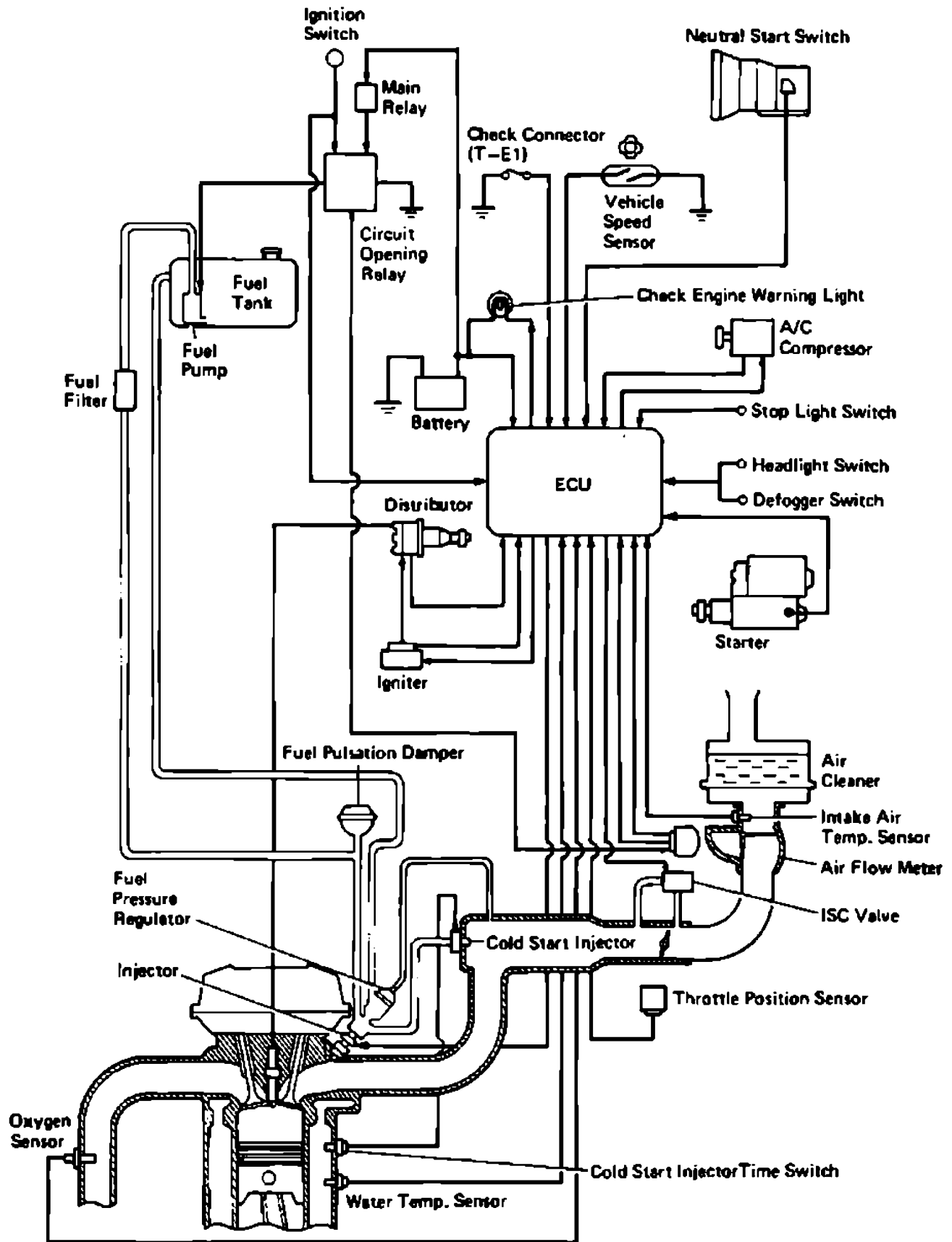


EFI SYSTEM

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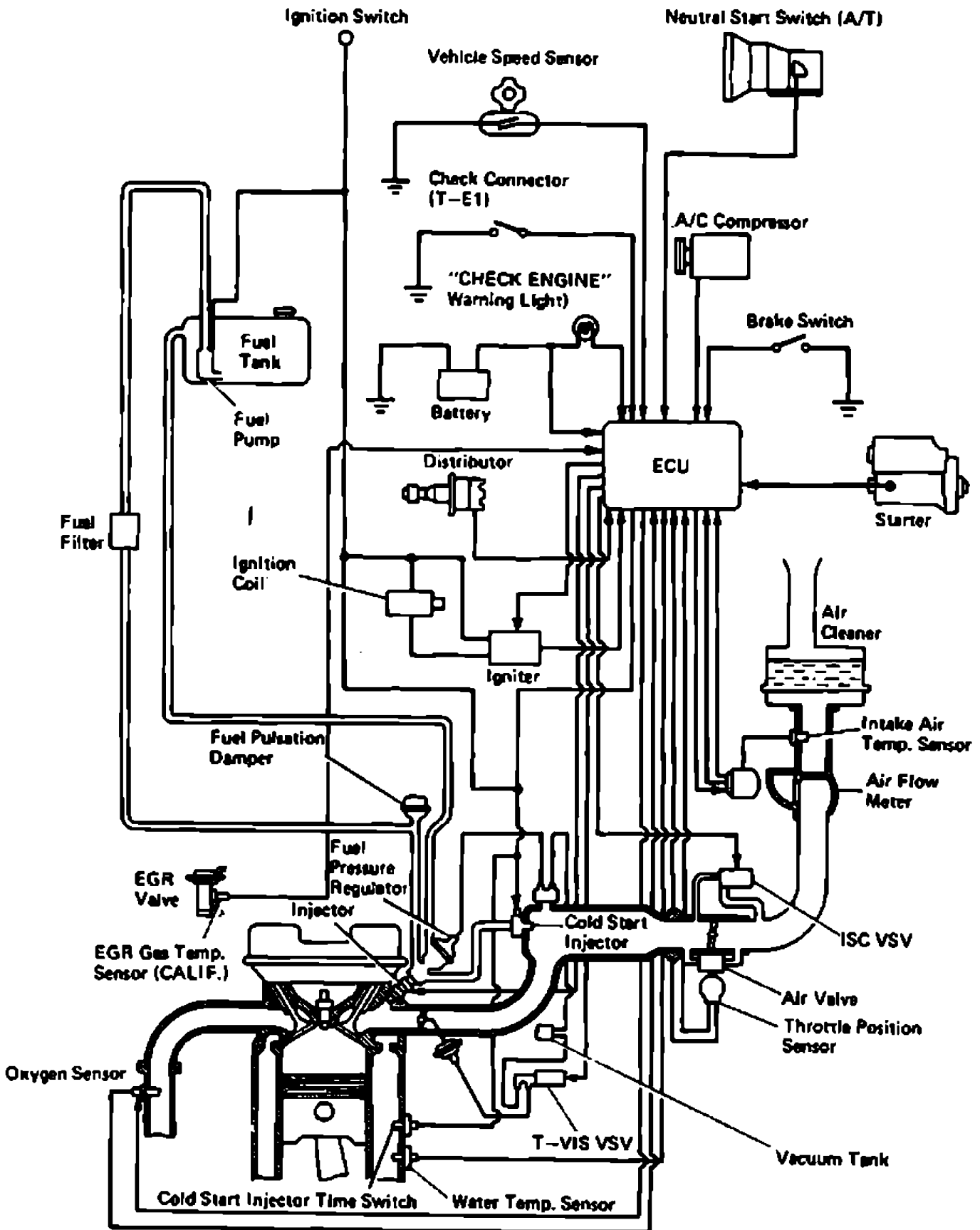
SYSTEM DESCRIPTION (3S-FE)

3S-FE



SYSTEM DESCRIPTION (3S-GE)

3S-GE



The EFI system is composed of three basic sub-systems: Fuel Induction, Air Induction and Electronic Control System.

FUEL SYSTEM

Fuel is supplied under constant pressure to the EFI injectors by an electric fuel pump. The injectors inject a metered quantity of fuel into the intake manifold in accordance with signals from the ECU (Electronic Control Unit).

AIR INDUCTION SYSTEM

The air induction system provides sufficient air for engine operation.

ELECTRONIC CONTROL SYSTEM

Both Celica 3S-FE and 3S-GE engines are equipped with a Toyota Computer Control System (TCCS) which centrally controls the EFI, ESA, ISC, Diagnosis systems, etc. by means of an Electronic Control Unit (ECU – formerly EFI computer) employing a microcomputer.

By means of the ECU, the TCCS controls the following functions:

1. Electronic Fuel Injection (EFI)

The ECU receives signals from various sensors indicating changing engine operating conditions such as:

- Intake air volume
- Intake air temperature
- Coolant temperature
- Engine rpm
- Acceleration/deceleration
- Exhaust oxygen content etc.

These signals are utilized by the ECU to determine the injection duration necessary for an optimum air-fuel ratio.

2. Electronic Spark Advance (ESA)

The ECU is programmed with data for optimum ignition timing under any and all operating conditions. Using data provided by sensors which monitor various engine functions (rpm, coolant temperature, etc.), the microcomputer (ECU) triggers the spark at precisely the right instant. (See IG section)

3. Idle Speed Control (ISC) (3S-FE)

The ECU is programmed with target idling speed values to respond to different engine conditions (coolant temperature, air conditioner on/off, etc.). Sensors transmit signals to the ECU which control the flow of air through the bypass of the throttle valve and adjust idle speed to the target value. (See page FI-42, 93)

4. Diagnosis

The ECU detects any malfunctions or abnormalities in the sensor network and lights a check engine warning light on the instrument panel. At the same time, the trouble is identified and a diagnostic code is recorded by the ECU. The diagnostic code can be read by the number of blinks of the check engine warning light when terminals T and E1 are short-circuited. The diagnostic codes are referred to the later page. (See page FI-25)

5. Fail-Safe Function

In the event of the sensor malfunctioning, a back-up circuit will take over to provide minimal drivesability, and the check engine warning light will light.

PRECAUTIONS

1. Before working on the fuel system, disconnect the cable from negative (⊖) terminal of the battery.

NOTE: Any diagnostic code retained by the computer will be erased when the battery terminal is removed. Therefore, if necessary, read the diagnosis before removing the battery terminal.

2. Do not smoke or work on open flame when working on the fuel system.

3. Keep gasoline off rubber or leather parts.

INSPECTION PRECAUTIONS

MAINTENANCE PRECAUTIONS

1. CHECK CORRECT ENGINE TUNE-UP
(See page EM-10)

2. PRECAUTIONS WHEN CONNECTING GAUGE

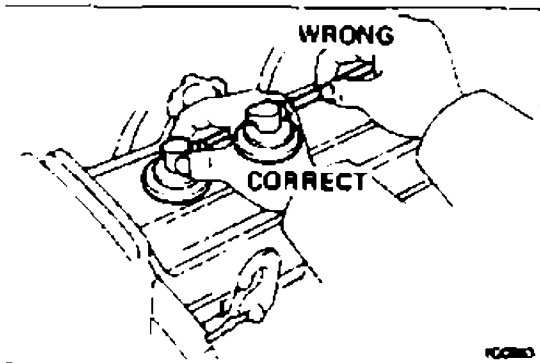
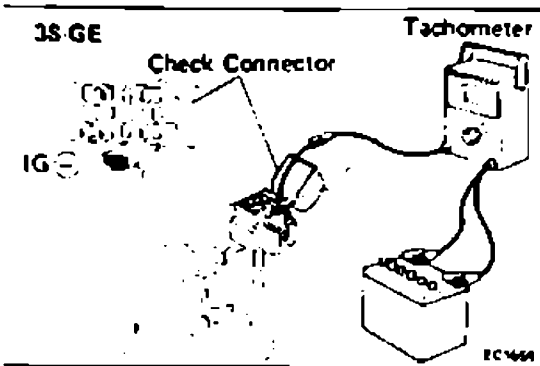
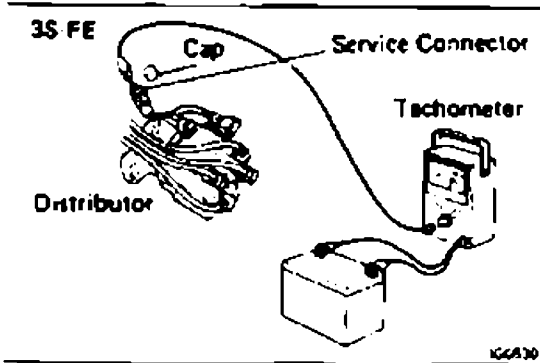
- (a) Use the battery as the power source for the timing light, tachometer, etc.
- (b) (3S-FE)
Connect the test probe of a tachometer to the service connector of the distributor.
- (c) (3S-GE)
Connect the test probe of a tachometer to terminal IG⊖ of the check connector.

3. IN EVENT OF ENGINE MISFIRE FOLLOWING PRECAUTIONS SHOULD BE TAKEN

- (a) Check proper connection of battery terminals, etc.
- (b) Handle high-tension cords carefully.
- (c) After repair work, check that the ignition coil terminals and all other ignition system lines are reconnected securely.
- (d) When cleaning the engine compartment, be especially careful to protect the electrical system from water.

4. PRECAUTIONS WHEN HANDLING OXYGEN SENSOR

- (a) Do not allow oxygen sensor to drop or hit against an object.
- (b) Do not allow the sensor to come into contact with water.

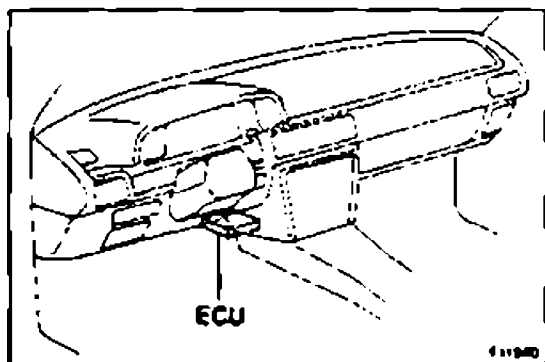


IF VEHICLE IS EQUIPPED WITH MOBILE RADIO SYSTEM (HAM, CB, ETC.)

The ECU has been designed so that it will not be affected by outside interference.

However, if your vehicle is equipped with a CB radio transceiver, etc. (even one with about 10 W output), it may, at times, have an effect upon ECU operation, especially if the antenna and feeder are installed nearby.

Therefore, observe the following precautions:

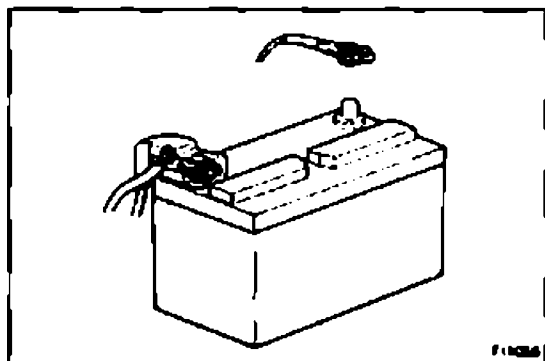


1. Install the antenna as far as possible from the ECU. The ECU is located under the radio so the antenna should be installed at the rear side of the vehicle.
2. Keep the antenna feeder as far away as possible from the ECU wires — at least 20 cm (7.87 in.) — and, especially, do not wind them together.
3. Check that the feeder and antenna are properly adjusted.
4. Do not equip your vehicle with a powerful mobile radio system.

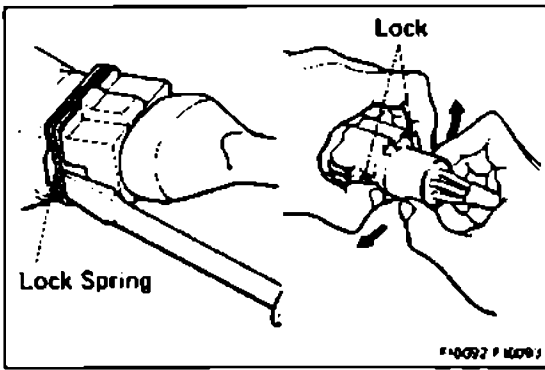
AIR INDUCTION SYSTEM

1. Separation of the engine oil level gauge, oil filler cap, PCV hose, etc. may cause the engine to run out of tune.
2. Disconnection, looseness or cracks in the parts of the air induction system between the throttle body and cylinder head will allow air suction and cause the engine to run out of tune.

ELECTRONIC CONTROL SYSTEM

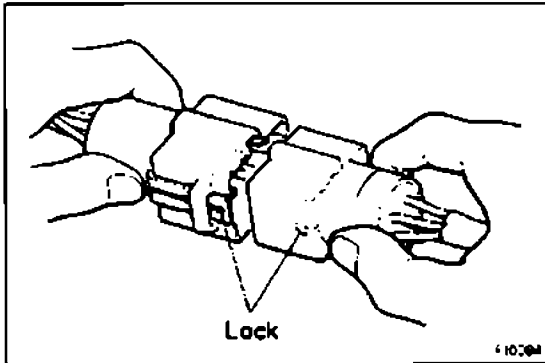


1. Before removing EFI wiring connectors, terminals, etc., first disconnect the power by either turning the ignition switch OFF or disconnecting the battery terminals.
2. When installing the battery, be especially careful not to incorrectly connect the positive (+) and negative (-) cables.
3. Do not permit parts to receive a severe impact during removal or installation. Handle all EFI parts carefully, especially the ECU.
4. Do not be careless during troubleshooting as there are numerous transistor circuits and even slight terminal contact can cause further troubles.
5. Do not open the ECU cover.
6. When inspecting during rainy weather, take care to prevent entry of water. Also, when washing the engine compartment, prevent water from getting on the EFI parts and wiring connectors.
7. Parts should be replaced as an assembly.

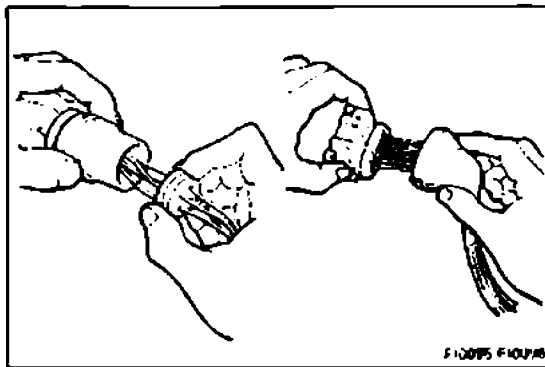


8. Care is required when pulling out and inserting wiring connectors.

(a) Release the lock and pull out the connector, pulling on the connectors.

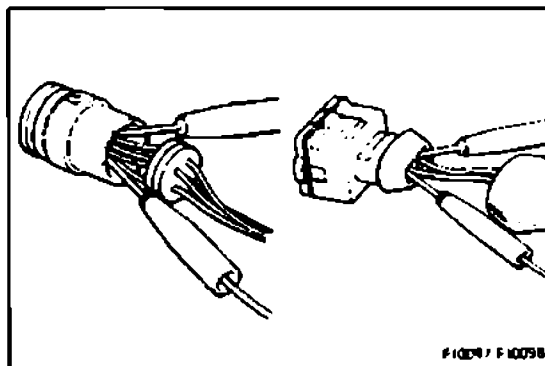


(b) Fully insert the connector and check that it is locked.



9. When inspecting a connector with a volt/ohmmeter.

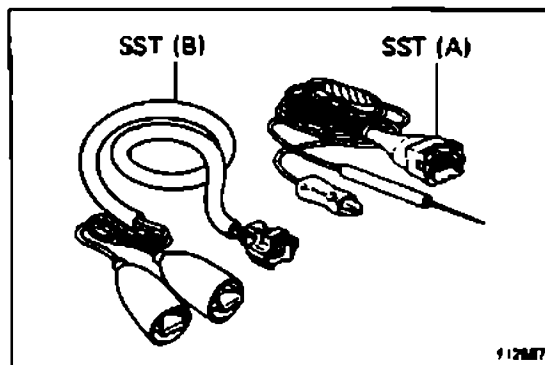
(a) Carefully take out the water-proofing rubber if it is a water-proof type connector.



(b) Insert the test probe into the connector from wiring side when checking the continuity, amperage or voltage.

(c) Do not apply unnecessary force to the terminal.

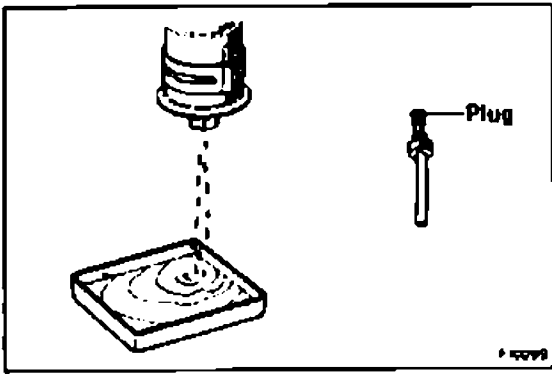
(d) After checking, install the water-proofing rubber on the connector securely.



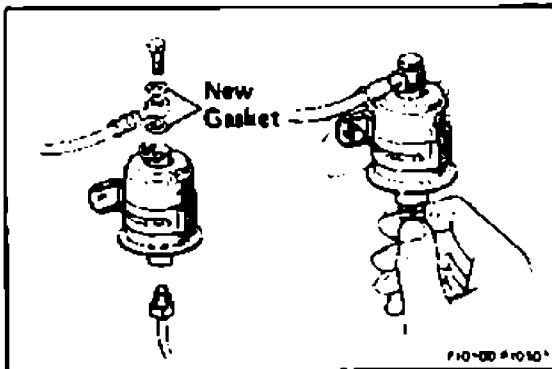
10. Use SST for inspection or test of the injector, cold start injector or its wiring connector.

SST 09842-30050(A) and 09842-30070(B)

FUEL SYSTEM



1. When disconnecting the high fuel pressure line, a large amount of gasoline will spill out, so observe the following procedure:
 - (a) Put a container under the connection.
 - (b) Slowly loosen the connection.
 - (c) Disconnect the connection.
 - (d) Plug the connection with a rubber plug.

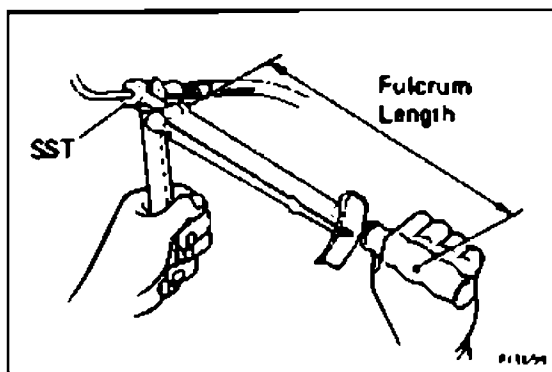


2. When connecting the flare nut or union bolt on the high pressure pipe union, observe the following procedure:

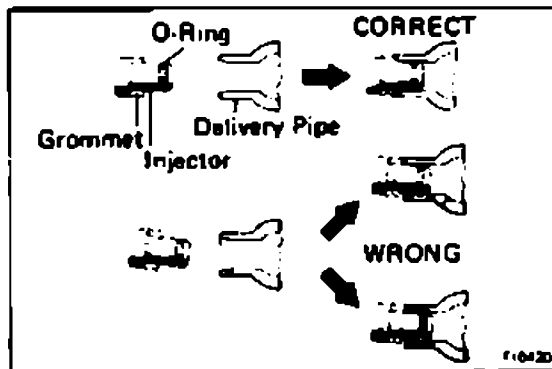
(Union Bolt Type)

 - (a) Always use a new gasket.
 - (b) Tighten the union bolt by hand.
 - (c) Tighten the union bolt to the specified torque.

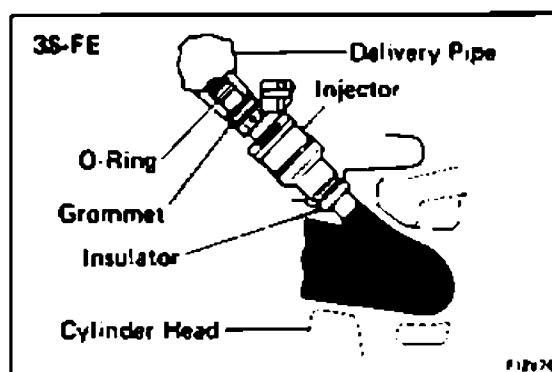
Torque: 300 kg-cm (22 ft-lb, 29 N·m)



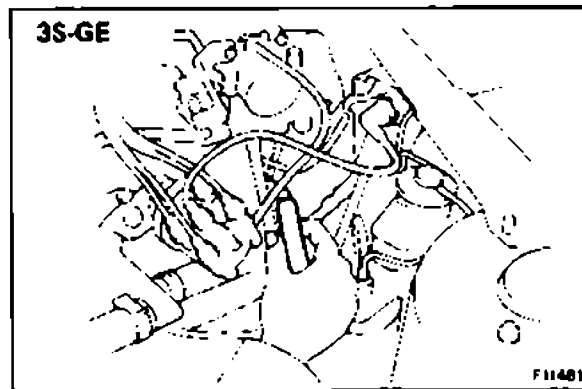
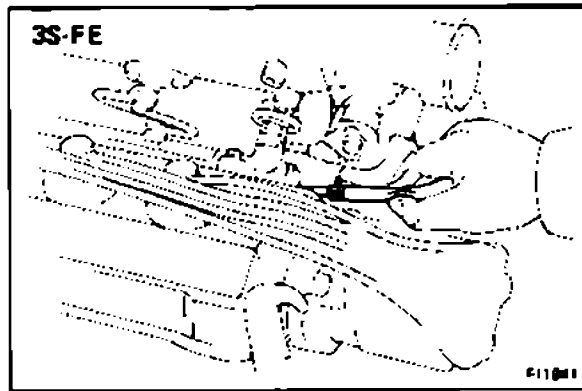
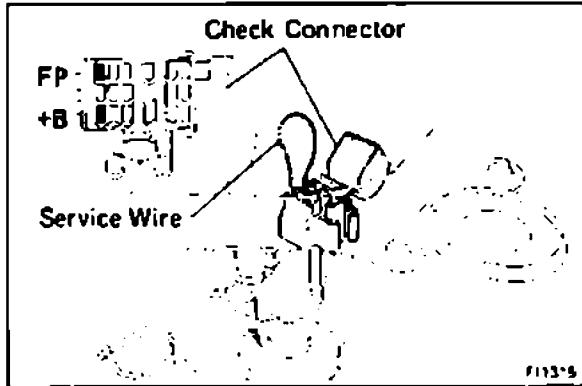
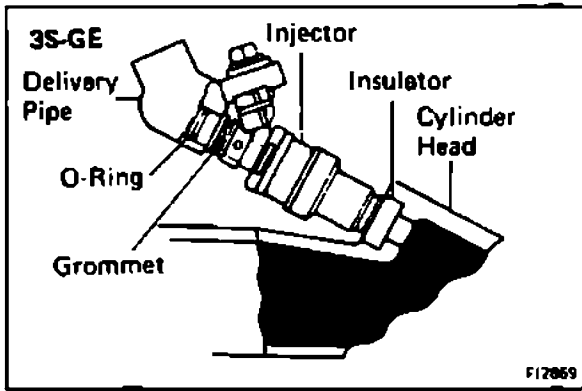
- (Flare Nut Type)
- (a) Apply a light coat of engine oil the flare and tighten the flare nut by hand.
 - (b) Using SST, tighten the flare nut to specified torque.
- Torque: 310 kg-cm (22 ft-lb, 30 N·m)**
- NOTE:** Use a torque wrench a fulcrum length of 30 cm (11.81 in.).



3. Observe the following precautions when removing and installing the injectors.
 - (a) Never reuse the O-ring.
 - (b) When placing a new O-ring on the injector, take care not to damage it in any way.
 - (c) Coat a new O-ring with spindle oil or gasoline before installing – never use engine, gear or brake oil.



4. Install the injector to delivery pipe and cylinder head as shown in the figure.



5. Check that there are no fuel leaks after performing any maintenance on the fuel system.

- (a) With engine stopped, turn the ignition switch ON.
- (b) Using a service wire, short terminals +B and FP of the check connector.

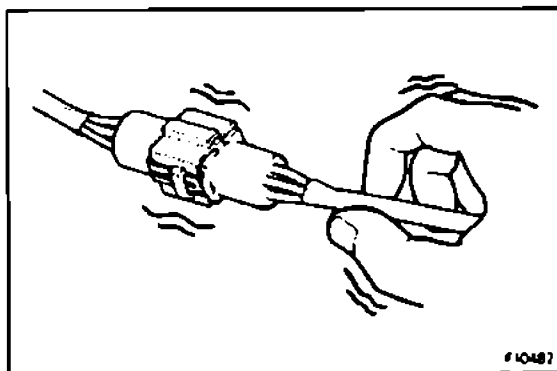
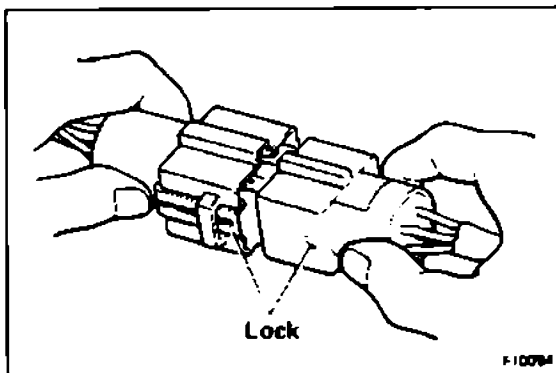
- (c) When the fuel return hose is pinched, the pressure within high pressure line will rise to approx. 4 kg/cm² (57 psi, 392 kPa). In this state, check to see that there are no leaks from any part of the fuel system.

CAUTION: Always pinch the hose. Avoid bending as it may cause the hose to crack.

TROUBLESHOOTING

TROUBLESHOOTING HINTS

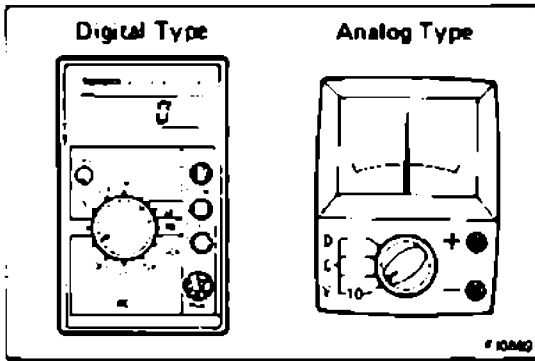
1. Engine trouble are usually not caused by the EFI system. When troubleshooting, always first check the condition of the other systems.
 - (a) Electronic source
 - Battery
 - Fusible links
 - Fuses
 - (b) Body ground
 - (c) Fuel supply
 - Fuel leakage
 - Fuel filter
 - Fuel pump
 - (d) Ignition system
 - Spark plugs
 - High-tension cords
 - Distributor
 - Ignition coil
 - Igniter
 - (e) Air induction system
 - Vacuum leaks
 - (f) Emission control system
 - PCV system
 - EGR system
 - (g) Others
 - Ignition timing
 - Idle speed
 - etc.



2. The most frequent cause of problems is simply a bad contact in wiring connectors. Always check that connections are secure.

When inspecting the connector, pay particular attention to the following points:

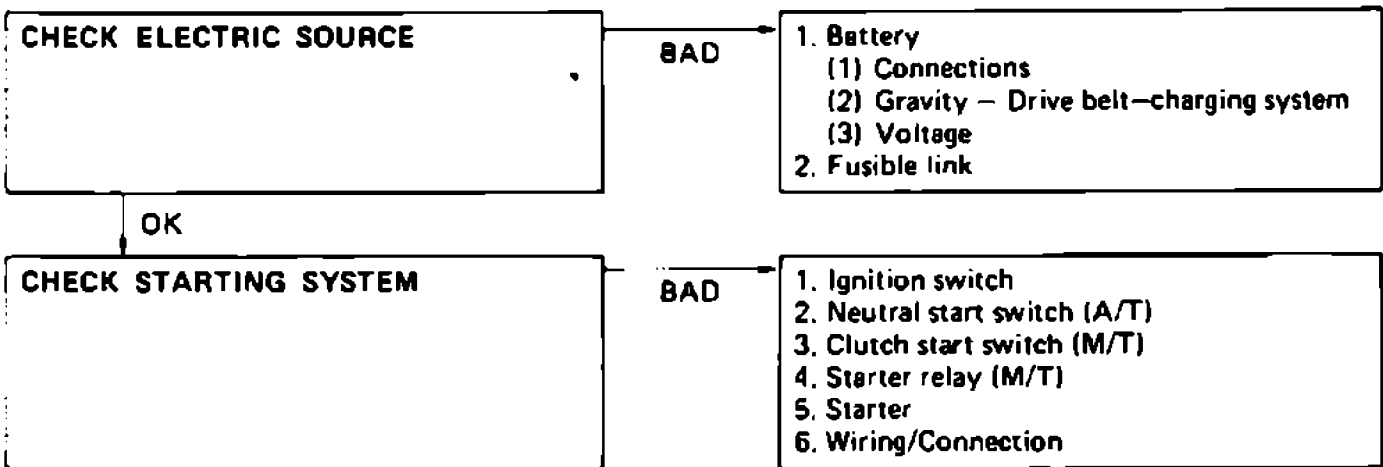
- (a) Check to see that the terminals are not bent.
 - (b) Check to see that the connector is pushed in completely and locked.
 - (c) Check to see that there is no signal change when the connector is slightly tapped or wiggled.
3. Sufficiently troubleshooting for other causes before replacing the ECU, as the ECU is of high quality and expensive.



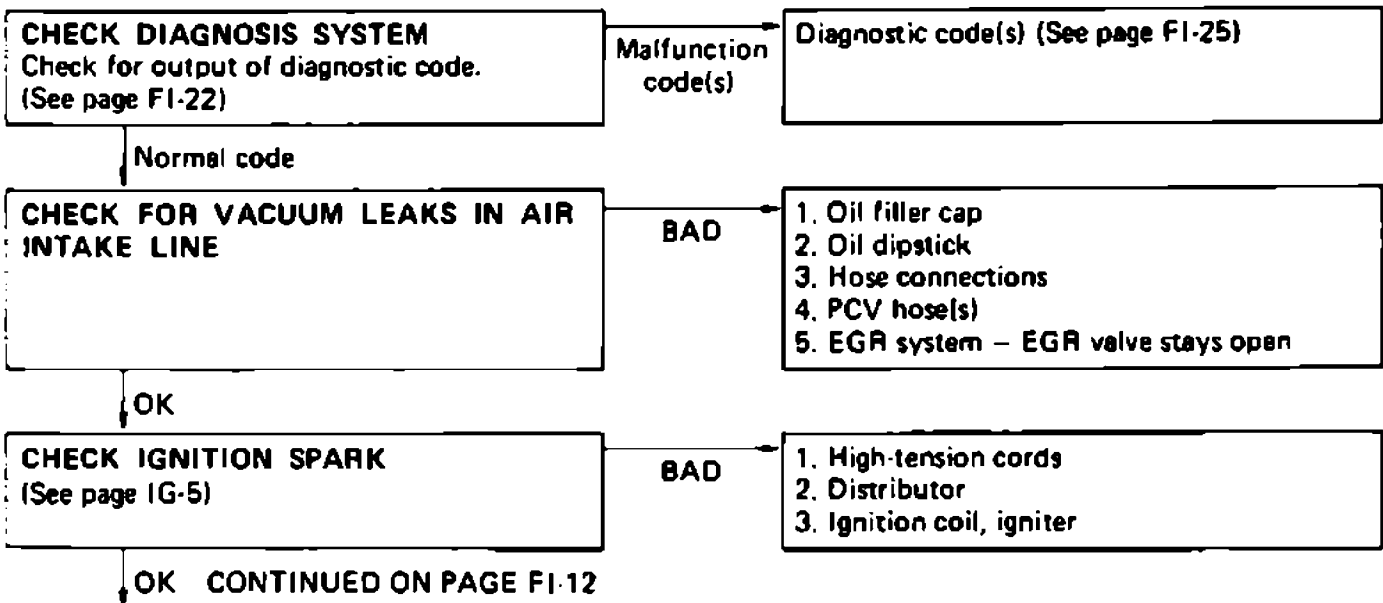
4. Use a volt/ohmmeter with high impedance (10 kΩ/V minimum) for troubleshooting of the electrical circuit. (See page FI-28)

TROUBLESHOOTING PROCEDURES

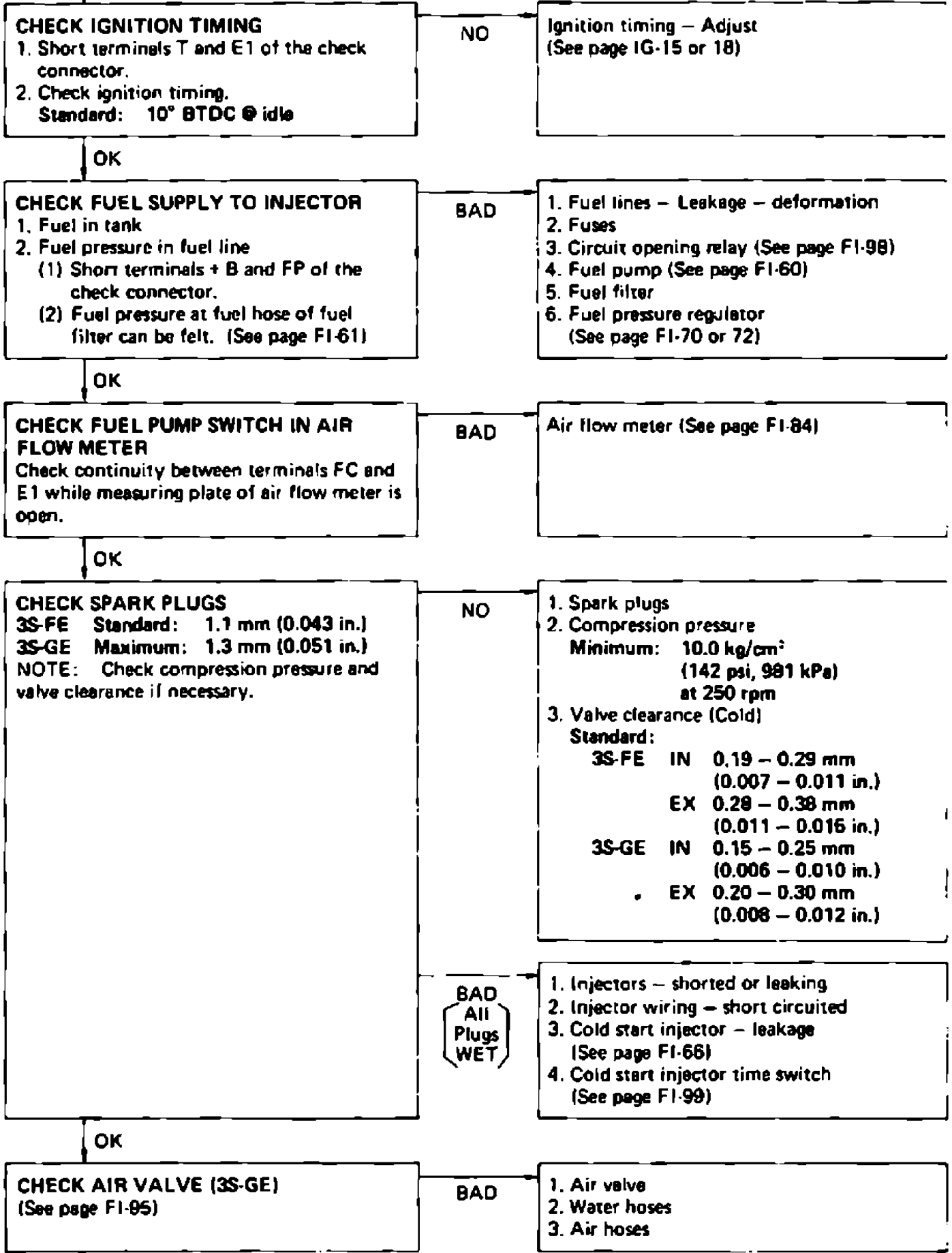
SYMPTOM—DIFFICULT TO START OR NO START (ENGINE WILL NOT CRANK OR CRANKS SLOWLY)



SYMPTOM – DIFFICULT TO START OR NO START (CRANKS OK)

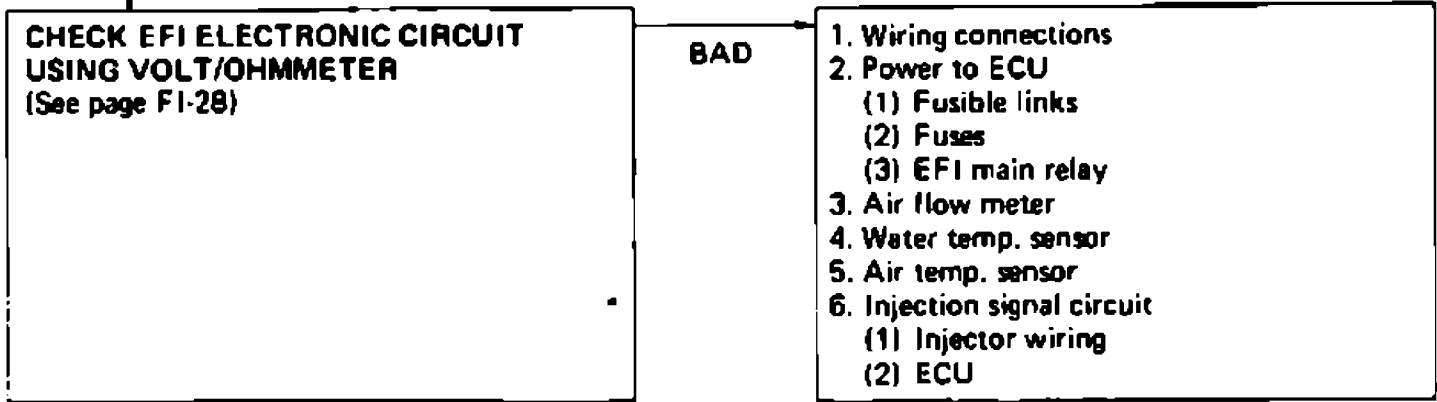


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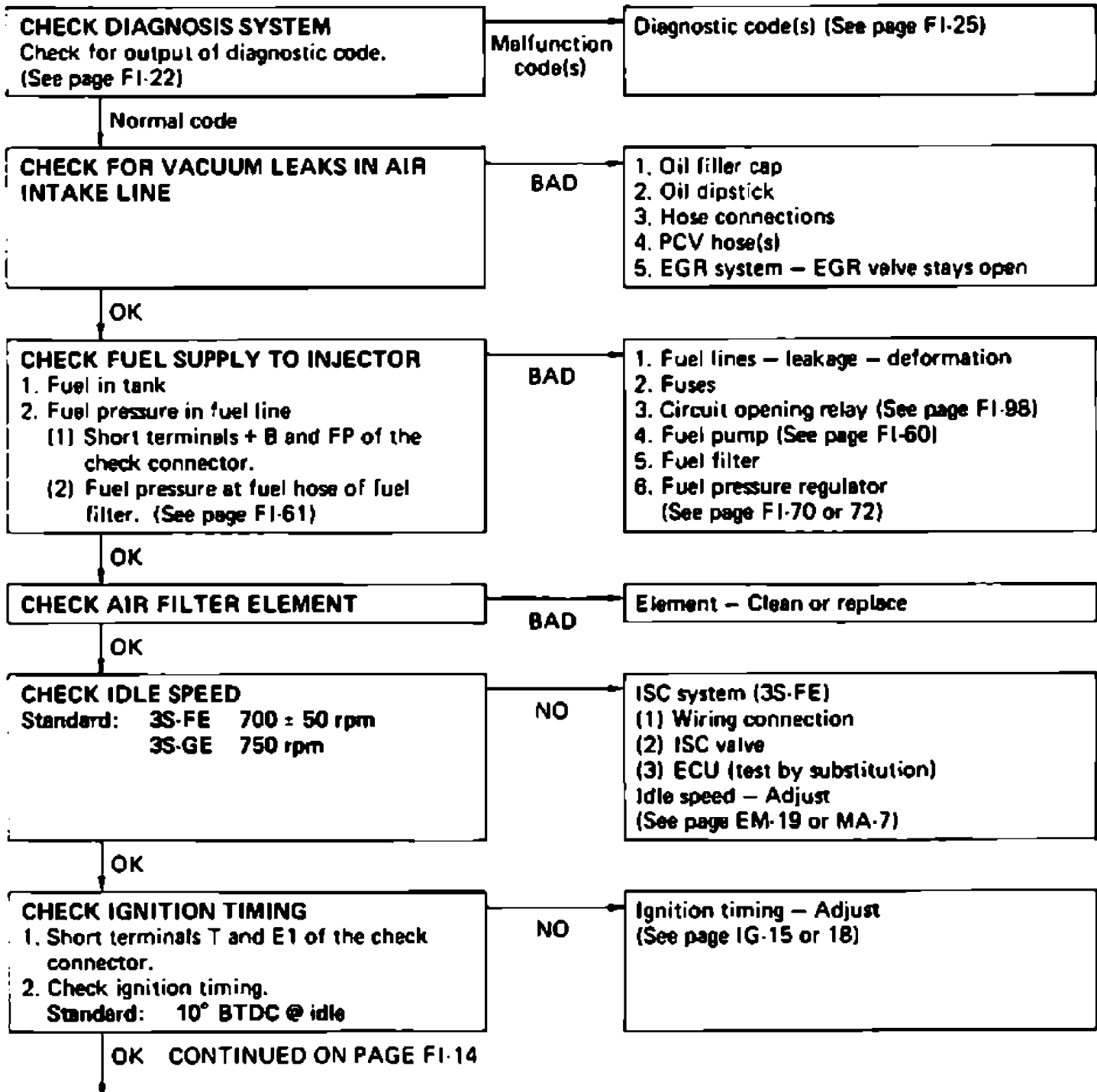


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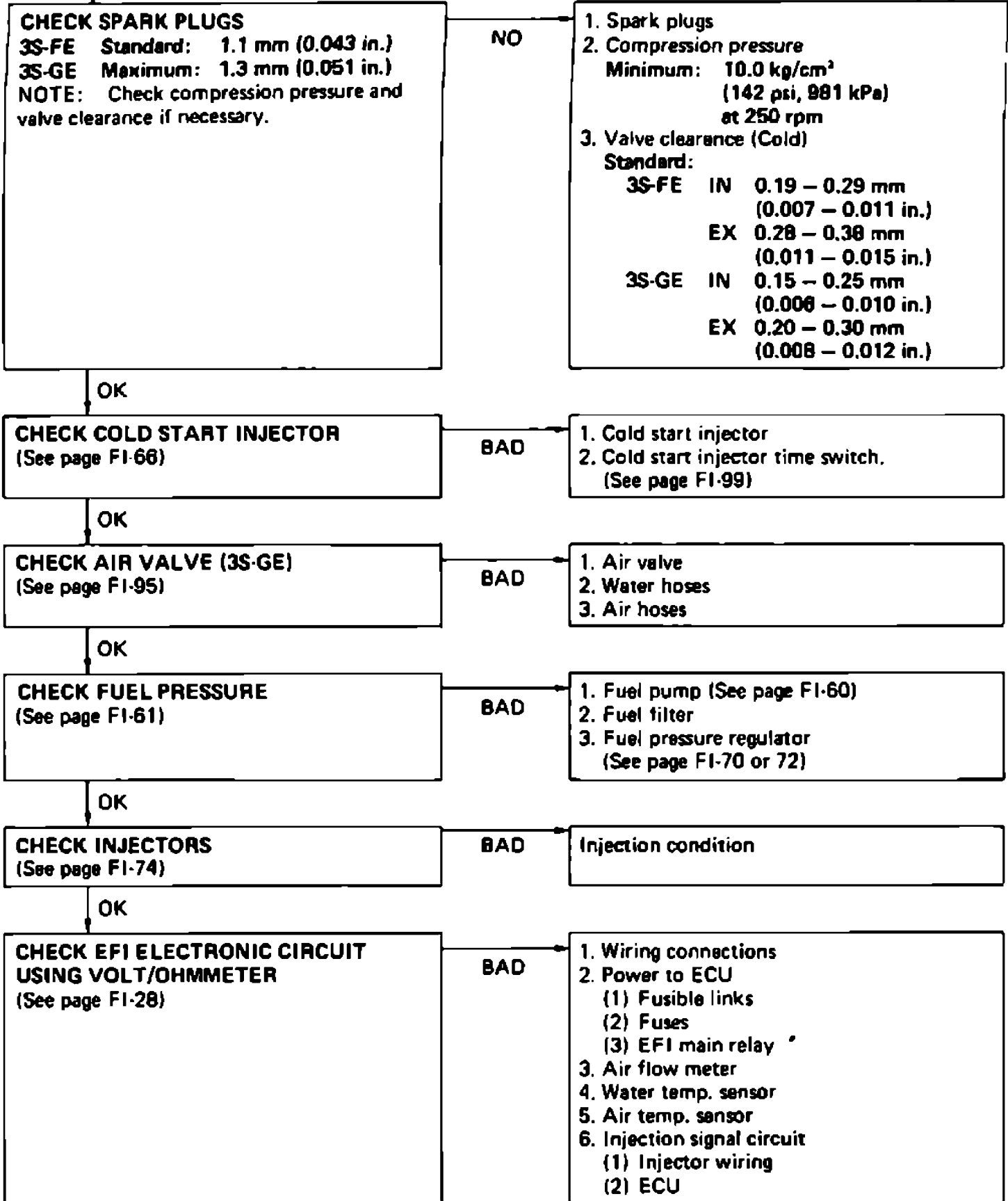
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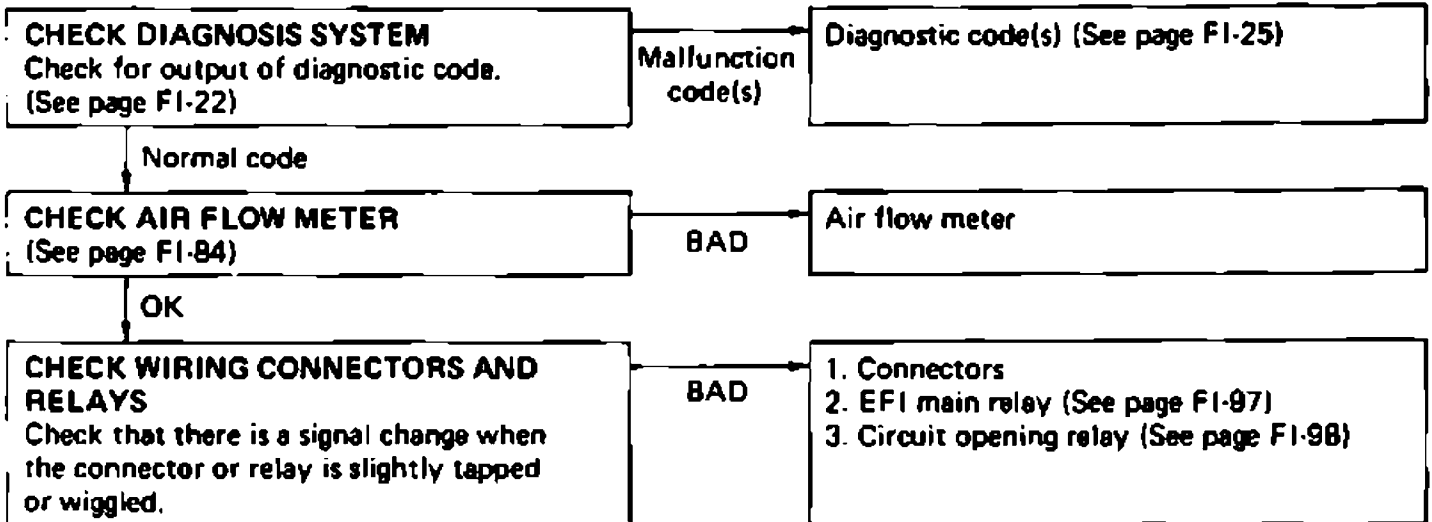
SYMPTOM – ENGINE OFTEN STALLS



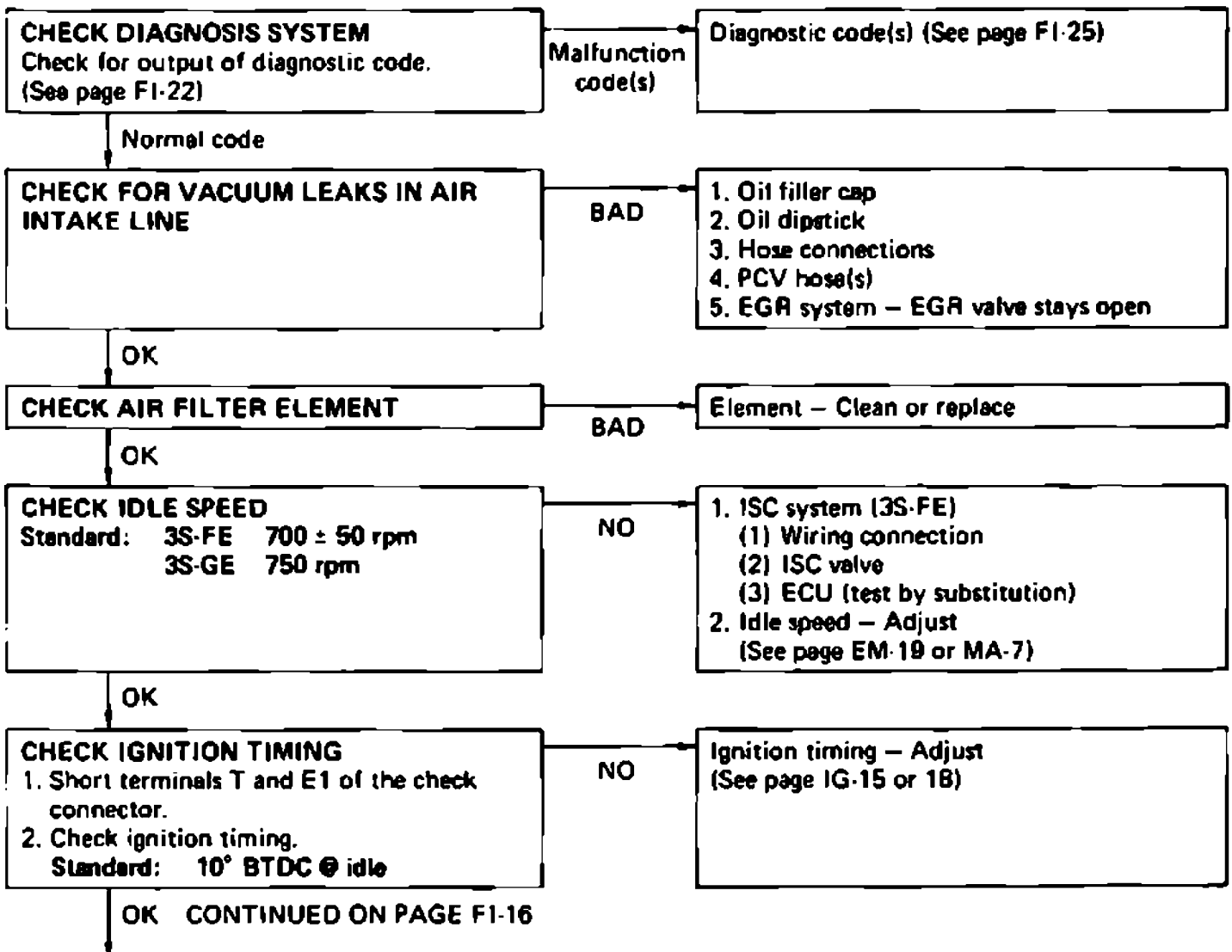
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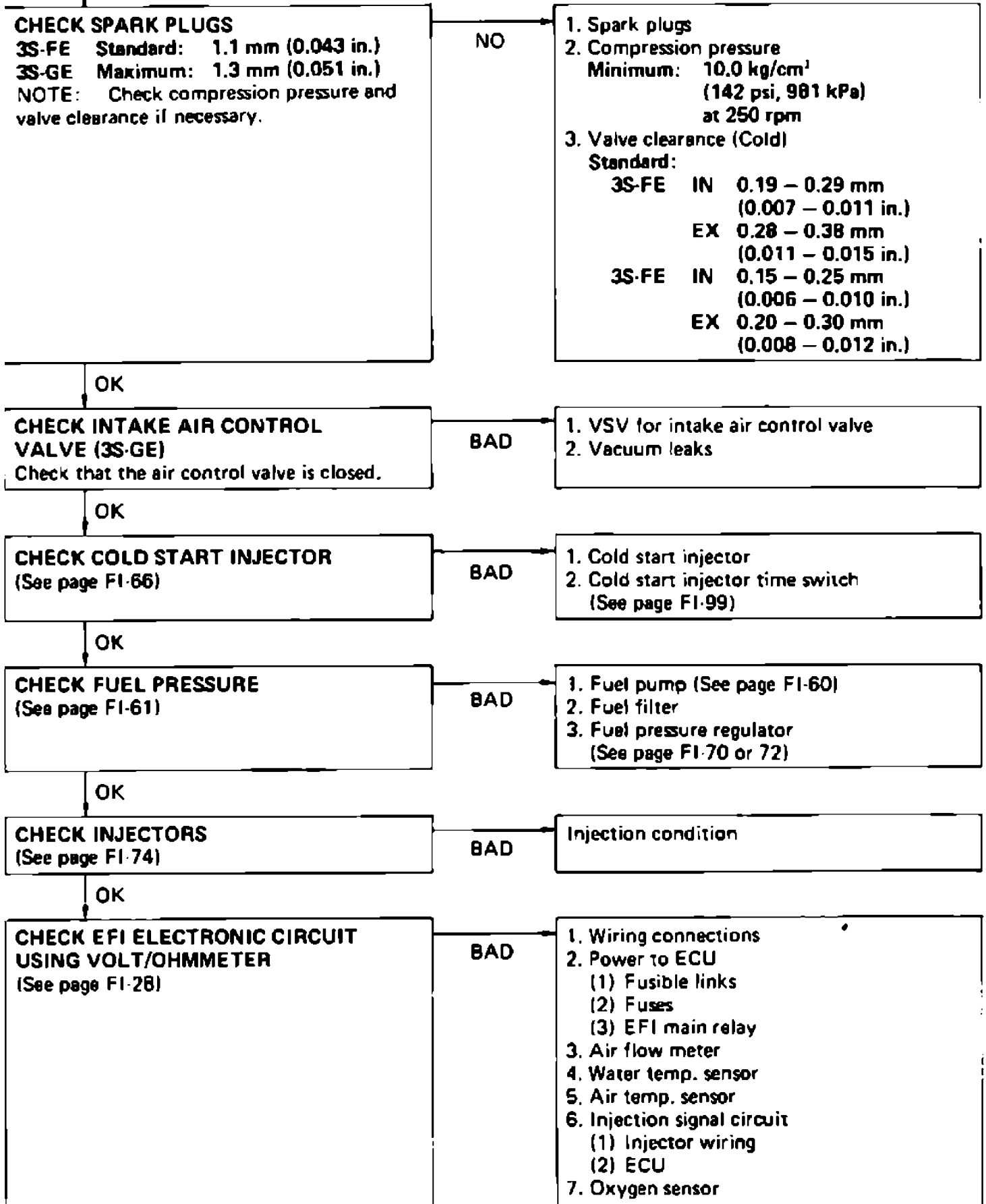
SYMPTOM – ENGINE SOMETIMES STALLS



SYMPTOM – ROUGH IDLING AND/OR MISSING



OK CONTINUED FROM PAGE FI-15



CHECK SPARK PLUGS

3S-FE Standard: 1.1 mm (0.043 in.)

3S-GE Maximum: 1.3 mm (0.051 in.)

NOTE: Check compression pressure and valve clearance if necessary.

NO

1. Spark plugs
2. Compression pressure
Minimum: 10.0 kg/cm²
(142 psi, 981 kPa)
at 250 rpm
3. Valve clearance (Cold)
Standard:
3S-FE IN 0.19 – 0.29 mm
(0.007 – 0.011 in.)
EX 0.28 – 0.38 mm
(0.011 – 0.015 in.)
3S-FE IN 0.15 – 0.25 mm
(0.006 – 0.010 in.)
EX 0.20 – 0.30 mm
(0.008 – 0.012 in.)

OK

CHECK INTAKE AIR CONTROL VALVE (3S-GE)

Check that the air control valve is closed.

BAD

1. VSV for intake air control valve
2. Vacuum leaks

OK

CHECK COLD START INJECTOR
(See page FI-66)

BAD

1. Cold start injector
2. Cold start injector time switch
(See page FI-99)

OK

CHECK FUEL PRESSURE
(See page FI-61)

BAD

1. Fuel pump (See page FI-60)
2. Fuel filter
3. Fuel pressure regulator
(See page FI-70 or 72)

OK

CHECK INJECTORS
(See page FI-74)

BAD

Injection condition

OK

CHECK EFI ELECTRONIC CIRCUIT USING VOLT/OHMMETER
(See page FI-28)

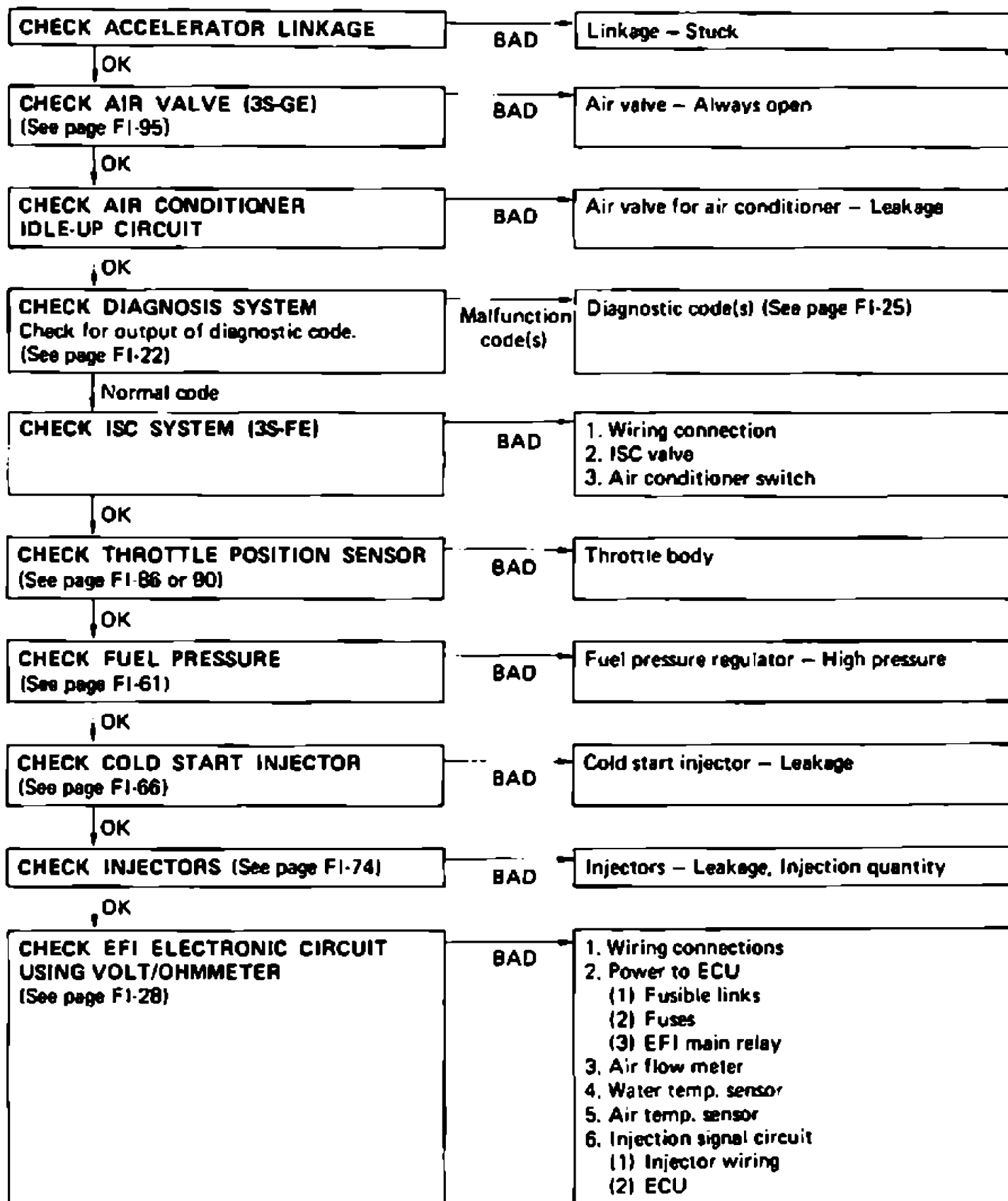
BAD

1. Wiring connections
2. Power to ECU
(1) Fusible links
(2) Fuses
(3) EFI main relay
3. Air flow meter
4. Water temp. sensor
5. Air temp. sensor
6. Injection signal circuit
(1) Injector wiring
(2) ECU
7. Oxygen sensor

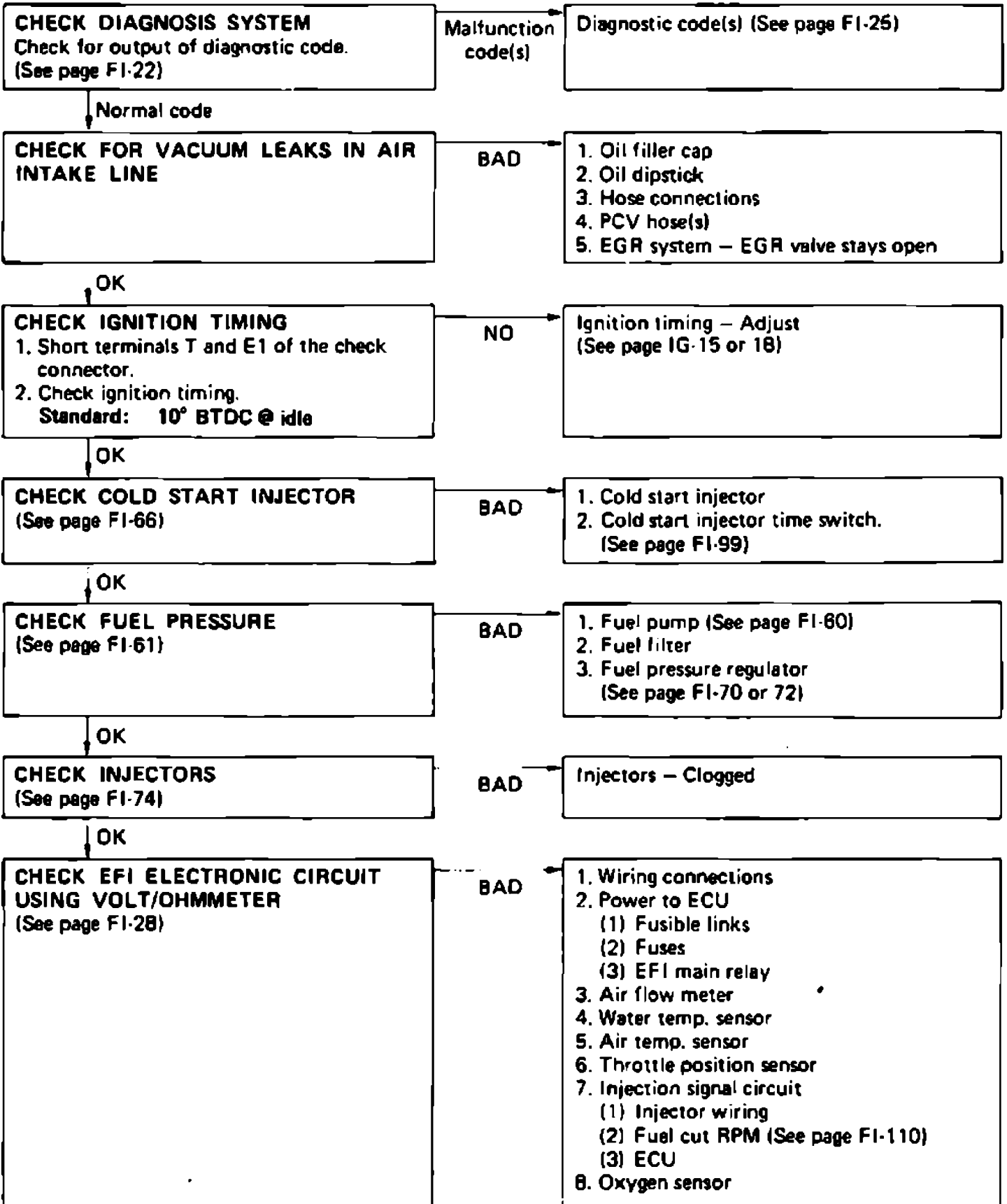
SYMPTOM – HIGH ENGINE IDLE SPEED (NO DROP)

NOTE (3S-FE):

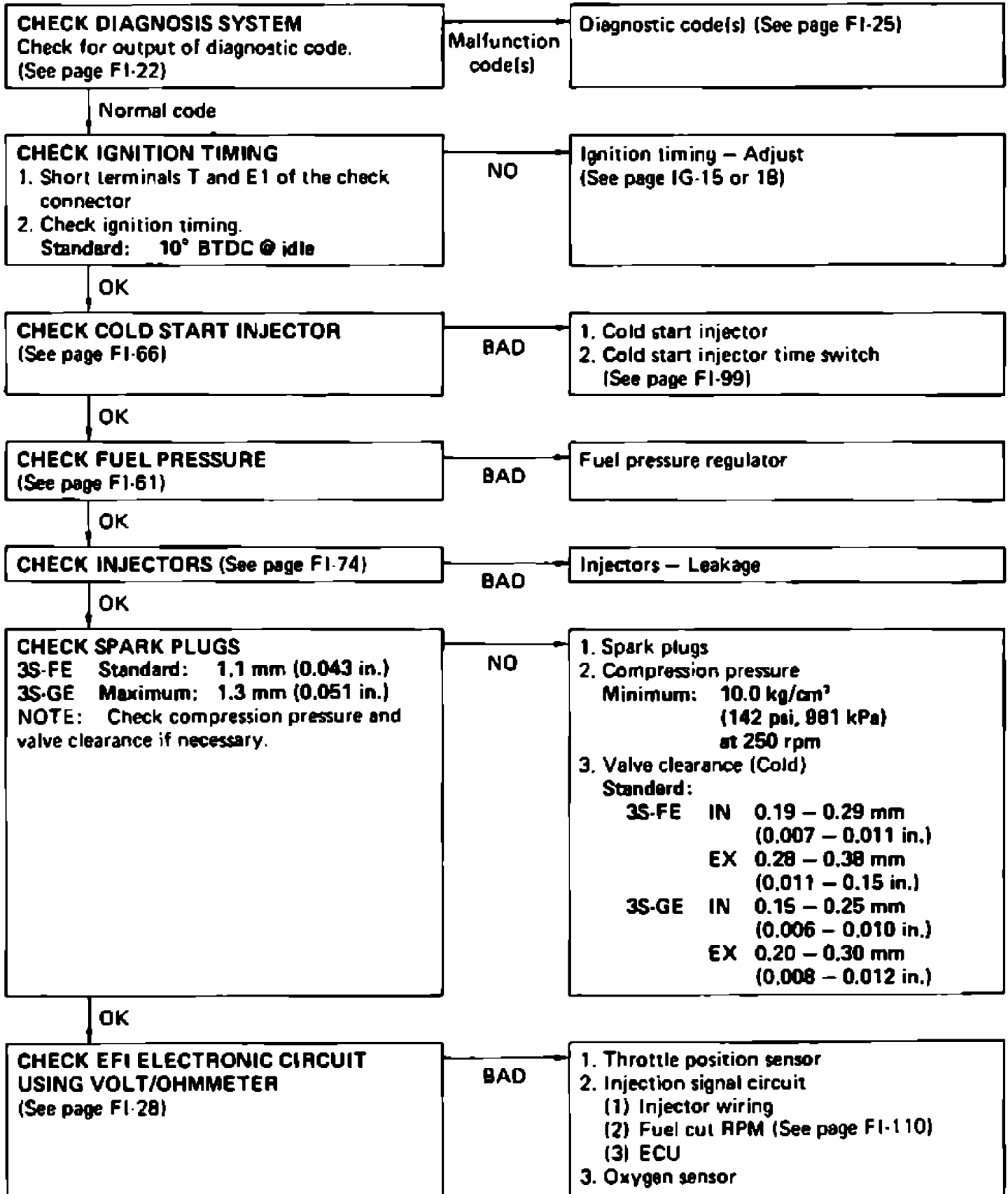
Disconnecting the battery will cause the idling speed data in the ISC to be returned to the initial idling speed, causing the idling speed to rise above 700 rpm. Should this happen, either carry out a driving test, including stop-go several times at a speed above 10 km/h, or start the engine, idle for 30 seconds and then turn the engine off repeatedly. By doing this, idle data will be stored in the ISC and the idle rpm will be at specified value.



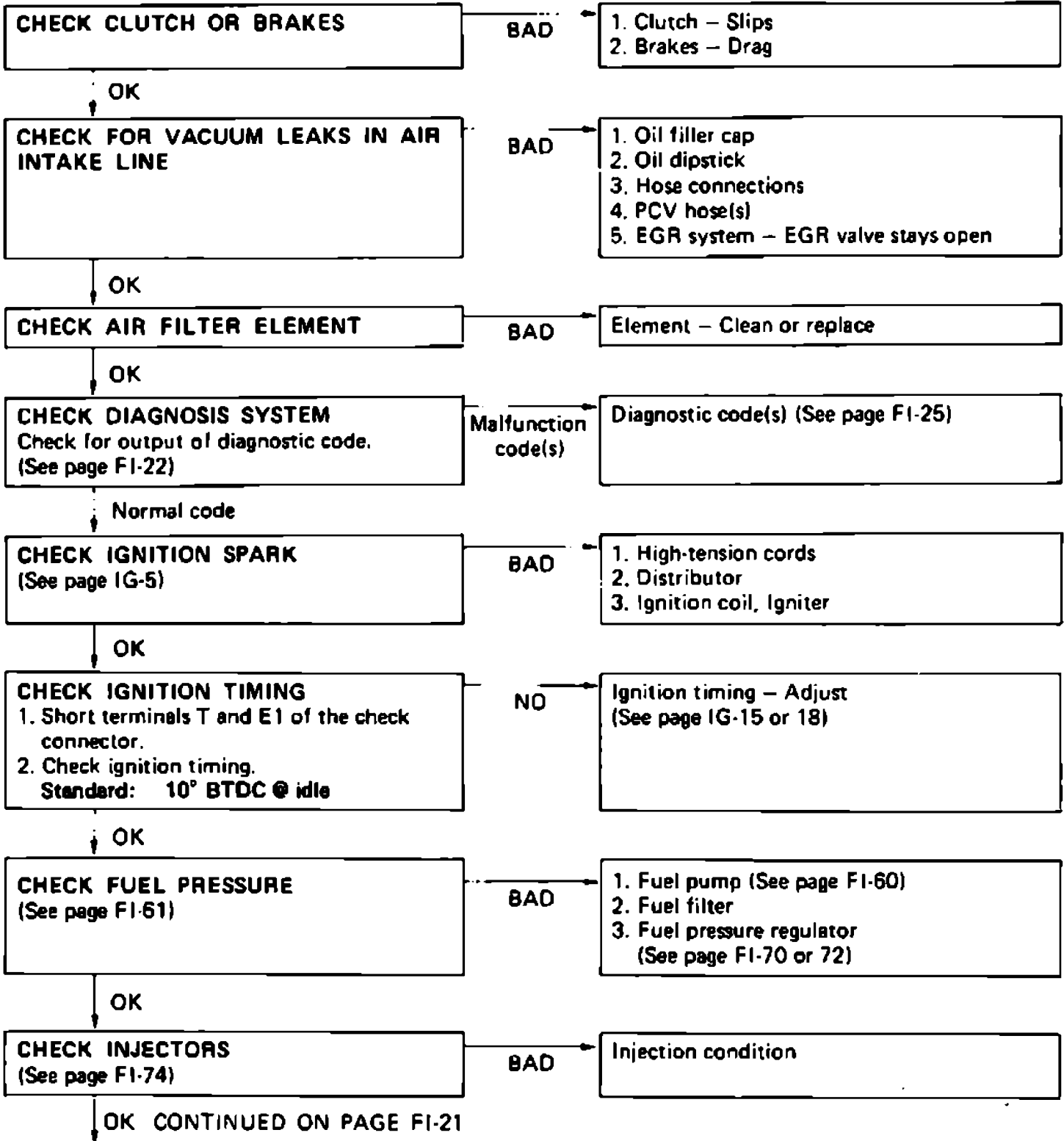
SYMPTOM – ENGINE BACKFIRES-Lean Fuel Mixture



**SYMPTOM – MUFFLER EXPLOSION (AFTER FIRE)
-Rich Fuel Mixture-Misfire**



SYMPTOM – ENGINE HESITATES AND/OR POOR ACCELERATION



OK CONTINUED FROM PAGE FI-20

CHECK SPARK PLUGS
 3S-FE Standard: 1.1 mm (0.043 in.)
 3S-GE Maximum: 1.3 mm (0.051 in.)
 NOTE: Check compression pressure and valve clearance if necessary.

BAD

1. Spark plugs
2. Compression pressure
 Minimum: 10.0 kg/cm²
 (142 psi, 981 kPa)
 at 250 rpm
3. Valve clearance (Cold)
 Standard:
 3S-FE IN 0.19 – 0.29 mm
 (0.007 – 0.011 in.)
 EX 0.28 – 0.38 mm
 (0.011 – 0.015 in.)
 3S-GE IN 0.15 – 0.25 mm
 (0.006 – 0.010 in.)
 EX 0.20 – 0.30 mm
 (0.008 – 0.012 in.)

OK

CHECK INTAKE AIR CONTROL VALVE (3S-GE)
 Check if air control valve is open with engine running at 4,400 rpm above.

BAD

1. VSV for intake air control valve
2. Vacuum leaks

OK

CHECK EFI ELECTRONIC CIRCUIT USING VOLT/OHMMETER
 (See page FI-28)

BAD

1. Wiring connections
2. Power to ECU
 (1) Fusible links
 (2) Fuses
 (3) EFI main relay
3. Air flow meter
4. Water temp. sensor
5. Air temp. sensor
6. Throttle position sensor
7. Injection signal circuit
 (1) Injector wiring
 (2) ECU

DIAGNOSIS SYSTEM

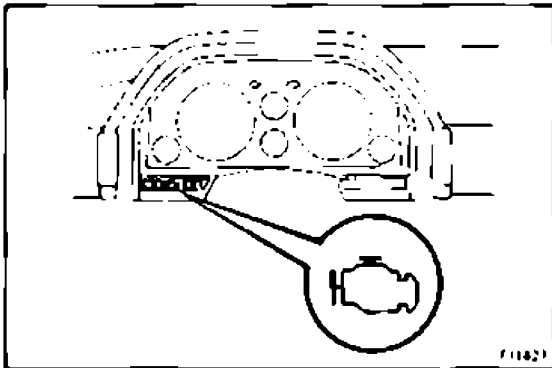
DESCRIPTION

The ECU contains a built-in self-diagnosis system by which troubles with the engine signal network are detected and a check engine warning light on the instrument panel flashes.

By analyzing various signals as shown in the later table (See page FI-25) the ECU detects system malfunctions which are related to the various operating parameter sensors or actuator. The ECU stores the failure code associated with the detected failure until the diagnosis system is cleared by removing the EFI fuse with the ignition switch OFF.

The check engine warning light on the instrument panel informs the driver that a malfunction has been detected.

The light goes out automatically when the malfunction has been cleared.



CHECK ENGINE WARNING LIGHT CHECK

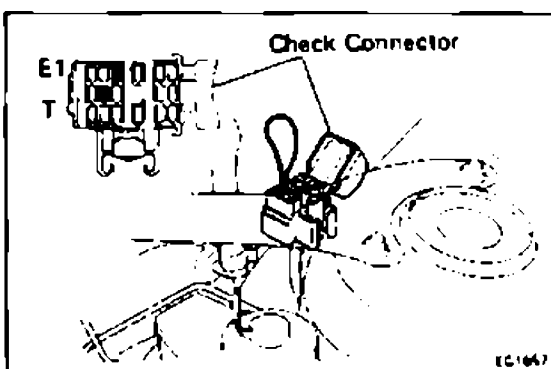
1. The check engine warning light will come on when the ignition switch is placed at ON and the engine is not running.
2. When the engine is started, the check engine warning light should go out.

If the light remains on, the diagnosis system has detected a malfunction or abnormality in the system.

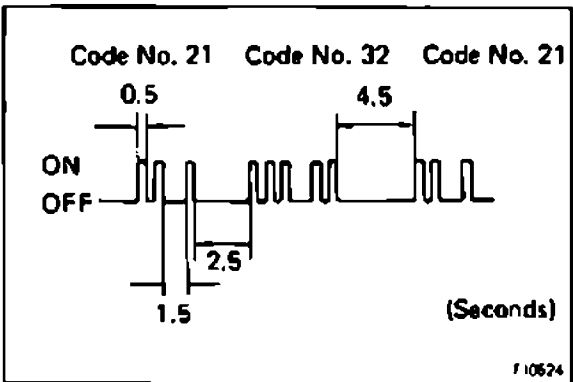
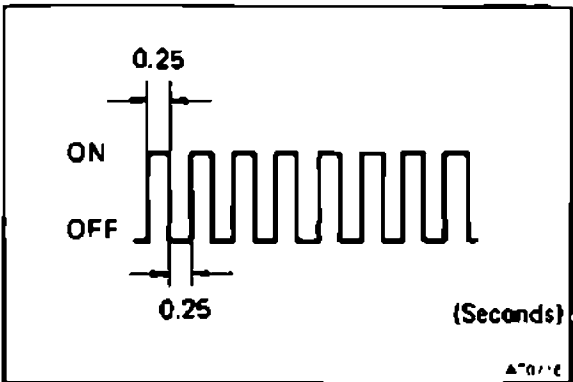
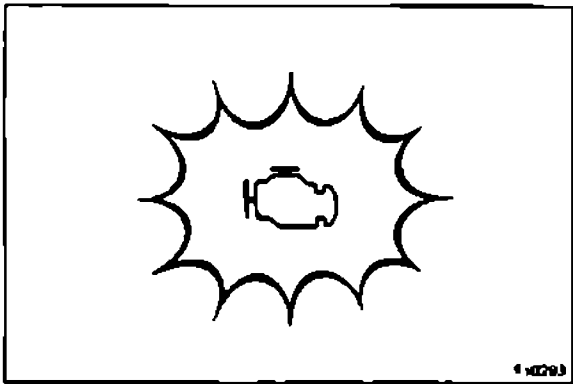
OUTPUT OF DIAGNOSTIC CODES

To obtain an output of diagnostic codes, proceed as follow:

1. Initial conditions
 - (a) Battery voltage 11 volts or more
 - (b) Throttle valve fully closed (throttle position sensor IDL points closed)
 - (c) Transmission in neutral position
 - (d) Accessories switched OFF
 - (e) Engine at reach normal operating temperature
2. Turn the ignition switch to ON. Do not start the engine.
3. Using a service wire, short terminals T and E1 of the check connector.



4. Read the diagnostic code as indicated by the number of flashes of the check engine warning light.



Diagnostic Codes (See page FI-25)

(a) Normal System Operation (no malfunction)

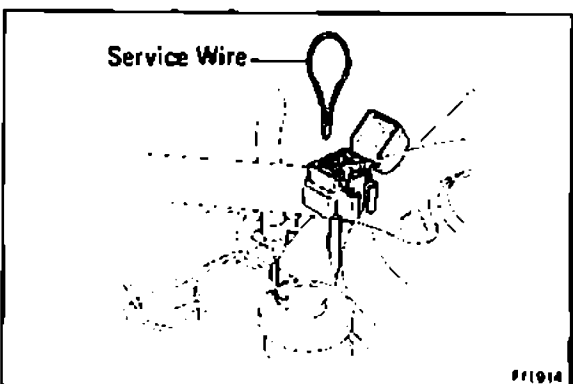
- The light will alternately blink on and OFF for 0.25 second intervals.

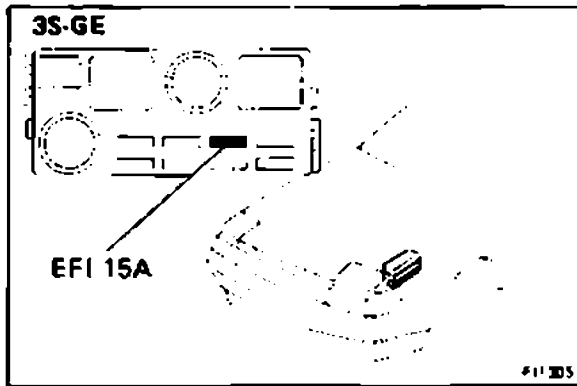
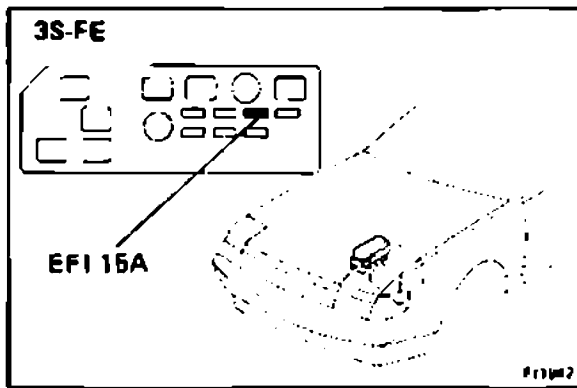
(b) Malfunction Code Indication

- In the event of a malfunction, the light will blink every 0.5 seconds. The first number of blinks will equal the first digit of a 2-digit diagnostic code and, after a 1.5 second pause, the 2nd number of blinks will equal the 2nd. If there are two or more codes, there will be a 2.5 second pause between each.
- After all the codes have been output, there will be a 4.5 second pause and they will all be repeated as long as the terminals T and E1 of the check connector are shorted.

NOTE: In the event of a number of trouble codes, indication will begin from the smaller value and continue in order to the larger.

5. After the diagnosis check, remove the service wire.





CANCELLING DIAGNOSTIC CODE











1. After repair of trouble area, the diagnostic code retained in memory by the ECU must be cancelled out by removing the EFI fuse (15A), located in the engine compartment relay box, for 10 seconds or more, depending on ambient temperature (the lower the temperature, the longer the fuse must be left out) with the ignition switch OFF.

NOTE:








- Cancellation can also be done by removing the battery negative (⊖) terminal, but in this case, other memory systems (clock, etc.) will also be cancelled out.
- If the diagnostic code is not cancelled out, it will be retained by the ECU and appear along with a new code in the event of future trouble.
- If it is necessary to work on engine components requiring removal of the battery terminal, a check must first be made to see if a diagnostic code is has been read.

2. After cancellation, road test the vehicle to check that a normal code is now read on the check engine warning light. If the same diagnostic code appears, it indicates that the trouble area has not been repaired thoroughly.

DIAGNOSTIC CODES

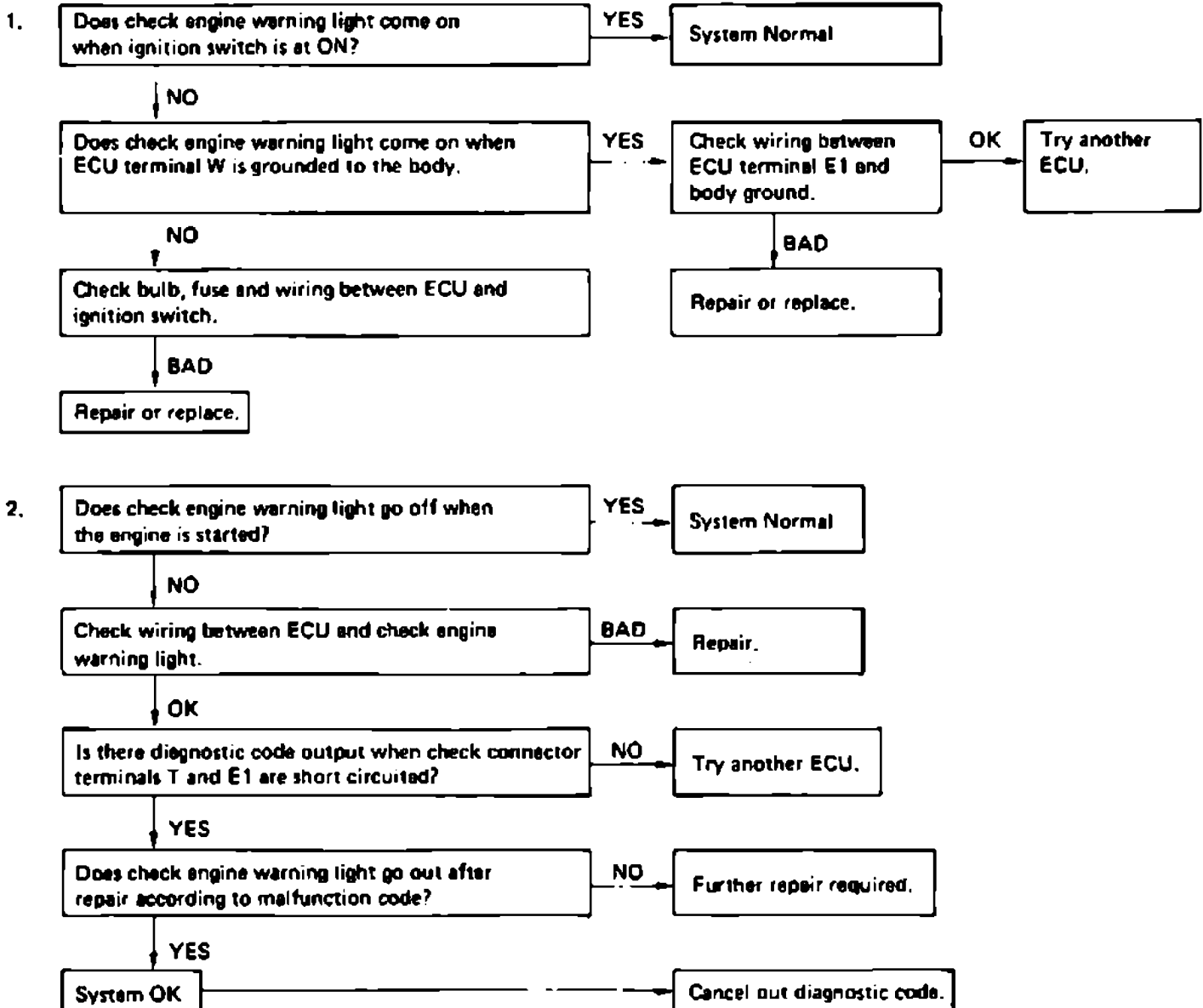
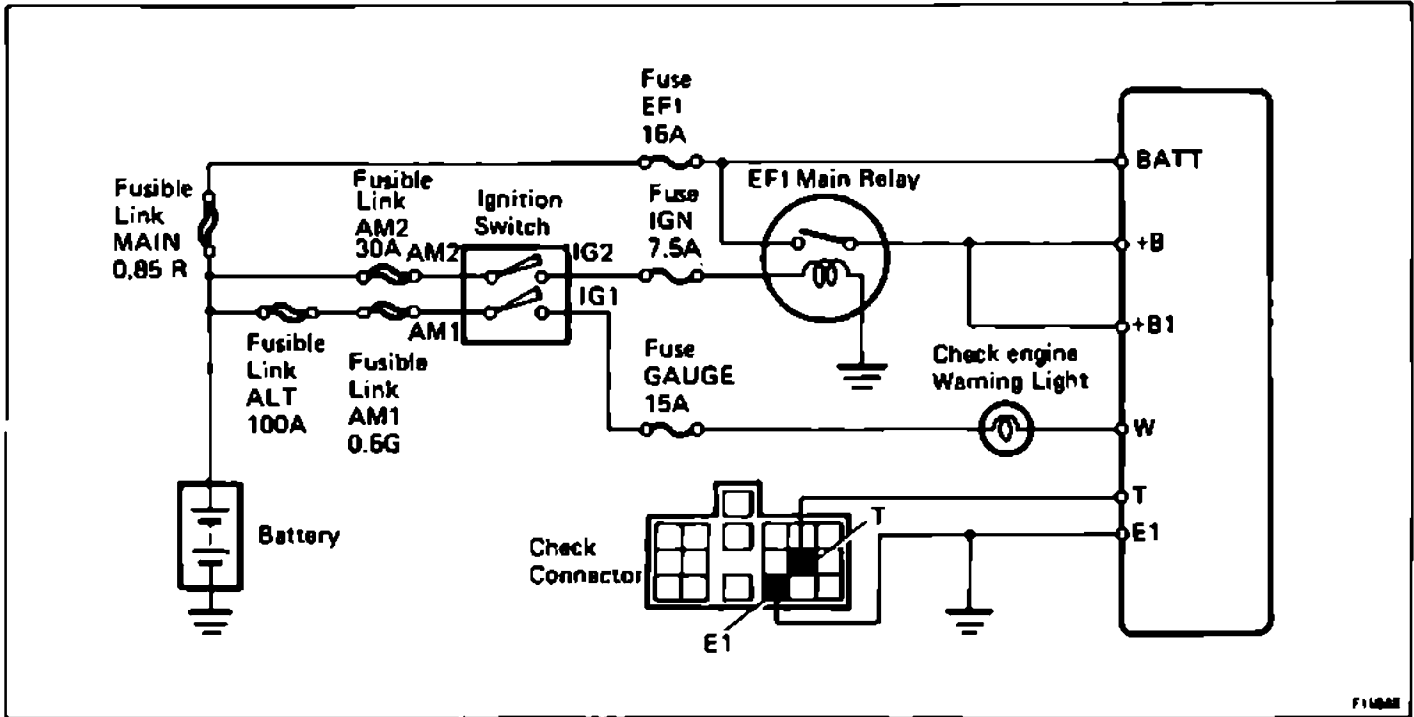
Code No.	Number of check engine blinks	System	Diagnosis	Trouble area	See page
-	 ON OFF P101	Normal	This appears when none of the other codes are identified.	-	-
11	 P102	ECU (+8)	Momentary interruption in power supply to ECU.	<ul style="list-style-type: none"> • IG switch circuit • IG switch • Main relay circuit • Main relay • ECU 	FI-32 or FI-46
12	 P103	RPM Signal	No "NE" or "G" signal to ECU within 2 seconds after engine has been cranked.	<ul style="list-style-type: none"> • Distributor circuit • Distributor • Starter signal circuit • ECU 	IG-4
13	 P104	RPM Signal	No "NE" signal to ECU when engine speed is above 1,000 rpm.	<ul style="list-style-type: none"> • Distributor circuit • Distributor • ECU 	-
14	 P105	Ignition Signal	(3S-FE) No "IGF" signal to ECU 4 – 5 times in succession.	<ul style="list-style-type: none"> • Igniter and ignition coil circuit • Igniter and ignition coil • ECU 	FI-35
		Ignition Signal	(3S-GE) No "IGF" signal to ECU 8 – 11 times in succession.		FI-50
21	 P106	Oxygen Sensor Signal	(3S-FE) Open circuit in oxygen sensor signal (only lean indication).	<ul style="list-style-type: none"> • Oxygen sensor circuit • Oxygen sensor • ECU 	-
		Oxygen Sensor Heater Circuit	Open or short circuit in oxygen sensor heater.		
22	 P107	Water Temp. Sensor Signal	Open or short circuit in water temp. sensor signal (THW).	<ul style="list-style-type: none"> • Water temp. sensor circuit • Water temp. sensor • ECU 	FI-41 or FI-68
24	 P108	Intake Air Temp. Sensor Signal	Open or short circuit in Intake air temp. sensor signal (THA).	<ul style="list-style-type: none"> • Intake air temp. sensor circuit • Intake air temp. sensor • ECU 	FI-40 or FI-65
*25	 P109	Air-fuel Ratio Lean Malfunction	(1) When oxygen sensor signal at the upper (rich) or lower (lean) limit for a certain period of time during feedback condition. (2) When air-fuel ratio feedback compensation value or adaptive control value continues at the upper (rich) or lower (rich) limit renewed for a certain period of time.	<ul style="list-style-type: none"> • Injector circuit • Injector • Oxygen sensor circuit • Oxygen sensor • ECU • Fuel line pressure • Air-flow meter • Air intake system • Ignition system 	FI-58
*26	 P110	Air-fuel Ratio Rich Malfunction	(3) When air-fuel ratio feedback compensation value or adaptive control value feedback frequency is abnormally high during feedback condition. NOTE: For conditions (3), since neither a lean (code No. 25) nor a rich (code No. 26) diagnosis displayed consecutively.	<ul style="list-style-type: none"> • Injector circuit • Injector • Fuel line pressure • Cold start injector • Air-flow meter • ECU 	

DIAGNOSTIC CODES (Cont'd)

Code No.	Number of check engine blinks	System	Diagnosis	Trouble area	See page
31	 #11304	Air-flow Meter Signal	Open circuit in VC signal or short circuit between VS and E2 when idle contacts are closed.	<ul style="list-style-type: none"> • Air flow meter circuit. • Air flow meter • ECU 	F1-39 or F1-54
32	 #11305	Air-flow Meter Signal	Open circuit in E2 or short circuit between VC and VS.	<ul style="list-style-type: none"> • Air flow meter circuit • Air flow meter • ECU 	F1-39 or F1-54
41	 #11306	Throttle position sensor signal	(3S-FE) IDL and PSW signals being output simultaneously for several seconds.	<ul style="list-style-type: none"> • Throttle position sensor circuit • Throttle position sensor • ECU 	F1-34
			(3S-GE) Open or short circuit in throttle position sensor signal (VTA).		F1-48
42	 #11307	Vehicle Speed Sensor Signal	<p>(3S-FE) No "SPD" signal for 5 seconds when engine speed is between 2,500 rpm and 5,500 rpm and coolant temp. is below 80°C (176°F) except when racing the engine.</p> <p>(3S-GE) No "SPD" signal for 5 seconds when engine speed is between 2,500 rpm and 6,000 rpm and coolant temp. is below 80°C (176°F) except when racing the engine.</p>	<ul style="list-style-type: none"> • Vehicle speed sensor circuit • Vehicle speed sensor • ECU 	-
43	 #11308	Starter Signal	No "STA" signal to ECU until engine speed reaches 800 rpm with vehicle not moving.	<ul style="list-style-type: none"> • Ignition switch circuit • Ignition switch • ECU 	F1-38 or F1-51
*71	 #12637	EGR System Malfunction	EGR gas temp. below pre-determined level during EGR operation.	<ul style="list-style-type: none"> • EGR system (EGR valve, EGR hose etc.) • EGR gas temp. sensor circuit • EGR gas temp. sensor • VSV for EGR • VSV for EGR circuit • ECU 	F1-59
51	 #11309	Switch Signal	No "IDL" signal or No "NSW" signal or "A/C" signal to ECU, with the check terminals E1 and T shorted.	<ul style="list-style-type: none"> • A/C switch circuit • A/C Amplifier • Throttle position sensor circuit • Throttle position sensor • Neutral start switch circuit • Neutral start switch • Accelerator pedal and cable • ECU 	-

* 3S-GE (CALIF.) only

INSPECTION OF DIAGNOSIS CIRCUIT



TROUBLESHOOTING WITH VOLT/OHMMETER

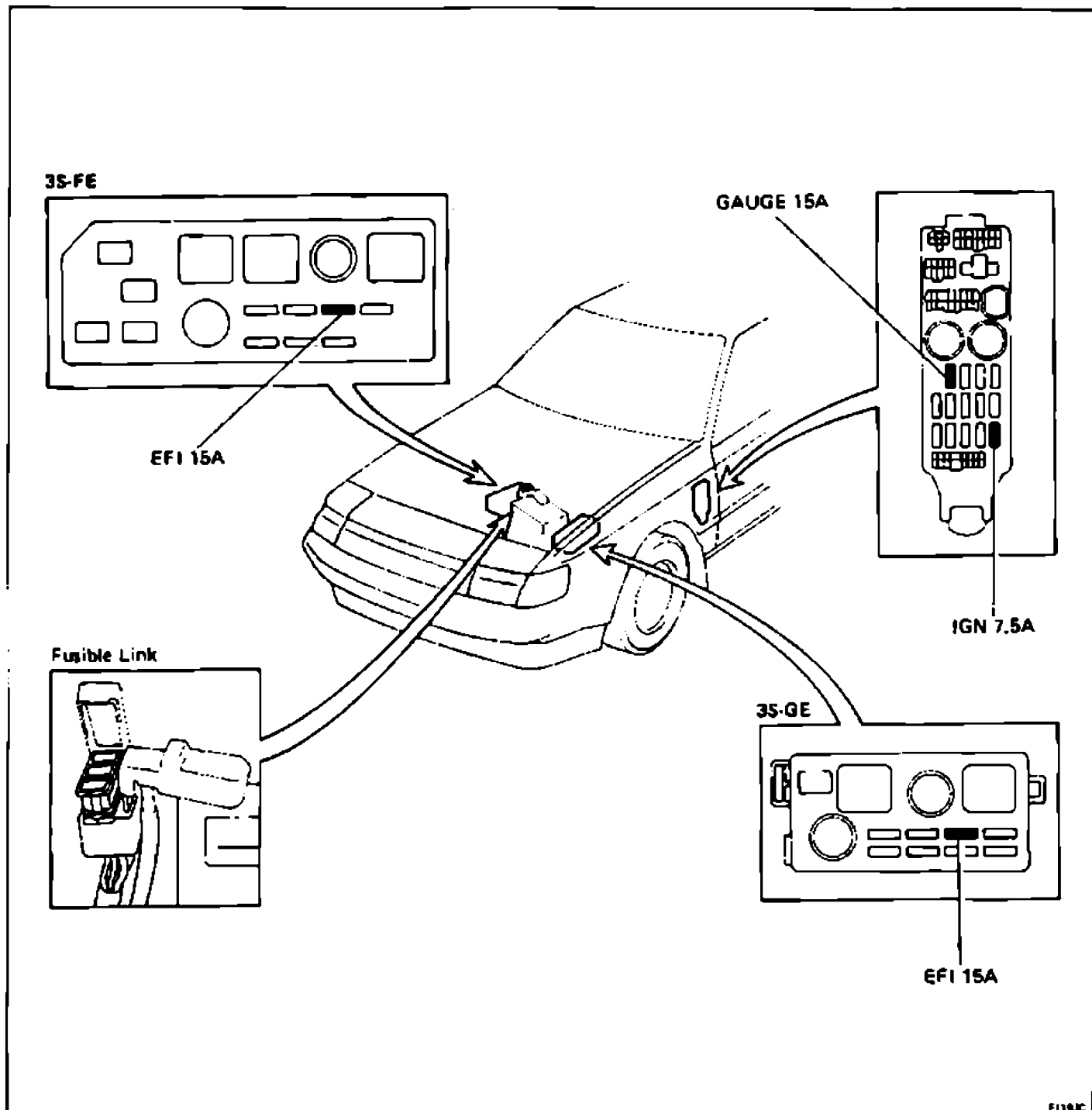
NOTE: The following troubleshooting procedures are designed for inspection of each separate system, and therefore the actual procedure may vary somewhat. However, troubleshooting should be performed referring to the inspection methods described in this manual.

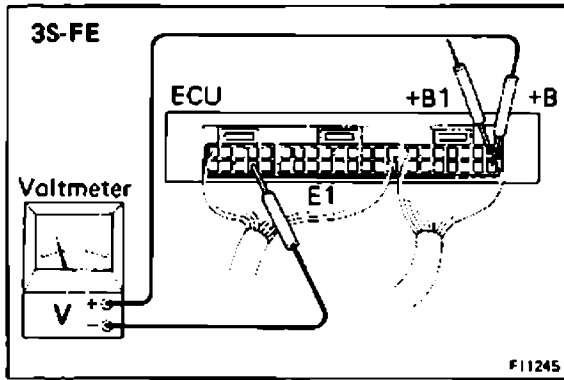
Before beginning inspection, it is best to first make a simple check of the fuses, fusible links and the condition of the connectors.

The following troubleshooting procedures are based on the supposition that the trouble lies in either a short or open circuit in a component outside the computer or a short circuit within the computer.

If engine trouble occurs even though proper operating voltage is detected in the computer connector, then the ECU is faulty and should be replaced.

LOCATION OF FUSES AND FUSIBLE LINKS



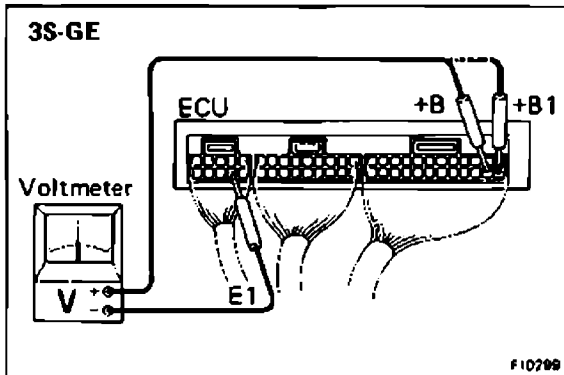


EFI SYSTEM CHECK PROCEDURE

NOTE:

- Perform all voltage measurements with the connectors connected.
- Verify that the battery voltage is 11 V or more when the ignition switch is at "ON".

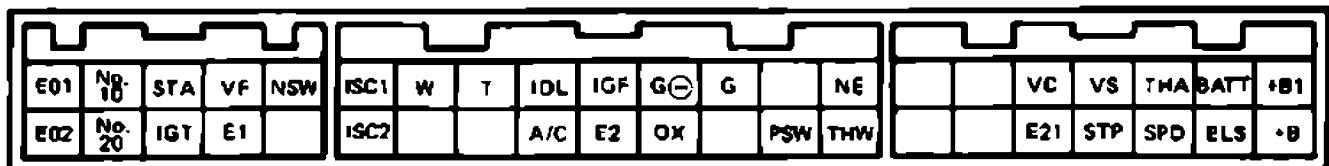
Using a voltmeter with high impedance (10 k Ω /V minimum), measure the voltage at each terminal of the wiring connectors.



Terminals of ECU (3S-FE)

Symbol	Terminal Name	Symbol	Terminal Name
E01	ENGINE GROUND	G ⊖	DISTRIBUTOR
E02	ENGINE GROUND	OX	OXYGEN SENSOR
No. 10	INJECTOR	G	DISTRIBUTOR
No. 20	INJECTOR	PSW	THROTTLE POSITION SENSOR
STA	STARTER SWITCH	NE	DISTRIBUTOR
IGT	IGNITER	THW	WATER TEMP. SENSOR
VF	CHECK CONNECTOR	VC	AIR FLOW METER
E1	SENSOR GROUND	E21	SENSOR GROUND
NSW	NEUTRAL START SWITCH	VS	AIR FLOW METER
ISC1	ISC VALVE	STP	STP LIGHT SWITCH
ISC2	ISC VALVE	THA	AIR TEMP. SENSOR
W	WARNING LIGHT	SPD	SPEED SENSOR
T	CHECK CONNECTOR	BATT	BATTERY
IDL	THROTTLE POSITION SENSOR	ELS	HEADLIGHT and DEFOGGER
A/C	A/C MAGNET SWITCH	+B1	MAIN RELAY
IGF	IGNITER	+B	MAIN RELAY
E2	SENSOR GROUND		

ECU Terminals

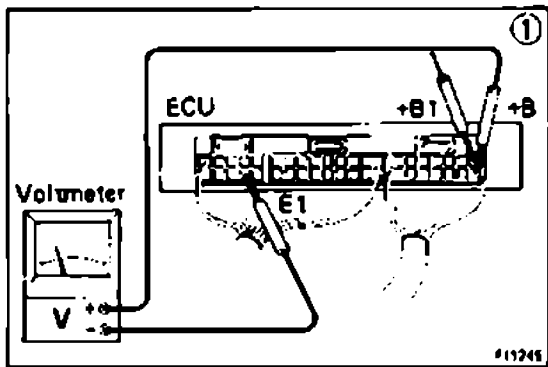
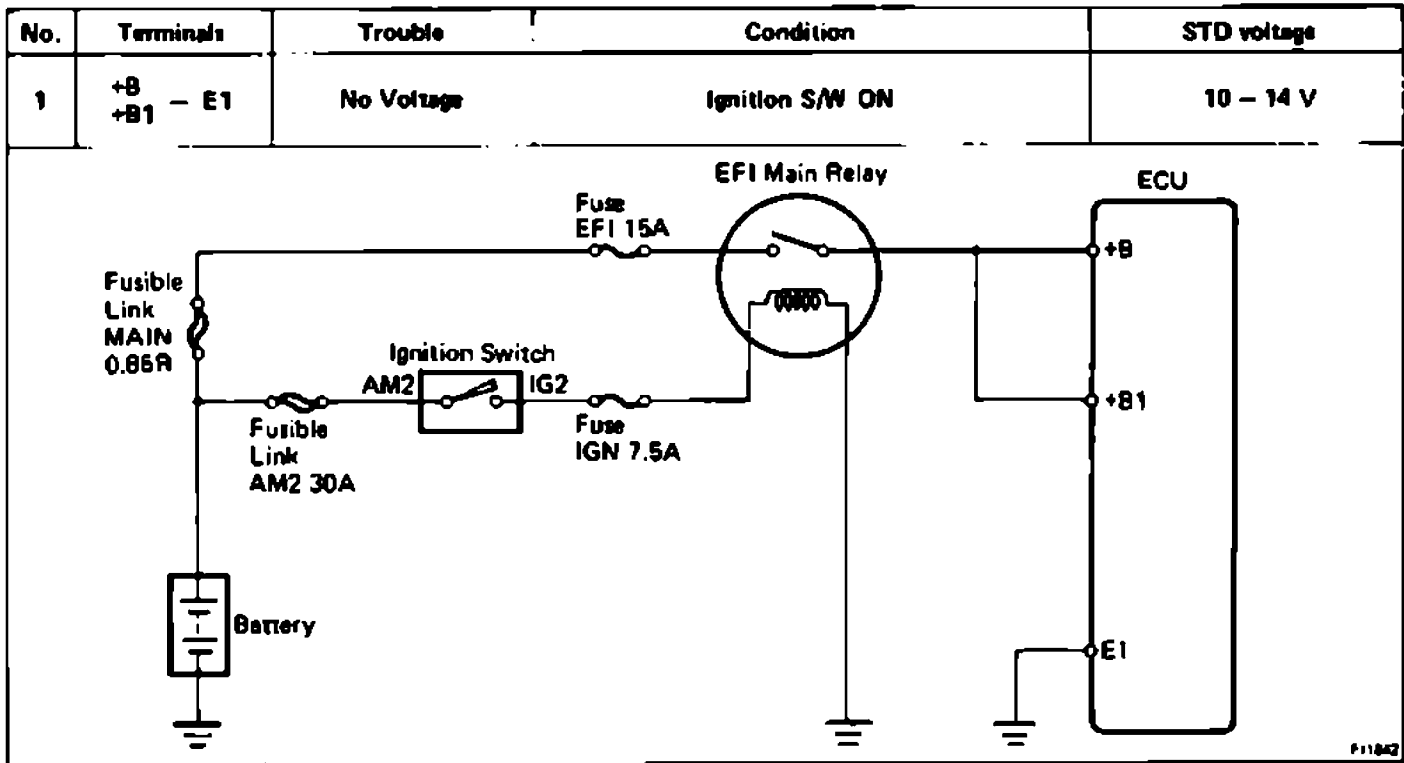


Voltage at ECU Wiring Connectors (3S-FE)

No.	Terminals	STD voltage (V)	Condition		See page
1	+B +B1 – E1	10 – 14	Ignition S/W ON		FI-32
2	BATT – E1	10 – 14	–		FI-33
3	IDL – E1	8 – 14	Ignition S/W ON	Throttle valve open	FI-34
	PSW – E1	4 – 5		Throttle valve fully closed	
4	IGT – E1	0.7 – 1.0	Idling		FI-35
5	STA – E1	6 – 14	Cranking		FI-36
6	No. 10 – E01 No. 20 – E02	9 – 14	Ignition S/W ON		FI-37
7	W – E1	8 – 14	No trouble (check engine warning light off) and engine running		FI-38
8	VC – E2	4 – 6	Ignition S/W ON	–	FI-38
	VS – E2	4 – 5		Measuring plate fully closed	
		0.02 – 0.5		Measuring plate fully open	
		2 – 4	Idling		
9	THA – E2	1 – 3	Ignition S/W ON	Intake air temperature 20°C (68°F)	FI-40
10	THW – E2	0.1 – 1.0		Coolant temperature 80°C (176°F)	FI-41
11	ISC1 ISC2 – E1	9 – 14	Ignition S/W ON		FI-42
12	A/C – E1	8 – 14	Ignition S/W ON	Air conditioning ON	FI-43

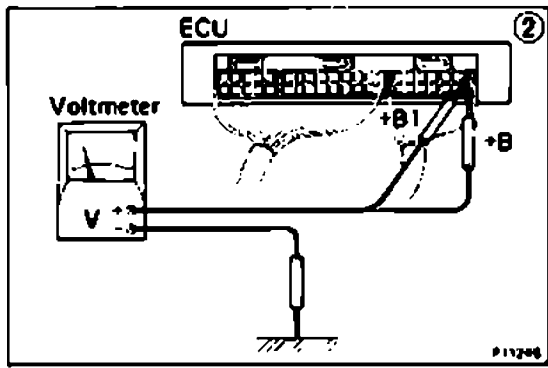
ECU Terminals

E01	No. 10	STA	VF	NSW	ISC1	W	T	IDL	IGF	G⊖	G	NE	L3	L1	VC	VS	THA	BATT	+B1	
E02	No. 20	IGT	E1		ISC2			A/C	E2	OX		PSW	THW	ECT	L2	E21	STP	SPD	ELS	+B



① No voltage between ECU terminals +B or +B1 and E1. (IG S/W ON)

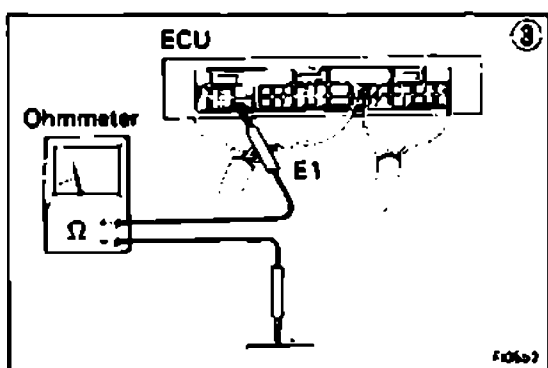
② Check that there is voltage between ECU terminal +B or +B1 and body ground. (IG S/W ON)



NO OK

③ Check wiring between ECU terminal E1 and body ground.

OK BAD
Try another ECU. Repair or replace.

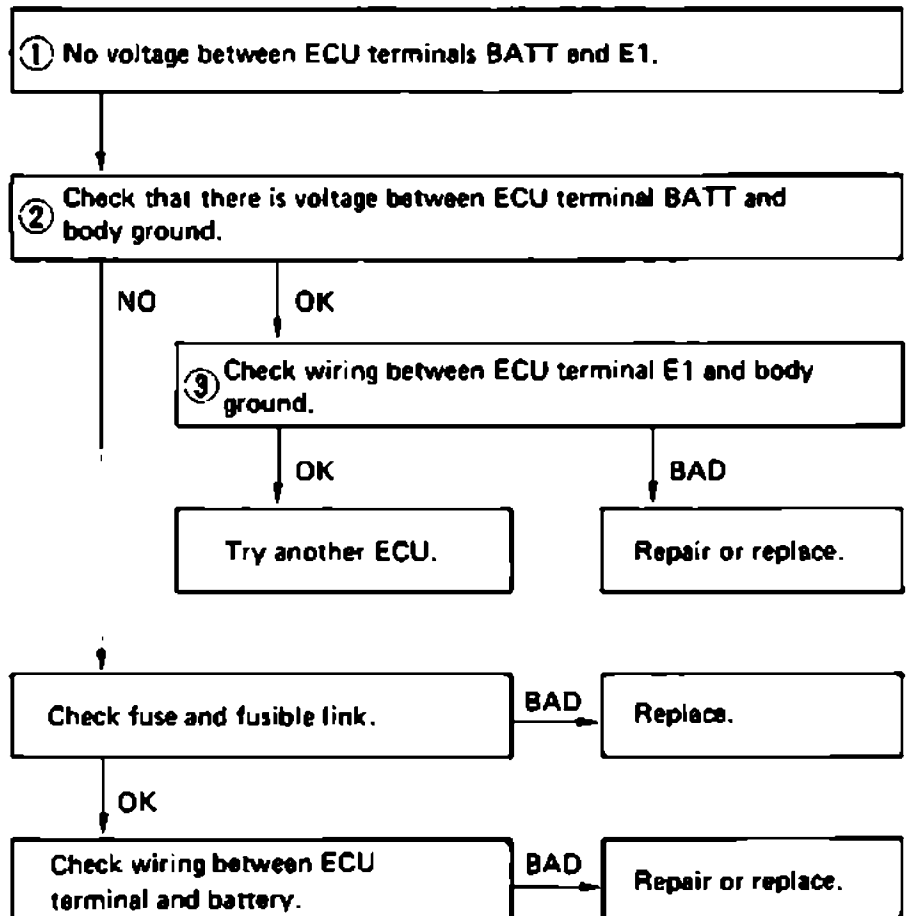
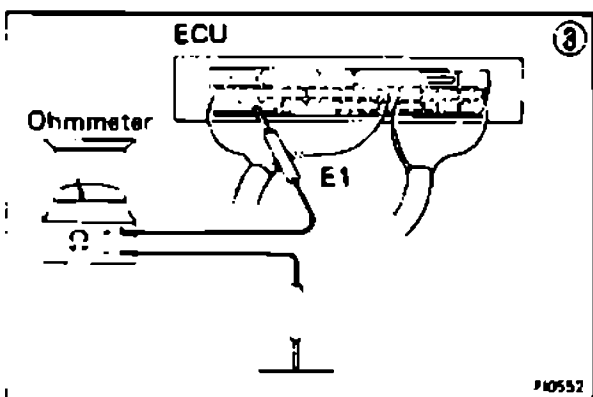
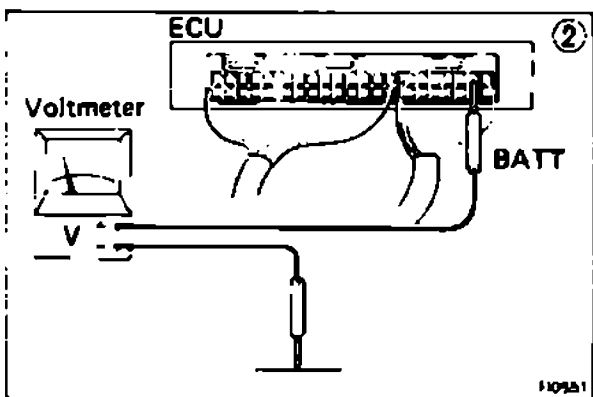
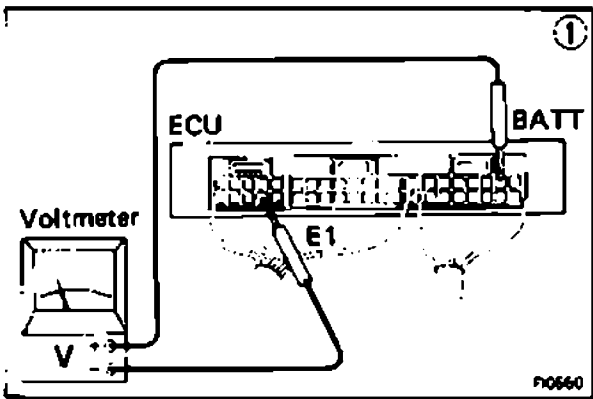
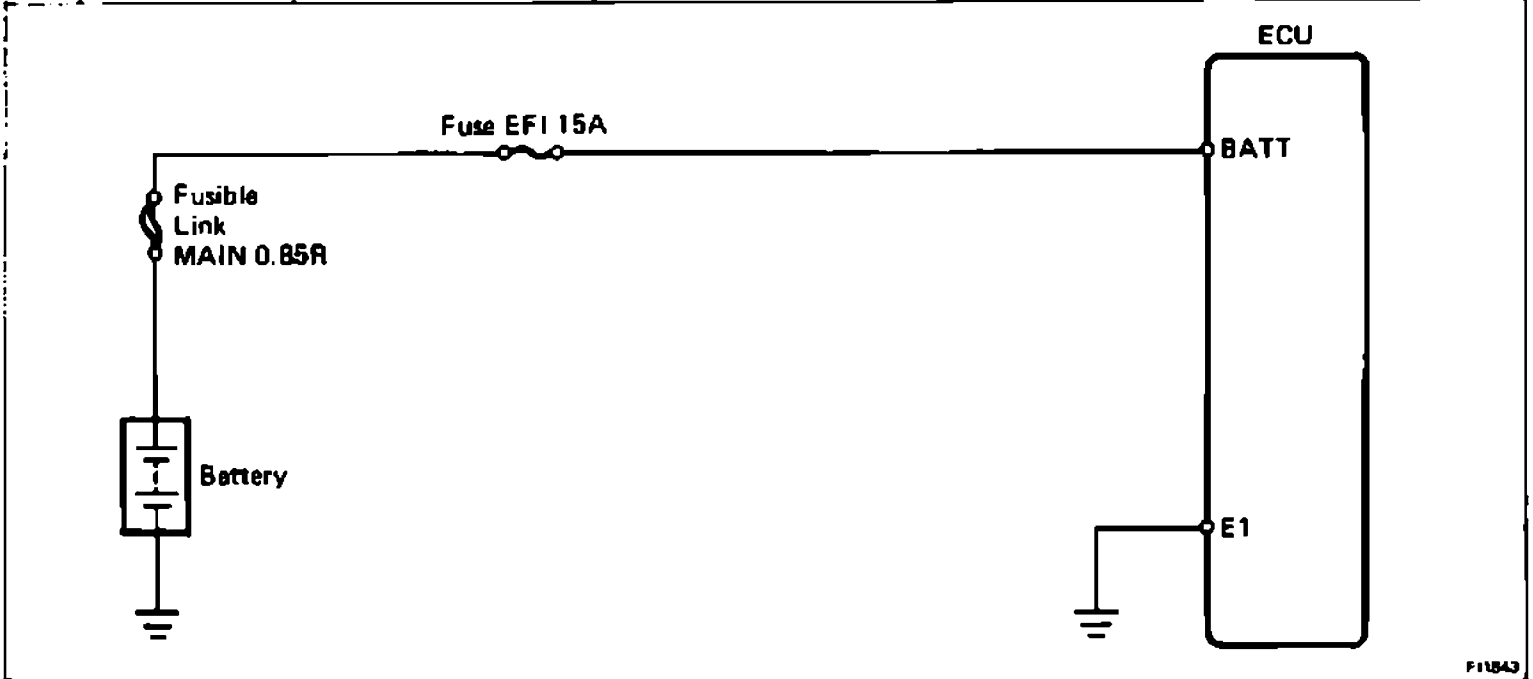


Check fuse, fusible link and ignition switch. BAD Repair or replace.

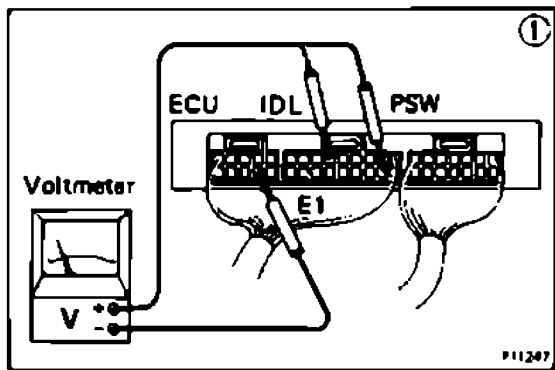
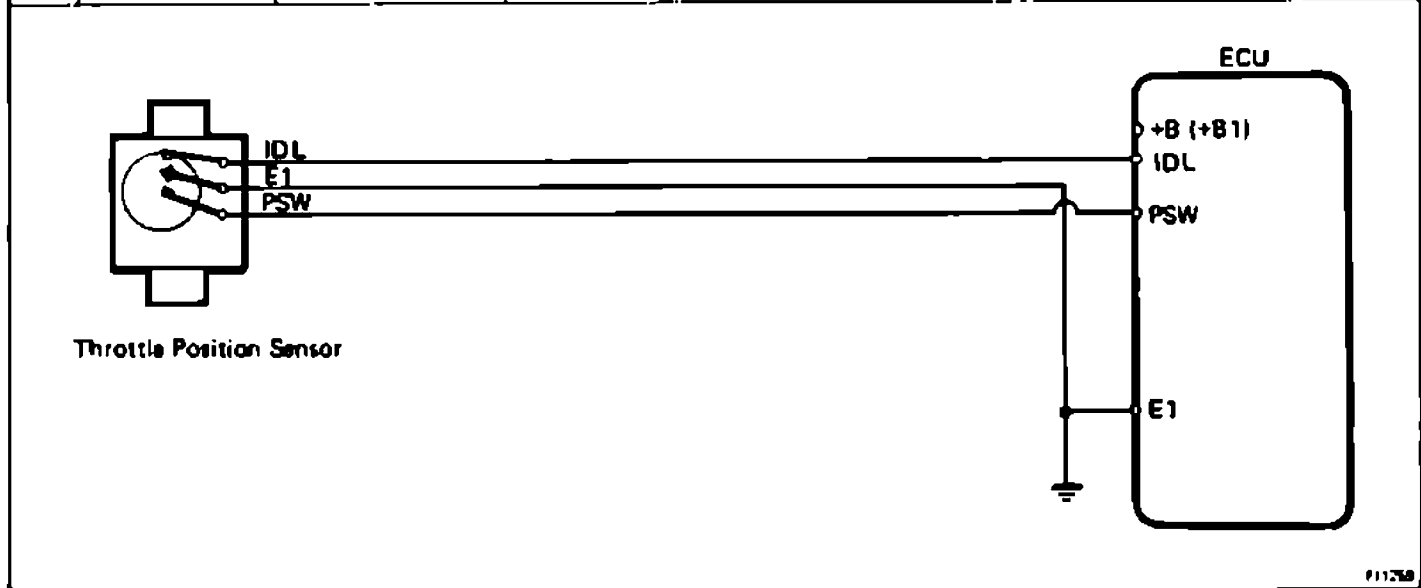
OK Check EFI main relay. BAD Replace.

OK Check wiring between EFI main relay and battery. BAD Repair or replace.

No.	Terminals	Trouble	Condition	STD voltage
2	BATT – E1	No voltage	–	10 – 14 V

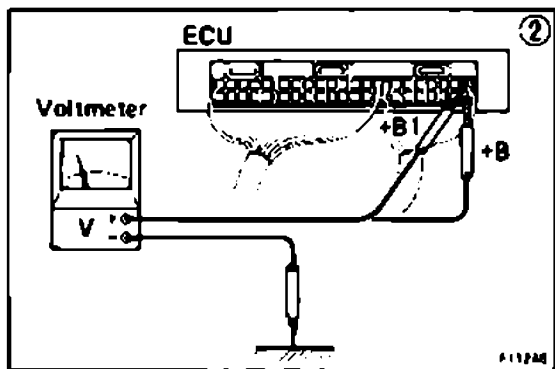


No.	Terminals	Trouble	Condition	STD voltage	
3	IDL – E1	No voltage	IG S/W ON	Throttle valve open	8 – 14 V
	PSW – E1			Throttle valve fully closed	4 – 5 V



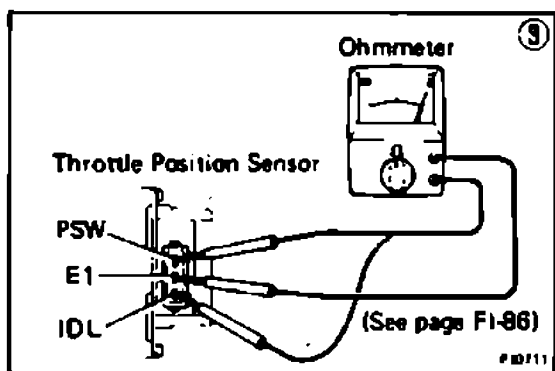
① No voltage between ECU terminals IDL or PSW and E1. (IG S/W ON)

② Check that there is voltage between ECU terminal +B or +B1 and body ground. (IG S/W ON)

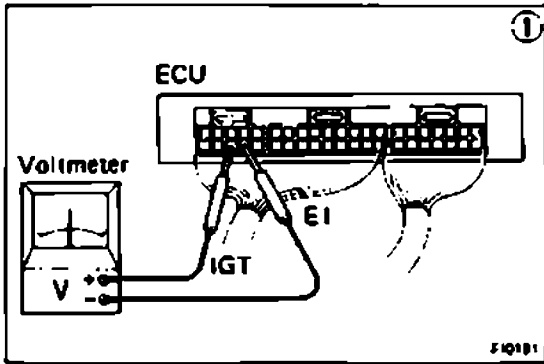
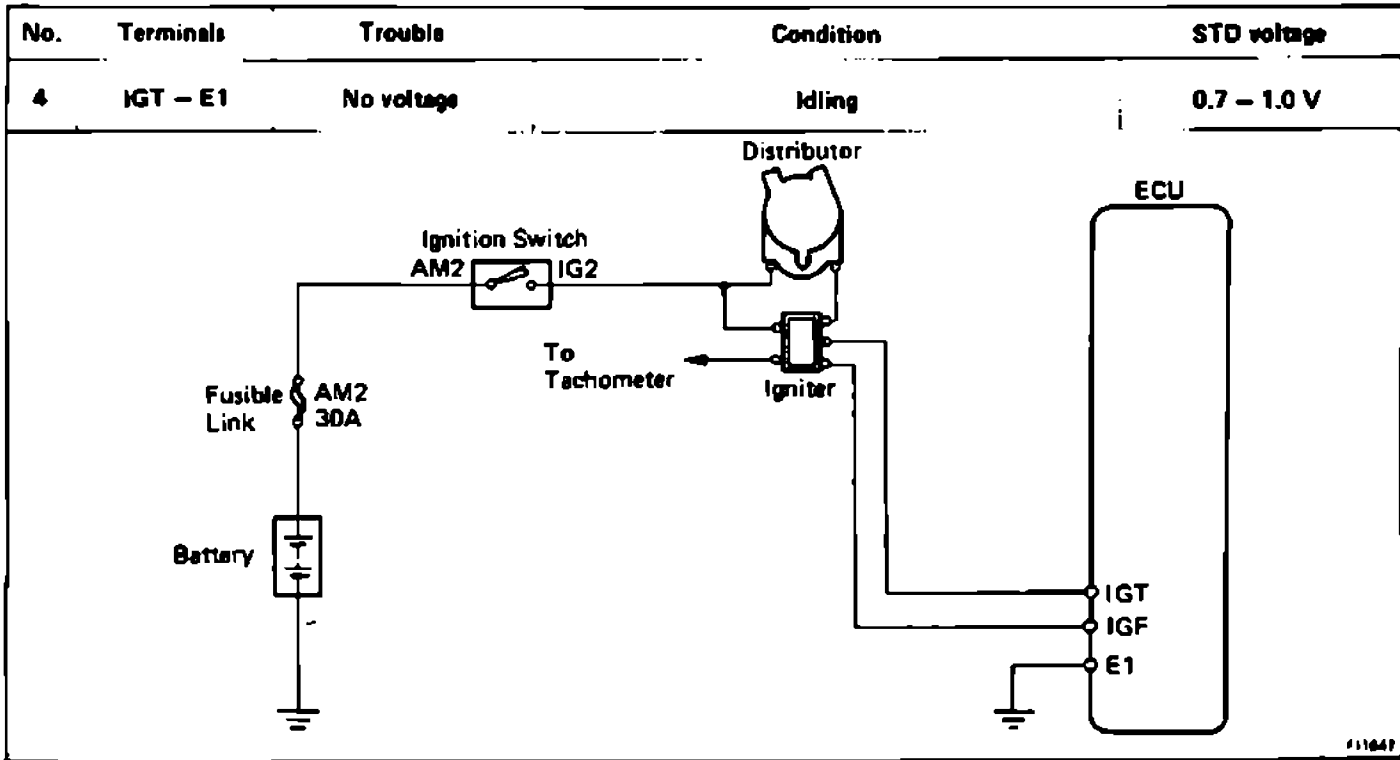


NO → Refer to No. 1. (See page FI-32)
 OK → Check wiring between ECU terminal E1 and body ground.
 BAD → Repair or replace.

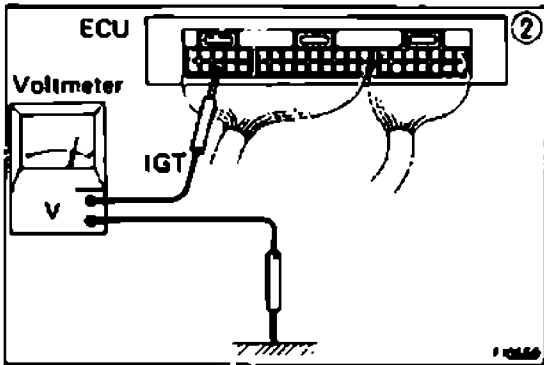
③ Check throttle position sensor. (See page FI-86)



BAD → Replace or repair throttle position sensor.
 OK → Check wiring between ECU and throttle position sensor.
 OK → Try another ECU.

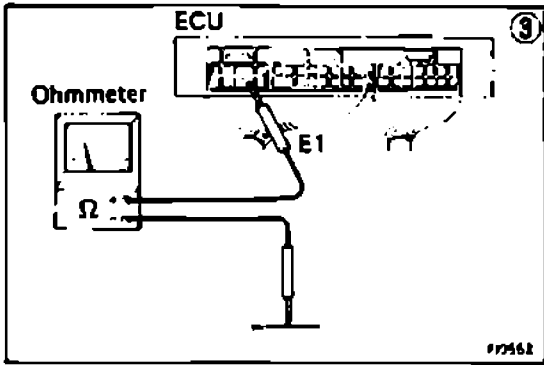


① No voltage between ECU terminals IGT and E1. (Idling)



② Check that there is voltage between ECU terminal IGT and body ground. (Idling)

NO OK



③ Check wiring between ECU terminal E1 and body ground. BAD → Repair or replace.

OK → Try another ECU.

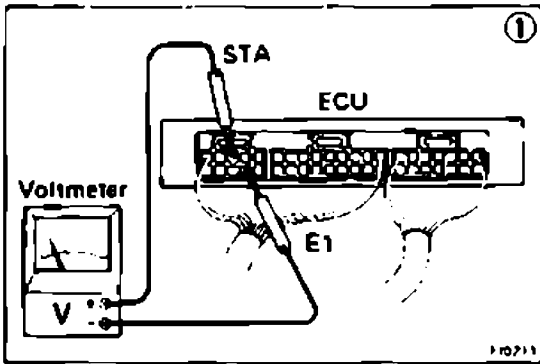
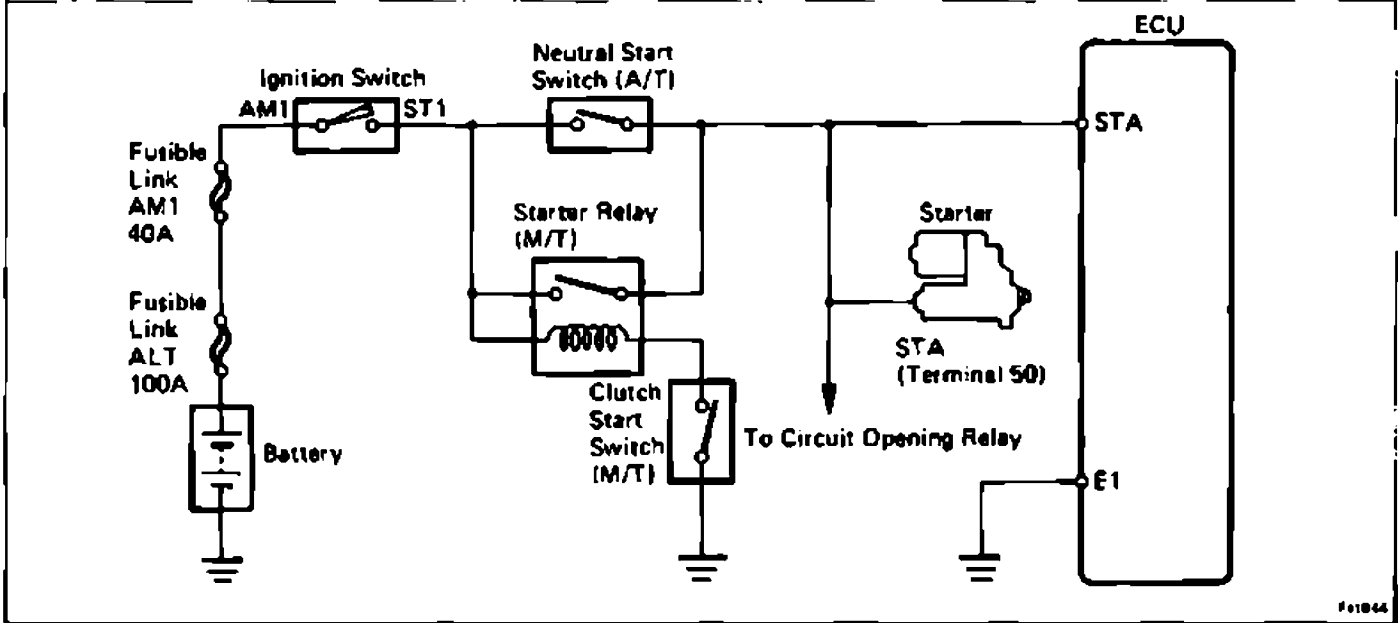
Check fusible link and ignition switch. BAD → Repair or replace.

Check distributor. (See page IG-10) BAD → Repair or replace.

Check wiring between ECU and battery. BAD → Repair or replace.

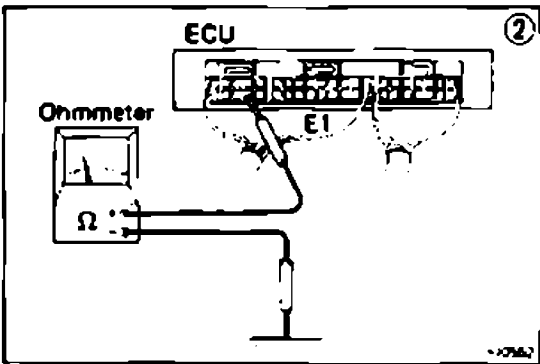
Check igniter. (See page IG-10) BAD → Repair or replace.

No.	Terminal	Trouble	Condition	STD voltage
5	STA – E1	No voltage	Cranking	0 – 14 V



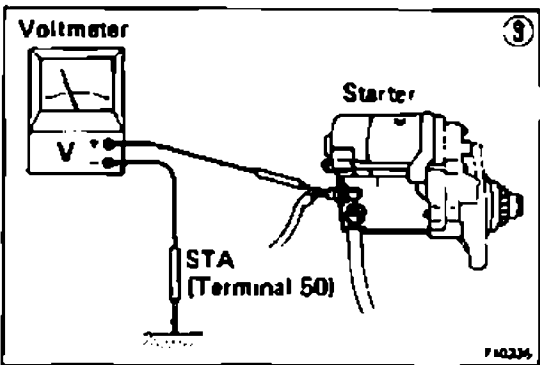
① No voltage between ECU terminals STA and E1. (IG S/W START)

Check starter operation.
 OK → Check wiring between ECU terminal STA and ignition switch terminal ST1.
 BAD → Repair or replace.

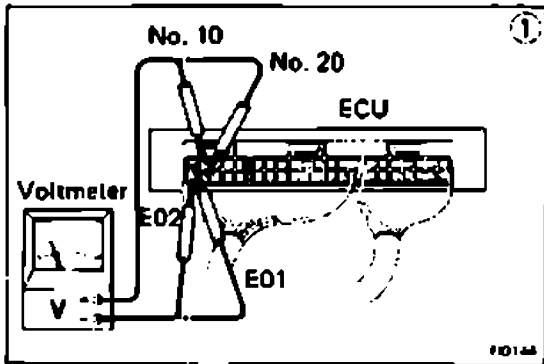
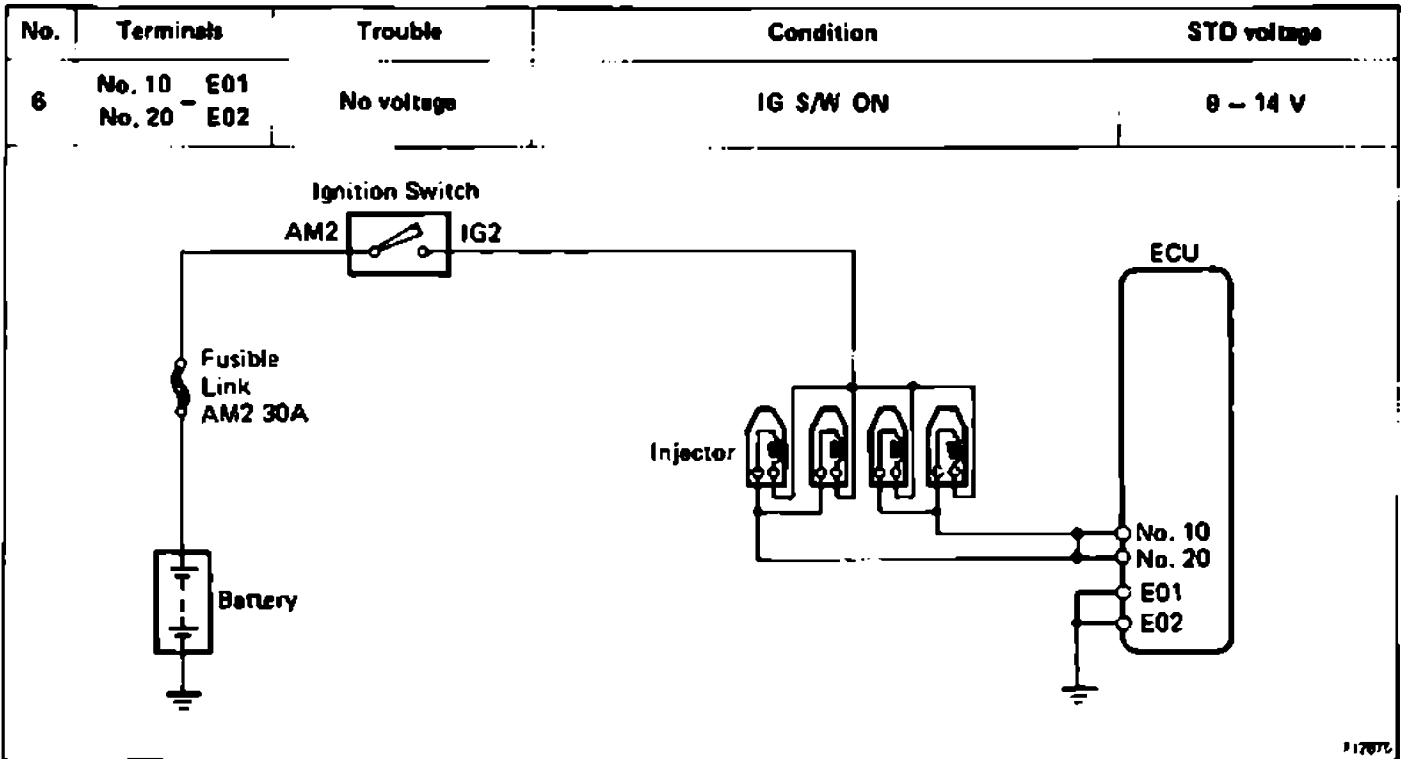


② Check wiring between ECU terminal E1 and body ground.
 OK → Try another ECU.
 BAD → Repair or replace.

Check fusible link, battery, wiring, ignition switch, clutch start switch, starter relay and neutral start switch.
 BAD → Repair or replace.

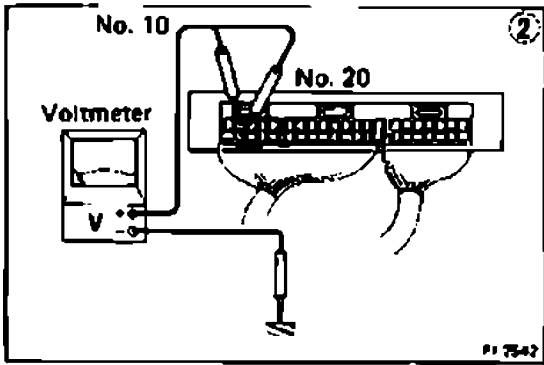


③ Check that there is voltage at STA (50) terminal of starter. (IG S/W START) STD voltage: 6 – 12 V
 OK → Check starter
 NO → Check wiring between ignition switch terminal ST1 and starter terminal STA (50).



① No voltage between ECU terminals No. 10 and/or No. 20 and E01 and/or E02. (IG S/W ON)

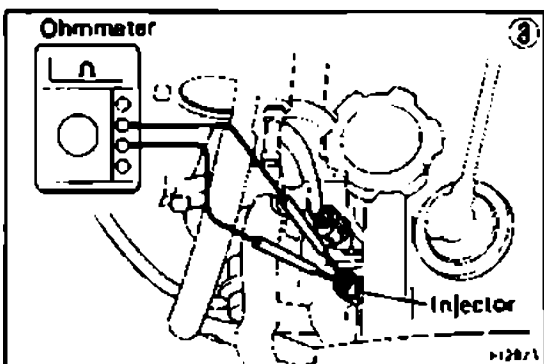
② Check that there is voltage between ECU terminal No. 10 and/or No. 20 and body ground.



NO | OK
 Check wiring between ECU terminal E01 and/or E02 and body ground.
 OK | BAD
 Try another ECU. | Repair or replace.

Check fuse, fusible link and ignition switch. BAD | Repair or replace.

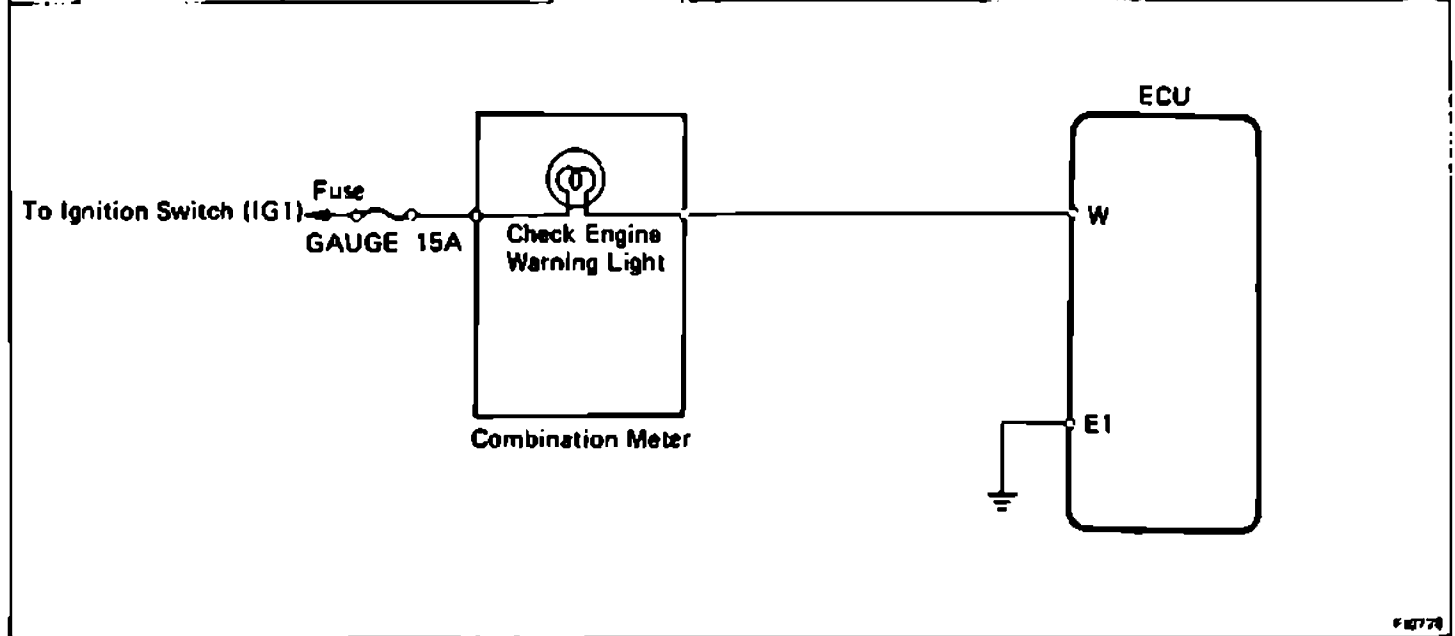
③ Check resistance of each injector. STD resistance: Approx. 13.8 Ω



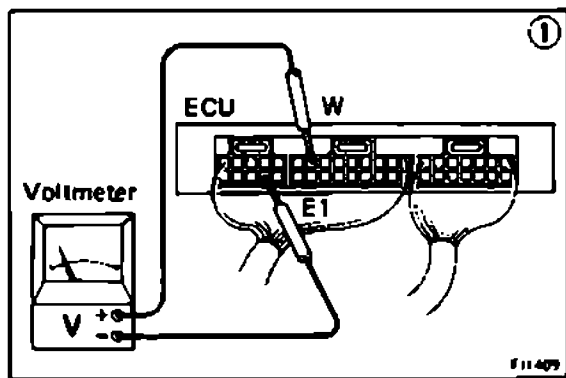
OK | BAD
 Replace injector.

Check wiring between ECU terminal No. 10 and/or No. 20 and battery. BAD | Repair or replace.

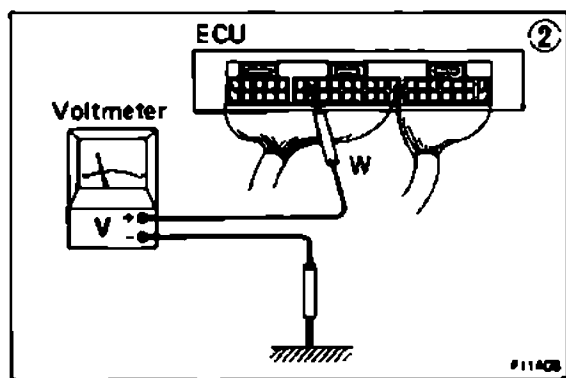
No.	Terminals	Trouble	Condition	STD voltage
7	W – E1	No voltage	No trouble (check engine warning light off) and engine running	8 – 14 V



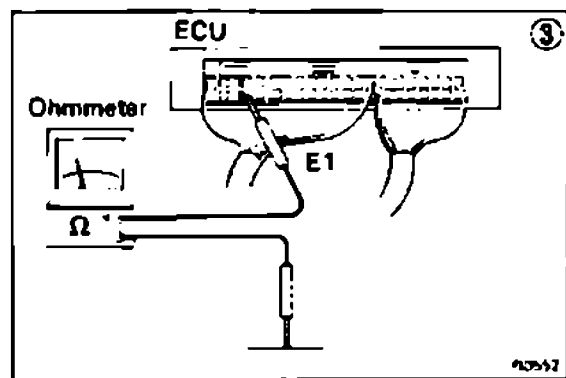
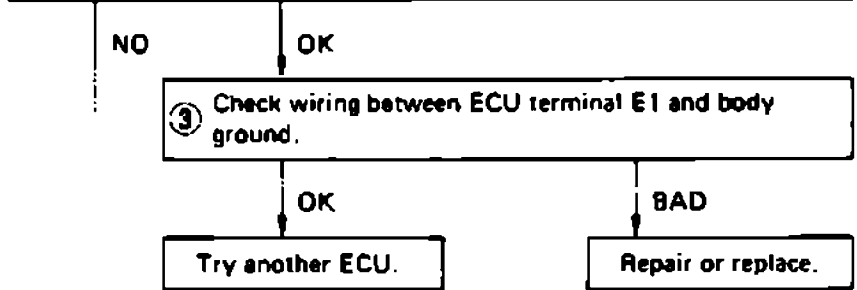
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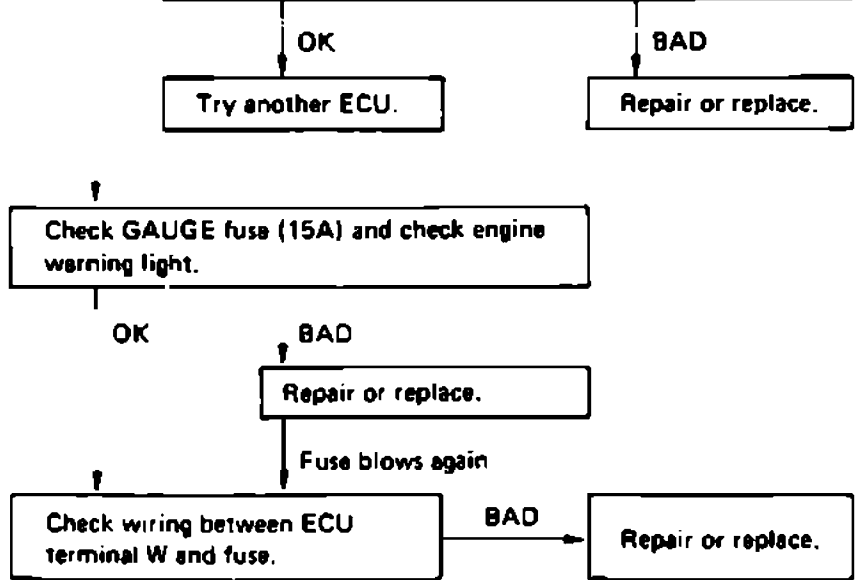
① No voltage between ECU terminals W and E1. (Idling)



② Check that there is voltage between ECU terminal W and body ground.

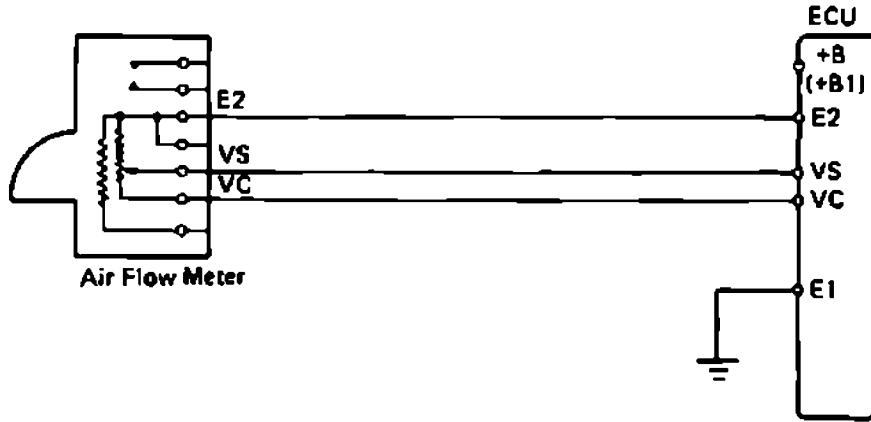


③ Check wiring between ECU terminal E1 and body ground.

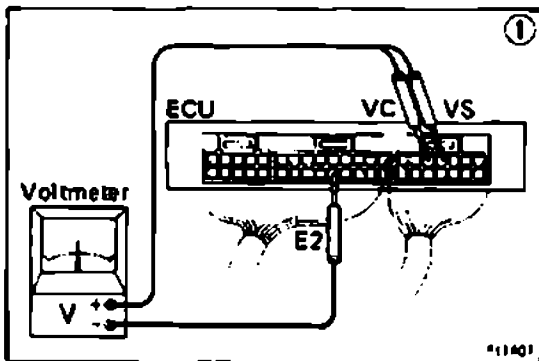


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No.	Terminals	Trouble	Condition		STD voltage
8	VC – E2	No voltage	IG S/W ON	—	4 – 6 V
	VS – E2			Measuring plate fully closed	4 – 5 V
				Measuring plate fully open	0.02 – 0.5 V
				Idling	2 – 4 V



FI-26B



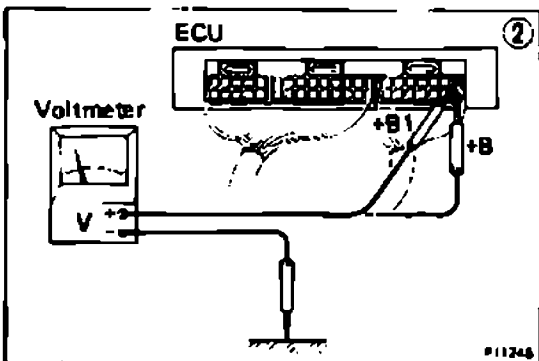
① No specified voltage at ECU terminals VC or VS and E2. (IG S/W ON)

② Check that there is voltage between ECU terminal +B or +B1 and body ground. (IG S/W ON)

OK

NO

Refer to No. 1. (See page FI-32)



Check wiring between ECU terminal E1 or E2 and body ground.

OK

BAD

③ Check air flow meter. (See page FI-84)

Repair or replace.

BAD

OK

Replace air flow meter.

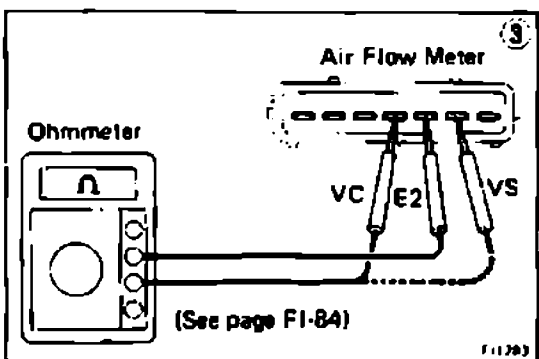
Check wiring between ECU and air flow meter.

OK

BAD

Try another ECU.

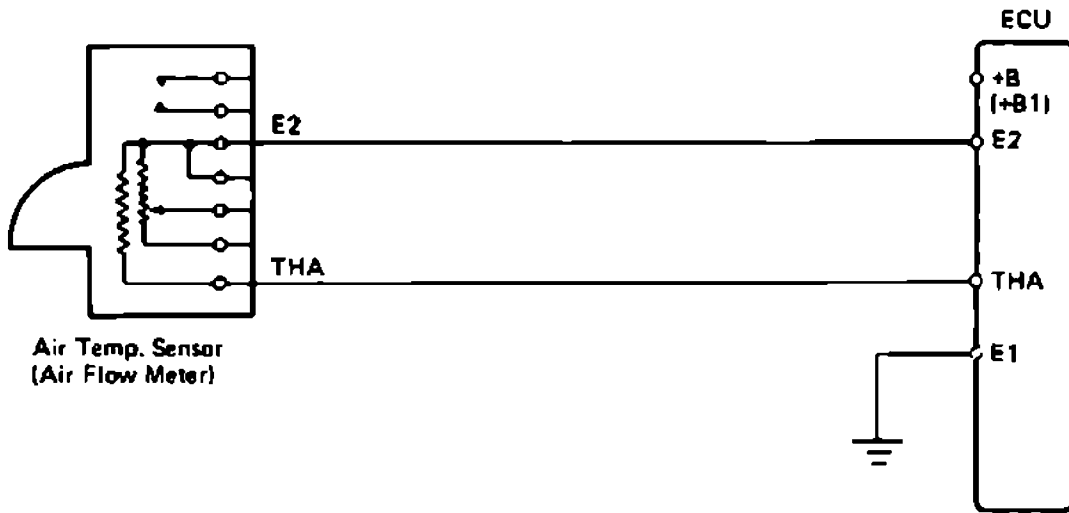
Repair or replace.



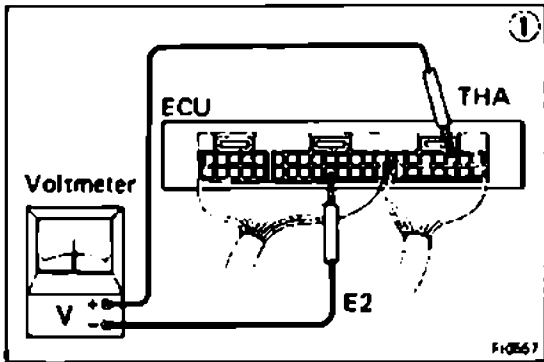
(See page FI-84)

FI-26C

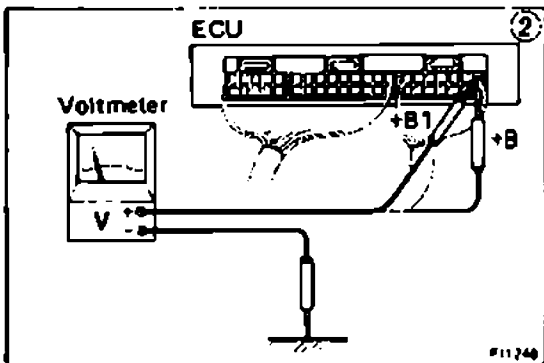
No.	Terminals	Trouble	Condition		STD voltage
			IG S/W ON	Intake air temperature 20°C (68°F)	
9	THA – E2	No voltage	IG S/W ON	Intake air temperature 20°C (68°F)	1 – 3 V



911222



① No voltage between ECU terminals THA and E2. (IG S/W ON)



② Check that there is voltage between ECU terminal +B or +B1 and body ground. (IG S/W ON)

OK

NO

Refer to No. 1. (See page F1-32)

Check wiring between ECU terminal E1 and body ground.

OK

BAD

③ Check air temp. sensor. (See page F1-84)

Repair or replace.

BAD

OK

Replace air flow meter.

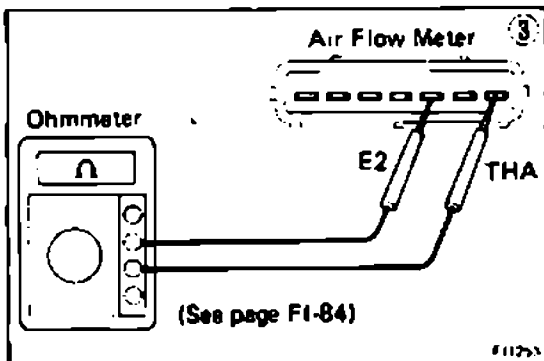
Check wiring between ECU and air temp. sensor.

Try another ECU.

OK

BAD

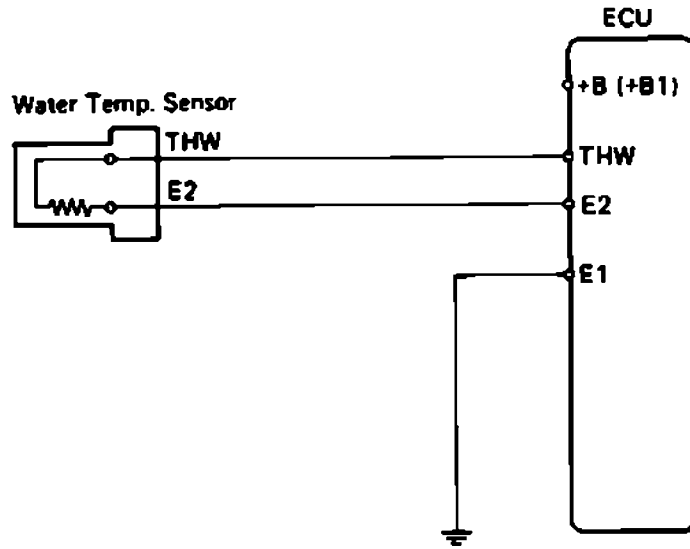
Repair or replace.



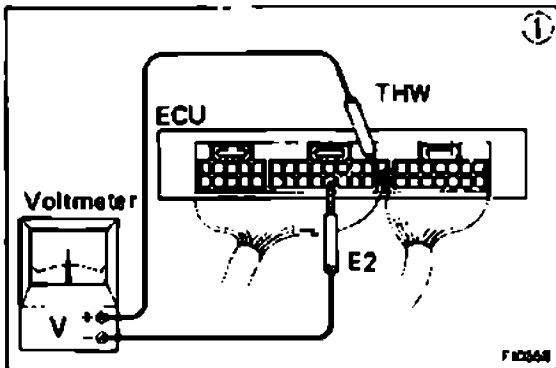
(See page F1-84)

F11253

No.	Terminals	Trouble	Condition		STD voltage
			IG S/W ON	Coolant temperature 80°C (176°F)	
10	THW – E2	No voltage	IG S/W ON	Coolant temperature 80°C (176°F)	0.1 – 1.0 V



FI0487



FI0548

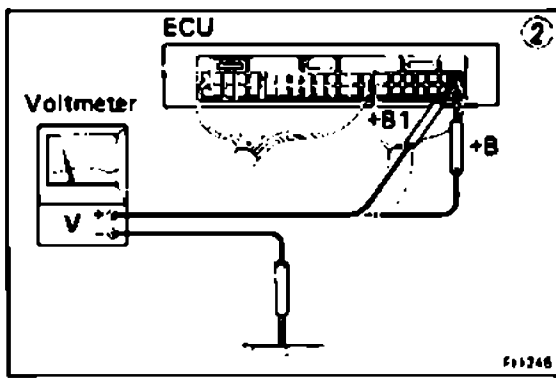
① No voltage between ECU terminals THW and E2. (IG S/W ON)

② Check that there is voltage between ECU terminal +B or +B1 and body ground. (IG S/W ON)

OK

NO

Refer to No. 1. (See page FI-32)



FI1246

Check wiring between ECU terminal E1 and body ground.

OK

BAD

③ Check water temp. sensor. (See page FI-100)

Repair or replace.

BAD

OK

Replace water temp. sensor.

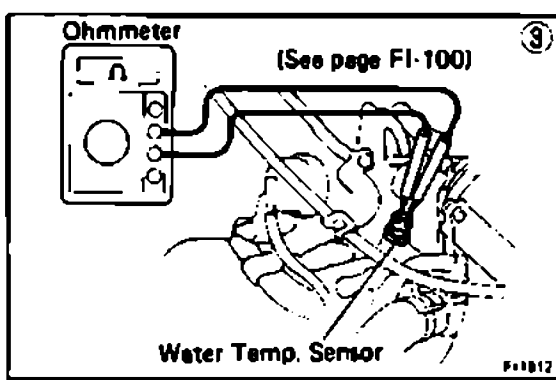
Check wiring between ECU and water temp. sensor.

OK

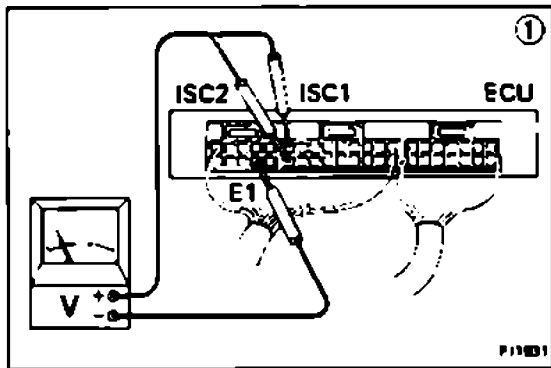
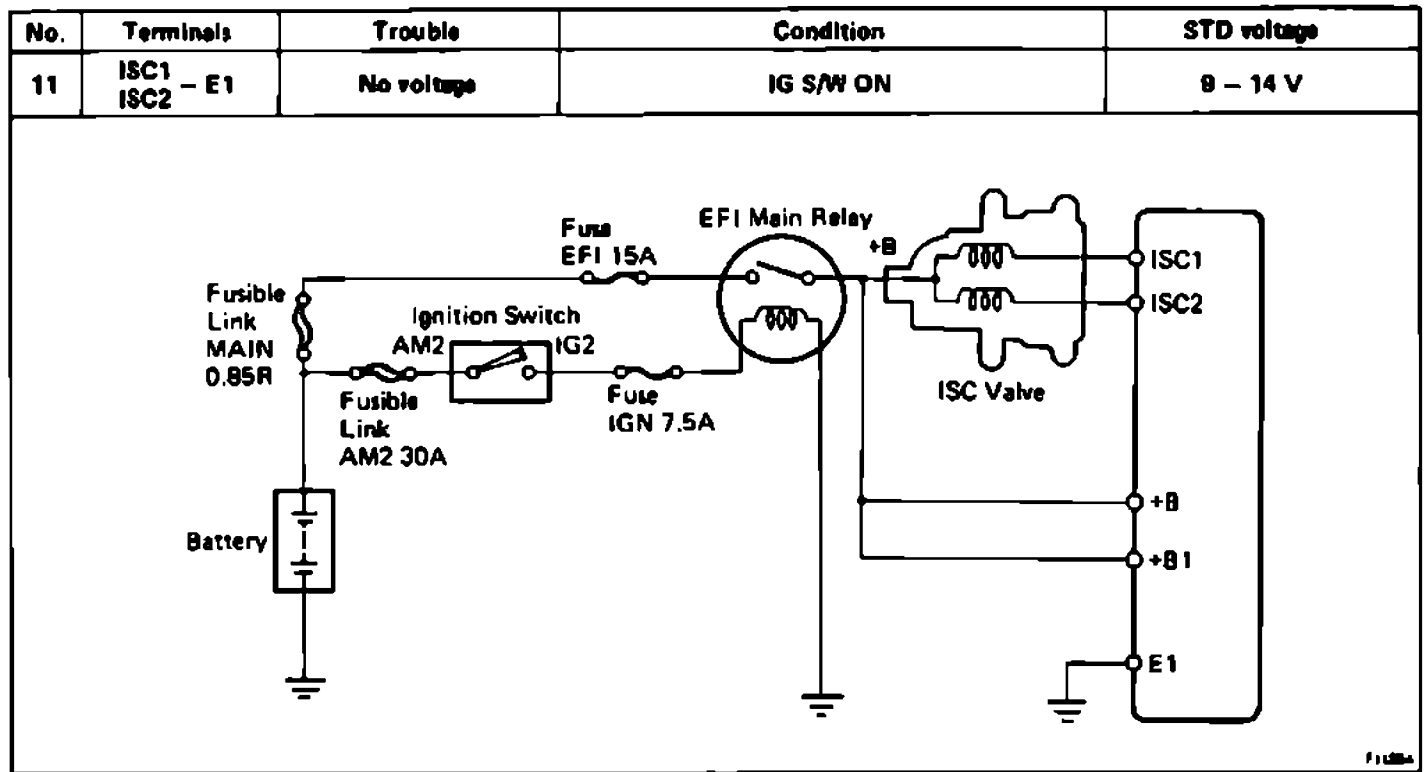
BAD

Try another ECU.

Repair or replace.



FI1812



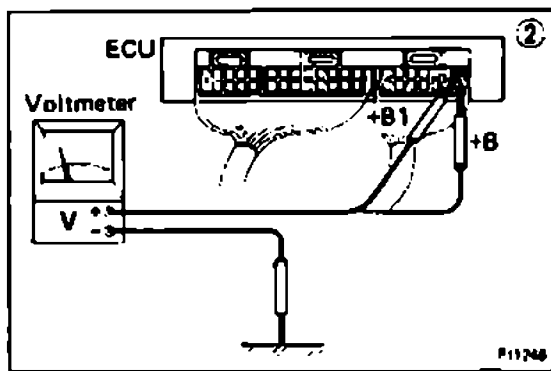
① There is no voltage between ECU terminals ISC1 or ISC2 and E1. (IG S/W ON)

② Check that there is voltage between ECU terminal +B or +B1 and body ground. (IG S/W ON)

OK

NO

Refer to No. 1.
(See page FI-32)



③ Check resistance between ISC valve terminals +B and ISC1 or ISC2. STD resistance: Approx. 16Ω

BAD

Replace ISC valve.

OK

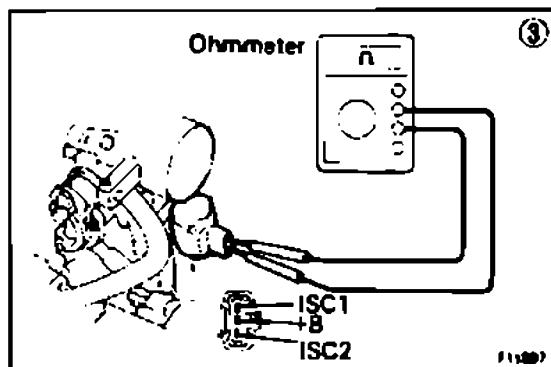
Check wiring between ECU and ISC valve.

BAD

Repair or replace wiring.

OK

Try another ECU.



No.	Terminals	Trouble	Condition	STD voltage
12	A/C – E1	No voltage	Air conditioning ON	8 – 14 V

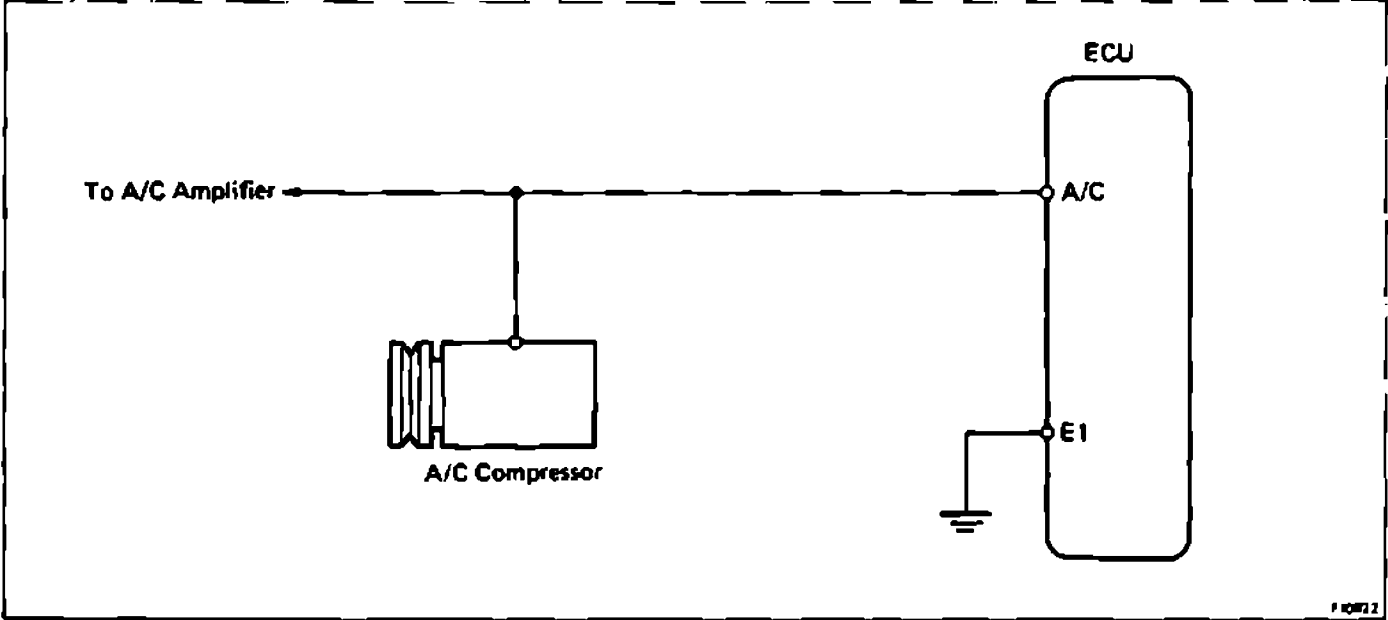
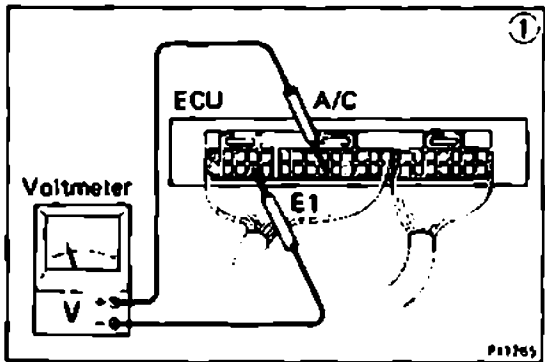
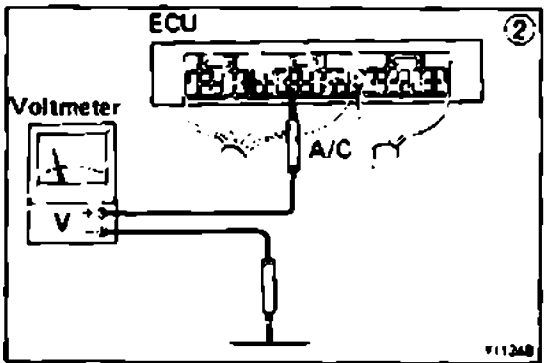


FIGURE 2

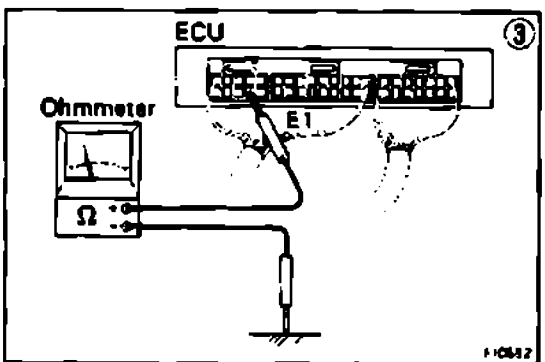


① No voltage between ECU terminals A/C and E1. (Air conditioning ON)

② Check that there is voltage between ECU terminal A/C and body ground.



NO → Check compressor running.
 OK → ③ Check wiring between ECU terminal E1 and body ground.
 OK → Try another ECU.
 BAD → Repair or replace.



Check compressor running.
 OK → Check wiring between ECU terminal A/C and amplifier.
 BAD → Repair or replace.

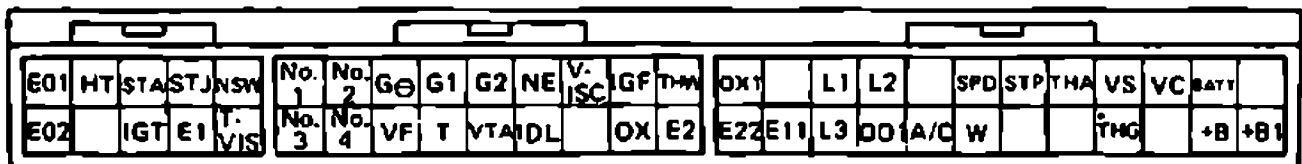
Check that there is voltage between amplifier terminal and body ground.
 BAD → Repair or replace.
 OK → Check wiring between amplifier and ECU or compressor.
 BAD → Repair or replace.

FIGURE 2

Terminals of ECU (3S-GE)

Symbol	Terminal name	Symbol	Terminal name	Symbol	Terminal name
E01	ENGINE GROUND	G1	DISTRIBUTOR	L3	ECU ECT
E02	ENGINE GROUND	T	CHECK CONNECTOR	L2	ECU ECT
HT	OXYGEN SENSOR HEATER	G2	DISTRIBUTOR	ODI	ECU ECT
STA	STARTER SWITCH	VTA	THRTTLE POSITION SENSOR	A/C	A/C MAGNET SWITCH
IGT	IGNITER	NE	DISTRIBUTOR	SPD	SPEED SENSOR
STJ	COLD START SWITCH	IDL	THROTTLE POSITION SENSOR	W	WARNING LIGHT
E1	ENGINE GROUND	V-ISC	IDLE-UP VSV	STP	STOP LIGHT SWITCH
NSW	NEUTRAL START SWITCH	IGF	IGNITER	THA	AIR TEMP. SWITCH
T-VIS	T-VIS VSV	OX	OXYGEN SENSOR	VS	AIR FLOW METER
No. 1	No. 1 INJECTOR	THW	WATER TEMP. SWITCH	*THG	EGR GAS TEMP. SENSOR
No. 2	No. 2 INJECTOR	E2	SENSOR GROUND	VC	AIR FLOW METER
No. 3	No. 3 INJECTOR	OX1	OXYGEN SENSOR	BATT	BATTERY
No. 4	No. 4 INJECTOR	E22	SENSOR GROUND	+B	MAIN RELAY
G⊖	DISTRIBUTOR	E11	ENGINE GROUND	+B1	MAIN RELAY
VF	CHECK CONNECTOR	LT	ECU ECT	*CALIF. only	

ECU Terminals



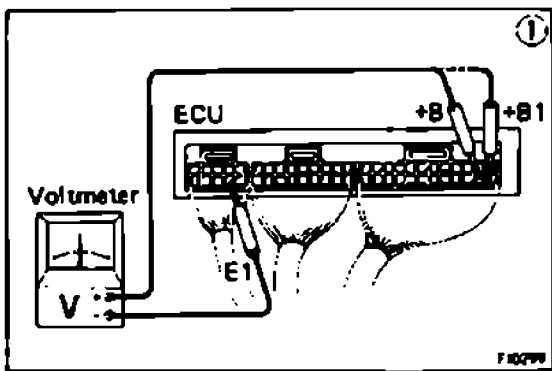
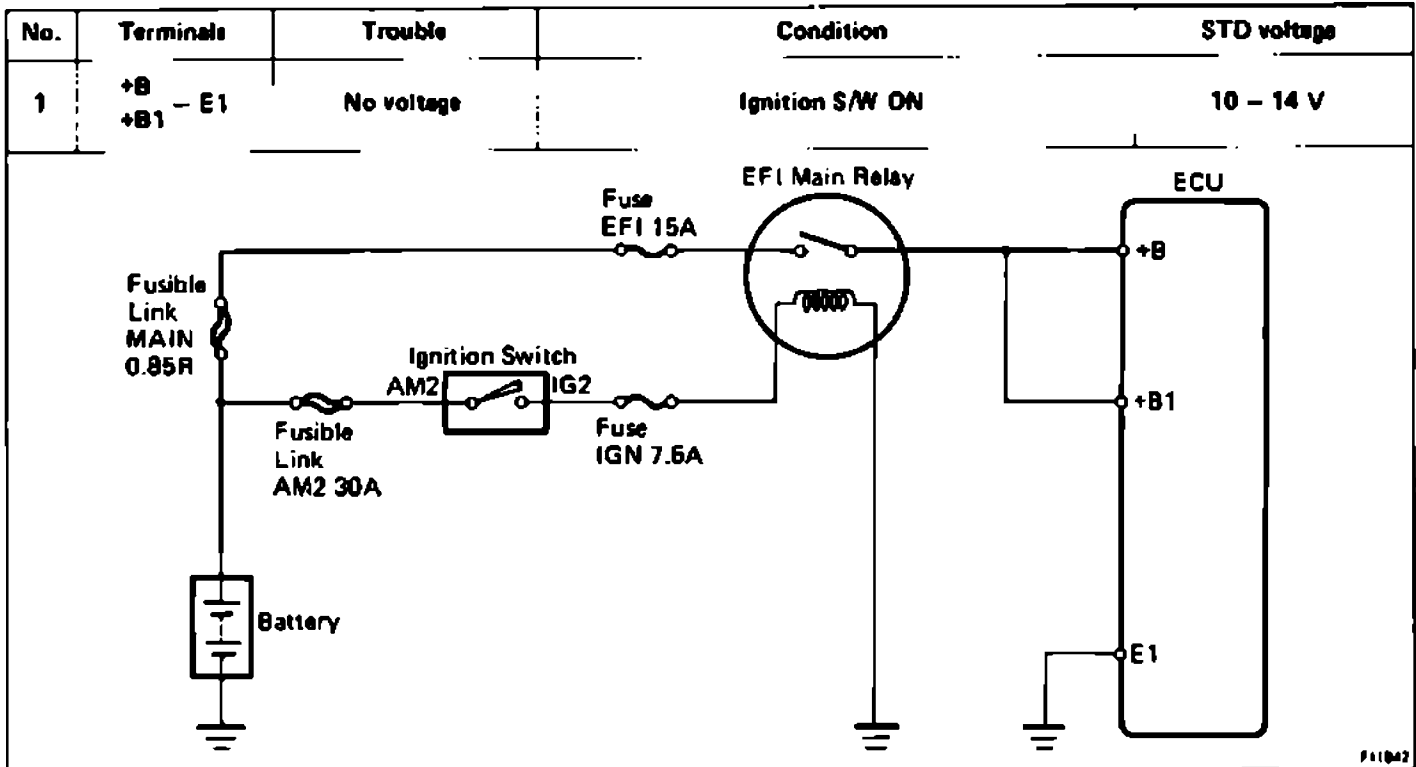
Voltage at ECU Wiring Connectors (3S-GE)

No.	Terminals	STD voltage (V)	Condition		See page	
1	+B - E1 +B1	10 – 14	Ignition S/W ON		FI-46	
2	BATT – E1	10 – 14	-		FI-47	
3	IDL – E2	^{*1} 4 – 6 or ^{*2} 8 – 14	Ignition S/W ON	Throttle valve open	FI-48	
	VTA – E2	0.1 – 1.0		Throttle valve fully closed		
		4 – 5		Throttle valve fully open		
VC – E2	4 – 6					
4	IGT – E1	0.7 – 1.0	Cranking or idling		FI-90	
5	STA – E1	6 – 14	Cranking		FI-51	
8	No. 1	9 – 14	Ignition S/W ON		FI-62	
	No. 2 E01					
	No. 3 E02					
	No. 4					
7	W – E1	8 – 14	No trouble (check engine warning light off) and engine running		FI-53	
8	VC – E2	4 – 6	Ignition S/W ON	Measuring plate fully closed	FI-54	
	VS – E2	4 – 5				Measuring plate fully open
		0.02 – 0.5		Idling		
	2 – 4					
9	THA – E2	1 – 3	Intake air temperature 20°C (68°F)		FI-55	
10	THW – E2	0.1 – 1.0	Ignition S/W ON	Coolant temperature 80°C (176°F)		FI-56
11	A/C – E1	8 – 14	Air conditioning ON		FI-57	

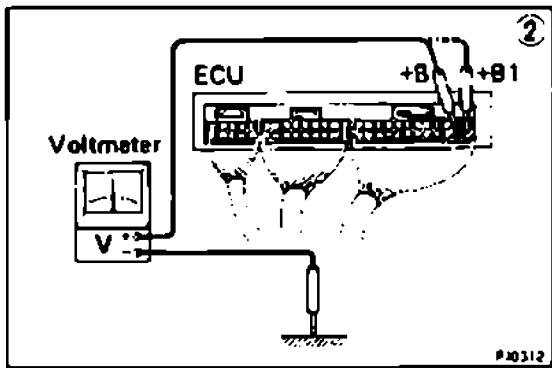
*1 w/o ECT
*2 w/ ECT
*3 CALIF. only

ECU Terminals

E01	HT	STA	STJ	NSW	No. 1	No. 2	G0	G1	G2	NE	V-ISC	IG	THW	OX1	L1	L2	SPD	STR	THA	VS	VC	BATT
E0		IGT	E2	T-VIS	No. 3	No. 4	VF	T	VTA	IDL		OX	E2	E2E	I1	L3	OD	A/C	W	^{*3} THG		+B +B1



① No voltage between ECU terminals +B or +B1 and E1. (IG S/W ON)



② Check that there is voltage between ECU terminal +B or +B1 and body ground. (IG S/W ON)

NO

OK

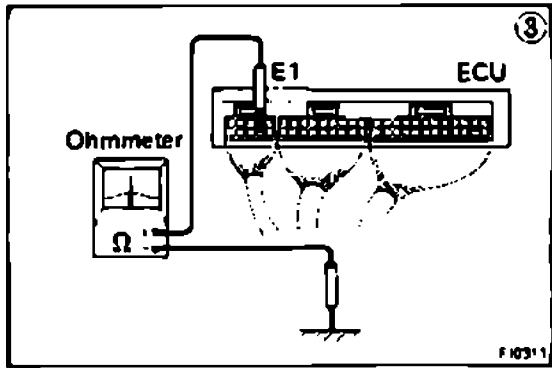
③ Check wiring between ECU terminal E1 and body ground.

OK

BAD

Try another ECU.

Repair or replace.



Check fuse, fusible link and ignition switch.

BAD

Repair or replace.

OK

Check EFI main relay.

BAD

Replace.

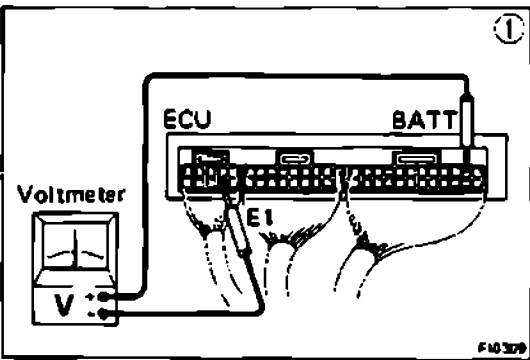
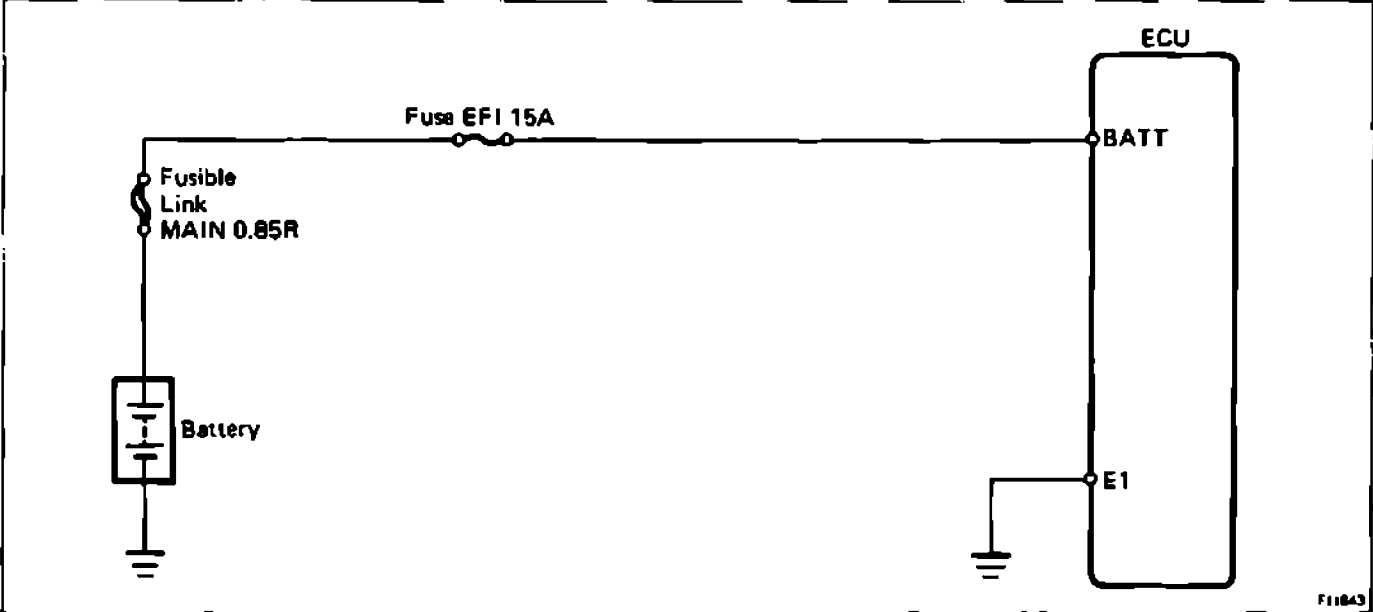
OK

Check wiring between EFI main relay and battery.

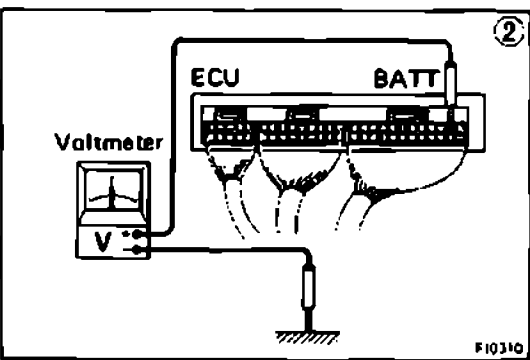
BAD

Repair or replace.

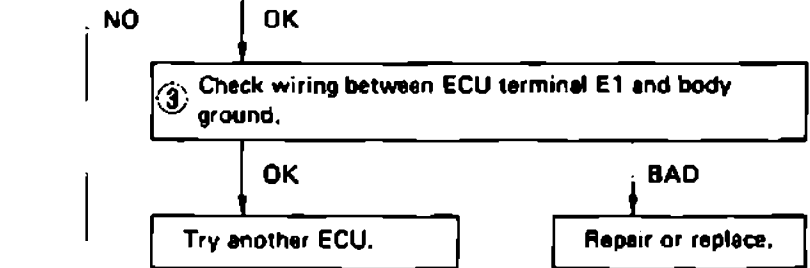
No.	Terminals	Trouble	Condition	STD voltage
2	BATT – E1	No voltage	–	10 – 14 V



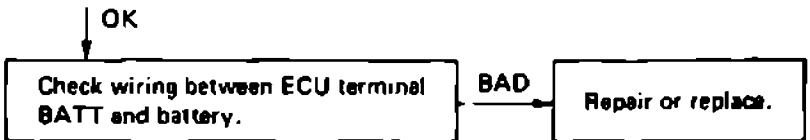
① No voltage between ECU terminals BATT and E1.



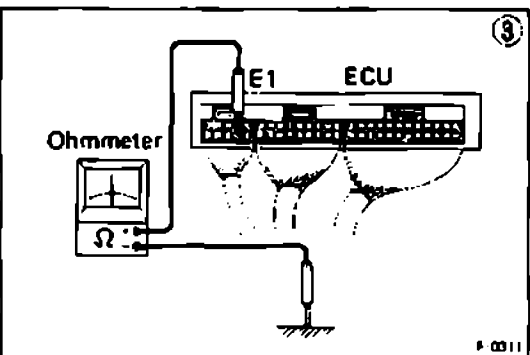
② Check that there is voltage between ECU terminal BATT and body ground.



Check fuse and fusible link. BAD → Replace.

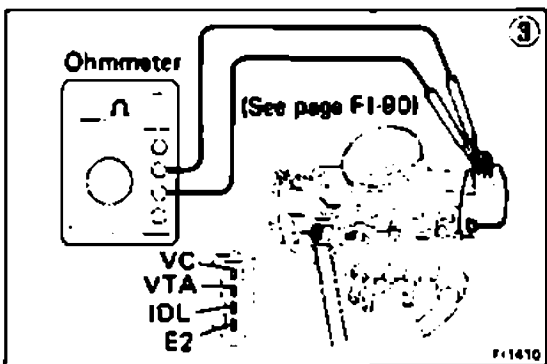
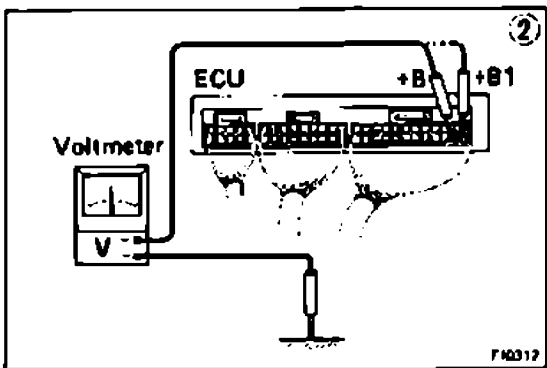
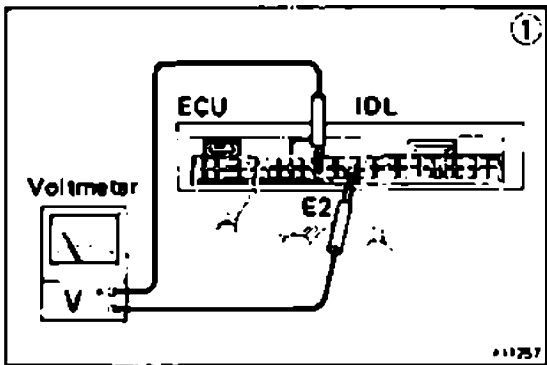
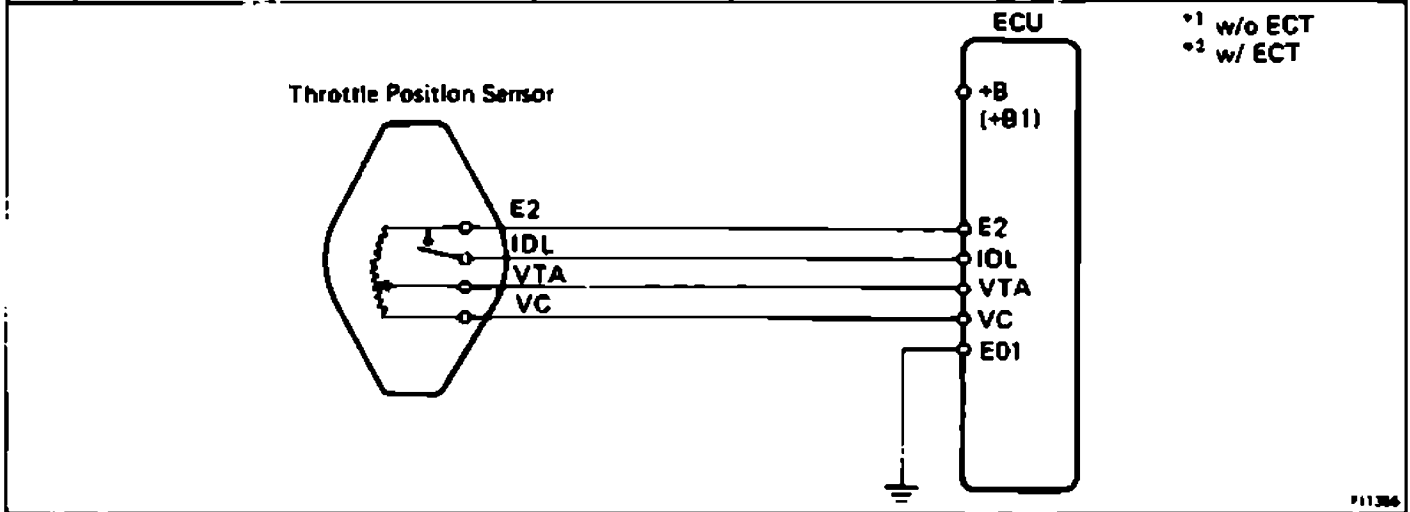


Check wiring between ECU terminal BATT and battery. BAD → Repair or replace.



③ Check wiring between ECU terminal E1 and body ground.
 OK → Try another ECU.
 BAD → Repair or replace.

No.	Terminals	Trouble	Condition	STD voltage	
3	IDL – E2	No voltage	IG S/W ON	Throttle valve open	*1 4 – 8 V or *2 8 – 14 V
	VTA – E2			Throttle valve fully closed	0.1 – 1.0 V
	VC – E2			Throttle valve fully open	4 – 5 V
					4 – 6 V



• IDL – E2

① No voltage between ECU terminals IDL and E2. (IG S/W ON) (Throttle valve open)

② Check that there is voltage between ECU terminal +B or +B1 and body ground. (IG S/W ON)

NO

OK

Check wiring between ECU terminal E1 and body ground.

BAD

Repair or replace.

Refer to No. 1. (See page FI-46)

BAD

Repair or replace.

OK

③ Check throttle position sensor. (See page FI-90)

BAD

Repair or replace throttle position sensor.

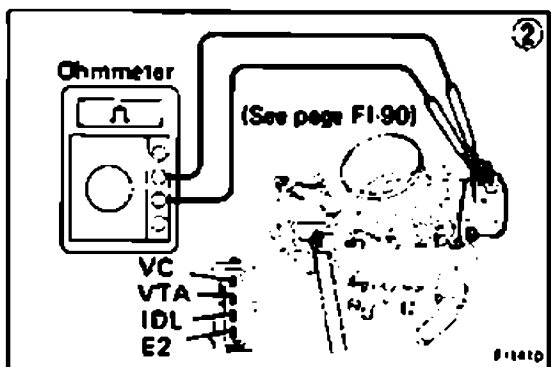
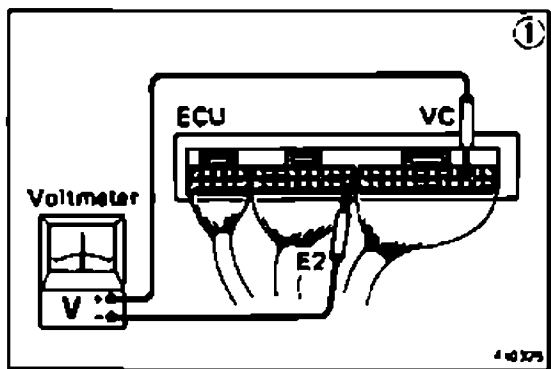
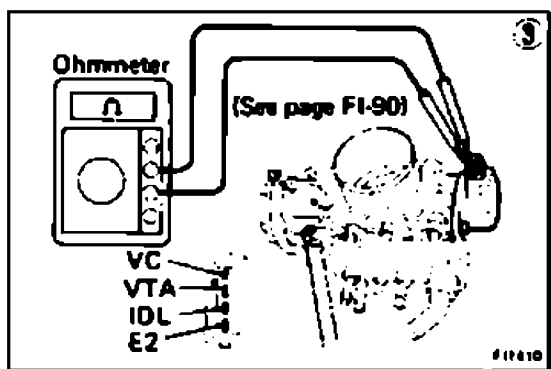
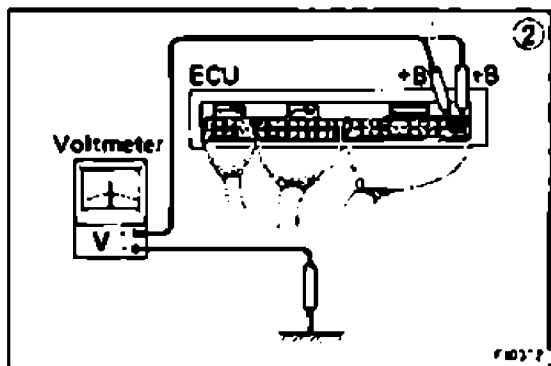
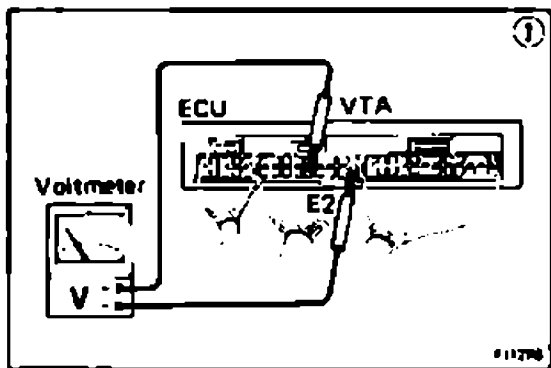
OK

Check wiring between ECU and throttle position sensor.

BAD

OK

Try another ECU.



• VTA – E2

```

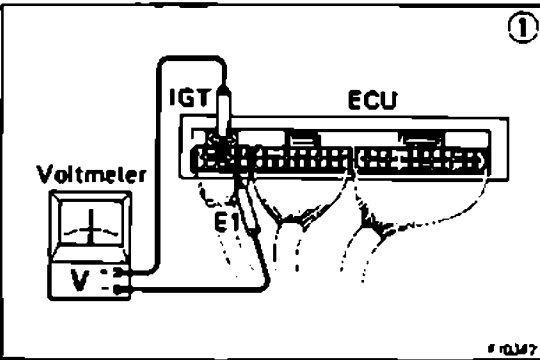
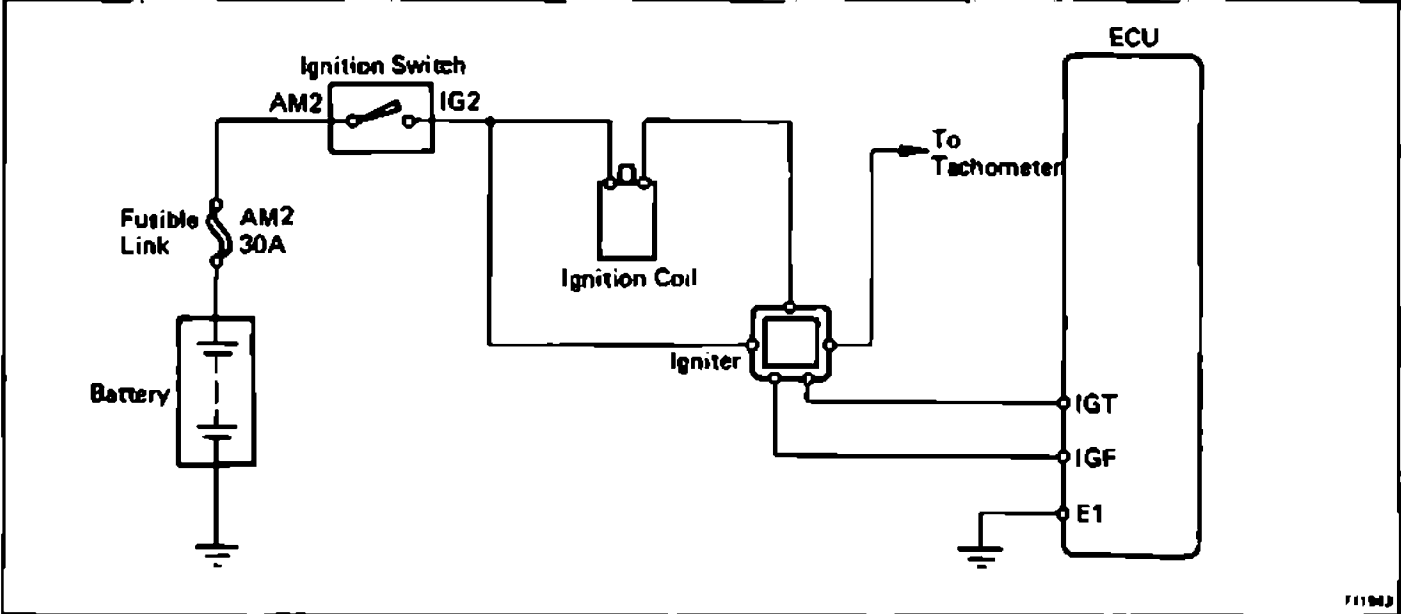
    graph TD
      A["① No specified voltage at ECU terminals VTA and E2.  
(IG S/W ON)"] --> B["② Check that there is voltage between ECU terminal +B or +B1 and  
body ground. (IG S/W ON)"]
      B -- NO --> C["Check wiring between ECU terminal E2 and body  
ground."]
      C -- BAD --> D["Repair or replace."]
      C -- OK --> E["Refer to No. 1. (See page FI-48)"]
      E -- BAD --> F["Repair or replace."]
      E -- OK --> G["③ Check throttle position sensor.  
(See page FI-90)"]
      G -- BAD --> H["Repair or replace."]
      G -- OK --> I["Check wiring between ECU and  
throttle position sensor."]
      I -- BAD --> J["Repair or replace."]
      I -- OK --> K["Try another ECU."]
    
```

• VC – E2

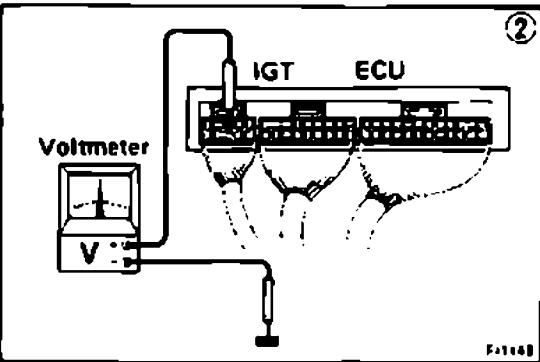
```

    graph TD
      A["① No voltage between ECU terminals VC and E2.  
(IG S/W ON)"] --> B["Check that there is voltage between ECU terminal +B or +B1 and  
body ground. (IG S/W ON)"]
      B -- NO --> C["Refer to No. 1.  
(See page FI-48)"]
      B -- OK --> D["② Check throttle position  
sensor. (See page FI-90)"]
      D -- BAD --> E["Repair or replace."]
      D -- OK --> F["Check wiring between ECU and throttle  
position sensor."]
      F -- OK --> G["Try another ECU."]
      F -- BAD --> H["Repair or replace  
wiring."]
    
```

No.	Terminals	Trouble	Condition	STD voltage
4	IGT – E1	No voltage	Cranking or Idling	0.7 – 1.0 V



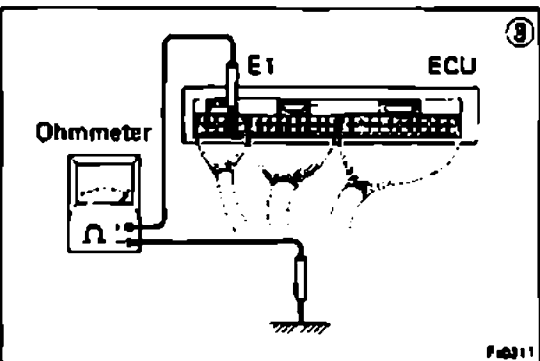
① No voltage between ECU terminals IGT and E1. (Cranking or Idling)



② Check that there is voltage between ECU terminal IGT and body ground. (Idling)

```

    graph TD
        A[② OK] --> B[③ Check wiring between ECU terminal E1 and body ground.]
        B -- BAD --> C[Repair or replace.]
        B -- OK --> D[Try another ECU.]
    
```



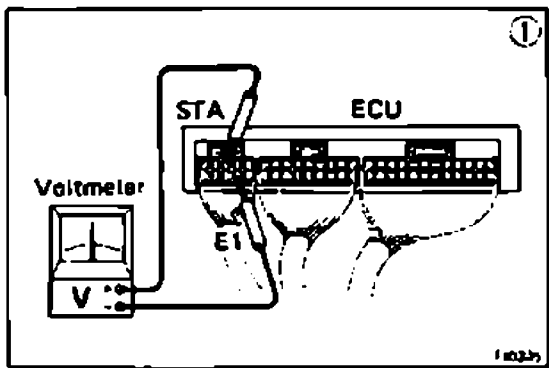
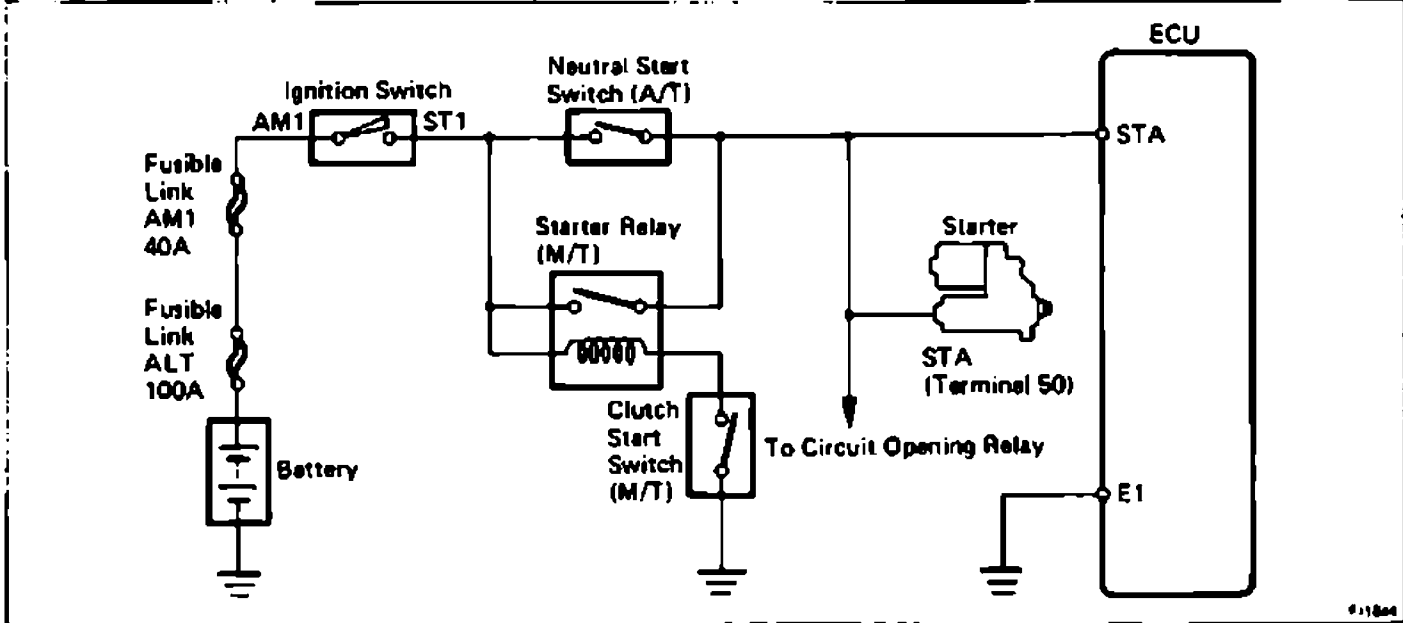
Check fuse, fusible link and ignition switch. BAD → Repair or replace.

Check distributor. (See page IG-10) BAD → Repair or replace.

Check wiring between ECU and battery. BAD → Repair or replace.

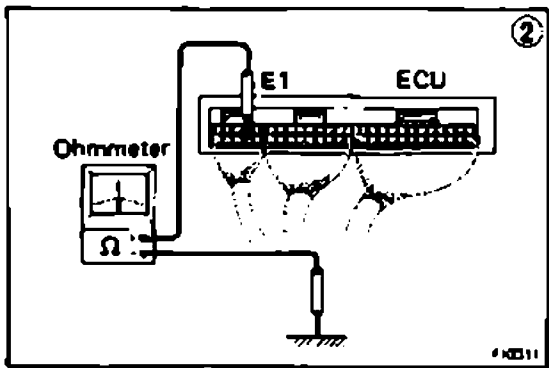
Check igniter. (See page IG-10) BAD → Repair or replace.

No.	Terminals	Trouble	Condition	STD voltage
5	STA – E1	No voltage	Cranking	8 – 14 V



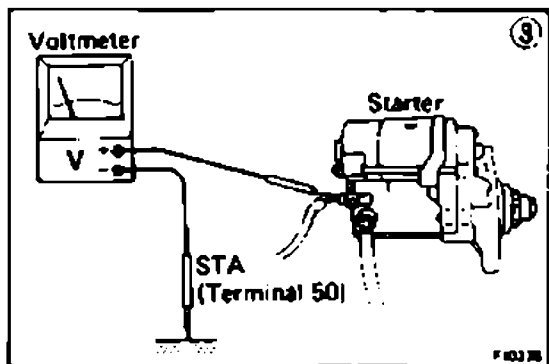
① No voltage between ECU terminals STA and E1. (IG S/W START)

Check starter operation. OK → Check wiring between ECU terminal STA and ignition switch terminal ST1. BAD → Repair or replace.



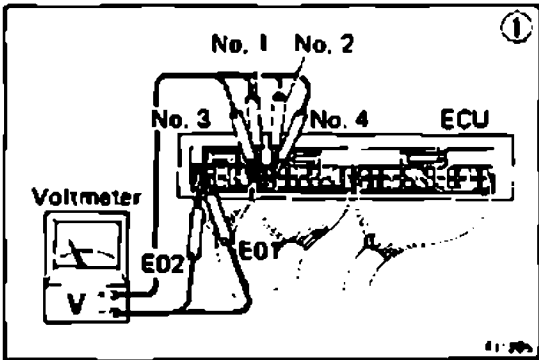
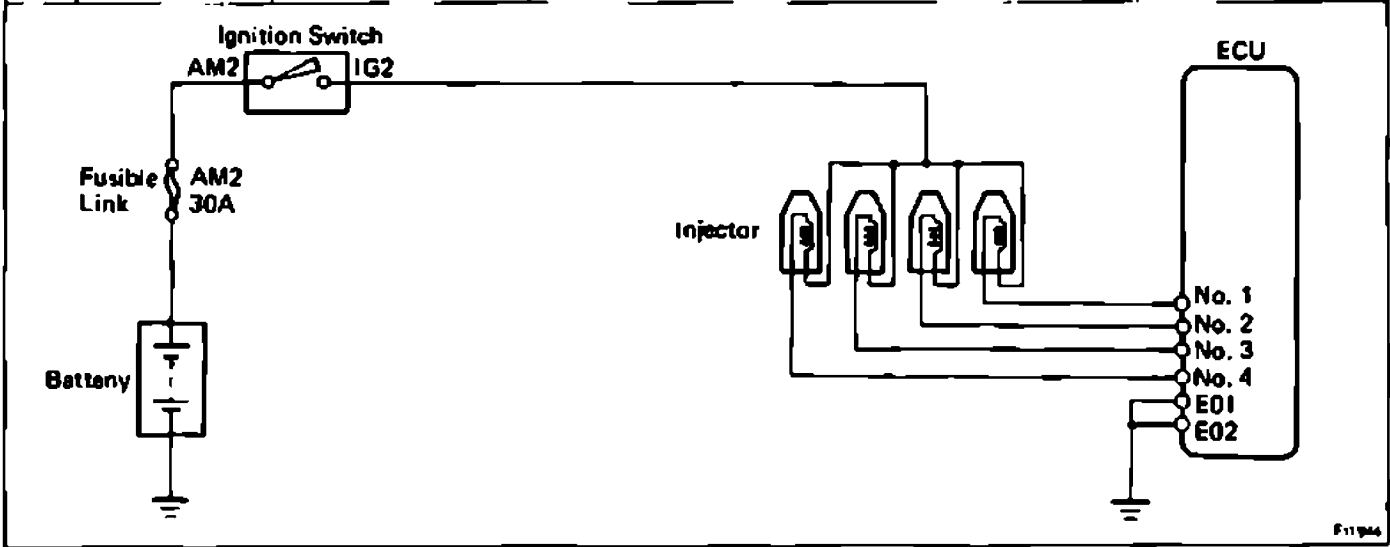
② Check wiring between ECU terminal E1 and body ground. OK → Try another ECU. BAD → Repair or replace.

Check fusible link, battery, wiring, ignition switch clutch start switch, starter relay and neutral start switch. BAD → Repair or replace.

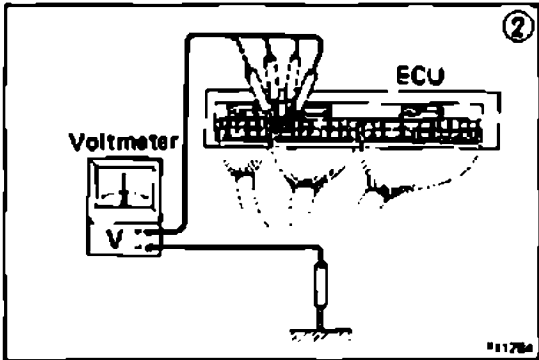


③ Check that there is voltage at STA (50) terminal of starter. (IG S/W START) STD voltage: 8 – 12 V. OK → Check starter. NO → Check wiring between ignition switch terminal ST1 and starter terminal STA (50).

No.	Terminals	Trouble	Condition	STD voltage
6	No.1 No.2 – E01 No.3 – E02 No.4	No voltage	IG S/W ON	8 – 14 V



① No voltage between ECU terminals No. 1, No. 2, No. 3 and/or No. 4 and E01 and/or E02. (IG S/W ON)

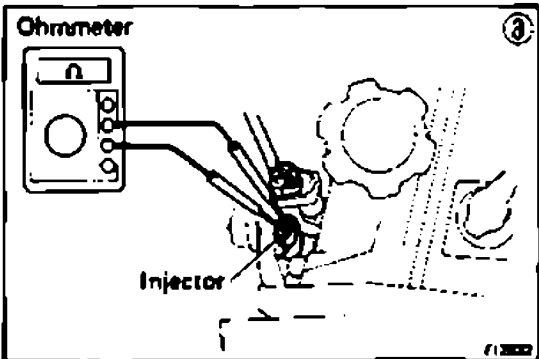


② Check that there is voltage between ECU terminal No. 1, No. 2, No. 3 and/or No. 4 and body ground.

NO → Check wiring between ECU terminal E01 and/or E02 and body ground.

OK → Try another ECU.
BAD → Repair or replace.

Check fusible link and ignition switch. BAD → Repair or replace.



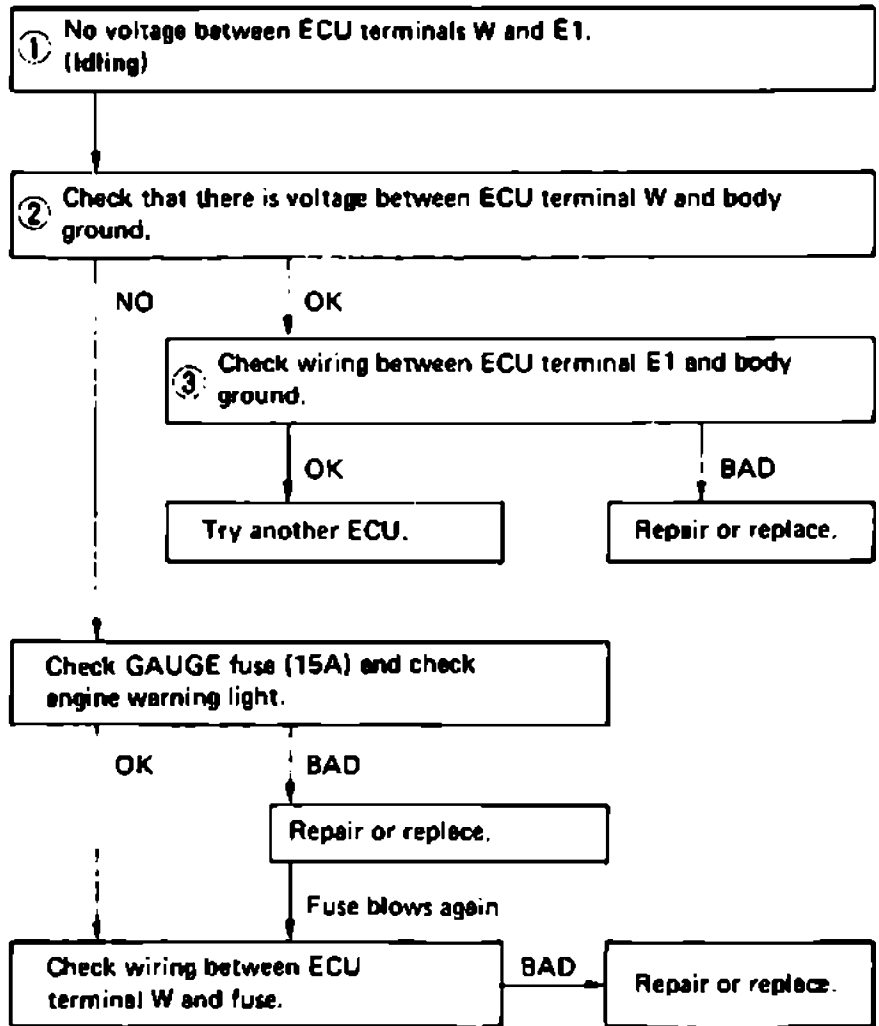
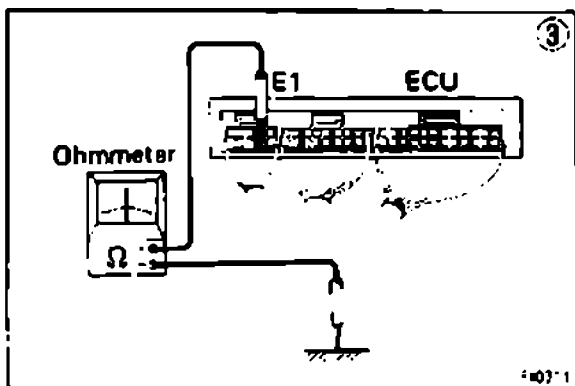
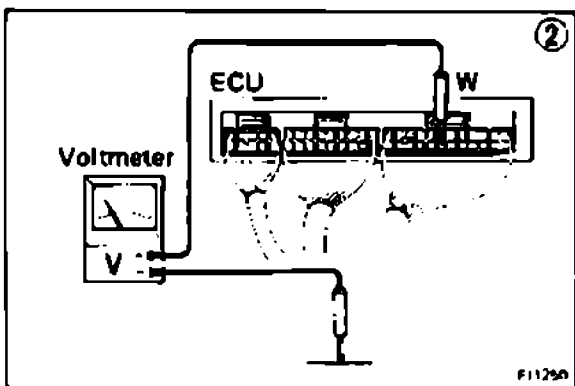
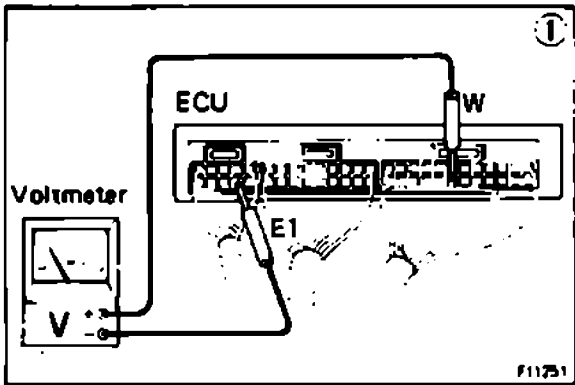
③ Check resistance of each injector. STD resistance: Approx. 13.8 Ω

OK →
BAD → Replace injector.

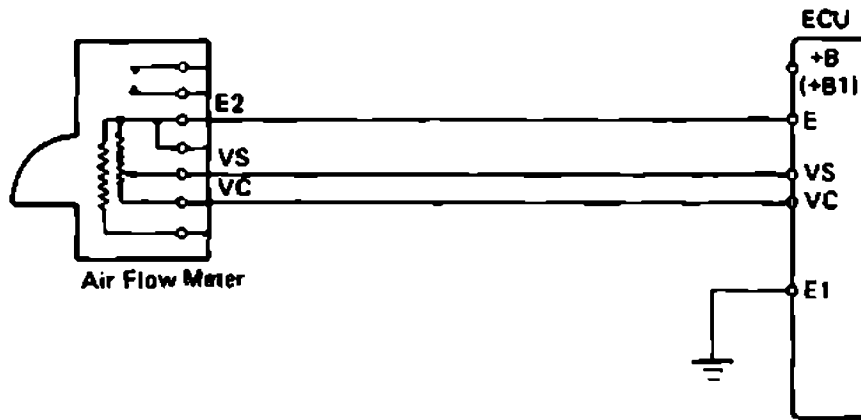
Check wiring between ECU terminal No. 1, No. 2, No. 3 and/or No. 4 and battery. BAD → Repair or replace.

No.	Terminals	Trouble	Condition	STD voltage
7	W – E1	No voltage	No trouble (check engine warning light off) and engine running	8 – 14 V

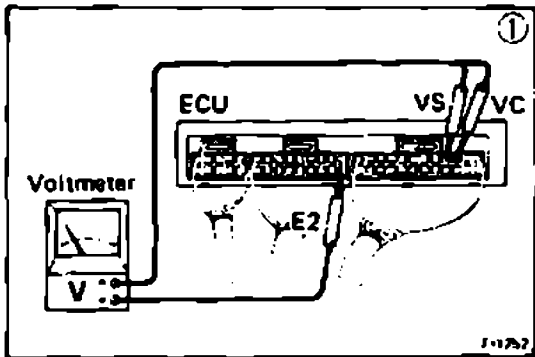
F1276



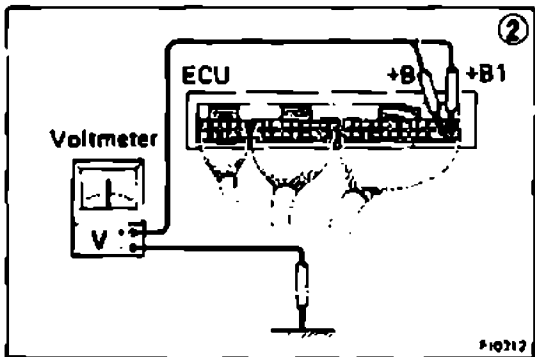
No.	Terminals	Trouble	Condition	STD voltage	
8	VC – E2	No voltage	IG S/W ON	-	4 – 8 V
	VS – E2			Measuring plate fully closed	4 – 5 V
				Measuring plate fully open	0.02 – 0.6 V
				Idling	2 – 4 V



F11209



① No specified voltage at ECU terminals VC or VS and E2. (IG S/W ON)

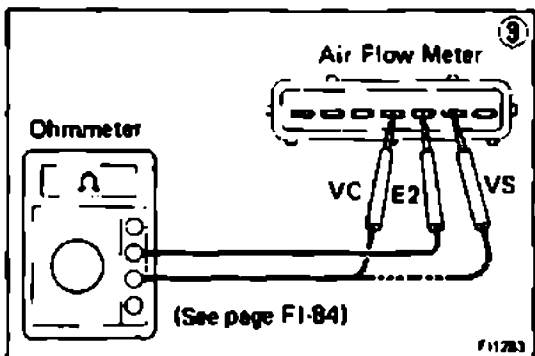


② Check that there is voltage between ECU terminal +B or +B1 and body ground. (IG S/W ON)

OK
NO
Refer to No. 1. (See page FI-46)

Check wiring between ECU terminal E1 and body ground.

OK
BAD
Repair or replace.

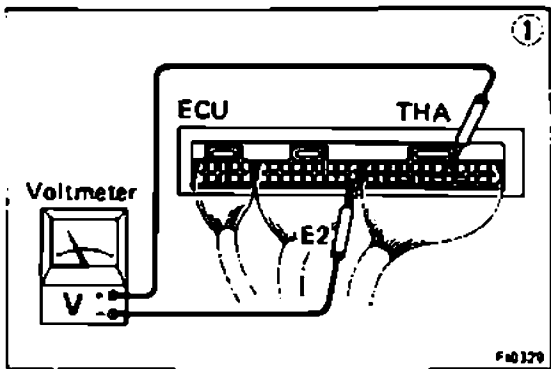
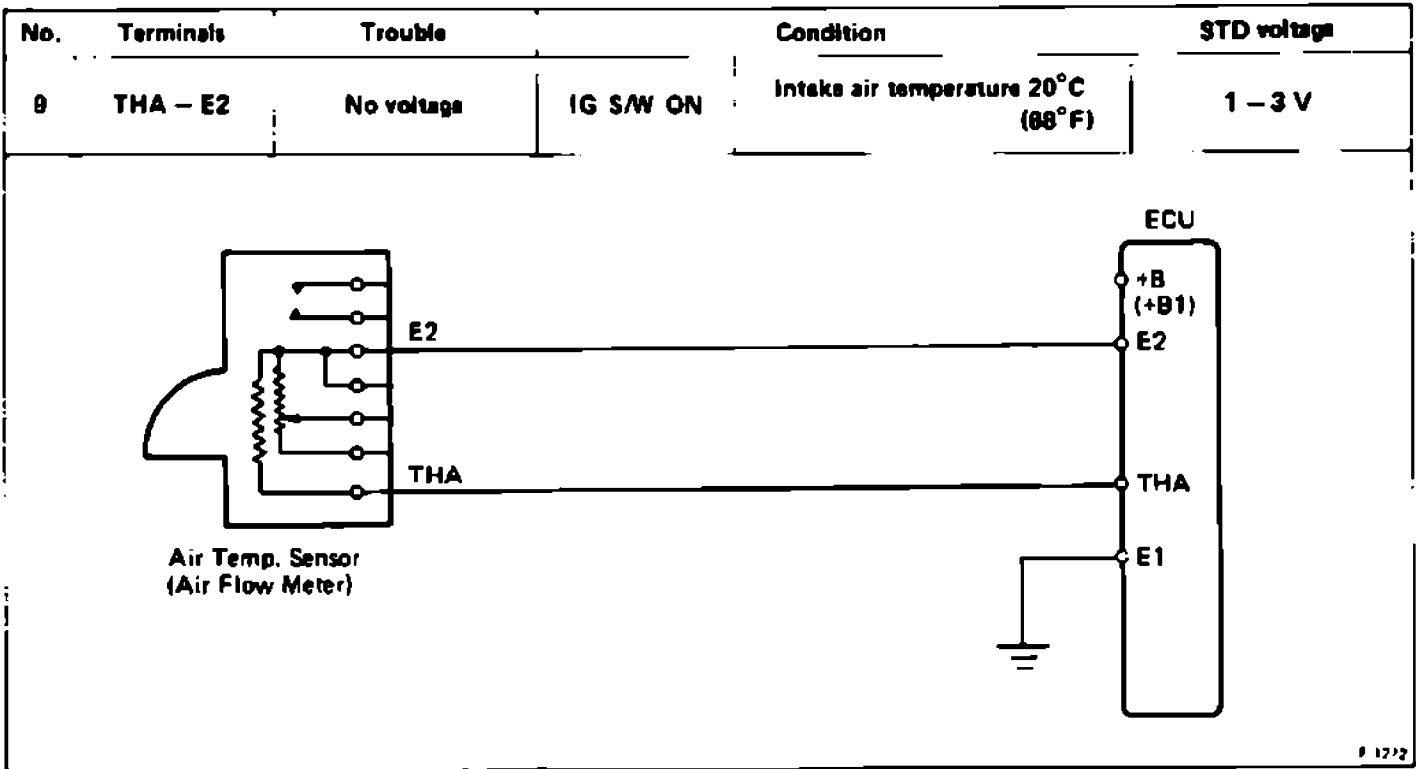


③ Check air flow meter. (See page FI-84)

BAD
OK
Repair or replace air flow meter.
Check wiring between ECU and air flow meter.

OK
BAD
Try another ECU.
Repair or replace.

F11283



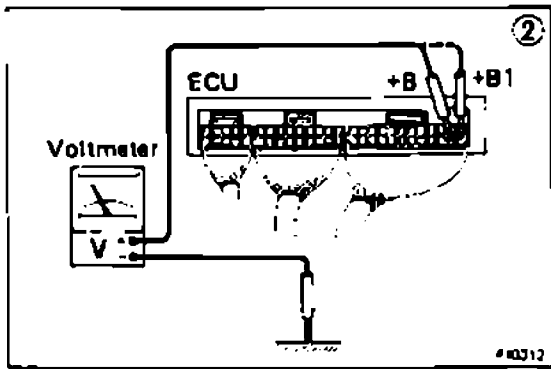
① No voltage between ECU terminals THA and E2. (IG S/W ON)

② Check that there is voltage between ECU terminal +B or +B1 and body ground. (IG S/W ON)

OK

NO

Refer to No. 1. (See page F1-46)



Check wiring between ECU terminal E1 and body ground.

OK

BAD

③ Check air temp. sensor. (See page F1-84)

Repair or replace.

BAD

OK

Replace air flow meter.

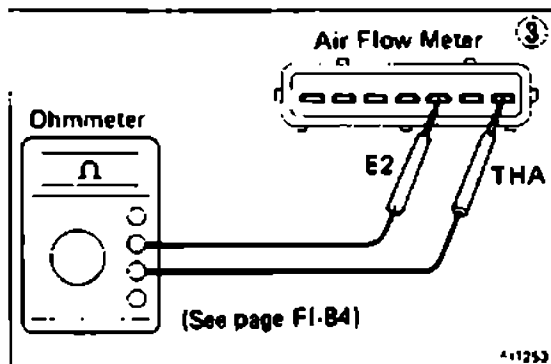
Check wiring between ECU and air temp. sensor.

OK

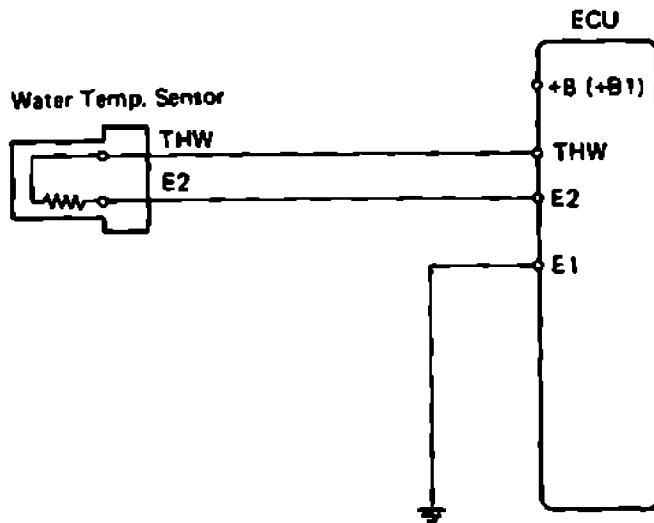
BAD

Try another ECU.

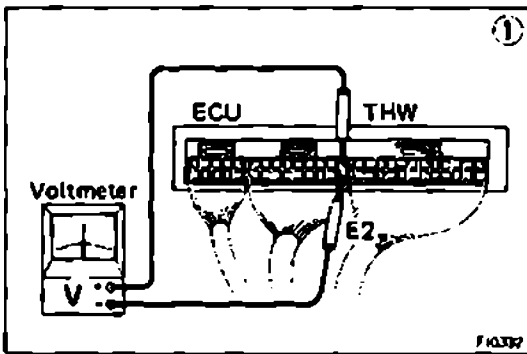
Repair or replace.



No.	Terminals	Trouble	Condition	STD voltage
10	THW – E2	No voltage	IG S/W ON Coolant temperature 80°C (176°F)	0.1 – 1.0 V



F1048Z



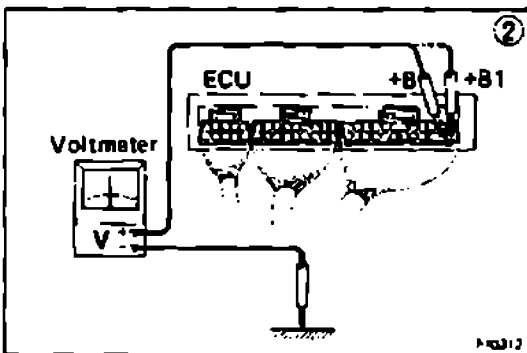
① No voltage between ECU terminals THW and E2. (IG S/W ON)

② Check that there is voltage between ECU terminal +B or +B1 and body ground. (IG S/W ON)

OK

NO

Refer to No. 1. (See page F1-46)



Check wiring between ECU terminal E2 and body ground.

OK

BAD

③ Check water temp. sensor. (See page F1-100)

Repair or replace.

BAD

OK

Replace water temp. sensor.

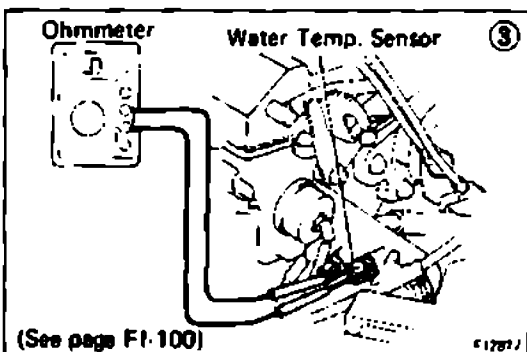
Check wiring between ECU and water temp. sensor.

OK

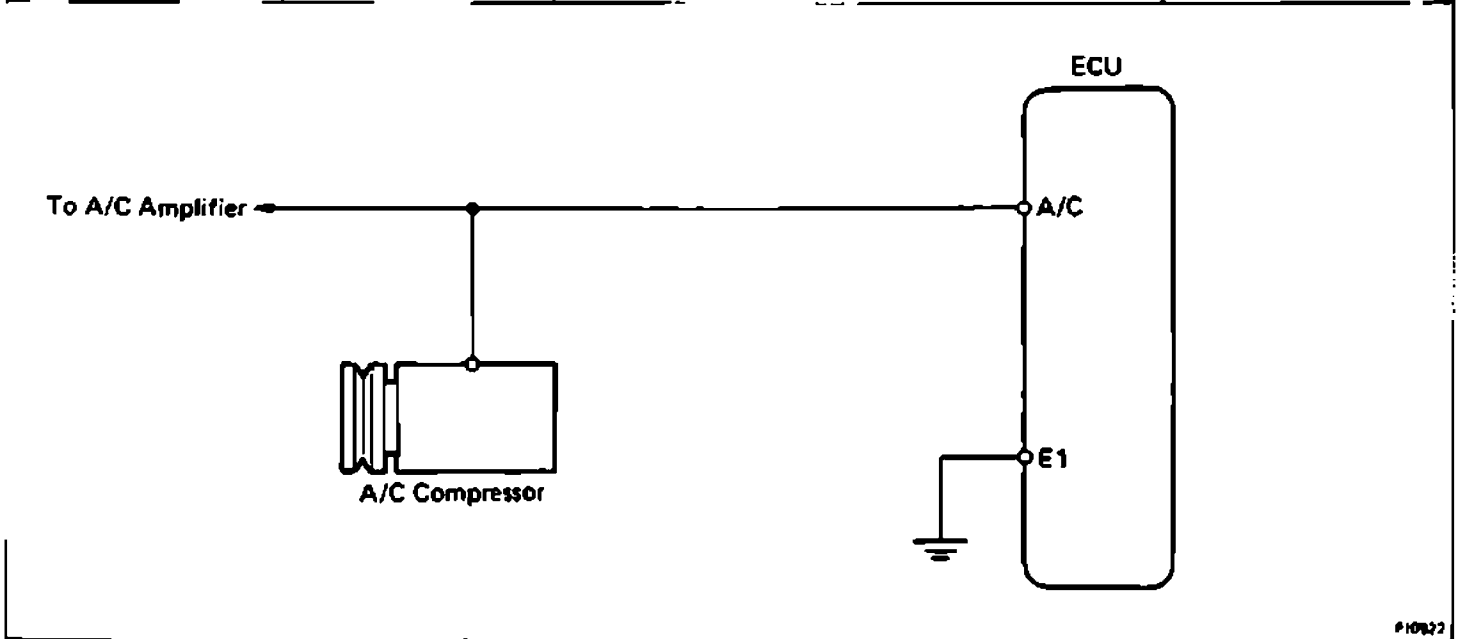
BAD

Try another ECU.

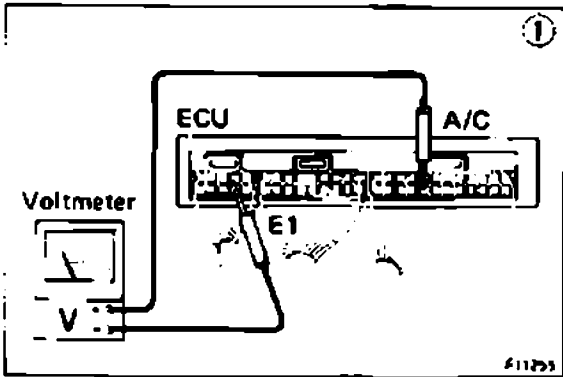
Repair or replace.



No	Terminal	Trouble	Condition	STD voltage
11	A/C – E1	No voltage	Air conditioning ON	8 – 14 V

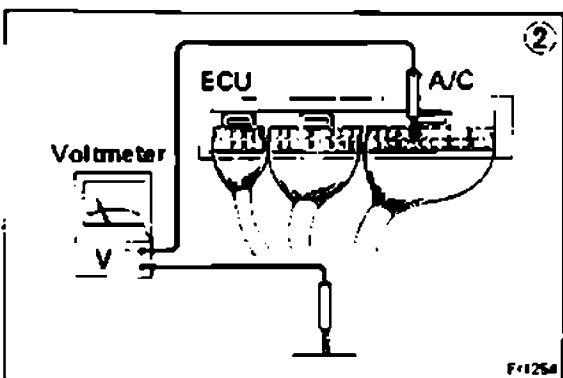


F10922



①

① No voltage between ECU terminals A/C and E1. (Air conditioning ON)



②

② Check that there is voltage between ECU terminal A/C and body ground.

NO

OK

③ Check wiring between ECU terminal E1 and body ground.

OK

BAD

Try another ECU.

Repair or replace.

Check compressor running.

BAD

OK

Check wiring between ECU terminal A/C and amplifier.

BAD

Repair or replace.

Check that there is voltage between amplifier terminal and body ground.

BAD

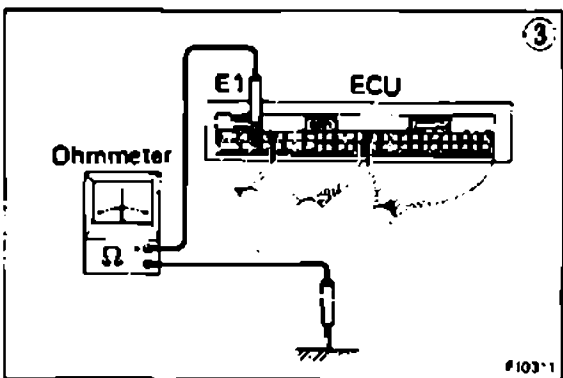
Repair or replace.

OK

Check wiring between amplifier and ECU or compressor.

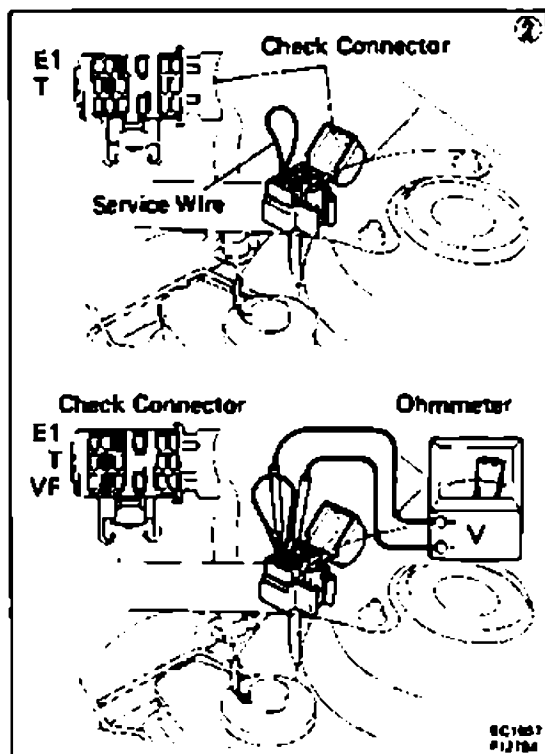
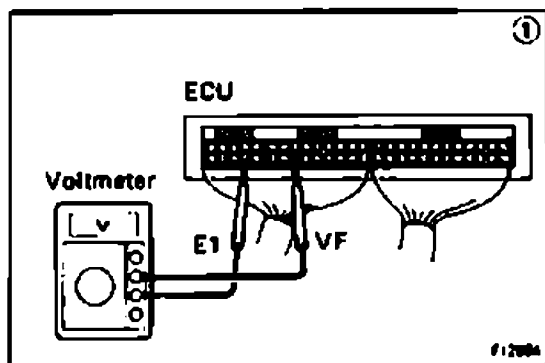
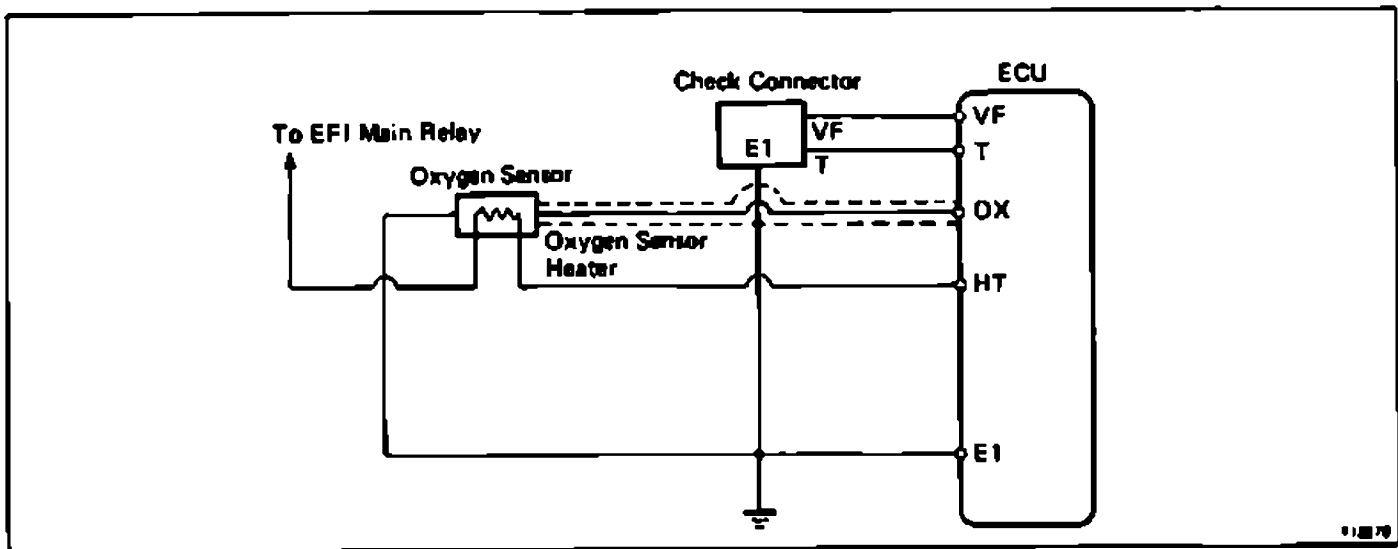
BAD

Repair or replace.



③

F10311



① There is no voltage between ECU terminals VF and E1.

Check that there is voltage between ECU terminal VF and body ground.

NO | OK
 Check wiring between ECU terminal E1 and body ground.
 OK | BAD
 Try another ECU. | Repair or replace.

Is air leaking into air induction system? | BAD | Repair air leak.

OK | BAD | Repair or replace.
 Check spark plugs. (See page IG-7)

OK | BAD | Repair or replace.
 Check distributor and ignition system. (See page IG-4)

OK | BAD | Repair or replace.
 Check fuel pressure. (See page FI-72)

OK | BAD | Repair or replace.
 Check injectors. (See page FI-74)

OK | BAD | Repair or replace.
 * Check cold start injector. (See page FI-66)

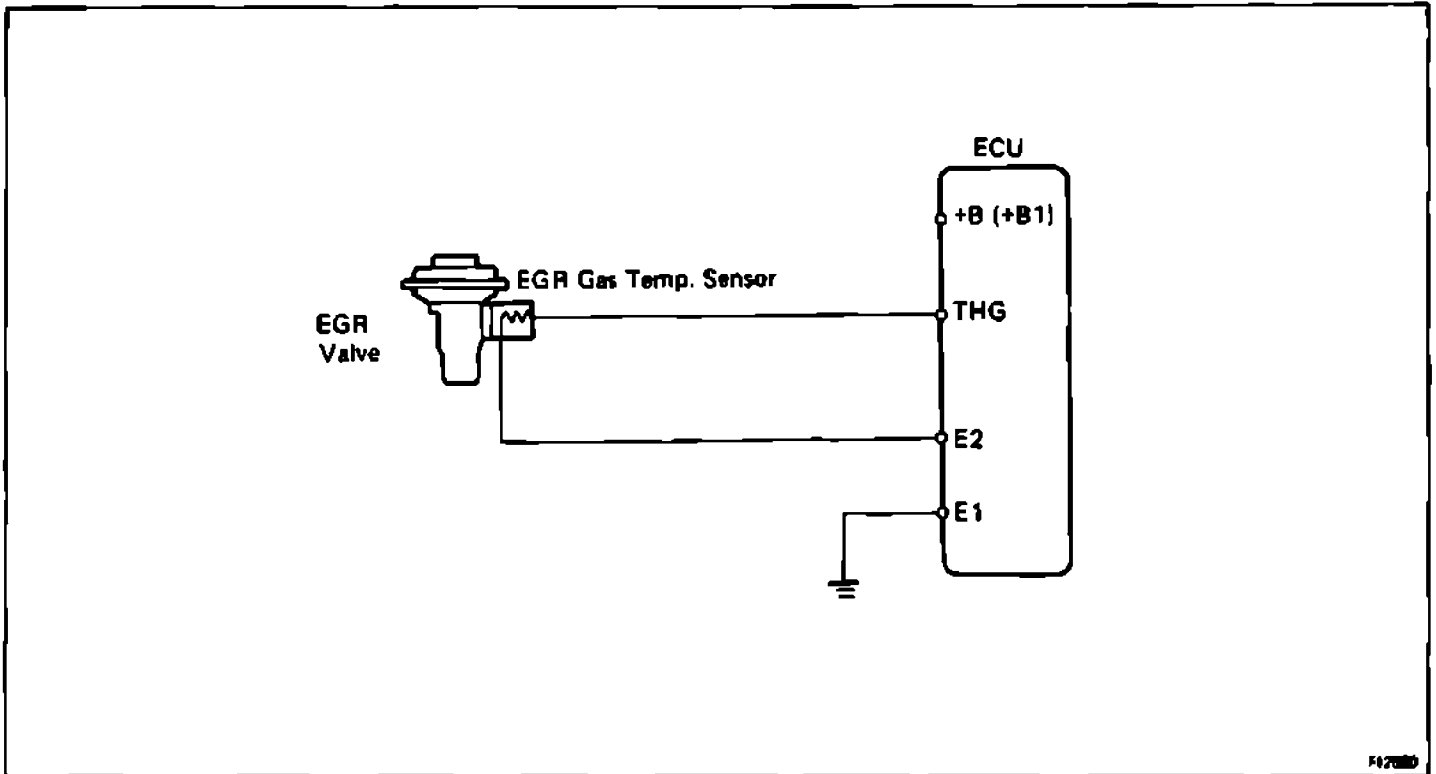
OK | BAD | Repair or replace.
 Check air flow meter. (See page FI-84)

OK | OK | System normal.
 Check operation of oxygen sensor. (See page FI-102)

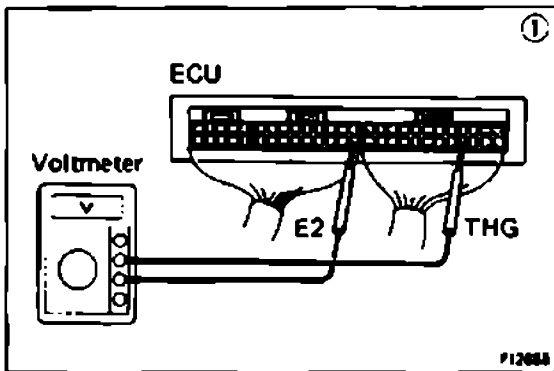
BAD | BAD | Repair wiring.
 Check wiring between oxygen sensor and ECU.

OK | Replace oxygen sensor.

* Rich malfunction only

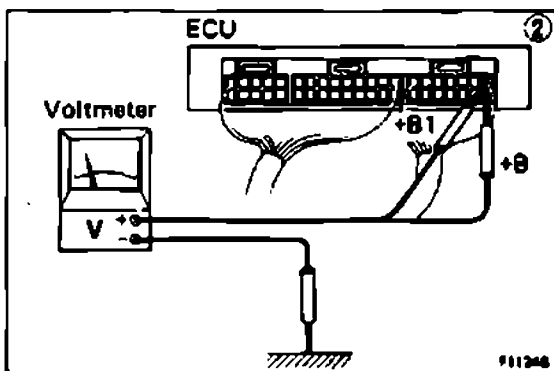


F12889



① No voltage between ECU terminals THG and E2. (IG S/W ON)

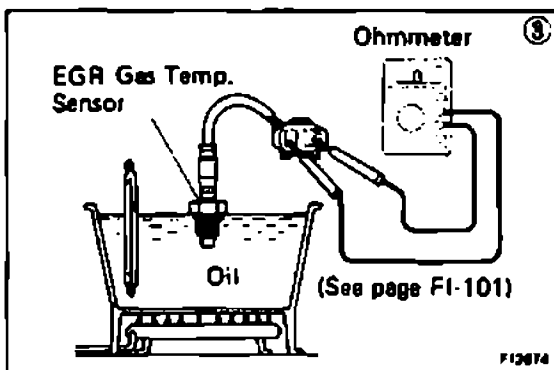
② Check that there is voltage between ECU terminal +B or +B1 and body ground. (IG S/W ON)



Check wiring between ECU terminal E1 and body ground.

OK
BAD
Repair or replace.

Check EGR system. (See page EC-19)
BAD
Repair or replace.



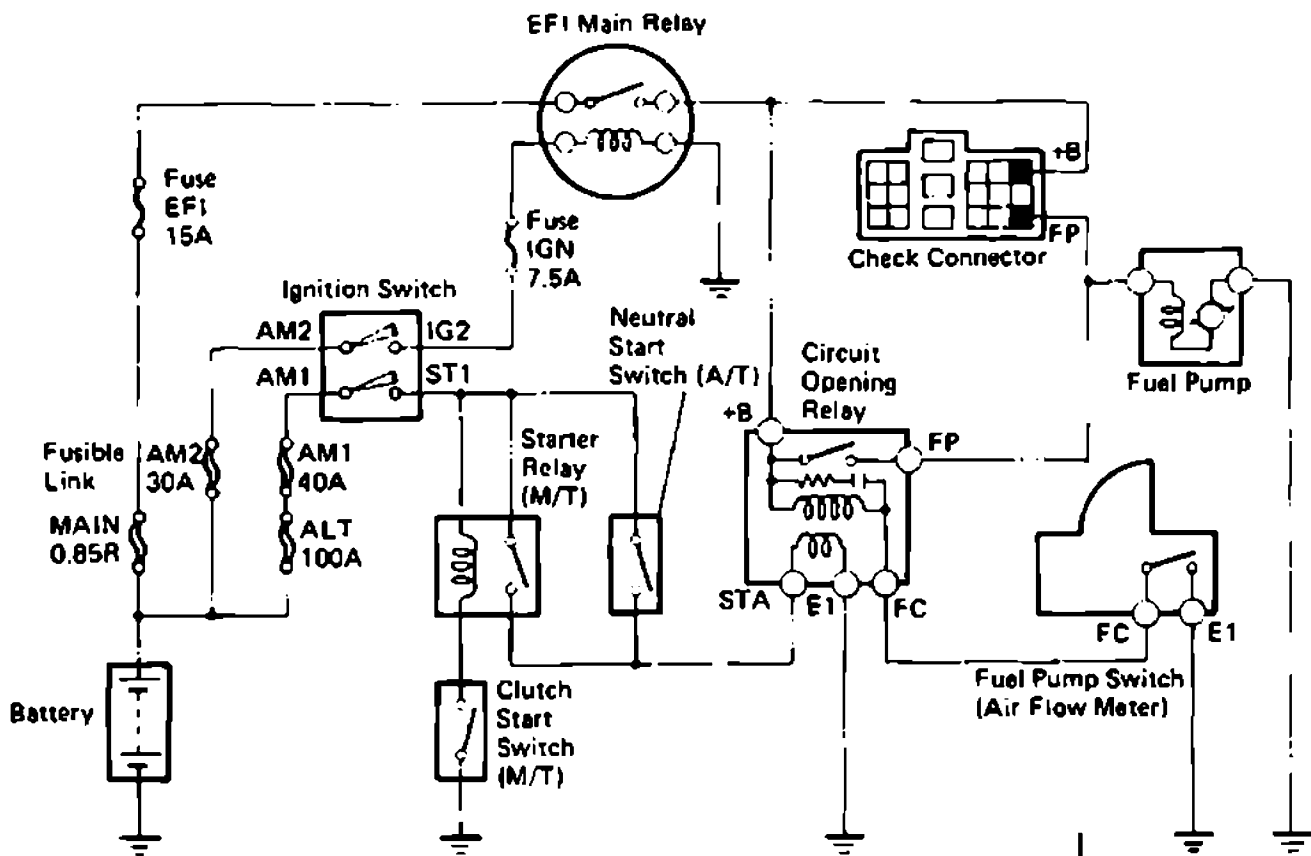
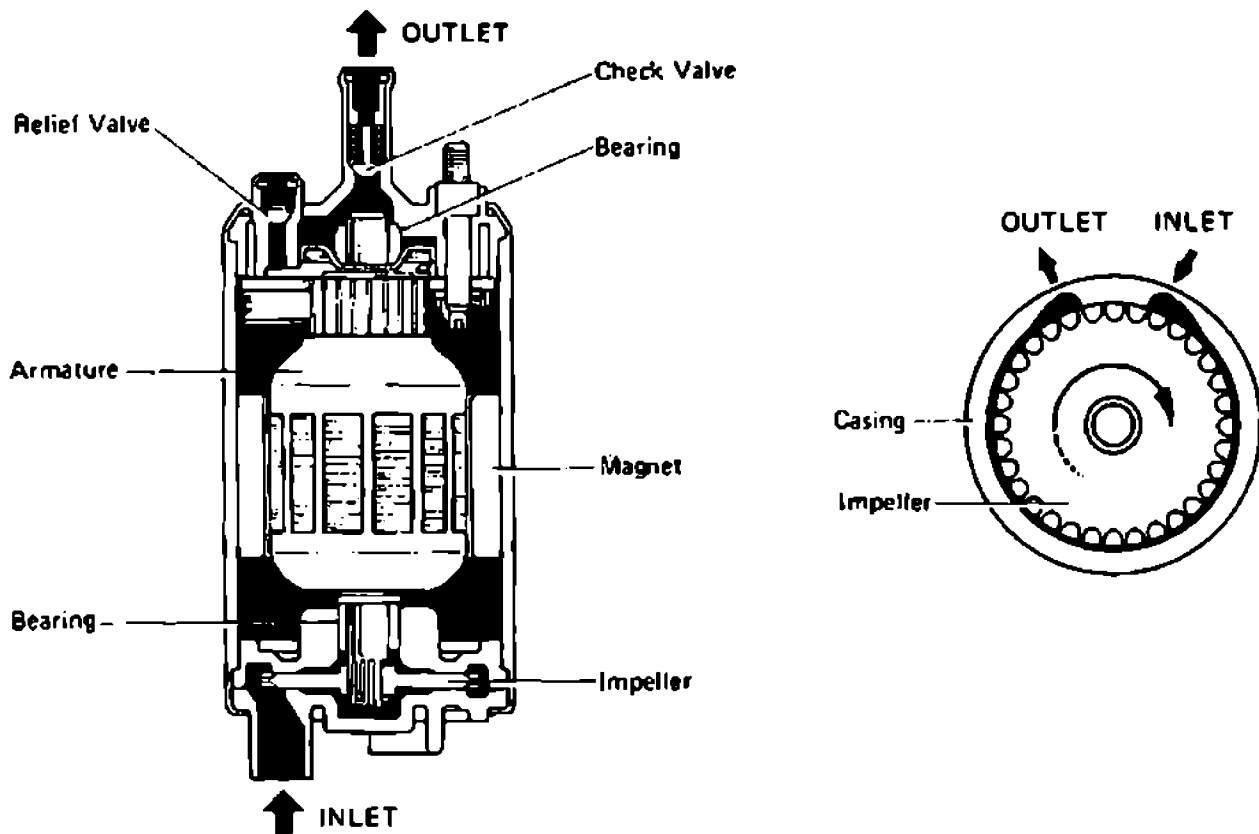
③ Check EGR gas temp. sensor. (See page F1-101)

BAD
Replace EGR gas temp. sensor.
OK
Check wiring between ECU and EGR gas temp. sensor.

OK
BAD
Try another ECU.
Repair or replace.

FUEL SYSTEM

Fuel Pump



ON-VEHICLE INSPECTION

1. INSPECT FUEL PUMP OPERATION

(a) Turn the ignition switch ON.

NOTE: Do not start the engine.

(b) Using a service wire, short terminals +B and FP of the check connector.

(c) Check that there is pressure in the hose from the fuel filter.

NOTE: At this time, you will hear fuel return noise.

(d) Remove the service wire.

(e) Turn the ignition switch OFF.

If there is no pressure, check the following parts:

- Fusible links
- Fuses (EFI 15A, IGN 7.5A)
- EFI main relay
- Circuit opening relay
- Fuel pump
- Wiring connections

2. INSPECT FUEL PRESSURE

(a) Check the battery voltage above 12 volts.

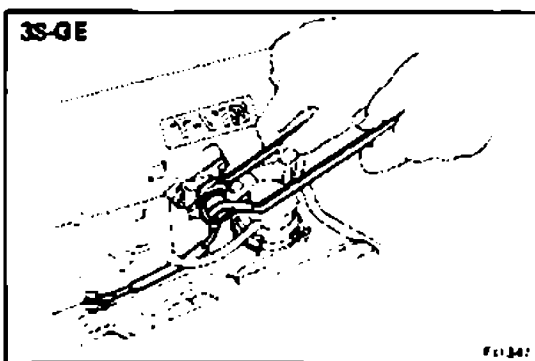
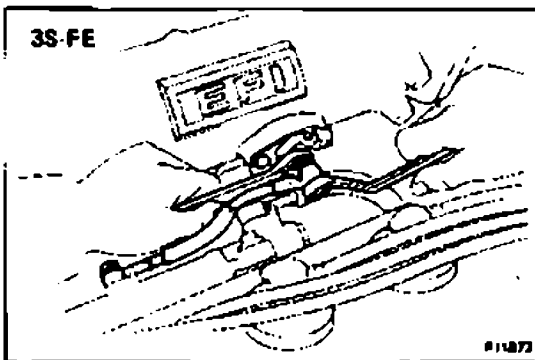
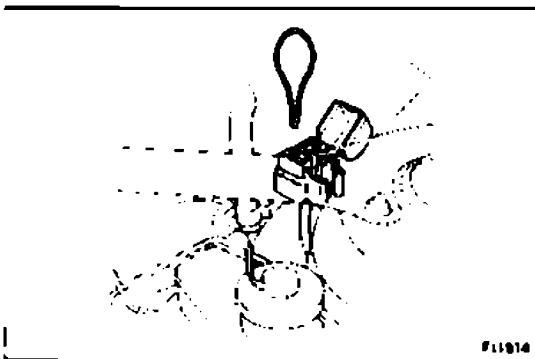
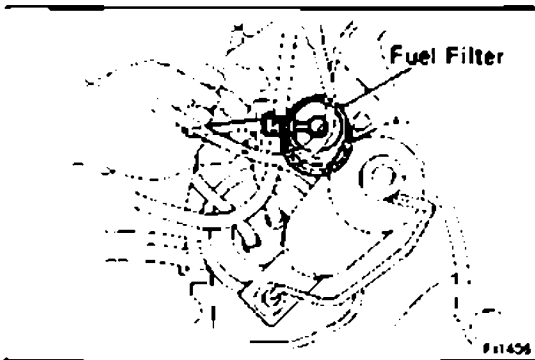
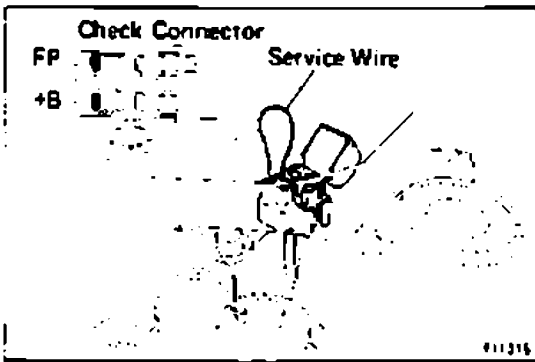
(b) Disconnect the cable from the negative (⊖) terminal of the battery.

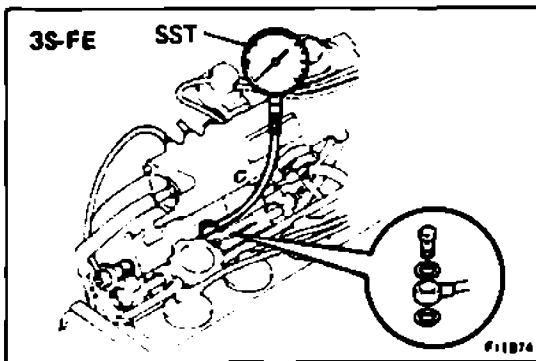
(c) Disconnect the cold start injector connector.

(d) Put a suitable container or shop towel under the cold start injector pipe.

(e) Remove the two union bolts, four gaskets and cold start injector pipe.

NOTE: Slowly loosen the union bolt.





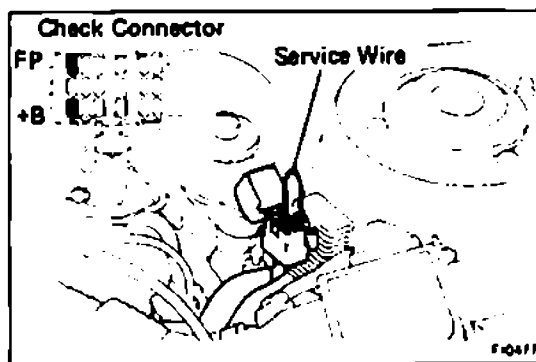
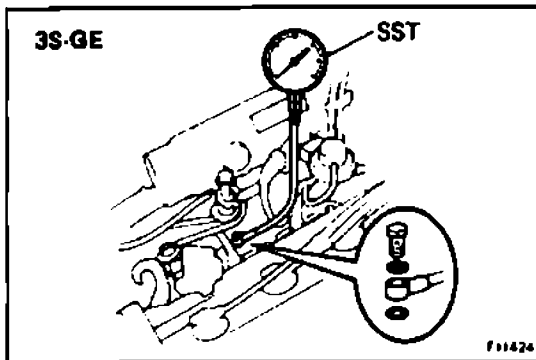
- (f) Install SST (pressure gauge) to the delivery pipe with new two gaskets and union bolt.

SST 09268-45011

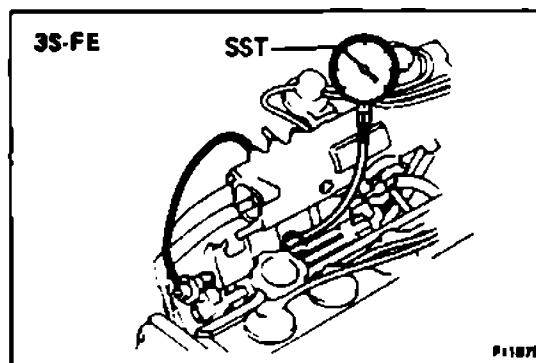
Torque: 180 kg-cm (13 ft-lb, 18 N-m)

- (g) Wipe off any splattered gasoline.

- (h) Reconnect the battery negative (⊖) cable.



- (i) Using a service wire, short terminals +B and FP of the check connector.



- (j) Turn the ignition switch ON.

- (k) Measure the fuel pressure.

Fuel pressure:

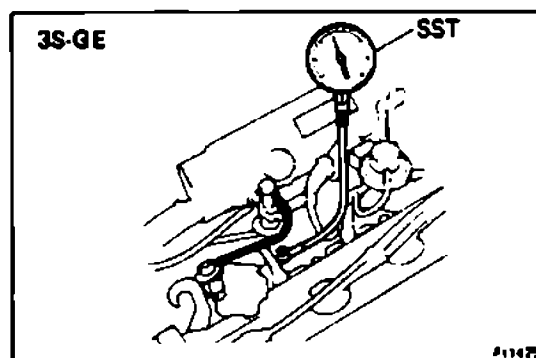
3S-FE 2.7 – 3.1 kg/cm²
(38 – 44 psi, 285 – 304 kPa)

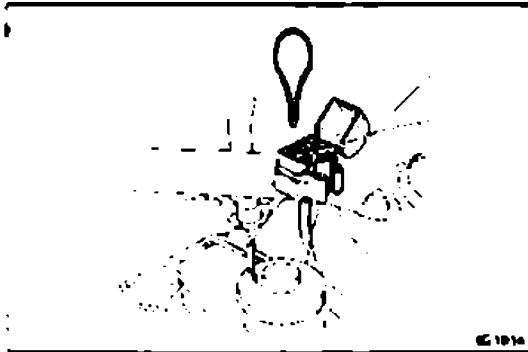
3S-GE 2.3 – 2.7 kg/cm²
(33 – 38 psi, 226 – 265 kPa)

If pressure is high, replace the fuel pressure regulator.

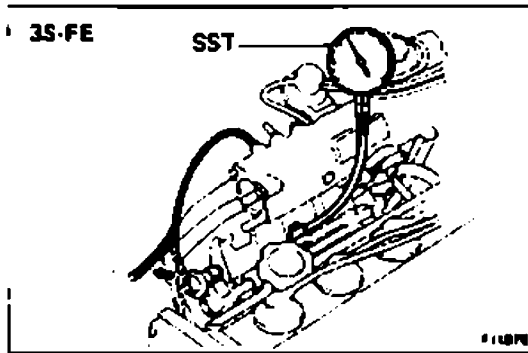
If pressure is low, check the following parts:

- Fuel hoses and connection
- Fuel pump
- Fuel filter
- Fuel pressure regulator





(l) Remove the service wire.



(m) Start the engine.

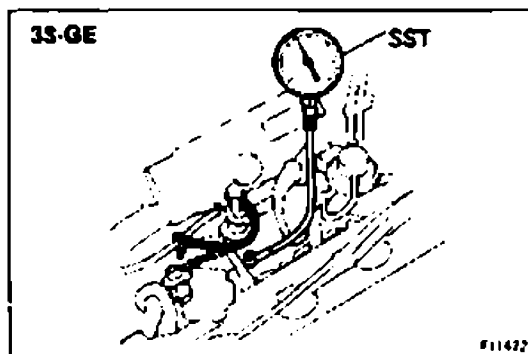
(n) Disconnect the vacuum sensing hose from the fuel pressure regulator.

(o) Measure the fuel pressure at idling.

Fuel pressure:

3S-FE 2.7 – 3.1 kg/cm²
(38 – 44 psi, 265 – 304 kPa)

3S-GE 2.3 – 2.7 kg/cm²
(33 – 38 psi, 226 – 265 kPa)



(p) Reconnect the vacuum sensing hose to the fuel pressure regulator.

(q) Measure the fuel pressure at idling.

Fuel pressure:

3S-FE 2.3 – 2.6 kg/cm²
(33 – 37 psi, 226 – 255 kPa)

3S-GE 1.9 – 2.2 kg/cm²
(27 – 31 psi, 166 – 216 kPa)

If pressure is not as specified, check the vacuum sensing hose and fuel pressure regulator.

(r) Stop the engine. Check that the fuel pressure remains 1.5 kg/cm² (21 psi, 147 kPa) or more for 5 minutes after the engine is turned off.

If pressure is not as specified, check the fuel pump, fuel pressure regulator and/or injector.

(s) After checking fuel pressure, disconnect the battery negative (⊖) cable and carefully remove the SST to prevent gasoline from splashing.

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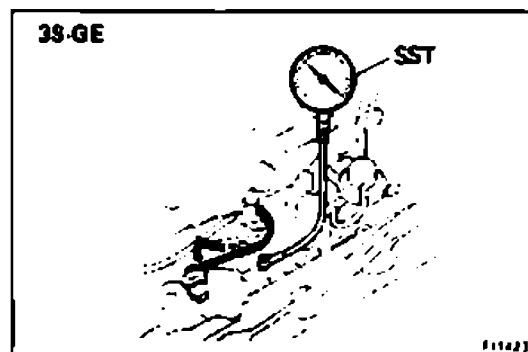
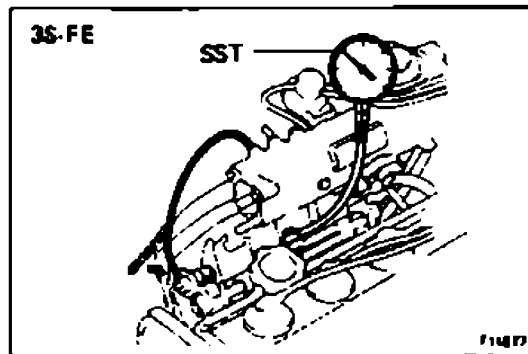
(t) Install the cold start injector pipe with new four gaskets and two union bolts.

Torque: 180 kg-cm (13 ft-lb, 18 N·m)

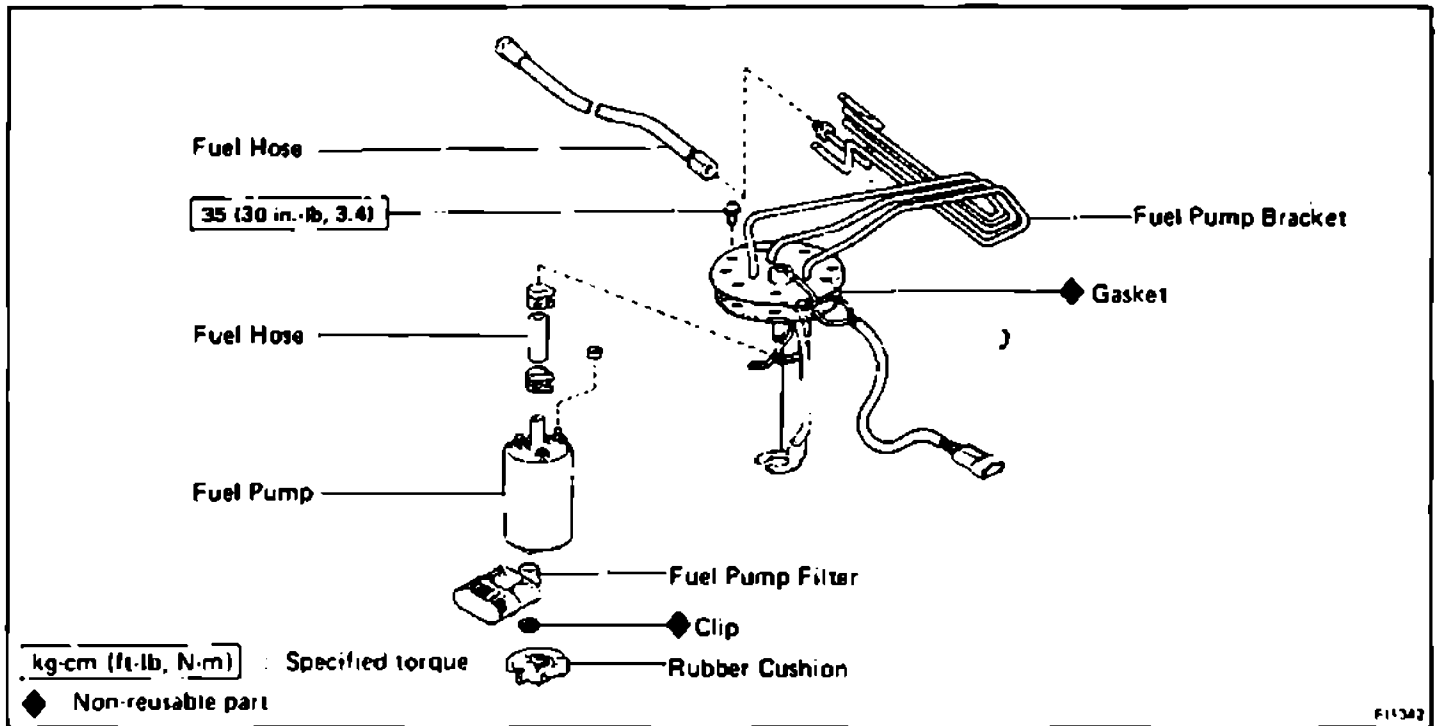
(u) Reconnect the cold start injector connector.

(v) Reconnect the cable to the negative (⊖) terminal of the battery.

(w) Check for fuel leakage.



REMOVAL OF FUEL PUMP

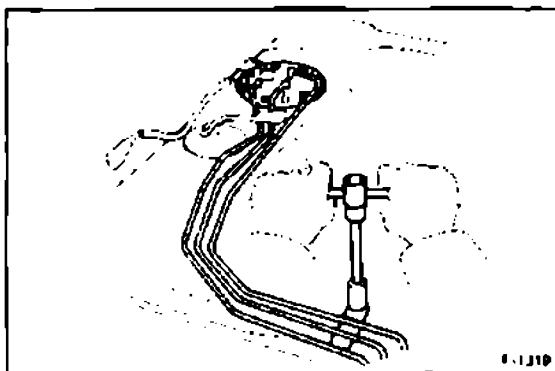


1. DISCONNECT CABLE FROM NEGATIVE TERMINAL OF BATTERY

2. DRAIN FUEL FROM FUEL TANK

WARNING: Do not smoke or work near an open flame when working on the fuel pump.

3. REMOVE FUEL TANK

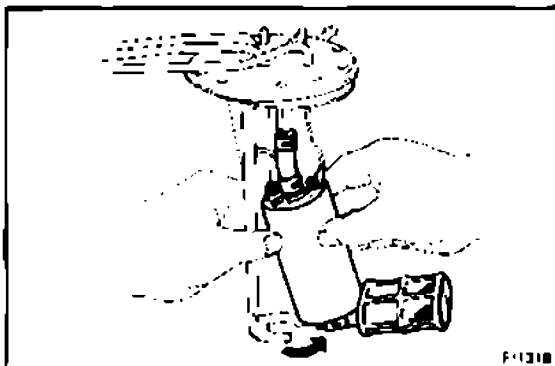


4. REMOVE FUEL PUMP BRACKET FROM FUEL TANK

(a) Remove the bolt of the bracket.

(b) Remove the six screws.

(c) Pull out the pump bracket.

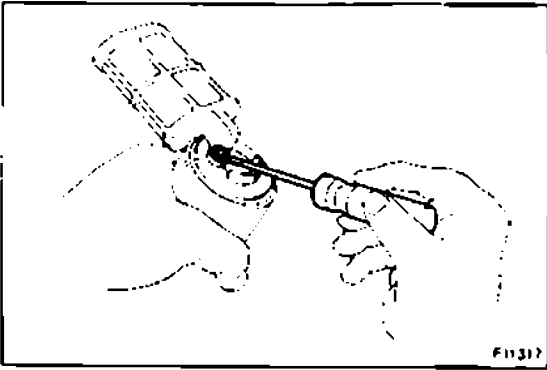


5. REMOVE FUEL PUMP FROM FUEL PUMP BRACKET

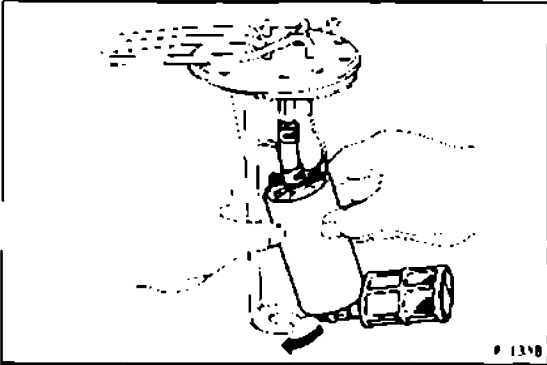
(a) Remove the two nuts, and disconnect the wires from the fuel pump.

(b) Pull off the lower side of the fuel pump from the bracket.

(c) Disconnect the fuel hose from the fuel hose.

**6. REMOVE FUEL PUMP FILTER FROM FUEL PUMP**

- (a) Remove the rubber cushion.
- (b) Using a small screwdriver, remove the clip.
- (c) Pull out the pump filter.

**INSTALLATION OF FUEL PUMP**

(See page FI-64)

1. INSTALL FUEL PUMP FILTER TO FUEL PUMP

- (a) Install the pump filter with the clip.
- (b) Install the rubber cushion.

2. INSTALL FUEL PUMP TO FUEL PUMP BRACKET

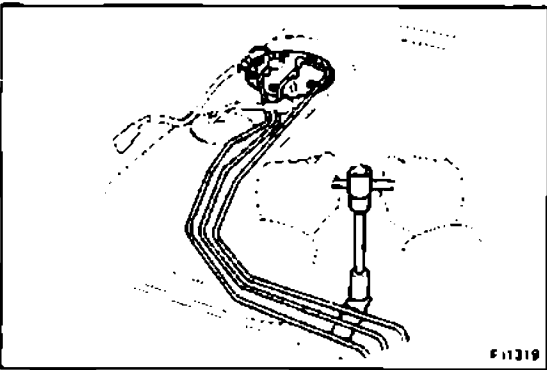
- (a) Connect the fuel hose to the outlet part of the fuel pump.
- (b) Push the lower side of the fuel pump, and install the fuel pump.

3. INSTALL FUEL PUMP BRACKET TO FUEL TANK

- (a) Install a new gasket and the pump bracket with the six screws.

Torque: 35 kg-cm (30 in.-lb, 3.4 N-m)

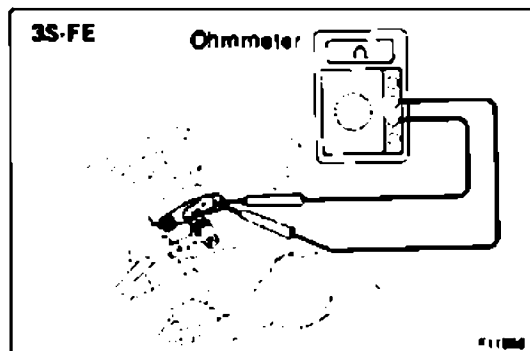
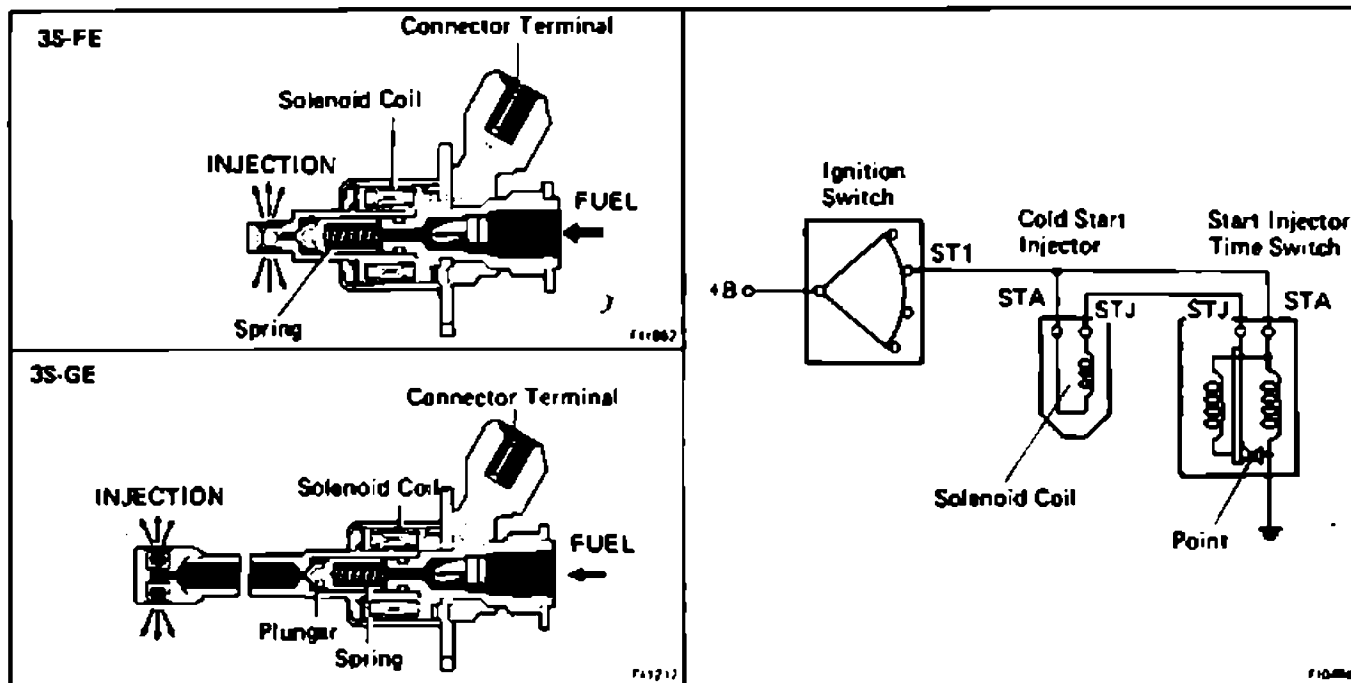
- (b) Install the bolt of the bracket.

**4. INSTALL FUEL TANK**

When installing the fuel tank, refer to FI-82 for the installation position of the cushion and the tightening torque.

5. CONNECT CABLE TO NEGATIVE TERMINAL OF BATTERY

Cold Start Injector



ON-VEHICLE INSPECTION

INSPECT RESISTANCE OF COLD START INJECTOR

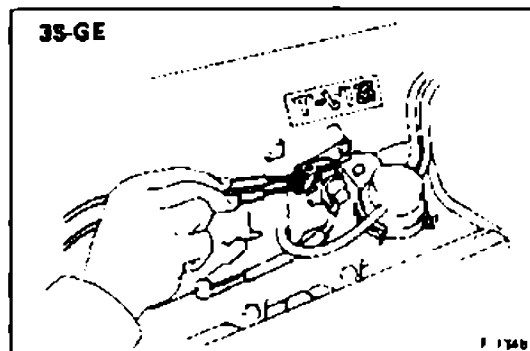
- (a) Disconnect the cold start injector connector.
- (b) Using an ohmmeter, measure the resistance between the terminals.

Resistance:

- 3S-FE 2 – 4 Ω
- 3S-GE 3 – 5 Ω

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

- (c) Reconnect the cold start injector connector.

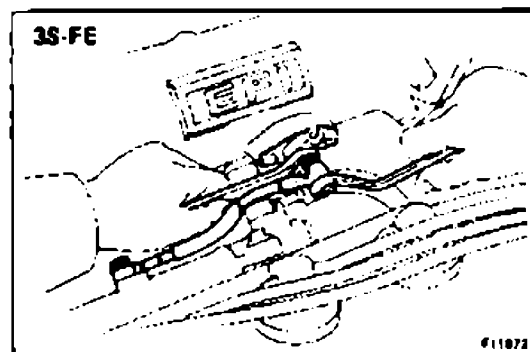


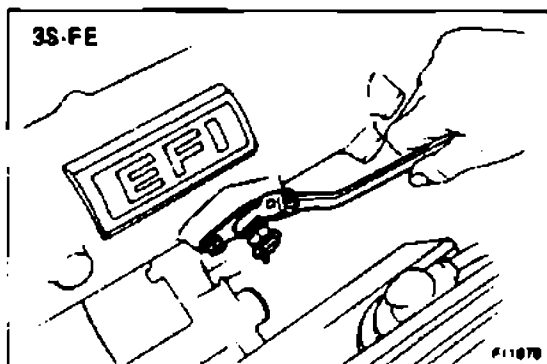
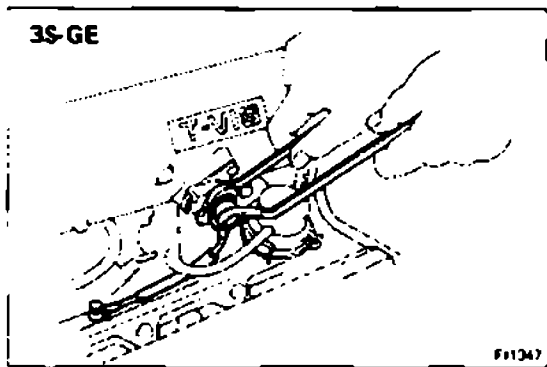
REMOVAL OF COLD START INJECTOR

1. DISCONNECT CABLE FROM NEGATIVE TERMINAL OF BATTERY
2. DISCONNECT COLD START INJECTOR CONNECTOR
3. REMOVE COLD START INJECTOR PIPE

- (a) Put a suitable container or shop towel under the injector pipe.
- (b) Remove the two union bolts, four gaskets and injector pipe.

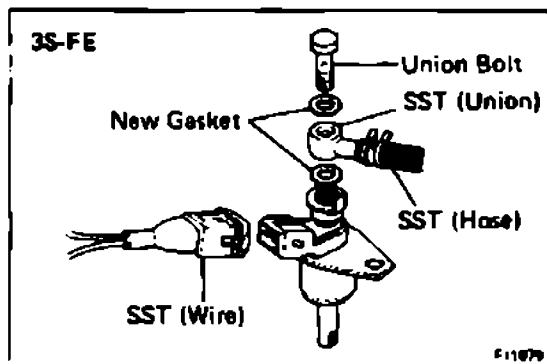
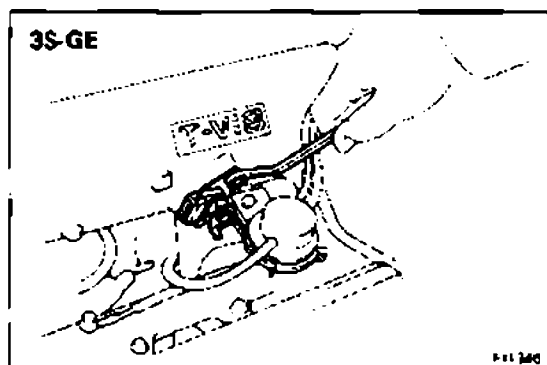
NOTE: Slowly loosen the union bolts.





4. REMOVE COLD START INJECTOR

Remove the two bolts, injector and gasket.



INSPECTION OF COLD START INJECTOR

1. INSPECT INJECTION OF COLD START INJECTOR

WARNING: Keep clear of sparks during the test.

(a) Install SST (two unions) to the injector and delivery pipe with new gaskets and the union bolts.

SST 09268-41045

(b) Connect the unions with SST (hose).

SST 09268-41045

(c) Connect SST (wire) to the injector.

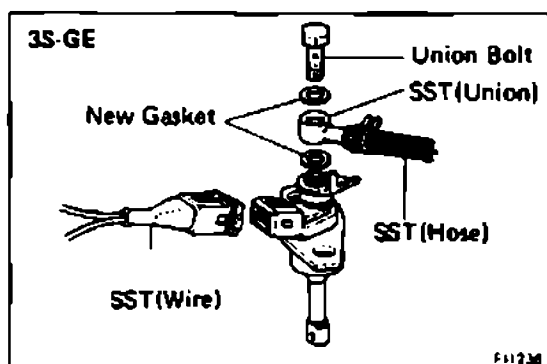
SST 09842-30050

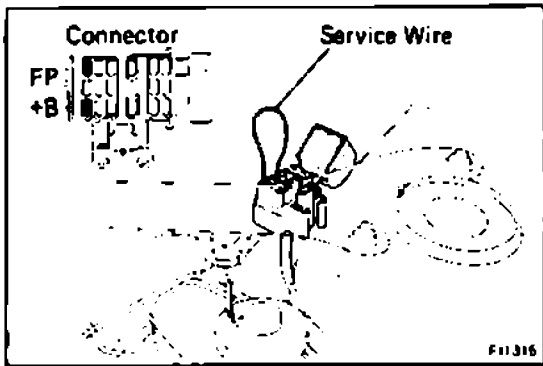
(d) Put a container under the injector.

(e) Reconnect the battery negative (⊖) cable.

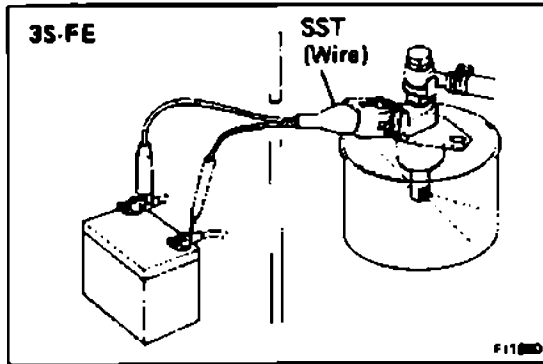
(f) Turn the ignition switch ON.

NOTE: Do not start the engine.





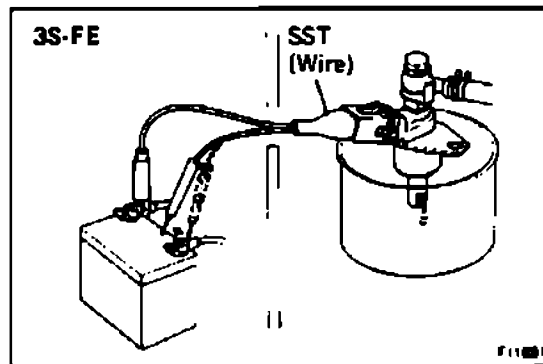
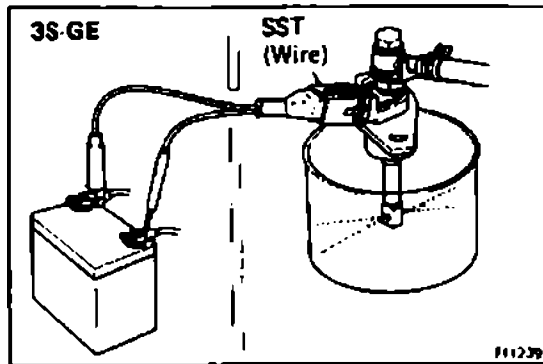
(g) Using a service wire, short terminals +B and FP of the check connector.



(h) Connect the test probes of the SST (wire) to the battery, and check that the fuel spray is as shown.

SST 09842-30050

CAUTION: Perform this within the shortest possible time.



2. INSPECT LEAKAGE

(a) In the condition above, disconnect the test probes of SST (wire) from the battery and check fuel leakage from the injector.

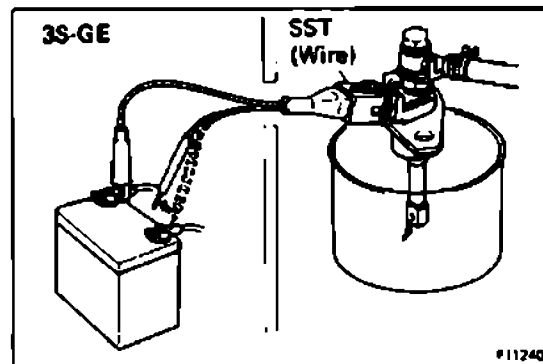
SST 09268-30050

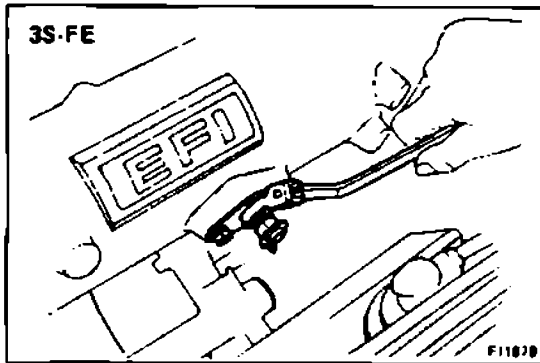
Fuel drop: One drop or less per minute

(b) Disconnect the battery negative (⊖) cable.

(c) Remove SST and the service wire.

SST 09268-41045 and 09842-30020





INSTALLATION OF COLD START INJECTOR

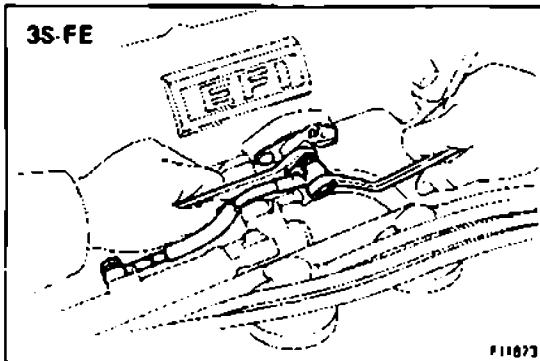
1. INSTALL COLD START INJECTOR

Install a new gasket and the injector with the two bolts.

Torque:

3S-FE 95 kg-cm (82 in.-lb, 9.3 N·m)

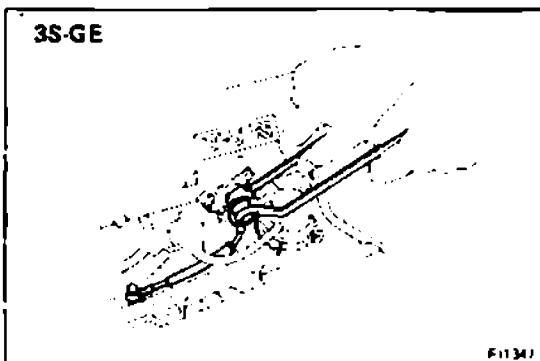
3S-GE 60 kg-cm (52 in.-lb, 5.9 N·m)



2. INSTALL COLD START INJECTOR PIPE

Install the injector pipe with new four gaskets and the two union bolts.

Torque: 180 kg-cm (13 ft-lb, 18 N·m)

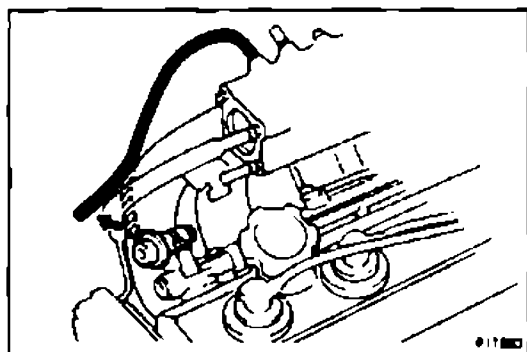
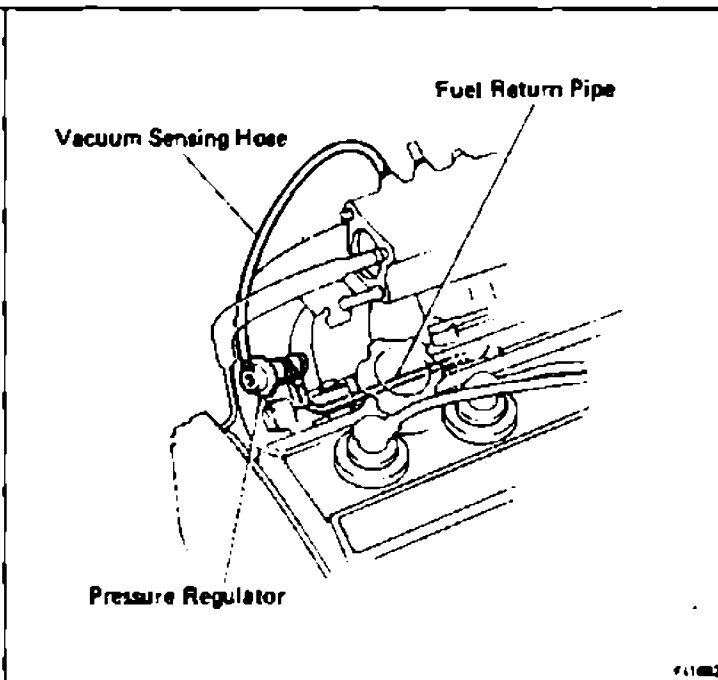
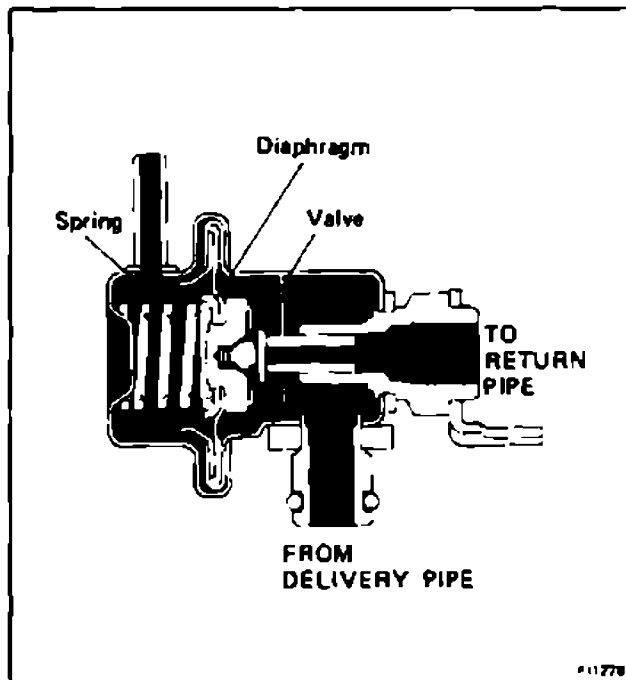


3. CONNECT COLD START INJECTOR CONNECTOR

4. CONNECT CABLE TO NEGATIVE TERMINAL OF BATTERY

5. CHECK FOR FUEL LEAKAGE (See page FI-9)

Fuel Pressure Regulator (3S-FE)

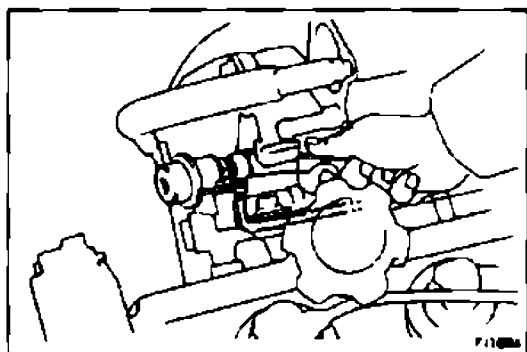


ON-VEHICLE INSPECTION

INSPECT FUEL PRESSURE (See page FI-61)

REMOVAL OF FUEL PRESSURE REGULATOR

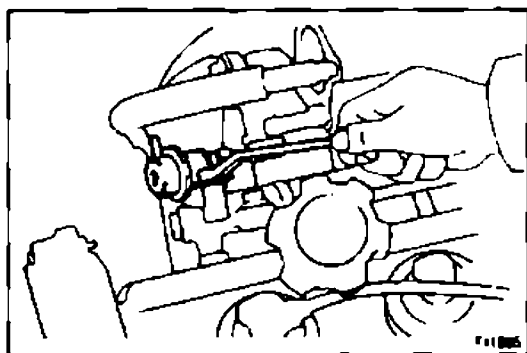
1. DISCONNECT CABLE FROM NEGATIVE TERMINAL OF BATTERY
2. DISCONNECT VACUUM SENSING HOSE



3. DISCONNECT FUEL RETURN PIPE

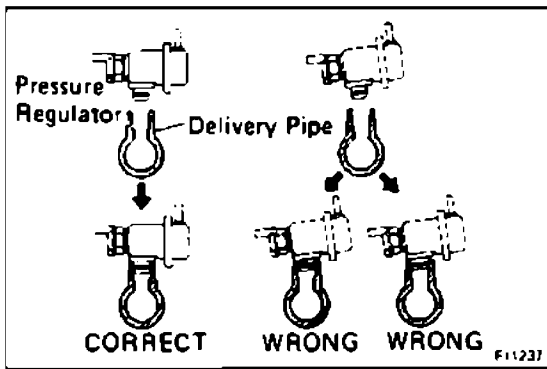
- (a) Put a suitable container or shop towel under the pressure regulator.
- (b) Remove the union bolt and two gaskets, and disconnect the return pipe.

NOTE: Slowly loosen the union bolt.



4. REMOVE FUEL PRESSURE REGULATOR

Remove the two bolts, and pull out the pressure regulator.



INSTALLATION OF FUEL PRESSURE REGULATOR

1. INSTALL FUEL PRESSURE REGULATOR

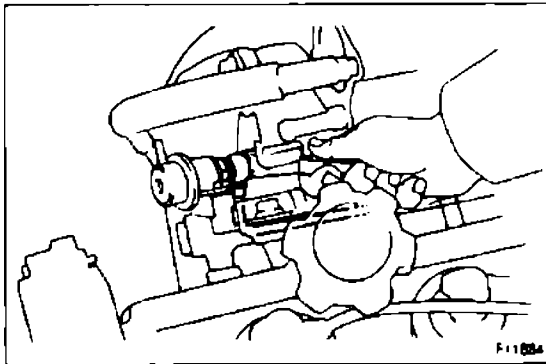
- Apply a light coat of gasoline to a new O-ring, and install it to the pressure regulator.
- Install the pressure regulator with the two bolts.

Torque: 55 kg-cm (48 in.-lb, 5.4 N·m)

2. CONNECT FUEL RETURN PIPE

Install the return pipe with new two gaskets and the union bolt.

Torque: 180 kg-cm (13 ft-lb, 18 N·m)

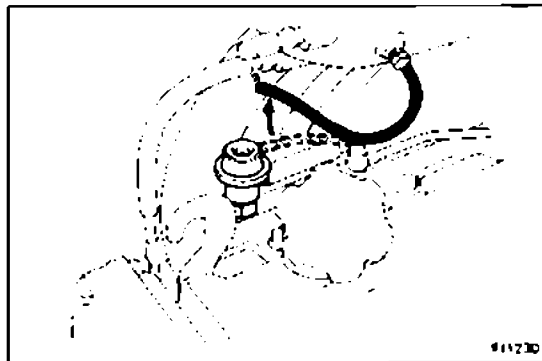
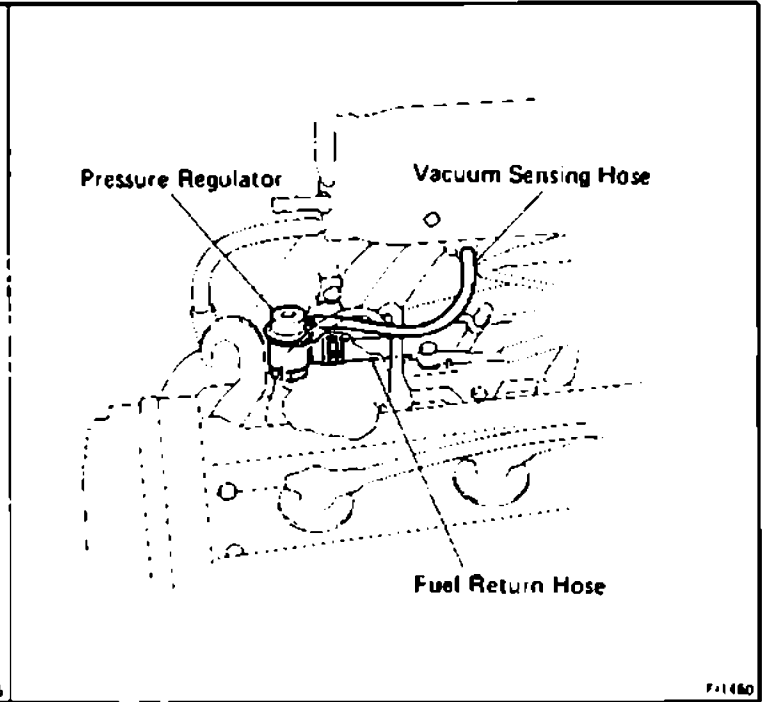
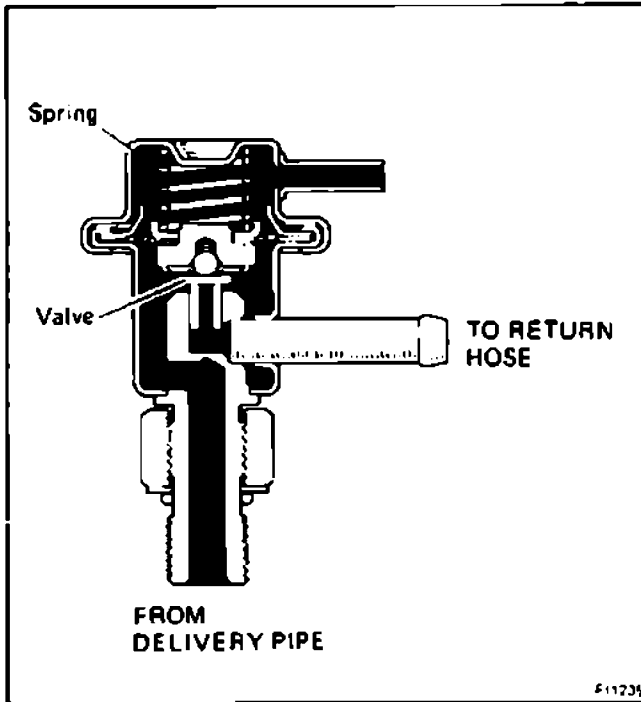


3. CONNECT VACUUM SENSING HOSE

4. CONNECT CABLE TO NEGATIVE TERMINAL OF BATTERY

5. CHECK FOR FUEL LEAKAGE (See page FI-9)

Fuel Pressure Regulator (3S-GE)

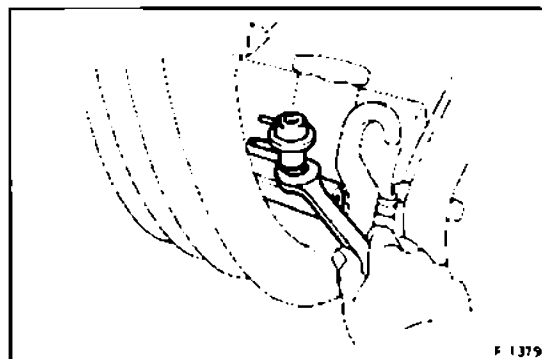


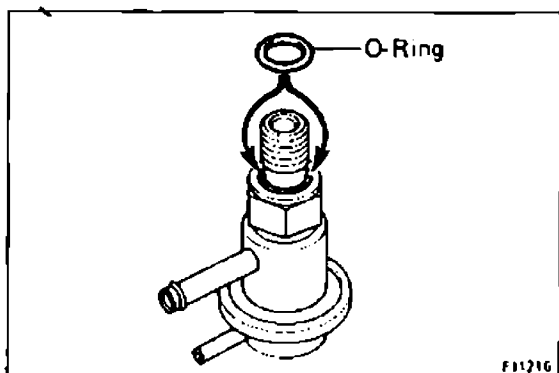
ON-VEHICLE INSPECTION

INSPECT FUEL PRESSURE (See page FI-61)

REMOVAL OF FUEL PRESSURE REGULATOR

1. DISCONNECT CABLE FROM NEGATIVE TERMINAL OF BATTERY
2. DISCONNECT VACUUM SENSING HOSE
3. DISCONNECT FUEL RETURN HOSE
 - (a) Put a suitable container or shop towel under the pressure regulator.
 - (b) Disconnect the return hose.
4. REMOVE FUEL PRESSURE REGULATOR
 - (a) Loosen the lock nut, and remove the pressure regulator.

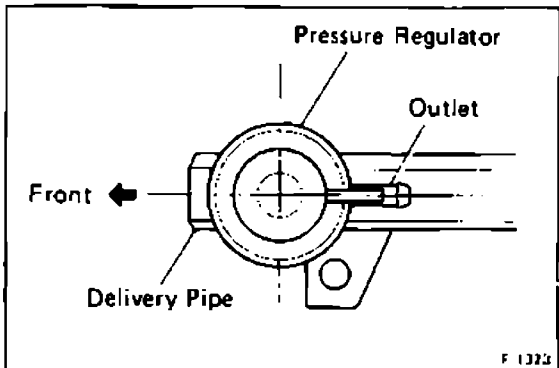




INSTALLATION OF FUEL PRESSURE REGULATOR

1. INSTALL FUEL PRESSURE REGULATOR

- (a) Fully loosen the lock nut of the pressure regulator.
- (b) Apply a light coat of gasoline to a new O-ring, and install it to the pressure regulator.



- (c) Thrust the pressure regulator completely into the delivery pipe by hand.
- (d) Turn the pressure regulator counterclockwise until the outlet faces in the direction indicated in the figure.
- (e) Torque the lock nut.

Torque: 300 kg-cm (22 ft-lb, 29 N·m)

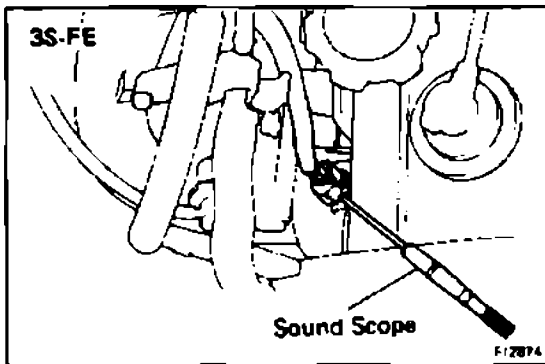
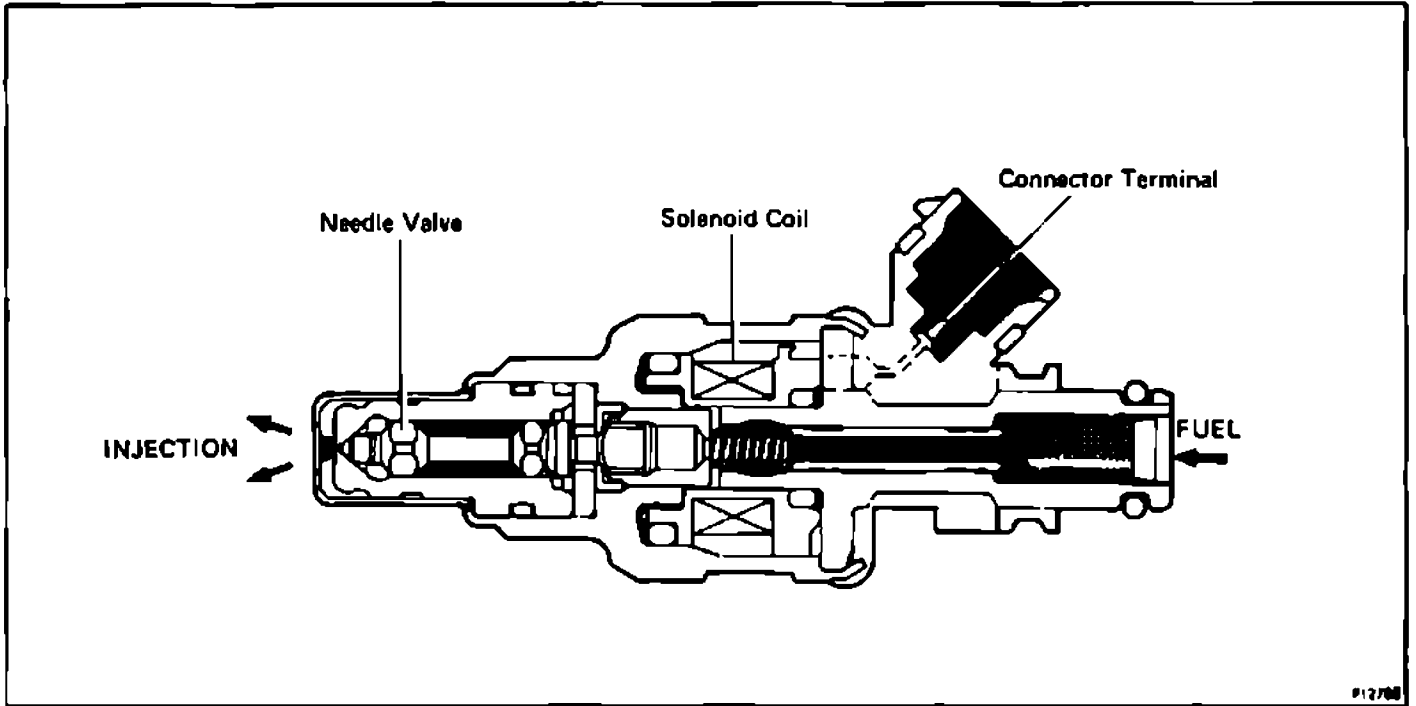
2. CONNECT FUEL RETURN HOSE

3. CONNECT VACUUM SENSING HOSE

4. CONNECT CABLE TO NEGATIVE TERMINAL OF BATTERY

5. CHECK FOR FUEL LEAKAGE (See page FI-9)

Injectors

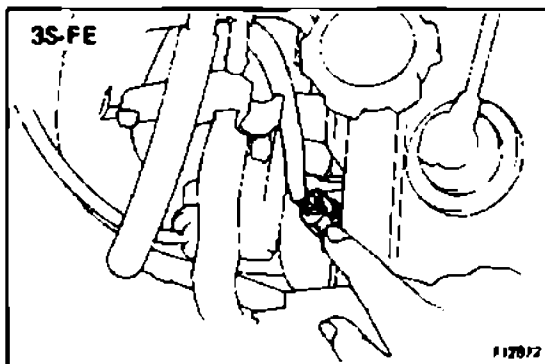
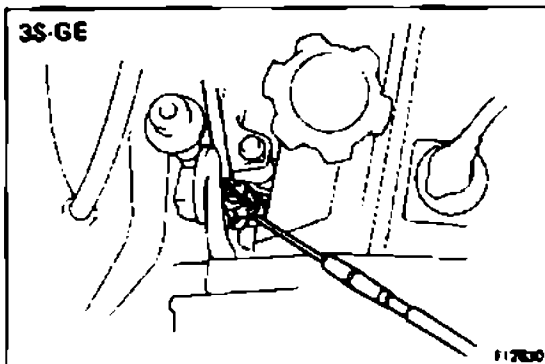


ON-VEHICLE INSPECTION

1. INSPECT INJECTOR OPERATION

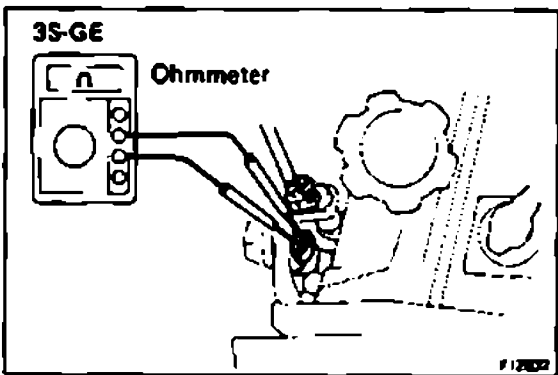
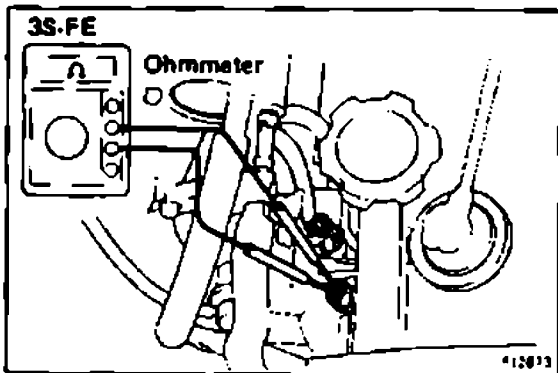
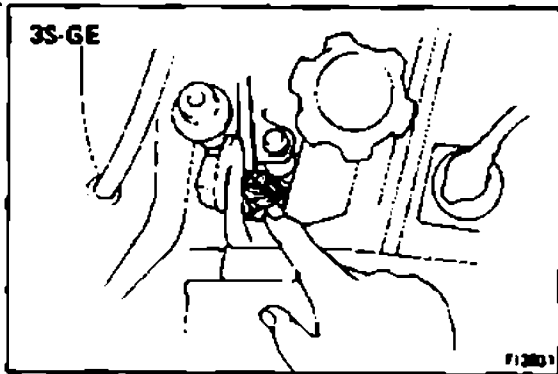
Check operation sound from each injector.

- (a) With the engine running or cranking, use a sound scope to check that there is normal operating noise in proportion to engine rpm.



- (b) If you have no sound scope, you can check the injector transmission operation with your finger.

If no sound or an unusual sound is heard, check the wiring connector, injector, resistor, or injection signal from ECU.



2. INSPECT INJECTOR RESISTANCE

- (a) Disconnect the injector connector.
- (b) Using an ohmmeter, measure the resistance between the terminals.

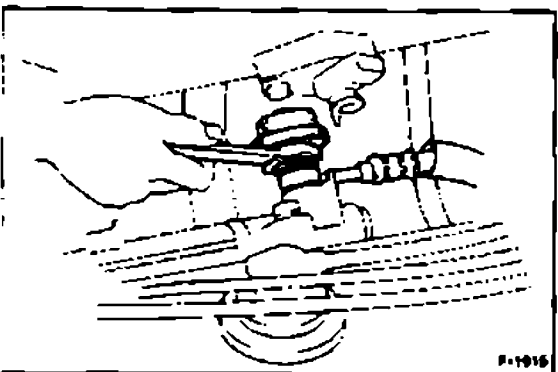
Resistance: Approx. 13.8 Ω

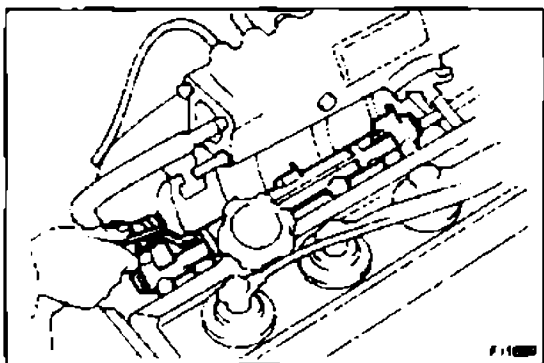
If resistance is not as specified, replace the injector.

- (c) Reconnect the injector connector.

REMOVAL OF INJECTORS (3S-FE)

1. DISCONNECT CABLE FROM NEGATIVE TERMINAL OF BATTERY
2. REMOVE COLD START INJECTOR PIPE
(See step 3 on page FI-66)
3. DISCONNECT VACUUM SENSING HOSE FROM FUEL PRESSURE REGULATOR (See step 2 on page FI-70)
4. DISCONNECT INJECTOR CONNECTORS
5. DISCONNECT HOSE FROM FUEL RETURN PIPE
6. REMOVE FUEL PRESSURE PULSATION DAMPER
Remove the pulsation damper and two gaskets.





7. REMOVE DELIVERY PIPE AND INJECTORS

(a) Remove the two bolts and delivery pipe together with the four injectors.

CAUTION: Be careful not to drop the injectors, when removing the delivery pipe.

(b) Remove the four insulators and two spacers from the cylinder head.

(c) Pull out the four injectors from the delivery pipe.

REMOVAL OF INJECTORS (3S-GE)

1. DISCONNECT CABLE FROM NEGATIVE TERMINAL OF BATTERY

2. DRAIN ENGINE COOLANT (See page CO-5)

3. (A/T)
DISCONNECT THROTTLE CABLE FROM THROTTLE LINKAGE

4. DISCONNECT ACCELERATOR CABLE FROM THROTTLE LINKAGE

5. REMOVE SUSPENSION UPPER BRACE
(See step 11 on page EM-104)

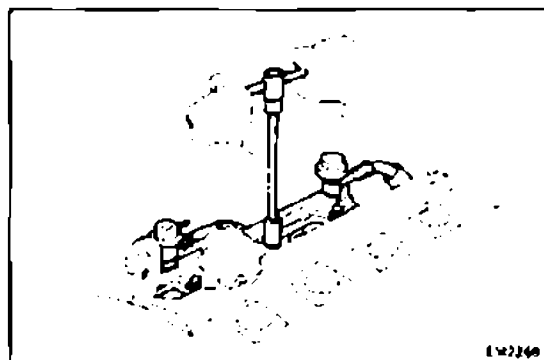
6. DISCONNECT AIR CLEANER HOSE

7. REMOVE IGNITER

8. REMOVE SUSPENSION LOWER CROSSMEMBER
(See step 25 on page EM-106)

9. REMOVE THROTTLE BODY
(See steps 5 and 6 on page FI-91)

10. REMOVE INTAKE MANIFOLD
(See steps 24 to 35 on pages EM-81 and 82)



11. REMOVE DELIVERY PIPE AND INJECTORS

(a) Remove the three bolts and delivery pipe together with the four injectors.

CAUTION: Be careful not to drop the injectors, when the removing the delivery pipe.

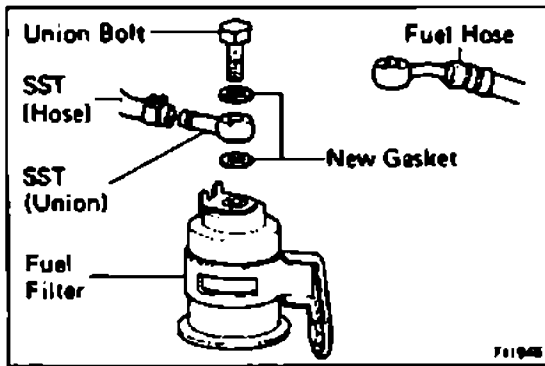
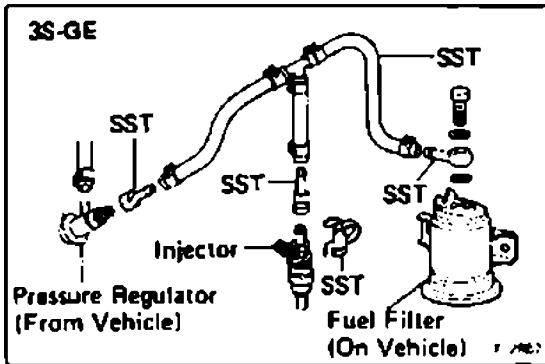
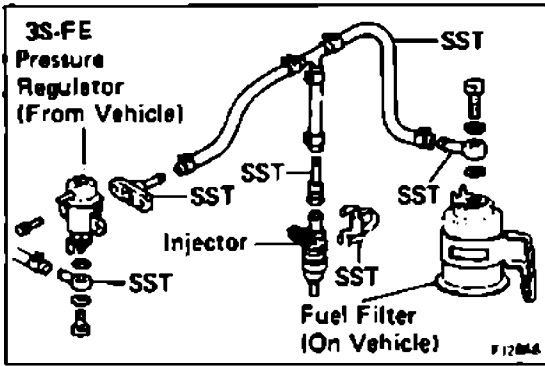
(b) Remove the three spacers and four insulators from the cylinder head.

(c) Pull out the four injectors from the delivery pipe.

INSPECTION OF INJECTORS

1. INSPECT INJECTOR INJECTION

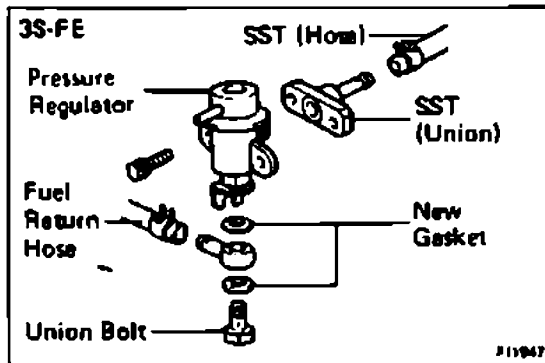
WARNING: Keep clear of sparks during the test.



- (a) Disconnect the fuel hose from the fuel filter outlet.
- (b) Connect SST (union and hose) to the fuel filter outlet with new gaskets and the union bolt.

SST 09268-41045

NOTE: Use the vehicle's fuel filter.



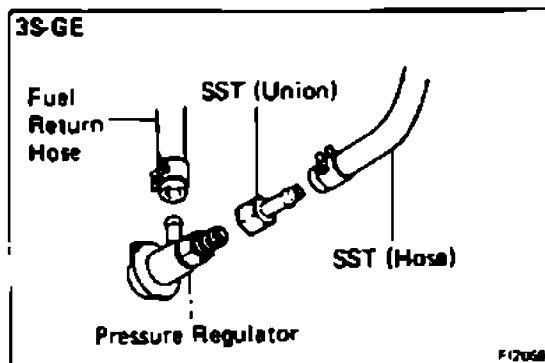
- (c) Remove the pressure regulator.

3S-FE (See page FI-70)

3S-GE (See page FI-72)

- (d) (3S-FE)
Connect the fuel return hose and SST (hose) to the pressure regulator with SST (union), new gaskets and union bolt.

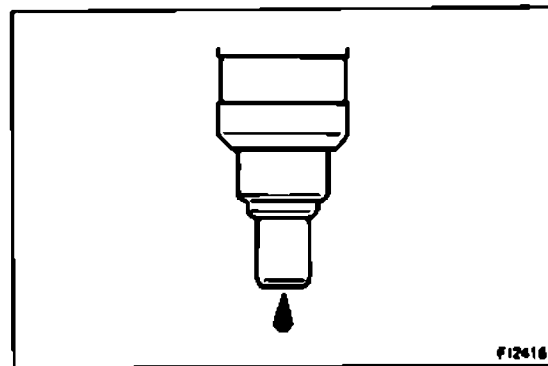
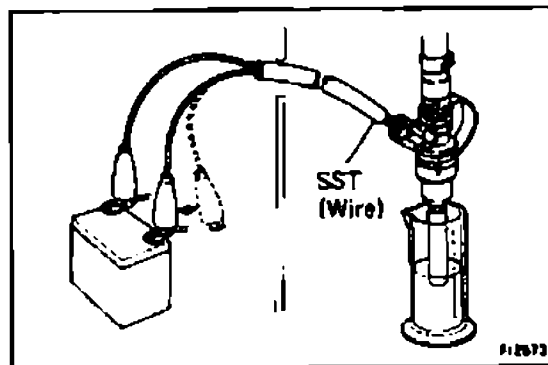
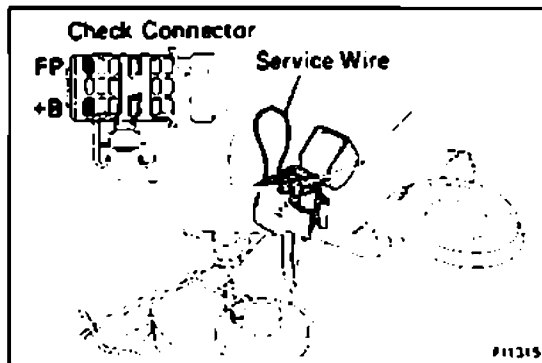
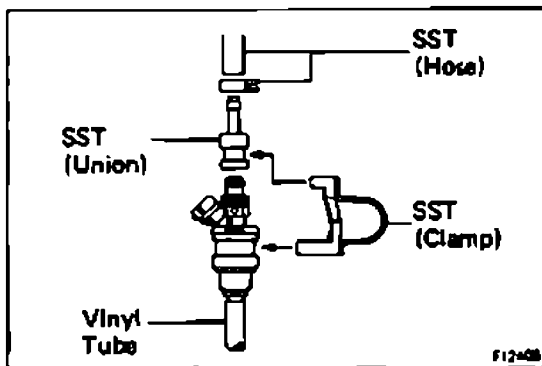
SST 09268-41045



(3S-GE)

Connect the fuel return hose and SST (hose) to the pressure regulator with SST (union).

SST 09268-41045



- (e) Connect SST (union and hose) to the injector, and hold the injector and SST (union) with SST (clamp).

SST 09268-41045

- (f) Put the injector into the graduated cylinder.

NOTE: Install the suitable vinyl hose onto the injector to prevent gasoline from splashing out.

- (g) Reconnect the battery negative (⊖) cable.

- (h) Turn the ignition switch ON.

NOTE: Do not start the engine.

- (i) Using a service wire, short terminals +B and FP of the check connector.

- (j) Connect SST (wire) to the injector and battery for 15 seconds, and measure the injection volume with a graduated cylinder. Test each injector two or three times.

SST 09842-30070

Volume:

3S-FE 45 – 55 cc (2.7 – 3.4 cu in.) per 15 sec.

3S-GE 66 – 82 cc (4.0 – 5.0 cu in.) per 15 sec.

Difference between each injector:

5 cc (0.31 cu in.) or less

If the injection volume is not as specified, replace the injector.

2. INSPECT LEAKAGE

- (a) In the condition above, disconnect the test probes of SST (wire) from the battery and check the fuel leakage from the injector.

SST 09842-30070

Fuel drop: One drop or less per minute.

- (b) Disconnect the battery negative (⊖) cable.

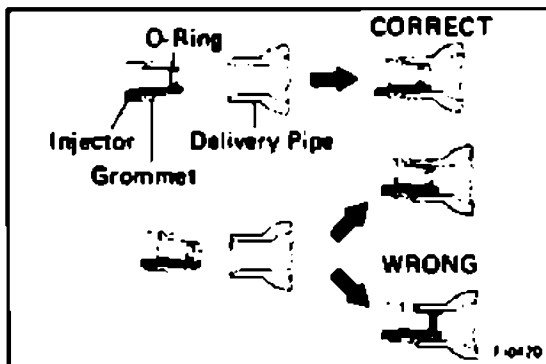
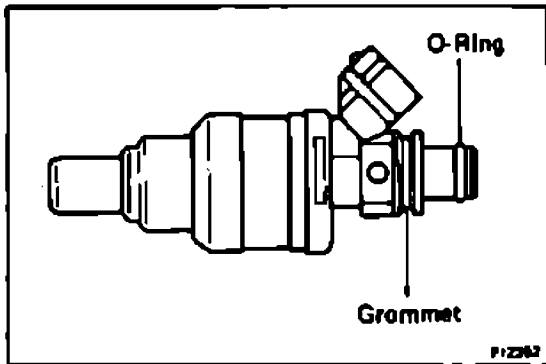
- (c) Remove SST and the service wire.

SST 09268-41045

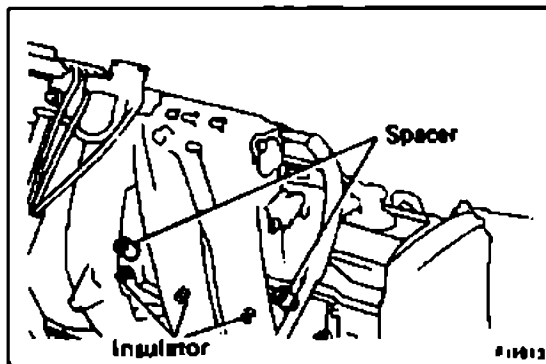
INSTALLATION OF INJECTORS (3S-FE)

1. INSTALL INJECTORS AND DELIVERY PIPE

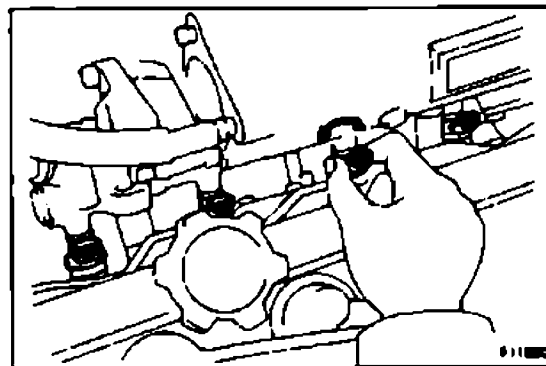
- (a) Install a new grommet to the injector.
- (b) Apply a light coat of gasoline to a new O-ring and install it to the injector.
- (c) While turning the injector left and right, install it to the delivery pipe. Install the four injectors.



- (d) Place the four insulators and two spacers in position on the cylinder head.
- (e) Place the injectors together with the delivery pipe in position on the cylinder head.

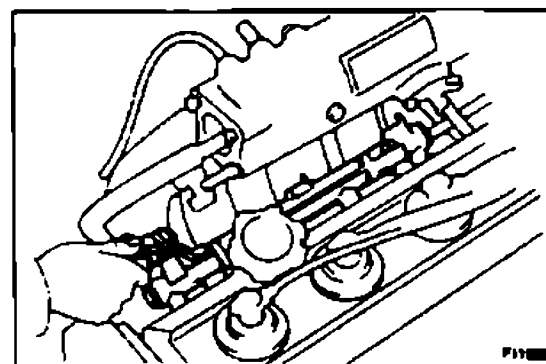


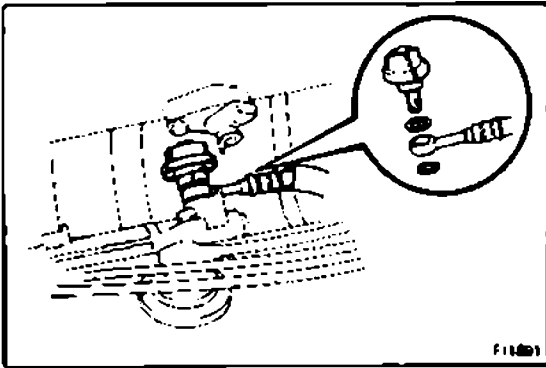
- (f) Check that the injectors rotate smoothly.
- NOTE:** If the injectors do not rotate smoothly, the probable cause is incorrect installation of O-rings. Replace the O-rings.



- (g) Position the injector connector upward.

- (h) Install and torque the two bolts.
- Torque:** 130 kg-cm (9 ft-lb, 13 N·m)





2. INSTALL FUEL PRESSURE PULSATION DAMPER

Install a new gasket, the hose, a new gasket and the pulsation damper.

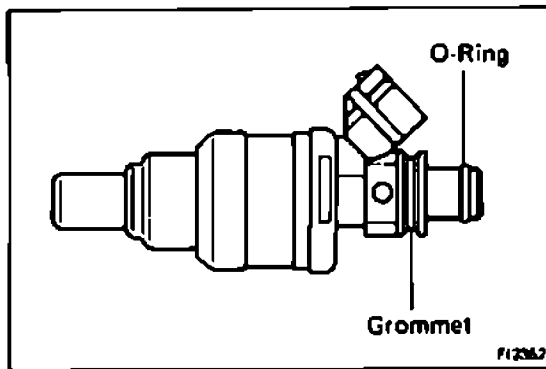
3. CONNECT FUEL RETURN HOSE

4. CONNECT INJECTOR CONNECTORS

5. CONNECT VACUUM SENSING HOSE

6. INSTALL COLD START INJECTOR PIPE
(See step 2 on page FI-69)

7. CONNECT CABLE TO NEGATIVE TERMINAL OF BATTERY

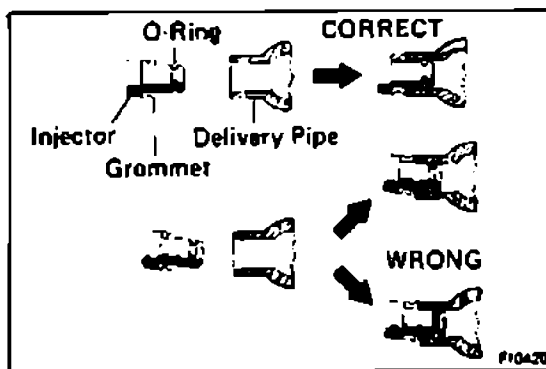


INSTALLATION OF INJECTORS (3S-GE)

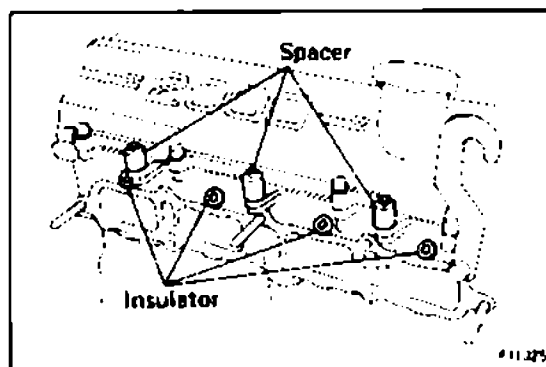
1. INSTALL INJECTORS AND DELIVERY PIPE

(a) Install a new grommet to the injector.

(b) Apply a light coat of gasoline to a new O-ring and install it to the injector.



(c) While turning the injector left and right, install it to the delivery pipe. Install the four injectors.



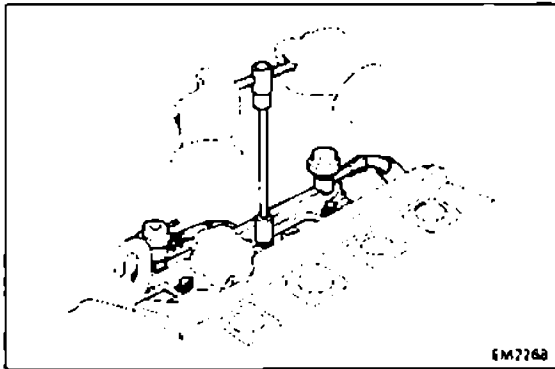
(d) Place the four insulators and three spacers in position on the cylinder head.

(e) Place the injectors together with the delivery pipe in position on the cylinder head.



(f) Check that the injectors rotate smoothly.

NOTE: If the injectors do not rotate smoothly, the probable cause is incorrect installation of O-rings. Replace the O-rings.

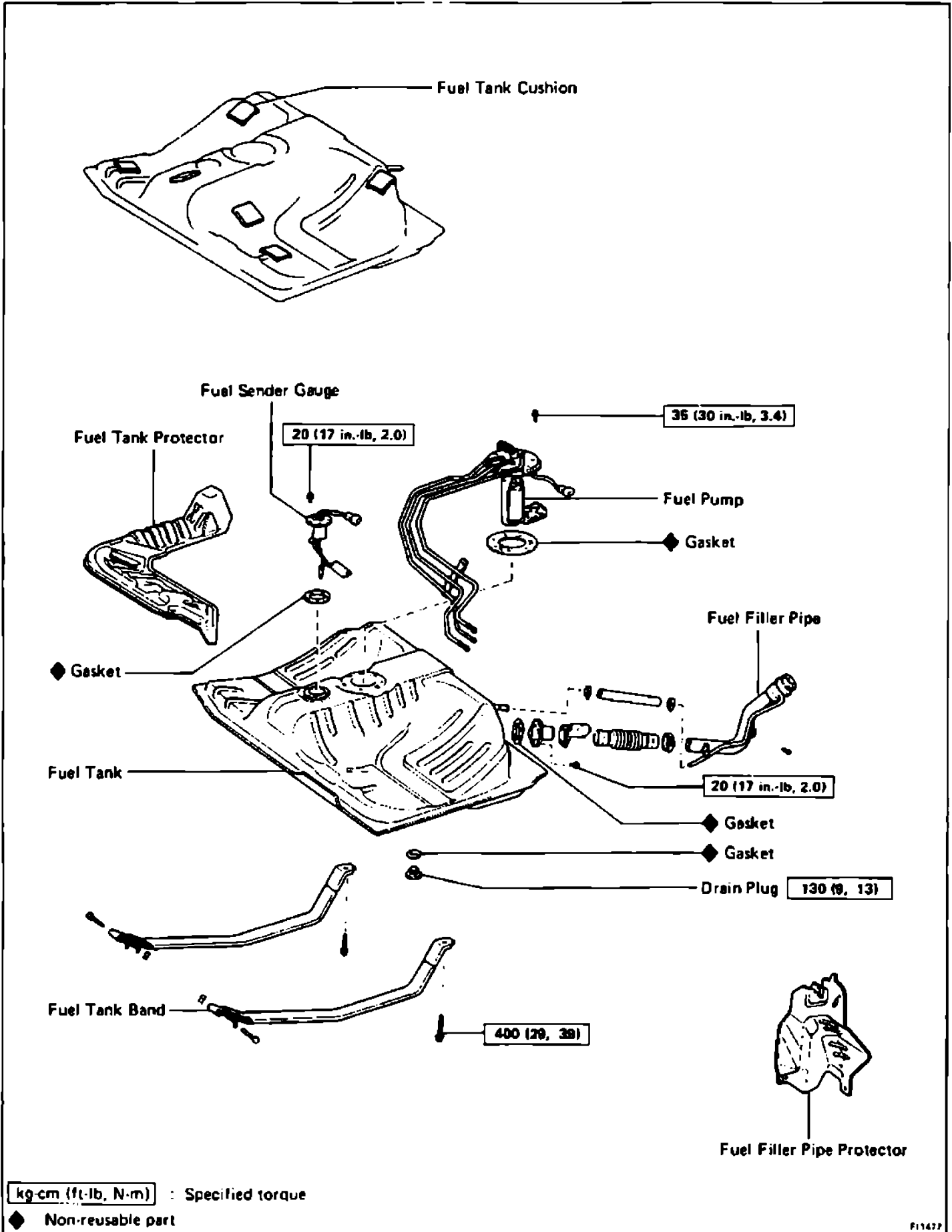


(g) Install and torque the three bolts.

Torque: 195 kg-cm (14 ft-lb, 19 N·m)

2. **INSTALL INTAKE MANIFOLD**
(See steps 11 to 21 on pages EM-99 and 100)
3. **INSTALL THROTTLE BODY**
(See steps 2 and 3 on page FI-92)
4. **INSTALL SUSPENSION LOWER CROSSMEMBER**
(See step 10 on page EM-132)
5. **INSTALL IGNITER**
6. **CONNECT AIR CLEANER HOSE**
7. **INSTALL SUSPENSION UPPER BRACE**
(See step 25 on page EM-134)
8. (A/T)
CONNECT THROTTLE CABLE, AND ADJUST IT
9. **CONNECT ACCELERATOR CABLE, AND ADJUST IT**
10. **FILL WITH ENGINE COOLANT** (See page CO-5)
11. **CONNECT CABLE TO NEGATIVE TERMINAL OF BATTERY**

Fuel Tank and Lines COMPONENTS



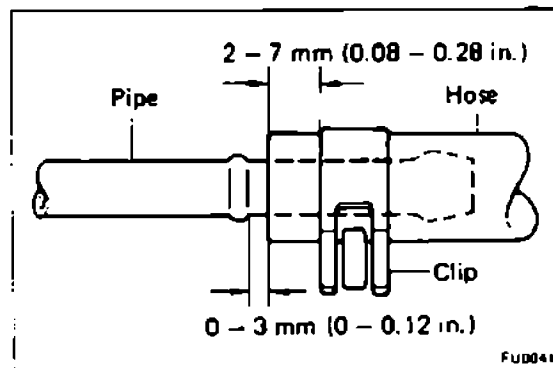
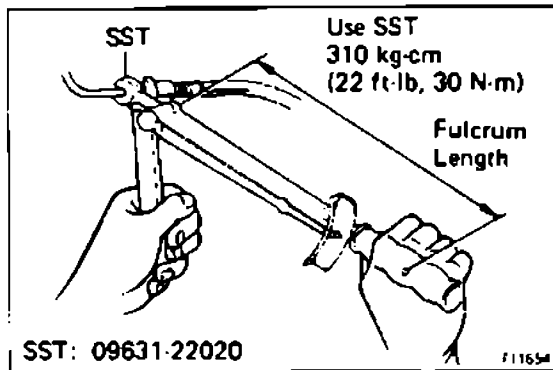
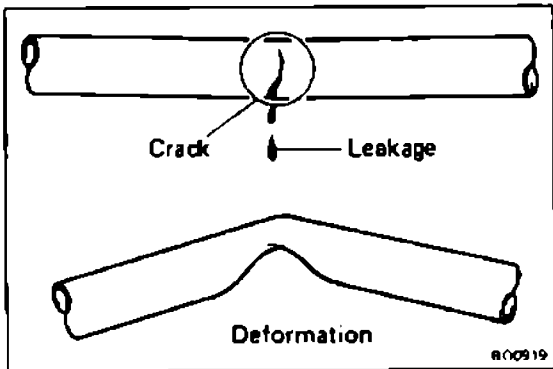
PRECAUTIONS

1. Always use new gaskets when replacing the fuel tank or component parts.
2. Apply the proper torque to all parts tightened.

INSPECT FUEL LINES AND CONNECTIONS

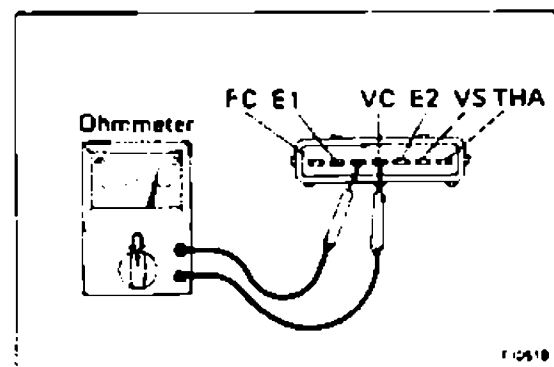
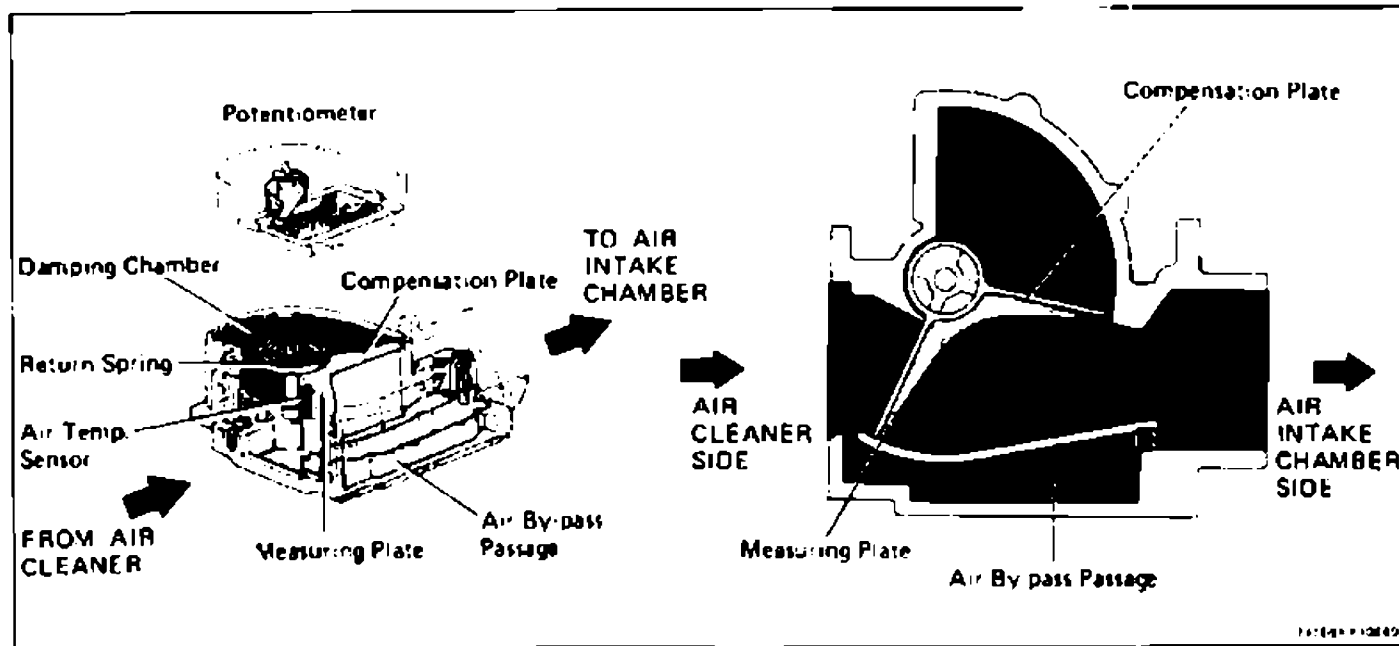
- (a) Check the fuel lines for cracks or leakage, and all connections for deformation.
- (b) Check the fuel tank vapor vent system hoses and connections for looseness, sharp bends or damage.
- (c) Check the fuel tank for deformation, cracks, fuel leakage or tank band looseness.
- (d) Check the filler neck for damage or fuel leakage.
- (e) Hose and tube connections are as shown in the illustration.

If a problem is found, repair or replace the parts as necessary.



AIR INDUCTION SYSTEM

Air Flow Meter



ON-VEHICLE INSPECTION

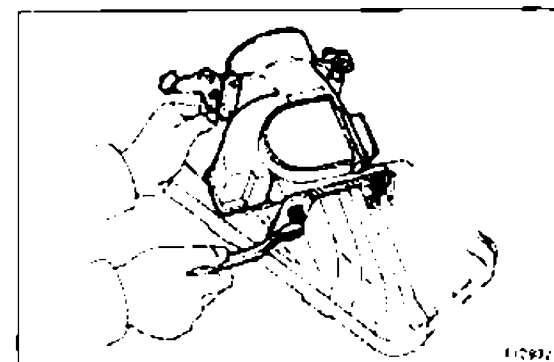
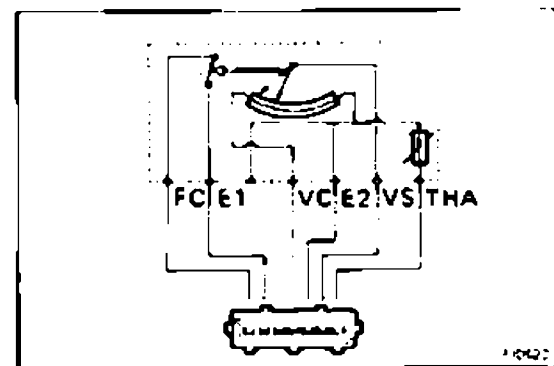
INSPECT RESISTANCE OF AIR FLOW METER

- (a) Disconnect the air flow meter connector.
- (b) Using an ohmmeter, measure the resistance between each terminal.

Between terminals	Resistance	Temperature
VS – E2	200 – 600 Ω	–
VC – E2	200 – 400 Ω	–
THA – E2	10 – 20 KΩ	–20°C (–4°F)
	4 – 7 KΩ	0°C (32°F)
	2 – 3 KΩ	20°C (68°F)
	0.9 – 1.3 KΩ	40°C (104°F)
	0.4 – 0.7 KΩ	80°C (140°F)
FC – E1	Infinity	–

If the resistance is not as specified, replace the air flow meter.

- (c) Reconnect the air flow meter connector.



REMOVAL OF AIR FLOW METER

1. DISCONNECT AIR FLOW METER CONNECTOR
2. DISCONNECT AIR CLEANER HOSE
3. REMOVE AIR CLEANER CAP
4. REMOVE AIR FLOW METER FROM AIR CLEANER CAP
Remove the bolt, four nuts and air flow meter.

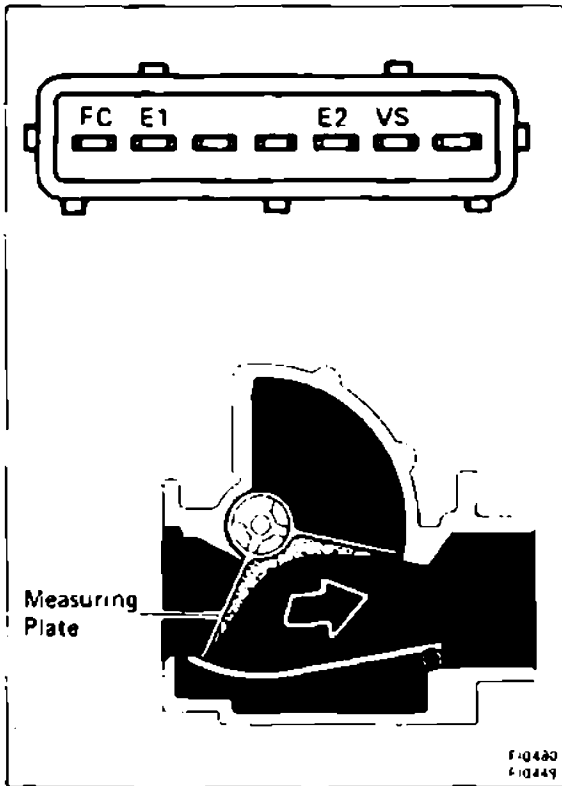
INSPECTION OF AIR FLOW METER

INSPECT RESISTANCE OF AIR FLOW METER

Using an ohmmeter, measure the resistance between each terminal by moving the measuring plate.

Between Terminals	Resistance Ω	Measuring plate opening
E1 - FC	Infinity	Fully closed
	Zero	Other than closed
E2 - VS	200 - 600	Fully closed
	20 - 1,200	Fully open

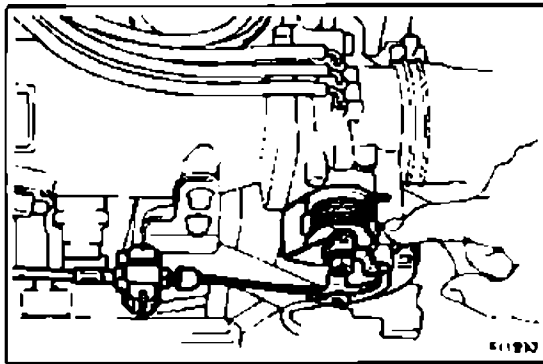
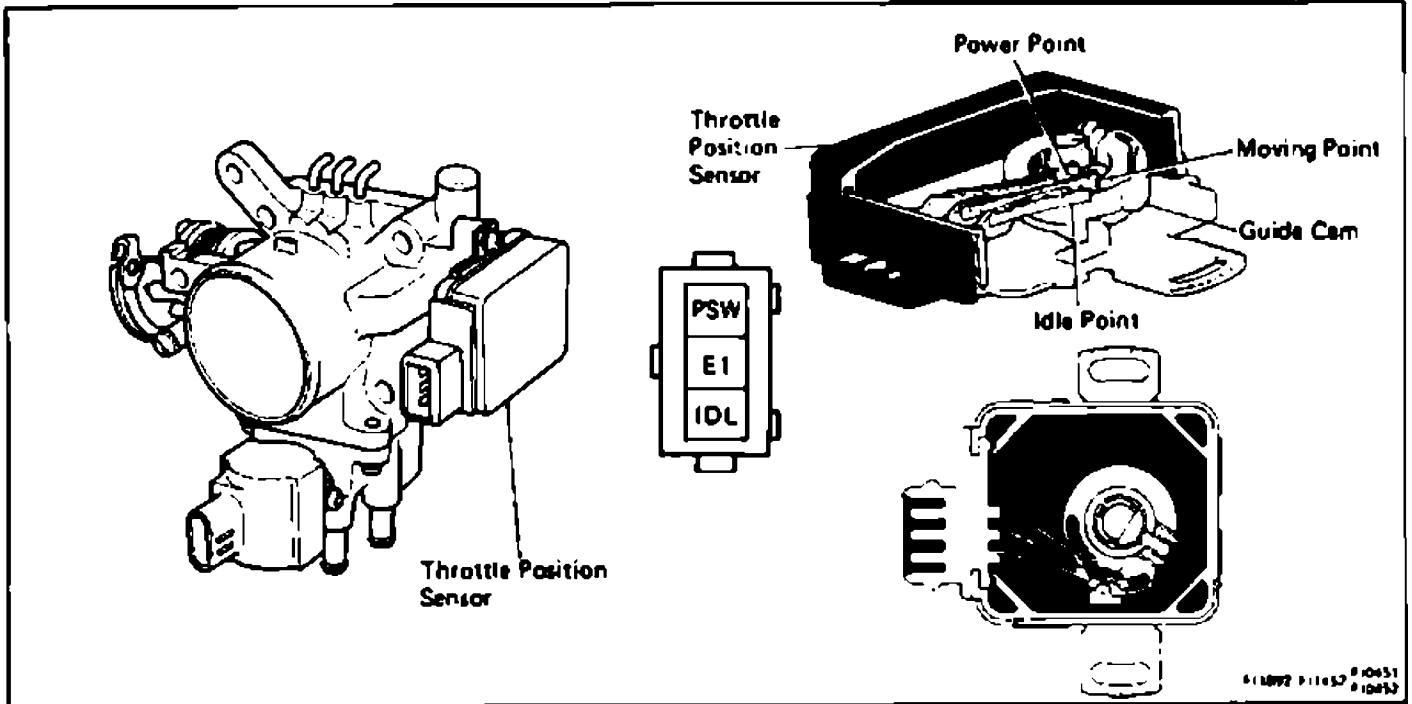
NOTE: Resistance between terminals E2 and VS will change in a wave pattern the measuring plate slowly opens. If the resistance is as specified, replace the meter.



INSTALLATION OF AIR FLOW METER

1. INSTALL AIR FLOW METER TO AIR CLEANER CAP
2. INSTALL AIR CLEANER CAP
3. CONNECT AIR CLEANER HOSE
4. CONNECT AIR FLOW METER CONNECTOR

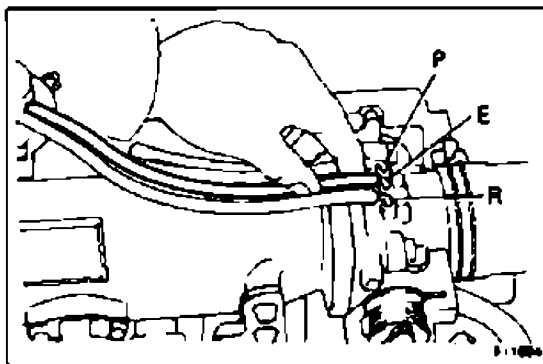
Throttle Body (3S-FE)



ON-VEHICLE INSPECTION

1. INSPECT THROTTLE BODY

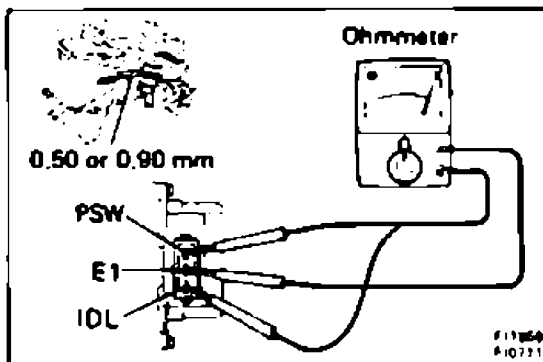
(a) Check that the throttle linkage moves smoothly.



(b) Check the vacuum at each port.

- Start the engine.
- Check the vacuum with your finger.

Port No.	At idling	Other than idling
P	No vacuum	Vacuum
E	No vacuum	Vacuum
R	No vacuum	No vacuum



2. INSPECT THROTTLE POSITION SENSOR

- (a) Disconnect the sensor connector.
- (b) Insert a feeler gauge between the throttle stop screw and stop lever.
- (c) Using an ohmmeter, measure the resistance between each terminal.

Clearance between lever and stop screw	Continuity between terminals	
	IDL – E1	PSW – E1
0.50 mm (0.020 in.)	Continuity	No continuity
0.80 mm (0.035 in.)	No continuity	No continuity
Throttle valve fully opened	No continuity	Continuity

(d) Reconnect the sensor connector.

REMOVAL OF THROTTLE BODY

1. DRAIN ENGINE COOLANT (See page CO-51)
2. (A/T)
DISCONNECT THROTTLE CABLE FROM THROTTLE LINKAGE
3. DISCONNECT ACCELERATOR CABLE FROM THROTTLE LINKAGE
4. DISCONNECT AIR CLEANER HOSE
5. DISCONNECT THROTTLE POSITION SENSOR CONNECTOR

6. DISCONNECT ISC VALVE CONNECTOR

7. REMOVE THROTTLE BODY

(a) Disconnect the following hoses:

- PCV hose
- Water hoses
- Air tube hose
- Emission control vacuum hoses

(b) Remove the four bolts, throttle body and gasket.

8. IF NECESSARY, REMOVE ISC VALVE FROM THROTTLE BODY (See step 2 on page FI-94)

INSPECTION OF THROTTLE BODY

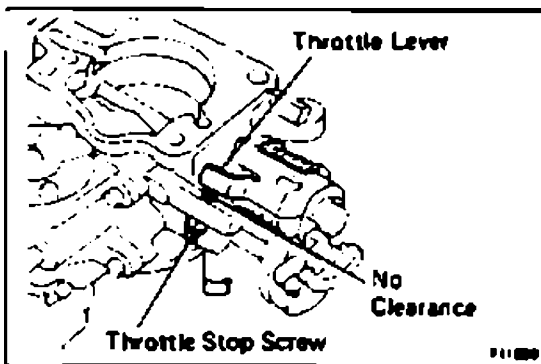
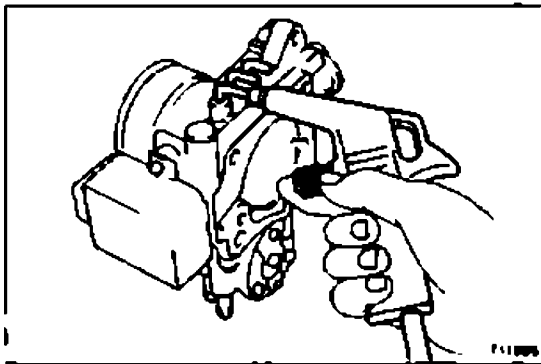
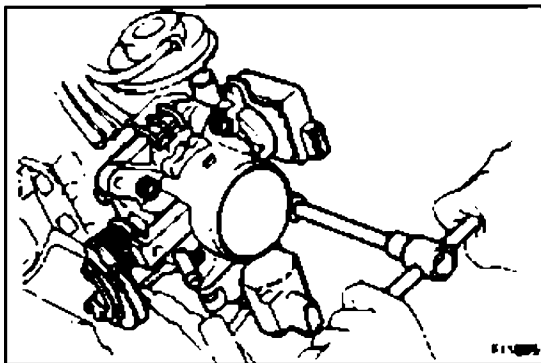
1. CLEAN THROTTLE BODY

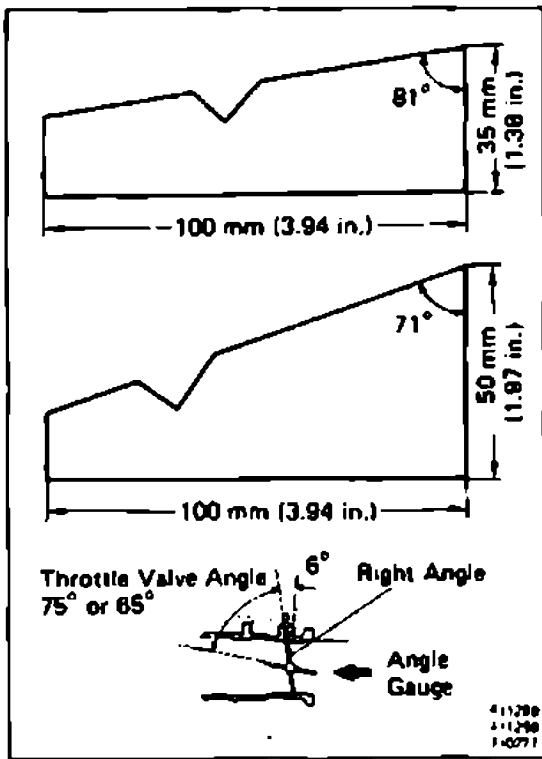
- (a) Using a soft brush and carburetor cleaner, clean the cast parts.
- (b) Using compressed air, clean all the passages and apertures.

CAUTION: To prevent deterioration, do not clean the throttle position sensor.

2. INSPECT THROTTLE VALVE

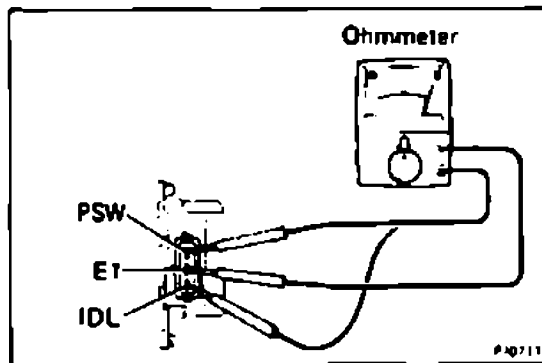
Check that there is no clearance between the throttle stop screw and throttle lever when the throttle valve is fully closed.





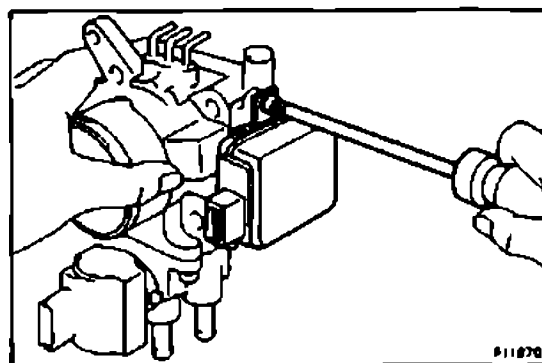
3. INSPECT THROTTLE POSITION SENSOR

- (a) Make an angle gauge as shown in the figure.
- (b) Set the throttle valve opening angle to 81° or 71° from the vertical position (incl. throttle valve fully closed angle 6°).



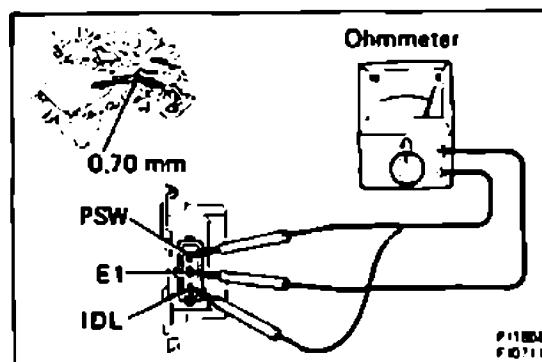
- (c) Using an ohmmeter, check the continuity between each terminal.

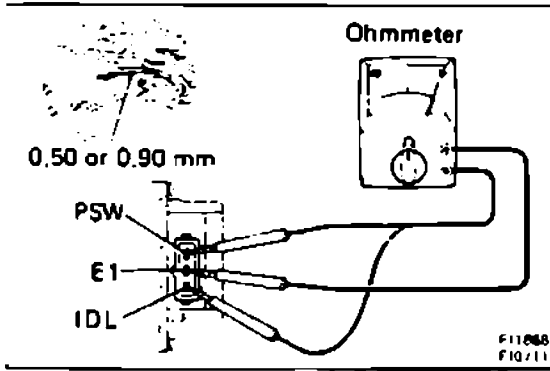
Throttle valve opening angle	Continuity	
	IDL – E1	PSW – E1
71° from vertical	No continuity	No continuity
81° from vertical	No continuity	Continuity
Less than 7.5° from vertical	Continuity	No continuity



4. IF NECESSARY, ADJUST THROTTLE POSITION SENSOR

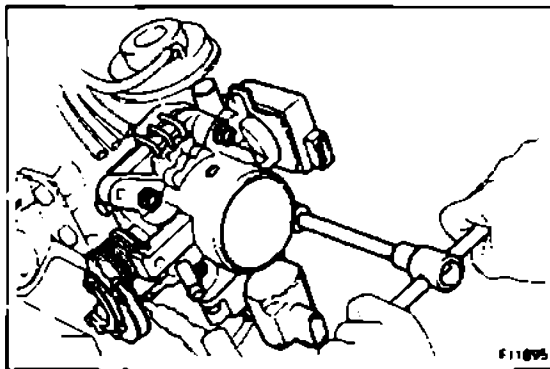
- (a) Loosen the two mount screws of the sensor.
- (b) Insert a 0.70 mm (0.028 in.) feeler gauge, between the throttle stop screw and stop lever.
- (c) Connect the test probe of an ohmmeter to the terminals IDL and E1 of the sensor.
- (d) Gradually turn the sensor clockwise until the ohmmeter deflects, and secure it with the two screws.





(e) Recheck the continuity between terminals IDL and E1.

Clearance between lever and stop screw	Continuity IDL – E1
0.50 mm (0.020 in.)	Continuity
0.90 mm (0.035 in.)	No continuity



INSTALLATION OF THROTTLE BODY

1. **INSTALL ISC VALVE TO THROTTLE BODY**
(See step 1 on page FI-94)

2. **INSTALL THROTTLE BODY**

(a) Install a new gasket and the throttle body with the four bolts.

Torque: 195 kg-cm (14 ft-lb, 19 N-m)

(b) Connect the following hoses:

- PCV hose
- Water hoses
- Air tube hose
- Emission control vacuum hoses

3. **CONNECT ISC VALVE CONNECTOR**

4. **CONNECT THROTTLE POSITION SENSOR CONNECTOR**

5. **CONNECT AIR CLEANER HOSE**

6. (A/T)
CONNECT THROTTLE CABLE, AND ADJUST IT

7. **CONNECT ACCELERATOR CABLE, AND ADJUST IT**

8. **FILL WITH ENGINE COOLANT (See page CO-5)**

Throttle Body (3S-GE)

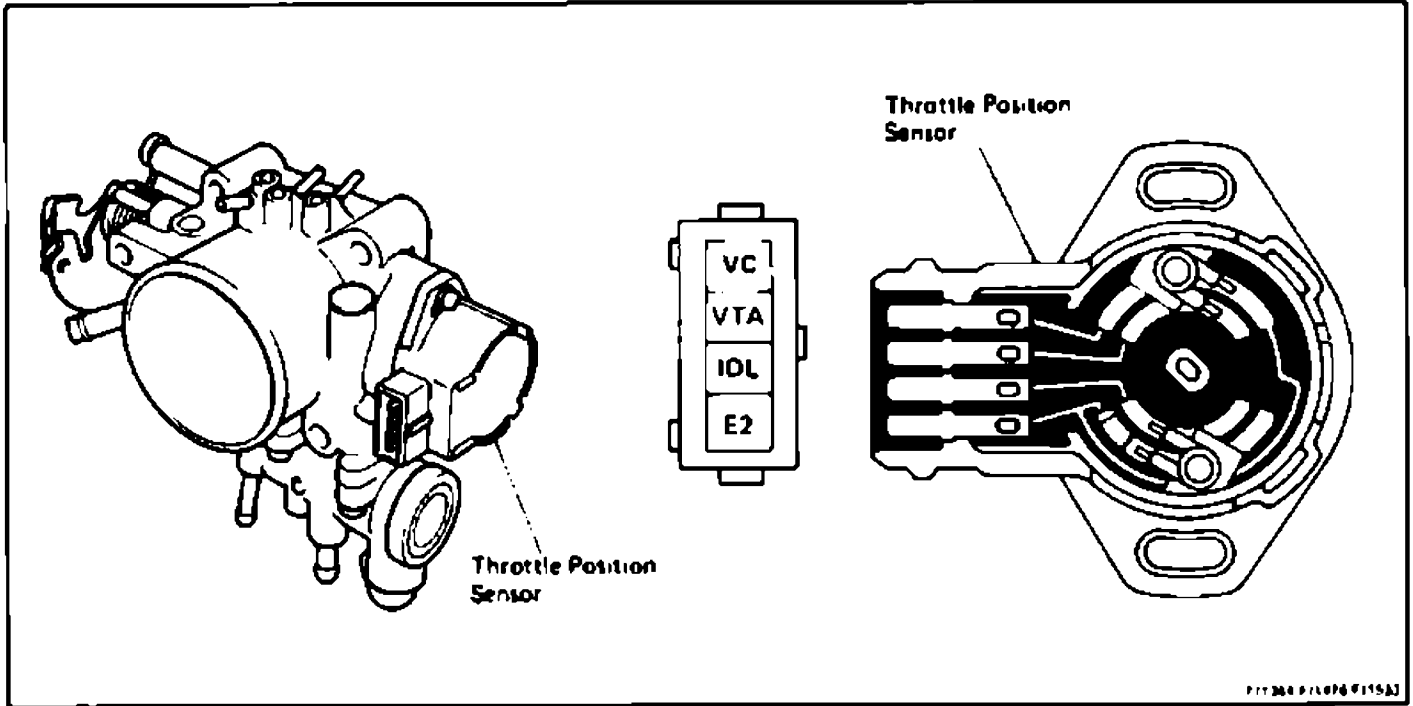
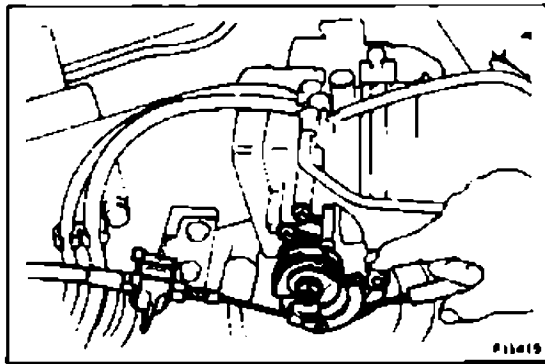


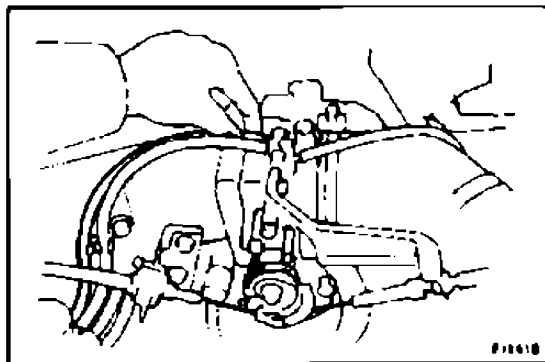
FIG. 204 FI1076 FI1583



ON-VEHICLE INSPECTION

1. INSPECT THROTTLE BODY

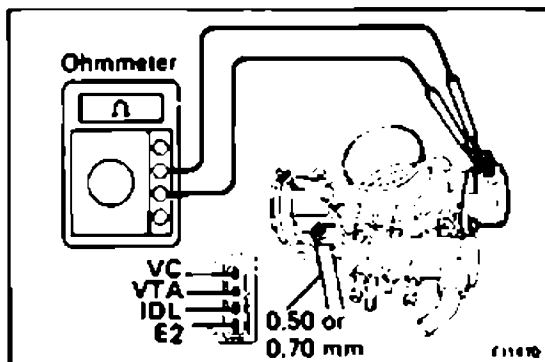
(a) Check that the throttle linkage moves smoothly.



(b) Check the vacuum at each port.

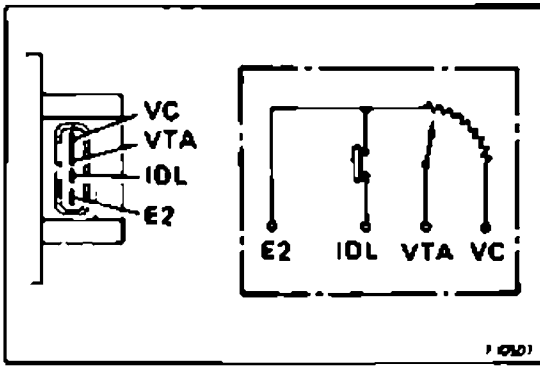
- Start the engine.
- Check the vacuum with your finger.

Port No.	At idling	Other than idling
E	No vacuum	Vacuum
P	No vacuum	Vacuum
R	No vacuum	No vacuum



2. INSPECT THROTTLE POSITION SENSOR

- (a) Disconnect the sensor connector.
- (b) Insert a feeler gauge between the throttle stop screw and stop lever.
- (c) Using an ohmmeter, measure the resistance between each terminal.

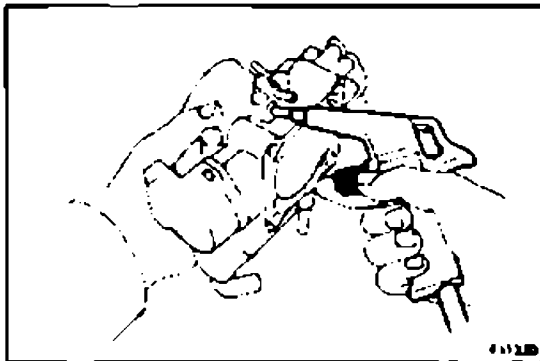
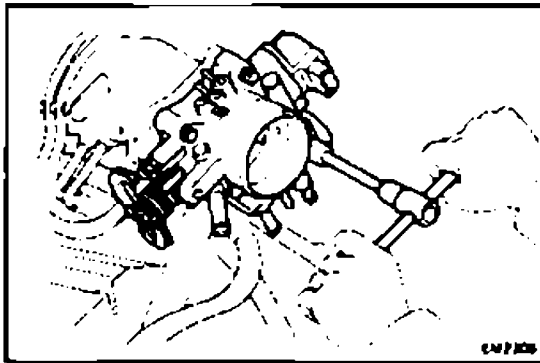


Clearance between lever and stop screw	Between terminals	Resistance
0 mm (0 in.)	VTA – E2	0.2 – 0.8 kΩ
0.50 mm (0.020 in.)	IDL – E2	Less than 2.3 kΩ
0.70 mm (0.028 in.)	IDL – E2	Infinity
Throttle valve fully opened	VTA – E2	3.3 – 10 kΩ
–	VC – E2	3 – 7 kΩ

(d) Reconnect the sensor connector.

REMOVAL OF THROTTLE BODY

1. DRAIN ENGINE COOLANT (See page CO-5)
2. (A/T)
DISCONNECT THROTTLE CABLE FROM THROTTLE LINKAGE
3. DISCONNECT ACCELERATOR CABLE FROM THROTTLE LINKAGE
4. DISCONNECT AIR CLEANER HOSE
5. DISCONNECT THROTTLE POSITION SENSOR CONNECTOR
6. REMOVE THROTTLE BODY
 - (a) Remove the following hoses:
 - PCV hose
 - Water hoses
 - Air tube hose
 - Emission control vacuum hoses
 - (b) Remove the four bolts, throttle body and gasket.
7. IF NECESSARY, REMOVE AIR VALVE FROM THROTTLE BODY (See step 2 on page FI-95)



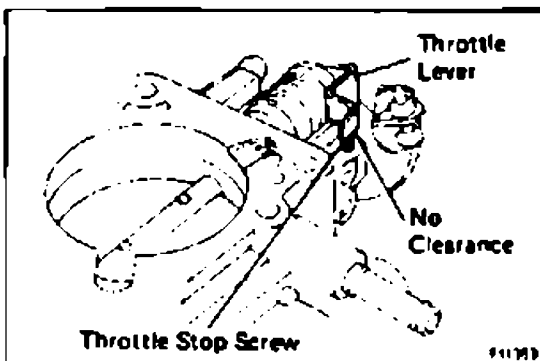
INSPECTION OF THROTTLE BODY

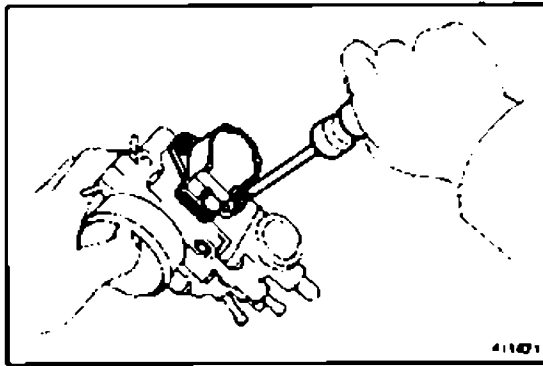
1. CLEAN THROTTLE BODY
 - (a) Using a soft brush and carburetor cleaner, clean the cast parts.
 - (b) Using compressed air, clean all the passages and apertures.

CAUTION: To prevent deterioration, do not clean the throttle position sensor.

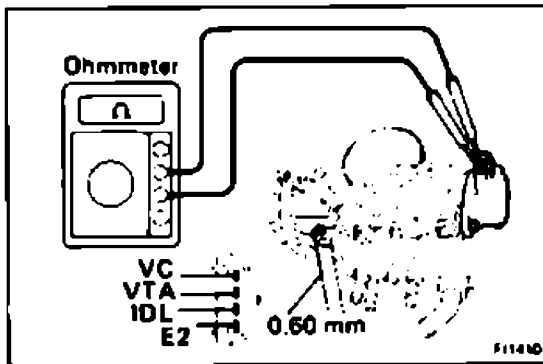
2. INSPECT THROTTLE VALVE

Check that there is no clearance between the throttle stop screw and throttle lever when the throttle valve is fully closed.

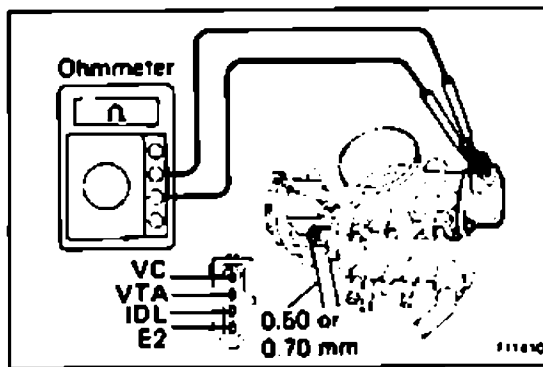




3. **INSPECT THROTTLE POSITION SENSOR**
(See page 2 on page FI-90)
4. **IF NECESSARY, ADJUST THROTTLE POSITION SENSOR**
 - (a) Loosen the two mount screws of the sensor.



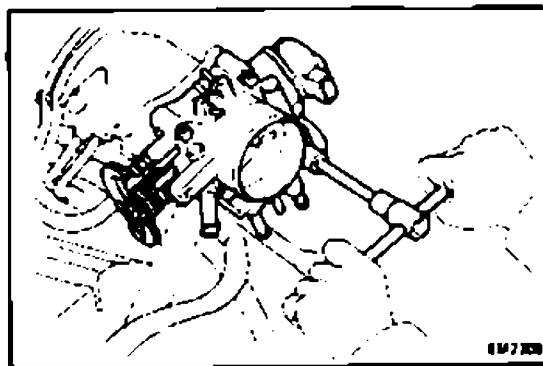
- (b) Insert a feeler gauge 0.60 mm (0.024 in.) between the throttle stop screw and throttle lever.
- (c) Connect the test probe of an ohmmeter to the terminals IDL and E2 of the sensor.
- (d) Gradually turn the sensor clockwise until the ohmmeter deflects, and secure it with the screws.



- (e) Recheck the continuity between terminals IDL and E2.

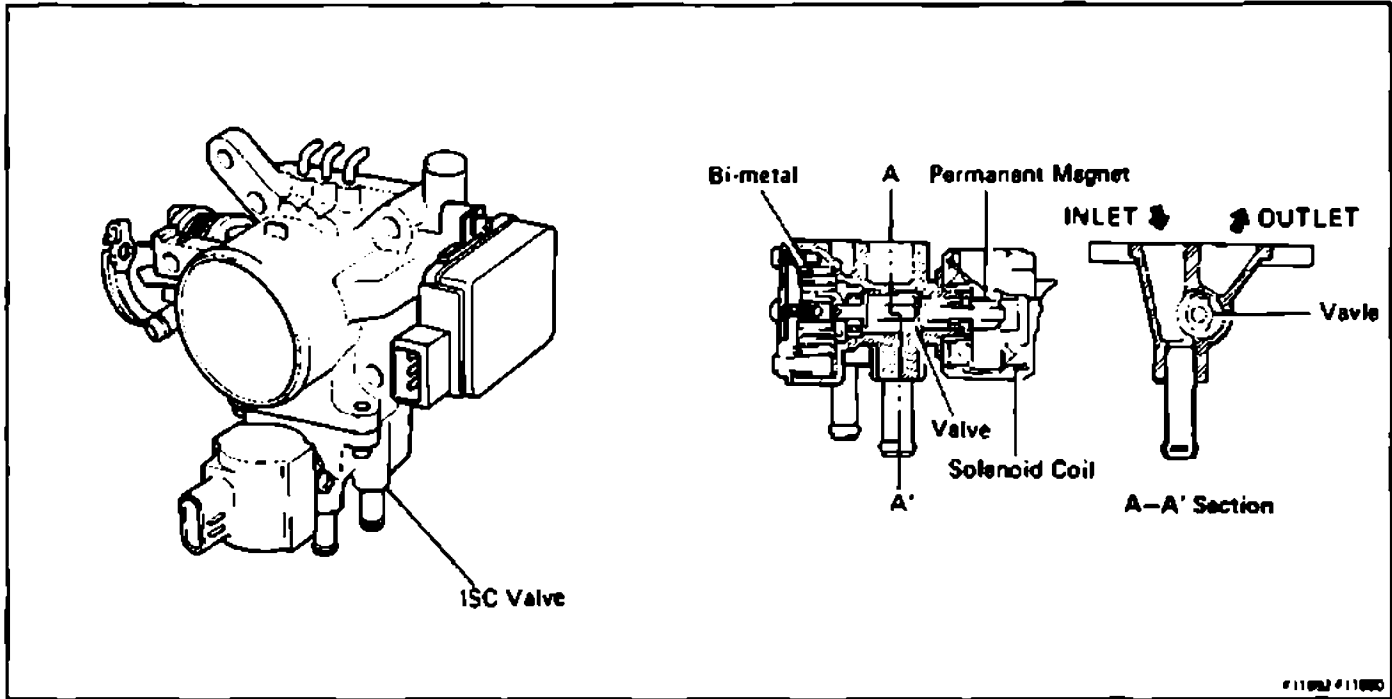
Clearance between lever and stop screw	Continuity (IDL – E2)
0.50 mm (0.020 in.)	Continuity
0.70 mm (0.028 in.)	No continuity

INSTALLATION OF THROTTLE BODY



1. **INSTALL AIR VALVE TO THROTTLE BODY**
(See step 1 on page FI-95)
2. **INSTALL THROTTLE BODY**
 - (a) Install a new gasket and the throttle body with the four bolts.
Torque: 195 kg-cm (14 ft-lb, 19 N-m)
 - (b) Connect the following hoses:
 - PCV hose
 - Water hoses
 - Air tube hose
 - Emission control vacuum hoses
3. **CONNECT THROTTLE POSITION SENSOR CONNECTOR**
4. **CONNECT AIR CLEANER HOSE**
5. (A/T)
CONNECT THROTTLE CABLE, AND ADJUST IT
6. **CONNECT ACCELERATOR CABLE, AND ADJUST IT**
7. **FILL WITH ENGINE COOLANT (See page CO-5)**

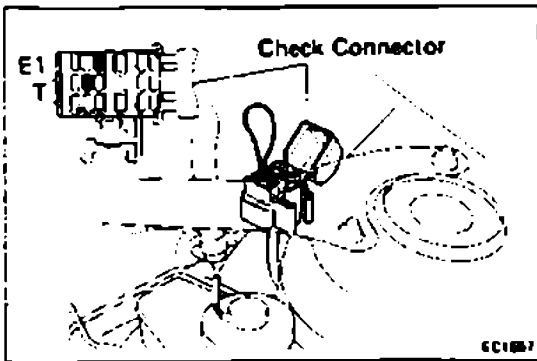
Idle Speed Control (ISC) Valve (3S-FE)



ON-VEHICLE INSPECTION

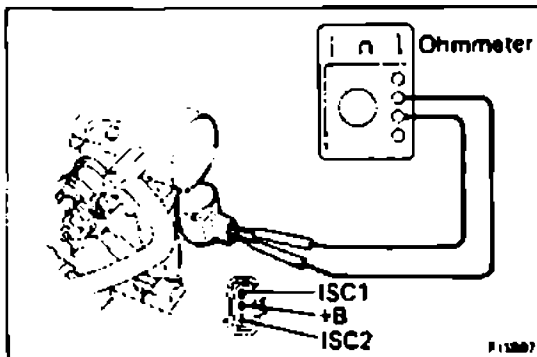
1. INSPECT ISC VALVE OPERATION

- (a) Initial conditions
 - Engine at reach normal operatig temperature
 - Idle speed set correctly
 - Transmission "N" range



- (b) Using a service wire, short terminals T and E1 of the check conector.
- (c) After engine rpm are kept at 1,000 – 1,300 rpm for 5 seconds, check that they return to 600 – 800 rpm.

If the rpm operation is not as specified, check the ISC valve, wiring and ECU.



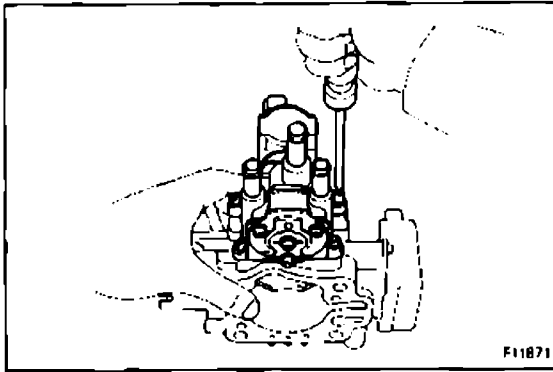
2. INSPECT ISC VALVE RESISTANCE

- (a) Disconnect the ISC valve connector.
- (b) Using an ohmmeter, measure the resistance between the terminal +B and other terminals (ISC1, ISC2).

Resistance: 16.0 – 17.0 Ω

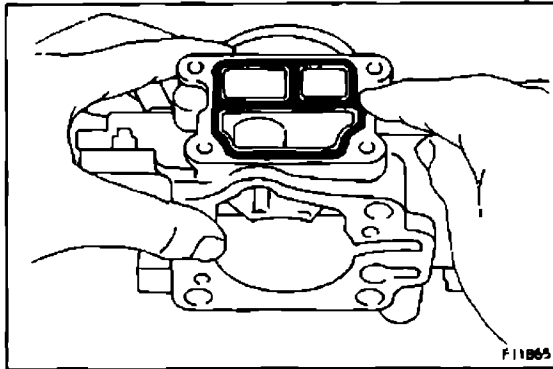
If the resistance is not as specified, replace the valve.

- (c) Reconnect the ISC valve connector.



REMOVAL OF ISC VALVE

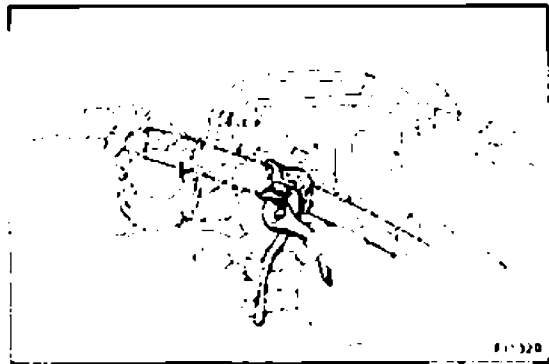
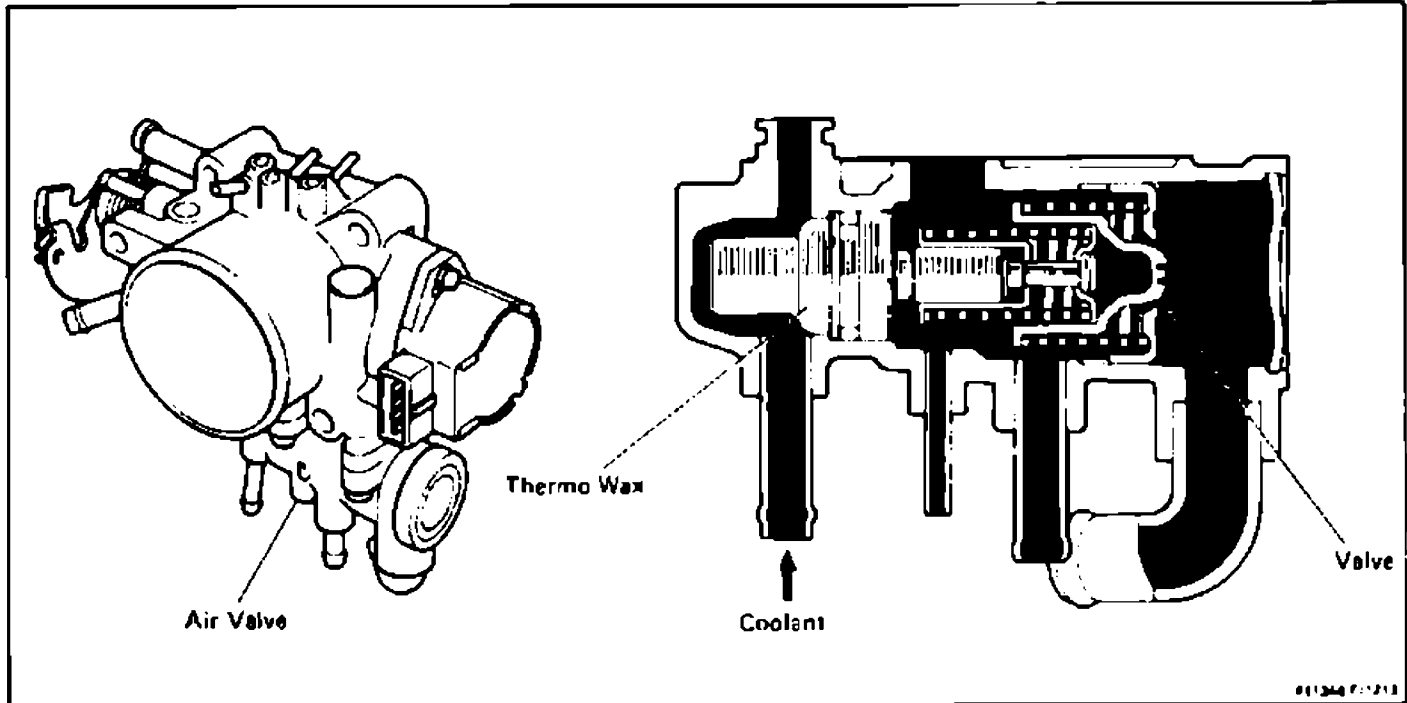
1. **REMOVE THROTTLE BODY**
(See steps 1 to 6 on page FI-87)
2. **REMOVE ISC VALVE FROM THROTTLE BODY**
Remove the four screws, ISC valve and gasket.



INSTALLATION OF ISC VALVE

1. **INSTALL ISC VALVE TO THROTTLE BODY**
 - (a) Place a new gasket on the throttle body.
 - (b) Install the ISC valve with the four screws.
2. **INSTALL THROTTLE BODY**
(See steps 2 to 8 on page FI-89)

Air Valve (3S-GE)



ON-VEHICLE INSPECTION

INSPECT AIR VALVE OPERATION

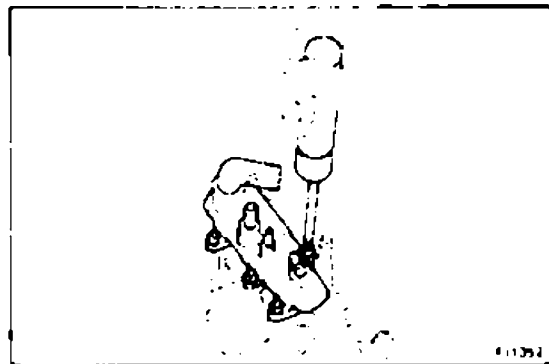
Check the engine RPM while pinching the air hose.

At low temp. (Coolant temp.: below 80°C (176°F))

- When the idle speed adjusting screw is in, the engine RPM should drop.

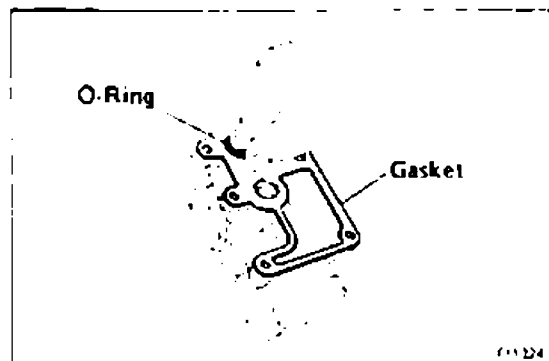
After warm-up

- When the hose is pinched, engine RPM should not drop more than 100 rpm.



REMOVAL OF AIR VALVE

1. REMOVE THROTTLE BODY
(See steps 1 to 6 on page FI-91)
2. REMOVE AIR VALVE FROM THROTTLE BODY
Remove the five screws, air valve, gasket and O-ring.



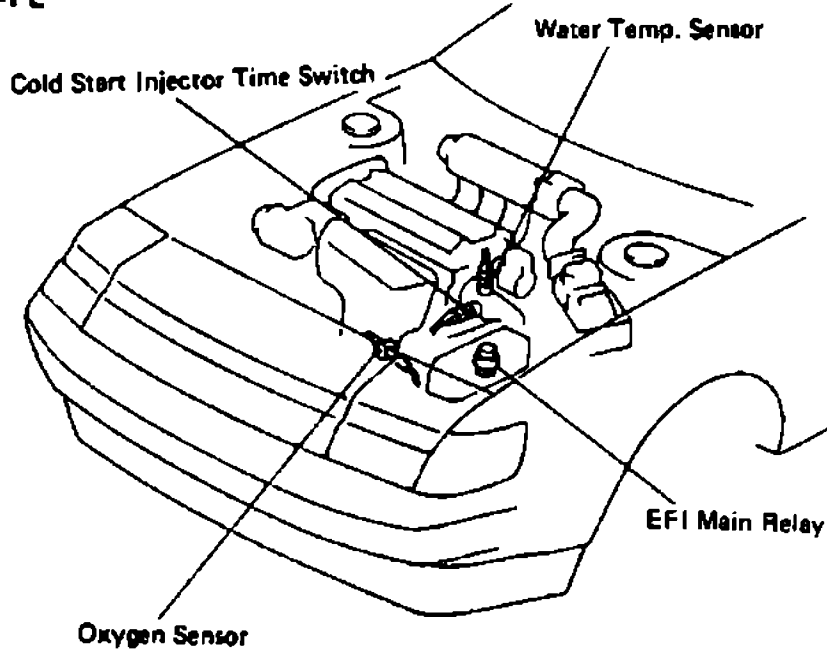
INSTALLATION OF AIR VALVE

1. INSTALL AIR VALVE TO THROTTLE BODY
 - (a) Place new gasket and O-ring on the air valve.
 - (b) Install the air valve with the five screws.
2. INSTALL THROTTLE BODY
(See steps 2 to 7 on page FI-92)

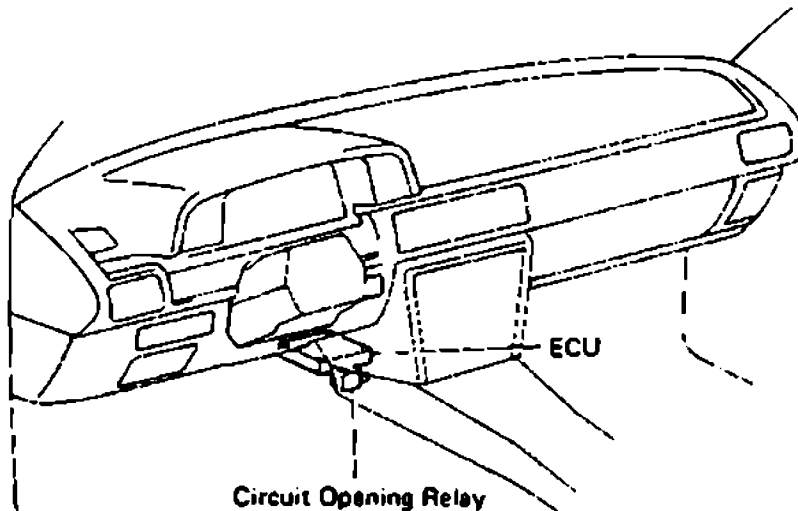
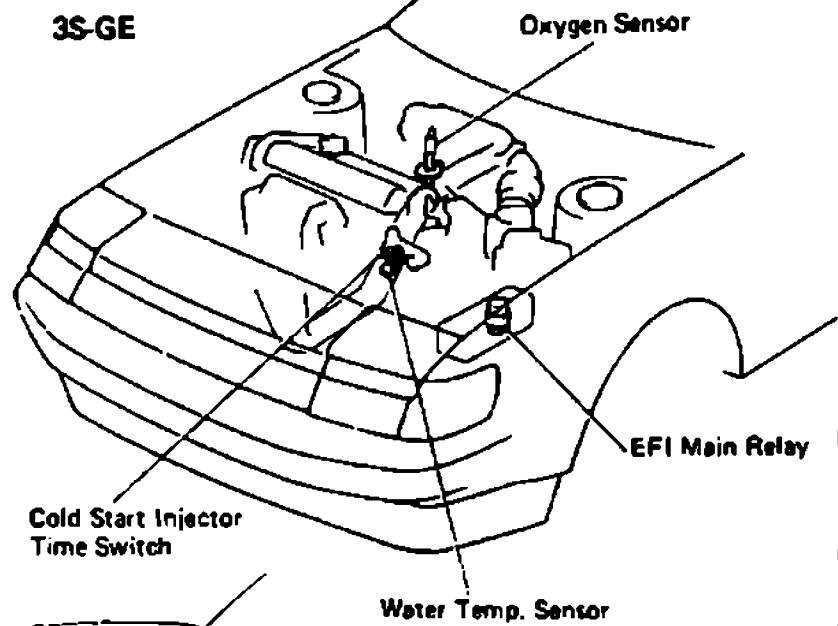
ELECTRONIC CONTROL SYSTEM

Location of Electronic Control Parts

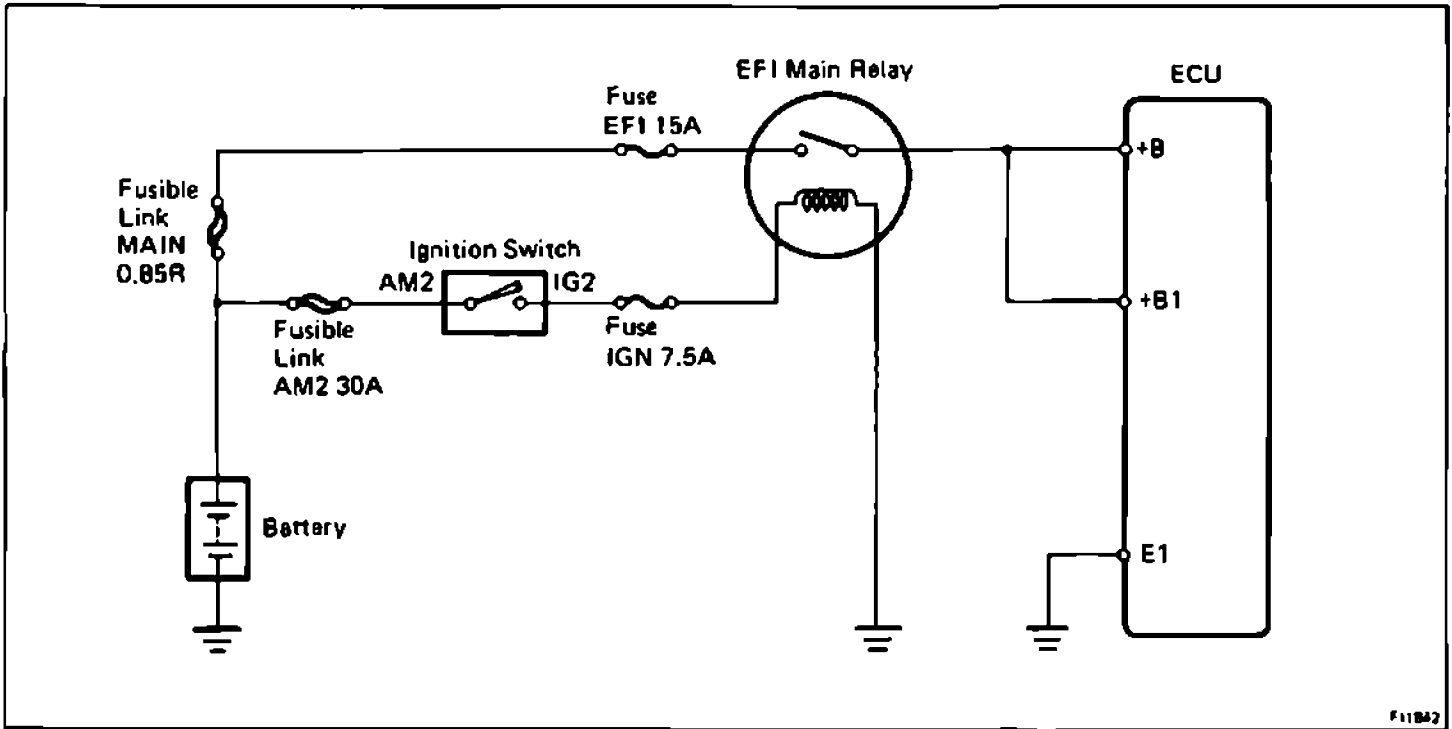
3S-FE



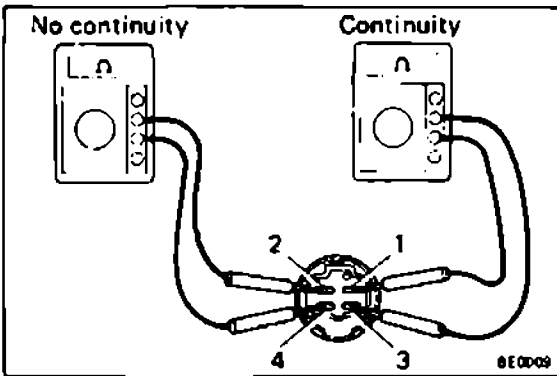
3S-GE



EFI Main Relay



F11B42

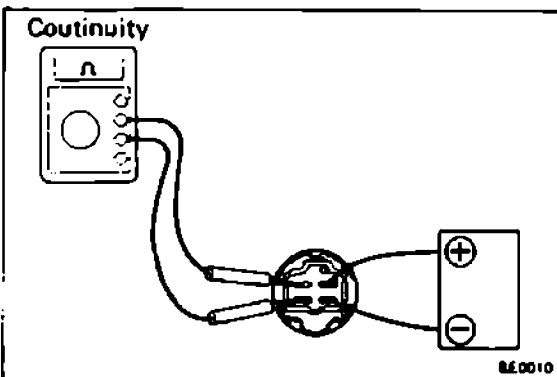


INSPECTION OF EFI MAIN RELAY

1. INSPECT RELAY CONTINUITY

- (a) Using an ohmmeter, check that there is continuity between terminals 1 and 3.
- (b) Check that there is no continuity between terminals 2 and 4.

If continuity is not as specified, replace the relay.

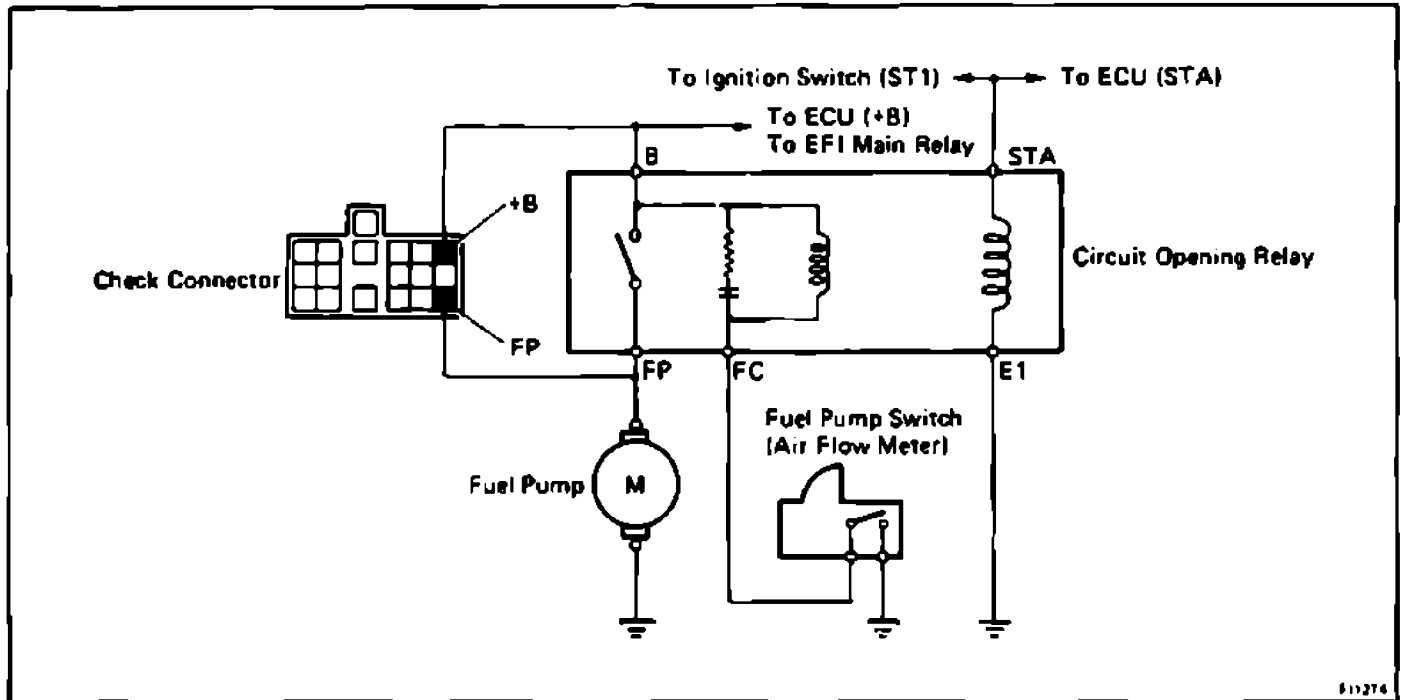


2. INSPECT RELAY OPERATION

- (a) Apply battery voltage across terminals 1 and 3.
- (b) Using an ohmmeter, check that there is continuity between terminals 2 and 4.

If operation is not as specified, replace the relay.

Circuit Opening Relay



F11274

INSPECTION OF CIRCUIT OPENING RELAY

1. INSPECT RELAY CONTINUITY

- (a) Using an ohmmeter, check that there is continuity between terminals STA and E1.
- (b) Check that there is continuity between terminals B and FC.
- (c) Check that there is no continuity between terminals B and FP.

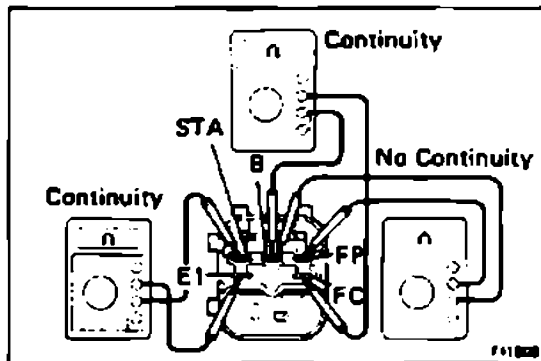
If continuity is not as specified, replace the relay.

2. INSPECT RELAY OPERATION

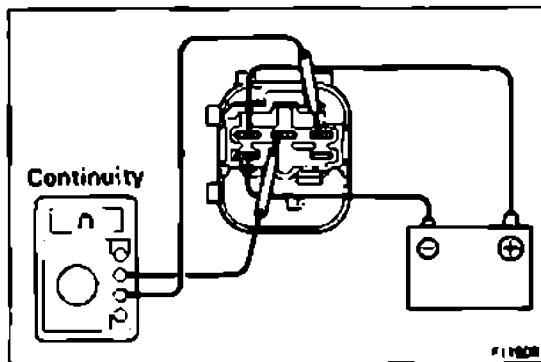
- (a) Apply battery voltage across terminals STA and E1.
- (b) Using an ohmmeter, check that there is continuity between terminals B and FP.

- (c) Apply battery voltage across terminals B and FC.
- (d) Check that there is continuity between terminals B and FP.

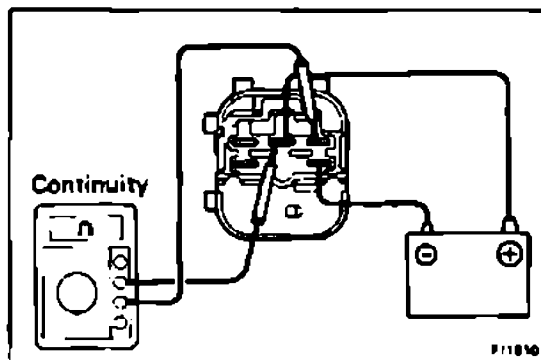
If operation is not as specified, replace the relay.



F11808

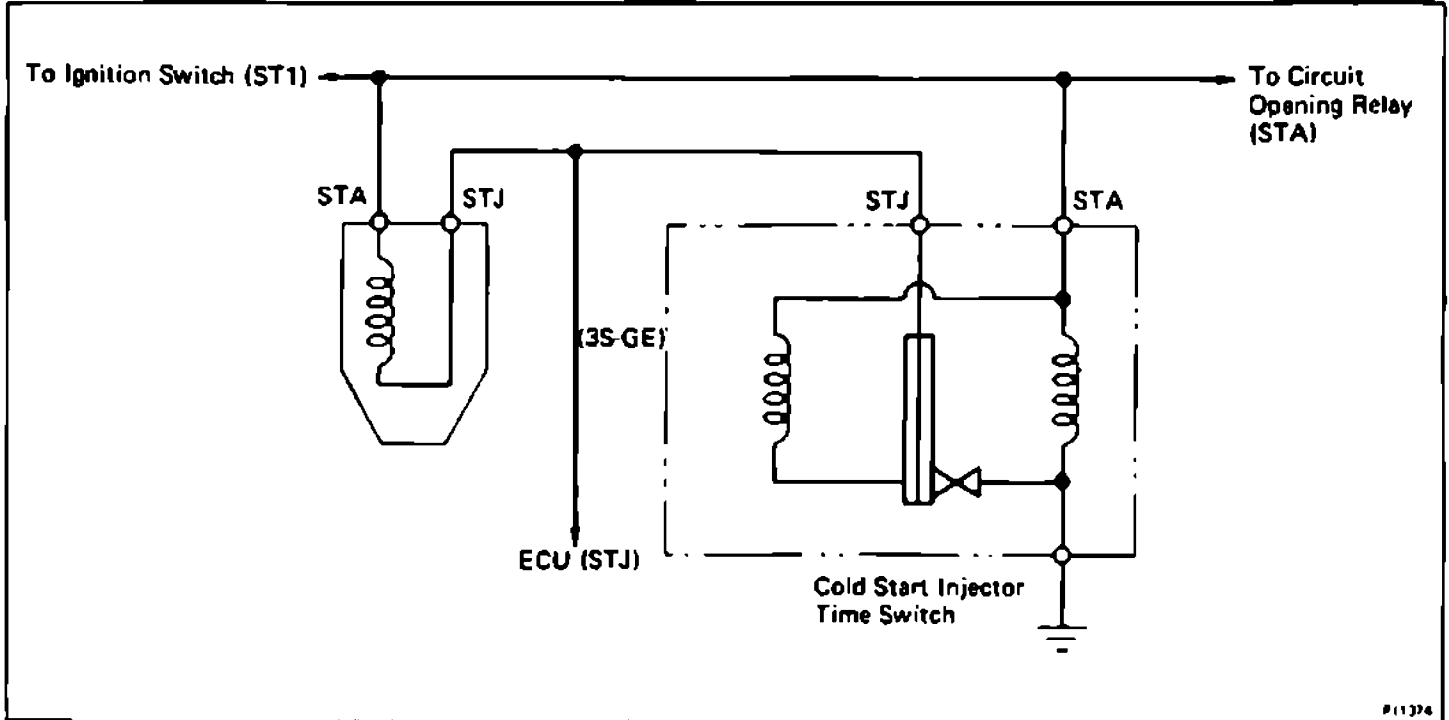


F11809

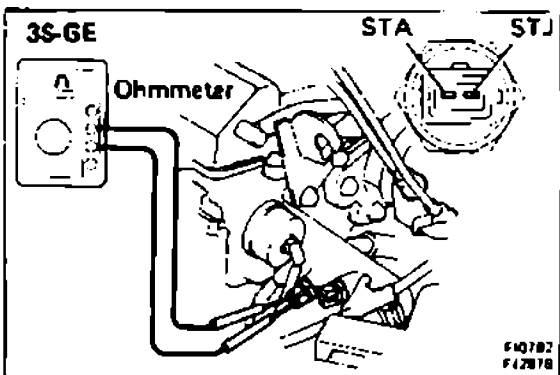
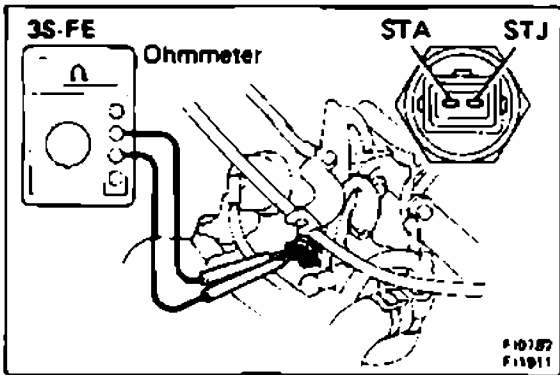


F11810

Cold Start Injector Time Switch



#11324



INSPECTION OF COLD START INJECTOR TIME SWITCH

INSPECT COLD START INJECTOR TIME SWITCH

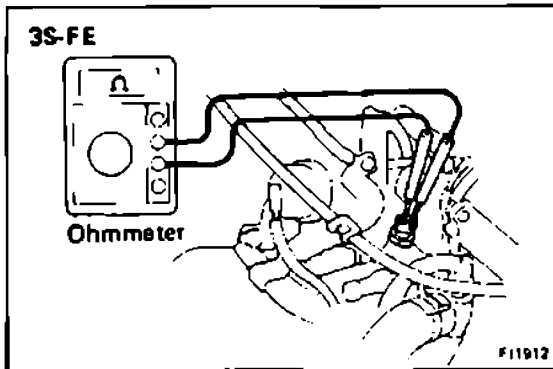
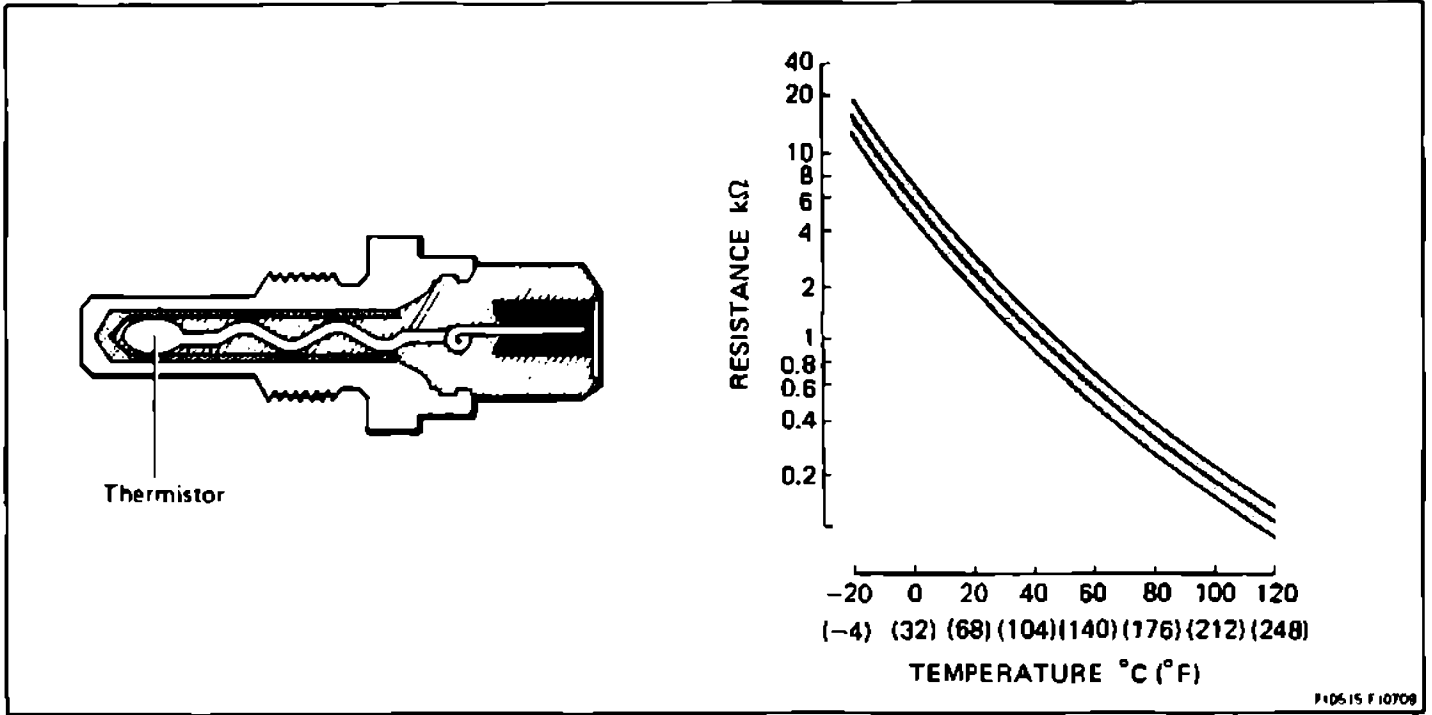
Using an ohmmeter, measure the resistance between each terminal.

Resistance:

- 3S-FE STA – STJ
 - 20 – 40 Ω below 30°C (86°F)
 - 40 – 60 Ω above 40°C (104°F)
- STA – Ground
 - 20 – 80 Ω
- 3S-GE STA – STJ
 - 30 – 50 Ω below 10°C (50°F)
 - 70 – 90 Ω above 25°C (77°F)
- STA – Ground
 - 30 – 90 Ω

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

Water Temperature Sensor



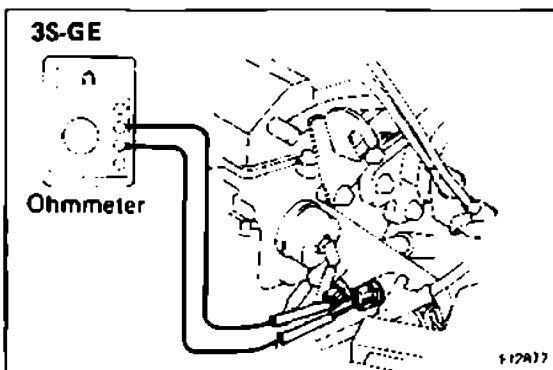
INSPECTION OF WATER TEMPERATURE SENSOR

INSPECT WATER TEMPERATURE SENSOR

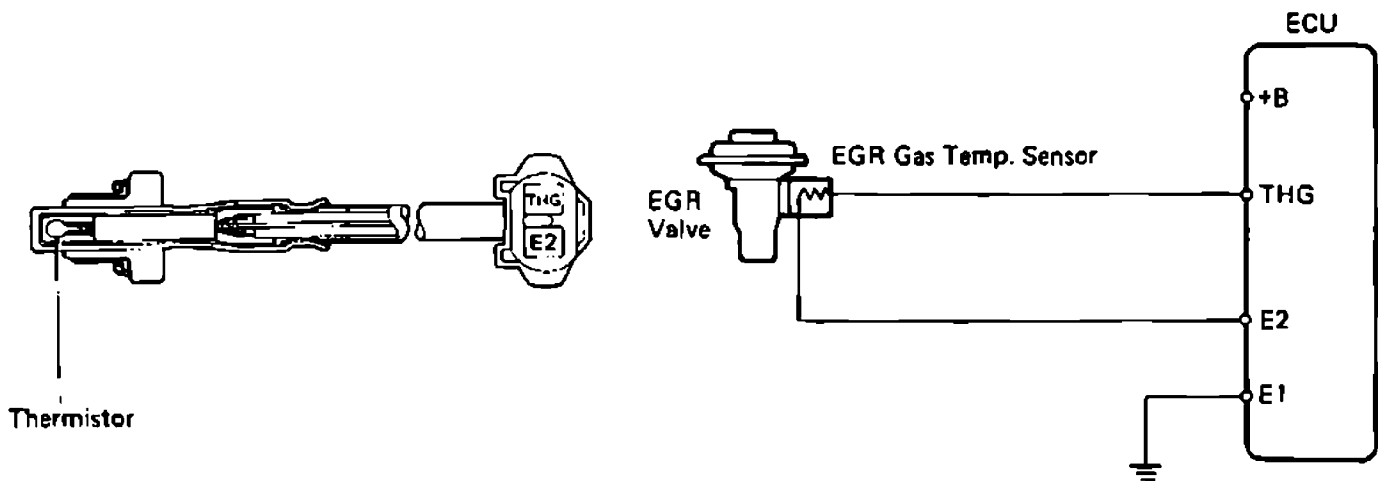
Using an ohmmeter, measure the resistance between the terminals.

Resistance: Refer to chart

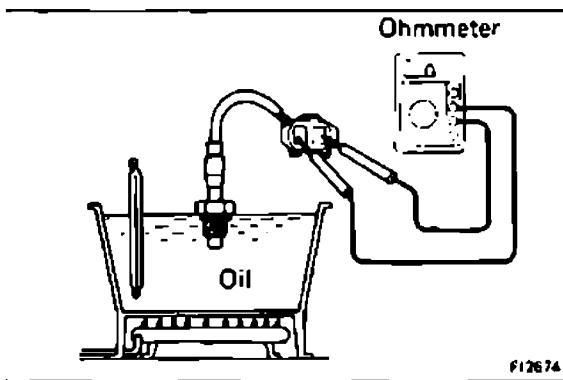
If the resistance is not as specified, replace the sensor.



EGR Gas Temperature Sensor (3S-GE (CALIF.))



F12673 F12680



INSPECTION OF EGR GAS TEMPERATURE SENSOR

INSPECT EGR GAS TEMPERATURE SENSOR

Using an ohmmeter, measure the resistance between the terminal.

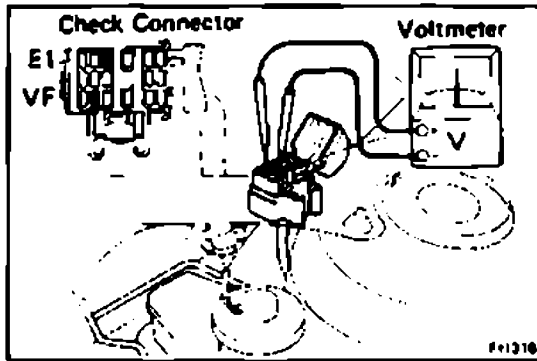
Resistance:

69.40 – 88.50 k Ω at 50°C (122°F)

11.89 – 14.37 k Ω at 100°C (212°F)

2.79 – 3.59 k Ω at 150°C (302°F)

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



Oxygen Sensor

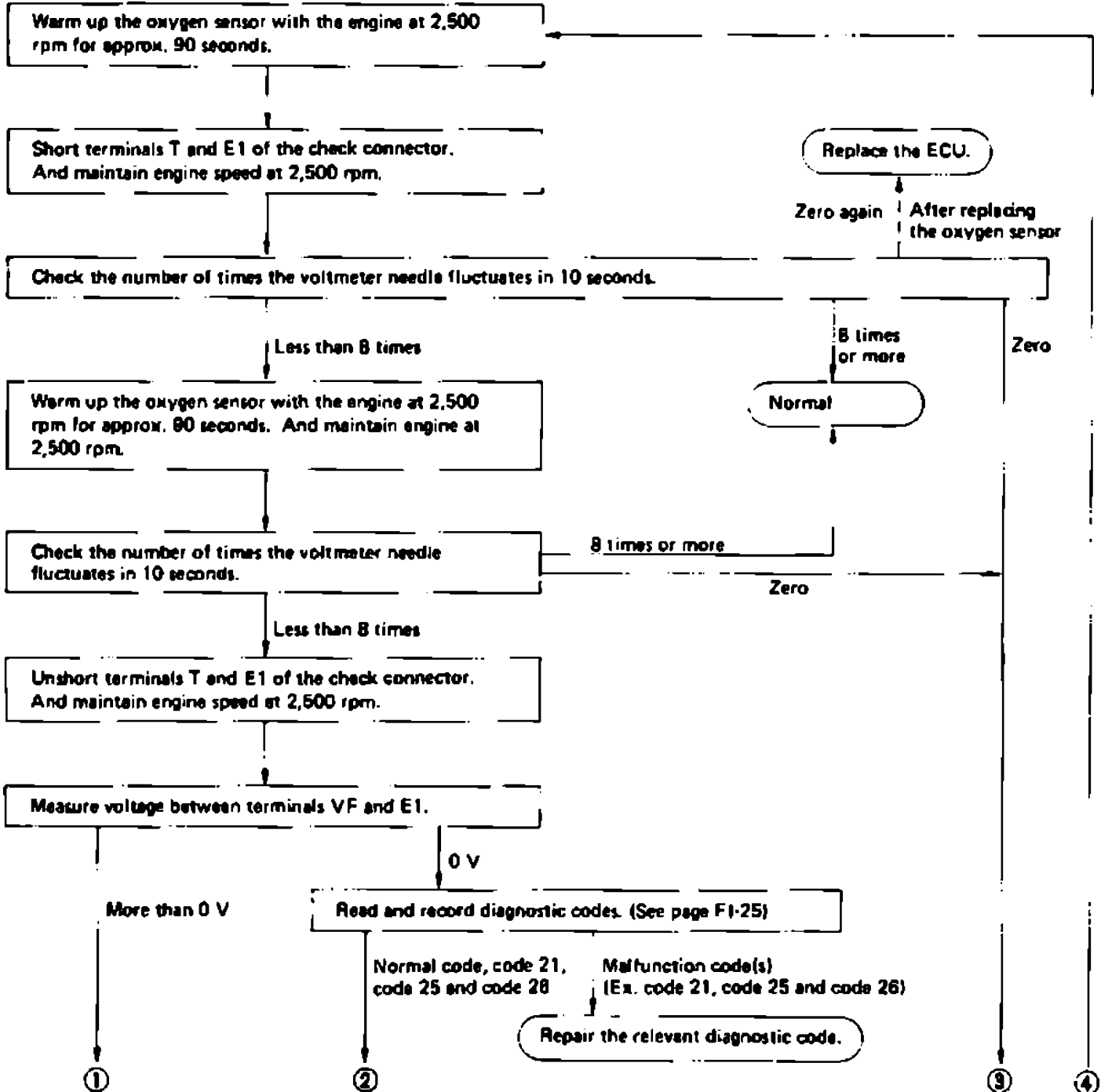
INSPECTION OF OXYGEN SENSOR

1. WARM UP ENGINE

Allow the engine to reach normal operating temperature.

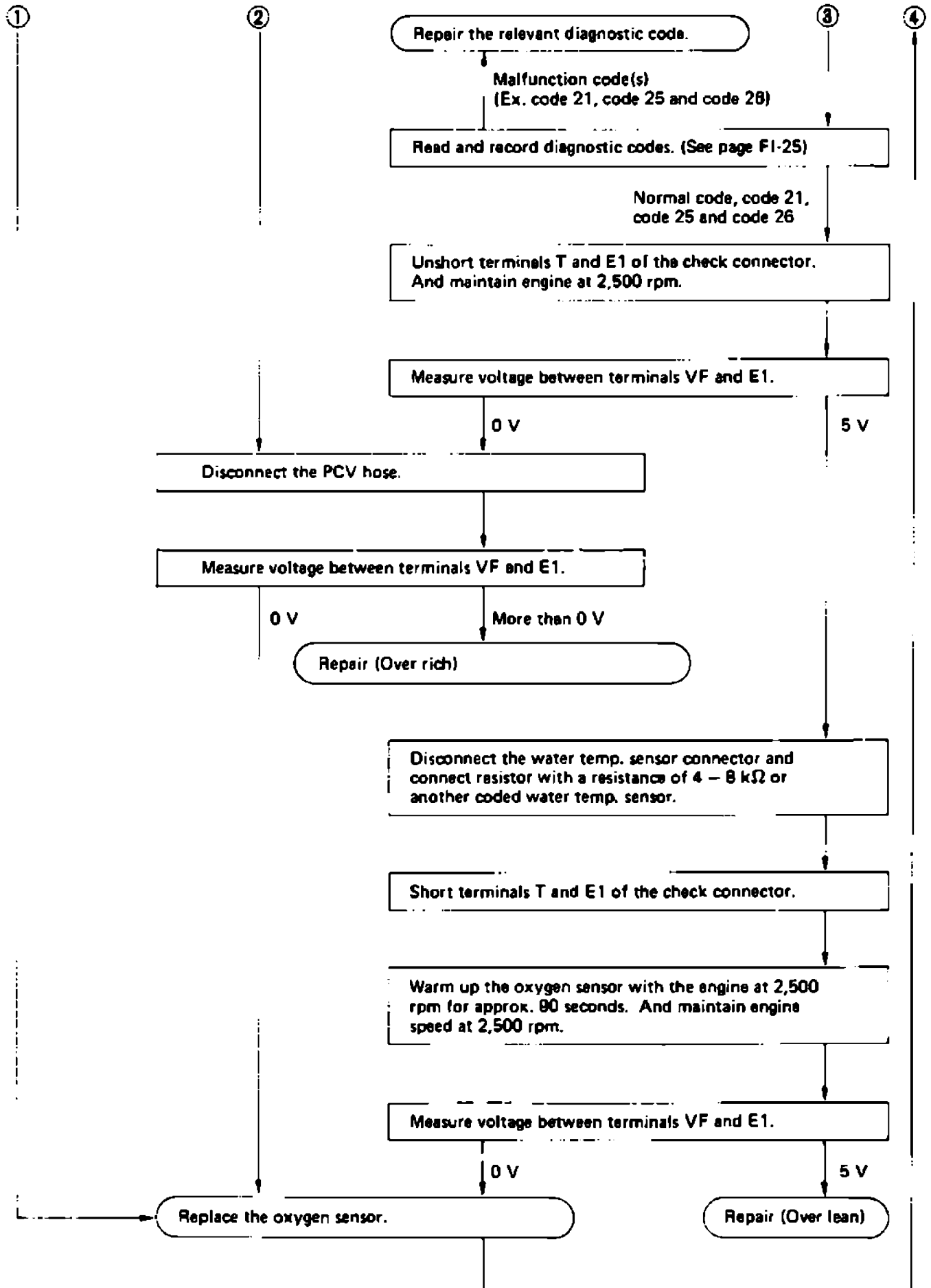
2. INSPECT FEEDBACK VOLTAGE (VF)

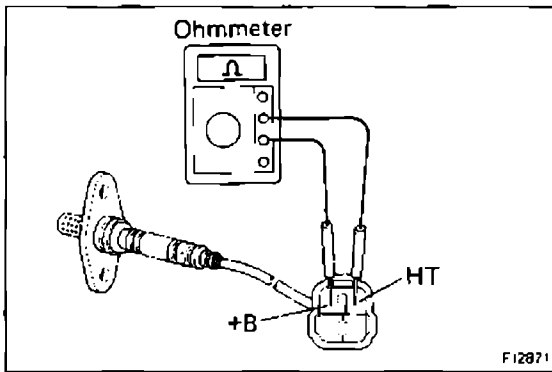
Connect the positive (+) probe of a voltmeter to terminal VF of the check connector, and negative (-) probe to terminal E1. Perform the test as follows:



CONTINUED ON PAGE FI-103

CONTINUED FROM PAGE FI-102



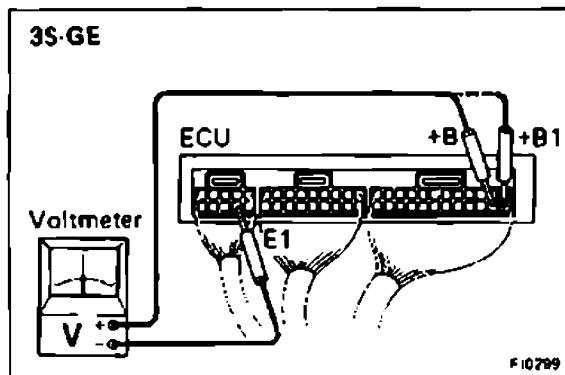
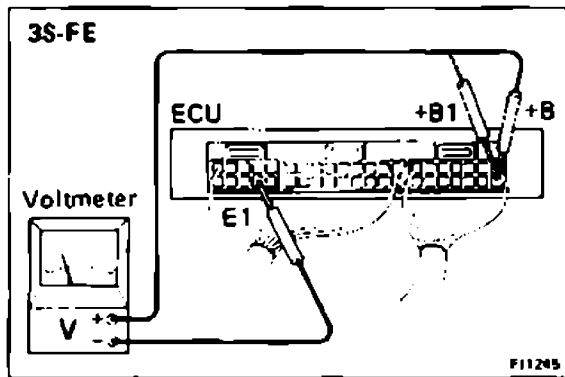


3. (3S-GE)
INSPECT HEATER COIL RESISTANCE OF OXYGEN SENSOR

Using an ohmmeter, measure the resistance between the terminals +B and HT.

Resistance (Cold): 5.1 – 6.3 Ω

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



Electronic Controlled Unit (ECU)

INSPECTION OF ECU

1. INSPECT VOLTAGE OF ECU

NOTE: The EFI circuit can be checked by measuring the and voltage at the wiring connectors of the ECU.

Check the voltage between each terminal of the wiring connectors.

- Turn the ignition switch.
- Measure the voltage at each terminal.

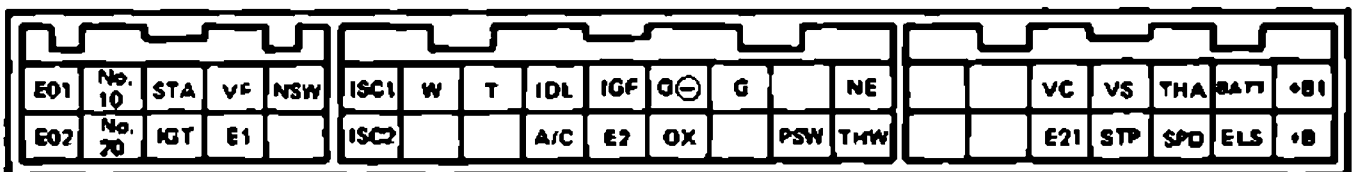
NOTE:

- Perform all voltage measurements with the connectors connected.
- Verify that the battery voltage is 11V or more when the ignition switch is ON.

Voltage at ECU Wiring Connectors (3S-FE)

Terminals	Condition		STD voltage (V)
+B +B1 – E1	Ignition S/W ON		10 – 14
BATT – E1	-		10 – 14
IDL – E1	Ignition S/W ON	Throttle valve open	8 – 14
PSW – E1		Throttle valve fully closed	4 – 5
IGT – E1	Idling		0.7 – 1.0
STA – E1	Cranking		6 – 14
No. 10 – E01 No. 20 – E02	Ignition S/W ON		9 – 14
W – E1	No trouble (check engine warning light off) and engine running		8 – 14
VC – E2	Ignition S/W ON	-	4 – 8
VS – E2		Measuring plate fully closed	4 – 6
		Measuring plate fully open	0.02 – 0.6
	Idling		2 – 4
THA – E2	Ignition S/W ON	Intake air temperature 20°C (88°F)	1 – 3
THW – E2		Coolant temperature 80°C (176°F)	0.1 – 1.0
ISC1 ISC2 – E1	Ignition S/W ON		9 – 14
A/C – E1	Ignition S/W ON	Air conditioning ON	8 – 14
T – E1		Check connector T – E1 not short	10 – 14
		Check connector T – E1 short	0.5 or less

ECU Terminals



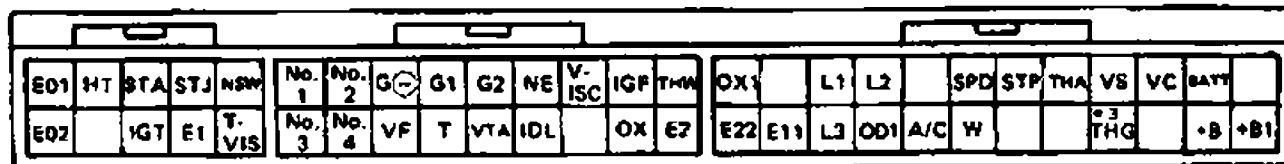
Voltage at ECU Wiring Connectors (3S-GE)

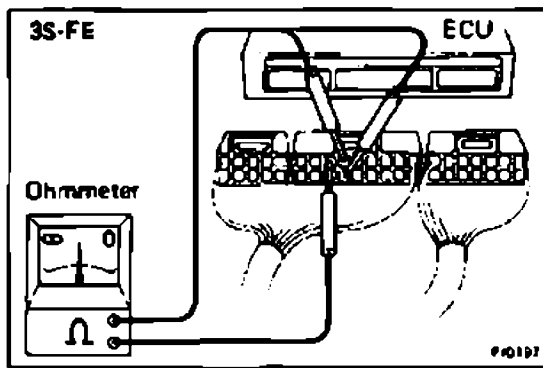
Terminals	Condition		STD voltage (V)
+B +B1 - E1	Ignition S/W ON		10 - 14
BATT - E1	-		10 - 14
IDL - E2	Ignition S/W ON	Throttle valve open	^{*1} 4 - 6 or ^{*2} 8 - 14
VTA - E2		Throttle valve fully closed	0.1 - 1.0
		Throttle valve fully open	4 - 5
VC - E2		-	
IGT - E1	Cranking or Idling		0.7 - 1.0
STA - E1	Cranking		6 - 14
No. 1 No. 2 - E01 No. 3 - E02 No. 4	Ignition S/W ON		9 - 14
W - E1	No trouble (check engine warning light off) and engine running		8 - 14
VC - E2	Ignition S/W ON	-	4 - 6
VS - E2		Measuring plate fully closed	4 - 5
		Measuring plate fully open	0.02 - 0.5
	Idling		2 - 4
THA - E2	Ignition S/W ON	Intake air temperature 20°C (68°F)	1 - 3
THW - E2		Coolant temperature 80°C (176°F)	0.1 - 1.0
A/C - E1		Air conditioning ON	8 - 14
T-VIS - E1	Idling		10 - 14
	More than 4,400 rpm		0 - 2
T - E1	Ignition S/W ON	Check connector T - E1 not short	4 - 8
		Check connector T - E1 short	0.5 or less

ECU Terminals

^{*1} w/o ECT
^{*2} w/ ECT

^{*3} CALIF. only





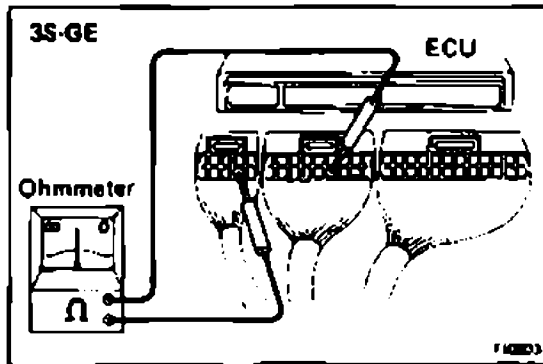
2. INSPECT RESISTANCE OF ECU

CAUTION:

- Do not touch the ECU terminals.
- The tester probe should be inserted into the wiring connector from the wiring side.

Check the resistance between each terminal of the wiring connectors.

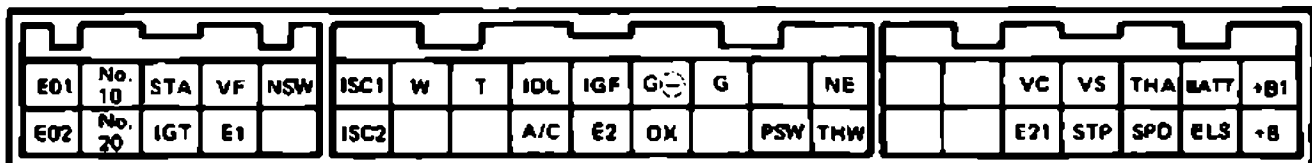
- Disconnect the connectors from the ECU.
- Measure the resistance at each terminal.



Resistance of ECU Wiring Connectors (3S-FE)

Terminals	Condition	Resistance (Ω)
IDL – E1	Throttle valve open	Infinity
	Throttle valve fully closed	0
PSW – E1	Throttle valve fully open	0
	Throttle valve fully closed	Infinity
VS – E2	Measuring plate fully closed	200 – 600
	Measuring plate fully open	20 – 1,200
THA – E2	Intake air temperature 20°C (68°F)	2,000 – 3,000
THW – E2	Coolant temperature 80°C (176°F)	200 – 400
G – G⊖	–	140 – 180
NE – G⊖	–	140 – 180

ECU Terminals



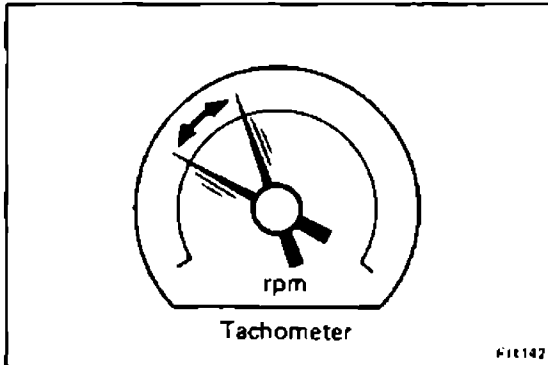
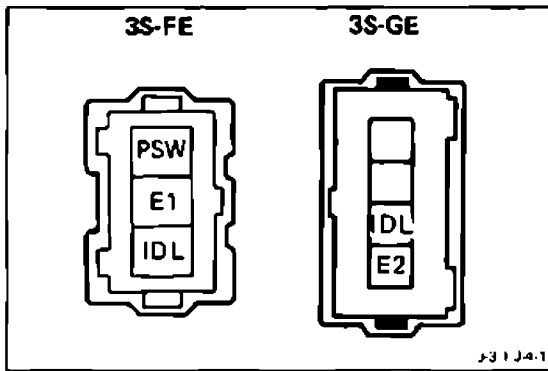
Resistance of ECU Wiring Connectors (3S-GE)

Terminals	Condition	Resistance (Ω)
IDL — E2	Throttle valve open	Infinity
	Throttle valve fully closed	Less than 2,300
VTA — E2	Throttle valve fully open	3,000 — 10,000
	Throttle valve fully closed	200 — 800
VS — E2	Measuring plate fully closed	200 — 600
	Measuring plate fully open	20 — 1,200
THA — E2	Intake air temperature 20°C (68°F)	2,000 — 3,000
THW — E2	Coolant temperature 80°C (176°F)	200 — 400
G1, G2 — G⊖	—	140 — 180
NE — G⊖	—	140 — 180

ECU Terminals

* CALIF. only

E01	HT	STA	STJ	NSW	No. 1	No. 2	G⊖	G1	G2	NE	V-ISC	IGF	THW	OX1		L1	L2		SPD	STP	THA	VS	VC	BATT	
E02		IGT	E1	T-VIS	No. 3	No. 4	VF	T	VTA	IDL		OX	E2	E22	E11	L3	OD1	A/C	W			THG		+B	+B1



Fuel Cut RPM

INSPECTION OF FUEL CUT RPM

1. WARM UP ENGINE

Allow the engine to reach normal operating temperature.

2. INSPECT FUEL CUT RPM

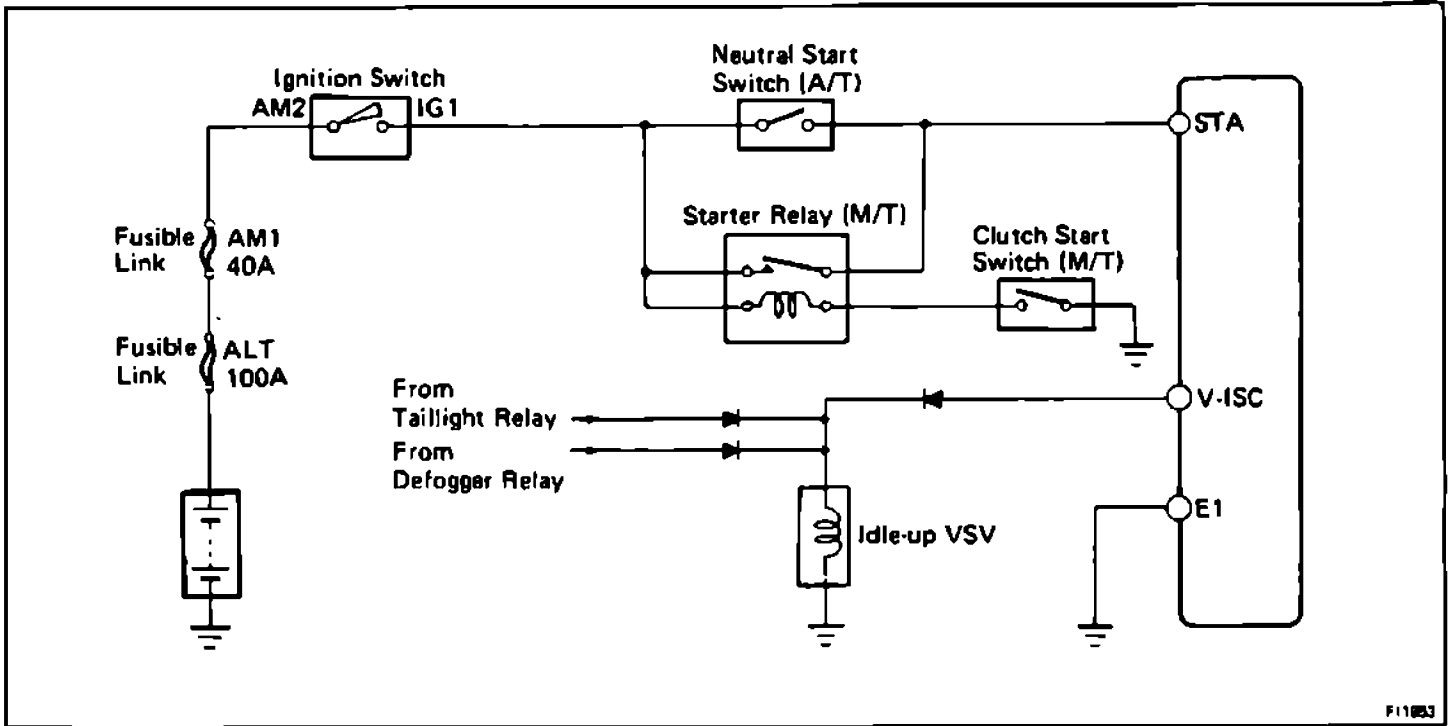
- (a) Disconnect the connector from the throttle position sensor.
- (b) Short terminals IDL and E1 (3S-FE) or E2 (3S-GE) of the wiring connector.
- (c) Gradually raise the engine rpm and check that there is fluctuation between the fuel cut and fuel return points.

NOTE: The vehicle should be stopped.

Fuel cut rpm: 1,700 rpm (3S-FE)
2,000 rpm (3S-GE)

Fuel return rpm: 1,300 rpm (3S-FE)
1,600 rpm (3S-GE)

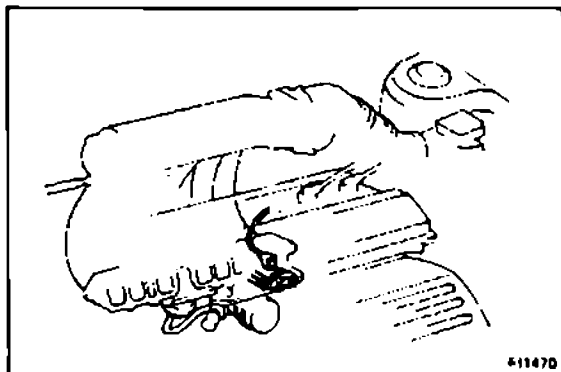
Idle-up System (3S-GE)



F11053

INSPECTION OF IDLE-UP SYSTEM

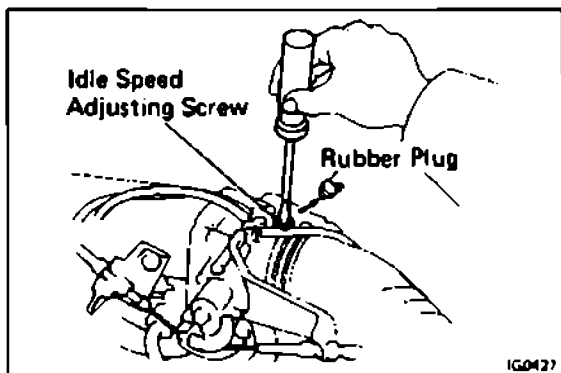
1. **WARM UP ENGINE**
Allow the engine to reach normal operating temperature.
2. **CONNECT TACHOMETER**



611470

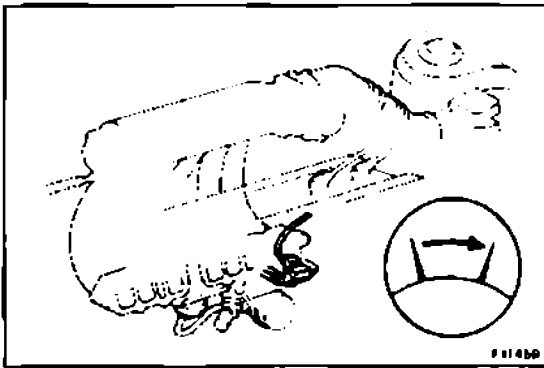
3. INSPECT IDLE-UP SYSTEM

- (a) Disconnect the VSV connector for idle-up.

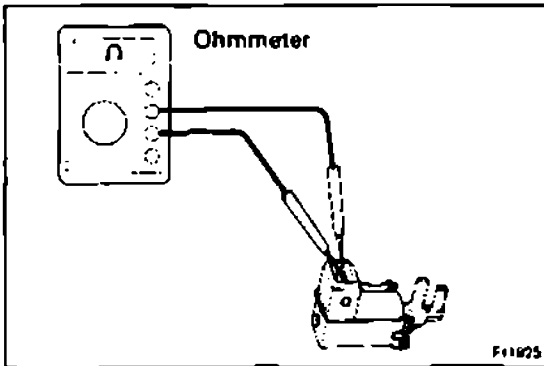


IG0427

- (b) Turn the idle speed adjusting screw until the rpm falls to 500 rpm.



- (c) Connect the VSV connector.
- (d) Check that the rises above 100 rpm.
- (e) Adjust the idle speed. (See page MA-7)



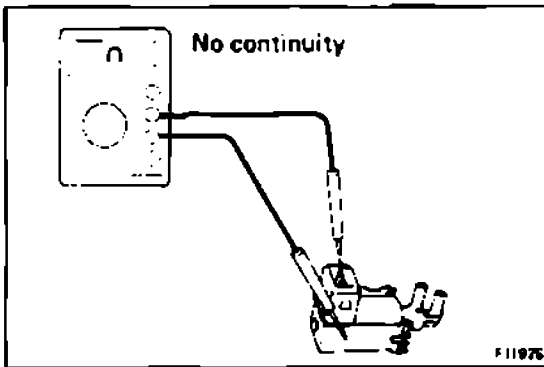
4. INSPECT IDLE-UP VSV

A. Inspect VSV for open circuit

Using an ohmmeter, check that there is continuity between the terminals.

Resistance (Cold): 33 — 39 Ω

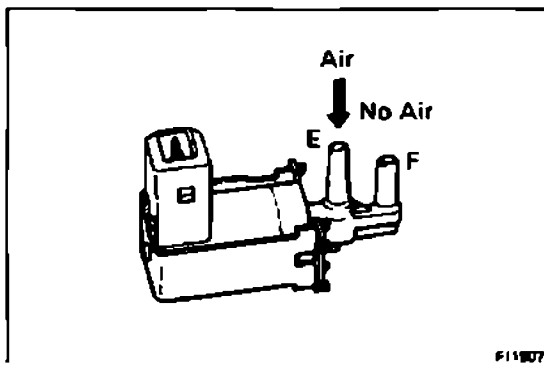
If there is no continuity, replace the VSV.



B. Inspect VSV for ground

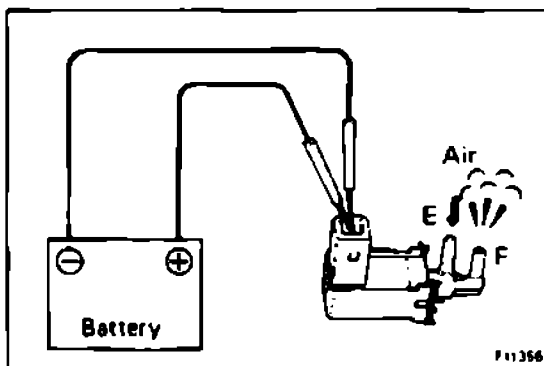
Using an ohmmeter, check that there is no continuity between each terminal and the body.

If there is continuity, replace the VSV.



C. Inspect VSV operation

- (a) Check that air does not flow from pipe E to pipe F.



- (b) Apply battery voltage across the terminals.
- (c) Check that air flows from pipe E to pipe F. If operation is not as specified, replace the VSV.