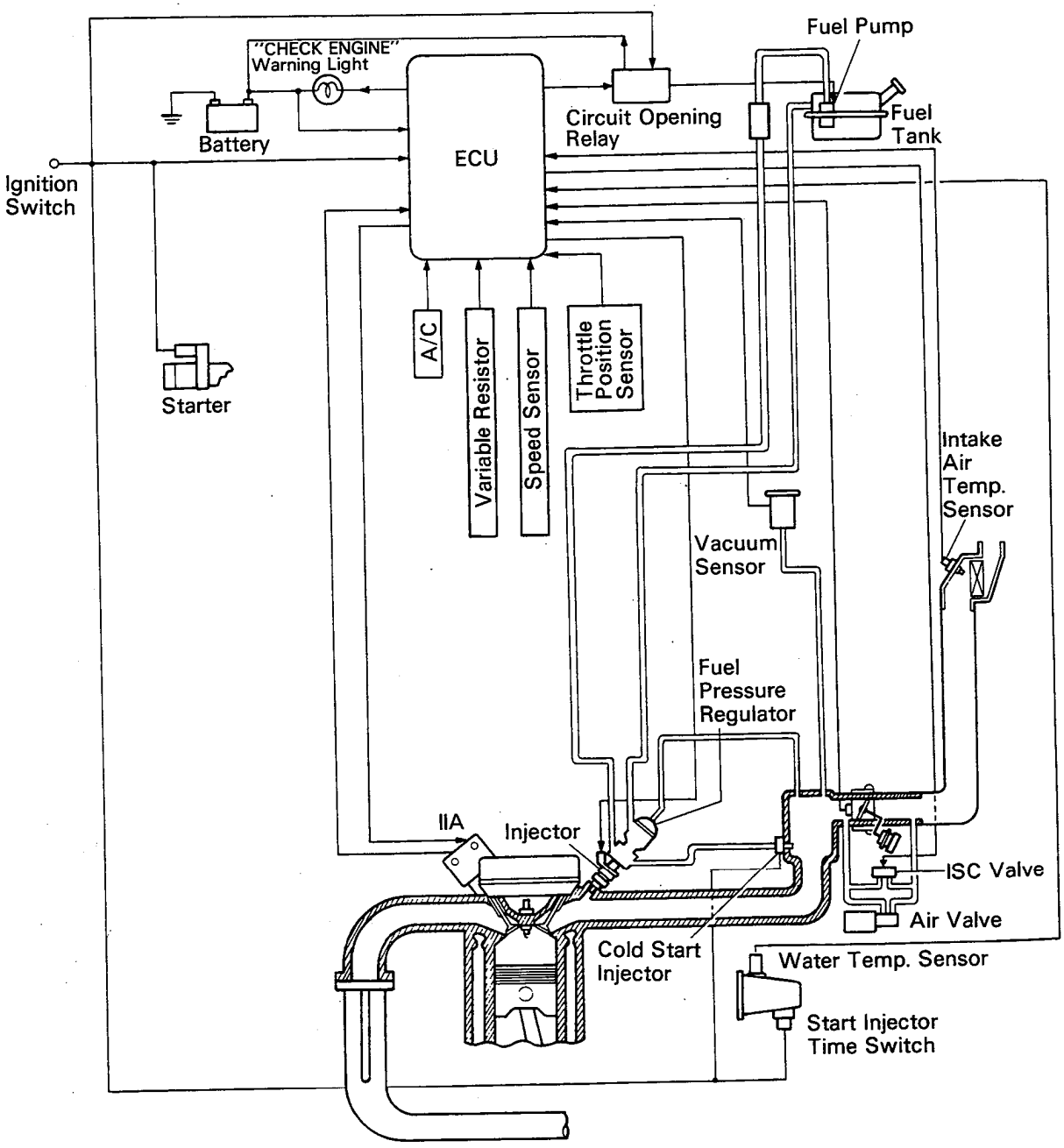
EFI SYSTEM

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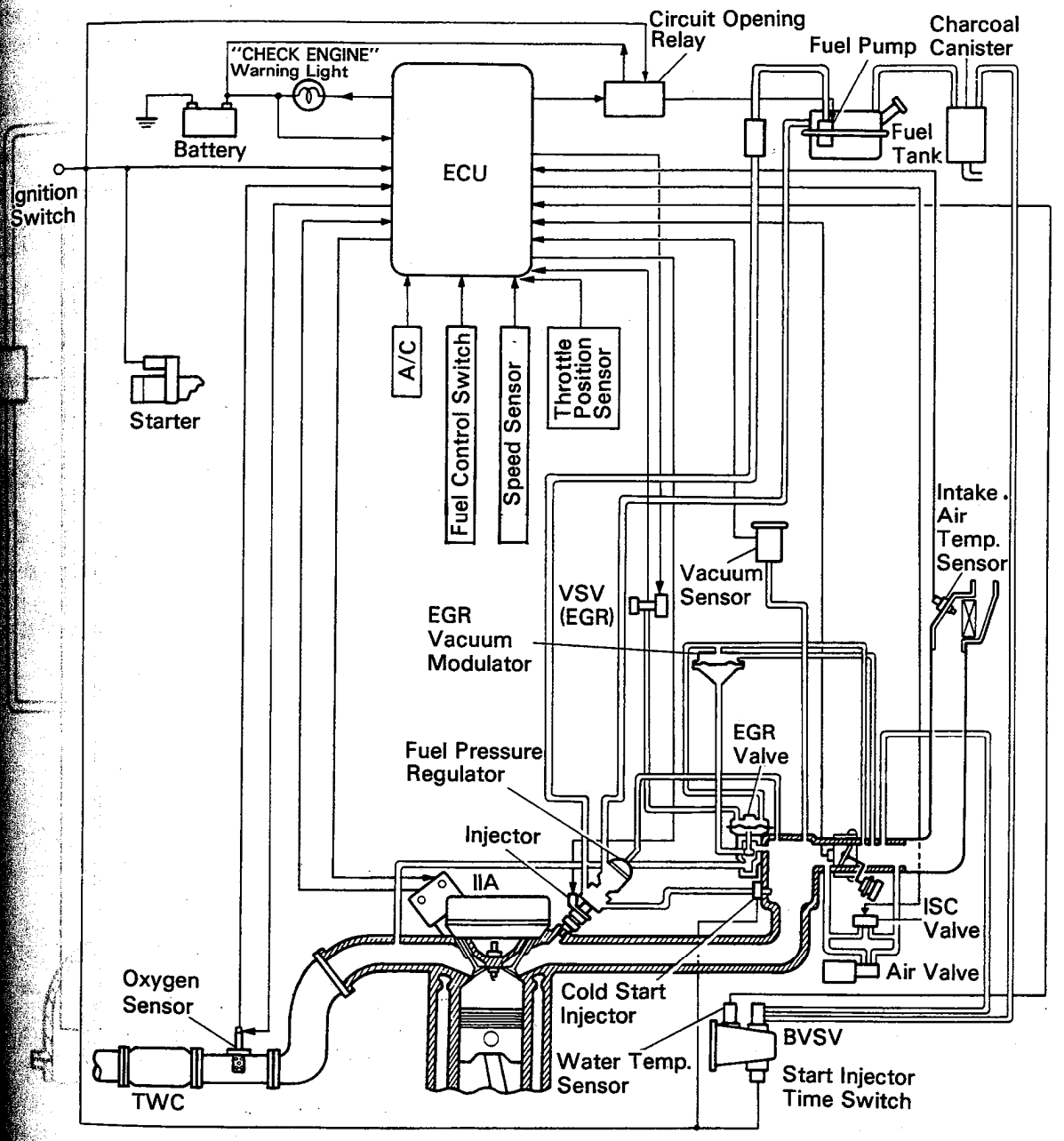
SYSTEM DESCRIPTION

4A-FE (2WD, w/o EGR System)



SYSTEM DESCRIPTION (Cont'd)

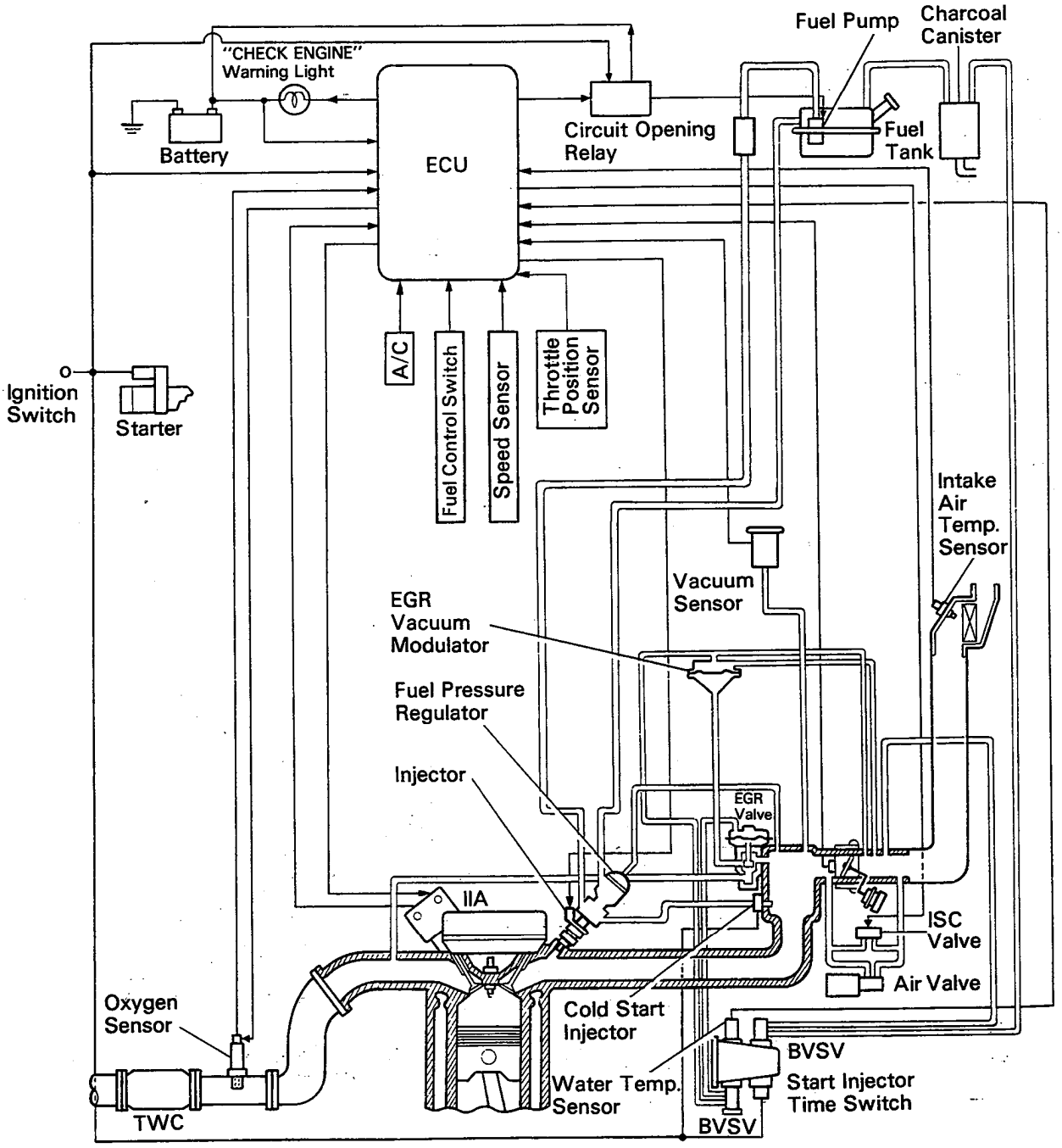
4A-FE (2WD, w/ EGR System)



FI4892

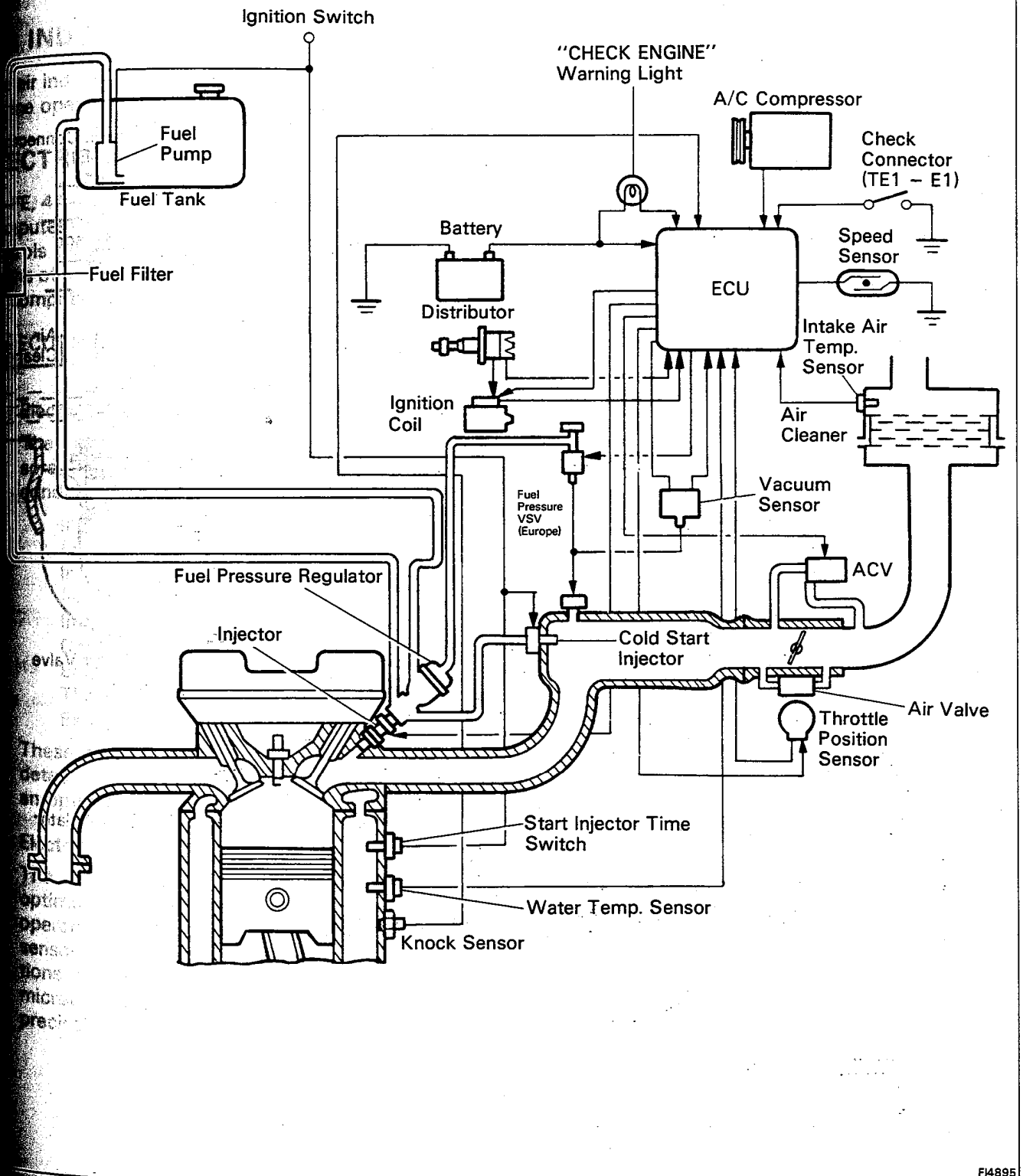
SYSTEM DESCRIPTION (Cont'd)

4A-FE (4WD)



SYSTEM DESCRIPTION (Cont'd)

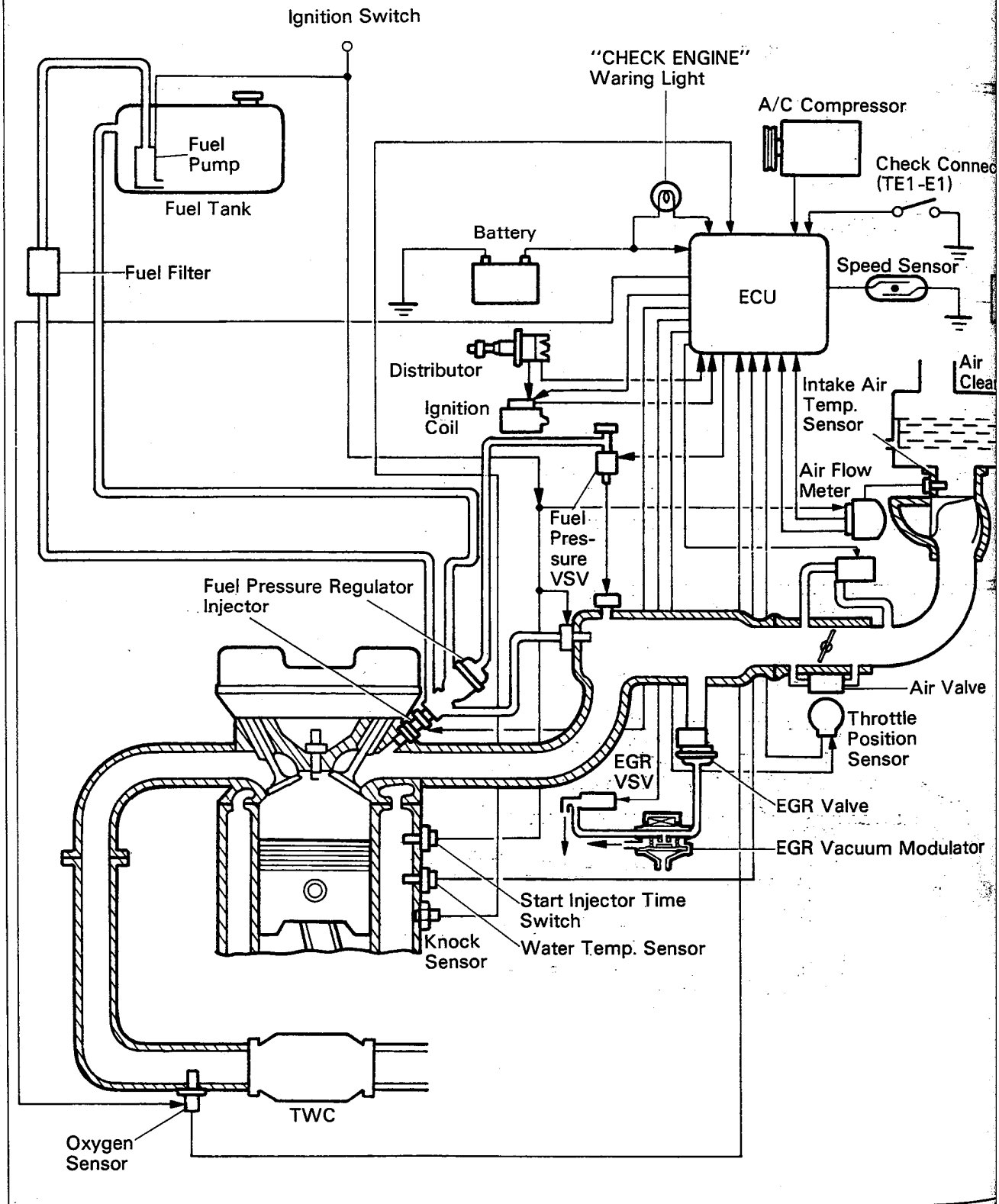
GE (w/o Air Flow Meter)



FI4895

SYSTEM DESCRIPTION (Cont'd)

4A-GE (w/ Air Flow Meter)



EFI system is composed of three basic sub-ems: Fuel, Air Induction and Electronic rol System.

L SYSTEM

s supplied under constant pressure to the EFI ors by an electric fuel pump. The injectors a metered quantity of fuel into the intake in accordance with signals from the ECU tronic Control Unit).

INDUCTION SYSTEM

air induction system provides sufficient air for e operation.

CTRONIC CONTROL SYSTEM

4A-GE engines are equipped with a Toyota puter Control System (TCCS) which centrally ols the EFI, ESA, Diagnosis systems, etc. by s of an Electronic Control Unit (ECU-formerly mputer) employing a microcomputer.

CU, the TCCS controls the following func-

lectronic Fuel Injection (EFI)

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

- Intake manifold absolute pressure (w/o Air flow meter)
- Intake air volume (w/ Air flow meter)
- Intake air temperature
- Coolant temperature
- Engine rpm
- Throttle valve opening valve
- Exhaust oxygen content (w/ TWC) etc.

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

lectronic Spark Advance (ESA)

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

3. Diagnosis

   The ECU detects any malfunctions or abnormalties in the sensor network and lights a "CHECK ENGINE" warning light on the instrument panel. At the same time, the trouble is identified and a diagnostic code is recorded by the ECU. The diagnostic code can be read by the number of blinks of the check engine warning light when terminals TE1 and E1 are connected. The diagnostic codes are refered to the later page.
   (See pages FI-28 to 31)

4. Fail-Safe Function

   In the event of the sensor malfanctioning, a back-up circuit will take over to provide minimal driveability, and the "CHECK ENGINE" warning light will illuminate.

PRECAUTIONS

1. **Before working on the fuel system, disconnect negative (−) terminal from the battery.**

   HINT: Any diagnostic code retained by the compute be cleared when the battery terminal is remo Therefore, if necessary, read the diagnosis before re ing the battery terminal.

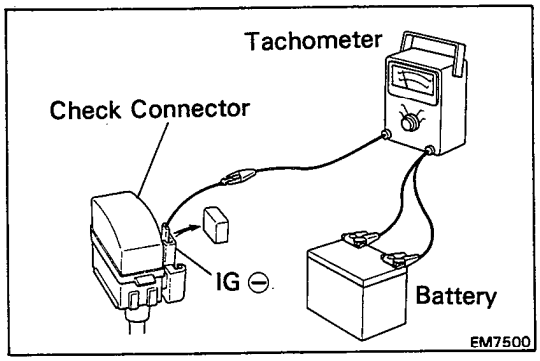
2. **(w/ AIRBAG)**
   Work must be started after approx. 20 second longer from the time the ignition switch is turne the "LOCK" position and the negative (−) tern cable is disconnected from the battery.

3. **When working on the fuel system, do not smok work near any fire hazard.**

4. **Keep gasoline off rubber or leather parts.**

INSPECTION PRECAUTIONS

MAINTENANCE PRECAUTIONS

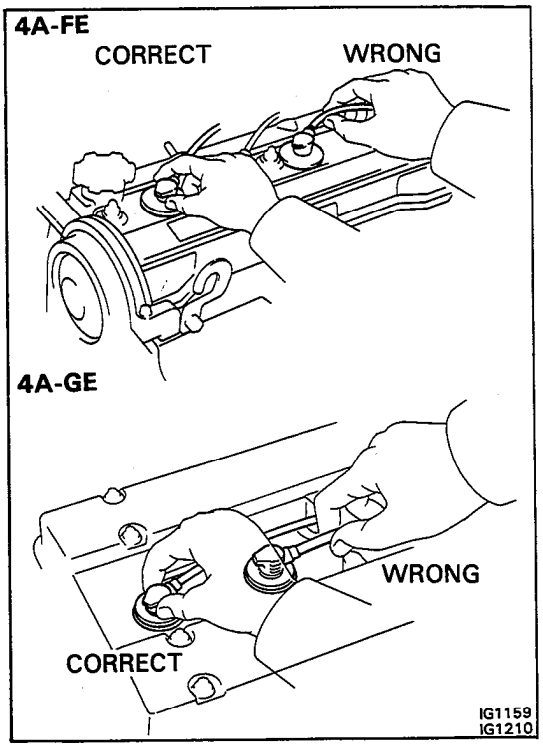


1. **CHECK CORRECT ENGINE TUNE-UP**

2. **PRECAUTIONS WHEN CONNECTING GAUGE**
   (a) Connect the tachometer test probe to IG ⊖ terminal of the check connector.

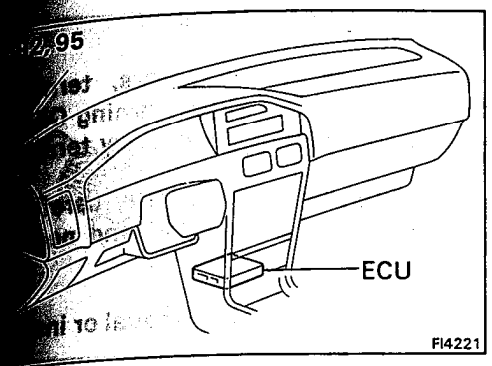
   LOCATION: See page FI-133

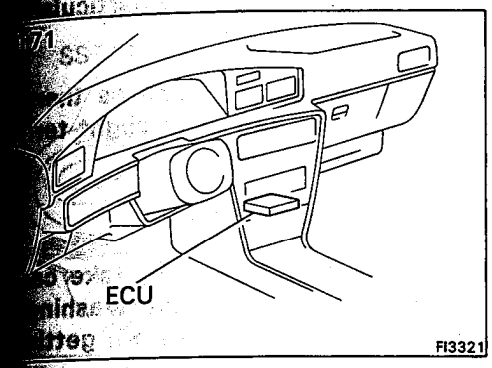
   (b) Use the battery as the power source for the ti light, tachometer, etc.

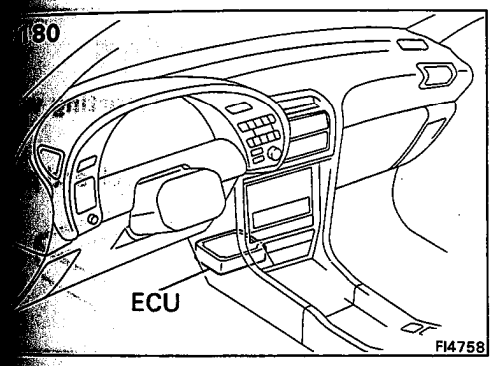


3. **IN EVENT OF ENGINE MISFIRE, THE CATALYTIC VERTER MAY OVERHEAT. THEREFORE, THE FOLLOWING PRECAUTIONS SHOULD BE TAKEN**
   (a) Check proper connection of battery terminals,
   (b) Handle high-tension cords carefully.
   (c) After repair work, check that all ignition systen ings are reconnected securely.
   (d) When cleaning the engine compartment, be esp ly careful to protect the electrical system from v

4. **PRECAUTIONS WHEN HANDLING OXYGEN SEN**
   (a) Do not allow the oxygen sensor to receive any p cal impact or shocks.
   (b) Do not allow water to come into contact wit sensor.







WHEN CAR IS EQUIPPED WITH A 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 an amateur radio transceiver, etc. (even one with approx. 10 W output), it may, at times, have an effect upon ECU operation, especially if the antenna and feeder are installed nearby.

Therefore, observe the following precautions.

(a) Install the antenna as far as possible from the ECU. The ECU is located below the glove box so the antenna should be installed at the rear, left side of the vehicle.

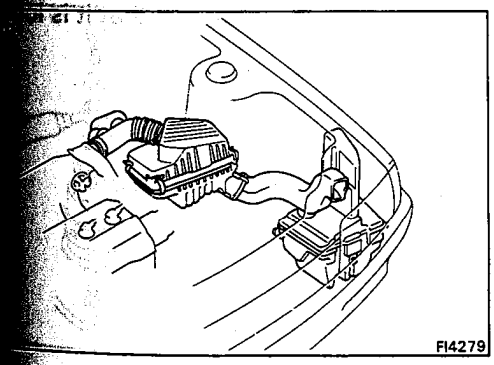
If installing on the bumper, do so on the right side, if possible.

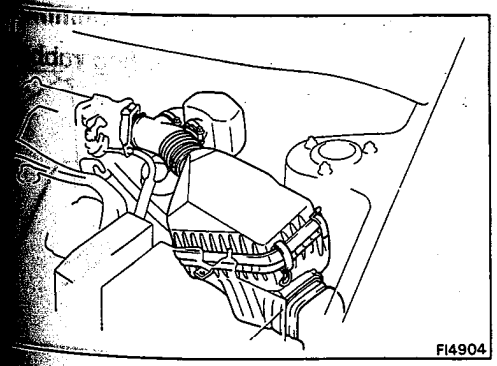
(b) Keep the antenna feeder as far away as possible from the ECU wires - at least 20 cm (7.87 in.) - and , especially, do not wind them together.

(c) Insure that the feeder and antenna are properly adjusted.

(d) Do not equip your vehicle with a powerful mobile radio system.

(e) 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.)

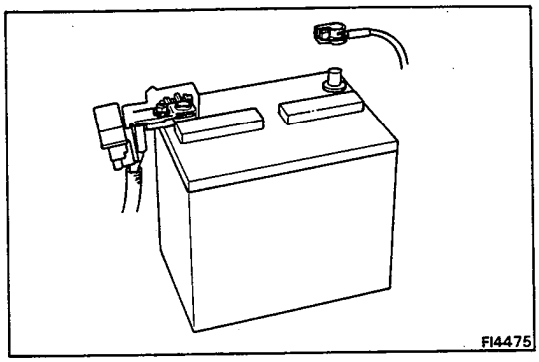




AIR INDUCTION SYSTEM

1. Separation of the engine oil dipstick, oil filler cap, PCV hose, etc. may cause the engine to mistune.

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 mistune.


FI4475

ELECTRONIC CONTROL SYSTEM

1. **Before removing EFI wiring connectors, termin etc., first disconnect power by either turning OFF ignition switch or disconnecting the battery termin**

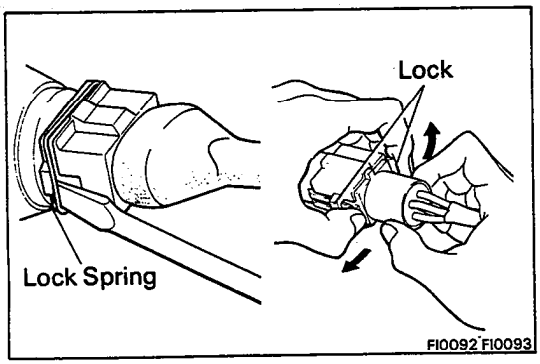
2. **When installing the battery, be especially careful to incorrectly connect the positive (+) and negat (−) cables.**

3. **Do not permit parts to touch during removal or insta tion.**
   Handle all EFI parts carefully and, in particular, ECU.

4. **Take great care during troubleshooting as there numerous transistor circuits and even slight term contact can cause further troubles.**

5. **Do not open the ECU cover.**

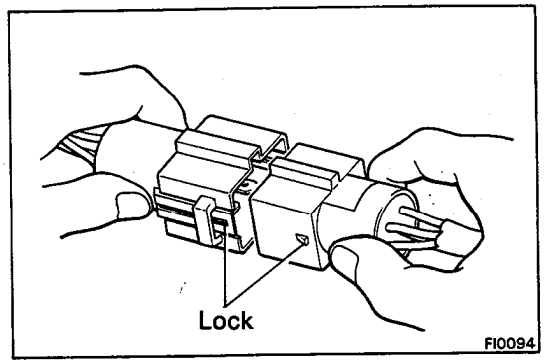
6. **When inspecting during rainy weather, take care prevent entry of water. Also, when washing engine compartment, prevent water from getting the EFI parts and wiring connectors.**



FI0092 FI0093

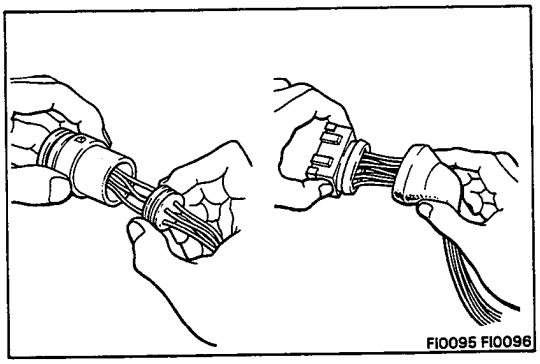
7. **Parts should be replaced as an assembly.**

8. **Care is required when pulling out and inserting wi connectors.**
   (a) To pull the connector out, release the lock and pu the connector.

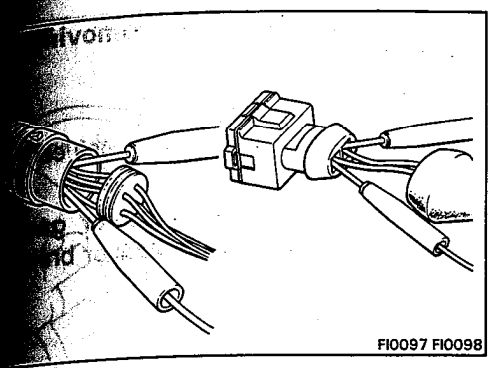


FI0094

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


FI0095 FI0096

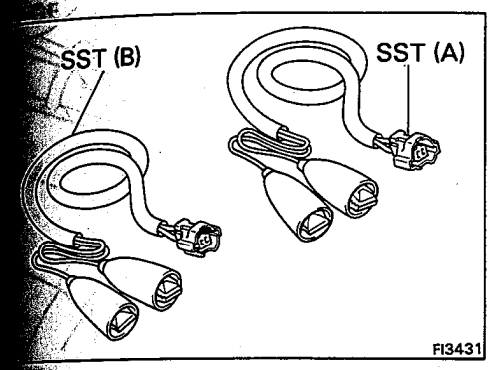
9. **When inspecting a connector with a volt/ohmme**
   (a) Carefully move away the water-proofing rubbe is a water-proof type connector.


FI0097 FI0098

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

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

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

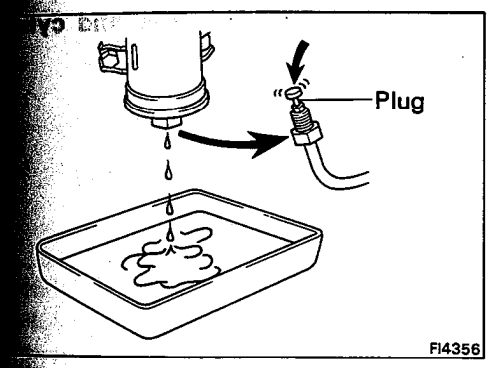


FI3431

10. Use SST for inspection or test of the injector, cold start injector or their wiring connectors.

SST 09842-30055 (A) and 09842-30070 (B)

FUEL SYSTEM



FI4356

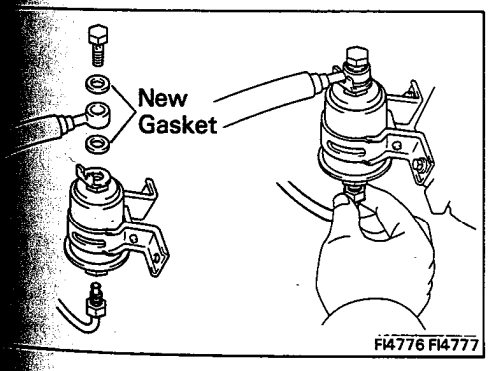
1. When disconnecting the flare nut or union bolt on the high pressure pipe union, observe the following procedure.

(a) Put a container under the connection.

(b) Slowly loosen the connection.

(c) Disconnect the connection.

(d) Plug the connection with a rubber plug.



FI4776 FI4777

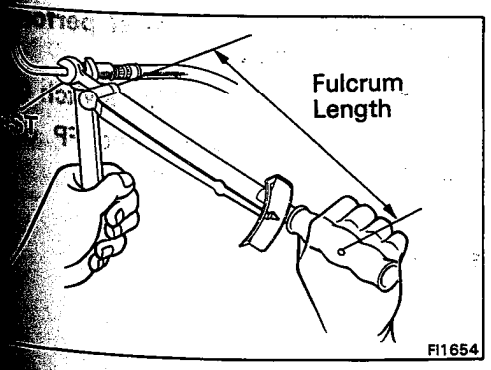
2. When connecting the flare nut or union bolt on the high pressure pipe union, observe the following procedure.

(Union bolt type)

(a) Always use a new gasket.

(b) Hand tighten the union bolt.

(c) Torque the bolt to the specified torque.



FI1654

(Flare nut type)

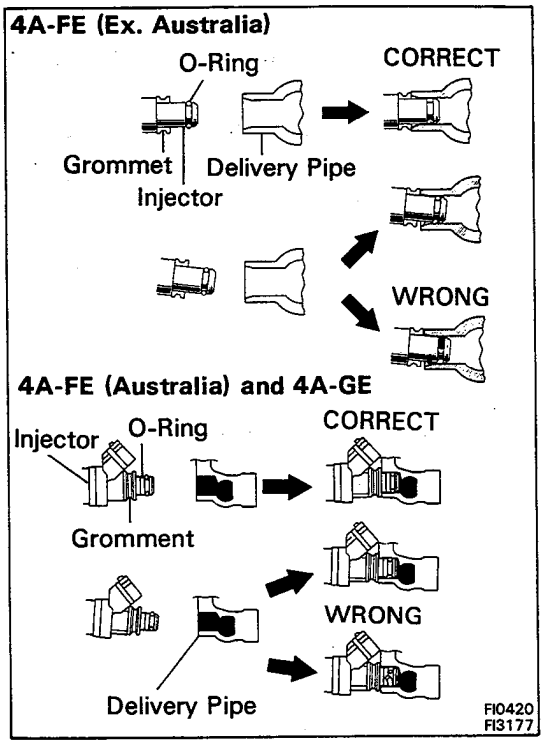
(a) Apply a thin coat of oil to the flare and tighten the flare nut.

(b) Then using SST, torque the unit to the specified torque.

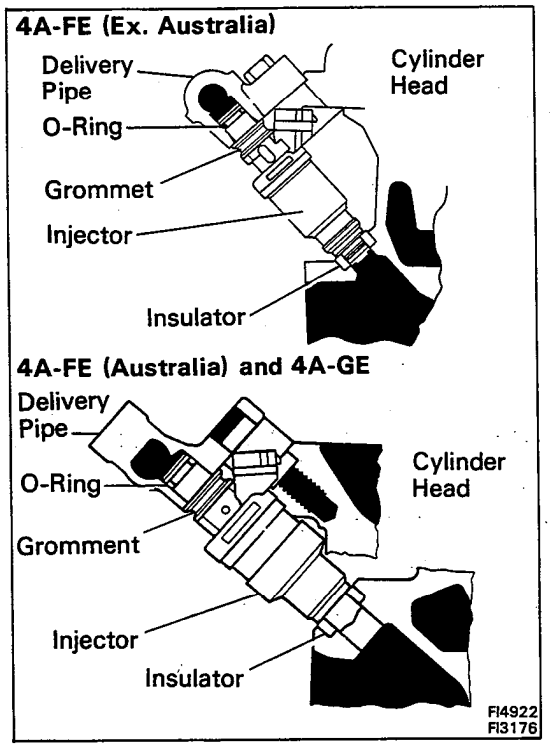
SST 09631-22020

Torque: 310 kg-cm (22 ft-lb, 30 N·m)

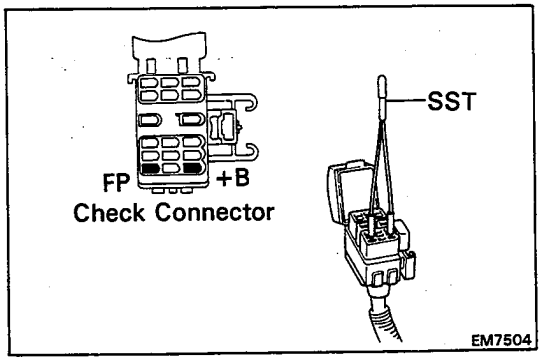
HINT: Use a torque wrench with a fulcrum length of 30 cm (11.81 in.).



3. **Take the following precautions when removing installing the injectors.**
   (a) Never reuse the O-ring.
   (b) When placing an O-ring on the injector, use care to damage it in any way.
   (c) Lubricate the O-ring with spindle oil or gaso before installing. Never use engine, gear or brake



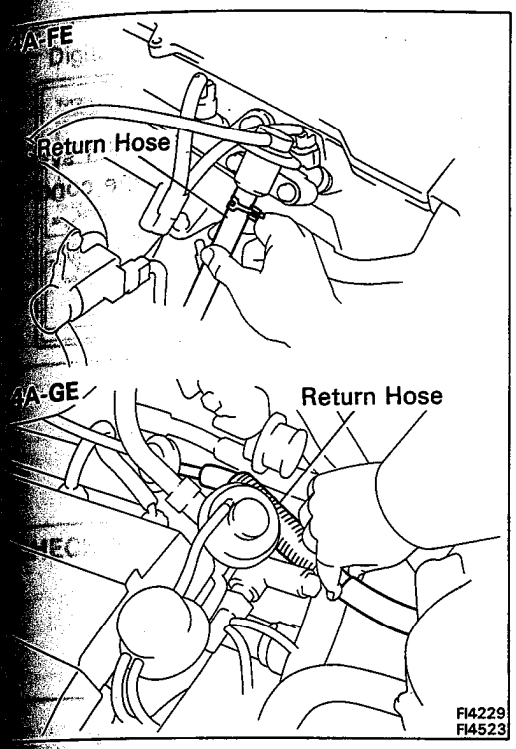
4. **Install the injector to the delivery pipe and cyli head as shown in the figure.**



5. **Confirm that there are no fuel leaks after perfor maintenance on the fuel system.**
   (a) With engine stopped, turn the ignition switch
   (b) Using SST, connect terminals +B and FP o check connector.

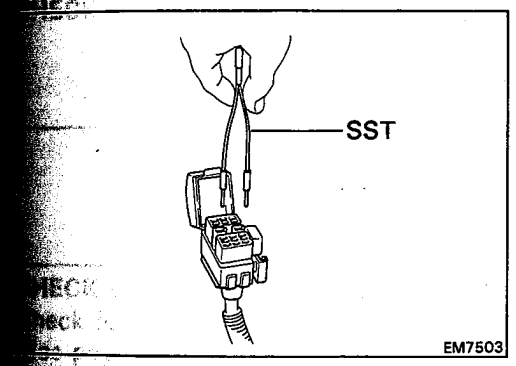
   SST 09843-18020

   LOCATION: See page FI-133



(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 the hose as it may cause the hose to crack.



(d) Remove SST from the check connector.

SST 09843-18020

TROUBLESHOOTING

TROUBLESHOOTING HINTS

1. Engine trouble are usually not caused by the EFI syste When troubleshooting, always firstly check the conditi of the other systems.
   (a) Electronic source
   - Battery
   - Fusible links
   - Fuses

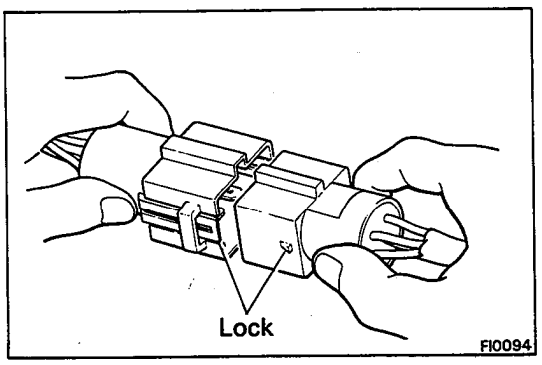
   (b) Body ground
   (c) Fuel supply
   - Fuel leakage
   - Fuel filter
   - Fuel pump

   (d) Ignition system
   - Spark plugs
   - High-tension cords
   - IIA or Distributor
   - Ignition coil
   - Igniter

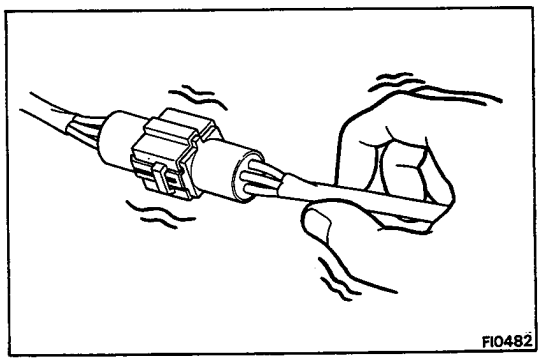
   (e) Air induction system
   - Vacuum leaks

   (f) Emission control system
   - PCV system
   - EGR system (w/ EGR system)

   (g) Others
   - Ignition timing
   - Idle speed
   - etc.

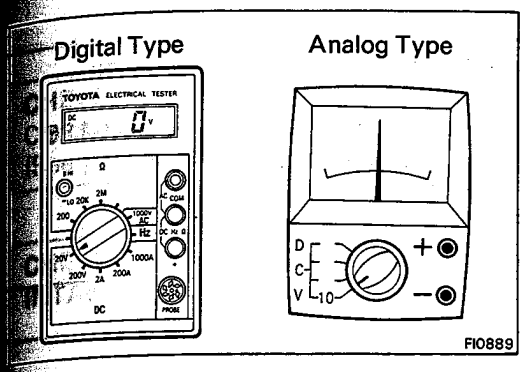


2. The most frequent cause of problems is simply a bad c tact in wiring connectors. Always check that connecti are secure.
   When inspecting the connector, pay particular attentio the following points:
   (a) Check to see that the terminals are not bent.
   (b) Check to see that the connector is pushed in co pletely and locked.



   (c) Check to see that there is no signal change when connector is slightly tapped or wiggled.

3. Sufficiently troubleshooting for other causes before r lacing the ECU, as the ECU is high quality and expens



4. Use a volt/ohmmeter with high impedance (10 kΩ/V minimum) for troubleshooting of the electrical circuit. (See page FI-34)

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

CHECK ELECTRIC SOURCE	BAD →	1. Battery (1) Connection (2) Gravity–Drive belt–charging system (3) Voltage 2. Fusible link
↓ OK		
CHECK STARTING SYSTEM	BAD →	1. Ignition switch 2. Starter 3. Neutral start switch (A/T) 4. Wiring/Connection

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

CHECK DIAGNOSIS SYSTEM Check for output of diagnosis code. (See page FI-25)	Malfunction code(s) →	Diagnosis code(s) 4A-FE (See page FI-28) 4A-GE (See page FI-29)
↓ Normal code		
CHECK FOR VACUUM LEAKS IN AIR INTAKE LINE	BAD →	1. Oil dipstick 2. Hose connection(s) 3. PCV hose(s) 4. EGR system – EGR valve stays open
↓ OK		
CHECK IGNITION SPARK 4A-FE (See page IG-6) 4A-GE (See page IG-10)	BAD →	1. High-tension cords 2. IIA, Distributor 3. Ignition coil, igniter
↓ OK		
CHECK IGNITION TIMING 1. Short terminals TE1 and E1 of the check connector. 2. Check ignition timing. **Standard: 10° BTDC @ idle**	NO →	Ignition timing – Adjust 4A-FE (See page EM-20) 4A-GE (See page EM-28)
↓ OK CONTINUED ON PAGE FI-16		

OK CONTINUED FROM PAGE FI-15

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-95)

BAD →
1. Fuel line – Leakage – deformation
2. Fuse
3. Circuit opening relay (See page FI-135)
4. Fuel pump (See page FI-94)
5. Fuel filter
6. Fuel pressure regulator (See page FI-109)

OK ↓

(w/ AIR FLOW METER)
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-120)

OK ↓

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: 10.0 kg/cm² (142 psi, 981 kPa) at 250 rpm
3. Valve clearance (Cold)
   Standard: IN 0.15 – 0.25 mm (0.006 – 0.010 in.)
   EX 0.20 – 0.30 mm (0.008 – 0.0012 in.)

BAD (ALL Plugs WET) →
1. Injectors – shorted or leaking
2. Injector wiring – short circuited
3. Cold start injector – leakage (See page FI-105)
4. Start injector time switch (See page FI-137)

OK ↓

CHECK AUXILIARY AIR VALVE
(See page FI-131)

BAD →
1. Auxiliary air valve
2. Water by-pass hose(s)
3. Air hose(s)

OK ↓

CHECK INTAKE VALVE

BAD → Intake valve – carbon deposits

OK ↓

CHECK EFI ELECTRONIC CIRCUIT USING VOLT/OHMMETER
(See page FI-34)

BAD →
1. Wiring connection(s)
2. Power to ECU
   (1) Fusible link(s)
   (2) Fuse(s)
   (3) EFI main relay
3. Air flow meter (w/ Air flow meter)
4. Vacuum sensor (w/o Air flow meter)
5. Water temp. sensor
6. Intake air temp. sensor
7. Injection signal circuit
   (1) Injector wiring
   (2) ECU

SYMPTOM — ENGINE OFTEN STALLS

CHECK DIAGNOSIS SYSTEM
Check for output of diagnostic code.
(See page FI-25)

Malfunction code(s) → Diagnostic code(s)
4A-FE (See page FI-28)
4A-GE (See page FI-29)

Normal code ↓

CHECK FOR VACUUM LEAKS IN AIR INTAKE LINE

BAD →
1. Oil dipstick
2. Hose connection(s)
3. PCV hose(s)
4. EGR system — EGR valve stays open

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. (See page FI-95)

BAD →
1. Fuel line — leakage — deformation
2. Fuse(s)
3. Circuit opening relay (See page FI-135)
4. Fuel pump (See page FI-94)
5. Fuel filter
6. Fuel pressure regulator (See page FI-109)

OK ↓

CHECK AIR FILTER ELEMENT

BAD → Element — Clean or replace

OK ↓

CHECK IDLE SPEED (AND IDLE CO CONCENTRATION)
Standard: 800 rpm

NO → Idle speed — Adjust
4A-FE (See pages EM-22, 23)
4A-GE (See pages EM-30, 31)

OK ↓

CHECK IGNITION TIMING
1. Connect terminals TE1 and E1 of the check connector.
2. Check ignition timing.
   Standard: 10° BTDC @ idle

NO → Ignition timing — Adjust
4A-FE (See page EM-20)
4A-GE (See page EM-28)

OK ↓

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: 10.0 kg/cm² (142 psi, 981 kPa) at 250 rpm
3. Valve clearance (Cold)
   Standard: IN 0.15 — 0.25 mm (0.006 — 0.010 in.)
   EX 0.20 — 0.30 mm (0.008 — 0.012 in.)

OK ↓

CHECK COLD START INJECTOR
(See page FI-105)

BAD →
1. Cold start injector
2. Start injector time switch (See page FI-137)

OK CONTINUED ON PAGE FI-18

OK CONTINUED FROM PAGE FI-17

CHECK AUXILIARY AIR VALVE
(See page FI-131)

BAD →
1. Auxiliary air valve
2. Water hose(s)
3. Air hose(s)

OK

CHECK FUEL PRESSURE
(See page FI-97)

BAD →
1. Fuel pump (See page FI-94)
2. Fuel filter
3. Fuel pressure regulator (See page FI-109)

OK

CHECK INJECTORS
(See page FI-111)

BAD → Injection condition

OK

CHECK EFI ELECTRONIC CIRCUIT USING VOLT/OHMMETER
(See page FI-34)

BAD →
1. Wiring connections
2. Power to ECU
   (1) Fusible link(s)
   (2) Fuse(s)
   (3) EFI main relay
3. Air flow meter (w/ Air flow meter)
4. Vacuum sensor (w/o Air flow meter)
5. Water temp. sensor
6. Intake air temp. sensor
7. Injection signal circuit
   (1) Injector wiring
   (2) ECU

SYMPTOM — ENGINE SOMETIMES STA

CHECK DIAGNOSTIC SYSTEM
Check for output of diagnostic code.
(See page FI-25)

Malfunction code(s) →
Diagnostic cord(s)
4A-FE (See page FI-28)
4A-GE (See page FI-29)

Normal code

(w/ AIR FLOW METER)
CHECK AIR FLOW METER
(See page FI-120)

BAD → Air flow meter

OK

(w/o AIR FLOW METER)
CHECK VACUUM SENSOR
(See page FI-140)

BAD → Vacuum sensor

OK

CHECK WIRING CONNECTORS AND RELAYS
Check that there is a signal change when the connector or relay is slightly tapped or wiggled.

BAD →
1. Connectors
2. EFI main relay (See page FI-134)
3. Circuit opening relay (See page FI-1

SYMPTOM — ROUGH IDLING AND/OR MISSING

HECK DIAGNOSIS SYSTEM
heck for output of diagnostic code.
ee page FI-25)

Malfunction code(s) → Diagnostic code(s)
4A-FE (See page FI-28)
4A-GE (See page FI-29)

CK Normal code

HECK FOR VACUUM LEAKS IN AIR TAKE LINE

BAD →
1. Oil dipstick
2. Hose connection(s)
3. PCV hose(s)
4. EGR system — EGR valve stays open

OK

ECK AIR FILTER ELEMENT

BAD → Element — Clean or replace

OK

ECK IDLE SPEED (AND IDLE CO ONCENTRATION)
tandard: 800 rpm

NO →
Idle speed — Adjust
4A-FE (See pages EM-22, 23)
4A-GE (See pages EM-30, 31)

OK

ECK IGNITION TIMING
Connect terminals TE1 and E1 of the check connector
Check ignition timing.
Standard: 10° BTDC @ idle

NO →
Ignition timing — Adjust
4A-FE (See page EM-20)
4A-GE (See page EM-28)

OK

ECK SPARK PLUGS
andard: 0.8 mm (0.031 in.)
INT: Check compression pressure and ve clearance if necessary.

NO →
1. Spark plugs
2. Compression pressure
   Minimum: 10.0 kg/cm² (142 psi, 981 kPa) at 250 rpm
3. Valve clearance (Cold)
   Standard: IN 0.15 — 0.25 mm (0.006 — 0.010 in.)
   EX 0.20 — 0.30 mm (0.008 — 0.012 in.)

OK

ECK COLD START INJECTOR
e page FI-105)

BAD →
1. Cold start injector
2. Start injector time switch (See page FI-137)

OK

ECK FUEL PRESSURE
e page FI-97)

BAD →
1. Fuel pump (See page FI-94)
2. Fuel filter
3. Fuel pressure regulator (See page FI-109)

OK CONTINUED ON PAGE FI-20

OK CONTINUED FROM PAGE FI-19

CHECK INJECTORS
(See page FI-111)
BAD → Injection condition

OK

CHECK EFI ELECTRONIC CIRCUIT USING VOLT/OHMMETER
(See page FI-34)
BAD →
1. Wiring connections
2. Power to ECU
   (1) Fusible link(s)
   (2) Fuse(s)
   (3) EFI main relay
3. Air flow meter (w/ Air flow meter)
4. Vacuum sensor (w/o Air flow meter)
5. Water temp. sensor
6. Intake air temp. sensor
7. Injection signal circuit
   (1) Injector wiring
   (2) ECU
8. Oxygen sensor (w/ TWC)

OK

(w/o TWC)
CHECK VARIABLE RESISTOR
(See page FI-142)
BAD → Variable resistor

SYMPTOM — HIGH ENGINE IDLE SPEED (NO DR

CHECK ACCELERATOR LINKAGE
BAD → Linkage — Stuck

OK

CHECK AUXILIARY AIR VALVE
(See page FI-131)
BAD → Auxiliary air valve — Always open

OK

(4A-FE)
CHECK ISC VALVE
(See page FI-158)
BAD →
1. ISC valve
2. Air pipe(s)
3. Air hose(s)

OK

CHECK FOR VACUUM LEAKS IN AIR INTAKE LINE
BAD →
1. Oil dipstick
2. Hose connection(s)
3. PCV hose(s)
4. EGR system — EGR valve stays open
5. Brake booster line
6. Throttle valve adjusting (open stick)

OK

CHECK AIR CONDITIONER IDLE-UP CIRCUIT
BAD → Air valve for air conditioner — Leakage

OK

CHECK DIAGNOSIS SYSTEM
Check for output of diagnostic code.
(See page FI-25)
Malfunction code(s) →
Diagnostic code(s)
4A-FE (See page FI-28)
4A-GE (See page FI-29)

Normal code

CHECK THROTTLE POSITION SENSOR
(See page FI-123)
BAD → Throttle body

OK CONTINUED ON PAGE FI-21

OK CONTINUED FROM PAGE FI-20

CHECK FUEL PRESSURE
(See page FI-97)
→ BAD → Fuel pressure regulator – High pressure

OK

CHECK COLD START INJECTOR
(See page FI-105)
→ BAD → Cold start injector – Linkage

OK

CHECK INJECTORS
(See page FI-111)
→ BAD → Injectors – Leakage, Injection quantity

OK

CHECK EFI ELECTRONIC CIRCUIT USING VOLT/OHMMETER
(See page FI-34)
→ BAD →
1. Wiring connection
2. Power to ECU
   (1) Fusible link(s)
   (2) Fuse(s)
   (3) EFI main relay
3. Air flow meter (w/ Air flow meter)
4. Vacuum sensor (w/o Air flow meter)
5. Water temp. sensor
6. Intake air temp. sensor
7. Injection signal circuit
   (1) Injector wiring
   (2) ECU

SYMPTOM – ENGINE BACKFIRES-Lean Fuel Mixture

CHECK DIAGNOSIS SYSTEM
Check for output of diagnostic code.
(See page FI-25)
→ Malfunction code(s) →
Diagnostic code(s)
4A-FE (See page FI-28)
4A-GE (See page FI-29)

Normal code

CHECK FOR VACUUM LEAKS IN AIR INTAKE LINE
→ BAD →
1. Oil dipstick
2. Hose connection(s)
3. PCV hose(s)
4. EGR system – EGR valve stays open

OK

CHECK IGNITION TIMING
Connect terminals TE1 and E1 of the check connector.
Check ignition timing.
Standard: 10° BTDC @ idle
→ NO →
Ignition timing – Adjust
4A-FE (See page EM-20)
4A-GE (See page EM-28)

OK

CHECK IDLE SPEED (AND IDLE CO CONCENTRATION)
Standard: 800 rpm
→ NO →
1. Idle speed – Adjust
   4A-FE (See pages EM-22, 23)
   4A-GE (See pages EM-30, 31)
2. Idle CO concentration – Adjust

OK CONTINUED ON PAGE FI-22

OK CONTINUED FROM PAGE FI-21

CHECK COLD START INJECTOR
(See page FI-105)
→ BAD
1. Cold start injector
2. Start injector time switch
(See page FI-137)

OK

CHECK FUEL PRESSURE
(See page FI-97)
→ BAD
1. Fuel pump (See page FI-94)
2. Fuel filter
3. Fuel pressure regulator
(See page FI-109)

OK

CHECK INJECTORS
(See page FI-111)
→ BAD
Injectors – Clogged

OK

CHECK EFI ELECTRONIC CIRCUIT USING VOLT/OHMMETER
(See page FI-34)
→ BAD
1. Wiring connections
2. Power to ECU
(1) Fusible link(s)
(2) Fuse(s)
(3) EFI main relay
3. Air flow meter (w/ Air flow meter)
4. Vacuum sensor (w/o Air flow meter)
5. Water temp. sensor
6. Intake air temp. sensor
7. Throttle position sensor
8. Injection signal circuit
(1) Injector wiring
(2) Fuel cut RPM (See page FI-153)
(3) ECU
9. Oxygen sensor (w/ TWC)

OK

(w/o TWC)
CHECK VARIABLE RESISTOR
(See page FI-142)
→ BAD
Variable resistor

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

CHECK DIAGNOSIS SYSTEM
Check for output of diagnostic code.
(See page FI-25)
→ Malfunction code(s)
Diagnostic code(s)
4A-FE (See page FI-28)
4A-GE (See page FI-29)

Normal

CHECK IGNITION TIMING
1. Connect terminals TE1 and E1 of the check connector
2. Check ignition timing.
Standard: 10° BTDC @ idle
→ NO
Ignition timing – Adjust
4A-FE (See page EM-20)
4A-GE (See page EM-28)

OK CONTINUED ON PAGE FI-23

OK CONTINUED FROM PAGE FI-22

HECK IDLE SPEED (AND IDLE CO ONCENTRATION)
Standard: 800 rpm

NO →
1. Idle speed – Adjust
   4A-FE (See pages EM-22, 23)
   4A-GE (See pages EM-30, 31)
2. Idle CO concentration – Adjust

OK ↓

HECK COLD START INJECTOR
(See page FI-105)

BAD →
1. Cold start injector
2. Start injector time switch.
   (See page FI-137)

OK ↓

HECK FUEL PRESSURE
(See page FI-97)

BAD →
Fuel pressure regulator

OK ↓

HECK THROTTLE POSITION ENSOR
A-FE (See page FI-123)
A-GE (See page FI-127)

BAD →
Throttle body

OK ↓

HECK INJECTORS (See page FI-111)

BAD →
Injectors – Leakage

OK ↓

HECK SPARK PLUGS
tandard: 0.8 mm (0.031 in.)
INT: Check compression pressure and lve clearance if necessary.

NO →
1. Spark plugs
2. Compression pressure
   Minimum: 10.0 kg/cm² (142 psi, 981 kPa) at 250 rpm
3. Valve clearance (Cold)
   Standard: IN 0.15 – 0.25 mm (0.006 – 0.010 in.)
   EX 0.20 – 0.30 mm (0.008 – 0.012 in.)

OK ↓

HECK EFI ELECTRONIC CIRCUIT SING VOLT/OHMMETER
(See page FI-34)

BAD →
1. Throttle position sensor
2. Injection signal circuit
   (1) Injector wiring
   (2) Fuel cut RPM (See page FI-153)
   (3) ECU
3. Oxygen sensor (w/ TWC)

SYMPTOM — ENGINE HESITATES AND/OR POOR ACCELERATION

HECK CLUTCH OR BRAKES

BAD →
1. Clutch – Slips
2. Brakes – Drag

OK ↓

HECK FOR VACUUM LEAKS IN AIR NTAKE LINE

BAD →
1. Oil dipstick
2. Hose connection(s)
3. PCV hose(s)
4. EGR system – EGR valve stays open

OK CONTINUED ON PAGE FI-24

OK CONTINUED FROM PAGE FI-23

CHECK AIR FILTER ELEMENT → BAD → Element – Clean or replace

OK

CHECK DIAGNOSIS SYSTEM
Check for output of diagnostic code.
(See page FI-25) → Malfunction code(s) → Diagnostic code(s)
4A-FE (See page FI-28)
4A-GE (See page FI-30)

Normal code

CHECK IGNITION SPARK
4A-FE (See page IG-6)
4A-GE (See page IG-10) → BAD →
1. High-tension cord(s)
2. IIA or Distributor
3. Ignition coil, igniter

OK

CHECK IGNITION TIMING
1. Connect terminals TE1 and E1 of the check connector
2. Check ignition timing.
Standard: 10° BTDC @ idle → NO → Ignition timing – Adjust
4A-FE (See page EM-20)
4A-GE (See page EM-28)

OK

CHECK FUEL PRESSURE
(See page FI-97) → BAD →
1. Fuel pump (See page FI-94)
2. Fuel filter
3. Fuel pressure regulator (See page FI-109)

OK

CHECK INJECTORS
(See page FI-111) → BAD → Injection condition

OK

CHECK SPARK PLUGS
Standard: 0.8 mm (0.031 in.)
HINT: Check compression pressure and valve clearance if necessary. → BAD →
1. Spark plugs
2. Compression pressure
Minimum: 10.0 kg/cm² (142 psi, 981 kPa) at 250 rpm
3. Valve clearance (Cold)
Standard: IN 0.15 – 0.25 mm (0.006 – 0.010 in.)
EX 0.20 – 0.30 mm (0.008 – 0.012 in.)

OK

CHECK INTAKE VALVE → BAD → Intake valve – corbon deposits

OK

CHECK EFI ELECTRONIC CIRCUIT USING VOLT/OHMMETER
(See page FI-34) → NO →
1. Wiring connections
2. Power to ECU
(1) Fusible link(s)
(2) Fuse(s)
(3) EFI main relay
3. Air flow meter (w/ Air flow meter)
4. Vacuum sensor (w/o Air flow meter)
5. Water temp. sensor
6. Intake air temp. sensor
7. Throttle position sensor
8. Injector signal circuit
(1) Injector wiring
(2) ECU

DIAGNOSIS SYSTEM

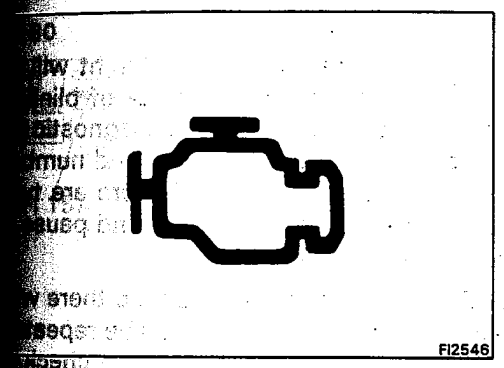
DESCRIPTION

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

By analyzing various signals as shown in the later table (See pages FI-28 to 31) 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 fuse stop 15A (AE) or EFI 15A (AT) 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.

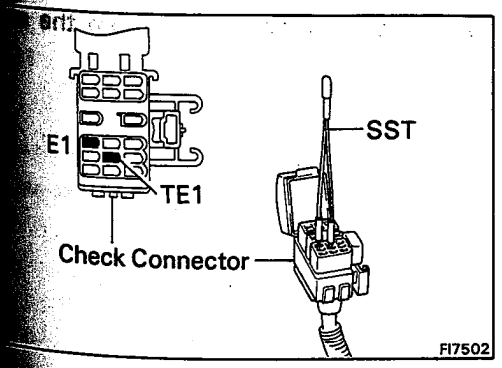
OUTPUT OF DIAGNOSTIC CODES

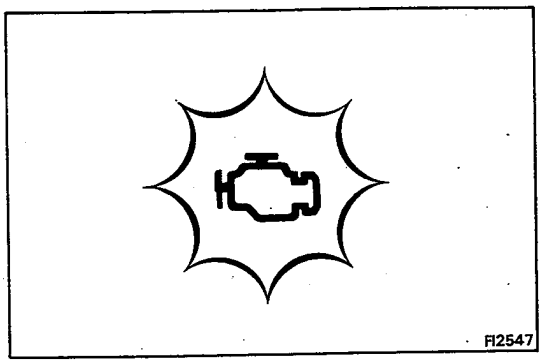
To obtain an output of diagnostic codes, proceed as follow:

1. Initial conditions
   (a) Battery voltage 11 V or more
   (b) Throttle valve fully closed (throttle position sensor IDL points closed)
   (c) Transmission in neutral position
   (d) Accessories switched OFF
2. Turn the ignition switch to ON. Do not start the engine.
3. Using SST, connect terminals TE1 and E1 of the check connector.

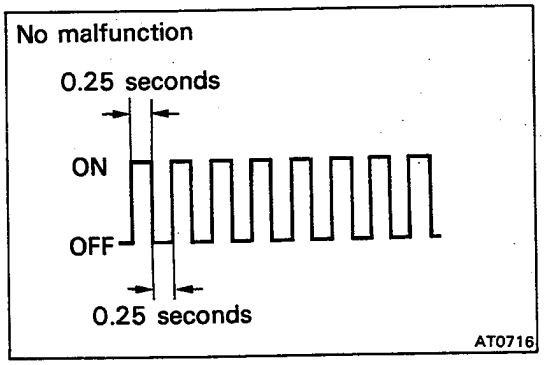
   SST 09843-18020

   LOCATION: See page FI-133




FI2547

4. Read the diagnostic code as indicated by the number of flashed of the "CHECK ENGINE" warning light.

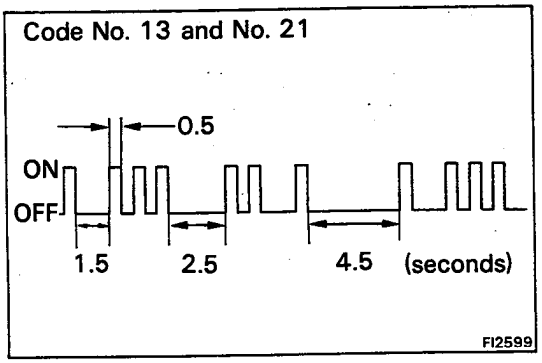


AT0716

Diagnostic Codes (See pages FI-28 to 31)

(a) Normal System Operation (no malfunction)

- The light will alternately blink ON and OFF at 0.25 second intervals.

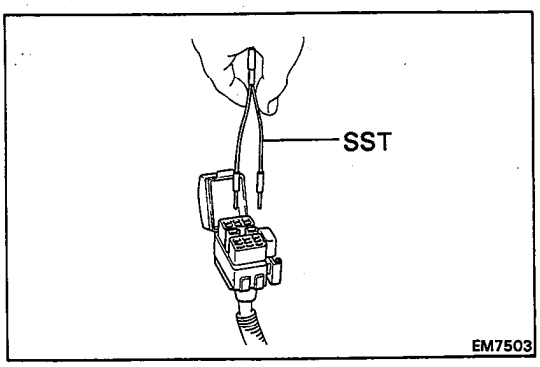


FI2599

(b) Malfunction Code Indication

- In the event of a malfunction, the light will blin every 0.5 seconds. The first number of blinks wi equal the first digit of a 2-digit diagnostic cod and, after a 1.5 second pause, the 2nd number o blinks will equal the 2nd digit. If there are two o more codes, there will be a 2.5 second pause be ween each code.
- After all the codes have been output, there will b a 4.5 second pause and they will all be repeated a long as the terminals TE1 and E1 of the check con nector are connected.

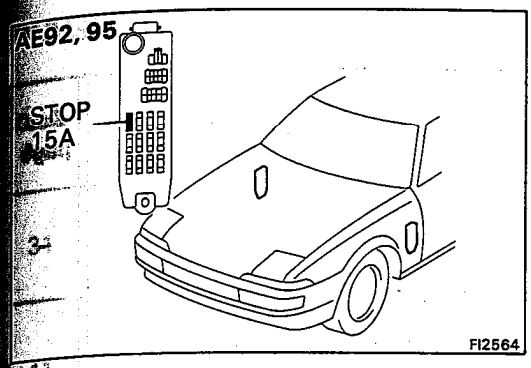
HINT: In the event of a number of trouble codes, indica tion will begin from the smaller value and continue to th larger.

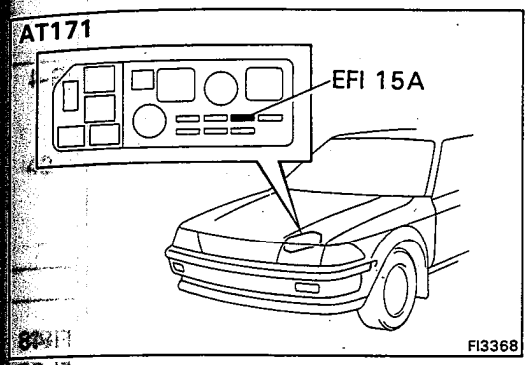


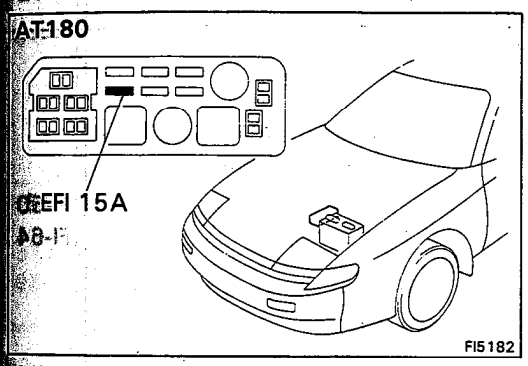
EM7503

5. After the diagnosis check, remove SST from the chec connector.

SST 09843-18020







CANCELLING DIAGNOSTIC CODE

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

   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 is has been recorded.

2. After cancellation, do the road test of the vehicle 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 diagnostic codes.

2. If two or more malfunctions are present at the same time, the lowest-numbered diagnostic code will be displayed first.

3. All detected diagnostic codes, except code No.51, will be retained in memory by the ECU from the time of detection until cancelled out.

4. Once the malfunction is corrected, the "CHECK ENGINE" warning light on the instrument panel will go out but the diagnostic code(s) will remain stored in ECU memory (except for code No.51).

DIAGNOSTIC CODES (4A-FE)

Code No.	Number of blinks "CHECK ENGINE"	System	Diagnosis	Trouble area	See page
–		Normal	This appears when none of the other codes are identified	–	–
12		PRM Signal	No "NE" or "G" signal to ECU within 2 seconds after the engine is cranked.	● Distributor (IIA) circuit ● Distributor (IIA) ● Starter signal circuit ● Igniter circuit ● Igniter ● ECU	IG-4
13		RPM Signal	No "NE" signal to ECU When the engine speed is above 1,000 rpm.	● Distributor (IIA) circuit ● Distributor (IIA) ● Igniter circuit ● Igniter ● ECU	
14		Ignition Signal	No "IGF" signal to ECU 4 times in succession.	● Igniter circuit ● Igniter ● ECU	FI-4 FI-6
*21		Oxygen Sensor Heater	During air-fuel ratio feedback correction, voltage output from the oxygen sensor does not exceed a set value on the lean side and the rich side continuously for a centain period.	● Oxygen sensor circuit ● Oxygen sensor	FI-5 FI-6
		Oxygen Sensor Heater	Open or short circuit in oxygen sensor heater (HT).	● Oxygen sensor heater circuit ● Oxygen sensor heater ● ECU	
22		Water Temp. Sensor	Open or short circuit in water temp. sensor signal (THW).	● Water temp. sensor circuit ● Water temp. sensor ● ECU	FI-4 FI-6
24		Intake air Temp. Sensor Signal	Open or short circuit in intake air temp. sensor signal (THA).	● Intake air temp. sensor circuit ● Intake air temp. sensor ● ECU	FI-4 FI-5
*25		Air-fuel Ratio Lean Malfunction	When air-fuel ratio feedback correction value cotinues at the upper (lean) limit for a certain period of time.	● Oxygen sensor circuit ● Oxygen sensor ● ECU	FI-5 FI-6
*26		Air-fuel Ratio Rich Malfunction			

*: w/ EGR System

AGNOSTIC CODES (4A-FE) (Cont'd)

Code No.	Number of blinks "CHECK ENGINE"	System	Diagnosis	Trouble area	See page
31	 FI1394	Vacuum Sensor Signal	Open or short circuit intake manifold pressure signal (PIM).	• Vacuum sensor circuit • Vacuum sensor • ECU	FI-44 FI-58
41	 FI1396	Throttle Position Sensor Signal	The "IDL" and "PSW" signals are output simultaneously for several seconds.	• Throttle position sensor circuit • Throttle position sensor • ECU	FI-41 FI-55
42	 FI1397	Vehicle Speed Sensor Signal	No "SPD" signal for 8 seconds when engine speed is between 2,600 rpm and 4,500 rpm and coolant temp. is below 80°C (176°F) except when racing the engine.	• Vehicle speed sensor circuit • Vehicle speed sensor • ECU	–
43	 FI1398	Starter Signal	No "STA" signal to ECU until engine speed reaches 800 rpm with vehicle not moving.	• IG switch circuit • IG switch, main relay circuit • ECU	FI-47 FI-61
51	 FI1399	Switch Condition Signal	No "IDL" signal, "NSW" signal or "A/C" signal to ECU, with the check terminals E1 and TE1 connected.	• A/C switch circuit • A/C switch • A/C amplifier • Neutral start switch circuit • Neutral start switch • Accelerator pedal and cable • Throttle position sensor • circuit • Throttle position sensor • ECU	FI-49 FI-63

IAGNOSTIC CODES (4A-GE)

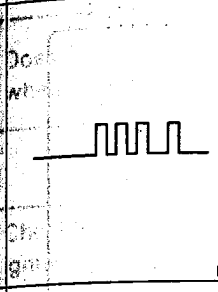
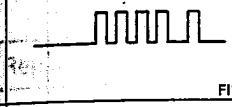
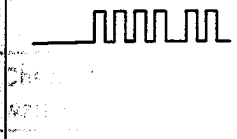
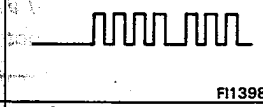
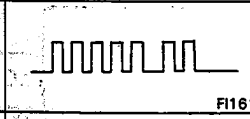
Code No.	Number of blinks "CHECK ENGINE"	System	Diagnosis	Trouble area	See page
51	 ON OFF FI1401	Normal	This appears when none of the other codes are identified.	–	–
12	 FI1389	PRM Signal	(w/o Air Flow Meter) No "NE" or "G" signal to ECU within 2 seconds after engine has been cranked. (w/ Air Flow Meter) • No "NE" signal to ECU within 2 seconds after the engine is cranked. • Ne "G" signal to ECU 4 times in succession when engine speed is between 500 rpm and 4,000 rpm.	• Distributor circuit • Distributor • Starter signal circuit • ECU	IG-5

DIAGNOSTIC CODES (4A-GE) (Cont'd)

Code No.	Number of blinks "CHECK ENGINE"	System	Diagnosis	Trouble area	See page
13	 FI1390	RPM Signal	(w/o Air Flow Meter) No "NE" signal to ECU When the engine speed is above 1,000 rpm	● Distributor circuit ● Distributor ● ECU	IG-
			(w/ Air Flow Meter) No "NE" signal to ECU when the engine speed is above 1,500 rpm		
14	 FI1391	Ignition Signal	(w/o Air Flow Meter) No "IGF" signal to ECU 4 – 7 times in succession.	● Igniter circuit ● Igniter ● ECU	FI- FI-
			(w/ Air Flow Meter) No "IGF" signal to ECU 4 times in succession.		
*21	 FI1400	Oxygen Sensor Signal	During air-fuel ratio feedback correction, voltage output from the oxygen sensor does not exceed a set value on the lean side and the rich side continuously for a certain period (OX1).	● Oxygen sensor circuit ● Oxygen sensor	FI-
		Oxygen Sensor Heater Circuit	Open or short circuit in oxygen sensor heater (HT).	● Oxygen sensor heater circuit ● Oxygen sensor heater ● ECU	
22	 FI1392	Water Temp. Sensor Signal	Open or short circuit in water temp. sensor signal (THW).	● Water temp. sensor circuit ● Water temp. sensor ● ECU	FI- FI-
24	 FI1611	Intake Air Temp. Sensor Signal	Open or short circuit in intake air temp. sensor signal (THA).	● Intake air temp. sensor circuit ● Intake air temp. sensor ● ECU	FI- FI-
*25	 FI2562	Air-fuel Ratio Lean Malfunction	When air-fuel ratio feedback compensation valve or adaptive control value continues at the upper (lean) or lower (rich) limit renewed for a certain period of time.	● Injector circuit ● Injector ● Oxygen sensor circuit ● Oxygen sensor ● ECU ● Fuel line pressure ● Air leak ● Air flow meter ● Air intake system	F
*26	 FI2563	Air-fuel Ratio Rich Malfunction		● Injector circuit ● Injector ● Oxygen sensor circuit ● Oxygen sensor ● Fuel line pressure ● Air flow meter ● Cold start injector circuit ● Cold start injector ● Water temp. sensor ● ECU	

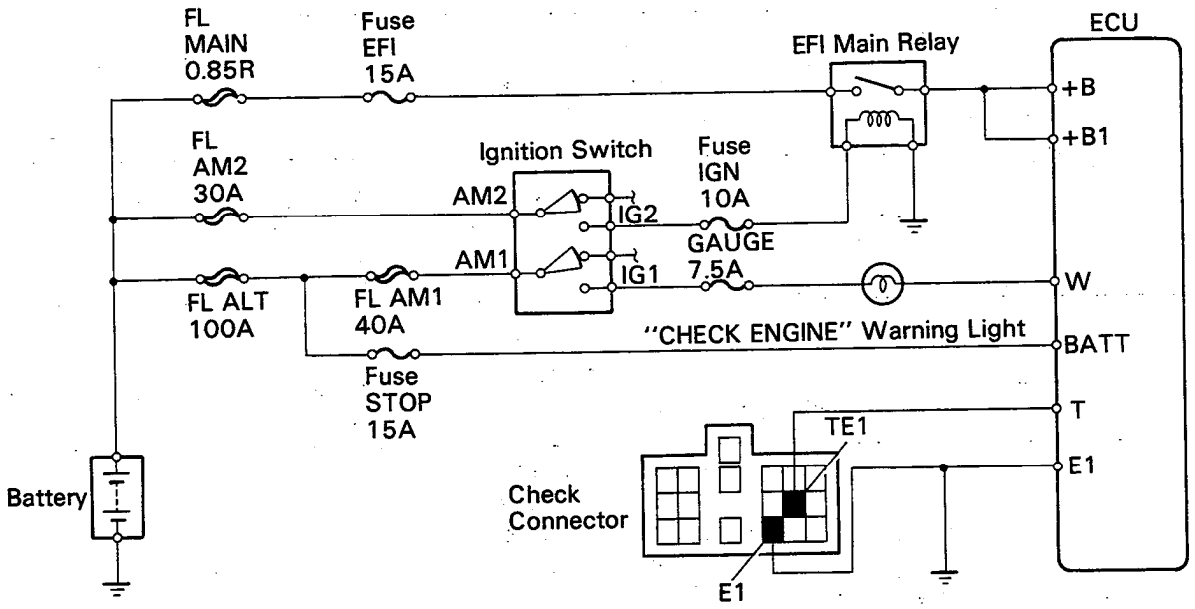
*: w/ Air Flow Mete

AGNOSTIC CODES (4A-GE) (Cont'd)

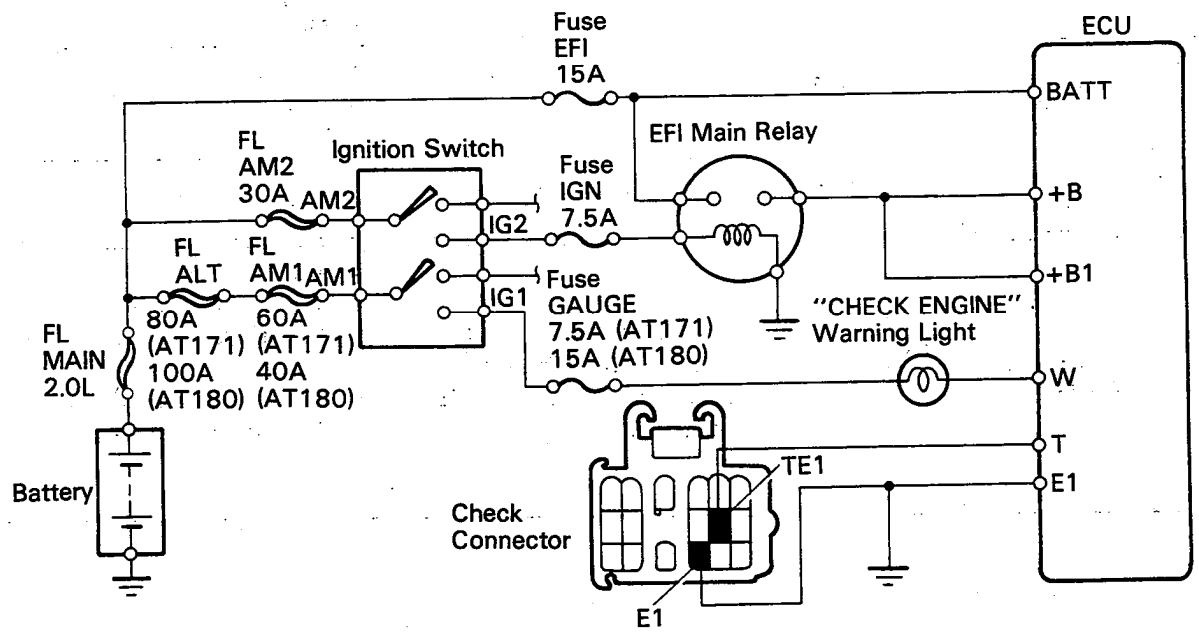
Code No.	Number of blinks "CHECK ENGINE"	System	Diagnosis	Trouble area	See page
31	 FI1394	(w/o Air Flow Meter) Vacuum Sensor Signal	Open or short circuit intake manifold pressure signal (PIM).	● Vacuum sensor circuit ● Vacuum sensor ● ECU	FI-73
		(w/ Air Flow Meter) Air Flow Meter Signal	Short circuit between VC and VB, VC and E2, or VS and VC.	● Air flow meter circuit ● Air flow meter ● ECU	FI-85
41	 FI1396	Throttle Position Sensor Signal	Open or short circuit in throttle position sensor signal (VTA).	● Throttle position sensor circuit ● Throttle position sensor ● ECU	FI-69 FI-83
42	 FI1397	Vehicle Speed Sensor Signal	(w/o Air Flow Meter) No "SPD" signal for 8 seconds when engine speed is between 2,500 rpm and 6,000 rpm. (w/ Air Flow Meter) No "SPD" signal for 8 seconds when engine speed is between 2,500 rpm and 5,500 rpm.	● Vehicle speed sensor circuit ● Vehicle speed sensor ● ECU	–
43	 FI1398	Starter Signal	No "STD" signal to ECU until engine speed reaches 800 rpm with vehicle not moving.	● Starter signal circuit ● Ignition switch, main relay circuit ● ECU	FI-76 FI-90
52	 FI1618	Knock Sensor Signal	Open or short circuit in knock sensor signal	● Knock sensor circuit ● Knock sensor circuit ● ECU	–
53	 FI1619	Knock Control Signal in ECU	Knock control in ECU faulty	● ECU	
51	 FI1399	Switch Condition Signal	No "IDL" signal, or "A/C" signal to ECU, with the check terminals E1 and TE1 connected	● A/C amplifier ● A/C switch circuit ● Accelerator pedal and cable ● Throttle position sensor ● Throttle position sensor circuit ● ECU	FI-78 FI-92

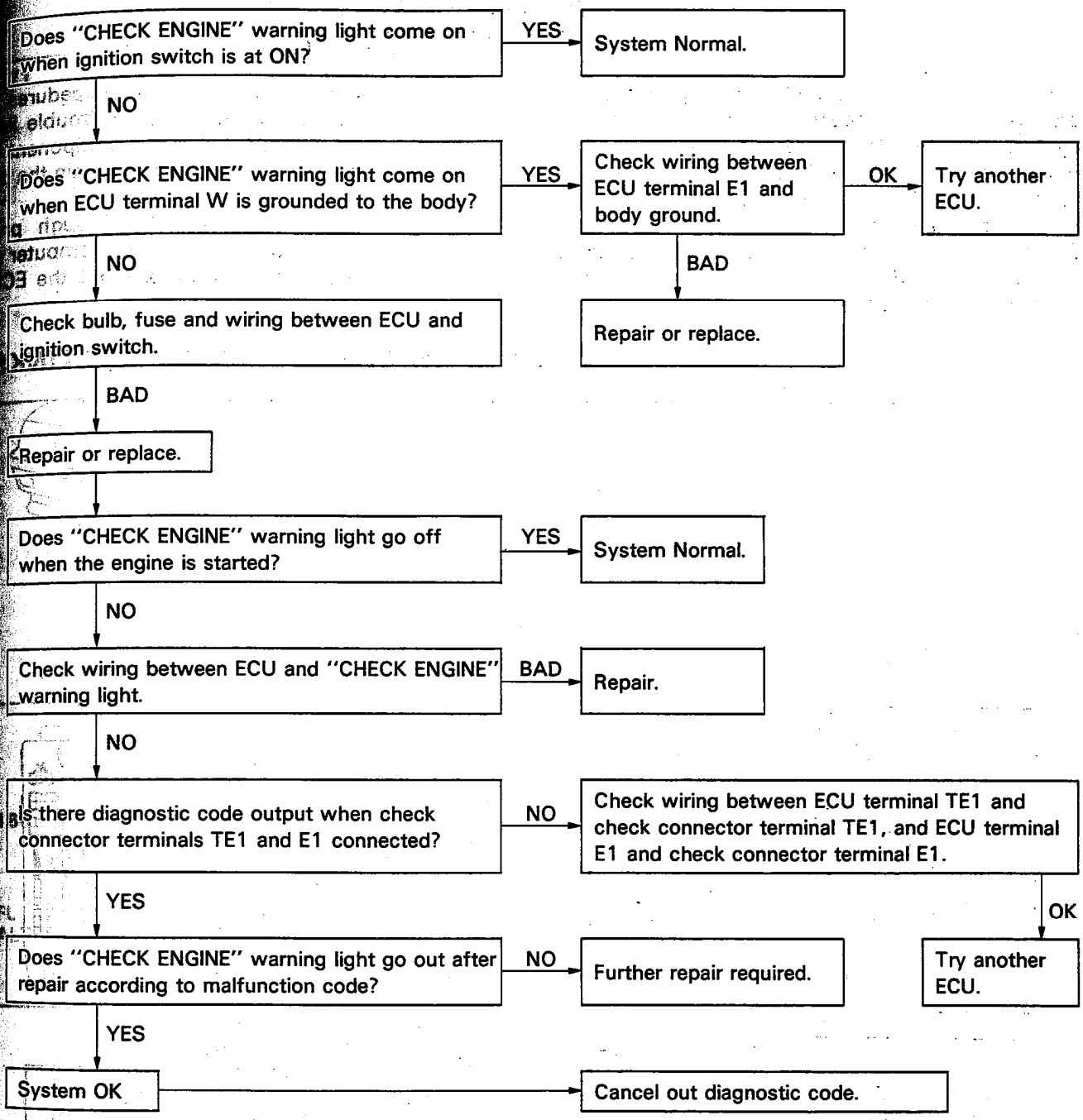
INSPECTION OF DIAGNOSIS CIRCUIT

AE



AT




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
NO
Check bulb, fuse and wiring between ECU and ignition switch.
Repair or replace.
BAD
Repair or replace.
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.
NO
Is there diagnostic code output when check connector terminals TE1 and E1 connected?
NO
Check wiring between ECU terminal TE1 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
System OK
Cancel out diagnostic code.

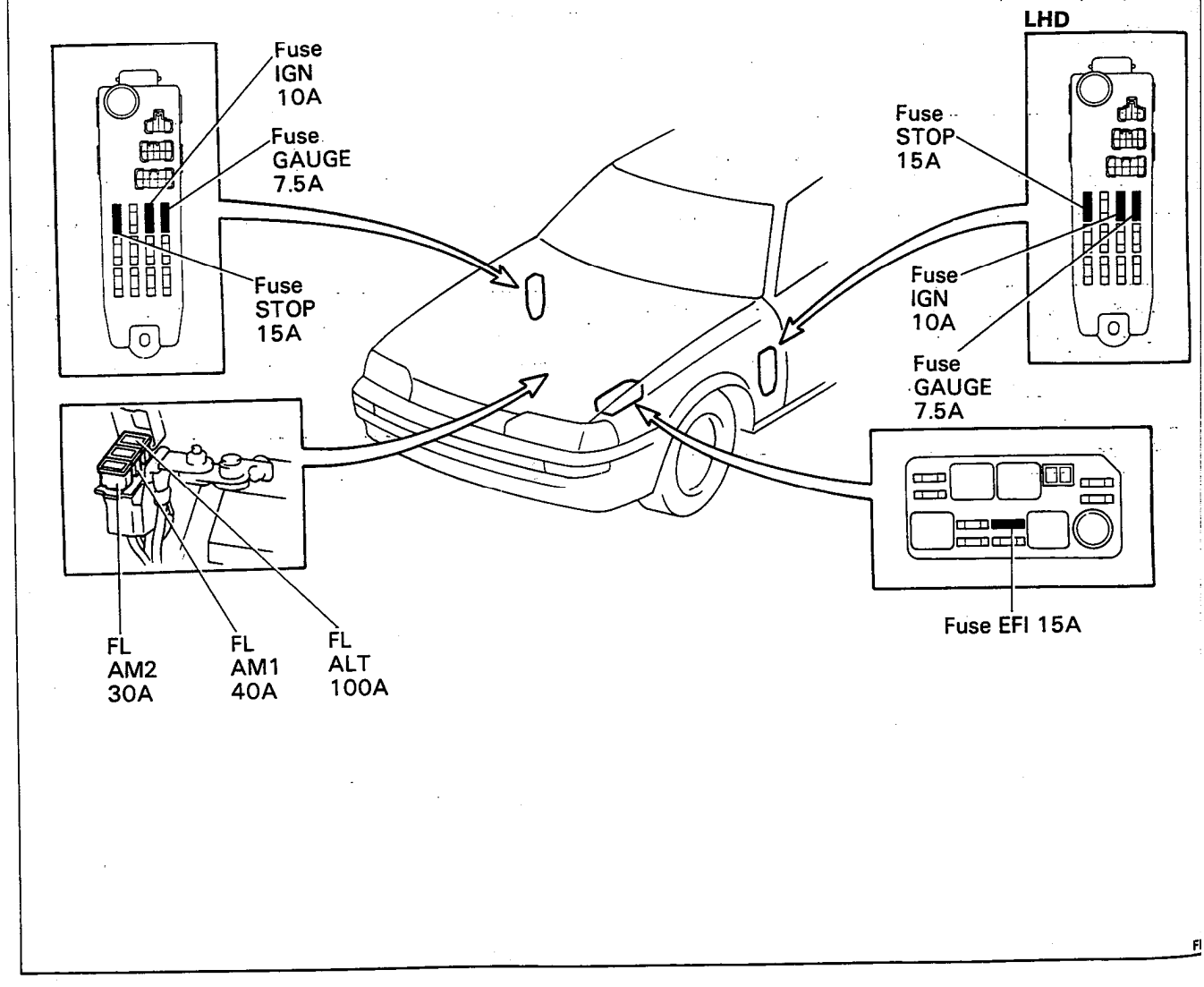
TROUBLESHOOTING WITH VOLT/OHMMETER

HINT: The following troubleshooting procedures are designed for inspection of each separate system, therefore the procedure may vary somewhat. However, troubleshooting should be performed refering to the inspection methods described in this manual.
Before beginning inspection, it is best to first make a simple check of the fuses, fusible links and the condition of the connectors.

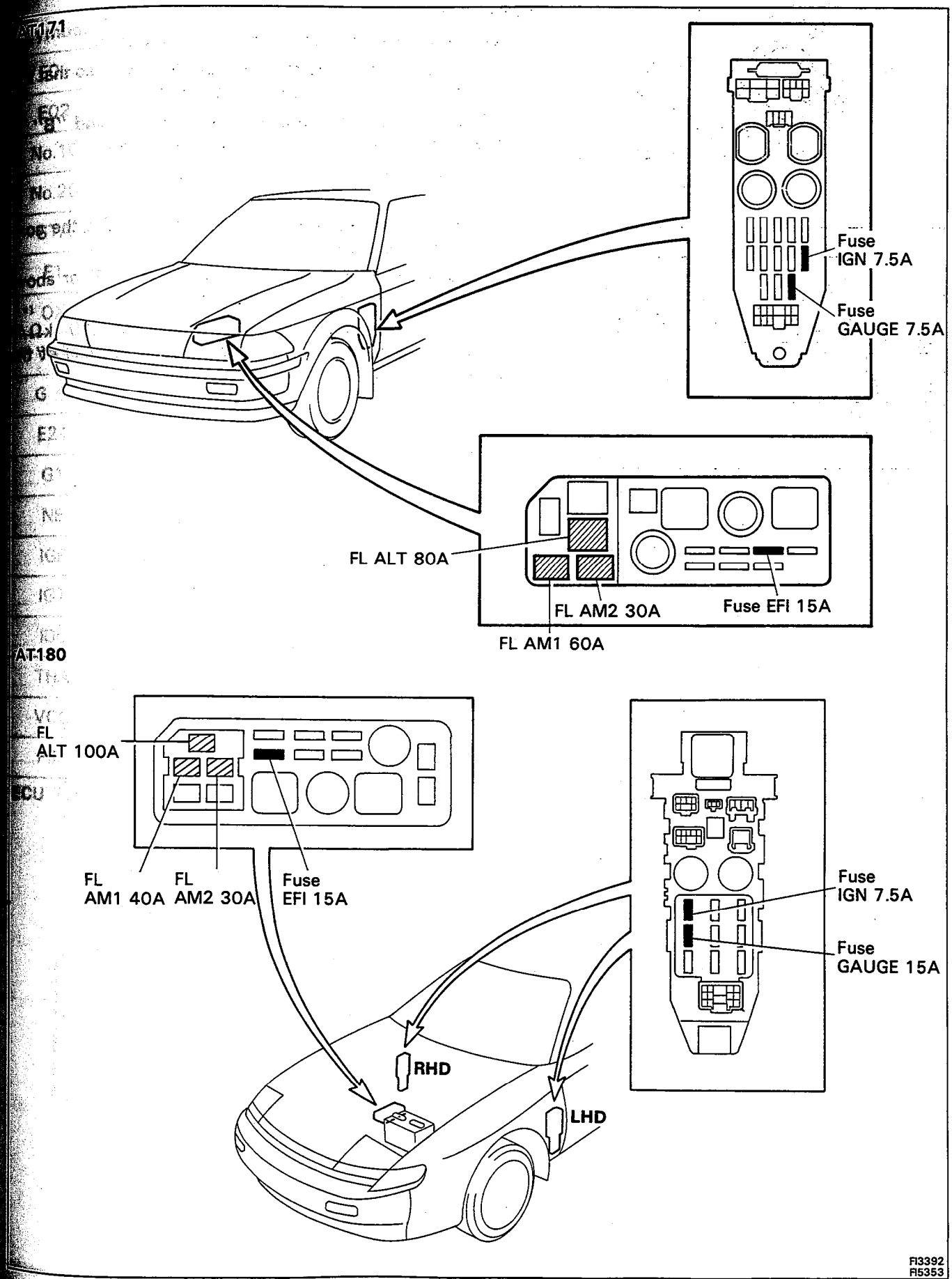
The following troubleshooting procedures ar based on the supposition that the trouble lies either a short or open circuit in a component ou side the computer or short circuit within the com puter.
If engine trouble occurs even through prope operating voltage is detected in the computer con nector, then it can be assumed that the ECU faulty and should be replaced.

LOCATION OF FUSES AND FUSIBLE LINKS

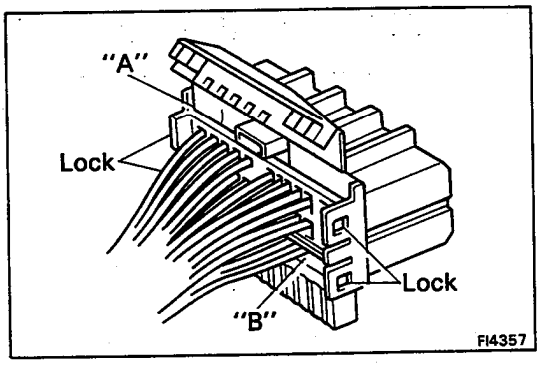
AE

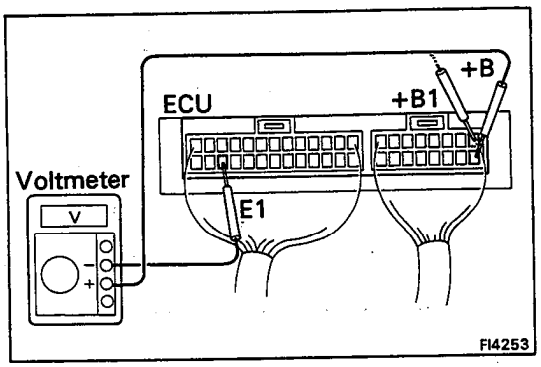


LOCATION OF FUSES AND FUSIBLE LINKS (Cont'd)



FI3392
FI5353





EFI SYSTEM CHECK PROCEDURE

PREPARATION

(a) Disconnect the connectors from the ECU.

(b) Remove the locks shown in the illustration so that the tester probe(s) can easily come in.

NOTICE: Pay attention to sections "A" and "B" in the illustration which can be easily broken.

(c) Reconnect the connectors to the ECU.

HINT:

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

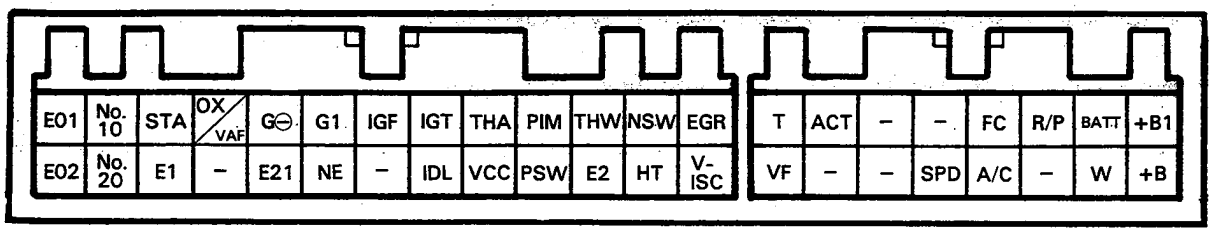
Using a voltmeter with high-impedance (10 kΩ/V minimum), measure the voltage at each terminal of the wiring connectors.

Terminals of ECU (4A-FE 2WD)

Symbol	Terminal Name	Symbol	Terminal Name
E01	POWER GROUND	PSW	THROTTLE POSITION SENSOR
E02	POWER GROUND	THW	WATER TEMP. SENSOR
No.10	INJECTOR	E2	SENSOR GROUND
No.20	INJECTOR	*3 NSW	NEUTRAL START SWITCH
STA	STARTER MAGNETIC SWITCH	*1 HT	OXYGEN SENSOR
E1	ECU GROUND	EGR	VSV (EGR)
*1 OX	OXYGEN SENSOR	V-ISC	VSV (ISC VALVE)
*2 VAF	VARIABLE RESISTOR	T	CHECK CONNECTOR
G ⊖	DISTRIBUTOR	VF	CHECK CONNECTOR
E21	SENSOR GROUND	*1 ACT	A/C AMPLIFIER
G1	DISTRIBUTOR	SPD	SPEED SENSOR
NE	DISTRIBUTOR	FC	CIRCUIT OPENING RELAY
IGF	IGNITER	A/C	A/C COMPRESSOR
IGT	IGNITER	*1R/P	FUEL CONTROL SWITCH
IDL	THROTTLE POSITION SENSOR	BATT	BATTERY
THA	INTAKE AIR TEMP. SENSOR	W	CHECK ENGINE WARNING LIGHT
VCC	VACUUM SENSOR	+B1	EFI MAIN RELAY
PIM	VACUUM SENSOR	+B	EFI MAIN RELAY

ECU Terminals

*1: w/ EGR System, *2: w/o EGR System, *3: A/T

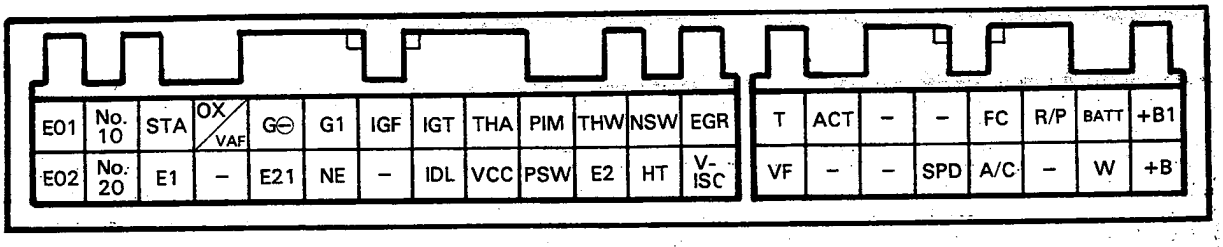


FI4266

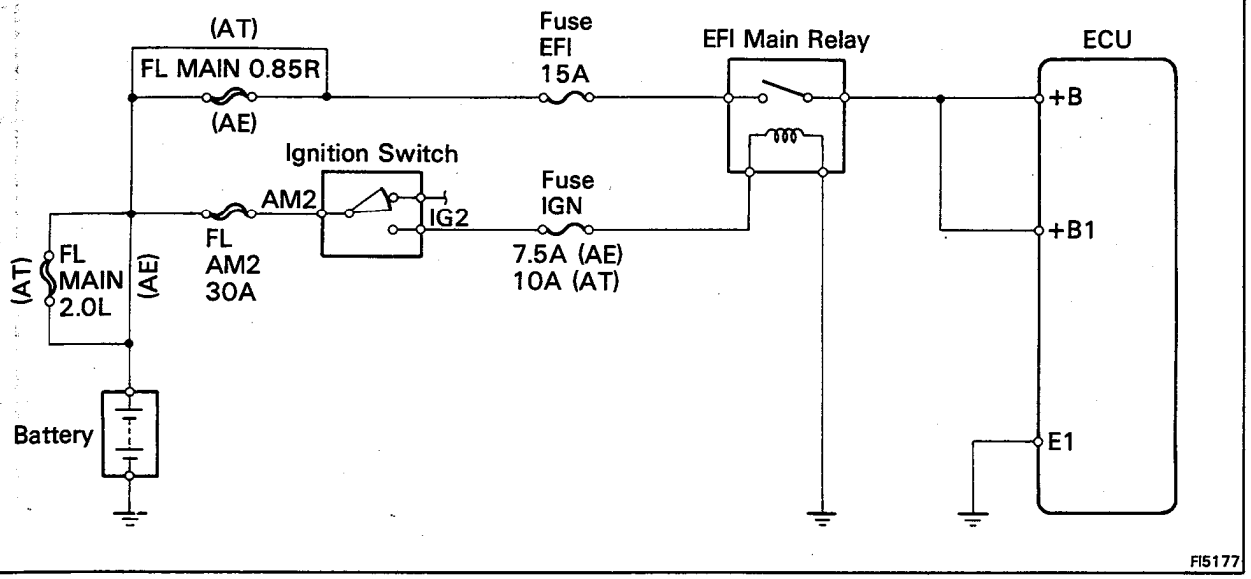
Voltage at ECU wiring connectors (4A-FE 2WD)

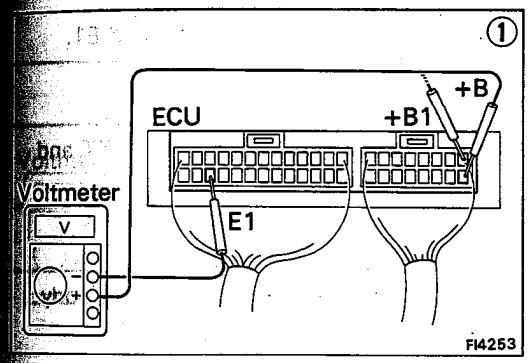
No.	Terminals	STD voltage (V)	Condition		See page
1	+B, +B1 – E1	10 – 14	Ignition SW ON		FI-39
2	BATT – E1	10 – 14	—		FI-40
3	IDL – E2	4.5 – 5.5	Ignition SW ON	Throttle valve open	FI-41
	PSW – E2			Throttle valve fully closed	
4	No.10, No.20 – E01, E02	10 – 14	Ignition SW ON		FI-42
5	W – E1	10 – 14	No trouble ("CHECK ENGINE" warning light off) and engine running		FI-43
6	PIM – E2	3.3 – 3.9	Ignition SW ON		FI-44
	VCC – E2	4.5 – 5.5			
7	THA – E2	2.0 – 2.5	Ignition SW ON	Intake air temp. 20°C (68°F)	FI-45
8	THW – E2	0.4 – 0.7		Coolant temp. 80°C (176°F)	FI-46
9	STA – E1	6 – 14	Cranking		FI-47
10	IGT – E1	0.7 – 1.0	Idling		FI-48
11	A/C – E1	5 – 14	Air conditioning ON		FI-49

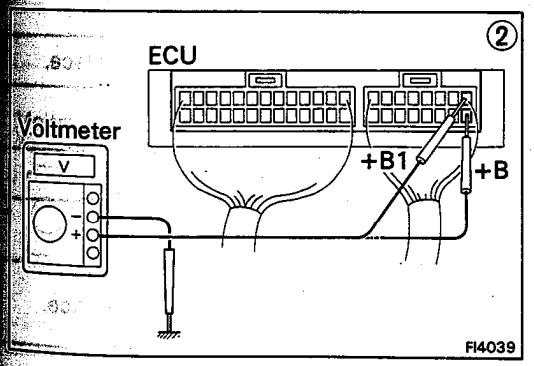
ECU Terminals

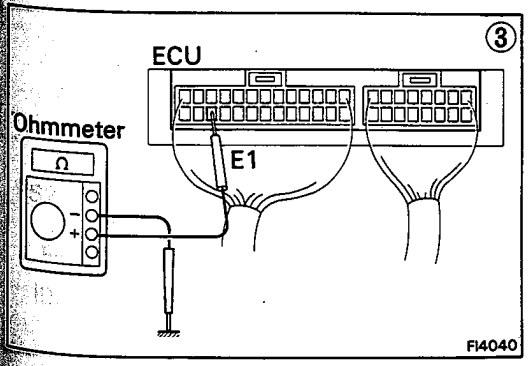


Terminals	Trouble	Condition	STD voltage
+B, +B1 – E1	No voltage	IG SW ON	10 – 14 V









① There is no voltage between ECU terminals +B (+B1) and E1. **(IG SW ON)**

↓

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

NO → OK

③ Check wiring between ECU terminal E1 and body ground.

OK → Try another ECU.

BAD → Repair or replace.

↓

Check fuses, fusible links and ignition switch. — BAD → Repair or replace.

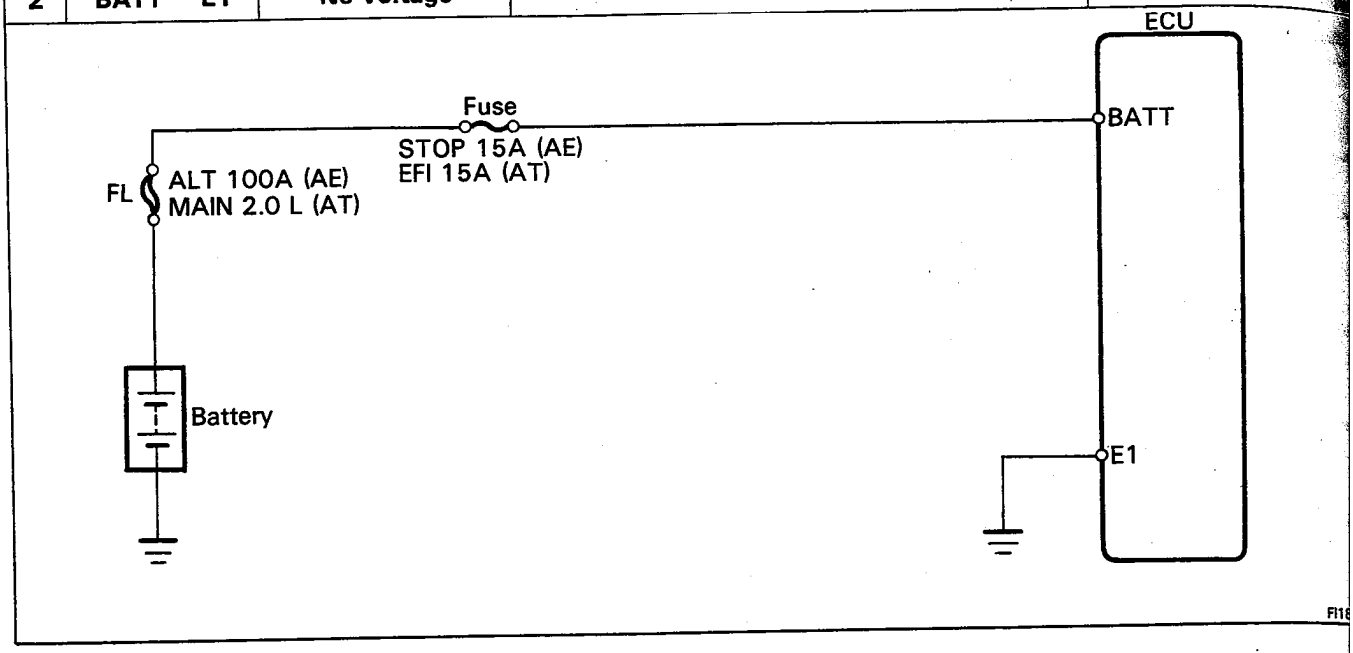
↓ OK

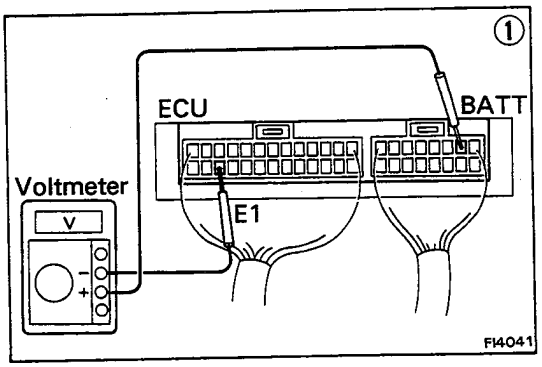
Check EFI main relay. (See page FI-134) — BAD → Replace.

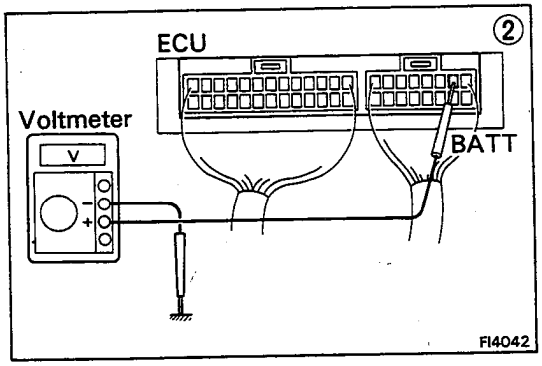
↓ OK

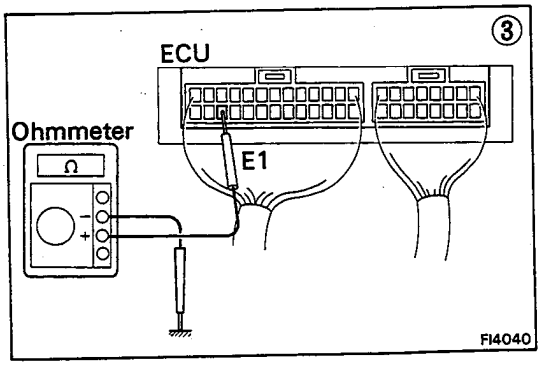
Check wiring between EFI main relay and battery. — BAD → Repair or replace.

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









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

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

NO

OK

③ Check wiring between ECU terminal E1 and body ground.

OK

Try another ECU.

BAD

Repair or replace.

Check fuse and fusible link.

BAD

Replace.

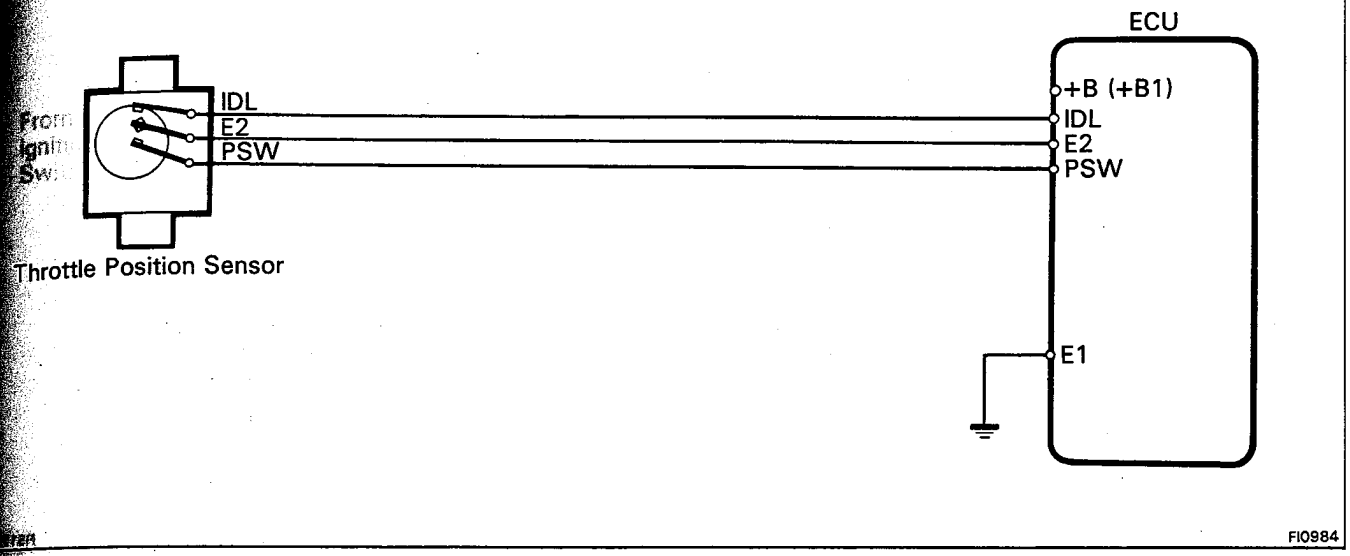
OK

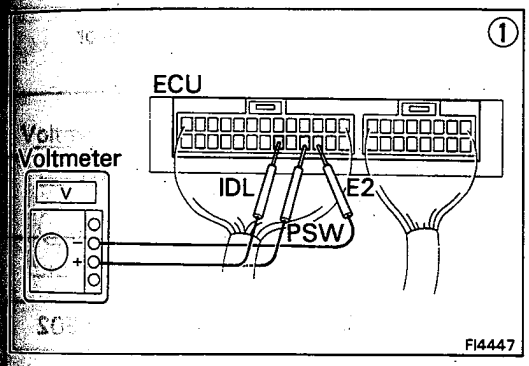
Check wiring between ECU terminal and battery.

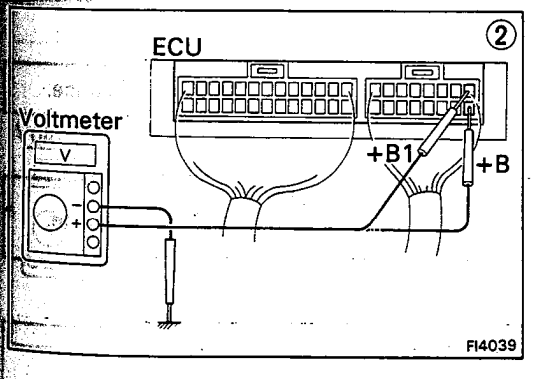
BAD

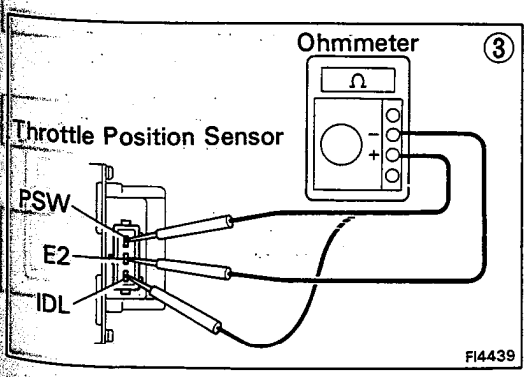
Repair or replace.

Terminals	Trouble		Condition	STD voltage
IDL – E2	No voltage	IG SW ON	Throttle valve open	4.5 – 5.5 V
PSW – E2			Throttle valve fully closed	4.5 – 5.5 V









① There is no voltage between ECU terminals IDL and E2. **(IG SW ON)** (Throttle valve open)

↓

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

NO → ↓ OK → Check wiring between ECU terminal E1 and body ground.

OK → Try another ECU.

BAD → Repair or replace.

↓ NO

Refer to +B – E1 trouble section. (No.1) (See page FI-39)

BAD → Repair or replace.

↓ OK

③ Check throttle position sensor. (See page FI-123)

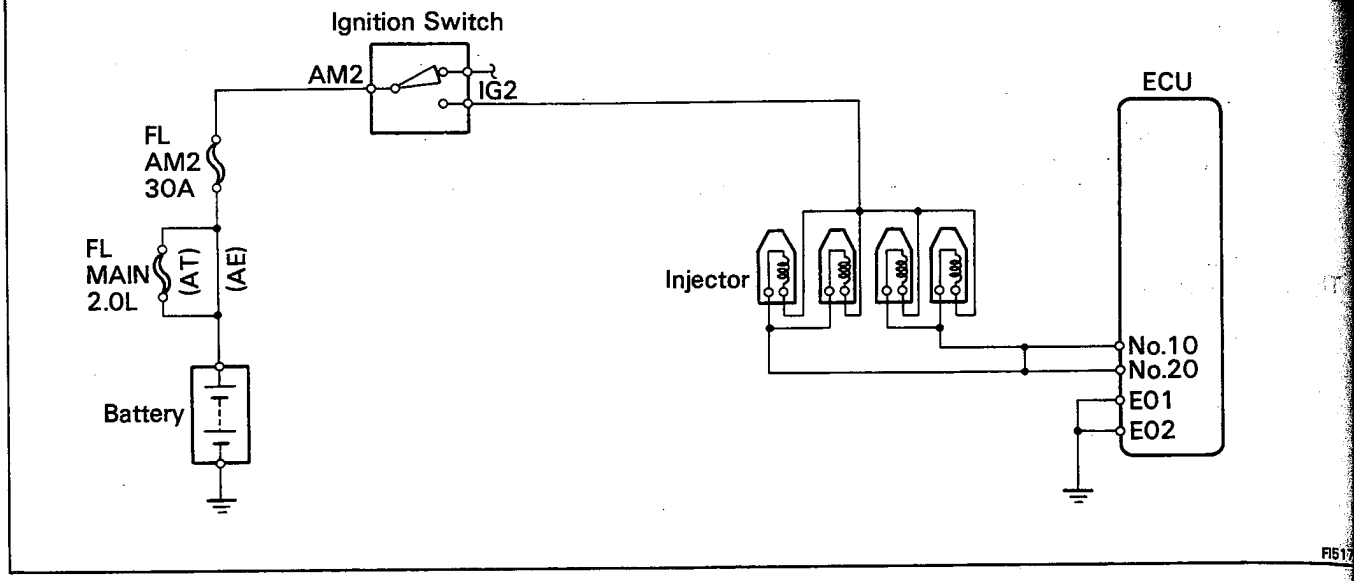
BAD → Repair or replace throttle position sensor.

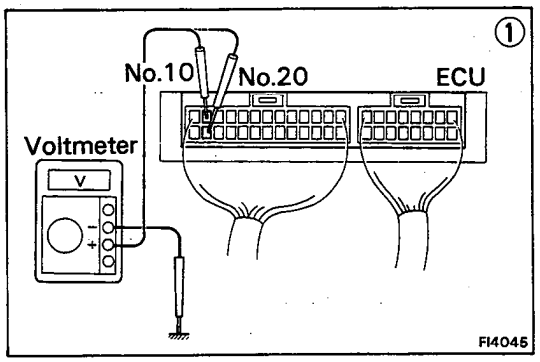
OK → Check wiring between ECU and throttle position sensor.

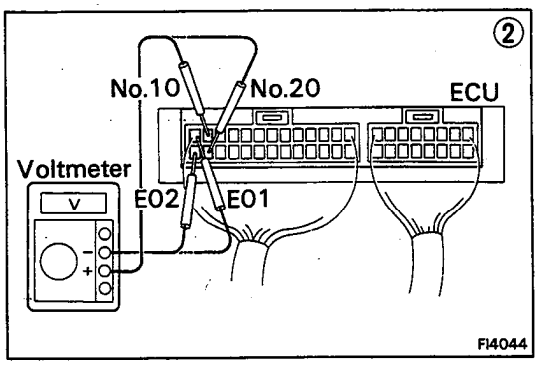
BAD → Repair or replace.

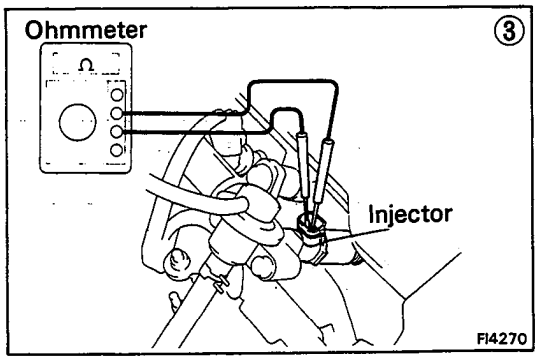
OK → Try another ECU.

No.	Terminals	Trouble	Condition	STD voltage
4	No.10 _ E01 No.20 E02	No voltage	IG SW ON	10 – 14 V









① There is no voltage between ECU terminals 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 and/or No.20 and body ground.

NO ← | → OK

OK: Check wiring between ECU terminal E01 and/or E02 and body ground.

OK → Try another ECU.

BAD → Repair or replace.

NO → Check fuse, fusible link, ignition switch. BAD → Repair or replace.

OK ↓

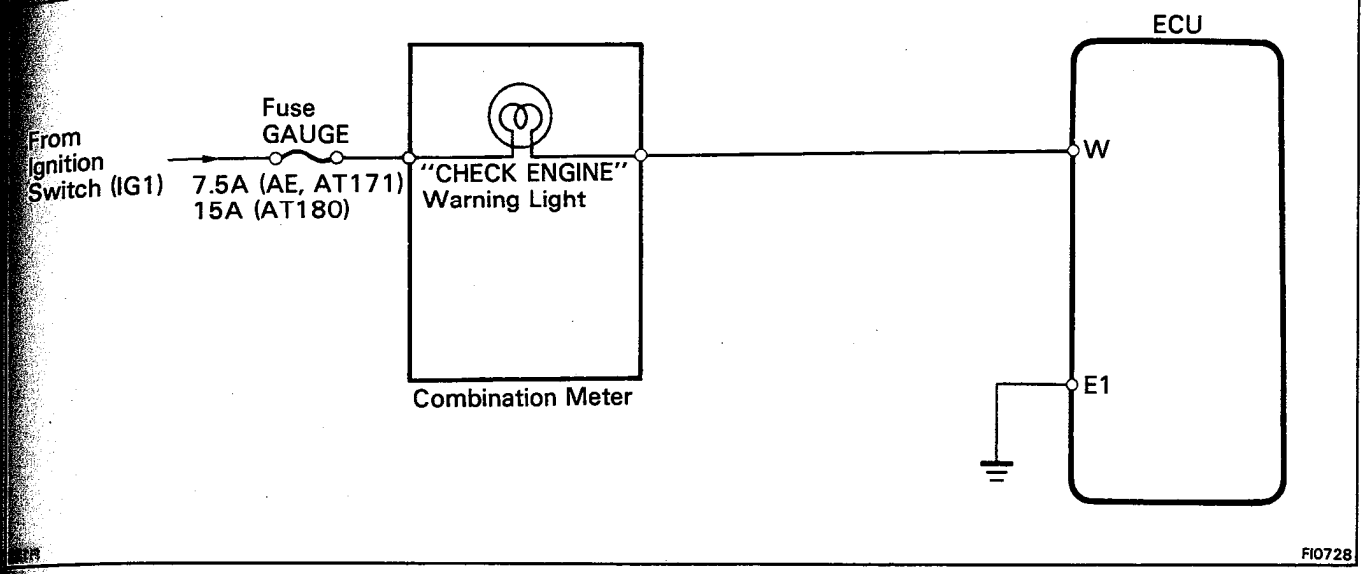
③ Check resistance of magnetic coil in each injector.
STD resistance: Approx. 13.8 Ω

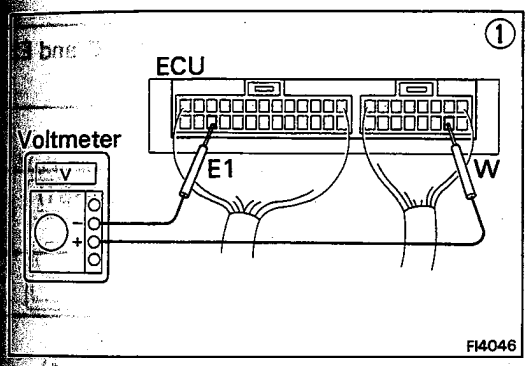
OK ↓

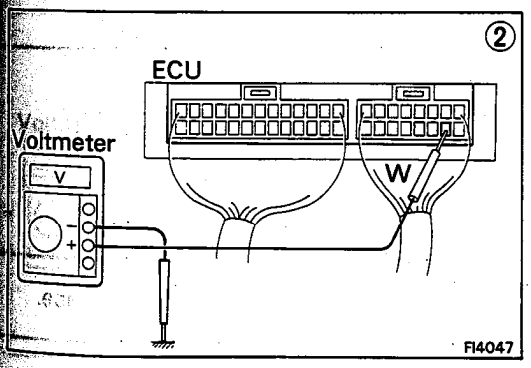
BAD → Replace injector.

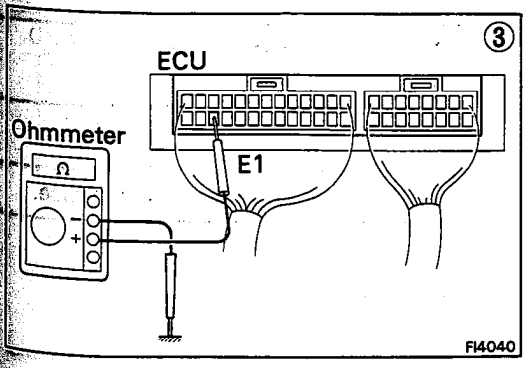
Check wiring between ECU terminal No.10 and/or No.20 and battery. BAD → Repair or replace.

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









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.

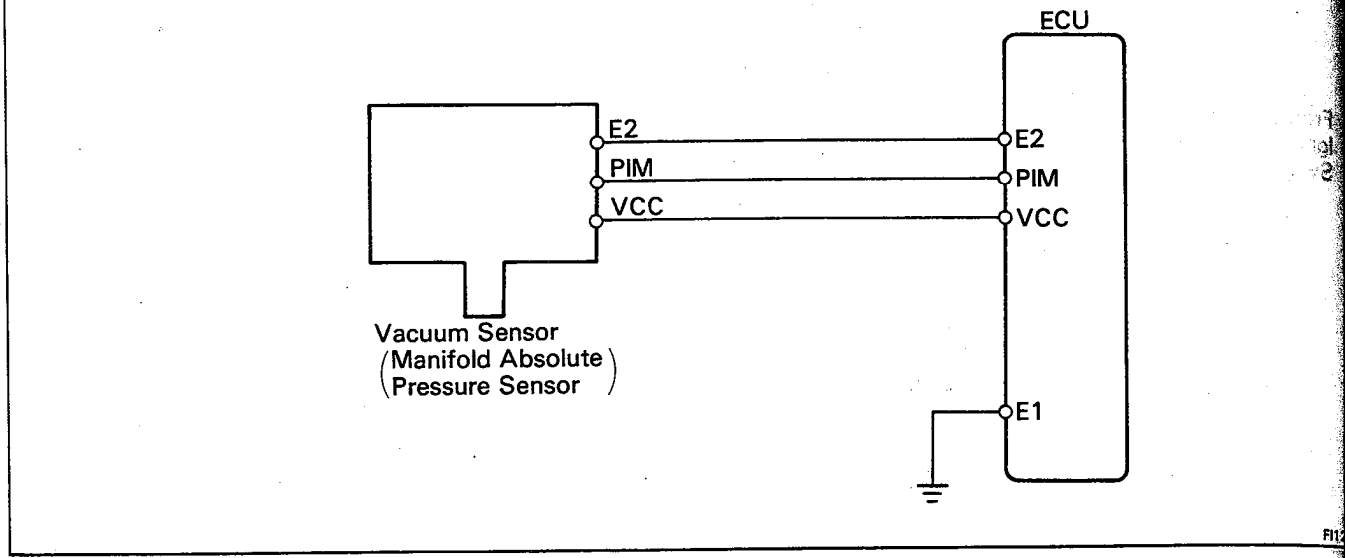
NO → ③ Check wiring between ECU terminal E1 and body ground.

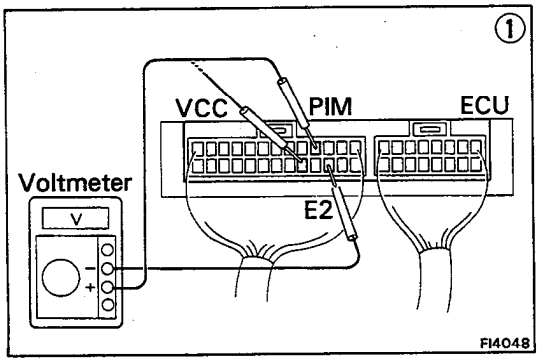
- OK → Try another ECU.
- BAD → Repair or replace.

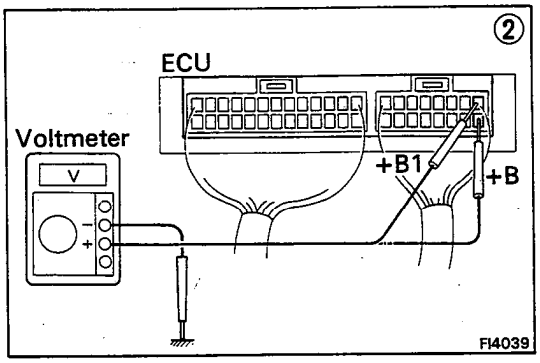
OK → Check GAUGE fuse and "CHECK ENGINE" warning light.

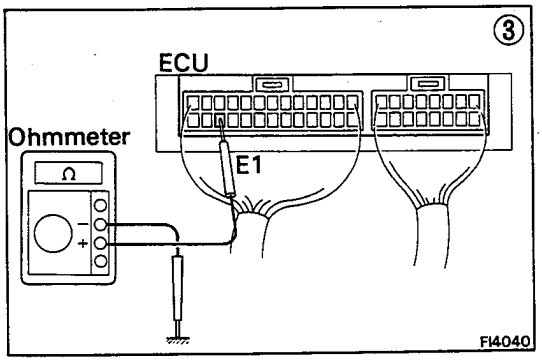
- BAD → Repair or replace. → Fuse blows again
- OK → Check wiring between ECU terminal W and fuse.
  - BAD → Repair or replace.

No.	Terminals	Trouble	Condition	STD voltage
6	PIM – E2	No voltage	IG SW ON	3.3 – 3.9 V
	VCC – E2			4.5 – 5.5 V









① There is no voltage between ECU terminals PIM or VCC and E **(IG SW ON)**

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

NO → Refer to +B – E1 trouble section (No.1). (See page FI-39)

NO

③ Check wiring between ECU terminal E1 and body ground.

OK

BAD → Repair or replace.

Check vacuum sensor. (See page FI-140)

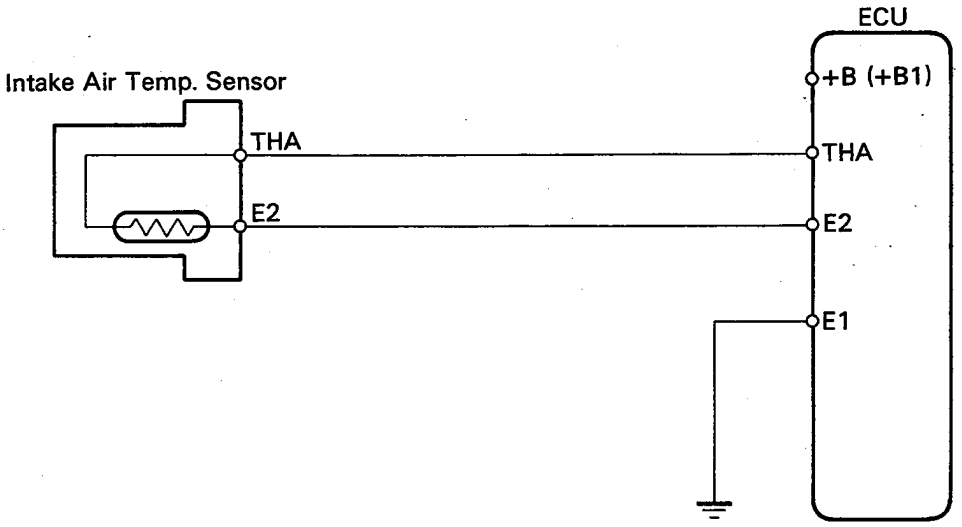
BAD → Replace vacuum sensor.

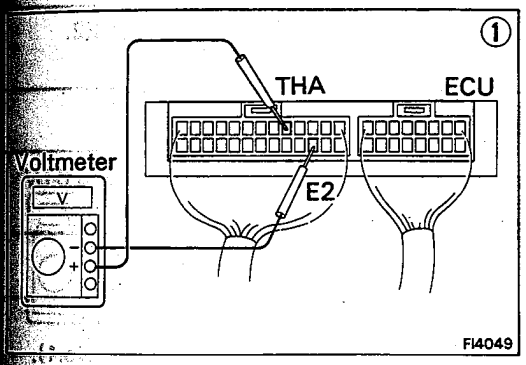
OK → Check wiring between ECU and vacuum sensor.

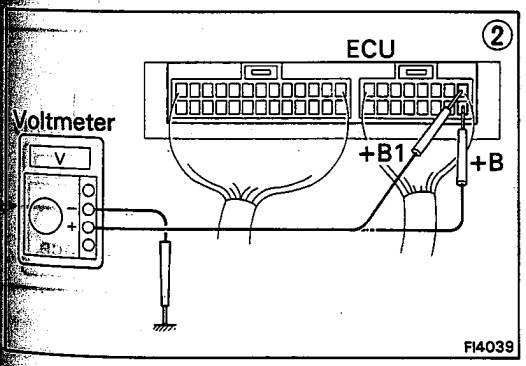
OK → Try another ECU.

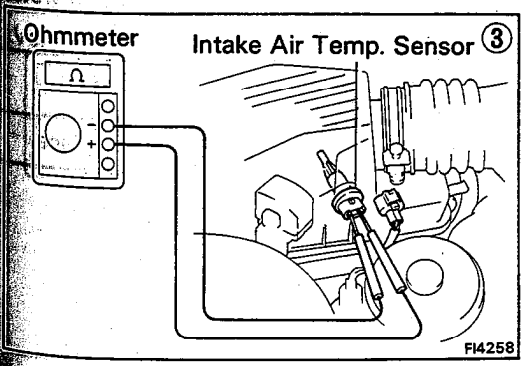
BAD → Repair or replace.

Terminals	Trouble	Condition		STD voltage
THA – E2	No voltage	IG SW ON	Intake air temperature 20°C (68°F)	2.0 – 2.5 V









① There is no voltage between ECU terminals THA 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 +B – E1 trouble section (No.1). (See page FI-39)

↓

Check wiring between ECU terminal E1 and body ground.

OK → ↓

BAD → Repair or replace.

↓

③ Check intake air temp. sensor. (See page FI-139)

BAD → Replace intake air temp. sensor

OK → ↓

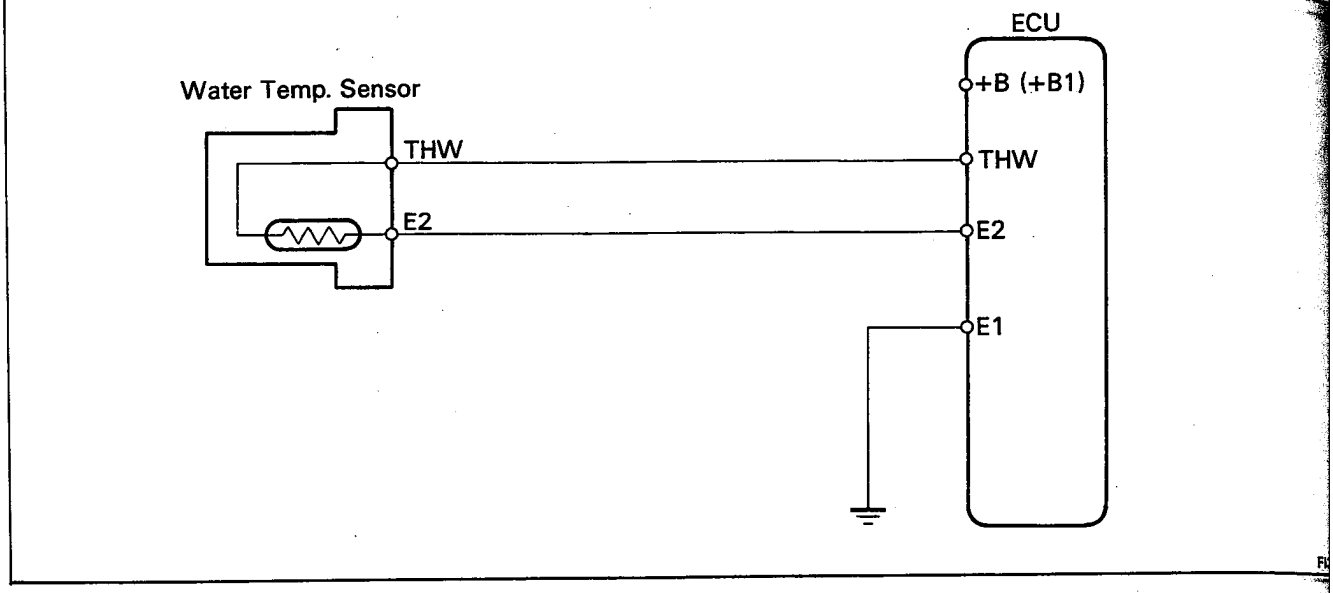
Check wiring between ECU and intake air temp. sensor.

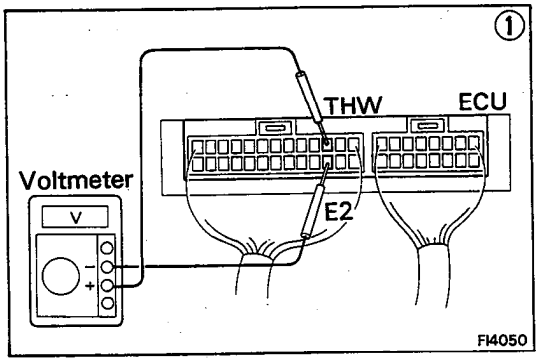
OK → ↓

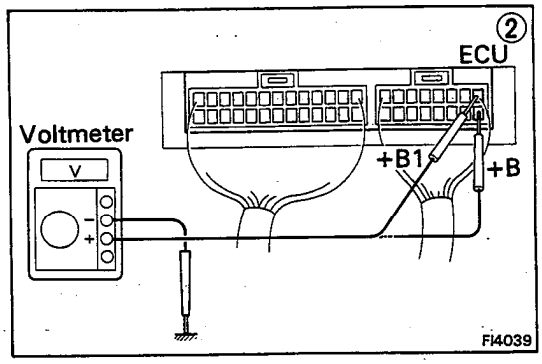
Try another ECU.

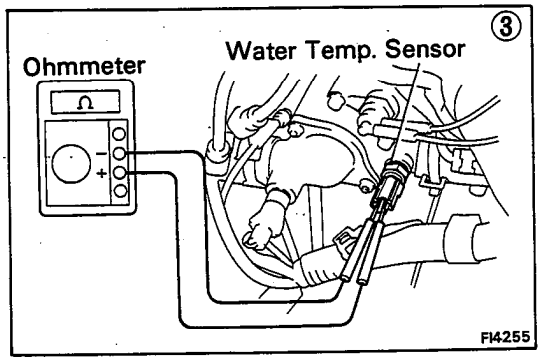
BAD → Repair or replace wiring.

No.	Terminals	Trouble	Condition		STD voltage
8	THW – E2	No voltage	IG SW ON	Coolant temperature 80°C (176°F)	0.4 – 0.7 V









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 +B – E1 trouble section (No.1). (See page FI-39)

↓

Check wiring between ECU terminal E1 and body ground.

OK ↓

BAD → Repair or replace.

↓

③ Check water temp. sensor. (See page FI-138)

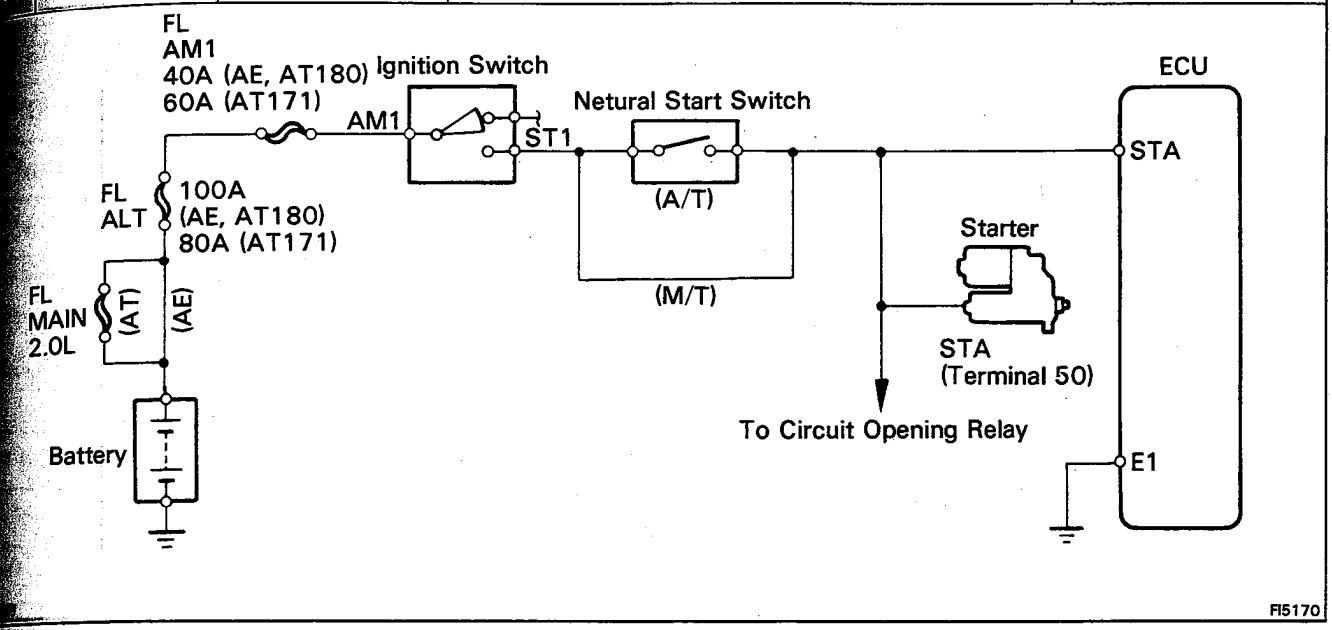
BAD → Replace water temp. sensor.

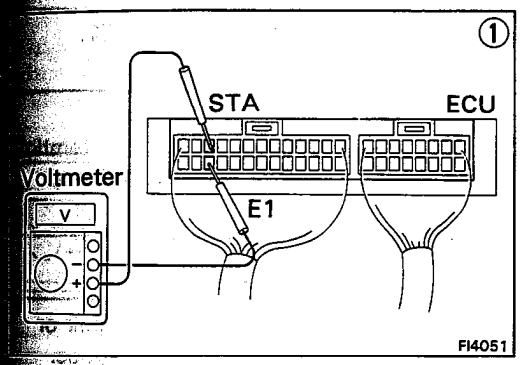
OK → Check wiring between ECU and wa temp. sensor.

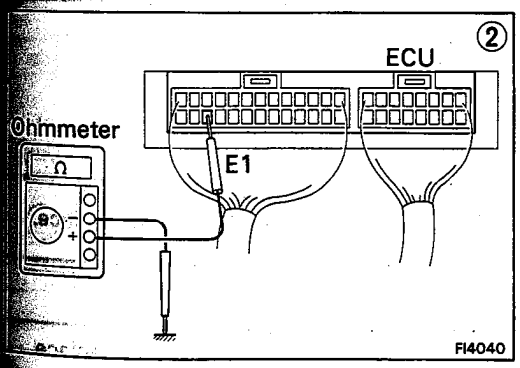
OK → Try another ECU.

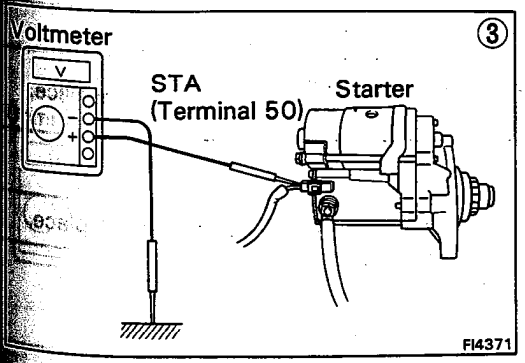
BAD → Repair or replace

Terminals	Trouble	Condition	STD voltage
V STA – E1	No voltage	Cranking	6 – 14 V





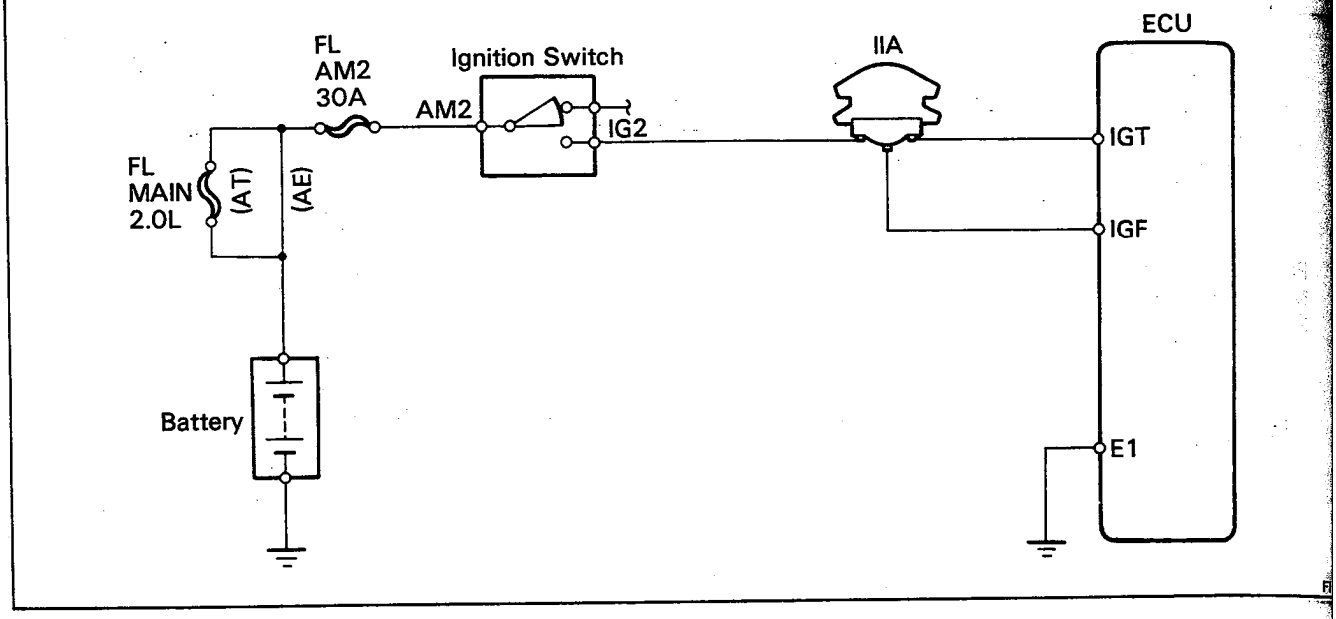


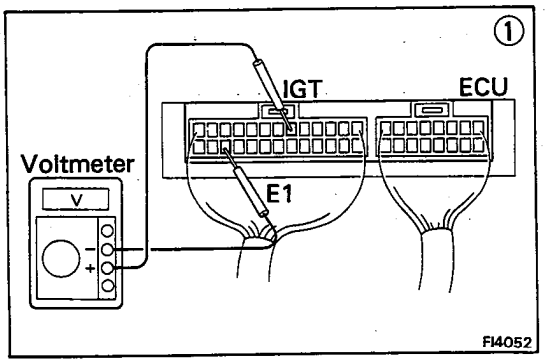


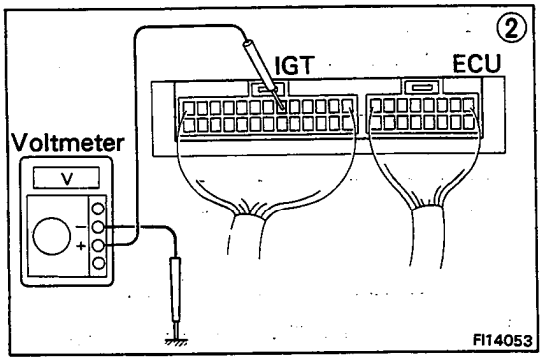
① There is no voltage between ECU terminals STA and E1. **(IG SW START)**

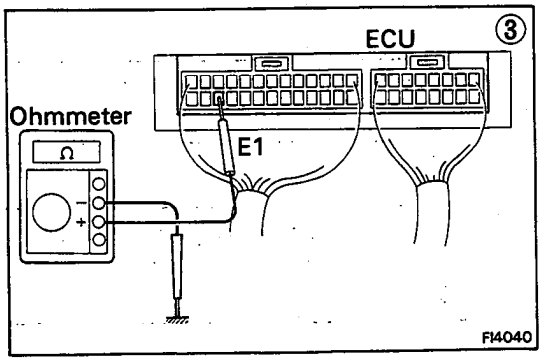
Check starter operation.
- OK → Check wiring between ECU terminal STA and ignition switch terminal ST1.
  - OK → ② Check wiring between ECU terminal E1 and body ground.
    - OK → Try another ECU.
    - BAD → Repair or replace.
  - BAD → Replace replace.
- BAD → Check fusible link, battery, wiring and ignition 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 → Check starter.
    - NO → Check wiring between ignition switch terminal ST1 and starter terminal STA (50)

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









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

③ → OK → Try another ECU.

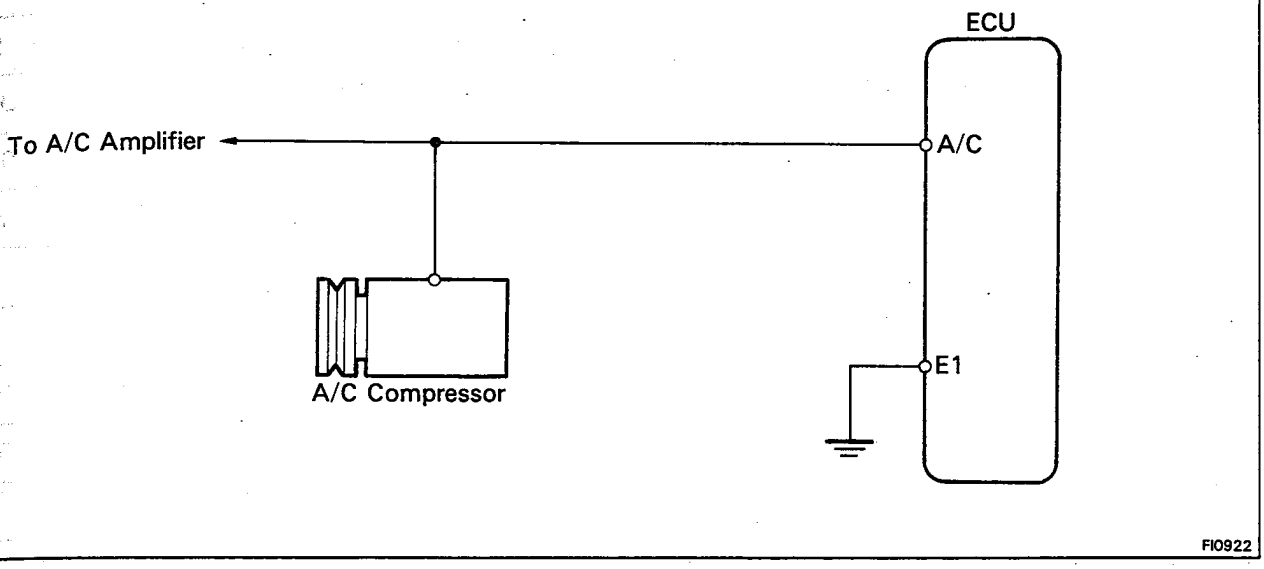
② → OK → Check fusible links and ignition switch. → BAD → Repair or replace.

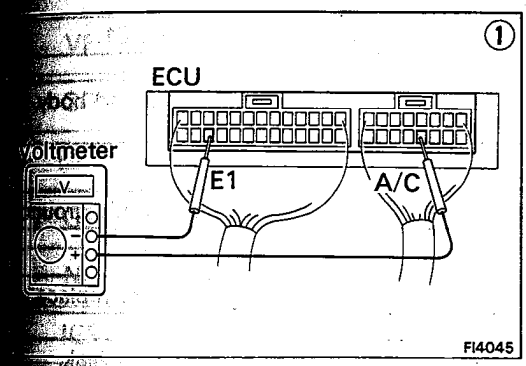
Check fusible links and ignition switch. → OK → Check IIA. (See page IG-8) → BAD → Repair or replace.

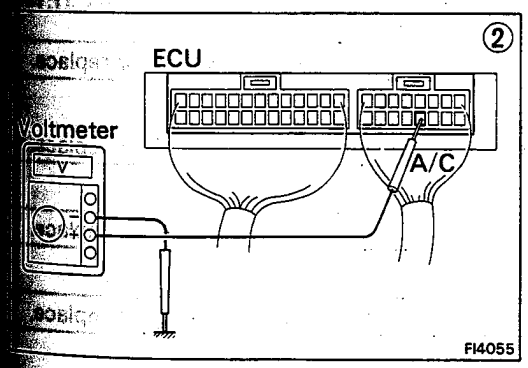
Check IIA. (See page IG-8) → OK → Check wiring between ECU and battery. → BAD → Repair or replace.

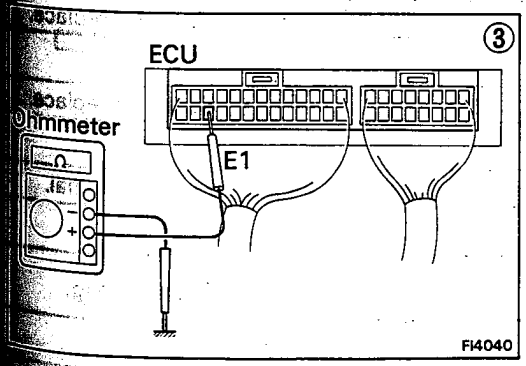
Check wiring between ECU and battery. → OK → Check igniter. (See page IG-6) → BAD → Repair or replace.

Terminals	Trouble	Condition	STD voltage
A/C – E1	No voltage	Air conditioning ON	5 – 14 V









① There is no voltage between ECU terminals A/C and E1. **(Air conditioning ON)**

↓

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

NO → ↓ OK

③ Check wiring between ECU terminal E1 and body ground.

OK → Try another ECU.

BAD → Repair or replace.

↓

Check compressor running.

OK → Check wiring between ECU terminal A/C and Amplifier.

BAD → Repair or replace.

↓ NO

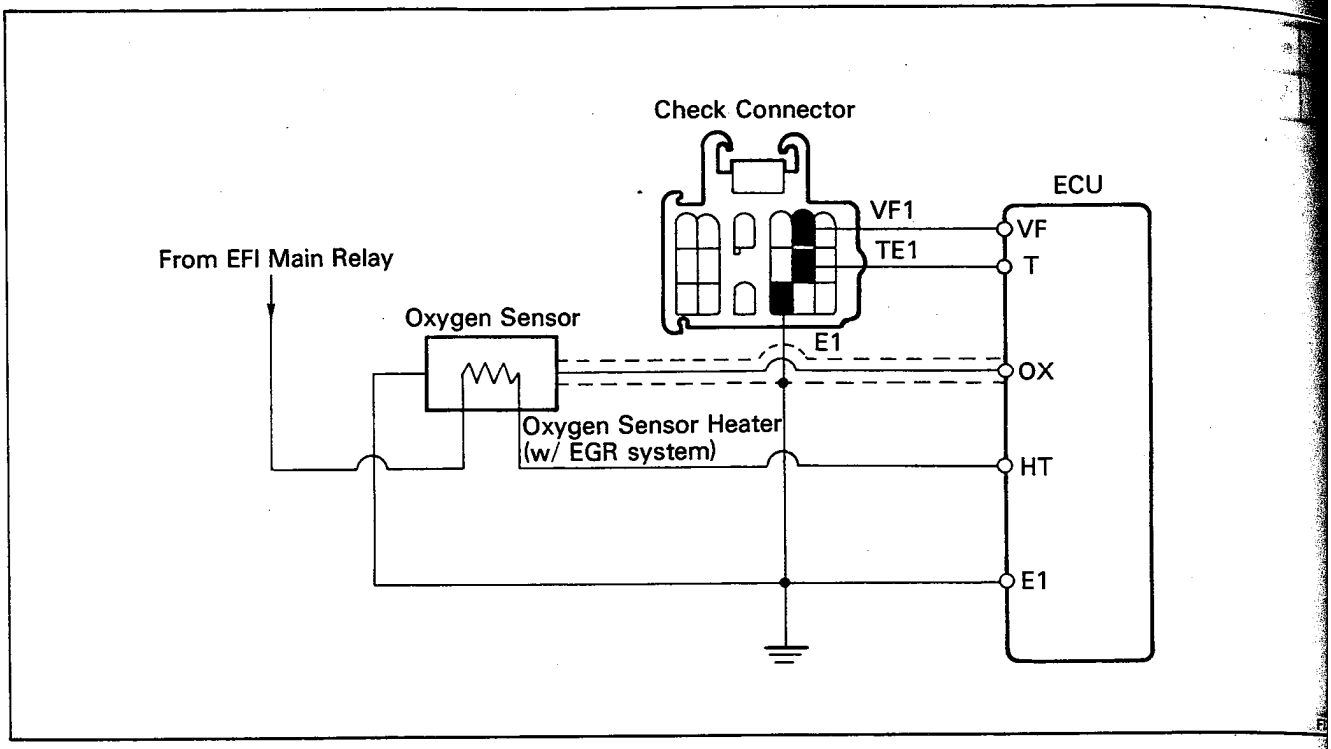
Check that there is voltage between amplifier terminal and body ground.

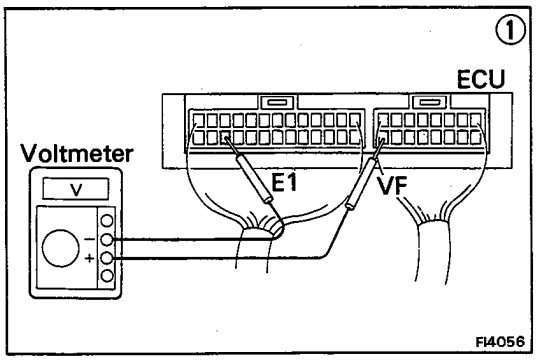
BAD → Repair or replace.

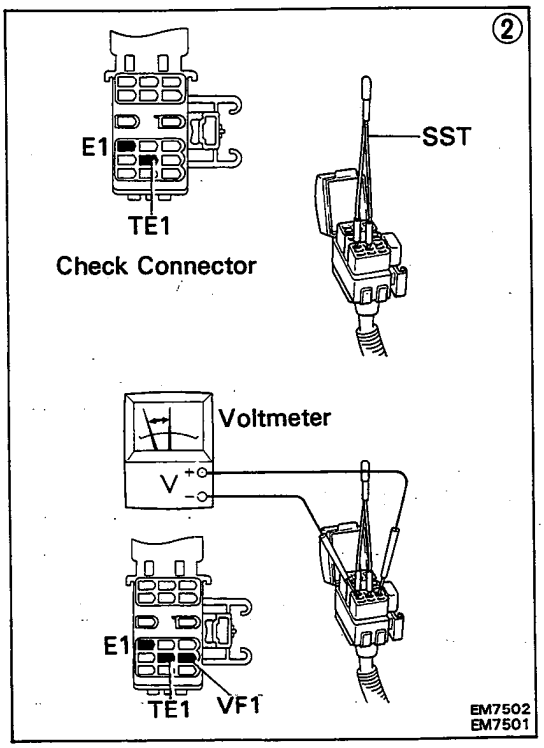
↓ OK

Check wiring between amplifier and ECU or compressor.

BAD → Repair or replace.







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

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

NO → OK

Check wiring between ECU terminal E1 and body grou

OK → Try another ECU.

BAD → Repair or replace

Is air leaking into air intake system? BAD → Repair air leak.

OK

Check spark plugs. BAD → Repair or replace

OK

Check distributor and ignition system. BAD → Repair or replac

OK

Check fuel pressure. BAD → Repair or replac

OK

Check injector. BAD → Repair or replac

OK

Check cold start injector.* BAD → Repair or replac

OK

Check vacuum sensor. BAD → Repair or replac

OK

② Check operation of oxygen sensor. OK → System normal.

BAD

Check wiring between oxygen sensor and ECU connector. BAD → Repair wiring.

OK

Replace oxygen sensor.

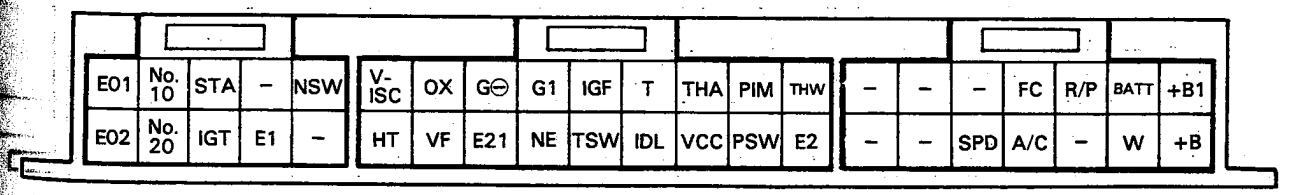
*Rich malfunction

Terminals of ECU (4A-FE 4WD)

Symbol	Terminal Name	Symbol	Terminal Name
E01	POWER GROUND	*2TSW	WATER TEMP. SWITCH
E02	POWER GROUND	T	CHECK CONNECTOR
No.10	INJECTOR	IDL	THROTTLE POSITION SENSOR
No.20	INJECTOR	THA	INTAKE AIR TEMP. SENSOR
STA	STARTER MAGNETIC SWITCH	VCC	VACUUM SENSOR
IGT	IGNITER	PIM	VACUUM SENSOR
E1	ECU GROUND	PSW	THROTTLE POSITION SENSOR
NSW	NEUTRAL START SWITCH	THW	WATER TEMP. SENSOR
V-ISC	VSV (ISC VALVE)	E2	SENSOR GROUND
HT	OXYGEN SENSOR HEATER	SPD	SPEED SENSOR
OX	OXYGEN SENSOR	FC	CIRCUIT OPENING RELAY
VF	CHECK CONNECTOR	A/C	A/C COMPRESSOR
G⊖	DISTRIBUTOR	*1 R/P	FUEL CONTROL SWITCH
E21	SENSOR GROUND	BATT	BATTERY
G1	DISTRIBUTOR	W	CHECK ENGINE WARNING LIGHT
NE	DISTRIBUTOR	+B1	EFI MAIN RELAY
IGF	IGNITER	+B	EFI MAIN RELAY

ECU Terminals

*1: Europe, *2: Australia *3: A/T

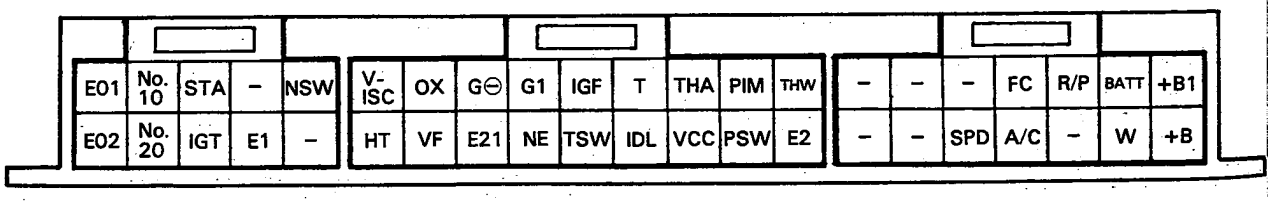


FI0234

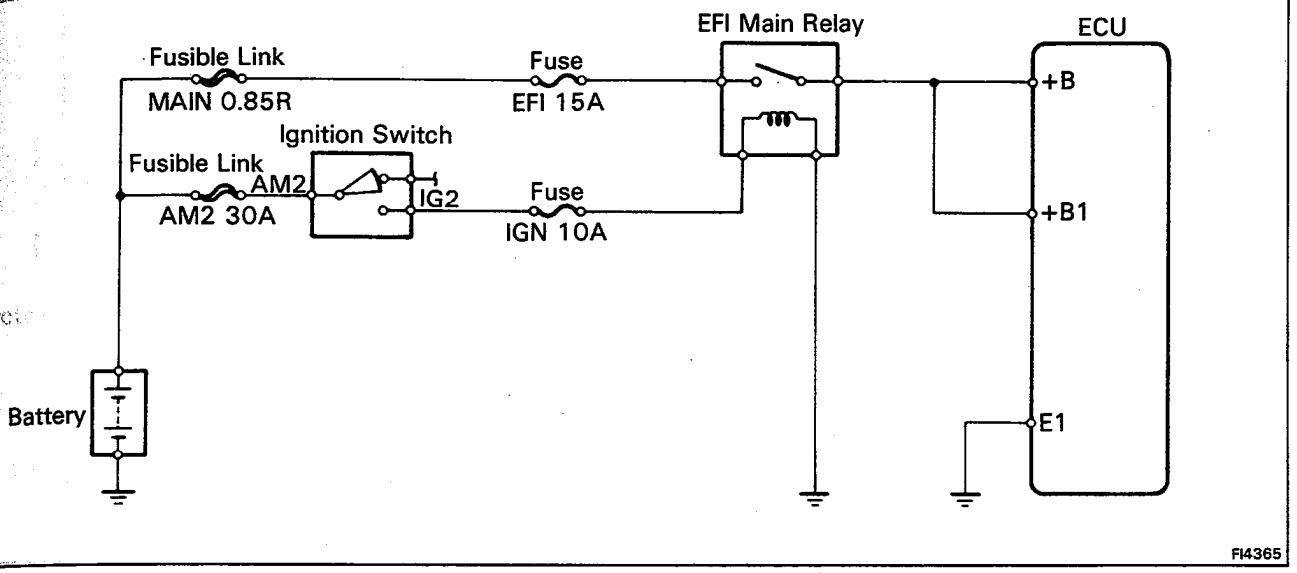
Voltage at ECU wiring connectors (4A-FE 4WD)

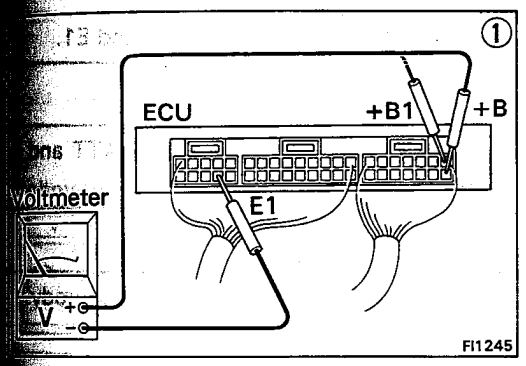
No.	Terminals	STD voltage (V)	Condition		See page
1	+B, +B1 – E1	10 – 14	Ignition SW ON		FI-53
2	BATT – E1	10 – 14	—		FI-54
3	IDL – E2	4.5 – 5.5	Ignition SW ON	Throttle valve open	FI-55
	PSW – E2			Throttle valve fully closed	
4	No.10, No.20 – E01, E02	10 – 14	Ignition SW ON		FI-56
5	W – E1	10 – 14	No trouble ("CHECK ENGINE" warning light off) and engine running		FI-57
6	PIM – E2	3.3 – 3.9	Ignition SW ON		FI-58
	VCC – E2	4.5 – 5.5			
7	THA – E2	2.0 – 2.5	Ignition SW ON	Intake air temp. 20°C (68°F)	FI-59
8	THW – E2	0.4 – 0.7		Coolant temp. 80°C (176°F)	FI-60
9	STA – E1	6 – 14	Cranking		FI-61
10	IGT – E1	0.7 – 1.0	Idling		FI-62
11	A/C – E1	5 – 14	Air conditioning ON		FI-63

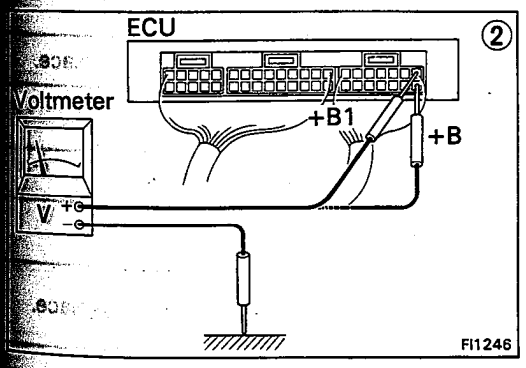
ECU Terminals

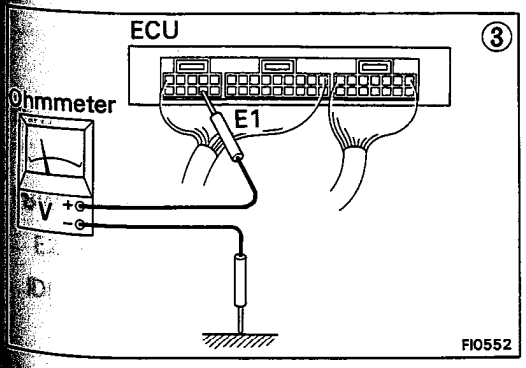


Terminals	Trouble	Condition	STD voltage
V+B, +B1 – E1	No voltage	IG SW ON	10 – 14 V









① There is no voltage between ECU terminals +B (+B1) and E1. **(IG SW ON)**

↓

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

NO → ↓ OK

③ Check wiring between ECU terminal E1 and body ground.

OK → Try another ECU.

BAD → Repair or replace.

↓

Check fuses, fusible links and ignition switch. → BAD → Repair or replace.

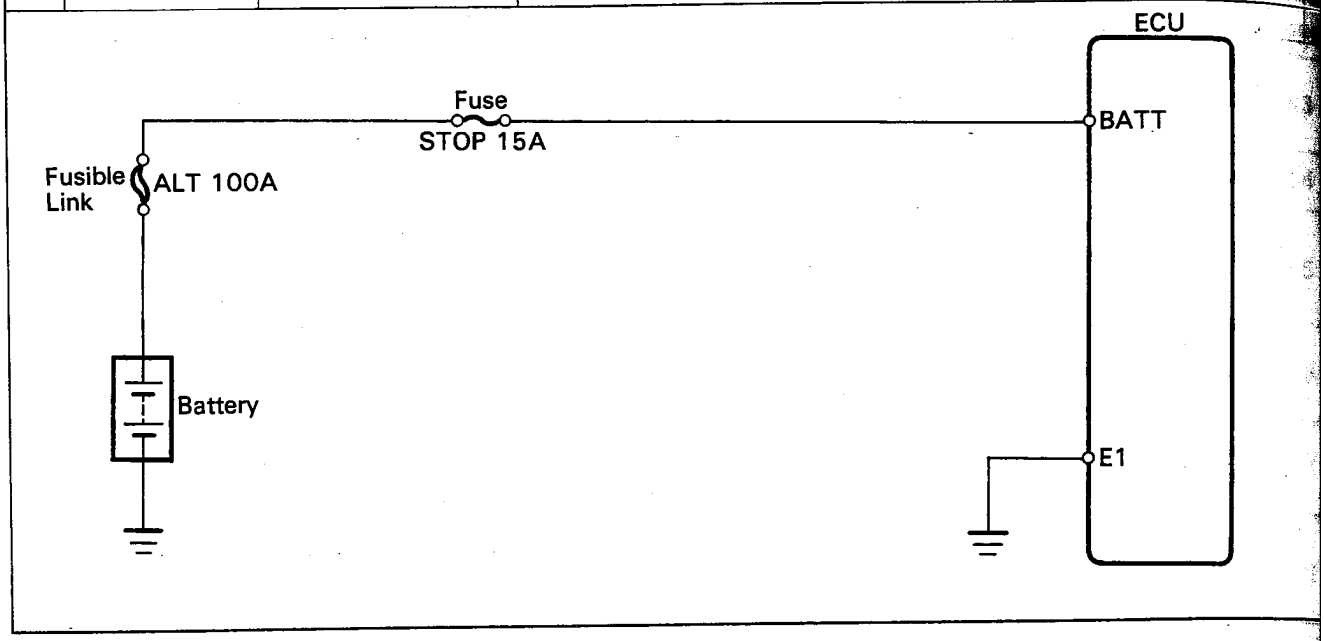
↓ OK

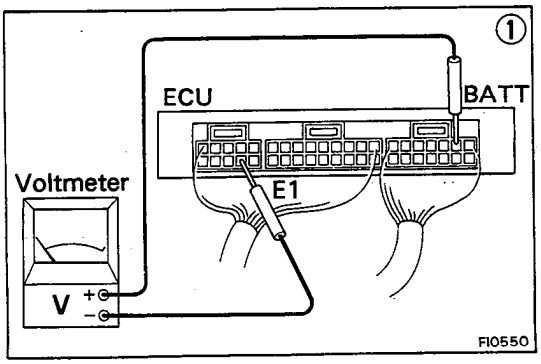
Check EFI main relay. (See page FI-134) → BAD → Replace.

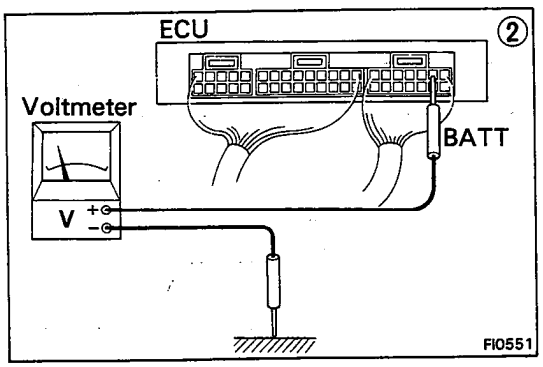
↓ OK

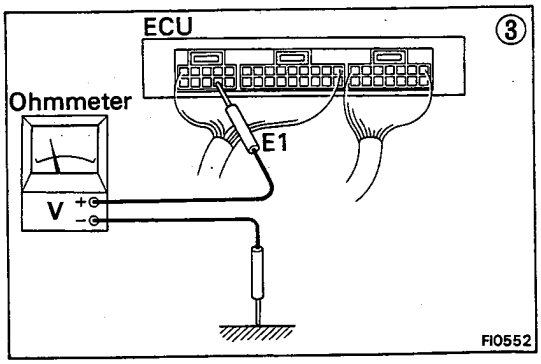
Check wiring between EFI main relay and battery. → BAD → Repair or replace.

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









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

↓

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

NO → ③ Check wiring between ECU terminal E1 and body ground.

OK → Try another ECU.

BAD → Repair or replace

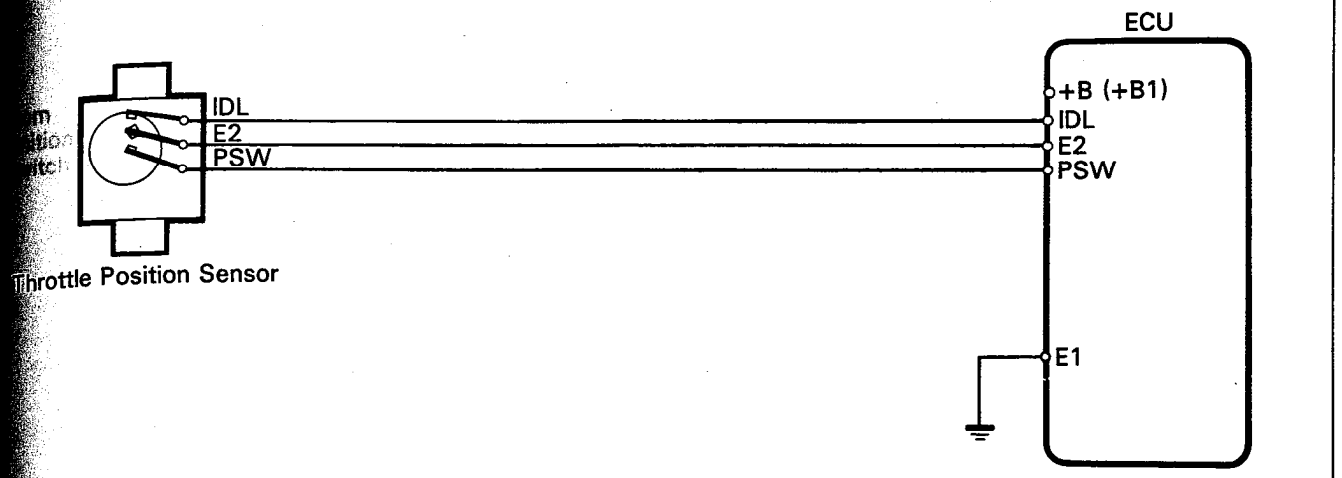
OK → Check fuse and fusible link.

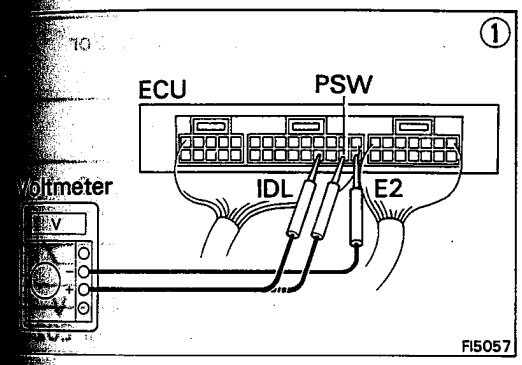
BAD → Replace.

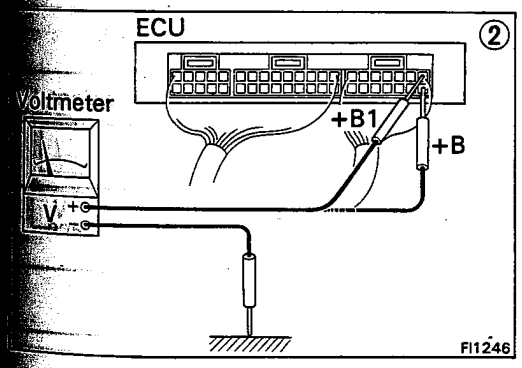
OK → Check wiring between ECU terminal and battery.

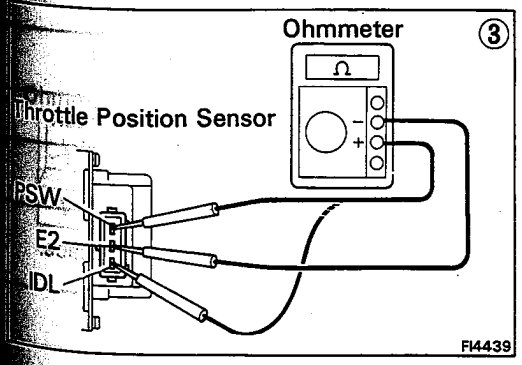
BAD → Repair or replace

Terminals	Trouble	Condition		STD voltage
IDL – E2	No voltage	IG SW ON	Throttle valve open	4.5 – 5.5 V
PSW – E2			Throttle valve fully closed	4.5 – 5.5 V









① There is no voltage between ECU terminals IDL or PSW and E2. **(IG SW ON)** (Throttle valve open)

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

NO

OK

Check wiring between ECU terminal E1 and body ground.

OK

Try another ECU.

BAD

Repair or replace.

Refer to +B – E1 trouble section. (No.1) (See page FI-53)

BAD

Repair or replace.

OK

③ Check throttle position sensor. (See page FI-123)

BAD

Repair or replace throttle position sensor.

OK

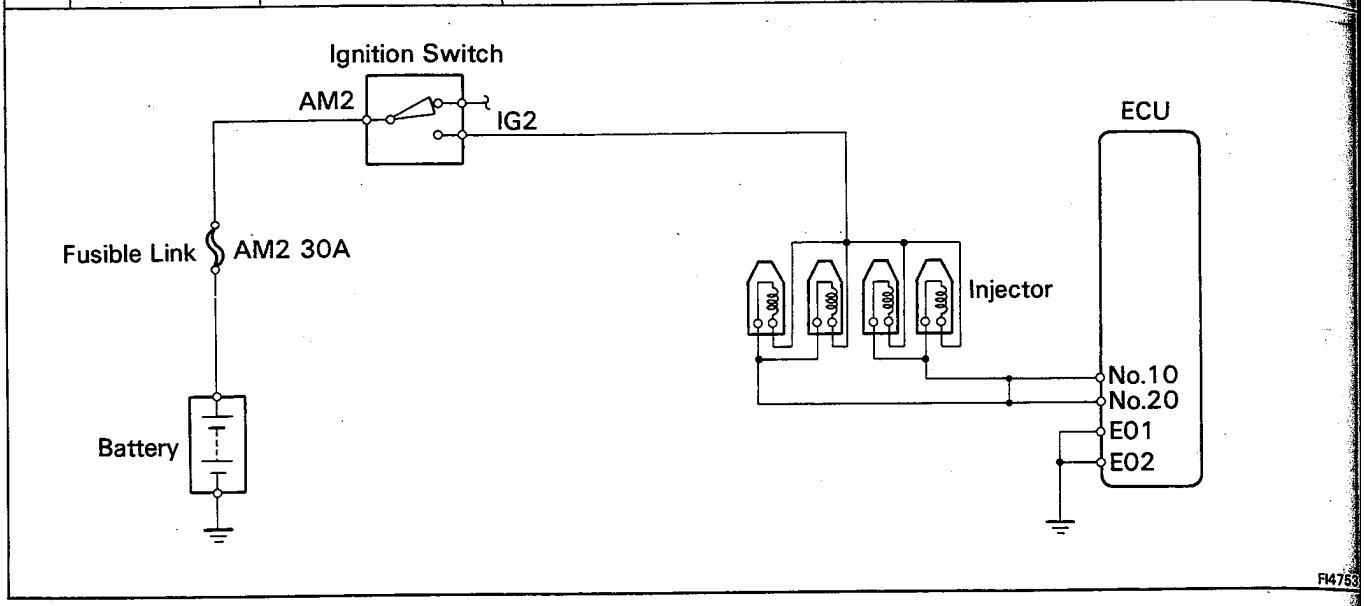
Check wiring between ECU and throttle position sensor.

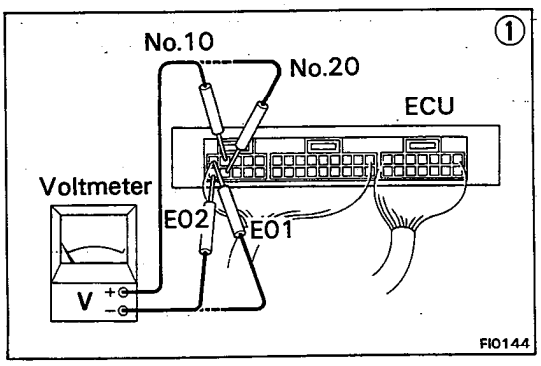
BAD

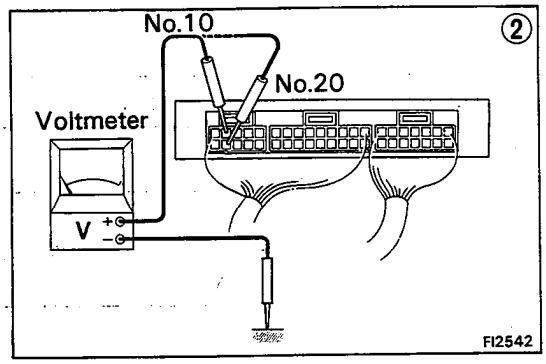
OK

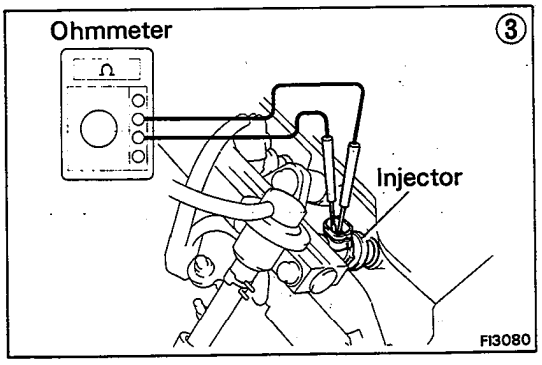
Try another ECU.

No.	Terminals	Trouble	Condition	STD voltage
4	No.10 – E01 No.20 – E02	No voltage	IG SW ON	10 – 14 V









① There is no voltage between ECU terminals 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 and/or No.20 and body ground.

NO — OK

Check wiring between ECU terminal E01 and/or E02 and body ground.

OK — Try another ECU.

BAD — Repair or replace.

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

OK

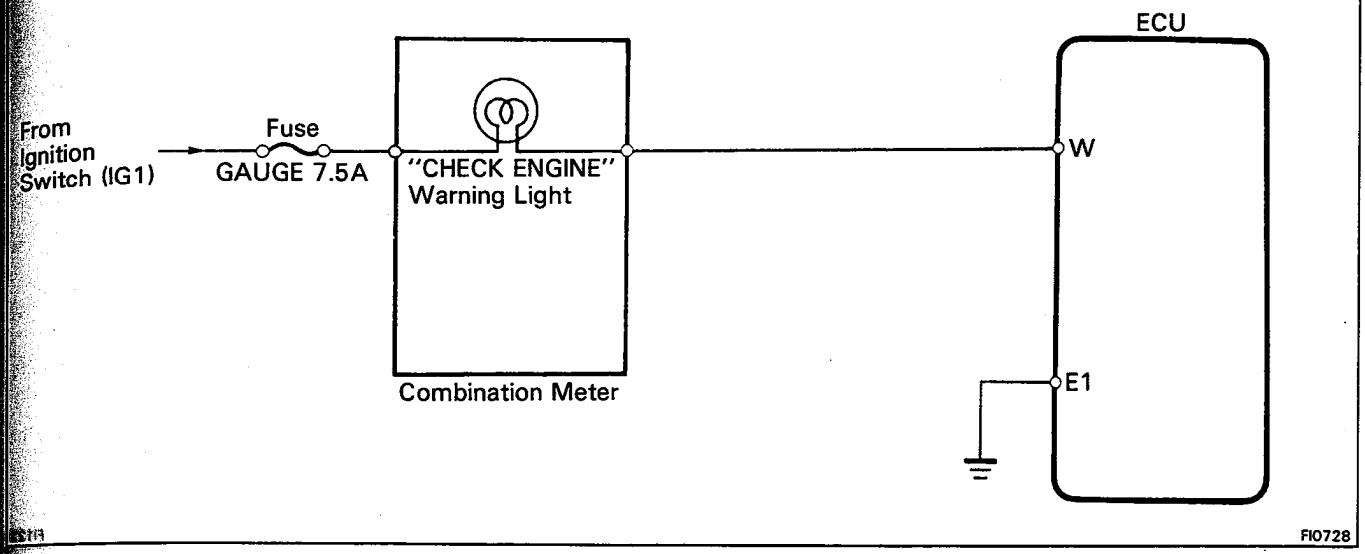
③ Check resistance of magnetic coil in each injector.
STD resistance: Approx. 13.8 Ω

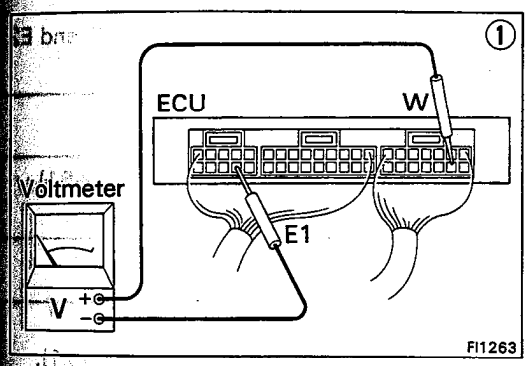
OK

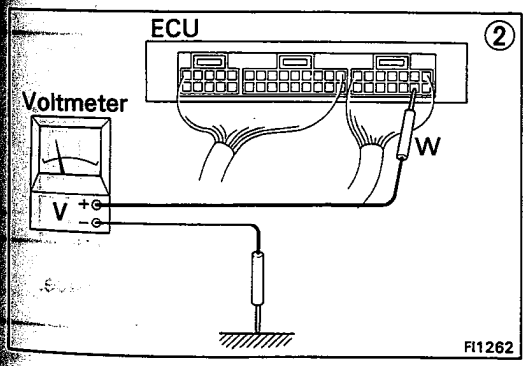
BAD — Replace injector.

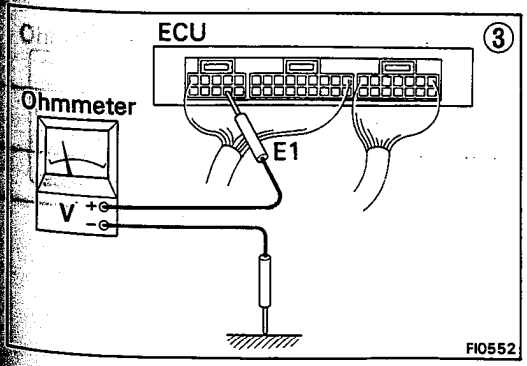
Check wiring between ECU terminal No.10 and/or No.20 and battery. — BAD — Repair or replace.

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









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 → Try another ECU.

BAD → Repair or replace.

↓

Check GAUGE fuse and "CHECK ENGINE" warning light.

OK → ↓

BAD →

Repair or replace.

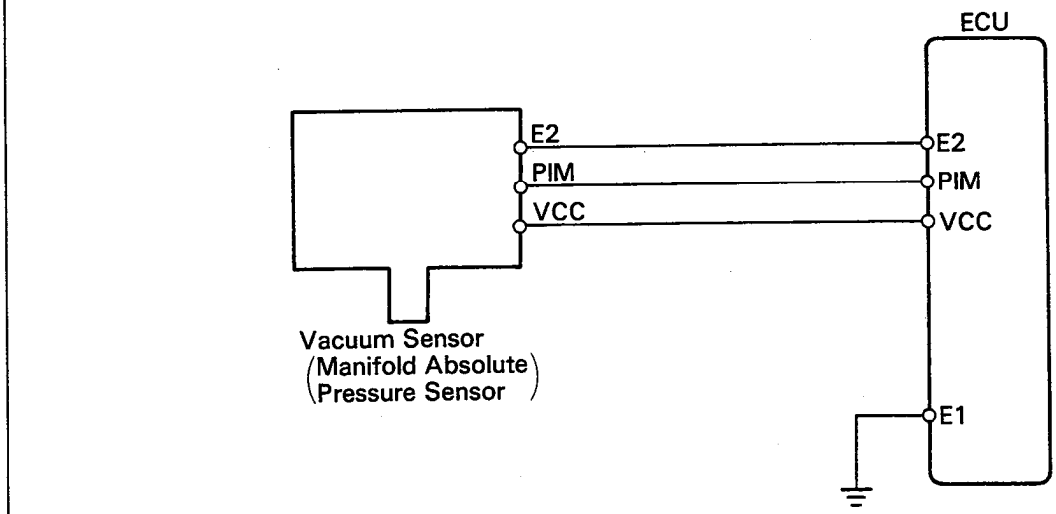
Fuse blows again

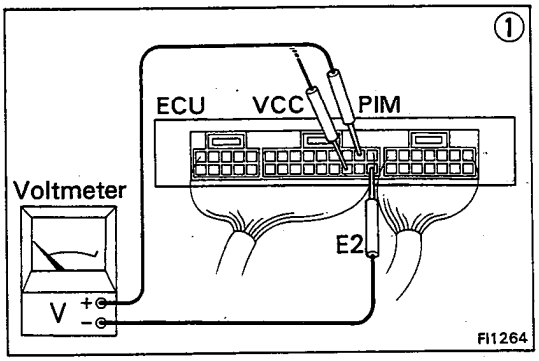
↓

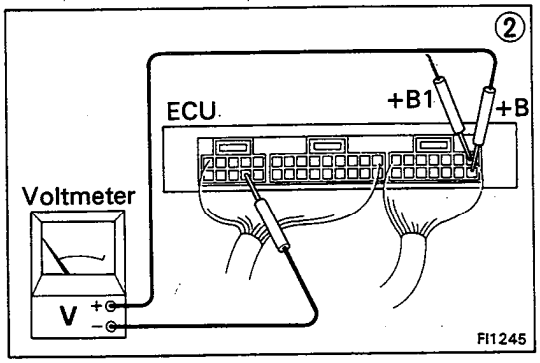
Check wiring between ECU terminal W and fuse.

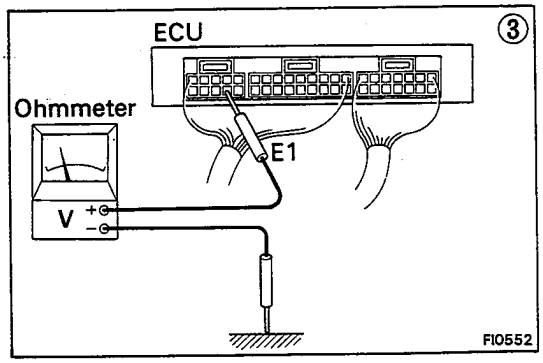
BAD → Repair or replace.

No.	Terminals	Trouble	Condition	STD voltage
6	PIM – E2	No voltage	IG SW ON	3.3 – 3.9 V
	VCC – E2			4.5 – 5.5 V









① There is no voltage between ECU terminals PIM or VCC and E2 **(IG SW ON)**

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

NO → ③

NO → Refer to +B – E1 trouble section (No.1) (See page FI-53)

③ Check wiring between ECU terminal E1 and body ground.

OK → Check vacuum sensor. (See page FI-140)

BAD → Repair or replace.

Check vacuum sensor. (See page FI-140)

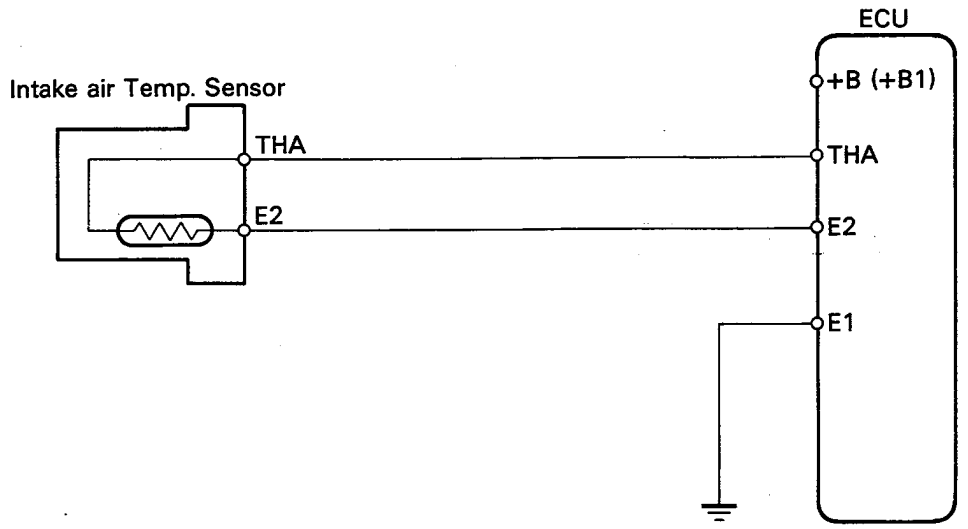
BAD → Replace vacuum sensor.

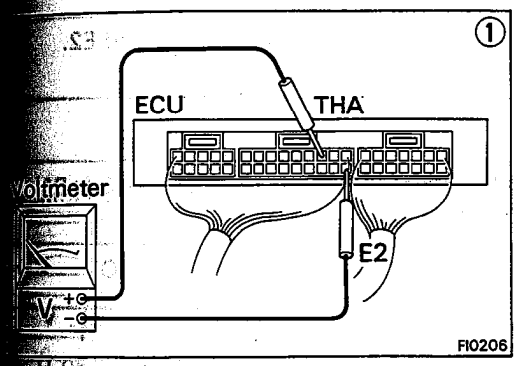
OK → Check wiring between ECU and vacuum sensor.

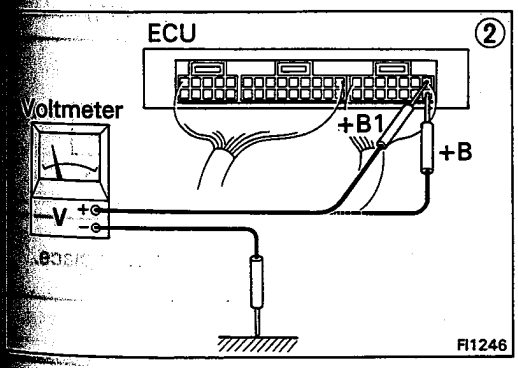
OK → Try another ECU.

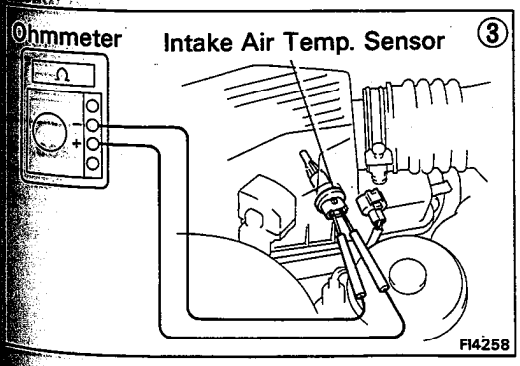
BAD → Repair or replace.

Terminals	Trouble	Condition		STD voltage
THA – E2	No voltage	IG SW ON	Intake air temperature 20°C (68°F)	2.0 – 2.5 V









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

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

OK → Check wiring between ECU terminal E1 and body ground.

NO → Refer to +B – E1 trouble section (No.1). (See page FI-53)

OK → ③ Check intake air temp. sensor. (See page FI-139)

BAD → Repair or replace.

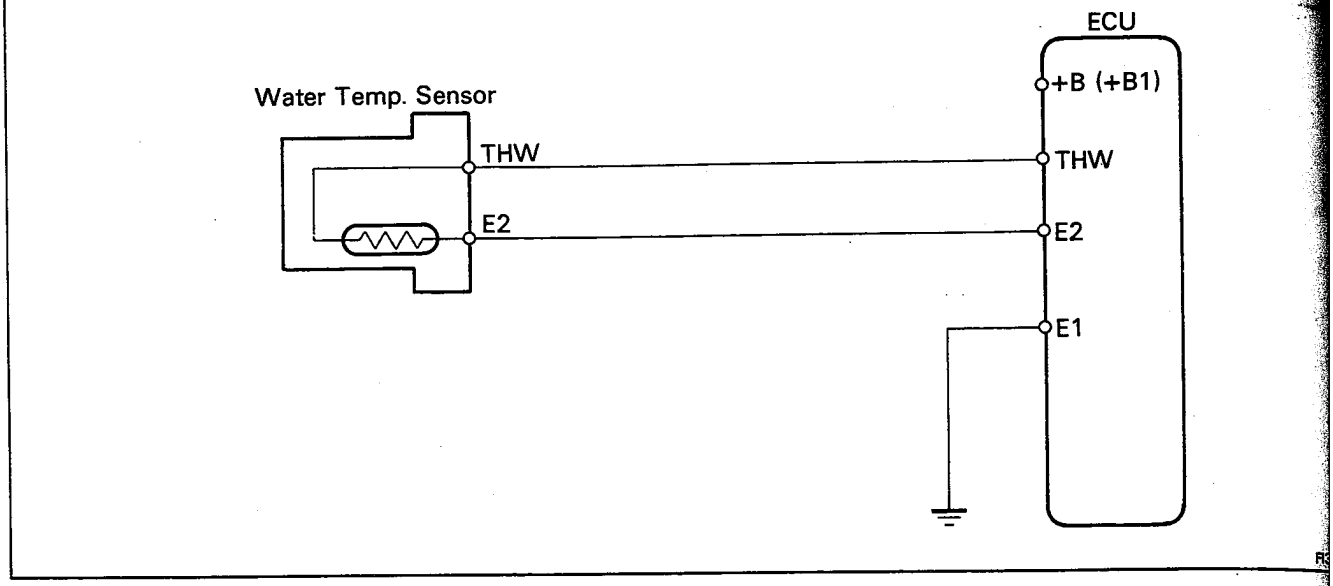
BAD → Replace intake air temp. sensor

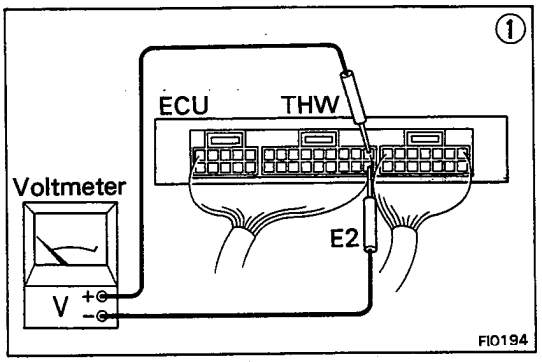
OK → Check wiring between ECU and intake air temp. sensor.

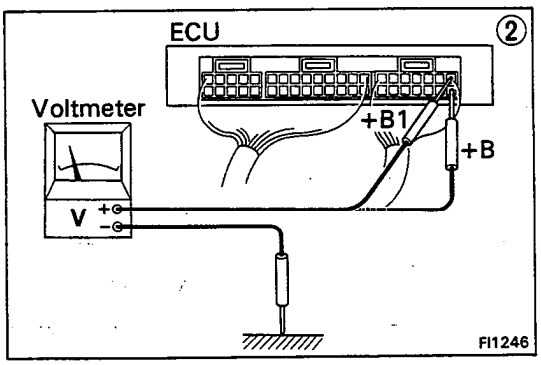
OK → Try another ECU.

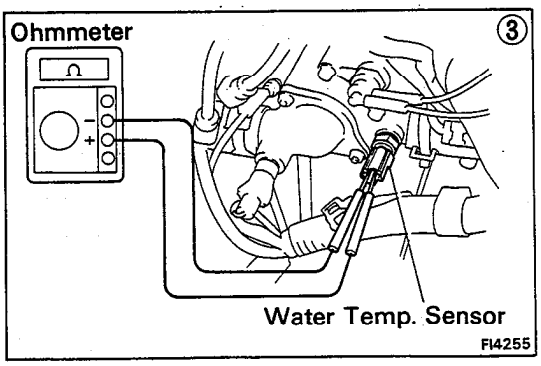
BAD → Repair or replace wiring.

No.	Terminals	Trouble	Condition		STD voltage
8	THW – E2	No voltage	IG SW ON	Coolant temperature 80°C (176°F)	0.4 – 0.7 V









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 +B – E1 trouble section (No.1) (See page FI-53)

↓

Check wiring between ECU terminal E1 and body ground.

OK ↓

BAD → Repair or replace.

↓

③ Check water temp. sensor. (See page FI-138)

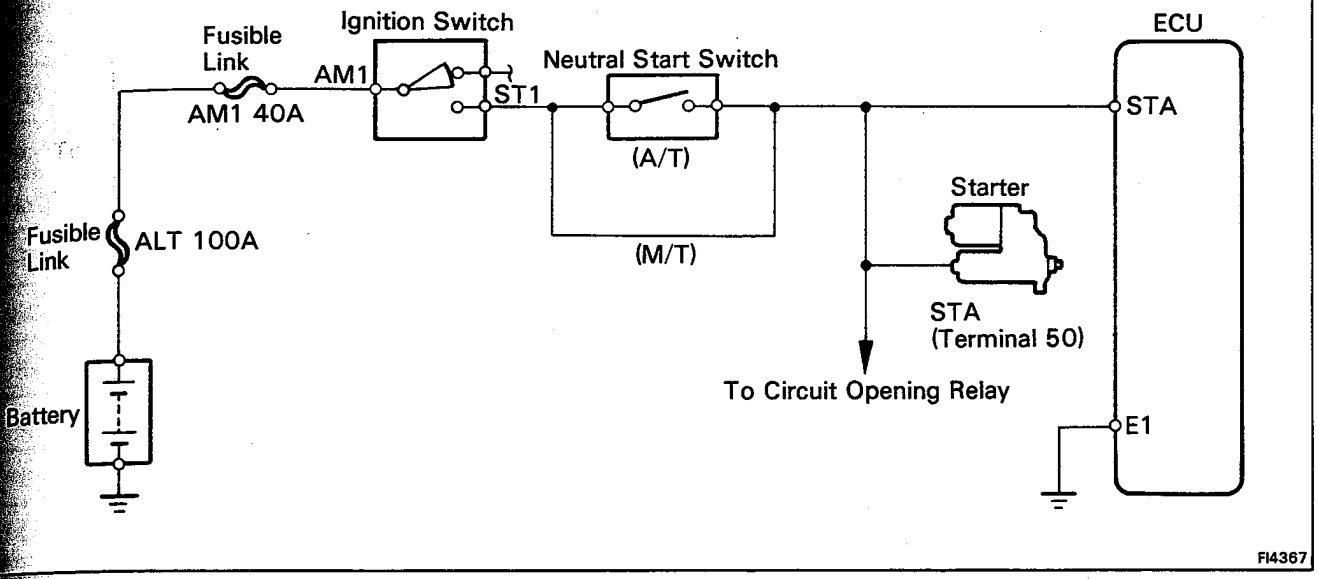
BAD → Replace water temp. sensor.

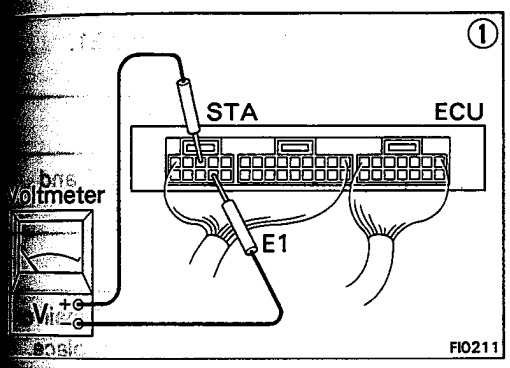
OK → Check wiring between ECU and wa temp. sensor.

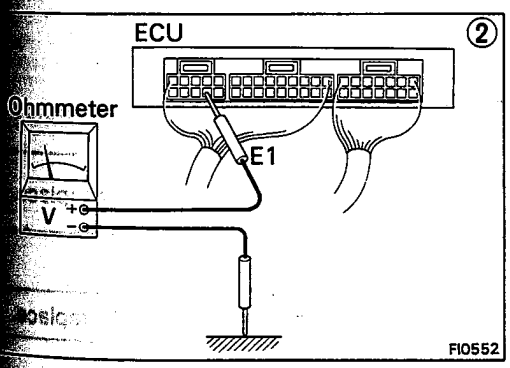
OK → Try another ECU.

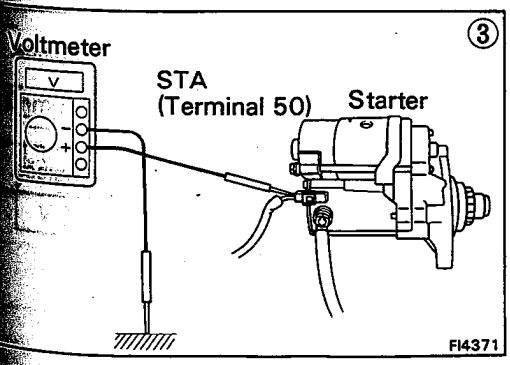
BAD → Repair or replace

Terminals	Trouble	Condition	STD voltage
STA – E2	No voltage	Cranking	6 – 14 V





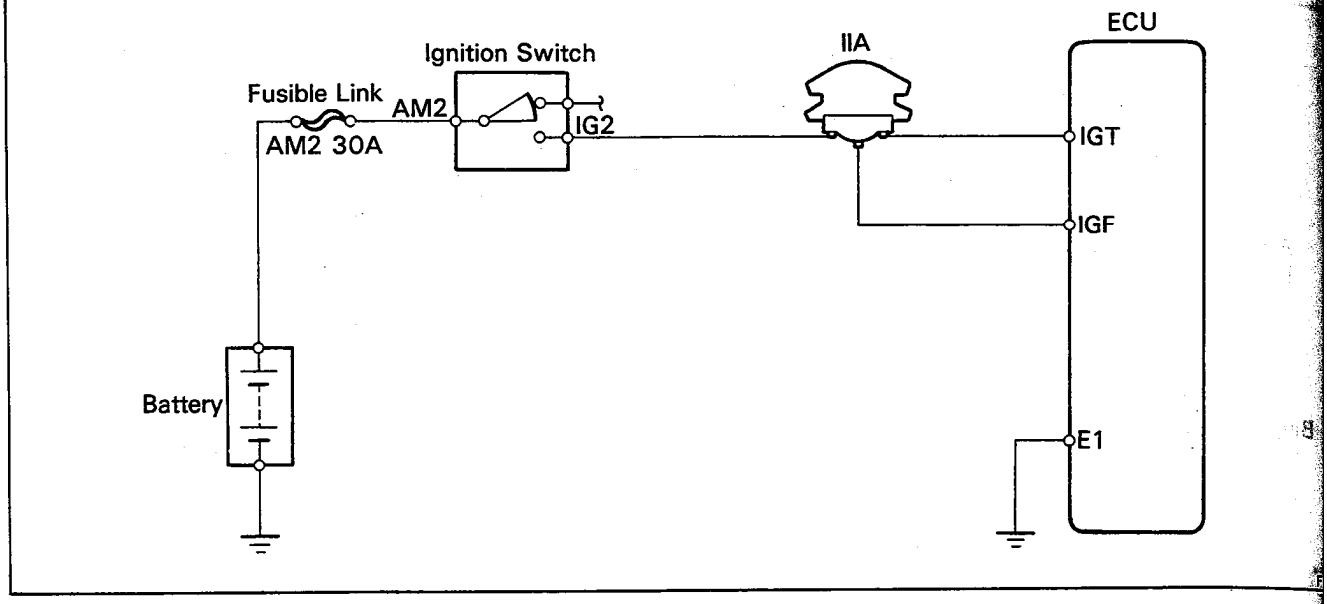


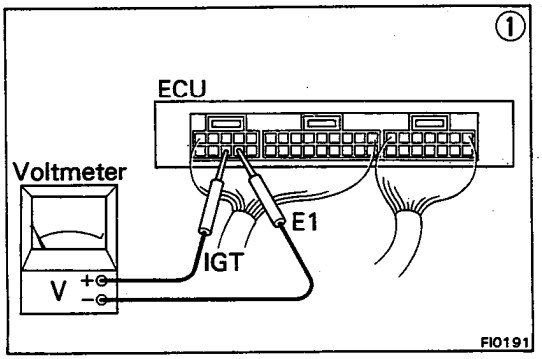


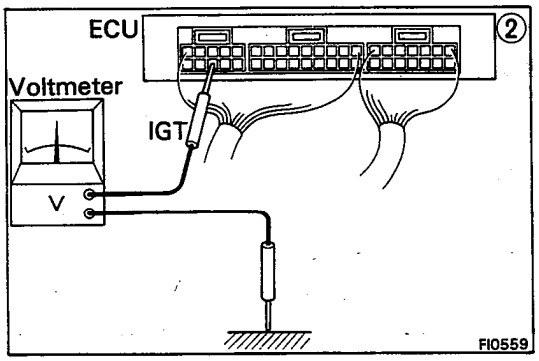
① There is no voltage between ECU terminals STA and E1. **(IG SW START)**

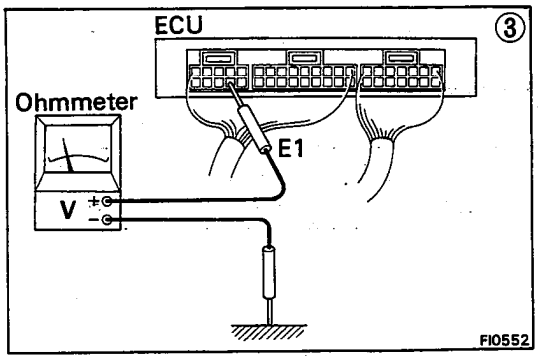
Check starter operation.
- OK → Check wiring between ECU terminal STA and ignition switch terminal ST1.
  - OK → ② Check wiring between ECU terminal E1 and body ground.
    - OK → Try another ECU.
    - BAD → Repair or replace.
  - BAD → Repair or replace.
- BAD → Check fusible link, battery wiring and ignition 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 → Check starter.
    - NO → Check wiring between ignition switch terminal ST1 and starter terminal STA (50)

No.	Terminals	Trouble	Condition	STD voltage
10	IGT – E2	No voltage	Idling	0.7 – 1.0 V









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

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

③ OK → Try another ECU.

↓

Check fusible links and ignition switch. → BAD → Repair or replac

OK ↓

Check IIA. (See page IG-8) → BAD → Repair or replac

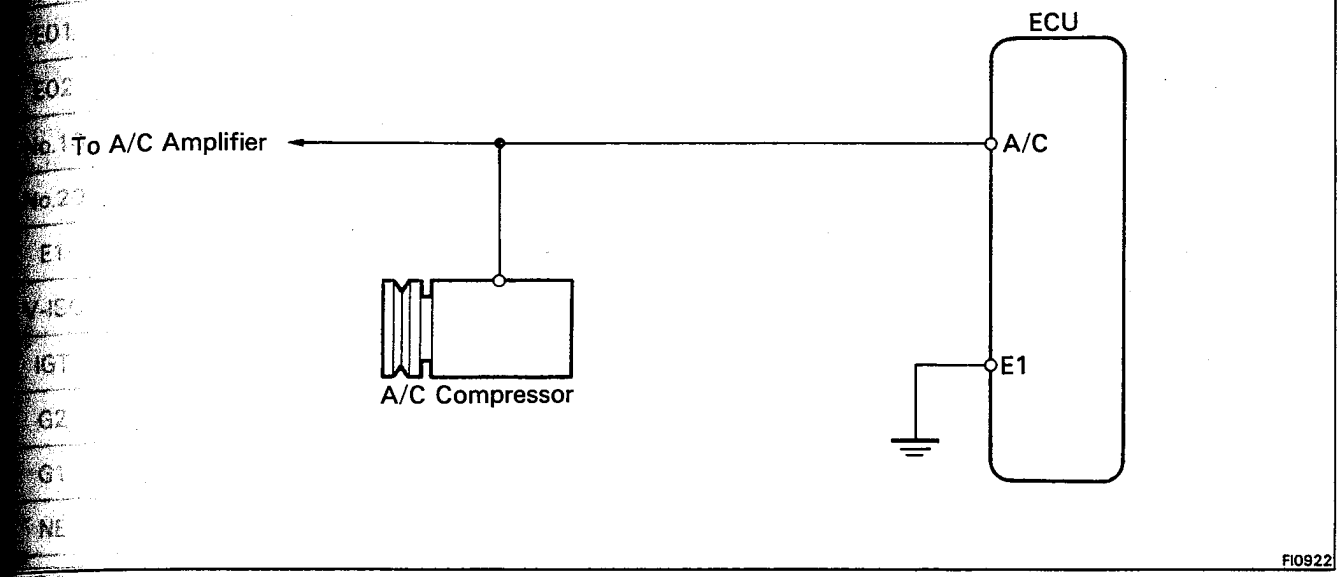
OK ↓

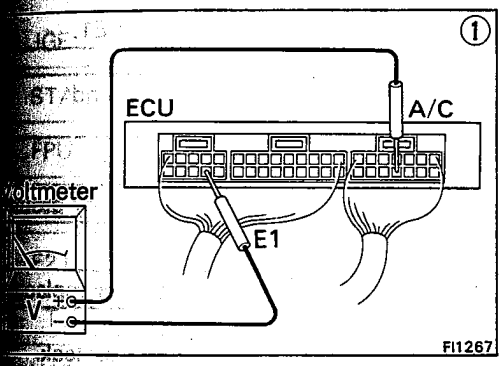
Check wiring between ECU and battery. → BAD → Repair or replac

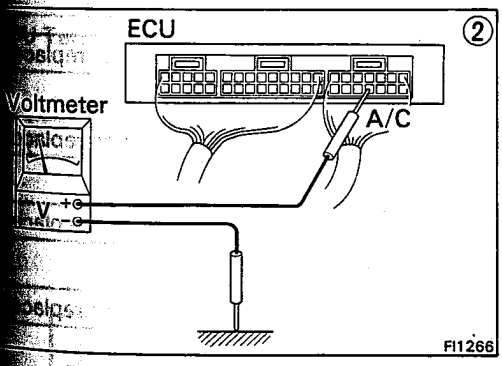
OK ↓

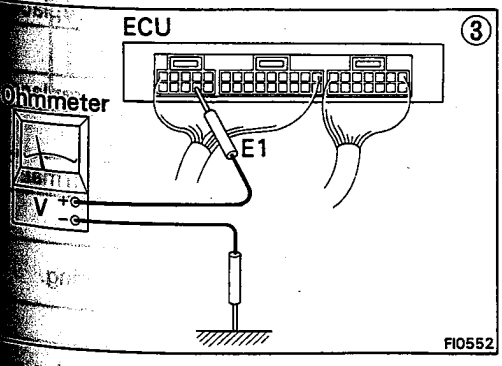
Check igniter. (See page IG-6) → BAD → Repair or replac

Terminals	Trouble	Condition	STD voltage
A/C – E2	No voltage	Air conditioning ON	5 – 14 V









① There is no voltage between ECU terminals A/C and E1. **(Air conditioning ON)**

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

NO

OK

③ Check wiring between ECU terminal E1 and body ground.

OK

Try another ECU.

BAD

Repair or replace.

Check compressor running.

OK

Check wiring between ECU terminal A/C and Amplifier.

BAD

Repair or replace.

NO

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

BAD

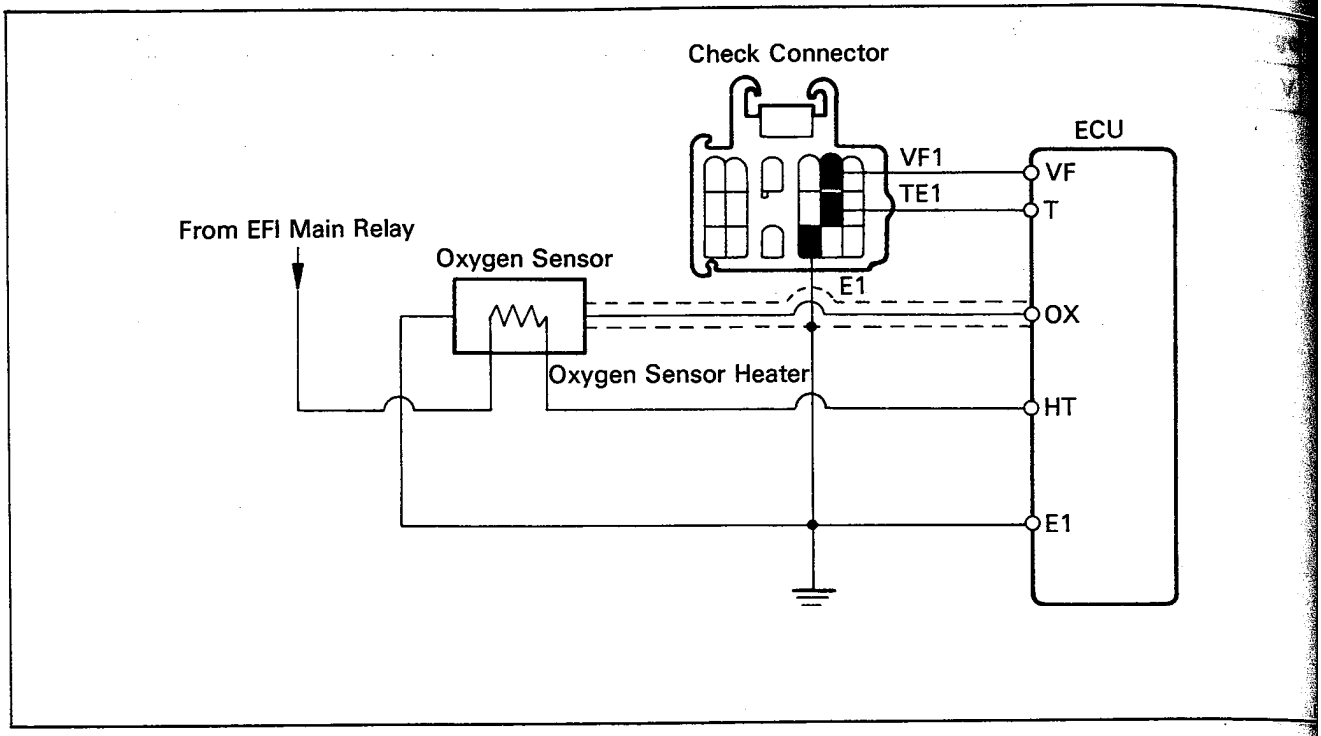
Repair or replace.

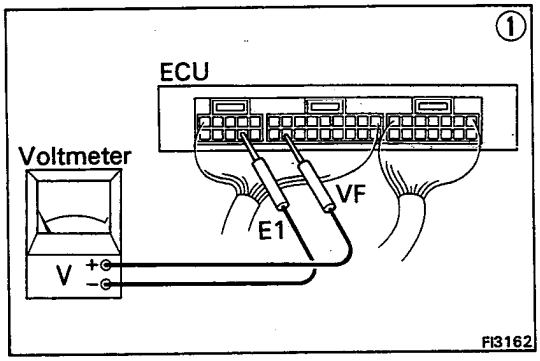
OK

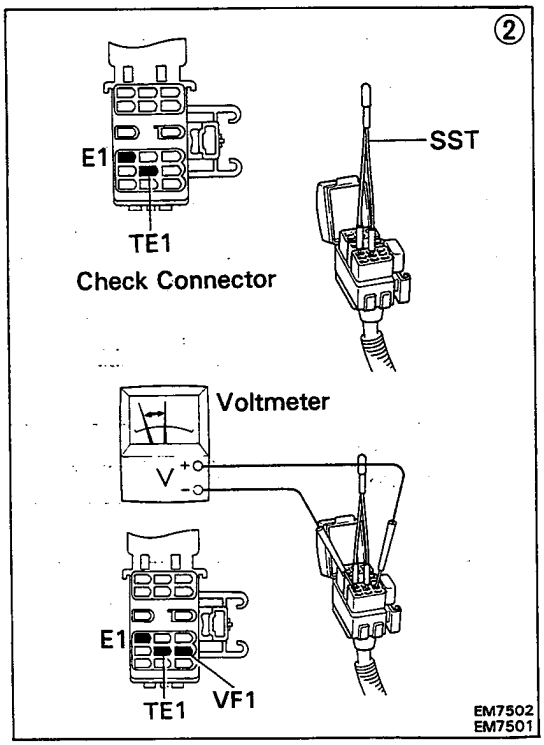
Check wiring between amplifier and ECU or compressor.

BAD

Repair or replace.







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

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

NO → Check wiring between ECU terminal E1 and body grou
OK → Try another ECU.
BAD → Repair or replac

OK → Is air leaking into air intake system? BAD → Repair air leak

OK → Check spark plugs. BAD → Repair or replac

OK → Check distributor and ignition system. BAD → Repair or replac

OK → Check fuel pressure. BAD → Repair or replac

OK → Check injector. BAD → Repair or replac

OK → Check cold start injector. * BAD → Repair or replac

OK → Check vacuum sensor. BAD → Repair or replac

OK → ② Check operation of oxygen sensor. OK → System norma

BAD → Check wiring between oxygen sensor and ECU connector. BAD → Repair wiring.

OK → Replace oxygen sensor.

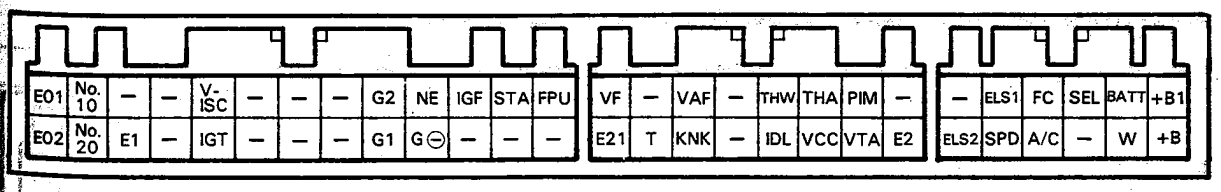
* Rich malfunction

Terminals of ECU (4A-GE w/o Air Flow Meter)

Symbol	Terminal Name	Symbol	Terminal Name
E01	POWER GROUND	KNK	KNOCK SENSOR
E02	POWER GROUND	THW	WATER TEMP. SENSOR
No.10	INJECTOR	IDL	THROTTLE POSITION SENSOR
No.20	INJECTOR	THA	INTAKE AIR TEMP. SENSOR
E1	ECU GROUND	VCC	VACUUM SENSOR
V-ISC	VSV (ACV)	PIM	VACUUM SENSOR
IGT	IGNITER	VTA	THROTTLE POSITION SENSOR
G2	DISTRIBUTOR	E2	SENSOR GROUND
G1	DISTRIBUTOR	ELS2	ELECTRIC LOAD
NE	DISTRIBUTOR	ELS1	STOP LAMP
G⊖	DISTRIBUTOR	SPD	SPEED SENSOR
IGF	IGNITER	FC	CIRCUIT OPENING RELAY
STA	STARTER MAGNETIC SWITCH	A/C	A/C COMPRESSOR
FPU	FUEL PRESSURE VSV	*SEL	SENSOR GROUND
VF	CHECK CONNECTOR	BATT	BATTERY
E21	SENSOR GROUND	W	CHECK ENGINE WARING LIGHT
T	CHECK CONNECTOR	+B1	EFI MAIN RELAY
VAF	VARIABLE RESISTOR	+B	EFI MAIN RELAY

ECU Terminals

* Europe

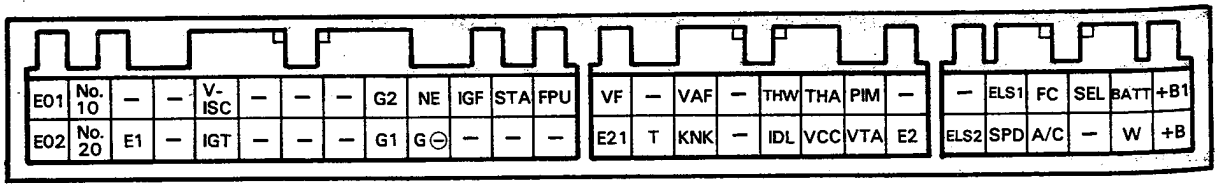


FI4265

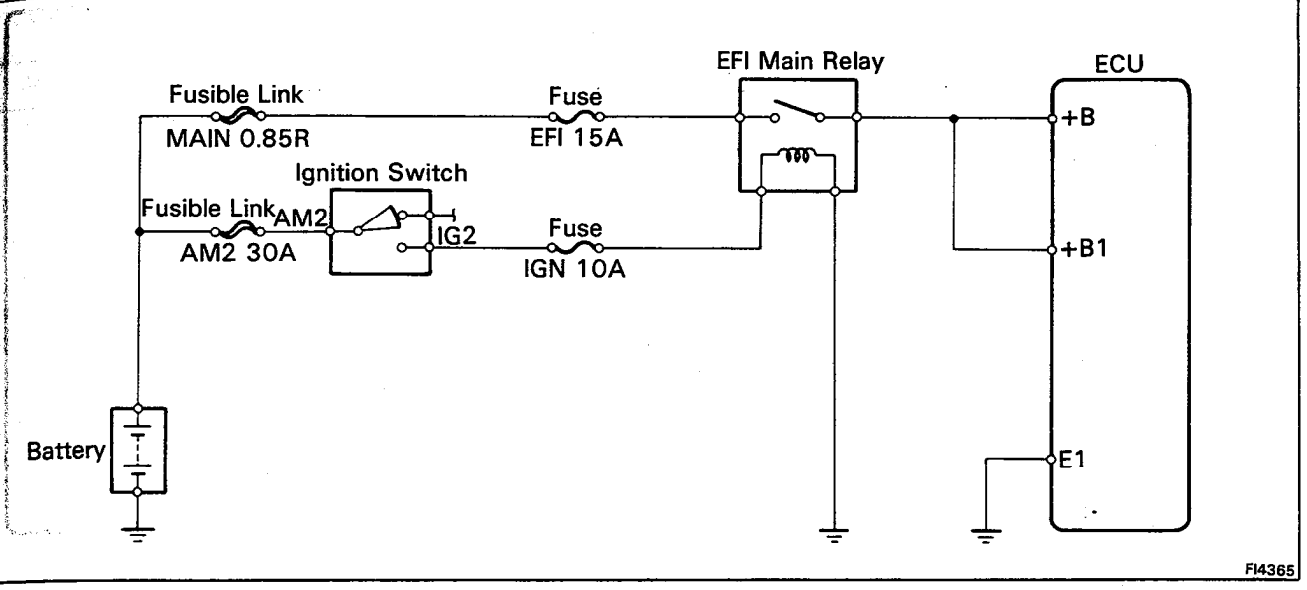
Voltage at ECU Wiring Connectors (4A-GE w/o Air Flow Meter)

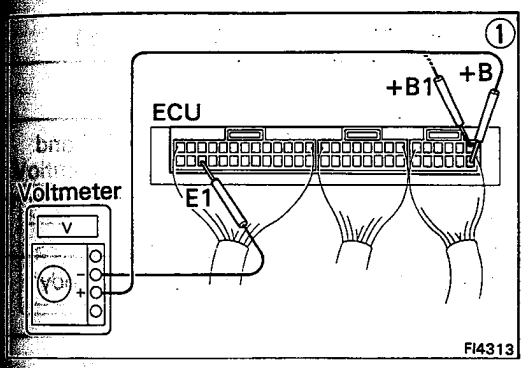
No.	Terminals	STD voltage (V)	Condition		See p.
1	+B, +B1 – E1	10 – 14	Ignition SW ON		FI-6
2	BATT – E1	10 – 14	–		FI-6
3	IDL – E2	4.5 – 5.5	Ignition SW ON	Throttle valve open	FI-6
	VTA – E2	0.5 or less		Throttle valve fully closed	
		3.5 – 5.5		Throttle valve fully open	
	VCC – E2	4.5 – 5.5		–	
4	No.10 – E01, No.20 – E02	10 – 14	Ignition SW ON		FI-7
5	W – E1	10 – 14	No trouble ("CHECK ENGINE" warning light off) and engine running.		FI-7
6	PIM – E2	3.3 – 3.9	Ignition SW ON		FI-
	VCC – E2	4.5 – 5.5			
7	THA – E2	2.0 – 2.8	Ignition SW ON	Intake air temp. 20°C (68°F)	FI-
8	THW – E2	0.4 – 0.7		Coolant temp. 80°C (176°F)	FI-
9	STA – E1	6 – 14	Cranking		FI-
10	IGT – E1	0.7 – 1.0	Idling		FI-
11	A/C – E1	10 – 14	Ignition SW ON	Air conditioning ON	FI-

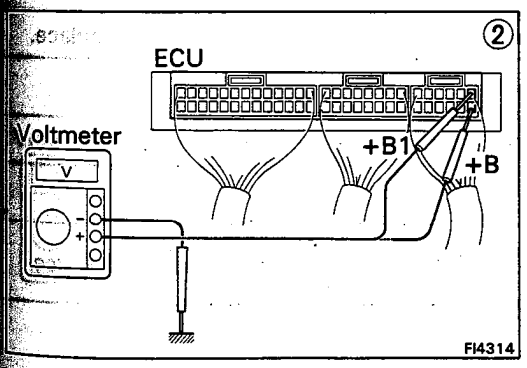
ECU Terminals

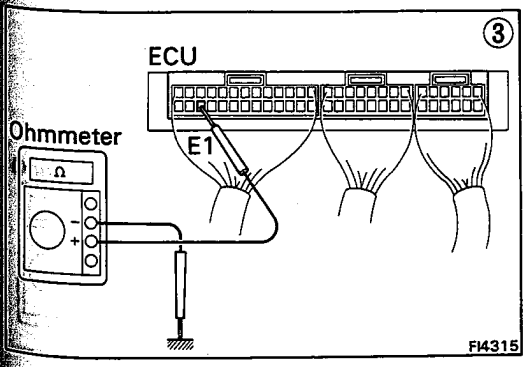


Terminals	Trouble	Condition	STD voltage
V+B, +B1 – E1	No voltage	IG SW ON	10 – 14 V









① There is no voltage between ECU terminals +B (+B1) and E1. **(IG SW ON)**

↓

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

NO → ↓ OK

③ Check wiring between ECU terminal E1 and body ground.

OK → Try another ECU. → Repair or replace.

BAD → Repair or replace.

↓

Check fuses, fusible links and ignition switch. → BAD → Repair or replace.

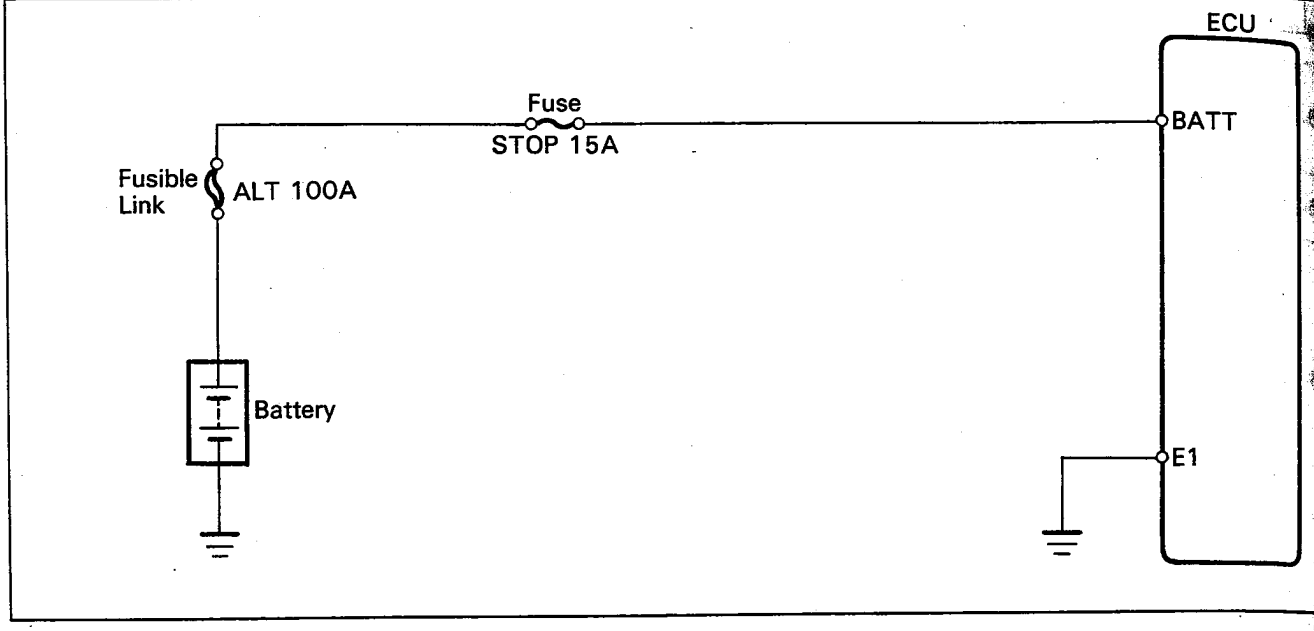
↓ OK

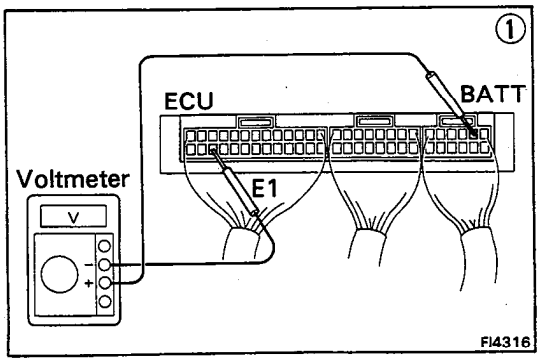
Check EFI main relay. (See page FI-134) → BAD → Replace.

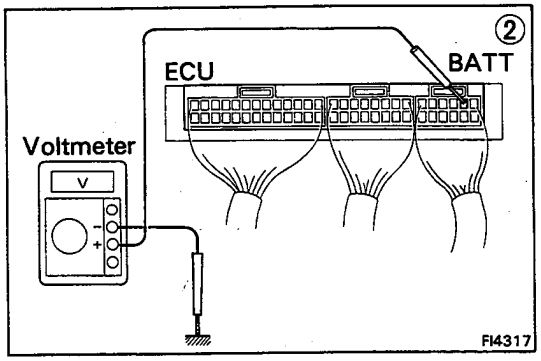
↓ OK

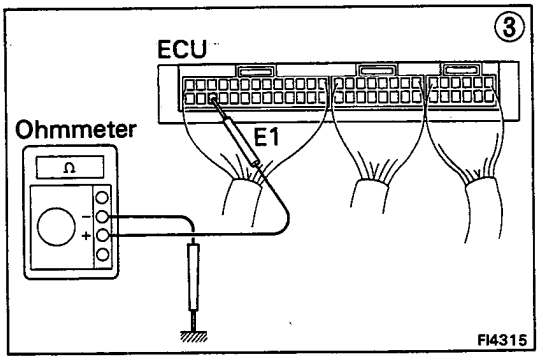
Check wiring between EFI main relay and battery. → BAD → Repair or replace.

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









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

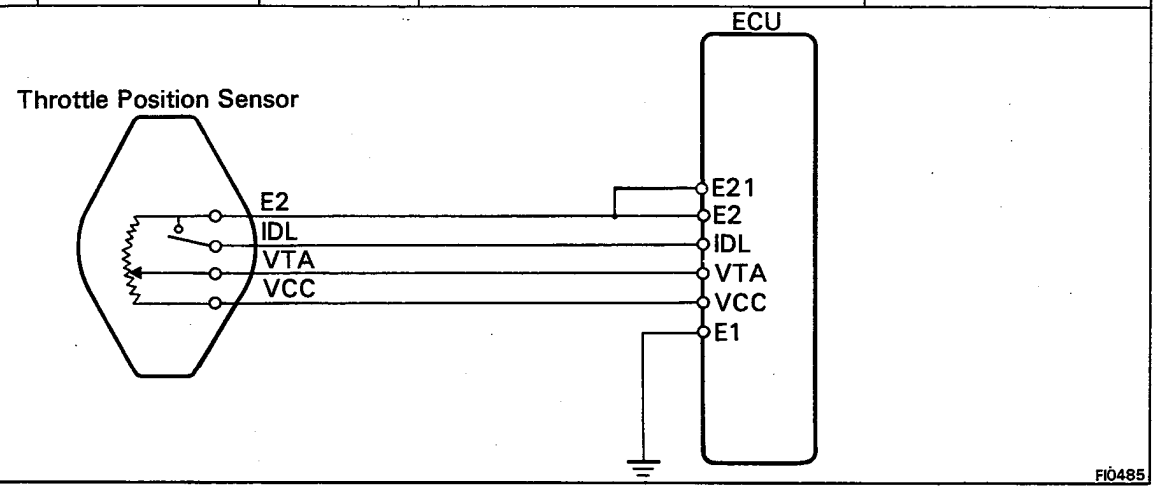
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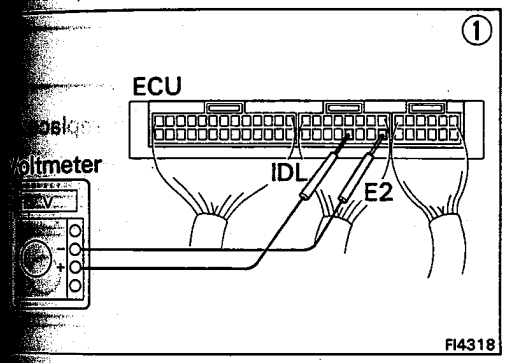
② Check that there is voltage between ECU terminal BATT and body ground.

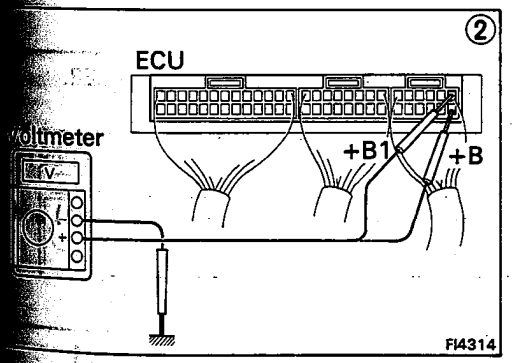
NO → Check fuse and fusible link.
- BAD → Replace.
- OK → Check wiring between ECU terminal and battery.
  - BAD → Repair or replace

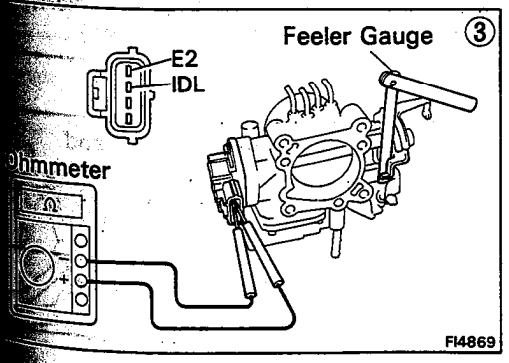
OK → ③ Check wiring between ECU terminal E1 and body ground.
- OK → Try another ECU.
- BAD → Repair or replace

Terminals	Trouble	Condition		STD voltage
IDL – E2	No voltage	IG SW ON	Throttle valve open	4.5 – 5.5 V
VTA – E2			Throttle valve fully closed	0.5 V or less
			Throttle valve fully open	3.5 – 5.5 V
VCC – E2			–	4.5 – 5.5 V









- **IDL – E2**

① There is no voltage between ECU terminals IDL and E2. **(IG SW ON)** (Throttle valve open)

↓

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

NO → ↓ OK

Check wiring between ECU terminal E1 and body ground.

↓ BAD

Repair or replace.

Refer to +B – E1 trouble section (No.1). (See page FI-67)

BAD → Repair or replace.

↓ OK

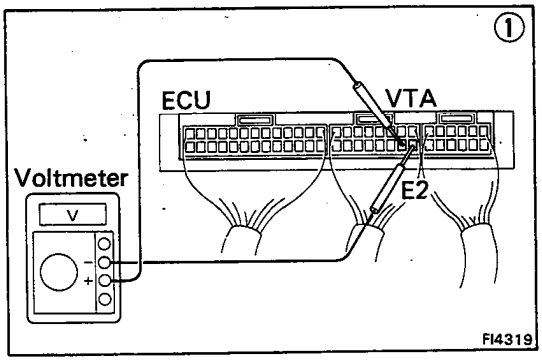
③ Check throttle position sensor. (See page FI-127)

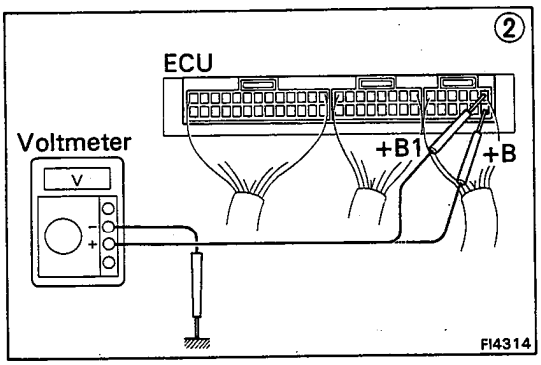
BAD → Repair or replace throttle position sensor.

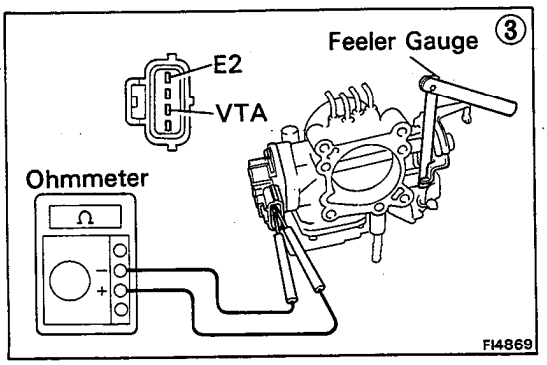
OK → Check wiring between ECU and throttle position sensor.

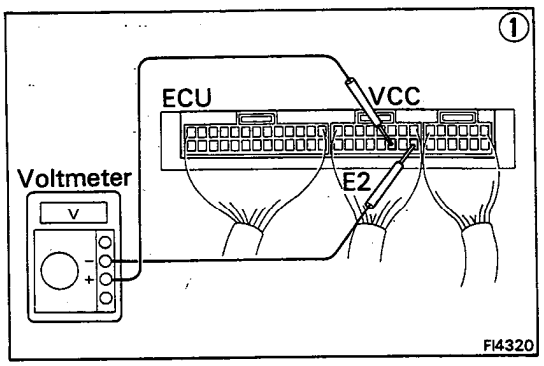
↓ OK

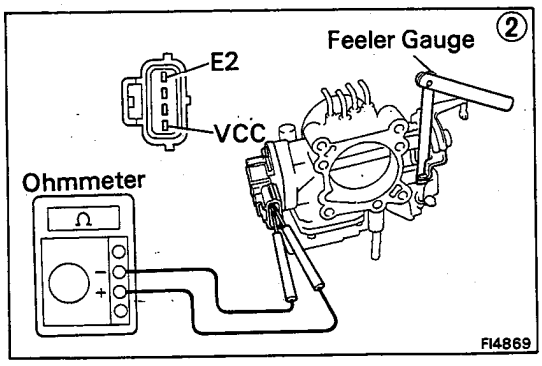
Try another ECU











• VTA – E2

① There is no specified voltage at ECU terminals VTA and E2. **(IG SW ON)**

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

NO → Check wiring between ECU terminal E1 and body ground.
- BAD → Repair or replace.

OK →

Refer to +B – E1 trouble section (No.1). (see page FI-67)
- BAD → Repair or replace.

OK →

③ Check throttle position sensor. (See page FI-127)
- BAD → Repair or replace.

OK →

Check wiring between ECU and throttle position sensor.
- BAD → Repair or replace.

OK →

Try another ECU.

• VCC – E2

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

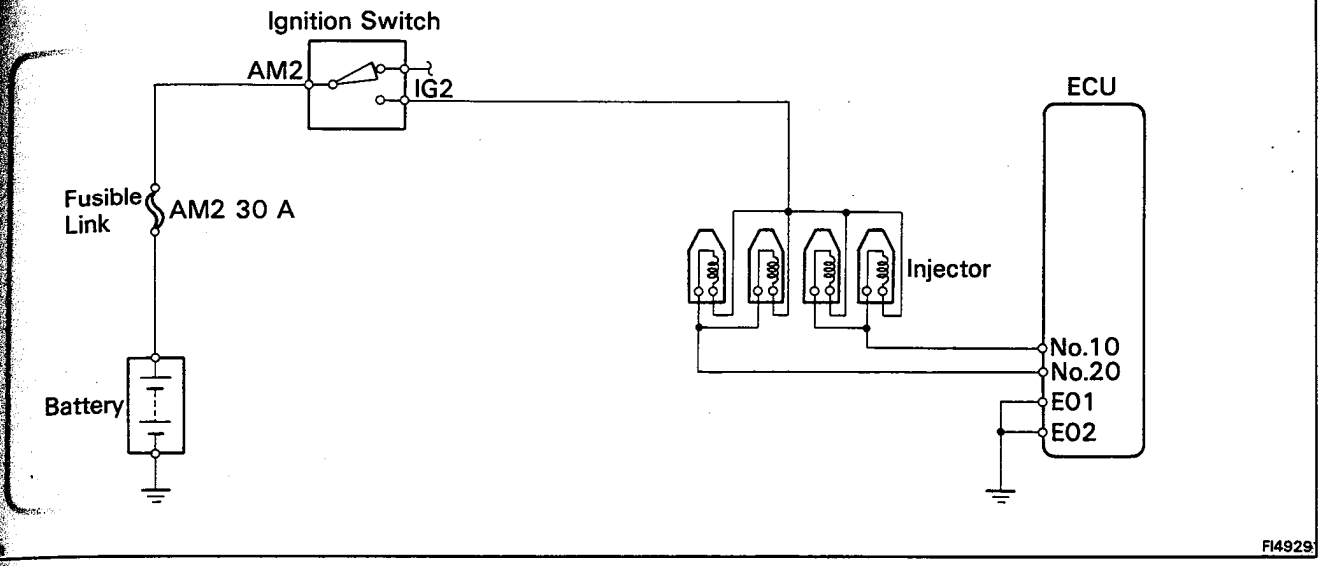
Check that there is voltage between ECU terminal +B (+B1) and body ground. **(IG SW ON)**

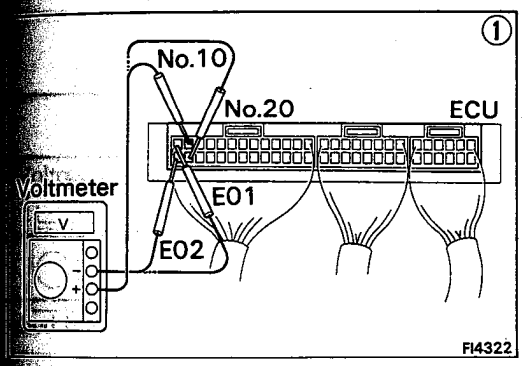
OK →

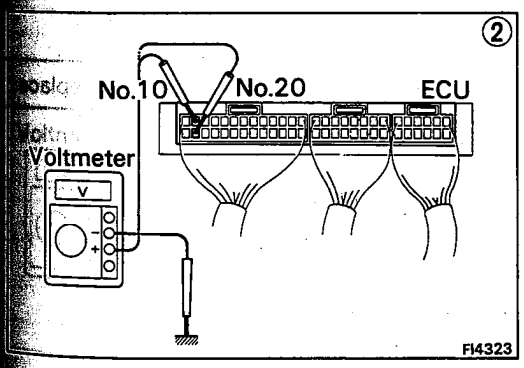
② Check throttle position sensor. (See page FI-127)
- BAD → Repair or replace
- OK → Check wiring between ECU and throttle position sensor.
  - OK → Try another ECU.
  - BAD → Repair or replace wiring.

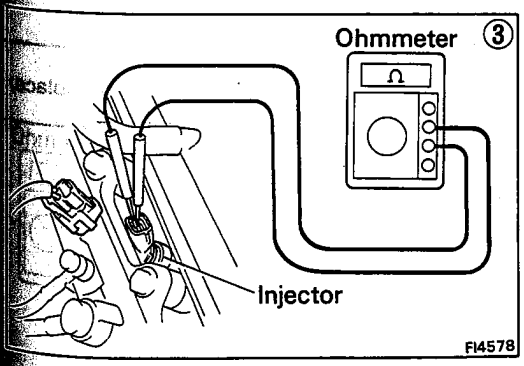
NO → Refer to +B – E1 trouble section (No.1) (See page FI-67)

Terminals	Trouble	Condition	STD voltage
No.10 – E01 No.20 – E02	No voltage	IG SW ON	10 – 14 V









① There is no voltage between ECU terminals 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 and/or No.20 and body ground.

NO → OK

OK → Check wiring between ECU terminal E01 and/or E02 and body ground.

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

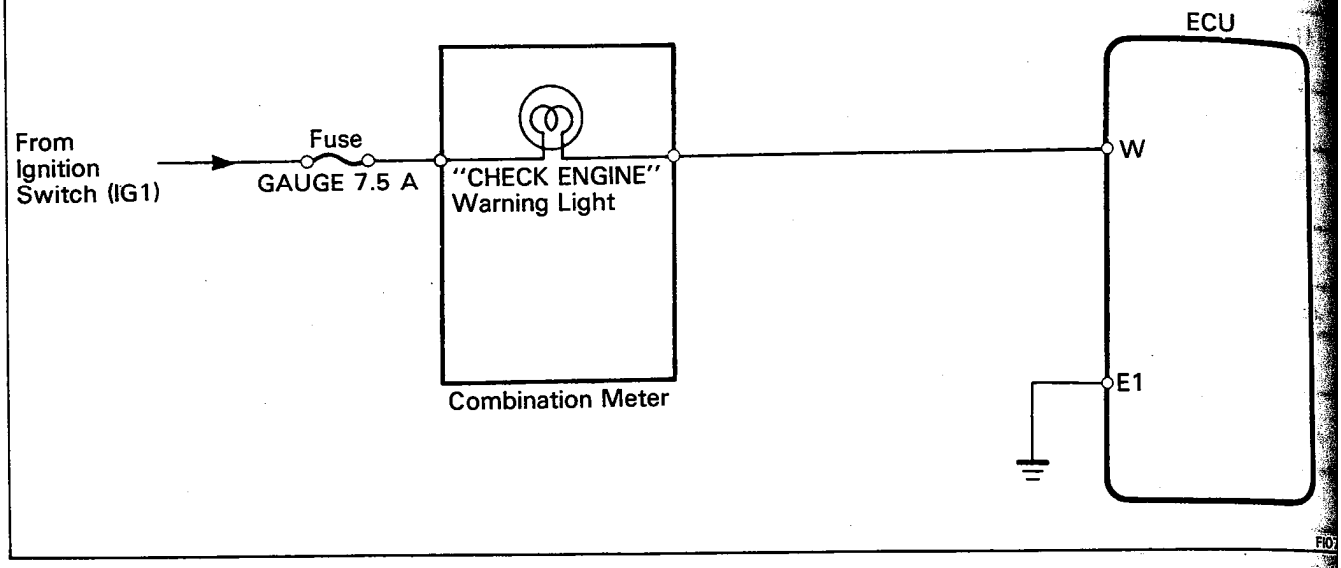
NO → Check fuse, fusible link, ignition switch and starter relay.

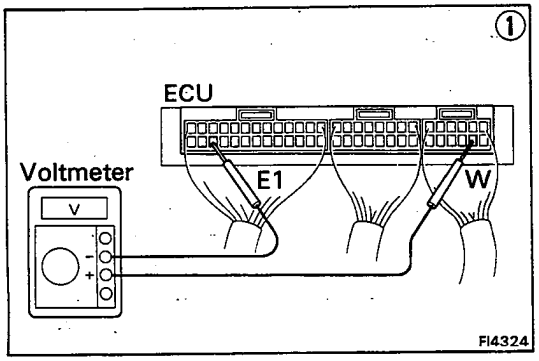
- BAD → Repair or replace.
- OK →

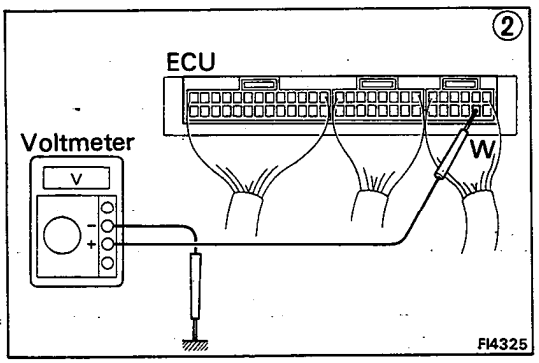
③ Check resistance of magnetic coil in each injector.
STD resistance: Approx. 13.8Ω

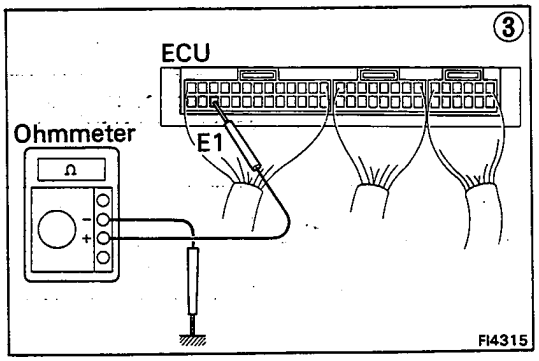
- OK → Check wiring between ECU terminal No.10 and/or No.20 and battery.
  - BAD → Repair or replace.
- BAD → Replace injector.

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









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 → ③ Check wiring between ECU terminal E1 and body ground.

③ OK → Try another ECU.

③ BAD → Repair or replace

② OK → Check GAUGE fuse and "CHECK ENGINE" warning light.

Check GAUGE fuse and "CHECK ENGINE" warning light.

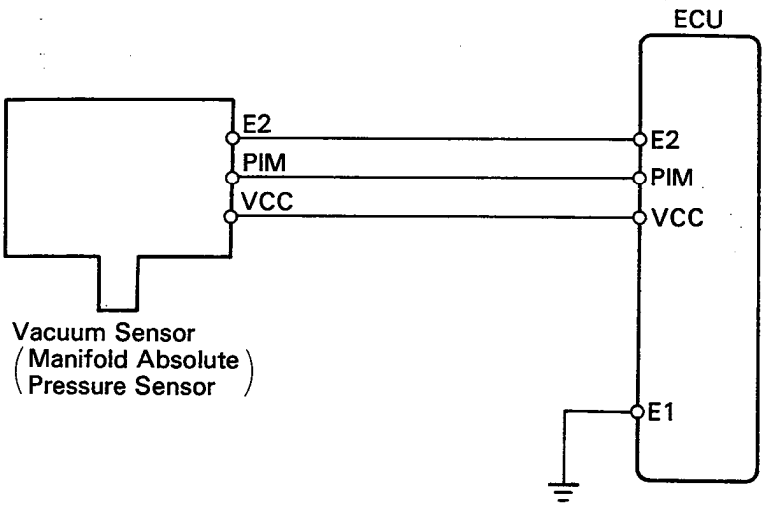
OK → Check wiring between ECU terminal W and fuse.

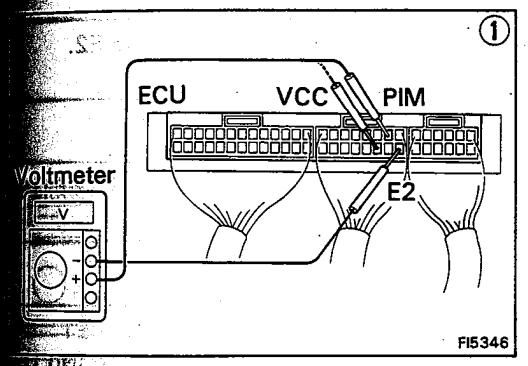
BAD → Repair or replace.

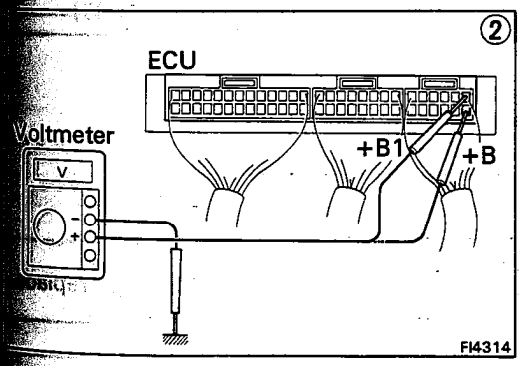
Fuse blows again → Check wiring between ECU terminal W and fuse.

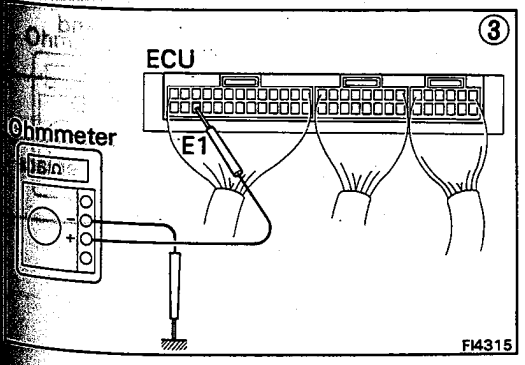
Check wiring between ECU terminal W and fuse. BAD → Repair or replace

Terminals	Trouble	Condition	STD voltage
PIM – E2	No voltage	IG SW ON	3.3 – 3.9 V
VCC – E2			4.5 – 5.5 V









① There is no voltage between ECU terminals PIM or VCC and E2. **(IG SW ON)**

↓

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

OK ↓ / NO → Refer to +B – E1 trouble section (No.1) (See page FI-67)

↓

③ Check wiring between ECU terminal E1 and body ground.

OK ↓ / BAD → Repair or replace.

Check vacuum sensor. (See page FI-140)

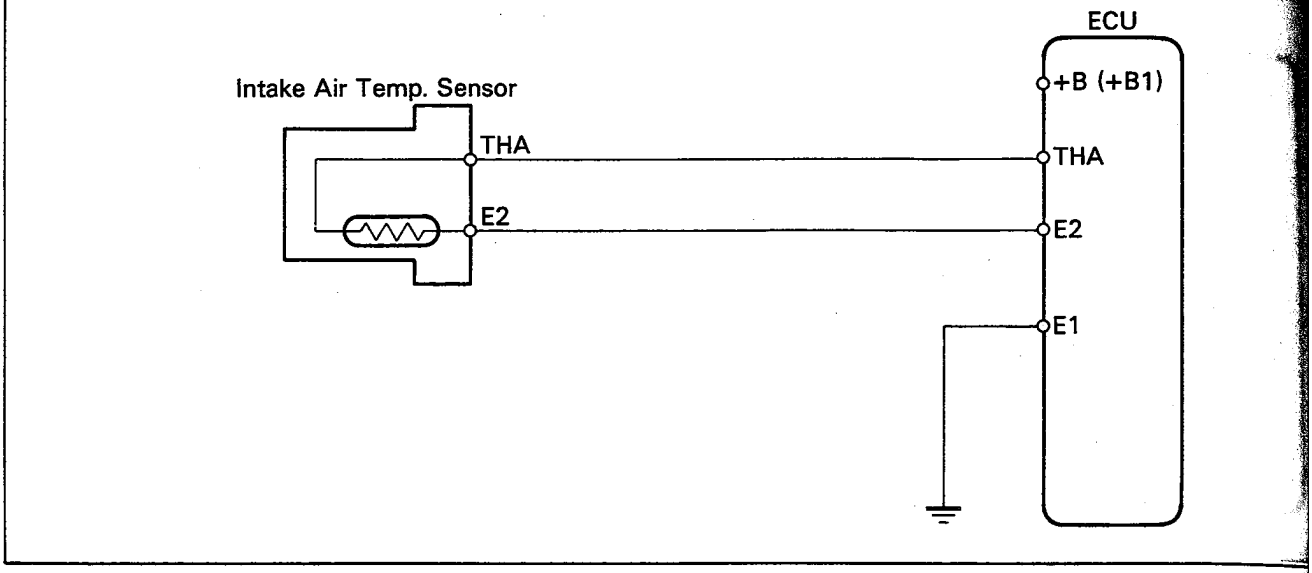
BAD → Replace vacuum sensor.

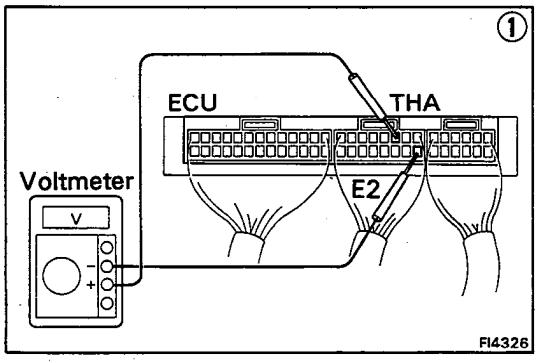
OK → Check wiring between ECU and vacuum sensor.

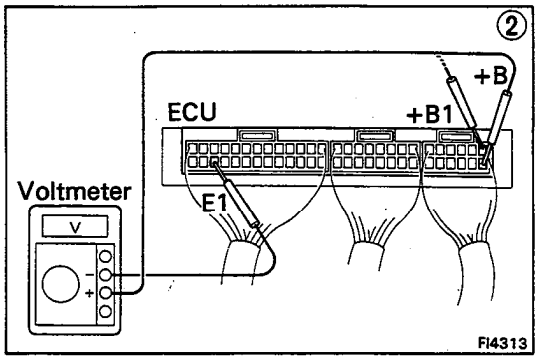
OK → Try another ECU.

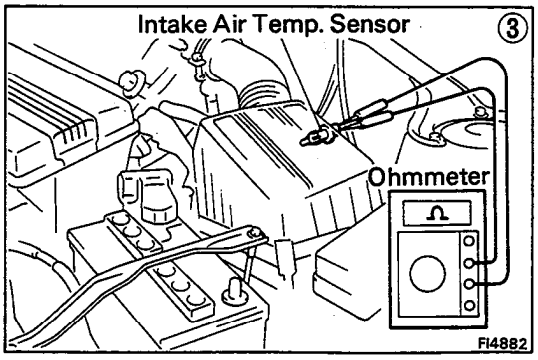
BAD → Repair or replace.

No.	Terminals	Trouble	Condition		STD voltage
7	THA – E2	No voltage	IG SW ON	Intake air temperature 20°C (68°F)	2.0 – 2.8 V









① There is no voltage between ECU terminals THA 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 +B – E1 trouble section (No. (See page FI-67)

Check wiring between ECU terminal E1 and body ground.

OK

BAD

Repair or repl

③ Check intake air temp. sensor. (See page FI-139)

BAD

OK

Replace intake air temp sensor.

Check wiring between ECU and intake air temp. sensor.

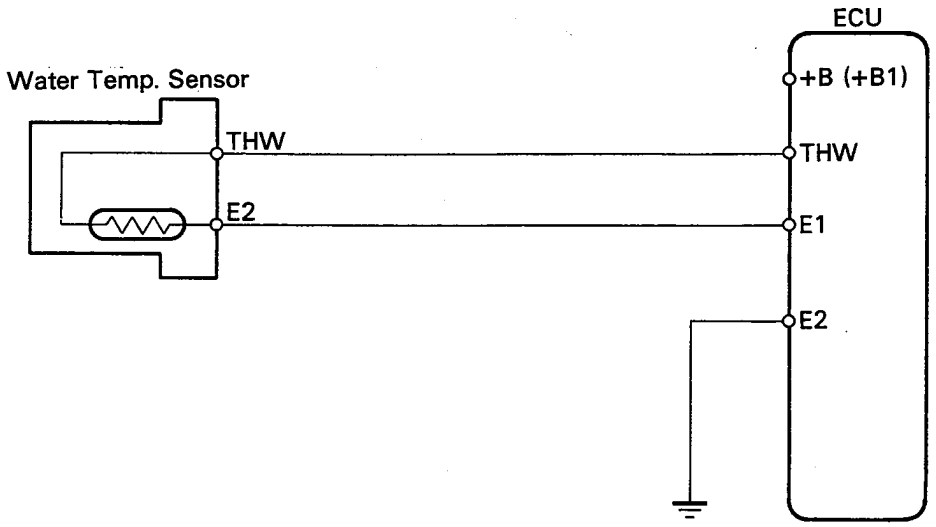
OK

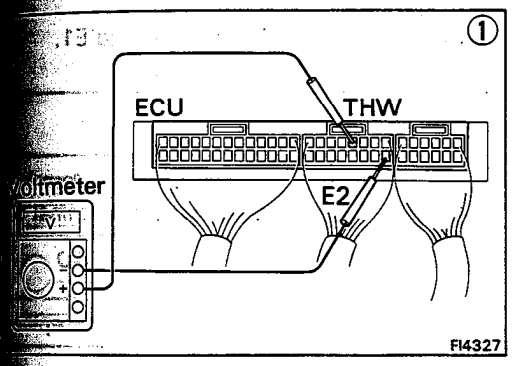
BAD

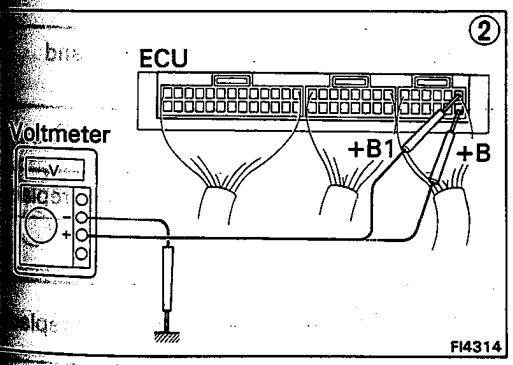
Try another ECU.

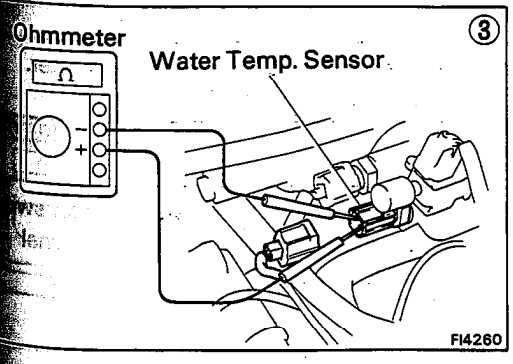
Repair or repl wiring.

Terminals	Trouble	Condition		STD voltage
THW – E2	No voltage	IG SW ON	Coolant temperature 80°C (176°F)	0.4 – 0.7 V









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 → Check wiring between ECU terminal E1 and body ground.

NO → Refer to +B – E1 trouble section (No.1) (See page FI-67)

Check wiring between ECU terminal E1 and body ground.

OK → ③ Check water temp. sensor (See page FI-138)

BAD → Repair or replace.

③ Check water temp. sensor (See page FI-138)

BAD → Replace water temp sensor.

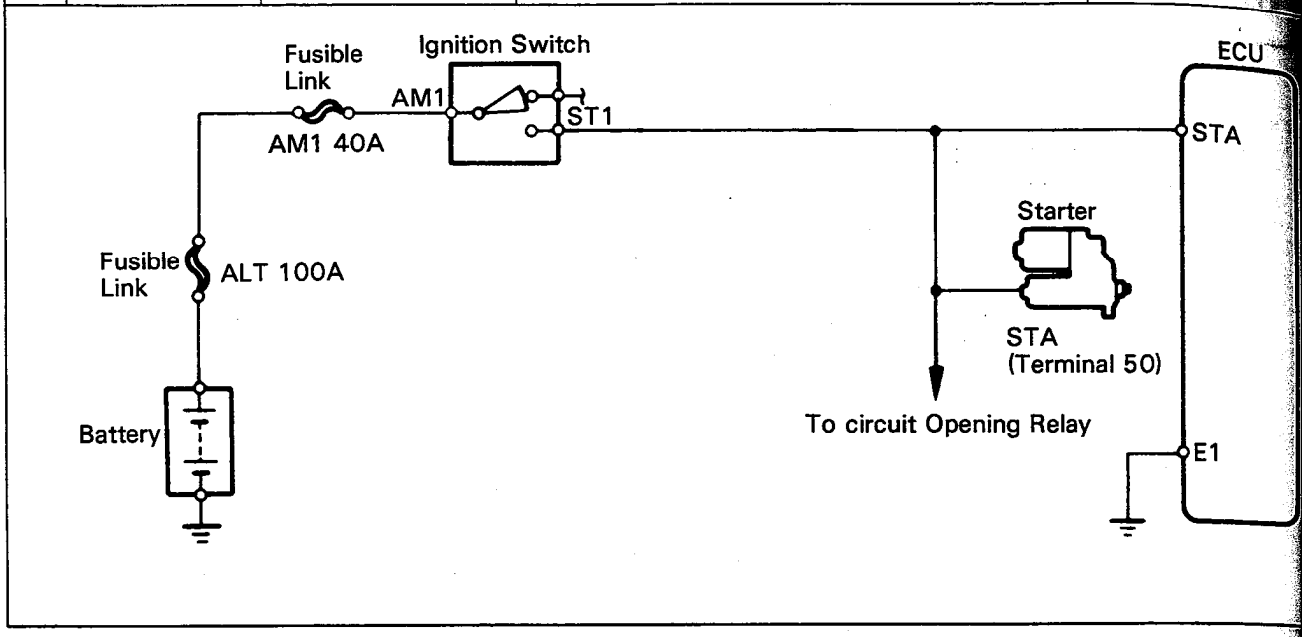
OK → Check wiring between ECU and water temp. sensor.

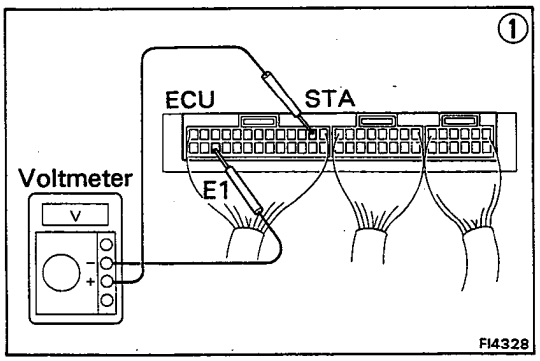
Check wiring between ECU and water temp. sensor.

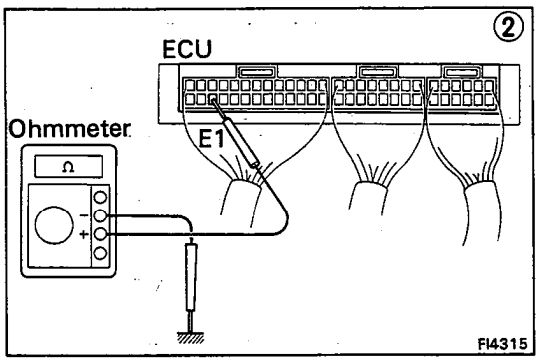
OK → Try another ECU.

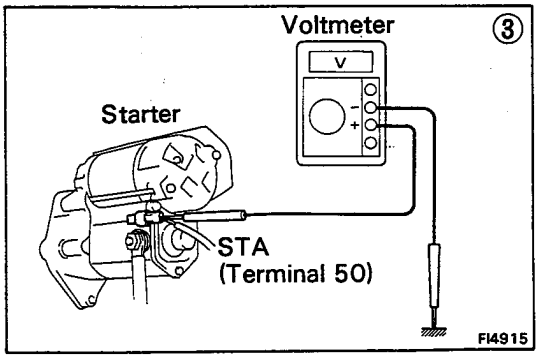
BAD → Repair or replace.

No.	Terminals	Trouble	Condition	STD voltage
9	STA – E1	No voltage	Cranking	6 – 14 V









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

Check starter operation. → OK → Check wiring between ECU term STA and ignition switch termina

BAD → OK → BAD → Repair or rep

② Check wiring between ECU terminal E1 and body ground.

OK → Try another ECU.

BAD → Repair or rep

Check fusible link, battery, wiring and ignition switch. → BAD → Repair or rep

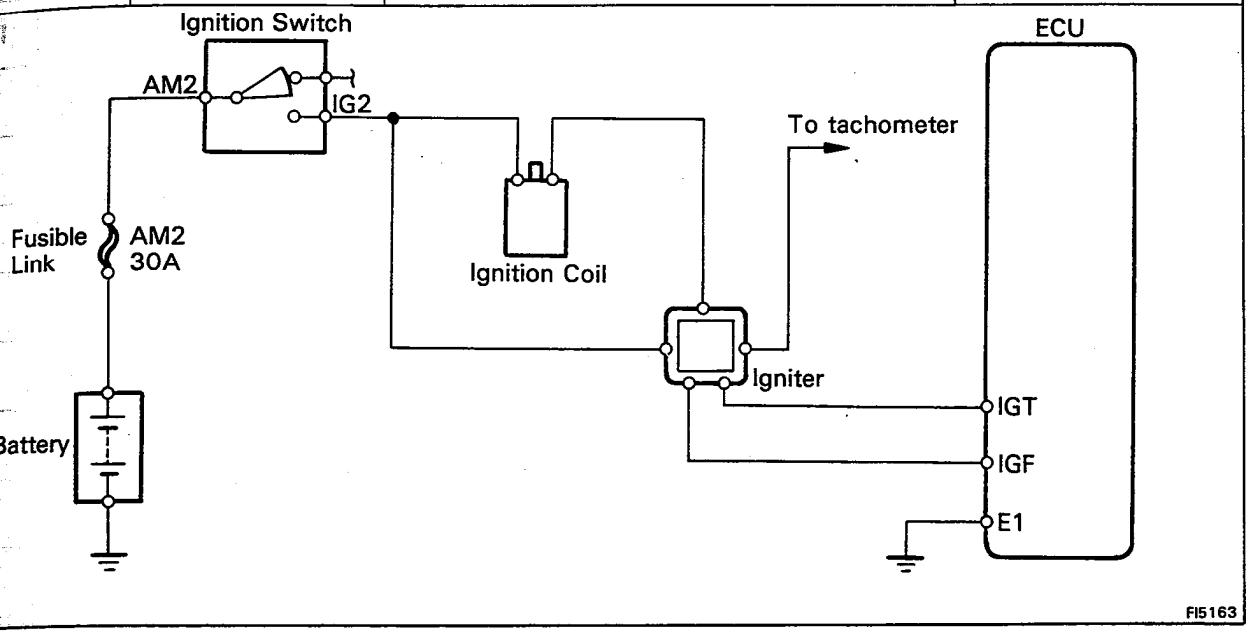
OK

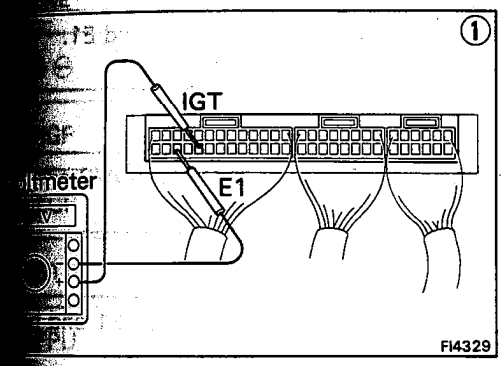
③ Check that there is voltage at STA (50) terminal of starte **(IG SW START) STD voltage: 6 – 14 V**

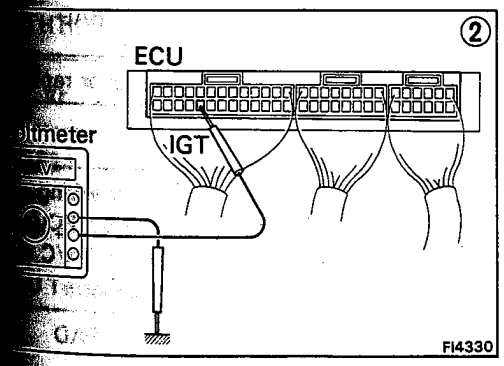
OK → Check starter.

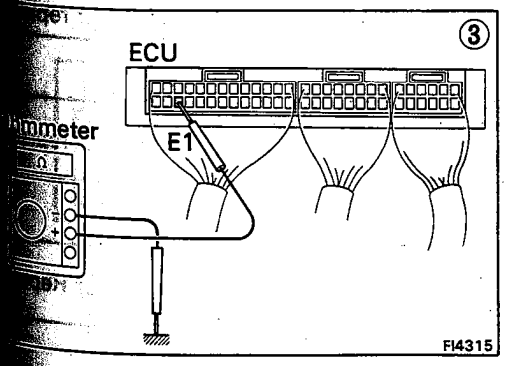
NO → Check wiring between ignition s terminal ST1 and starter termin STA (50).

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









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

③ OK → Try another ECU.

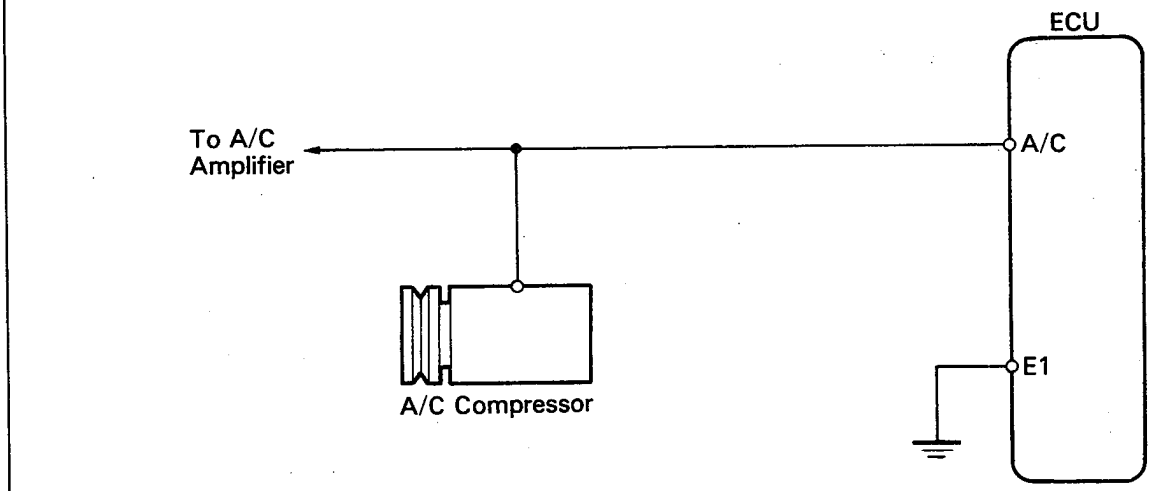
② OK → Check fusible link and ignition switch. — BAD → Repair or replace.

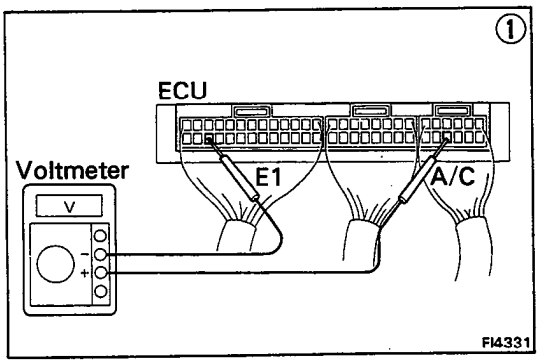
OK → Check distributor. (See page IG-14) — BAD → Repair or replace.

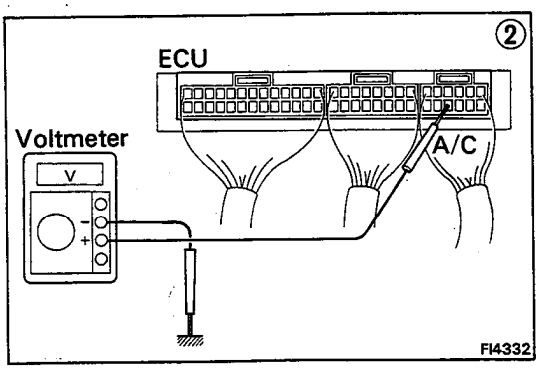
OK → Check wiring between ECU and battery. — BAD → Repair or replace.

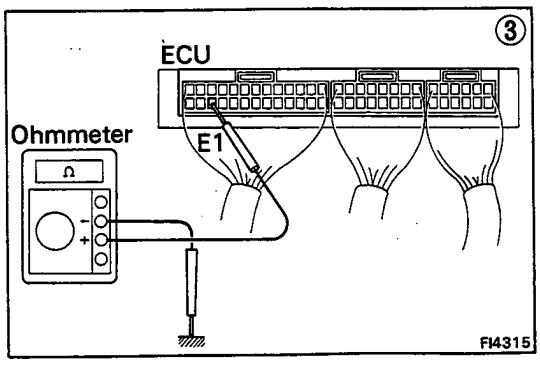
OK → Check igniter. (See page IG-10) — BAD → Repair or replace.

No.	Terminals	Trouble	Condition	STD voltage
11	A/C – E1	No voltage	Air conditioning ON	10 – 14 V









① There is no voltage between ECU terminals A/C and E1. **(Air conditioning ON)**

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

NO

OK

③ Check wiring between ECU terminal E1 and b ground.

OK

Try another ECU.

BAD

Repair or repla

Check compressor running

OK

Check wiring between ECU terminal A/C a amplifier.

NO

BAD

Repair or repl

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

BAD

Repair or repl

OK

Check wiring between amplifier and ECU or compressor.

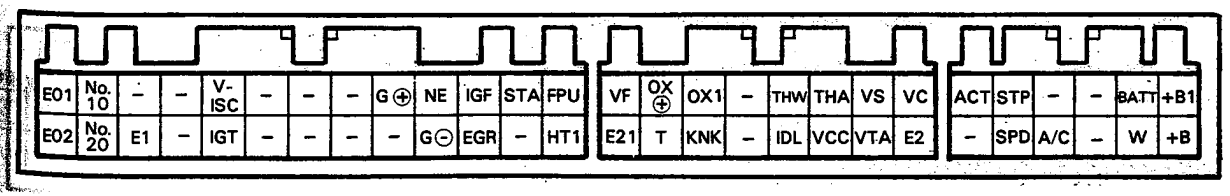
BAD

Repair or Rep

Terminals of ECU (4A-GE w/ Air Flow Meter)

Symbol	Terminal Name	Symbol	Terminal Name
E01	POWER GROUND	T	CHECK CONNECTOR
E02	POWER GROUND	OX1	OXYGEN SENSOR
No.10	INJECTOR	KNK	KNOCK SENSOR
No.20	INJECTOR	THW	WATER TEMP. SENSOR
E1	ECU GROUND	IDL	THROTTLE POSITION SENSOR
V-ISC	VSV (IDLE-UP)	THA	INLET AIR TEMP. SENSOR
IGT	IGNITER	VCC	THROTTLE POSITION SENSOR
G⊕	DISTRIBUTOR	VS	AIR FLOW METER
NE	DISTRIBUTOR	VTA	THROTTLE POSITION SENSOR
G⊖	DISTRIBUTOR	VC	AIR FLOW METER
IGF	IGNITER	ACT	A/C AMPLIFIER
EGR	VSV (EGR)	STP	STOP LIGHT SWITCH
STA	STARTER SWITCH	SPD	SPEED SENSOR
FPU	VSV (FPU)	A/C	A/C COMPRESSOR
HT1	OXYGEN SENSOR HEATER	BATT	BATTERY
VF	CHECK CONNECTOR	W	CHECK ENGINE WARNING LIGHT
E21	SENSOR GROUND	+B1	EFI MAIN RELAY
OX⊕	OXYGEN SENSOR	+B	EFI MAIN RELAY

ECU Terminals

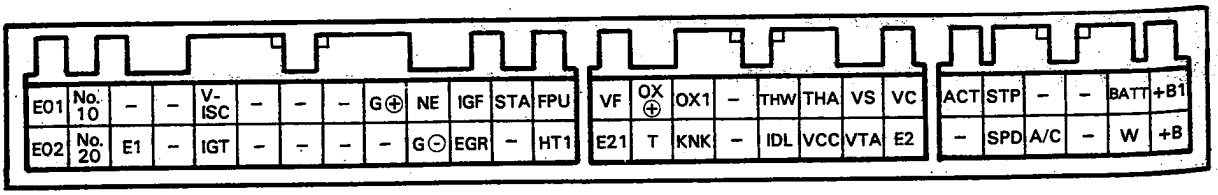


FI4265

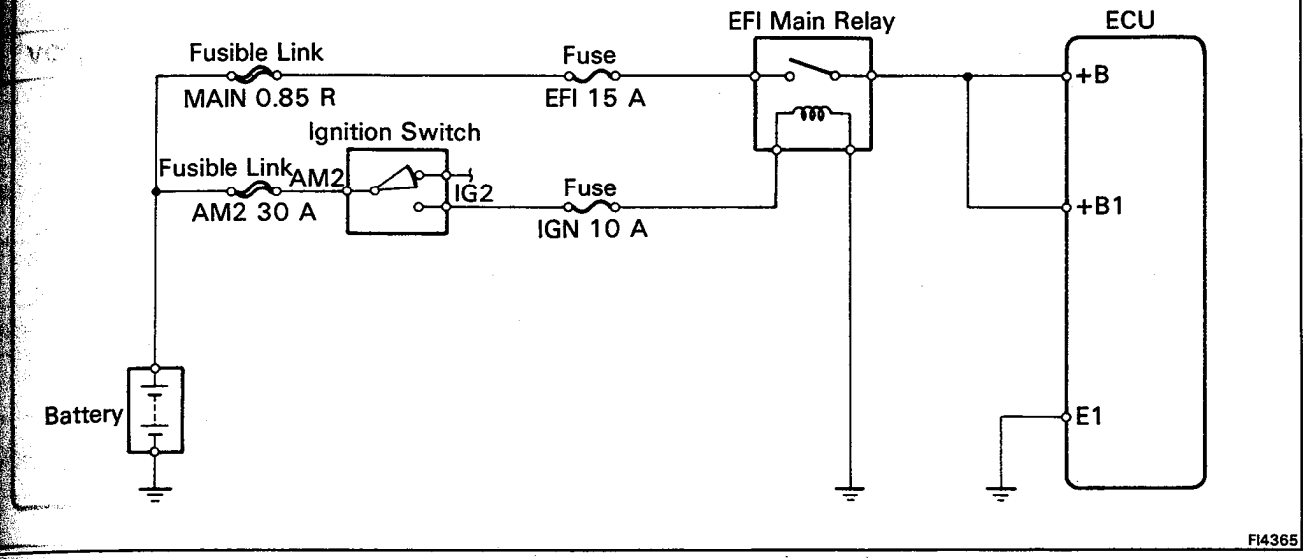
Voltage at ECU Wiring Connectors (4A-GE w/ Air Flow Meter)

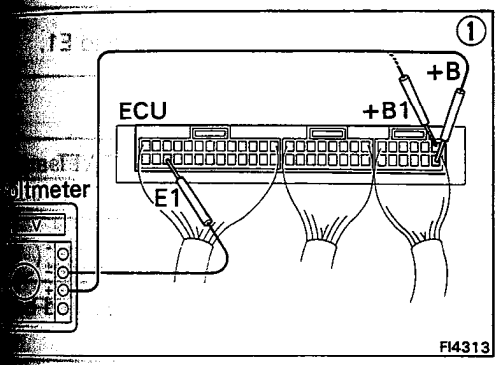
No.	Terminals	STD voltage (V)	Condition		See page
1	+B, +B1 – E1	10 – 14	Ignition SW ON		FI-81
2	BATT – E1	10 – 14	–		FI-82
3	IDL – E2	10 – 14	Ignition SW ON	Throttle valve open	FI-83
	VTA – E2	0.1 – 1.0		Throttle valve fully closed	
		4 – 5		Throttle valve fully open	
	VCC – E2	4.5 – 5.5		–	
4	VC – E2	4.5 – 5.5	Ignition SW ON	–	FI-85
	VS – E2	2.0 – 5.5		Measuring plate fully closed	
		6 – 9		Measuring plate fully open	
		2 – 8	Idling		
5	No.10 – E01, No.20 – E02	10 – 14	Ignition SW ON		FI-86
6	W – E1	10 –14	No trouble ("CHECK ENGINE" warning light off) and engine running		FI-87
7	THA – E2	2.0 – 2.8	Ignition SW ON	Intake air temp. 20°C (68°F)	FI-88
8	THW – E2	0.4 – 0.7		Coolant temp. 80°C (176°F)	FI-89
9	STA – E1	6 –14	Cranking		FI-90
10	IGT – E1	0.7 – 1.0	Idling		FI-91
11	A/C – E1	10 –14	Ignition SW ON	Air conditioning ON	FI-92

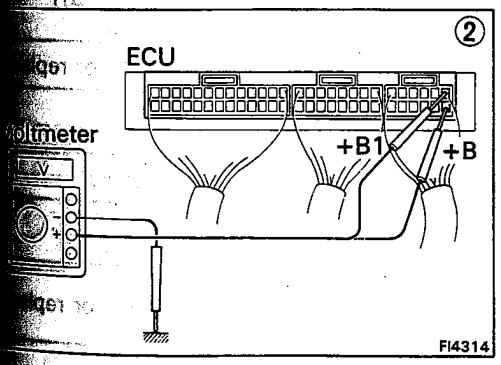
ECU Terminals

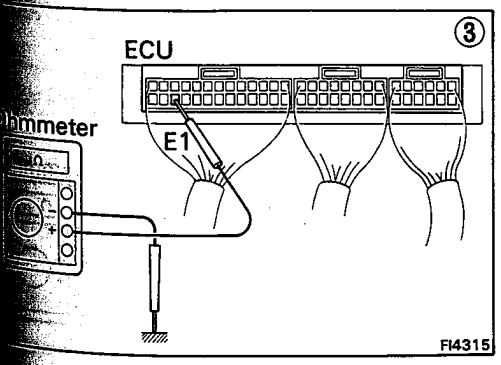


Terminals	Trouble	Condition	STD voltage
+B, +B1 – E1	No voltage	IG SW ON	10 – 14 V









① There is no voltage between ECU terminals +B (+B1) and E1. **(IG SW ON)**

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

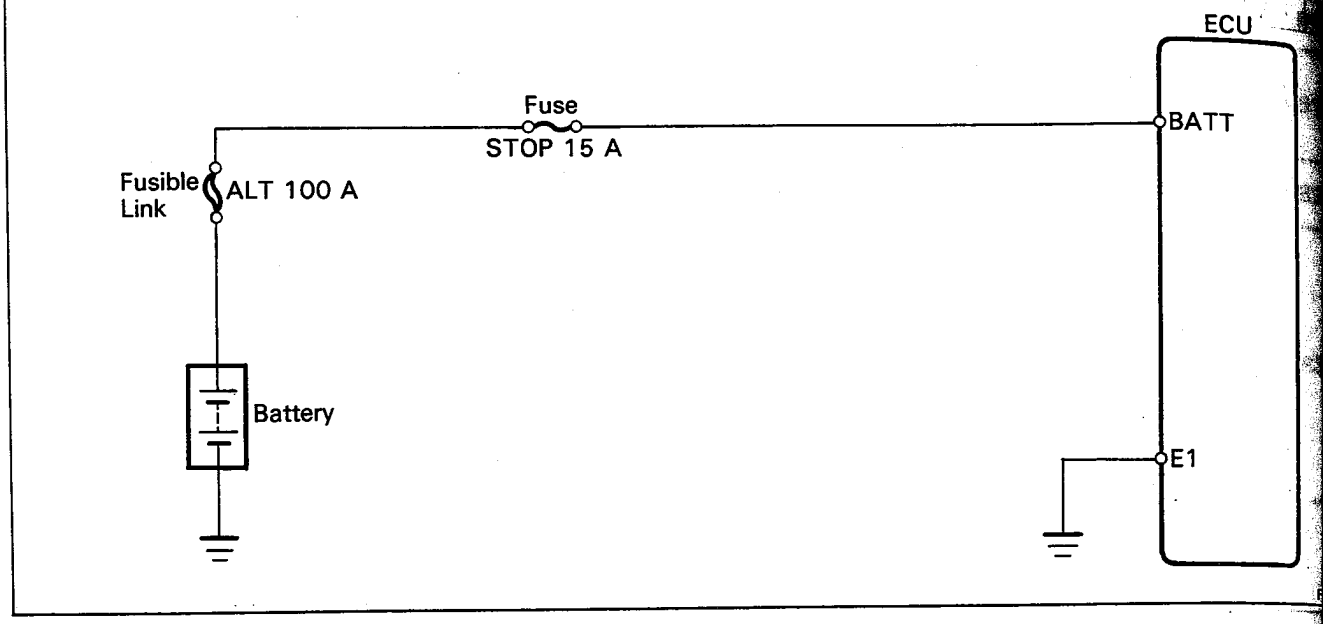
NO → ③ Check wiring between ECU terminal E1 and body ground.
- OK → Try another ECU.
- BAD → Repair or replace.

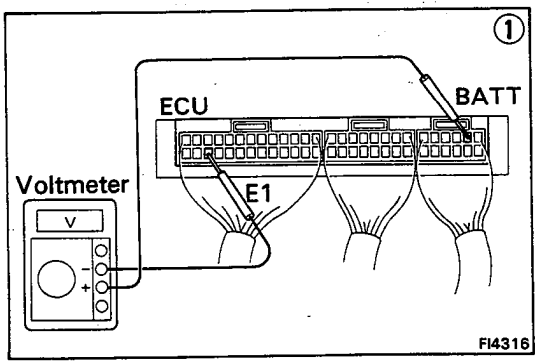
OK → Check fuses, fusible links and ignition switch.
- BAD → Repair or replace.

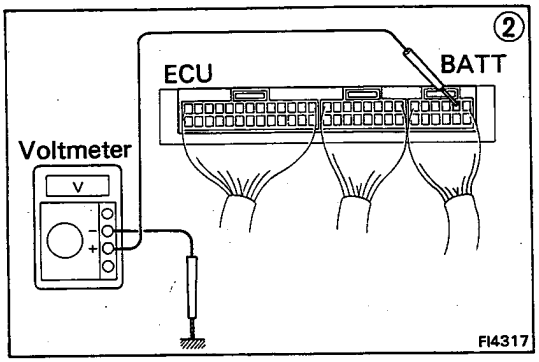
OK → Check EFI main relay. (See page FI-134)
- BAD → Replace.

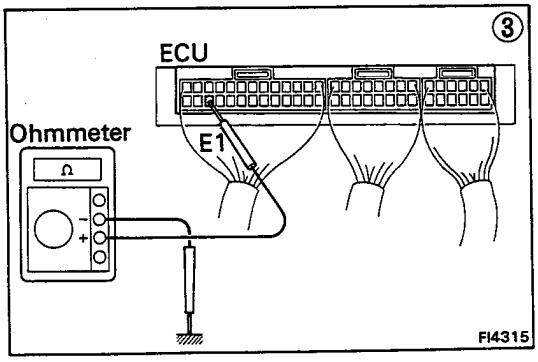
OK → Check wiring between EFI main relay and battery.
- BAD → Repair or replace.

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









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

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

NO

OK

③ Check wiring between ECU terminal E1 and body ground.

OK

Try another ECU.

BAD

Repair or repla

BAD

Check fuse and fusible link.

Replace.

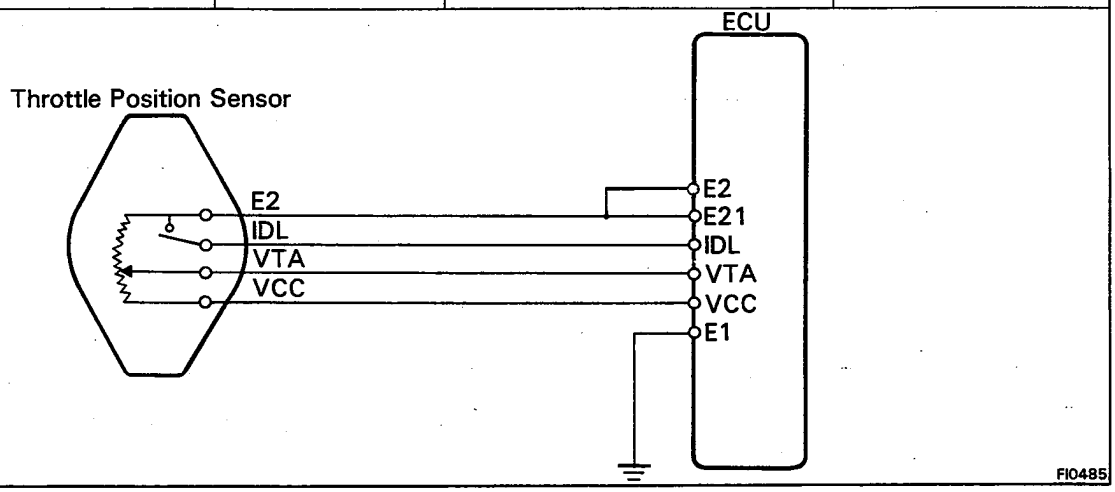
OK

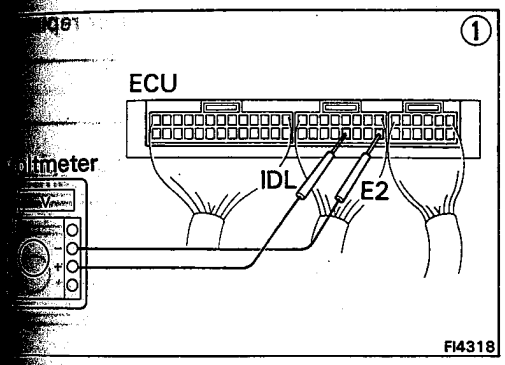
Check wiring between ECU terminal and battery.

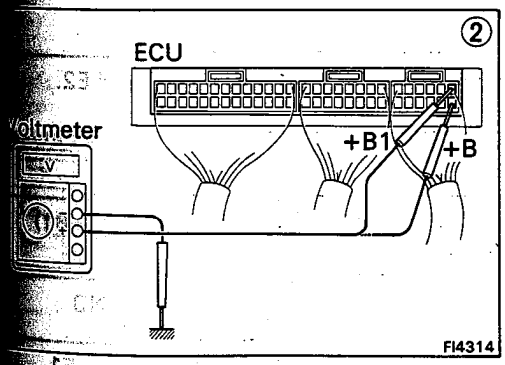
BAD

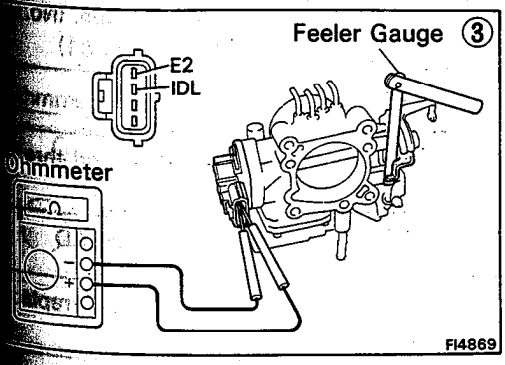
Repair or repla

Terminals	Trouble	Condition		STD voltage
IDL – E2	No voltage	IG SW ON	Throttle valve open	10 – 14 V
VTA – E2			Throttle valve fully closed	0.1 – 1.0 V
			Throttle valve fully open	4 – 5 V
VCC – E2			–	4.5 – 5.5 V









- **IDL – E2**

① There is no voltage between ECU terminals IDL and E2. **(IG SW ON)** (Throttle valve open)

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

NO

OK

Check wiring between ECU terminal E1 and body ground.

BAD

Repair or replace.

Refer to +B – E1 trouble section. (No.1) (See page FI-81)

BAD

Repair or replace.

OK

③ Check throttle position sensor. (See page FI-127)

BAD

OK

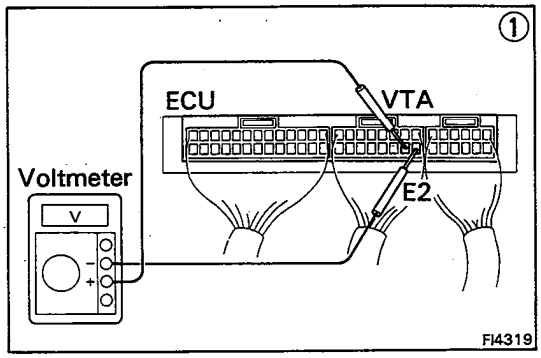
Repair or replace throttle position sensor.

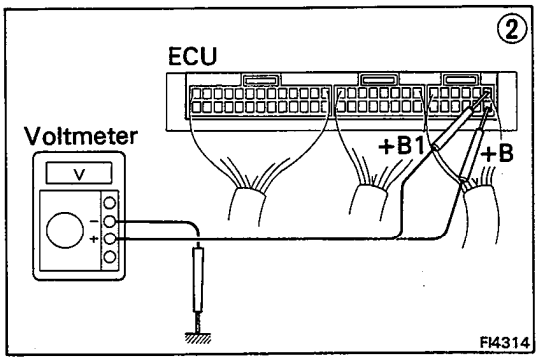
Check wiring between ECU and throttle position sensor.

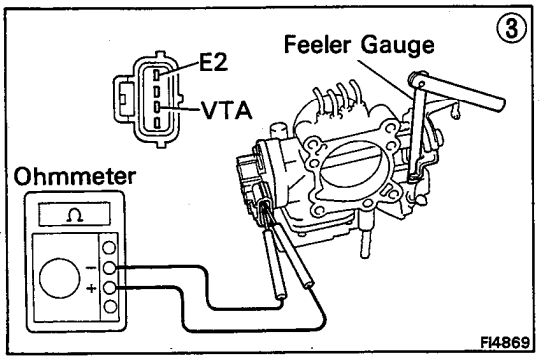
BAD

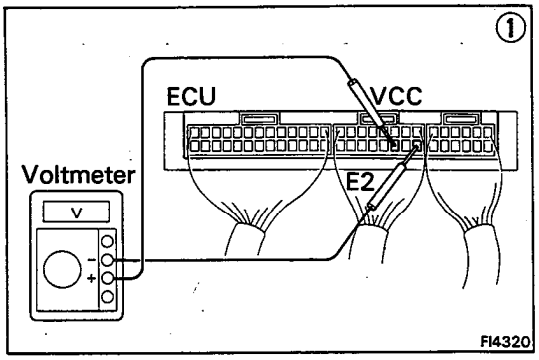
OK

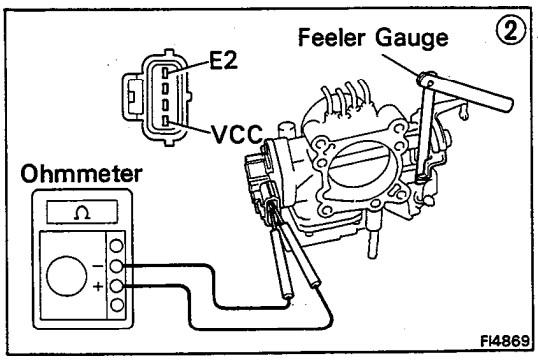
Try another ECU











- **VTA – E2**

① There is no specified voltage at ECU terminals VTA and E2. **(IG SW ON)**

↓

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

NO → ↓

OK → Check wiring between ECU terminal E1 and body ground.

BAD → Repair or replace

↓

Refer to trouble section (No.1) (See page FI-81) → BAD → Repair or replace

↓ OK

③ Check throttle position sensor. (See page FI-127) → BAD → Repair or replace

↓ OK

Check wiring between ECU and throttle position sensor. → BAD → Repair or replace

↓ OK

Try another ECU.

- **VCC – E2**

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

↓

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

OK → ↓

NO → Refer to +B – E1 trouble section. (No.1) (See page FI-81)

② Check throttle position sensor. (See page FI-127)

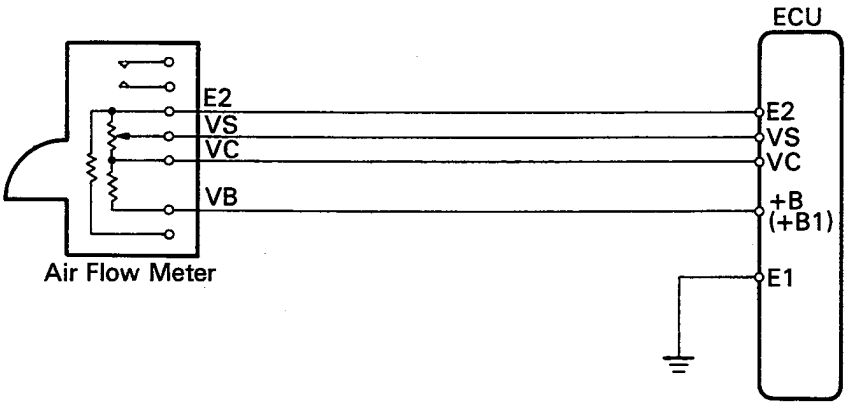
BAD → Repair or replace.

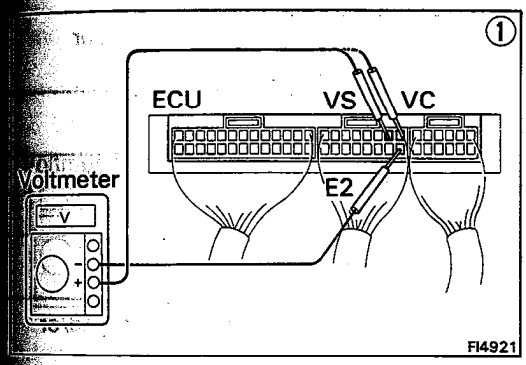
OK → Check wiring between ECU and throtti position sensor.

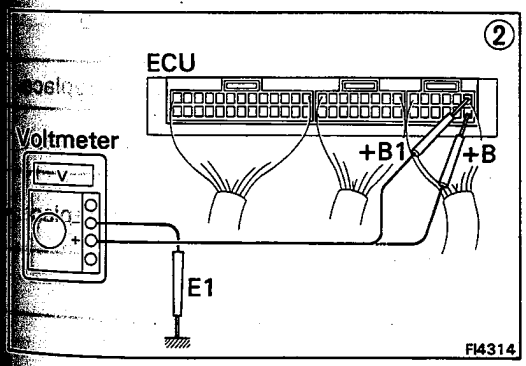
OK → Try another ECU.

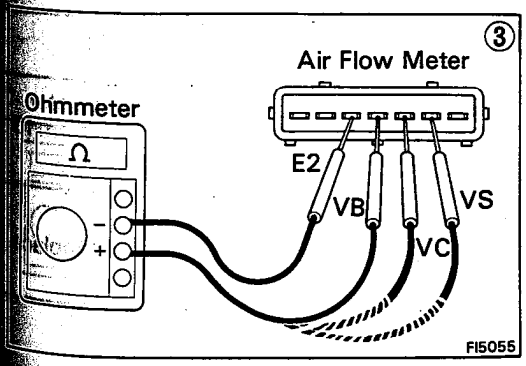
BAD → Repair or replace wiring.

Terminals	Trouble	Condition		STD voltage
VC – E2	No voltage	IG SW ON	–	4.5 – 5.5 V
VS – E2			Measuring plate fully closed	2.0 – 5.5 V
			Measuring plate fully open	6 – 9 V
		Idling		2 – 8 V









① There is no specified voltage at ECU terminals VC or VS 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 +B – E1 trouble section (No.1) (See page FI-81)

↓

Check wiring between ECU terminal E1 and body ground.

OK → ↓

BAD → Repair or replace.

↓

③ Check air flow meter. (See page FI-120)

BAD → Replace air flow meter.

OK → ↓

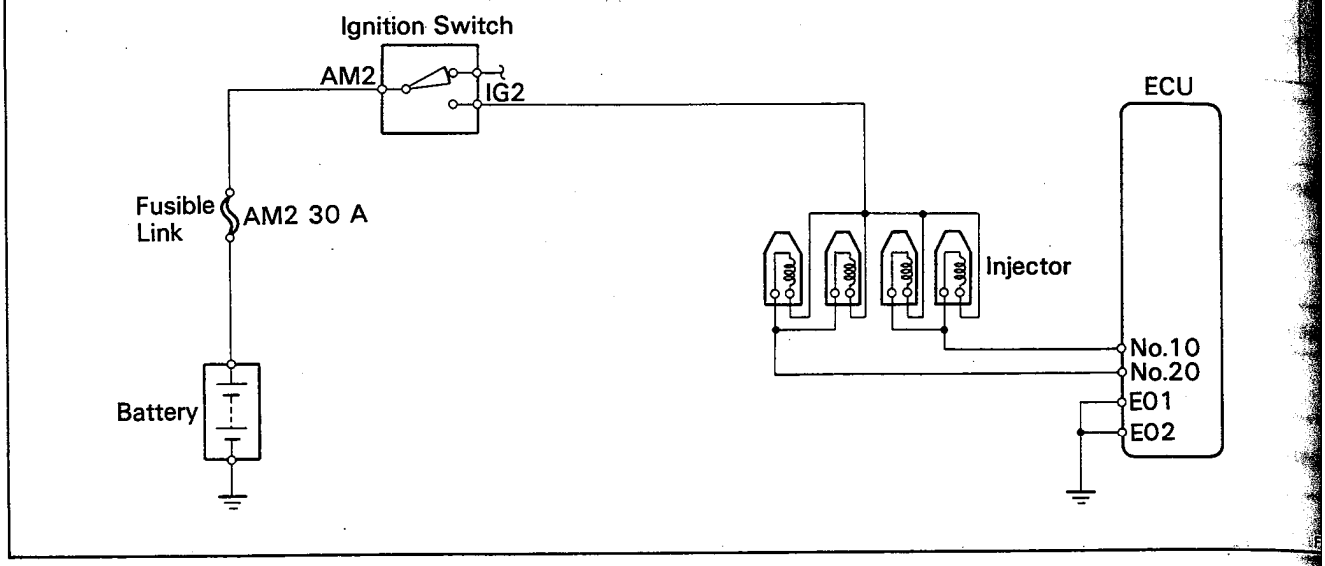
Check wiring between ECU and air flow meter.

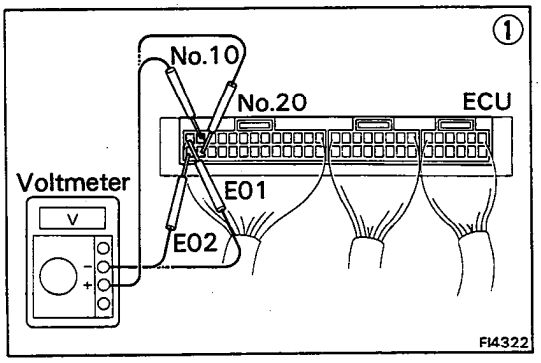
OK → ↓

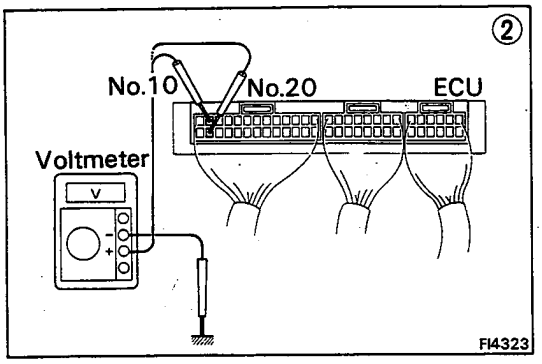
Try another ECU.

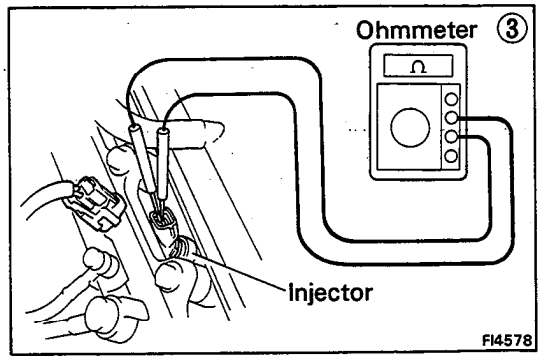
BAD → Repair or replace.

No.	Terminals	Trouble	Condition	STD voltage
5	No.10 – E01 No.20 – E02	No voltage	IG SW ON	10 – 14 V









① There is no voltage between ECU terminals 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 and/or No.20 and body ground.

NO

OK

Check wiring between ECU terminal E01 and/or E02 and body ground.

OK

BAD

Try another ECU.

Repair or repla

Check fuse, fusible link, ignition switch and starter relay.

OK

Repair or repla

OK

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

OK

BAD

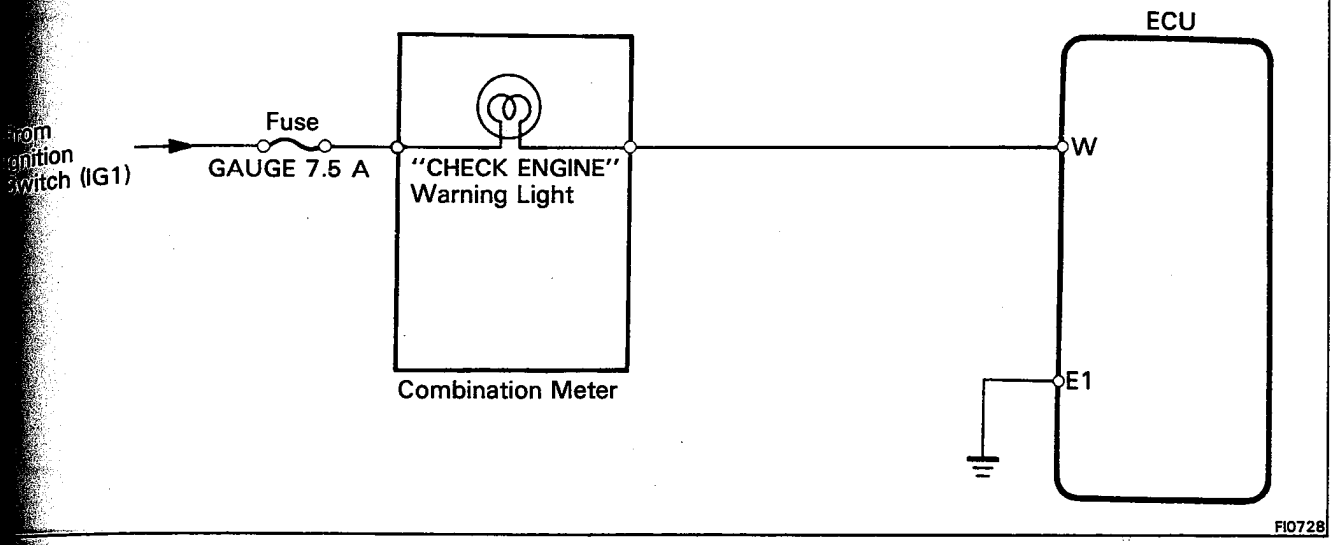
Replace injecto

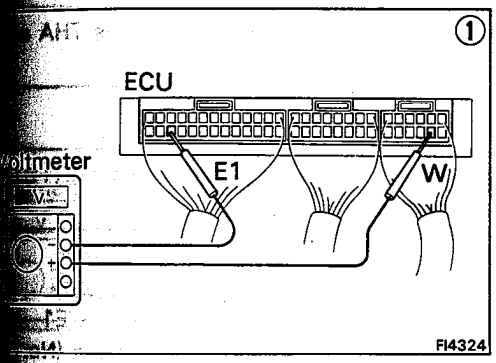
Check wiring between ECU terminal No.10 and/or No.20 and battery.

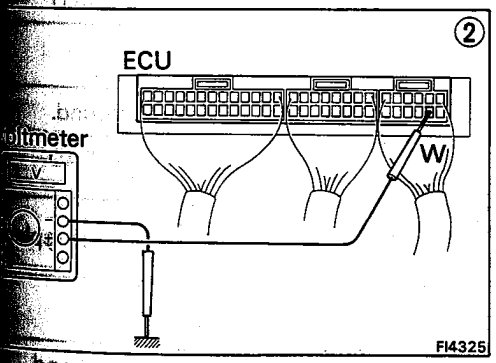
BAD

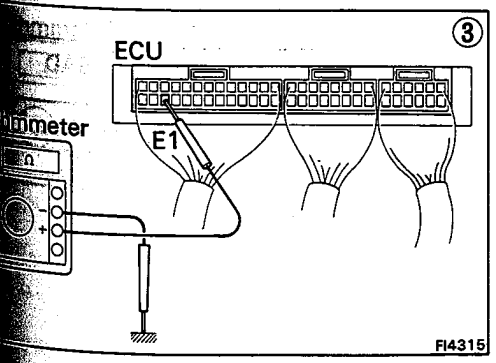
Repair or Repl

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









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

OK → ③ Check wiring between ECU terminal E1 and body ground.

OK → Try another ECU.

BAD → Repair or replace.

NO → Check GAUGE fuse and "CHECK ENGINE" warning light.

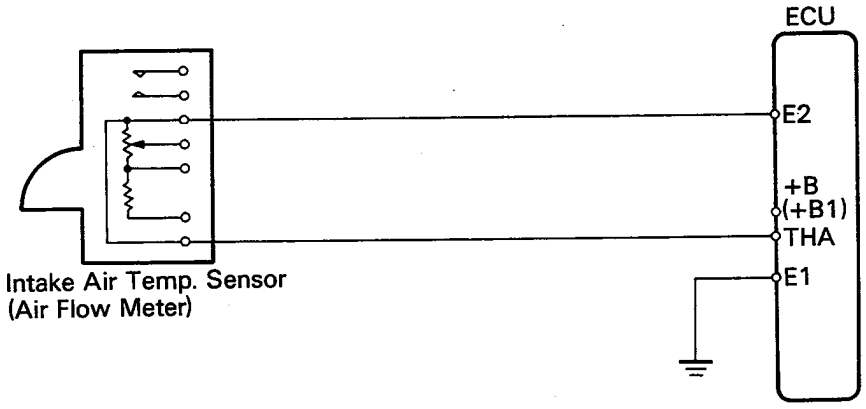
OK → Check wiring between ECU terminal W and fuse.

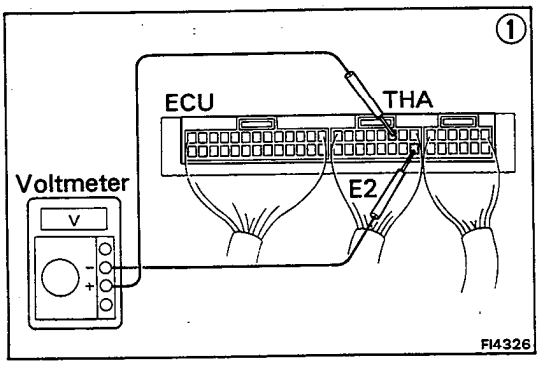
BAD → Repair or replace.

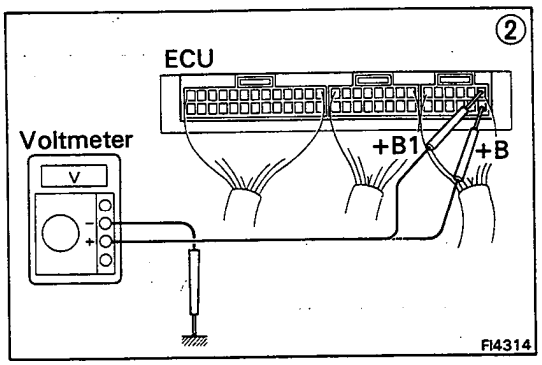
BAD → Repair or replace.

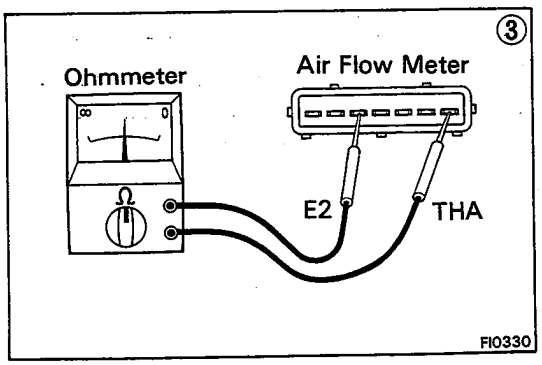
Fuse blows again → Check wiring between ECU terminal W and fuse.

No.	Terminals	Trouble	Condition		STD voltage
7	THA – E2	No voltage	IG SW ON	Intake air temperature 20°C (68°F)	2.0 – 2.8 V









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

↓

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

OK ↓

NO → Refer to +B – E1 trouble section (No.1) (See page FI-81)

↓

Check wiring between ECU terminal E1 and body ground.

OK ↓

BAD → Repair or replace

↓

③ Check intake air temp. sensor. (See page FI-120)

BAD → Replace air flow meter.

OK ↓

Check wiring between ECU and intake air temp. sensor.

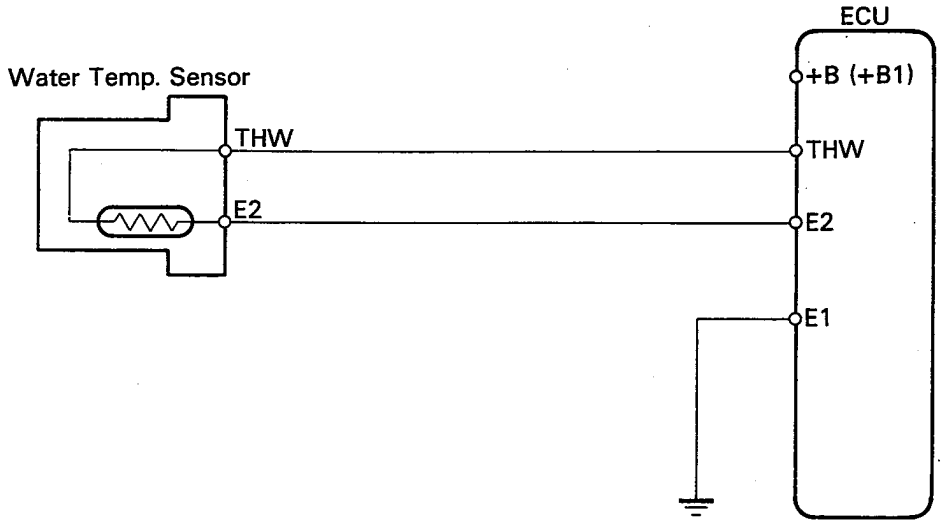
OK ↓

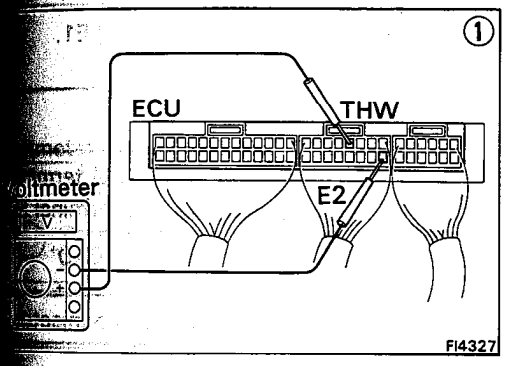
BAD → Repair or replace

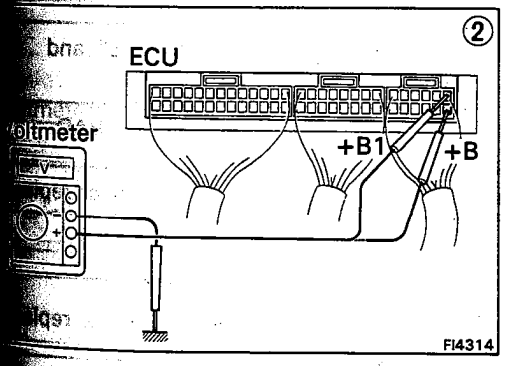
↓

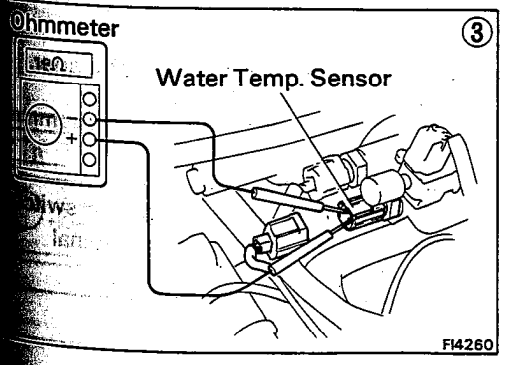
Try another ECU.

Terminals	Trouble	Condition		STD voltage
THW – E2	No voltage	IG SW ON	Coolant temperature 80°C (176°F)	0.4 – 0.7 V









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 +B – E1 trouble section (No.1). (See page FI-81)

↓

Check wiring between ECU terminal E1 and body ground.

OK → ↓

BAD → Repair or replace.

↓

③ Check water temp. sensor (See page FI-138)

BAD → Replace water temp sensor.

OK → ↓

Check wiring between ECU and water temp. sensor.

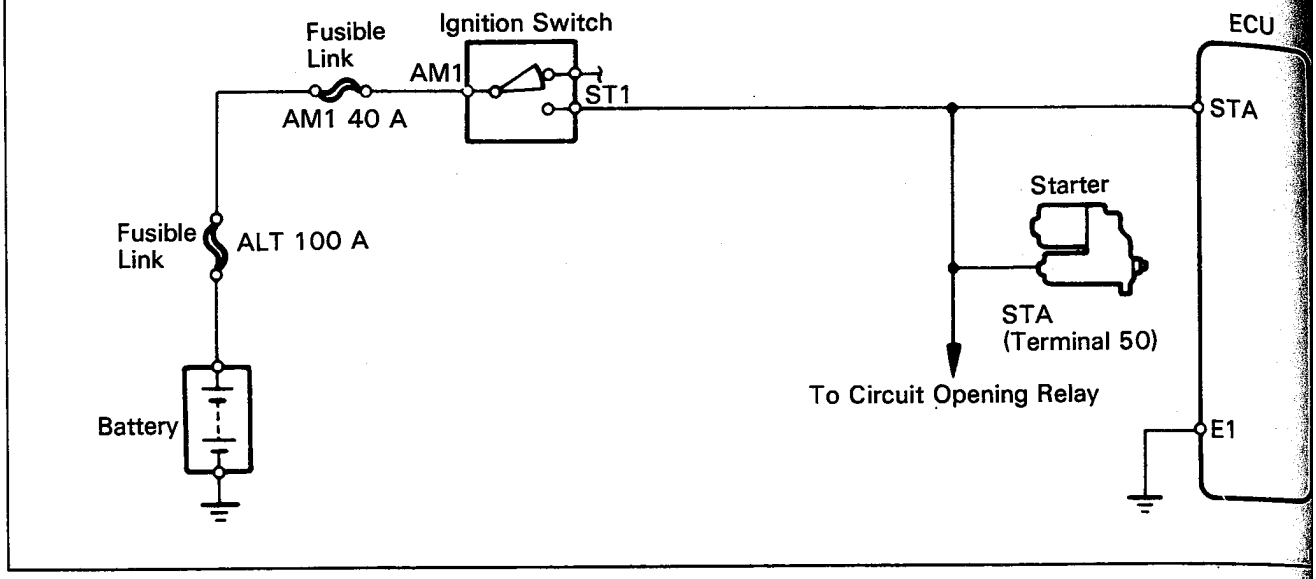
OK → ↓

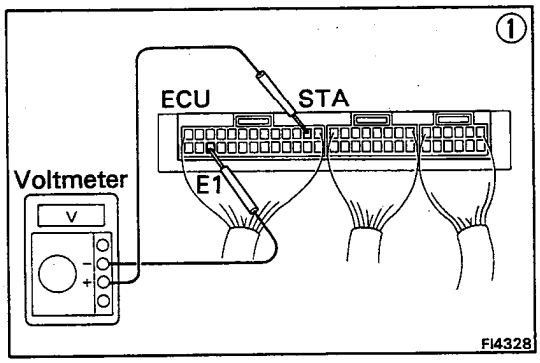
BAD → Repair or replace.

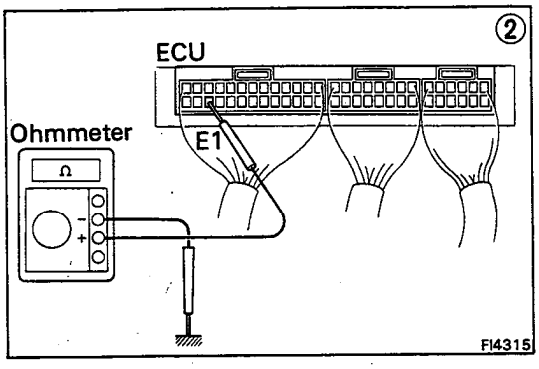
↓

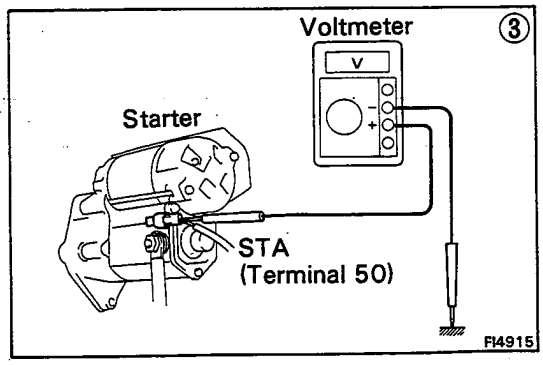
Try another ECU.

No.	Terminals	Trouble	Condition	STD voltage
9	STA – E1	No voltage	Cranking	6 – 14 V









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
- BAD

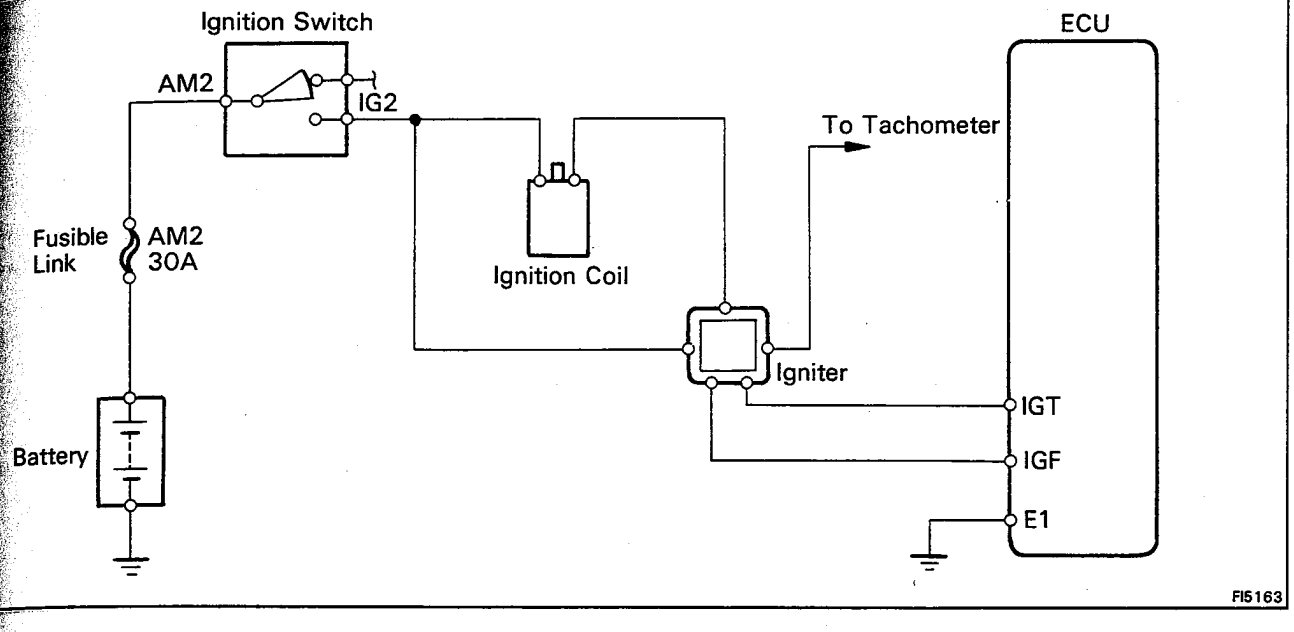
Check wiring between ECU terminal STA and ignition switch terminal
- OK
- BAD → Replace injector

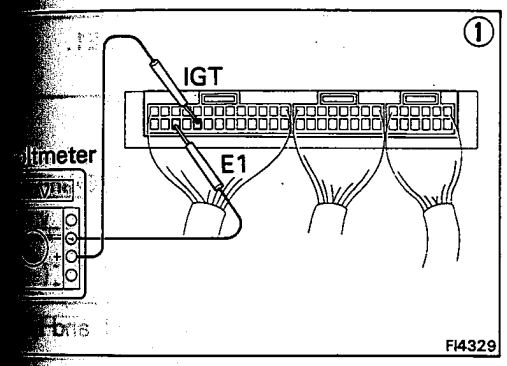
② Check wiring between ECU terminal E1 and body ground.
- OK → Try another ECU.
- BAD → Repair or replace

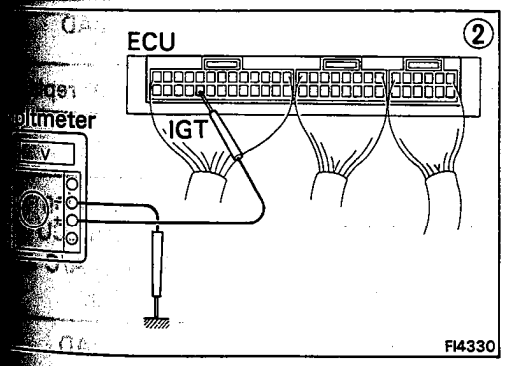
Check fusible link, battery, wiring and ignition switch.
- BAD → Repair or replace
- OK

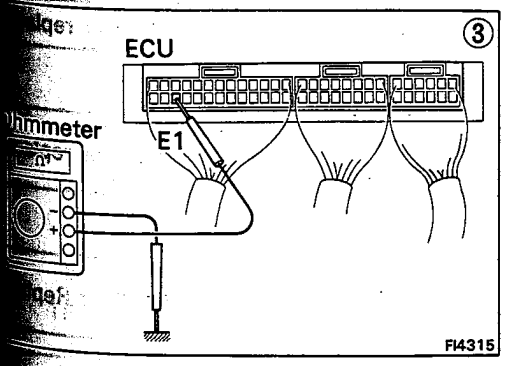
③ Check that there is voltage at STA (50) terminal of starter. **(IG SW START) STD voltage: 6 – 14 V**
- OK → Check starter.
- NO → Check wiring between ignition switch terminal ST1 and starter terminal STA (50).

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









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.

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

OK

Check distributor. (See page IG-14) — BAD → Repair or replace.

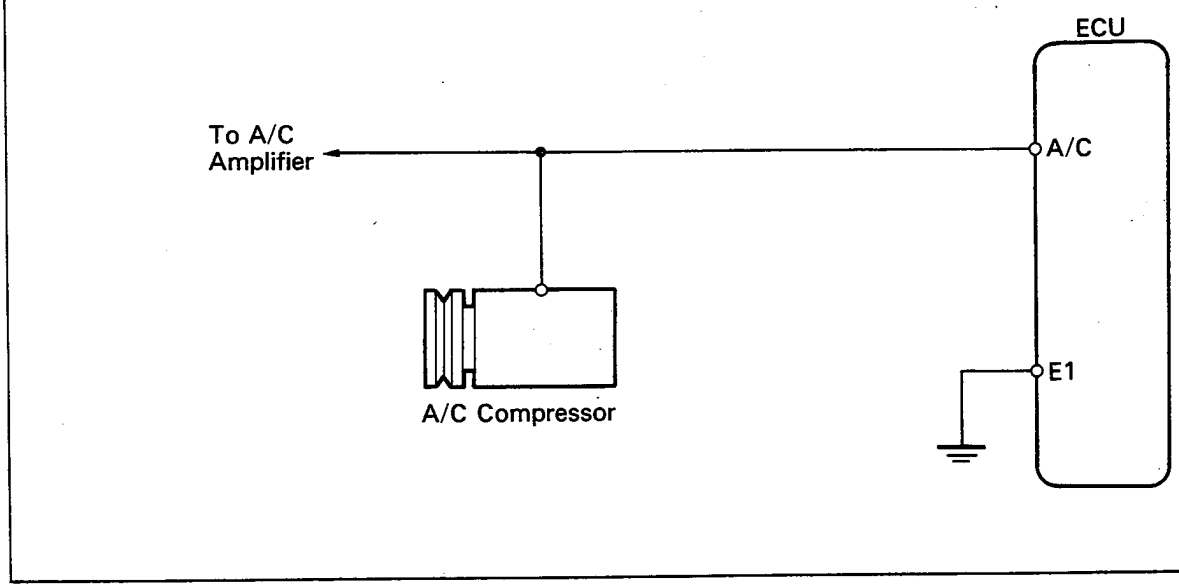
OK

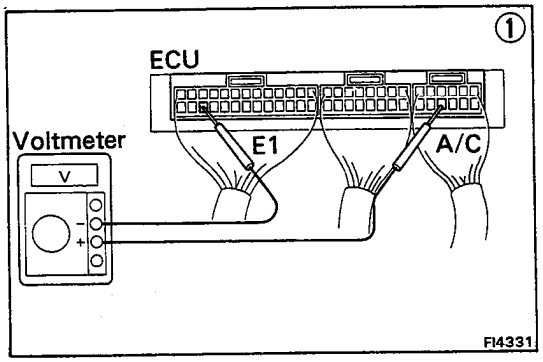
Check wiring between ECU and battery — BAD → Repair or replace.

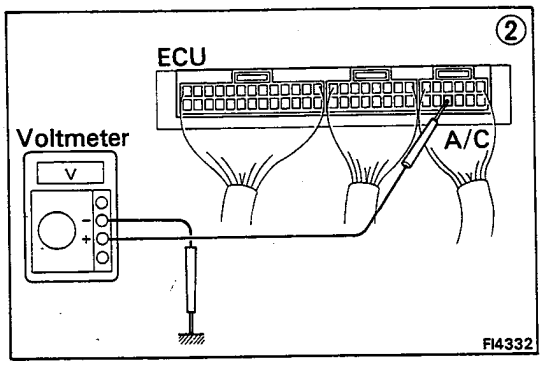
OK

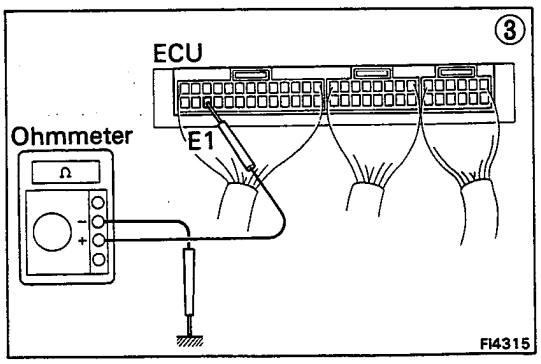
Check igniter. (See page IG-10) — BAD → Repair or replace.

No.	Terminals	Trouble	Condition	STD voltage
11	A/C – E1	No voltage	Air conditioning ON	10 – 14 V









① There is no voltage between ECU terminals A/C and E1. **(Air conditioning ON)**

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

NO

OK

③ Check wiring between ECU terminal E1 and b ground.

OK

Try another ECU.

BAD

Repair or repla

Check compressor running

OK

Check wiring between ECU terminal A/C a amplifier.

NO

BAD

Repair or repl

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

BAD

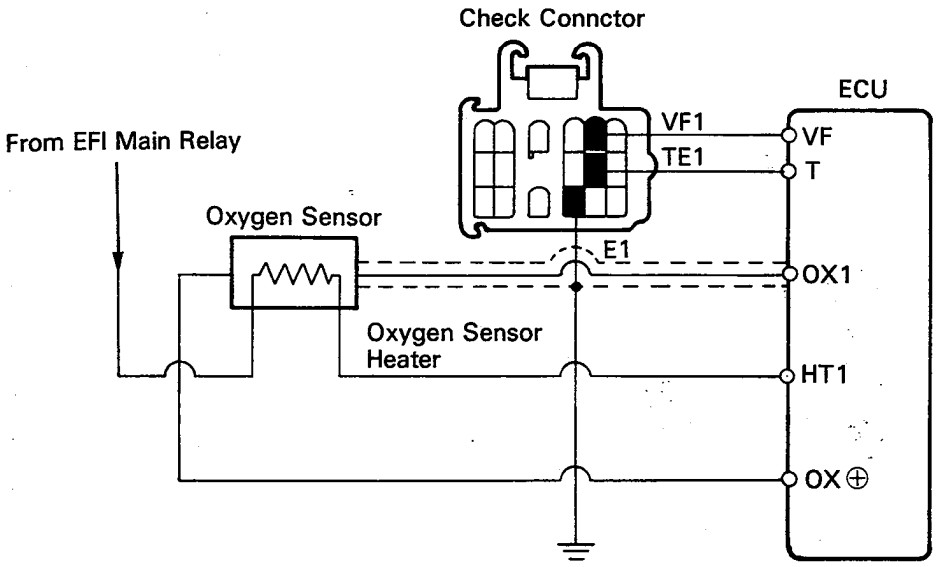
Repair or repl

OK

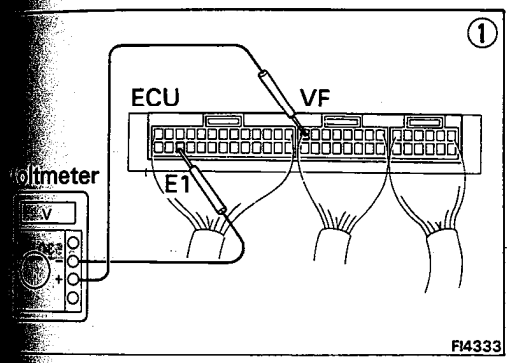
Check wiring between amplifier and ECU or compressor.

BAD

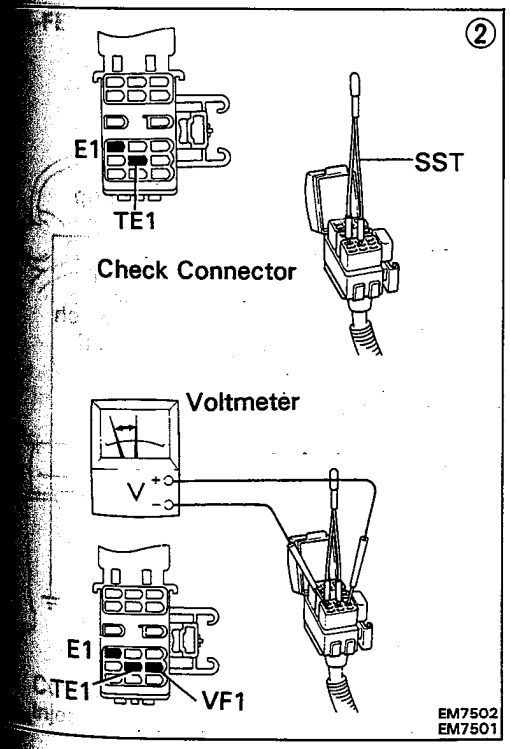
Repair or Rep



FI5171



FI4333



EM7502
EM7501

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

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

NO → OK: Check wiring between ECU terminal E1 and body ground.

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

Is air leaking into 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 injector
- BAD → Repair or replace.
- OK ↓

Check cold start injector.*
- BAD → Repair or replace.
- OK ↓

Check vacuum sensor.
- BAD → Repair or replace.
- OK ↓

② Check operation of oxygen sensor.
- OK → System normal.
- BAD ↓

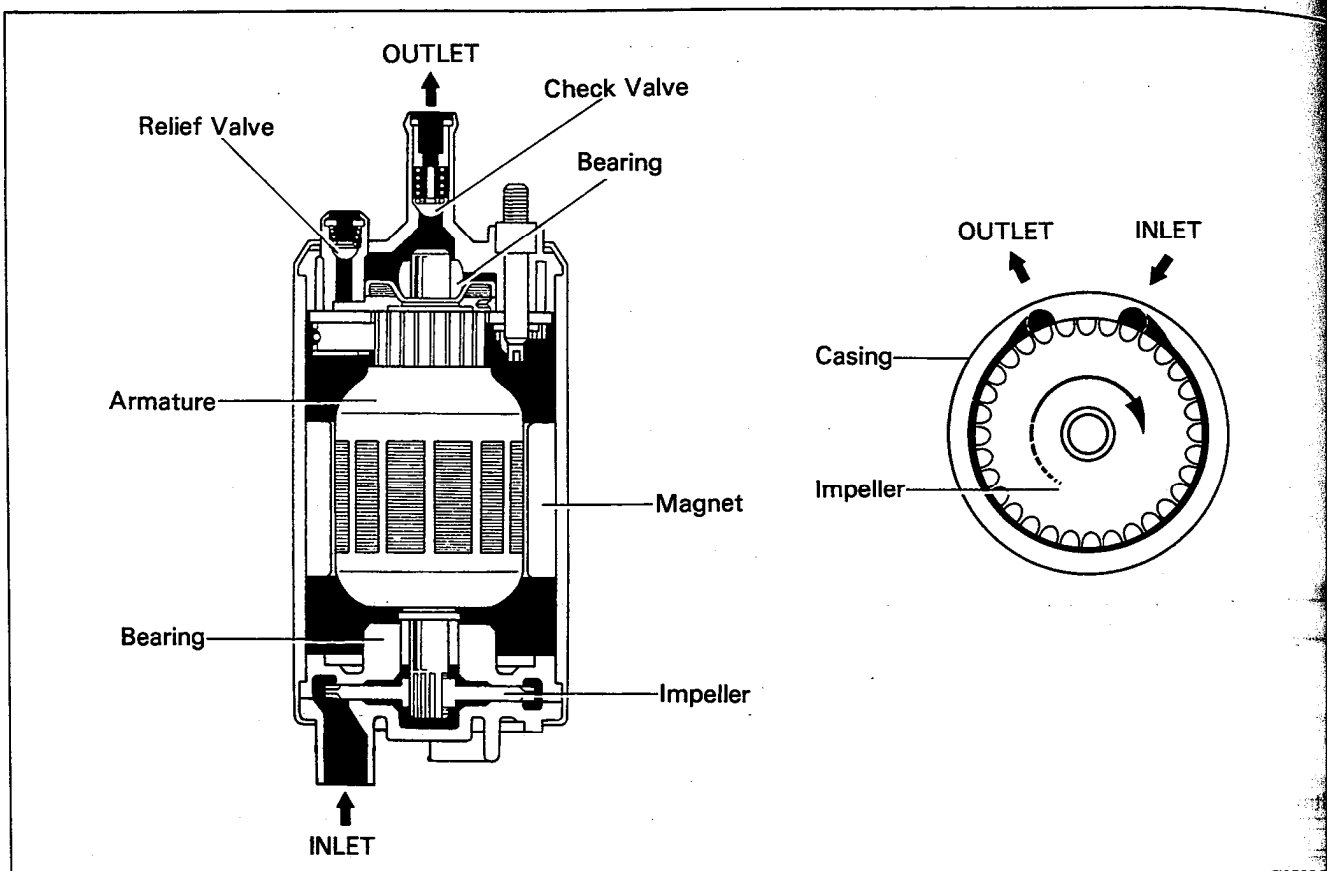
Check wiring between oxygen sensor and ECU connector.
- BAD → Repair wiring.
- OK ↓

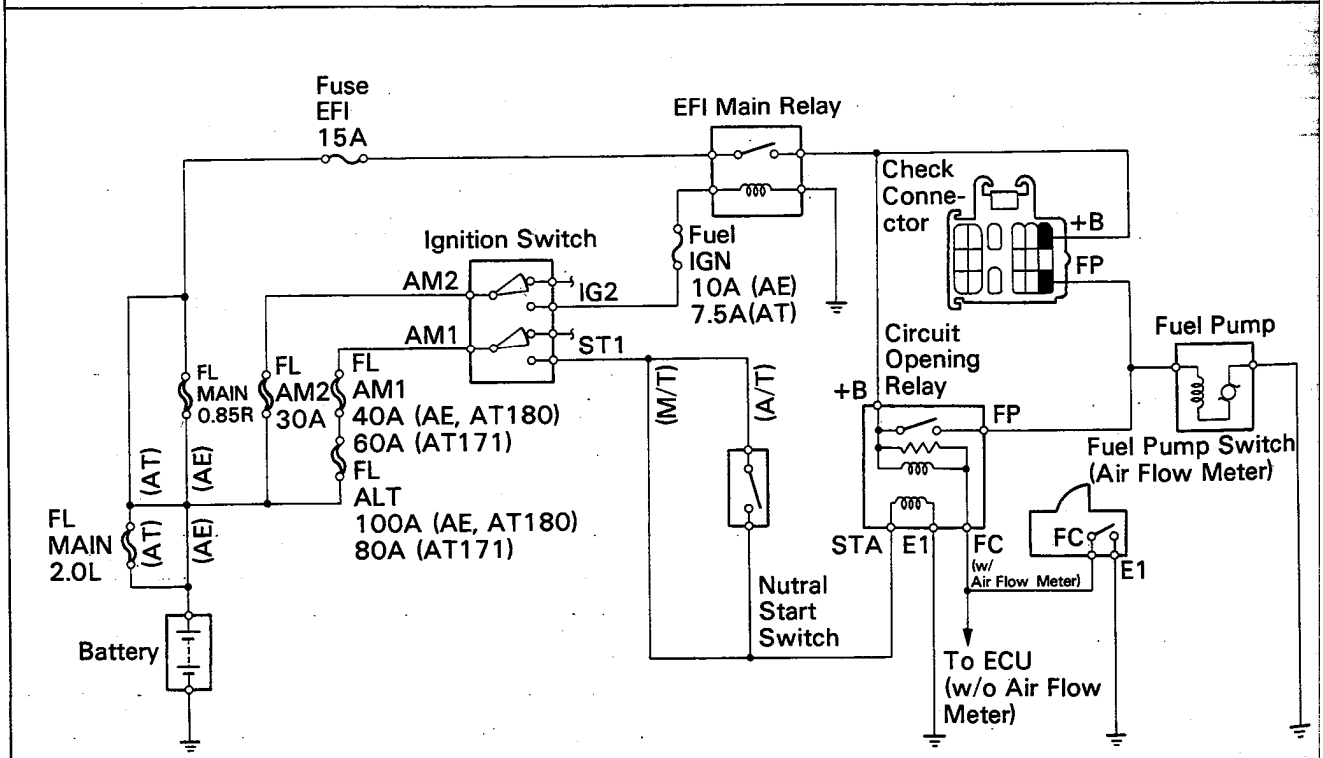
Replace oxygen sensor.

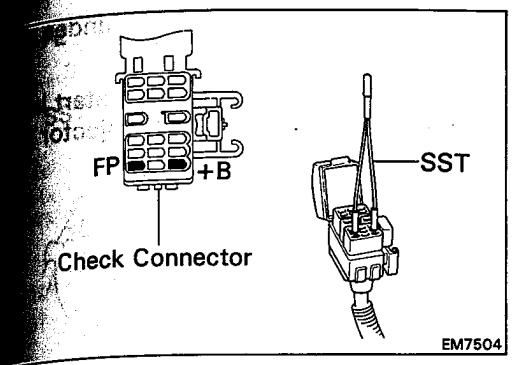
* Rich malfunction only

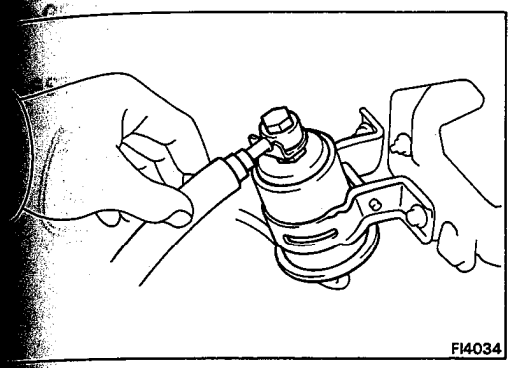
FUEL SYSTEM

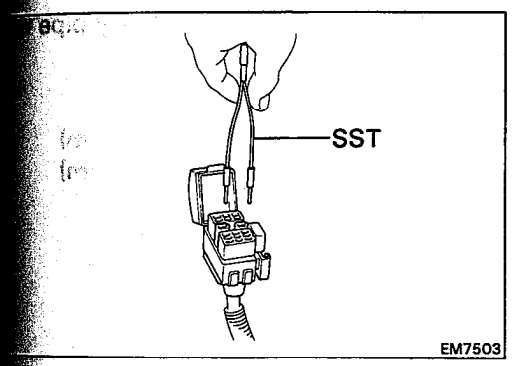
Fuel Pump

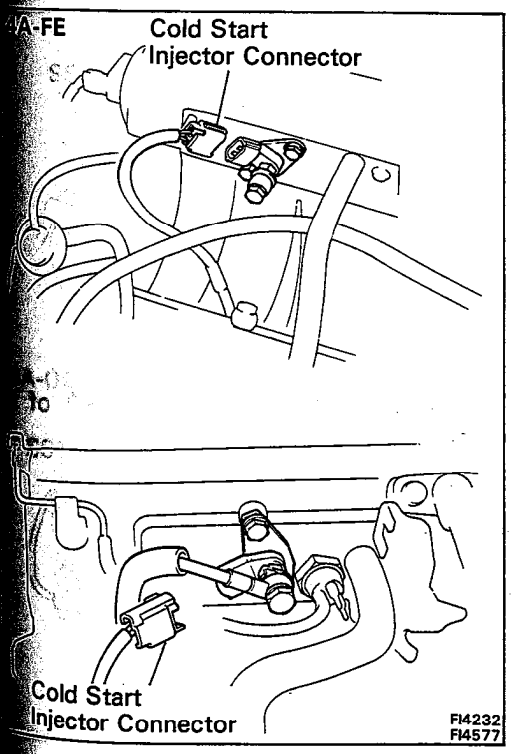












ON-VEHICLE INSPECTION

1. CHECK FUEL PUMP OPERATION

(a) Turn the ignition to ON.

HINT: Do not start the engine.

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

SST 09843-18020

LOCATION: See page FI-133

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

HINT: At this time, you will hear fuel return noise from the pressure regulator.

(d) Remove SST from the check connector.

SST 09843-18020

(e) Turn the ignition switch to OFF.

If there is no pressure, check the following parts:

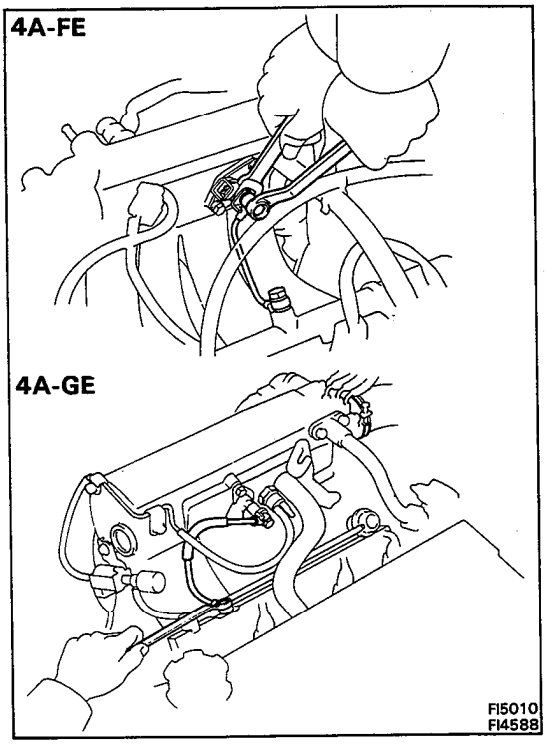
- Fusible links
- Fuses
- EFI main relay
- Circuit opening relay
- Fuel pump
- ECU
- Wiring connections

2. INSPECT FUEL PRESSURE

(a) Check that the battery voltage is above 12 V.

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

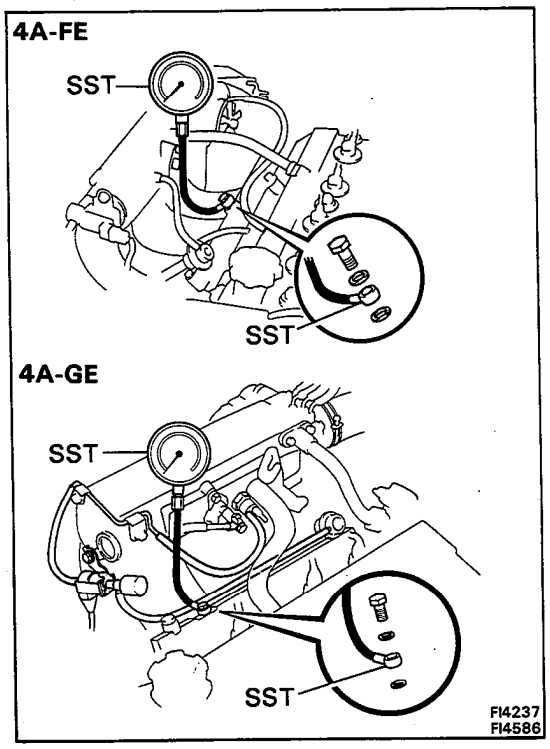
(c) Disconnect the wiring connector from the cold start injector.



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

(e) Slowly loosen the union bolts of the cold start inje
tor pipe and remove the bolts, cold start injector pi
and four gaskets.

(f) Drain the fuel from the delivery pipe.



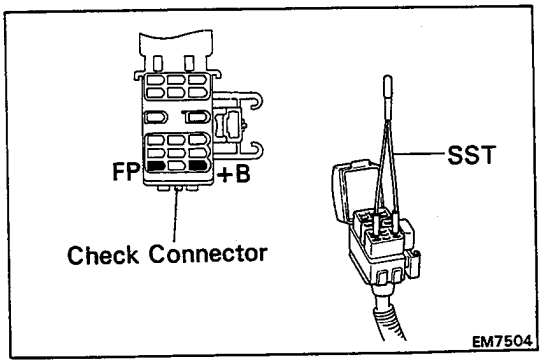
(g) Install SST (pressure gauge) to the delivery pipe w
new two gasket and union bolt.

SST 09268-45012

Torque: 4A-FE 180 kg-cm (13 ft-lb, 18 N·m)
4A-GE 150 kg-cm (11 ft-lb, 15 N·m)

(h) Wipe off any splattered gasoline.

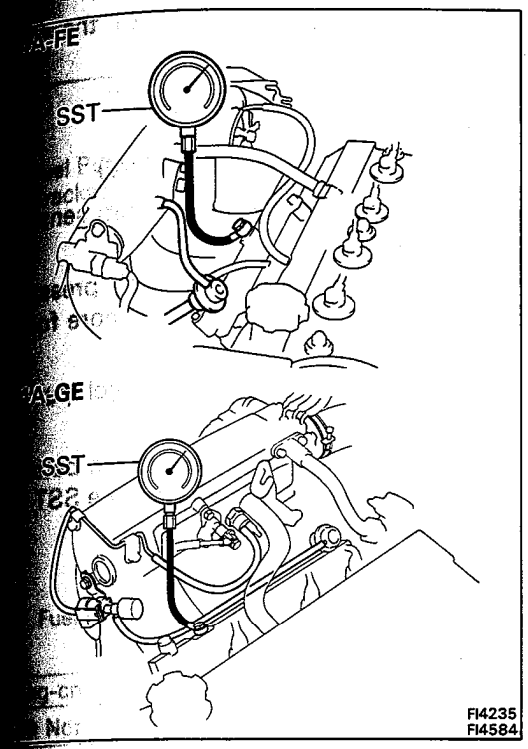
(i) Reconnect the battery negative (–) cable.



(j) Using SST, connect terminals +B and FP of
check connector.

SST 09843-18020

LOCATION: See page FI-133



(k) Turn the ignition switch ON.

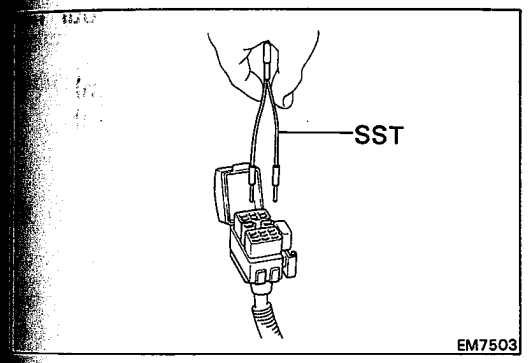
(l) Measure the fuel pressure.

Fuel pressure: 2.7 – 3.1 kg/cm² (38 – 44 psi, 265 – 304 kPa)

If pressure is high, replace the fuel pressure regulator.

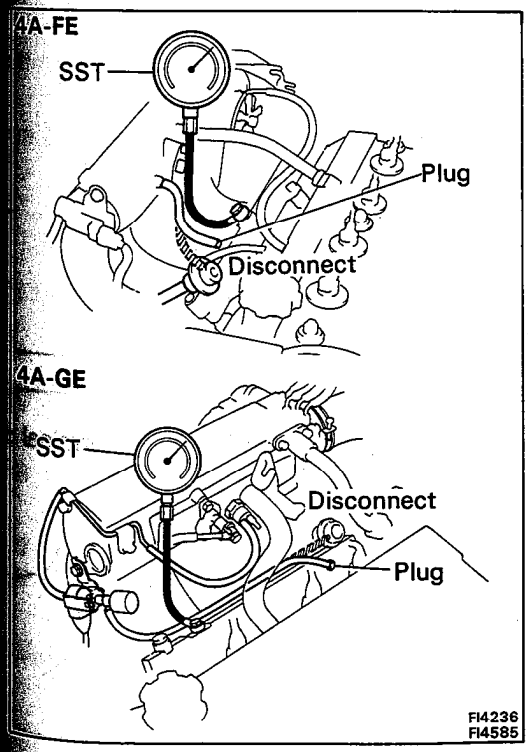
If pressure is low, check the following parts:

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



(m) Remove SST from the check connector.

SST 09843-18020

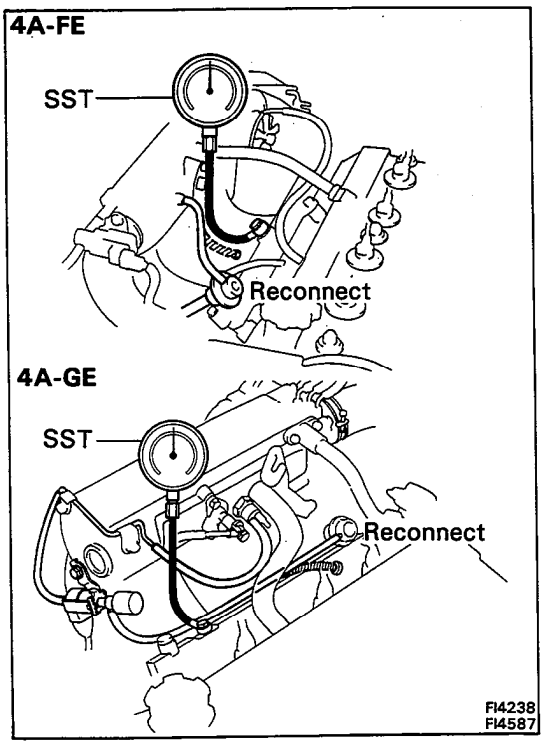


(n) Start the engine.

(o) Disconnect the vacuum sensing hose from the fuel pressure regulator, and plug the hose end.

(p) Measure the fuel pressure at idling.

Fuel pressure: 2.7 – 3.1 kg/cm² (38 – 44 psi, 265 – 304 kPa)



(q) Reconnect the vacuum sensing hose to the pressure regulator.

(r) Measure the fuel pressure at idling.

Fuel pressure: 2.1 – 2.6 kg/cm² (30 – 37 psi, 206 – 255 kPa)

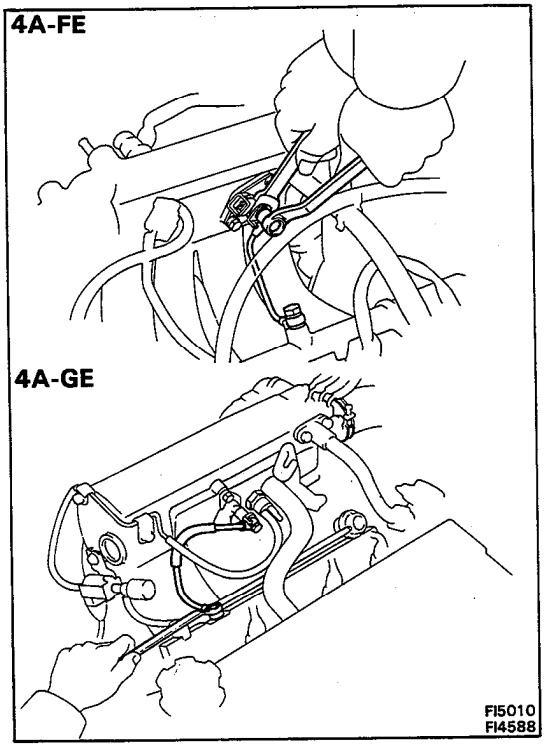
If pressure is not as specified, check the vacuum sens hose and fuel pressure regulator.

(s) Stop the engine. Check that the fuel press remains 1.5 kg/cm² (21 psi, 147 kPa) or more fo minutes after the engine is turned off.

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

(t) After checking fuel pressure, disconnect the bat negative (–) cable and carefully remove the SS prevent gasoline from splashing.

SST 09268-45012



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

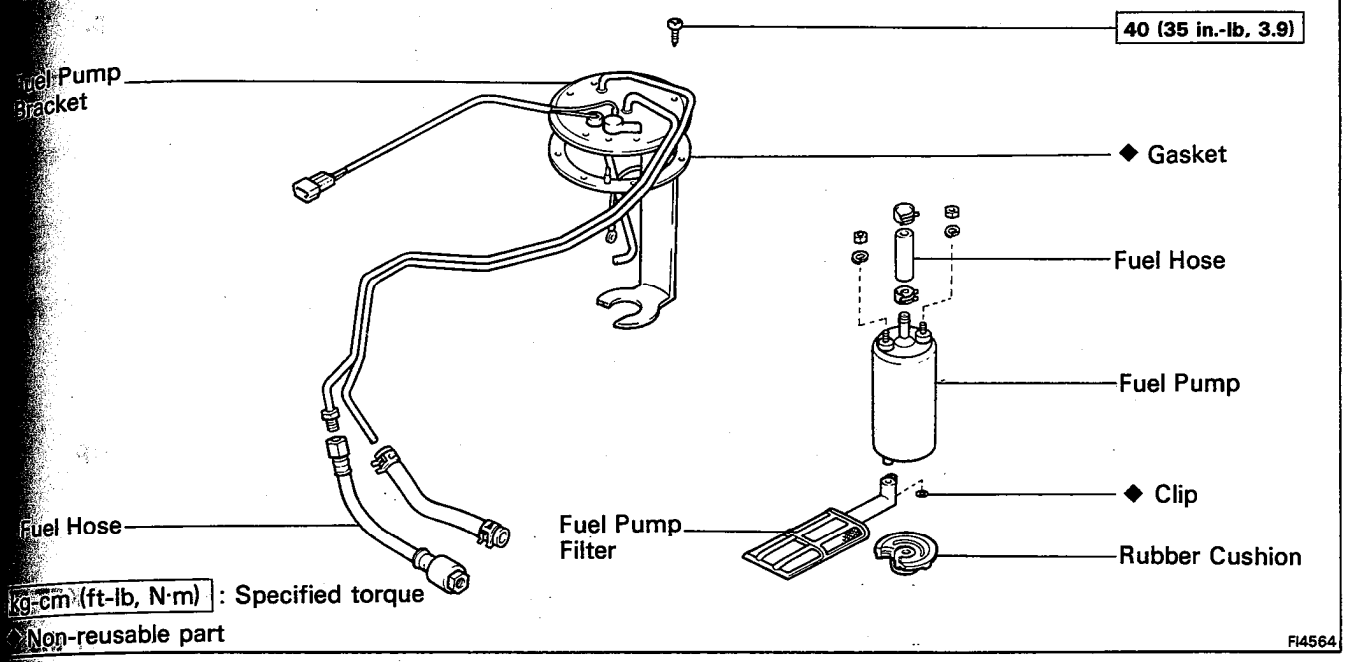
Torque: 4A-FE 180 kg-cm (13 ft-lb, 18 N·m)
4A-GE 150 kg-cm (11 ft-lb, 15 N·m)

(v) Reconnect the cold start injector connector.

(w) Reconnect the cable to the negative (–) termi the battery.

(x) Check for fuel leakage. (See page FI-12)

REMOVAL OF FUEL PUMP (AE 92, 95, AT171)

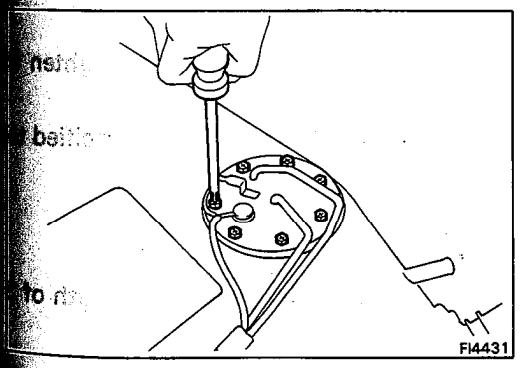


1. **DISCONNECT CABLE FROM NEGATIVE TERMINAL OF BATTERY**

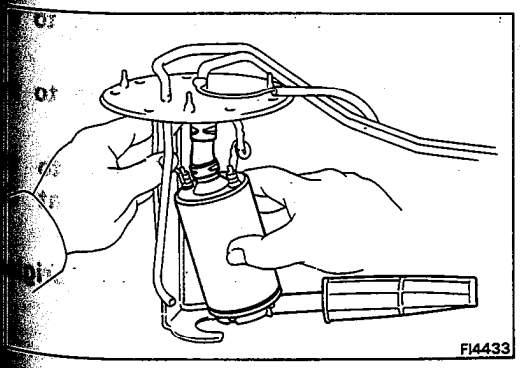
2. **DRAIN FUEL FROM FUEL TANK**

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

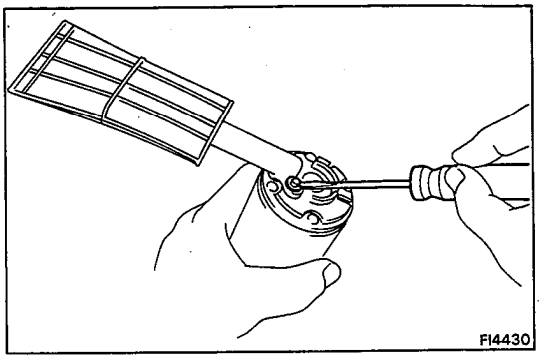
3. **REMOVE FUEL TANK**



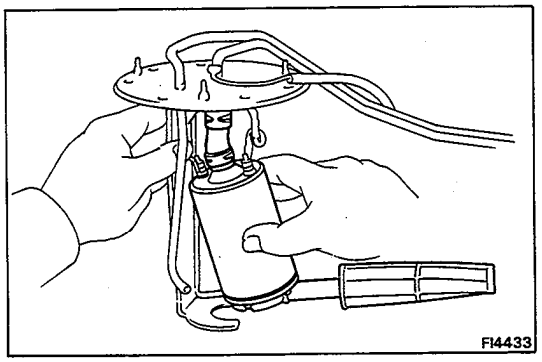
4. **REMOVE FUEL PUMP BRACKET FROM FUEL TANK**
   (a) Remove the screws.
   (b) Pull out the fuel pump bracket.



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 hose from the fuel pump.



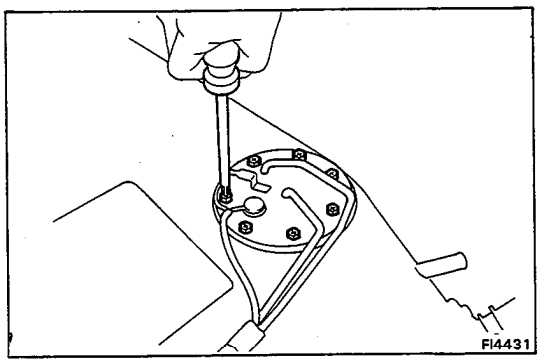
6. **REMOVE FUEL PUMP FILTER FROM FUEL PUMP**
   (a) Remove the rubber cushion.
   (b) Using a small screwdriver, remove the clip.
   (c) Pull out the pump filter.



INSTALLATION OF FUEL PUMP (AE92, 95, AT171)

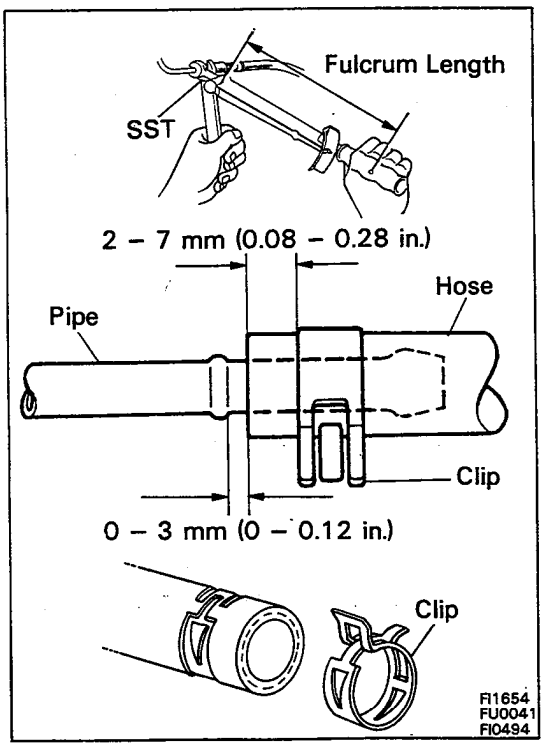
(See page FI-99)

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 ON FUEL PUMP BRACKET**
   (a) Connect the fuel hose to the outlet port of the pump.
   (b) Connect the wires to the pump with the two nu
   (c) Push the lower side of the fuel pump with the ru cushion, into the fuel pump bracket.

3. **INSTALL FUEL PUMP BRACKET**
   Install a new gasket and the pump bracket with screws.
   Torque: 40 kg-cm (35 in.-lb, 3.9 N·m)

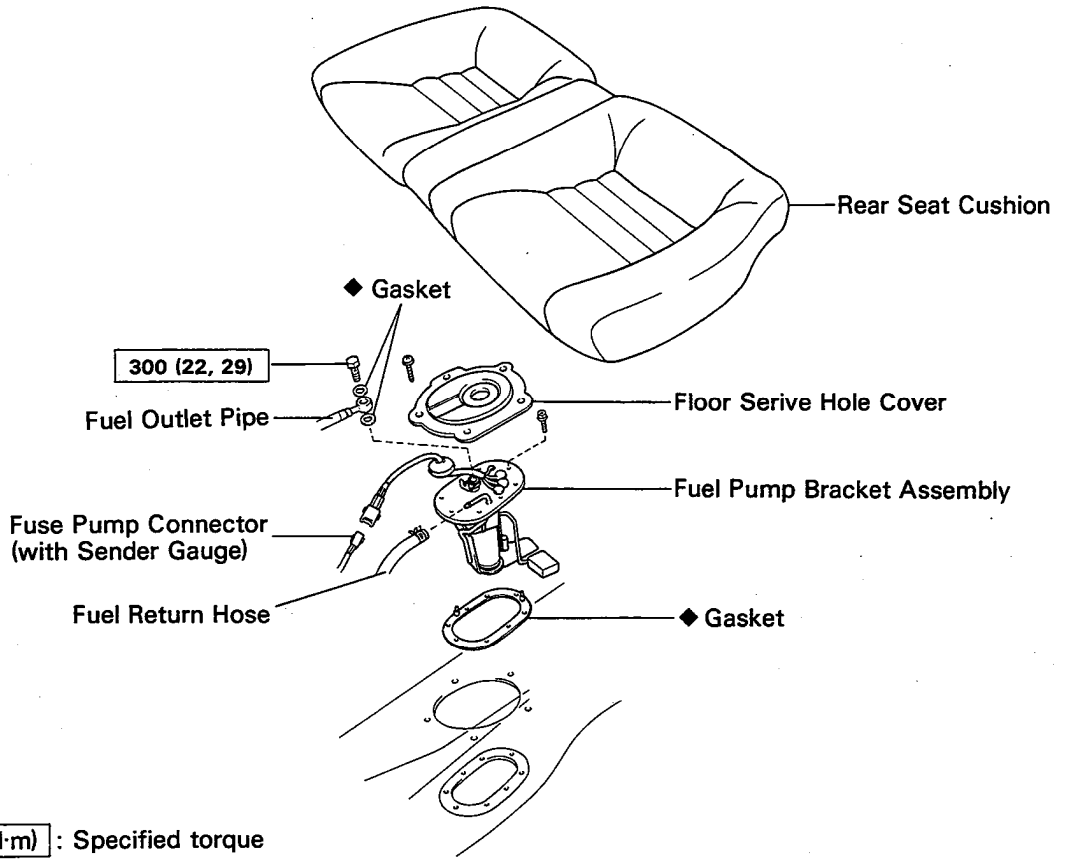


4. **INSTALL FUEL TANK**
   (a) Apply a thin coat of oil to the flare and tighte flare nut.
   (b) Then using SST, tighten the nut to the specifie que.
   SST 09631-22020
   Torque: 310 kg-cm (22 ft-lb, 30 n·m)
   HINT: Use a torque wrench with a fulcrum length cm (11.81 in.)
   NOTICE:
   - **Tighten the fuel tank mounting bolts, etc. t specified torque.**
   - **Tighten the pipe and flare nut type hose t specified torque.**
   - **Push in the pipe and insert-type hose t specified position, then install the clip a specified location.**
   - **If reusing the hose, reinstall the clip at the or location.**

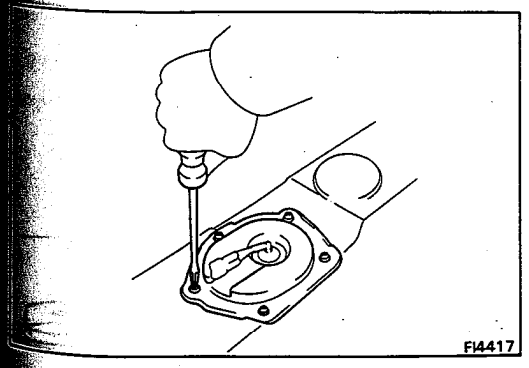
5. **REFILL WITH FUEL**

REMOVAL OF FUEL PUMP (AT180)

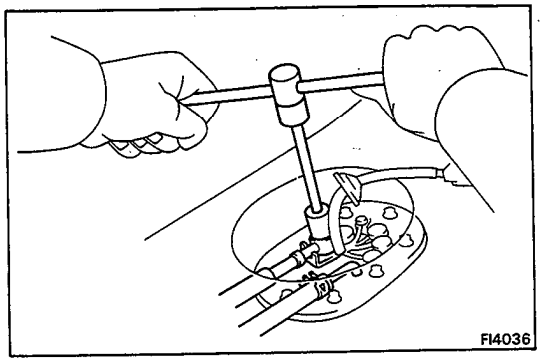
CAUTION: Do not smoke or work near an open flame when working on the fuel pump.



1. **DISCONNECT CABLE FROM NEGATIVE TERMINAL OF BATTERY**
2. **REMOVE REAR SEAT CUSHION**



3. **REMOVE FLOOR SERVICE HOLE COVER**
   (a) Disconnect the fuel pump (with fuel sender gauge) connector.
   (b) Remove the five screws and service hole cover.

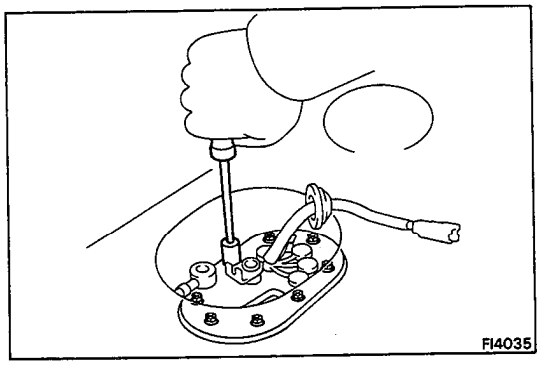


4. **DISCONNECT FUEL PIPE AND HOSE FROM FUEL PUMP BRACKET**

CAUTION: Remove the fuel filter cap to prevent fuel from flowing out.

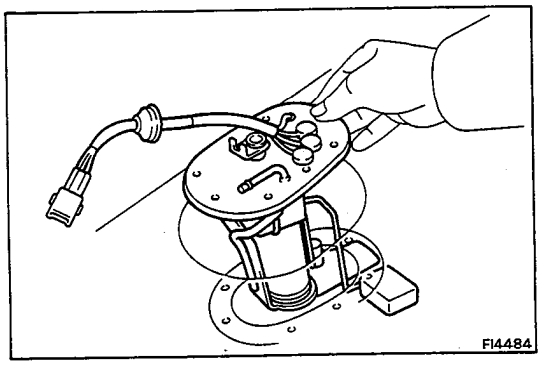
(a) Remove the union bolt and two gaskets, and disconnect the outlet pipe from the pump bracket.

(b) Disconnect the return hose from the pump bracket.



5. **REMOVE FUEL PUMP BRACKET ASSEMBLY FROM FUEL TANK**

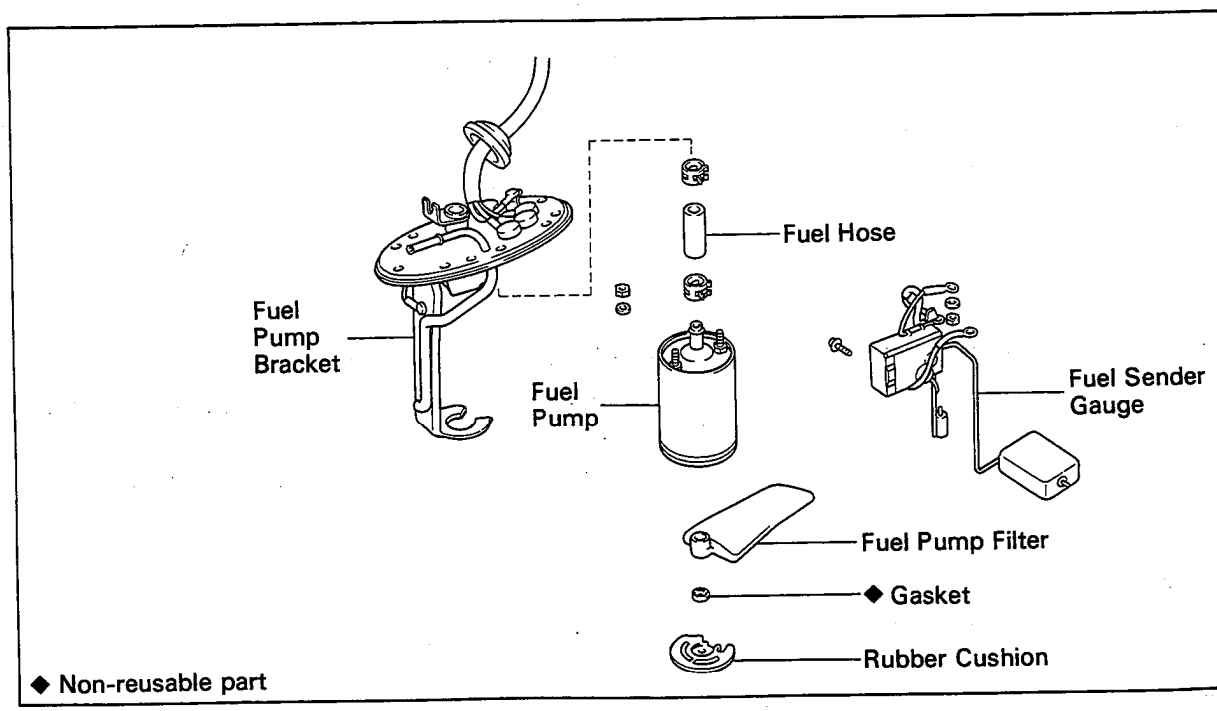
(a) Remove the eight bolts.

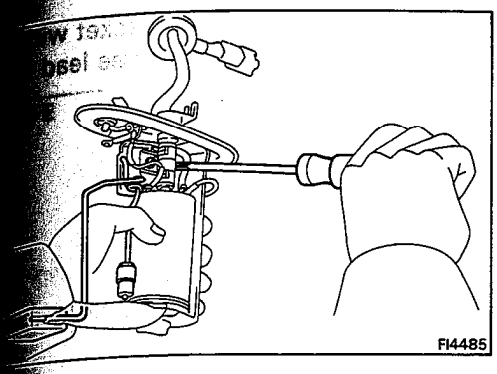


(b) Pull out the pump bracket assembly.

(c) Remove the gasket from the pump bracket.

COMPONENTS (AT180)

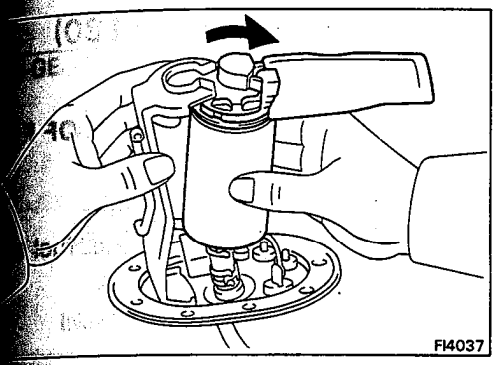




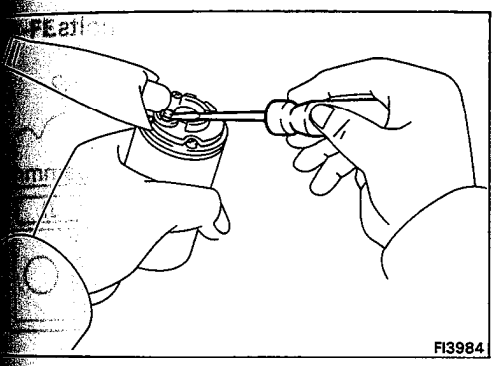
DISASSEMBLY OF FUEL PUMP (AT180)

(See page FI-102)

1. **REMOVE FUEL SENDER GAUGE FROM FUEL PUMP BRACKET**
   (a) Remove the nut and spring washer, and disconnect the lead wire from the pump bracket. Disconnect the three lead wires.
   (b) Remove the two screws and sender gauge.



2. **REMOVE FUEL PUMP FROM FUEL PUMP BRACKET**
   (a) Remove the nut and spring washers, and disconnect the lead wire from the fuel pump. Disconnect the two lead wires.
   (b) Pull out the lower side of the fuel pump from the pump bracket.
   (c) Disconnect the fuel hose from the fuel pump, and remove the fuel pump.
   (d) Remove the rubber cushion from the fuel pump.



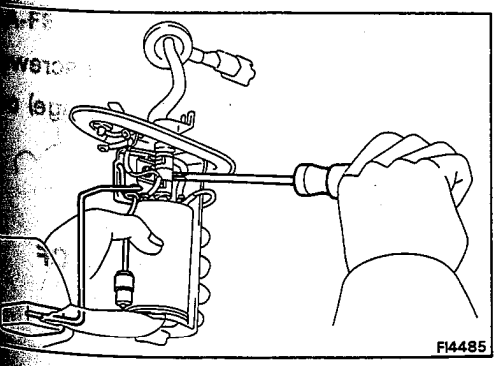
3. **REMOVE FUEL PUMP FILTER FROM FUEL PUMP**
   (a) Using a small screwdriver, remove the clip.
   (b) Pull out the pump filter.

ASSEMBLY OF FUEL PUMP (AT180)

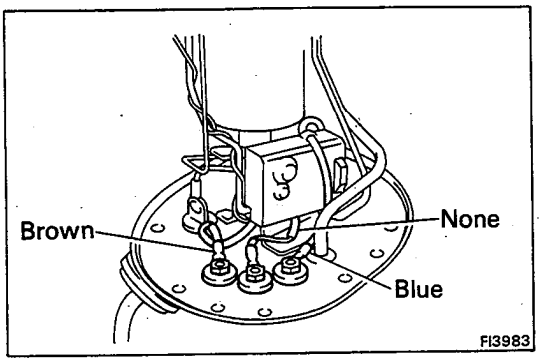
(See page FI-102)

1. **INSTALL FUEL PUMP FILTER TO FUEL PUMP**
   Install the pump filter with a new clip.

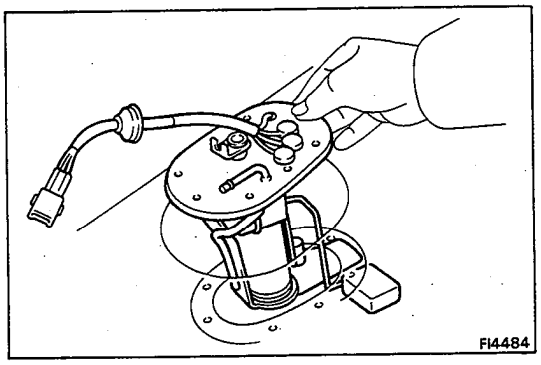
2. **INSTALL FUEL PUMP TO FUEL PUMP BRACKET**
   (a) Install the rubber cushion to the fuel pump.
   (b) Connect the fuel hose to the outlet port of the fuel pump.
   (c) Connect the lead wire to the fuel pump with the spring washer and nut. Connect the two lead wires.
   (d) Install the fuel pump by pushing the lower side of the fuel pump.



3. **INSTALL FUEL SENDER GAUGE TO FUEL PUMP BRACKET**
   (a) Install the sender gauge with the two screws.



(b) Connect the lead wire to the pump bracket with spring washer and nut. Connect the three lead as shown.



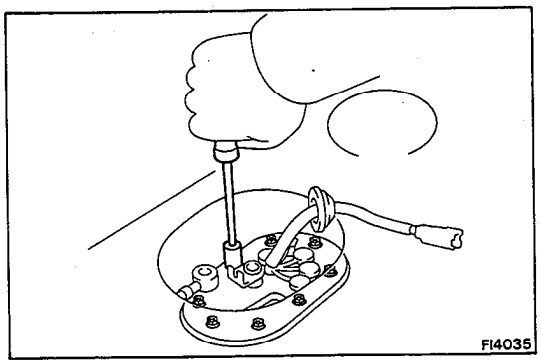
INSTALLATION OF FUEL PUMP (AT180)

(See page FI-101)

1. INSTALL FUEL PUMP BRACKET ASSEMBLY OF F TANK

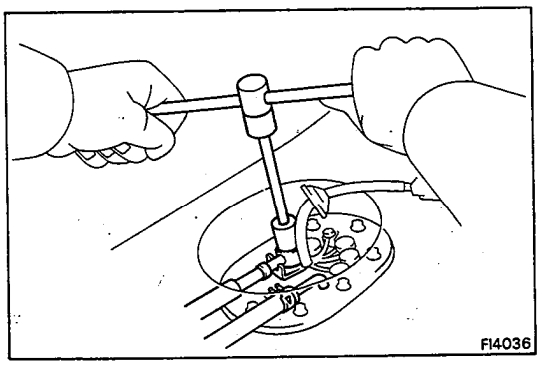
(a) Install a new gasket to the pump bracket.

(b) Insert the pump bracket assembly into the fuel



(c) Install the pump bracket with the eight bolts.

Torque: 40 kg-cm (35 in.-lb, 3.9 N·m)



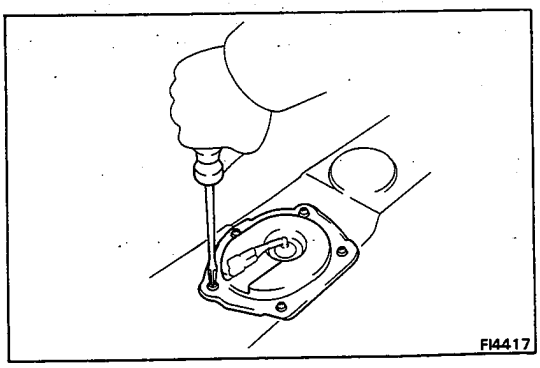
2. CONNECT FUEL PIPE AND HOSE TO FUEL PUMI BRACKET

(a) Connect the outlet pipe to the pump bracket two new gaskets and the union bolt.

Torque: 300 kg-cm (22 ft-lb, 29 N·m)

(b) Connect the return hose to the pump bracket.

3. CHECK FOR FUEL LEAKAGE (See page FI-12)



4. INSTALL FLOOR SERVICE HOLE COVER

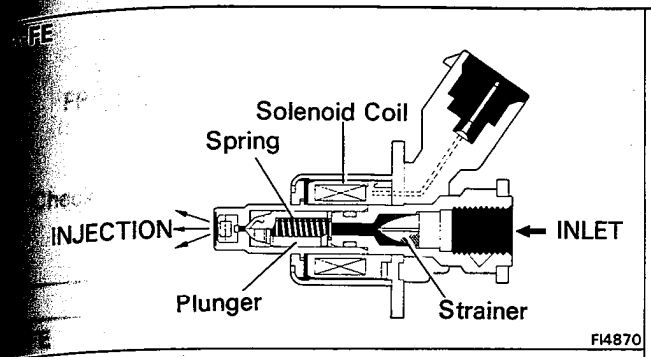
(a) Install the service hole cover with the five scre

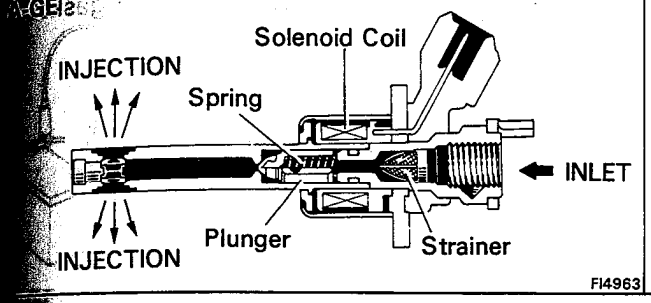
(b) Connect the fuel pump (with fuel sender gauge nector.

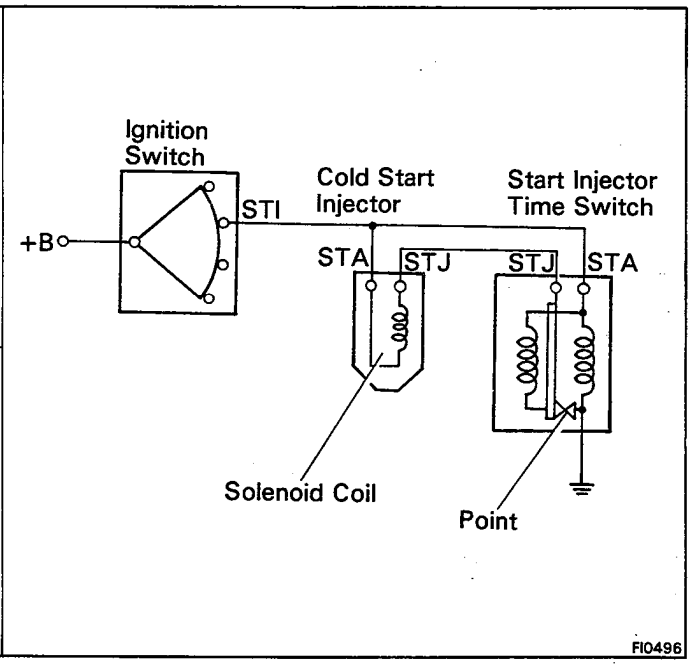
5. INSTALL REAR SEAT CUSHION

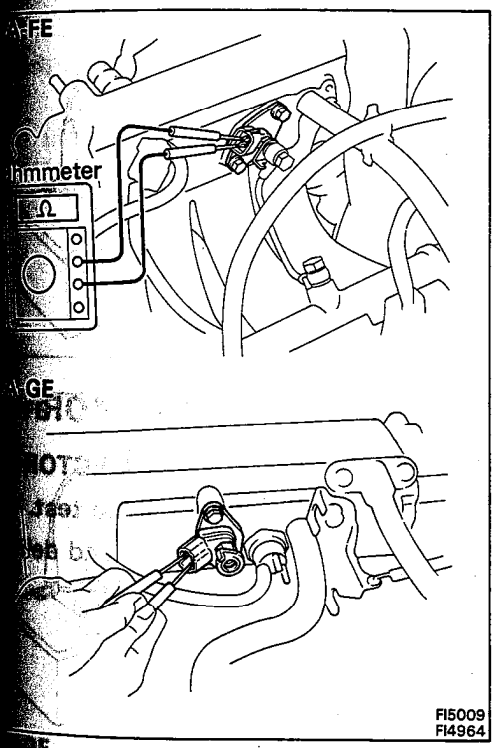
6. CONNECT CABLE TO NEGATIVE TERMINAL OF BATTERY

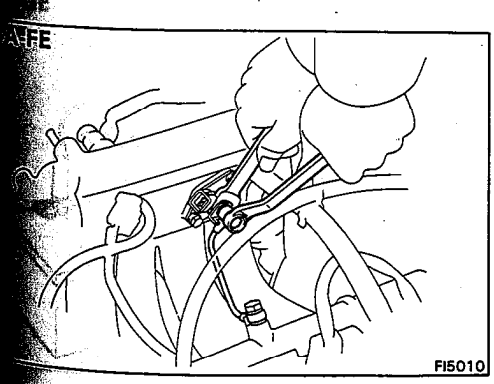
Cold Start Injector











ON-VEHICLE INSPECTION

INSPECT RESISTANCE OF COLD START INJECTOR

(a) Disconnect the cold start injector connector.

(b) Using an ohmmeter, measure the resistence between the terminals.

Resistance: **4A-FE** **3 – 5 Ω**
4A-GE **2 – 4 Ω**

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

(c) Reconnect the cold start injector connector.

REMOVAL OF COLD START INJECTOR

1. **DISCONNECT CABLE FROM NEGATIVE TERMINAL OF BATTERY**

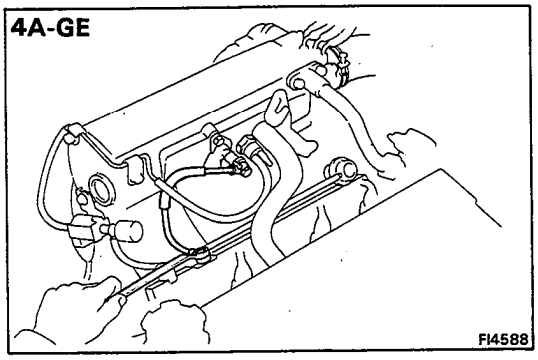
2. **DISCONNECT COLD START INJECTOR CONNECTOR**

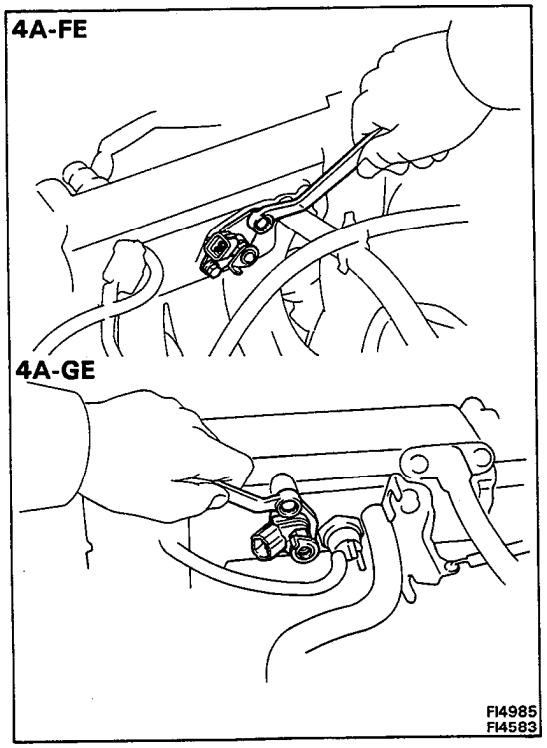
3. **REMOVE COLD START INJECTOR PIPE**

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

(b) Remove the two union bolts, four gaskets and injector pipe.

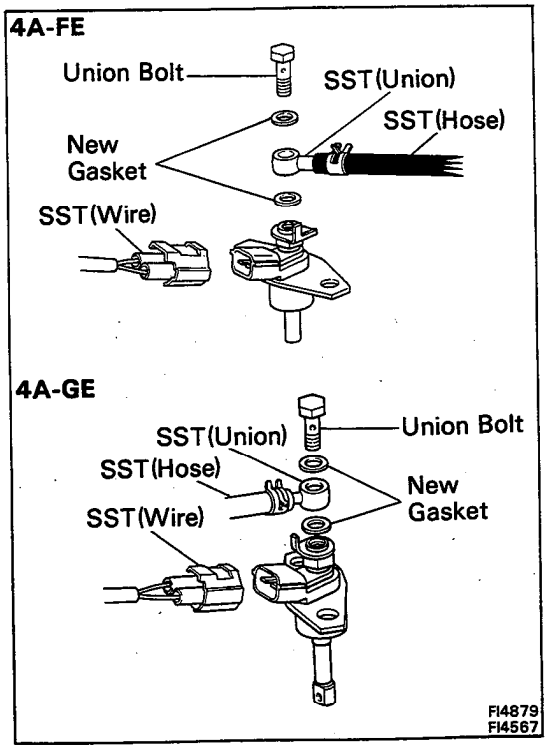
HINT: Slowly loosen the union bolts.





4. 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 del pipe with new gaskets and the union bolts.

SST 09268-41045 (09268-41080)

(b) Connect SST (hose) to the union.

SST 09268-41045

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

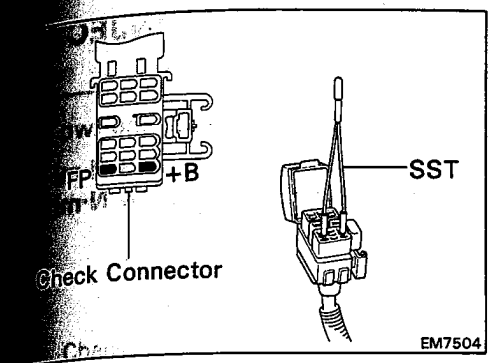
SST 09842-30055

(d) Put a container under the injector.

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

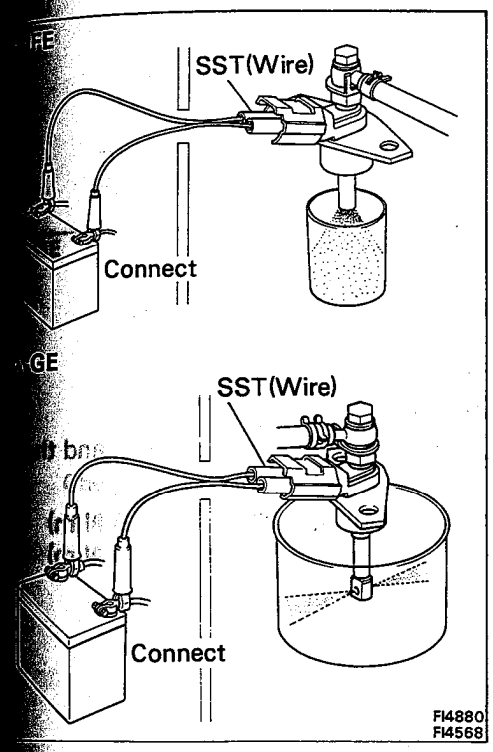
(f) Turn the ignition switch ON.

NOTICE: Do not start the engine.



(g) Using SST, connect terminals +B and FP of the check connector.

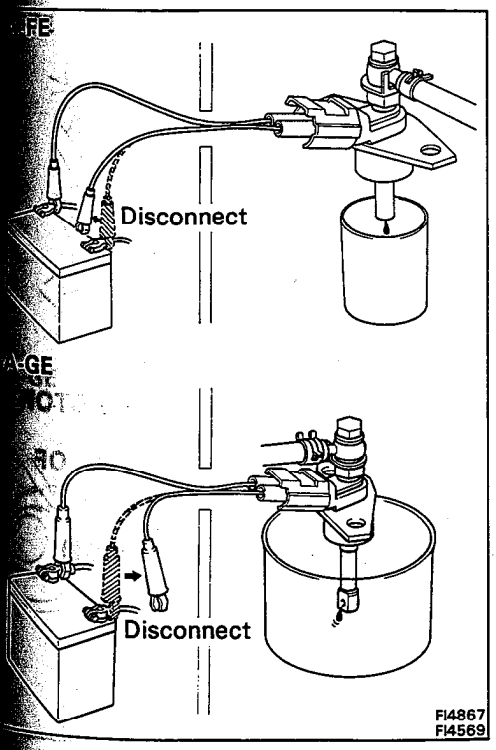
SST 09843-18020



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

SST 09842-30055

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.

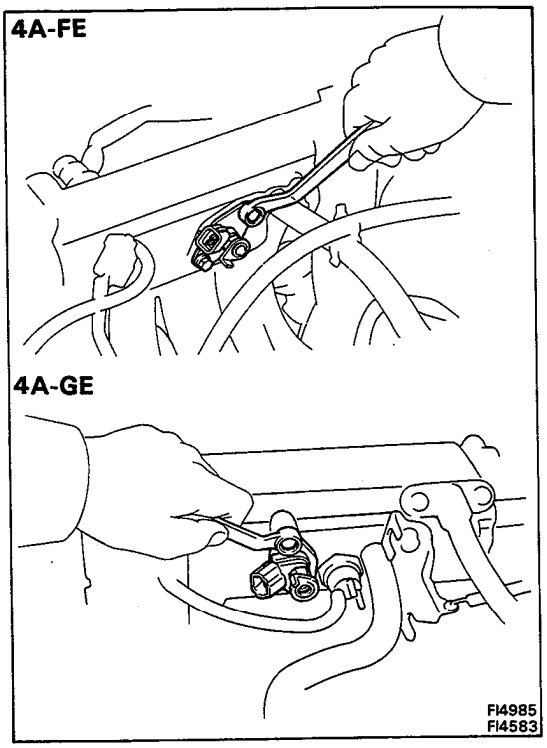
SST 09842-30055

Fuel drop: One drop or less per minute

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

(c) Remove SST.

SST 09268-41045 (09268-41080) and 09842-30055
09843-18020

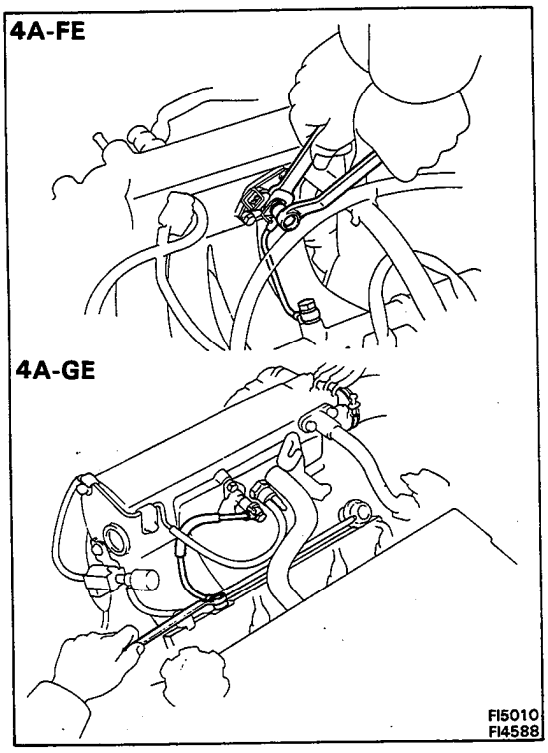


INSTALLATION OF COLD START INJECTOR

1. **INSTALL COLD START INJECTOR**

   Install a new gasket and the injector with the two bolt

   Torque: 4A-FE 95 kg-cm (82 in.-lb, 9.3 N·m)
   4A-GE 75 kg-cm (65 in.-lb, 7.4 N·m)



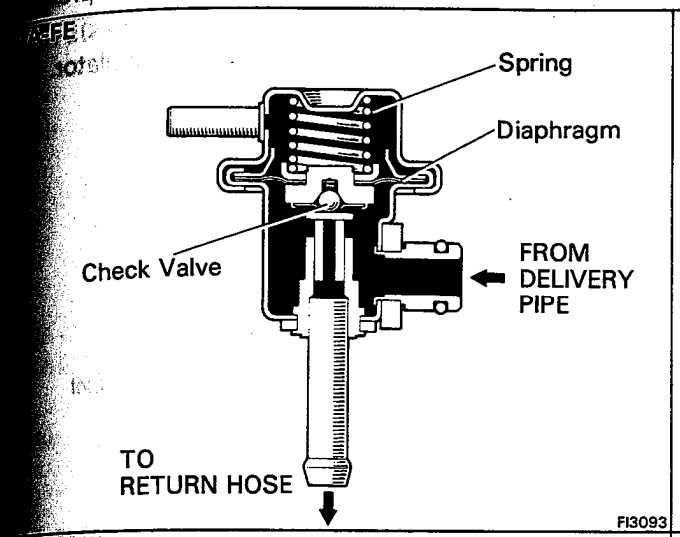
2. **INSTALL COLD START INJECTOR PIPE**

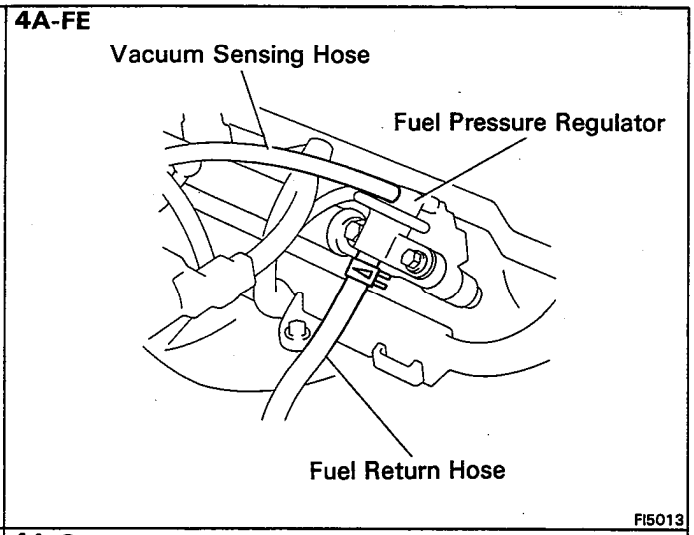
   Install the injector pipe with four new gaskets and the union bolts.

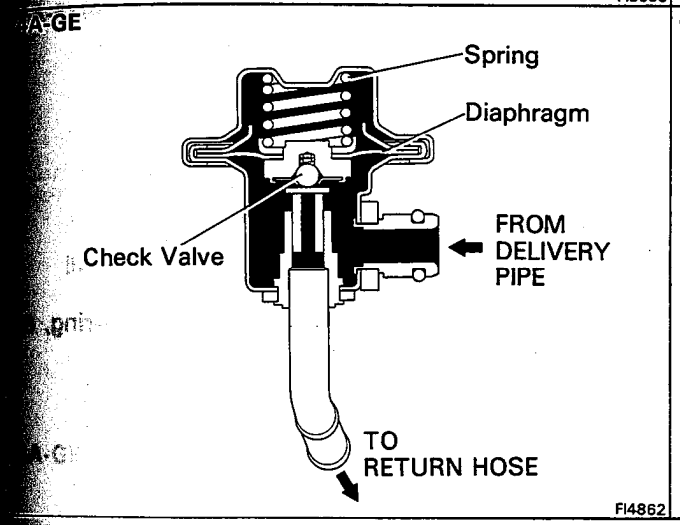
   Torque: 4A-FE 180 kg-cm (13 ft-lb, 18 N·m)
   4A-GE 150 kg-cm (11 ft-lb, 15 N·m)

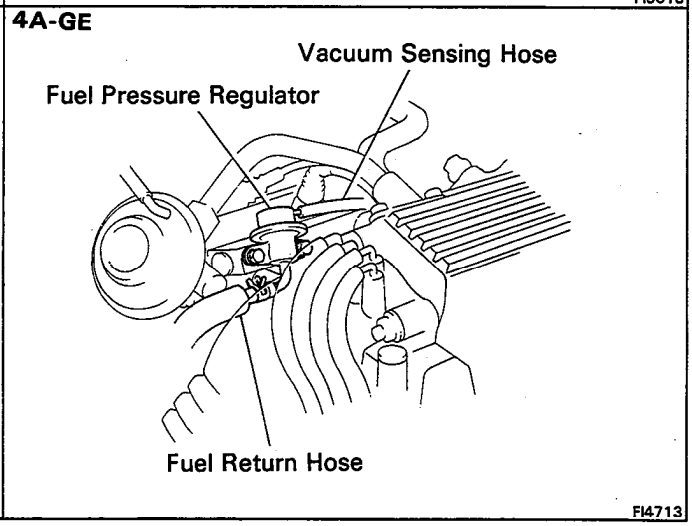
3. **CONNECT COLD START INJECTOR CONNECTOR**
4. **CONNECT CABLE TO NEGATIVE TERMINAL OF BATTERY**
5. **CHECK FOR FUEL LEAKAGE (See page FI-12)**

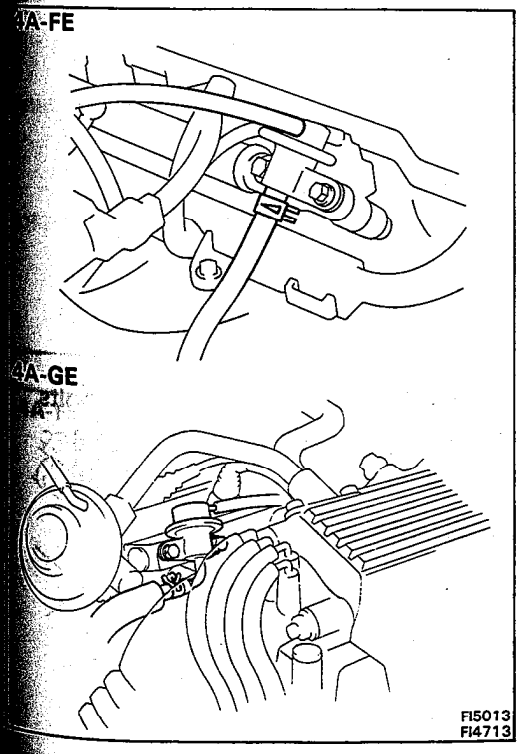
Fuel Pressure Regulator









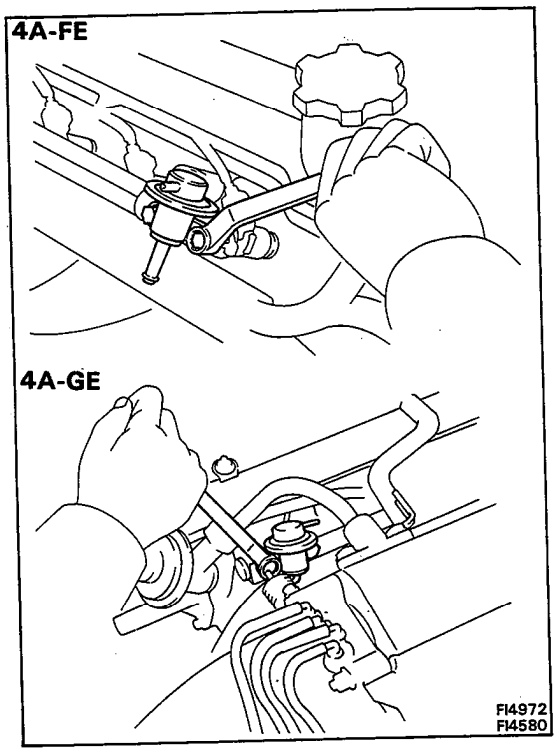


ON-VEHICLE INSPECTION

INSPECT FUEL PRESSURE (See page FI-95)

REMOVAL OF FUEL PRESSURE REGULATOR

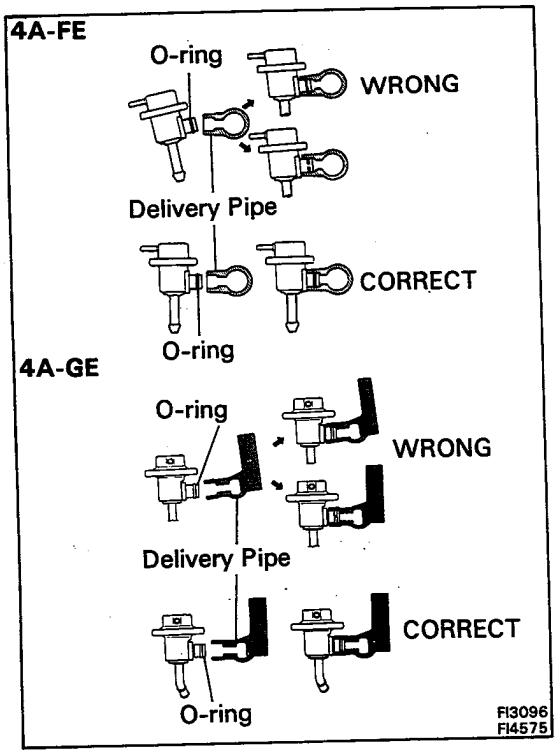
1. **DISCONNECT VACUUM SENSING HOSE**
2. **DISCONNECT FUEL RETURN HOSE**



3. **REMOVE FUEL PRESSURE REGULATOR**

(a) Remove the two bolts, and pull out the pressure regulator.

(b) Remove the O-ring from 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, install it to the pressure regulator.

(b) Install the pressure regulator with the two bolt

Torque: 4A-FE 95 kg-cm (82 in-lb, 9.3 N·m)
4A-GE 75 kg-cm (65 in-lb, 7.3 N·m)

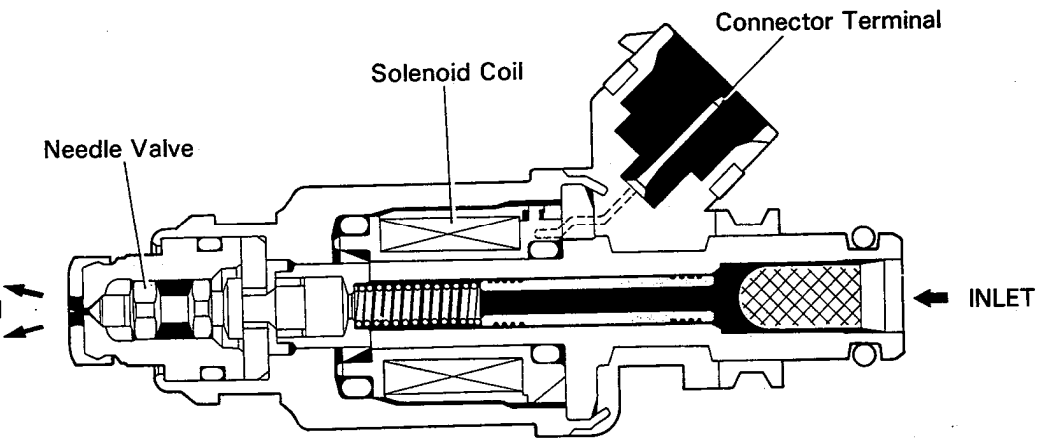
2. **CONNECT FUEL RETURN HOSE**

3. **CONNECT VACUUM SENSING HOSE**

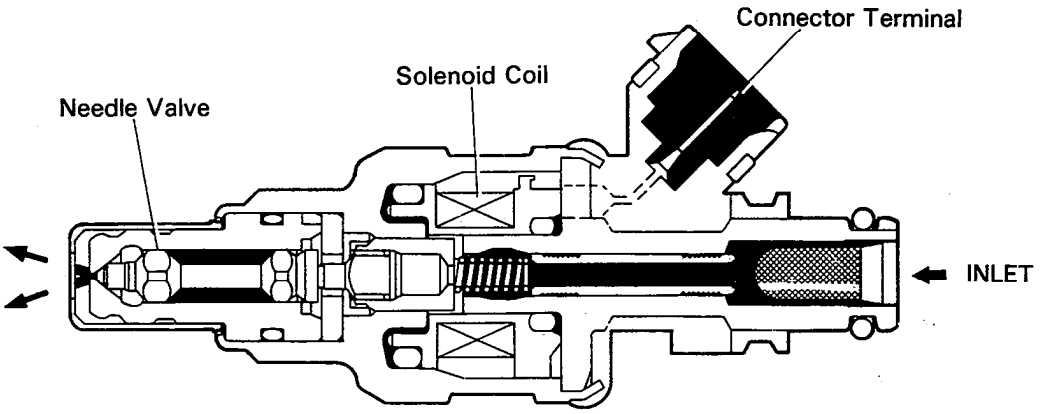
4. **CHECK FOR FUEL LEAKAGE** **(See page FI-12)**

Injector

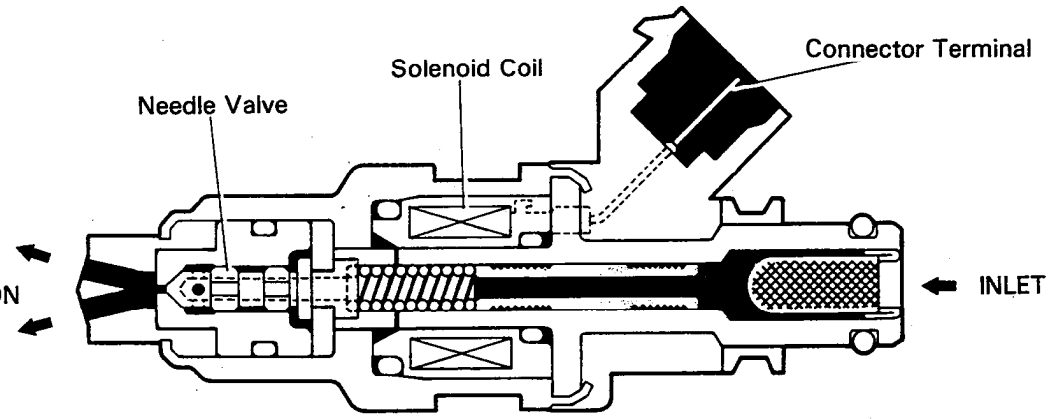
A-FE(2WD)



A-FE(4WD)

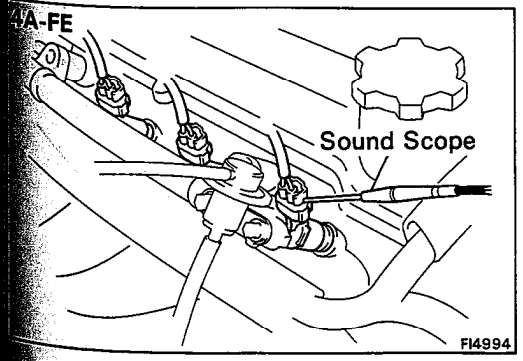


4A-GE



FI4481
FI2785
FI4826

4A-FE



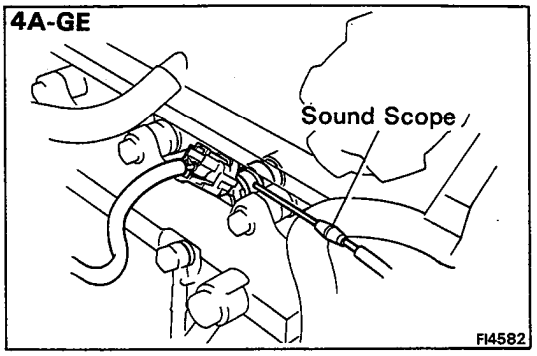
FI4994

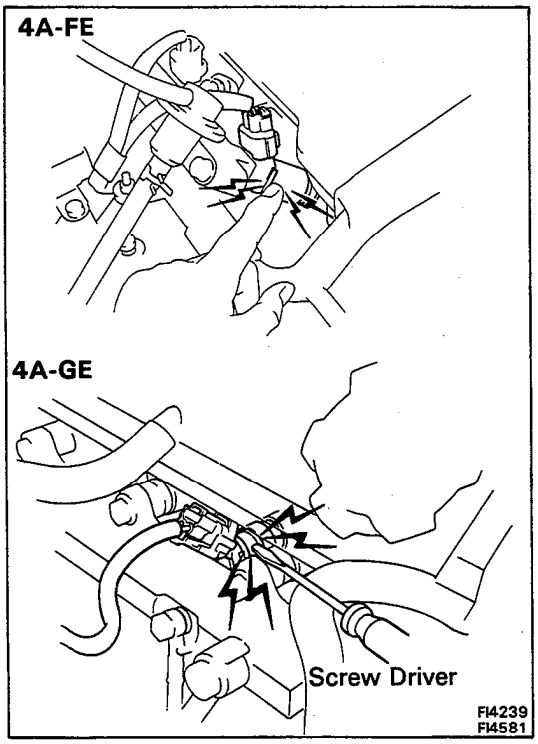
ON-VEHICLE INSPECTION

1. INSPECT INJECTOR OPERATION

Check operation sound from each injector.

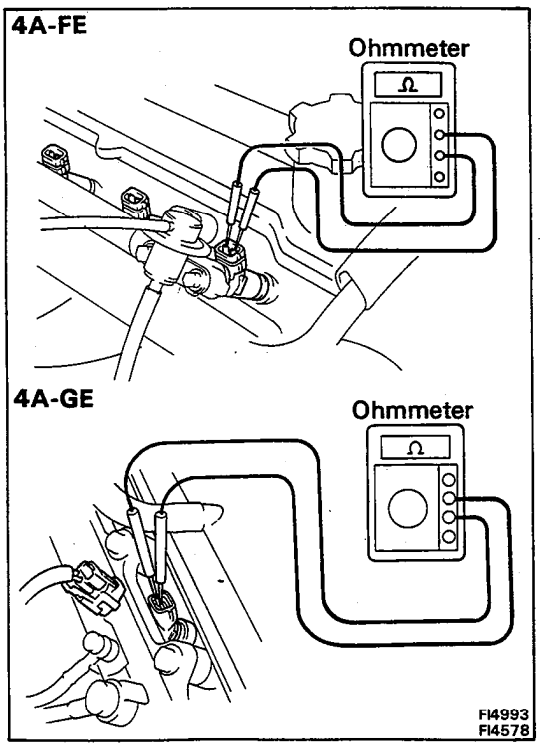
(a) With the engine running or cranking, use a sound scope to check that there is normal operating noise inproportion to engine rpm.





(b) If you have no sound scope, you can check the inj tor transmission operation with your finger (4A- or a screwdriver (4A-GE).

If no sound or an unusual sound is heard, check the wi connector, injector or injector signal from the ECU



2. INSPECT INJECTOR RESISTANCE

(a) Disconnect the injector connector.

(b) Using an ohmmeter, measure the resistance betw the terminals.

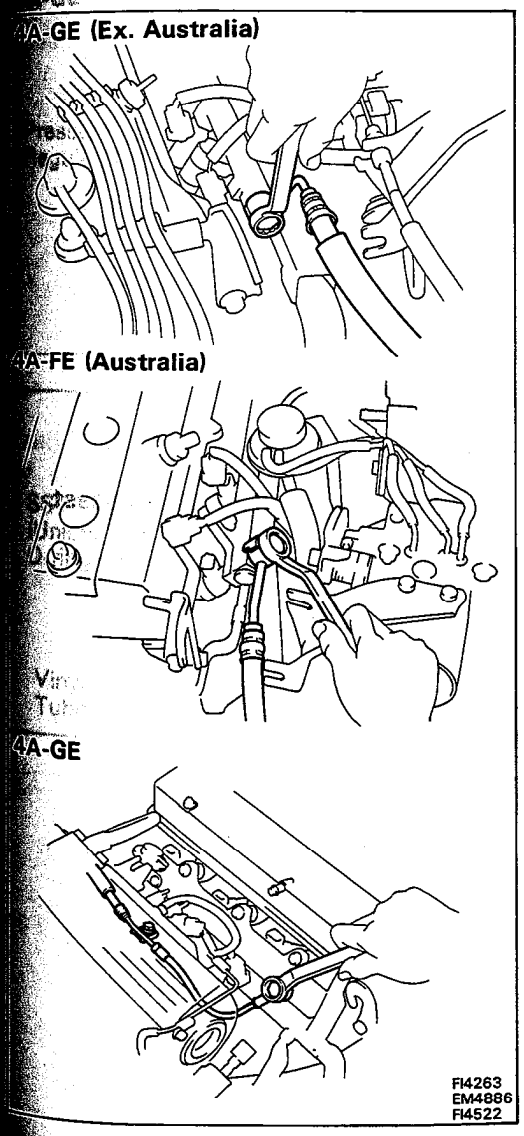
Resistance: Approx. 13.8 Ω

If the resistance is not as specified, replace the inject

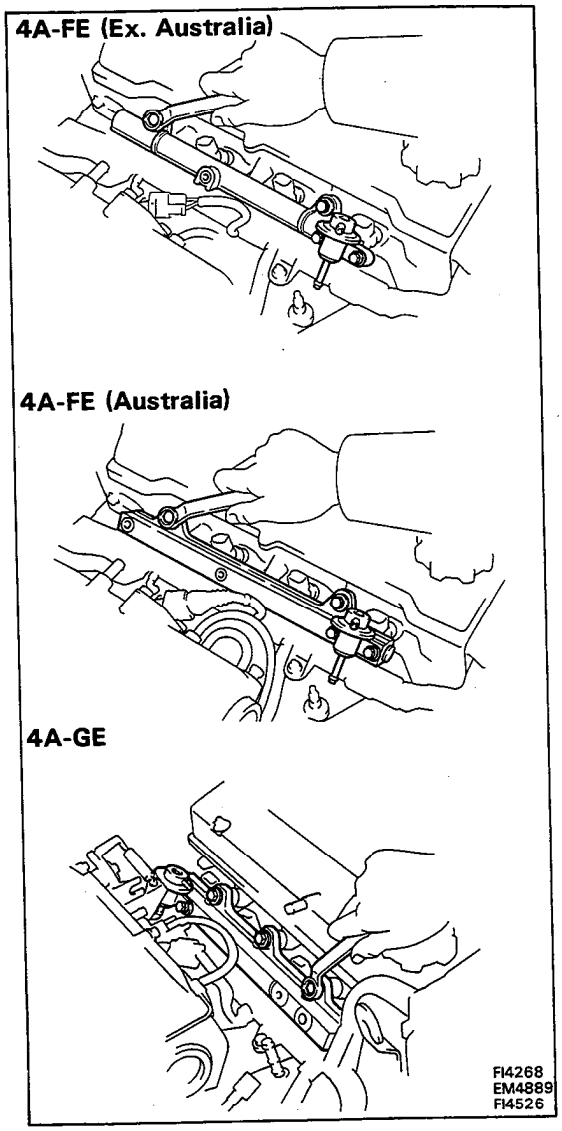
(c) Reconnect the injector connector.

REMOVAL OF INJECTORS

1. **DISCONNECT CABLE FROM NEGATIVE TERMINAL OF BATTERY**
2. **REMOVE COLD START INJECTOR PIPE (See step 3 page FI-105)**
3. **DISCONNECT VACUUM SENSING HOSE FROM FUEL PRESSURE REGULATOR**
4. **DISCONNECT INJECTOR CONNECTORS**
5. **DISCONNECT HOSE FROM FUEL RETURN PIPE**



6. **DISCONNECT FUEL INLET HOSE FROM DELIVERY PIPE**
   (a) (4A-FE)
   Remove the inlet pipe mount bolt.
   (b) Remove the union bolt and two gaskets, and disconnect the inlet hose from the delivery pipe.
7. **(4A-FE 4WD)**
   REMOVE EGR VACUUM MODULATOR (See step 6 page EM-60)



8. REMOVE DELIVERY PIPE AND INJECTORS

(a) (4A-FE)
Remove the two bolts and delivery pipe together wit the four injectors.

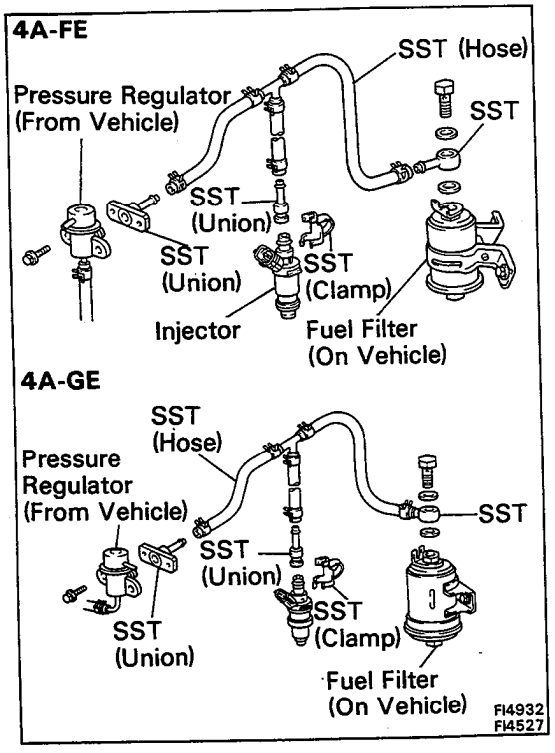
(4A-GE)
Remove the three bolts and delivery pipe togethe with the four injectors.

NOTICE: Be careful not to drop the injector, whe removing the delivery pipe.

(b) (4A-FE)
Remove the four insulators and two spacers from th cylinder head.

(4A-GE)
Remove the four insulators and three spacers fro the cylinder head.

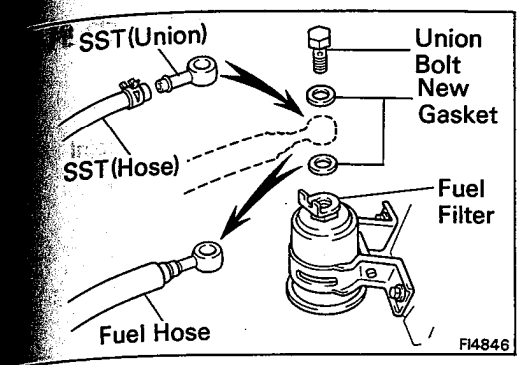
(c) Pull out the four injectors from the delivery pipe.



INSPECTION OF INJECTORS

1. INSPECT INJECTOR INJECTION

CAUTION: Keep clear of sparks during the test.

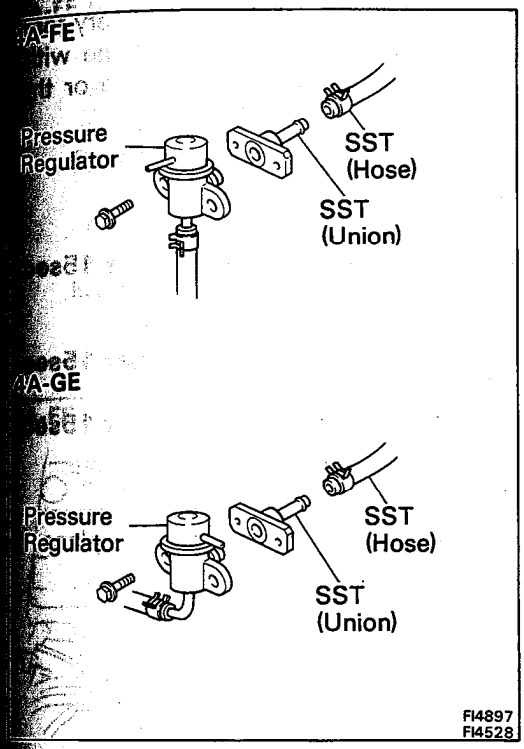


(a) Disconnect the fuel inlet hose from the fuel filter outlet.

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

SST 09268-41045 (90405-09015)

HINT: Use the vehicle's fuel filter.

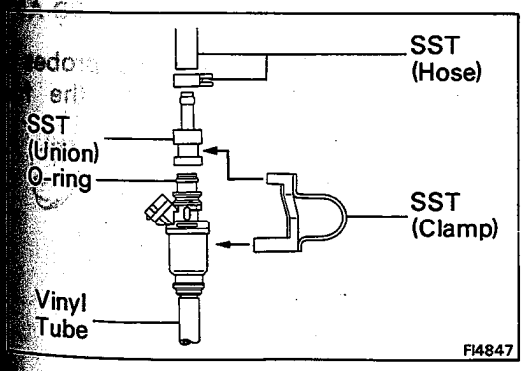


(c) Remove the pressure regulator from the delivery pipe, and connect the fuel hose to pressure regulator.

(d) Install a new O-ring to the pressure regulator.

(e) Connect the SST (hose) to the pressure regulator with SST (union) and two bolts.

SST 09268-41045 (09268-41090)



(f) Install the grommet and a new O-ring to the injector.

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

SST 09268-41045

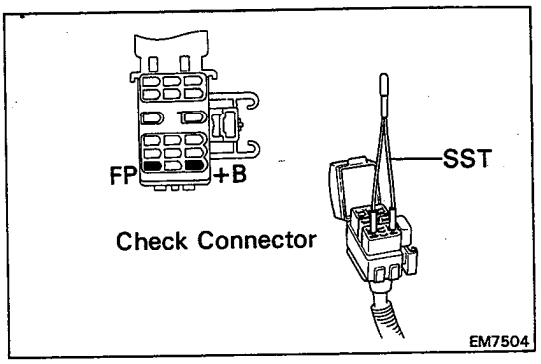
(h) Put the injector into the graduated cylinder.

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

(i) Reconnect the battery negative (–) cable.

(j) Turn the ignition switch ON.

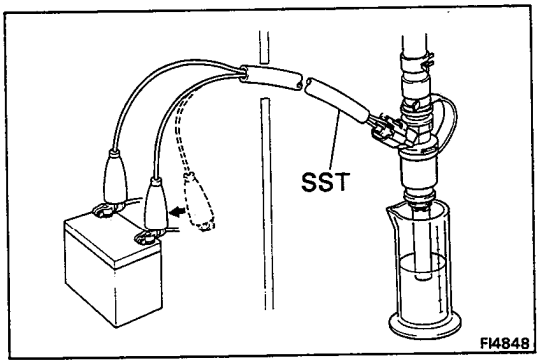
NOTICE: Do not start the engine.



(k) Using SST, connect terminals +B and FP of check connector.

SST 09843-18020

LOCATION: See page FI-133



(l) Connect SST (wire) to the injector and battery for seconds, and measure the injection volume with graduated cylinder. Test each injector two or th times.

SST 09842-30070

Volume:

4A-FE

40 — 50cc (2.4 — 3.1 cu in.) per 15sec

4A-GE

w/o Air flow meter

44 — 49cc (2.7 — 3.0 cu in.) per 15sec

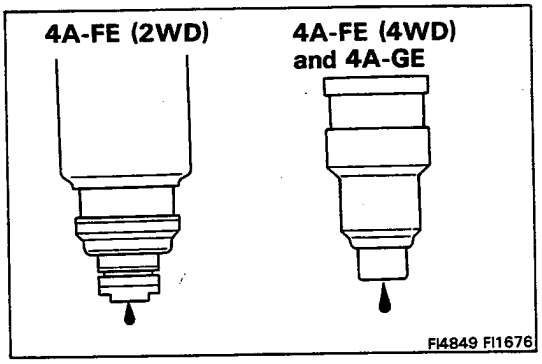
w/ Air flow meter

48 — 53cc (2.9 — 3.2 cu in.) per 15sec

Difference between each injector:

5cc (0.3 cu in.) or less

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



2. INSPECT LEAKAGE

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

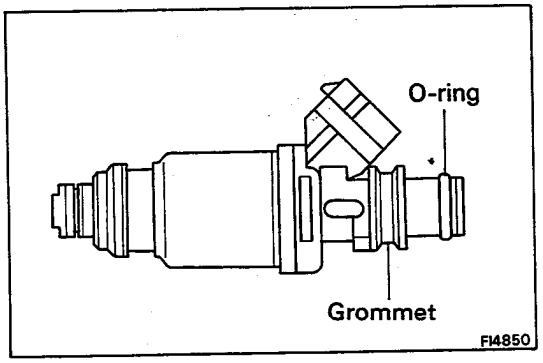
SST 09842-30070

Fuel drop: One drop or less per minute.

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

(c) Remove SST and the service wire.

SST 09268-41045

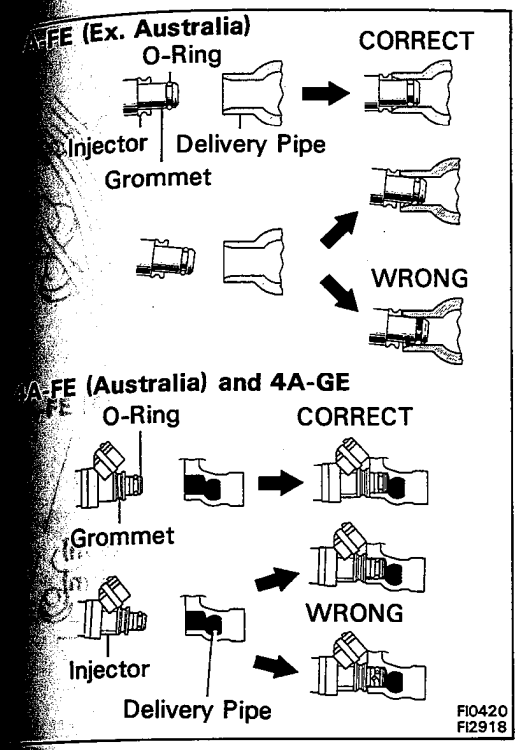


INSTALLATION OF INJECTORS

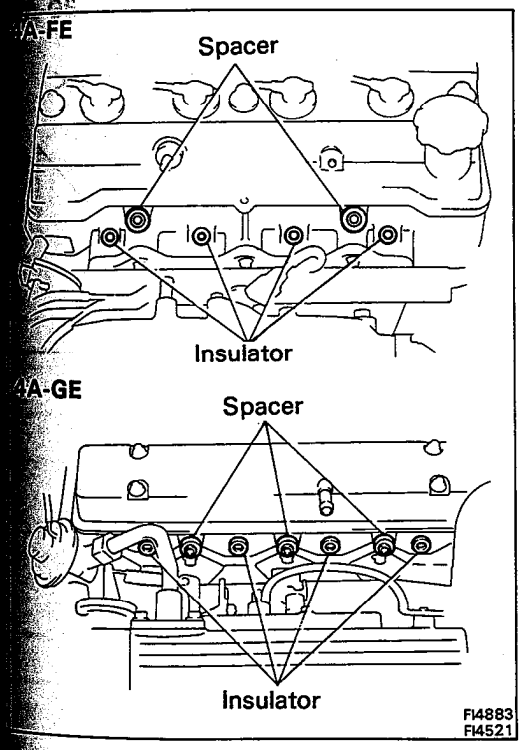
1. INSTALL INJECTORS AND DELIVERY PIPE

(a) Install a new grommet to the injector.

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

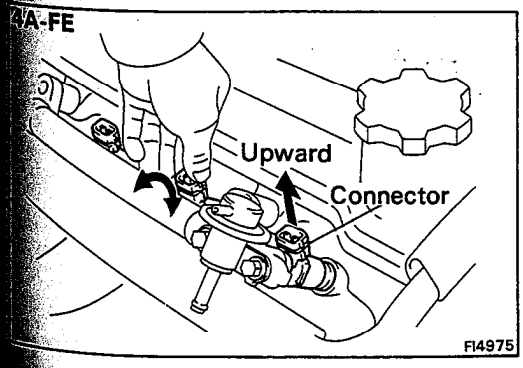


(c) While turning the injector left and right, install it to the delivery pipe. Install the four injectors.



(d) (4A-FE)
Place the four insulators and two spacers in position on the cylinder head.

(4A-GE)
Place the four insulators and three spacers in position on the cylinder head.

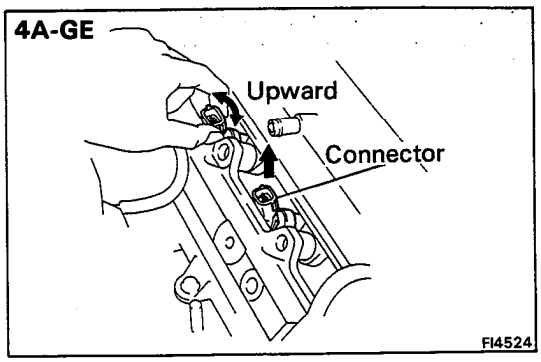


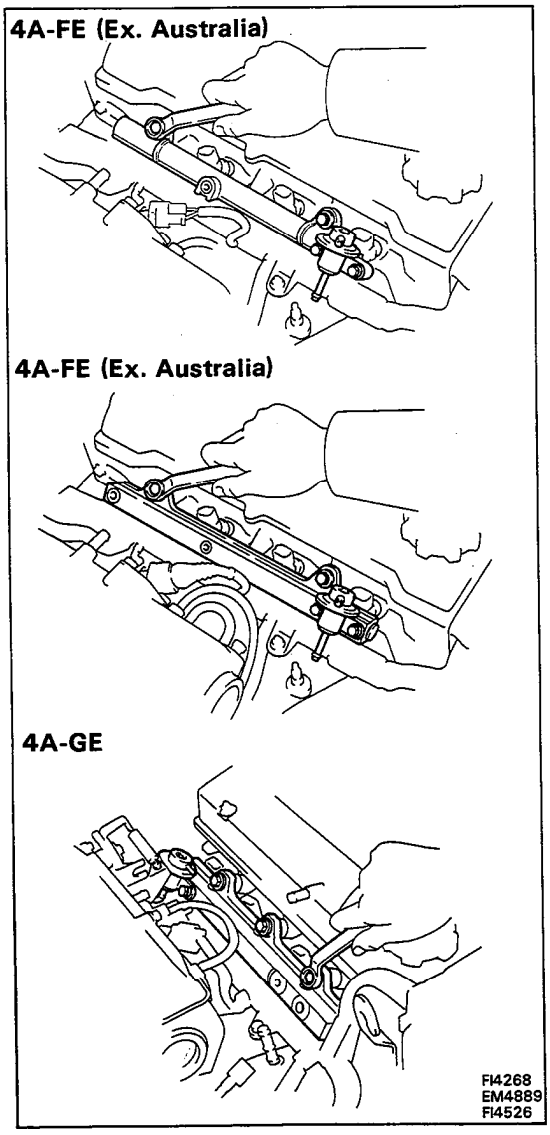
(e) Place the injectors together with the delivery pipe in position on the cylinder head.

(f) Check that the injectors rotate smoothly.

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

(g) Position the injector connector upward.



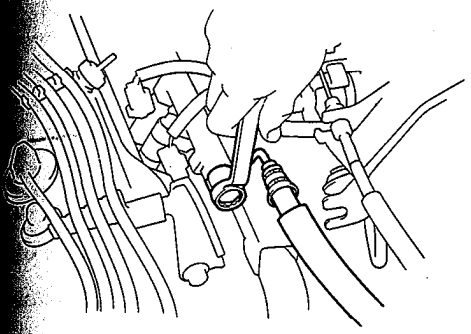


(h) (4A-FE)
Install and torque the two bolts.
(4A-GE)
Install and torque the three bolts.

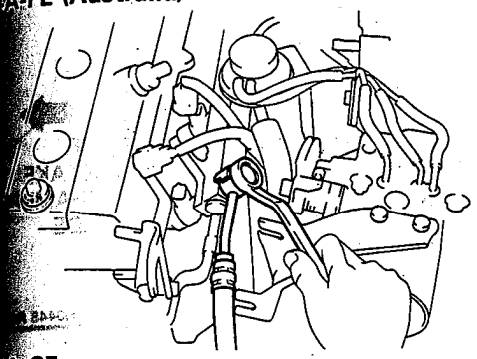
Torque: 4A-FE 150 kg-cm (11 ft-lb, 15 N·m)
4A-GE 175 kg-cm (13 ft-lb, 17 N·m)

2. (4A-FE 4WD)
INSTALL EGR VACUUM MODULATOR
(See step 20 on page EM-89)

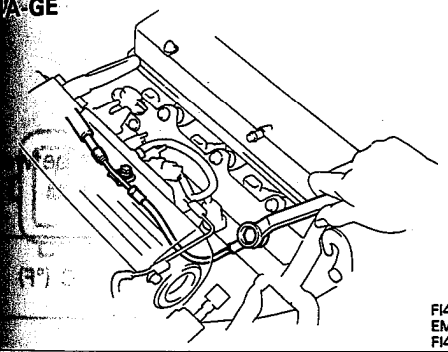
A-FE (Ex. Australia)



A-FE (Australia)



A-GE



FI4263
EM4886
FI4522

3. **CONNECT FUEL INLET HOSE TO DELIVERY PIPE**

(a) Connect the inlet hose with two new gaskets and the union bolt.

Torque: 300 kg-cm (22 ft-lb, 29 N·m)

(b) (4A-GE)
Install the inlet pipe mounting bolt.

Torque: 75 kg-cm (65 in-lb, 7.4 N·m)

4. **CONNECT FUEL RETURN HOSE**

5. **CONNECT INJECTOR CONNECTORS**

6. **CONNECT VACUUM SENSING HOSE**

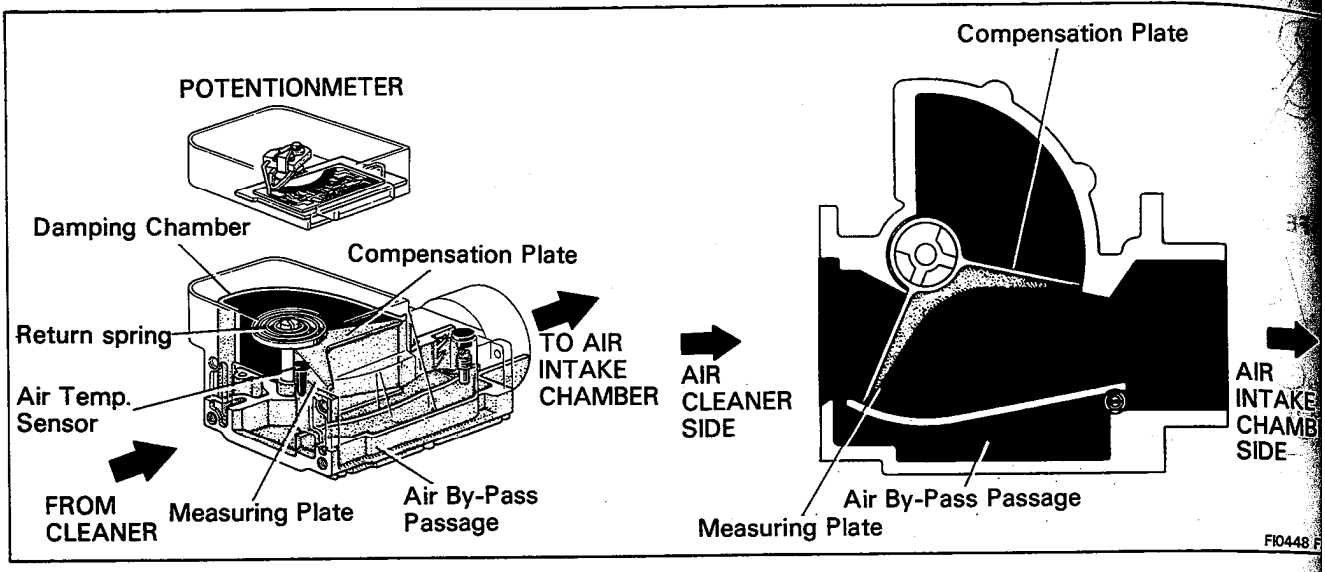
7. **INSTALL COLD START INJECTOR PIPE**
(See step 2 page FI-108)

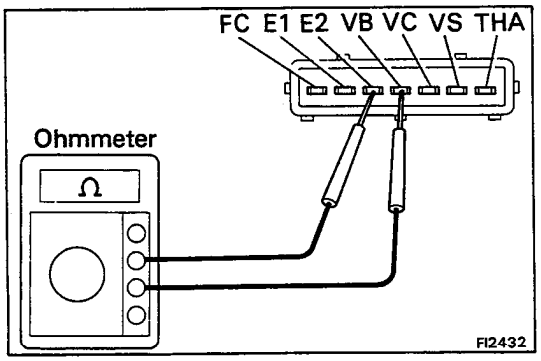
8. **CONNECT CABLE TO NEGATIVE TERMINAL OF BATTERY**

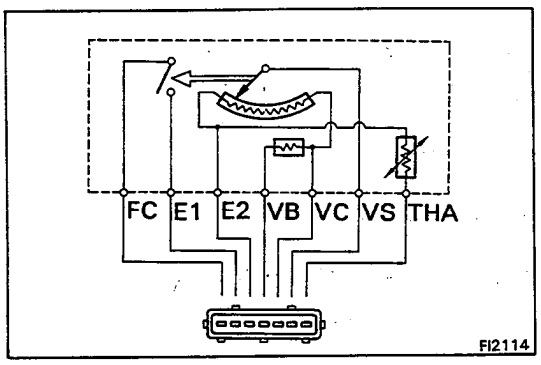
9. **CHECK FOR FUEL LEAKAGE (See page FI-12)**

AIR INDUCTION SYSTEM

Air Flow Meter (4A-GE W/ Air Flow Meter)







ON-VEHICLE INSPECTION

INSPECT RESISTANCE OF AIR FLOW METER

(a) Disconnect the air flow meter connector.

(b) Using an ohmmeter, measure the resistance betw each terminal.

Between terminals	Resistance	Temp. °C (°F
E2 – VS	20 – 400	–
E2 – VC	100 – 300	–
E2 – VB	200 – 400	–
E2 – THA	10,000 – 20,000 4,000 – 7,000 2,000 – 3,000 900 – 1,300 400 – 700	–20 (–4) 0 (32) 20 (68) 40 (104) 60 (140)
E1 – FC	Infinity	–

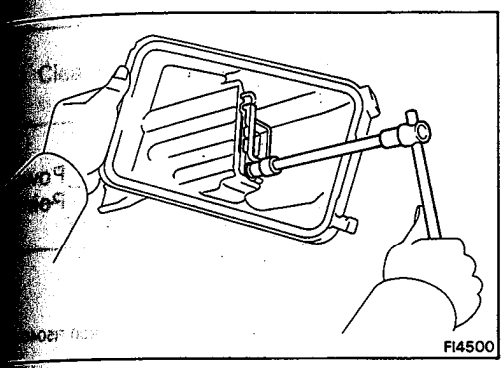
If the resistance is not as specified, replace the air meter.

(c) Reconnect the air flow meter connector.

REMOVAL OF AIR FLOW METER

1. **DISCONNECT CABLE FROM NEGATIVE TERMINAL OF BATTERY**
2. **DISCONNECT AIR CLEANER HOSE**
3. **REMOVE VSV (IDLE-UP)**
4. **DISCONNECT AIR FLOW METER CONNECTOR**
5. **REMOVE AIR CLEANER CAP WITH AIR FLOW METER**
6. **REMOVE AIR FLOW METER**

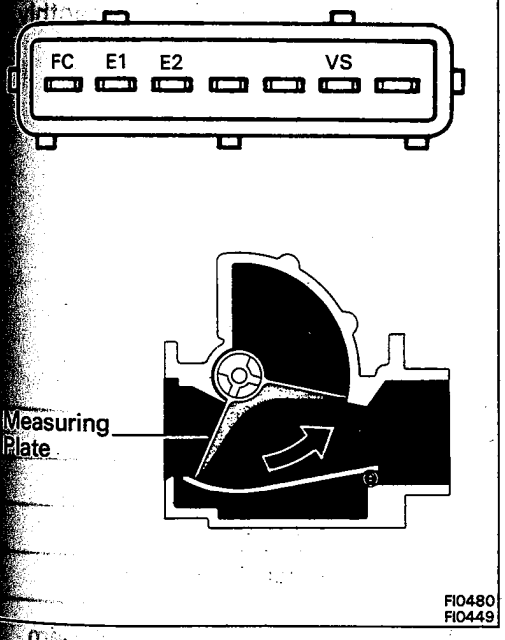
   Pry off the lock plate, and remove the four nuts, lock plate air flow meter and gasket.



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)	Measure plate opening
E1 – FC	Infinity	Fully closed
	Zero	Other than closed
E2 – VS	20 – 400	Fully closed
	20 – 1,000	Fully open

HINT: Resistance between terminals E2 and VS will change in accordance with the measuring plate opening.

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

INSTALLATION OF AIR FLOW METER

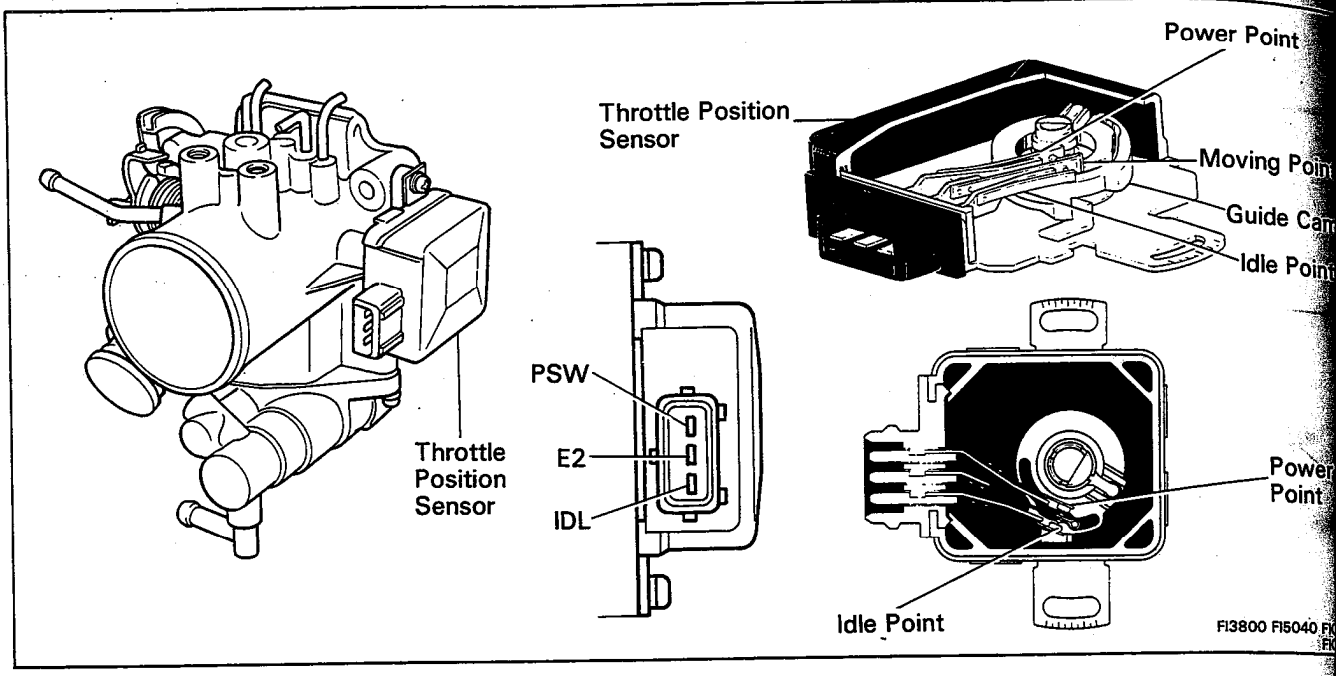
1. **INSTALL AIR FLOW METER**

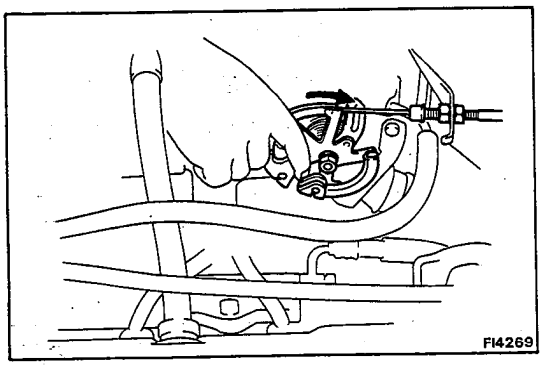
   Install the gasket and air flow meter with the lock plate and four nuts.

   If the lock plate on the nut.

2. **INSTALL AIR CLEANER WITH AIR FLOW METER**
3. **CONNECT AIR FLOW METER CONNECTOR**
4. **INSTALL VSV (IDLE-UP)**
5. **CONNECT AIR CLEANER HOSE**
6. **CONNECT CABLE TO NEGATIVE TERMINAL OF BATTERY**

Throttle Body (4A-FE)

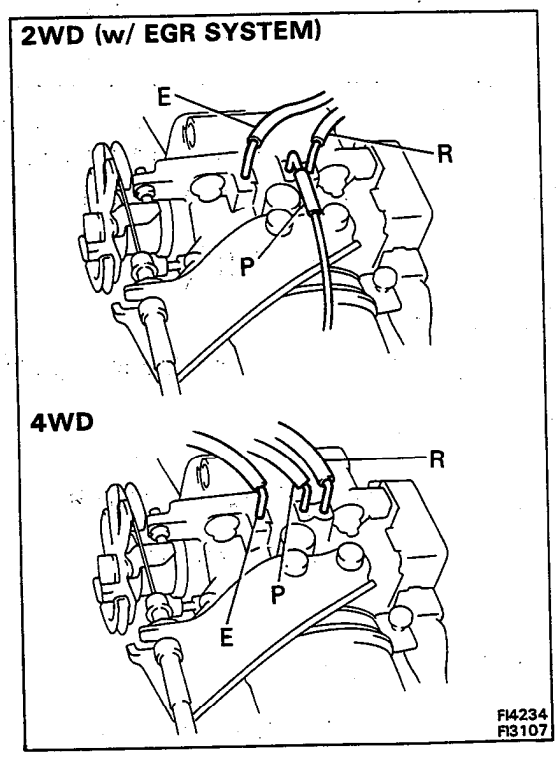




ON-VEHICLE CHECK

1. CHECK THROTTLE BODY

(a) Check that the throttle linkage moves smoothly.

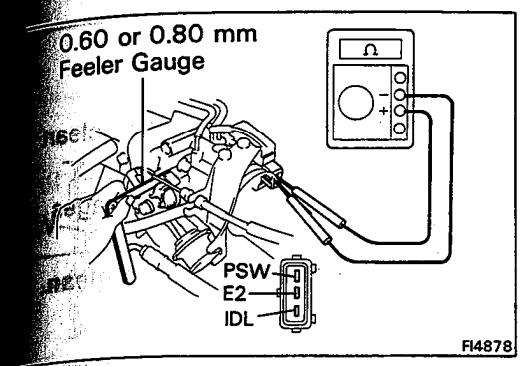


(b) Check the vacuum at each port.

- Start and warm up the engine.
- Check the vacuum with your finger.

Port	Throttle Valve Opening
P*1	Positioned more than P port.
E*2	Positioned more than E port.
R*2	Positioned more than R port.

*1: With fuel evaporative emission control system
*2: With exhaust gas recirculation system



2. INSPECT THROTTLE POSITION SENSOR

(a) Disconnect the sensor connector.

(b) Insert a feeler gauge between the throttle stop screw and stop lever.

(c) Using an ohmmeter, measure the resistance between each terminal.

If the resistance is not as specified, adjust or replace the throttle position sensor.

Clearance between lever and stop screw	Continuity between terminals		
	IDL – E2	PSW – E2	IDL – PSW
0.60 mm (0.0236 in.)	Continuity	No continuity	No continuity
0.80 mm (0.0316 in.)	No continuity	No continuity	No continuity
Throttle valve fully opened position	No continuity	Continuity	No continuity

(d) Reconnect the sensor connector.

REMOVAL OF THROTTLE BODY

1. DISCONNECT CABLE FROM NEGATIVE TERMINAL OF BATTERY

2. DRAIN ENGINE COOLANT

3. DISCONNECT ACCELERATOR CABLE

4. (A/T)
DISCONNECT THROTTLE CABLE

5. DISCONNECT AIR CLEANER HOSE

6. REMOVE CABLE BRACKET FROM THROTTLE BODY

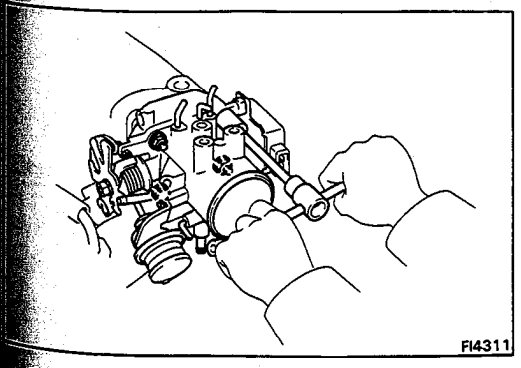
7. DISCONNECT THROTTLE POSITION SENSOR CONNECTOR

8. DISCONNECT FOLLOWING HOSES:

(a) No.2 water by-pass hose from the air valve.

(b) PCV hose from the throttle body.

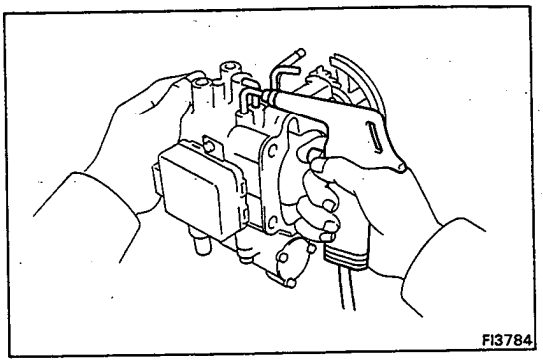
(c) Vacuum hose(s) from the port(s).



9. REMOVE THROTTLE BODY

(a) Remove the two bolts and nuts, and disconnect the throttle body and gasket.

(b) Disconnect the No.1 water by-pass hose, and remove the throttle body.


FI3784

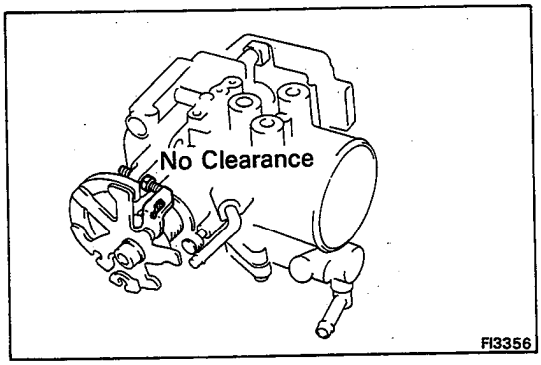
INSPECTION OF THROTTLE BODY

1. CLEAN THROTTLE BODY

(a) Using a soft brush and carburetor cleaner, clean th cast parts.

(b) Using compressed air, clean all the passages an apertures.

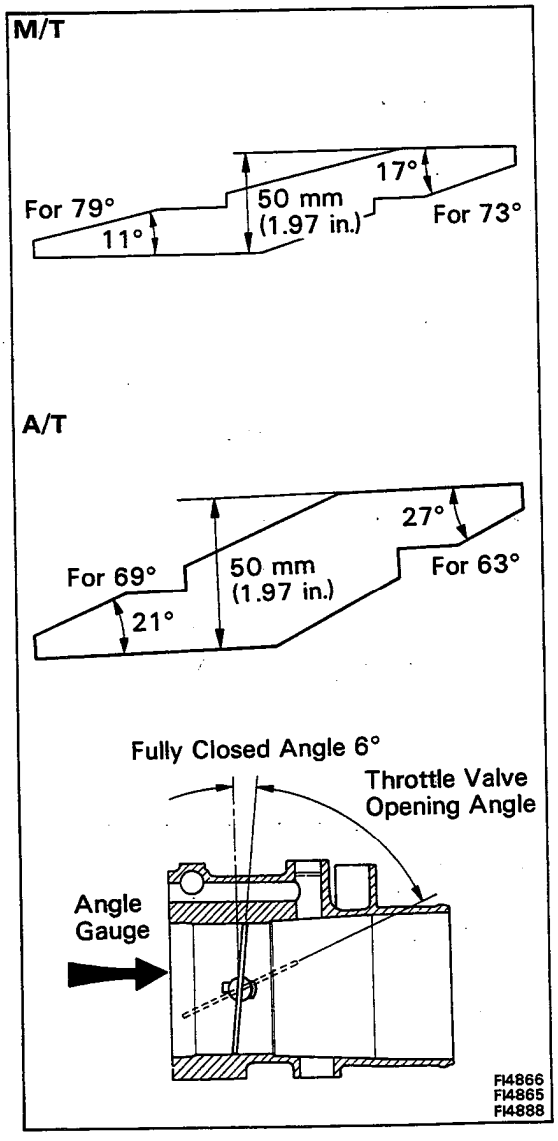
NOTICE: To prevent deterioration, do not clean th throttle position sensor.



FI3356

2. INSPECT THROTTLE BODY VALVE

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



FI4866
FI4865
FI4888

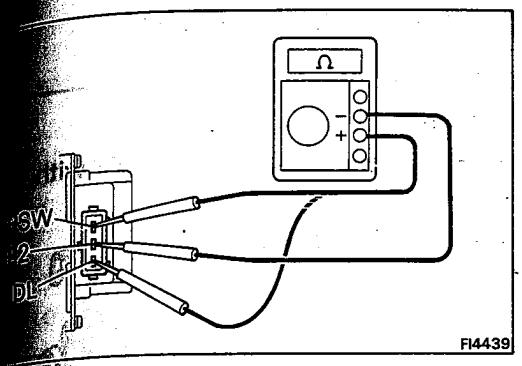
3. INSPECT THROTTLE POSITION SENSOR

(a) Make an angle gauge as shown in the figure.

(b) Set throttle valve opening angle to the specificatio below from the vertical position (incl. throttle val fully closed angle 6°).

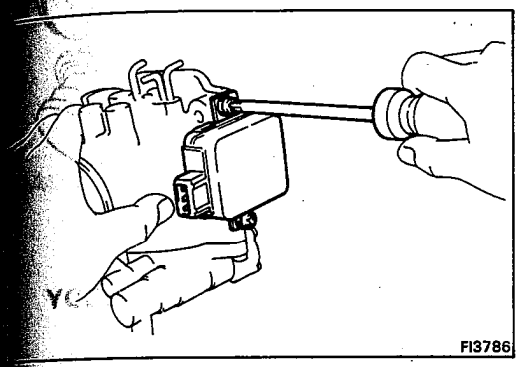
Throttle valve opening angle:

M/T	**73° or 79°**
A/T	**63° or 69°**



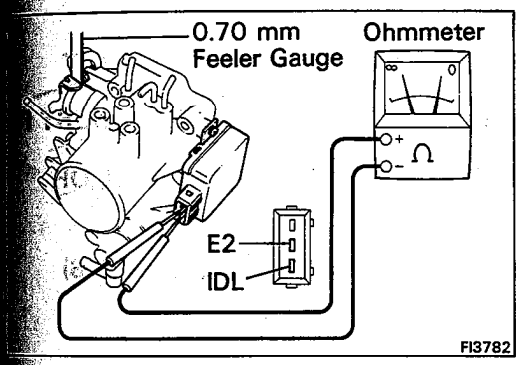
(c) Using an ohmmeter, check the continuity between each of the terminals.

Throttle valve opening angle		Continuity		
M/T	A/T	IDL – E2	PSW – E2	IDL – PSW
73° from vertical	63° from vertical	No continuity	No continuity	No continuity
79° from vertical	69° from vertical	No continuity	Continuity	No continuity
Less than 7.5 from vertical		Continuity	No continuity	No continuity



4. IF NECESSARY, ADJUST THROTTLE POSITION SENSOR

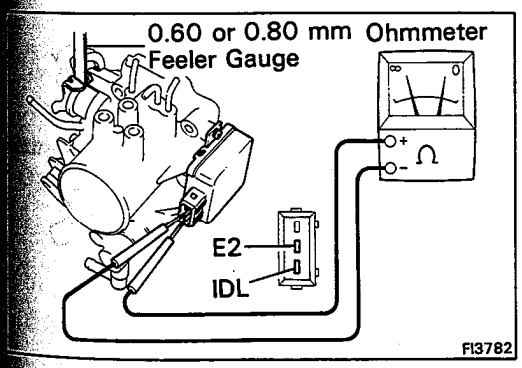
(a) Loosen the two set screws of the sensor.



(b) Insert a 0.70 mm (0.028 in.) feeler gauge, between the throttle stop screw and stop lever.

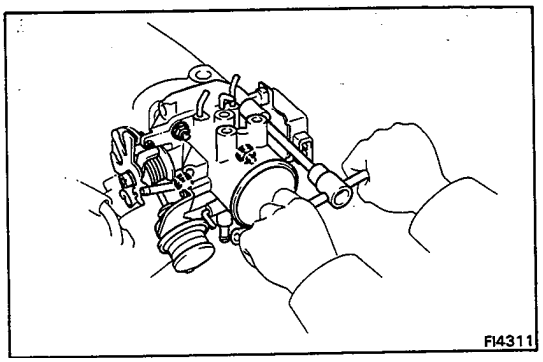
(c) Connect the test probe of an ohmmeter to the terminals IDL and E2 of the sensor.

(d) Gradually turn the sensor counterclockwise 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)
0.60 mm (0.024 in.)	Continuity
0.80 mm (0.032 in.)	No continuity



INSTALLATION OF THROTTLE BODY

1. **INSTALL THROTTLE BODY**
   (a) Connect No.1 water by-pass hose.
   (b) Install a new gasket and the throttle body with two bolts and nuts.

   Torque: 220 kg-cm (16 ft-lb, 22 N·m)

2. **CONNECT FOLLOWING HOSES:**
   (a) No.2 water by-pass hose.
   (b) PCV hose to the throttle body.
   (c) Vacuum hose(s) to the port(s).

3. **CONNECT THROTTLE POSITION SENSOR CONNECTOR**

4. **INSTALL CABLE BRACKET TO THROTTLE BODY**

5. **CONNECT AIR CLEANER HOSE**

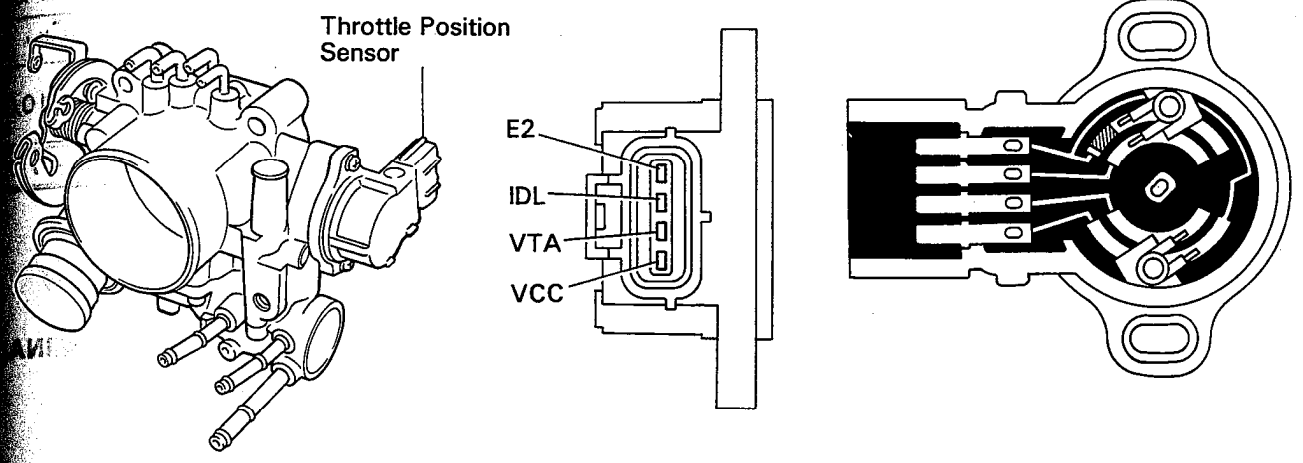
6. **(A/T)**
   CONNECT THROTTLE CABLE, AND ADJUST IT

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

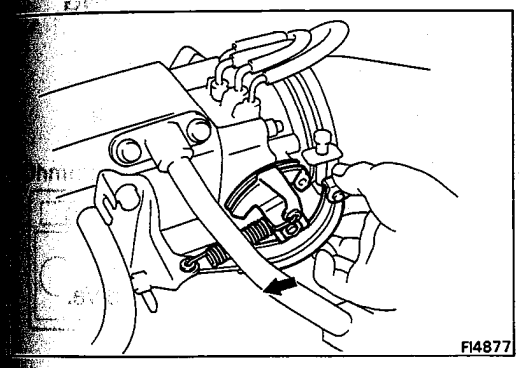
8. **CONNECT CABLE TO NEGATIVE TERMINAL OF BATTERY**

9. **FILL WITH ENGINE COOLANT (See page CO-6)**

Throttle Body (4A-GE)



FI4576 FI5144 FI4143

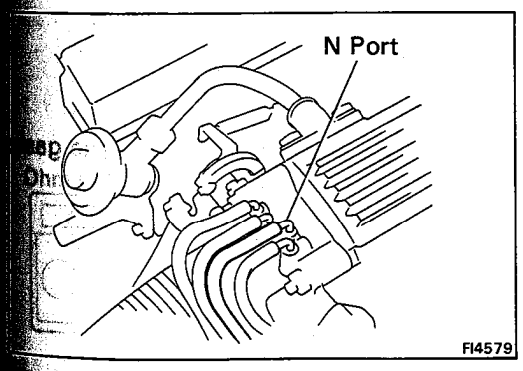


FI4877

ON-VEHICLE INSPECTION

1. INSPECT THROTTLE BODY

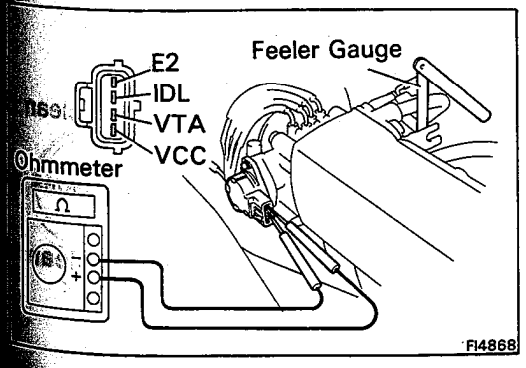
(a) Check that the throttle linkage moves smoothly.



FI4579

(b) Check the vacuum at N port.

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



FI4868

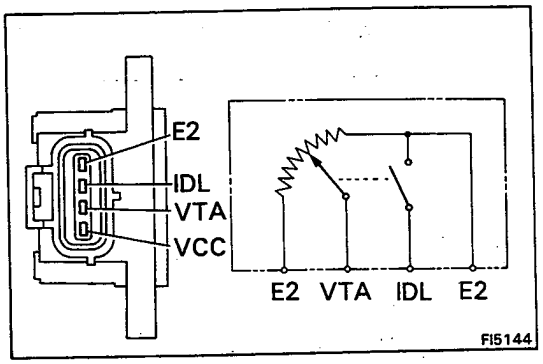
2. INSPECT THROTTLE POSITION SENSOR

(a) Disconnect the sensor connector.

(b) Insert a feeler gauge between the throttle stop screw and stop lever.

(c) Using an ohmmeter, measure the resistance between each terminal.

If the resistance is not as specified, adjust or replace the throttle position sensor.

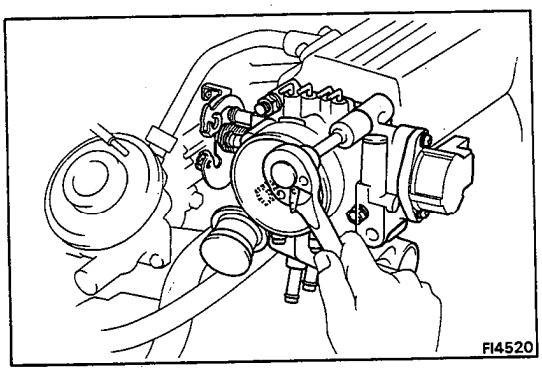


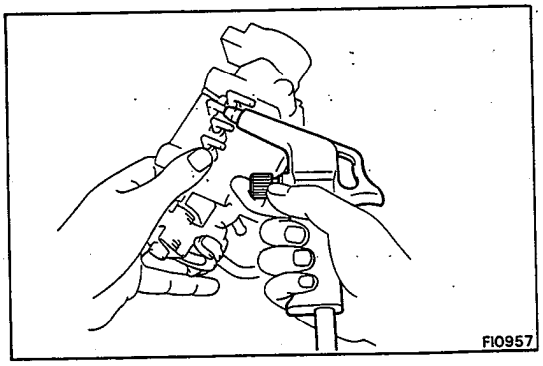
Clearance between lever and stop screw mm (in.)	Between Terminal	Resistance
0 (0)	VTA – E2	200 – 800
0.35 (0.014)	IDL – E2	2,300 or les
0.59 (0.023)	IDL – E2	Infinity
Throttle valve fully opened position	VTA – E2	3,300 – 10,0
–	VCC – E2	3,000 – 7,00

(d) Reconnect the sensor connector.

REMOVAL OF THROTTLE BODY

1. **DISCONNECT CABLE FROM NEGATIVE TERMINAL OF BATTERY**
2. **DRAIN ENGINE COOLANT**
3. **DISCONNECT AIR CLEANER HOSE**
4. **DISCONNECT ACCELERATOR RETURN SPRING**
5. **DISCONNECT ACCELERATOR CABLE**
6. **DISCONNECT THROTTLE POSITION SENSOR CONNECTOR**
7. **DISCONNECT FOLLOWING HOSES:**
   (a) Vacuum hoses from the ports.
   (b) Two water by-pass hoses from the air valve.
8. **(w/ EGR SYSTEM)**
   REMOVE VACUUM PIPE
   Remove the three bolts and vacuum pipe.
9. **REMOVE THROTTLE BODY**
   Remove the two bolts, two nuts, throttle body and ga

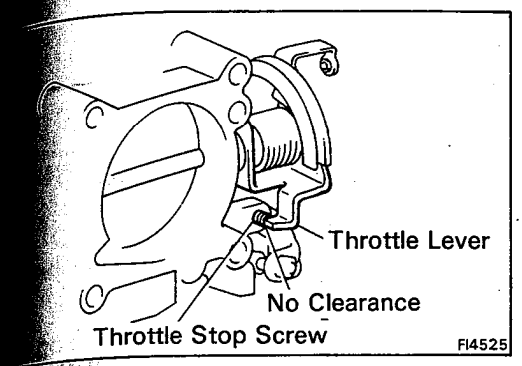




INSPECTION OF THROTTLE BODY

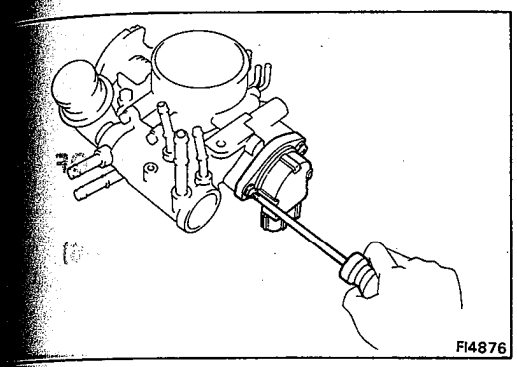
1. **CLEAN THROTTLE BODY**
   (a) Using a soft brush and carburetor cleaner, clea cast parts.
   (b) Using compressed air, clean all the passage apertures.

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



2. INSPECT THROTTLE BODY VALVE

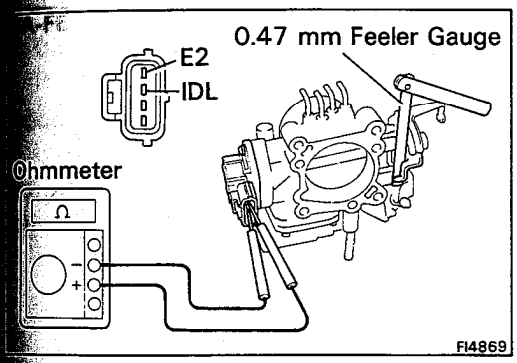
Check that there is no clearance between the throttle stop screw and throttle lever when the throttle valve is fully closed.



3. INSPECT THROTTLE POSITION SENSOR
(See step 2 on page FI-127)

4. IF NECESSARY, ADJUST THROTTLE POSITION SENSOR

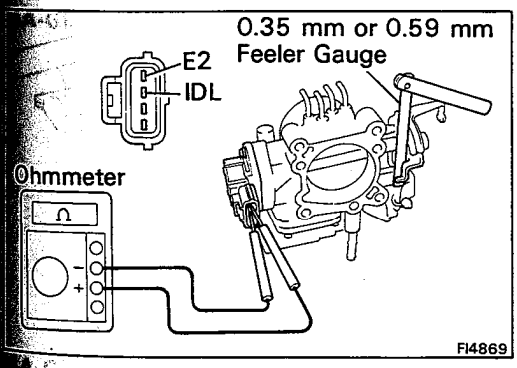
(a) Loosen the two set screws of the sensor.



(b) Insert a 0.47 mm (0.019 in.) feeler gauge, between the throttle stop screw and stop lever.

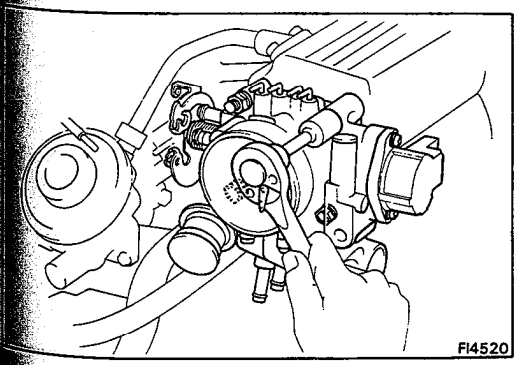
(c) Connect the test probe of an ohmmeter to the terminals IDL and E2 of the sensor.

(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 mm (in.)	Continuity (IDL – E2)
0.35 (0.014)	Continuity
0.59 (0.023)	No continuity



INSTALLATION OF THROTTLE BODY

1. INSTALL THROTTLE BODY

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

Torque: 220 kg-cm (16 ft-lb, 22 N·m)

2. **(w/ EGR SYSTEM)**
   INSTALL VACUUM PIPE
   Install the vacuum pipe with the three bolts.

3. **CONNECT FOLLOWING HOSES:**
   (a) Two water by-pass hoses to the air valve.
   (b) Vacuum hoses to the ports.

4. **CONNECT THROTTLE POSITION SENSOR CONNECTOR**

5. **CONNECT ACCELERATOR CABLE, AND ADJUST**

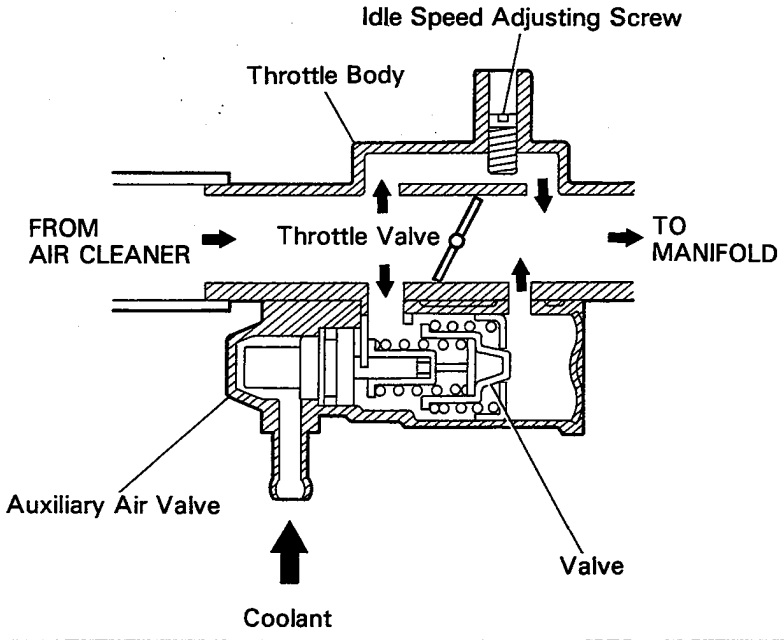
6. **CONNECT ACCELERATOR RETURN SPRING**

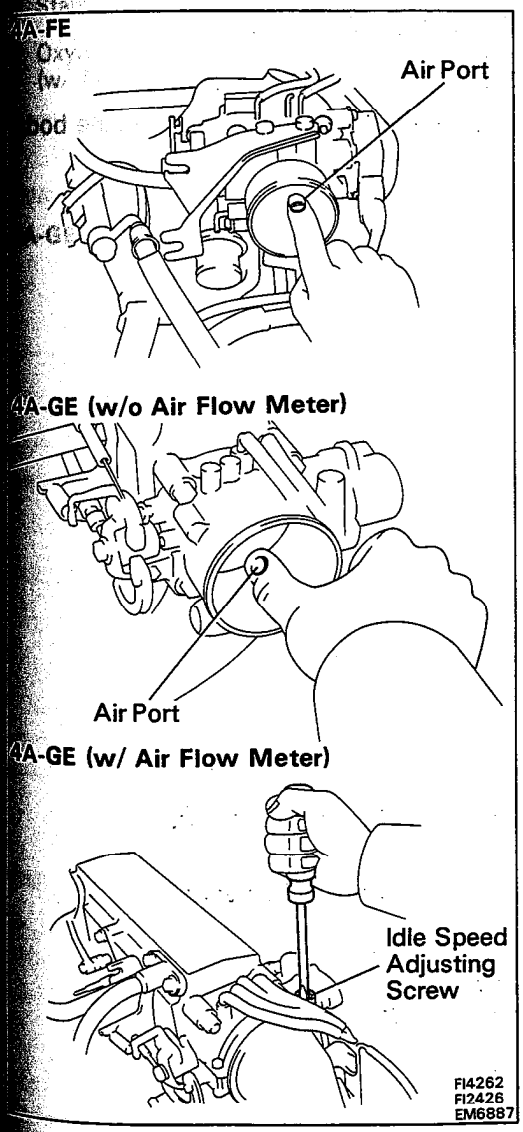
7. **CONNECT AIR CLEANER HOSE**

8. **CONNECT CABLE TO NEGATIVE TERMINAL OF BATTERY**

9. **FILL WITH ENGINE COOLANT (See page CO-6)**

Auxiliary Air Valve





ON-VEHICLE INSPECTION

INSPECT AIR VALVE OPERATION

(w/o Air Flow Meter)

(a) Remove the air cleaner hose.

(b) Check the engine rpm by closing the air port on the throttle body.

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

- The engine RPM should drop.

After warm-up

- Check that engine RPM does not drop more than 100 rpm.

(c) Install the air cleaner hose.

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

(w/ Air Flow Meter)

Check the engine rpm by fully screwing in the idle speed adjusting screw.

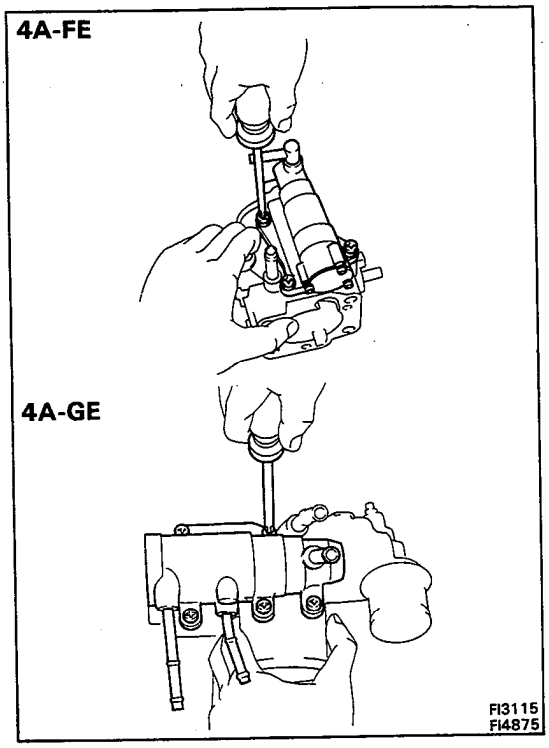
At low temp. (Coolant temp.: below 80°C (176°F))

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

After warm-up

- When the idle speed adjusting screw is in, the engine rpm should drop below idle speed duel stop.

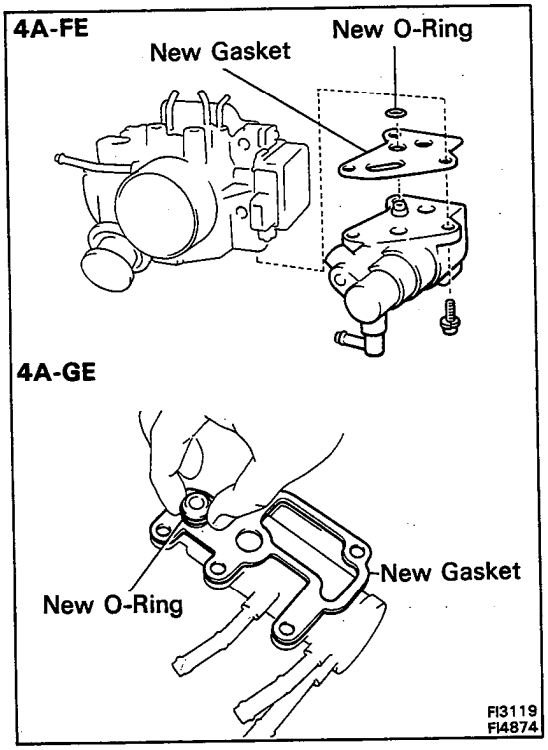
If operation is not as specified, replace the air valve.



REMOVAL OF AUXILIARY AIR VALVE

1. **REMOVE THROTTLE BODY**
   4A-FE (See page FI-123)
   4A-GE (See page FI-128)

2. **REMOVE AIR VALVE FROM THROTTLE BODY**
   (4A-FE)
   Remove the three screws, air valve, gasket and O-ring.
   (4A-GE)
   Remove the five screws, air valve, gasket and O-ring.



INSTALLATION OF AIR VALVE

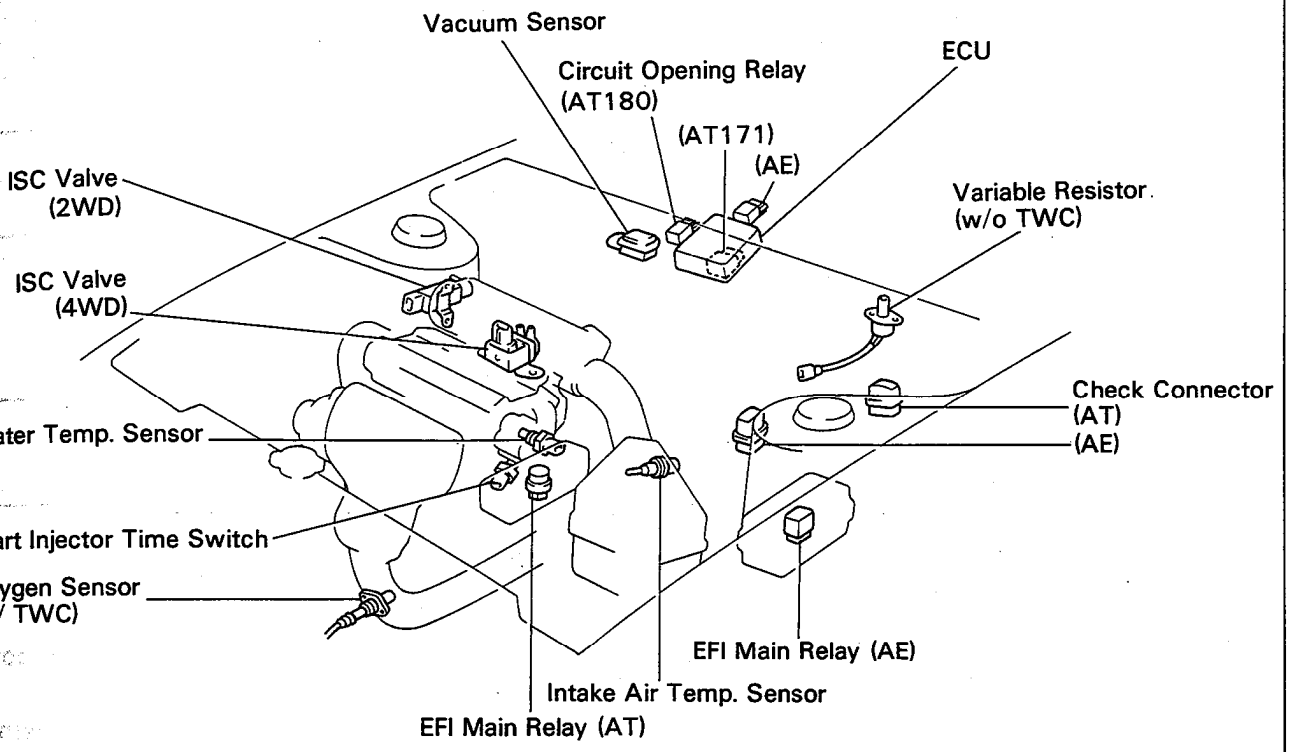
1. **INSTALL AIR VALVE TO THROTTLE BODY**
   (a) Place new gasket and O-ring on the throttle bod

   (b) (4A-FE)
   Install the air valve with the three screws.
   (4A-GE)
   Install the air valve with the five screws.

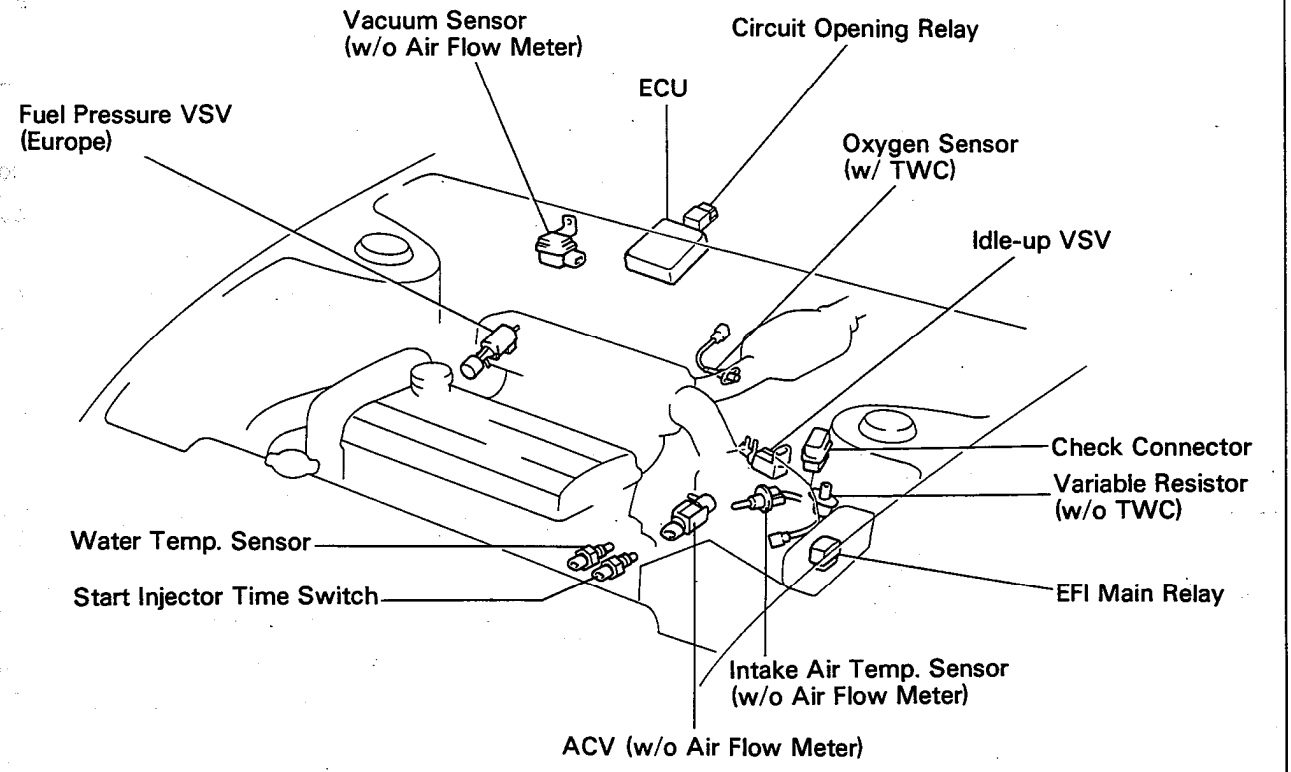
2. **INSTALL THROTTLE BODY**
   4A-FE (See page FI-126)
   4A-GE (See page FI-129)

ELECTRONIC CONTROL SYSTEM
Location of Electronic Control Parts

4A-FE

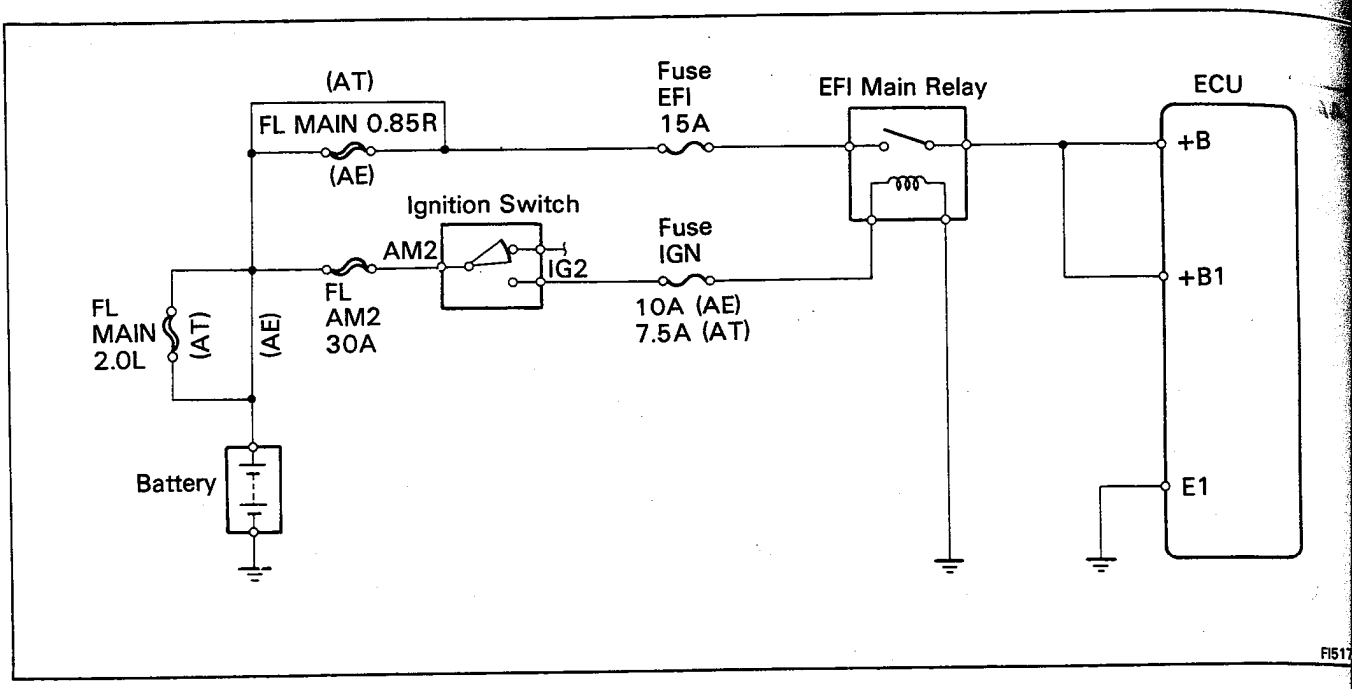


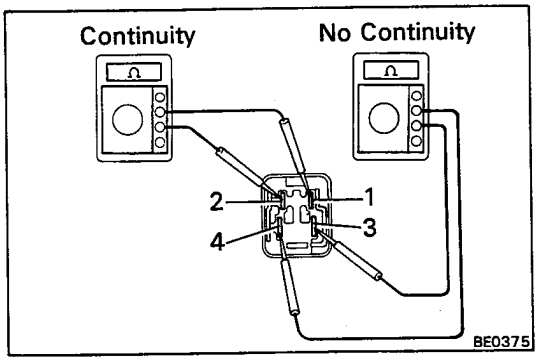
4A-GE



FI5156
FI5155

EFI Main Relay





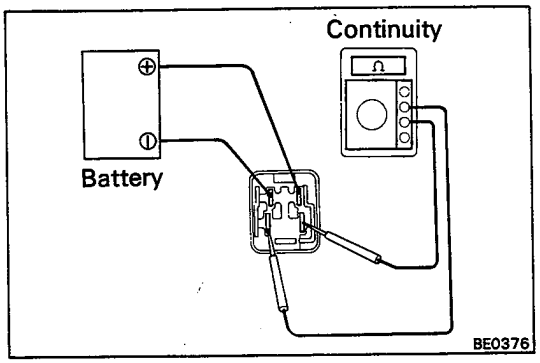
INSPECTION OF EFI MAIN RELAY (AE)

1. INSPECT RELAY CONTINUITY

(a) Using an ohmmeter, check that there is continui between terminals 1 and 2.

(b) Check that there is no continuity between terminals and 4.

If continuity is not as specified, replace the relay.

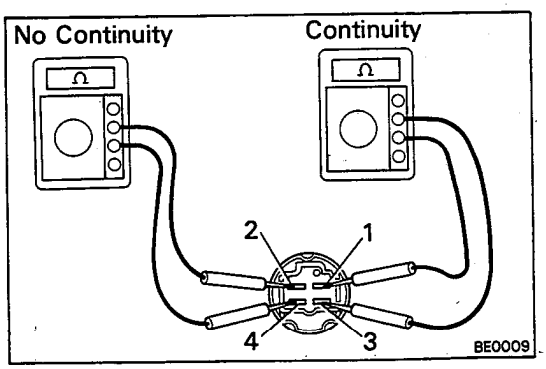


2. INSPECT RELAY OPERATION

(a) Apply battery voltage across terminals 1 and 2.

(b) Using an ohmmeter, check that there is continu between terminals 3 and 4.

If operation is not as specified, replace the relay.



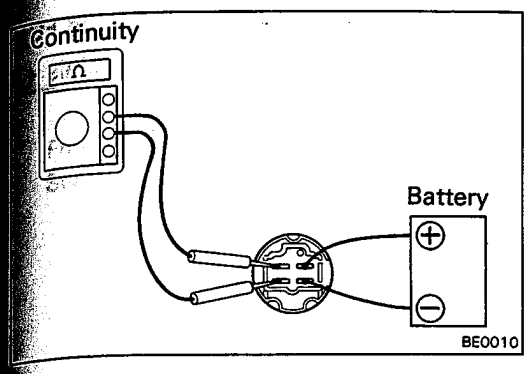
INSPECTION OF EFI MAIN RELAY (AT)

1. INSPECT RELAY CONTINUITY

(a) Using an ohmmeter, check that there is continu between terminals 1 and 3.

(b) Check that there is no continuity between terminal and 4.

If continuity is not as specified, replace the relay.



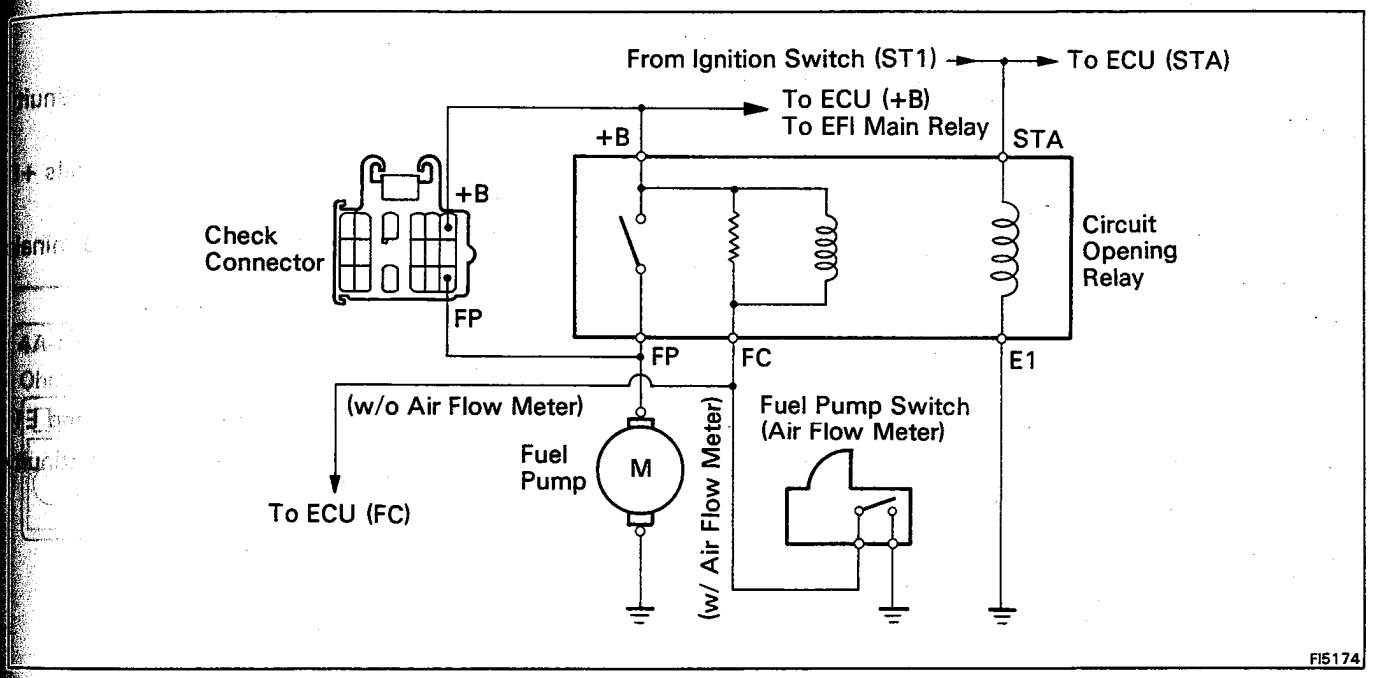
2. INSPECT RELAY OPERATION

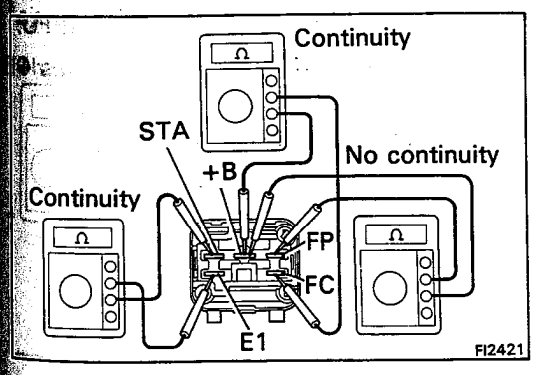
(a) Apply battery voltage across terminals 1 and 3.

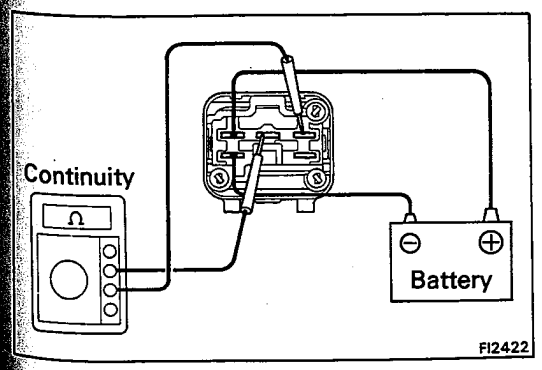
(b) Using an ohmmeter, check that there is continuity between terminals 2 and 4.

If operation is not as specified, replace the relay.

Circuit Opening Relay







INSPECTION OF CIRCUIT OPENING RELAY (w/o Air Flow Meter)

1. INSPECT RELAY CONTINUITY

(a) Using an ohmmeter, check that there is continuity between terminals STA and E1.

(b) Check that there is continuity between terminals +B and FC.

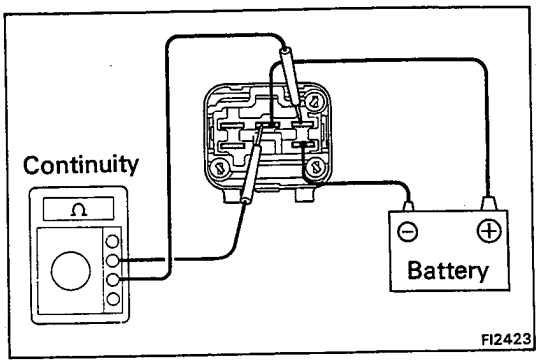
(c) Check that there is no continuity between terminals +B and FP.

If continuity is not as specified, replace the relay.

2. INSPECT RELAY OPERATION

(a) Apply battery voltage across terminals STA and E1.

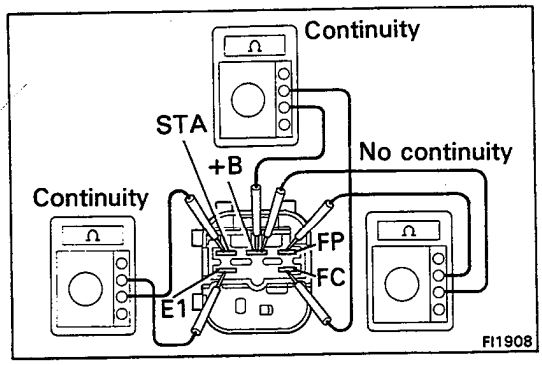
(b) Using an ohmmeter, check that there is continuity between terminals +B and FP.



(c) Apply battery voltage across terminals +B and FC.

(d) Check that there is continuity between terminals STA and FP.

If operation is not as specified, replace the relay.



INSPECTION OF CIRCUIT OPENING RELAY (w/ Air Flow Meter)

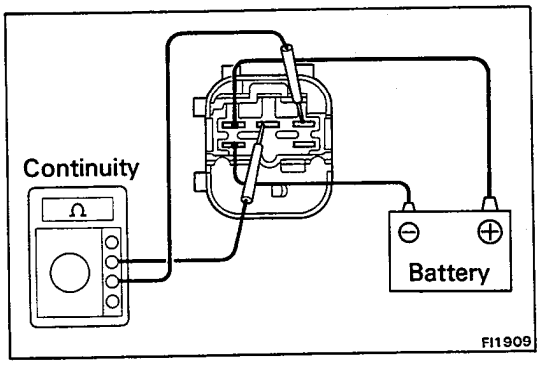
1. INSPECT RELAY CONTINUITY

(a) Using an ohmmeter, check that there is continuity between terminals STA and E1.

(b) Check that there is continuity between terminals +B and FC.

(c) Check that there is no continuity between terminals +B and FP.

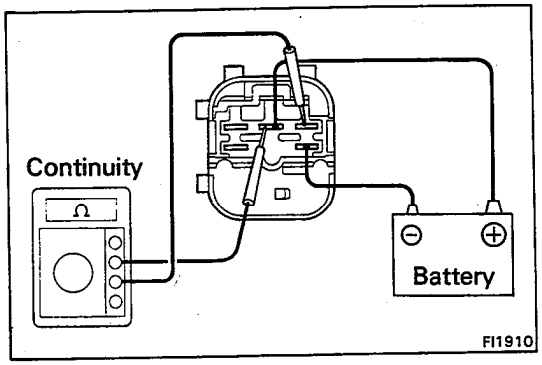
If continuity is not as specified, replace the relay.



2. INSPECT RELAY OPERATION

(a) Apply battery voltage across terminals STA and E1.

(b) Using an ohmmeter, check that there is continuity between terminals +B and FP.

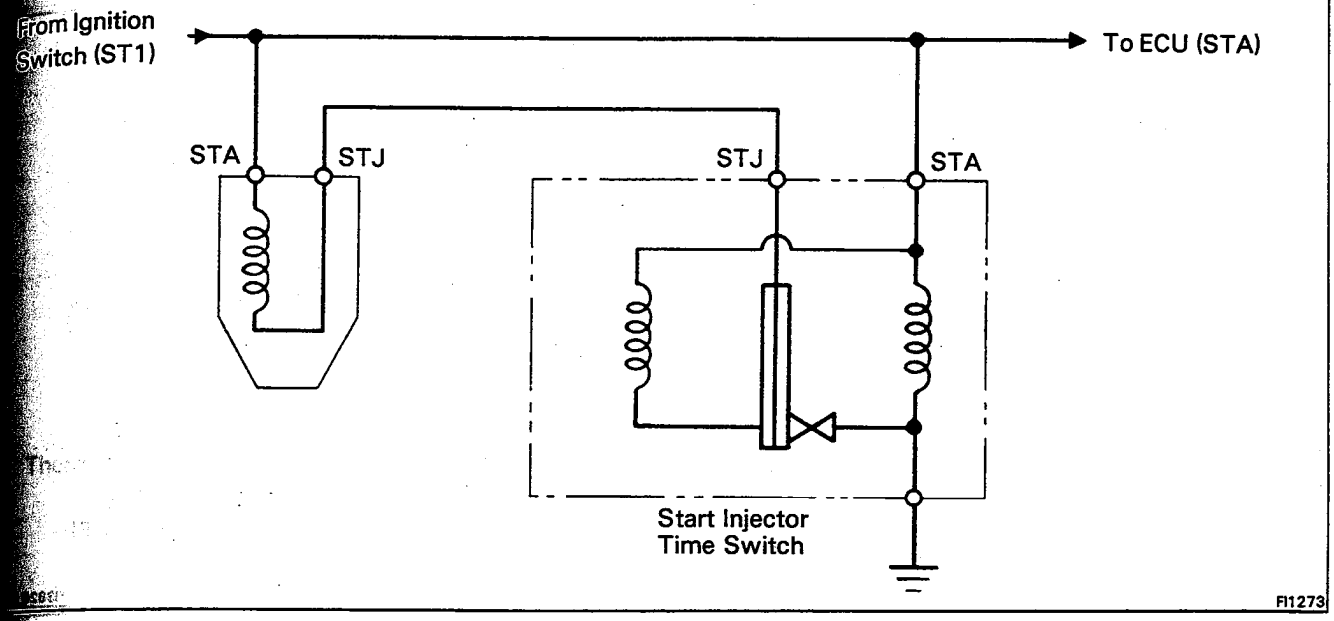


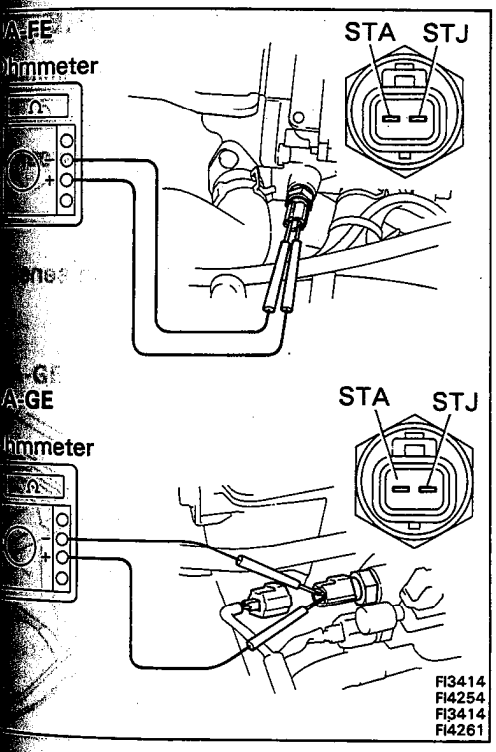
(c) Apply battery voltage across terminals +B and FC.

(d) Check that there is continuity between terminals STA and FP.

If operation is not as specified, replace the relay.

Start Injector Time Switch





INSPECTION OF START INJECTOR TIME SWITCH

INSPECT START INJECTOR TIME SWITCH

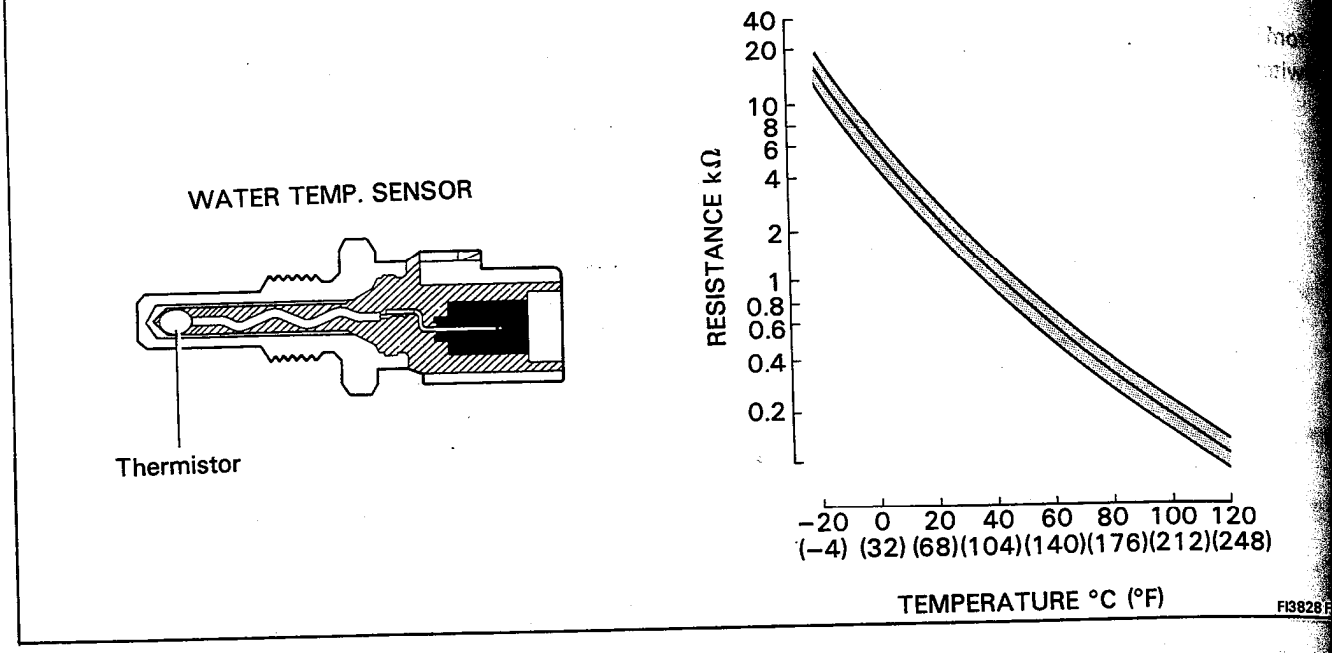
Using an ohmmeter, measure the resistance between each terminal.

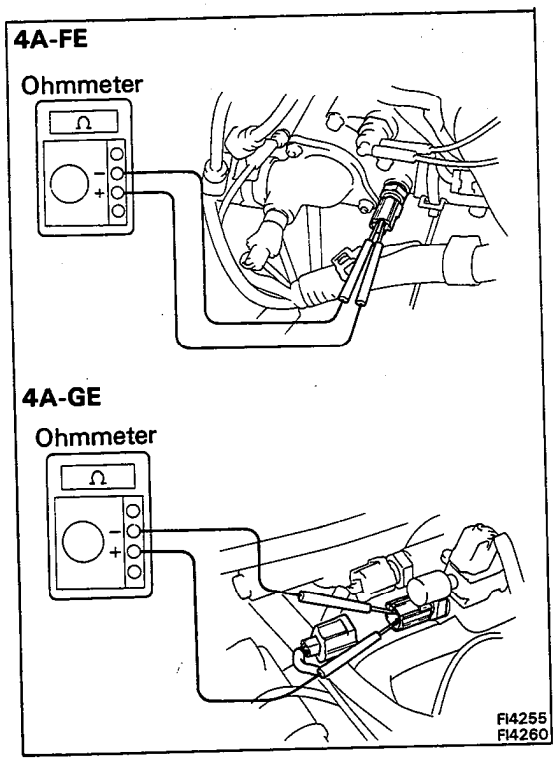
Resistance:

STA — STJ	**20 — 40 Ω below 30°C (86°F)**
	40 — 60 Ω above 40°C (104°F)
STA — Ground	**20 — 80 Ω**

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

Water Temperature Sensor





INSPECTION OF WATER TEMPERATURE SENSOR

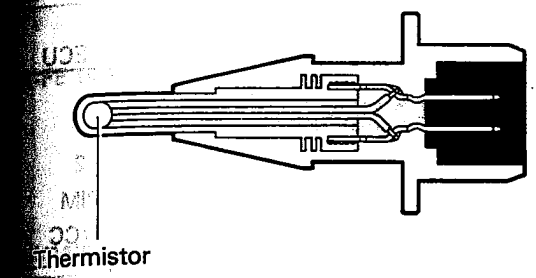
INSPECT WATER TEMPERATURE SENSOR

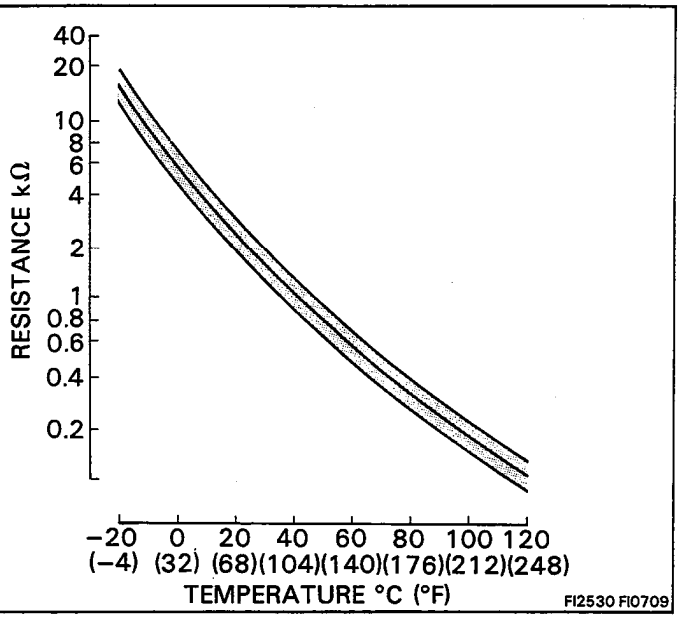
Using an ohmmeter, measure the resistance between terminals.

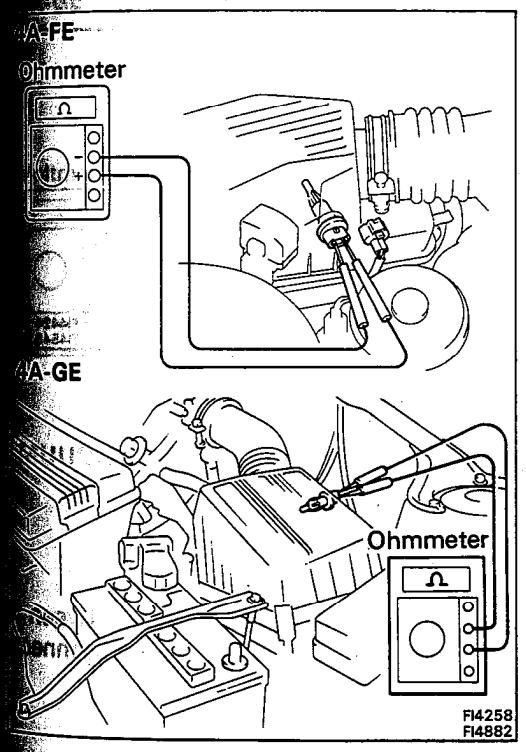
Resistance: Refer to the chart above

If the resistance is not as specified, replace the sens

Intake Air Temperature Sensor (w/o Air Flow Meter)







INSPECTION OF INTAKE AIR TEMPERATURE SENSOR

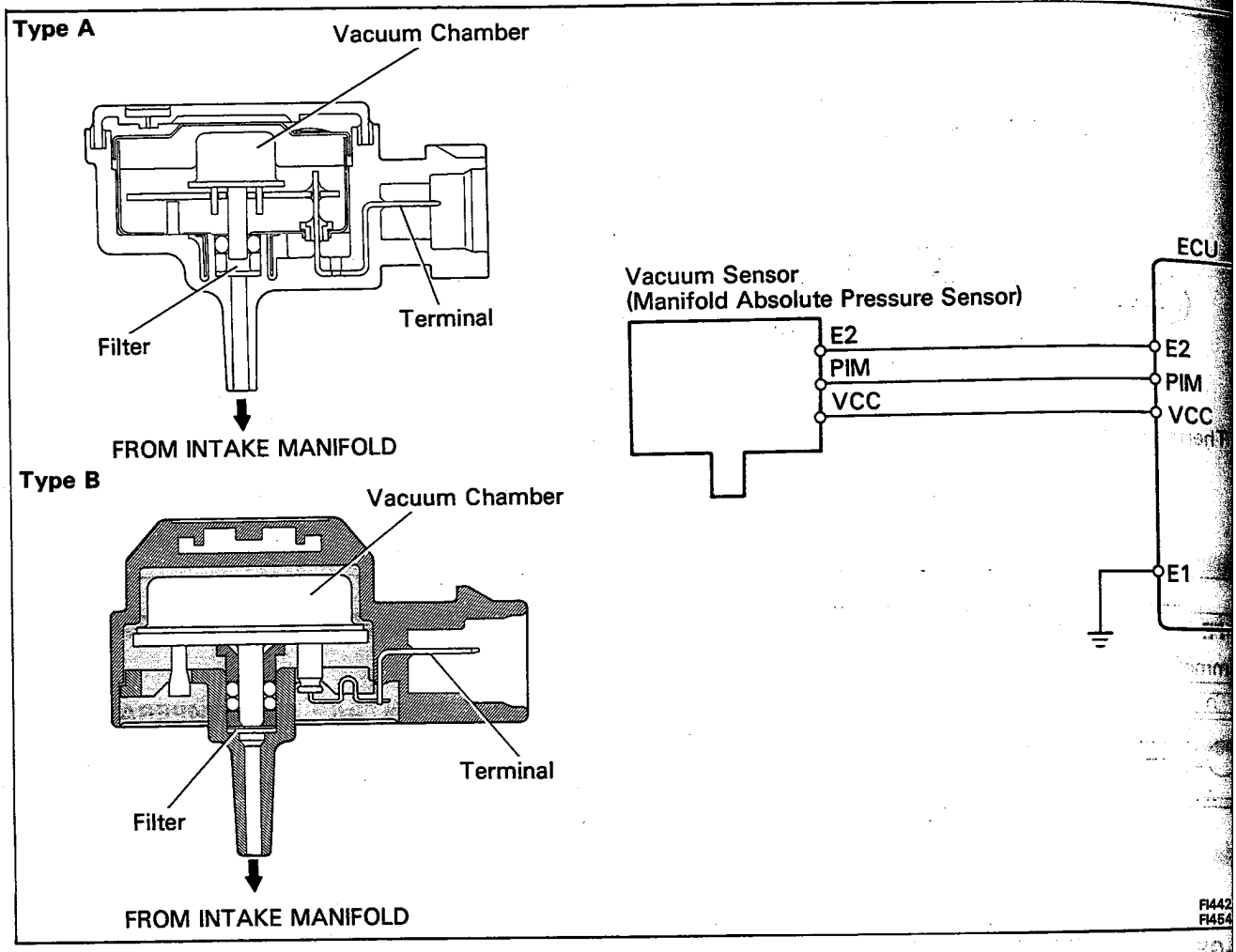
INSPECT RESISTANCE OF INTAKE AIR TEMPERATURE SENSOR

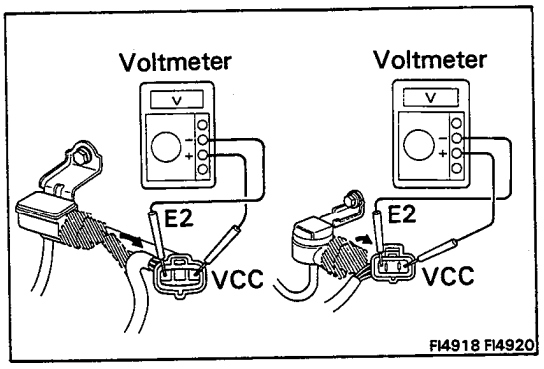
Using an ohmmeter, measure the resistance between the terminals.

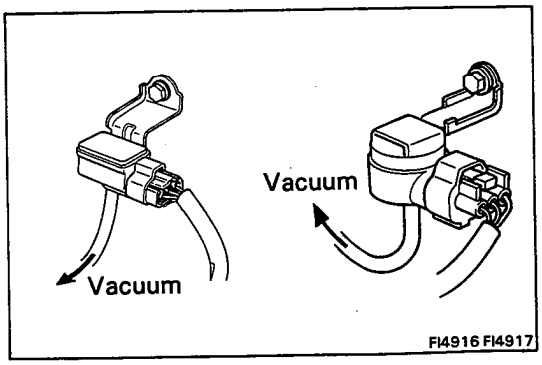
Resistance: Refer to the chart above

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

Vacuum Sensor (w/o Air Flow Mete
(Manifold Absolute Pressure Senso







INSPECTION OF VACUUM SENSOR

1. INSPECT POWER SOURCE VOLTAGE OF VACU SENSOR

(a) Disconnect the vacuum sensor connector.

(b) Turn the ignition switch ON.

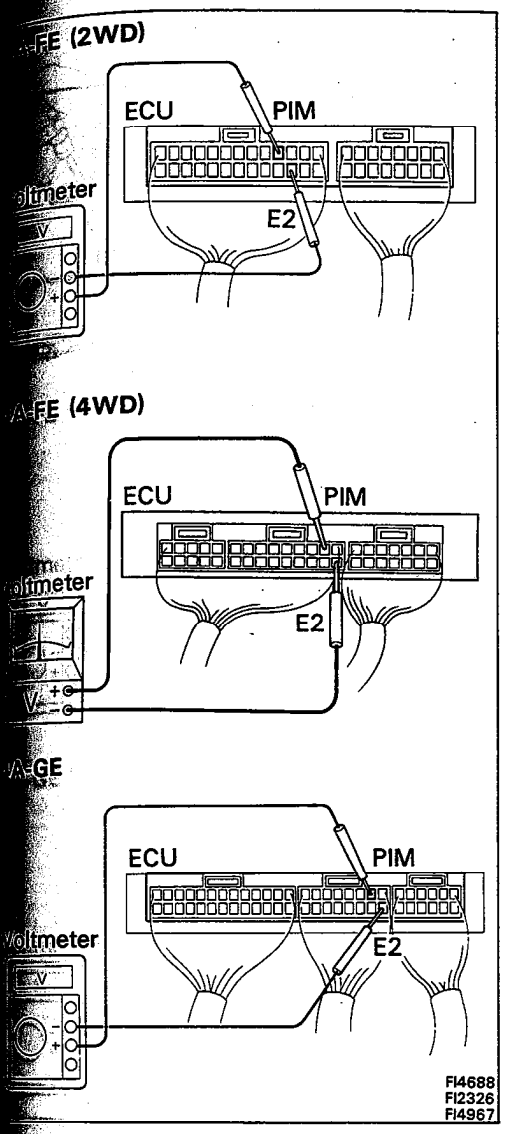
(c) Using a voltmeter, measure the voltage betwee minals VCC and E2 of the vacuum sensor conn

Voltage: 4 – 6 V

2. INSPECT POWER OUTPUT OF VACUUM SENSO

(a) Turn the ignition switch ON.

(b) Disconnect the vacuum hose of the intake ma side.



(c) Connect a voltmeter to terminals PIM and E2 of the ECU, and measure and record the output voltage under ambient atmospheric pressure.

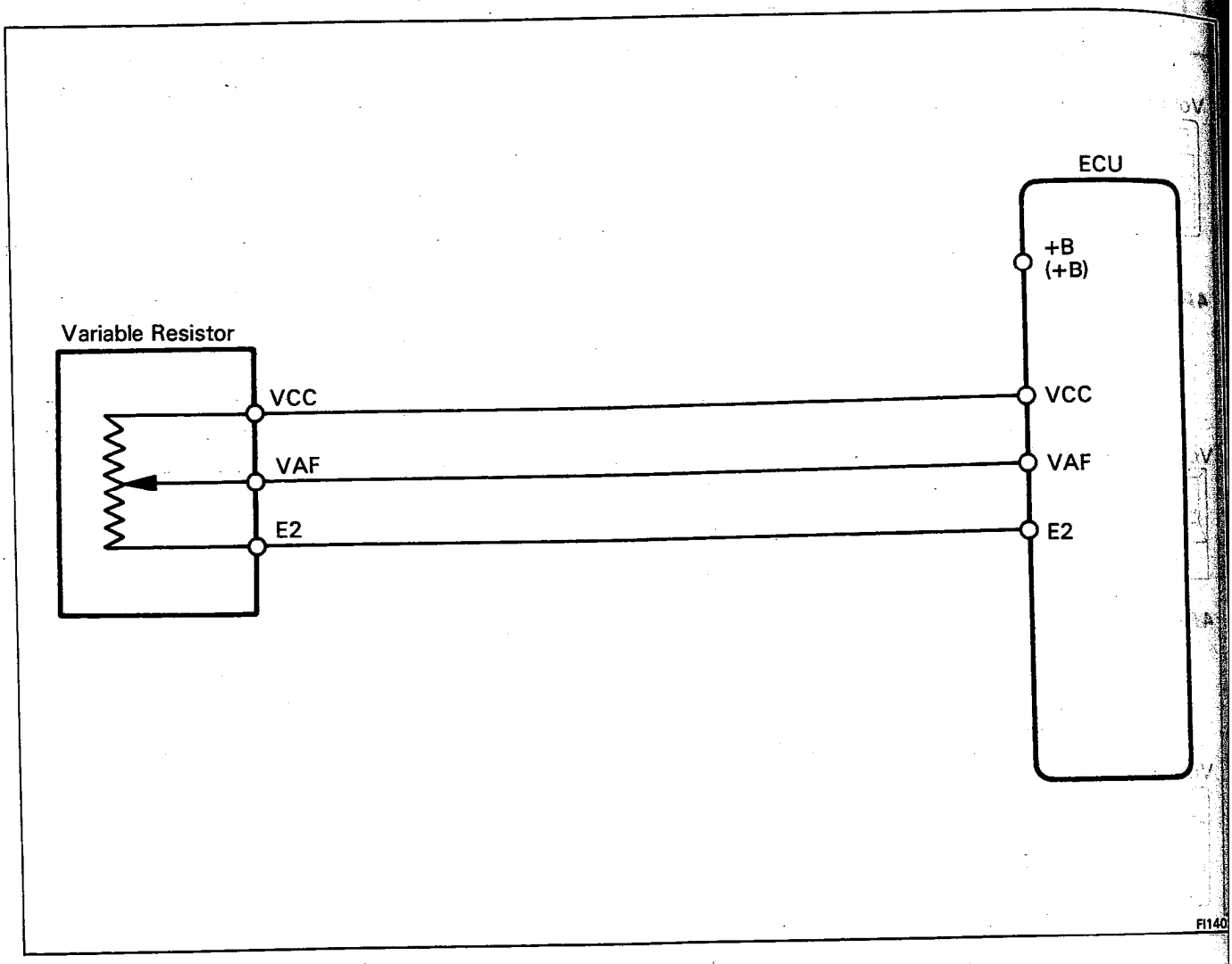
(d) Apply vacuum to the vacuum sensor in 100 mmHg (3.94 in.Hg, 13.3 kPa) segments to 500 mmHg (19.69 in.Hg, 66.7 kPa).

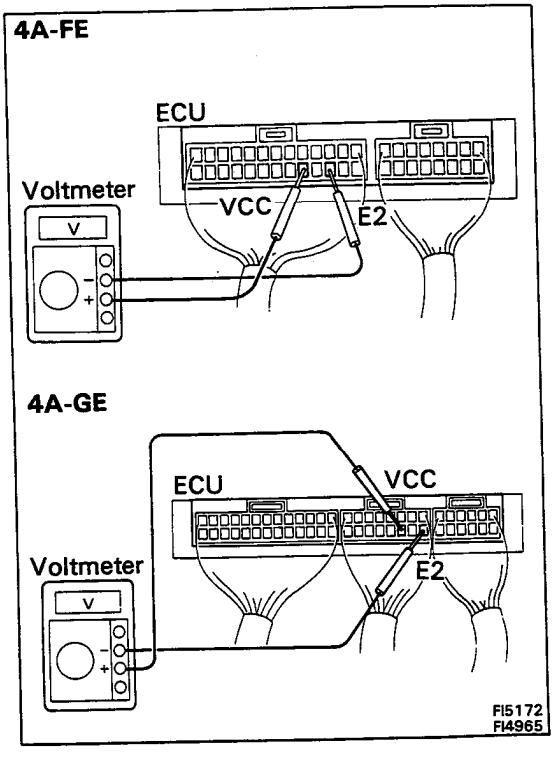
(e) Measure voltage drop from step (c) above for each segment.

Voltage drop

Applied Vacuum mmHg (in.Hg, kPa)	100 (3.94 13.3)	200 (7.87 26.7)	300 (11.81 40.0)	400 (15.75 53.3)	500 (19.69 66.7)
Voltage drop V	0.3–0.5	0.7–0.9	1.1–1.3	1.5–1.7	1.9–2.1

Variable Resistor (w/o TWC)



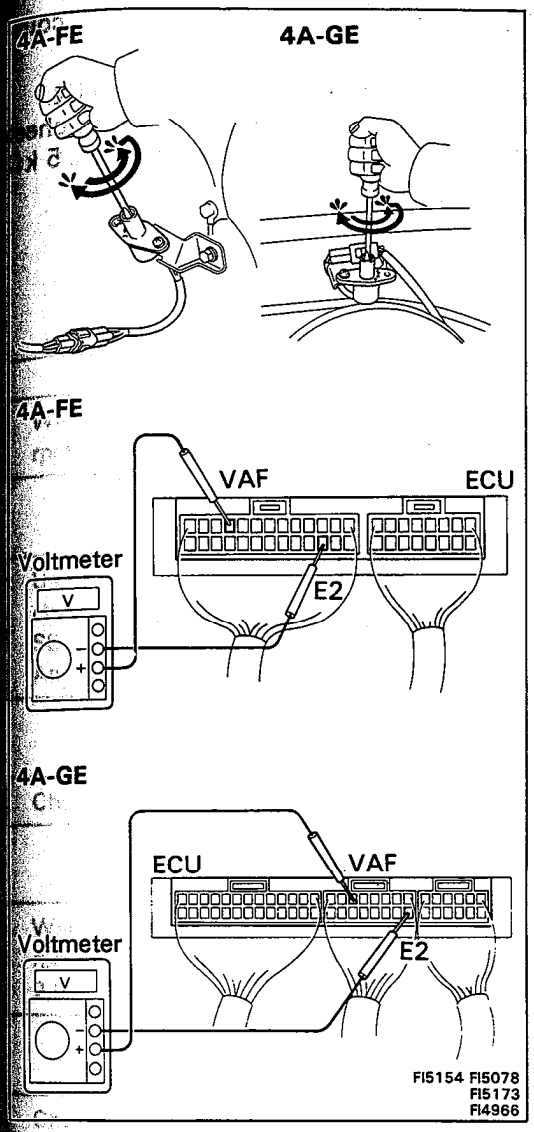


INSPECTION OF VARIABLE RESISTOR

1. INSPECT VOLTAGE OF VARIABLE RESISTOR

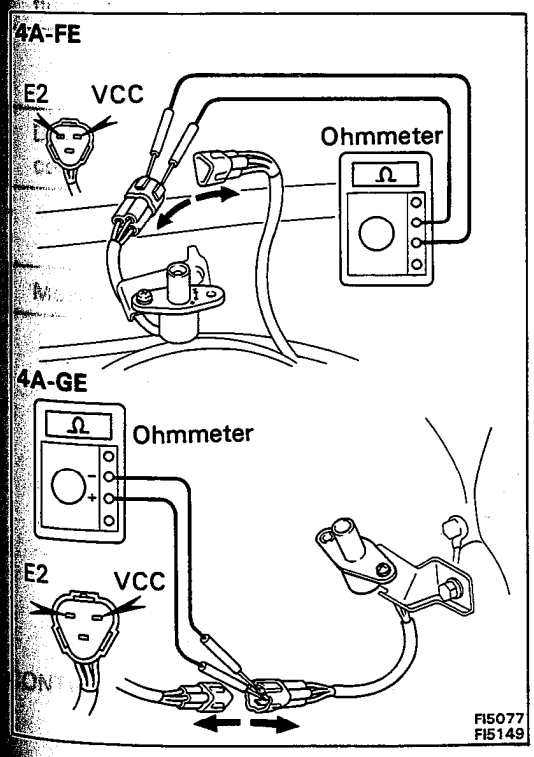
(a) Using a voltmeter, measure the voltage between ECU terminals VCC and E2.

Voltage: 4 – 6 V



(b) Measure the voltage between ECU terminals VAF and E2 while slowly turning idle mixture adjusting screw first fully counterclockwise, and then fully clockwise.

(c) Check that the voltage changes smoothly from 0 V to approx. 5 V.

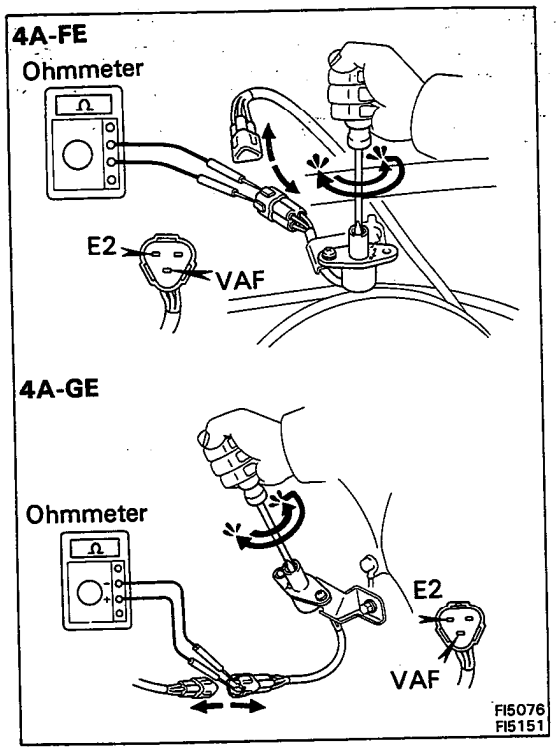


2. INSPECT RESISTANCE OF VARIABLE RESISTOR

(a) Disconnect the variable resistor connector.

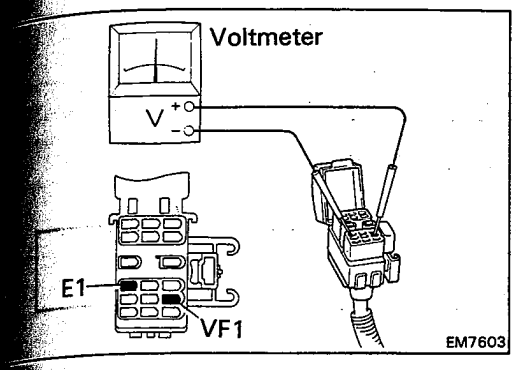
(b) Using an ohmmeter, measure the resistance between the terminals VCC and E2.

Resistance: 4 – 6 kΩ



(c) Turn the idle mixture adjusting screw fully counterclockwise.

(d) Connect an ohmmeter to terminals VAF and E2. Turn the adjusting screw fully clockwise and check that the resistance value changes from approx. 5 kΩ to 0 Ω accordingly.



Oxygen Sensor (w/ TWC)

INSPECTION OF OXYGEN SENSOR

1. WARM UP ENGINE

Allow the engine to reach normal operating temperature.

2. INSPECT FEEDBACK VOLTAGE (VF)

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

Warm up the oxygen sensor with the engine at 2,500 rpm for approx. 90 seconds.

Using SST, connect terminals TE1 and E1 of the check connector.
SST 09843-18020
And maintain engine speed at 2,500 rpm

Check the number of times the voltmeter needle fluctuates in 10 seconds.

- 4A-FE Less than 8 times, 4A-GE Less than 6 times
- 4A-FE 8 times or more, 4A-GE 6 times or more
- Zero

Warm up the oxygen sensor with the engine at 2,500 rpm for approx. 90 seconds. And maintain engine at 2,500 rpm.

Check the number of times the voltmeter needle fluctuates in 10 seconds.

- 6 times or more
- Zero
- 4A-FE Less than 8 times, 4A-GE Less than 6 times

Disconnect terminals TE1 and E1 of the check connector. And maintain engine speed at 2,500 rpm.

Measure voltage between terminals VF1 and E1.

- More than 0 V
- 0 V

Read and record diagnostic codes. (See pages FI-28 to 31)

- Normal code and code 21
- Malfunction code(s) (Ex. code 21)

Repair the relevant diagnostic code.

Replace the ECU.

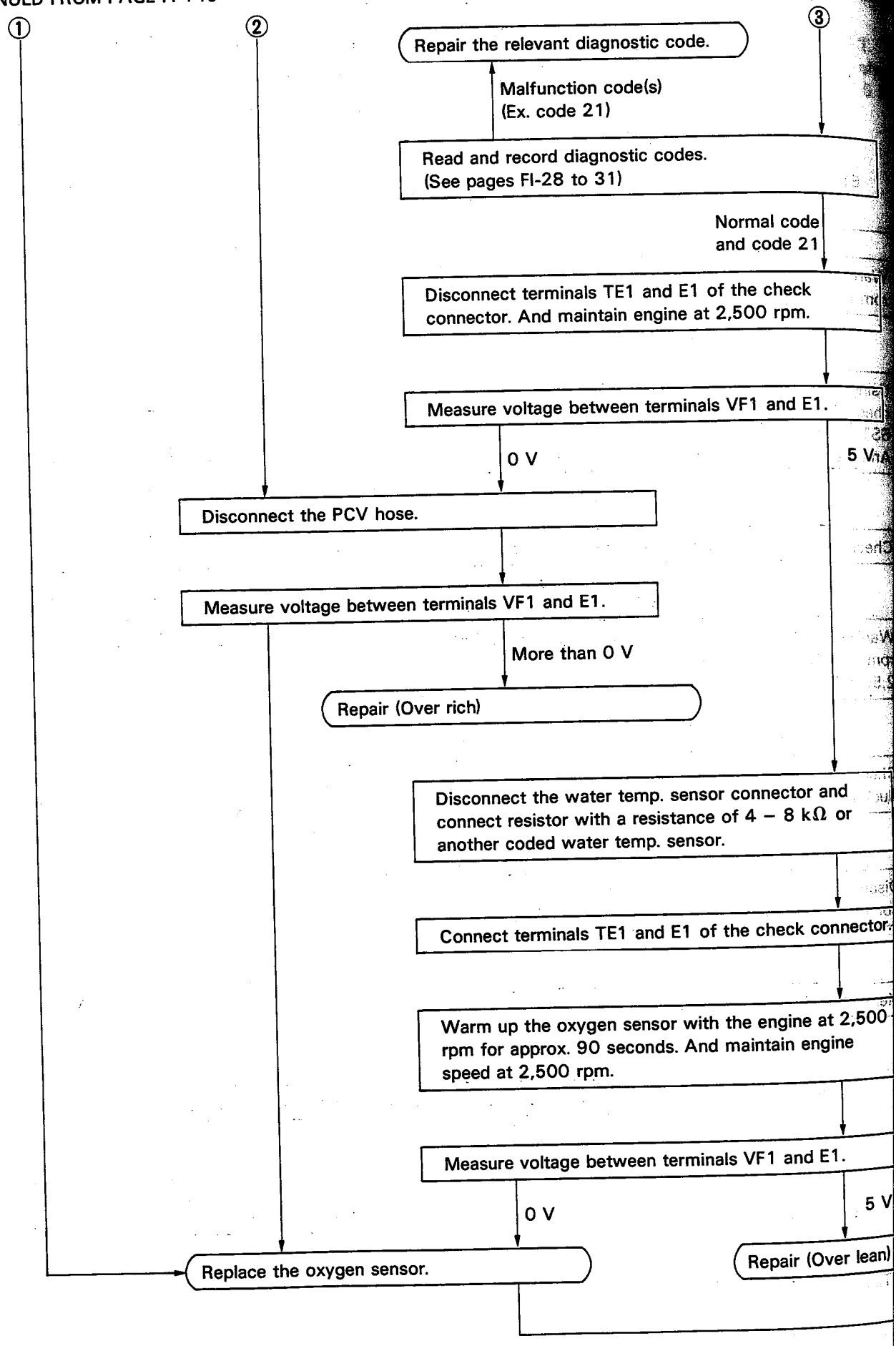
Zero again / After replacing the oxygen sensor

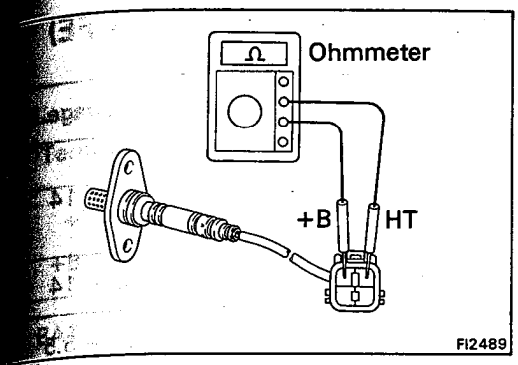
Normal

① ② ③ ④

CONTINUED ON PAGE FI-146

CONTINUED FROM PAGE FI-145





3. **INSPECT HEATER COIL RESISTANCE OF OXYGEN SENSOR**

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

Resistance: 5.1 — 6.3 Ω

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

Engine 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. **PREPARATION**
(See page FI-36)

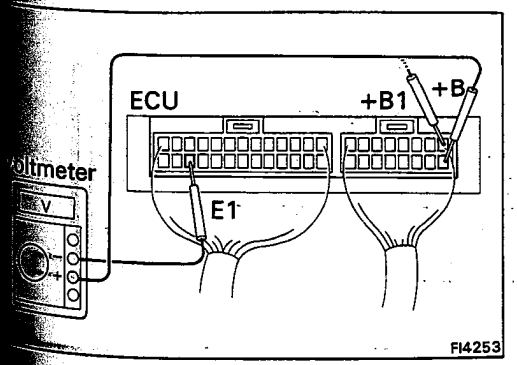
2. **INSPECT VOLTAGE OF ENGINE ECU**

Check the voltage between each terminal of the wiring connectors.

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

HINT:

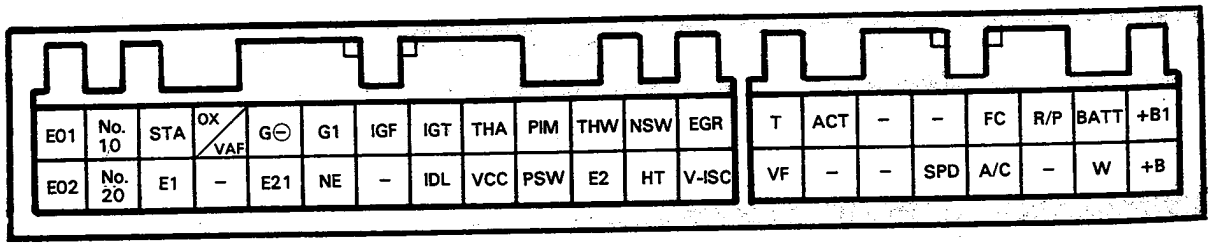
- **Perform all voltage measurements with the connectors connected.**
- **Verify that the battery voltage is 11 V or more when the ignition switch is ON position.**



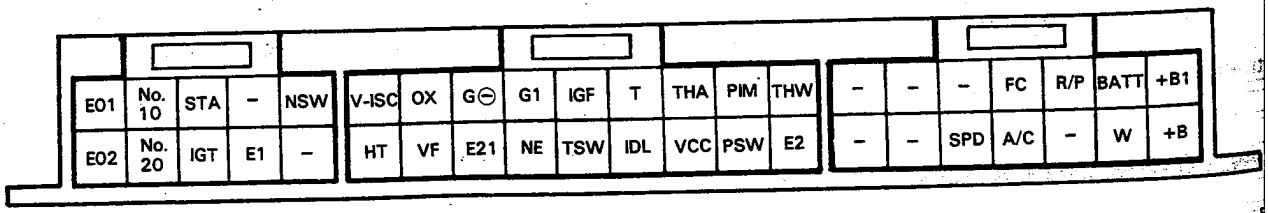
Voltage at ECU Wiring Connectors (4A-FE)

Terminals	Condition		STD voltage (V)
+B – E1	Ignition SW ON		10 – 14
+B1 – E1			
BATT – E1	–		10 – 14
IDL – E2	Ignition SW ON	Throttle valve open	4.5 – 5.5
PSW – E2		Throttle valve fully closed	4.5 – 5.5
No.10 – E01 No.20 – E02	Ignition SW ON		10 – 14
W – E1	Ignition SW ON		0
	No trouble ("CHECK ENGINE" light off) and engine running		10 – 14
PIM – E2	Ignition SW ON		3.3 – 3.9
VCC – E2			4.5 – 5.5
THA – E2	Ignition SW ON	Intake air temperature 20°C (68°F)	2.0 – 2.5
THW – E2		Coolant temperature 80°C (176°F)	0.4 – 0.7
STA – E1	Cranking		6 – 14
IGT – E1	Idling		0.7 – 1.0
A/C – E1	Ignition SW ON	A/C switch ON	5 – 14
		A/C switch OFF	0
T – E1	Ignition SW ON	Check connector TE1 – E1 not connect	10 – 14
		Check connector TE1 – E1 connect	0

ECU Terminals (2WD)



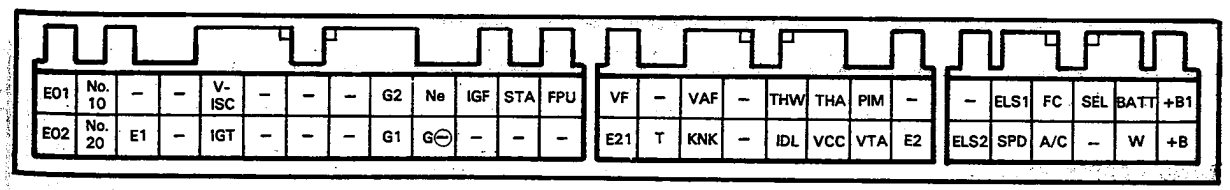
ECU Terminals (4WD)



Voltage at ECU Wiring Connectors (4A-GE w/o Air Flow Meter)

Terminals	Condition		STD voltage (V)
+B, +B1 – E1	Ignition SW ON		10 – 14
BATT – E1	–		10 – 14
IDL – E2	Ignition SW ON	Throttle valve open	4.5 – 5.5
VTA – E2		Throttle valve fully closed	0.5 or less
		Throttle valve fully open	3.5 – 5.5
VCC – E2		–	4.5 – 5.5
IGT – E1	Idling		0.7 – 1.0
STA – E2	Cranking		6 – 14
No.10 – E01, No.20 – E02	Ignition SW ON		10 – 14
W – E1	No trouble ("CHECK ENGINE" warning light off) and engine running		10 – 14
PIM – E2	Ignition SW ON		3.3 – 3.9
VCC – E2			4.5 – 5.5
THA – E2	Ignition SW ON	Intake air temp. 20°C (68°F)	2.0 – 2.8
THW – E2		Coolant temp. 80°C (176°F)	0.4 – 0.7
A/C – E1		Air conditioning ON	10 – 14
T – E1		Check connector TE1 – E1 not connect	10 – 14
		Check connector TE1 – E1 connect	0.5 or less

ECU Terminals

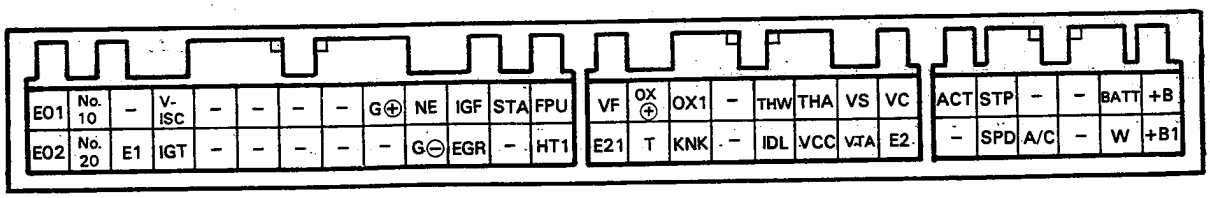


FI4265

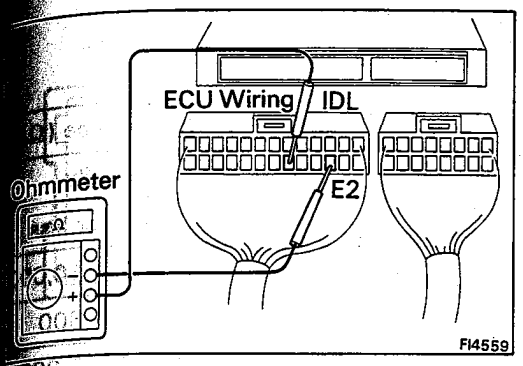
Voltage at ECU Wiring Connectors (4A-GE w/ Air Flow Meter)

Terminals	Condition		STD voltage (V)
+B, +B1 – E1	Ignition SW ON		10 – 14
BATT – E1	–		10 – 14
IDL – E2	Ignition SW ON	Throttle valve open	10 – 14
VTA – E2	Ignition SW ON	Throttle valve fully closed	0.1 – 1.0
VTA – E2	Ignition SW ON	Throttle valve fully open	4 – 5
VCC – E2	Ignition SW ON	–	4.5 – 5.5
IGT – E1	Idling		0.7 – 1.0
STA – E2	Cranking		6 – 14
No.10 – E01, No.20 – E02	Ignition SW ON		10 – 14
W – E1	No trouble ("CHECK ENGINE" warning light off) and engine running		10 – 14
VC – E2	–		4.5 – 5.5
VS – E2	Ignition SW ON	Measuring plate fully closed	2.0 – 5.5
VS – E2	Ignition SW ON	Measuring plate fully open	6 – 9
VS – E2	Idling		2 – 8
THA – E2	Ignition SW ON	Intake air temp. 20°C (68°F)	2.0 – 2.8
THW – E2	Ignition SW ON	Coolant temp. 80°C (176°F)	0.4 – 0.7
A/C – E1	Ignition SW ON	Air conditioning ON	10 – 14
T – E1	Ignition SW ON	Check connector TE1 – E1 not connect	10 – 14
T – E1	Ignition SW ON	Check connector TE1 – E1 connect	0.5 or less

ECU Terminals



FI4



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.**

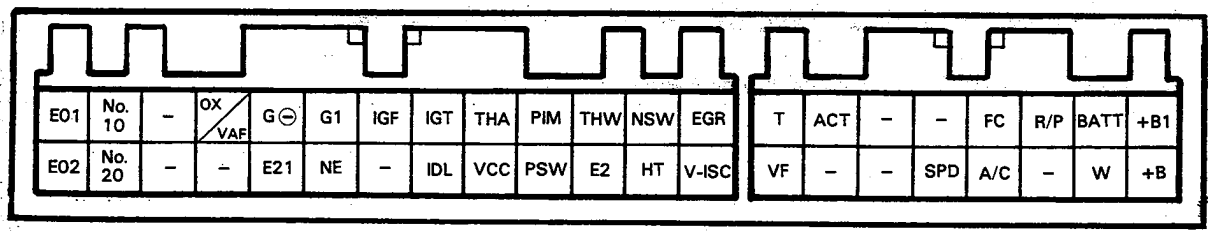
Check the resistance between each terminal of the wiring connectors.

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

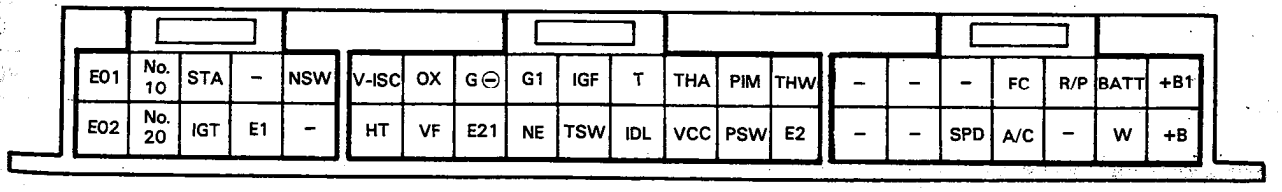
Resistance of ECU Wiring Connectors (4A-FE)

Terminals	Condition	Resistance (Ω)
IDL – E2	Throttle valve open	Infinity
	Throttle valve fully closed	0
PSW – E2	Throttle valve fully open	0
	Throttle valve fully closed	Infinity
THA – E2	Intake temperature 20°C (68°F)	2,000 – 3,000
THW – E2	Coolant temperature 80°C (176°F)	200 – 400
G1 – G ⊖	–	140 – 180
NE – G ⊖	–	140 – 180

ECU Terminals (2WD)



ECU Terminals (4WD)

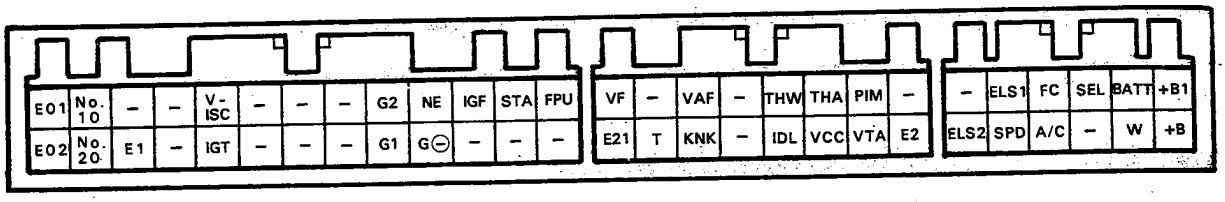


FI4266
FI0234

Resistance of ECU Wiring Connectors (4A-GE w/o Air Flow Meter)

Terminals	Condition	Resistance (Ω)
IDL – E2	Throttle valve open	Infinity
	Throttle valve fully closed	2,300 or less
VTA – E2	Throttle valve fully open	3,300 – 10,000
	Throttle valve fully closed	200 – 800
VCC – E2	–	3,000 – 7,000
THA – E2	Intake air temp. 20°C (68°F)	2,000 – 3,000
THW – E2	Coolant temp. 80°C (176°F)	200 – 400
G1, G2 – G⊖	–	140 – 180
NE – G⊖	–	140 – 180

ECU Terminals

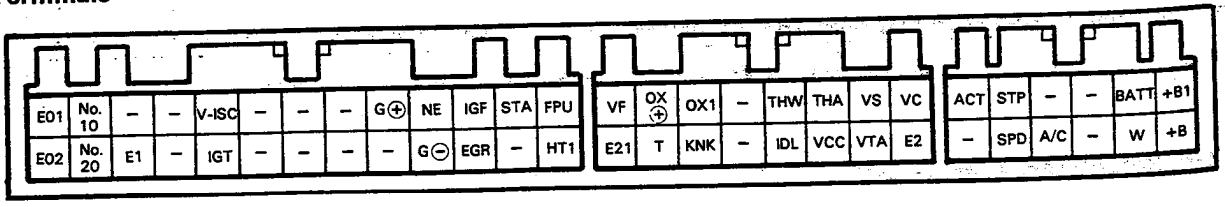


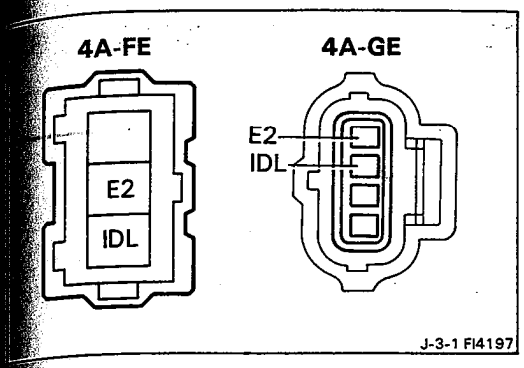
FI42

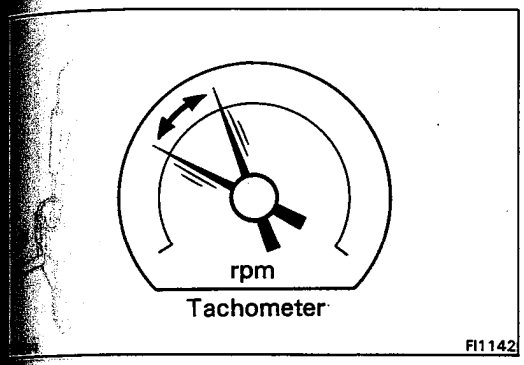
Resistance at ECU Wiring Connectors (4A-GE w/ Air Flow Meter)

Terminals	Condition	Resistance (Ω)
IDL – E2	Throttle valve open	Infinity
	Throttle valve fully closed	2,300 or less
VTA – E2	Throttle valve fully open	3,300 – 10,0
	Throttle valve fully closed	200 – 800
VCC – E2	–	3,000 – 7,00
VS – E2	Measuring plate fully closed	20 – 400
	Measuring plate fully open	20 – 3,00
VC – E2	–	100 – 300
THA – E2	Intake air temp. 20°C (68°F)	2,000 – 3,00
THW – E2	Coolant temp. 80°C (176°F)	200 – 400
G⊕ – G⊖	–	140 – 180
NE – G⊖	–	140 – 180

ECU Terminals







Fuel Cut RPM

INSPECTION OF FUEL CUT RPM

(a) Start and warm up the engine.

(b) Disconnect the connector from the throttle position sensor.

(c) Connect circuit terminals IDL and E2 on the wiring connector side.

(d) 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.
- Accessories switched off.

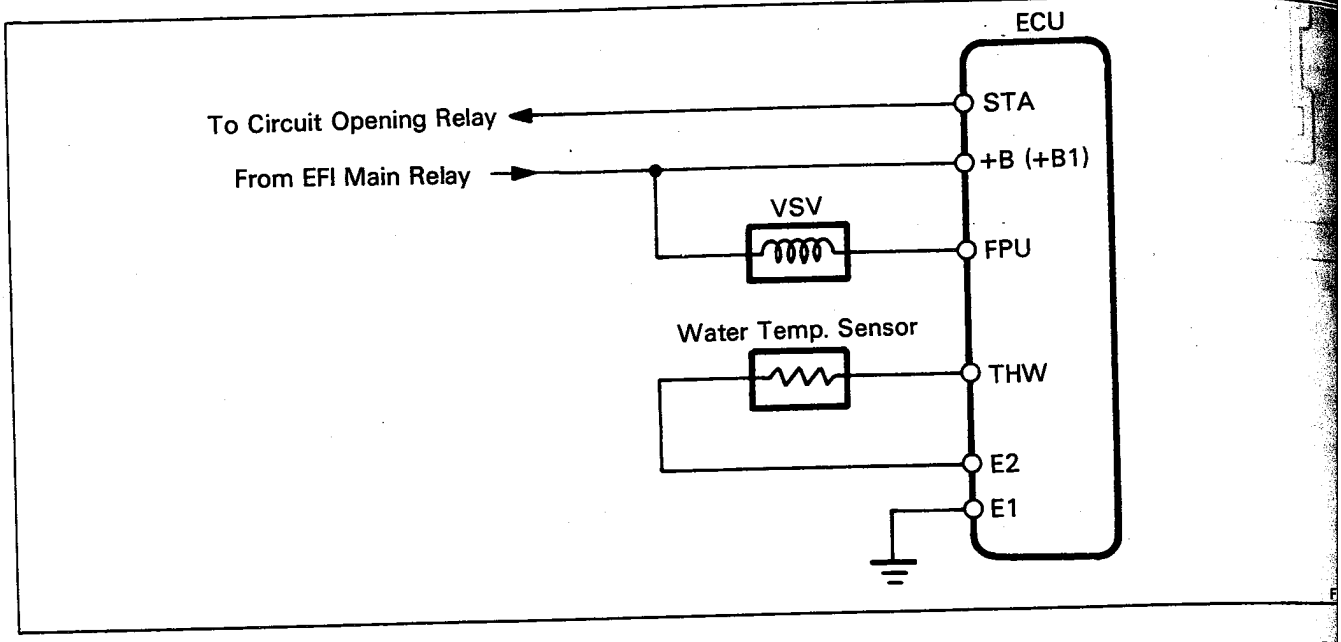
Fuel cut rpm:

4A-FE	**w/o TWC**	**1,700 rpm**
	w/ TWC	**1,900 rpm**
4A-GE	**w/o Air flow meter**	**1,450 rpm**
	w/ Air flow meter	**1,600 rpm**

Fuel return rpm:

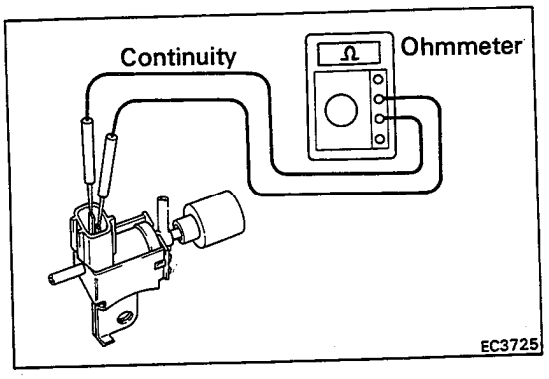
4A-FE	**w/o TWC**	**1,200 rpm**
	w/ TWC	**1,200 rpm**
4A-GE	**w/o Air flow meter**	**1,050 rpm**
	w/ Air flow meter	**1,200 rpm**

Fuel Pressure Control System (4A-GE Europe)



INSPECTION OF FUEL PRESSURE CONTRO SYSTEM

1. **INSPECT WATER TEMPERATURE SENSOR (See page FI-138)**



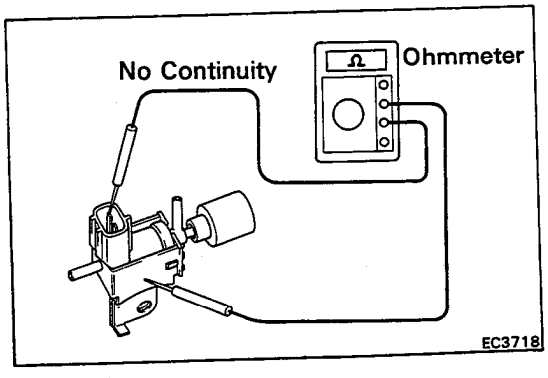
2. **INSPECT FUEL PRESSURE VSV**

A. **Inspect VSV for open circuit**

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

Resistance (Cold): 33 – 39 Ω

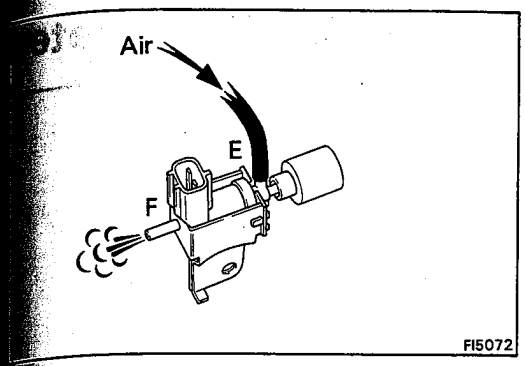
If there is no continuity, replace the VSV.



B. **Inspect VSV for ground**

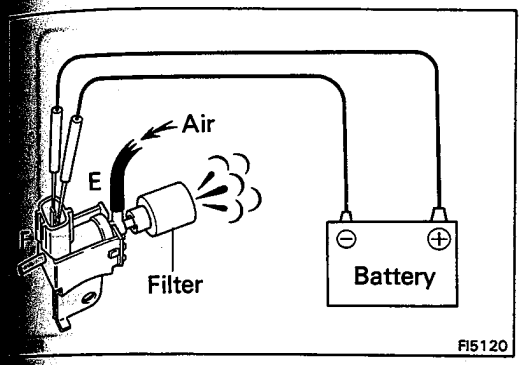
Using an ohmmeter, check that there is no continuit ween each terminal and the body.

If there is continuity, replace the VSV.



C. Inspect VSV operation

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

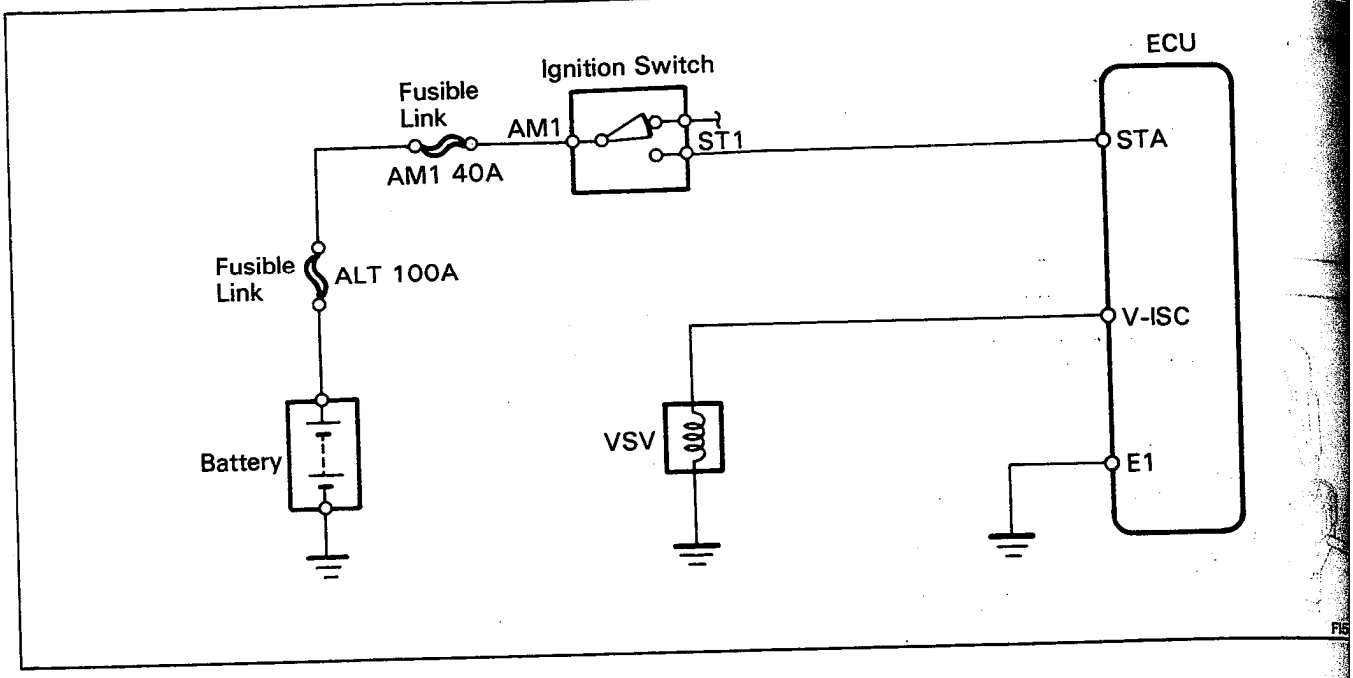


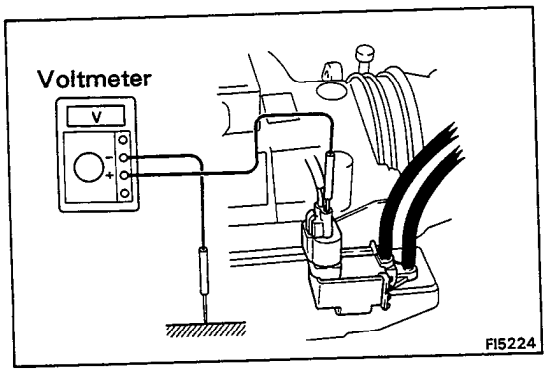
(b) Apply battery voltage across the terminals.

(c) Check that air flows from pipe E to the filter.

If operation is not as specified, replace the VSV.

Idle-up System (w/ Air Flow Meter



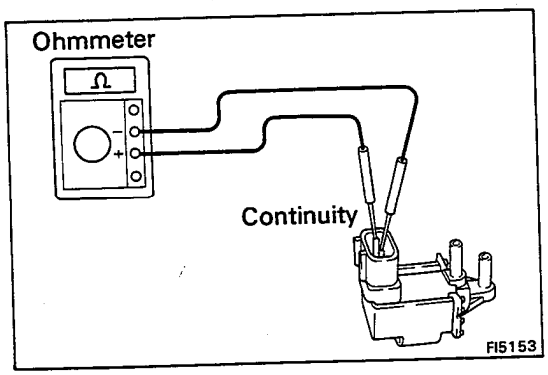


INSPECTION OF IDLE-UP SYSTEM

1. INSPECTION BATTERY VOLTAGE OF IDLE-UP VSV

(a) All accessories switched off.

(b) Using a voltmeter, check that it indicates batt voltage during cranking and for ten seconds a starting.



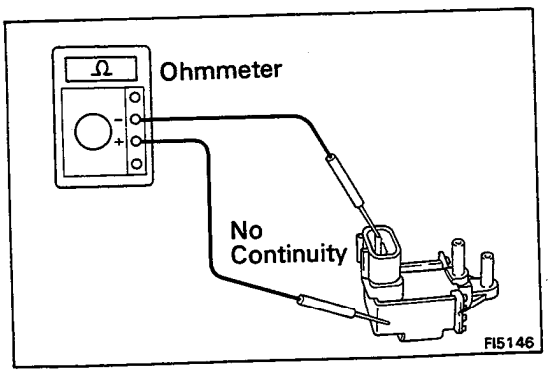
2. INSPECT IDLE-UP VSV

A. Inspect VSV for open circuit

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

Resistance (Cold): 37 – 44 Ω

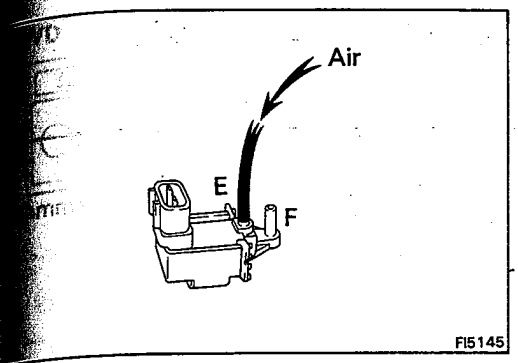
If there is no continuity, replace the VSV.



B. Inspect VSV for ground

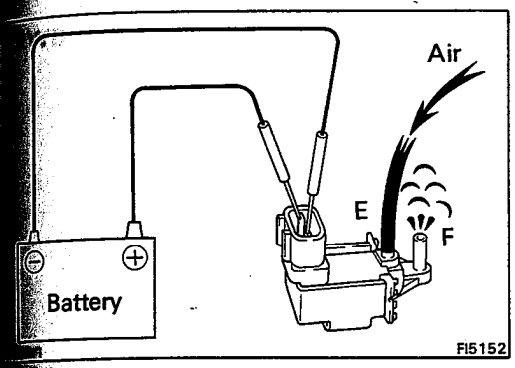
Using an ohmmeter, check that there is no continuity ween each terminal and the body.

If there is continuity, replace the VSV.



C. Inspect VSV operation

(a) Check that air flows from pipe E to pipe F.

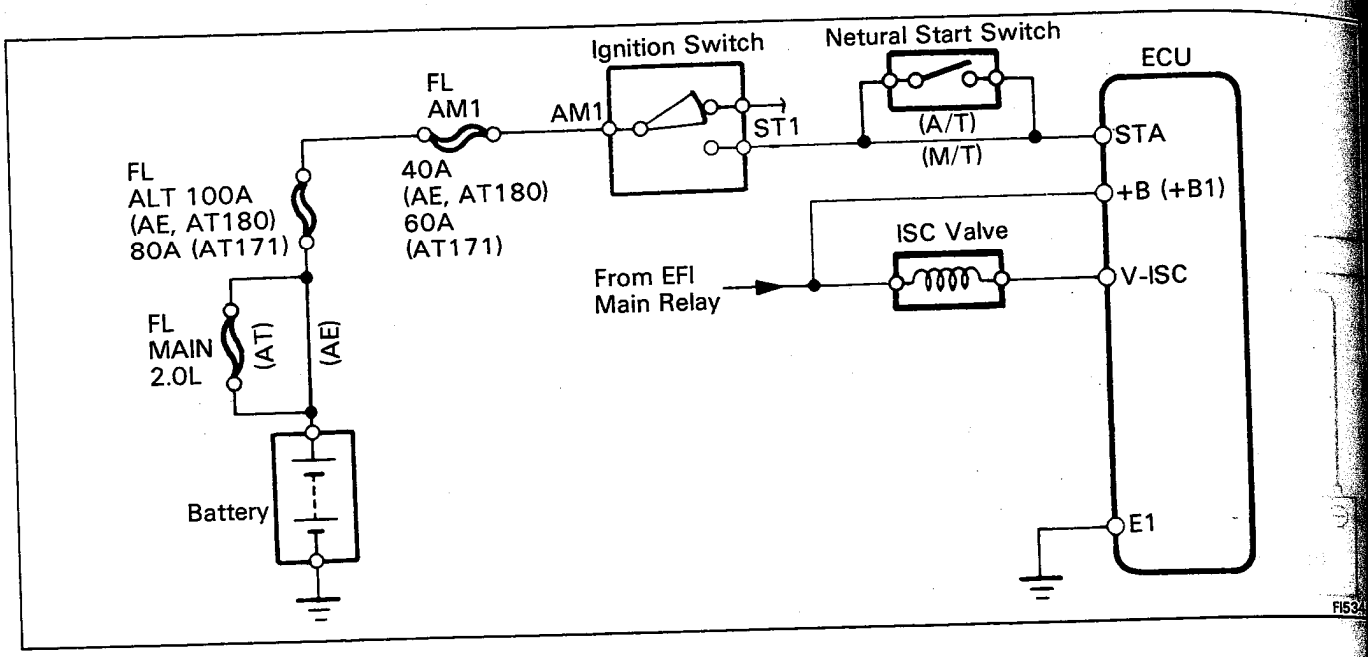


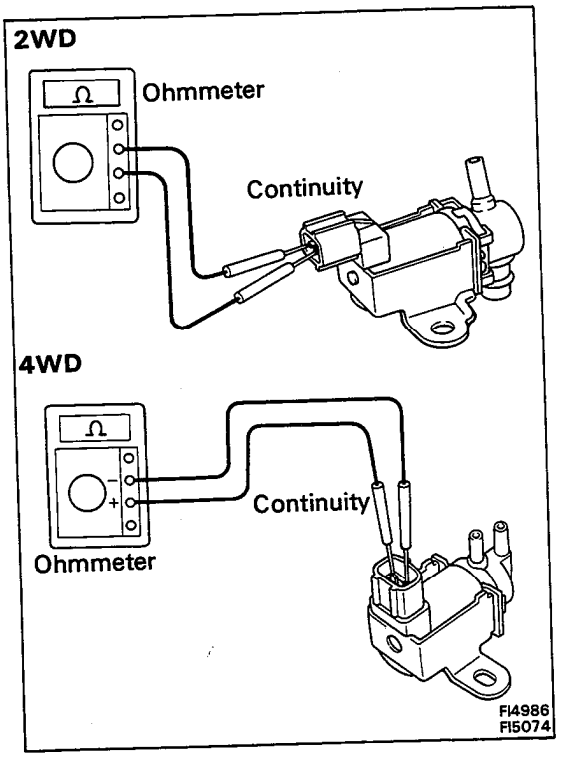
(b) Apply battery voltage across the terminals.

(c) Check that air flows from pipe E to pipe F.

If operation is not as specified, replace the VSV.

Idle Speed Control (ISC) Valve (4A-FE)





INSPECTION OF ISC VALVE

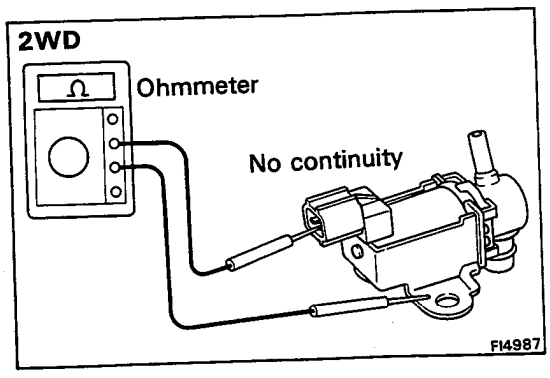
INSPECT ISC VALVE

A. Inspect ISC Valve for open circuit

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

Resistance: **2WD** **30 – 33 Ω**
4WD **30 – 34 Ω**

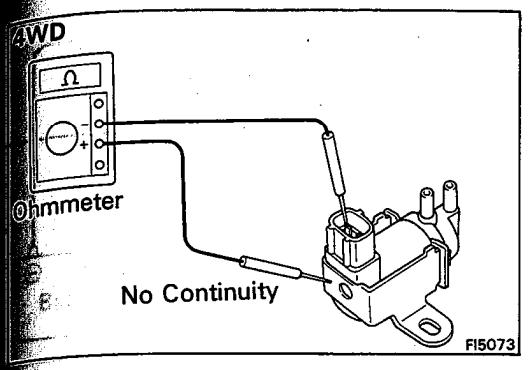
If there is no continuity, replace the ISC valve.

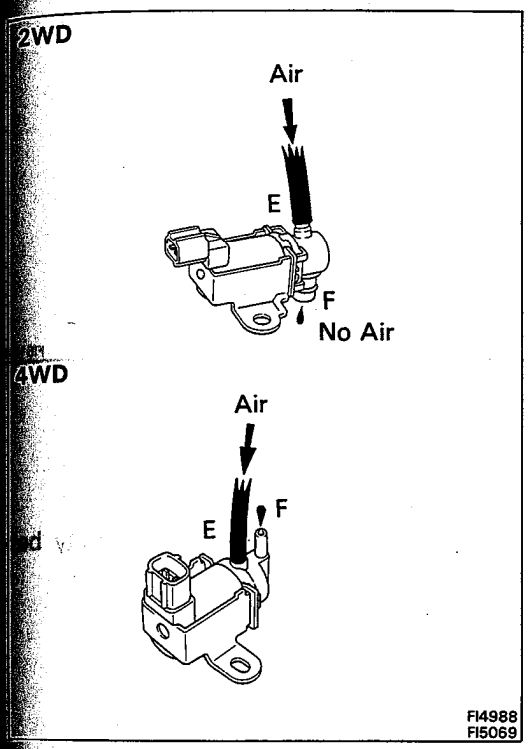


B. Inspect ISC valve for ground

Using an ohmmeter, check that there is no continuity b ween each terminal and body.

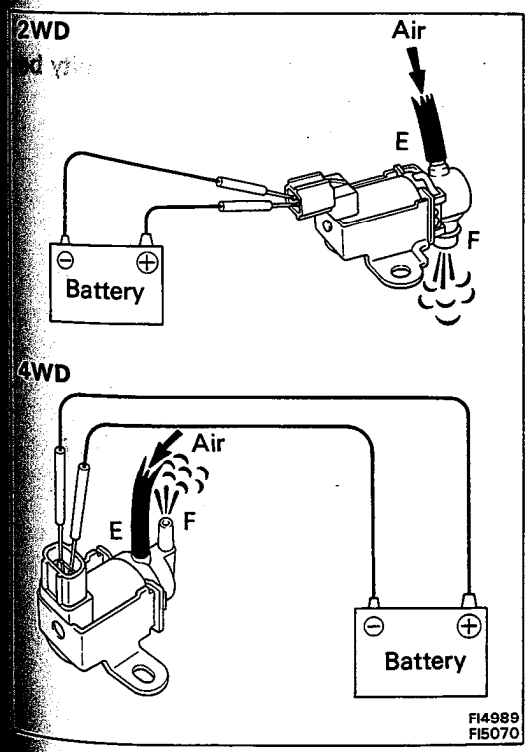
If there is continuity, replace the ISC valve.





C. Inspect ISC valve operation

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

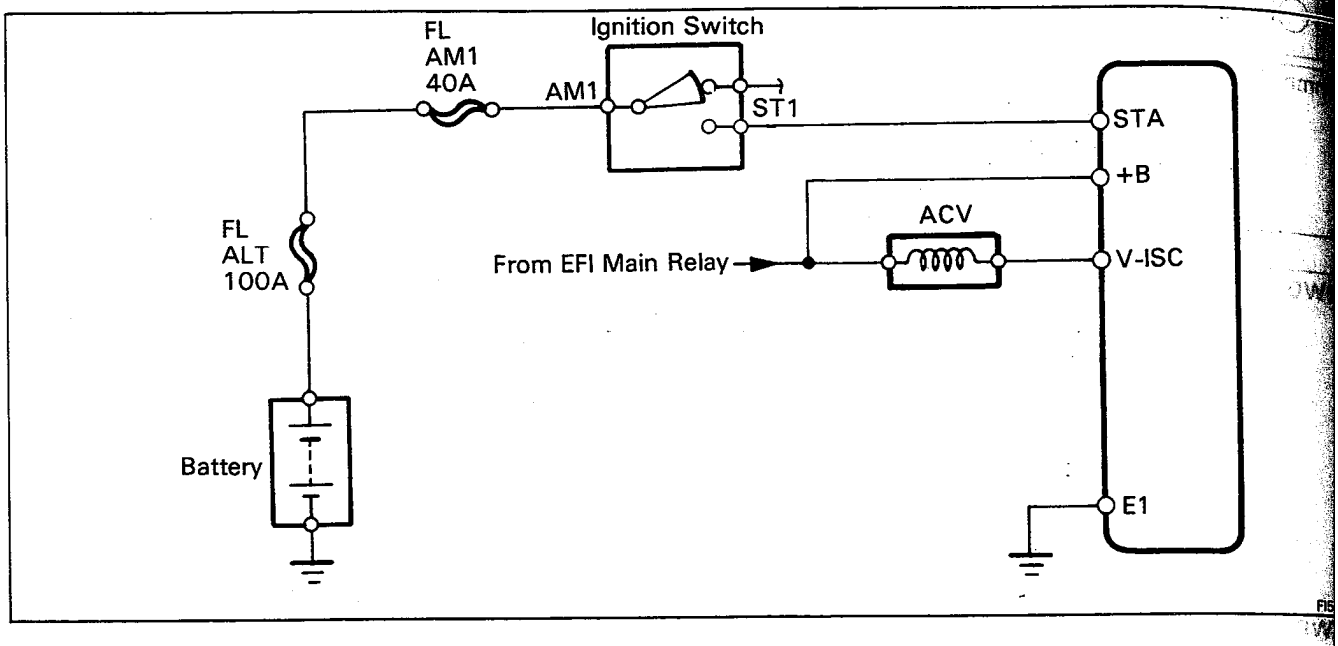


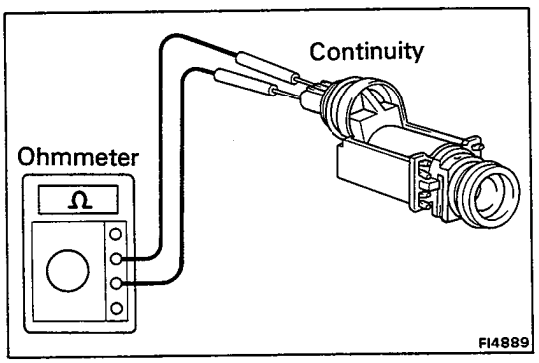
(b) Apply battery voltage across the terminals.

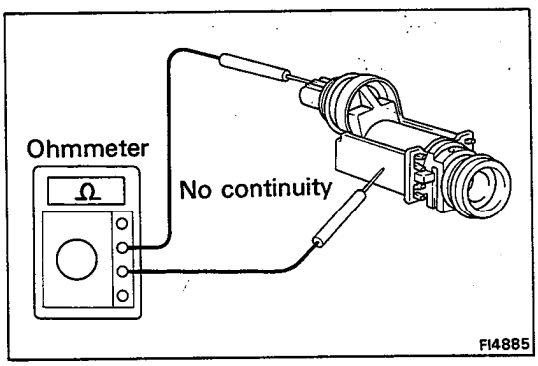
(c) Check that air flows pipes E to F.

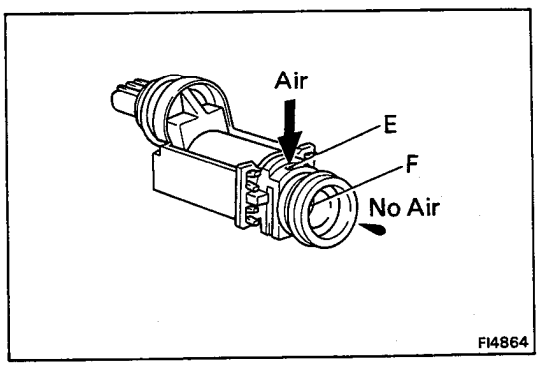
If operation is not as specified, replace the ISC valve.

Air Control Valve (ACV) (4A-GE w/o Air Flow Meter)









INSPECTION OF ACV

INSPECT ACV

A. Inspect ACV for open circuit

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

Resistance: 22 – 26 Ω

If there is no continuity, replace the ACV.

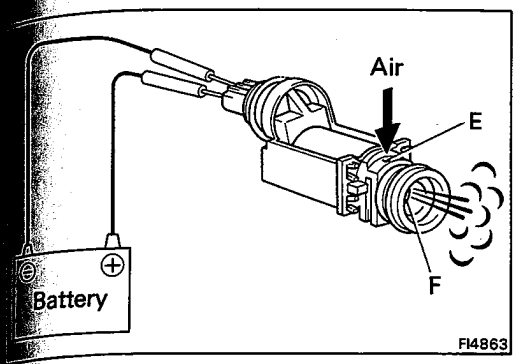
B. Inspect ACV for ground

Using an ohmmeter, check that there is no continuity b ween each terminal and body.

If there is continuity, replace the ACV.

C. Inspect ACV opreration

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



(b) Apply battery voltage across the terminals.
(c) Check that air flows from ports E to F.

If operation is not as specified, replace the ACV.