



SERVICE MANUAL 4554

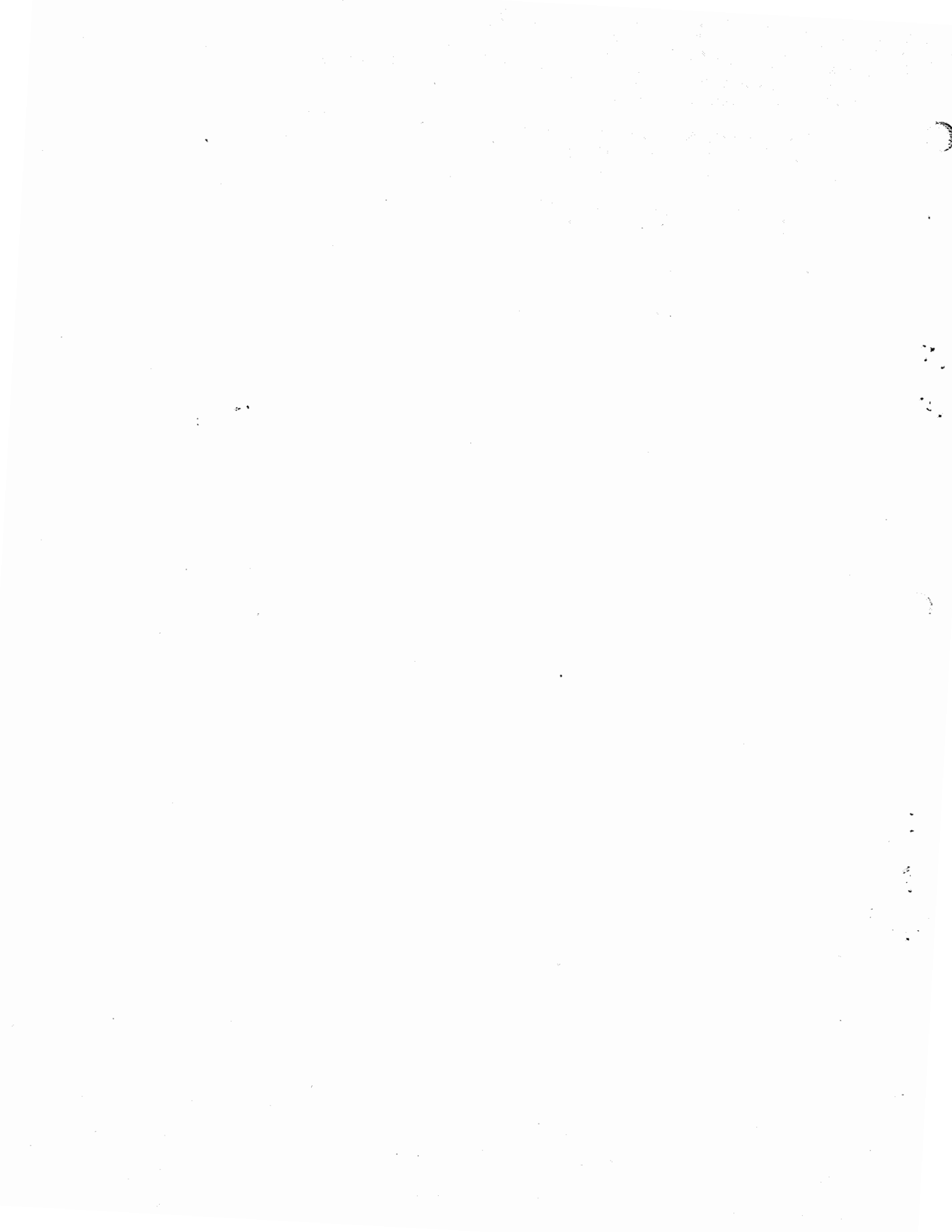
**DC PLUG-IN
CODED GROUND DETECTOR COMBINATION**

PD-63DC

January, 1978
D-4/87-50-326-6

UNION SWITCH & SIGNAL
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STYLE PD-63DC PLUG-IN GROUND DETECTOR CONTROL UNIT AND THE PLUG-IN CODED GROUND DETECTOR COMBINATION

This service manual describes the PD-63DC ground detector control unit and also covers the necessary information for shop testing the plug-in coded ground detector combination, consisting of one PC-56A code transmitter (Service Manual 4518) or one PC-250TR code transmitter (Service Manual 4569), one PN-150B biased neutral relay (Service Manual 4596), one PP-64D code following relay (Service Manual 4553) and the PD-63DC ground detector control unit. The principles of operation and recommended method of field testing the plug-in coded ground detector combination are covered by Service Manual 5480 which includes the figures referred to herein.

I. GROUND DETECTOR CONTROL UNIT

This unit consists of a housing containing circuit accessories (resistors and capacitors), and a control panel on which are mounted the test switches and ground indication lights. This housing is designed for application to a standard size PN-50 plug-in relay mounting base.

Information on indexing of the control unit is covered by Service Manual 4525.

The control unit must be tested in combination with the three other components of the plug-in ground detector.

II. TESTING OF PLUG-IN GROUND DETECTOR COMBINATION

A. Resistance Test

With the reset button turned to the "+test" position and the power lead to control unit terminal #13 disconnected, it should be checked that the test ground resistance measured between terminals #13 and #26 is not less than 4750 ohms nor more than 5250 ohms.

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B. Normal Voltage Test

For this test, all components of the ground detector combination should be connected as shown in the figures, with the ground connections "G1" and "G" jumpered solidly together. The power supply should be as shown in the proper figure. (See Service Manual 5480).

1. With the system energized and the disconnect toggle switch in the normal position as shown, the reset button should be pushed but not turned. After a short delay, the PN-150B relay should pick-up causing the green "no ground" lamp to light. The green lamp should remain lit when the reset button is released.

2. The reset button should then be turned to apply the "+ test" and held in that position for a few seconds. This should cause the red "+ ground" lamp to be lit and the green "no ground" lamp to be extinguished.

When the reset button is returned to its normal position, the "+ ground" and " - ground" lamps should flash alternately. When the button is pushed again, the red lamps should be extinguished and the green lamp should light.

3. The test should then be repeated with the reset button turned to the " - test" position to see that the "-ground" lamp lights after a few seconds delay.

4. With the circuit restored to normal conditions so that the green "no ground" lamp is lit, a separate 5000 ohm resistor for the 16V relay (not shown in figures) should be connected between control unit terminals #13 and #17. This should cause the red "+ ground" lamp to light. A 40000 ohm resistor should be used for the 130V relay.

5. With the circuit again restored to normal conditions, the separate 5000 ohm resistor should then be connected between terminals #14 and #17. This should cause the red " - ground" lamp to light. A 40000 ohm resistor should be used for the 130V relay.

6. The circuit should then be restored to normal conditions and the disconnect switch moved to the "disconnect" position. This should cause all lamps to be extinguished.

C. Low Voltage Test

After successfully testing the ground detector unit at normal voltage, the voltage applied to the white lead of the RCS-2 rectifier-capacitor unit should be reduced to 75% of normal. If the rectifier-capacitor unit is not used, this reduced voltage should be applied directly to terminal #16 of the PD-63DC control unit as shown in figures.

The voltage applied to all other terminals should be maintained at the nominal value.

1. With the reduced voltage applied, the steps of the normal voltage test procedure should then be repeated as explained in Section IIA.

2. If the PN-150B relay fails to pick-up on reduced voltage with the reset button depressed, the PN-150B relay should be removed from its mounting base and the control unit checked as follows:

With the control unit reset button depressed, the resistance between control unit terminals #16 and #25 should be measured by any convenient method. This resistance should be approximately 100 ohms as indicated in figures. If the resistor is open or measures less than 80 ohms, it should be replaced.

The 1000 microfarad capacitor should then be checked using a capacitance tester with the "+" lead connected to control unit terminal #25 and the "-" lead connected to terminal #9. If the capacitance is less than 800 microfarads, the capacitor should be replaced. If a capacitance tester is not available, this capacitor may be checked by connecting a 100 ohm resistor and a dc ammeter with a 0-150 ma scale in series to terminal #25 and applying 15 volts dc to the ammeter (+) and terminal #9 (-). If the leakage current through the capacitor is more than 5 ma after the voltage has been applied for 15 minutes, the capacitor should be replaced.