

Diagnostic Procedure for 1991/1992 3F-E EFI Related Issues

Motor not running; key in ON position; CEL, A/T, CHARGE lamps should be on.
No CEL=No Start

The EFI circuit is initiated from the ECU (E5-pin 3) which energizes the EFI relay coil. The load side of the EFI relay feeds +12 to the ECU (EFI on logic), all 3 VSV valves, both O2 sensors, the ISC valve, pin 8 (B+) on the Check Connector, and the load side of the circuit opening relay which feeds the fuel pump. All EFI related +12 comes from the 15 amp EFI fuse in the under hood fuse box. This fuse also feeds constant B+ to the ECU.

The CEL (**CHECK ENGINE LIGHT**) is illuminated by the ECU with a logic low on E6-pin 8 and should **always** function as described. In other words...**No CEL=No Start**.

The most common cause of a no-start is a failed fusible link, Toyota part# 90982-08264

Below is a cursory check of all 3 fusible links in system. This assumes an unmolested OEM configuration.

FL AM1 - Dome lights working?

FL AM2 - When you turn the key to ON does the CHARGE LAMP light up?

FL MAIN - Brake lights working?

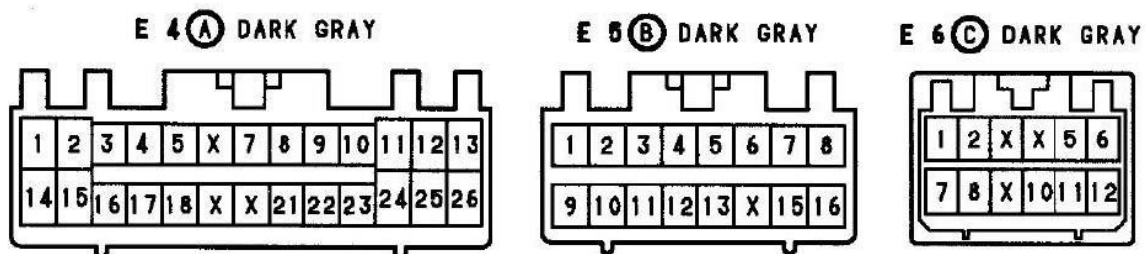
If yes to all 3, then all 3 fusible links are intact.

NOTE 1: A short or damage inside the AFM can cause the CEL not to illuminate. A short or damage is usually the result of removing the 2 Phillips screws on the connector housing when trying to remove the connector. **Do not remove the screws.** There is a thin spring steel clip that you just need to push up.

A quick AFM diagnosis is to simply unplug the AFM connector. If the CEL now illuminates, the problem is internal to the AFM.

NOTE 2: Proper operation of the AFM will shut down the fuel pump when the air flow flap closes. This ensures that in the event of an accident/motor stall the fuel pump is not running even with the key in the ON position. There have been several reports of folks being able to unplug the AFM connector and the truck continuing to run. **THIS IS WRONG AND POTENTIALLY LETHAL.** Look into the **CIRCUIT OPENING RELAY** in the left kick panel and test associated fuel pump logic.

Motor not running; key in ON position; CEL, A/T, CHARGE lamps should be on. If ALL 3 are out, check IGN fuse and fusible link AM2 or ignition switch.



Remember...No CEL=No Start. Don't even bother cranking the starter.

These are the 3 ECU connectors referenced in this document.

Motor not running; key in ON position; CEL, A/T, CHARGE lamps should be on. If no CEL then,

1. Check for +12 VDC on brass terminal screw in under hood fuse box. This terminal is located directly to the left of the main fuse and is a [Phillips screw head](#).
2. If no +12 VDC in fuse box, then check fusible links off [positive battery terminal](#). While the one in the picture is not stock, the links are going to the stock locations. 2 to the black plastic junction box and one to the connector.
3. If +12 VDC in fuse box and no CEL, then suspect [EFI relay/fuse and associated wiring and contacts](#). Many have said that the wire from the EFI fuse to the EFI relay is undersized and is the root cause of all these problems. I disagree with this. At 2500 RPM I measured 6.25 amps across the load side of the EFI relay contacts. I believe the cause of the problem is related to the heat of the manifold combined with poor crimps on the connectors in the fuse box. Over time these connectors can become corroded and resistive.
4. Check for +12 on pin 8 (B+) on the CHECK CONNECTOR mounted on the right side of the fire wall. If +12 on pin 8 and still no CEL, then EFI circuit OK and problem is with ECU or related wiring.

Coil/Igniter: The coil/igniter are mounted as a pair on the right front fender next to the cruise control actuator.

If CEL is ON and no spark from coil, then possible coil/igniter failure.

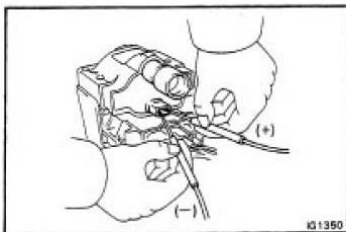
From the FSM...

1. DISCONNECT HIGH-TENSION CORD
2. INSPECT PRIMARY COIL RESISTANCE

Using an ohmmeter, measure the resistance between the positive (right when looking at the coil) and negative (left when looking at the coil) terminals. (Small 2 pin connector below the output of the coil that feeds the distributor)

Primary coil resistance (cold): 0.41 – 0.50 ohms.

If the resistance is not as specified, replace the ignition coil.

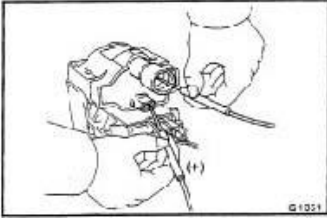


NOTE: Many consumer grade multimeters are not very accurate when measuring small resistance values. Be sure to “zero out” the meter by touching the 2 meter leads together and note the reading on the meter. Subtract this value from the value measured on the component.

INSPECT SECONDARY COIL RESISTANCE

Using an ohmmeter, measure the resistance between the positive (+) terminal and high-tension terminal.

Secondary coil resistance (Cold): 10.2 – 13.8 k ohms.
If the resistance is not as specified, replace the ignition coil.

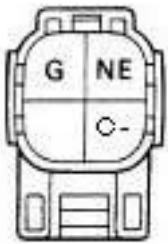


In the FSM there is no diagnostic procedure for the igniter. These can become intermittent and the only course of action is to swap it out with a known good one. Both the ignition coil and igniter are grounded through the mounting bracket. It must be secured to the body.

Distributor coils can open or short but are not a common failure.

Again from the FSM...

INSPECT PICKUP COIL RESISTANCE



Using an ohmmeter, measure the resistance between the terminals.

G pickup coil resistance (G – G (-)):
140–180 ohms.

NE pickup coil resistance (NE – G (-)):
140–180 ohms.

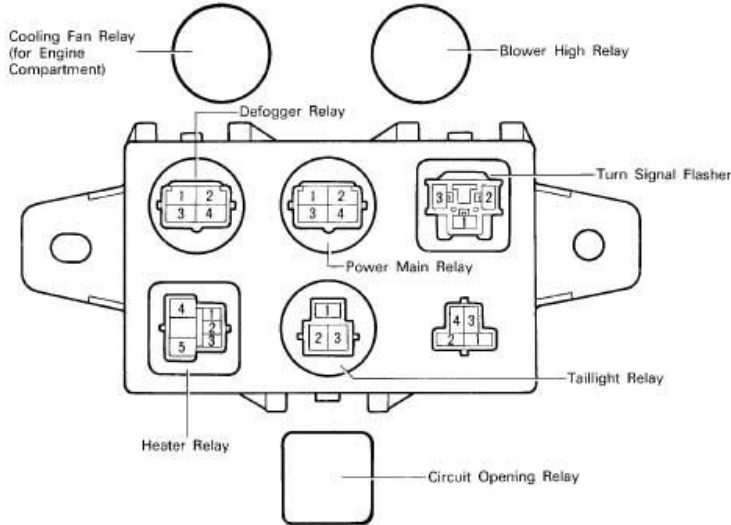
If the resistance is not as specified, replace the distributor.

Be certain that the distributor pickup coils are hitting the ECU.

G (E4-pin 18)
NE (E4-pin 4)
G- (E4-pin 17)

Some notes on fuel pump operation:

The fuel pump is fired by the CIRCUIT OPENING RELAY and its 2 logic paths, left side kick panel, bottom center below the relay block.



The primary relay coil is energized from the STARTER circuit when cranking the starter. The secondary relay coil is energized when the flap in the AFM opens after the motor starts sucking air.

For diagnostic purposes only, you can bypass all fuel pump logic by shorting pins 1 (FP) and 8 (B+) in the diagnostic connector mounted on the firewall. This will force the fuel pump to run with the key in the ON position, assuming proper operation of the EFI circuitry.

		FIREWALL				
		IG- (18)				
COVER HINGE	TT (17)	TS (16)	OX2 (11)	VF2 (10)	VF1 (9)	B+ (8)
	TC (15)	CC2 (14)		TE2 (7)	TE1 (6)	CCO (5)
	OPT (13)	AB (12)	OX1 (4)	E1 (3)	W (2)	FP (1)