D. 6.2L ENGINE GLOW PLUG SYSTEM (Figure 12-3 through 12-6)

The glow plug is basically an electric heater that is energized by the operator through the ignition switch. Once energized, electric current flows through the glow plug to cause it to glow or become red hot 1550°F to1650°F (829° to 884°C). After a given time period when the starter motor is engaged, the ambient air that flows into the engine will be rapidly increased in temperature through the use of the hot glow plug within the combustion chamber.

Each cylinder in the 6.2L engine employs a glow plug that is actually a 12-volt unit operated from the 24-volt battery system when the ignition key is turned to the run position prior to engaging the starter motor. They remain pulsing for a short time after starting, then automatically turn off.

Within the instrument panel of the vehicle is a “glow plugs” light that will turn on immediately when the ignition switch is turned to the run position.

The major components of the glow plug system are described in the following paragraphs.

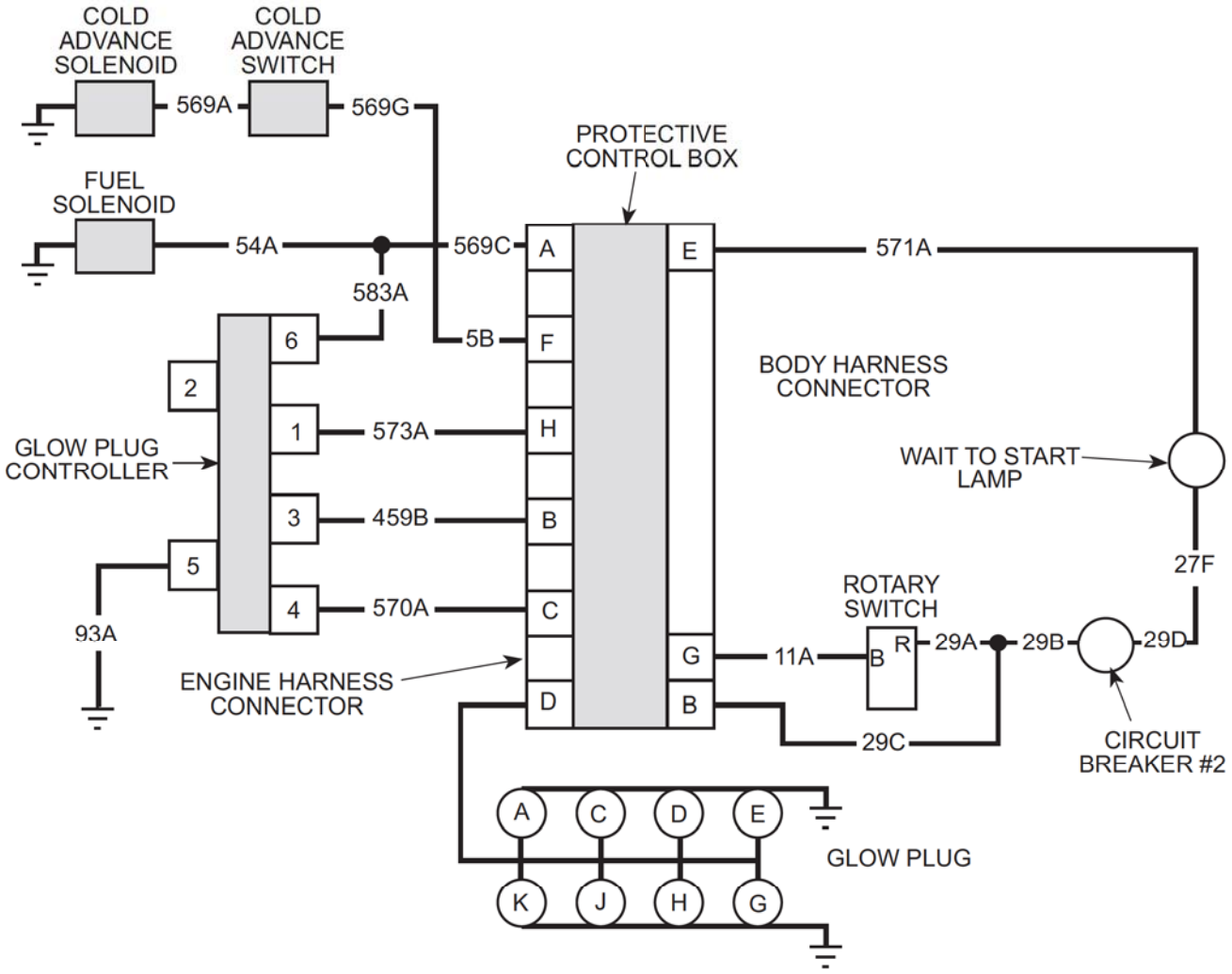

Figure 12-3. Glow Plug Controller Testing

(MALFUNCTION)

a. Glow Plug System Continues To Cycle After Engine Is Warmed Up

Start engine, and check for 12-14 volts DC signal at alternator lead 2A. If no voltage is present or voltage is not within limits, replace the alternator. If 12-14 volts DC is present, replace protective control box.

b. Using multimeter, check glow plug internal resistance (Figure 12-5)

Connect one test lead to terminal (1) and other test lead to threaded area (2).

Glow plug internal resistance should be 1.5-5.0 ohms. If resistance is not 1.5-5.0 ohms, replace glow plug.

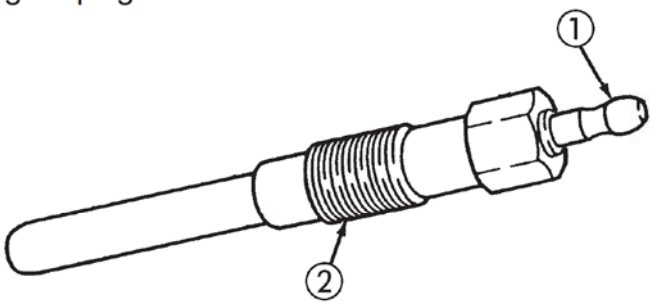

Figure 12-4. HMMWV Glow Plug.

NOTE

- **The following will explain proper operation of glow plug system. When engine is below 120°F (48°C) and rotary switch is positioned to "RUN", "Wait-To-Start" lamplight then goes on for up to fifteen seconds, depending on engine temperature, then goes off, engine can then be started. After engine is started, glow plugs will continue to cycle (for up to 5 minutes) then stop cycling.**

- **Glow plug system is cycling normal when there is an on pulse for approximately 1 second and an off pulse for approximately 15 seconds.**

- **To detect glow plug system cycling, watch voltmeter. The gage needle will move to the left when glow plugs are on, then return to normal position when glow plugs are off. A relay click should be heard from the protective control box as the system switches on and off. Multimeter may be used on any glow plug wire to visually watch operation of glow plug system.**

- **If engine temperature is above 120°F (48°C), glow plugs are not required to start engine.**

- **Each glow plug draws approximately 11.25 amperes. To test system connect AMP meter across batteries. With glow plugs cycling, there should be approximately 90 ampere draw. Each bad glow plug will lower ampere draw approximately 11.25 amperes. (Example) With one bad glow plug, reading will be approximately 78.75 amperes. With two bad glow plugs, reading will be approximately 67.5 amperes etc.**

NOTE

Allow engine to cool for 30 minutes before performing glow plug resistance checks.

1. Remove engine wiring harness connectors from all glow plugs. Using a multimeter, check glow plug resistance. Replace any glow plug not having 1.5-5.0 ohms resistance.

NOTE

Allow engine to cool 2-3 hours before performing glow plug controller resistance checks if continuous controller cycling is suspected.

NOTE

If solid state glow plug controller is being used, no test is available to test the controller. Replace if suspected of being faulty. If symptoms still exist, continue with step 3.

Refer to Figure 12-6 for the following steps.

2. Disconnect engine wiring harness connector from glow plug controller. Check the controller connector for dirt or moisture contamination, clean if required. Using multimeter, check controller for the following:

a. Check for continuity between pin 2 and pin 6 (continuity should exist).

b. Check resistance between pin 2 and pin 3. The resistance should be approximately 0.5 ohms.

c. Check resistance between pin 4 and pin 5. The resistance should be 24-30 ohms.

d. Check resistance between pin 1 and pin 5. The resistance should be 117-143 ohms.

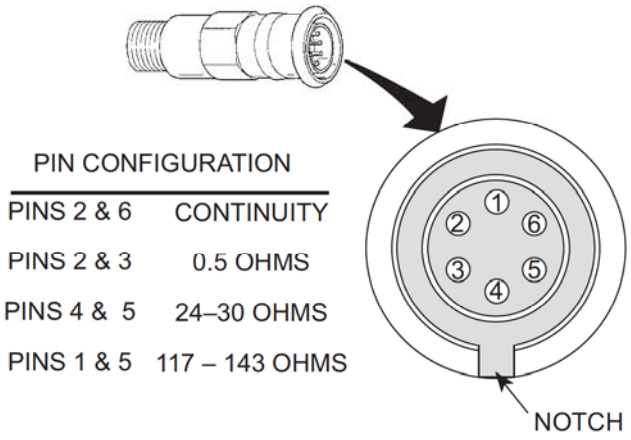

Figure 12-5. Glow Plug Controller

If any of the above conditions are not met, replace glow plug controller.

Refer to Figure 12-7 for the following steps.

3. Using a multimeter, check for continuity between terminal 5 at glow plug controller connector (lead 93A) and ground. Repair engine wiring harness if continuity is not present.

WARNING

Negative battery cable must be disconnected before disconnecting any harness from protective control box. Failure to do so may result in injury to personnel or damage to equipment.

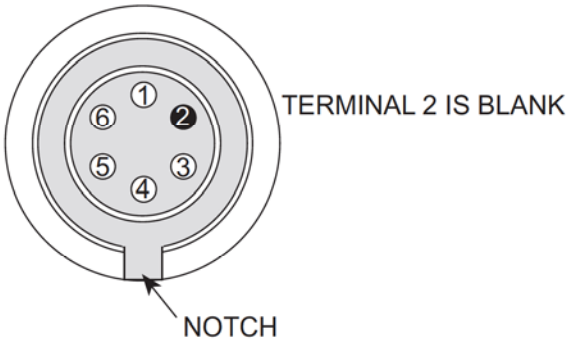

Figure 12-6. Glow Plug Controller Continuity Test.

4. Disconnect negative battery cable and disconnect engine wiring harness connector at protective control box. Inspect the control box and harness connector for dirt, or moisture contamination, clean if required. Using a multimeter, check for continuity between terminal “D” in protective control box engine wiring harness connector and eight glow plug connectors (leads 575). Repair engine harness, if any glow plug leads do not have continuity.

5. Using a multimeter, check for continuity between terminal “G” in engine wiring harness connector at protective control box and lead 2A at alternator. Repair engine wiring harness, if continuity is not present.

6. Using a multimeter, the following continuity checks must be made from engine wiring harness connector at protective control box to engine wiring harness connector at glow plug controller.

   a. Terminal “C” at protective control box connector to terminal 4 at glow plug controller connector (lead 370A).

   b. Terminal “B” at protective control box connector to terminal 3 at glow plug controller connector (lead 459B).

   c. Terminal “H” at protective control box connector to terminal 1 at glow plug controller connector (lead 573A).

   d. Terminal “A” at protective control box connector (lead 54B) to terminal 6 at glow plug controller connector (lead 583A).

If any leads did not have continuity, repair engine wiring harness.

7. If no problem is found in glow plugs, glow plug controller or engine wiring harness, replace protective control box and check system for proper operation.

END OF TESTING!

E. COLD START ADVANCE DOES NOT FUNCTION PROPERLY

1. Remove engine access cover. Disconnect leads 569A and 569B from cold advance switch. Using multimeter, check for battery voltage at lead 569A with rotary switch in “RUN” position. If battery voltage is not present, repair engine wiring harness.

2. Disconnect lead 569B from fuel injection pump. Using multimeter, check for continuity through lead 569B from injection pump to cold advance switch. If continuity is not present, repair engine wiring harness.

3. Using multimeter, check for continuity through cold advance switch with engine temperature below 70°F (21°C). If continuity is not present, replace cold advance switch. Check for continuity through cold advance switch with engine temperature above l00°F (38°C). If continuity is present, replace cold advance switch.