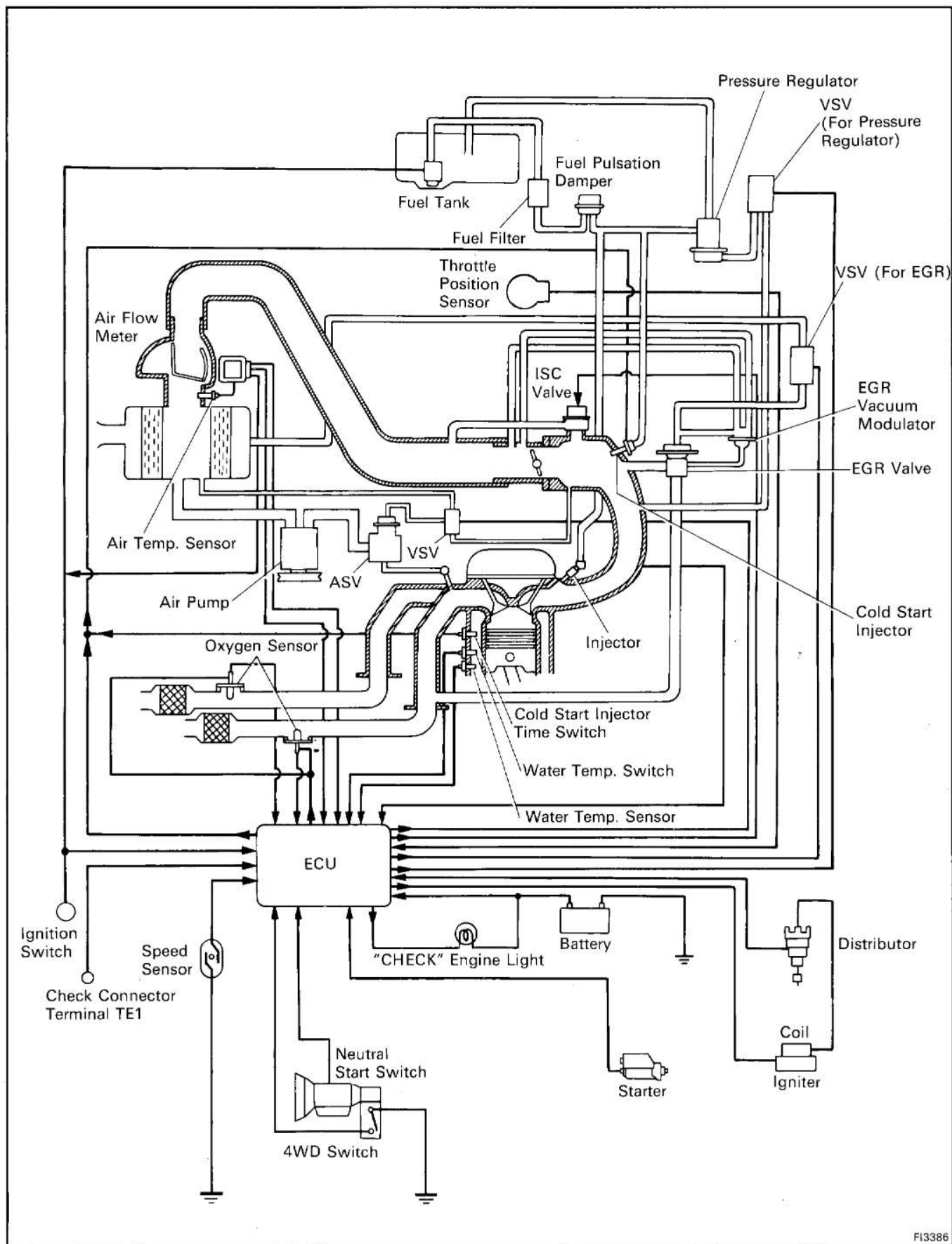


EFI SYSTEM

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INSPECTION PRECAUTIONS	FI-4
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Electronic Controlled Unit (ECU)	FI-77
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SYSTEM DESCRIPTION



ENGINE DIESELING

Problem	Possible cause	Remedy	Page
Engine diesels (runs after ignition switch turned off)	EFI system problems	Repair as necessary	

AFTER FIRE, BACKFIRE

Problem	Possible cause	Remedy	Page
Muffler explosion (after fire) on deceleration only	Deceleration fuel cut system always off	Check EFI (fuel cut) system	
Muffler explosion (after fire) all the time	Air cleaner clogged EFI system problem Incorrect ignition timing	Check air cleaner Repair as necessary Reset timing	EM-8 EM-11
Engine backfires	EFI system problem Vacuum leak • PCV line • EGR line • Intake manifold • Air intake chamber • Throttle body • ISC valve • Brake booster line Pulling in air between air flow meter and throttle body Insufficient fuel flow Incorrect ignition timing Incorrect valve clearance Carbon deposits in combustion chambers	Repair as necessary Check hoses and repair as necessary Repair as necessary Troubleshoot fuel system Reset timing Adjust valve clearance Inspect cylinder head	FI-9 EM-11 EM-10

EXCESSIVE OIL CONSUMPTION

Problem	Possible cause	Remedy	Page
Excessive oil consumption	Oil leak PCV line clogged Piston ring worn or damaged Valve stem and guide bushing worn Valve stem oil seal worn	Repair as necessary Check PCV system Check rings Check valves and guide bushing Check seals	EM-45

PRECAUTIONS

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

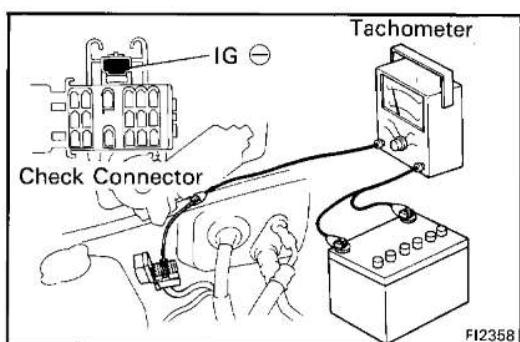
HINT: Any diagnostic code retained by the computer will be erased when the battery terminal is removed. Therefore, if necessary, read the diagnosis before removing the battery terminal.

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

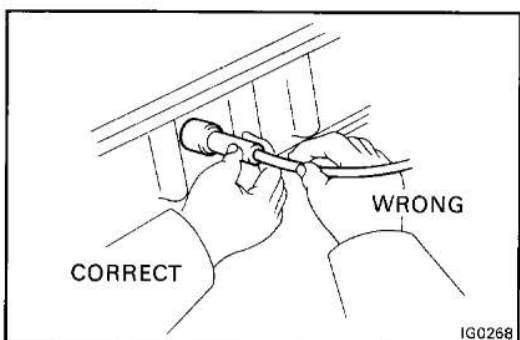
MAINTENANCE PRECAUTIONS

1. CHECK CORRECT ENGINE TUNE-UP
(See page EM-11)



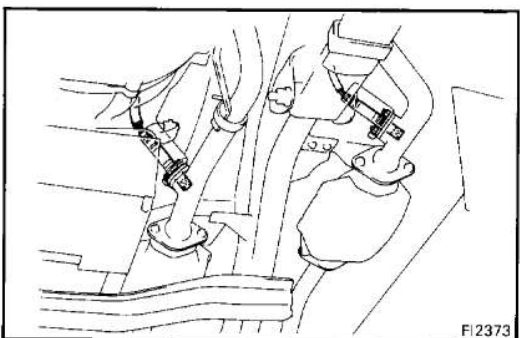
2. PRECAUTIONS WHEN CONNECTING GAUGE

- (a) Use the battery as the power source for the timing light, tachometer, etc.
- (b) Connect the test probe of a tachometer to the 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 SENSORS

- (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.

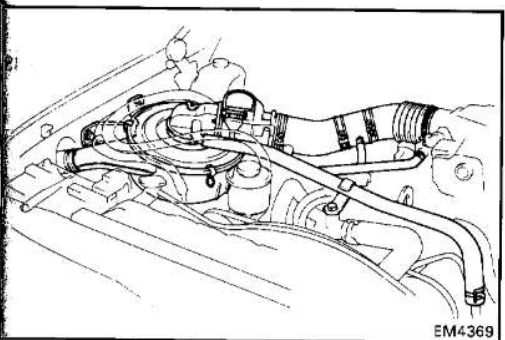
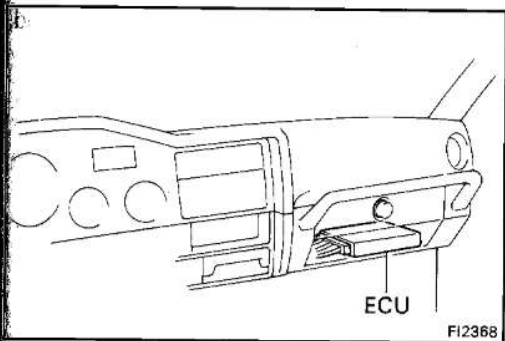
IF VEHICLE IS EQUIPPED WITH MOBILE RADIO SYSTEM (HAM, CB, ETC.)

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 affect 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 behind the glove box, 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.
5. Do not open the cover or the case of the ECU unless absolutely necessary.
(If the IC terminals are touched, the IC may be destroyed by static electricity.)

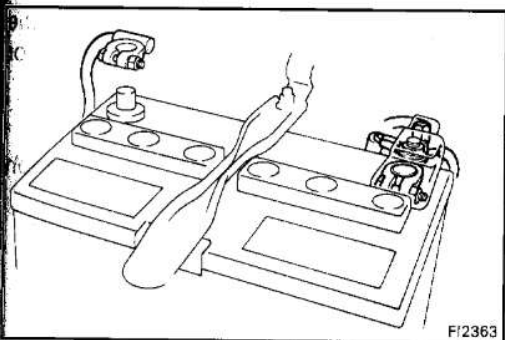


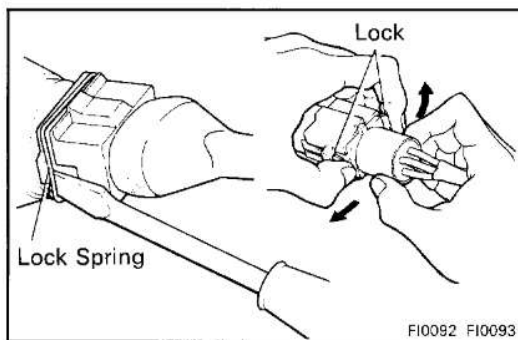
AIR INDUCTION SYSTEM

1. Separation of the engine oil dipstick, 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 air flow meter and cylinder head will allow air suction and cause the engine to run out of tune.

ELECTRONIC CONTROL SYSTEM

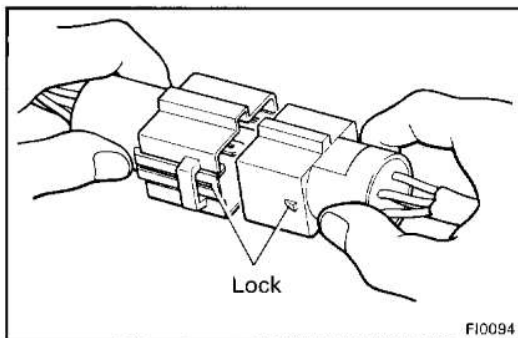
1. Before removing EFI wiring connectors, terminals, etc., first disconnect the power by either turning the ignition switch OFF or disconnecting the battery terminals.
2. When installing the battery, be especially careful not to incorrectly connect the positive (+) and negative (-) cables.
3. Do not jolt parts 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 contact with terminal can cause further trouble.
5. When inspecting during rainy weather, take care to prevent entry of water. Also, when washing the engine compartment, prevent water from getting on EFI parts and wiring connectors.
6. Parts should be replaced as an assembly.



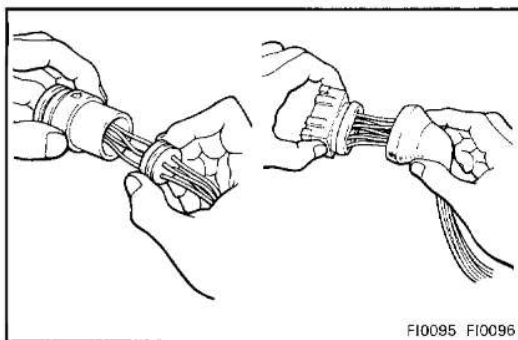


7. Care is required when pulling out and inserting wiring connectors.

(a) Release the lock and pull out the connector.

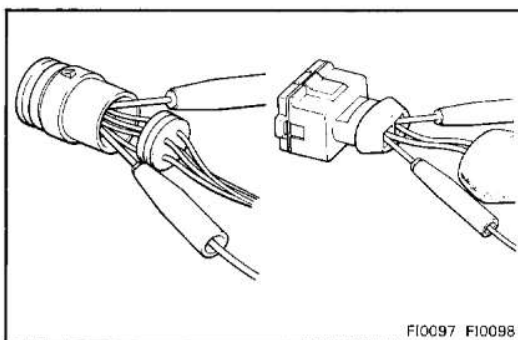


(b) Fully insert the connector and check that it is locked.



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

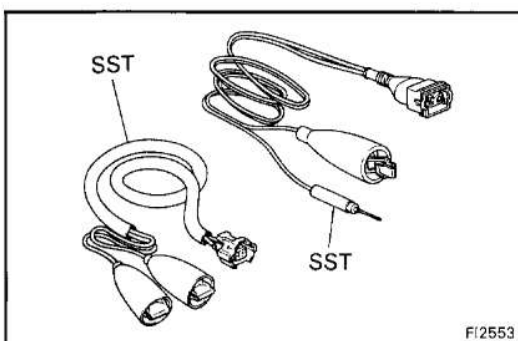
(a) Carefully take out the water-proofing rubber if it is a water-proof type connector.



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

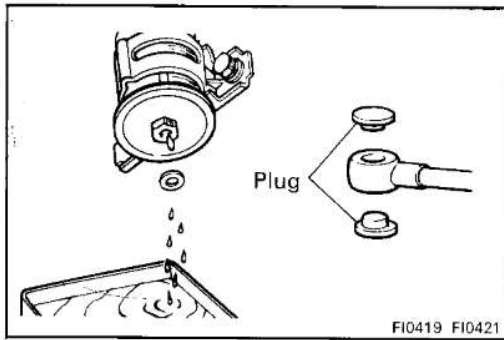
(c) Do not apply unnecessary force to the terminal.

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



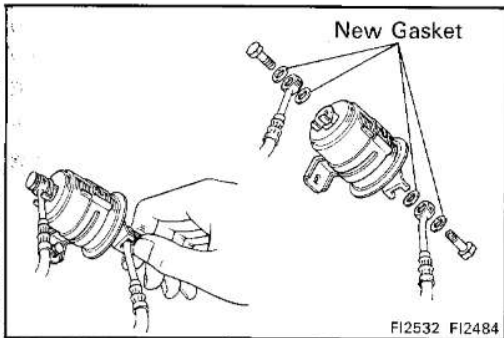
9. Use SST for inspection or test of the injector, cold start injector or its wiring connector.

SST 09842-30050 and 09842-30070



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.

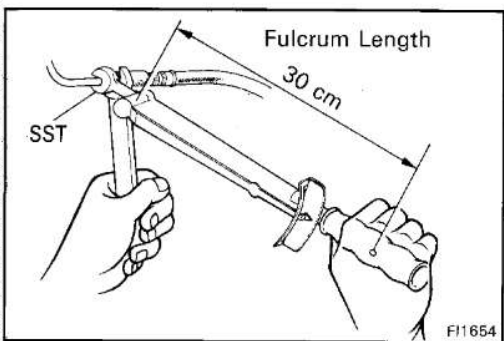


2. When connecting the flare nut or union bolt on the high pressure pipe union, observe the following procedure:

(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)

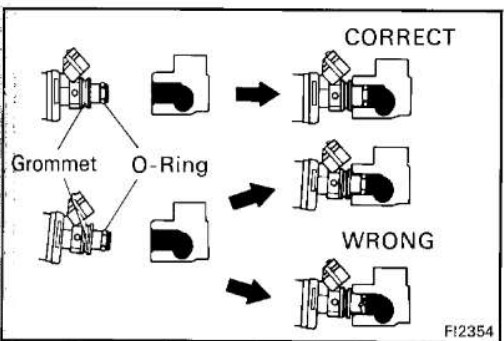


(Flare Nut Type)

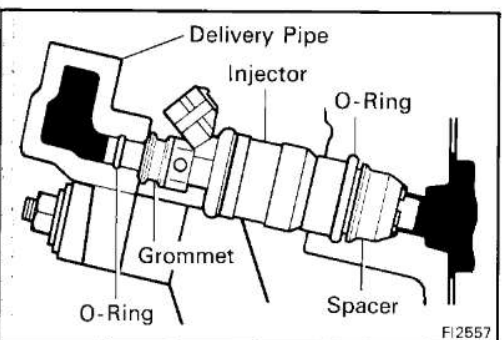
- (a) Apply a light coat of engine oil to the flare and tighten the flare nut by hand.
- (b) Using SST, tighten the flare nut to specified torque.

Torque: 310 kg-cm (22 ft-lb, 30 N-m)

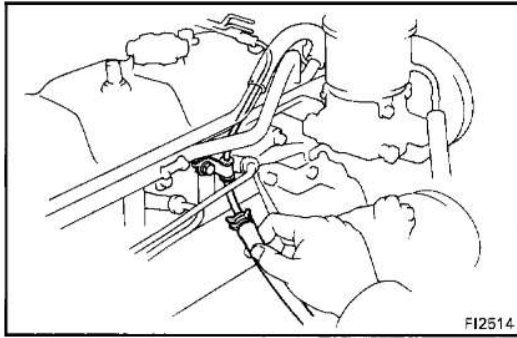
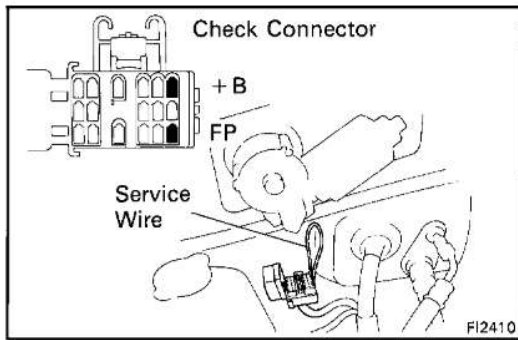
HINT: Use a torque wrench with a fulcrum length of 30 cm (11.81 in.).



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 the 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 illustration.



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.

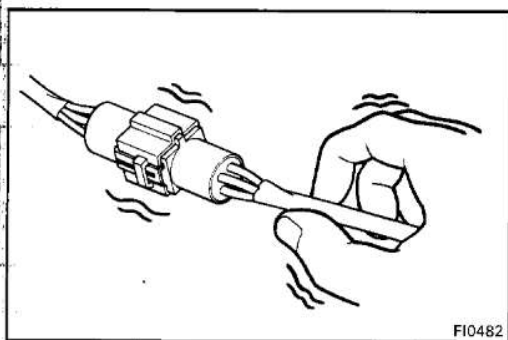
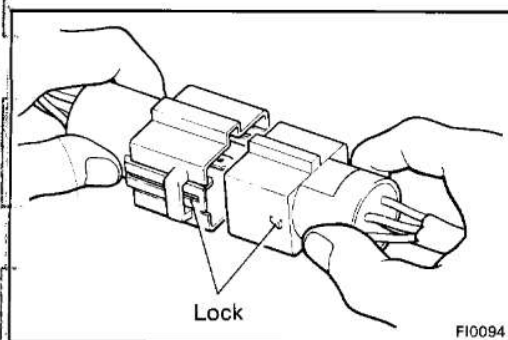
- (c) When the fuel return hose is pinched, the pressure within high pressure line will rise to approx. 4 kg / cm² (57 psi, 392 kPa). In this state, check to see that there are no leaks from any part of the fuel system.

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

TROUBLESHOOTING

TROUBLESHOOTING HINTS

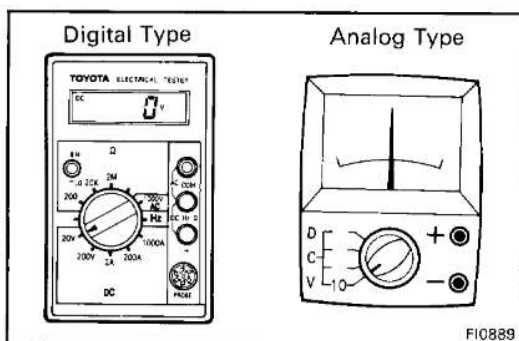
1. Engine troubles are usually not caused by the EFI system. When troubleshooting, always first check the condition of the other systems.
 - (a) Electronic source
 - Battery
 - Fusible links
 - Fuses
 - (b) Body ground
 - (c) Fuel supply
 - Fuel leakage
 - Fuel filter
 - Fuel pump
 - (d) Ignition system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

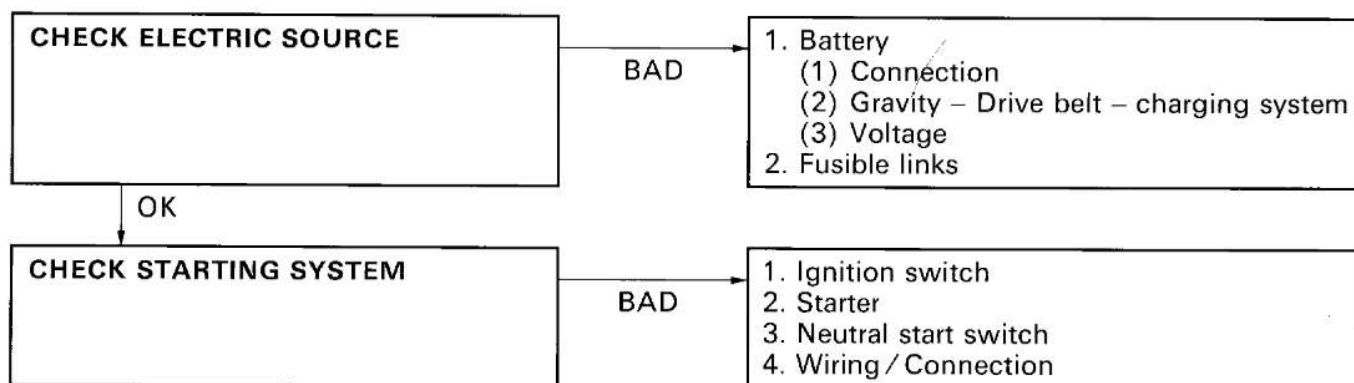
- (a) Check to see that the terminals are not bent.
 - (b) Check to see that the connector is pushed in completely and locked.
 - (c) Check to see that there is no signal change when the connector is slightly tapped or wiggled.
3. Sufficiently troubleshoot for other causes before replacing the ECU, as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



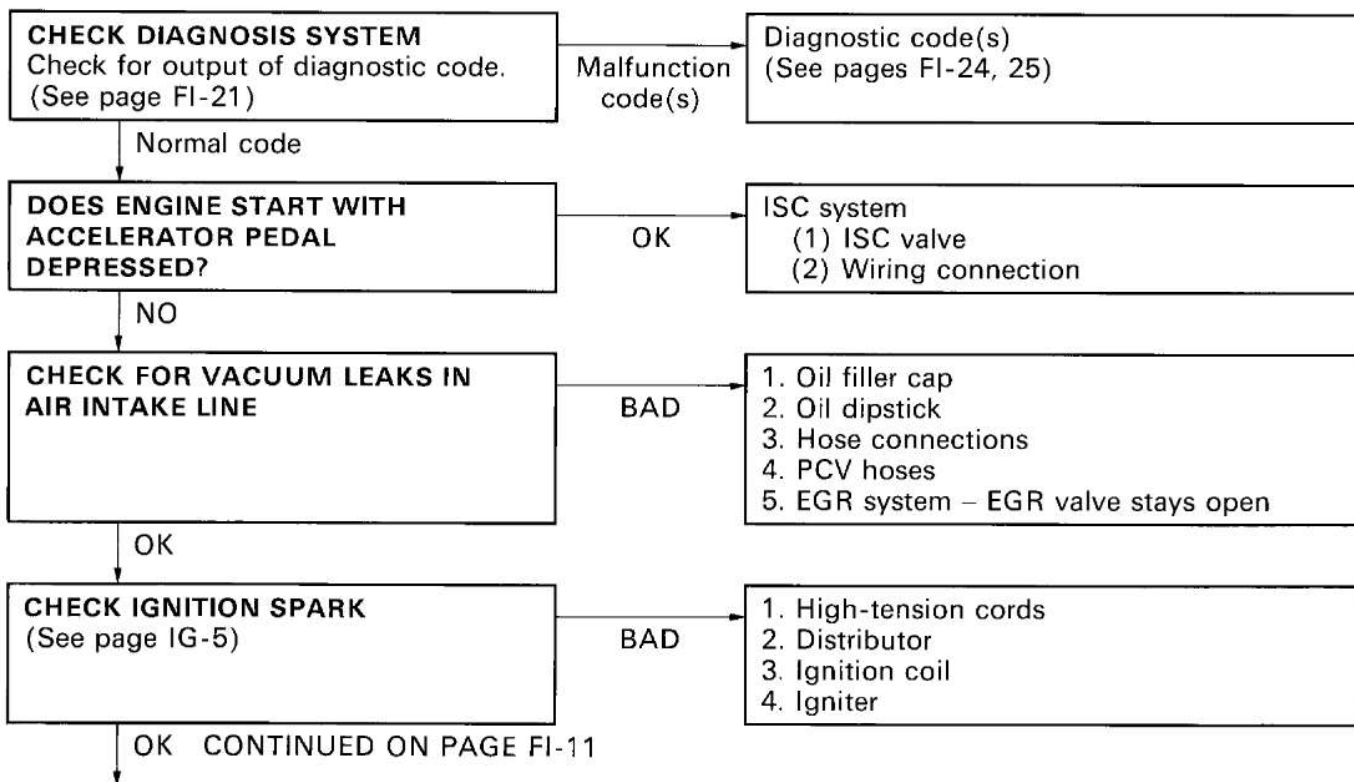
4. Use a volt / ohmmeter with high impedance ($10\text{ k}\Omega/\text{V}$ minimum) for troubleshooting of the electrical circuit.
(See page FI-27)

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)



OK CONTINUED FROM PAGE FI-10

CHECK SPARK PLUGS**Standard: 0.8 mm (0.031 in.)****HINT:** Check compression pressure and valve clearance if necessary.

NO

1. Spark plugs
2. Compression pressure
Minimum: 8.0 kg/cm²
(114 psi, 785 kPa)
at 200 rpm
3. Valve clearance (Hot)
Standard: IN 0.20 mm (0.008 in.)
EX 0.35 mm (0.014 in.)

BAD
(All
Plugs
WET)

1. Injector(s) – shorted or leaking
2. Injector wiring – short circuited
3. Cold start injector – leakage
(See page FI-50)
4. Cold start injector time switch
(See page FI-72)

OK

CHECK FUEL SUPPLY TO INJECTOR

1. Fuel in tank
2. Fuel pressure in fuel line
 - (1) Connect terminals + B and FP of the check connector.
 - (2) Fuel pressure at fuel hose of fuel filter can be felt. (See page FI-45)

BAD

1. Fuel line – Leakage – deformation
2. Fuse
3. Fuel pump (See page FI-44)
4. Fuel filter
5. Fuel pressure regulator (See page FI-53)

OK

CHECK FUEL PUMP SWITCH IN AIR FLOW METER

Check continuity between terminals FC and E1 while measuring plate of air flow meter is open.

BAD

Air flow meter (See page FI-62)

OK

CHECK IGNITION TIMING

1. Connect terminals TE1 and E1 of the check connector.
2. Check ignition timing.
Standard: 7° BTDC @ idle
(w/ connected TE1 and E1)

NO

Ignition timing – Adjust (See page EM-11)

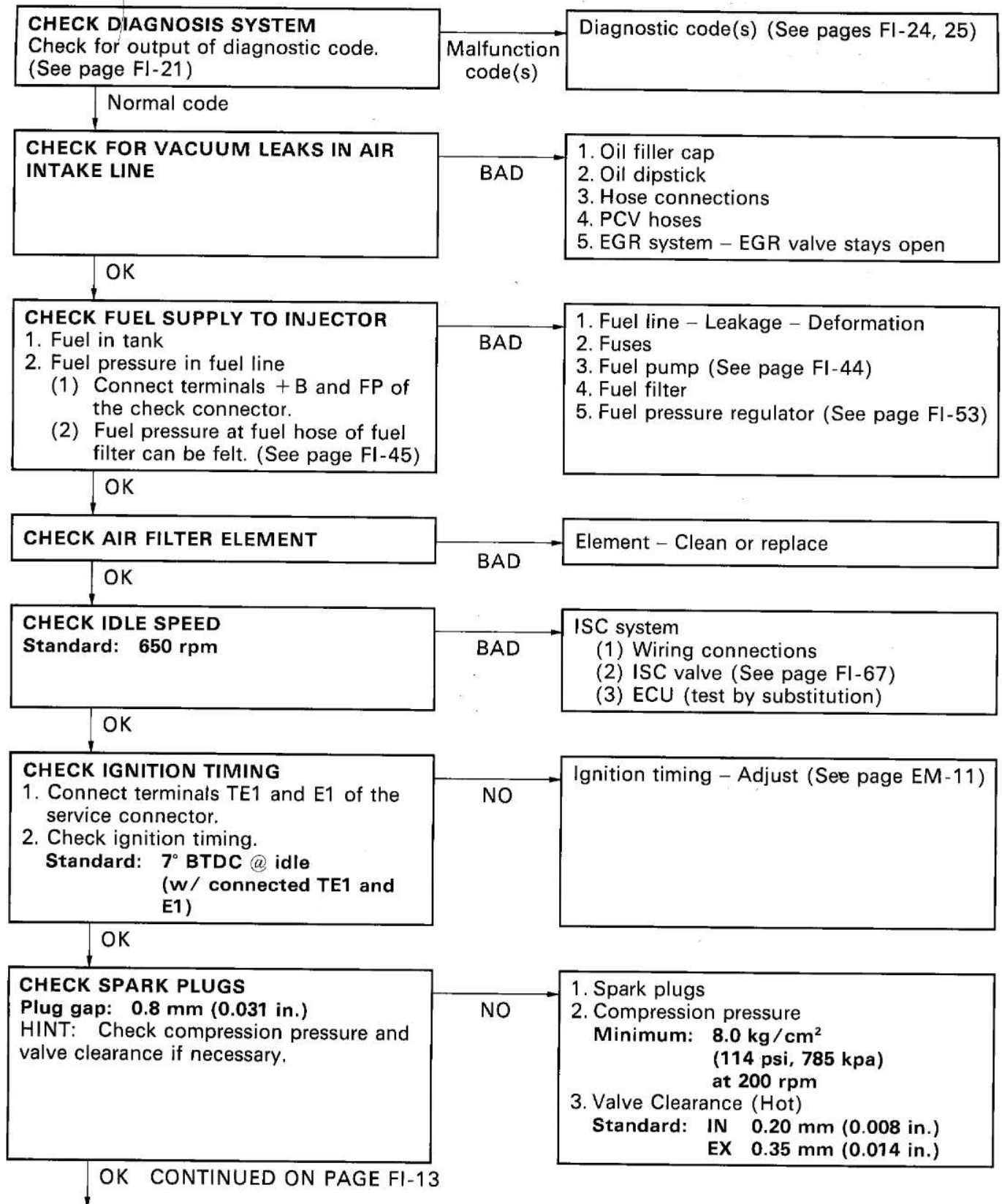
OK

CHECK EFI ELECTRONIC CIRCUIT USING VOLT/OHMMETER
(See page FI-27)

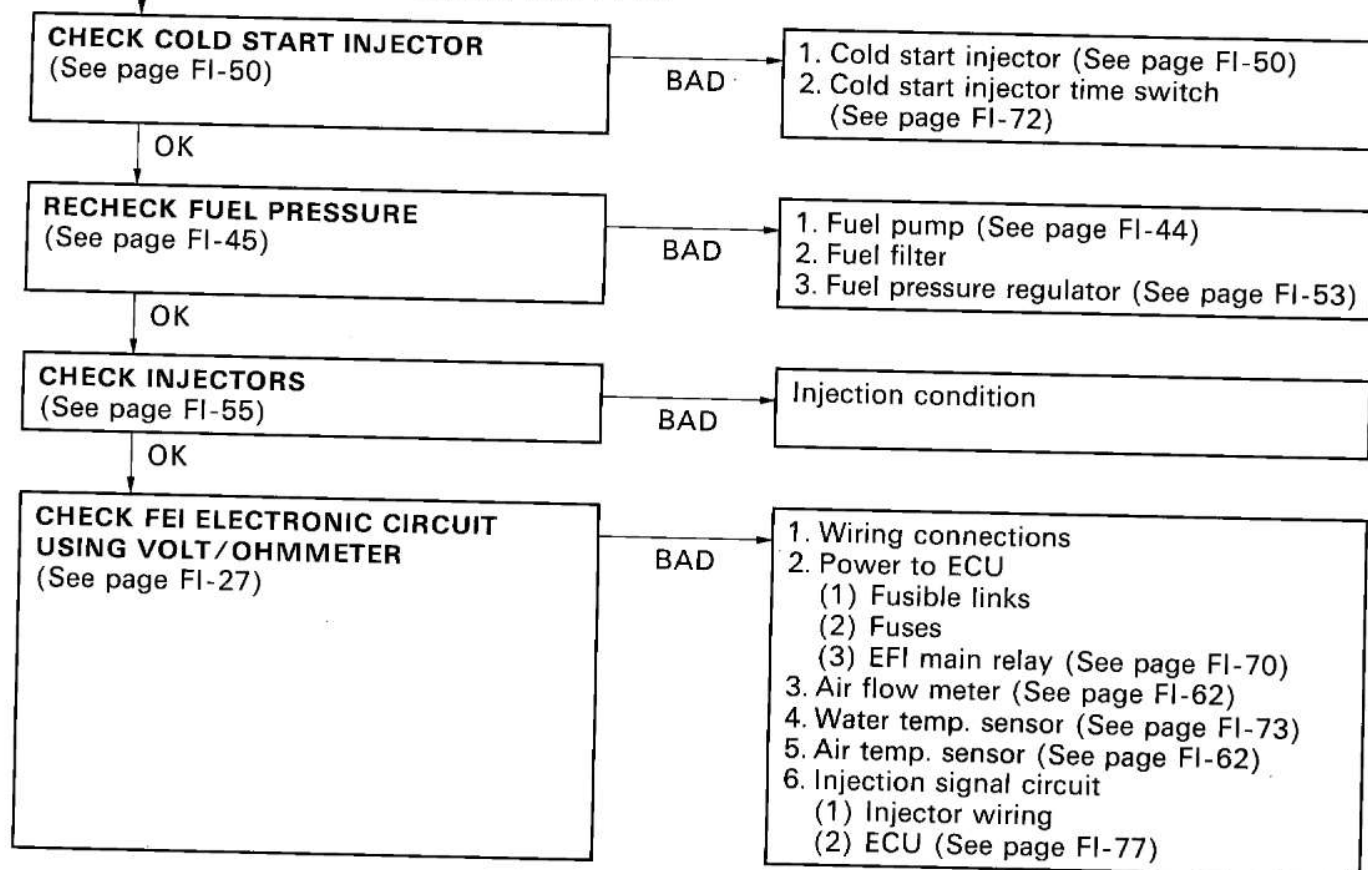
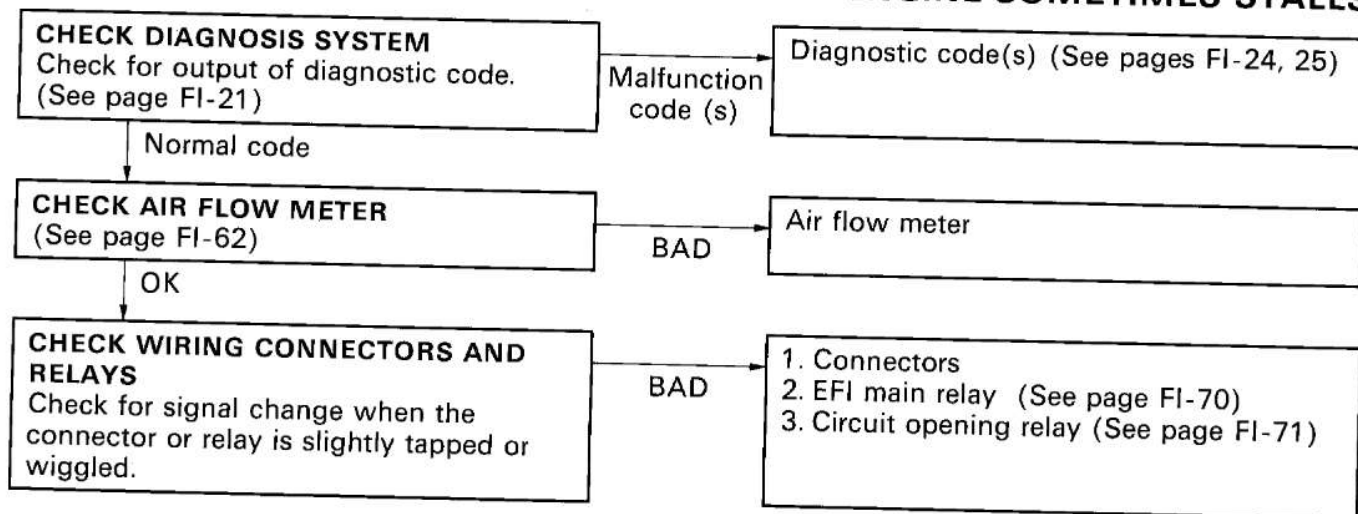
BAD

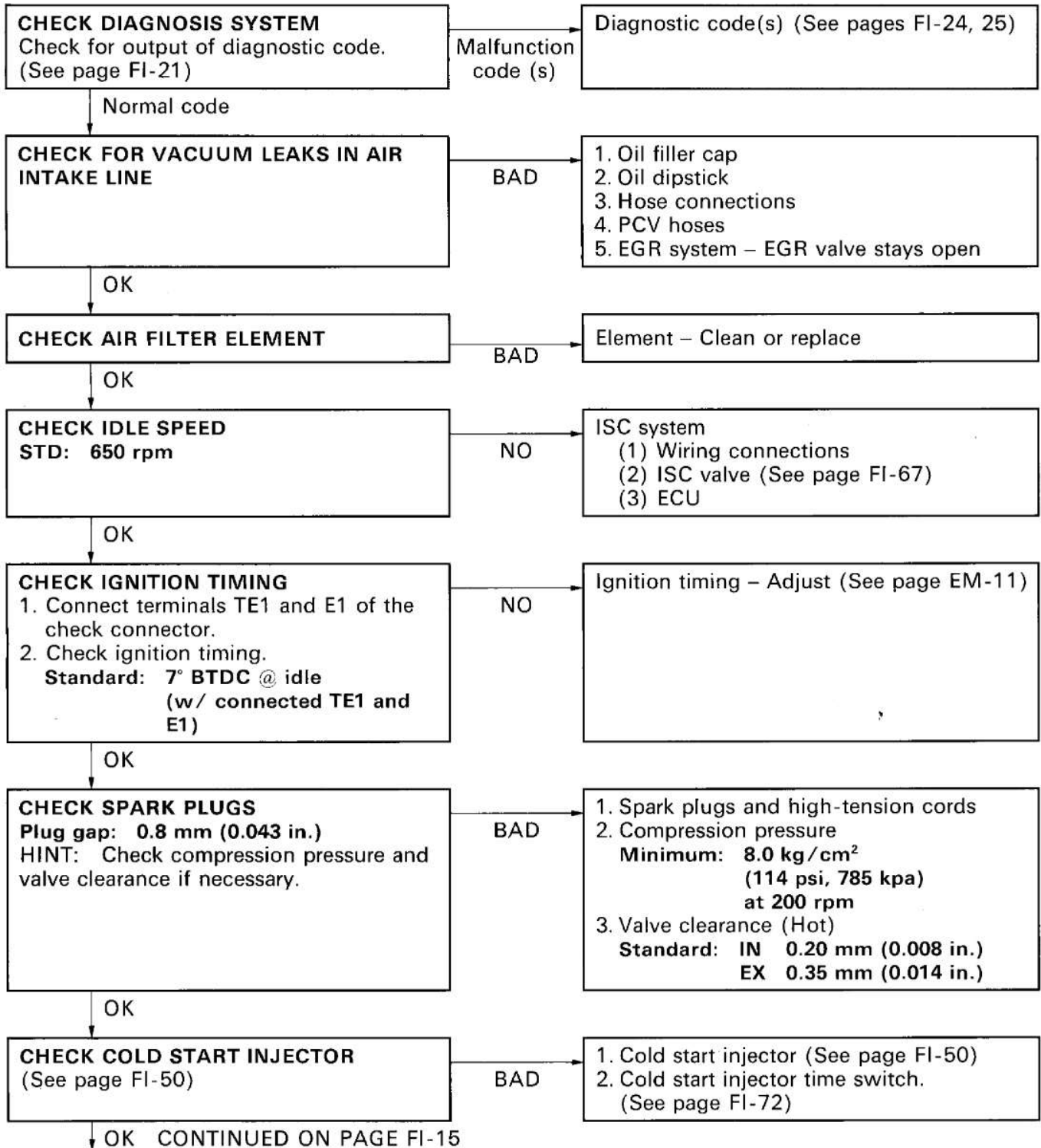
1. Wiring connection
2. Power to ECU
 - (1) Fusible links
 - (2) Fuses
 - (3) EFI main relay (See page FI-70)
3. Air flow meter (See page FI-62)
4. Water temp. sensor (See page FI-73)
5. Air temp. sensor (See page FI-62)
6. Injection signal circuit
 - (1) Injector wiring
 - (2) ECU (See page FI-77)

SYMPTOM – ENGINE OFTEN STALLS



OK CONTINUED FROM PAGE FI-12

**SYMPTOM – ENGINE SOMETIMES STALLS**

SYMPTOM – ROUGH IDLING AND/OR MISSING

OK CONTINUED FROM PAGE FI-14

CHECK FUEL PRESSURE
(See page FI-45)

BAD

1. Fuel pump (See page FI-44)
2. Fuel filter
3. Fuel pressure regulator (See page FI-53)

OK

CHECK INJECTORS
(See page FI-55)

BAD

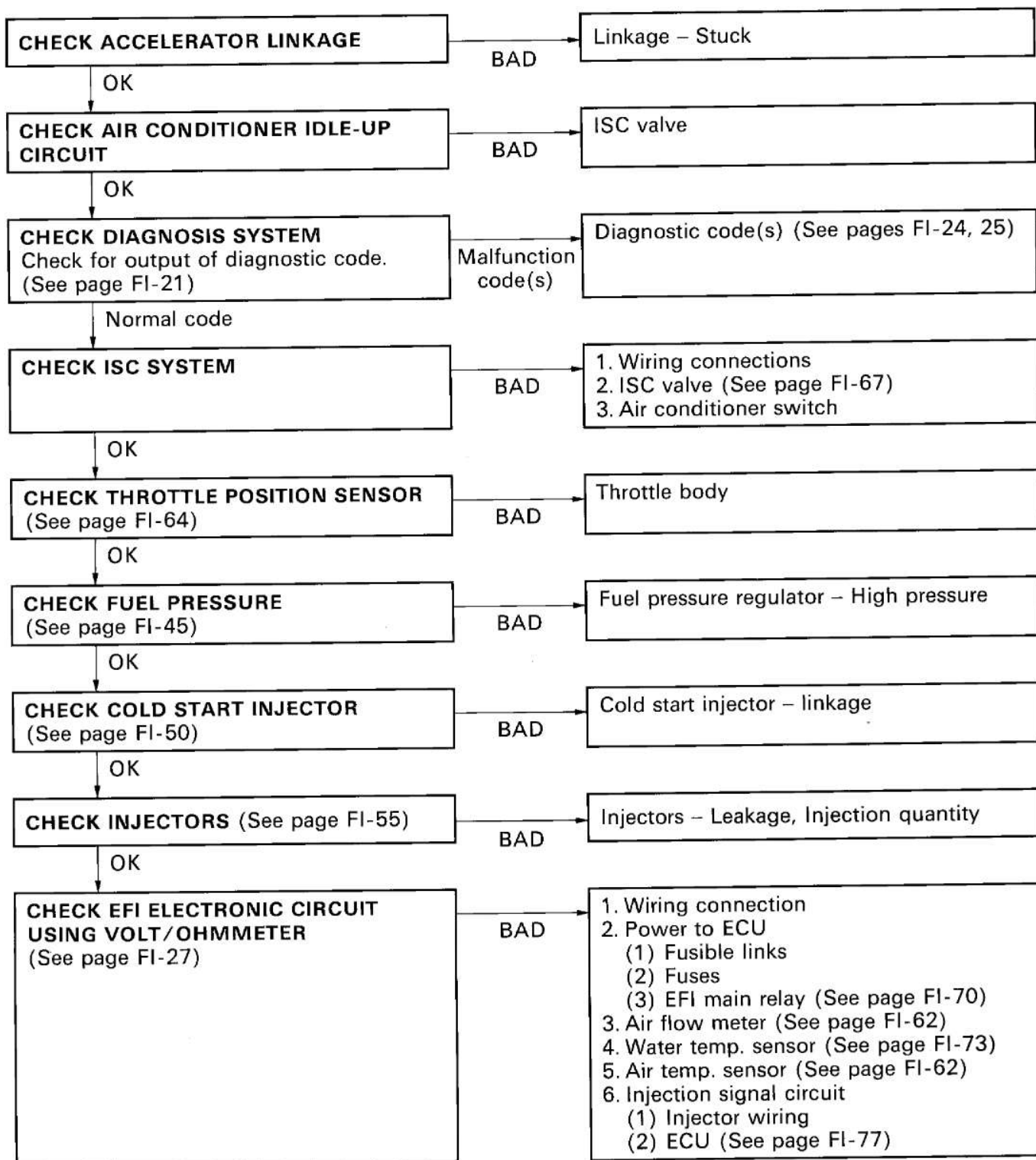
Injection condition

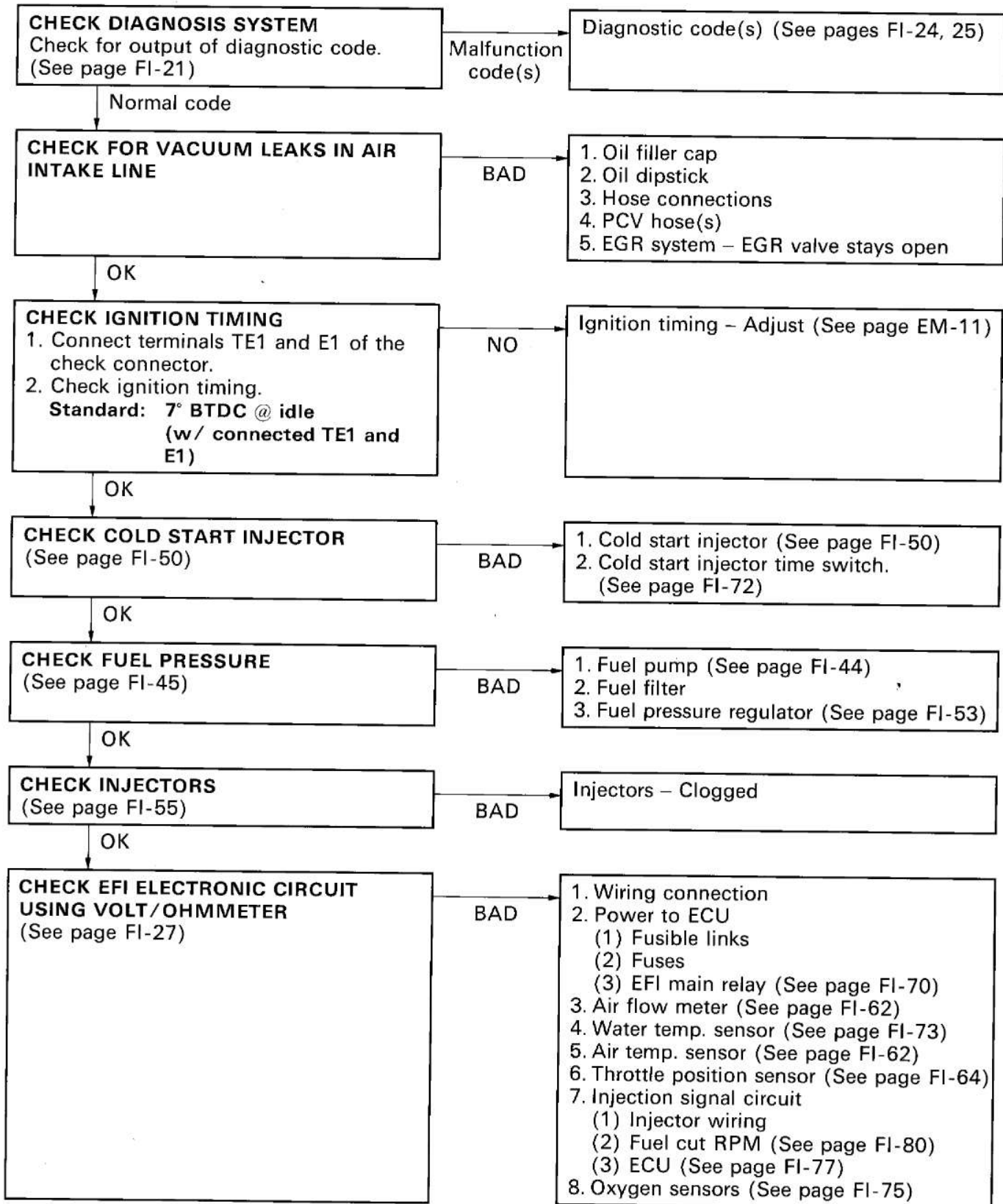
OK

**CHECK EFI ELECTRONIC CIRCUIT
USING VOLT/OHMMETER**
(See page FI-27)

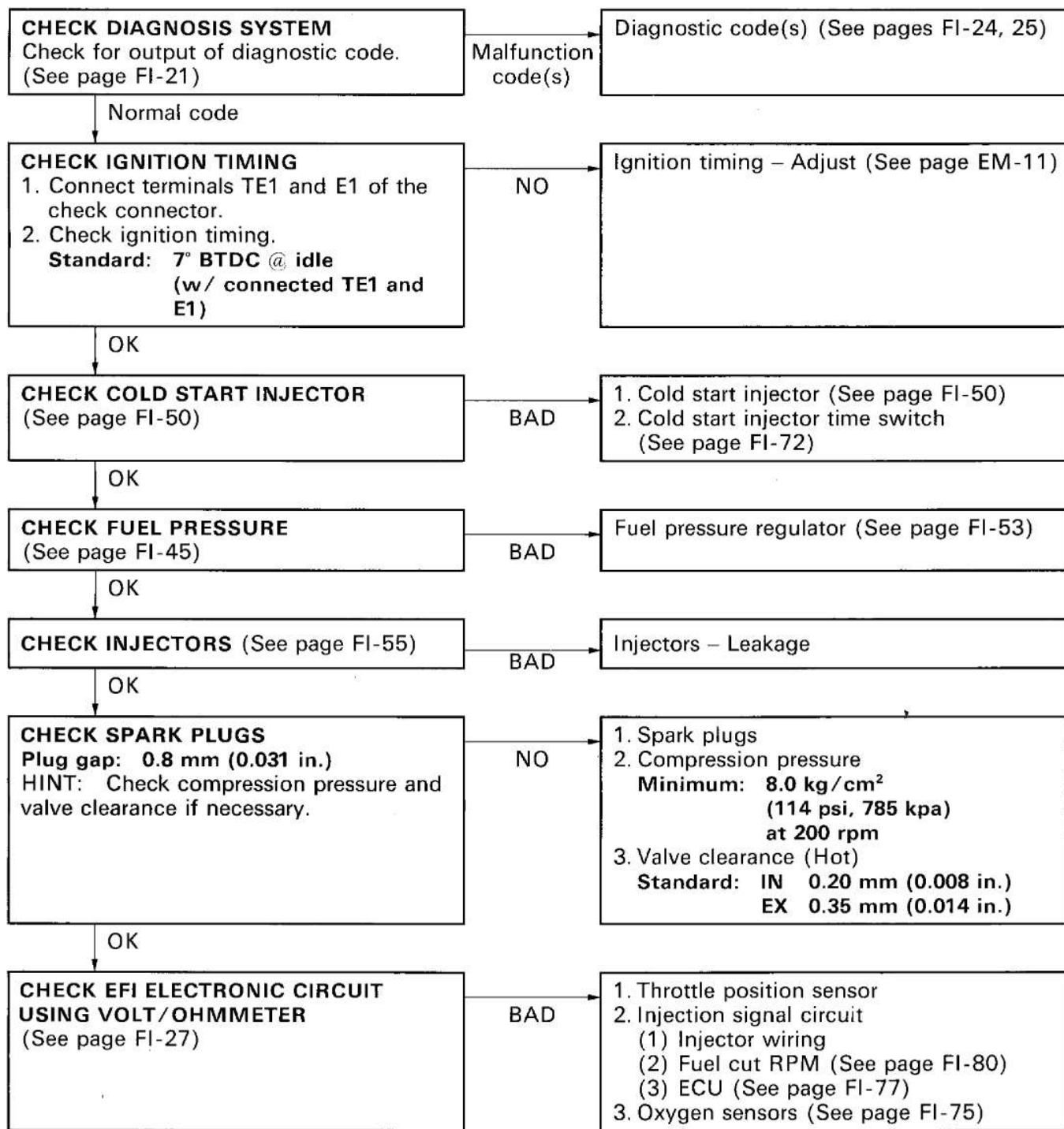
BAD

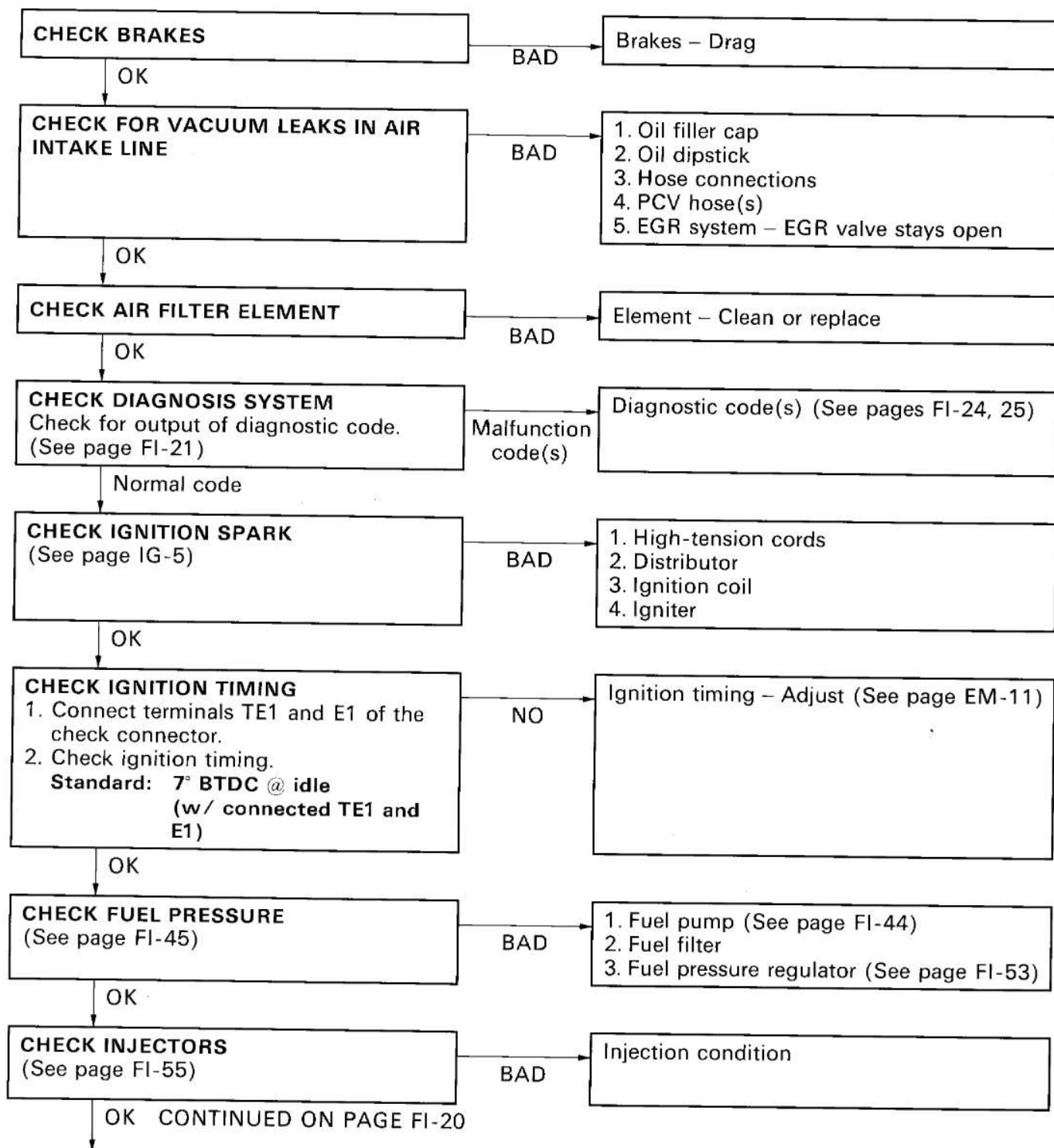
1. Wiring connections
2. Power to ECU
 - (1) Fusible links
 - (2) Fuses
 - (3) EFI main relay (See page FI-70)
3. Air flow meter (See page FI-62)
4. Water temp. sensor (See page FI-73)
5. Air temp. sensor (See page FI-62)
6. Injection signal circuit
 - (1) Injector wiring
 - (2) ECU (See page FI-77)
7. Oxygen sensors (See page FI-75)

SYMPTOM – HIGH ENGINE IDLE SPEED (NO DROP)

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-19

CHECK SPARK PLUGS**Plug gap: 0.8 mm (0.031 in.)****HINT:** Check compression pressure and valve clearance if necessary.

NO

1. Spark plugs
2. Compression pressure
Minimum: 8.0 kg/cm²
(114 psi, 785 kpa)
at 200 rpm
3. Valve clearance (Hot)
Standard: IN 0.20 mm (0.008 in.)
EX 0.35 mm (0.014 in.)

OK

**CHECK EFI ELECTRONIC CIRCUIT
USING VOLT/OHMMETER**
(See page FI-27)

BAD

1. Wiring connections
2. Power to ECU
 - (1) Fusible links
 - (2) Fuses
 - (3) EFI main relay (See page FI-70)
3. Air flow meter (See page FI-62)
4. Water temp. sensor (See page FI-73)
5. Air temp. sensor (See page FI-62)
6. Throttle position sensor (See page FI-64)
7. Injection signal circuit
 - (1) Injector wiring
 - (2) ECU (See page FI-77)

DIAGNOSIS SYSTEM

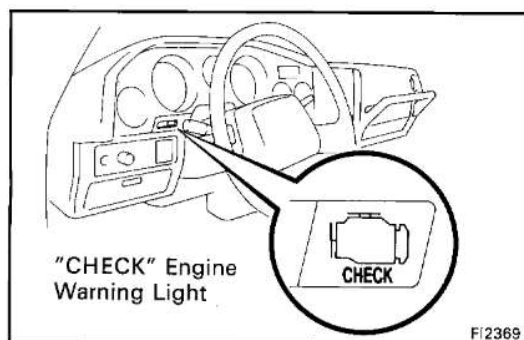
DESCRIPTION

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 tables (See pages FI-24, 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.



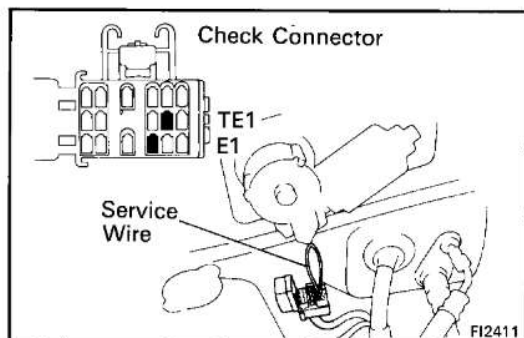
"CHECK" ENGINE WARNING LIGHT CHECK

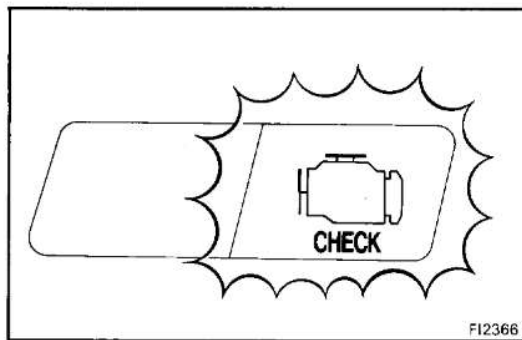
1. The "CHECK" engine warning light will come on when the ignition switch is placed at ON and the engine is not running.
2. When the engine is started, the "CHECK" engine warning light should go out.
If the light remains on, the diagnosis system has detected a malfunction or abnormality in the system.

OUTPUT OF DIAGNOSTIC CODES

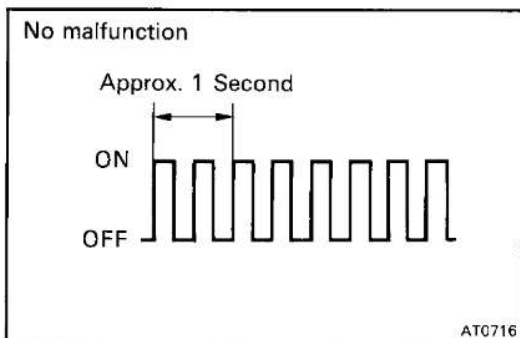
To obtain an output of diagnostic codes, proceed as follow:

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
 - (d) Accessories switched OFF
 - (e) Engine at normal operating temperature
2. Turn the ignition switch to ON. Do not start the engine.
3. Using a service wire, connect terminals TE1 and E1 of the check connector.





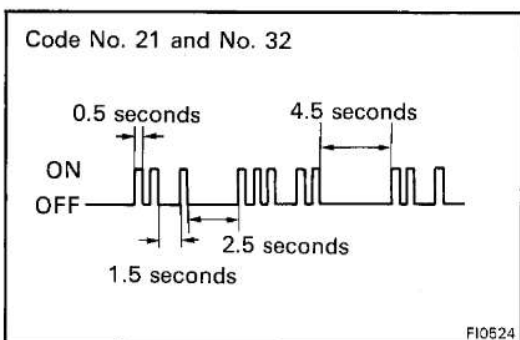
4. Read the diagnostic code as indicated by the number of flashes of the "CHECK" engine warning light.



Diagnostic Codes (See pages FI-24, 25)

- (a) Normal System Operation (no malfunction)

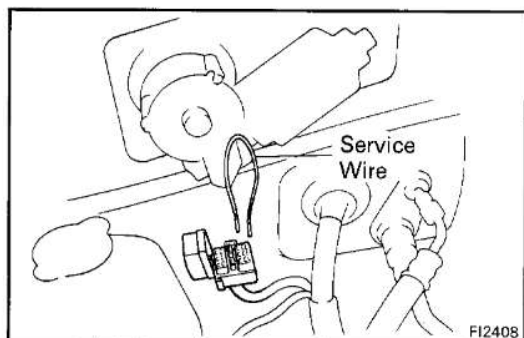
- The light will alternately blink ON and OFF 2 times per second.



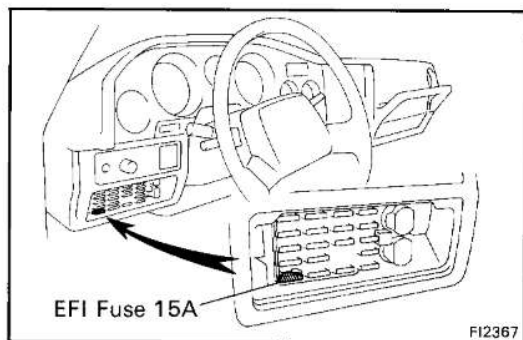
- (b) Malfunction Code Indication

- 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 TE1 and E1 of the check connector are connected.

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



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



CANCELLING DIAGNOSTIC CODE

1. After repair of the trouble area, the diagnostic code retained in memory by the ECU must be cancelled out by removing the EFI fuse (15A) for 30 seconds or more, depending on ambient temperature (the lower the temperature, the longer the fuse must be left out) with the ignition switch OFF.

HINT:

- 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 has been recorded.
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.

DIAGNOSIS INDICATION

1. Including "normal", the ECU is programmed with the following 18 diagnostic codes.
2. When 2 or more codes are indicated, the lowest number (code) will appear first.
However, no other code will appear along with code No.11.
3. All detected diagnostic codes, except code No.51, will be retained in memory by the ECU from the time of detection until cancellation.
4. Once the malfunction is cleared, the "CHECK" engine warning light on the instrument panel will go out but the diagnostic code(s) remains stored in ECU memory (except for code No.51).

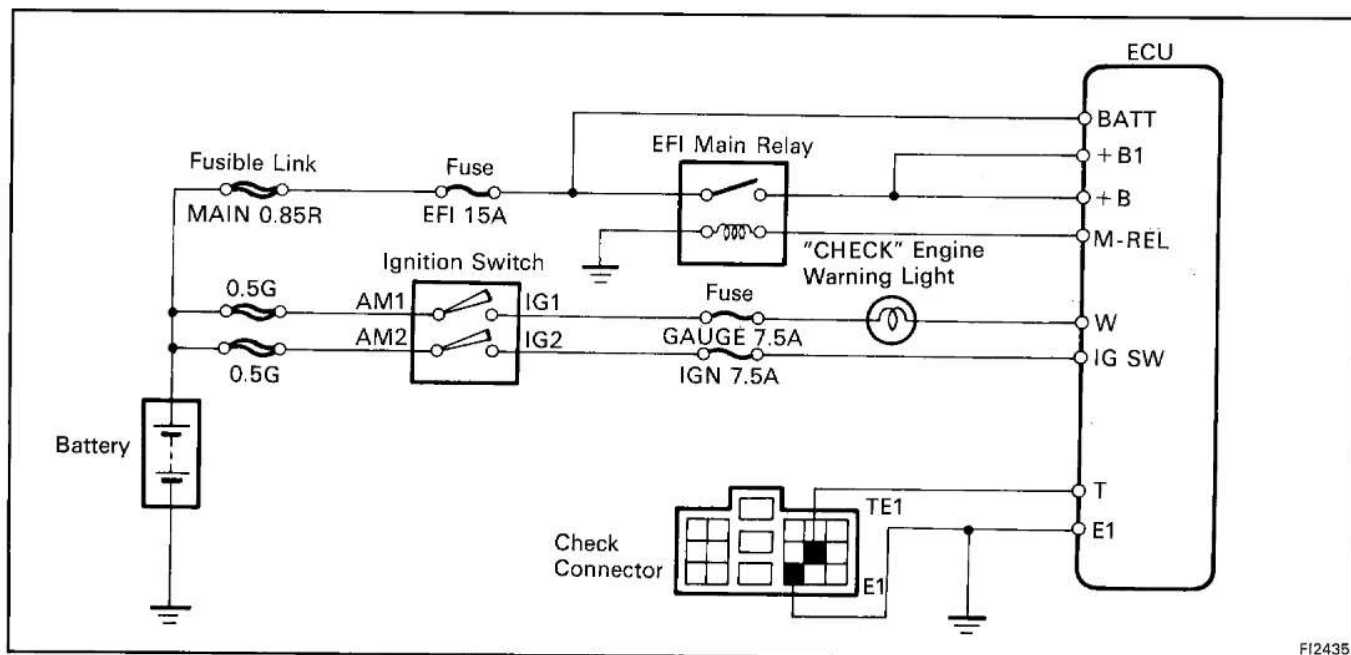
DIAGNOSTIC CODES

Code No.	Number of Check engine blinks	System	Diagnosis	Trouble area	See page
—	 FI1604	Normal	This appears when none of the other codes are identified.	—	—
11	 FI1605	ECU (+B)	Momentary interruption in power supply to ECU.	• Ignition switch circuit • Ignition switch • Main relay circuit • Main relay • ECU	FI-30
12	 FI1606	PRM Signal	No "NE" or "G" signal to ECU within 2 seconds after engine has been cranked.	• Distributor circuit • Distributor • Starter signal circuit • ECU	IG-4
13	 FI1607	RPM Signal	No "NE" signal to ECU when engine speed is above 1,000 rpm.	• Distributor circuit • Distributor • ECU	—
14	 FI1608	Ignition Signal	No "IGF" signal to ECU 6 – 8 times in succession.	• Igniter and ignition coil circuit • Igniter and ignition coil • ECU	FI-41
21	 FI1609	Oxygen Sensor Signal	Detects deterioration of oxygen sensor.	• Oxygen sensor circuit • Oxygen sensor • ECU	FI-44
		Oxygen Sensor Heater Signal	Open or short circuit in oxygen sensor heater signal.	• Oxygen sensor heater circuit • Oxygen sensor heater • ECU	
22	 FI1610	Water Temp. Sensor Signal	Open or short circuit in water temp. sensor signal.	• Water temp. sensor circuit • Water temp. sensor • ECU	FI-37
24	 FI1611	Intake Air Temp. Sensor Signal	Open or short circuit in intake air temp. sensor signal.	• Intake air temp. sensor circuit • Intake air temp. sensor • ECU	FI-36
25	 FI2562	Air-fuel Ratio Lean Malfunction	(1) When air-fuel ratio feedback compensation value or adaptive control value continues at the upper (lean) or lower (rich) limit. (2) When air-fuel ratio feedback compensation value or adaptive control value feedback frequency is abnormally high during feedback condition. HINT: For condition (2), neither a lean (Code No. 25) nor a rich (Code No. 26) diagnosis is displayed consecutively.	• Injector circuit • Injector • Fuel line pressure • Air flow meter • Air intake system • Oxygen sensor circuits • Oxygen sensors • Ignition system • ECU	—
26	 FI2563	Air-fuel Ratio Rich Malfunction	Same as code No. 25	• Injector circuit • Injector • Fuel line pressure • Air flow meter • Cold start injector • ECU	—
28	 FI2698	No. 2 Oxygen Sensor Signal	Same as code No. 21	Same as code No. 21	FI-44
		No. 2 Oxygen Sensor Heater			

DIAGNOSTIC CODES (Cont'd)

Code No.	Number of Check engine blinks	System	Diagnosis	Trouble area	See page
31	 FI1612	Air flow Meter Signal	Open circuit in VC signal or short circuit between VS and E2 when idle contacts are closed.	• Air flow meter circuit • Air flow meter • ECU	FI-35
32	 FI1613	Air Flow Meter Signal	Open circuit in E2 or short circuit between VC and VS.	• Air flow meter circuit • Air flow meter • ECU	FI-35
35	 FI2699	HAC Sensor Signal	Open circuit in altitude compensation sensor signal.	• ECU	—
41	 FI1614	Throttle Position Sensor Signal	Open or short circuit in throttle position sensor signal.	• Throttle position sensor circuit • Throttle position sensor • ECU	FI-33
42	 FI1615	Vehicle Speed Sensor Signal	No "SPD" signal for 8 seconds when engine speed in between 2,000 rpm and 5,000 rpm and coolant temp. is below 80°C (176°F) except when racing the engine.	• Vehicle speed sensor circuit • Vehicle speed sensor • ECU	—
43	 FI1616	Starter Signal	No "STA" signal to ECU until engine speed reaches 800 rpm with vehicle not moving	• Ignition switch circuit • Ignition switch • ECU	FI-39
51	 FI1617	Switch Signal	No "IDL" signal or "NSW" signal to ECU, with the check terminals E1 and TE1 shorted.	• Throttle position sensor circuit • Throttle position sensor • Neutral start switch • Acceleration pedal and cable • ECU	—

INSPECTION OF DIAGNOSIS CIRCUIT



1. Does "CHECK" engine warning light come on when ignition switch is at ON?
 - YES → System Normal
 - NO → Does "CHECK" engine warning light come on when ECU terminal W is grounded to the body?
 - YES → Check wiring between ECU terminal E1 and body ground.
 - OK → Try another ECU.
 - BAD → Repair or replace.
 - NO → Check bulb, fuse and wiring between ECU and ignition switch.
 - BAD → Repair or replace.
2. Does "CHECK" engine warning light go off when the engine is started?
 - YES → System Normal
 - NO → Check wiring between ECU and "CHECK" engine warning light.
 - BAD → Repair.
 - OK → Is there diagnostic code output when check connector terminals TE1 and E1 are connected?
 - NO → Check wiring between ECU terminal T and check connector terminal TE1, and ECU terminal E1 and check connector terminal E1.
 - OK → Try another ECU.
 - YES → Does "CHECK" engine warning light go out after repair according to malfunction code?
 - NO → Further repair required.
 - YES → OK → Cancel out diagnostic code.

TROUBLESHOOTING WITH VOLT/OHMMETER

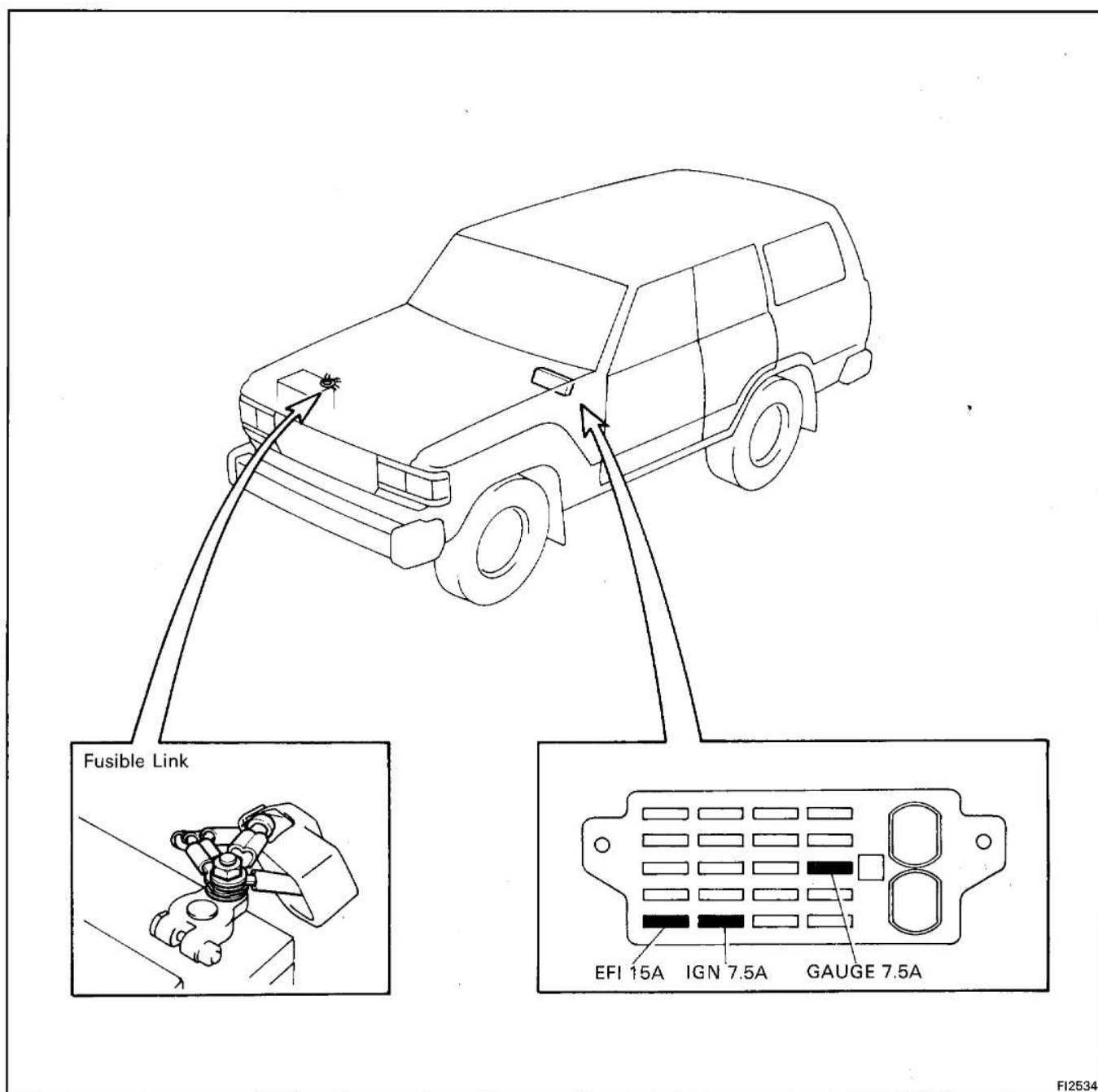
HINT: The following troubleshooting procedures are designed for inspection of each separate system, and therefore the actual procedure may vary somewhat. However, troubleshooting should be performed referring to the inspection methods described in this manual.

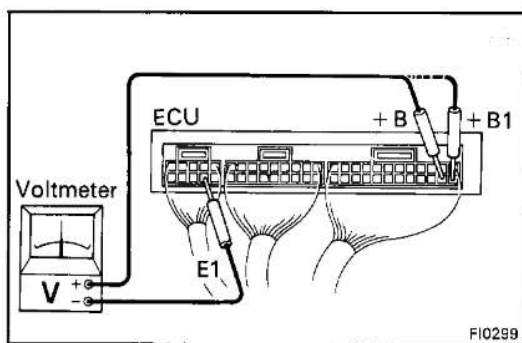
Before beginning inspection, it is best to first make a simple check of the fuses, fusible links and condition of the connectors.

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 it can be assumed that the ECU is faulty and should be replaced.

LOCATION OF FUSES AND FUSIBLE LINKS





EFI SYSTEM CHECK PROCEDURE

HINT:

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

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

Terminals of ECU

Symbol	Terminal Name	Symbol	Terminal Name	Symbol	Terminal Name
E01	ENGINE GROUND	G1	DISTRIBUTOR	EGR	EGR VSV
E02	ENGINE GROUND	VF2	CHECK CONNECTOR	A/C	A/C MAGNET SWITCH
No. 10	INJECTOR (No. 1, 2, 3)	VTA	THROTTLE POSITION SENSOR	SPD	SPEED SENSOR
No. 20	INJECTOR (No. 4, 5, 6)	NE	DISTRIBUTOR	W	WARNING LIGHT
HT1	OXYGEN SENSOR HEATER	IDL	THROTTLE POSITION SENSOR	FPU	FPU VSV
HT2	OXYGEN SENSOR HEATER	E11	COMPUTER GROUND	NSW	NEUTRAL START SWITCH
STJ	COLD START INJECTOR	OX1	OXYGEN SENSOR	THA	AIR TEMP. SENSOR
E1	COMPUTER GROUND	OX2	OXYGEN SENSOR	STA	STARTER SWITCH
T	CHECK CONNECTOR	THW	WATER TEMP. SENSOR	VS	AIR FLOW METER
TWS	WATER TEMP. SWITCH	E2	SENSOR GROUND	AI	AI VSV
ISC1	ISC MOTOR No. 1 COIL	IGF	IGNITER	VC	AIR FLOW METER or THROTTLE POSITION SENSOR
ISC2	ISC MOTOR No. 2 COIL	E22	SENSOR GROUND	BATT	BATTERY
ISC3	ISC MOTOR No. 3 COIL	IGT	IGNITER	+B	EFI MAIN RELAY
ISC4	ISC MOTOR No. 4 COIL	4WD	4WD INDICATOR	IG SW	IGNITION SWITCH
G $\ominus$	DISTRIBUTOR	M-REL	EFI MAIN RELAY	+B1	EFI MAIN RELAY
VFI	CHECK CONNECTOR	STP	STOP LIGHT SWITCH		

ECU Terminals

E01	No. 10	HT1	STJ	T	ISC 1	ISC 2	G $\ominus$	G1	—	NE	—	OX1	THW	IGF	IGT	—	M-REL	EGR	SPD	FPU	THA	VS	VC	BATT	IG SW
E02	No. 20	HT2	E1	TWS	ISC 3	ISC 4	VF1	VF2	VTA	IDL	E11	OX2	E2	E22	—	4WD	STP	—	W	NSW	STA	AI	—	+B	+B1

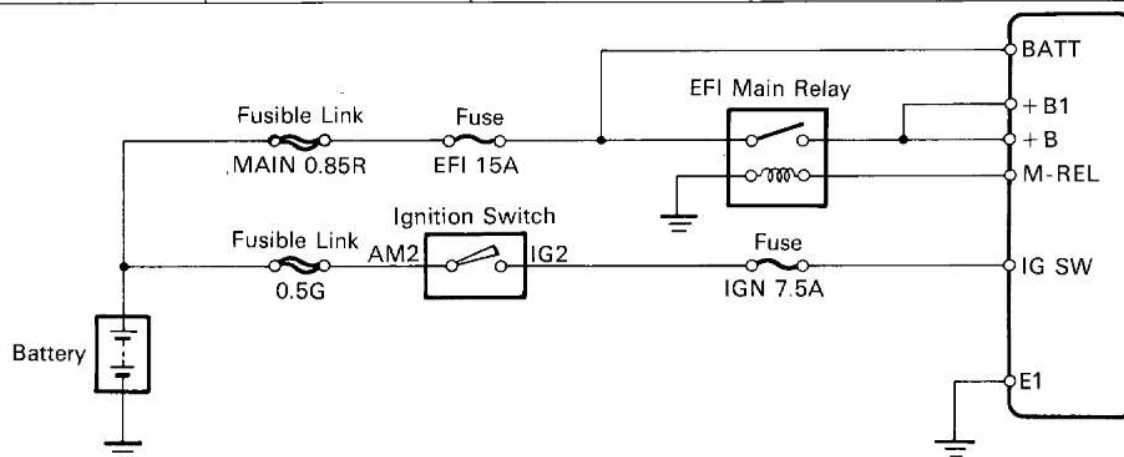
Voltage at ECU Wiring Connectors

No.	Terminals	Condition		STD Voltage	See page
1	BATT – E1	—		10 – 14	FI-30
	IG SW – E1	Ignition switch ON		10 – 14	FI-31
	M-REL – E1				
	+ B (+ B1) – E1				FI-32
2	IDL – E2	Ignition switch ON	Throttle valve open	4 – 6	FI-33
	VC – E2		—	4 – 6	FI-34
	VTA – E2		Throttle valve fully closed	0.1 – 1.0	
			Throttle valve fully open	4 – 5	
3	VC – E22	Ignition switch ON	—	4 – 6	FI-35
	VS – E22		Measuring plate fully closed	4 – 5	
			Measuring plate fully open	0.02 – 0.08	
	VS – E22	Idling	2 – 4		
		3,000 rpm	0.3 – 1.0		
4	THA – E2	Ignition switch ON	Intake air temperature 20°C (68°F)	1 – 3	FI-36
5	THW – E2	Ignition switch ON	Coolant temperature 80°C (176°F)	0.1 – 1.0	FI-37
6	No. 10 E01 – No. 20 E02	Ignition switch ON		10 – 14	FI-38
7	STA – E1	Cranking		6 – 14	FI-39
8	ISC1 – E1 ISC4	Ignition switch ON		10 – 14	FI-40
9	IGT – E1	Idling		0.7 – 1.0	FI-41
10	W – E1	No trouble ("CHECK" engine warning light off) and engine running		10 – 14	FI-42

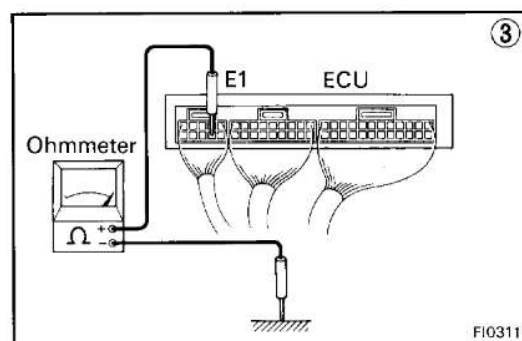
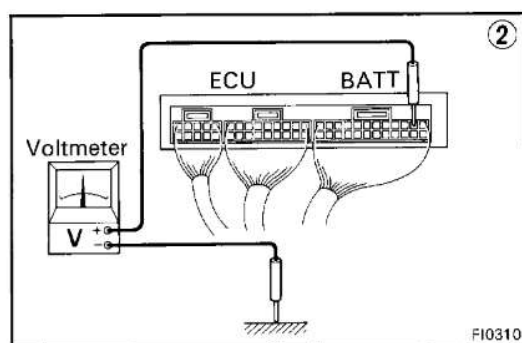
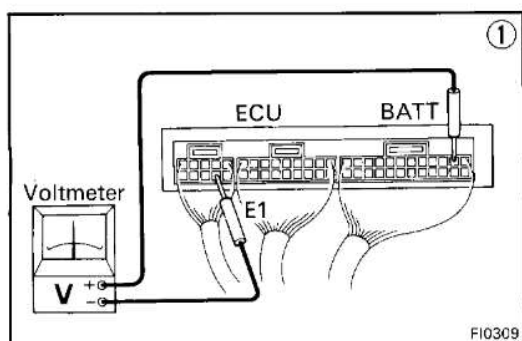
ECU Terminals

E01	No. 10	HT1	STJ	T	ISC 1	ISC 2	G $\oplus$	G1	—	NE	—	OX1	THW	IGF	IGT	—	M-REL	EGR	SPD	FPU	THA	VS	VC	BATT	IG SW
E02	No. 20	HT2	E1	TWS	ISC 3	ISC 4	VF1	VF2	VTA	IDL	E11	OX2	E2	E22	—	4WD	STP	—	W	NSW	STA	AI	—	+B	+B1

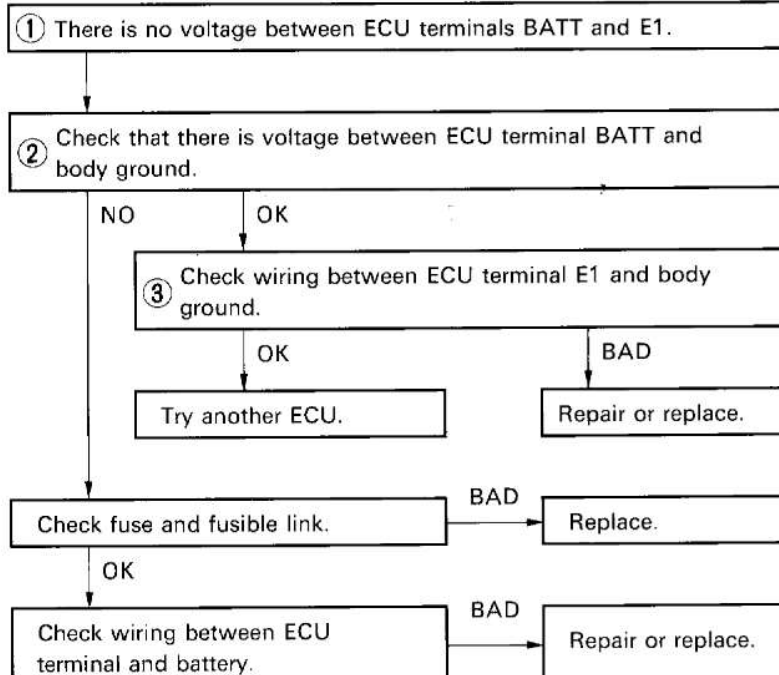
No.	Terminals	Trouble	Condition	STD Voltage
1	BATT – E1	No voltage	—	10 – 14 V
	IG SW – E1	No voltage	Ignition switch ON	10 – 14 V
	M-REL – E1	No voltage	Ignition switch ON	10 – 14 V
	+ B (+ B1) – E1	No voltage	Ignition switch ON	10 – 14 V

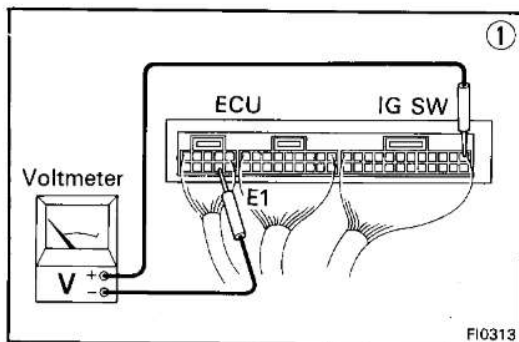


FI2434



• BATT – E1





• IG SW – E1

① There is no voltage between ECU terminals IG SW and E1. (IG SW ON)

② Check that there is voltage between ECU terminal IG SW and body ground. (IG SW ON)

NO

OK

Check wiring between ECU terminal E1 and body ground.

OK

BAD

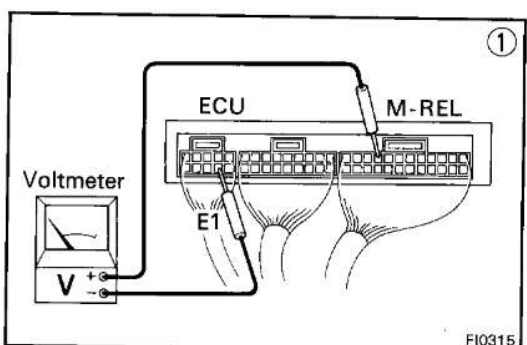
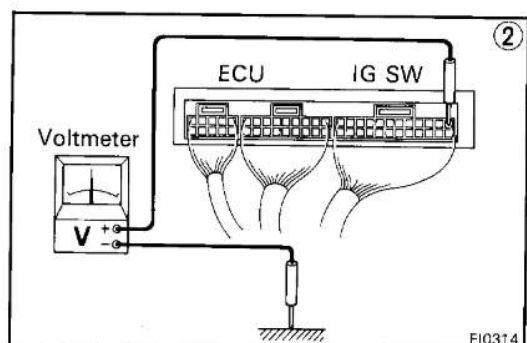
Try another ECU.

Replace or repair.

Check fuse, fusible link and ignition switch.

BAD

Repair or replace.



• M-REL – E1

① There is no voltage between ECU terminals M-REL and E1. (IG SW ON)

② Check that there is voltage between ECU terminal M-REL and body ground. (IG SW ON)

NO

OK

Check wiring between ECU terminal E1 and body ground.

OK

BAD

Try another ECU.

Replace or repair.

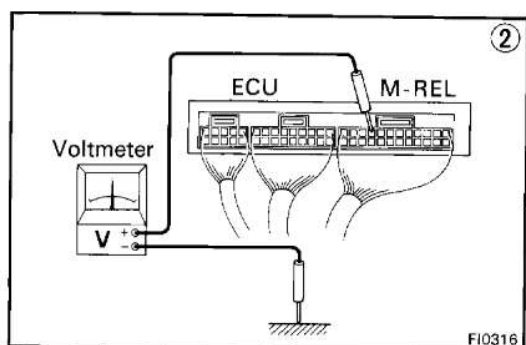
Check EFI main relay and wiring harness. (See page FI-70)

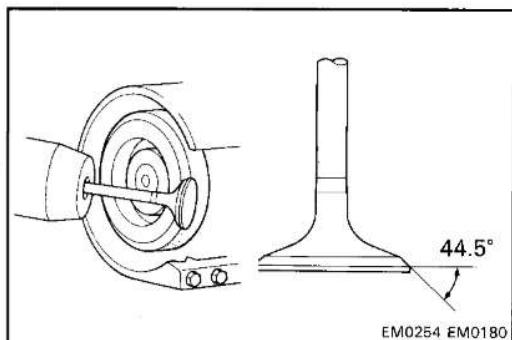
BAD

Replace.

OK

Try another ECU.





11. INSPECT AND GRIND VALVES

- (a) Grind the valve only enough to remove pits and carbon.
- (b) Check that the valve is ground to the correct valve face angle.

Valve face angle: 44.5°

- (c) Check the valve head margin thickness.

Standard margin thickness:

Intake 1.5 – 2.1 mm (0.059 – 0.083 in.)

Exhaust 1.7 – 2.3 mm (0.067 – 0.091 in.)

Minimum margin thickness:

Intake 1.0 mm (0.039 in.)

Exhaust 1.2 mm (0.047 in.)

If the valve head margin thickness is less than minimum, replace the valve.

- (d) Check the valve overall length.

Standard overall length:

Intake 124.8 mm (4.913 in.)

Exhaust 128.0 mm (5.039 in.)

Minimum overall length:

Intake 124.3 mm (4.894 in.)

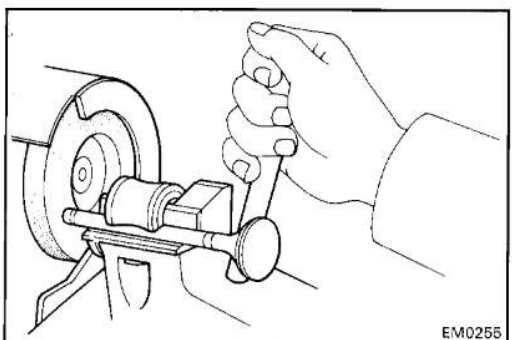
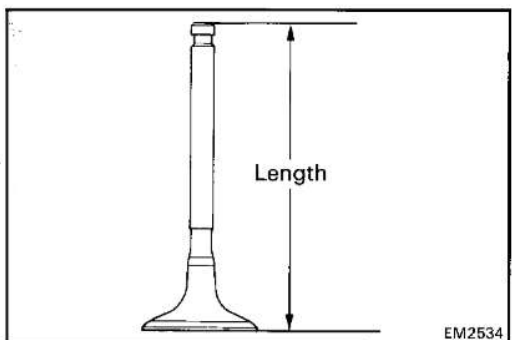
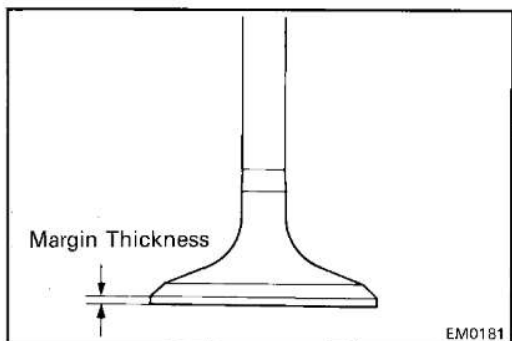
Exhaust 127.5 mm (5.020 in.)

If the valve overall length is less than minimum, replace the valve.

- (e) Check the surface of the valve stem tip for wear.

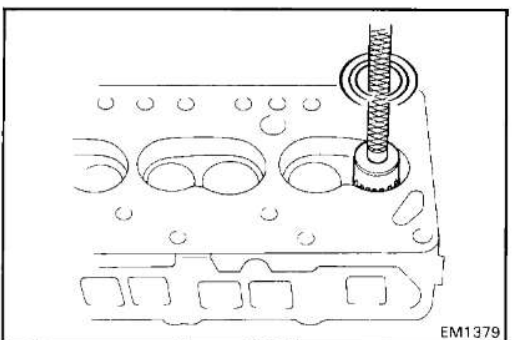
If the valve stem tip is worn, resurface the tip with a grinder or replace the valve.

CAUTION: Do not grind off more than the minimum overall length.

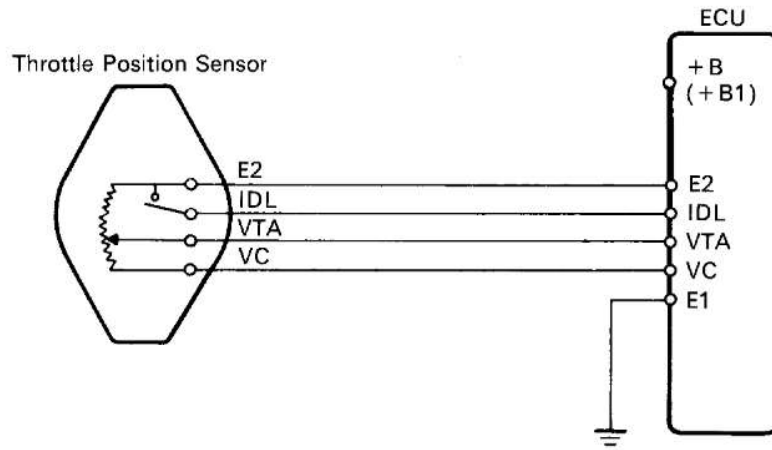


12. INSPECT AND CLEAN VALVE SEATS

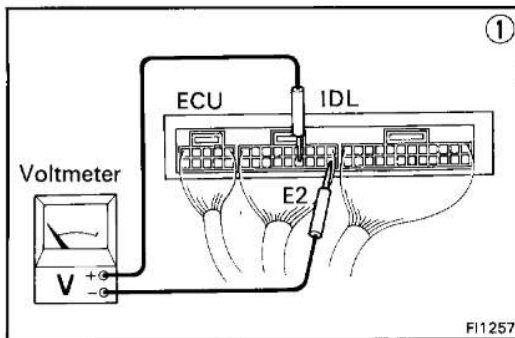
- (a) Using a 45° carbide cutter, resurface the valve seats. Remove only enough metal to clean the seats.



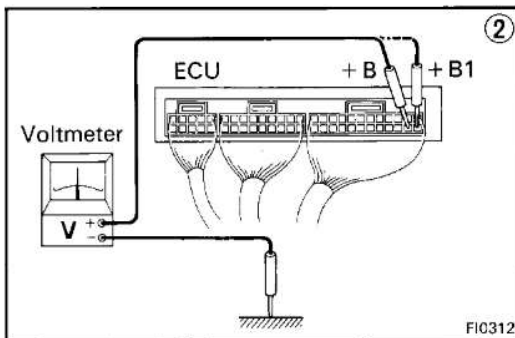
No.	Terminals	Trouble	Condition	STD Voltage
2	IDL – E2	No voltage	Throttle valve open	4 – 6 V
	VC – E2		—	4 – 6 V
	VTA – E2		Throttle valve fully closed	0.1 – 1.0 V
	VTA – E2		Throttle valve fully open	4 – 5 V



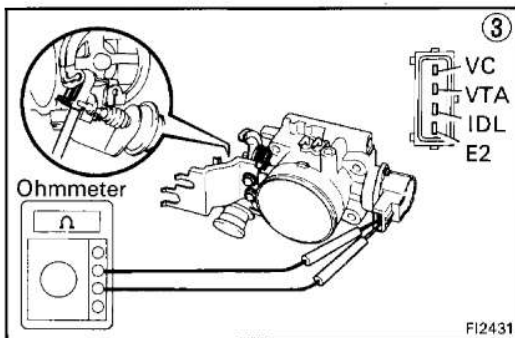
FI1366



FI1257

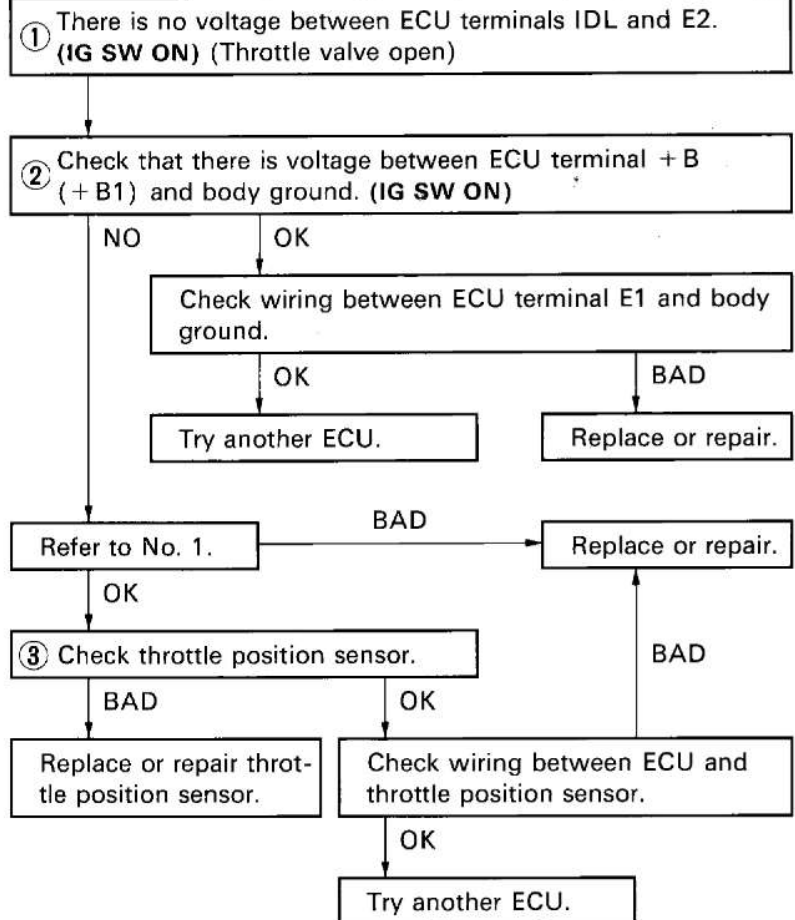


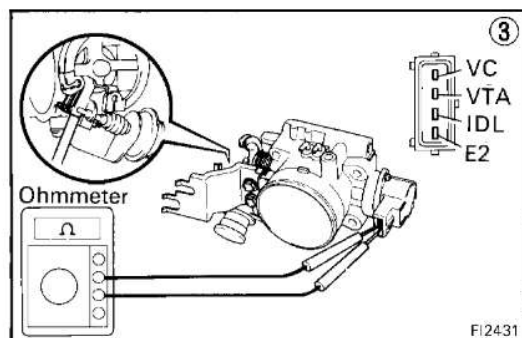
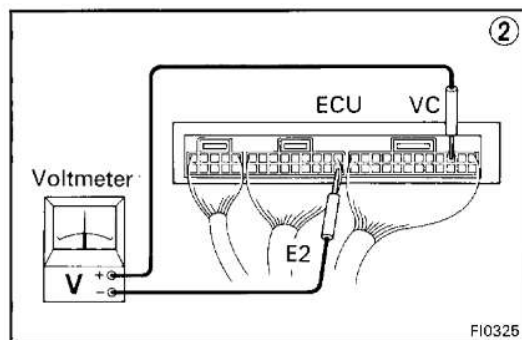
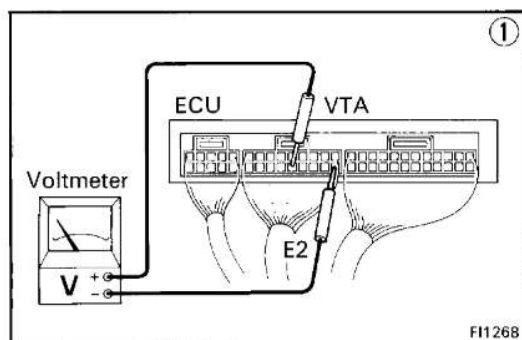
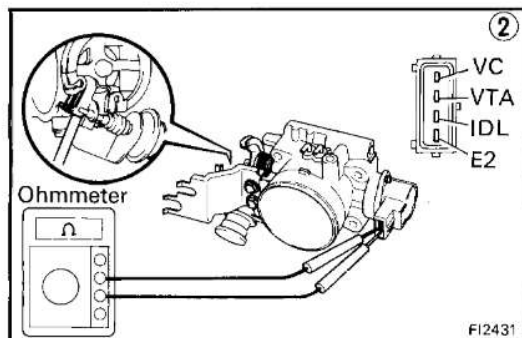
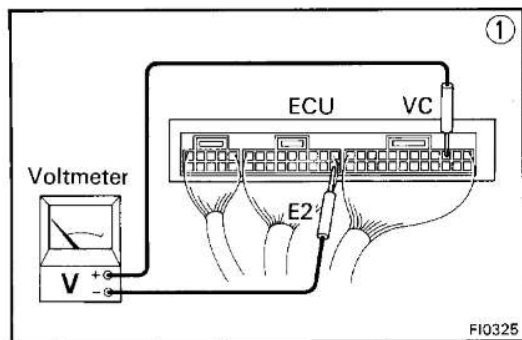
FI0312



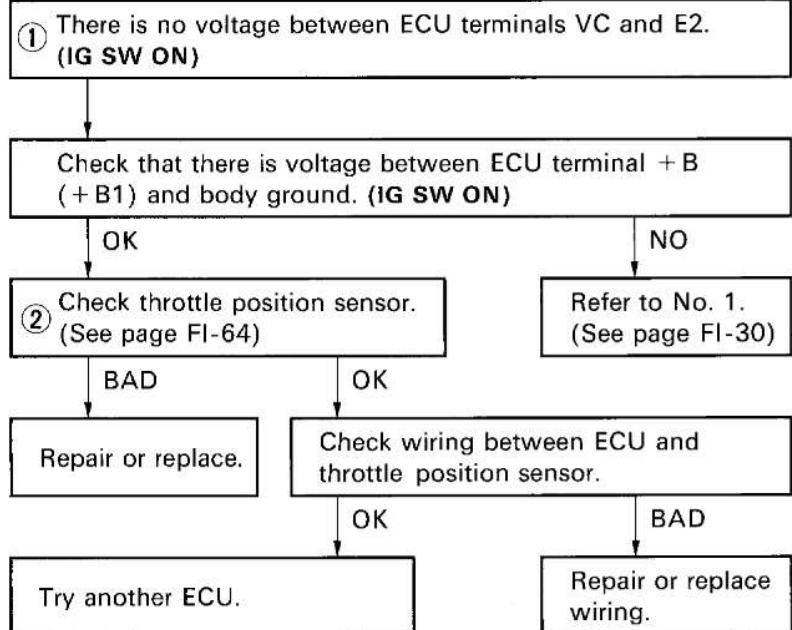
FI2431

• IDL – E2

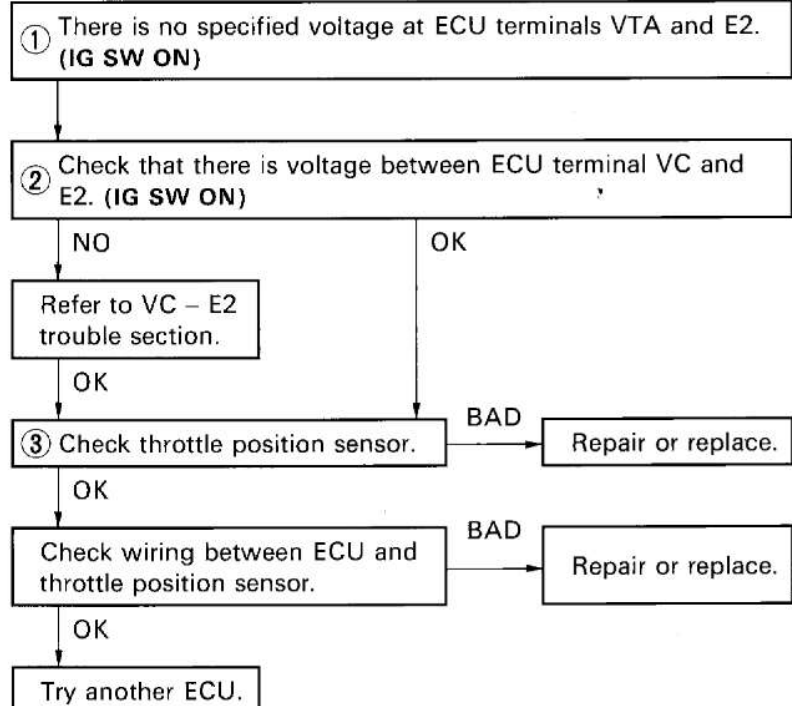




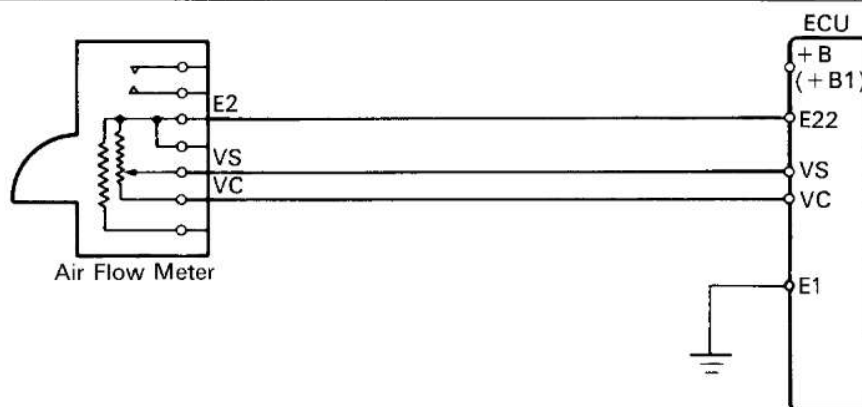
• VC – E2



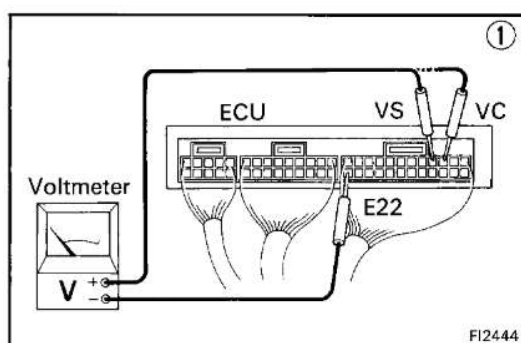
• VTA – E2



No.	Terminals	Trouble	Condition		STD Voltage
3	VC – E22	No voltage	Ignition SW ON	—	4 – 6 V
	VS – E22			Measuring plate fully closed	4 – 5 V
	VS – E22			Measuring plate fully open	0.02 – 0.08 V
	VS – E22		Idling	—	2 – 4 V
	VS – E22		3,000 rpm	—	0.3 – 1.0 V



FI1269



FI2444

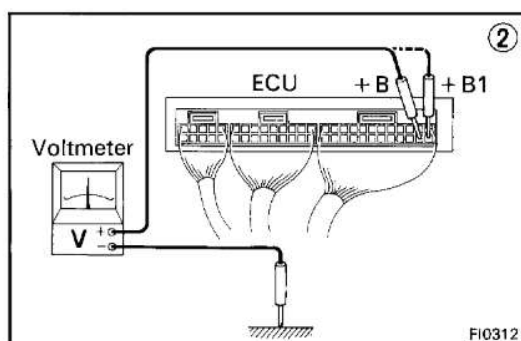
① There is no voltage between ECU terminals VC or VS and E22. (IG SW ON)

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

OK

NO

Refer to No. 1.
(See page FI-30)



FI0312

Check wiring between ECU terminal E1 and body ground.

OK

BAD

③ Check air flow meter.
(See page FI-62)

BAD

OK

Repair or replace.

Replace air flow meter.

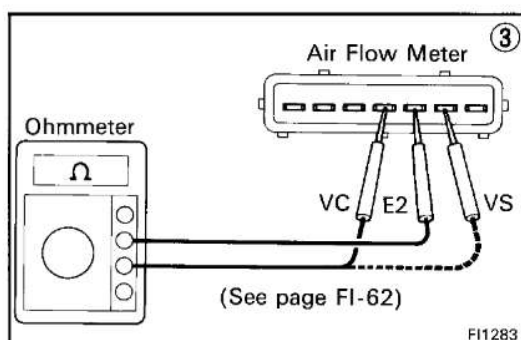
Check wiring between ECU and air flow meter.

OK

BAD

Try another ECU.

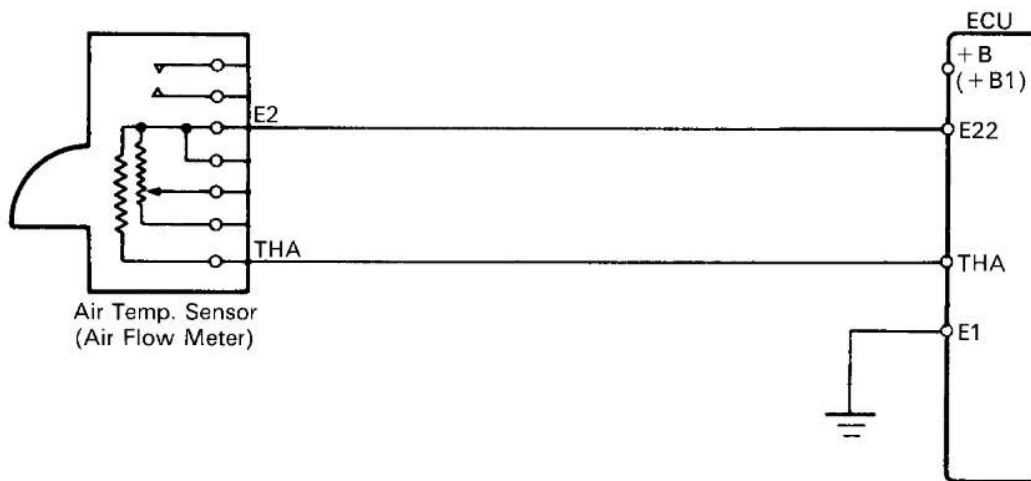
Repair or replace.



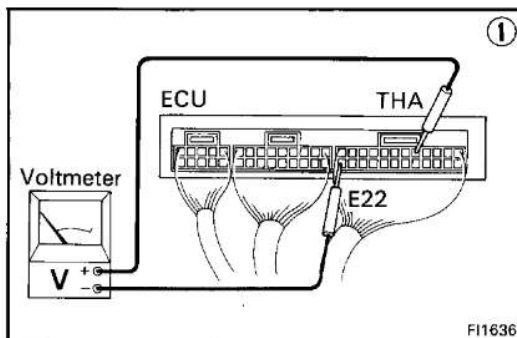
(See page FI-62)

FI1283

No.	Terminals	Trouble	Condition		STD Voltage
4	THA – E22	No voltage	Ignition switch ON	Intake air temperature 20°C (68°F)	1 – 3 V



FI1272



① There is no voltage between ECU terminals THA and E22.
(IG SW ON)

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

OK

NO

Refer to No. 1.
(See page FI-30)

Check wiring between ECU terminal E1 and body
ground.

OK

BAD

③ Check air temp. sensor.
(See page FI-62)

BAD

OK

Repair or replace.

Replace air
flow meter.

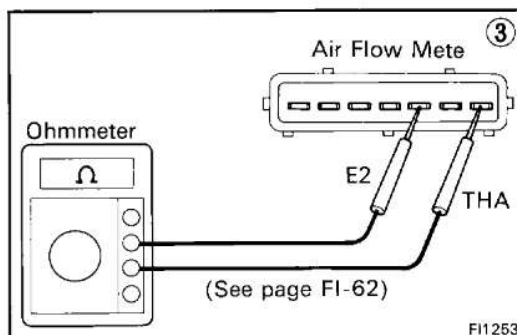
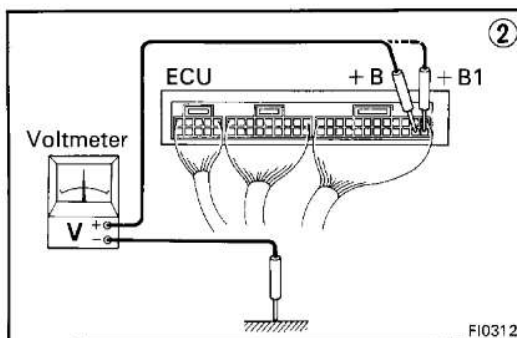
Check wiring between ECU and
air temp. sensor.

OK

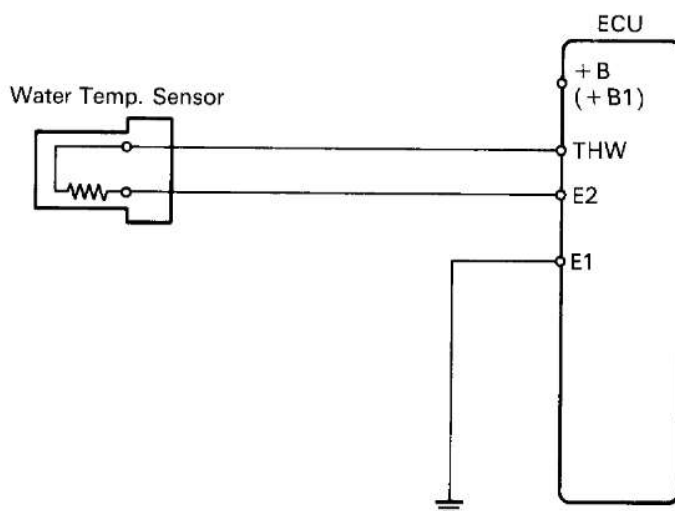
BAD

Try another ECU.

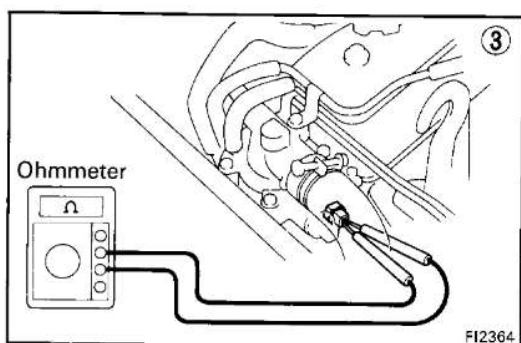
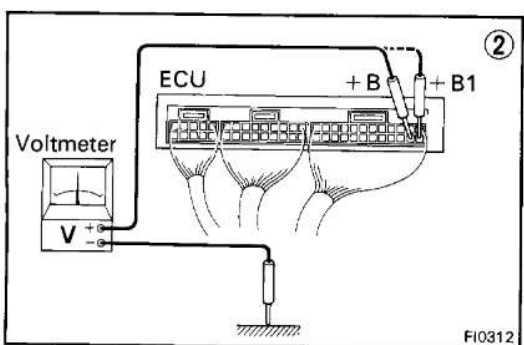
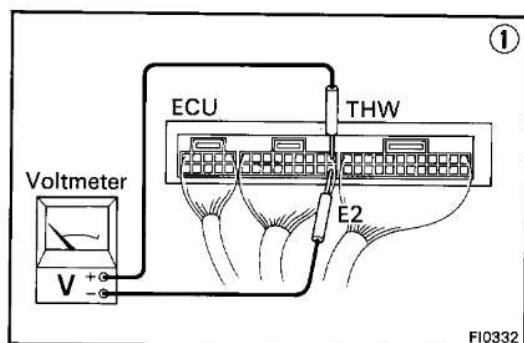
Repair or replace.



No.	Terminals	Trouble	Condition		STD Voltage
5	THW – E2	No voltage	Ignition switch ON	Coolant temperature 80°C (176°F)	0.1 – 1.0 V



FI0487



① There is no voltage between ECU terminals THW and E2. (IG SW ON)

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

OK

NO

Refer to No. 1.
(See page FI-30)

Check wiring between ECU terminal E1 and body ground.

OK

BAD

③ Check water temp. sensor. (See page FI-73)

Repair or replace.

BAD

OK

Replace water temp. sensor.

Check wiring between ECU and water temp. sensor.

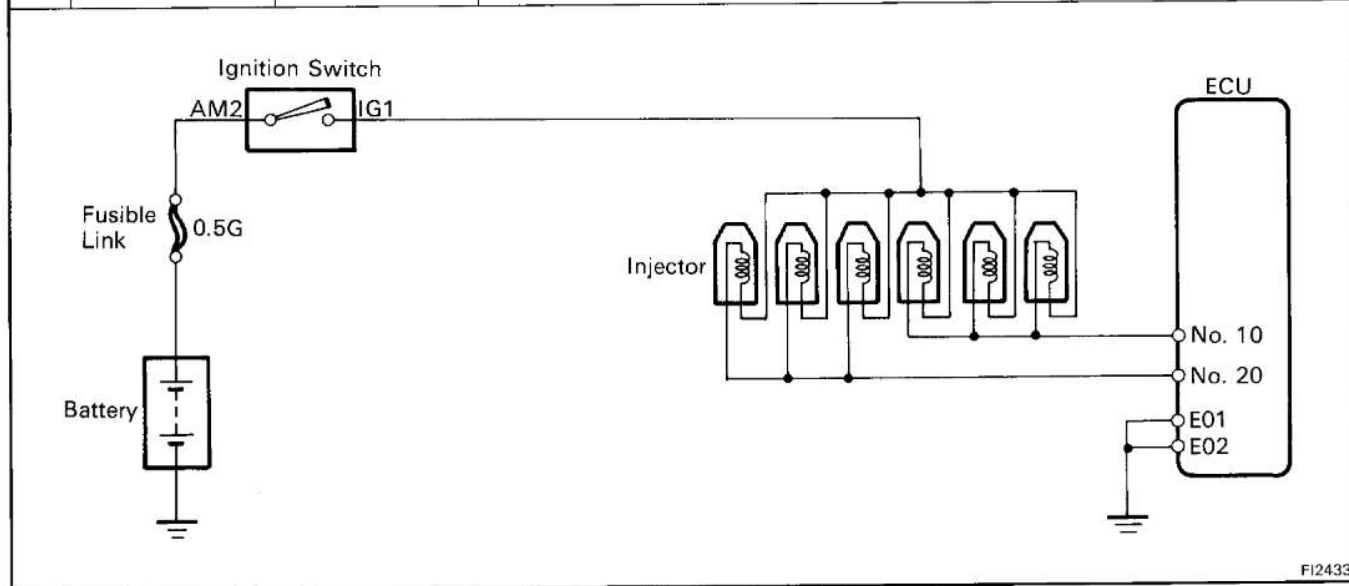
OK

BAD

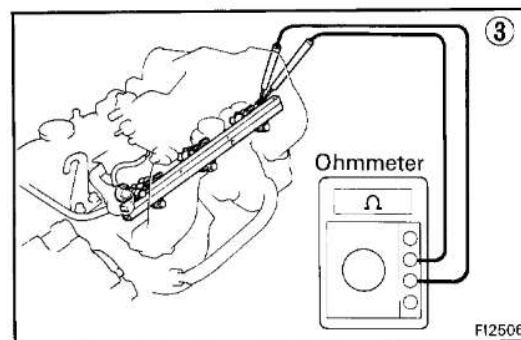
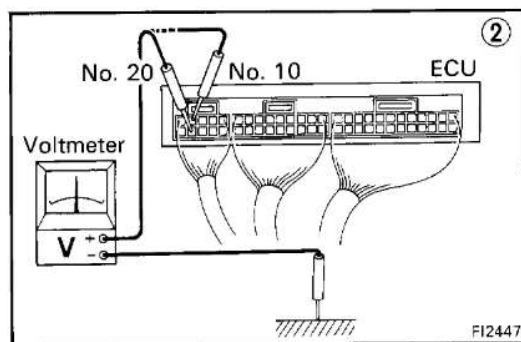
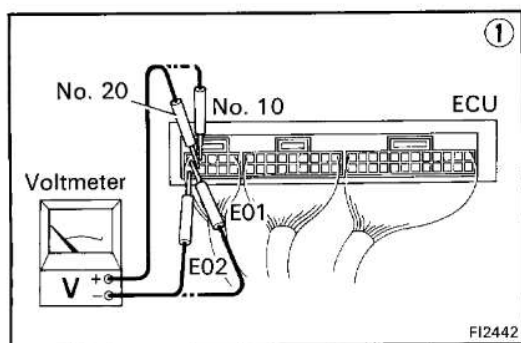
Try another ECU.

Repair or replace.

No.	Terminals	Trouble	Condition	STD Voltage
6	No. 10 – E01 No. 20 – E02	No voltage	Ignition switch ON	10 – 14 V



FI2433



① There is no voltage between ECU terminal No. 10 and/or No. 20 and E01 and/or E02. (IG SW ON)

② Check that there is voltage between ECU terminal No. 10 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 fusible link and ignition switch.

BAD

Repair or replace.

OK

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

OK

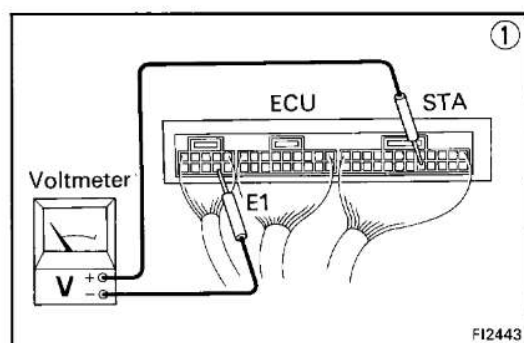
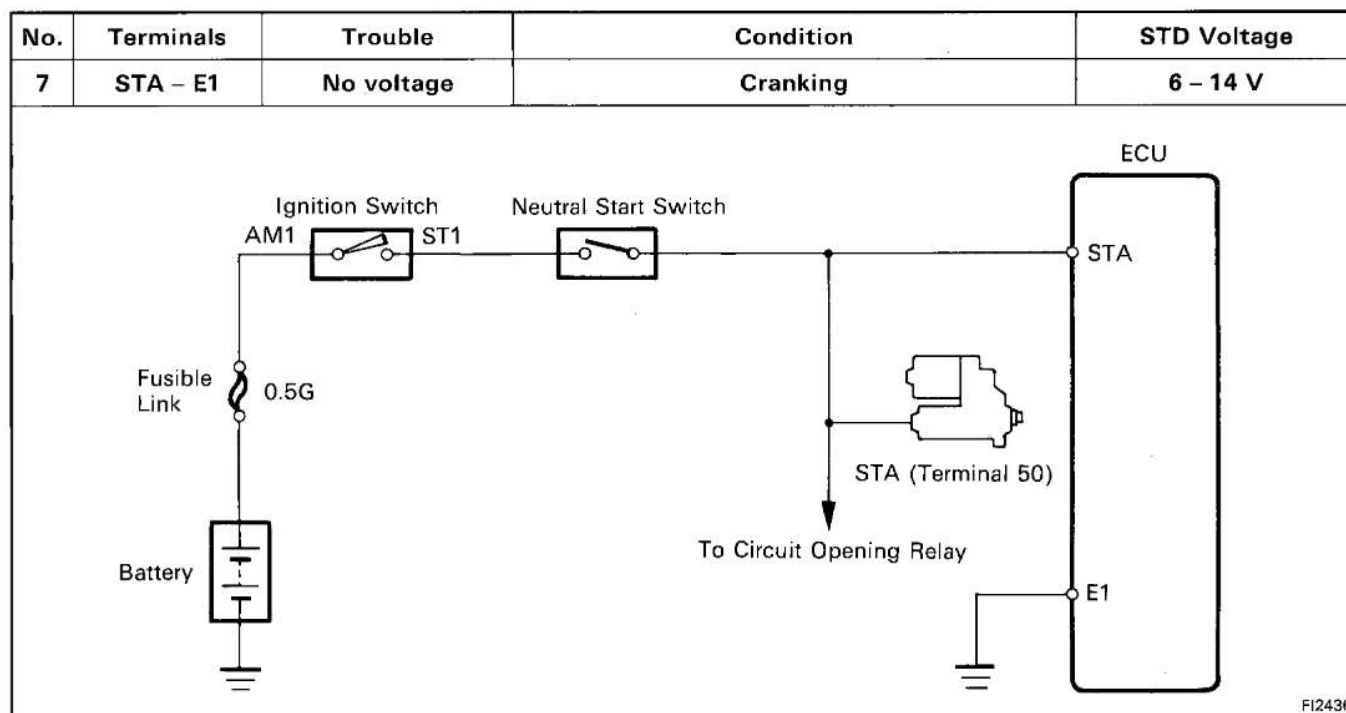
BAD

Replace injector.

Check wiring between ECU terminal No. 10 and/or No. 20 and battery.

BAD

Repair or replace.



① There is no voltage between ECU terminals STA and E1.
(IG SW START)

Check starter operation.

OK

Check wiring between ECU terminal STA and ignition switch terminal ST1.

OK

BAD

Repair or replace.

BAD

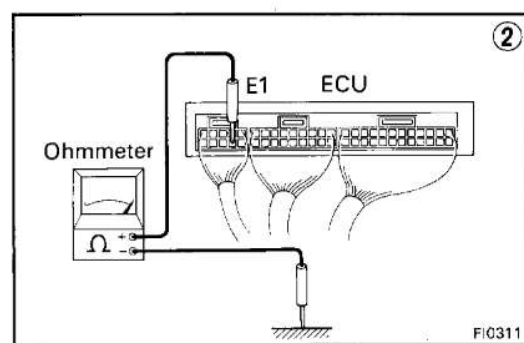
② Check wiring between ECU terminal E1 and body ground.

OK

BAD

Try another ECU.

Repair or replace.



Check fusible link, battery, wiring, ignition switch and neutral start switch.

BAD

Repair or replace.

OK

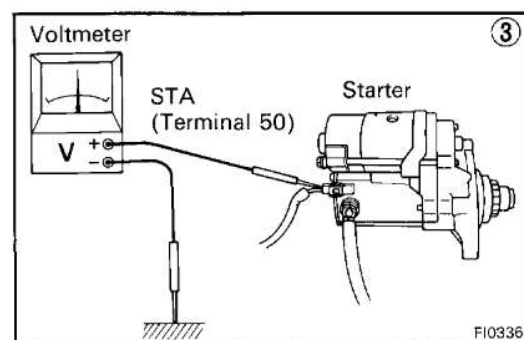
③ Check that there is voltage at STA (50) terminal of starter.
(IG SW START) STD voltage: 6 – 14 V

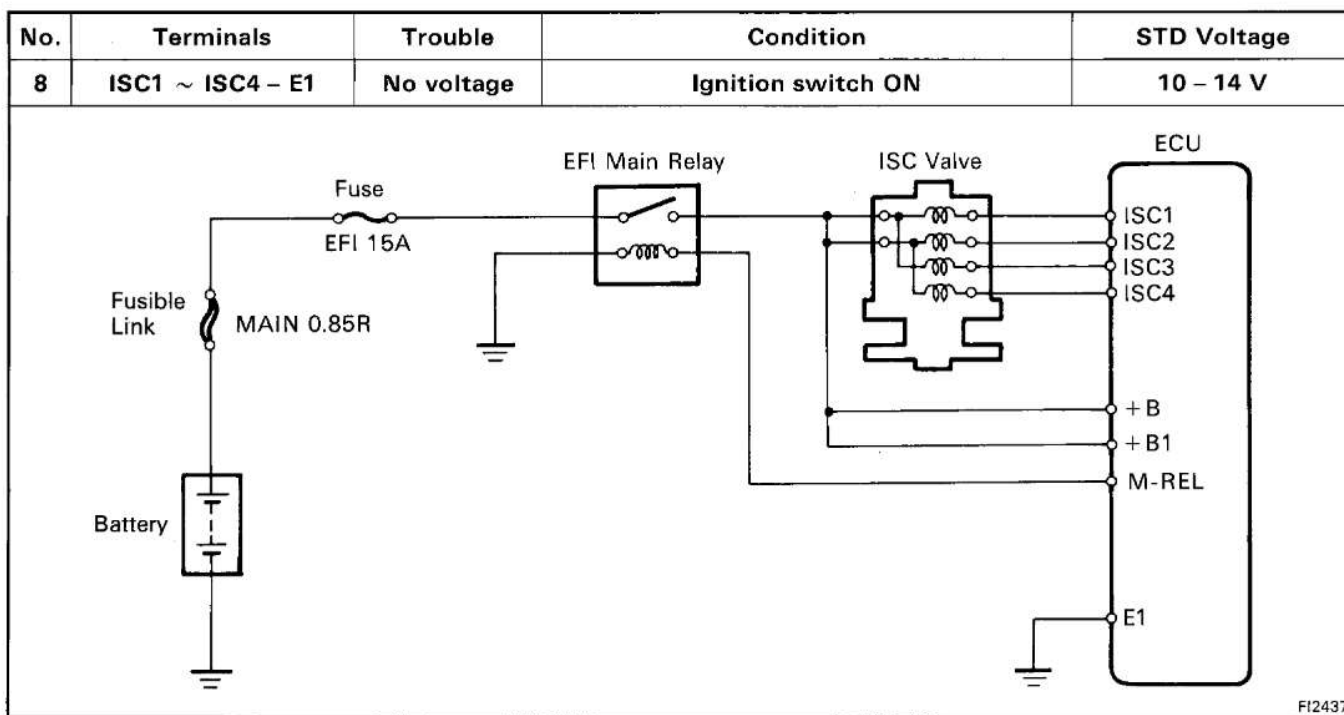
OK

NO

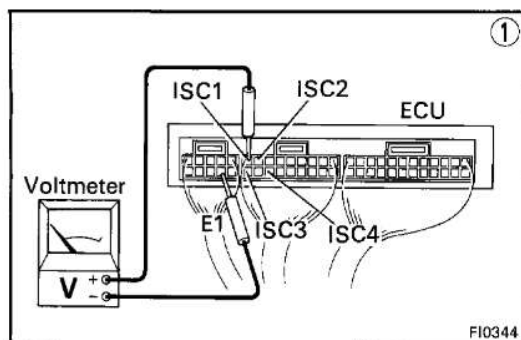
Check starter.

Check wiring between ignition switch terminal ST1 and starter terminal STA (50).





FI2437



① There is no voltage between ECU terminals ISC1 ~ ISC4 and E1. (IG SW ON)

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

OK

NO

Refer to No. 1.
(See page FI-30)

Check wiring between ECU terminal E1 and body ground.

OK

BAD

③ Check ISC valve.
(See page FI-67)

BAD

OK

Replace ISC valve.

Repair or replace.

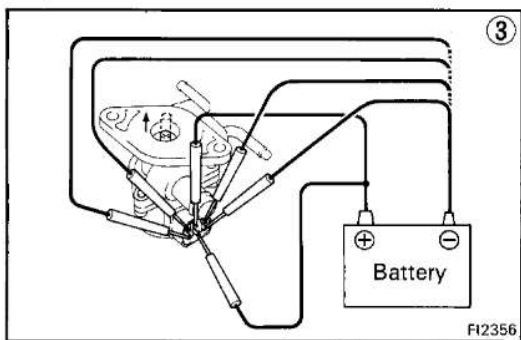
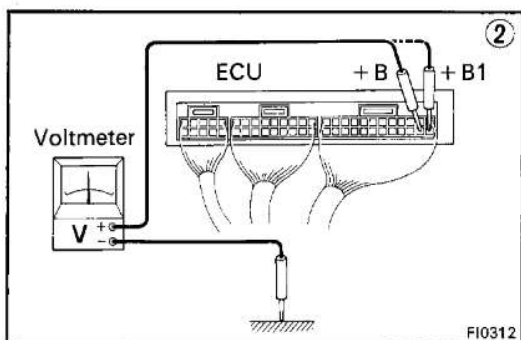
Check wiring between ECU and EFI main relay.

OK

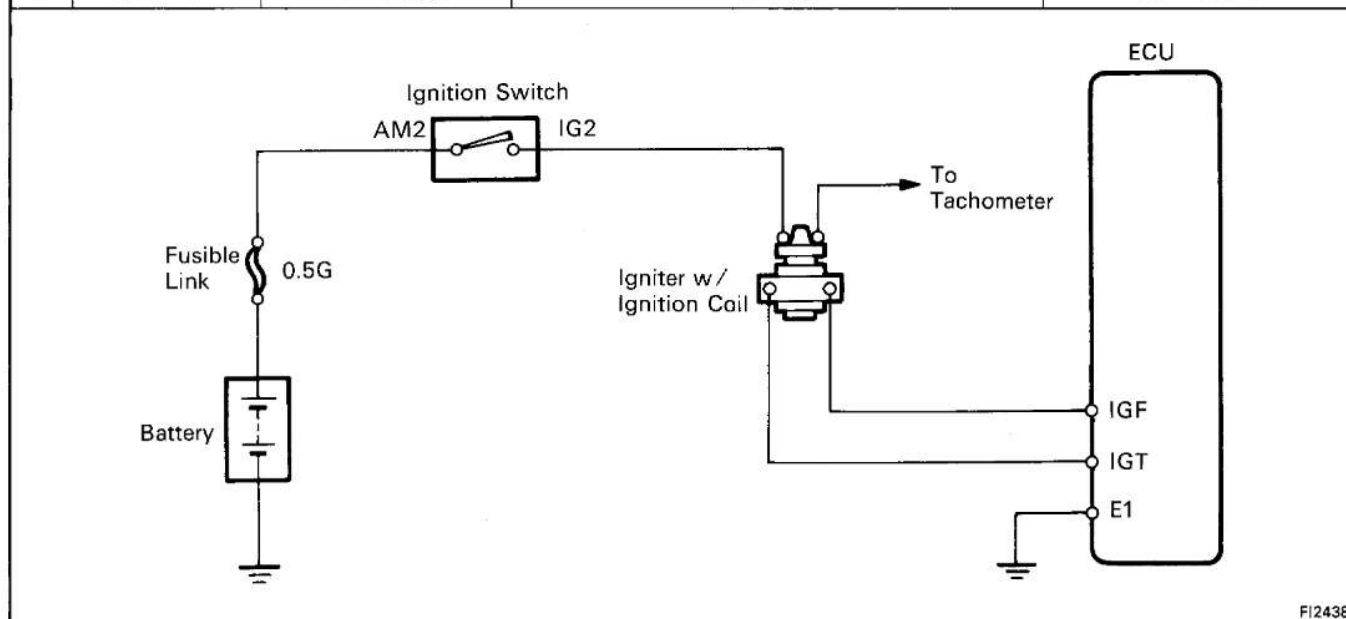
BAD

Try another ECU.

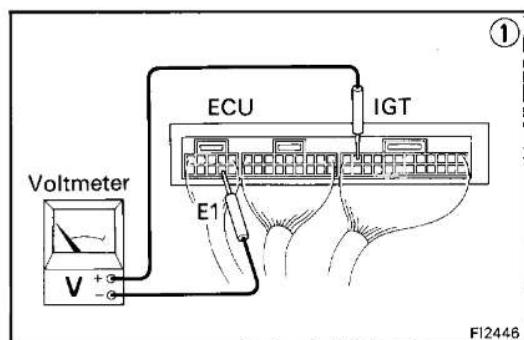
Repair or replace.



No.	Terminals	Trouble	Condition	STD Voltage
9	IGT – E1	No voltage	Idling	0.7 – 1.0 V



FI2438



FI2446

① There is 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

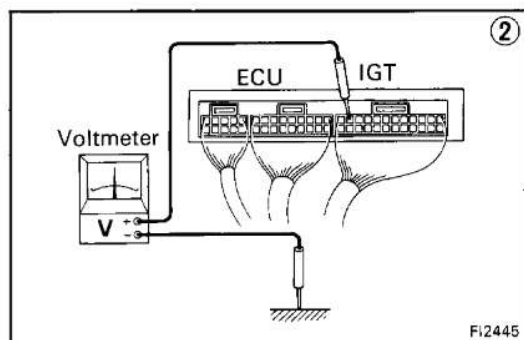
③ Check wiring between ECU terminal E1 and body ground.

BAD

Repair or replace.

OK

Try another ECU.



FI2445

Check fusible link and ignition switch.

BAD

Repair or replace.

OK

Check distributor. (See page IG-7)

BAD

Repair or replace.

OK

Check wiring between ECU and battery.

BAD

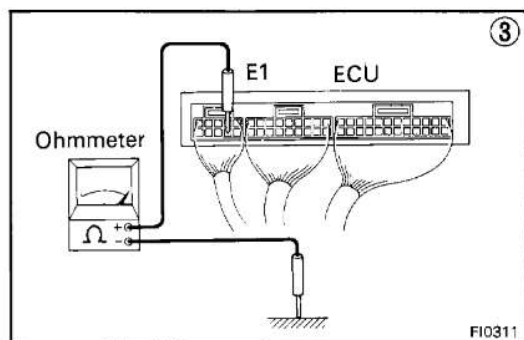
Repair or replace.

OK

Check igniter. (See page IG-7)

BAD

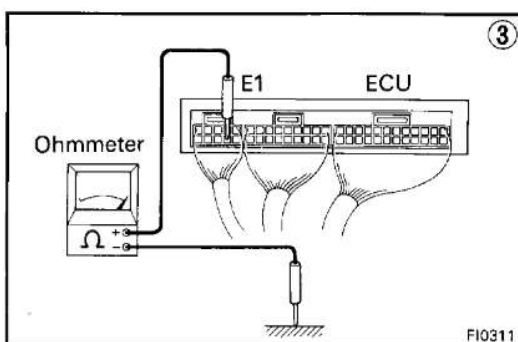
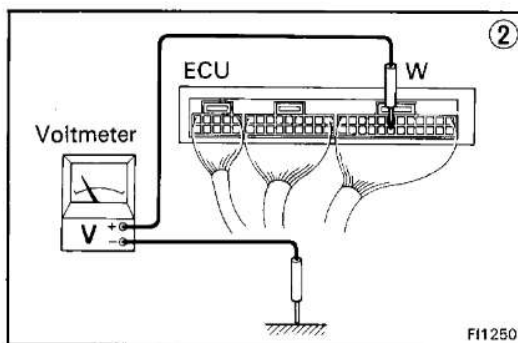
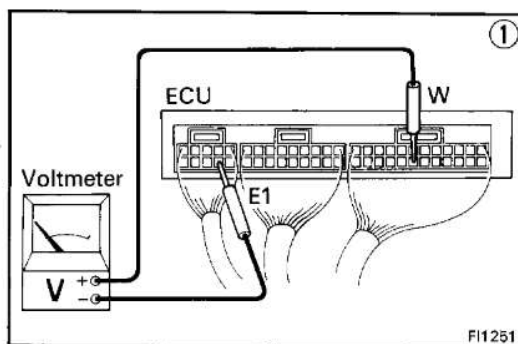
Repair or replace.



FI0311

No.	Terminals	Trouble	Condition	STD Voltage
10	W – E1	No voltage	No trouble ("CHECK" engine warning light off) and engine running	10 – 14 V

FI0728



① There is no voltage between ECU terminals W and E1. (Idling)

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

NO

OK

③ Check wiring between ECU terminal E1 and body ground.

OK

BAD

Try another ECU.

Repair or replace.

Check GAUGE fuse (7.5A) and "CHECK" engine warning light.

OK

BAD

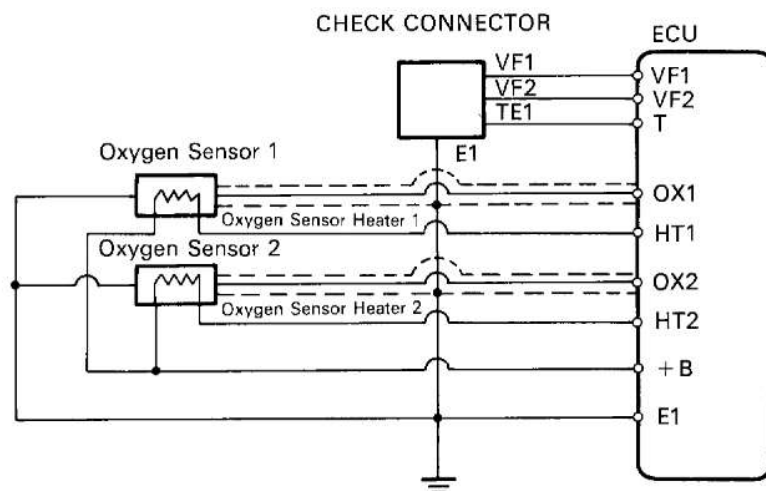
Repair or replace.

Fuse blows again

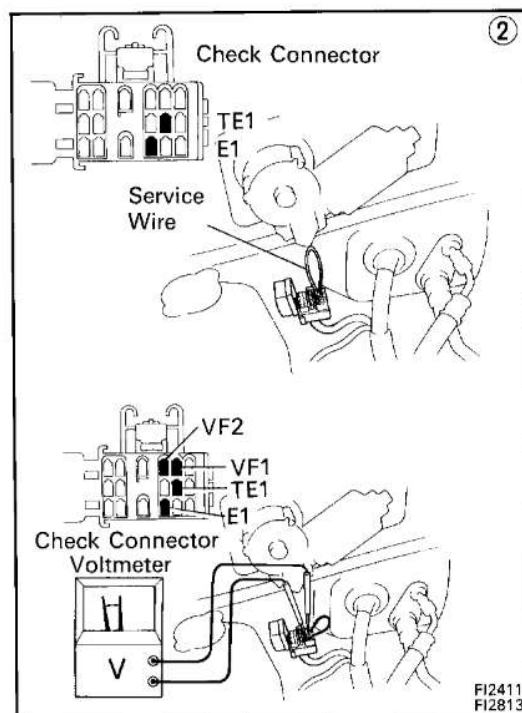
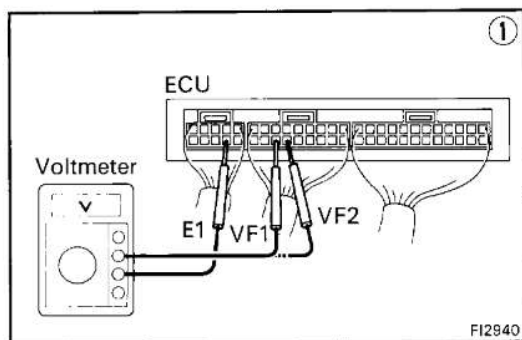
Check wiring between ECU terminal W and fuse.

BAD

Repair or replace.



FI2702



① There is no voltage between ECU terminals VF1 or VF2 and E1.

Check that there is specified voltage between ECU terminal VF1 or VF2 and body ground.

NO

OK

Check wiring between ECU terminal E1 and body ground.

OK

BAD

Try another ECU.

Repair or replace.

Check for suction of air into exhaust system.

BAD

Repair air suction.

OK

Check for air leak from air intake system.

BAD

Repair air leak.

OK

Check spark plugs.

BAD

Repair or replace.

OK

Check distributor and ignition system.

BAD

Repair or replace.

OK

Check fuel pressure.

BAD

Repair or replace.

OK

Check injectors.

BAD

Repair or replace.

OK

Check cold start injector. *

BAD

Repair or replace.

OK

Check air flow meter.

BAD

Repair or replace.

OK

② Check operation of oxygen sensors.

OK

System normal.

BAD

Check wiring between oxygen sensors and ECU connectors.

BAD

Repair wiring.

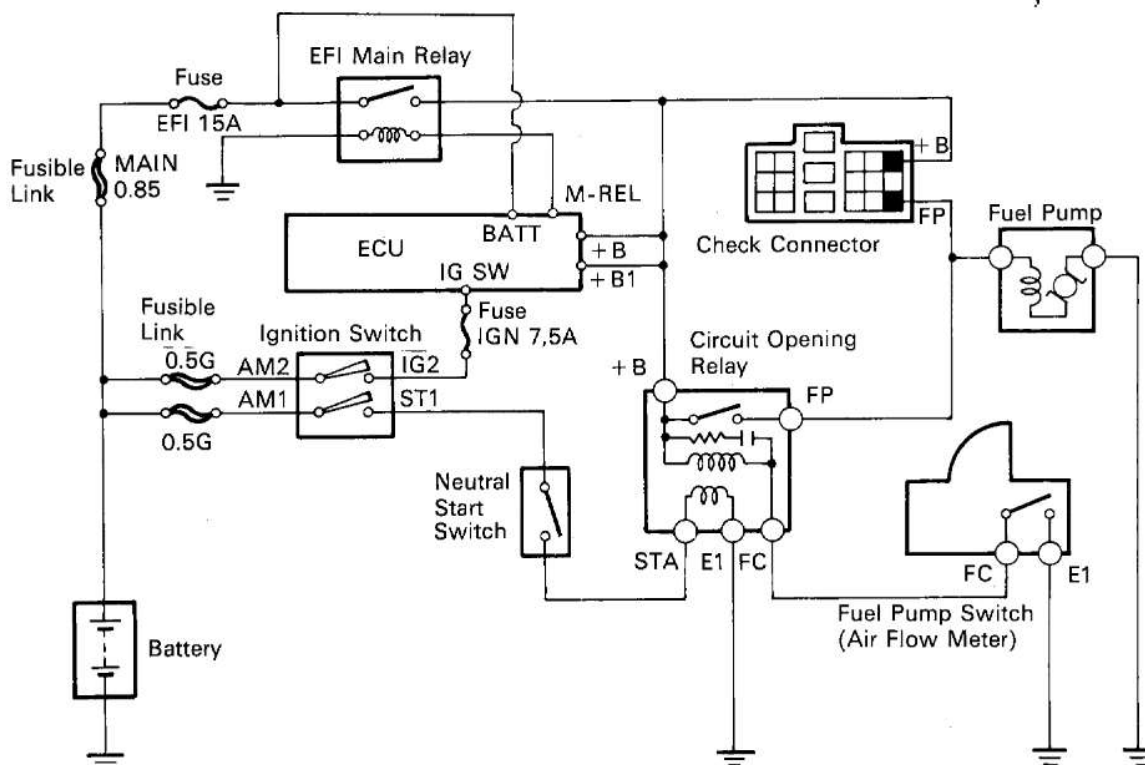
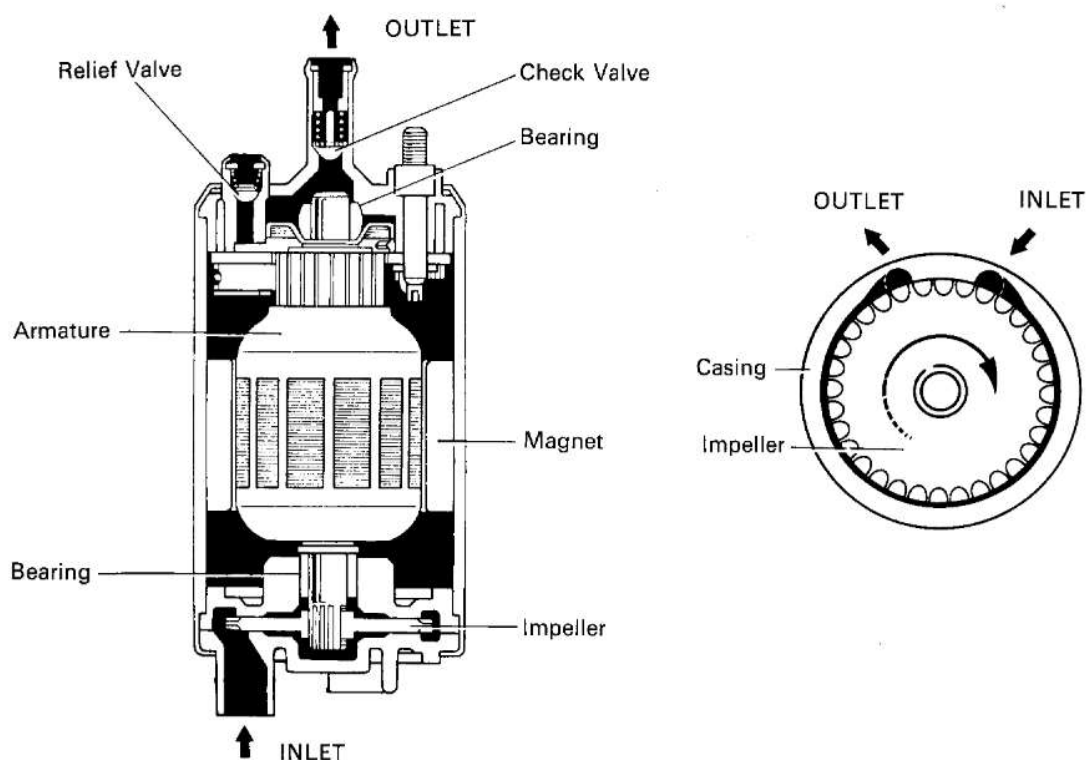
OK

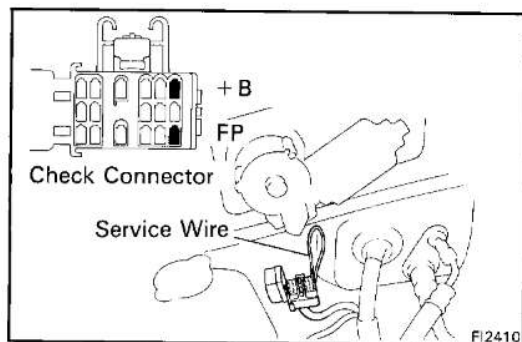
Replace oxygen sensors.

* Rich malfunction only

FUEL SYSTEM

Fuel Pump





ON-VEHICLE INSPECTION

1. INSPECT FUEL PUMP OPERATION

(a) Turn the ignition switch ON.

HINT: Do not start the engine.

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

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

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
- Fuse (EFI 15A or IGN 7.5A)
- EFI main relay
- Fuel pump
- ECU
- Wiring connections

2. INSPECT FUEL PRESSURE

(a) Check the battery voltage above 11 volts.

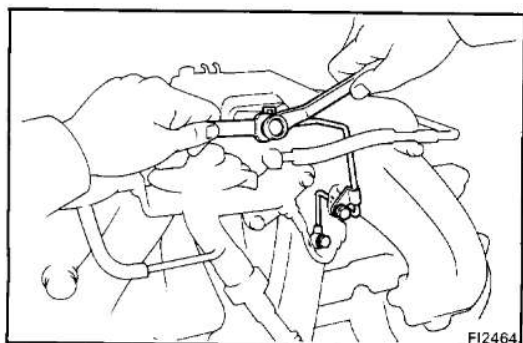
(b) Disconnect the cable from the negative (–) terminal of the battery.

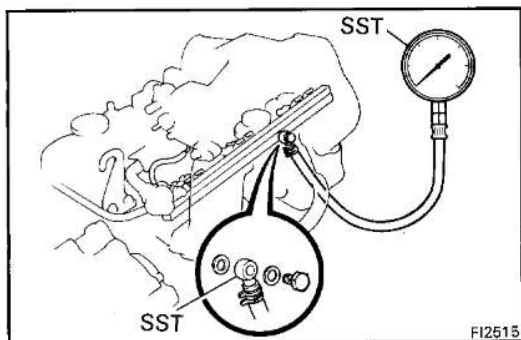
(c) Disconnect the cold start injector connector.

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

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

HINT: Slowly loosen the union bolt.



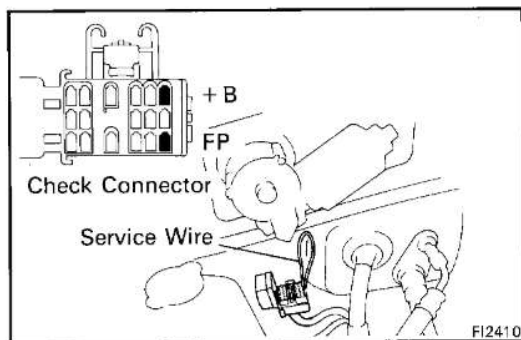


- (f) Install SST (pressure gauge) to the delivery pipe with new two gaskets and union bolt.

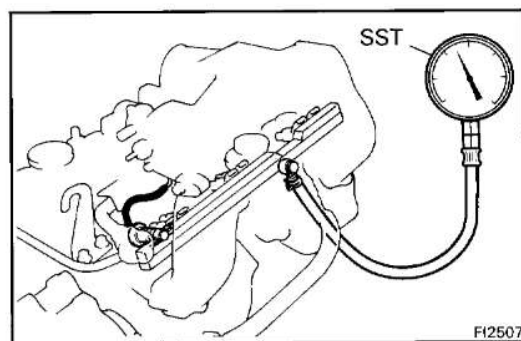
SST 09268-45012 (09268-41080)

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, connect terminals + B and FP of the check connector.



- (j) Turn the ignition switch ON.

- (k) Measure the fuel pressure.

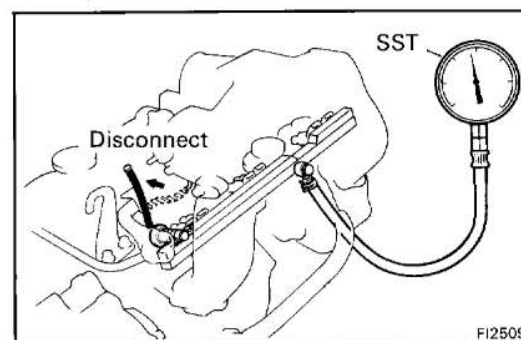
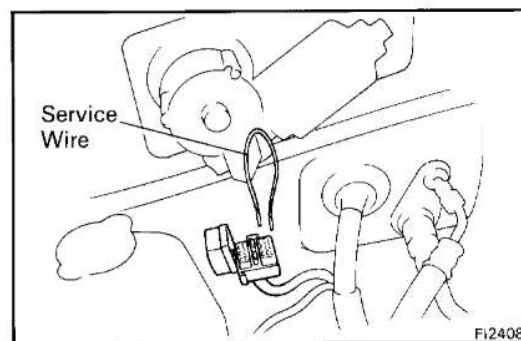
**Fuel pressure: 2.6 – 3.2 kg/cm²
(37 – 46 psi, 255 – 314 kPa)**

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.

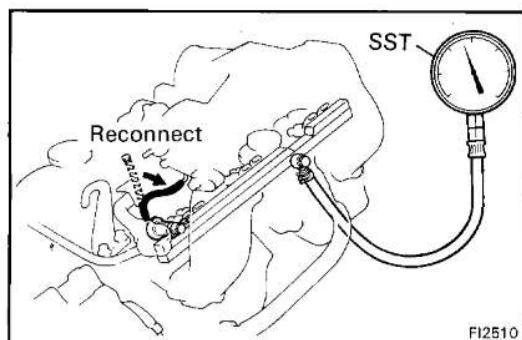


- (m) Start the engine.

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

- (o) Measure the fuel pressure at idling.

**Fuel pressure: 2.6 – 3.2 kg/cm²
(37 – 46 psi, 255 – 314 kPa)**



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

(q) Measure the fuel pressure at idling.

Fuel pressure: 2.3 – 2.6 kg/cm²
(33 – 37 psi, 226 – 265 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, 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.

SST 09268-45012 (09268-41080)

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

Torque:

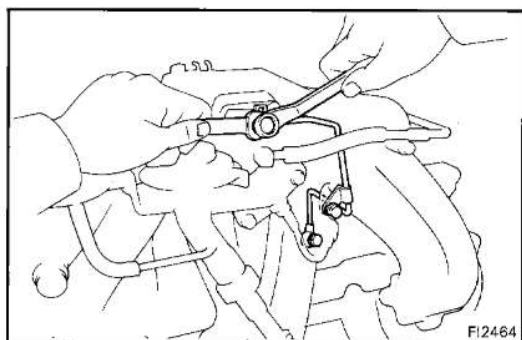
Union bolt 180 kg-cm (13 ft-lb, 18 N·m)

Clamp bolt 120 kg-cm (9 ft-lb, 12 N·m)

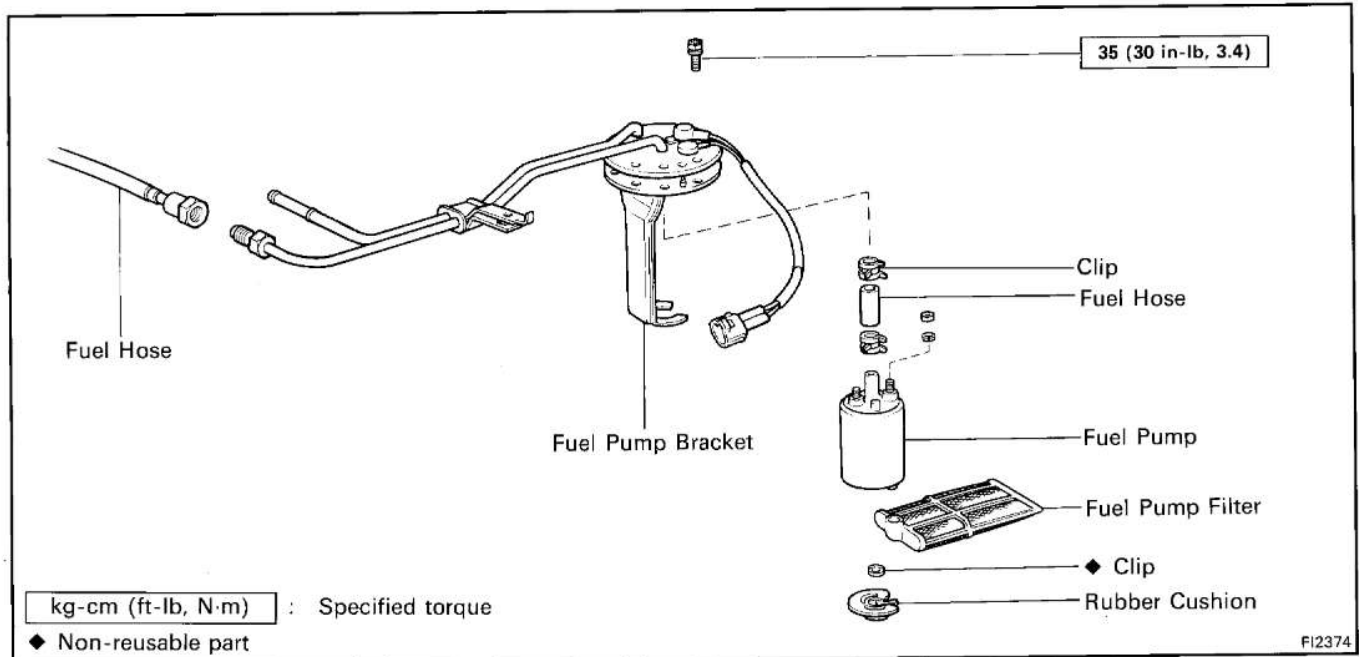
(u) Reconnect the cold start injector connector.

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

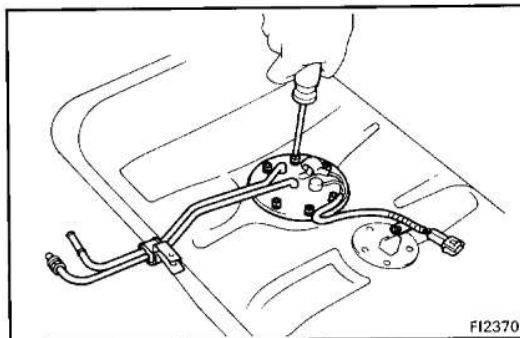
(w) Check for fuel leakage.



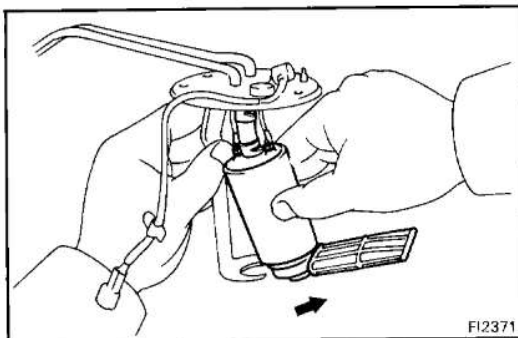
REMOVAL OF FUEL PUMP



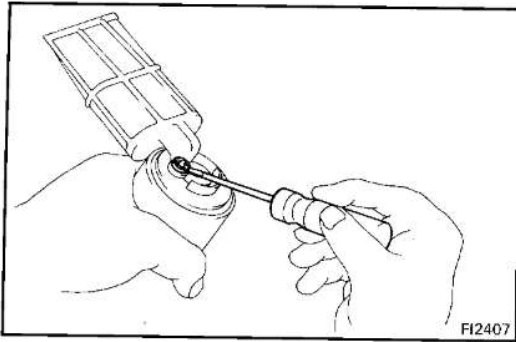
1. **DISCONNECT CABLE FROM NEGATIVE TERMINAL OF BATTERY**
2. **DRAIN FUEL FROM FUEL TANK**
CAUTION: Do not smoke or work near an open flame when working on the fuel pump.
3. **REMOVE FUEL TANK**



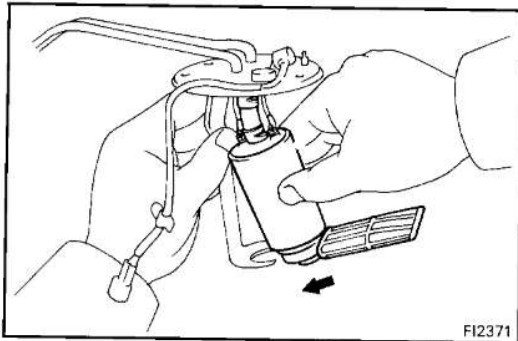
4. **REMOVE FUEL PUMP BRACKET FROM FUEL TANK**
 - (a) Remove the screw of the wire clamp.
 - (b) Remove the screws, pull out the pump bracket.



5. **REMOVE FUEL PUMP FROM FUEL PUMP BRACKET**
 - (a) Pull off the lower side of the fuel pump from the bracket.
 - (b) Remove the two nuts, and disconnect the wires from the fuel pump.
 - (c) Remove the fuel pump 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-48)

1. INSTALL FUEL PUMP FILTER TO FUEL PUMP

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

2. INSTALL FUEL PUMP TO FUEL PUMP BRACKET

- (a) Connect the fuel hose to the outlet port of the fuel pump.
- (b) Connect the wires to the fuel pump with the two nuts.
- (c) Push the lower side of the fuel pump, and install the fuel pump.

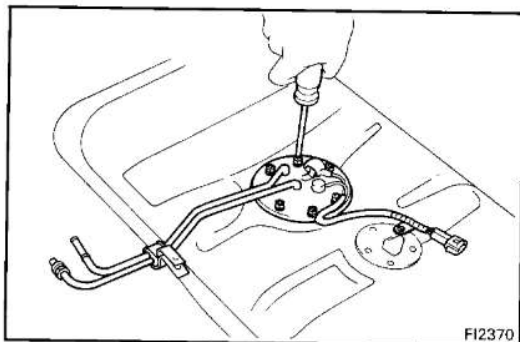
3. INSTALL FUEL PUMP BRACKET TO FUEL TANK

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

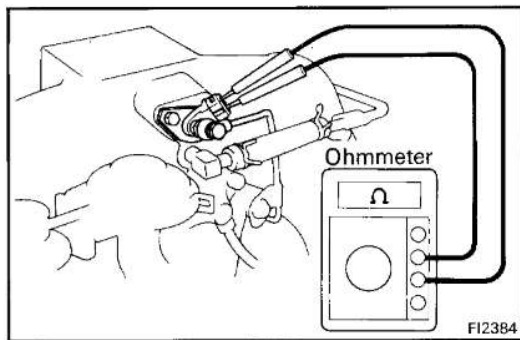
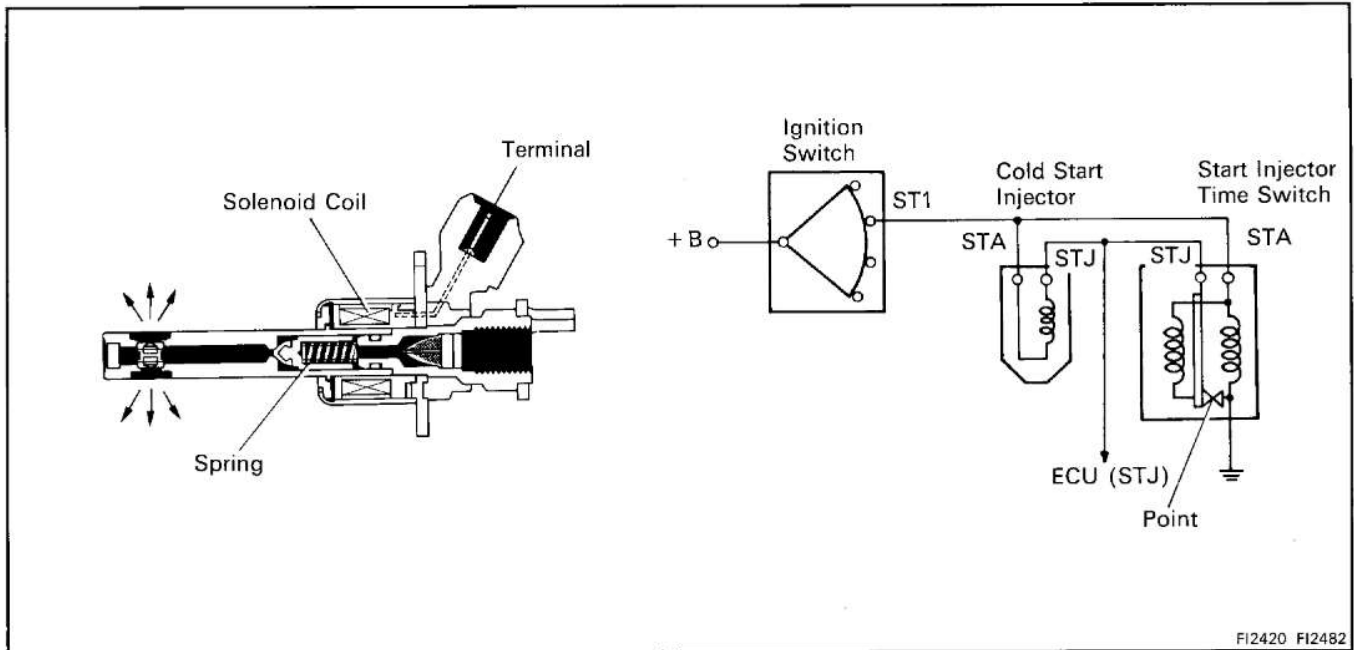
Torque: 35 kg-cm (30 in.-lb, 3.4 N·m)

- (b) Connect the wire clamp with the screw.

Torque: 20 kg-cm (17 in.-lb, 2.0 N·m)

4. INSTALL FUEL TANK**5. CONNECT CABLE TO NEGATIVE TERMINAL OF BATTERY**

Cold Start Injector



ON-VEHICLE INSPECTION

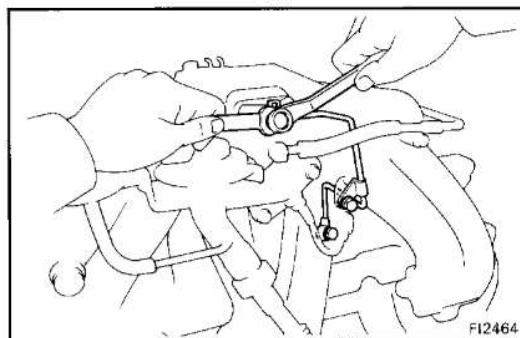
INSPECT RESISTANCE OF COLD START INJECTOR

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

Resistance: 2 – 4 Ω

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

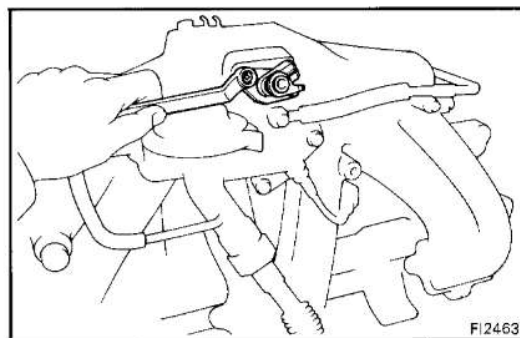
- Reconnect the cold start injector connector.



REMOVAL OF COLD START INJECTOR

- DISCONNECT CABLE FROM NEGATIVE TERMINAL OF BATTERY**
- DISCONNECT COLD START INJECTOR CONNECTOR**
- REMOVE COLD START INJECTOR PIPE**
 - Put a suitable container or shop towel under the injector pipe.
 - Remove the two union bolts, four gaskets, pipe clamp bolt and injector pipe.

HINT: Slowly loosen the union bolts.
- REMOVE COLD START INJECTOR**
Remove the two bolts, cold start injector and gasket.



INSPECTION OF COLD START INJECTOR

1. INSPECT INJECTION OF COLD START INJECTOR

CAUTION: 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 (09268-41080)

- (b) Connect SST (hose) to the unions.

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.

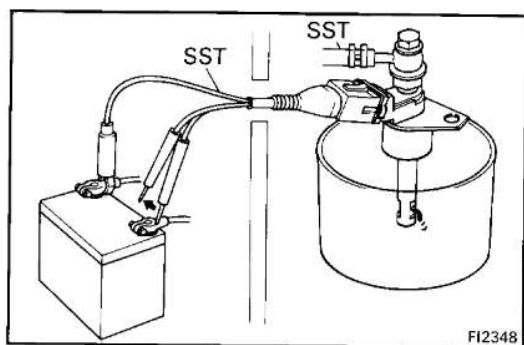
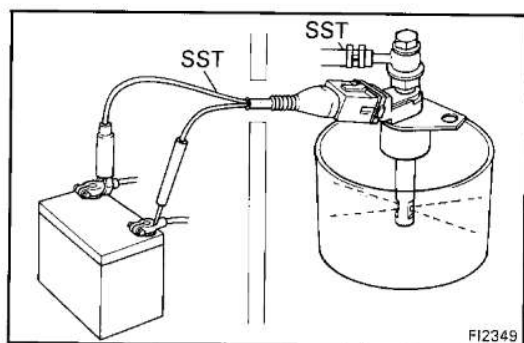
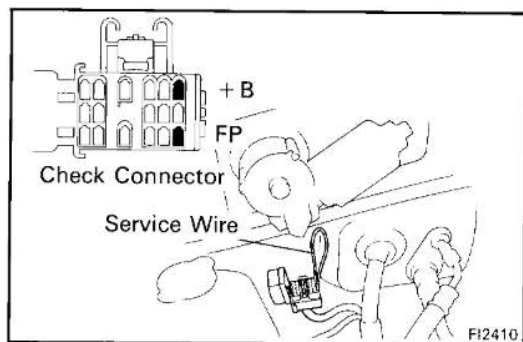
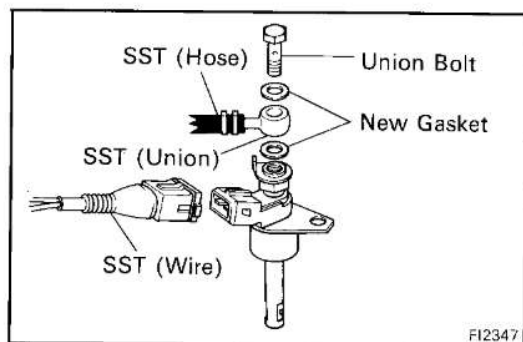
HINT: Do not start the engine.

- (g) Using a service wire, connect 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

NOTICE: Perform this check 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.

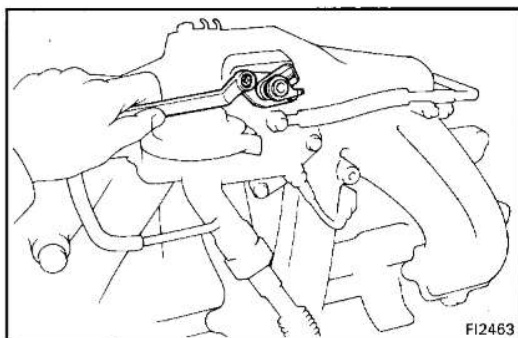
SST 09268-30050

Fuel drop: One drop or less per minute

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

- (c) Remove SST and the service wire.

SST 09268-41045 (09268-41080) and 09842-30050

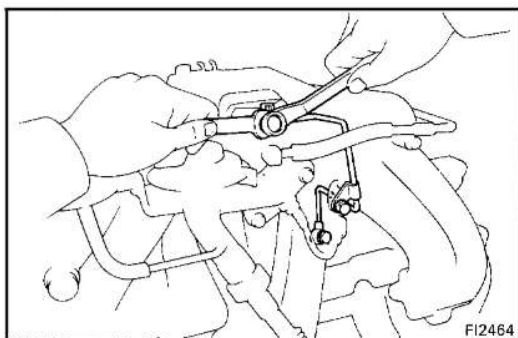


INSTALLATION OF COLD START INJECTOR

1. INSTALL COLD START INJECTOR

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

Torque: 50 kg-cm (43 in.-lb, 4.9 N·m)



2. INSTALL COLD START INJECTOR PIPE

Install the cold injector pipe with new four gaskets, the two union bolts and pipe clamp bolt.

Torque:

Union bolt 180 kg-cm (13 ft-lb, 18 N·m)

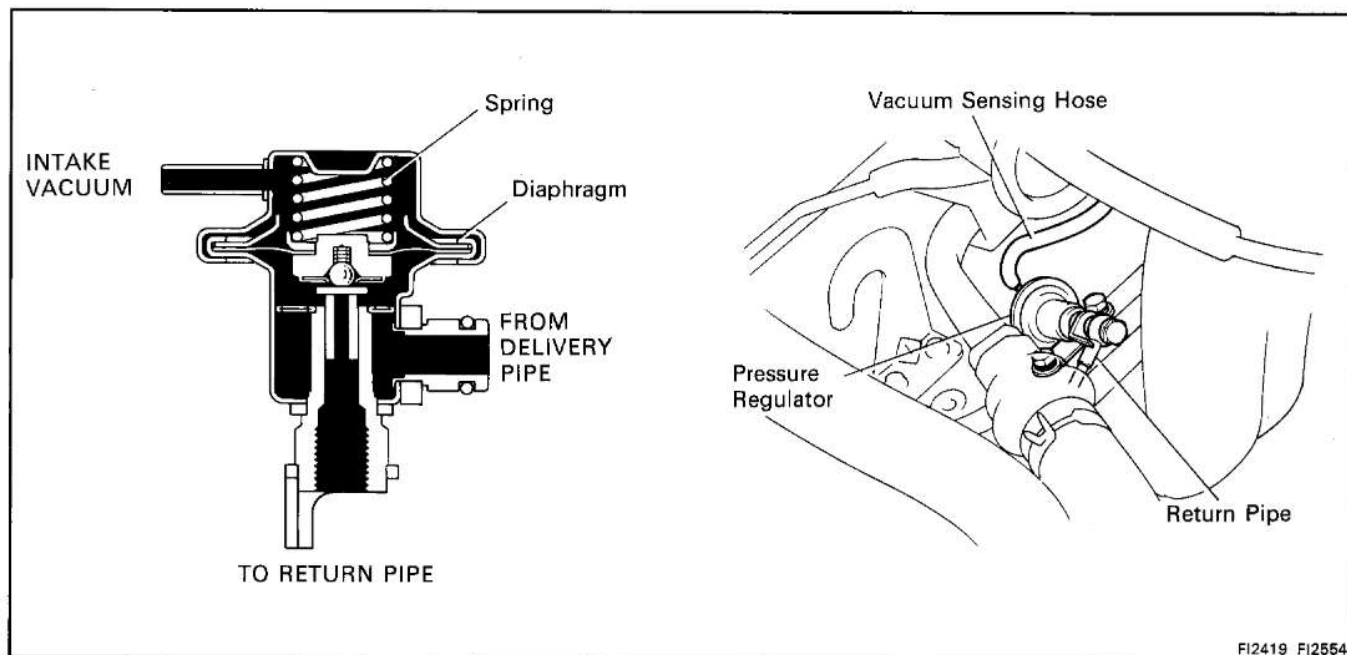
Clamp bolt 120 kg-cm (9 ft-lb, 12 N·m)

3. CONNECT COLD START INJECTOR CONNECTOR

4. CONNECT CABLE TO NEGATIVE TERMINAL OF BATTERY

5. CHECK FOR FUEL LEAKAGE (See page FI-8)

Fuel Pressure Regulator

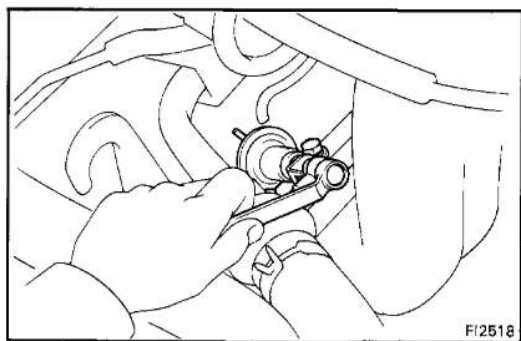


ON-VEHICLE INSPECTION

INSPECT FUEL PRESSURE (See page FI-45)

REMOVAL OF FUEL PRESSURE REGULATOR

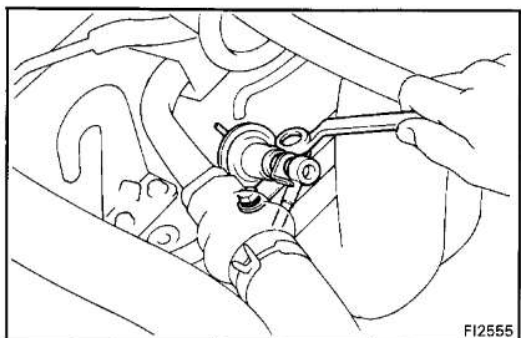
1. DISCONNECT VACUUM SENSING HOSE.



2. DISCONNECT FUEL RETURN PIPE

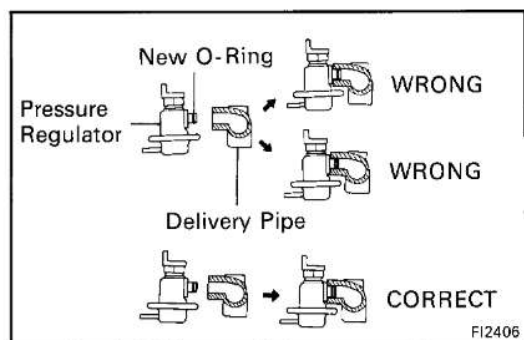
- (a) Put a suitable container or shop towel under the pressure regulator.
- (b) Remove the union bolt and two gaskets, and disconnect the return pipe.

HINT: Slowly loosen the union bolt.



3. REMOVE FUEL PRESSURE REGULATOR

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



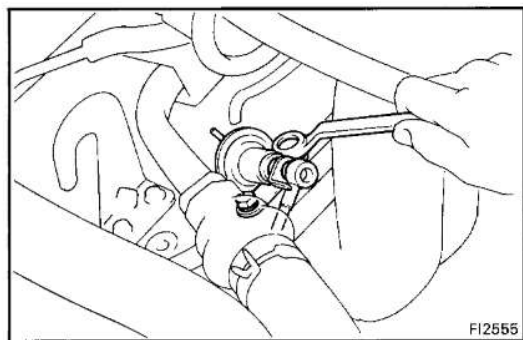
INSTALLATION OF FUEL PRESSURE REGULATOR

1. INSTALL FUEL PRESSURE REGULATOR

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

- (b) Install the pressure regulator with the two bolts.

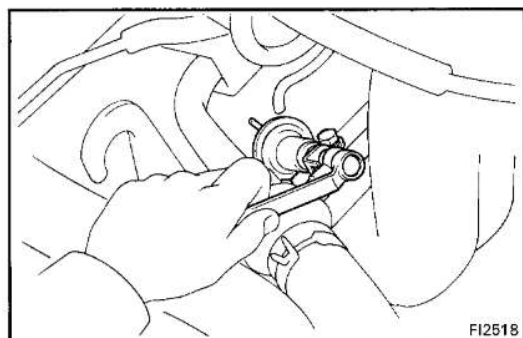
Torque: 50 kg-cm (43 in.-lb, 4.9 N·m)



2. CONNECT FUEL RETURN PIPE

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

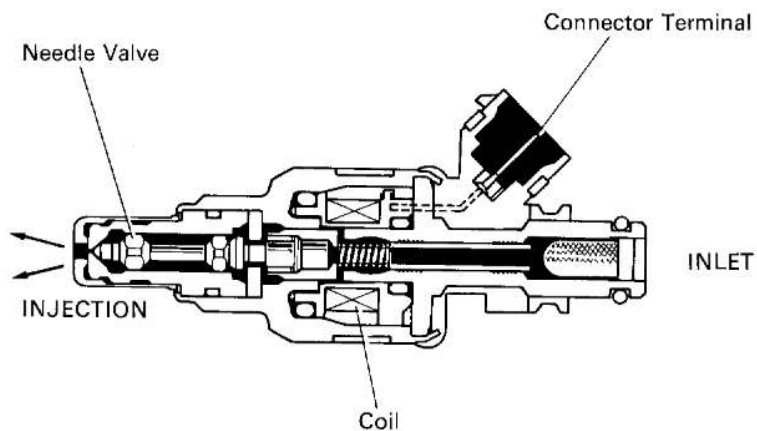
Torque: 180 kg-cm (13 ft-lb, 18 N·m)



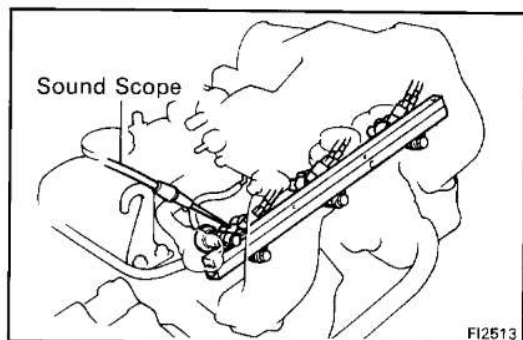
3. CONNECT VACUUM SENSING HOSE

4. CHECK FOR FUEL LEAKAGE (See page FI-8)

Injectors



FI2478



ON-VEHICLE INSPECTION

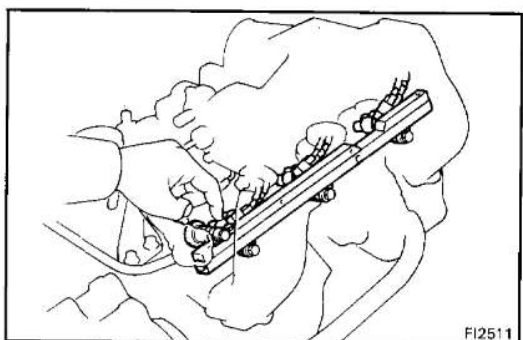
1. INSPECT INJECTOR OPERATION

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 or injection signal from ECU.



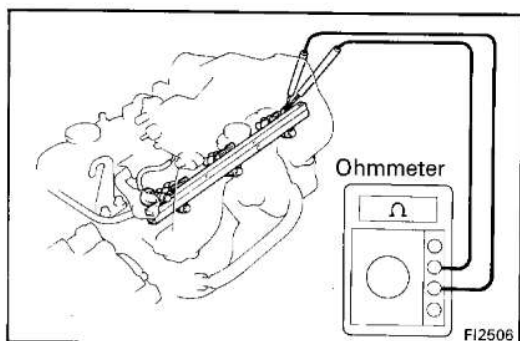
2. INSPECT INJECTOR RESISTANCE

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

Resistance: Approx. 13.8 Ω

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

- (c) Reconnect the injector connector.



REMOVAL OF INJECTOR

1. DISCONNECT CABLE FROM NEGATIVE TERMINAL OF BATTERY
2. DISCONNECT ACCELERATOR AND THROTTLE CABLES
3. REMOVE AIR INTAKE HOSE
4. DISCONNECT FOLLOWING HOSES:

(a) Emission control hoses

HINT: Before disconnecting the emission control hoses, use tags to identify how they should be reconnected.

(b) Air hose from AI check valve

(c) Vacuum sensing hose

(d) PCV hose

(e) Vacuum hose for transfer

(f) Brake booster hose

5. DISCONNECT FOLLOWING CONNECTORS AND WIRE:

(a) ISC valve connector

(b) Throttle position sensor connector

(c) Oxygen sensor connector

(d) Manifold temperature sensor connector

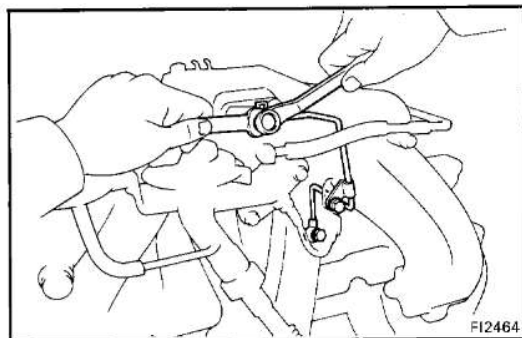
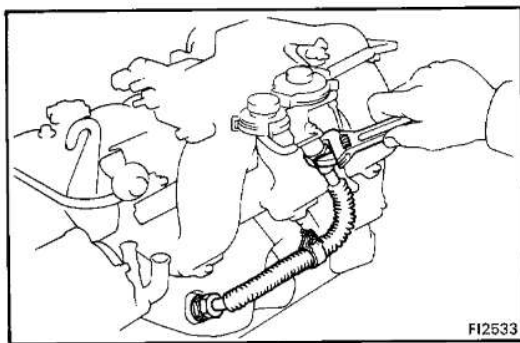
(e) Cold start injector connector

(f) EGR gas sensor connector

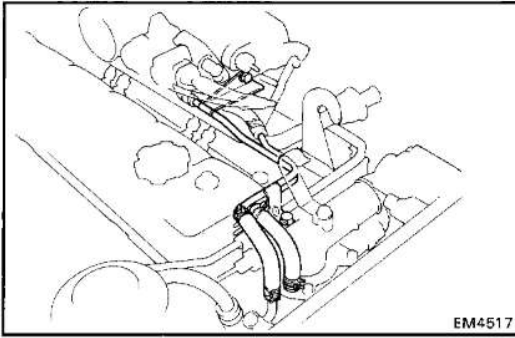
(g) Ground strap

6. REMOVE AIR INTAKE CHAMBER

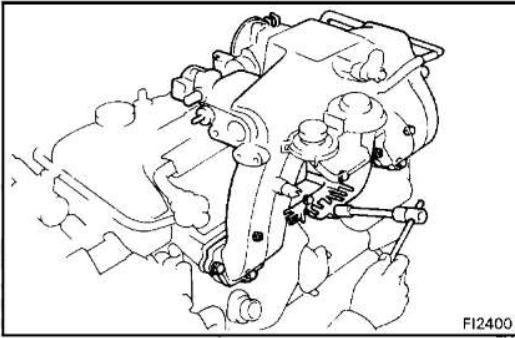
(a) Loosen the two union nuts, and remove the two clamp bolts and EGR pipe.



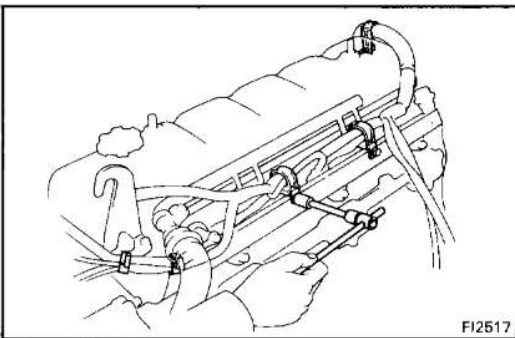
(b) Remove the two union bolts, four gaskets, clamp bolt and cold start injector pipe.



- (c) Disconnect the water hoses and remove the two bolts and water by-pass pipe.
- (d) Remove the four bolts and two intake chamber stays.

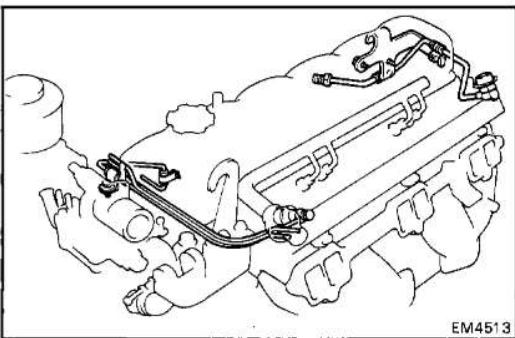


- (e) Remove the seven bolts, two nuts and air intake chamber.
- (f) Remove the bolt, manifold temperature sensor with stay and air intake chamber gasket.



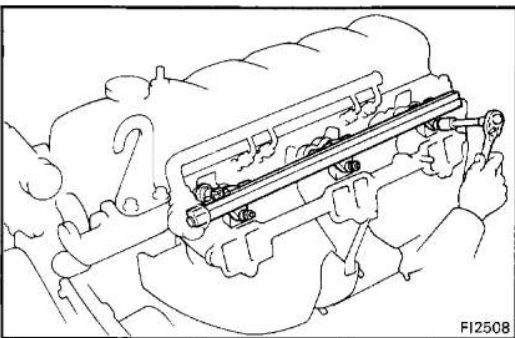
7. DISCONNECT ENGINE WIRE HARNESS ON INTAKE MANIFOLD

- (a) Disconnect the following connectors:
 - (1) Cold start injector time switch connector
 - (2) Water temperature sensor connector
 - (3) Water temperature sender gauge connector
 - (4) Water temperature switch
 - (5) Six injector connectors
- (b) Remove the two clamps and three clamp bolts, and disconnect the engine wire harness.



8. REMOVE NO.1 FUEL PIPE AND NO.2 FUEL PIPE WITH ENGINE HANGER

- (a) Disconnect the fuel and vacuum hoses.
- (b) Remove the pulsation damper and two gaskets.
- (c) Remove the two bolts and No.2 fuel pipe with engine hanger.
- (d) Remove the union bolt and two gaskets from the pressure regulator.
- (e) Remove the two bolts and No.1 fuel pipe.

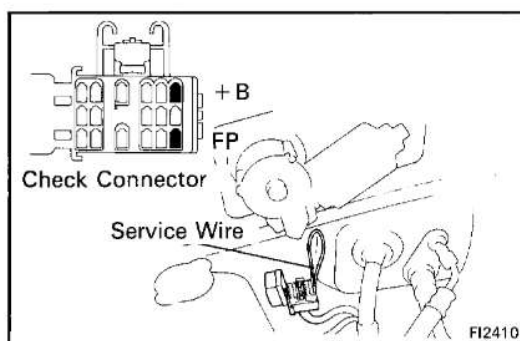
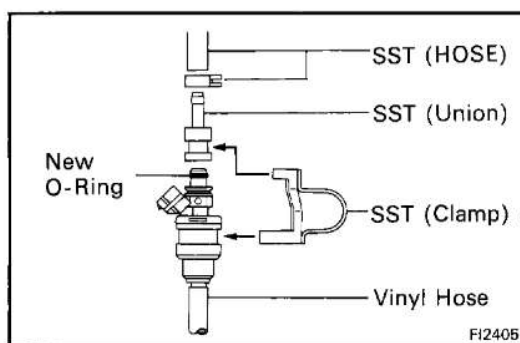
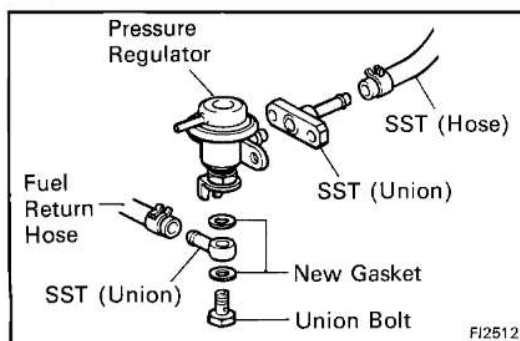
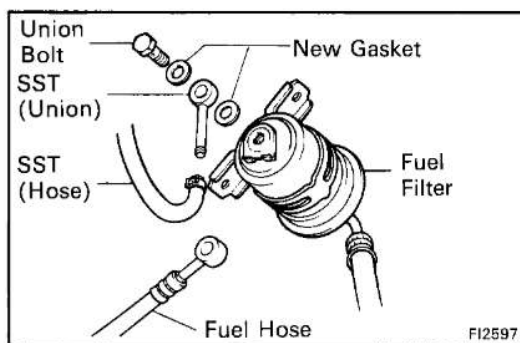
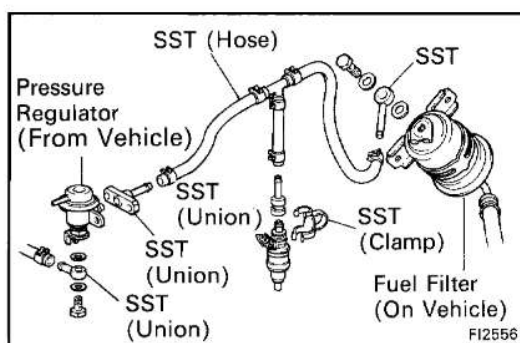


9. REMOVE DELIVERY PIPE AND INJECTORS

- (a) Remove the three nuts, plate washers, spacers and delivery pipe together with the six injectors.

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

- (b) Remove the six insulators, six spacers and three collars from the intake manifold.
- (c) Pull out the six injectors from the delivery pipe.



INSPECTION OF INJECTORS

1. INSPECT INJECTOR INJECTION

CAUTION: 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 (90405-09015)

NOTE: Use the vehicle's fuel filter.

- (c) Remove the pressure regulator. (See page FI-53)
- (d) Connect the fuel return hose and SST (hose) to the pressure regulator with SST (unions), new gaskets and union bolt.

SST 09268-41045 (09268-41080, 09268-41090)

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

SST 09268-41045

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

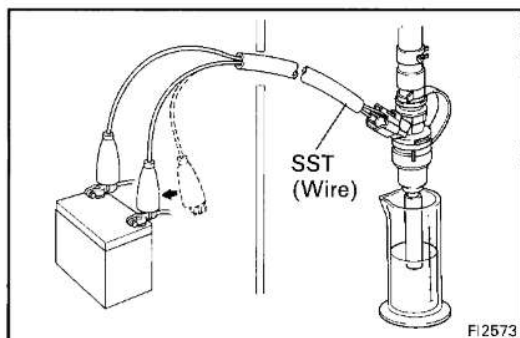
HINT: Install a suitable vinyl hose onto the injector to prevent gasoline from splashing out.

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

- (h) Turn the ignition switch ON.

HINT: Do not start the engine.

- (i) Using a service wire, connect 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.

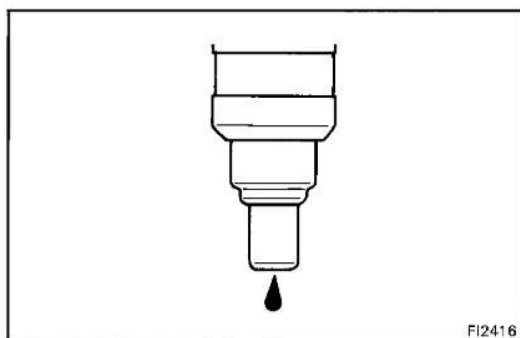
SST 09842-30070

Volume: 47 – 59 cc (2.9 – 3.6 cu in.) per 15 sec.

Difference between each injector:

5 cc (0.3 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.

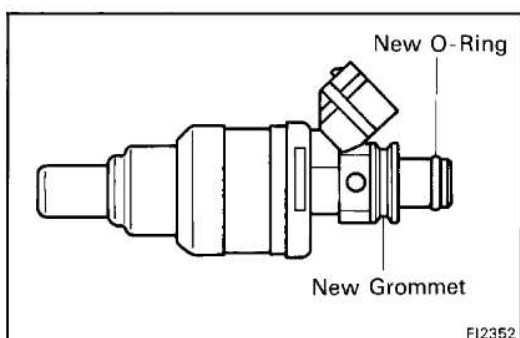
SST 09842-30070

Fuel drop: One drop or less per minute.

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

- (c) Remove SST and the service wire.

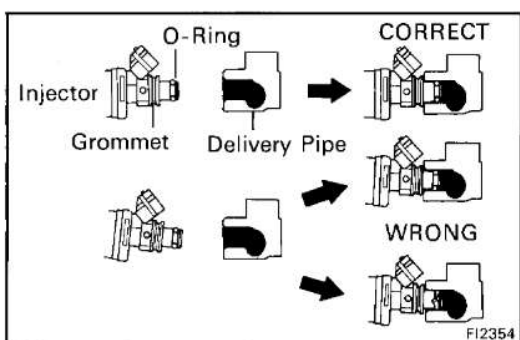
SST 09268-41045



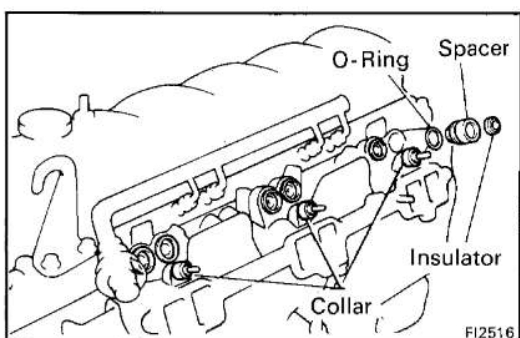
INSTALLATION OF INJECTORS

1. INSTALL INJECTORS AND DELIVERY PIPE

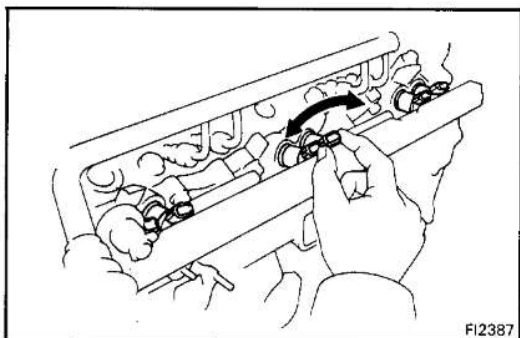
- (a) Install a new grommet to the injector.
- (b) Apply a light coat of gasoline to a new O-ring and install it to the injector.



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



- (d) Install a new O-ring to the insulator.
- (e) Place the six insulators, six spacers and three collars in position on the intake manifold.

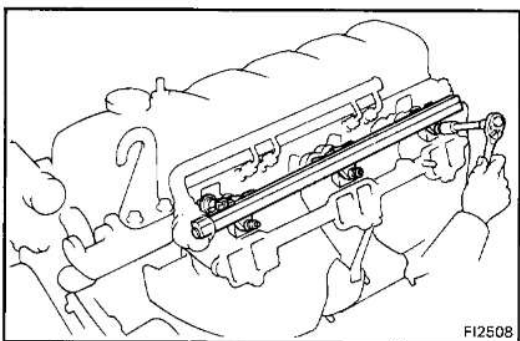


FI2387

(f) Place the injectors together with the delivery pipe in position on the intake manifold.

(g) Check that the injectors rotate smoothly.

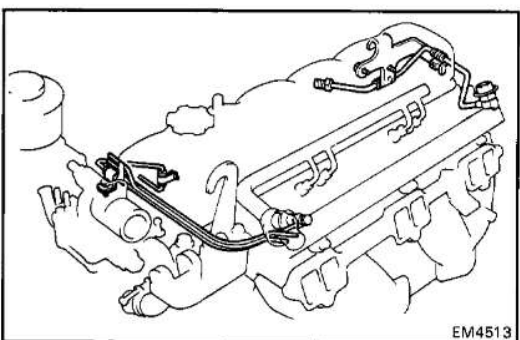
HINT: If injectors do not rotate smoothly, the probable cause is incorrect installation of O-rings. Replace the O-rings.



FI2508

(h) Install the three spacers, plate washers and nuts. Torque the nuts.

Torque: 120 kg-cm (9 ft-lb, 12 N·m)



EM4513

2. INSTALL NO.1 FUEL PIPE AND NO.2 FUEL PIPE WITH ENGINE HANGER

(a) Install the No.1 fuel pipe with the two bolts.

(b) Install the union bolt and new two gaskets to the pressure regulator.

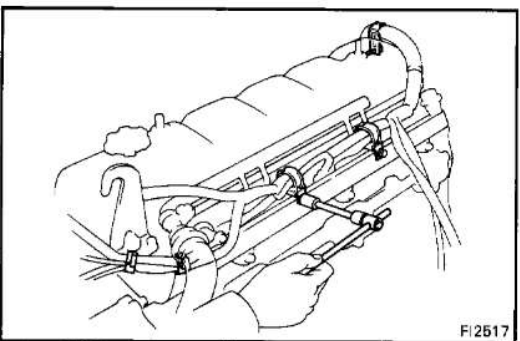
Torque: 195 kg-cm (14 ft-lb, 19 N·m)

(c) Install the No.2 fuel pipe with engine hanger with the two bolts.

(d) Install the pulsation damper with the two new gasket.

Torque: 300 kg-cm (22 ft-lb, 29 N·m)

(e) Connect the two fuel hoses and vacuum hoses.



FI2517

3. CONNECT ENGINE WIRE HARNESS ON INTAKE MANIFOLD

(a) Connect the following connectors:

- (1) Cold start injector time switch connector
- (2) Water temperature sensor connector
- (3) Water temperature sender gauge connector
- (4) Water temperature switch
- (5) Six injector connectors

(b) Install the three clamp bolts and two clamp.

4. INSTALL AIR INTAKE CHAMBER

(a) Install a new gasket and air intake chamber with the seven bolts and two nuts.

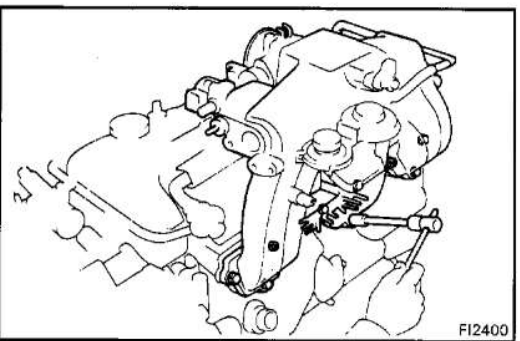
Torque: 250 kg-cm (18 ft-lb, 25 N·m)

(b) Install the manifold temperature sensor with stay with the bolt.

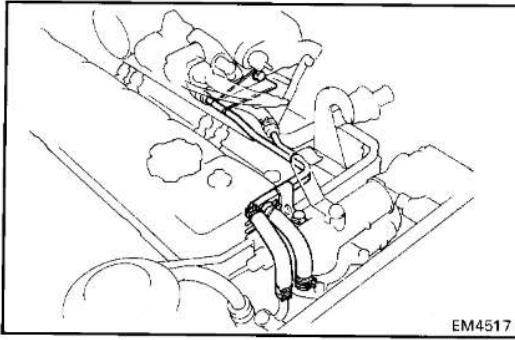
Torque: 120 kg-cm (9 ft-lb, 12 N·m)

(c) Install the two intake chamber stays with the four bolts.

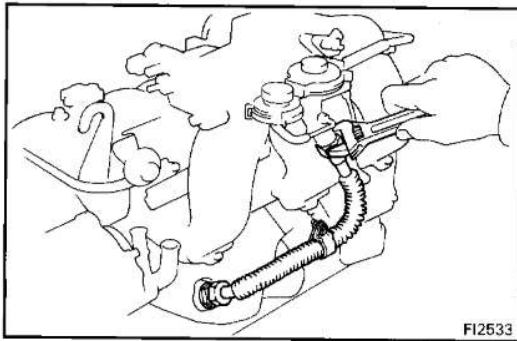
Torque: 120 kg-cm (9 ft-lb, 12 N·m)



FI2400



- (d) Install the water by-pass pipe with the two bolts and connect the water hoses.
- (e) Install the cold start injector pipe.
(See page FI-52)



- (f) Install the EGR pipe with the two union nuts.
Torque: 800 kg-cm (58 ft-lb, 78 N·m)
- (g) Install the two clamp mount bolts.

5. CONNECT FOLLOWING CONNECTORS AND WIRE:

- (a) ISC valve connector
- (b) Throttle position sensor connector
- (c) Oxygen sensor connector
- (d) Manifold temperature sensor connector
- (e) Cold start injector connector
- (f) EGR gas sensor connector
- (g) Ground strap

6. CONNECT FOLLOWING HOSES:

- (a) Emission control hoses
- (b) Air hose from AI check valve
- (c) Vacuum sensing hose
- (d) PCV hose
- (e) Vacuum hose for transfer
- (f) Brake booster hose

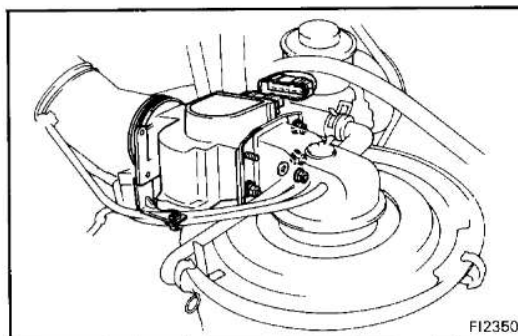
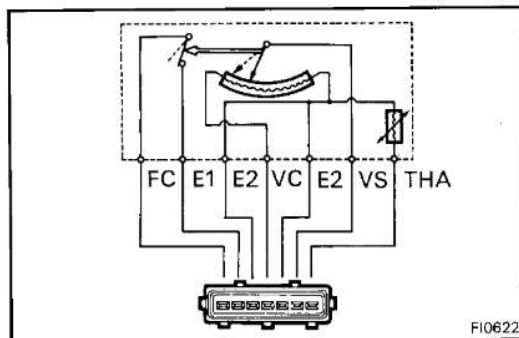
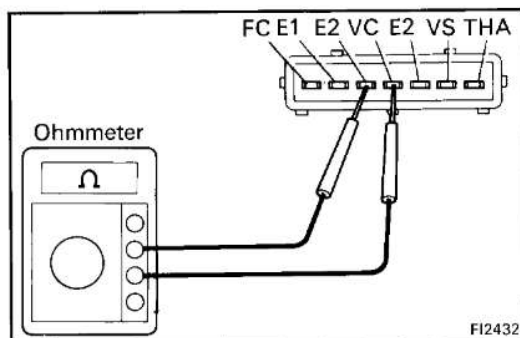
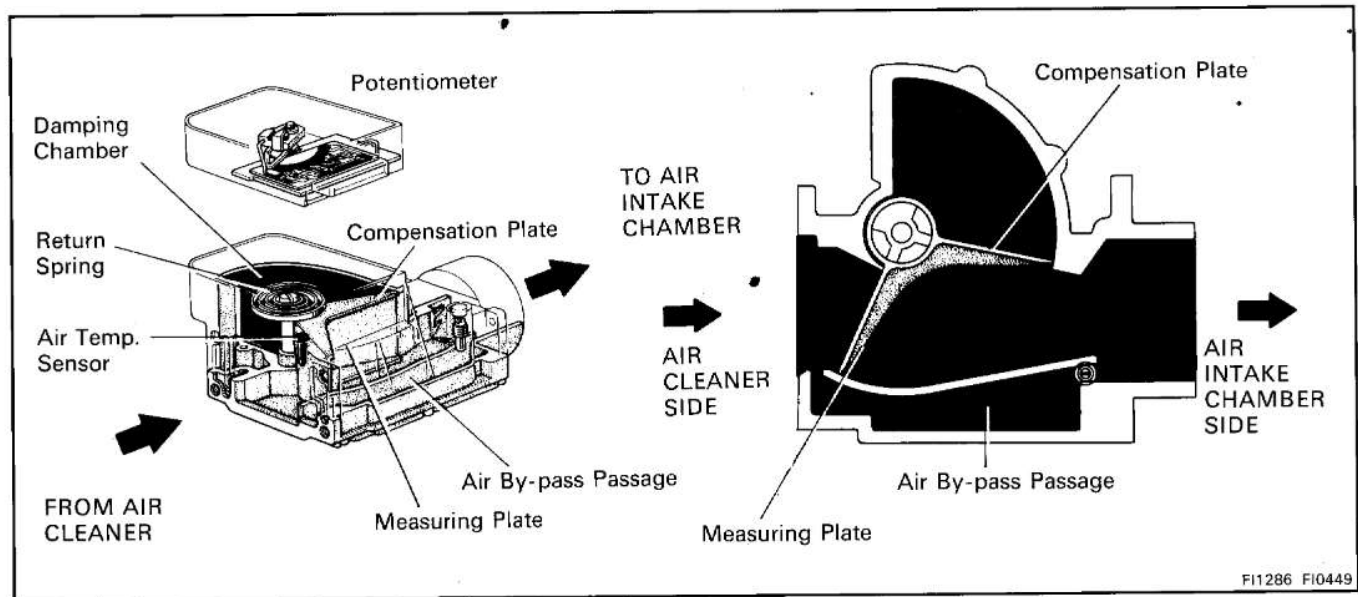
7. INSTALL AIR INTAKE HOSE

8. CONNECT ACCELERATOR AND THROTTLE CABLES, AND ADJUST THEM

9. CONNECT CABLE TO NEGATIVE TERMINAL OF BATTERY

AIR INDUCTION SYSTEM

Air Flow Meter



ON-VEHICLE INSPECTION

INSPECT RESISTANCE OF AIR FLOW METER

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

Between terminals	Resistance	Temperature
E2 – VS	200 – 600 Ω	–
E2 – VC	200 – 400 Ω	–
E2 – THA	10 – 20 k Ω	–20°C (–4°F)
	4 – 7 k Ω	0°C (32°F)
	2 – 3 k Ω	20°C (68°F)
	0.9 – 1.3 k Ω	40°C (104°F)
	0.4 – 0.7 k Ω	60°C (140°F)
E1 – FC	Infinity	–

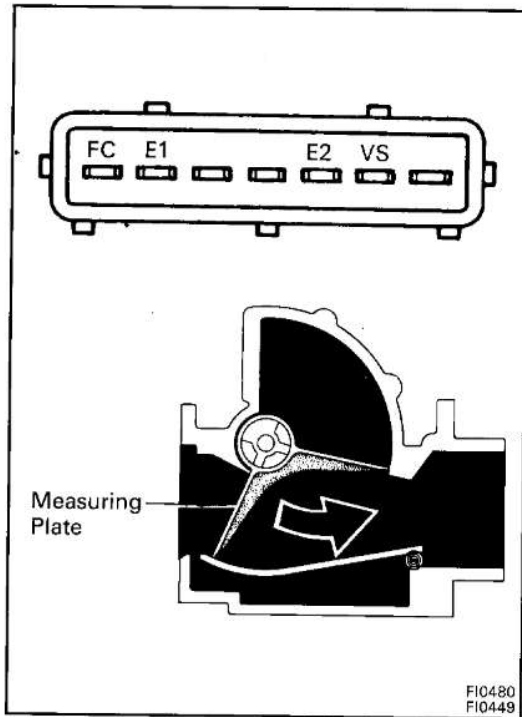
If the resistance is not as specified, replace the air flow meter.

- Reconnect the air flow meter connector.

REMOVAL OF AIR FLOW METER

- DISCONNECT AIR FLOW METER CONNECTOR
- DISCONNECT AIR CLEANER HOSE
- REMOVE AIR FLOW METER

Remove the bolt, four nuts and air flow meter.



INSPECTION OF AIR FLOW METER

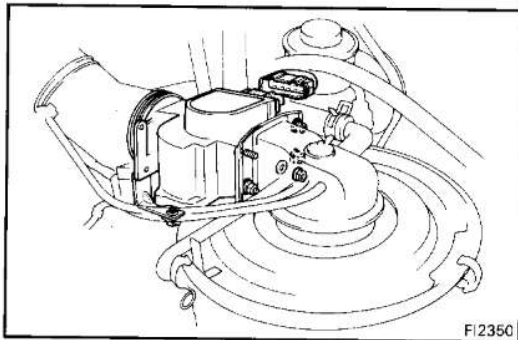
INSPECT RESISTANCE OF AIR FLOW METER

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

HINT: Resistance between terminals E2 and VS will change in a wave pattern as the measuring plate slowly opens.

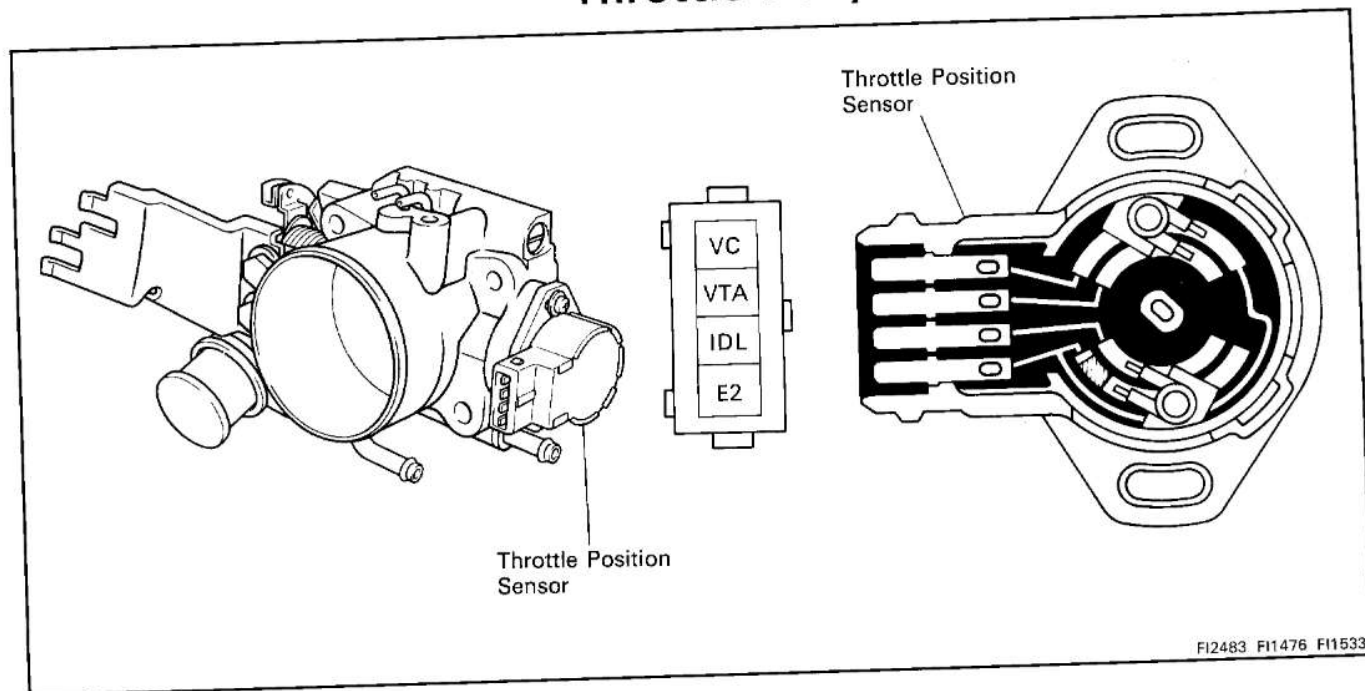
If the resistance is not as specified, replace the meter.



INSTALLATION OF AIR FLOW METER

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

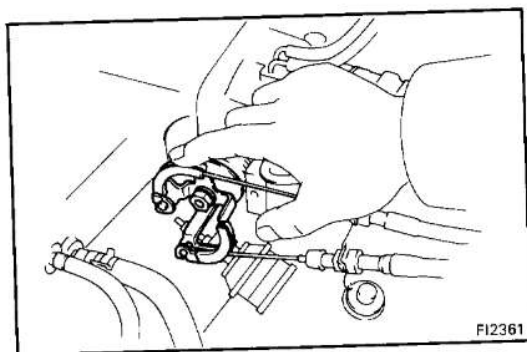
Throttle Body



ON-VEHICLE INSPECTION

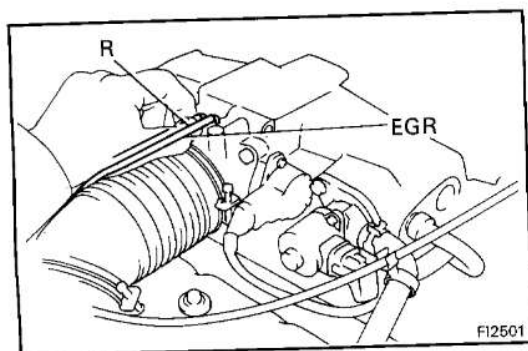
1. INSPECT THROTTLE BODY

- (a) Check that the throttle linkage moves smoothly.



- (b) Check the vacuum at each port.

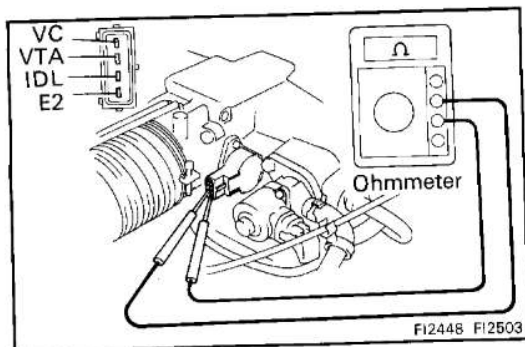
- Start the engine.
- Check the vacuum with your finger.

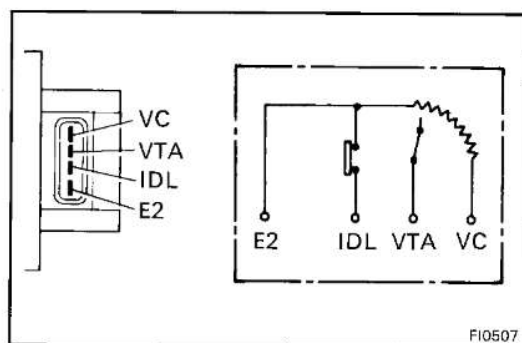


Port No.	At idling	Other than idling
EGR	No vacuum	Vacuum
R	No vacuum	Vacuum

2. INSPECT THROTTLE POSITION SENSOR

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





FI0507

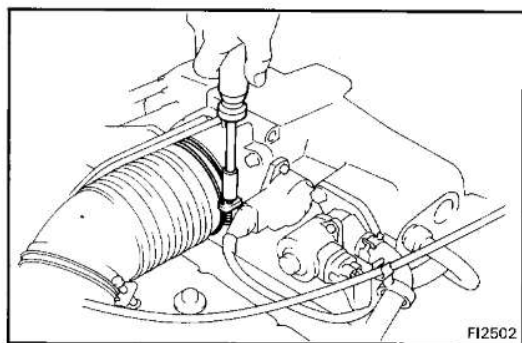
Clearance between lever and stop screw	Between terminals	Resistance
0 mm (0 in.)	VTA – E2	0.3 – 6.3 kΩ
0.77 mm (0.0303 in.)	IDL – E2	Less than 2.3 kΩ
1.09 mm (0.0429 in.)	IDL – E2	Infinity
Throttle valve fully opened position	VTA – E2	3.5 – 10.3 kΩ
—	VC – E2	4.25 – 8.25 kΩ

(d) Reconnect the sensor connector.

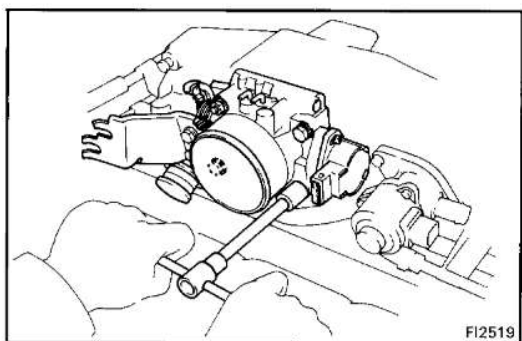
REMOVAL OF THROTTLE BODY

1. DRAIN ENGINE COOLANT
2. DISCONNECT ACCELERATOR AND THROTTLE CABLES
3. DISCONNECT AIR CLEANER HOSE
4. DISCONNECT THROTTLE POSITION SENSOR CONNECTOR
5. DISCONNECT WATER HOSES
6. DISCONNECT VACUUM HOSES
7. REMOVE THROTTLE BODY

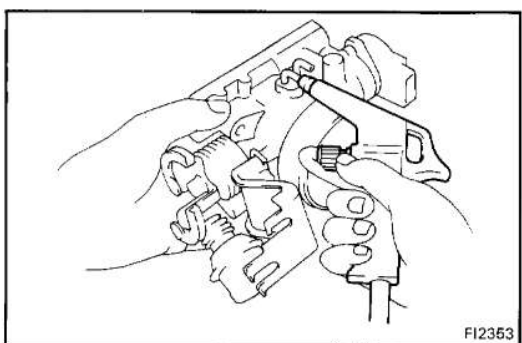
Remove the three bolts, nut, throttle body and gasket.



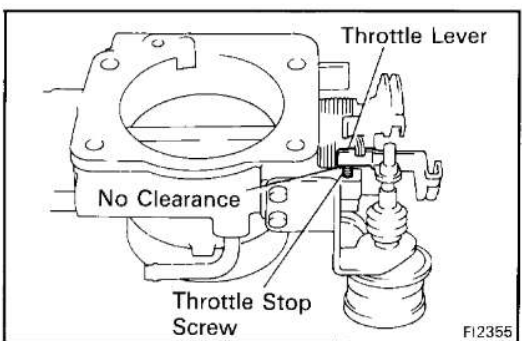
FI2502



FI2519



FI2353



FI2355

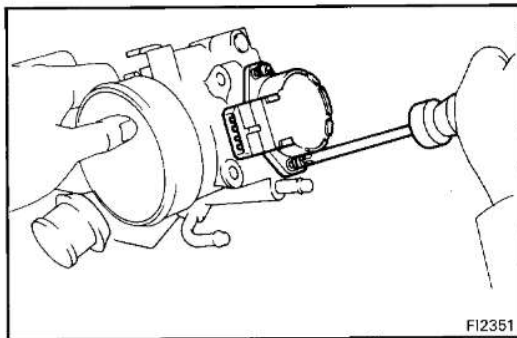
INSPECTION OF THROTTLE BODY

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.

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

2. INSPECT THROTTLE VALVE

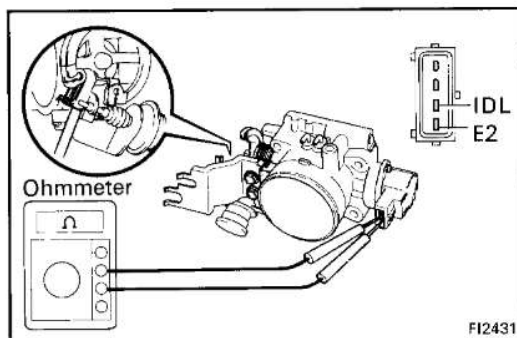
Check that there is no clearance between the throttle stop screw and throttle lever when the throttle valve is fully closed.



3. INSPECT THROTTLE POSITION SENSOR (See step 2 on page FI-64)

4. IF NECESSARY, ADJUST THROTTLE POSITION SENSOR

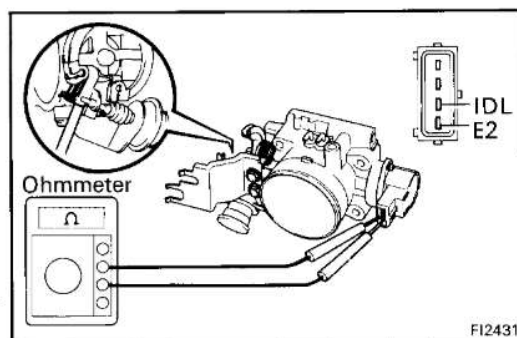
(a) Loosen the two set screws of the sensor.



(b) Insert a 0.93 mm (0.0366 in.) thickness gauge, between the throttle stop screw and stop lever.

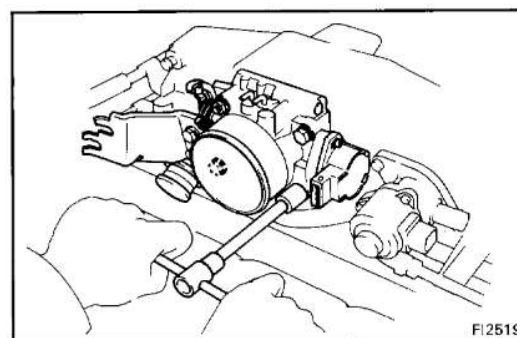
(c) Connect the test probe of an ohmmeter to the terminals IDL and E2 of the sensor.

(d) Gradually turn the sensor clockwise until the ohmmeter deflects, and secure it with the two screws.



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

Clearance between lever and stop screw	Continuity (IDL — E2)
0.77 mm (0.0303 in.)	Continuity
1.09 mm (0.0429 in.)	No continuity



INSTALLATION OF THROTTLE BODY

1. INSTALL THROTTLE BODY

Install a new gasket and the throttle body with the three bolts and nut.

Torque: 120 kg-cm (9 ft-lb, 12 N·m)

2. CONNECT WATER HOSES

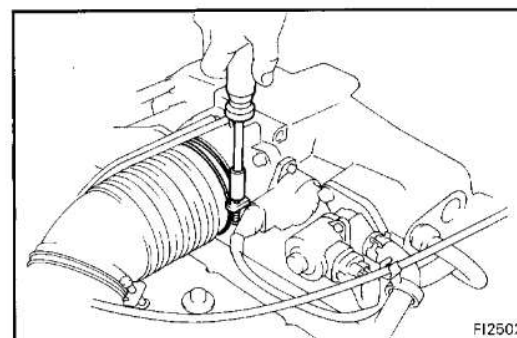
3. CONNECT VACUUM HOSES

4. CONNECT THROTTLE POSITION SENSOR CONNECTOR

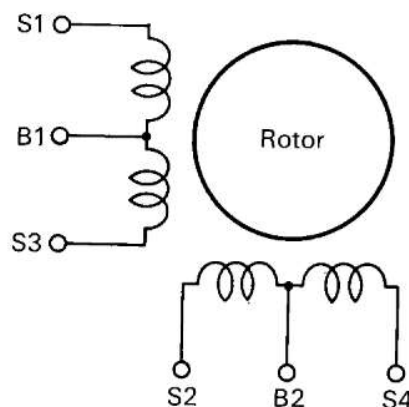
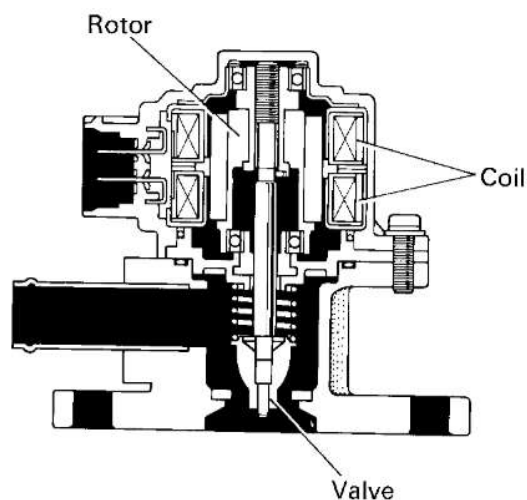
5. CONNECT AIR CLEANER HOSE

6. CONNECT ACCELERATOR AND THROTTLE CABLES, AND ADJUST THEM

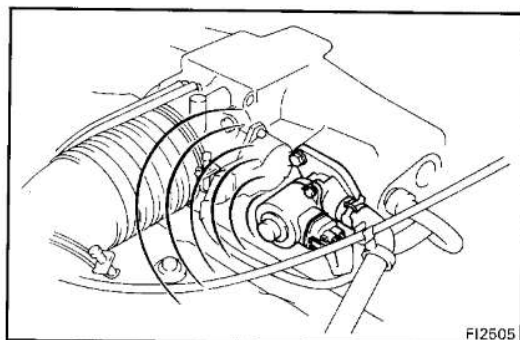
7. FILL WITH ENGINE COOLANT



Idle Speed Control (ISC) Valve



FI2372 FI1692



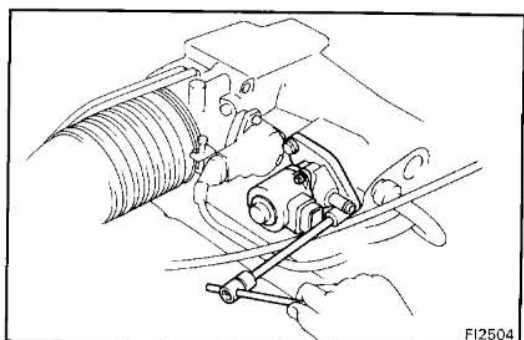
ON-VEHICLE INSPECTION

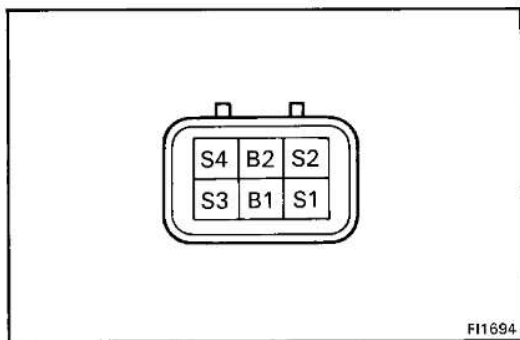
CHECK FOR OPERATING SOUND FROM ISC VALVE

Check that there is a clicking sound immediately after stopping the engine.

REMOVAL OF ISC VALVE

1. DRAIN ENGINE COOLANT
2. DISCONNECT ISC VALVE CONNECTOR
3. DISCONNECT AIR AND TWO WATER BY-PASS HOSES
4. REMOVE ISC VALVE
Remove the two bolts, ISC valve and gasket.





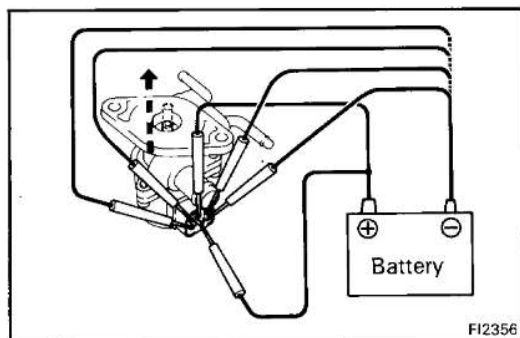
INSPECTION OF ISC VALVE

1. INSPECT ISC VALVE RESISTANCE

Using an ohmmeter, measure the resistance between terminal B1 – S1 or S3, and B2 – S2 or S4.

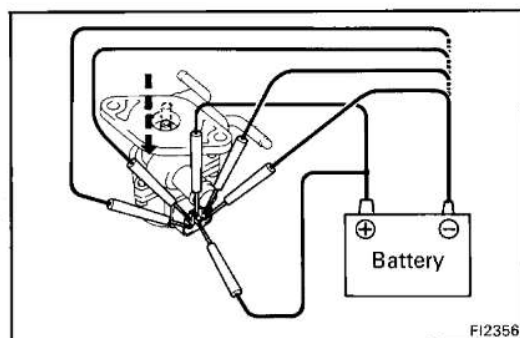
Resistance: B1 – S1 or S3 10 – 30 Ω
B2 – S2 or S4 10 – 30 Ω

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



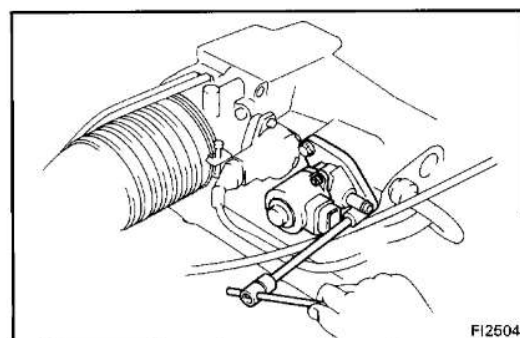
2. INSPECT ISC VALVE OPERATION

- (a) Apply battery voltage to terminals B1 and B2, and while repeatedly grounding S1 – S2 – S3 – S4 – S1 in sequence, check that the valve moves toward the closed position.



- (b) Apply battery voltage to terminals B1 and B2, and while repeatedly grounding S4 – S3 – S2 – S1 – S4 in sequence, check that the valve moves toward the opened position.

If operation is not as specified, replace the ISC valve.



INSTALLATION OF ISC VALVE

1. INSTALL ISC VALVE

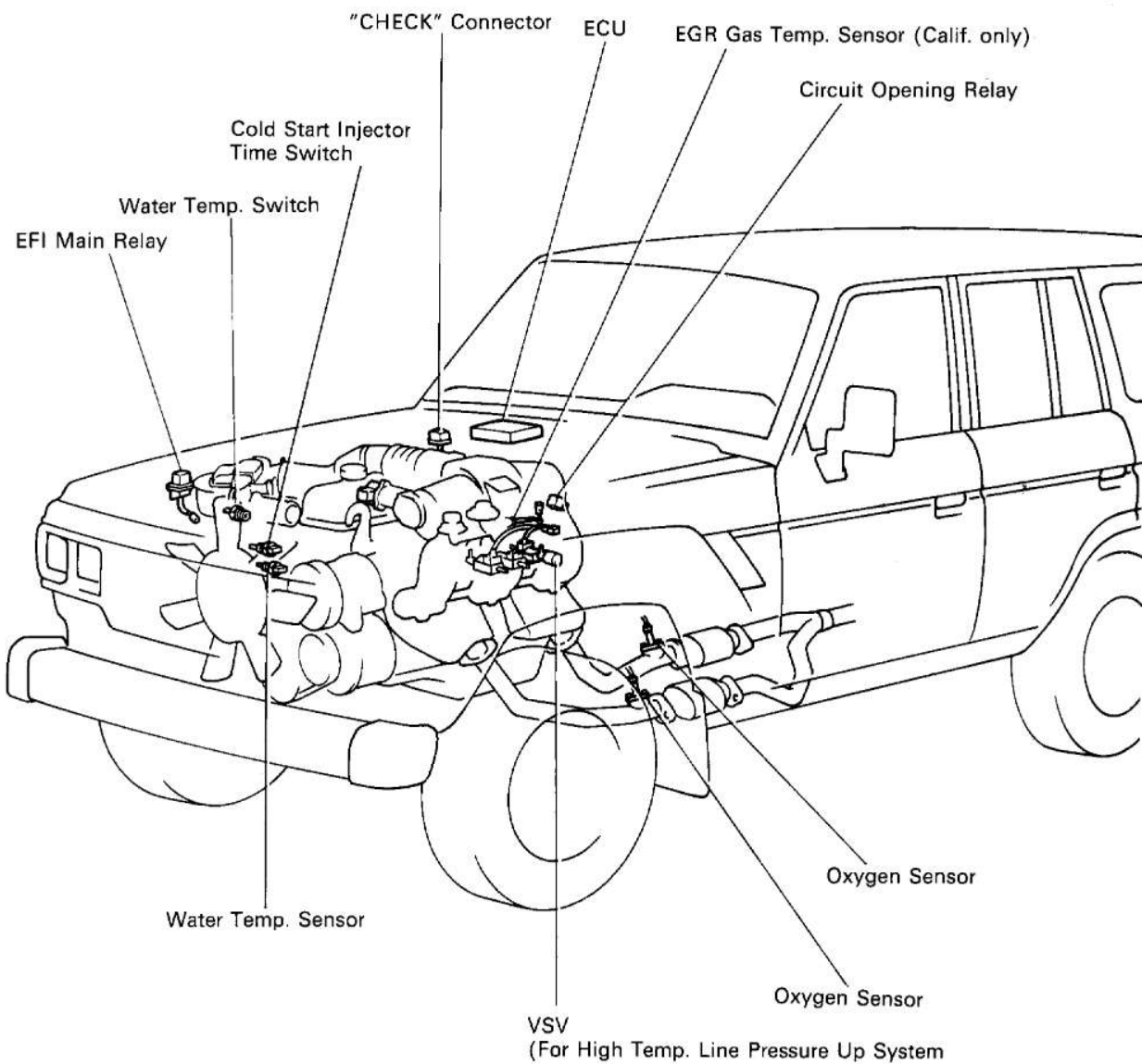
Install a new gasket and ISC valve with the two bolts.

Torque: 120 kg-cm (9 ft-lb, 12 N·m)

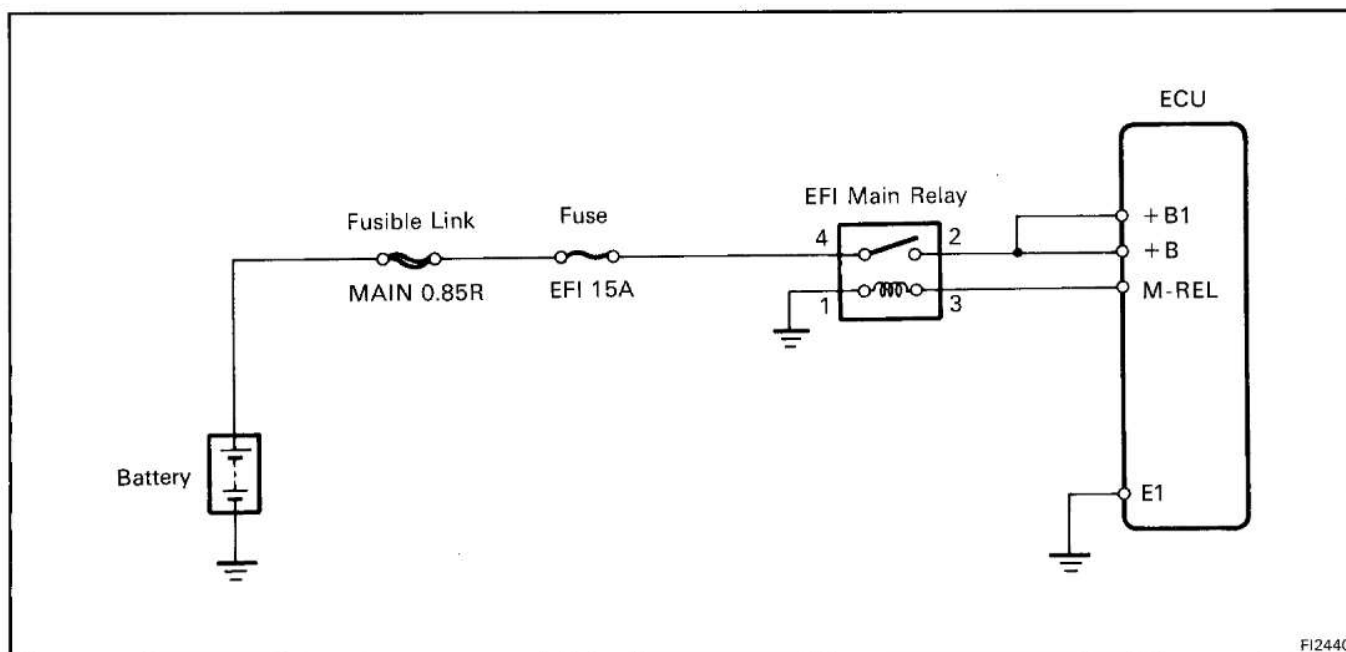
2. CONNECT TWO WATER BY-PASS AND AIR HOSES

3. CONNECT ISC VALVE CONNECTOR

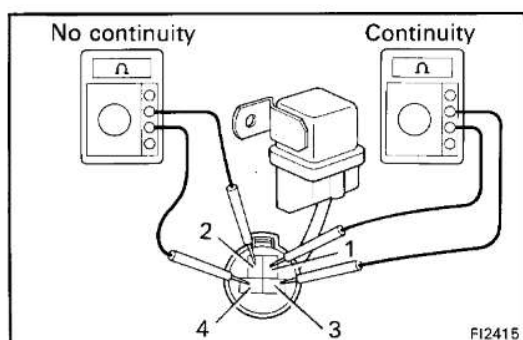
4. FILL WITH ENGINE COOLANT

ELECTRONIC CONTROL SYSTEM**Location of Electronic Control Parts**

EFI Main Relay



FI2440



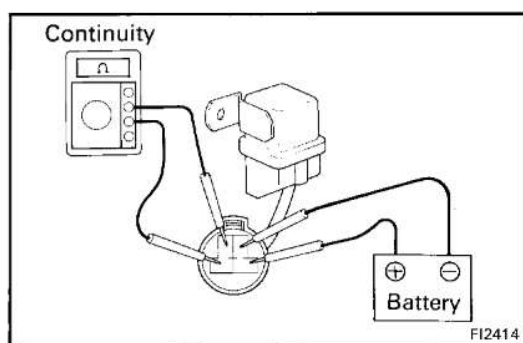
FI2415

INSPECTION OF EFI MAIN RELAY

1. INSPECT RELAY CONTINUITY

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

If continuity is not as specified, replace the relay.



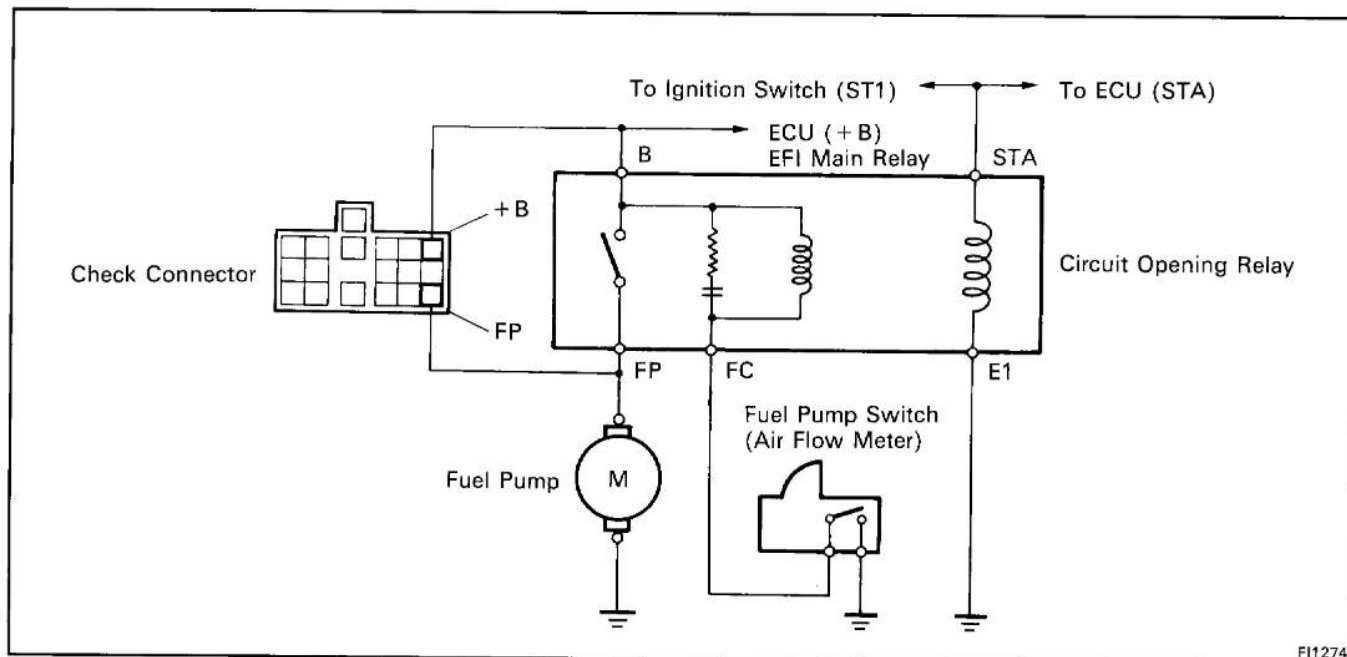
FI2414

2. INSPECT RELAY OPERATION

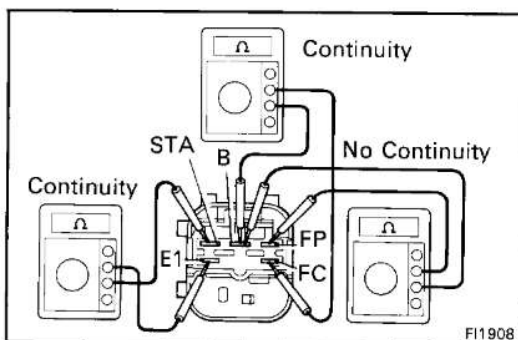
- Apply battery voltage across terminals 1 and 3.
- Using an ohmmeter, check that there is continuity between terminals 2 and 4.

If operation is not as specified, replace the relay.

Circuit Opening Relay



FI1274



FI1908

INSPECTION OF CIRCUIT OPENING RELAY

1. INSPECT RELAY CONTINUITY

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

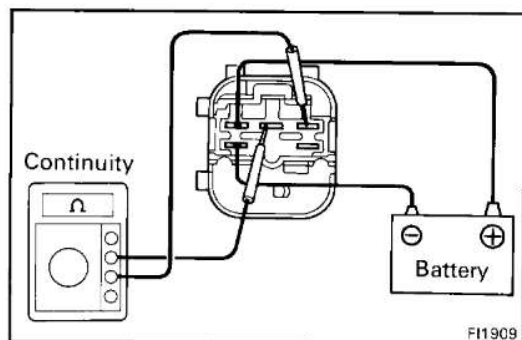
If continuity is not as specified, replace the relay.

2. INSPECT RELAY OPERATION

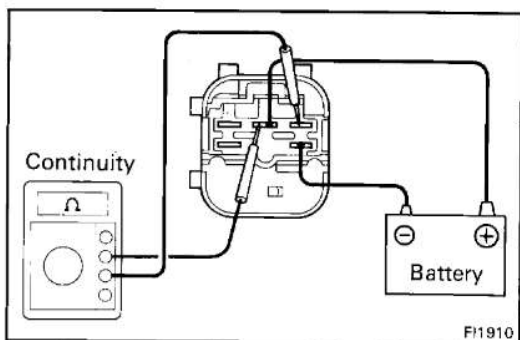
- Apply battery voltage across terminals STA and E1.
- Using an ohmmeter, check that there is continuity between terminals B and FP.

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

If operation is not as specified, replace the relay.

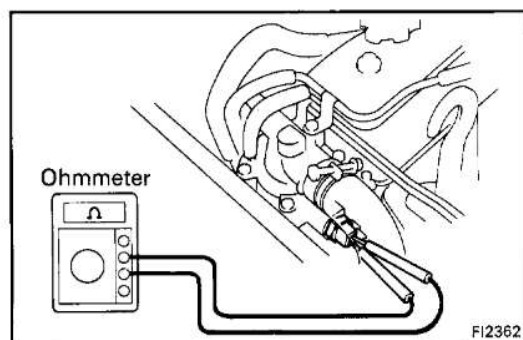
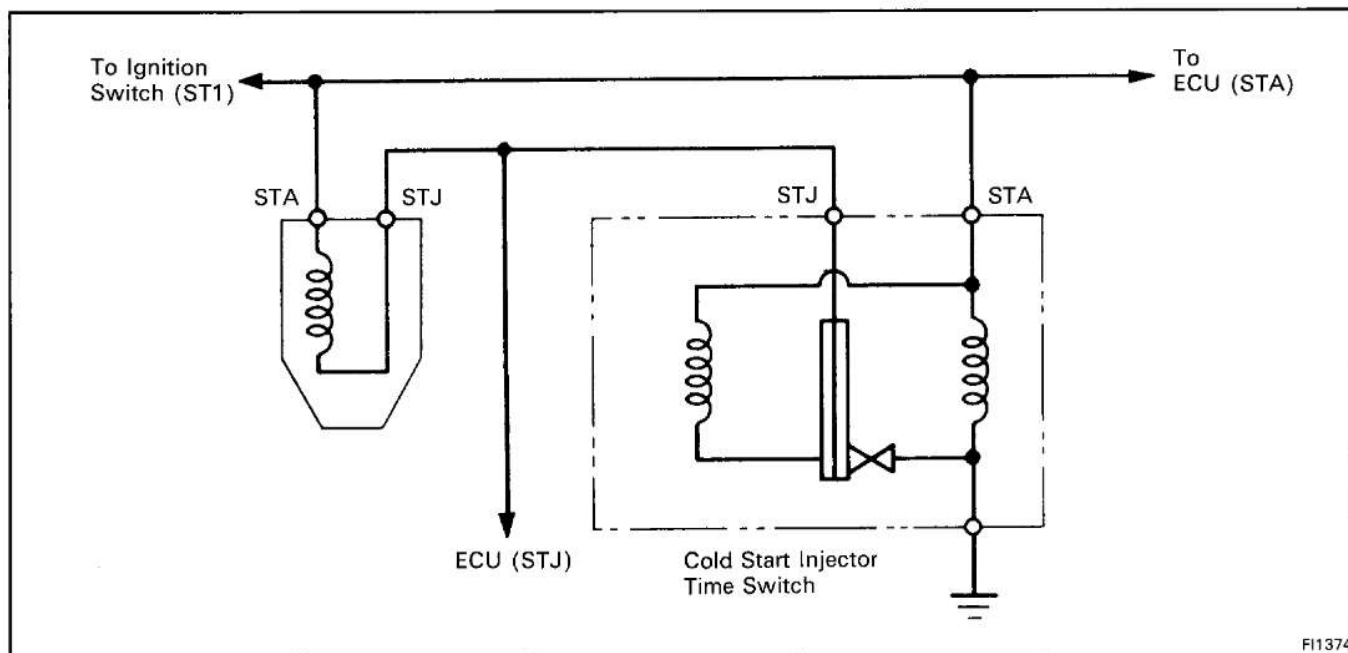


FI1909



FI1910

Cold Start Injector Time Switch



INSPECTION OF COLD START INJECTOR TIME SWITCH

INSPECT RESISTANCE OF COLD START INJECTOR TIME SWITCH

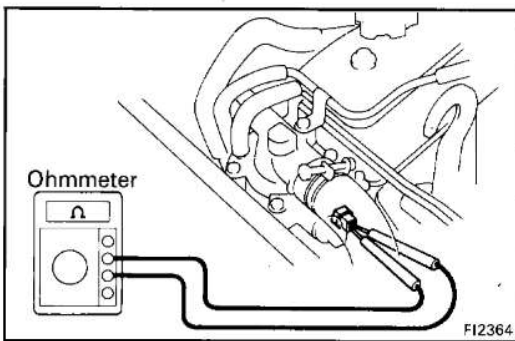
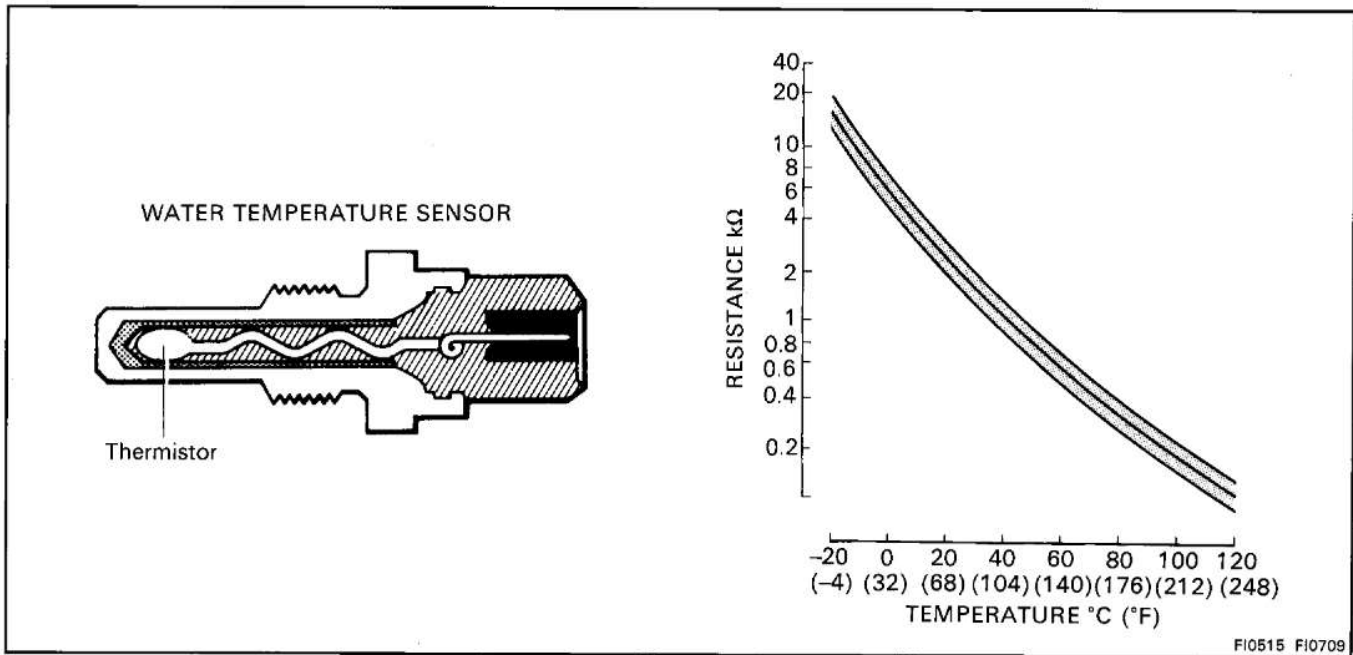
Using an ohmmeter, measure the resistance between each terminal.

Resistance:

STA – STJ	30 – 50 Ω below 15°C (59°F)
	70 – 90 Ω above 30°C (86°F)
STA – Ground	30 – 90 Ω

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

Water Temperature Sensor



INSPECTION OF WATER TEMPERATURE SENSOR

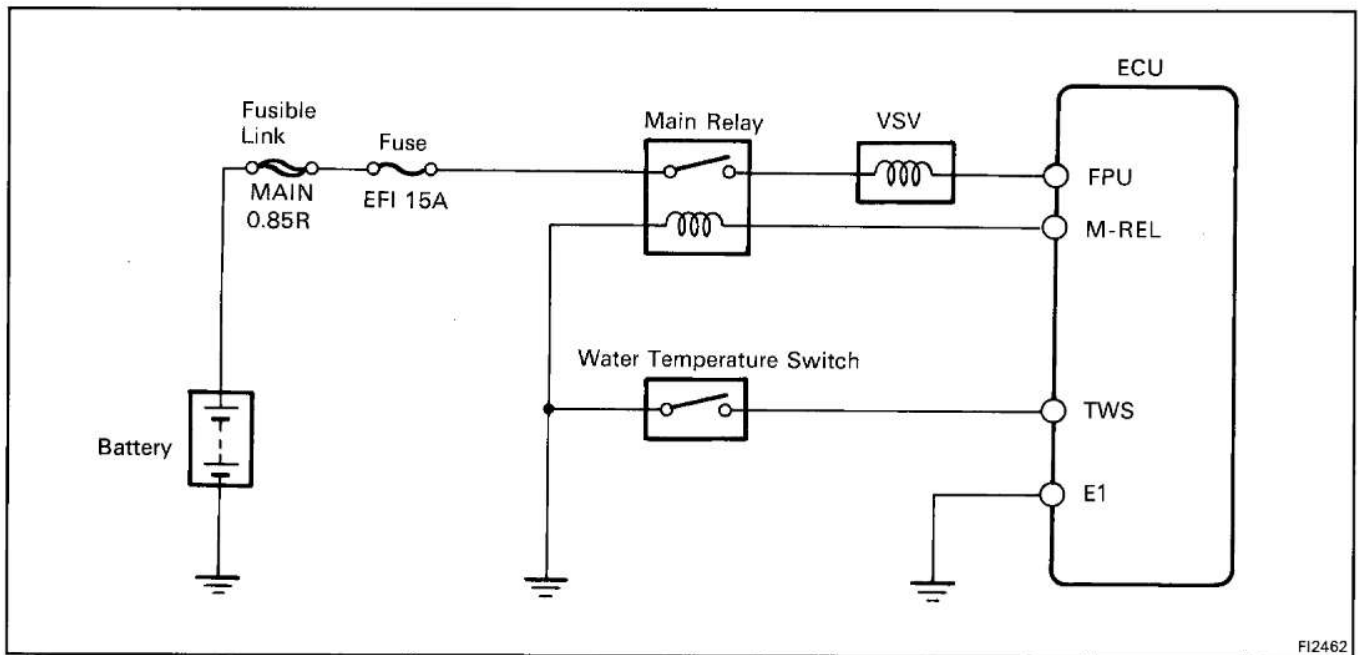
INSPECT RESISTANCE OF WATER TEMPERATURE SENSOR

Using an ohmmeter, measure the resistance between the terminals.

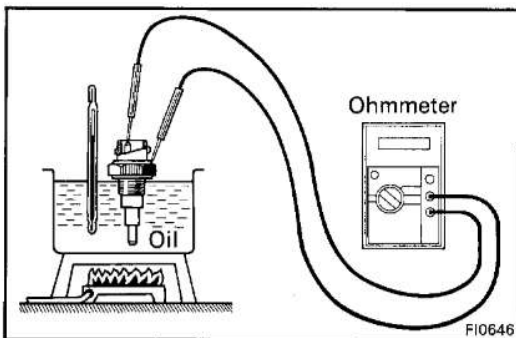
Resistance: Refer to chart

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

High Temperature Line Pressure Up System



FI2462



FI0646

INSPECTION OF HIGH TEMPERATURE LINE UP SYSTEM

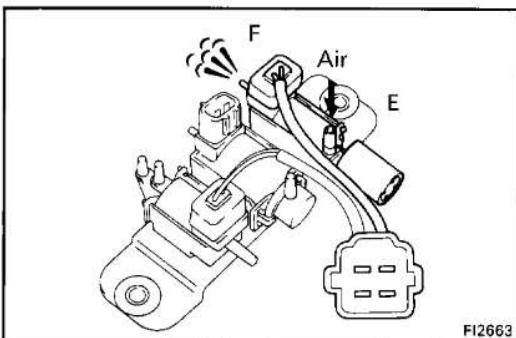
1. INSPECT WATER TEMPERATURE SWITCH

- Using an ohmmeter, check that there is no continuity between the terminal and body when the oil temperature is below 98°C (208°F).
- Check that there is continuity between the terminal and body when the oil temperature is above 105°C (221°F).

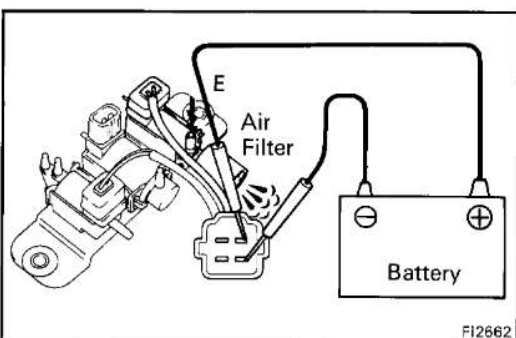
If operation is not as specified, replace the switch.

2. INSPECT VSV

- Check that air flows from the pipe E to pipe F.

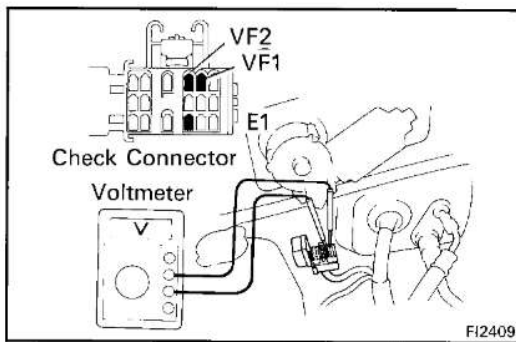


FI2663



FI2662

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



Oxygen Sensors

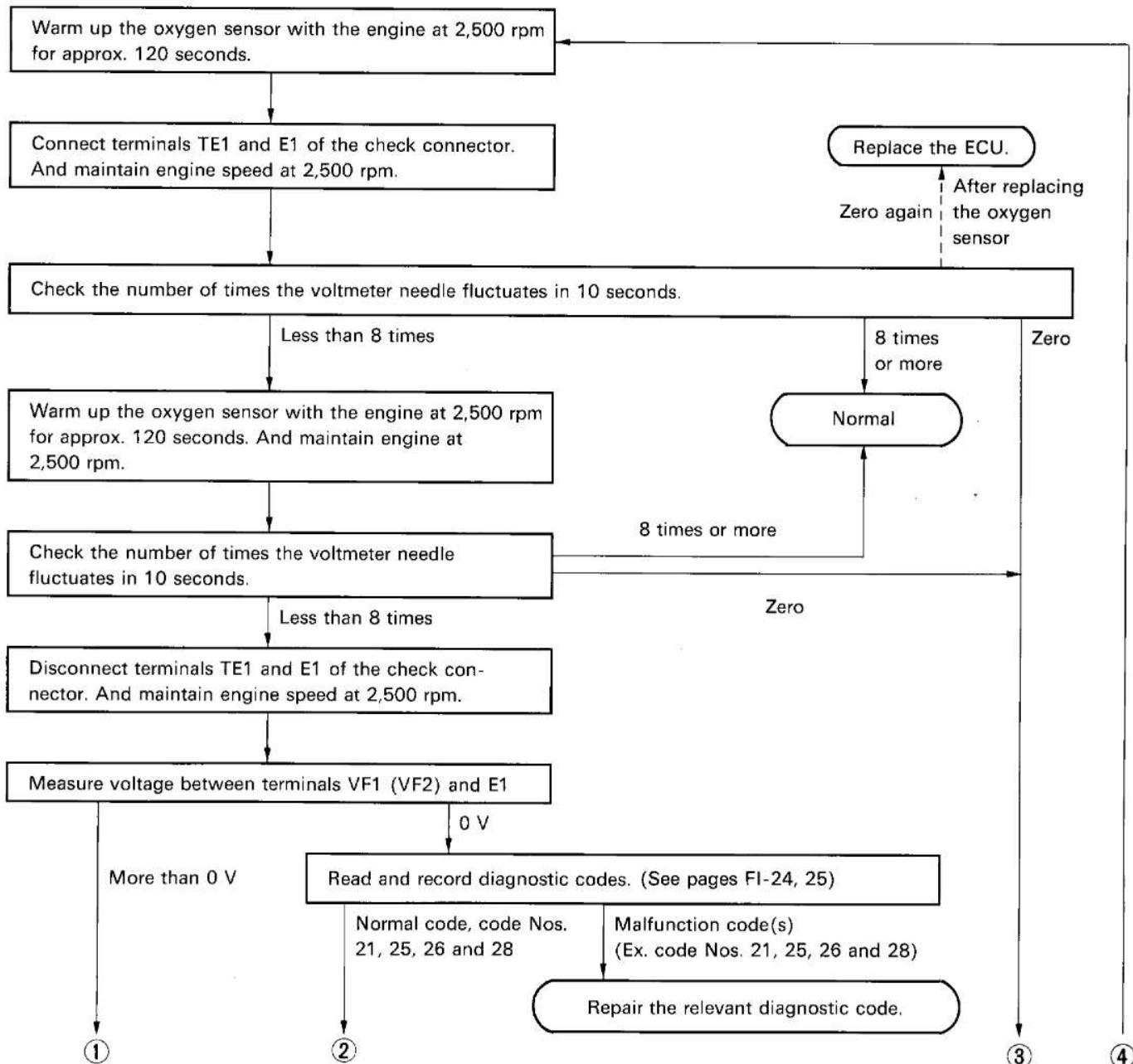
INSPECTION OF OXYGEN SENSOR

1. WARM UP ENGINE

Allow the engine to reach normal operating temperature.

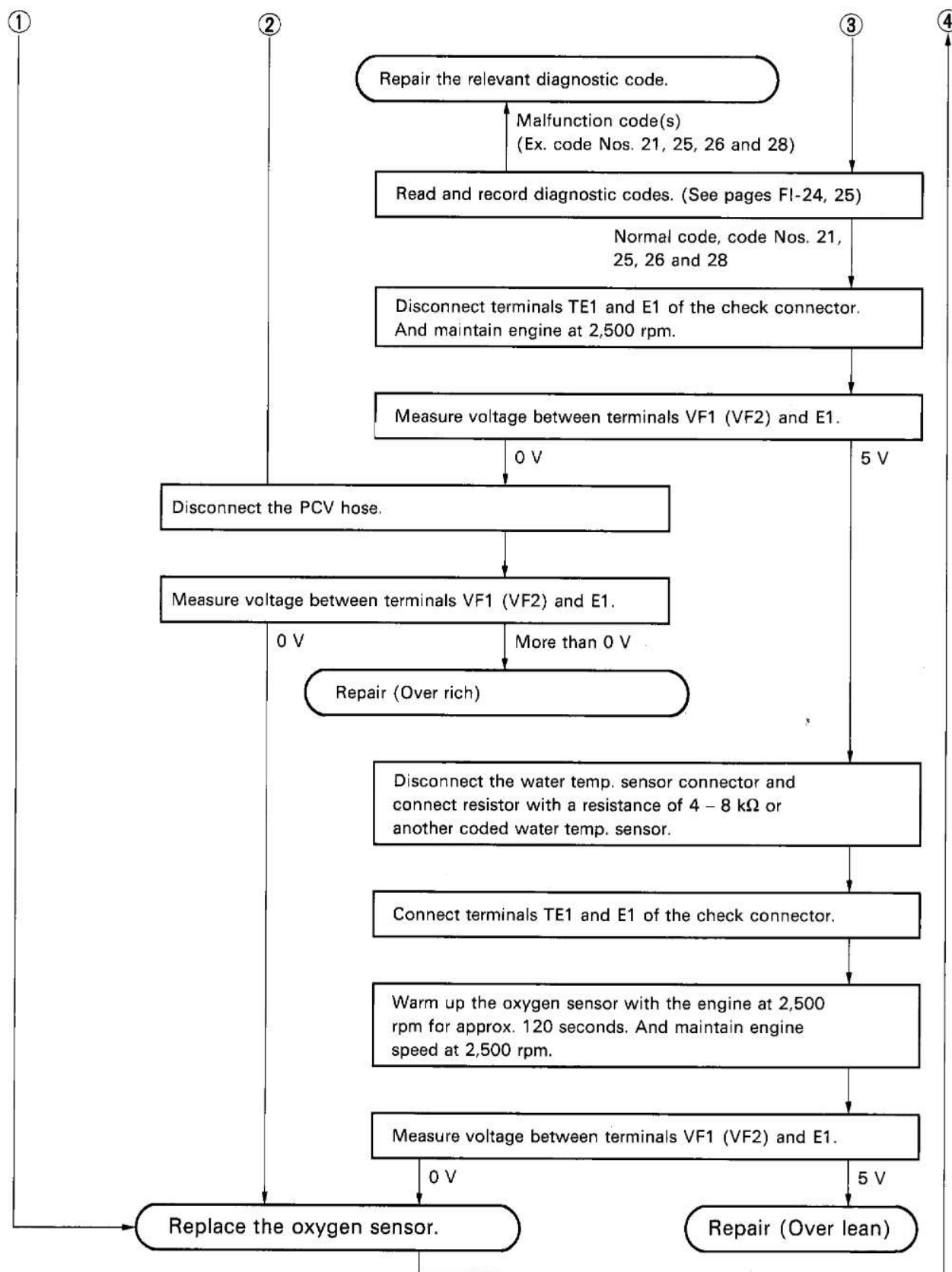
2. INSPECT FEEDBACK VOLTAGE

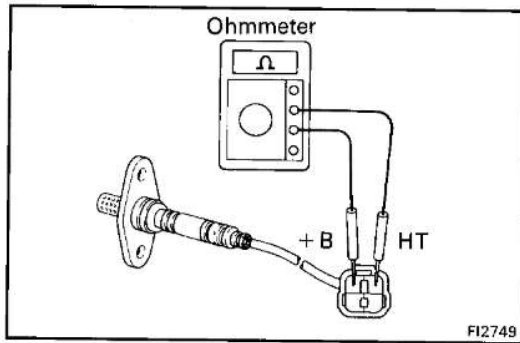
Connect the positive (+) probe of a voltmeter to terminal VF1 of the check connector, and negative (–) probe to terminal E1. Perform the test as follows:



CONTINUED ON PAGE FI-76

CONTINUED FROM PAGE FI-75



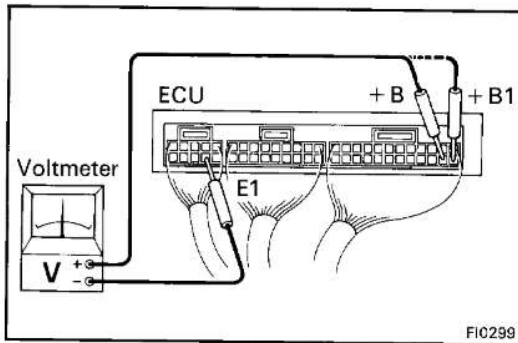


3. INSPECT HEATER RESISTANCE OF OXYGEN SENSOR

Using an ohmmeter, measure the resistance between the terminal + 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

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

1. INSPECT VOLTAGE OF ECU

Check the voltage between each terminal of the wiring connectors.

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

HINT:

- 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

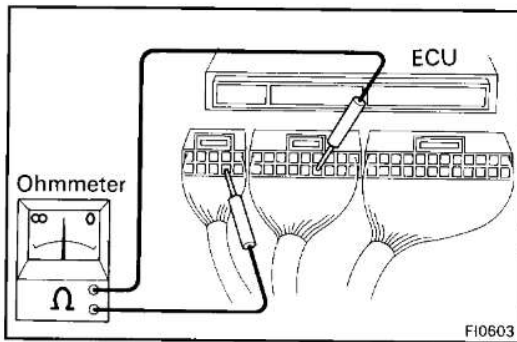
Terminals	STD Voltage	Condition	
BATT – E1	10 – 14	—	
IG SW – E1		Ignition switch ON	
M-REL – E1			
+ B (+ B1) – E1			
IDL – E2	4 – 6	Ignition switch ON	Throttle valve open
VC – E2	4 – 6		—
VTA – E2	0.1 – 1.0		Throttle valve fully closed
	4 – 5		Throttle valve fully open
VC – E22	4 – 6	Ignition switch ON	—
VS – E22	4 – 5		Measuring plate fully closed
	0.02 – 0.08		Measuring plate fully open
	2 – 4		Idling
	0.3 – 1.0		3,000 rpm

Voltage at ECU Wiring Connectors (Cont'd)

Terminals	STD Voltage	Condition	
THA – E2	1 – 3	Ignition switch ON	Intake air temperature 20°C (68°F)
THW – E2	0.1 – 1.0	Ignition switch ON	Coolant temperature 80°C (176°F)
No. 10 E01 ? – No. 20 E02	10 – 14	Ignition switch ON	
STA – E1	6 – 14	Cranking	
ISC1 ? – E1 ISC4	10 – 14	Ignition switch ON	
IGT – E1	0.7 – 1.0	Idling	
W – E1	10 – 14	No trouble ("CHECK" engine warning light off) and engine running	
T – E1	4 – 6	Ignition switch ON	Check connector TE1-E1 not connect
	0		Check connector TE1-E1 connect
NSW – E1	0	Ignition switch ON	Shift position P or N range
	10 – 14		Ex. P or N range
4WD – E1	10 – 14	Ignition switch ON	4WD switch ON
	0		4WD switch OFF
STP – E1	10 – 14	Ignition switch ON	Stop light switch ON
	0		Stop light switch OFF

ECU Terminals

E01	No. 10	HT1	STJ	T	ISC 1	ISC 2	G $\ominus$	G1	–	NE	–	OX1	THW	IGF	IGT	–	M-REL	EGR	SPD	FPU	THA	VS	VC	BATT	IG SW
E02	No. 20	HT2	E1	TWS	ISC 3	ISC 4	VF1	VF2	VTA	IDL	E11	OX2	E2	E22	–	4WD	STP	–	W	NSW	STA	AI	–	+B	+B1



2. INSPECT RESISTANCE OF ECU

NOTICE:

- 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.

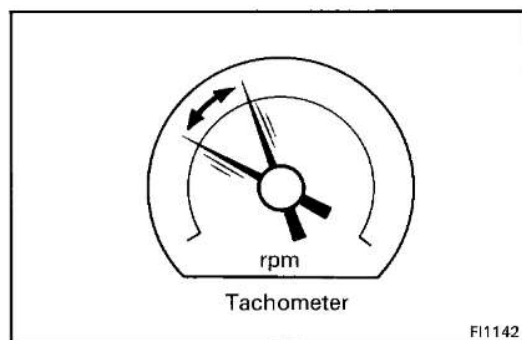
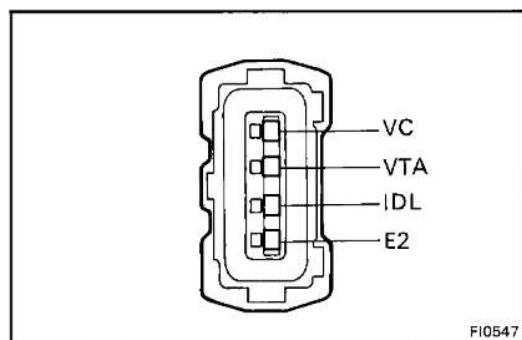
- Disconnect the connectors from the ECU.
- Measure the resistance at each terminal.

Resistance of ECU Wiring Connectors

Terminals	Condition	Resistance (Ω)
IDL – E2	Throttle valve open	∞
	Throttle valve fully closed	Less than 2,300
VTA – E2	Throttle valve fully open	3,500 – 10,300
	Throttle valve fully closed	300 – 6,300
VC – E2	—	4,250 – 8,250
VC – E22	—	200 – 400
VS – E22	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 – G $\ominus$	—	185 – 265
NE – G $\ominus$	—	
ISC1, ISC2 ISC3, ISC4 – +B	—	10 – 30

ECU Terminals

E01	No. 10	HT1	STJ	T	ISC 1	ISC 2	G $\ominus$	G1	—	NE	—	OX1	THW	IGF	IGT	—	M-REL	EGR	SPD	FPU	THA	VS	VC	BATT	IG SW
E02	No. 20	HT2	E1	TWS	ISC 3	ISC 4	VF1	VF2	VTA	IDL	E11	OX2	E2	E22	—	4WD	STP	—	W	NSW	STA	AI	—	+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) Connect terminals IDL and E2 of the wiring connector.
- (c) Gradually raise the engine rpm and check that there is fluctuation between the fuel cut and fuel return points.

HINT: The vehicle should be stopped.

Fuel cut rpm: 1,300 rpm

Fuel return rpm: 1,000 rpm