

## Glow Plug Relay Problems..

Appears the glow plug timer on my delica is malfunctioning, not the relay as the previous owner had thought. I can hear the relay click on and then off after 1 second or so. After looking at the schematics of the glow plug circuit that Bruce posted, I was able to get relay 1 to stay closed with 12V jumpered straight from the battery to the green post - voila!...nice easy start.

Rather than mess about with the glow plug controller I'm going to cut the green wire from the controller and run 12V to the green post on relay 1 from a push button switch on the dash (crushers provided a link to IH8MUD for this). Power will be supplied from the radio source (ignition switched source) with a 10A fuse between this connection and the push button switch. This set-up should give me control of the primary glow plug heaters while still using the existing relay and wiring. Sound reasonable?

Sounds reasonable, thats exactly what I did. I purchased 1986 F250 glow plug relay for \$25, 14 gauge wire, and a momentary rocker switch (I didn't want to use the original relays). You will notice beside your rear gate release there is an extra switch spot with a blank (already has a wiring harness with power to it), mount it in there for a seamless look. I reused the existing wires and and jumped the 12V into the glow plugs, I know some guys are worried that you will wear out the plugs prematurely but I only hold it for 3 or 4 seconds. Worst case; if the 6V plugs burn out, I will replace them with 12V plugs. It fires up like a charm.

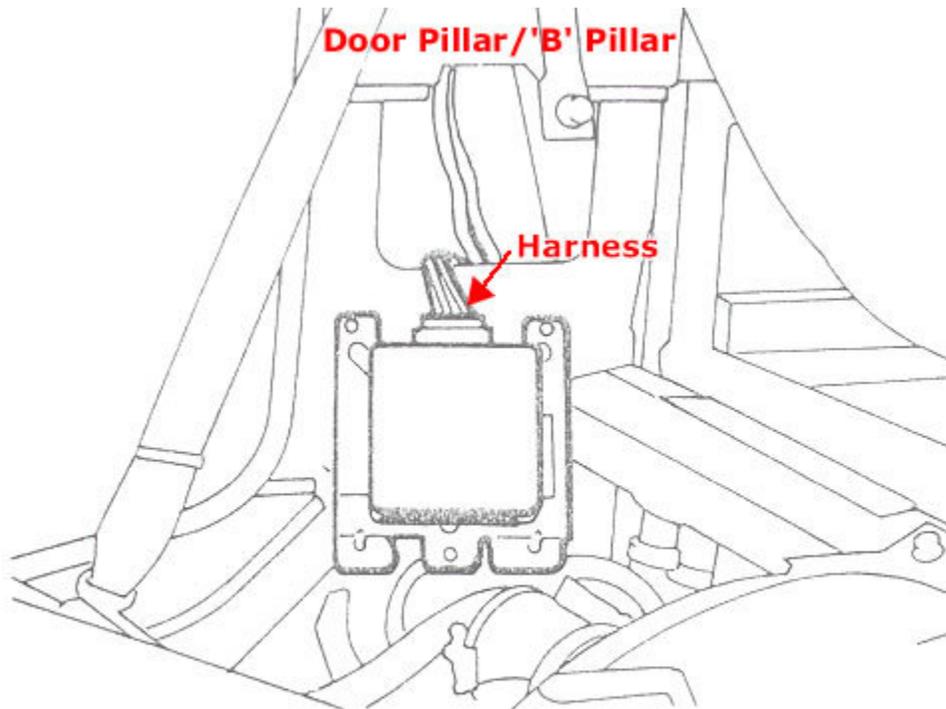
Thanks for that. No extra switch spot on our rig. I used the one beside the cigarette lighter and ran power from the radio. Since it's already fused I decided not to run an inline fuse, and used the existing relay. Lucky for me, the previous owner put new glow plugs in it, I assume in trying to fix the problem. The system works perfectly - about 2m wire, a few connectors and a \$12 switch from Napa. Sweet.

Right - this last lot should help you locate a potential problem! Tie this little lot in with the chart above and double check against the wiring diagram and you may well get a result! 😊

I FULLY agree with MardyDelica that you shouldn't attempt wiring diagnostics unless you know what you are up to (it sounds like you do though! 😊) I'd hate to think of you burning out the glow control unit or melting any wiring in the loom! 🤔🤔 (maybe this is more a warning to others?? Please don't take it the wrong way! 😊)

## Diagnostics for the GLOW PLUG RELAYS:

The unit can be found inside the 'B' Pillar to the right of the drivers shoulder (just above the access hatch for the air filter etc...)



**Pull Glow Control Unit out from door pillar**

The diagram below shows the pin configuration of the harness plug for the control unit.

**Connector on harness side in Glow Control Unit**

12	10	8	X	-	3	1
13	-	9	7	-	4	2

I have written up all the diagnostic information associated with this unit (took me a few minutes I can tell you! 😊) but it doesn't translate too well without keeping it in a table, so have uploaded it as a Word document with all the table intact as well as screen-grabbing the document to make the image below:

## GLOW CONTROL UNIT DIAGNOSTICS

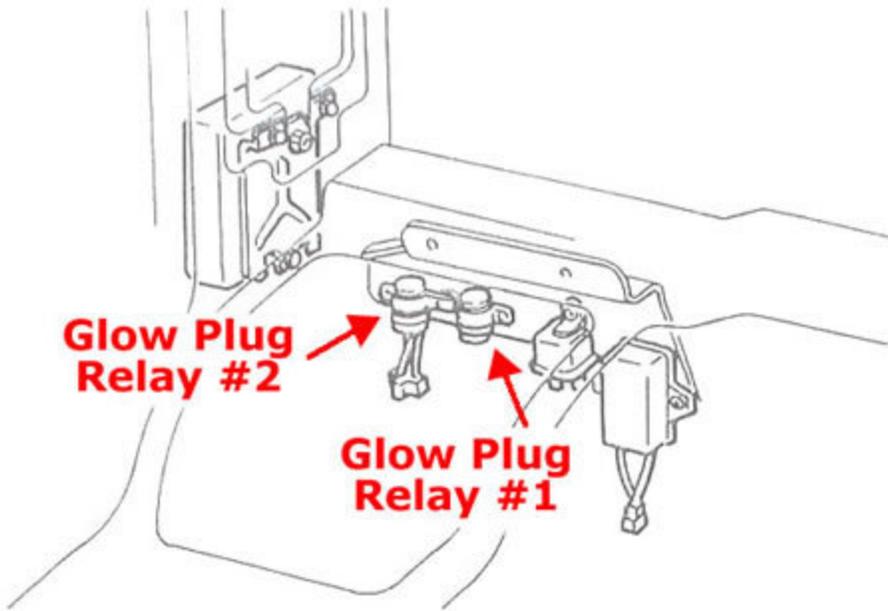
### (1) Check with *Glow Control Unit* connected

Terminal /pin	Connect area or measuring part	Measuring item	Tester Connection	Check conditions	Standard value
Pin 2	Glow Plug Relay #1	Voltage	Pin 2 - earth	Ignition switch OFF ON (when glow plug is cool)	Indicates battery voltage for about 3 seconds after ON
Pin 4	Glow Plug Relay #2	Voltage	Pin 2 - earth	Ignition switch OFF ON (when glow plug is cool)	Indicates battery voltage for about 3 seconds after ON
				During engine cranking	About 8-10 battery voltage

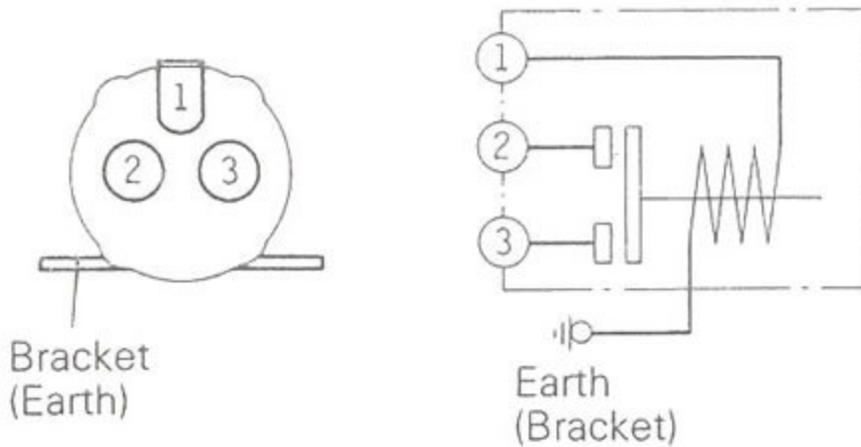
### (2) Remove *Glow Control Unit* connector. Check with harness side connector

Terminal /pin	Connect area or measuring part	Measuring item	Tester Connection	Check conditions	Standard value
Pin 1	Ignition switch (IG1 power source)	Voltage	Pin 1 - earth	Ignition switch ON	Battery voltage (approx 12V)
Pin 2	Glow Plug Relay #1 coil	Resistance	Pin 2 - earth	Constantly	About 20Ω (at 20°C)
Pin 3	Ignition switch (ST power source)	Voltage	Pin 3 - earth	During engine cranking	Battery voltage (approx 8-10V)
Pin 4	Glow Plug Relay #2 coil	Resistance	Pin 4 - earth	Constantly	About 20Ω (at 20°C)
Pin 5	Unused pin	-	-	-	-
Pin 6	Unused pin	-	-	-	-
Pin 7	Glow Plug (Terminal voltage measuring)	Continuity	Pin 7 - earth	Constantly	Continuity (0 Ω)
Pin 8			Pin 8 - 10 Pin 9 - earth		
Pin 9			Pin 8 - earth Pin 10 - earth	Constantly (at 20°C)	Continuity (about 50 mΩ)
Pin 10					
Pin 11	Unused pin	-	-	-	-
Pin 12	Alternator (L) Pin	Voltage	Pin 12 - earth	Ignition switch ON	1-4V
Pin 13	Water Temp Sensor	Resistance	Pin 13 - earth	-20°C	24.8 ±2.5 kΩ
				0°C	8.6 kΩ
				20°C	3.3 kΩ
				40°C	1.5 kΩ

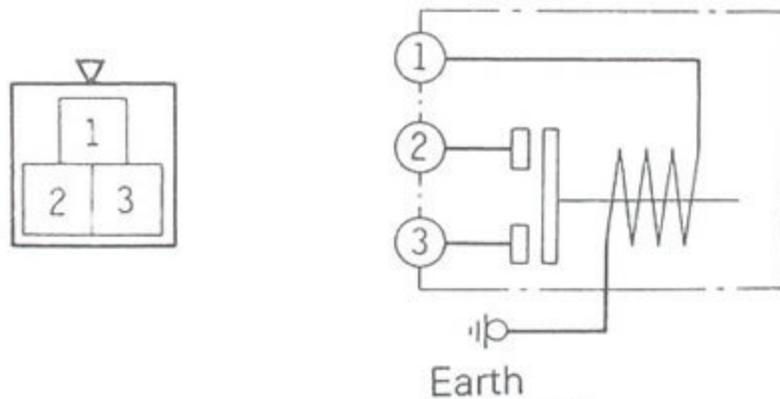




## Glow Plug Relay #1



## Glow Plug Relay #2



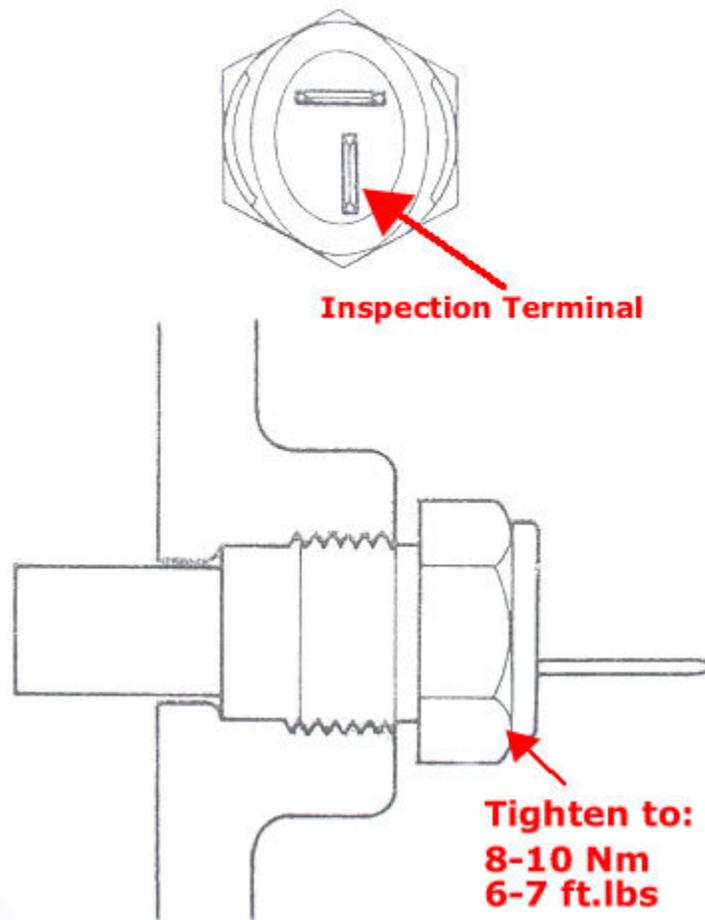
## Inspection of Glow Plug Relays

- (1) Remove Glow Plug Relay from bracket
- (2) Connect battery power source (12V) to Pin (1)
- (3) Check continuity between pins with bracket earthed

With Power	Between Pins (2) and (3)	Continuity
Without Power	Between Pins (1) and bracket	Continuity
	Between Pins (2) and (3)	No Continuity

## Diagnostics for the WATER TEMP SENSOR:

### Water Temperature Sensor



#### Inspection of Water Temperature Sensor

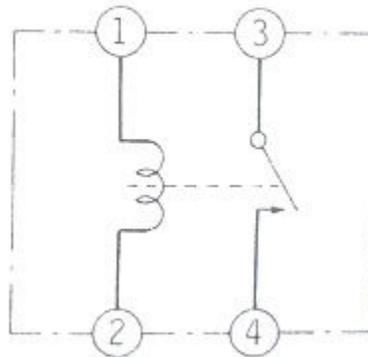
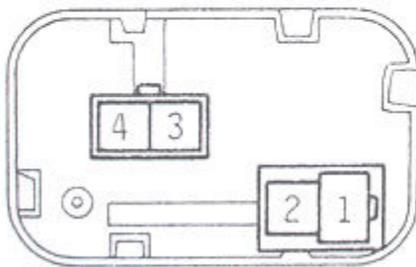
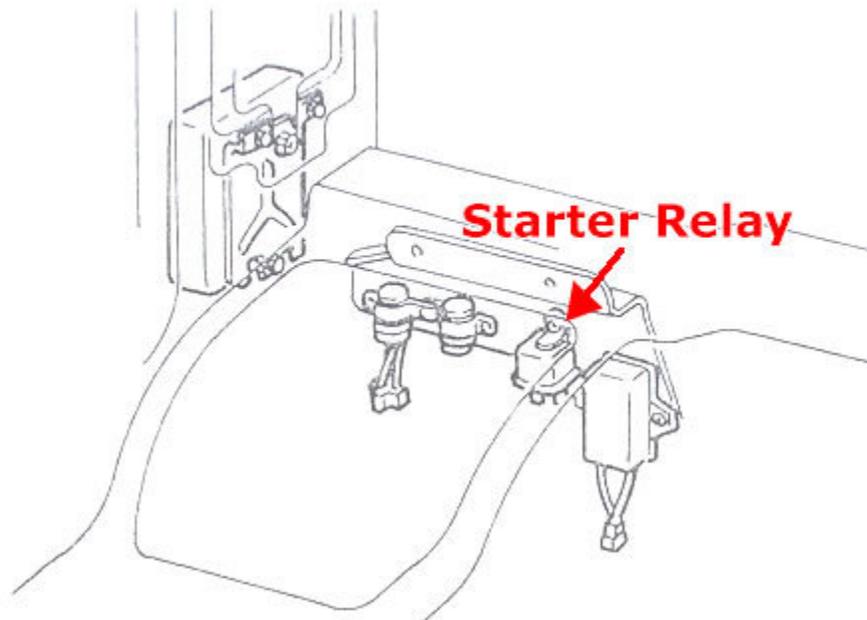
- (1) Remove the Water Temperature Sensor from the intake manifold
- (2) Check the Water Temperature Sensor resistance is within the standard value

**Standard value: 2.92 k $\Omega$  – 3.58 k $\Omega$  (at 20°C)**

- (3) After checking, apply specified sealant to Water Temperature Sensor and install into the intake manifold

**Specified sealant: 3M Nut Locking Part #4171 or equivalent**

## Diagnostics for the STARTER RELAY:

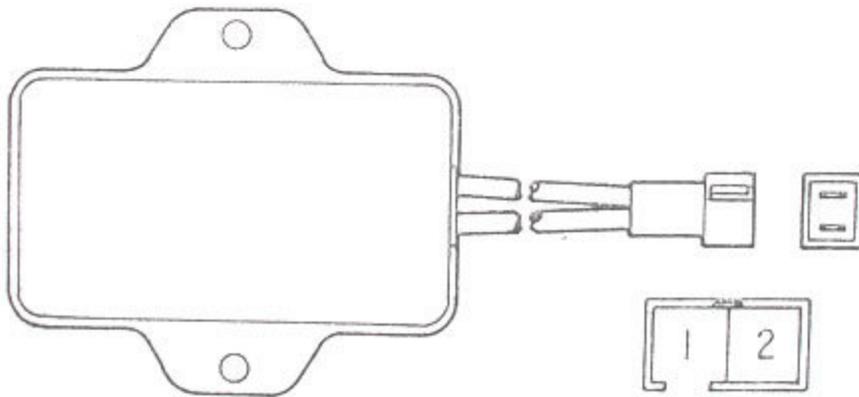
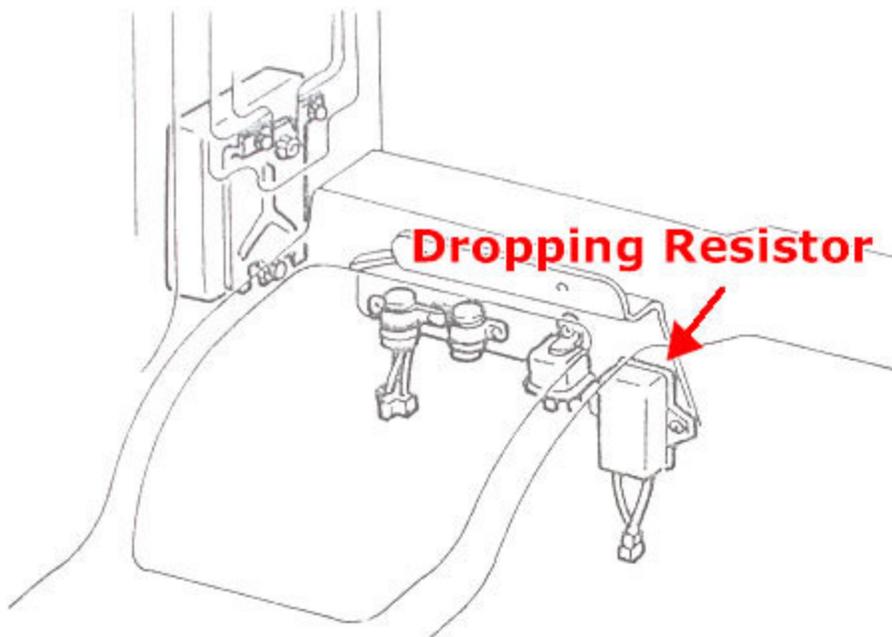


### Inspection of Starter Relay

- (1) Remove Starter Relay from relay bracket
- (2) Connect battery power source to Pin (1).
- (3) Check continuity between pins with Pin (2) earthed

With Power	Between Pins (3) and (4)	Continuity
Without Power	Between Pins (1) and (2)	Continuity
	Between Pins (3) and (4)	No Continuity

**Diagnostics for the DROPPING RESISTOR:**



### **Inspection of 'Dropping' Resistor**

Disconnect the connecting plug from the Dropping Resistor and measure the resistance between the resistor side connector pins

**Standard value: 150 m $\Omega$**