutral Relay: 50Amp with Auxiliary Switch	1
21080-84	Hot Relay: 50 Amp	1
LAB-50-BLOCK	Terminal Block Label 50	1
LAB-I50BRD NEW	Inside Wiring Label I-50 BRD	1
LAB-50TBNUM	9 Position Label for Terminal Block	1
LAB-TORQ	Torque Label 1/2x1/2	1
10WHP-75S-00	7 1/2" White Wire with 1 Spade	6
10BKP-77S8-00	7 3/4" Black Wire with 1 Spade	6
16BLF-90F-00	9" Blue Wire with 2 Female Disconnect	1
16BLF-60S8-00	6" Blue Wire w/Female Disconnect & Spade	2
16BLF-90F-40F	Dbl Blue Wire - Female Disconnect 9" & 4"	2
QN2-6	Ground Bar	1
LPT30-TIME	Time Delay TD 30	1
PLS-0002	Insulator Pan	1
NDN111A-WH-SPEC	Term Block 3 Position	3
NDNA200	Din Rail (21mm ~ 8.25")	1
L-BRACKET	L Bracket for Din Rail	2
COVER LABEL	Cover Label Transfer Switch	1
SPC8X8X4 1/2	Metal Box 8x8x4	1
LAB-ID50BRD	LPT50BRD ID Label	1

LPT50BRD Wiring Diagram