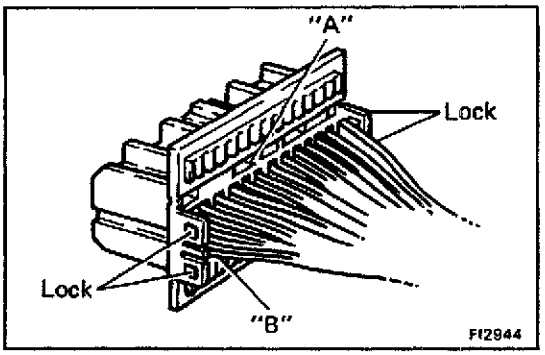
# TROUBLESHOOTING w/ VOLT, OHMMETER (Station Wagon)

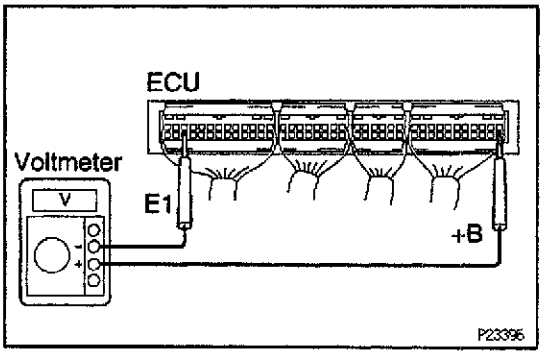
EG0GB-04

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, fusible links 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

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### PREPARATION

(a) Disconnect the connectors from the ECU.

(b) Remove the locks as 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.**

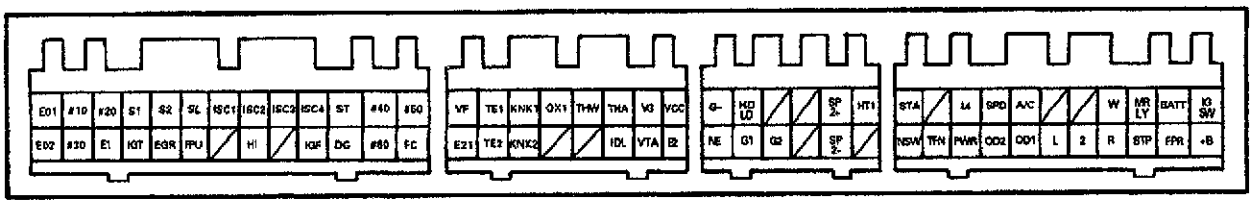
(c) Reconnect the connectors to the ECU.

(d) Using a voltmeter with high impedance (10 kΩ/V minimum), measure the voltage at each terminal of the wiring connectors.
HINT:
- Perform all voltage measurements with the connectors connected.
- Verify that the battery voltage is 11 V or more when the ignition switch is in "ON" position.

## ECU Terminals (Europe)

| Symbol | Connection | Symbol | Connection | Symbol | Connection |
|---|---|---|---|---|---|
| E01 | POWER GROUND | VF | CHECK CONNECTOR | HT1 | OXYGEN SENSOR |
| E02 | POWER GROUND | E21 | AIR FLOW METER | | – |
| #10 | INJECTOR (No.1) | TE1 | CHECK CONNECTOR | STA | NEUTRAL START SWITCH |
| #30 | INJECTOR (No.3) | TE2 | CHECK CONNECTOR | NSW | IGNITION SWITCH |
| #20 | INJECTOR (No.2) | KNK1 | NO.1 KNOCK SENSOR | | – |
| E1 | ECU GROUND | KNK2 | NO.2 KNOCK SENSOR | TFN* | TRANSFER NEUTRAL POSITION SWITCH |
| S1* | ECT SOLENOID | OX1 | OXYGEN SENSOR | L4* | L4 POSITION SENSOR |
| IGT | IGNITER | | – | PWR* | PATERN SELECT SWITCH |
| S2* | ECT SOLENOID | THW | WATER TEMP. SENSOR | SPD | NO.1 VEHICLE SPEED SENSOR |
| EGR | VSV FOR EGR | | – | OD2* | O/D MAIN SWITCH |
| SL* | ECT SOLENOID | THA | AIR FLOW METER | A/C | A/C AMPLIFIE |
| FPU | VSV FOR FUEL PRESSURE CONTROL | IDL | TP SENSOR | OD1* | CRUISE CONTROL ECU |
| ISC1 | ISC VALVE (No.1 Motor Coil) | VG | AIR FLOW METER | | – |
| | – | VTA | TP SENSOR | L* | NEUTRAL START SWITCH |
| ISC2 | ISC VALVE (No.2 Motor Coil) | VCC | TP SENSOR | | – |
| HI* | HOLD INDICATOR LIGHT | E2 | SENSOR GROUND | 2* | NEUTRAL START SWITCH |
| ISC3 | ISC VALVE (No.3 Motor Coil) | G– | DISTRIBUTOR | W | "CHECK" ENGINE WARNING LIGHT |
| | – | NE | DISTRIBUTOR | R* | NEUTRAL START SWITCH |
| ISC4 | ISC VALVE (No.4 Motor Coil) | HOLD* | PATTERN SELECT SWITCH | MRLY | EFI MAIN RELAY (COIL) |
| IGF | IGNITER | G1 | DISTRIBUTOR | STP | STOP LIGHT SWITCH |
| ST* | ECT SOLENOID | | – | BATT | BATTERY B + |
| DG* | CHECK CONNECTOR | G2 | DISTRIBUTOR | FPR | FUEL PUMP RELAY |
| #40 | INJECTOR (No.4) | | – | IGSW | IGNITION SWITCH |
| #60 | INJECTOR (No.6) | | – | +B | EFI MAIN RELAY |
| #50 | INJECTOR (No.5) | SP2+* | NO.2 VEHICLE SPEED SENSOR | * Only for ECT | |
| FC | CIRCUIT OPENING RELAY | SP2–* | NO.2 VEHICLE SPEED SENSOR | | |

**ECU Terminals**

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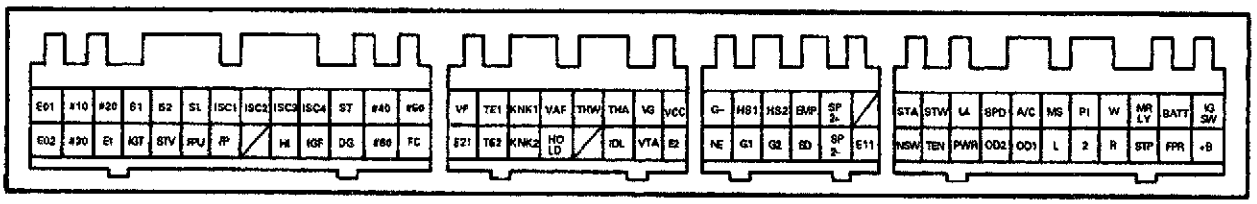
## ECU Terminals (Except Europe)

| Symbol | Connection | Symbol | Connection | Symbol | Connection |
|---|---|---|---|---|---|
| E01 | POWER GROUND | VF | CHECK CONNECTOR | | – |
| E02 | POWER GROUND | E21 | AIR FLOW METER | E11 | SENSOR GROUND |
| #10 | INJECTOR (No.1) | TE1 | CHECK CONNECTOR | STA | NEUTRAL START SWITCH |
| #30 | INJECTOR (No.3) | TE2 | CHECK CONNECTOR | NSW | IGNITION SWITCH |
| #20 | INJECTOR (No.2) | KNK1 | NO.1 KNOCK SENSOR | STW | SUB TANK WARNING LIGHT |
| E1 | ECU GROUND | KNK2 | NO.2 KNOCK SENSOR | TFN* | TRANSFER NEUTRAL POSITION SWITCH |
| S1* | ECT SOLENOID | VAF | VARIABL RESISTOR | L4* | L4 POSITION SENSOR |
| IGT | IGNITER | HOLD* | PATERN SELECT SWITCH | PWR* | PATERN SELECT SWITCH |
| S2* | ECT SOLENOID | THW | WATER TEMP. SENSOR | SPD | VEHICLE SPEED SENSOR |
| STV | SUB FUEL TANK VALVE | | – | OD2* | O/D MAIN SWITCH |
| SL* | ECT SOLENOID | THA | AIR FLOW METER | A/C | A/C AMPLIFIE |
| FPU | VSV FOR FUEL PRESSURE CONTROL | IDL | TP SENSOR | OD1* | CRUISE CONTROL ECU |
| ISC1 | ISC VALVE (No.1 Motor Coil) | VG | AIR FLOW METER | MS | FUEL MAIN SWITCH |
| FP | SUB FUEL TANK PUMP | VTA | TP SENSOR | L* | NEUTRAL START SWITCH |
| ISC2 | ISC VALVE (No.2 Motor Coil) | VCC | TP SENSOR | PI | FUEL MAIN SWITCH |
| | – | E2 | SENSOR GROUND | 2* | NEUTRAL START SWITCH |
| ISC3 | ISC VALVE (No.3 Motor Coil) | G– | DISTRIBUTOR | W | "CHECK" ENGINE WARNING LIGHT |
| HI* | HOLD INDICATOR LIGHT | NE | DISTRIBUTOR | R* | NEUTRAL START SWITCH |
| ISC4 | ISC VALVE (No.4 Motor Coil) | HS1 | TOP SWITCH | MRLY | EFI MAIN RELAY (COIL) |
| IGF | IGNITER | G1 | DISTRIBUTOR | STP | STOP LIGHT SWITCH |
| ST* | ECT SOLENOID | HS2 | TOP SWITCH | BATT | BATTERY B + |
| DG* | CHECK CONNECTOR | G2 | DISTRIBUTOR | FPR | FUEL PUMP SWITCH |
| #40 | INJECTOR (No.4) | EMP | SUB FUEL SWITCH | IGSW | IGNITION SWITCH |
| #60 | INJECTOR (No.6) | SD | FUEL SENDER GAUGE | +B | EFI MAIN RELAY |
| #50 | INJECTOR (No.5) | SP2+* | NO.2 VEHICLE SPEED SENSOR | * Only for ECT | |
| FC | CIRCUIT OPENING RELAY | SP2–* | NO.2 VEHICLE SPEED SENSOR | | |

**ECU Terminals**

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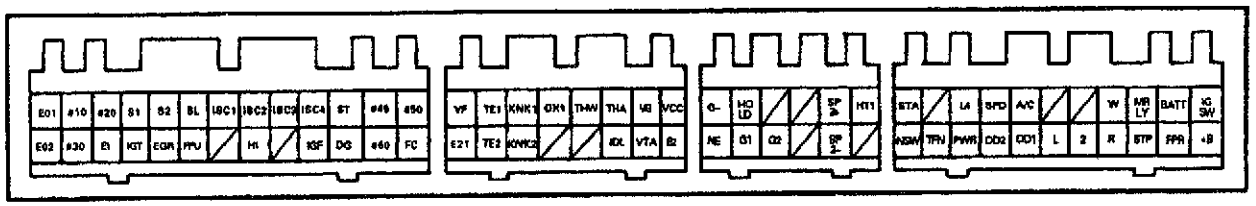
## ECU Wiring Connectors Voltage

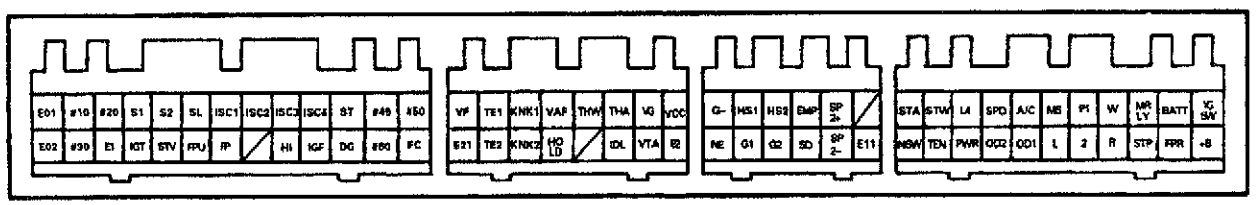
| No. | Terminals | Condition | | STD voltage (V) | See page |
|---|---|---|---|---|---|
| 1 | BATT – E1 | – | | 9 – 14 | EG-23 |
| | IG SW – E1 | IG SW ON | | | |
| | MRLY – E1 | | | | |
| | +B – E1 | | | | |
| 2 | IDL – E2 | IG SW ON | Throttle valve open | 9 – 14 | EG-26 |
| | VCC – E2 | | – | 4.5 – 5.5 | |
| | VTA – E2 | | Throttle valve fully closed (Throttle opener must be cancelled first) | 0.3 – 0.8 | |
| | | | Throttle valve fully open | 3.2 – 4.9 | |
| 3 | VG – E21 | Idling | N position, A/C switch OFF | 1.1 – 1.5 | EG-28 |
| 4 | #10 ~ #60 – E01 E02 | IG SW ON | | 9 – 14 | EG-29 |
| 5 | THA – E2 | IG SW ON | Intake air temp. 20°C (68°F) | 0.5 – 3.4 | EG-30 |
| 6 | THW – E2 | | Engine coolant temp. 80°C (176°F) | 0.2 – 1.0 | EG-31 |
| 7 | STA – E1 | Cranking | | 6 or more | EG-32 |
| 8 | IGT – E1 | Idling | | Pulse generation | EG-33 |
| 9 | ISC1 ~ ISC4 – E1 | IG SW ON | | 9 – 14 | EG-34 |
| 10 | W – E1 | No trouble ("CHECK" engine warning light off) and engine running | | 9 – 14 | EG-35 |

**ECU Terminals**

**Europe**




**Except Europe**

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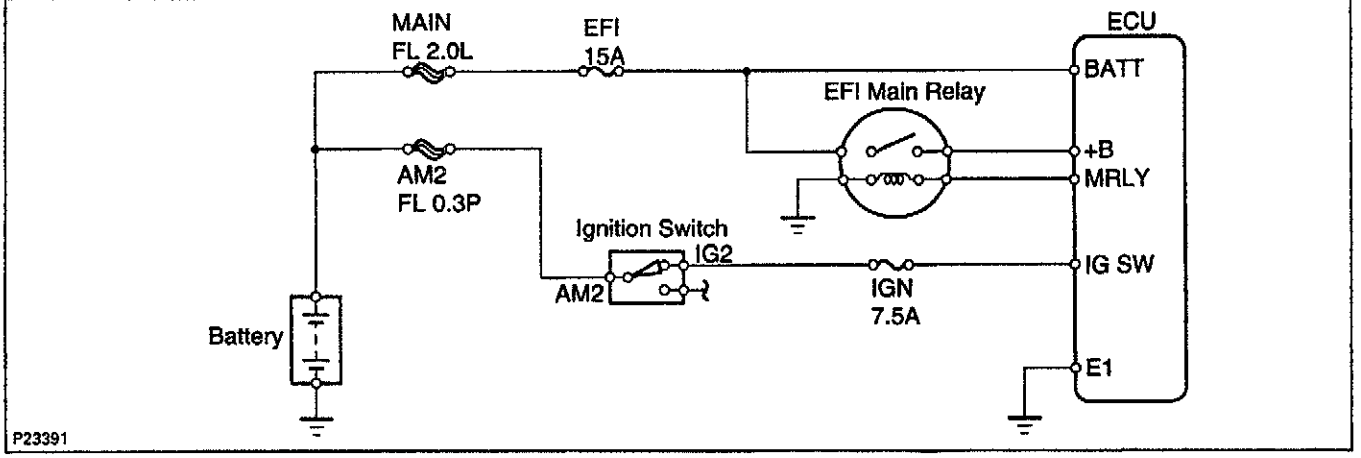
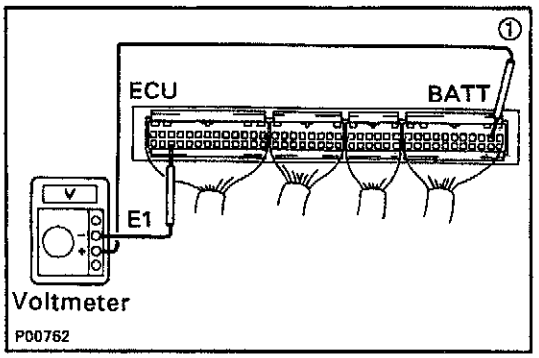
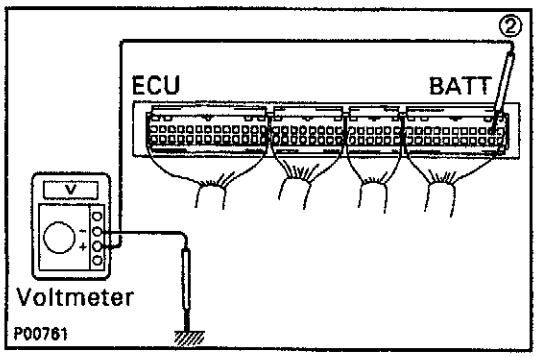
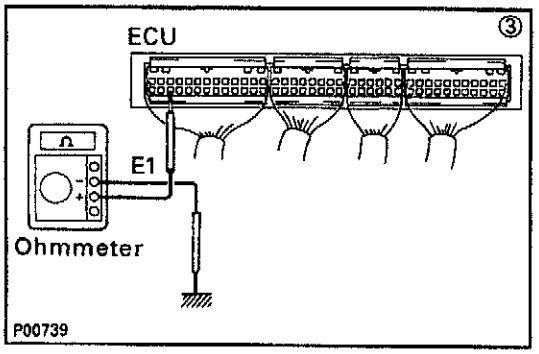
| No. | Terminals | Trouble | Condition | STD voltage |
|---|---|---|---|---|
| 1 | BATT – E1 | No voltage | — | 9 – 14 V |
| | IG SW – E1 | No voltage | IG SW ON | 9 – 14 V |
| | MRLY – E1 | | | |
| | +B – E1 | | | |




• **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 → 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.

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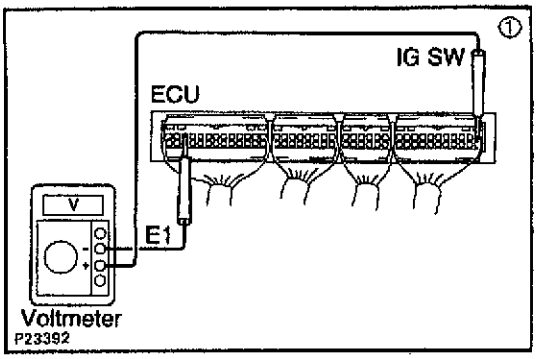
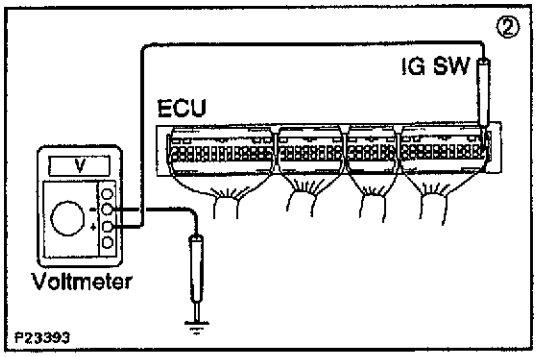



• **IG SW – E1**

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

↓

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

NO → ↓

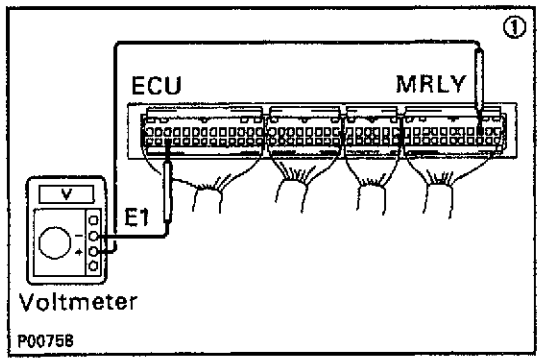
OK → Check wiring between ECU terminal E1 and body ground.

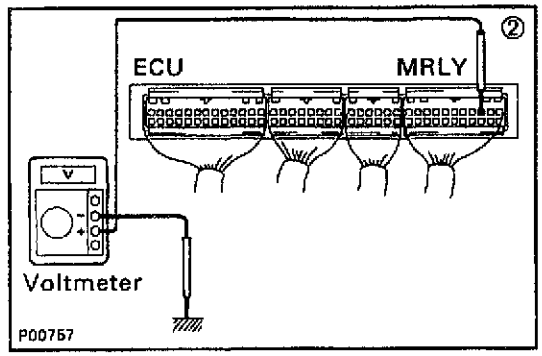
OK → Try another ECU.

BAD → Repair or replace.

↓

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




• **MRLY – E1**

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

↓

② Check that there is voltage between ECU terminal MRLY 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.

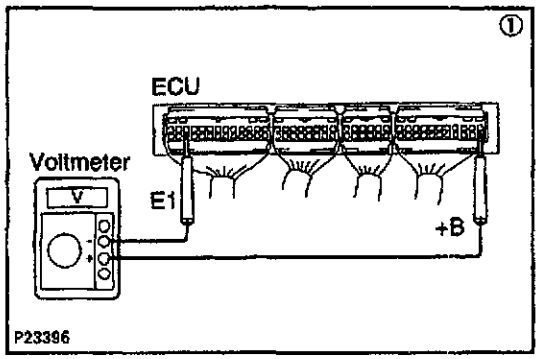
↓

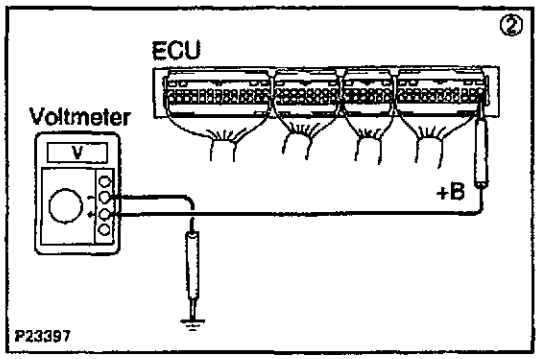
Check EFI main relay and wiring harness. → BAD → Replace.

↓ OK

Try another ECU.

V06541




• +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 fuse, fusible link and wiring harness. BAD → Repair or replace.

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

OK → Try another ECU.

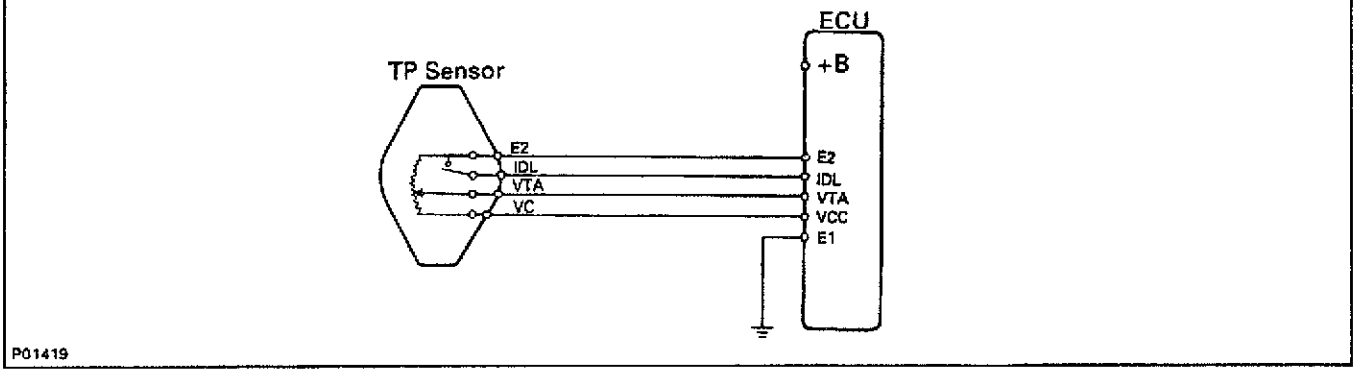
BAD → Repair or replace.

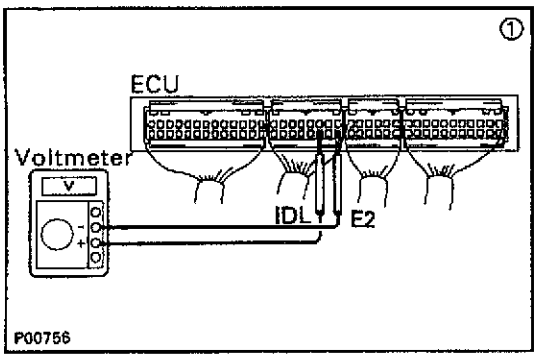
Check fuse, fusible link and wiring harness. OK → Check EFI main relay. BAD → Replace.

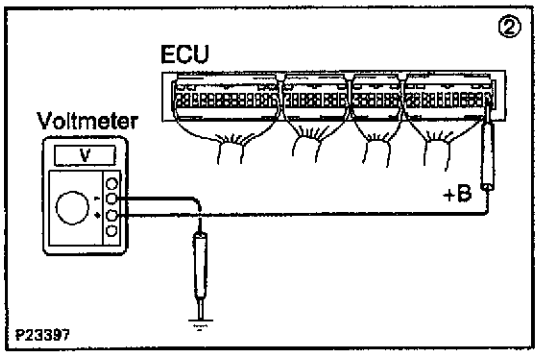
Check EFI main relay. OK → Refer to MRLY – E1 trouble section.

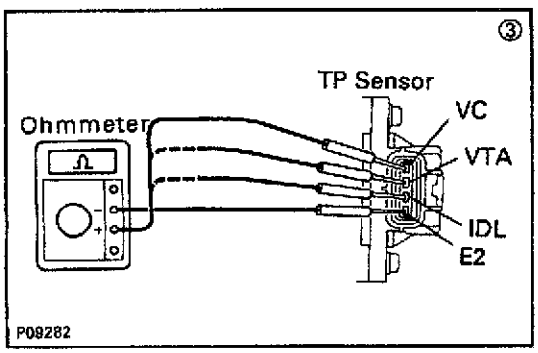
V06553

| No. | Terminals | Trouble | Condition | | STD voltage |
|---|---|---|---|---|---|
| 2 | IDL – E2 | No voltage | IG SW ON | Throttle valve open | 9 – 14 V |
| | VCC – E2 | | | – | 4.5 – 5.5 V |
| | VTA – E2 | | | Throttle valve fully closed (Throttle opener must be cancelled first) | 0.3 – 0.8 V |
| | | | | Throttle valve fully open | 3.2 – 4.9 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 and body ground. **(IG SW ON)**

NO → Refer to No.1. (See page EG-23)

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

OK → Try another ECU.

BAD → Repair or replace.

Refer to No.1. (See page EG-23) — BAD → Repair or replace.

OK → ③ Check TP sensor.

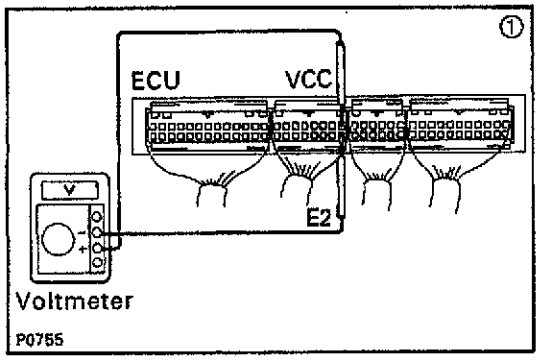
BAD → Repair or replace TP sensor.

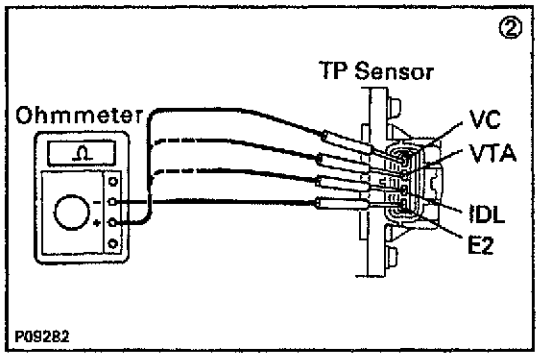
OK → Check wiring between ECU and TP sensor.

OK → Try another ECU.

BAD → Repair or replace.

V06542




• **VC – E2**

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

↓

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

↓ OK

② Check TP sensor.

↓ BAD

Repair or replace.

OK ↓

Check wiring between ECU and TP sensor.

↓ OK

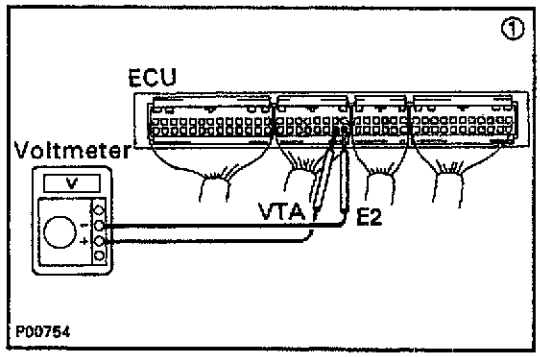
Try another ECU.

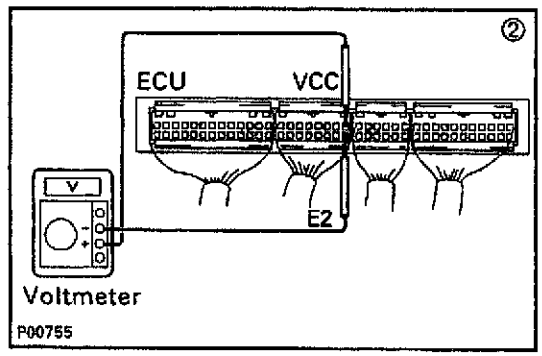
BAD ↓

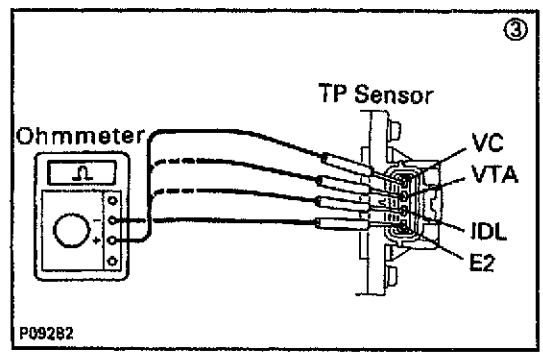
Repair or replace wiring.

NO →

Refer to No.1. (See page EG-23)




• **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

OK →

③ Check TP sensor. BAD → Repair or replace.

↓ OK

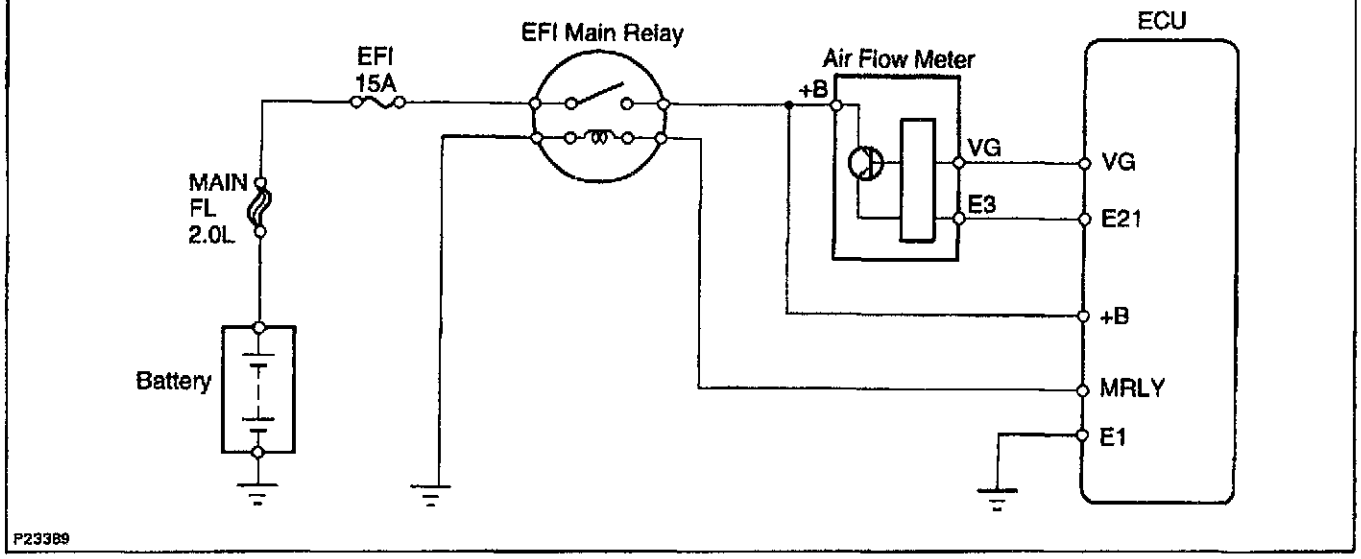
Check wiring between ECU and TP sensor. BAD → Repair or replace.

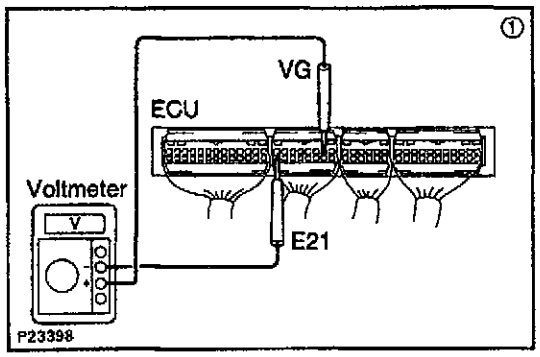
↓ OK

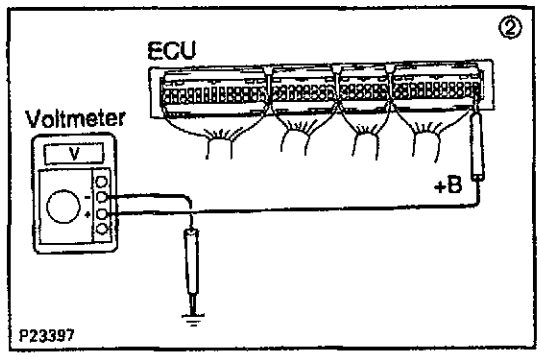
Try another ECU.

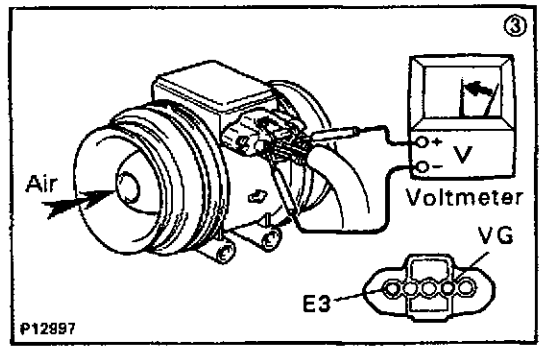
V06543

| No. | Terminals | Trouble | Condition | | STD voltage |
|---|---|---|---|---|---|
| 3 | VG – E21 | No voltage | Idling | N position, A/C switch OFF | 1.1 – 1.5 V |




① There is no voltage between ECU terminals VG and E21. **(Idling)**

↓

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

OK → ↓

NO → Refer to No.1. (See page EG-23)

↓

Check wiring between ECU terminal E1 and body ground.

OK → ↓

BAD → Repair or replace.

③ Check air flow meter. (See page EG-54)

BAD → Replace air flow meter.

OK → ↓

Check wiring between ECU and air flow meter.

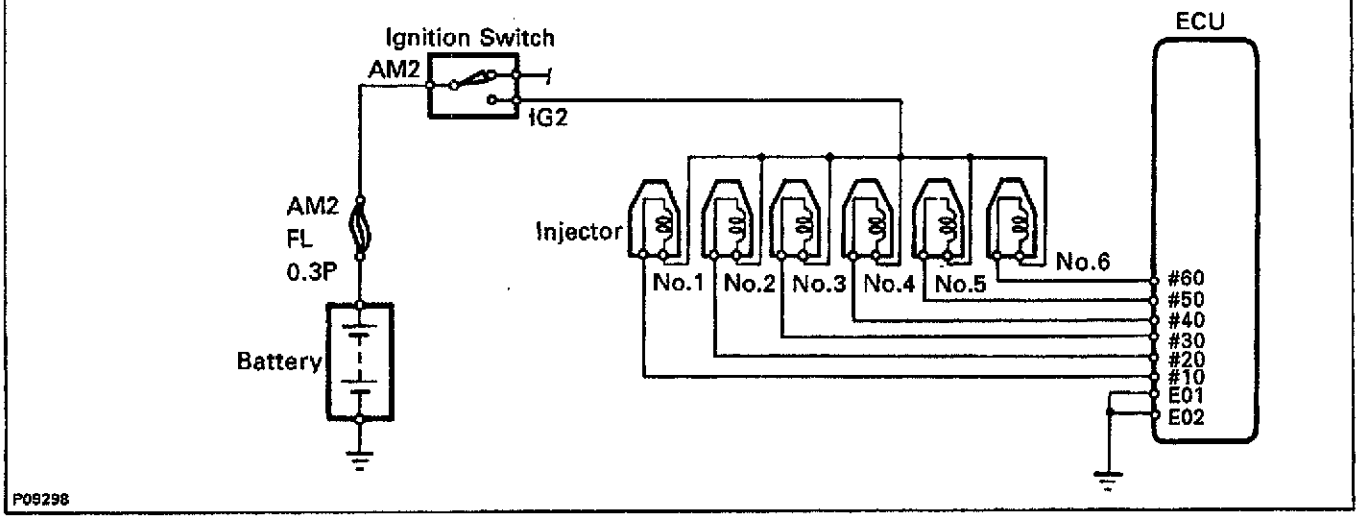
OK → ↓

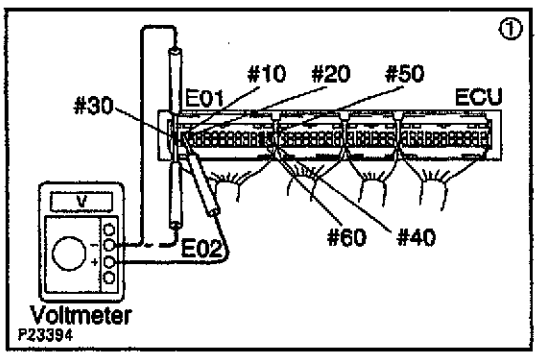
BAD → Repair or replace.

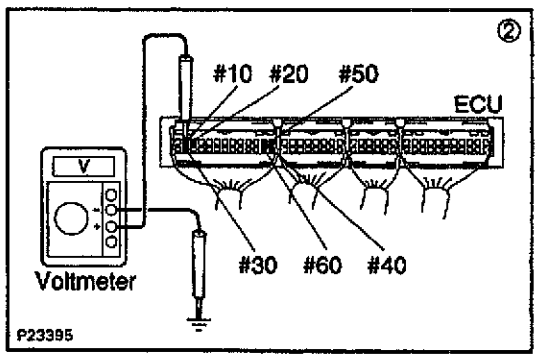
Try another ECU.

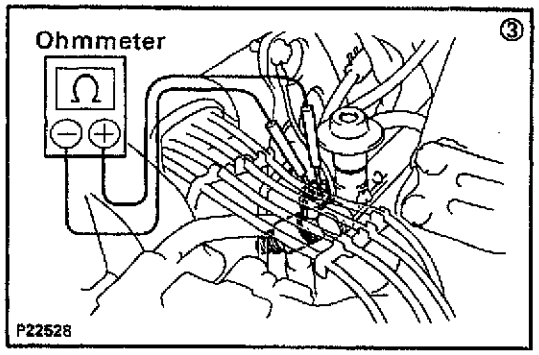
V06544

| No. | Terminals | Trouble | Condition | STD voltage |
|---|---|---|---|---|
| 4 | #10 E01<br>S –<br>#60 E02 | No voltage | IG SW ON | 9 – 14 V |




① There is no voltage between ECU terminals #10 ~ #60 and E01 and/or E02. **(IG SW ON)**

② Check that there is voltage between ECU terminal #10 ~ #60 and body ground.

NO → Check wiring between ECU terminal E01 and/or E02 and body ground.
- OK → Try another ECU.
- BAD → Repair or replace.

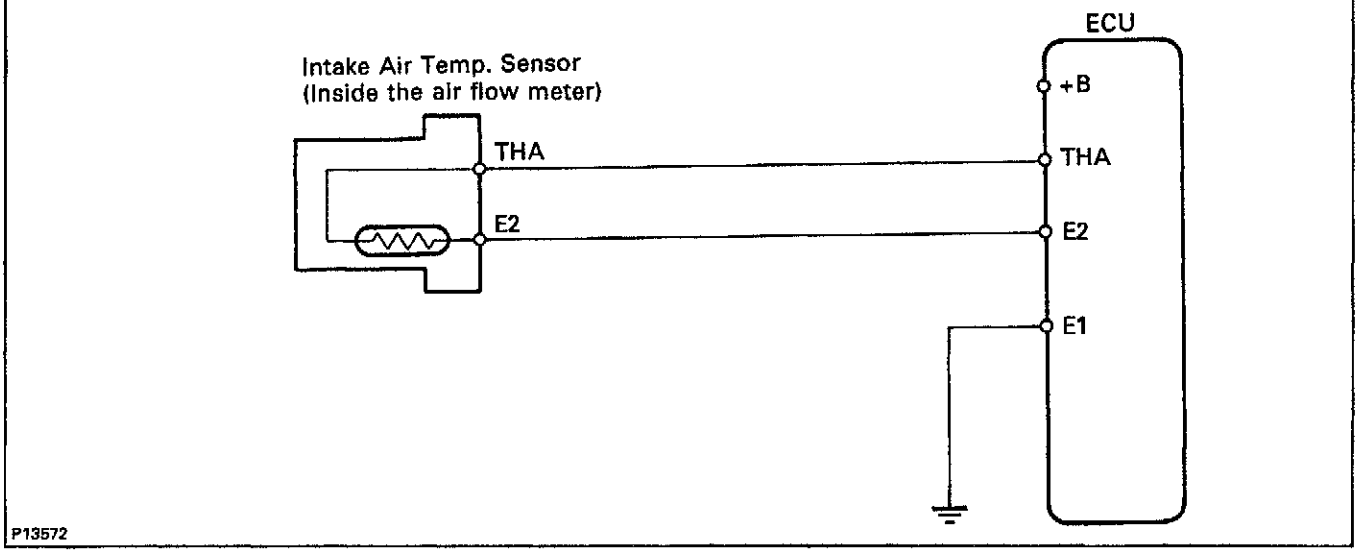
OK → Check fusible link and ignition switch.
- BAD → Repair or replace.

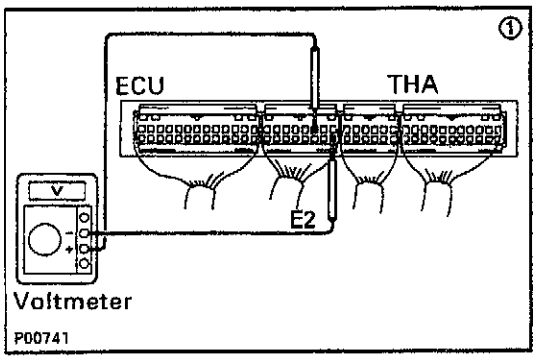
OK → ③ Check resistance of each injector.
**STD resistance: Approx. 13.8 Ω**
- BAD → Replace injector.

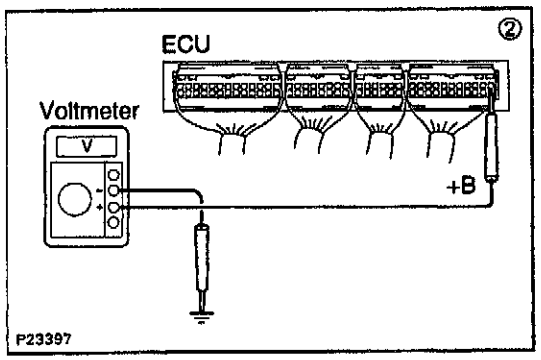
OK → Check wiring between ECU terminal #10 ~ #60 and battery.
- BAD → Repair or replace.

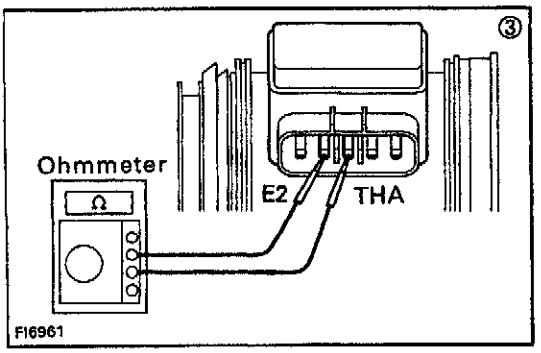
V06545

| No. | Terminals | Trouble | Condition | | STD voltage |
|---|---|---|---|---|---|
| 5 | THA – E2 | No voltage | IG SW ON | Intake air temp. 20°C (68°F) | 0.5 – 3.4 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 and body ground. **(IG SW ON)**

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

NO → Refer to No.1. (See page EG-23)

Check wiring between ECU terminal E1 and body ground.

OK → ③ Check intake air temp. sensor.

BAD → Repair or replace.

③ Check intake air temp. sensor.

BAD → Replace air flow meter.

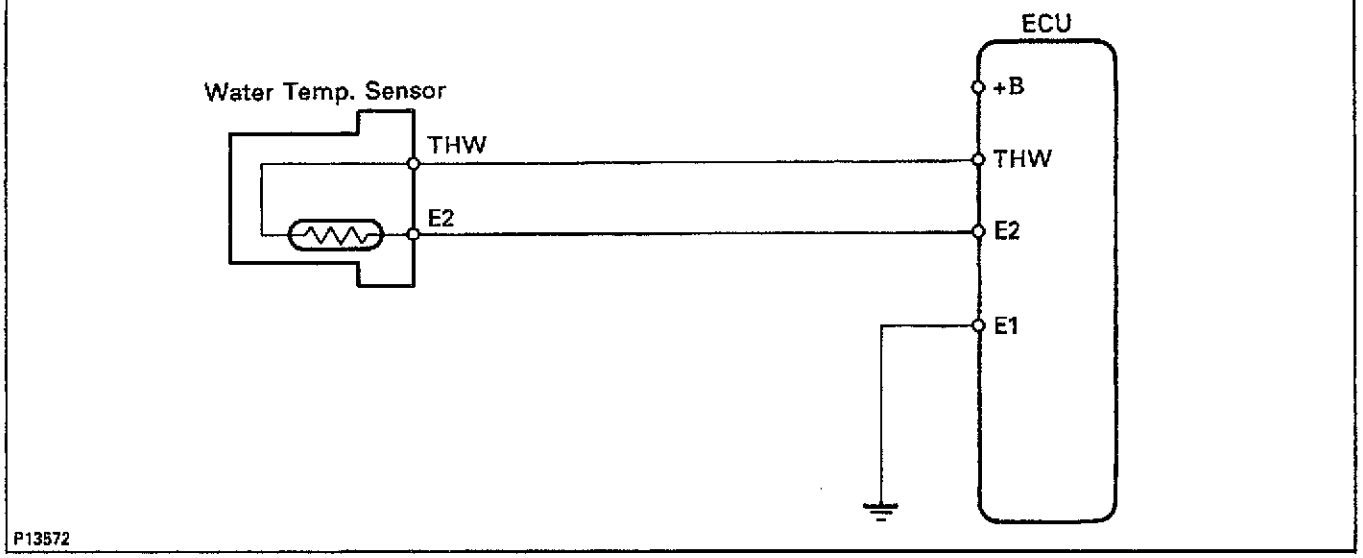
OK → Check wiring between ECU and intake air temp. sensor.

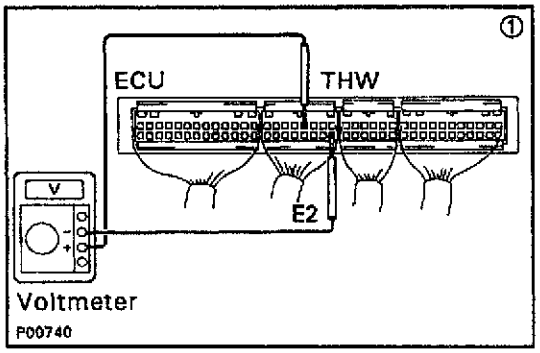
OK → Try another ECU.

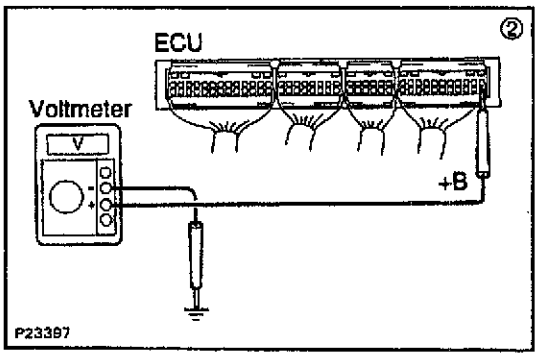
BAD → Repair or replace.

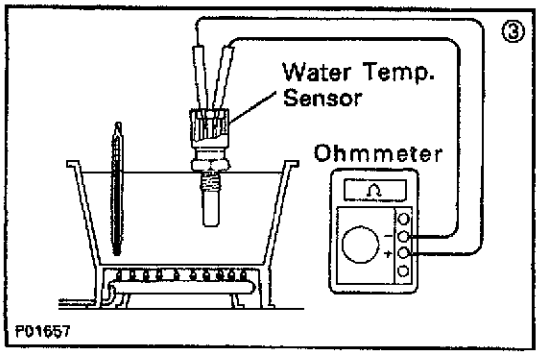
V06546

| No. | Terminals | Trouble | Condition | | STD voltage |
|---|---|---|---|---|---|
| 6 | THW – E2 | No voltage | IG SW ON | Engine coolant temp. 80°C (176°F) | 0.2 – 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 and body ground. **(IG SW ON)**

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

NO → Refer to No.1. (See page EG-23)

OK → ③ Check water temp. sensor.

BAD → Repair or replace.

BAD → Replace water temp. sensor.

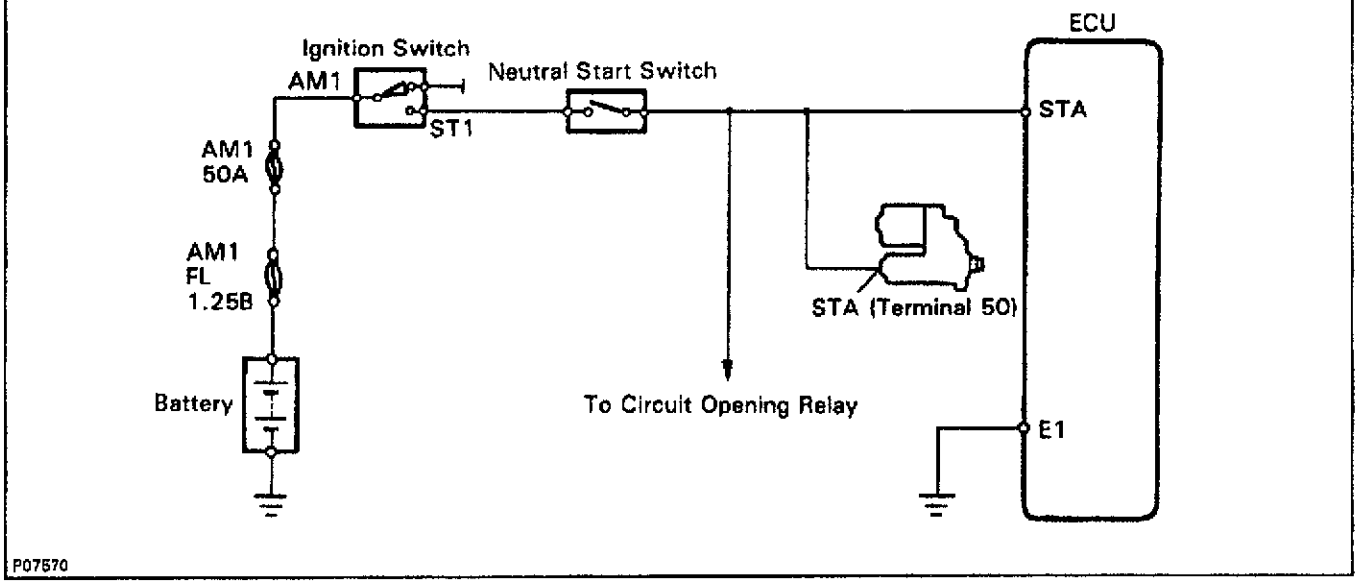
OK → Check wiring between ECU and water temp. sensor.

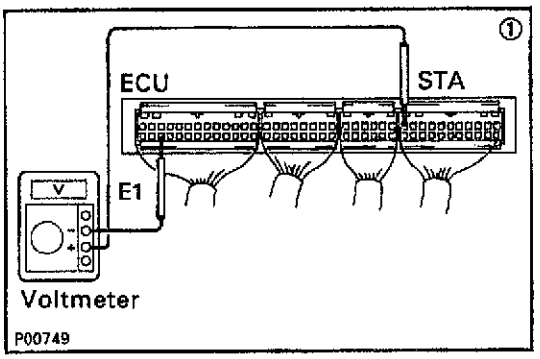
OK → Try another ECU.

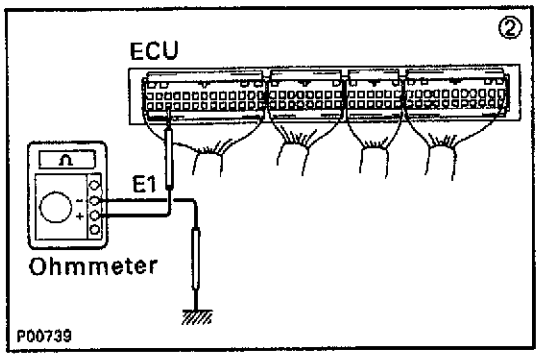
BAD → Repair or replace.

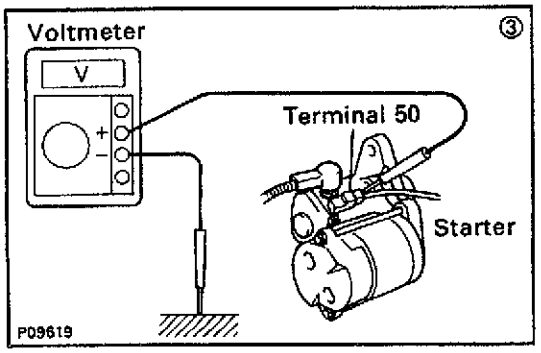
V06547

| No. | Terminals | Trouble | Condition | STD voltage |
|---|---|---|---|---|
| 7 | STA – E1 | No voltage | Cranking | 6 V or more |




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 → Try another ECU.

BAD → Repair or replace.

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

OK

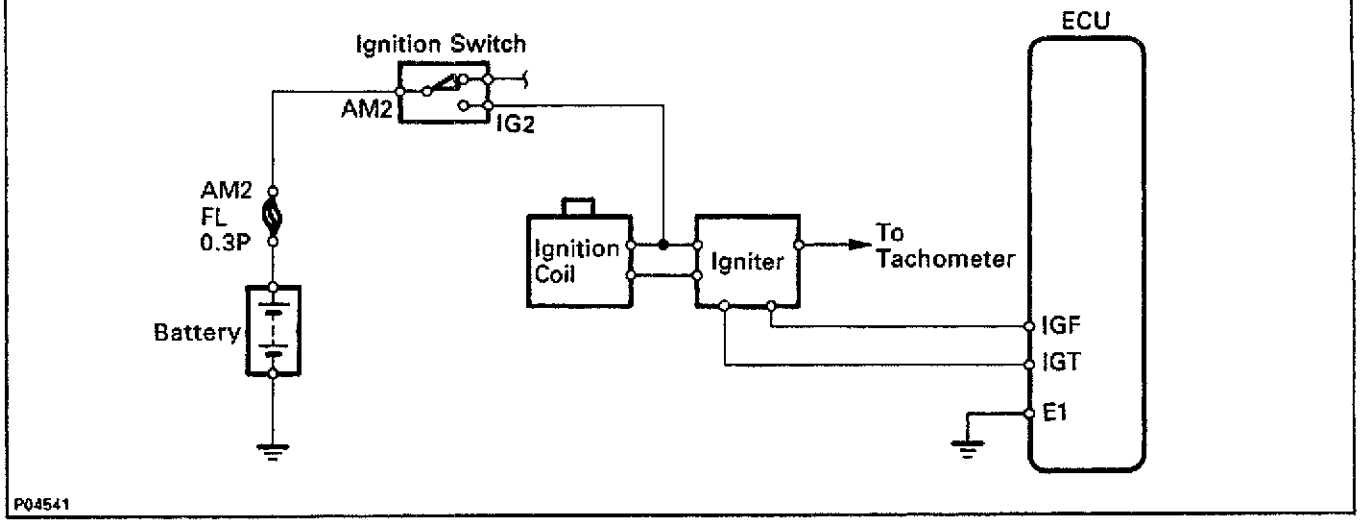
③ Check that there is voltage at starter terminal 50. **(IG SW START) STD voltage: 6 V or more**

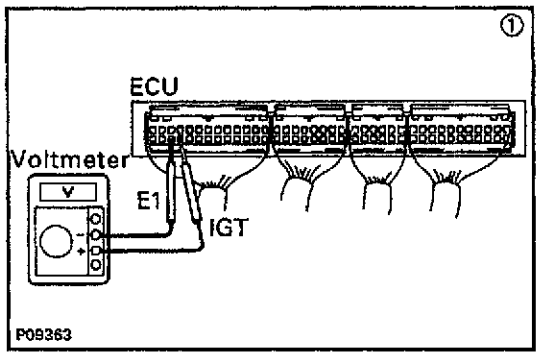
OK → Check starter.

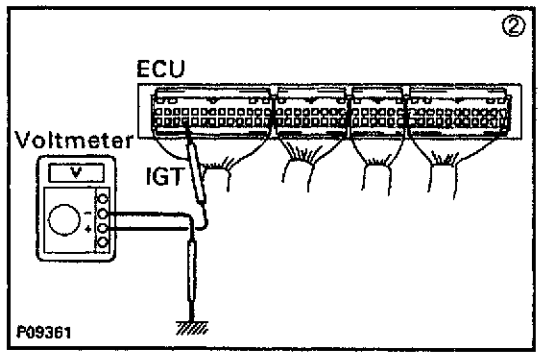
NO → Check wiring between ignition switch terminal ST1 and starter terminal 50.

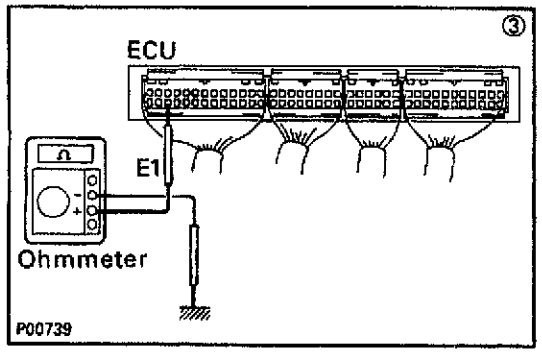
V06548

| No. | Terminals | Trouble | Condition | STD voltage |
|---|---|---|---|---|
| 8 | IGT – E1 | No voltage | Idling | Palse generation |




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. — BAD → Repair or replace.

OK

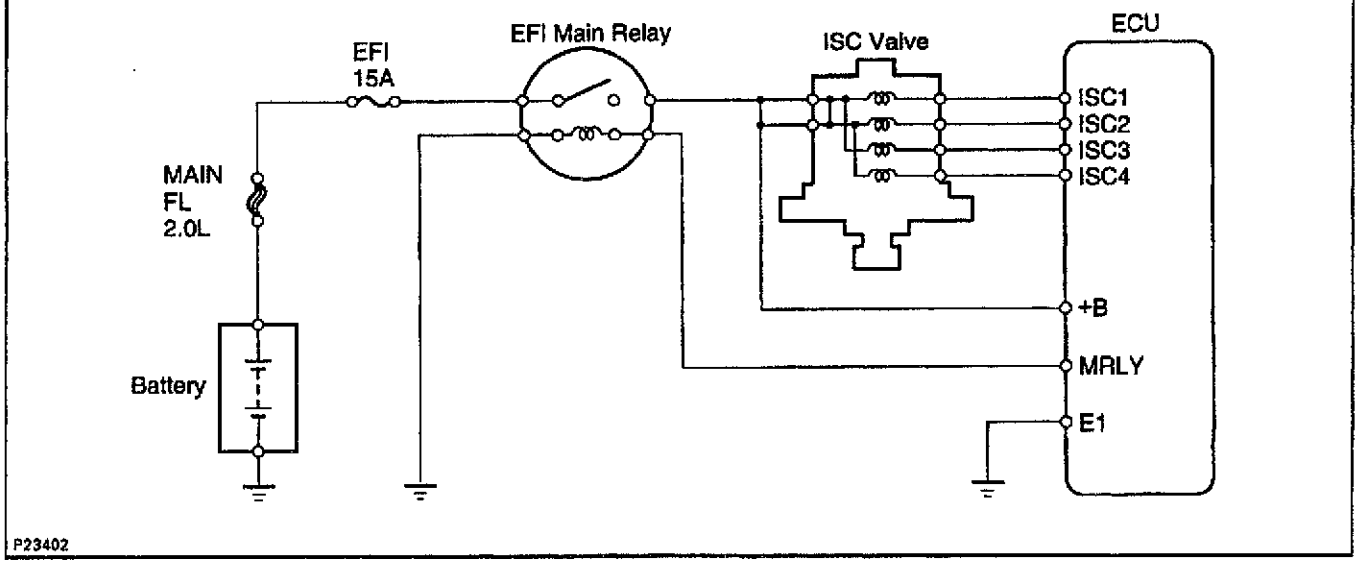
Check wiring between ECU and battery. — BAD → Repair or replace.

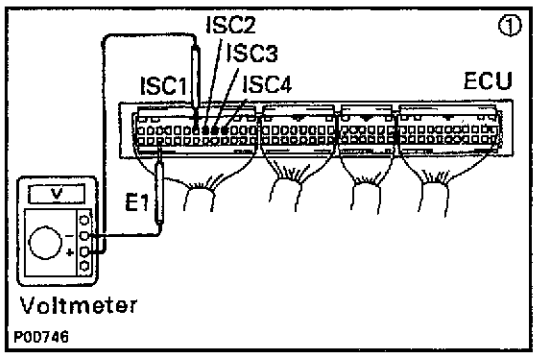
OK

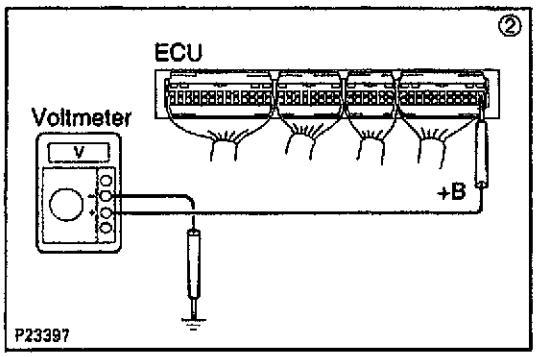
Check igniter. — BAD → Repair or replace.

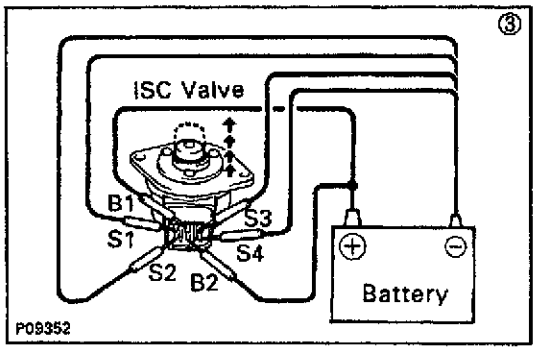
V06549

| No. | Terminals | Trouble | Condition | STD voltage |
|---|---|---|---|---|
| 9 | ISC1 ~ ISC4 – E1 | No voltage | IG SW ON | 9 – 14 V |




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 and body ground. **(IG SW ON)**

OK → ③ Check ISC valve.

NO → Refer to No.1. (See page EG-23)

Check wiring between ECU terminal E1 and body ground.

OK → ③ Check ISC valve.

BAD → Repair or replace.

③ Check ISC valve.

BAD → Replace ISC valve.

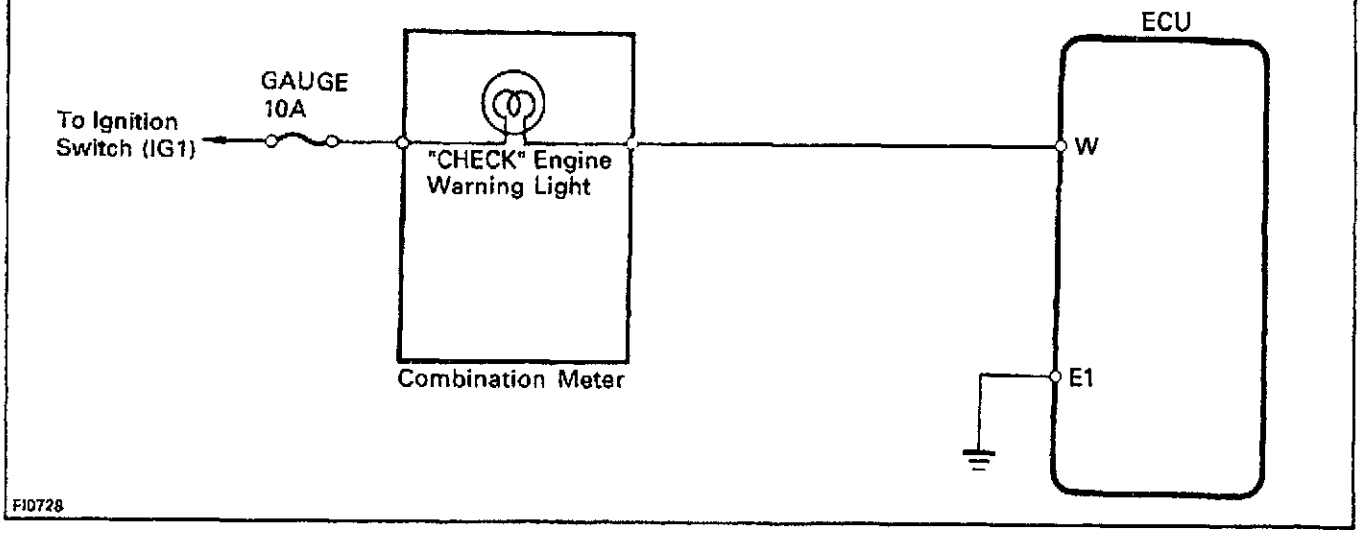
OK → Check wiring between ECU and EFI main relay.

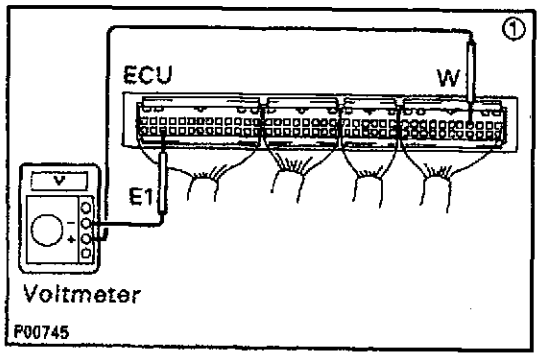
OK → Try another ECU.

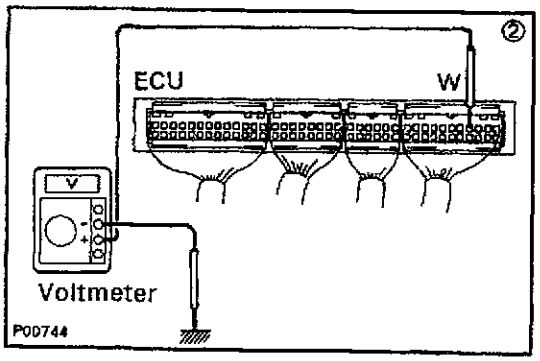
BAD → Repair or replace.

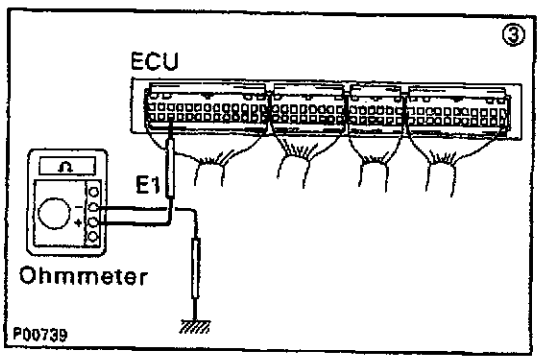
V06550

| No. | Terminals | Trouble | Condition | STD voltage |
|---|---|---|---|---|
| 10 | W – E1 | No voltage | No trouble ("CHECK" engine warning light off) and engine running. | 9 – 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

BAD

Try another ECU.

Repair or replace.

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

OK

BAD

Repair or replace.

Fuse blows again

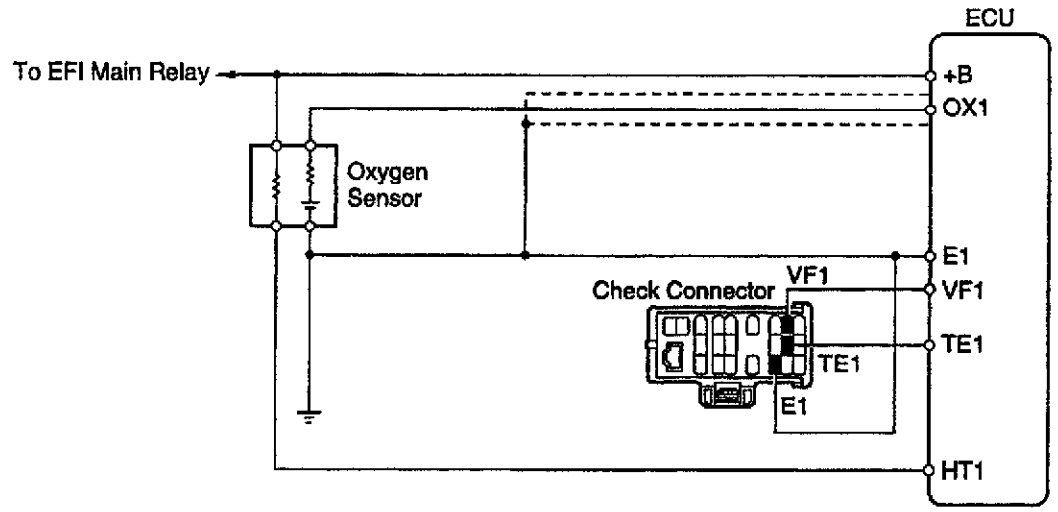
Check wiring between ECU terminal W and fuse.

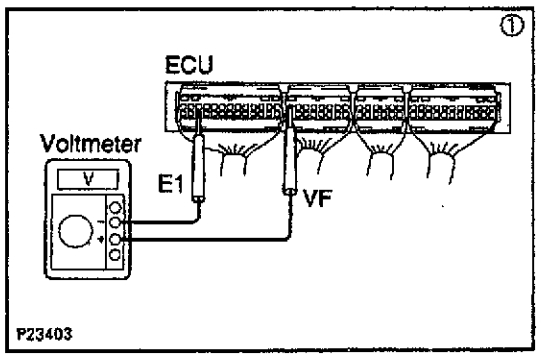
BAD

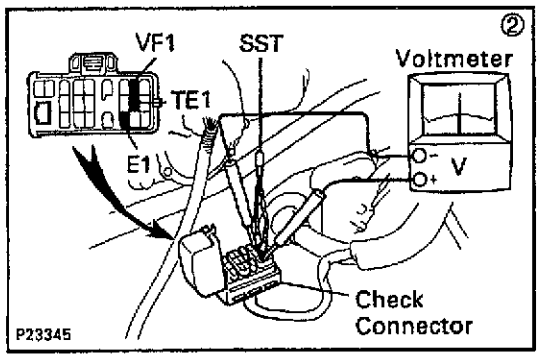
Repair or replace.

V06551

**Oxygen Sensor**




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

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

NO → OK

Check wiring between ECU terminal E1 and body ground.

OK → Try another ECU.

BAD → Repair or replace.

Check for air suction of air 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. BAD → Repair or replace.

OK

Check air flow meter. BAD → Repair or replace.

OK

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

BAD

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

OK

Repair oxygen sensor.

V06552