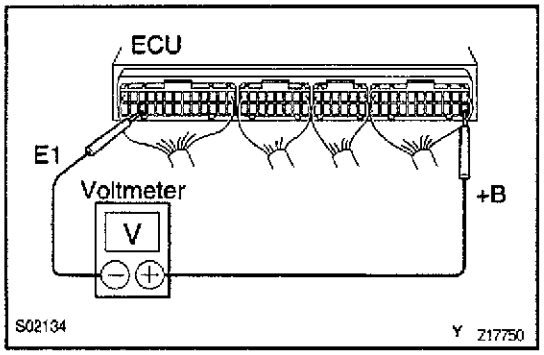
TROUBLESHOOTING w/ VOLT, OHMMETER

EG129-0E

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 while referring to the inspection methods described in this manual.
- Before beginning inspection, it is best to first make a simple check of the fuses, H—fuses and the condition of the connectors.
- The following troubleshooting procedures are based on the supposition that the trouble lies in either a short or open circuit 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.



EFI SYSTEM CHECK PROCEDURE

EG6N7-02

PREPARATION

Disconnect the ECU from the vehicle body.
(See engine ECU)
HINT:

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

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

E99QY-04

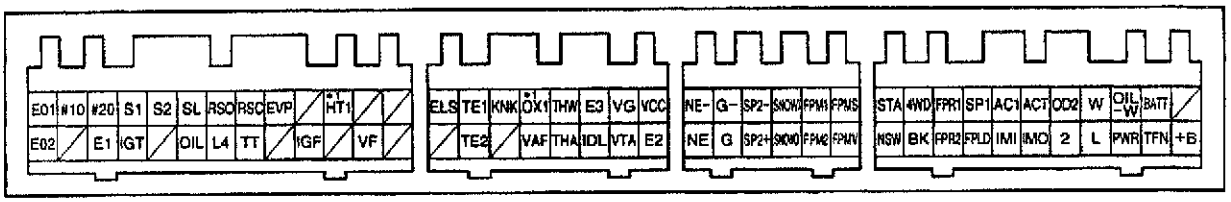
Engine (& ECT) ECU Terminals

EG

Symbol	Connection	Symbol	Connection	Symbol	Connection
E01	POWER GROUND	ELS	TAILLIGHT RELAY, DEFOGGER RELAY	FPMS	FUEL TANK CHANGEOVER SWITCH
E02	POWER GROUND		–	FPMV	FUEL TANK SOLENOID RETURN VALVE
#10	INJECTOR	*TE1	CHECK CONNECTOR	STA	STARTER RELAY
	–	TE2	CHECK CONNECTOR	NSW	NEUTRAL START SWITCH
#20	INJECTOR	KNK	KNOCK SENSOR	4WD	TRANSFER 4WD DETECTION SWITCH
E1	ECU GROUND		–	BK	STOP LIGHT SWITCH
*S1	ECT SOLENOID (NO.1)	*1OX1	OXYGEN SENSOR	FPR1	CIRCUIT OPENING RELAY
IGT	IGNITER	VAF	VARIABLE RESISTER	FPR2	SUB FUEL PUMP RELAY
*S2	ECT SOLENOID (NO.2)	THW	WATER TEMP. SENSOR	SP1	VEHICLE SPEED SENSOR
	–	THA	INTAKE AIR TEMP. SENSOR	FPLD	DOUBLE TANK INDICATOR
*SL	ECT SOLENOID (NO.3)	E3	SENSOR GROUND	AC1	A/C AMPLIFIER
*OIL	A/T FLUID TEMP. SENSOR	IDL	THROTTLE POSITION SENSOR	IMI	TRANSPONDER KEY COMPUTER
RSO	ISC VALVE	VG	AIR FLOW METER	ACT	A/C AMPLIFIER
L4	SHIFT POSITION SWITCH	VTA	THROTTLE POSITION SENSOR	IMO	TRANSPONDER KEY COMPUTER
RSC	ISC VALVE	VCC	THROTTLE POSITION SENSOR	*OD2	O/D MAIN SWITCH
TT	CHECK CONNECTOR	E2	SENSOR GROUND	*2	NEUTRAL START SWITCH
EVP	VSV FOR EVAP	NE–	CRAKSHAFT POSITION SENSOR	W	WARNING LIGHT
	–	NE	CRAKSHAFT POSITION SENSOR	*L	NEUTRAL START SWITCH
	–	G–	DISTRIBUTOR	*OIL-W	A/T OIL TEMP. LIGHT
IGF	IGNITER	G	DISTRIBUTOR	*PWR	PATTERN SELECT SWITCH
*1HT1	OXYGEN SENSOR HEATER	*SP2–	VEHICLE SPEED SENSOR	BATT	BATTERY
	–	*SP2+	VEHICLE SPEED SENSOR	*TFN	TRANSFER NEUTRAL DETECTION SWITCH
	–	*SNOW1	SECOND START SWITCH		–
VF	CHECK CONNECTOR	*SNOW0	SECOND START LIGHT	+B	EFI MAIN RELAY
	–	FPM1	MAIN FUEL PUMP		
	–	FPM2	SUB FUEL PUMP		

*** : A/T only**
***1 : Except Australia**

ECU Terminals



P01399

V08019

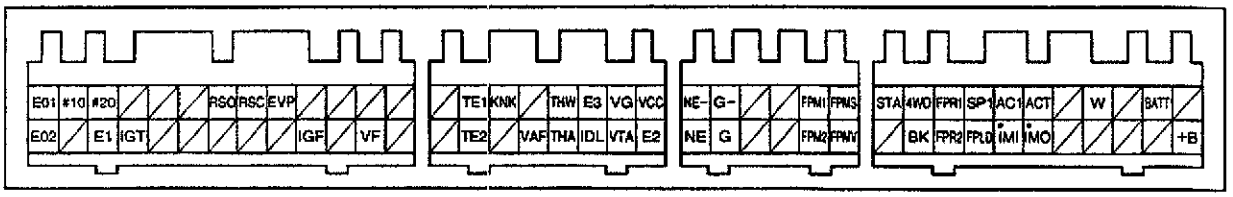
EG57D–06

Engine (& ECT) ECU Wiring Connectors Voltage

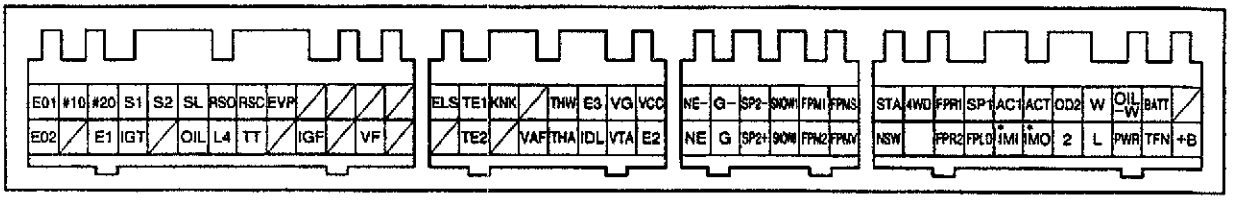
No.	Terminals	Condition			STD voltage (V)	See page
1	BATT – E1	No voltage			9 – 14	EG – 150
	+B – E1	No voltage		IG SW ON	9 – 14	EG – 150
2	IDL – E2	No voltage	Ignition switch ON	Throttle valve open	9 – 14	EG – 152
	VCC – E2			–	4.5 – 5.5	
	VTA – E2			Throttle valve fully closed	0.3 – 0.8	
				Throttle valve fully open	3.2 – 4.9	
3	#10 – E01 #20 – E02	IG SW ON			9 – 14	EG – 154
4	THA – E2	IG SW ON	Intake air temp. 20°C (68°F)		0.5 – 3.4	EG – 155
5	THW – E2		Coolant temp. 80°C (176°F)		0.2 – 1.0	EG – 156
6	STA – E1	Cranking			6 or more	EG – 157
7	IGF – E1	IG SW ON	Igniter connector disconnected		4.5 – 5.5	EG – 158
	IGT – E1	Idling			Pulse generation	
8	RSC, RSO – E1	IG SW ON	ECU Connector disconnected		9 – 14	EG – 159
9	W – E	No trouble (Check engine warning lightoff) and engine running			9 – 14	EG – 160

ECU Terminals *** : w/ Engine Immobiliser System**

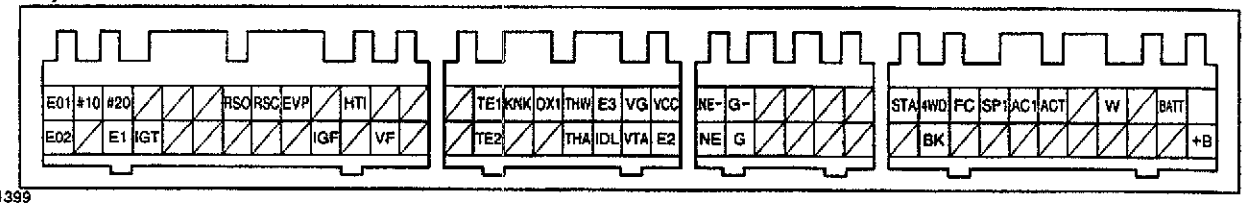
For M/T



For A/T



Except Australia

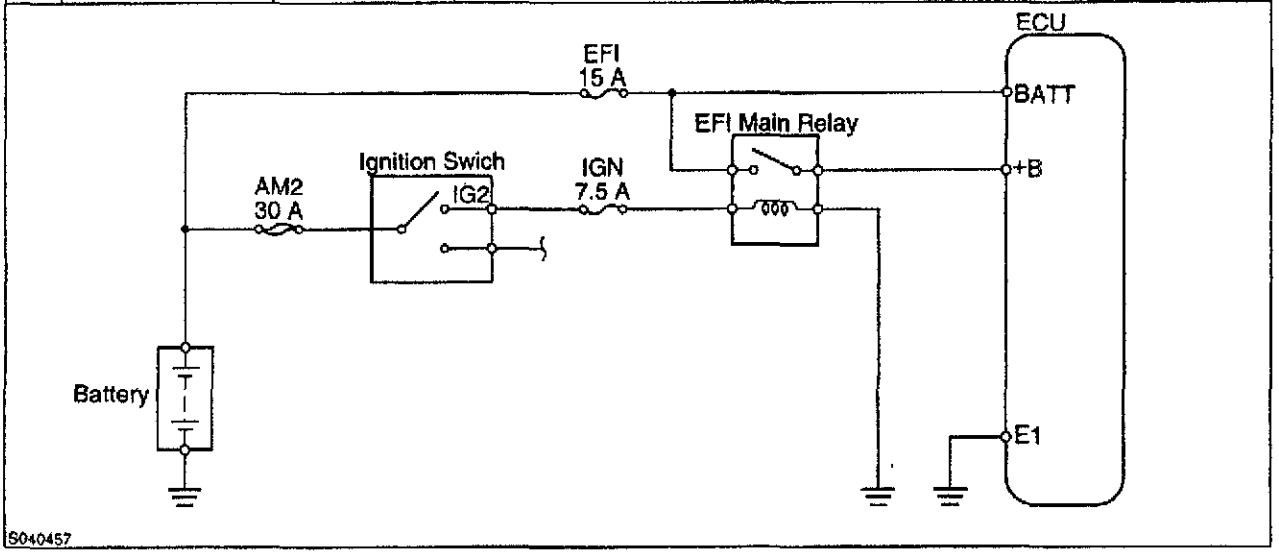


P01399
P01399
P01399

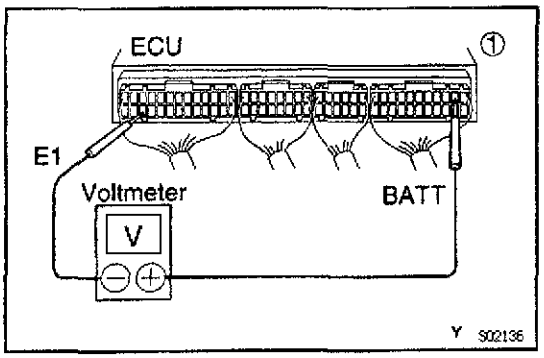
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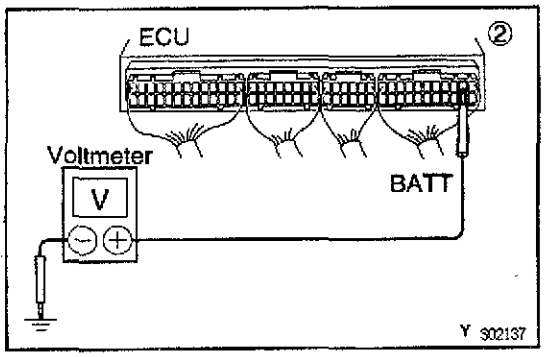
EQ790-01

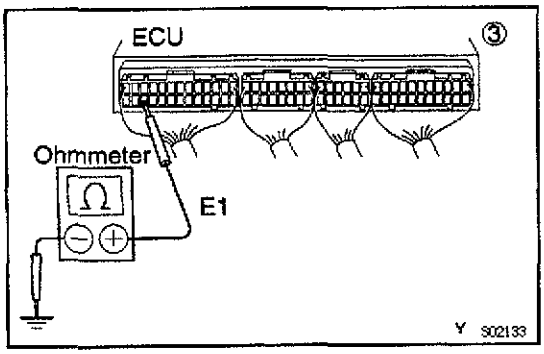
No.	Terminals	Trouble	Condition	STD Voltage
1	BATT - E1	No Voltage	—	9 - 14V
	+B - E1	No Voltage	IG SW ON	9 - 14V



T V07991







• BATT – E1

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.

③ OK → Try another ECU.

③ BAD → Repair or replace.

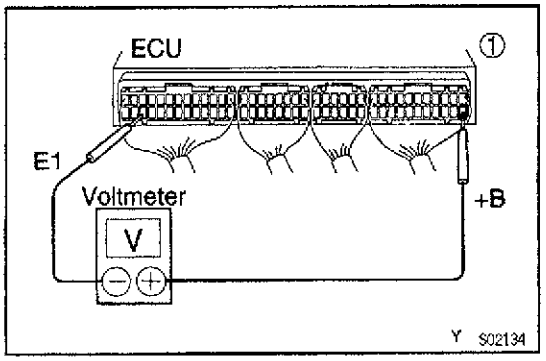
② OK → *Check fuse.*

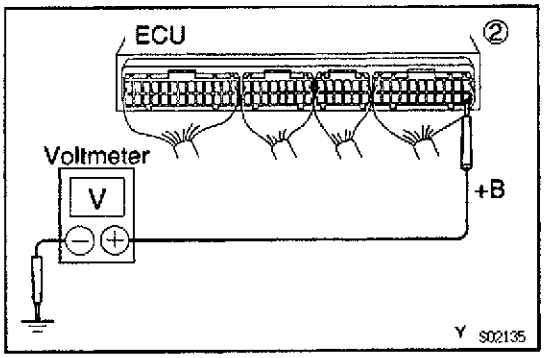
Check fuse. BAD → *Replace.*

Check fuse. OK → Check wiring between ECU terminal and battery.

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

V07488





• +B – E1

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

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

NO → Check fuses, fusible link and ignition switch.

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

OK → Try another ECU.

BAD → Repair or replace.

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

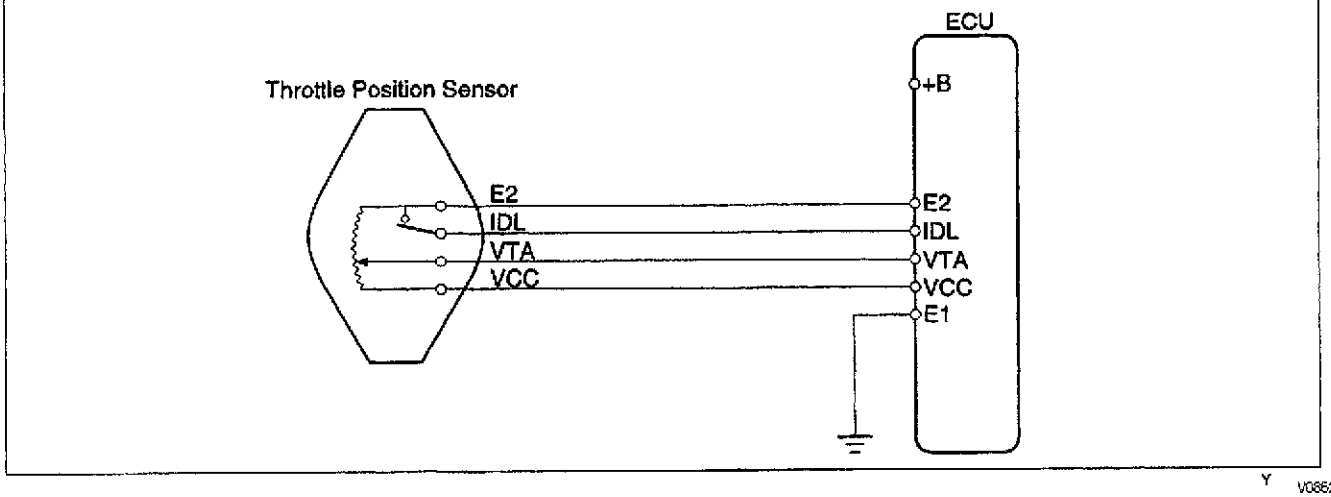
OK → Check EFI main relay. (See page EG-189) BAD → Replace.

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

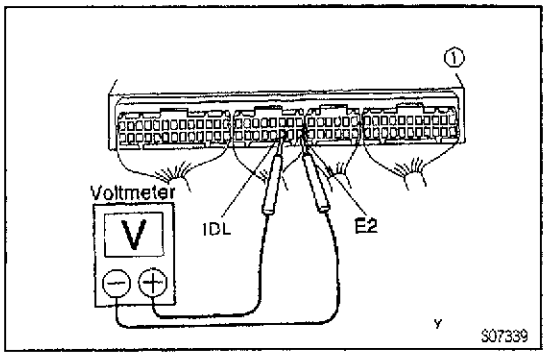
V08112

EG

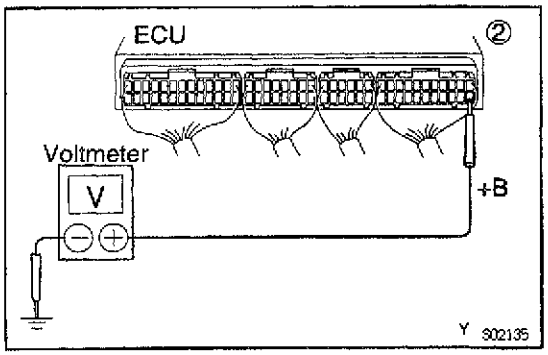
No.	Terminals	Trouble	Condition		STD Voltage
2	IDL-E2	No voltage	Ignition switch ON	Throttle valve open	9 - 14 V
	VC-E2			–	4.5 - 5.5 V
	VTA-E2			Throttle valve fully closed	0.3 - 0.8 V
				Throttle valve fully open	3.2 - 4.9 V



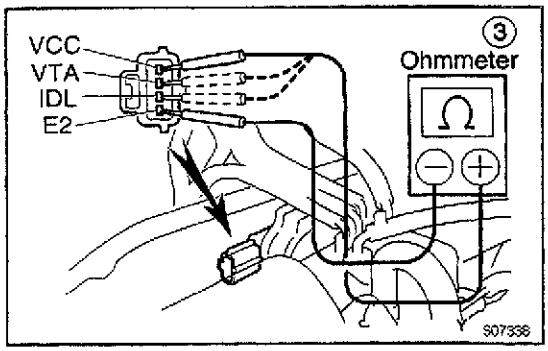
Y V08626



Y S07339



Y S02135



S07336

- **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 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 EG-150) → BAD → Repair or replace.

↓

③ Check throttle position sensor. (See page EG-180)

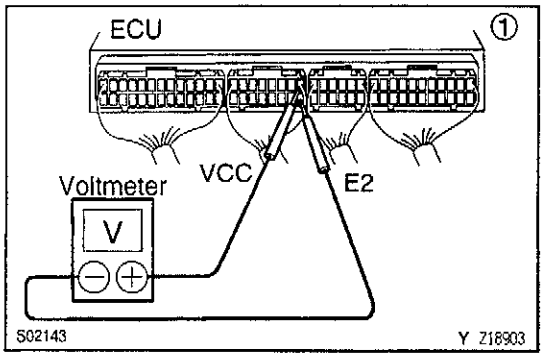
↓ BAD → Repair or replace throttle position sensor.

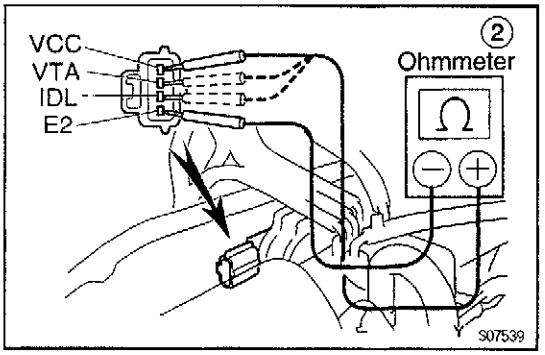
↓ OK → Check wiring between ECU and throttle position sensor.

↓ OK → Try another ECU.

BAD → Repair or replace.

Y V08626





• VCC – E2

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

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

OK → ② Check throttle position sensor.

NO → Refer to +B – E1 trouble section (No.1). (See page EG-150)

② Check throttle position sensor.

BAD → Repair or replace.

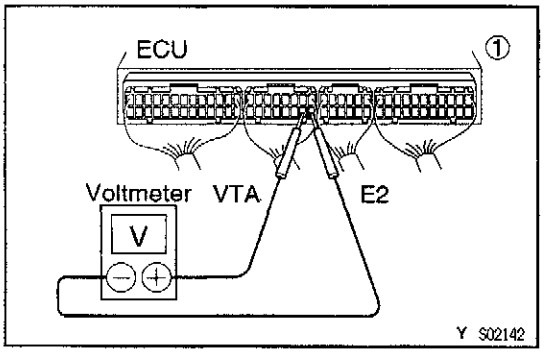
OK → Check wiring berween ECU and throttle position sensor.

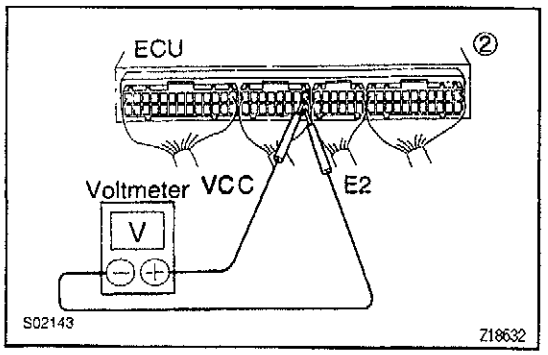
Check wiring berween ECU and throttle position sensor.

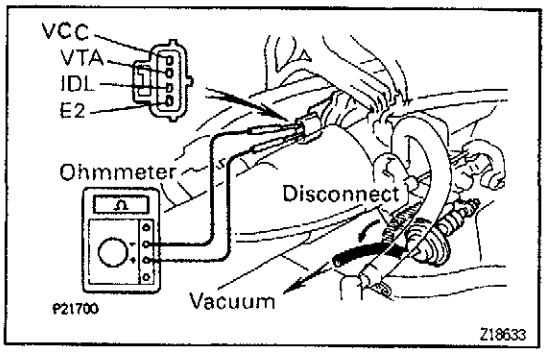
BAD → Repair or replace.

OK → Try another ECU.

Y V08627







• 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 terminals VCC and E2. **(IG SW ON)**

NO → Refer to VCC - E2 trouble section.

OK

Refer to VCC - E2 trouble section.

OK → ③ Check throttle position sensor.

③ Check throttle position sensor.

BAD → Repair or replace.

OK → Check wiring between ECU and throttle position sensor.

Check wiring between ECU and throttle position sensor.

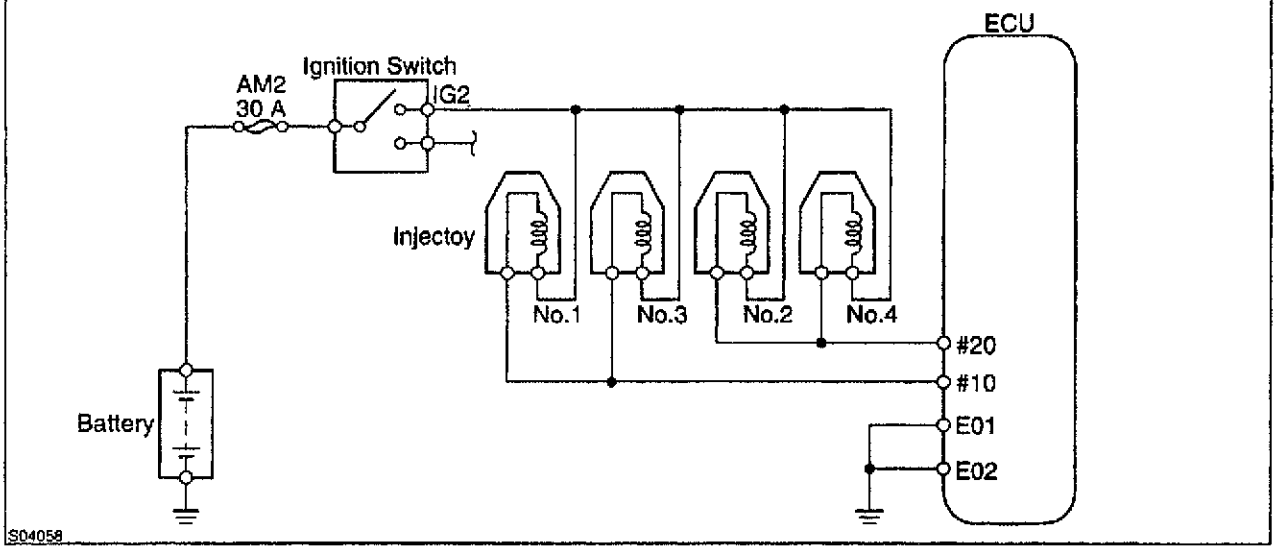
BAD → Repair or replace.

OK → Try another ECU.

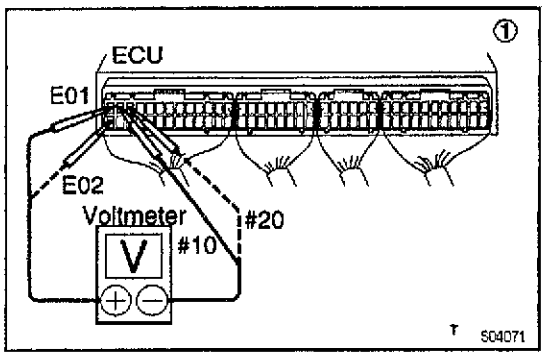
Y V08097

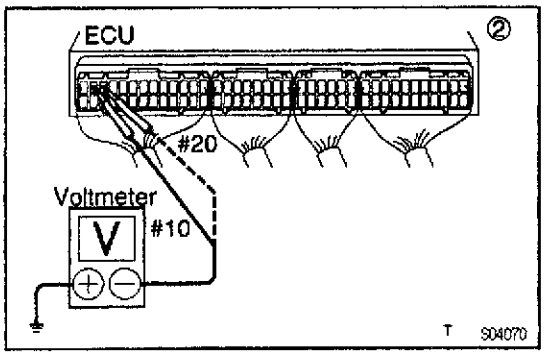
EG

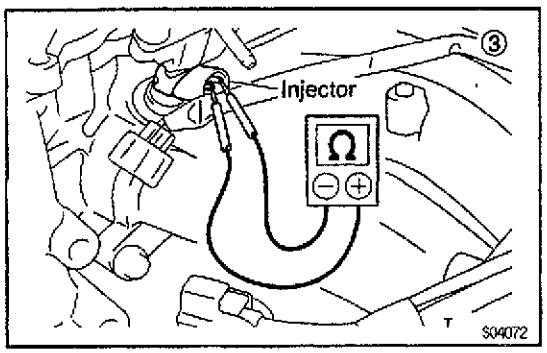
No.	Trouble	Condition	STD Voltage
3	#10 E01 – #20 E02	IG SW ON	9 - 14V



T V07992







- **#10, #20 — E01, E02**

① There is no voltage between ECU terminals #10,#20 and E01 and / or E02. **(IG SW ON)**

↓

② Check that there is voltage between ECU terminal #10,#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 and ignition switch. → BAD → Repair or replace.

↓ OK

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

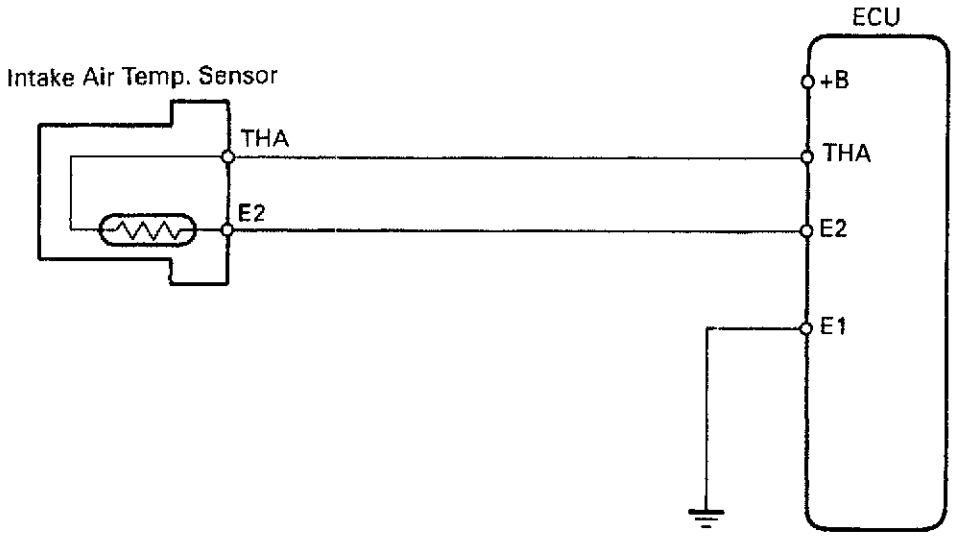
↓ OK

↓ BAD → Replace injector.

Check wiring between ECU terminal #10,#20 and battery. → BAD → Repair or replace.

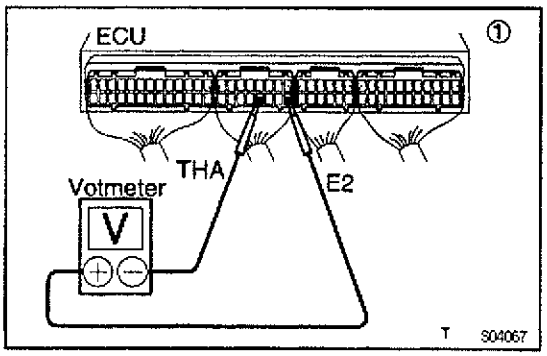
Y V08099

No.	Terminals	Trouble	Condition		STD voltage
4	THA – E2	No voltage	IG SW ON	Intake air temp. 20°C (68°F)	0.5 – 3.4 V

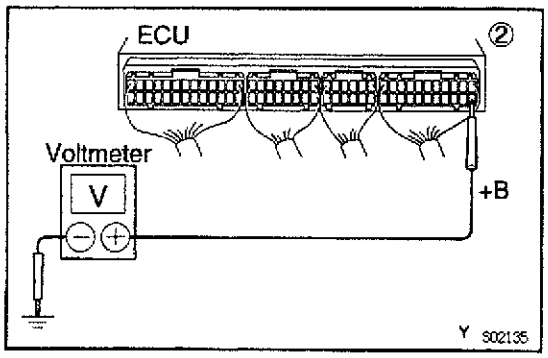


FI3572

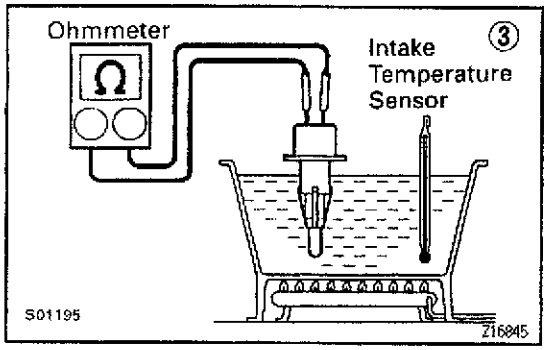
Z17784



T S04067



Y S02135



S01195

Z16845

• THA – E2

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

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

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

NO → Refer to No.1. (See page EG-198)

OK → ③ Check intake air temp. sensor.

BAD → Repair or replace.

BAD → Replace intake air temp. sensor.

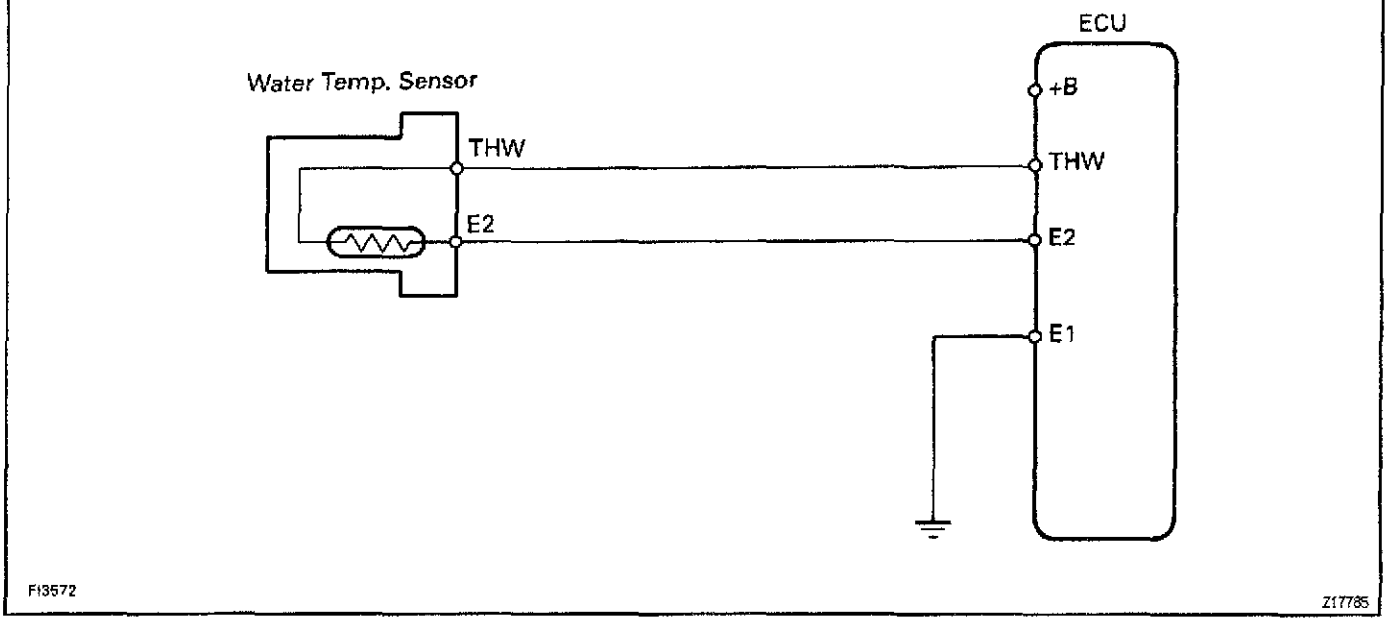
OK → Check wiring between ECU and intake air temp. sensor.

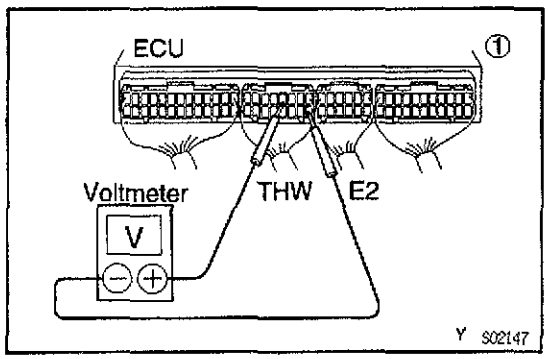
OK → Try another ECU.

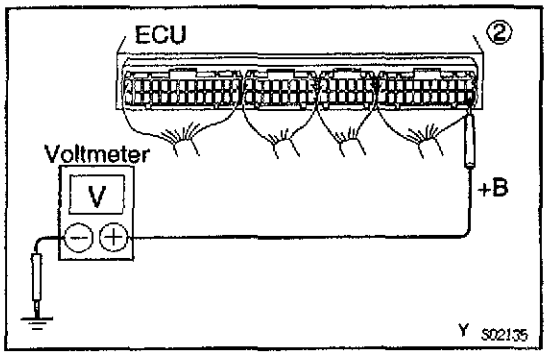
BAD → Repair or replace.

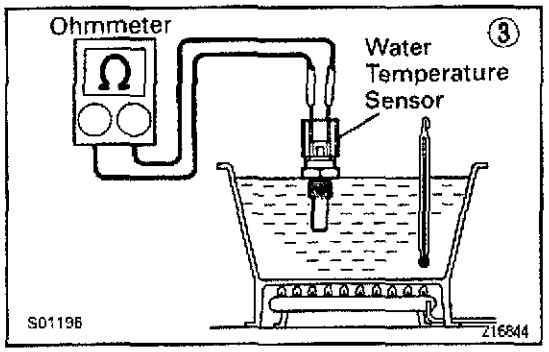
V07494

No.	Terminals	Trouble	Condition		STD voltage
5	THW – E2	No voltage	IG SW ON	Engine coolant temp. 80°C (176°F)	0.2 – 1.0 V









• THW – E2

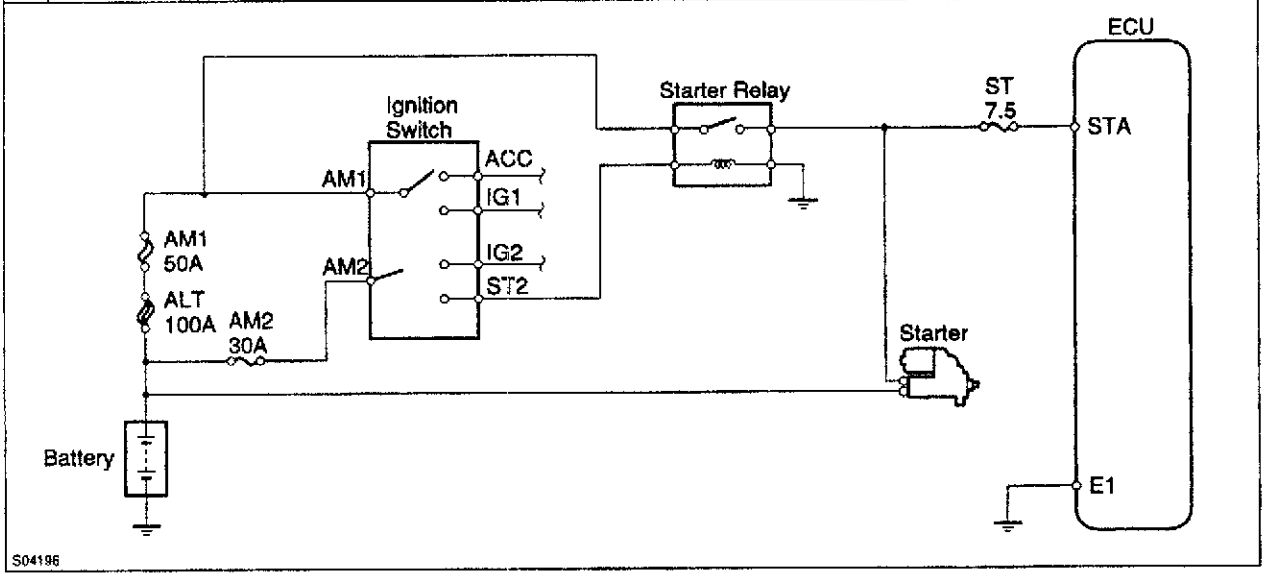
① *There is no voltage between ECU terminals THW and E2.* **(IG SW ON)**

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

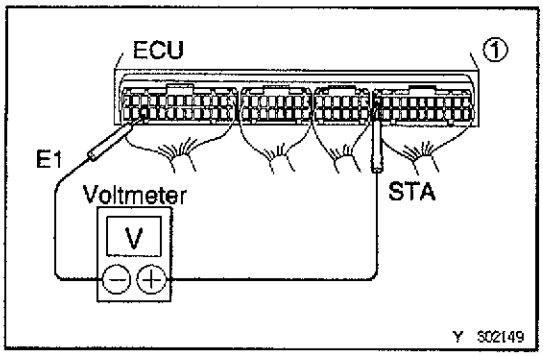
- OK → *Check wiring between ECU terminal E1 and body ground.*
  - OK → ③ Check water temp. sensor.
    - BAD → Replace water temp. sensor.
    - OK → Check wiring between ECU and water temp. sensor.
      - OK → Try another ECU.
      - BAD → Repair or replace.
  - BAD → Repair or replace.
- NO → Refer to No.1. (See page EG-198)

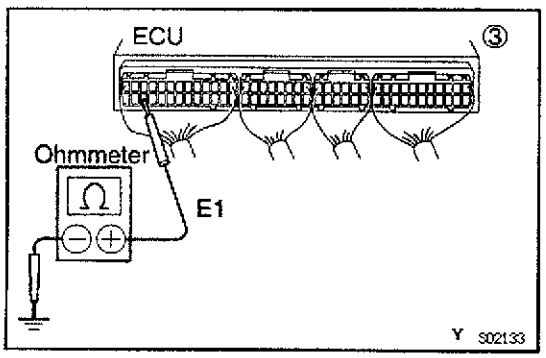
V07496

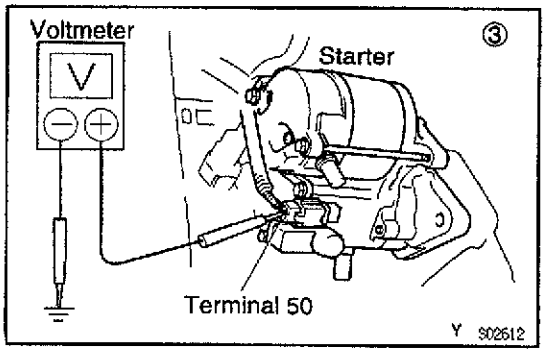
No.	Terminals	Trouble	Condition	STD voltage
6	STA-E2	No voltage	Cranking	6V or more



V08026







• STA – E1

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 ST2. — OK → ② Check wiring between ECU terminal E1 and body ground. — OK → Try another ECU.

Check starter operation. — BAD → Check M-fuse, fuse, battery, wiring, ignition switch,and starter relay. — BAD → Repair or replace.

Check M-fuse, fuse, battery, wiring, ignition switch,and starter relay. — OK → ③ Check that there is voltage at starter terminal 50. **(IG SW START) STD voltage: 6V or more**

③ — OK → Check starter.

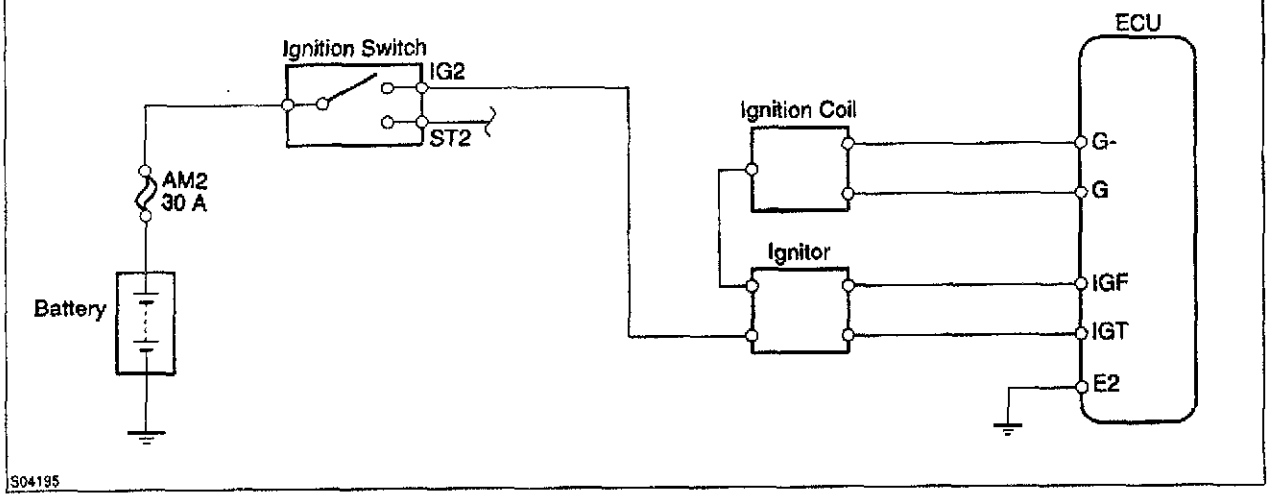
③ — NO → Check wiring between ignition switch terminal ST2 and starter terminal 50.

Check wiring between ECU terminal STA and ignition switch terminal ST2. — BAD → Repair or replace.

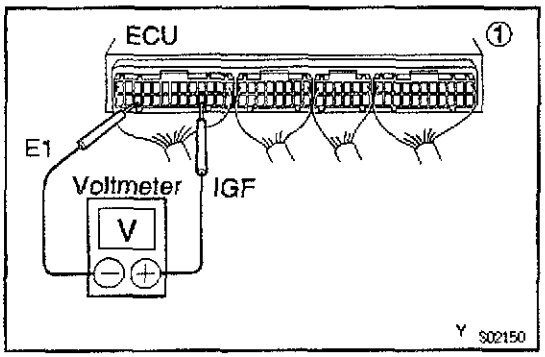
② Check wiring between ECU terminal E1 and body ground. — BAD → Repair or replace.

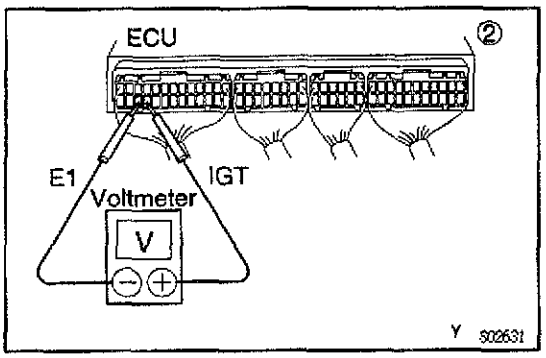
V08021

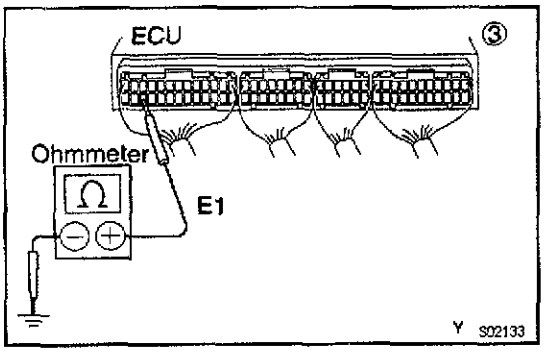
No.	Terminals	Trouble	Condition		STD voltage
7	IGF-E1	No voltage	IG SW ON	Igniter connector disconnected	4.5-5.5V
	IGT-E1	No voltage	Idling		Paise generation



V09027







• IGF, IGT – E1

① There is no voltage between ECU terminals IGF and E1.
(Disconnect igniter connector, IG SW ON)

② Check that there is voltage between ECU terminals IGT and E1.
(Idling)

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

③ OK → *Try another ECU.*

② OK → *Check fuse and ignition switch.* BAD → *Repair or replace.*

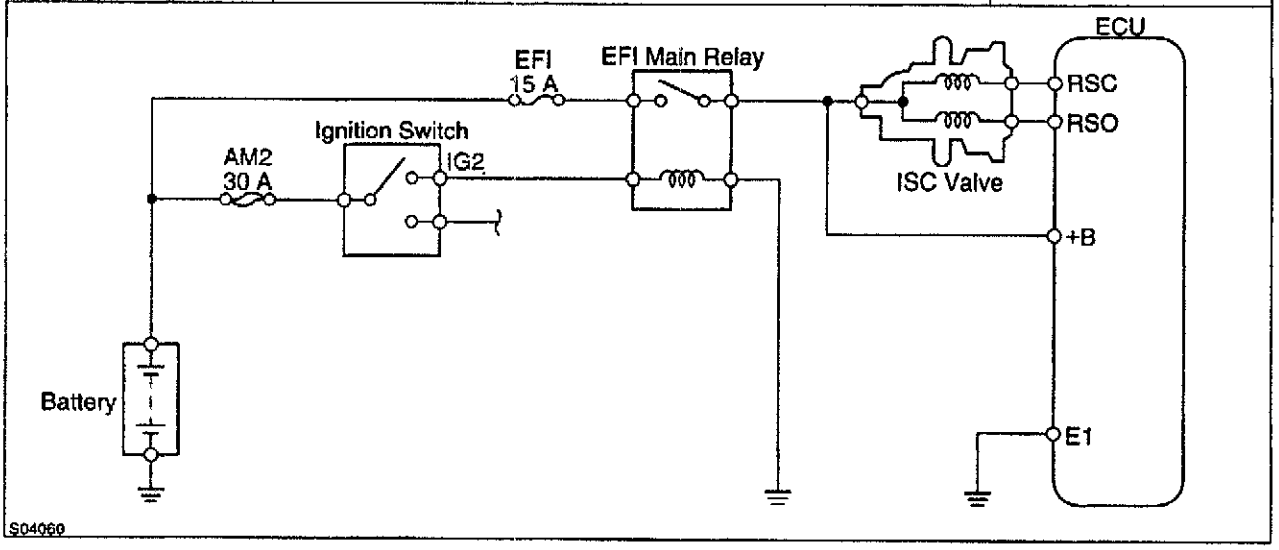
OK → Check ignition coil. BAD → Repair or replace.

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

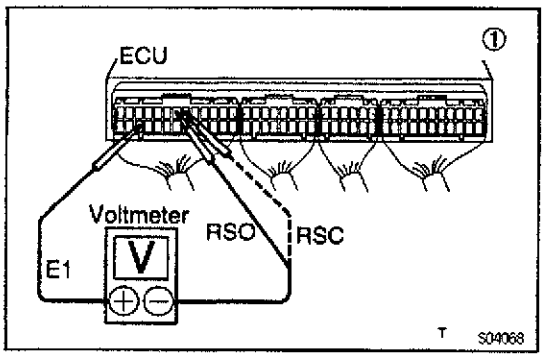
OK → Check igniter. BAD → Repair or replace.

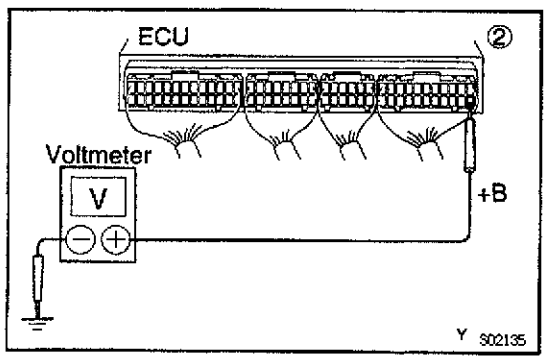
V07497

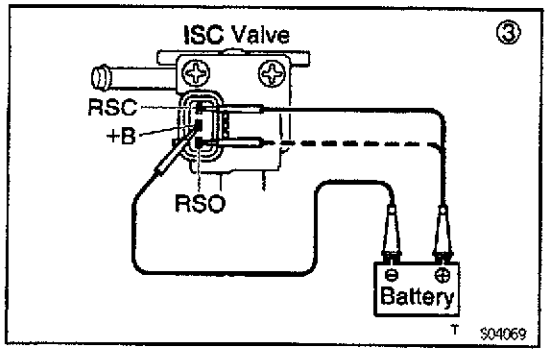
No.	Trouble	Condition		STD Voltage
8	RSC RSO – E1	IG SW ON	ECU Connector disconnected	9 – 14V



T V07993







• RSC, RSO – E1

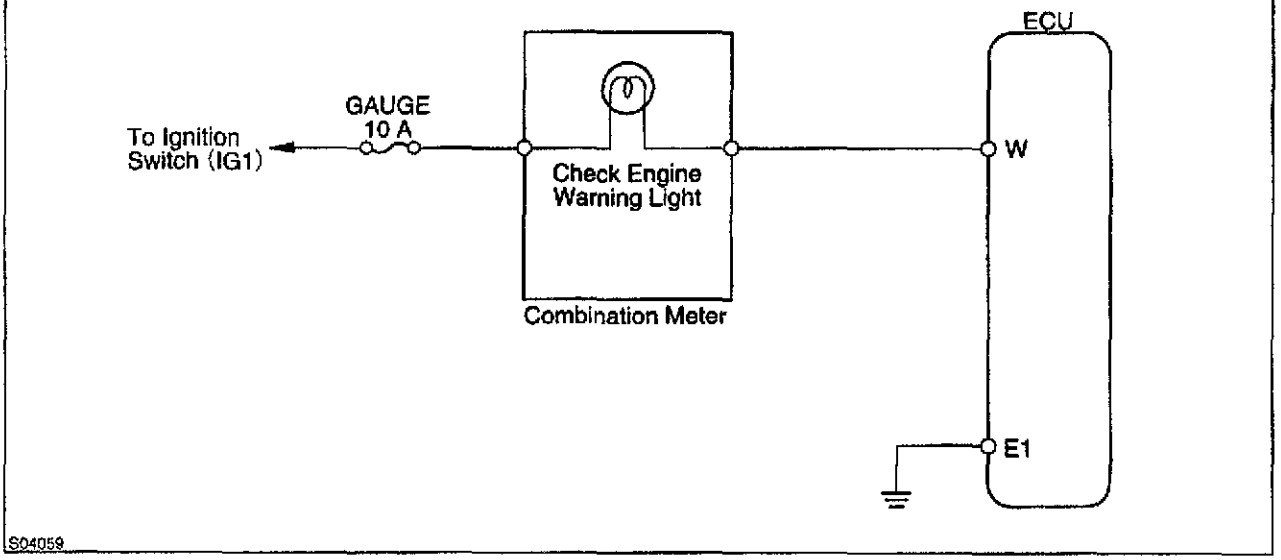
① There is no voltage between ECU terminals RSC,RSO and E1. **(IG SW ON)**

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

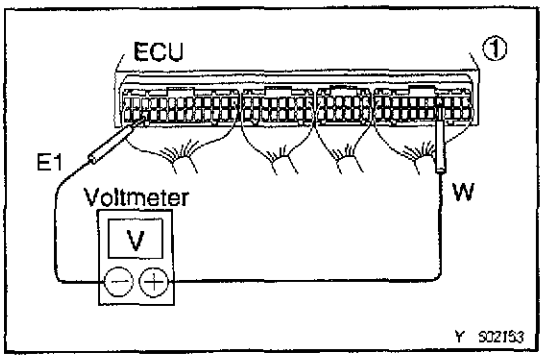
- OK → Check wiring between ECU terminal E1 and body ground.
  - OK → ③ Check ISC valve.
    - BAD → Replace ISC valve.
    - OK → Check wiring between ECU and EFI main relay.
      - OK → Try another ECU.
      - BAD → Repair or replace.
  - BAD → Repair or replace.
- NO → Refer to No.1. (See page EG-198)

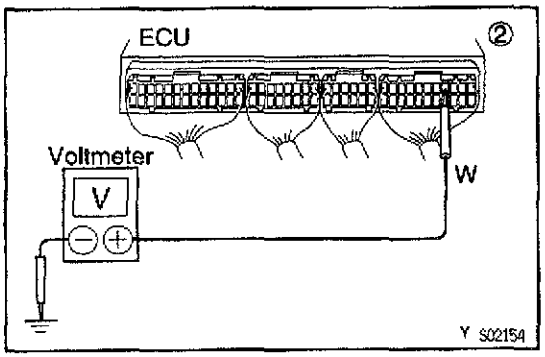
Y V08100

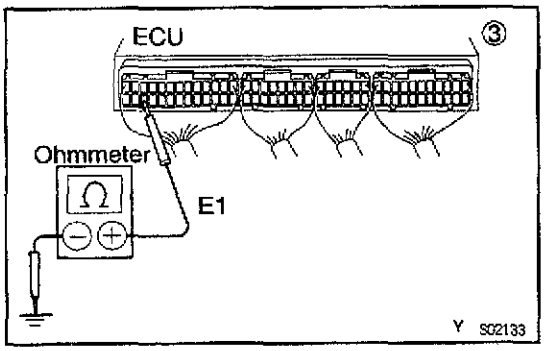
No.	Trouble	Condition	STD Voltage
9	W - E	No trouble (Check engine warning light off) and engine running	9 - 14 V



T V07994







- **W – E1**

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

② Check that there is voltage between ECU terminals 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 (10 A) and check engine *warning light.*

OK → Check wiring between ECU terminal *W and fuse.*

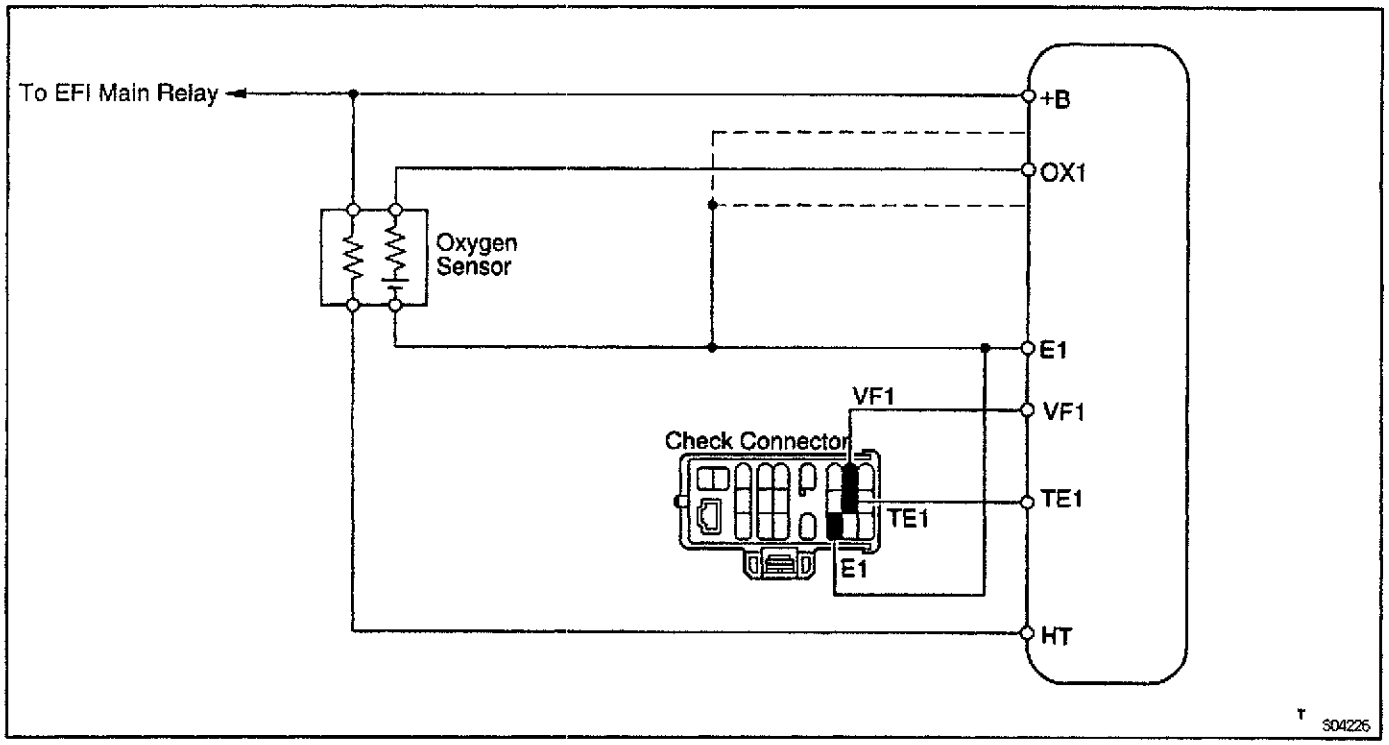
BAD → Repair or replace.

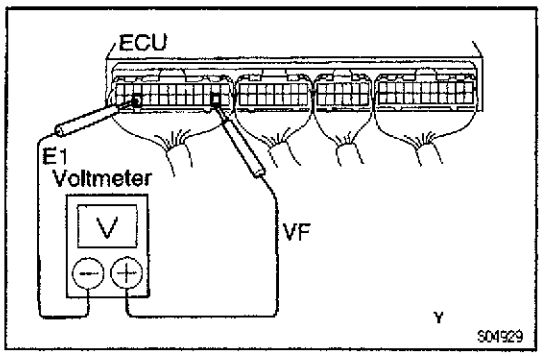
BAD → Repair or replace.

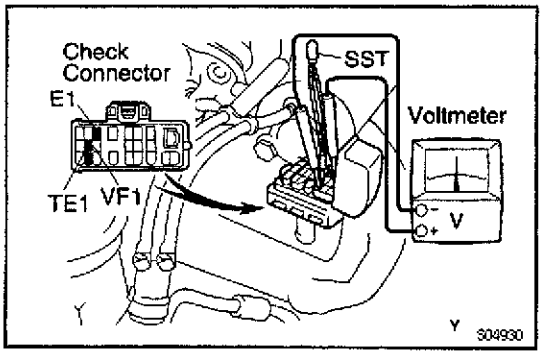
Fuse blows again → Check wiring between ECU terminal *W and fuse.*

Y

V08217







• VF – E1

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 for suction of air into exhaust system.

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

OK → Try another ECU.

BAD → Repair or replace.

BAD → 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 ignition system. BAD → Repair or replace.

OK ↓

Check fuel pressure. BAD → Repair or replace.

OK ↓

Check injectors. 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. BAD → Repair wiring.

OK ↓

Replace oxygen sensor.

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