

TROUBLESHOOTING WITH VOLT OHMMETER

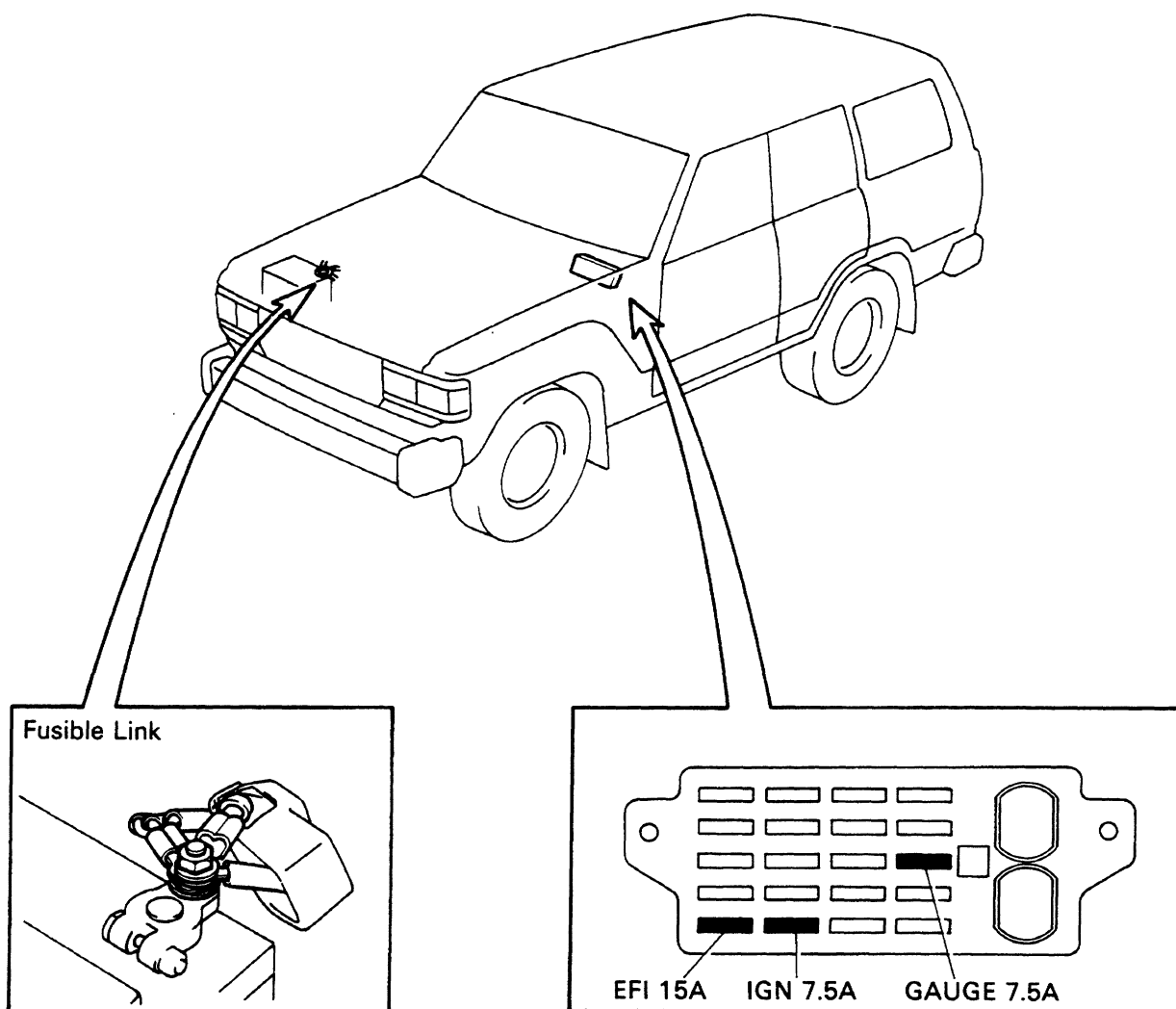
HINT: The following troubleshooting procedures are designed for inspection of each separate system, and therefore may vary somewhat. However, troubleshooting should be performed referring to the inspection methods described in this manual.

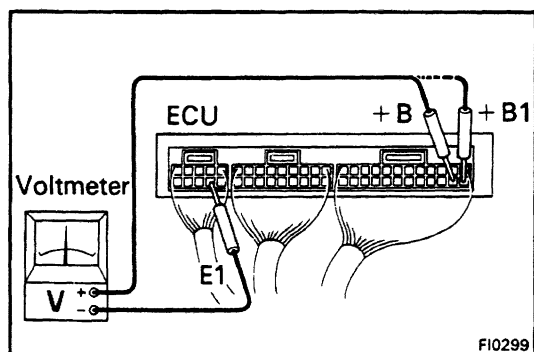
Before beginning inspection, it is best to first make a simple check of the fuses, fusible links and condition of the connectors.

The following troubleshooting procedures are based in 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 k Ω /V minimum), measure the voltage at each terminal of the wiring connectors.

Terminals of ECU

Symbol	Terminal Name	Symbol	Terminal Name	Symbol	Terminal Name
E01	ENGINE GROUND	G1	DISTRIBUTOR	STP	STOP LIGHT SWITCH
E02	ENGINE GROUND	VF2	CHECK CONNECTOR	EGR	EGR VSV
No. 10	INJECTOR (No. 1, 2,3)	VTA	THROTTLE POSITION SENSOR	A/C	A/C MAGNET SWITCH
No. 20	INJECTOR (No. 4, 5, 6)	NE	DISTRIBUTOR	SPD	SPEED SENSOR
HT1	OXYGEN SENSOR HEATER	IDL	THROTTLE POSITION SENSOR	W	WARNING LIGHT
HT2	OXYGEN SENSOR HEATER	*THG	EGR GAS TEMP. SENSOR	FPU	FPU VSV
STJ	COLD START INJECTOR	E11	COMPUTER GROUND	NSW	NEUTRAL START SWITCH
E1	COMPUTER GROUND	OX1	OXYGEN SENSOR	THA	AIR TEMP. SENSOR
T	CHECK CONNECTOR	OX2	OXYGEN SENSOR	STA	STARTER SWITCH
TWS	WATER TEMP. SWITCH	THW	WATER TEMP. SENSOR	VS	AIR FLOW METER
ISC1	ISC MOTOR No. 1 COIL	E2	SENSOR GROUND	AI	AI VSV
ISC2	ISC MOTOR No. 2 COIL	IGF	IGNITER	VC	AIR FLOW METER or THROTTLE POSITION SENSOR
ISC3	ISC MOTOR No. 3 COIL	E22	SENSOR GROUND	BATT	BATTERY
ISC4	ISC MOTOR No. 4 COIL	IGT	IGNITER	+ B	EFI MAIN RELAY
G $\ominus$	DISTRIBUTOR	4WD	4WD INDICATOR	IG SW	IGNITION SWITCH
VF1	CHECK CONNECTOR	M-REL	EFI MAIN RELAY	+ B1	EFI MAIN RELAY

ECU Terminals

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

* California vehicles only

Voltage at ECU Wiring Connectors

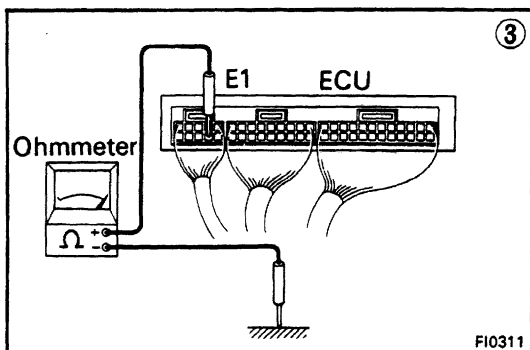
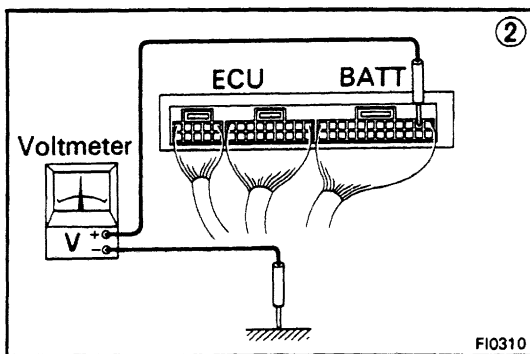
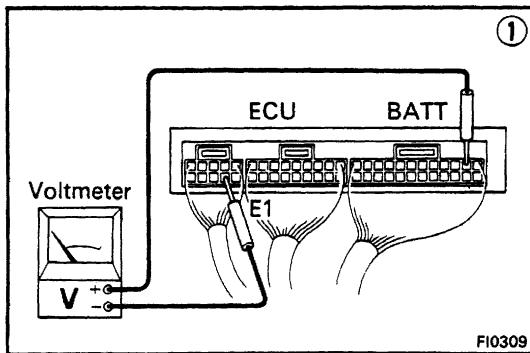
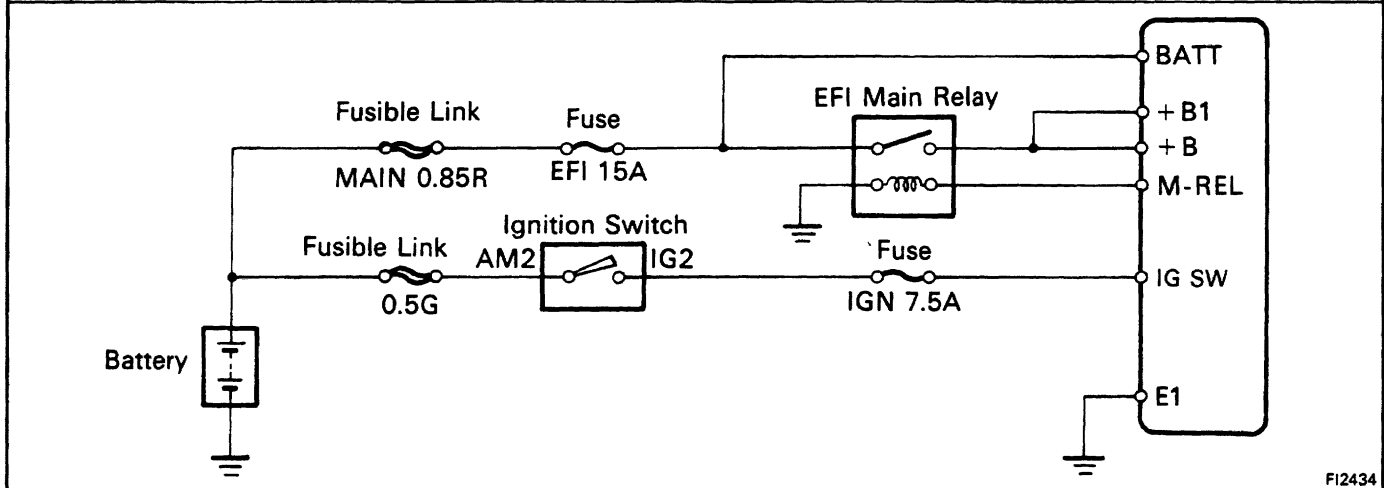
No.	Terminals	Condition		STD Voltage	See page
1	BATT – E1			10 – 14	FI-30
	IG SW – E1			10 – 14	FI-31
	M-REL – E1	Ignition switch ON			
	+ B (+ B1) – E1				FI-32
2	IDL – E2	Ignition switch 4N	Throttle valve open	4 – 6	FI-33
	VC – E2			4 – 6	Ff-34
	VTA – E2		Throttle valve fully closed	0.1 – 1.0	
			Throttle valve fully open	4 – 5	
3	VC – E22	Ignition switch ON		4 – 6	FI-35
	VS – E22		Measuring plate fully closed	4 – 5	
			Measuring plate fully open	0.02 – 0.08	
		Idling		2 – 4	
		3,000 rpm		0.3 – 1.0	
4	THA – E2	Ignition switch ON	Intake air temperature 24°C (68°F)	1 – 3	FI –36
5	THW – E2	Ignition switch ON	Coolant temperature 80°C (176°F)	0.1 – 1.0	FI-37
6	No. 10 E01 – No. 20 E02	Ignition switch ON		10 – 14	FI-38
7	STA – E1	Cranking		6 – 14	FI-39
8	ISC1 – E1 ISC4	Ignition switch ON		10 – 14	FI –40
9	IGT – E1	Idling		0.7 – 1.0	FI –41
10	W – E1	No trouble ("CHECK" engine warning light off) and engine running		10 – 14	FI-42
11	A / C – E1	Air conditioning ON		10 – 14	FI-43

ECU Terminals

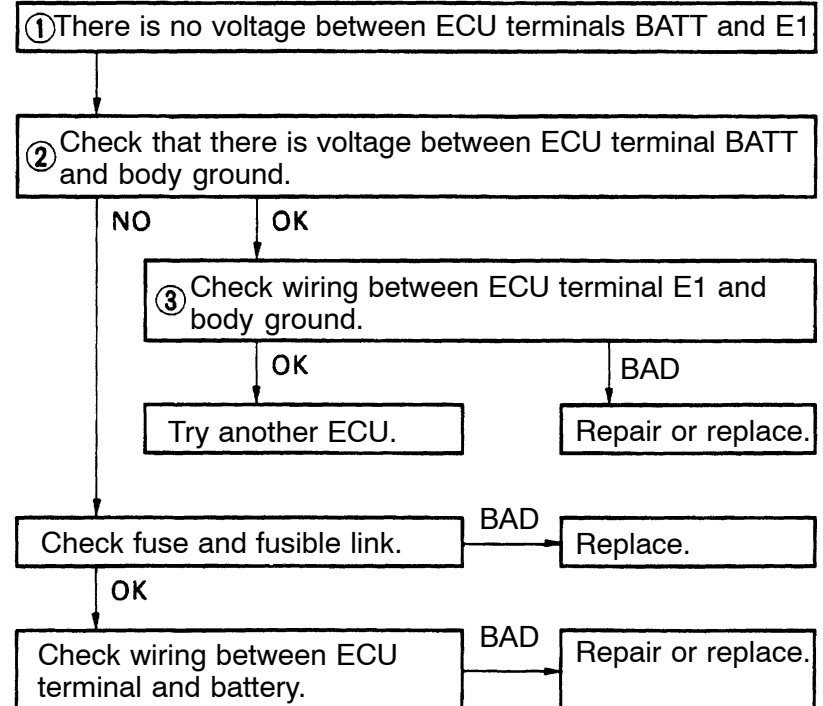
E01	No. 10	HT1	STJ	T	ISC 1	ISC 2	G $\ominus$	G1	-	NE	THG	OX1	THW	IGF	IGT	-	M-REL	EGR	SPD	FPU	THA	VS	VC	BATT	IG SW
E02	No. 20	HT2	E1	TWS	ISC 3	ISC 4	VF1	VF2	VTA	IDL	E11	OX2	E2	E22	-	4WD	STP	A/C	W	NSW	STA	AI	-	+ B	+ B1

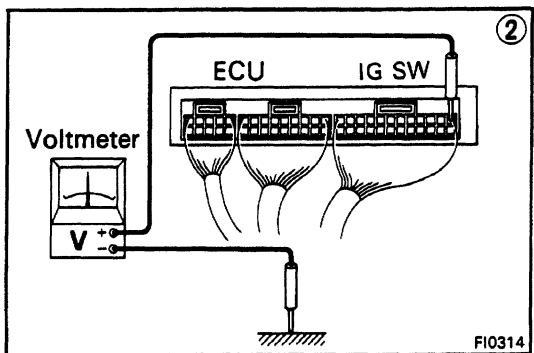
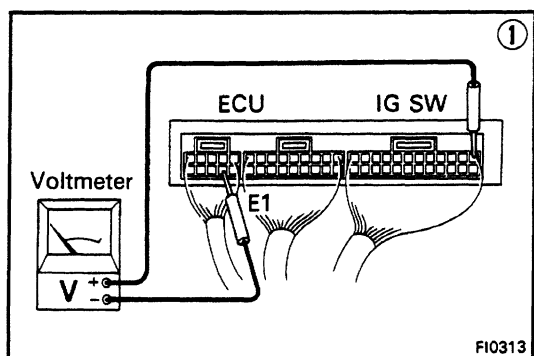
* California vehicles only

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

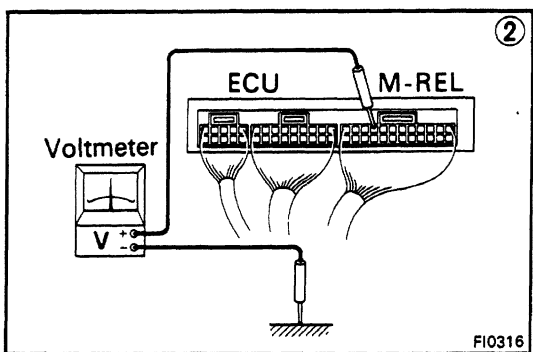
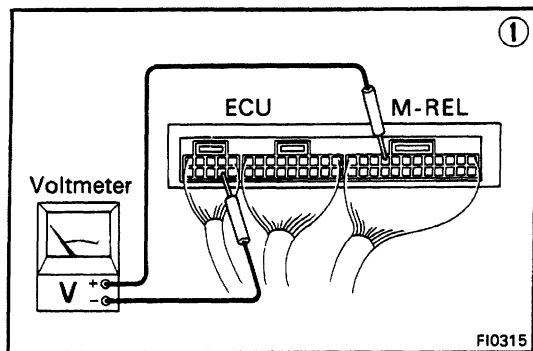
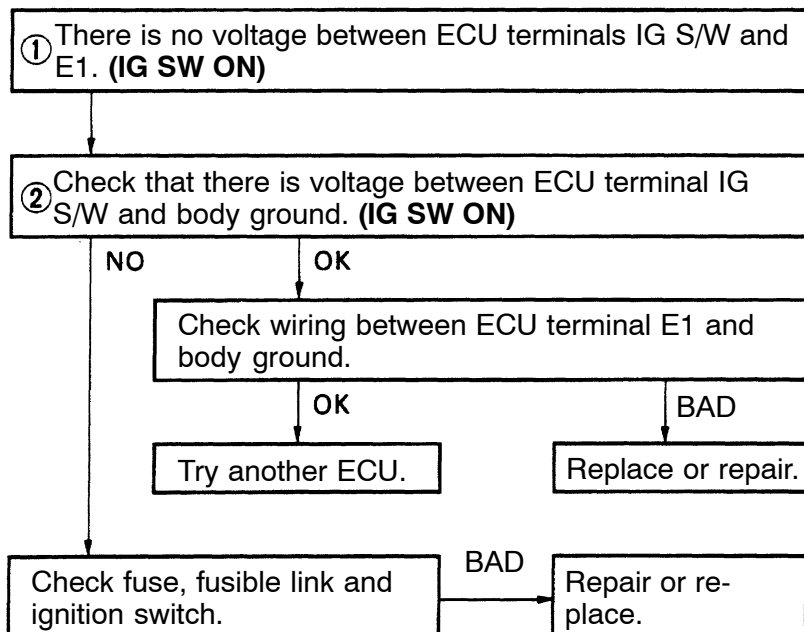


. BA[^] - EI

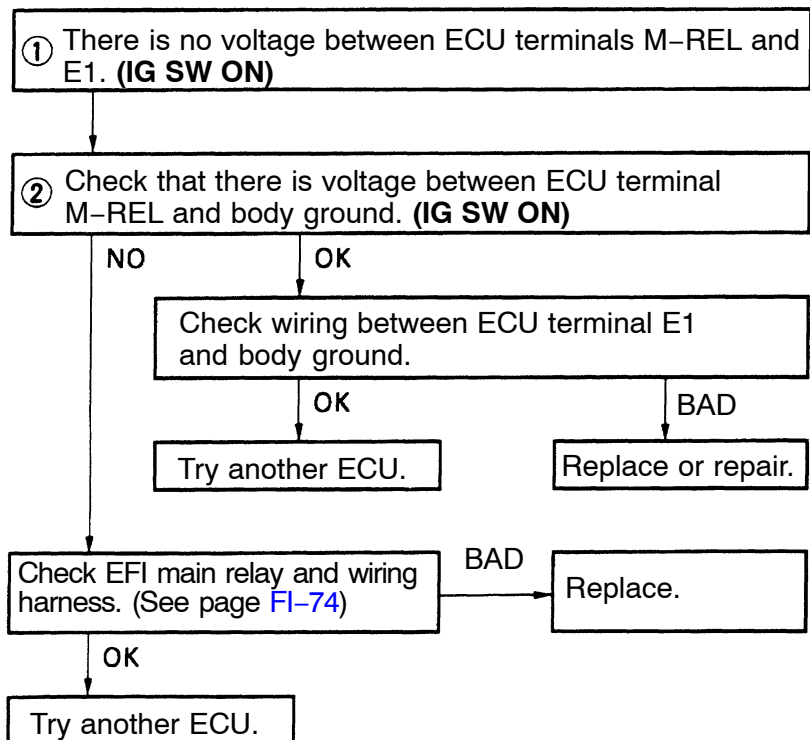


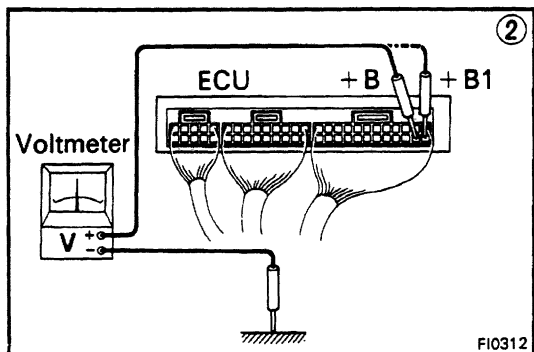
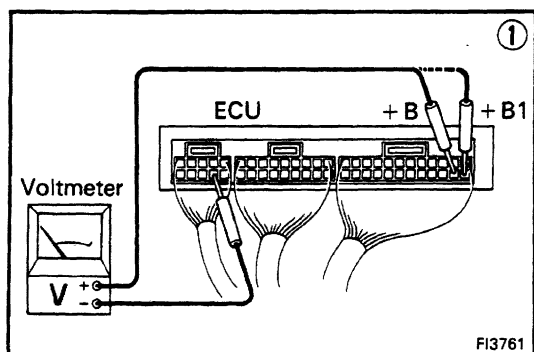


• IG SW- E1



• M-REL - E1





• +B (+B1) - E1

(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

Check wiring between ECU terminal E1 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.

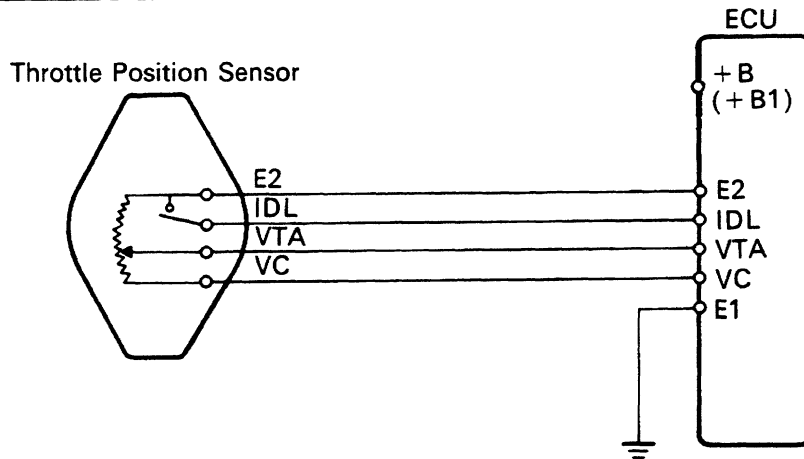
BAD

Replace.

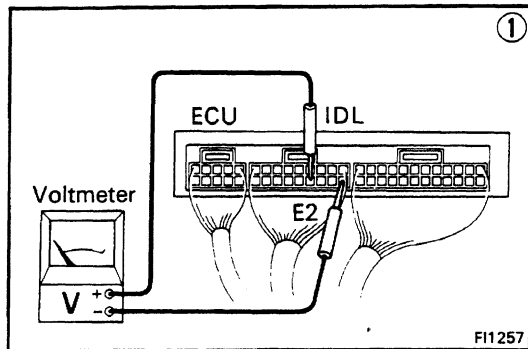
OK

Refer to M - RE L - E1 trouble section.

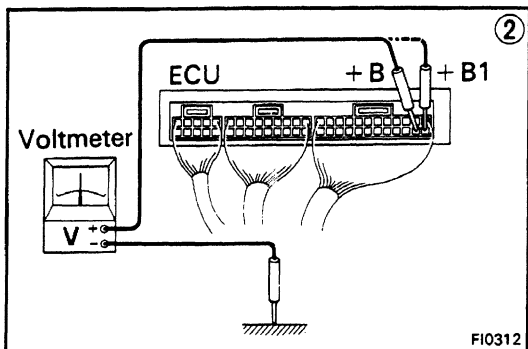
No.	Terminals	Trouble	Condition		STD Voltage
2	IDL – E2	No voltage	Ignition switch ON	Throttle valve open	4 – 6 V
	VC – E2				4 – 6 V
	VTA – E2			Throttle valve fully closed	0.1 – 1.0 V
				Throttle valve fully open	4 – 5 V



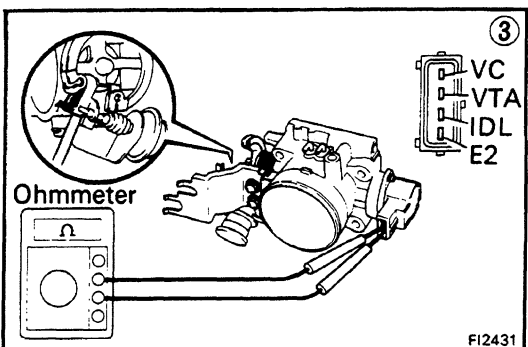
FI1366



FI1257



FI0312



FI2431

9 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.

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.

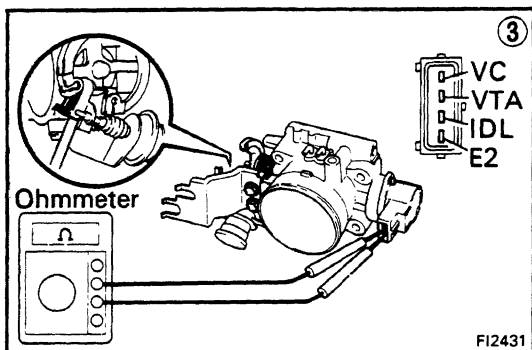
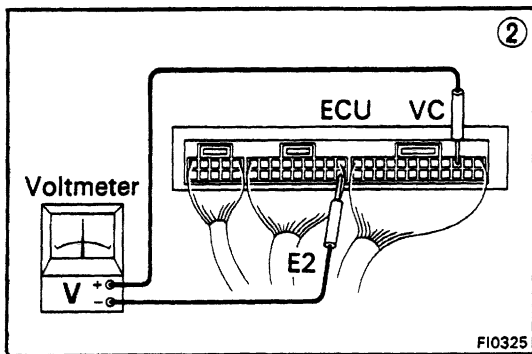
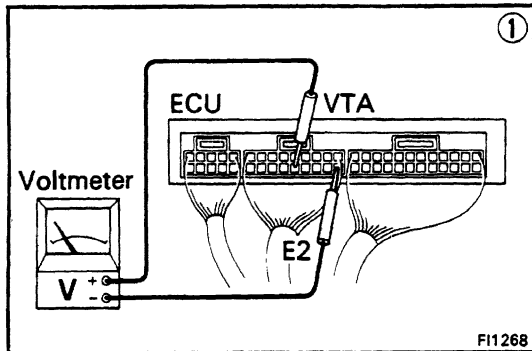
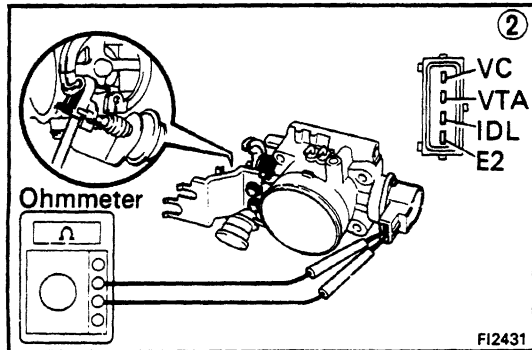
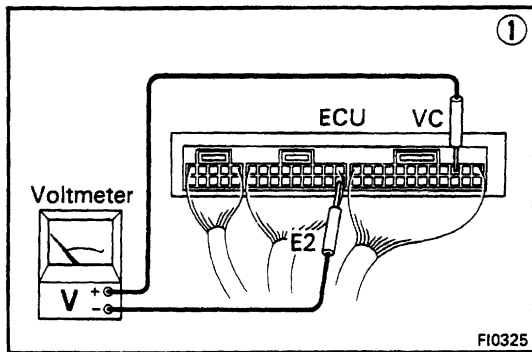
OK

Check wiring between ECU and throttle position sensor.

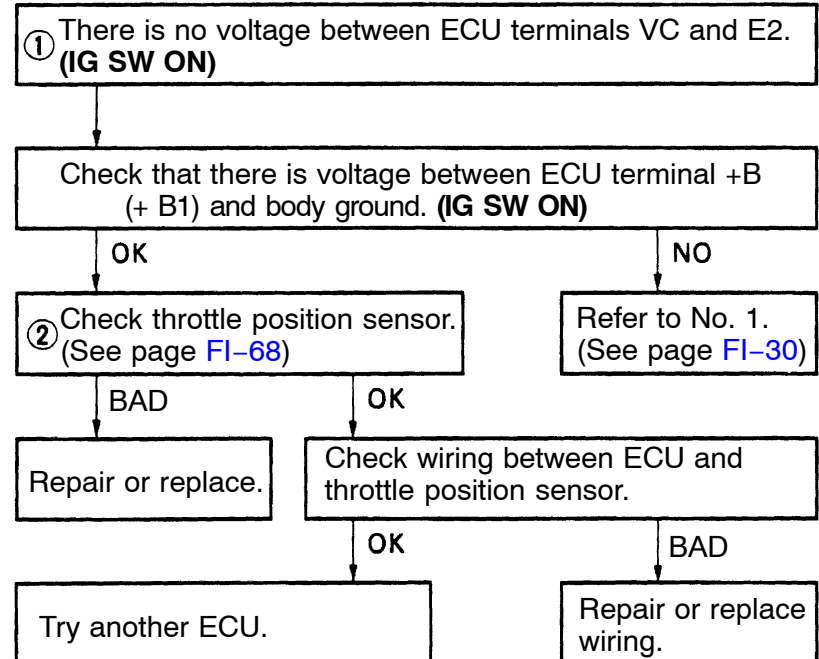
OK

Try another ECU.

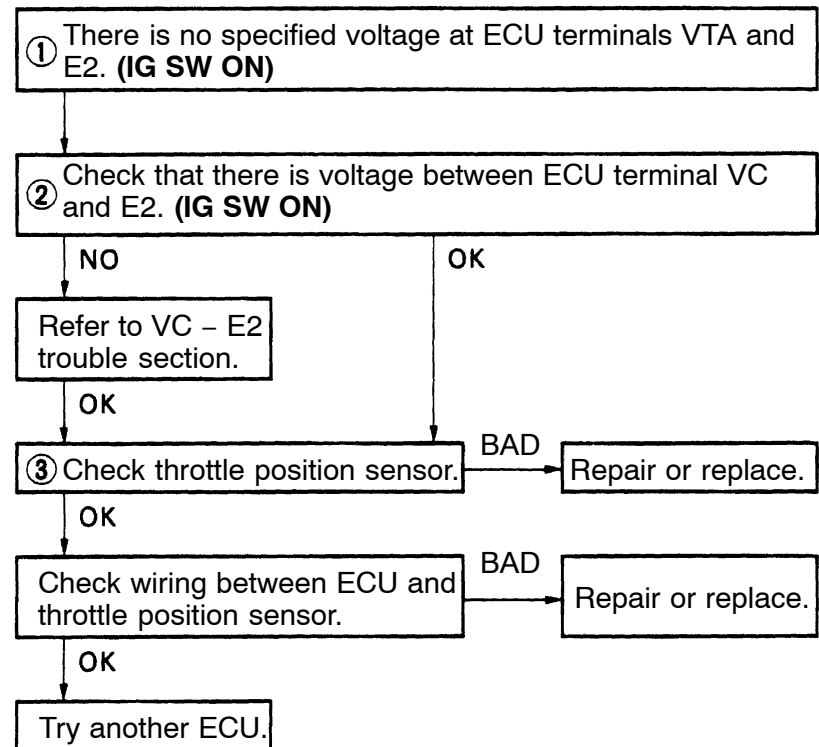
BAD



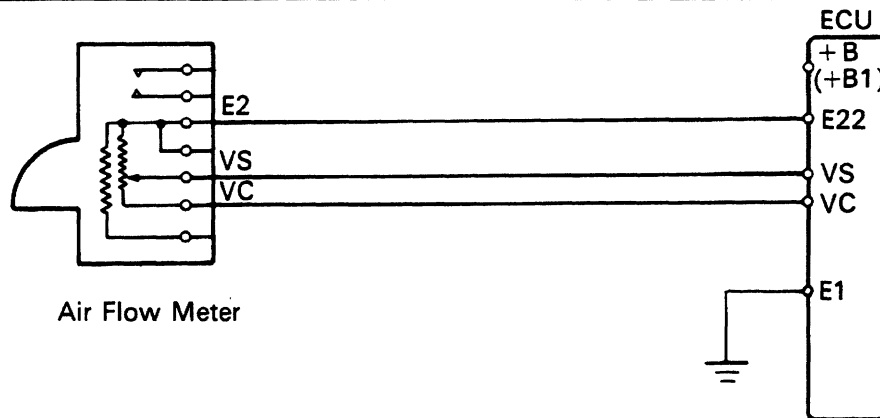
• VC - E2



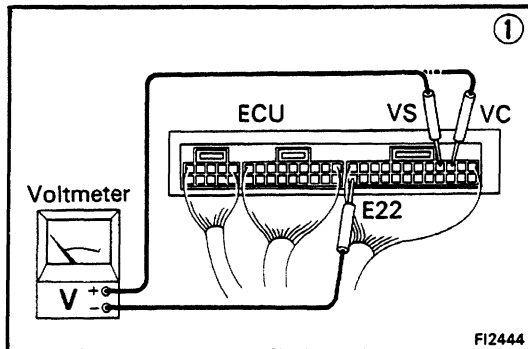
• VTA - E2



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



FI1269



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

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

OK

NO

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

Check wiring between ECU terminal E1 and body ground.

OK

BAD

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

BAD

OK

Repair or replace.

Replace air flow meter.

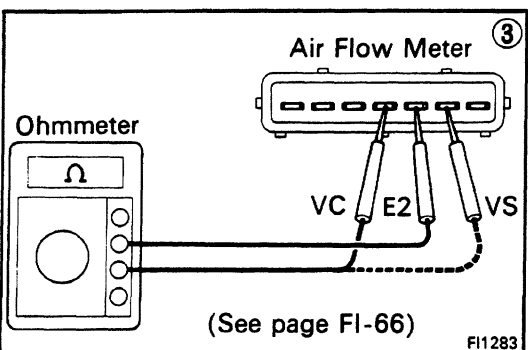
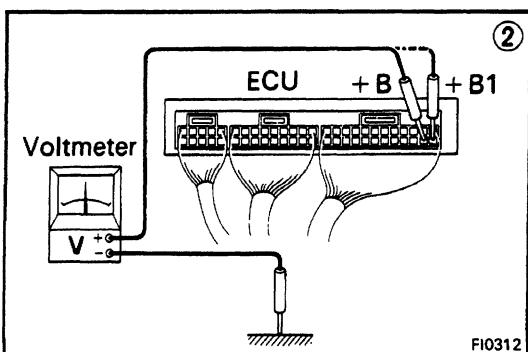
Check wiring between ECU and air flow meter.

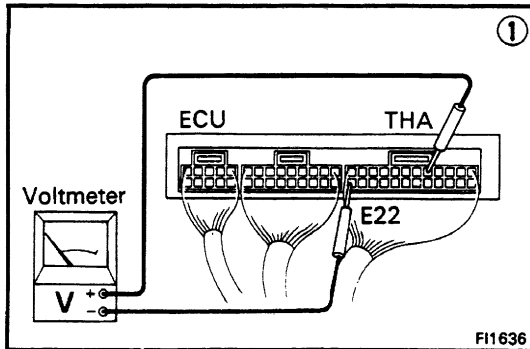
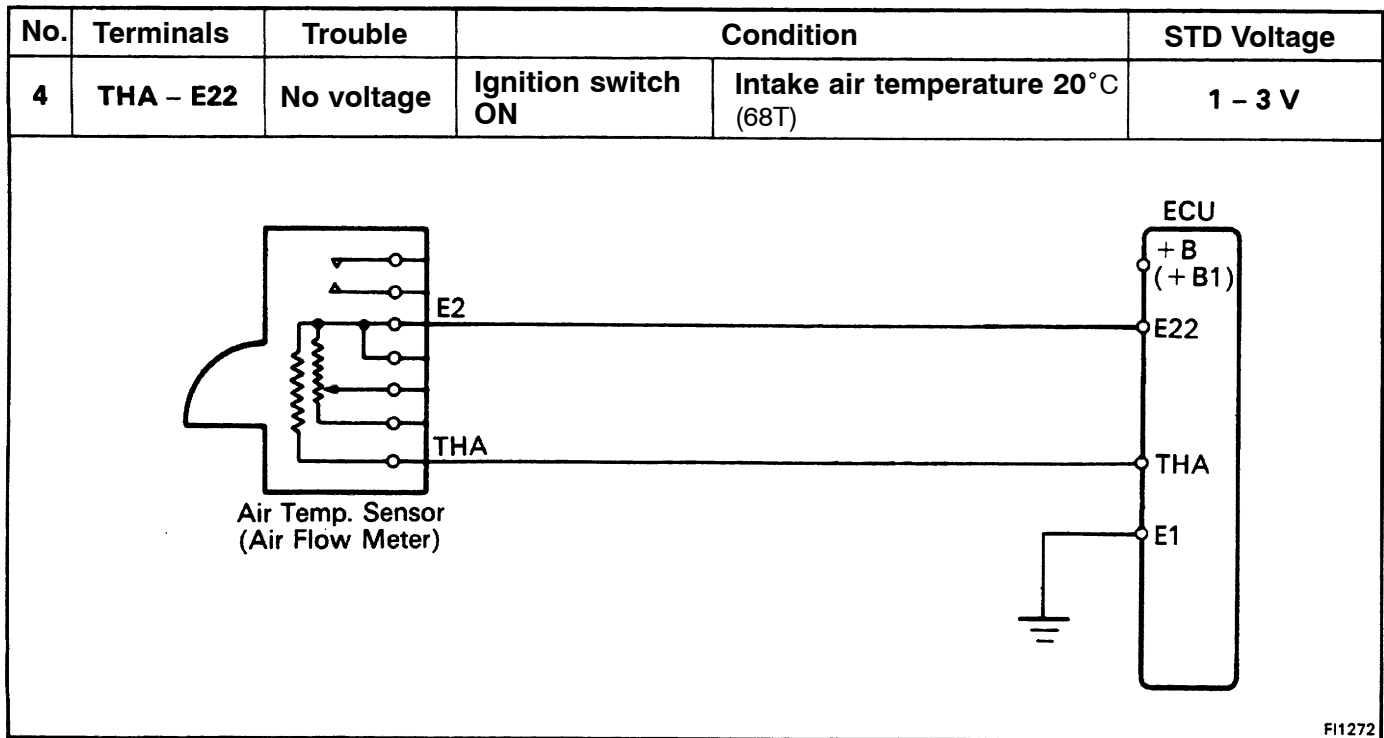
OK

BAD

Try another ECU.

Repair or replace.





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

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

OK

NO

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

Check wiring between ECU terminal E1 and body ground.

OK

BAD

③ Check air temp. sensor.
(See page FI-66)

Repair or replace.

BAD

OK

Replace air flow meter.

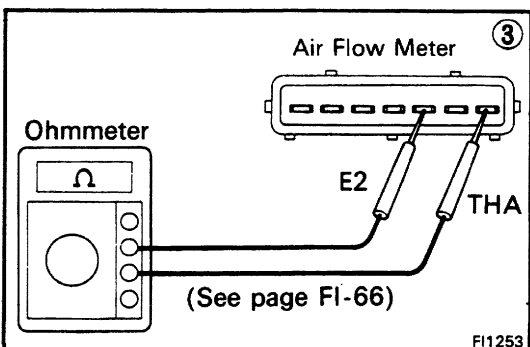
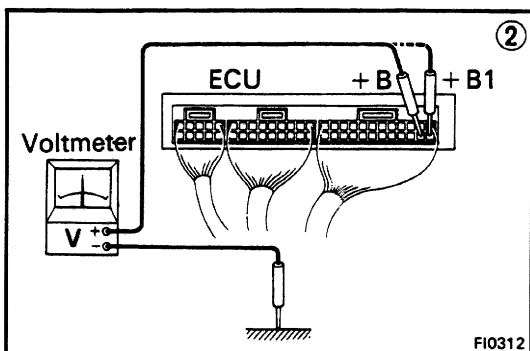
Check wiring between ECU and air temp. sensor.

OK

BAD

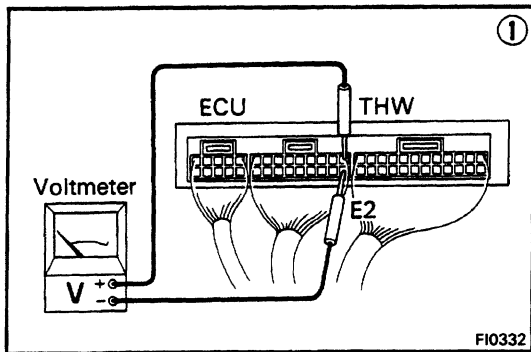
Try another ECU.

Repair or replace.



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

FI0487



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

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

OK

NO

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

Check wiring between ECU terminal E1 and body ground.

OK

BAD

Repair or replace.

③ Check water temp. sensor.
(See page FI-77)

BAD

OK

Replace water temp. sensor.

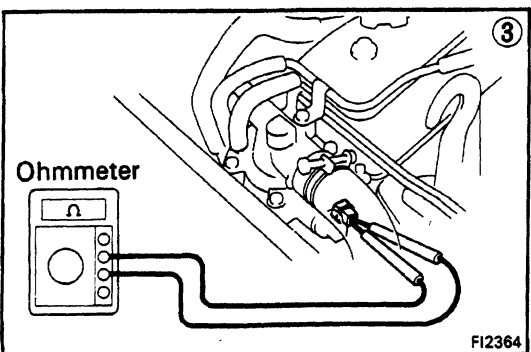
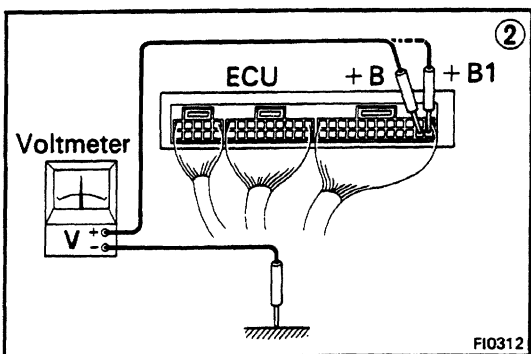
Check wiring between ECU and water temp. sensor.

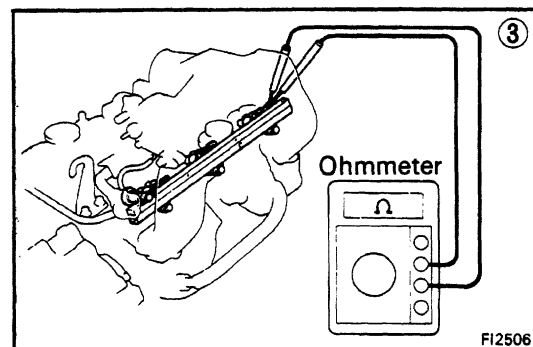
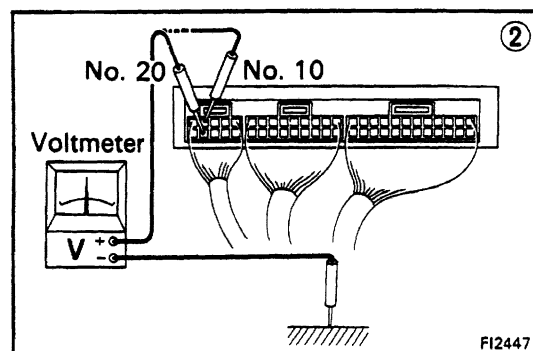
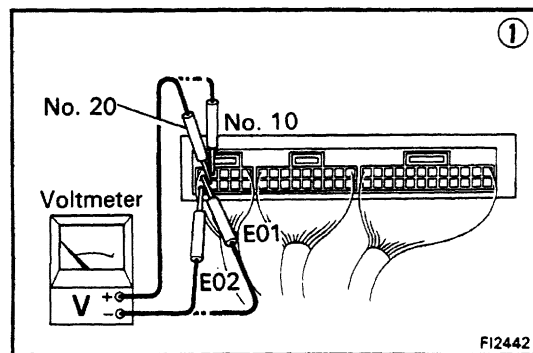
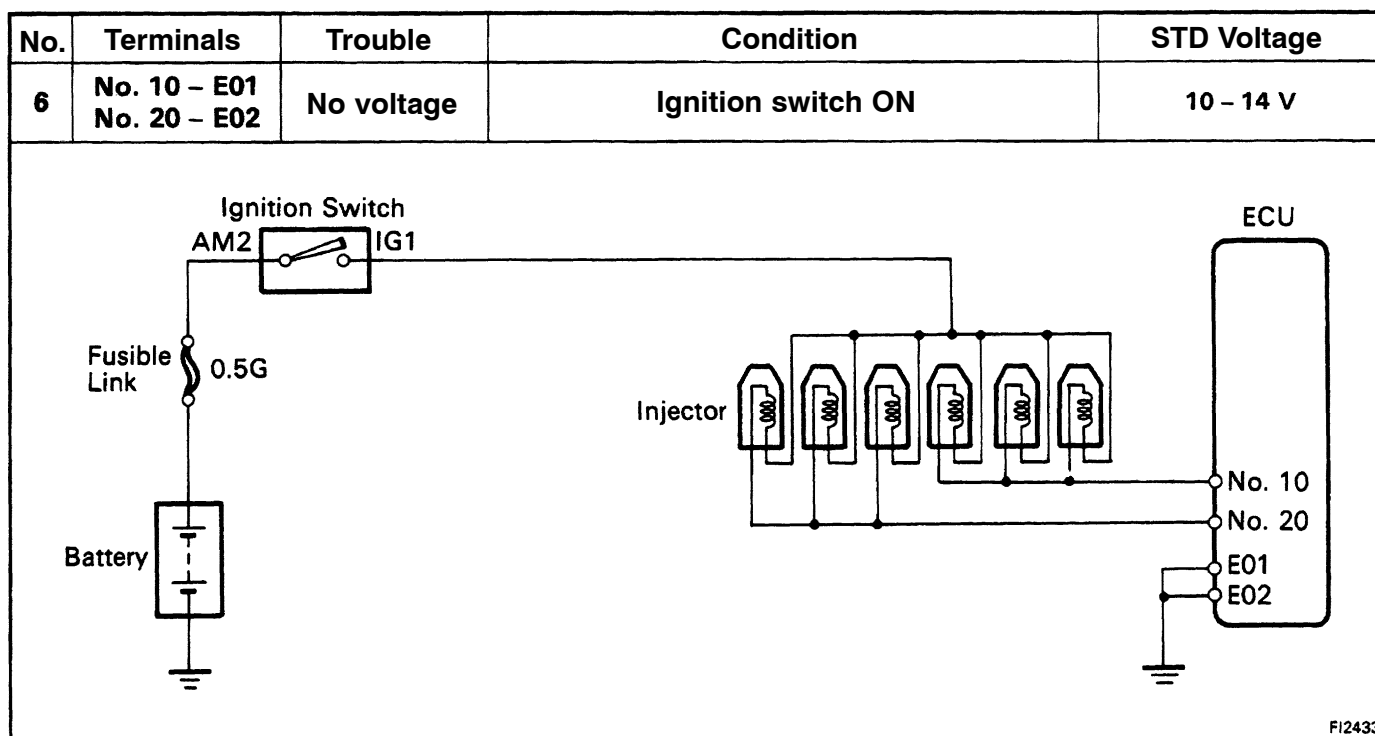
OK

BAD

Try another ECU.

Repair or replace.





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

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

NO OK

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

OK

Try another ECU.

BAD

Repair or replace.

Check fusible link and ignition switch.

BAD

Repair or replace.

OK

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

OK

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

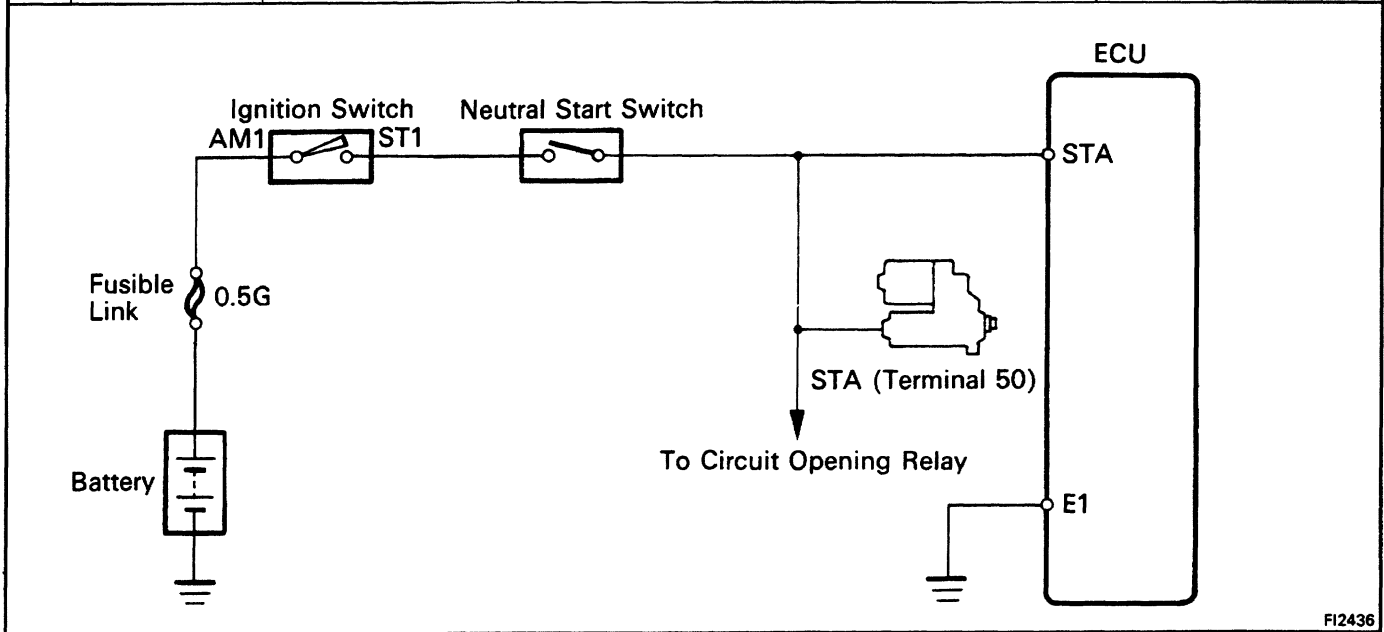
BAD

Repair or replace.

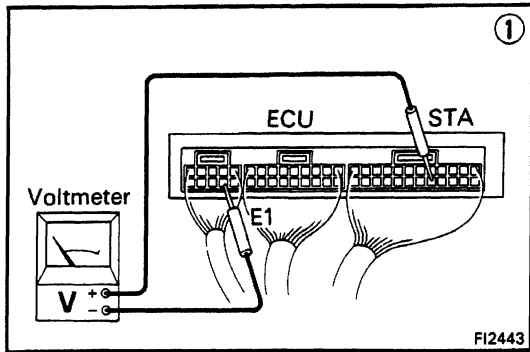
BAD

Replace injector.

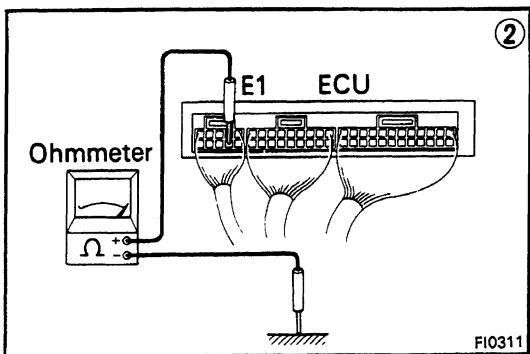
No.	Terminals	Trouble	Condition	STD Voltage
7	STA - E1	No voltage	Cranking	6 - 14 V



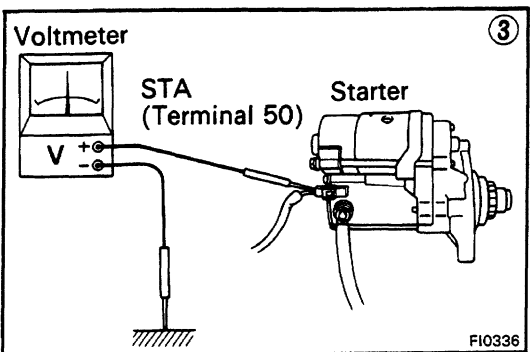
FI2436



FI2443



FI0311



FI0336

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.

BAD

OK

BAD

Repair or replace.

② Check wiring between ECU terminal E1 and body ground.

OK

BAD

Try another ECU.

Repair or replace.

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

OK

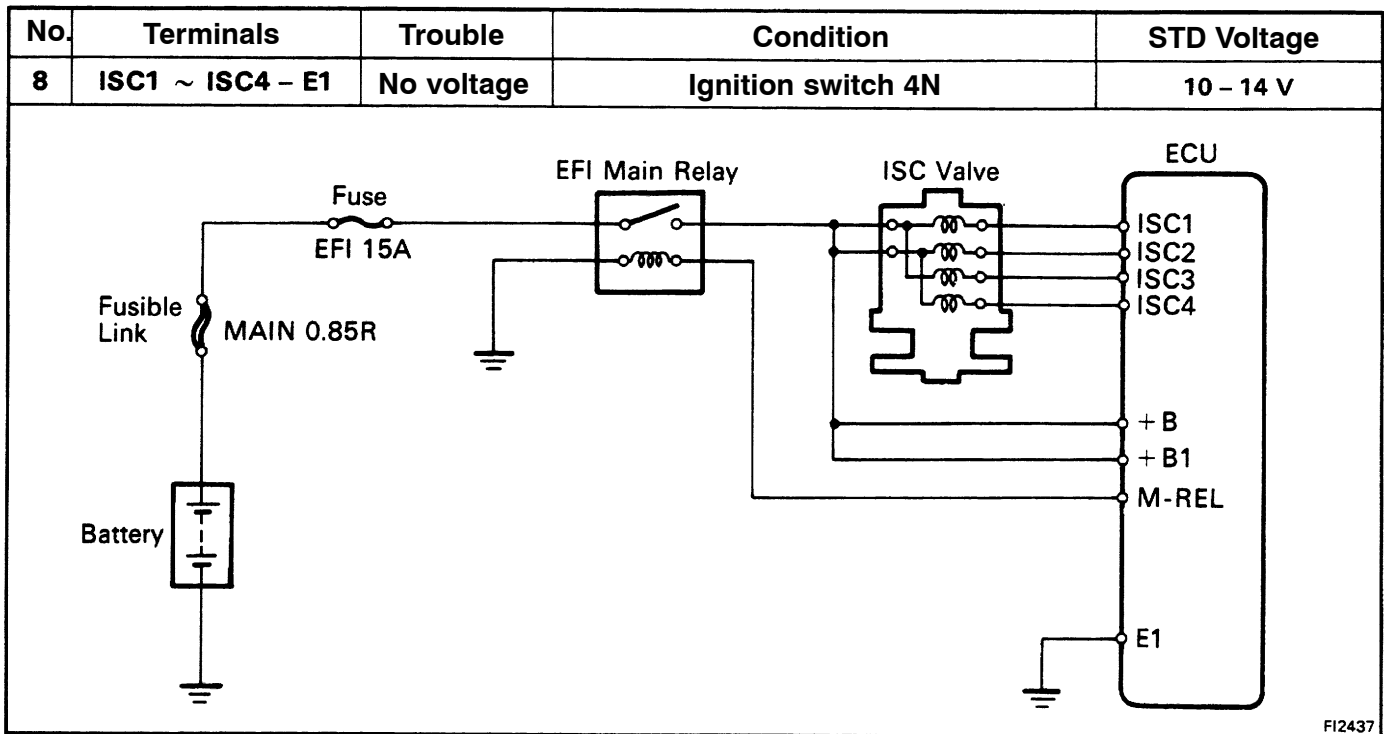
③ Check that there is voltage at STA (50) terminal of starter. (IG SW START) STD voltage: 6-14V

OK

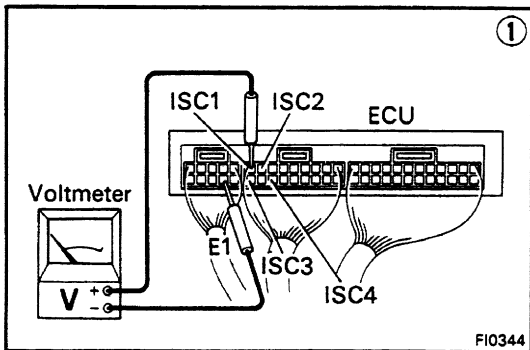
NO

Check starter.

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



FI2437



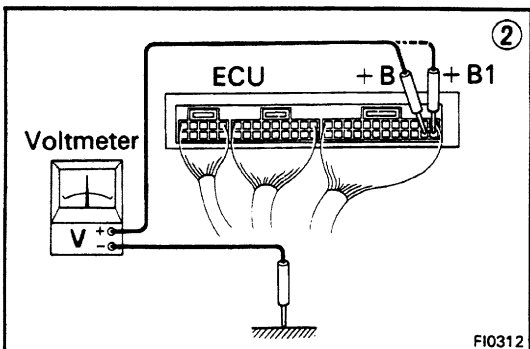
① There is no voltage between ECU terminals ISC1 ~ ISC4 and E1. (IG SW ON)

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

OK

NO

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



Check wiring between ECU terminal E1 and body ground.

OK

BAD

③ Check ISC valve.
(See page FI-71)

Repair or replace.

BAD

OK

Replace ISC valve.

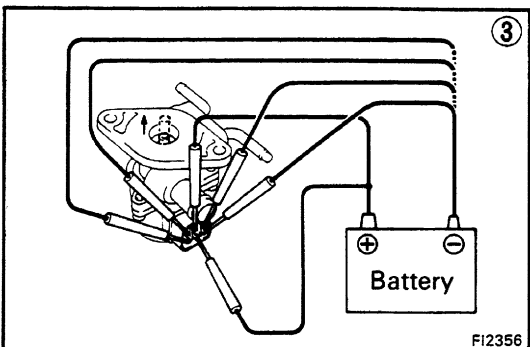
Check wiring between ECU and EFI main relay.

OK

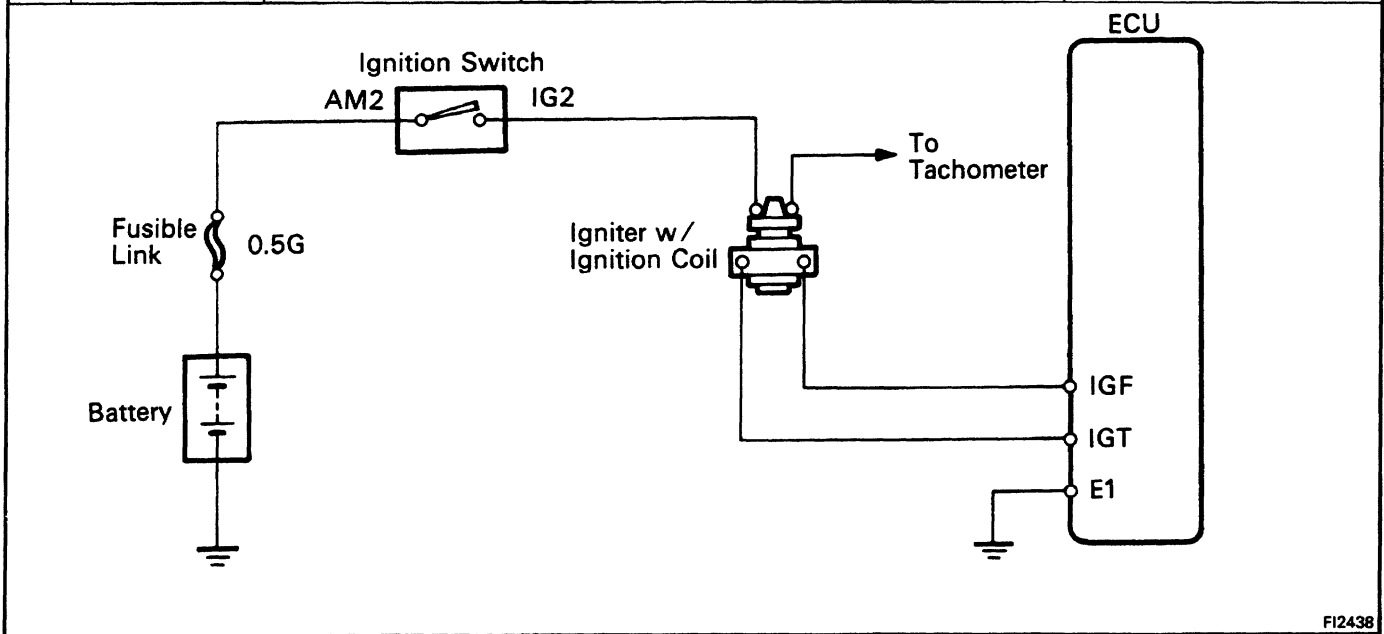
BAD

Try another ECU.

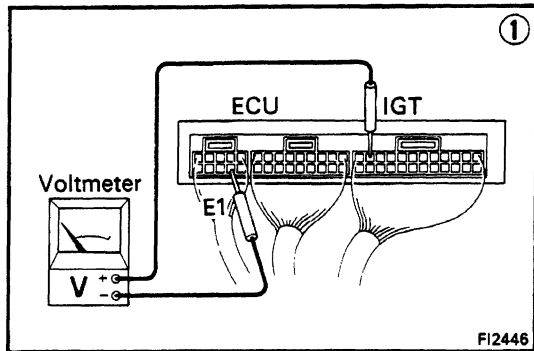
Repair or replace.



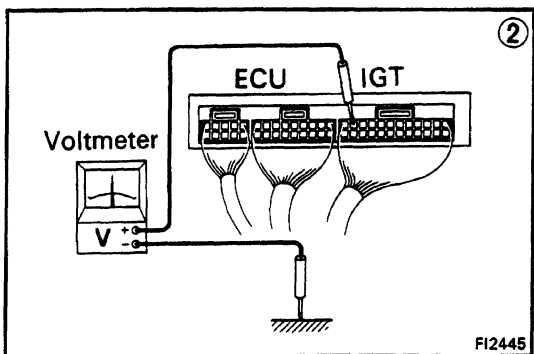
No.	Terminals	Trouble	Condition	STD Voltage
9	IGT - E1	No voltage	Idling	0.7 - 1.0 V



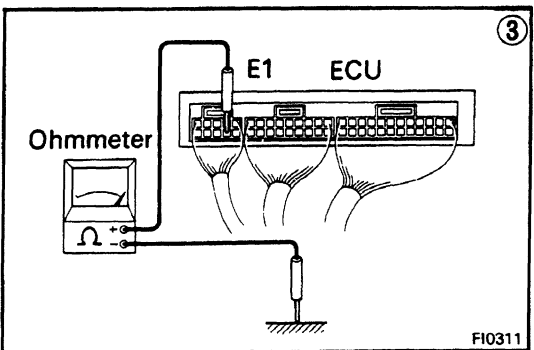
FI2438



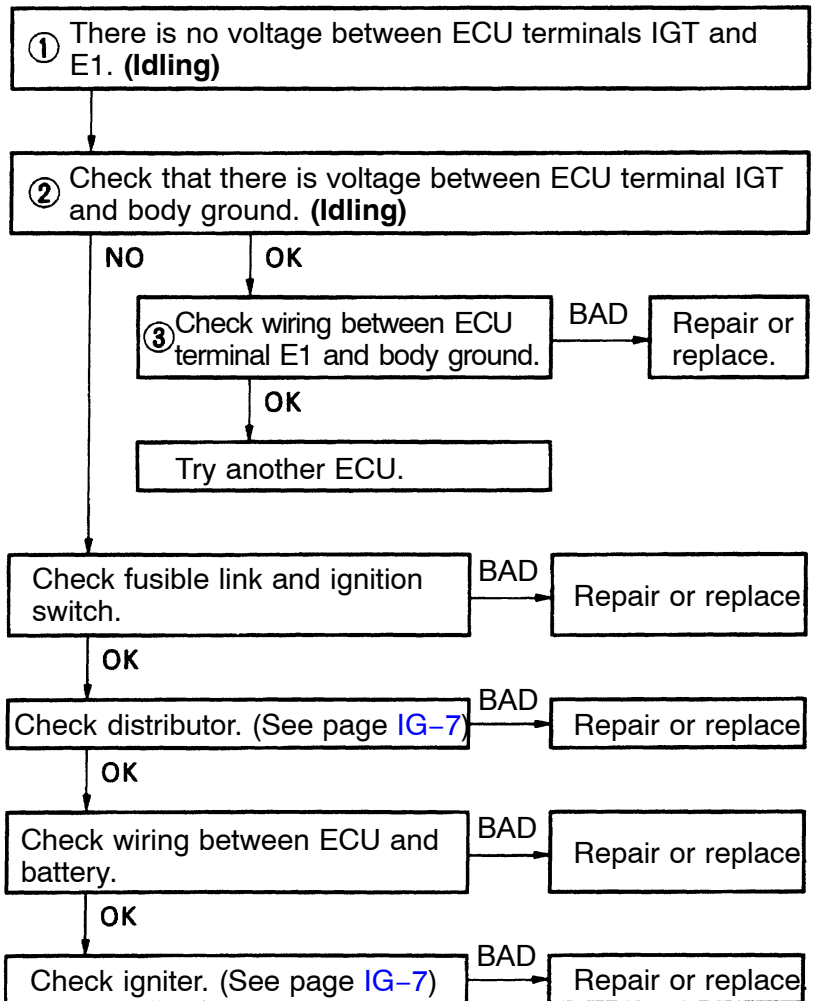
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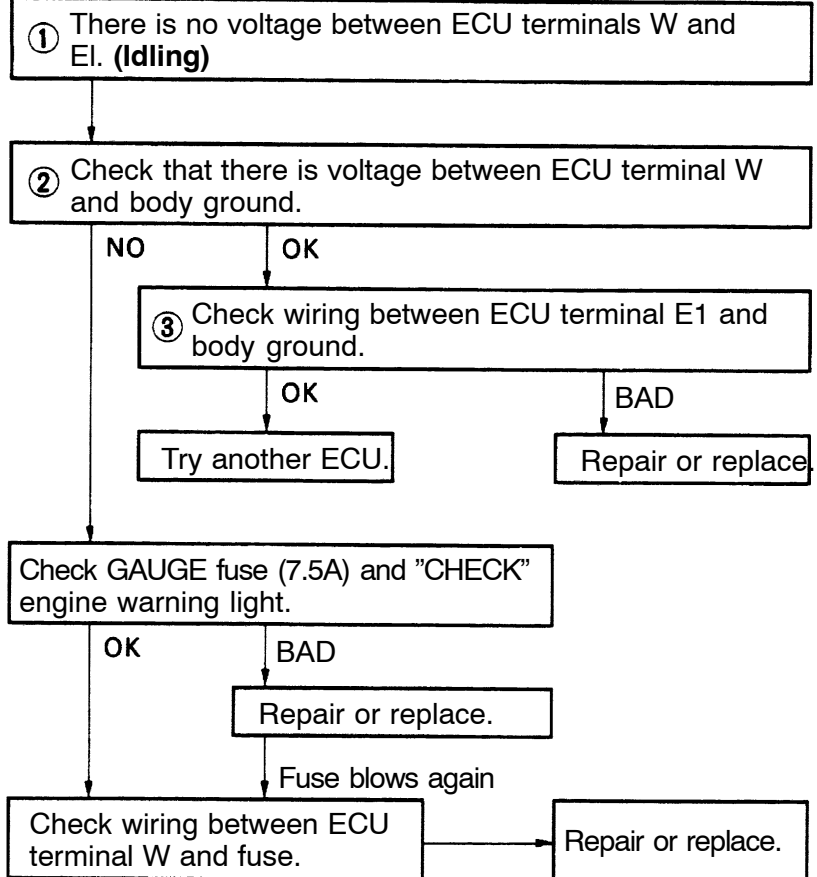
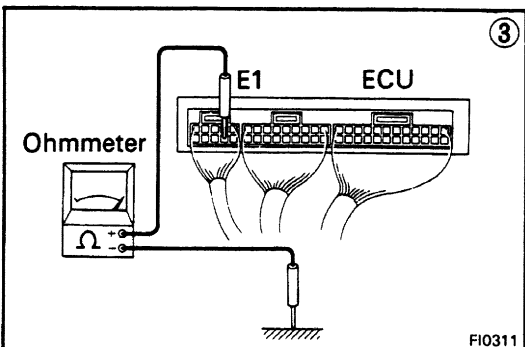
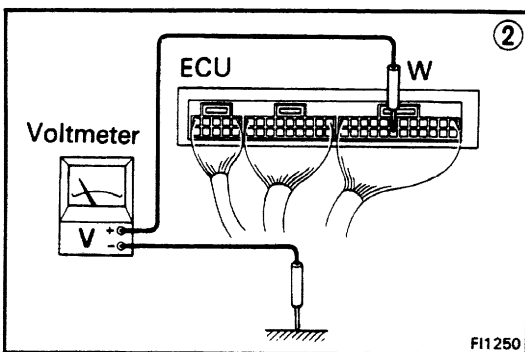
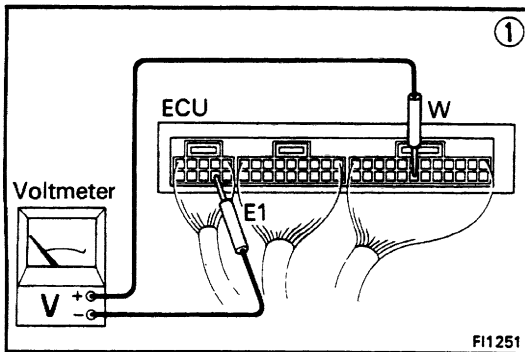
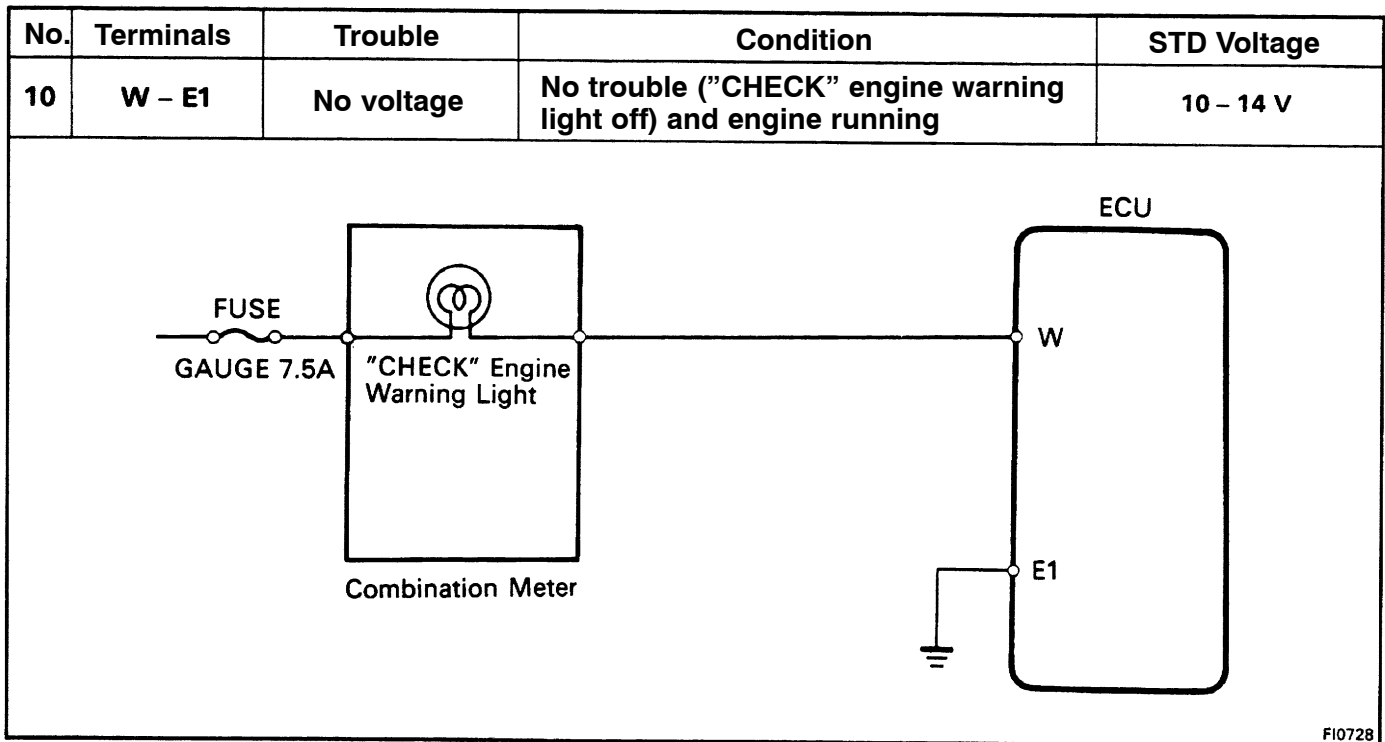


FI2445

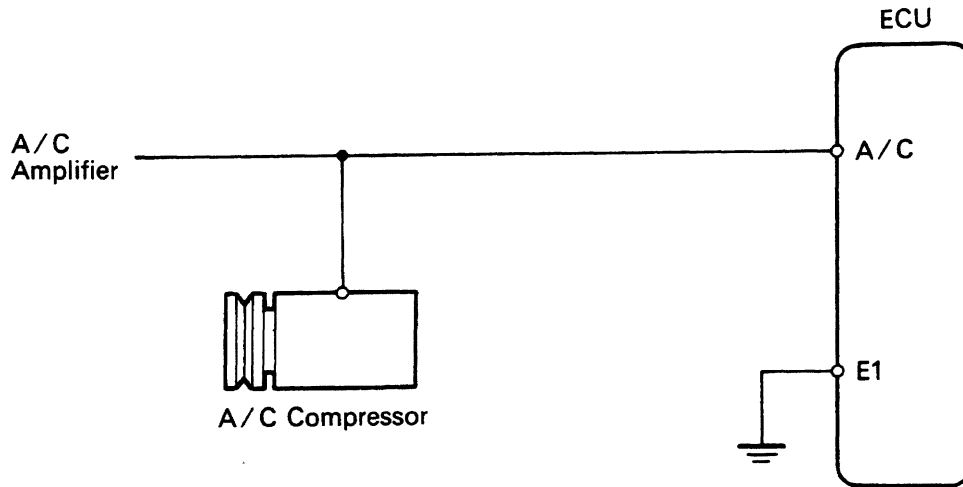


FI0311

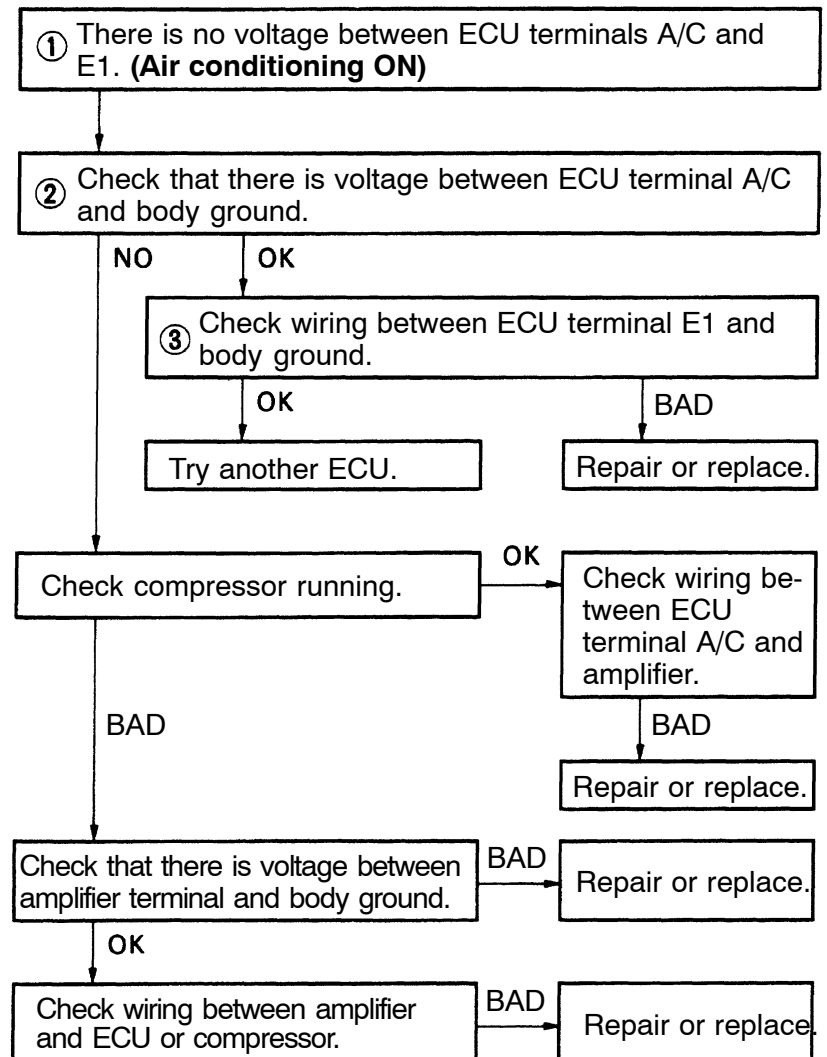
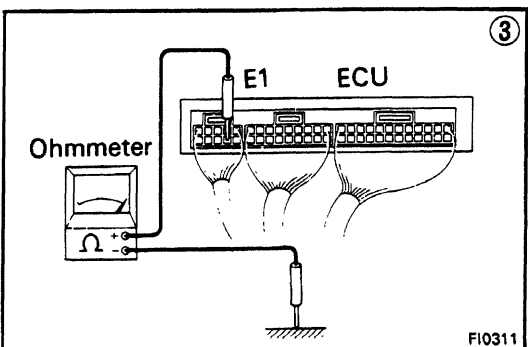
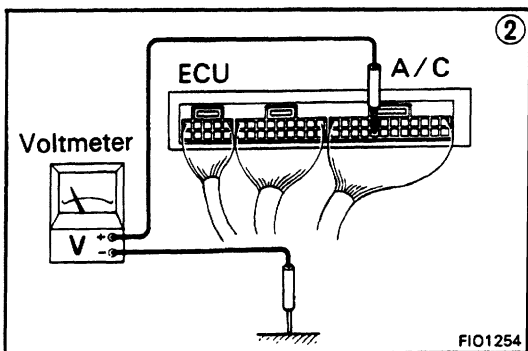
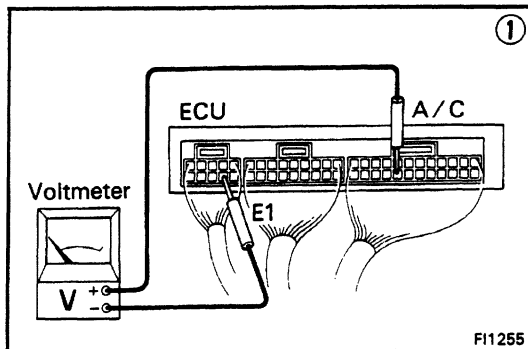


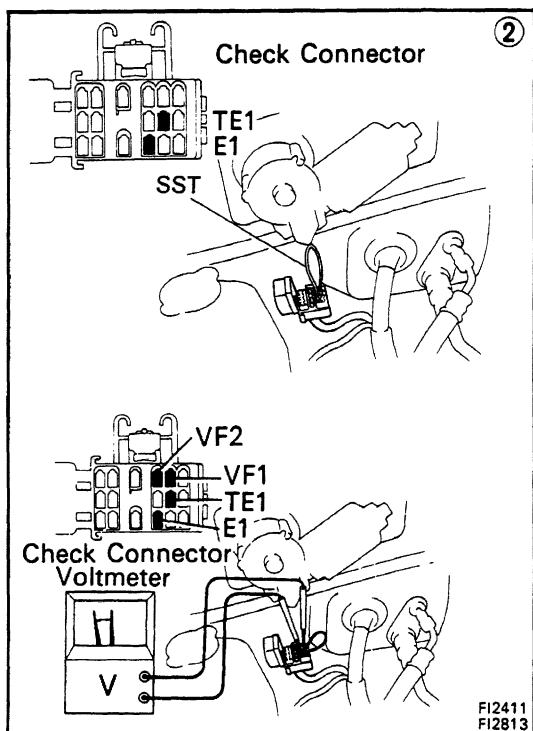
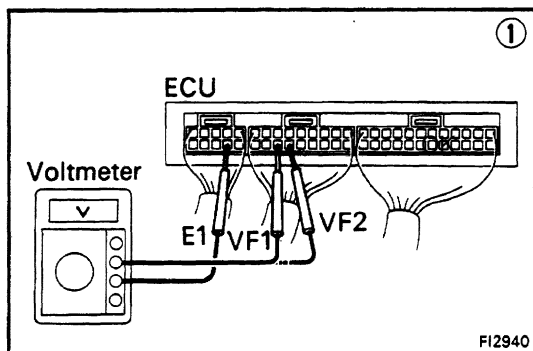
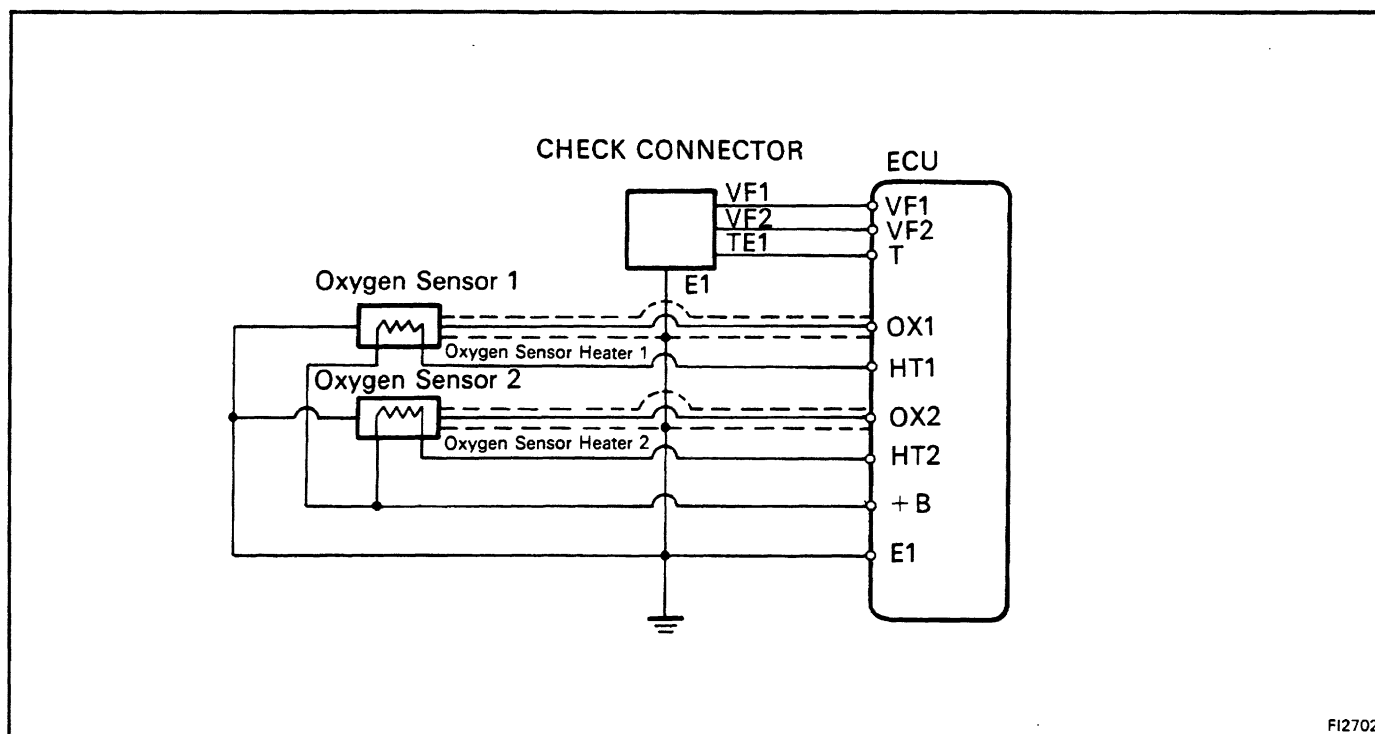


No.	Terminals	Trouble	Condition	STD Voltage
11	A/C - E1	No voltage	Air conditioning ON	10 - 14 V



FI0922





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

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

NO

OK

Check wiring between ECU terminal E1 and body ground.

OK

BAD

Try another ECU.

Repair or replace.

Check for suction of air into exhaust system.

BAD

Repair air suction.

OK

Check for air leak from air intake system.

BAD

Repair air leak.

OK

Check spark plugs.

BAD

Repair or replace.

OK

Check distributor and ignition system.

BAD

Repair or replace.

OK

Check fuel pressure.

BAD

Repair or replace.

OK

Check injectors.

BAD

Repair or replace.

OK

Check cold start injector.

BAD

Repair or replace.

OK

Check air flow meter.

BAD

Repair or replace.

OK

Check operation of oxygen sensors.

OK

System normal.

BAD

Check wiring between oxygen sensors and ECU connectors.

BAD

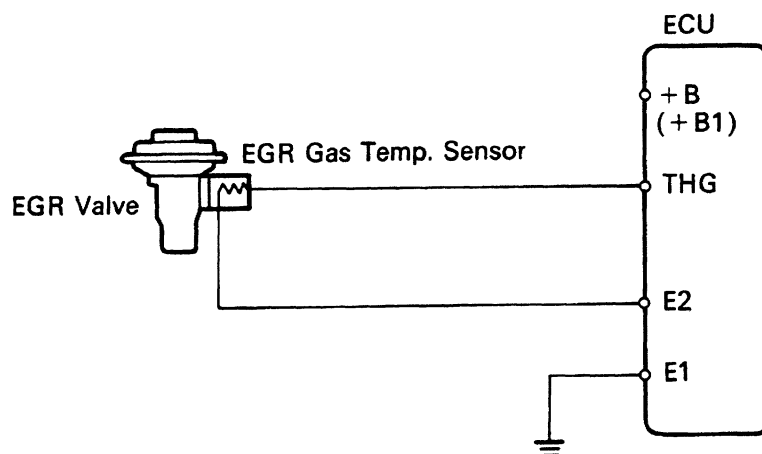
Repair wiring.

OK

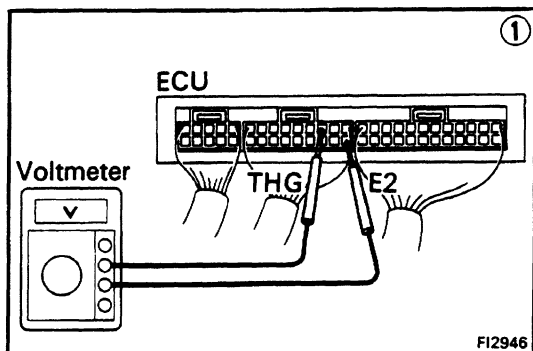
Replace oxygen sensors.

* Rich malfunction only

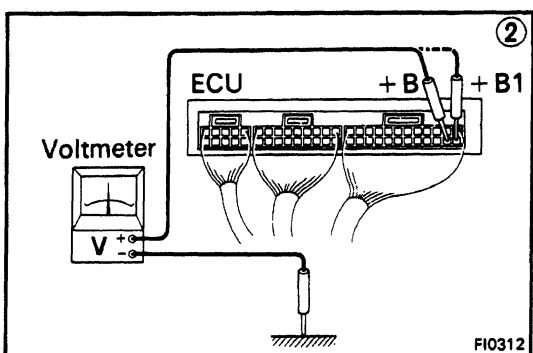
California vehicles only



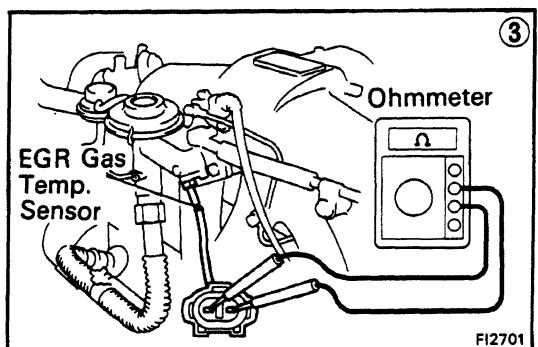
FI2680



FI2946



FI0312



FI2701

① No voltage between ECU terminals THG and E2. (IG SW ON)

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

OK

NO

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

Check wiring between ECU terminal E1 and body ground.

OK

BAD

Repair or replace.

Check EGR system.

BAD

Repair or replace.

OK

③ Check EGR gas temp. sensor. (See page FI-79)

BAD

OK

Replace EGR gas temp. sensor.

Check wiring between ECU and EGR gas temp. sensor.

OK

BAD

Try another ECU.

Repair or replace