Operation Instructions for Ignition Powered Panel Tester
Model HC-9040

HC-94076N
Effective 01-95
Section 50

Please read the following information before operating. A visual inspection of this product for damage during shipping is recommended before mounting. It is your responsibility to have a qualified person operate this unit.

GENERAL INFORMATION

WARNING

BEFORE BEGINNING INSTALLATION OF THIS MURPHY PRODUCT

- ✔ Disconnect all electrical power to the machine.
- ✔ Make sure the machine cannot operate during installation.
- ✔ Follow all safety warnings of the machine manufacturer.
- ✔ Read and follow all installation instructions.

Description

The Murphy HC-9040 Ignition Powered Panel Tester allows you to test your panel for short circuits and insulation leaks in sensor leads or panel wiring.

The tester provides 160 to 180 VDC–nearly simulating ignition voltage and current conditions. The current-limited output provides sufficient current to operate TATTLETALE® annunciators (mechanical and digital) and fuel gas valves. The HC-9040 is designed for testing Murphy Ignition Powered Panels incorporating 307PH-CD, LCDT, MARK II or IV Series TATTLETALE® annunciators and M25-CD or M50-CD Series fuel gas valves. The HC-9040 can test digital tachometers and loop monitors applied to negative ground CD ignition systems. Contact Murphy for more details.

The HC-9040 connects to the panel's terminals by means of clip leads. **This operation can produce a spark, therefore the tester is to be used only in areas where there is no danger of ignitable gas mixtures.**

WARNING: Do not use Panel Tester in hazardous locations where an ignitable mixture of gases may accumulate.

The HC-9040 has two modes of operation: (**1**) apply 160 to 180 VDC for component operation testing; (**2**) indicate short circuits by making the lamp glow brightly or glow dimly to indicate insulation leakage.

Specifications

Power Requirements: Four "D" cell 1.5 V batteries–6 VDC total (DURACELL MN1300 batteries are recommended).

Output Voltage: 160 to 180 VDC.

Relative Humidity: Operates up to 95% relative humidity under conditions of no condensation.

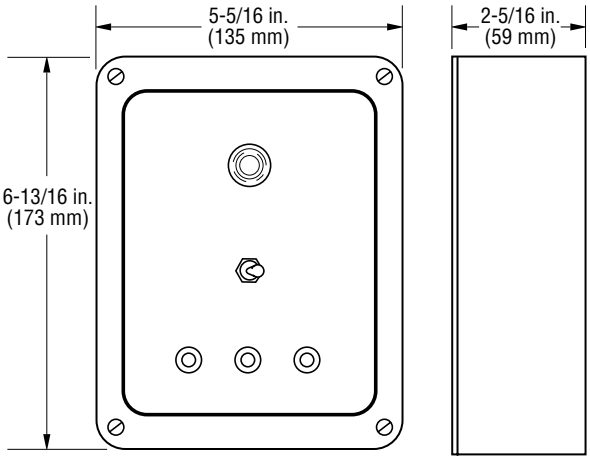
Power On-Off Switch: Turns battery power ON or OFF. Bright glow of lamp indicates short circuit; dim glow indicates insulation leak.

Positive Output Terminal: 160 to 180 VDC output for use in testing component operation.

Common Terminal (COM): Common return for either output circuit.

Insulation Test Terminal: DC output in series with lamp to indicate short circuits or insulation leaks.

Dimensions



Warranty

A two-year limited warranty on materials and workmanship is given with this Murphy product. Details are available on request and are packed with each unit.

OPERATING TEST PROCEDURES

Test procedures using the HC-9040 Panel Tester consist of operational checks for the fuel gas valve and TATTLETALE® annunciators with related sensor circuit checks and tests for short circuits and insulation checks. Each test requires current flow through the panel's circuits. A diode in each panel's adapter package permits current flow in only one direction; therefore polarity must be observed when connecting the leads from the Panel Tester to the panel's terminals.

Operation Test Procedure

The following procedure is for testing TATTLETALE® and fuel gas valve operation using the HC-9040 Panel Tester. **Figure 1** shows a typical negative-ground diagram with test setup. This procedure is **written for a negative-ground system with notes to facilitate operation with positive ground system.**

WARNING: Do not use Panel Tester in hazardous locations where an ignitable mixture of gases may accumulate.

1. Remove ignition lead from the control panel's ignition input terminal.

2. Switch Panel Tester's power switch to OFF.

3. Plug the black test lead into black **COM** test jack of the Panel Tester, and plug the red test lead into red **POS OUTPUT** test jack.

4. Touch test lead clips together to discharge Panel Tester output compacitor if applicable.

5. Connect black (common) test lead clip to panel board ground terminal.

6. Connect red (positive) test lead clip to panel board ignition input terminal.

NOTE: For positive ground system, reverse test lead clip connections so that the black (common) lead is connected to ignition input terminal and red (positive) lead is connected to ground.

7. Set control panel's Emergency Stop or Stop/Run switch to RUN or ON position.

8. Clear all sensor contacts.

9. Switch Panel Tester's power switch to ON.

10. Check each TATTLETALE® by closing each associated sensor contact and verifying that TATTLETALE® operates.

NOTE: If none of the TATTLETALE® annunciators trip, you should suspect a short circuit or leak to ground that drains off sufficient current to drop the Panel Tester output voltage below operating level. In such case, perform the Insulation Leak or Ground Test procedure.

11. When a fuel gas valve is included in the system, check valve operation by observing fuel gas valve operation as a shutdown TATTLETALE® trips.

12. After operational test is complete, diconnect leads from control panel, switch Panel Tester's power switch to OFF and touch ends of test leads together to discharge energy stored in output capacitor.

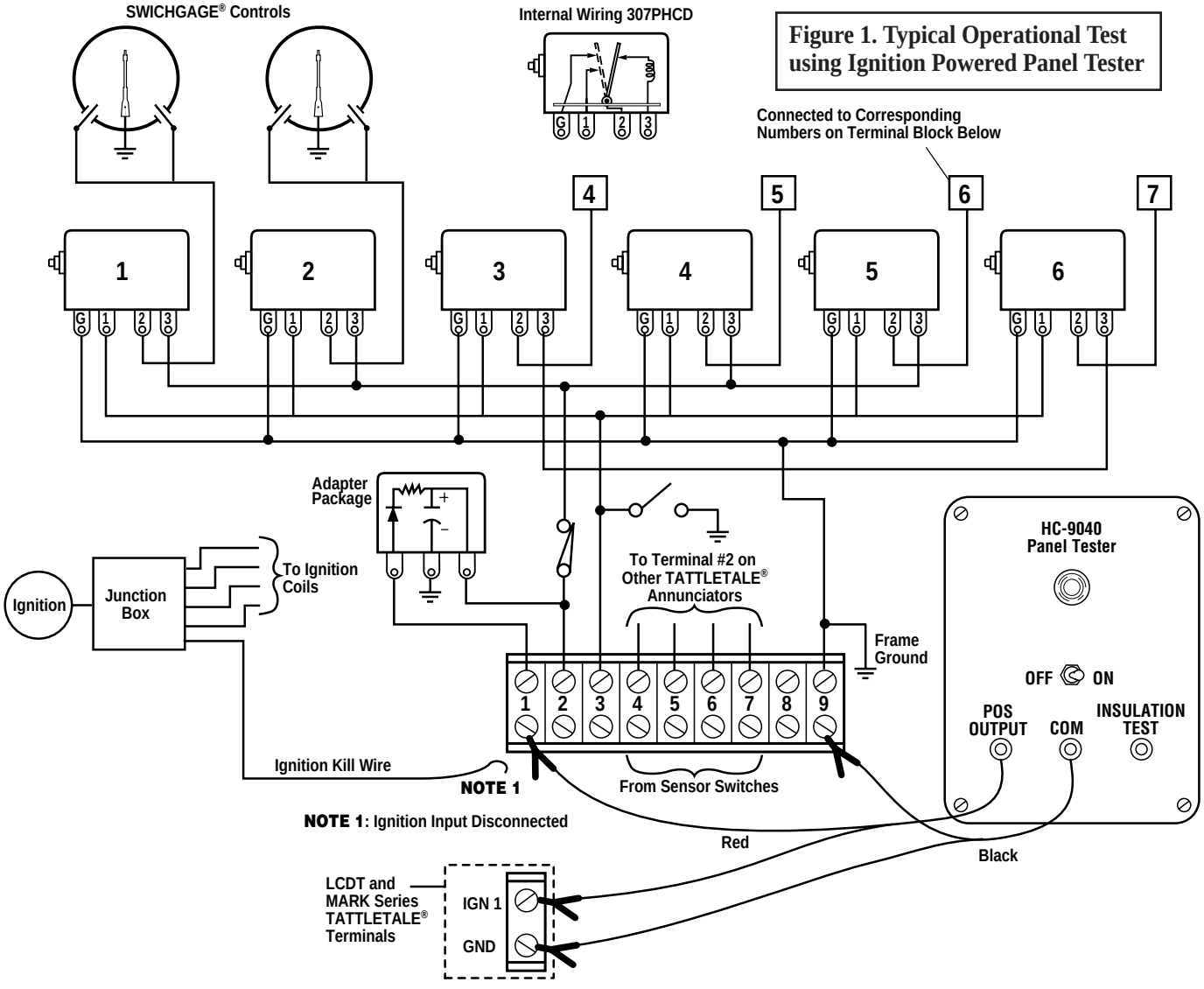


Figure 1. Typical Operational Test using Ignition Powered Panel Tester

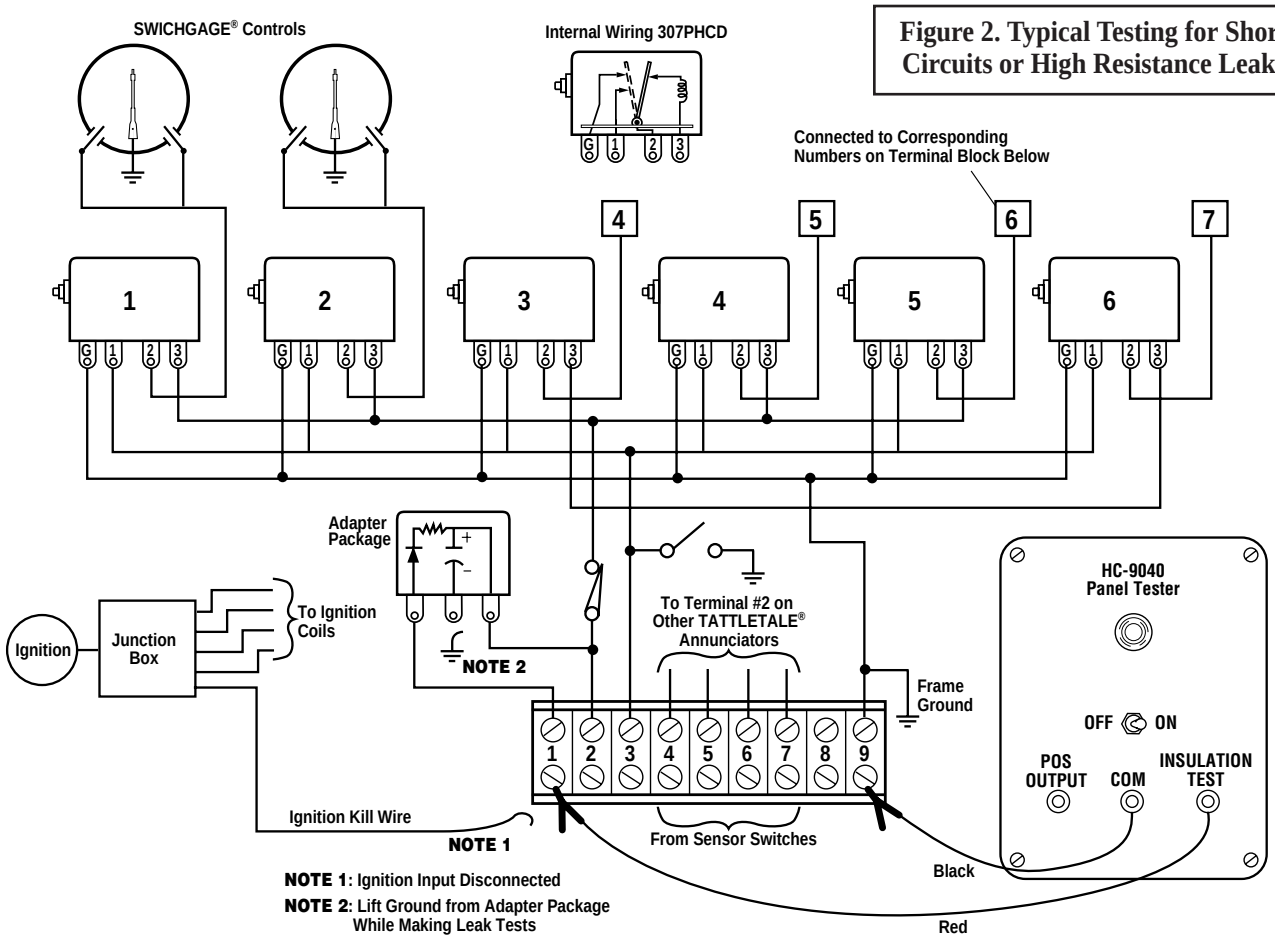


Figure 2. Typical Testing for Short Circuits or High Resistance Leaks

Insulation Leak or Ground Test

The following procedure is for testing for insulation leaks on grounds. **Figure 2** shows a typical negative-ground diagram with test setup. This **procedure is written for negative ground system with notes to facilitate operation with positive ground system.**

WARNING: Do not use Panel Tester in hazardous locations where an ignitable mixture of gases may accumulate.

1. Remove ignition lead from the control panel's ignition input terminal.

2. Locate ignition adapter package and disconnect the ground lead temporarily while making tests.

CAUTION: RECONNECT GROUND LEAD TERMINAL AFTER TESTS ARE COMPLETED.

3. Switch Panel Tester's power switch to OFF.

4. Plug black test lead into black **COM** test jack of Panel Tester, and plug red test lead into **INSULATION TEST** jack.

5. Touch ends of test leads together to discharge Panel Tester output capacitor if applicable.

6. Connect black (**COM**) test lead clip to control panel's ground terminal (**Figure 2**).

7. Connect red (**INSULATION TEST**) lead clip to control panel's ignition input terminal.

NOTE: For positive ground system, reverse test lead clip connections so that the black (COM) lead is connected to ignition input terminal and red (INSULATION TEST) lead is connected to ground.

8. Set panel's Emergency Stop or Stop/Run switch to RUN or ON position.

9. Check and clear each sensor contact. All sensor circuits should then be isolated from ground.

10. Switch Panel Tester power switch to ON.

11. Check and clear any leaks or shorts as follows:

NOTE: If amber test lamp glows after all sensors have been cleared, it indicates a short circuit or insulation leak. A bright glow indicates a grounded circuit and a dim glow indicates a high resistance leak. When testing a long lead with a high resistance leak, the lamp may flash due to lead capacitance between lead and ground.

a. If amber test lamp glows after all sensors have been cleared, begin disconnecting sensor leads at terminal block, observing lamp as each lead is disconnected.

b. Note lead whose removal extinguishes amber test lamp; and assume that lead has a short circuit or high resistance leak according to intensity of lamp.

c. Leaving faulty sensor lead disconnected, begin to replace leads previously disconnected to be sure that none of these leads also contains a short or leak.

d. Troubleshoot and clear any leads determined to be faulty and reconnect them to terminal block.

Continued on next page

e. If lamp continues to glow after all sensor leads have been disconnected, assume a short circuit or leak in the panel board internal circuit and troubleshoot it.

12. After all leads have been checked and any faults corrected, be sure that all leads are reconnected including ground lead removed from ignition adapter package in step 2.

13. Disconnect test leads from control panel, set Panel Tester's power switch to OFF, and touch test leads together to discharge output capacitor.

CAUTION: RECONNECT GROUND LEAD TERMINAL AFTER TESTS ARE COMPLETED.

Fuel Gas Valve Operational and Insulation Leakage Test

Fuel Valve Operational Test

1. To test the M5081 and M5381 fuel valves, reset the valve and connect the HC-9040 **COM** test lead to terminal 3 on the fuel valve. Connect the **POS OUTPUT** test lead to terminal 1. See **Figure 3.** The valve should trip. If valve fails to trip, perform Insulation Test to check continuity between terminals 1 and 3. If testing the M2582 fuel valve connect the HC-9040 **COM** test lead to the white wire and connect the **POS OUTPUT** test lead to the red wire. The valve should trip. If valve fails to trip, use Insulation Test to check continuity between the white and red wire.

2. After test is completed, disconnect test leads from fuel valve, set Panel Tester Power switch to OFF and touch test leads together to output capacitor.

Fuel Valve Insulation Leak Test (M5081 and M5381 Fuel Valves)

Connect the **INSULATION TEST** test lead on the HC-9040 to terminal 1 on the fuel valve. Connect the **COM** test lead to the valve body. With the valve reset, the panel tester lamp should remain off. If the light on the panel tester is on and remains on, there could be a grounded coil or coil leads or shorted switch contacts.

Internal Wiring for M5081/M5381 Fuel Valve

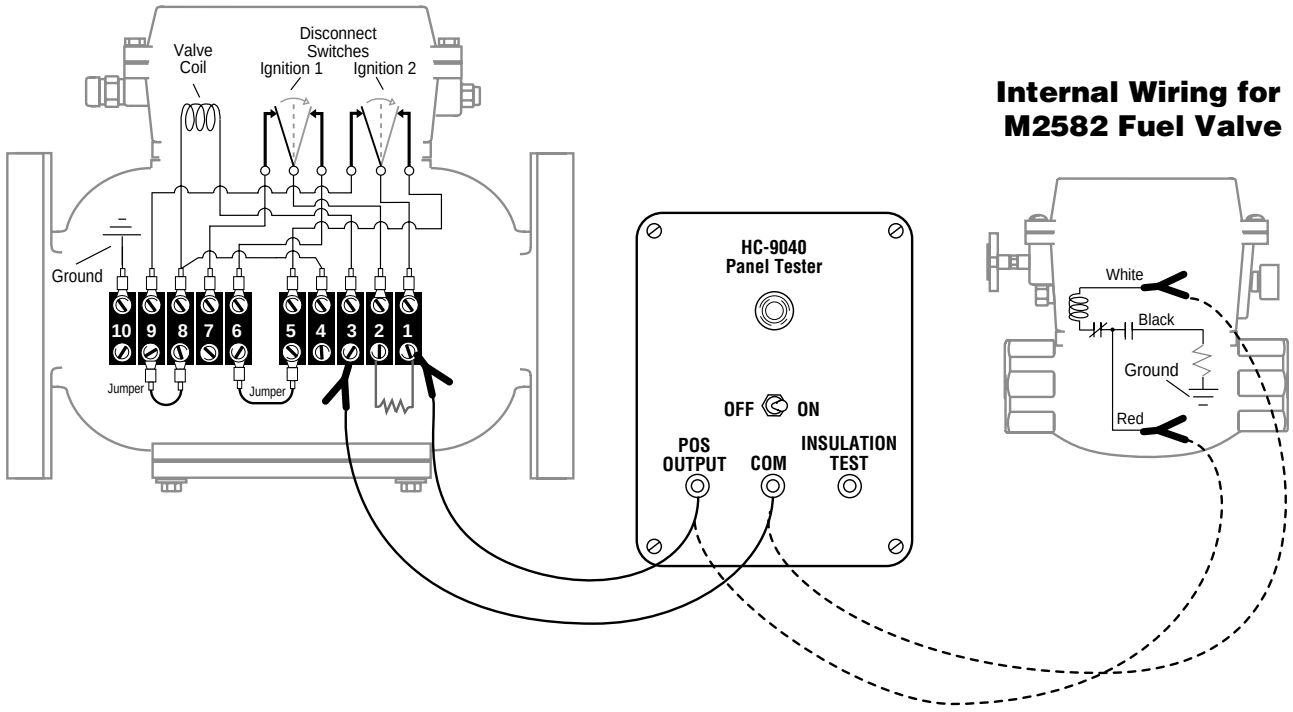


Figure 3. Fuel Gas Valve Operation Test

In order to consistently bring you the highest quality, full featured products, we reserve the right to change our specifications and designs at any time.

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