

TROUBLESHOOTING WITH VOLT OHMMETER

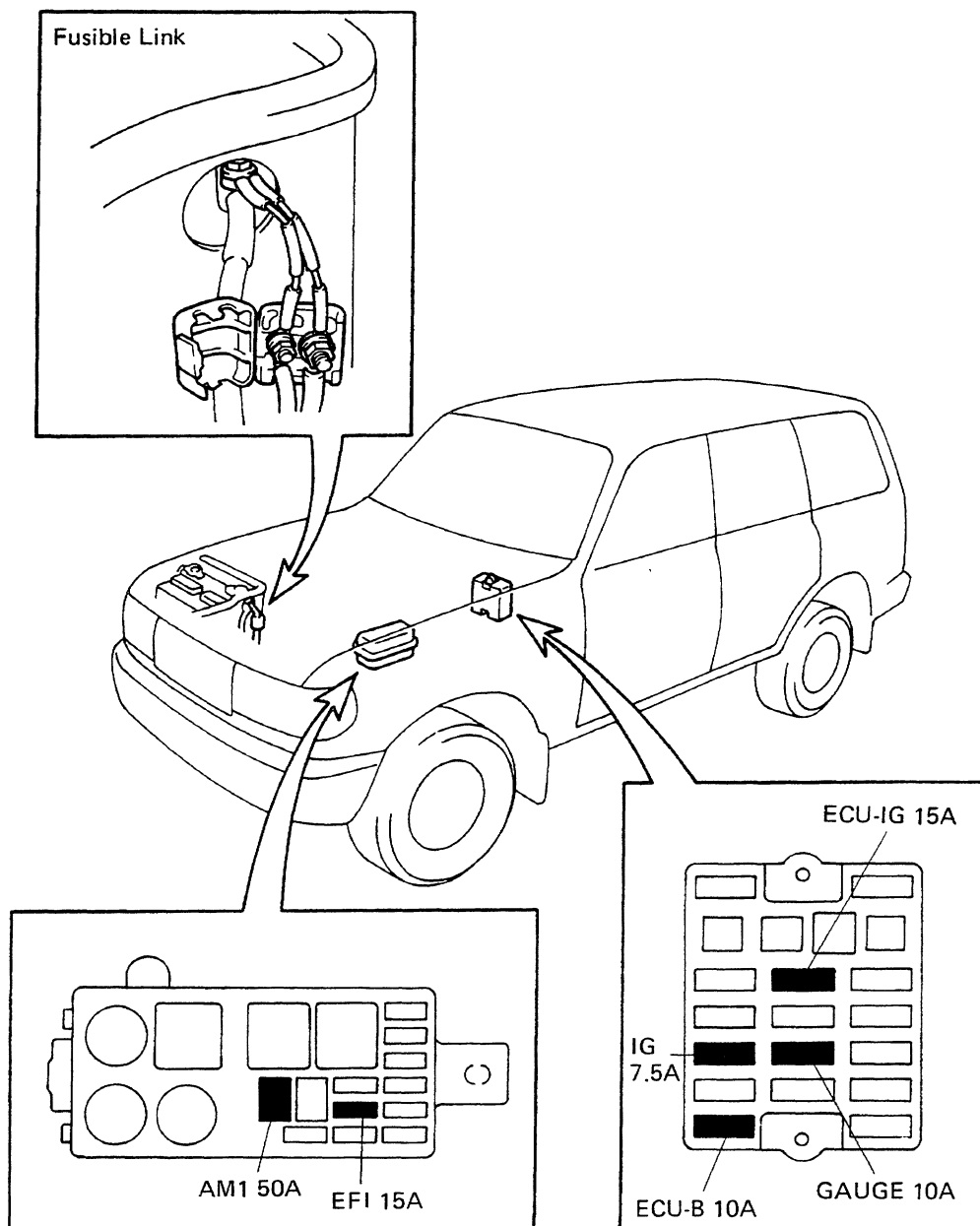
HINT: The following troubleshooting procedures are designed for inspection of each separate system, and therefore the actual procedure may vary somewhat. However, troubleshooting should be performed referring to the inspection methods described in this manual.

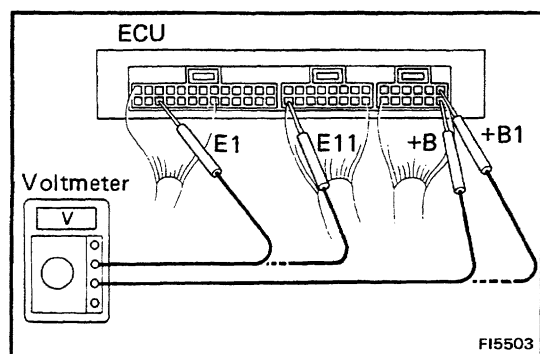
Before beginning inspection, it is best to first make a simple check of the fuses, fusible links and condition of the connectors.

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

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

LOCATION OF FUSES AND FUSIBLE LINKS





EFI SYSTEM CHECK PROCEDURE

HINT:

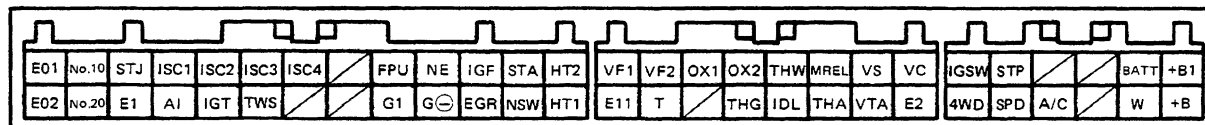
- Perform all voltage measurements with the connectors connected.
- Verify that the battery voltage is 11 V or more when the ignition switch is "ON".

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

Terminals of ECU

Symbol	Terminal Name	Symbol	Terminal Name	Symbol	Terminal Name
E01	ENGINE GROUND	G —	DISTRIBUTOR	M-REL	EFI MAIN RELAY
E02	ENGINE GROUND	IGF	IGNITER	THA	AIR TEMP. SENSOR
No. 10	INJECTOR (No.1, 2, 3)	EG R	EGR VSV	VS	AIR FLOW METER
No.20	INJECTOR (No.4, 5, 6)	STA	STARTER SWITCH	VTA	THROTTLE POSITION SENSOR
S TJ	COLD START INJECTOR	NSW	NEUTRAL START SWITCH	VC	AIR FLOW METER or THROT- TLE POSITION SENSOR
E1	COMPUTER GROUND	HT2	OXYGEN SENSOR HEATER	E2	SENSOR GROUND
ISC1	ISC MOTOR No.1 COIL	HT 1	OXYGEN SENSOR HEATER	IG SW	IGNITION SWITCH
AI	AI VSV	VF1	CHECK CONNECTOR	4WD	CENTER DIFELock INDICATOR
ISC2	ISC MOTOR No.2 COIL	E11	COMPUTER GROUND	STP	STOP LIGHT SWITCH
IGT	IGNITER	VF2	CHECK CONNECTOR	SPD	SPEED SENSOR
ISC3	ISC MOTOR No.3 COIL	T	CHECK CONNECTOR	A/C	A/C MAGNET SWITCH
TWS	WATER TEMP. SWITCH	OX1	OXYGEN SENSOR	BATT	BATTERY
ISC4	ISC MOTOR No.4 COIL	OX2	OXYGEN SENSOR	W	WARNING LIGHT
FPU	FPU VSV	*THG	EGR GAS TEMP. SENSOR	+ B	EFI MAIN RELAY
G1	DISTRIBUTOR	THW	WATER TEMP. SENSOR	+B1	EFI MAIN RELAY
NE	DISTRIBUTOR	IDL	THROTTLE POSITION SENSOR		

ECU Terminals



*California vehicles only

Voltage at ECU Wiring Connectors

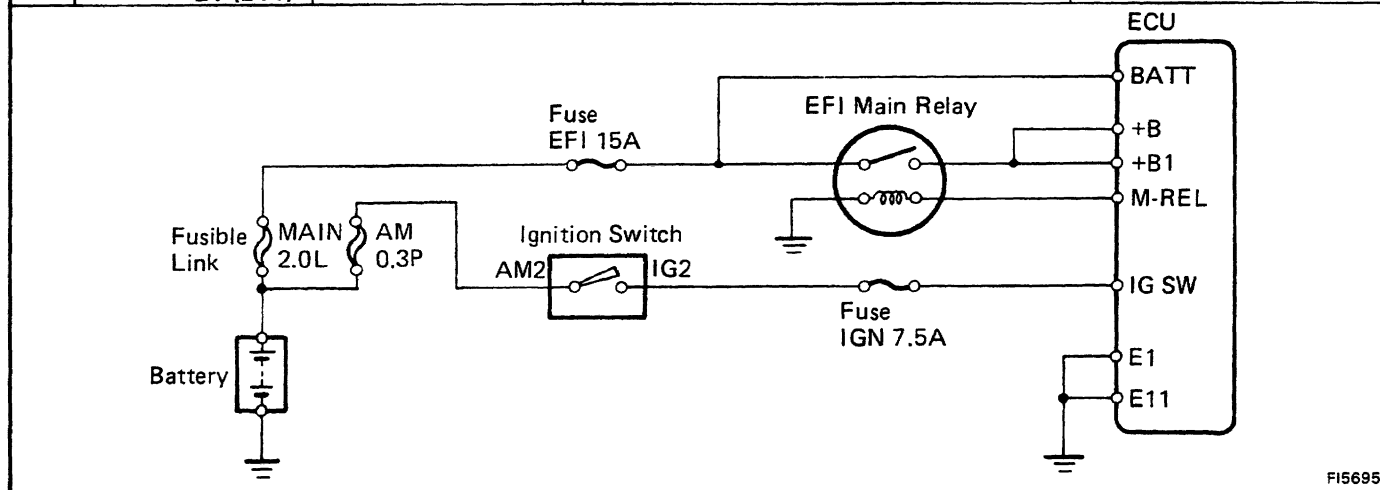
No.	Terminals	Condition		STD Voltage	See page
1	BATT-E1 (E11)	—		10 – 14	FI-30
	IG SW-E1 (11)	Ignition switch ON		10 – 14	FI-31
	M-REL-E1(E11)				
	+B (+B1)-E1(E11)				FI-32
2	IDL-E2	Ignition switch ON	Throttle valve open	4 – 6	FI-33
	VC-E2		—	4 – 6	FI-34
	VTA-E2		Throttle valve fully closed	0.1 – 1.0	
			Throttle valve fully open	3 – 5	
3	VC-E2	Ignition switch ON	—	4 – 6	FI-35
	VS-E2		Measuring plate fully closed	4 – 5	
			Measuring plate fully open	0.02 – 0.08	
		Idling	2 – 4		
	3,000 rpm	0.3 – 1.0			
4	THA-E2	Ignition switch ON	Intake air temperature 20°C (68°F)	1 – 3	FI-36
5	THW – E2	Ignition switch ON	Coolant temperature 80°C (176°F)	0.1 – 1.0	FI-37
6	No.10- E01 No. 20- E02	Ignition switch ON		10 – 14	FI-38
7	STA-E1 (E11)	Cranking		6 – 14	FI-39
8	ISC 1 -E1 (E11) ISC4	Ignition switch ON		10 – 14	FI-40
9	IGT- E1 (E 11)	Idling		0.7 – 1.0	FI-41
10	W-E1 (E 11)	No trouble ("CHECK" engine warning light off) and engine running		10 – 14	FI-42
11	A/C-E1 (E 11)	Air conditioning ON		10 – 14	FI-43

ECU Terminals

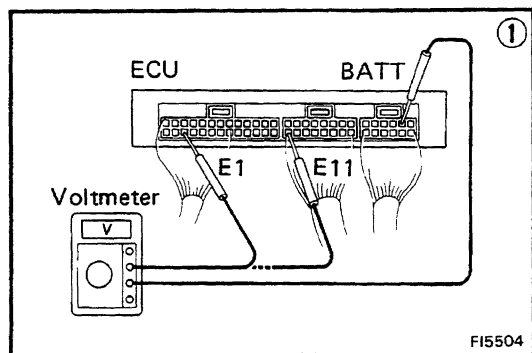
E01	No.10	STJ	ISC1	ISC2	ISC3	ISC4	FPU	NE	IGF	STA	HT2	VF1	VF2	OX1	OX2	THW	MREL	VS	VC	IGSW	STP	BATT +B1
E02	No.20	E1	AI	IGT	TWS		G1	G⊖	EGR	NSW	HT1	E11	T	THG	IDL	THA	VTA	E2	4WD	SPD	A/C	W +B

* California vehicles only

No.	Terminals	Trouble	Condition	STD Voltage
1	BATT—E1 (E11)	No voltage		10 – 14 V
	IG SW—E1 (E11)	No voltage	Ignition switch ON	10 – 14 V
	M-REL—E1 (E11)	No voltage	Ignition switch ON	10 – 14 V
	+B (+B1) —E1 (E11)	No voltage	Ignition switch ON	10 – 14 V



FI5695



9 BATT-E1 (E 11)

(1) There is no voltage between ECU terminals BATT and E1 (E 11).

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

NO

OK

(3) Check wiring between ECU terminal E 1 (E 11) and body ground.

OK

BAD

Try another ECU.

Repair or replace.

Check fuse and fusible link.

BAD

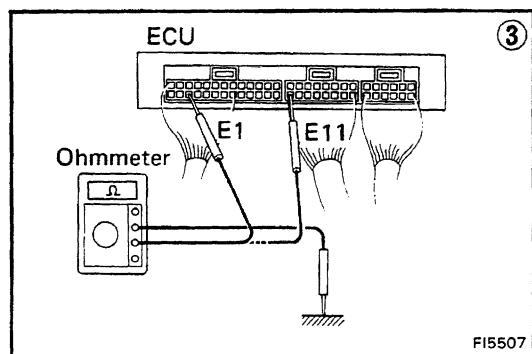
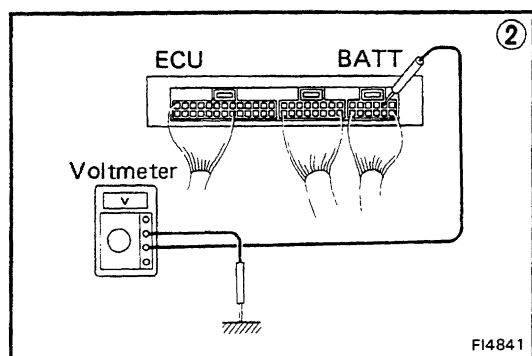
Replace.

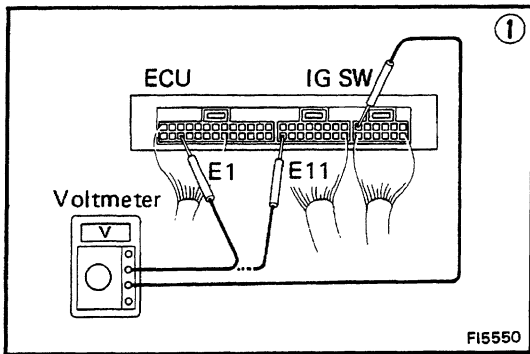
OK

Check wiring between ECU terminal and battery.

BAD

Repair or replace.





• IG SW-E1(E11)

There is no voltage between ECU terminals IG SW and E1 (E 11). (**IG SW ON**)

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

NO

OK

Check wiring between ECU terminal E1 (E11) and body ground.

OK

BAD

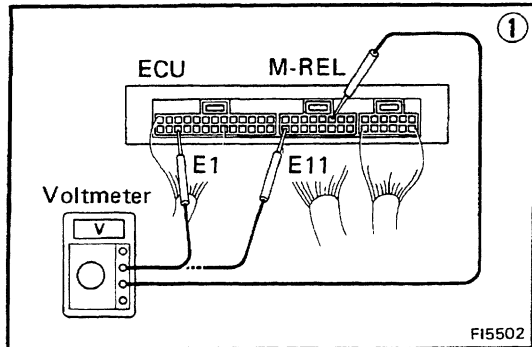
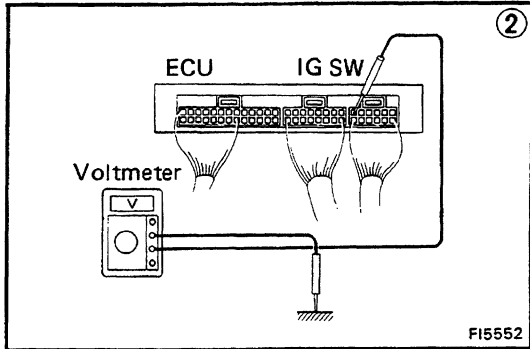
Try another ECU.

Replace or repair.

Check fuse, fusible link and ignition switch.

BAD

Repair or replace.



• M-REL-E1(E11)

There is no voltage between ECU terminals M-RE1 and E1 (E11). (**IG SW ON**)

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

NO

OK

Check wiring between ECU terminal E1 (E11) and body ground.

OK

BAD

Try another ECU.

Replace or repair.

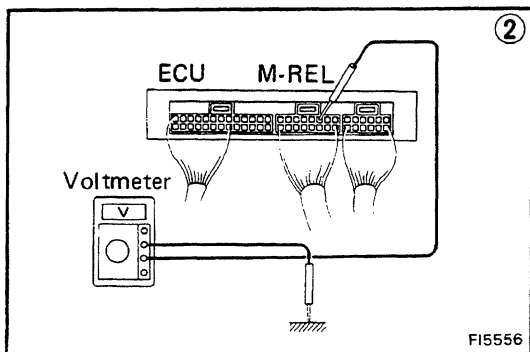
Check EFI main relay and wiring harness. (See page FI-74)

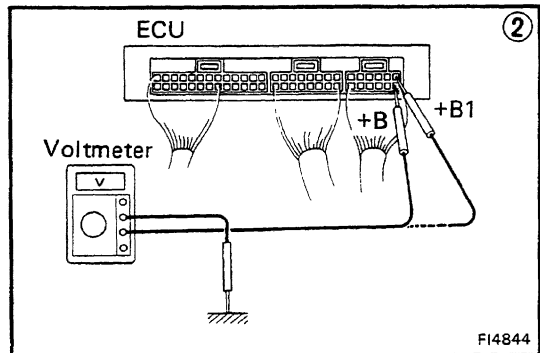
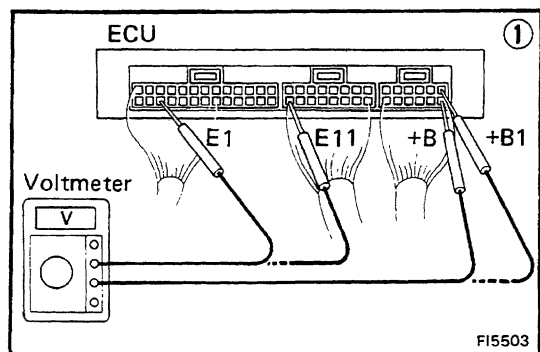
BAD

Replace.

OK

Try another ECU.





• +B (+B1) — E1 (E11)

(1) There is no voltage between ECU terminals +B (+B1) and E1 (E11). (**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(E11) and body ground.

OK

BAD

Try another ECU.

Replace or repair.

Check fuse, fusible link and wiring harness.

BAD

Repair or replace.

OK

Check EFI main relay.

BAD

Replace.

OK

Refer to M-RE1- E1 (E 11) trouble section.

No.	Terminals	Trouble	Condition		STD Voltage
2	IDL - E2	No voltage	Ignition switch ON	Throttle valve open	4 - 6 V
	V C - EZ			-	4 - 6 V
	VTA - E2			Throttle valve fully closed	0.1 - 1.0 V
				Throttle valve fully open	3 - 5 V

Throttle Position Sensor

ECU

+B (+B1)

E2

IDL

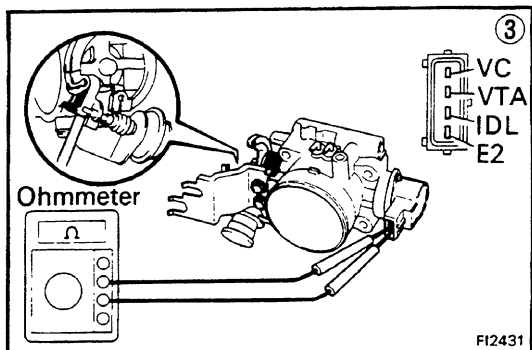
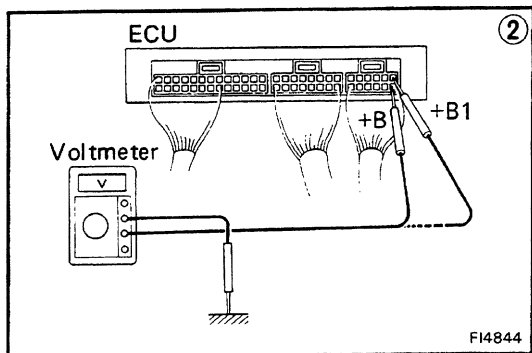
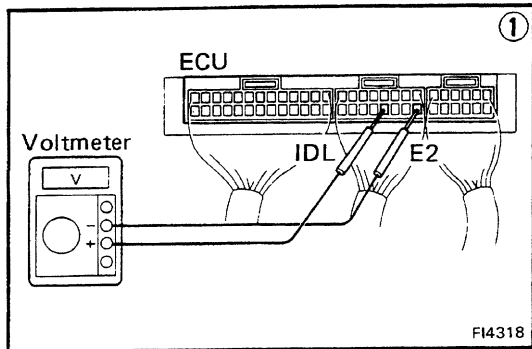
VTA

VC

E1

E11

F15489



• IDL- E2

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

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

NO

OK

Check wiring between ECU terminal E1 (E 11)
and body ground.

OK

BAD

Try another ECU.

Replace or repair.

Refer to No. 1 .

BAD

Replace or repair.

OK

3 Check throttle position sensor.

BAD

Replace or repair throttle
position sensor.

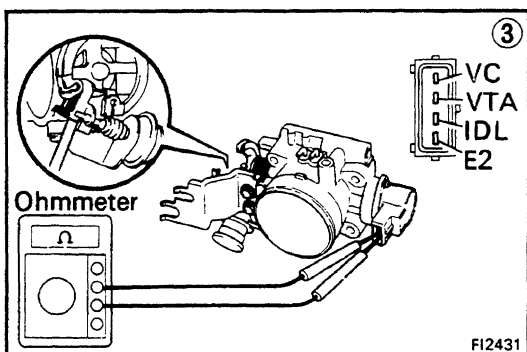
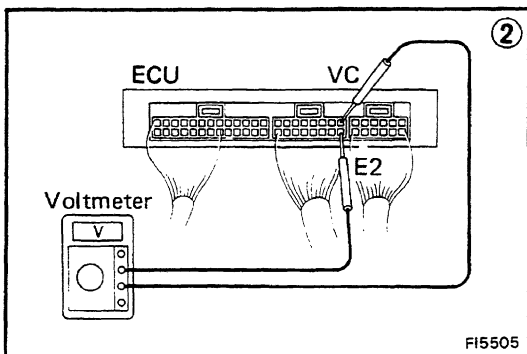
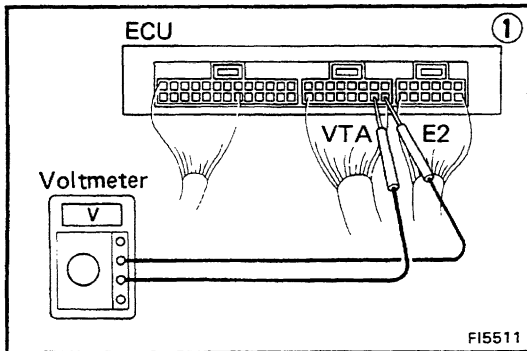
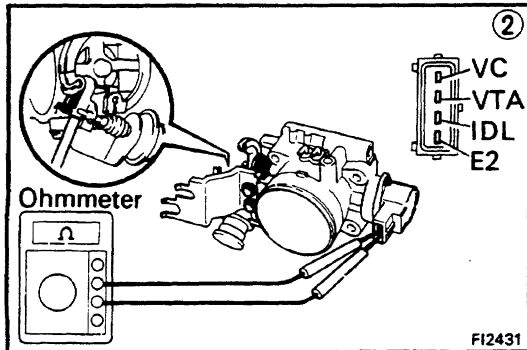
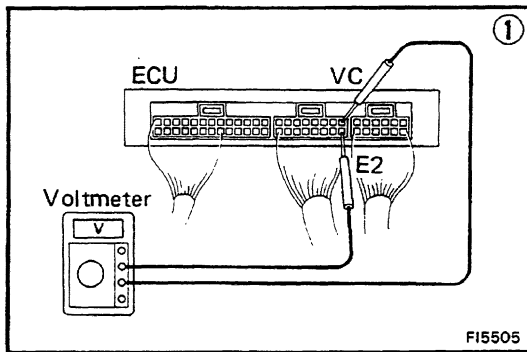
OK

Check wiring between ECU and throttle
position sensor.

BAD

OK

Try another ECU.



• VC - E2

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

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

OK

NO

Check throttle position sensor.
(See page FI-68)

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

BAD

OK

Repair or replace.

Check wiring between ECU and throttle
position sensor.

OK

BAD

Try another ECU.

Repair or replace
wiring.

• 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 VC and E2.
(IG SW ON)

NO

OK

Refer to VC - E2
trouble section.

OK

(4) Check throttle position sensor.

BAD

Repair or replace.

OK

Check wiring between ECU and throttle
position sensor.

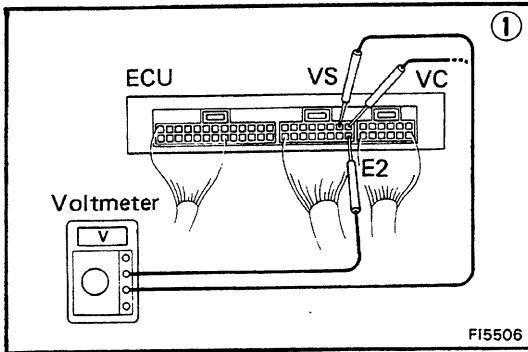
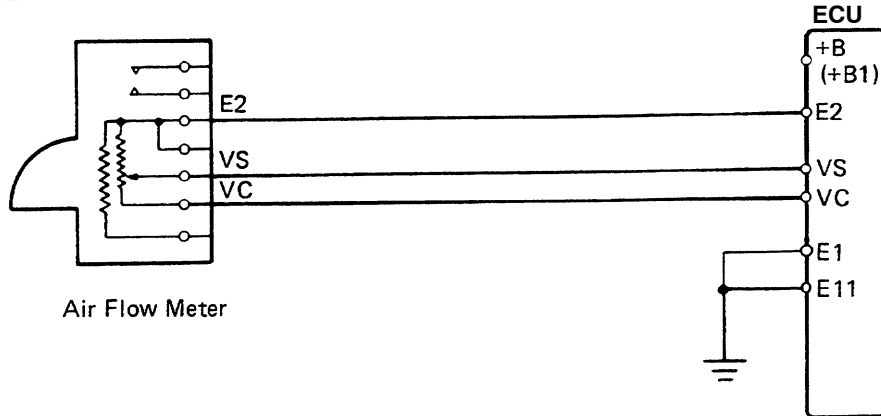
BAD

Repair or replace.

OK

Try another ECU.

No.	Terminals	Trouble	Condition		STD Voltage
3	VC - E2	No voltage	Ignition switch ON		4 - 6 V
	VS - E2			Measuring plate fully closed	4 - 5 V
	VS - E2			Measuring plate fully open	0.02 - 0.08 V
	VS - E2		Idling		2 - 4 V
	VS - E2		3,000 rpm		0.3 - 1.0 V



(1) There is no voltage between 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 No. 1.
(See page FI-30)

Check wiring between ECU terminal E1(E11) and body ground.

OK

BAD

(3) Check air flow meter. (See page FI-66)

Repair or replace.

BAD

OK

Replace air flow meter.

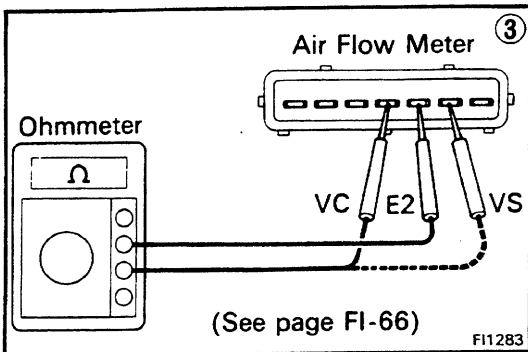
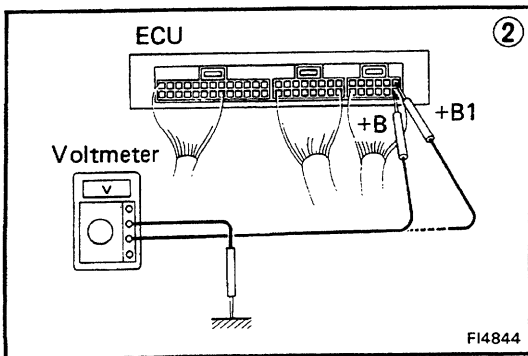
Check wiring between ECU and air flow meter.

OK

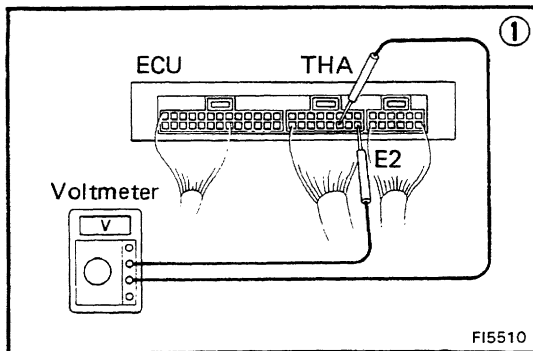
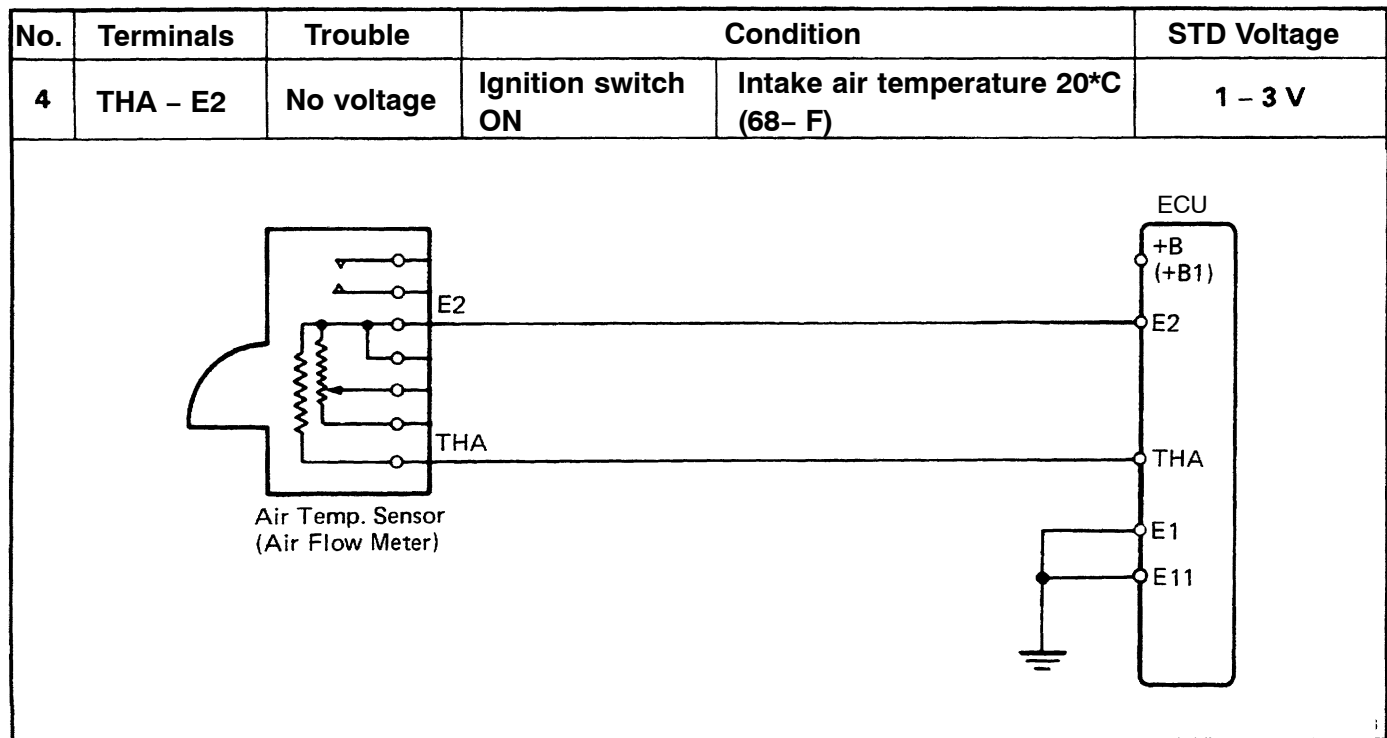
BAD

Try another ECU.

Repair or replace.



(See page FI-66)



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

Check wiring between ECU terminal E1 (E11) and body ground.

OK

BAD

Check air temp. sensor See
(page FI-66)

Repair or replace.

BAD

Replace air
flow meter.

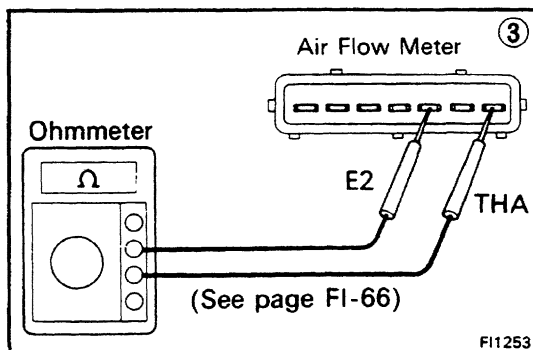
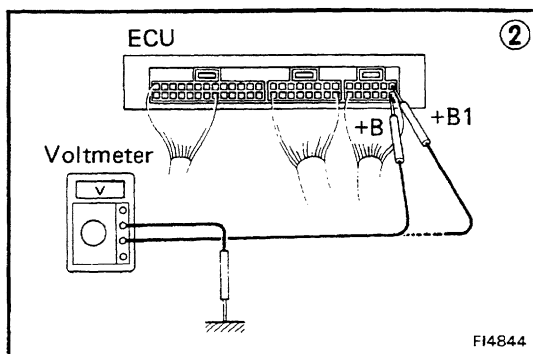
Check wiring between ECU and air
temp. sensor.

OK

BAD

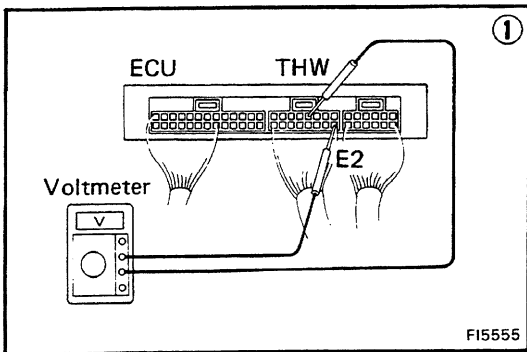
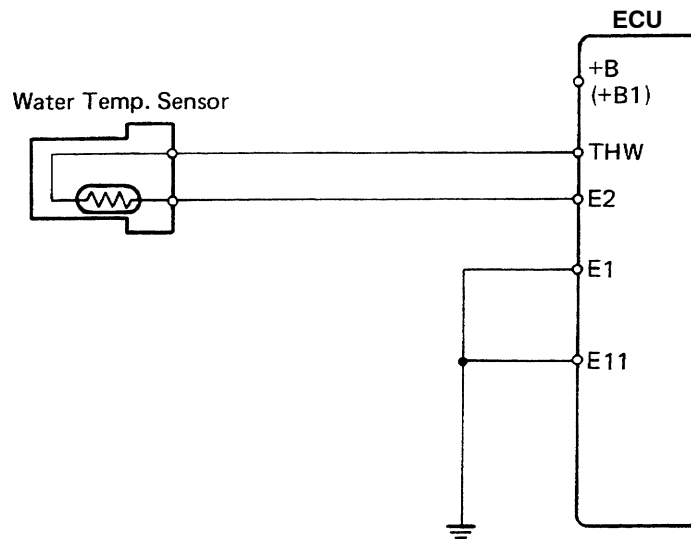
Try another ECU.

Repair or replace.



(See page FI-66)

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



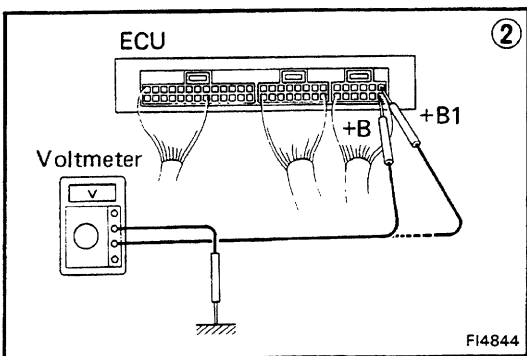
(1) There is no voltage between ECU terminals THW and E2 (IG SW ON)

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

OK

NO

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



Check wiring between ECU terminal E 1 (E11) and body ground.

OK

BAD

Check water temp. sensor.
(See page FI-77)

Repair or replace.

BAD

OK

Replace water temp. sensor.

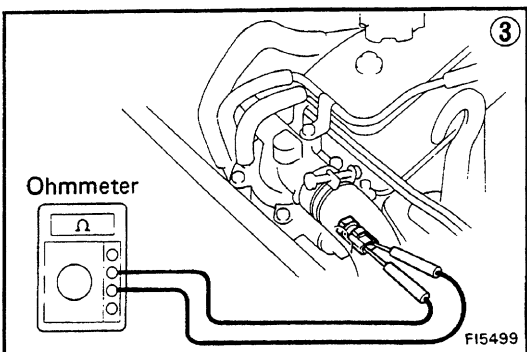
Check wiring between ECU and water temp. sensor.

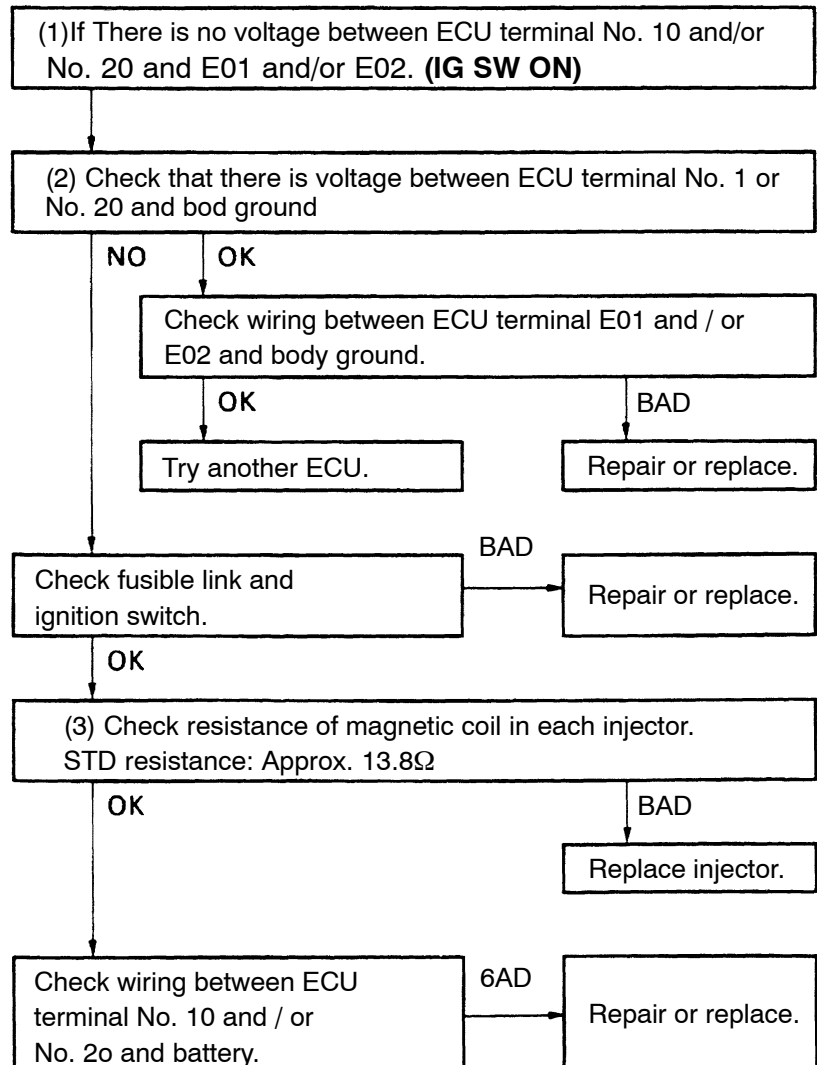
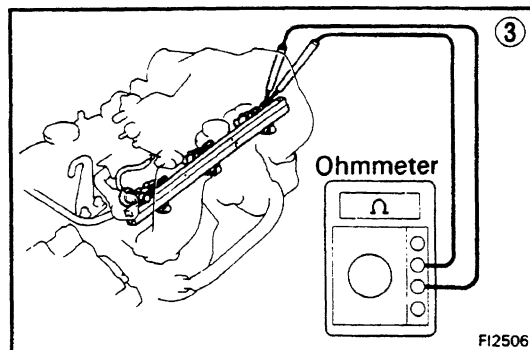
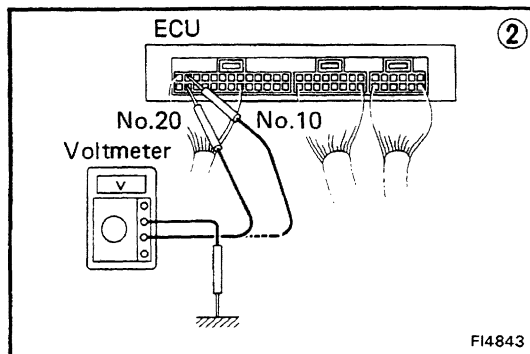
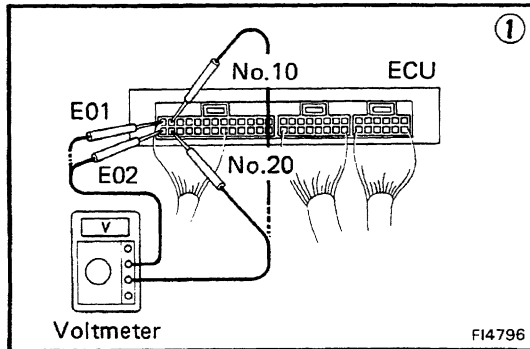
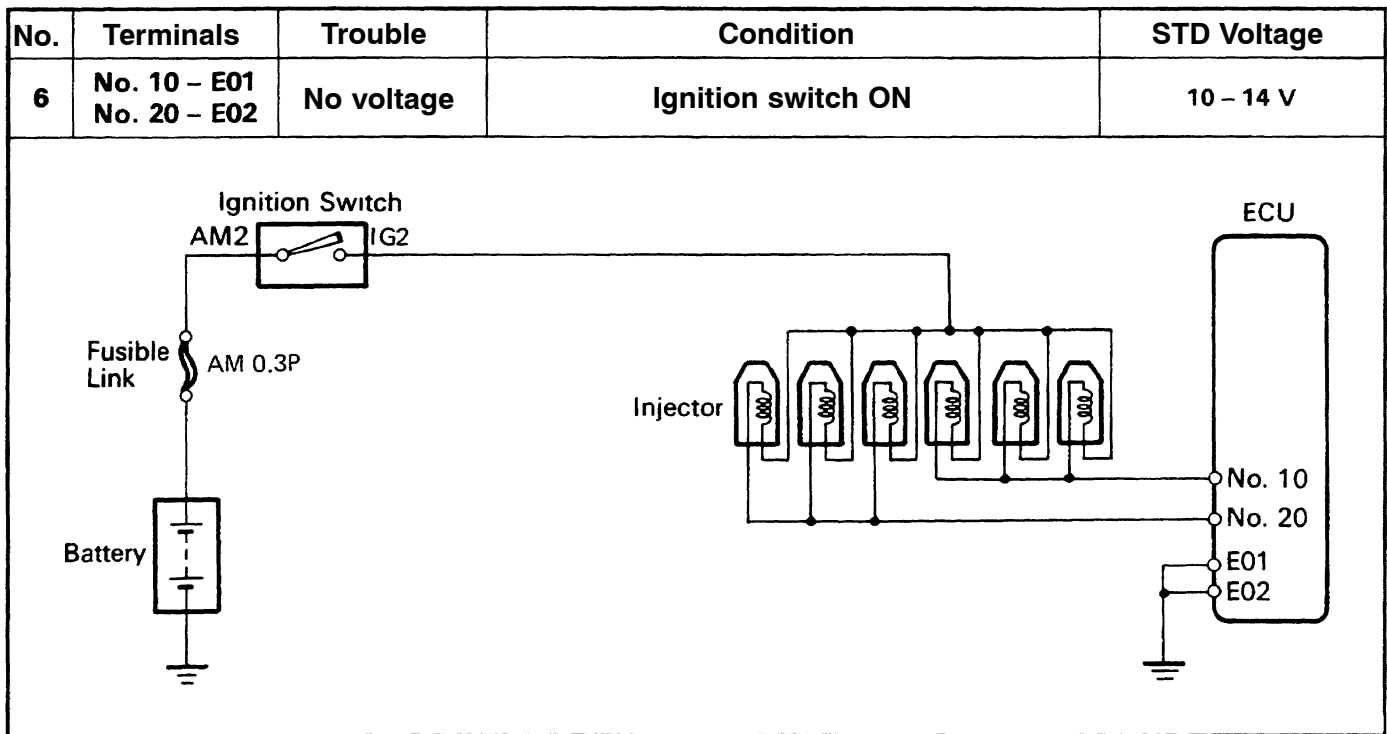
OK

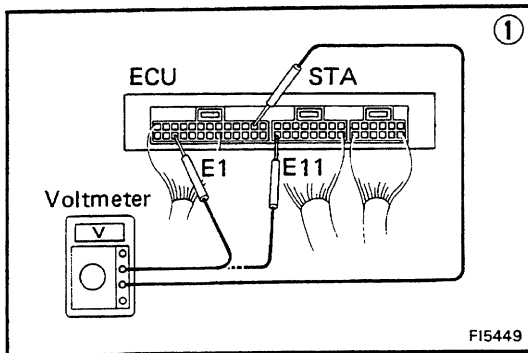
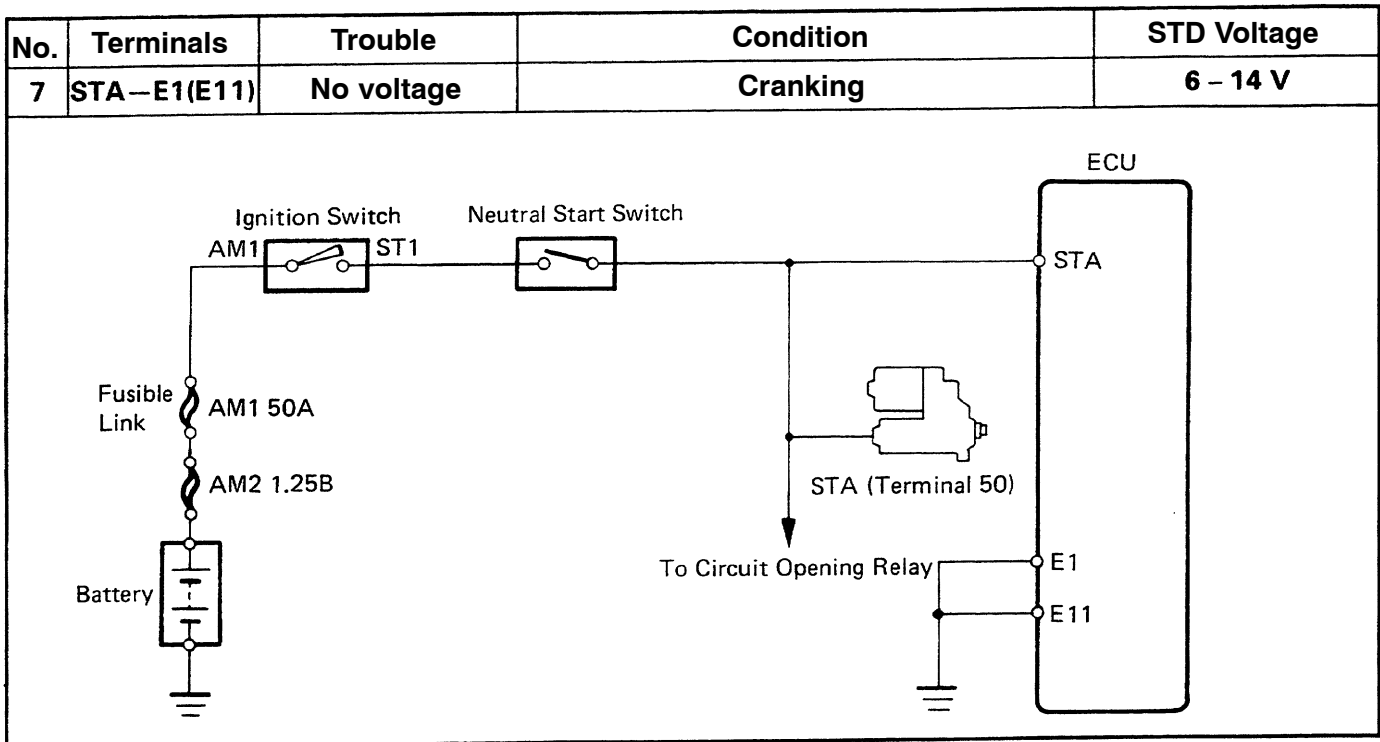
BAD

Try another ECU.

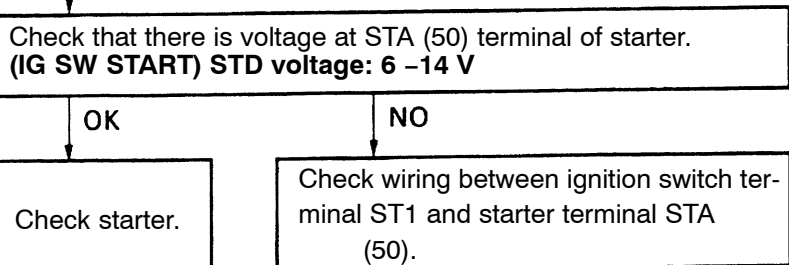
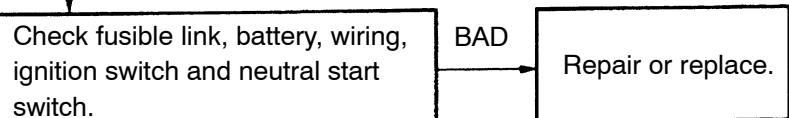
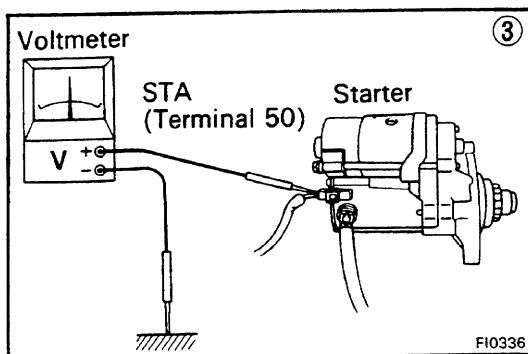
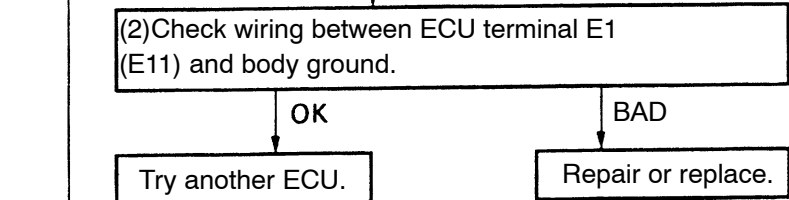
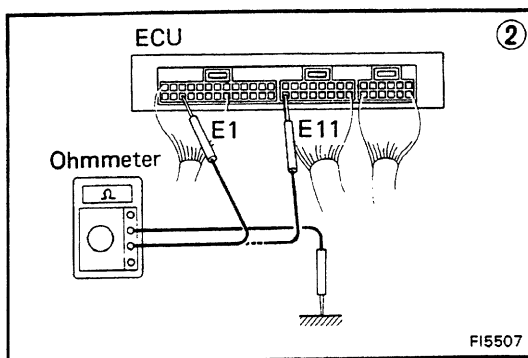
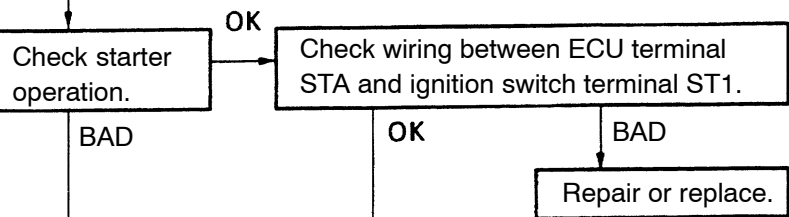
Repair or replace.

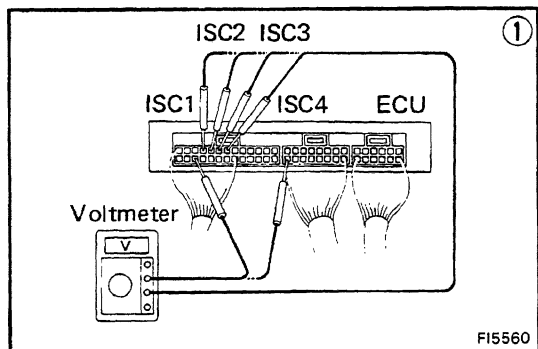
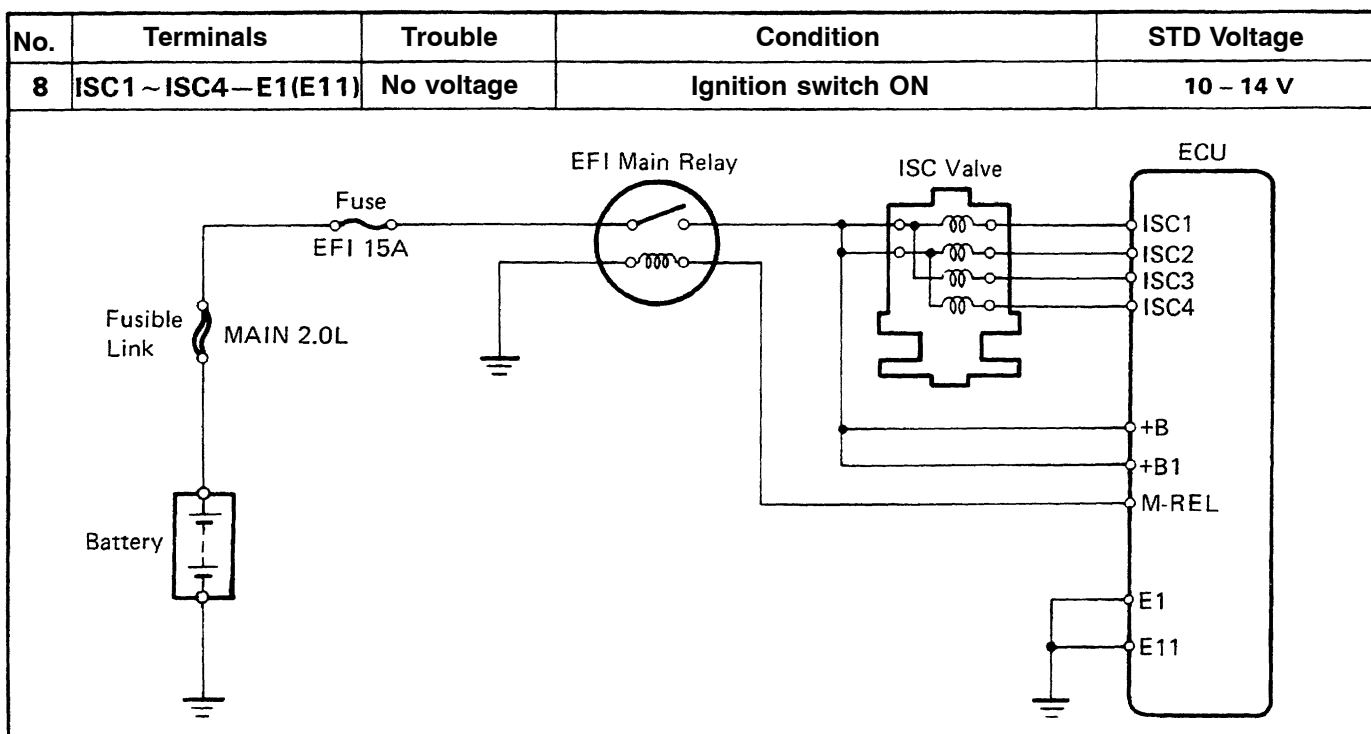






(1) There is no voltage between ECU terminals STA and E1 (E11). (**IG SW START**)





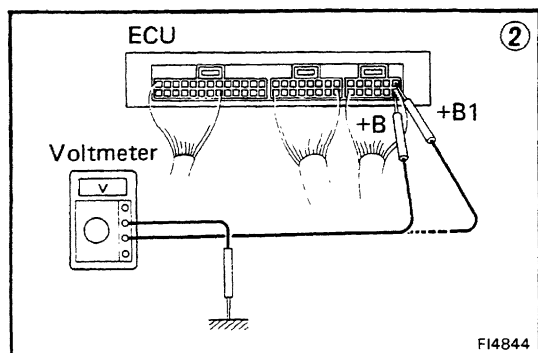
(1) There is no voltage between ECU terminals ISC1 – ISC4 and E1 (E11). (**IG SW ON**)

(2) Check that there is voltage between ECU terminal + B (+ 1b) and body ground. (**IG SW ON**)

OK

NO

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



Check wiring between ECU terminal E1 (E11) and body ground.

OK

BAD

(3) Check ISC valve
(See page [FI-71](#))

BAD

OK

Replace ISC valve.

Repair or replace.

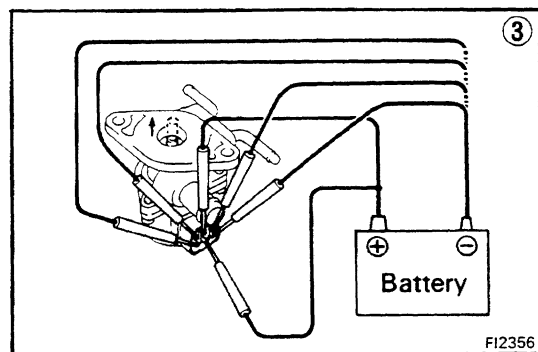
Check wiring between ECU and EFI main relay.

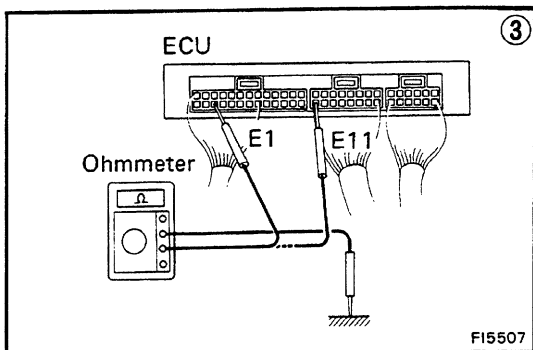
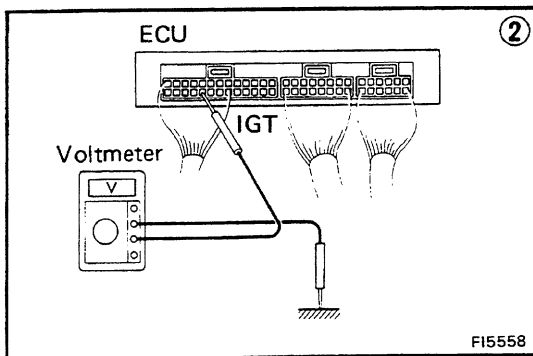
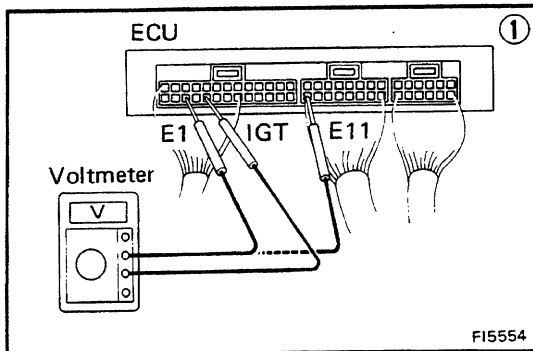
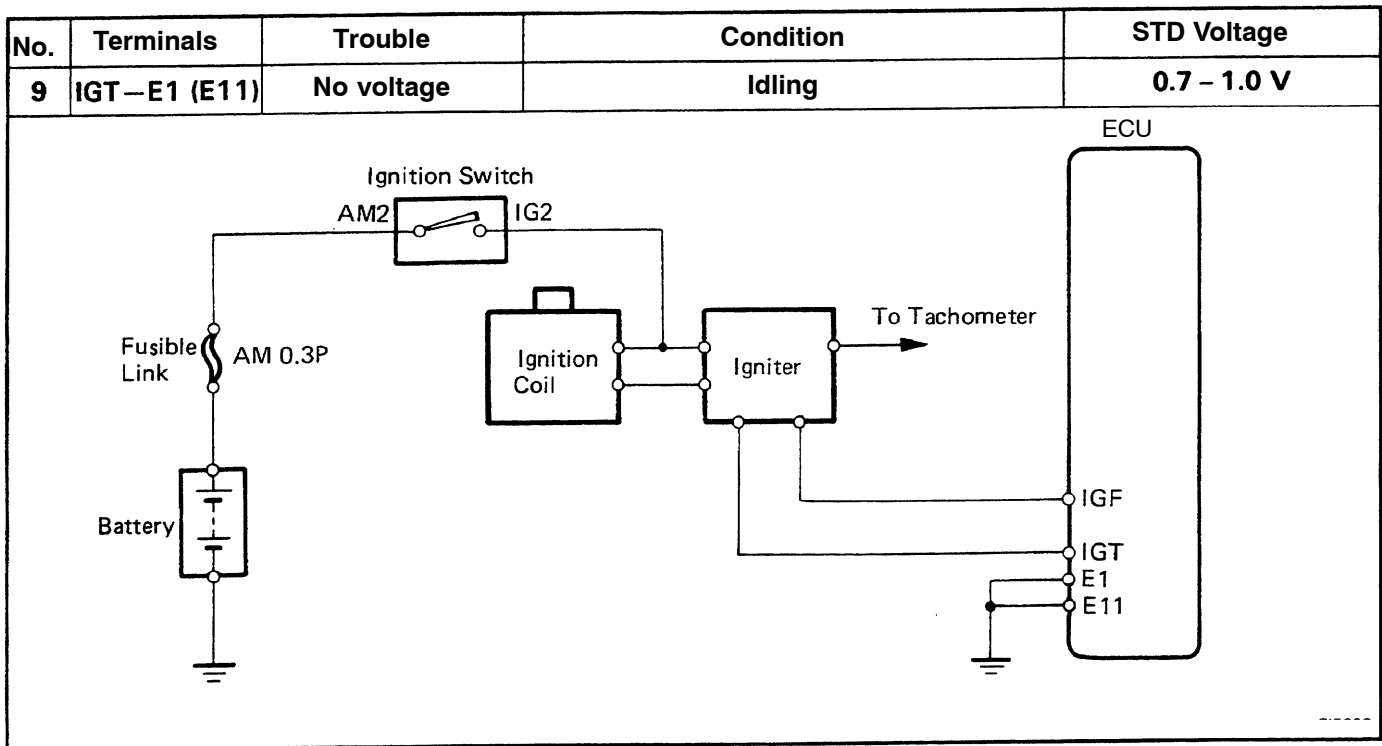
OK

BAD

Try another ECU.

Repair or replace.





(1) There is no voltage between ECU terminals IGT and E1 (E11). (Idling)

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

NO

OK

Check wiring between ECU (3) terminal E1 (E11) 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-7)

BAD

Repair or replace.

OK

Check wiring between ECU and battery.

BAD

Repair or replace.

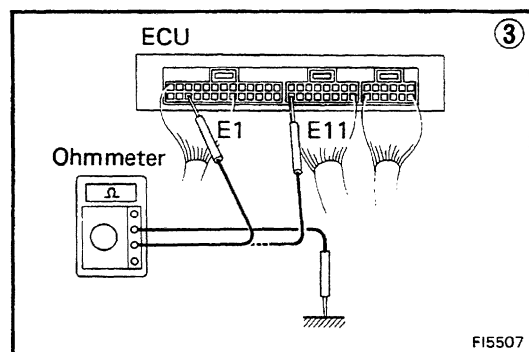
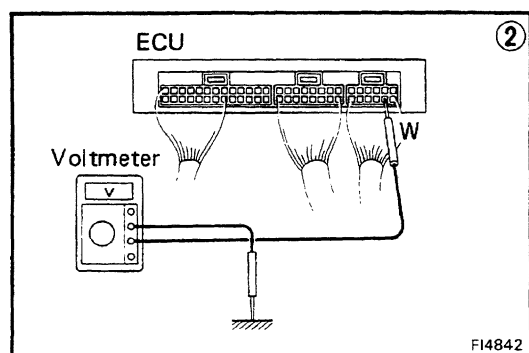
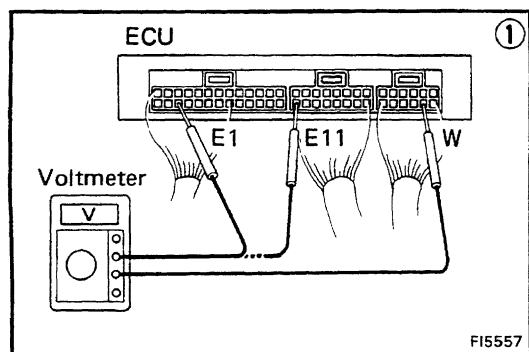
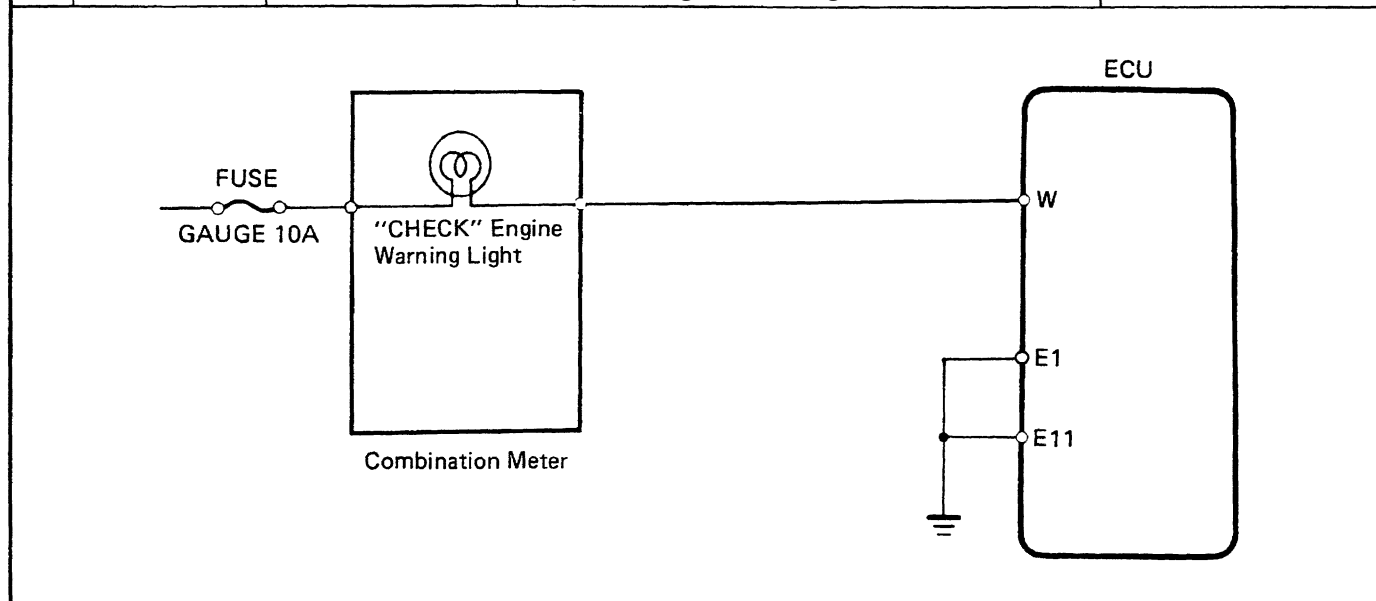
OK

Check igniter. (See page (IG-7))

BAD

Repair or replace.

No.	Terminals	Trouble	Condition	STD Voltage
10	W—E1 (E11)	No voltage	No trouble ("CHECK" engine warning tight off) and engine running	10 – 14 V



(1) There is no voltage between ECU terminals W and E1 (E11). (idling)

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

NO

OK

(3) Check wiring between ECU terminal E1(E11) and body ground.

OK

BAD

Try another ECU.

Repair or replace.

Check GAUGE fuse (10A) and "CHECK" engine warning light.

OK

BAD

Repair or replace.

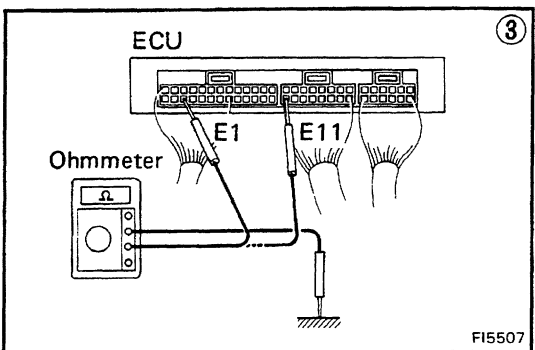
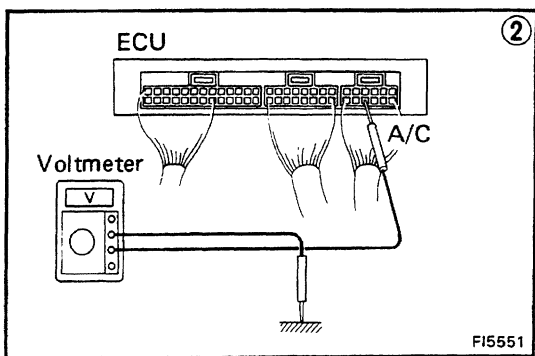
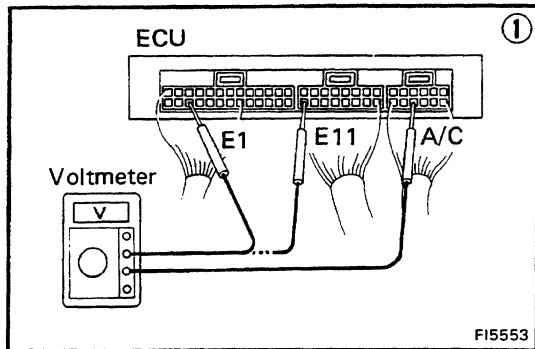
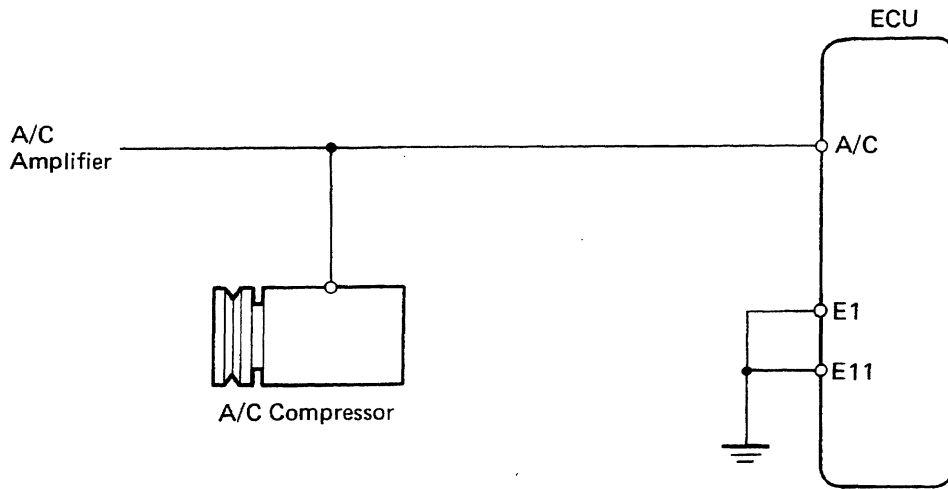
Fuse blows again

Check wiring between ECU terminal W and fuse.

BAD

Repair or replace.

No.	Terminals	Trouble	Condition	STD Voltage
11	A/C—E1(E11)	No voltage	Air conditioning ON	10 – 14 V



(1) There is no voltage between ECU terminals A/C and E 1 (E11). (Air conditioning ON)

(1) Check that there is voltage between ECU terminal A/C and body ground.

NO

OK

Check wiring between ECU terminal E1 (E11) and body ground.

OK

BAD

Try another ECU.

Repair or replace.

Check compressor running.

OK

Check wiring between ECU terminal A/C and amplifier.

BAD

Repair or replace.

BAD

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

BAD

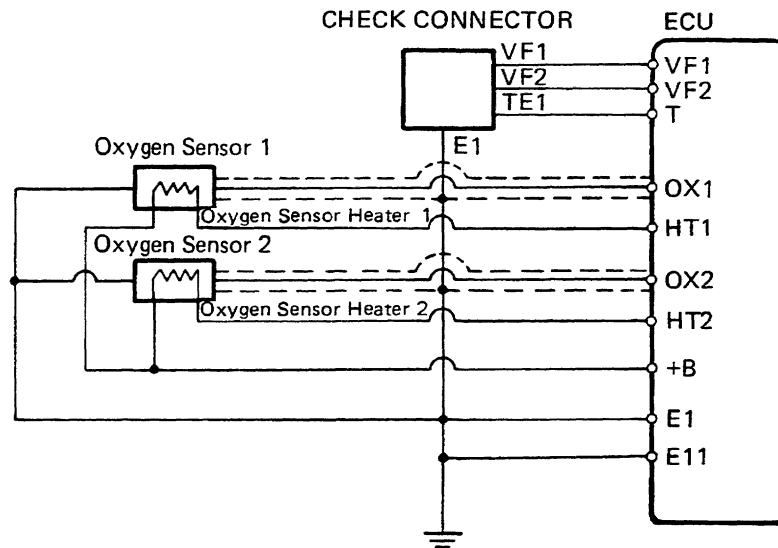
Repair or replace.

OK

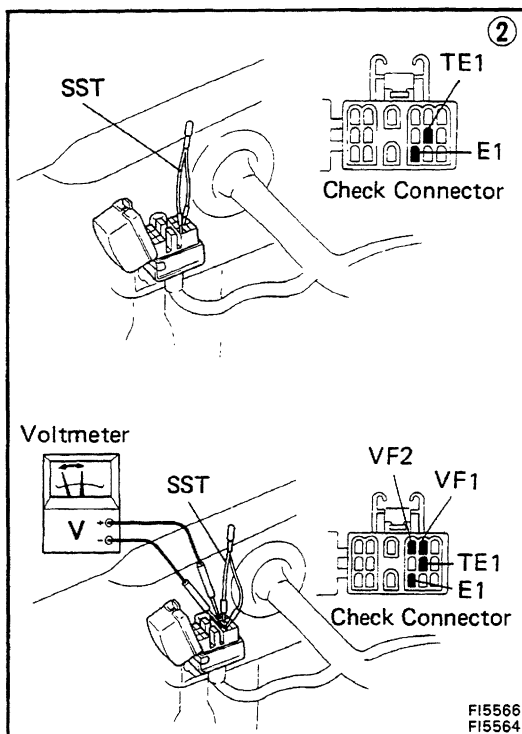
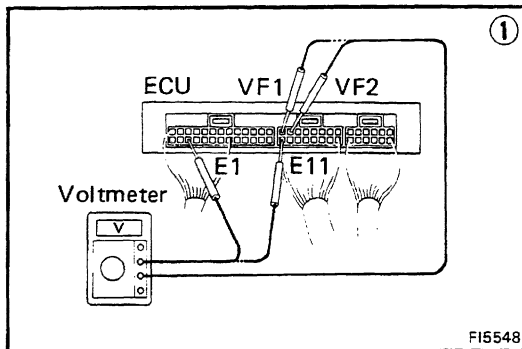
Check wiring between amplifier and ECU or compressor.

BAD

Repair or replace.



FI5405



(1) There is no voltage between ECU terminals VF 1 or VF2 and E1 (E 11).

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

NO

OK

Check wiring between ECU terminal E 1 (E11) and body ground.

OK

Try another ECU.

BAD

Repair or replace.

Check for air suction into exhaust system.

BAD

Repair air suction.

OK

Check for air leak from air induction system.

BAD

Repair air leak.

OK

Check spark plugs.

BAD

Repair or replace.

OK

Check distributor and ignition system.

BAD

Repair or replace.

OK

Check fuel pressure.

BAD

Repair or replace.

OK

Check injectors.

Repair or replace.

Check cold start injector.

BAD

Repair or replace.

OK

Check air flow meter.

BAD

Repair or replace.

OK

(1) Check operation of oxygen sensors.

OK

System normal.

BAD

Check wiring between oxygen sensors and ECU connectors.

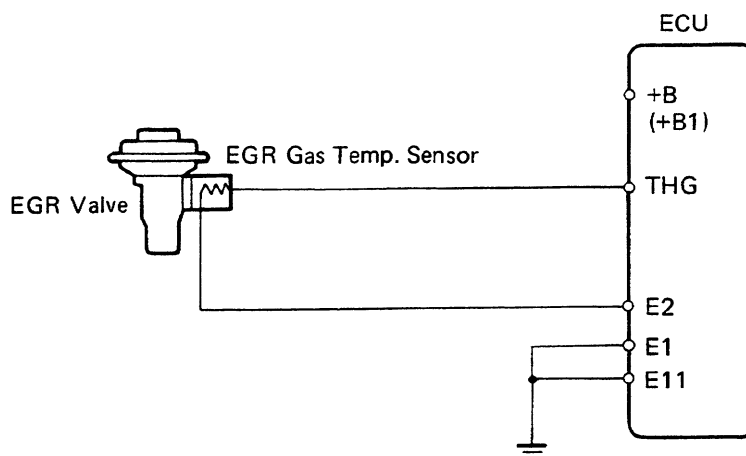
BAD

Repair wiring.

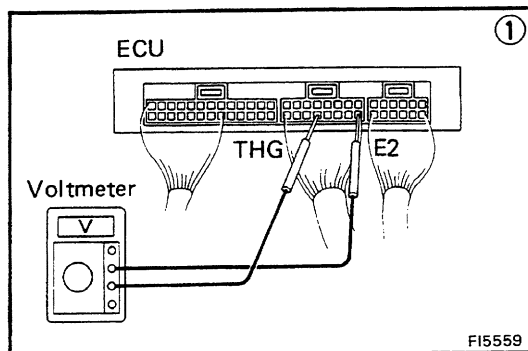
OK

Replace oxygen sensors.

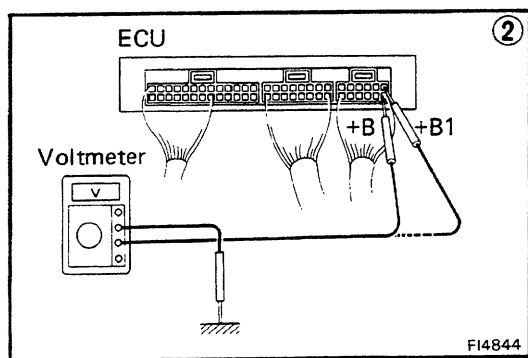
Rich malfunction only

California vehicles only

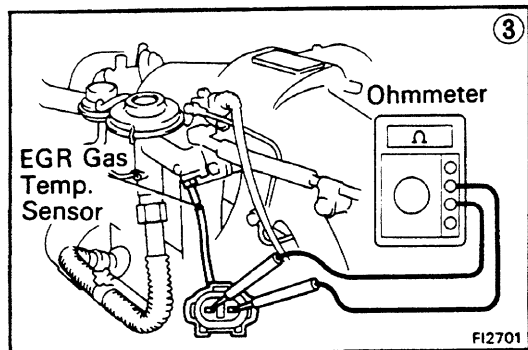
FI5491



FI5559



FI4844



FI2701

No voltage between ECU terminals THG 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 No. 1.
(See page FI-30)

Check wiring between ECU terminal E1 (E 11) and body ground.

OK

BAD

Repair or replace.

Check EGR system.

BAD

Repair or replace.

OK

Check EGR gas temp. sensor.
(See page FI-79)

BAD

Replace EGR gas
temp. sensor.

OK

Check wiring between ECU and
EGR gas temp. sensor.

OK

BAD

Try another ECU.

Repair or replace.