

6.5. Idle speed control

STEP 34 XR25 Diagnostic unit :

Press # 06 for engine speed
Display value is 900 RPM \pm 50 at idle

Press # 20 for nominal idle speed
Display value is 908 RPM --> STEP 35

If the engine speed value is not consistent with the nominal value : FAILURE go to STEP 151.

Tachometer :

Engine idle speed is 900 RPM \pm 50 RPM -> STEP 35
If not : FAILURE go to STEP 151.

6.6. Ignition spark advance

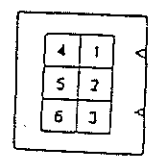
STEP 35 XR25 Diagnostic unit :

Press # 08 .

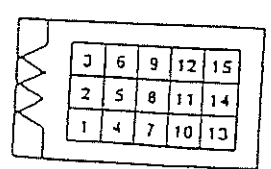
Display value is 14 \pm 5 crankshaft degrees at idle
----> STEP 36

Strobo :

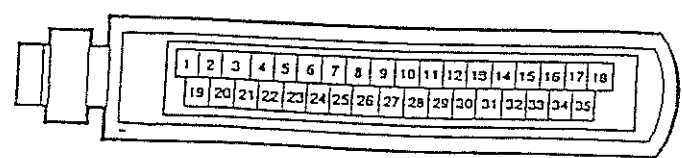
Advance value is 14 \pm 5 crankshaft degrees.
----> STEP 36



CONNECTOR 01



CONNECTOR 02



ECU CONNECTOR :

6.7. Injection time

STEP 36 If no XR25 diagnostic unit ----> STEP 37a

STEP 37 XR25 Diagnostic unit :

Engine running at idle

Press # 07 for injection time.
Should be 1.8 ms +/- 0.3

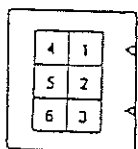
Press # 34 for mapping correction.
Should be 46 % +/- 3

Press # 32 for coolant temp. correction.
Should be 0 %

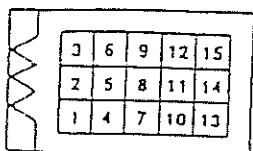
Press # 33 for air temp. correction.
Should be 0 % -----> STEP 38

Step 37a Scope.
Measure injector time
1.8ms+-0.3

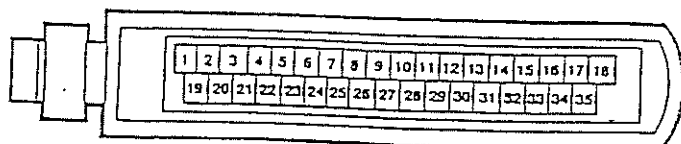
Yes--> step 39
No --> step 86 and 96



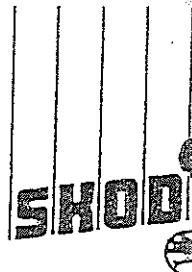
CONNECTOR
01



CONNECTOR
02



ECU CONNECTOR



6.8. Oxygen sensor

STEP 38 XR25 Diagnostic unit :

Press # 05 for oxygen sensor output.

Display value should change from 0 % to 100 %.

If not : FAILURE go to STEP 135

Press # 35 for oxygen sensor correction.

Display value should be 50 % +/- 30 %

Press # 30 for adaptative gain correction.

Display value should be between 27.7 % and 72.3 %

Press # 31 for adaptative zero correction.

display value should be between 96^o μs and 416 μs.

Press # 41 for FLAG01.

Bit 4 is lighted at the first passage in closed loop.

Bit 1 is lighted if delay active.

Press # 42 for FLGFG0

Bit 7 is lighted if A/F is rich.

Bit 6 is lighted if closed loop active

Bit 5 is lighted if oxygen sensor transition

Bit 4 is lighted if proportionnal correction

Bit 3 is lighted if adaptative (gain or zero) out of limits.

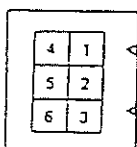
-----> STEP 40.

STEP 39 Voltmeter :

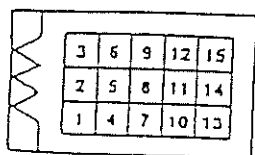
Test the Oxygen sensor voltage between ECU connector terminals 35 and 1. Terminal 1 is ground.

Voltage changes from 0V to 12 V.-----> STEP 40
Back to 0 volts.

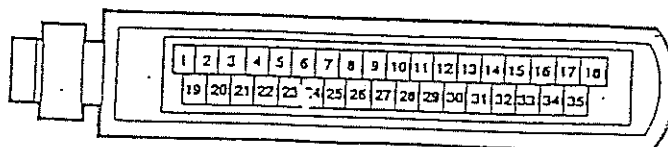
If not : FAILURE go to STEP 135.



CONNECTOR



CONNECTOR



6.9 Wide open throttle information

STEP 40 XR25 Diagnostic unit :

Throttle closed, bargraph 10 left should be lighted and 10 right should be off.

(or press # 40 bit 3 should be zero and bit 7 should be one)

Depress the throttle, bargraph 10 left should be off as well as 10 right (or both bit 3 and bit 7 should be one).

At wide open throttle, bargraph 10 right should be lighted. (or bit 7 should be one)

The condition for wide open throttle is TPS value greater than 3.83 V (press # 17).

----> STEP 41.

Voltmeter, between throttle position switch > 3.83Volts.

6.10. Deceleration fuel cut off

STEP 41 XR25 Diagnostic unit :

Press # 42 (FLGFGO)

Bit 1 should be zero

Depress the throttle and run the engine at 3000 RPM

Release the throttle

Bit 1 should be one until the engine reaches 1000 RPM.

-----> STEP 42.

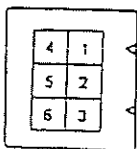
Step 41a Voltmeter and tachometer

D1-2 to Injector 21

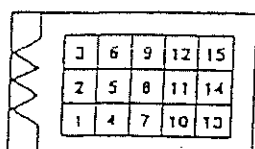
Depress throttle and run engine at 3000 rpm

Release throttle

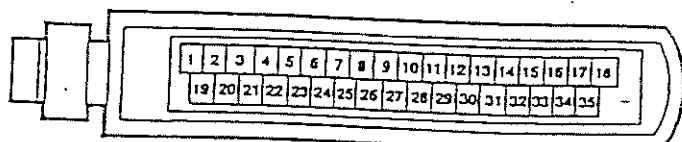
No injection until engine reaches 1000 rpm.



CONNECTOR
D1



CONNECTOR
D2



ECU CONNECTOR

6.11 Canister purge operations

STEP 42 Disconnect the vacuum hose from the canister and connect a vacuum gauge to the hose.

At Idle no vacuum should be indicated on the gauge.

XR25 Diagnostic unit

Voltmeter

Press # 43 (IMPRT1)

Bit 5 should be one

Test for voltage between D2-10 and D1-3 (ground)
Voltage should be 0V

If not : FAILURE go to STEP 160.

Increase the engine speed manually until the ISA motor plunger loses contact with the throttle lever.

Manifold vacuum should be indicated on the gauge.

XR25 Diagnostic unit

Voltmeter

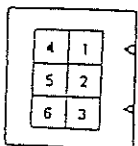
Press # 43

Bit 5 should be zero

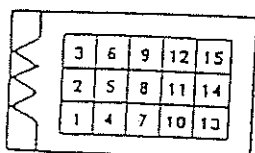
Voltage at D2-10 should be 14 V

If OK ----> STEP 43.

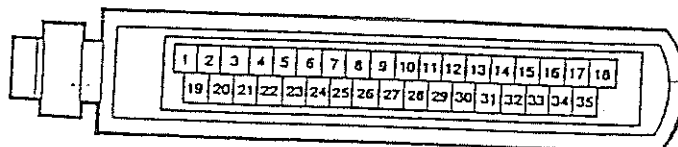
If not : FAILURE got to STEP 161.



CONNECTOR
D1



CONNECTOR
D2



ECU CONNECTOR :

7. ENGINE SWITCH OFF TESTS

STEP 43. Turn the ignition switch off
 Voltmeter D1-2 to injector 21

The ECU ceases to provide a ground for the injector and the fuel injection stops

Yes -----> STEP 44
 No -----> STEP 53

STEP 44

The idle speed actuator fully extend

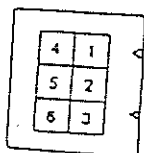
Yes -----> STEP 45
 No -----> STEP 151

STEP 45

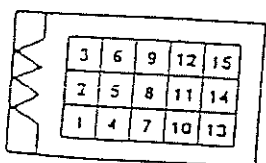
The ECU deactivates

Yes -----> STEP 46
 No -----> STEP 57

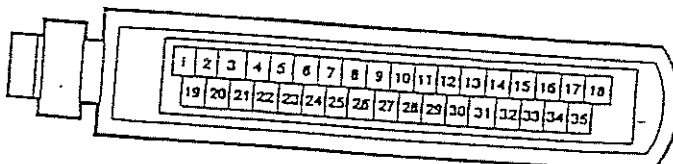
STEP 46 End of test



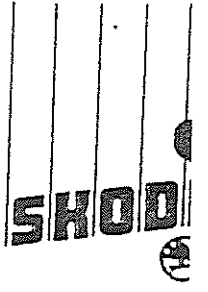
CONNECTOR
D1



CONNECTOR
O2



ECU CONNECTOR :



3. SYSTEM COMPONENTS FAILURE TESTS

STEP 47 Check the system fuses
if OK ----> STEP 48

1.1. Battery voltage failure test

STEP 48 Remove the ECU and test for battery voltage between ECU connector terminals 4 and 1. Terminal 1 is ground
Battery voltage
Yes -----> STEP 52
No -----> STEP 49

STEP 49 Test for continuity between ECU wire harness connector terminal 1 and engine ground
Continuity
Yes -----> STEP 50
No -----> STEP 51

STEP 50 Repair the power supply fault fault in the wire harness
-----> STEP 2

STEP 51 Repair the ground circuit fault in the wire harness
-----> STEP 2

STEP 52 Repair the circuit between ECU connector terminal 4 and diagnostic connector terminal D1-5
-----> STEP 2

2. Ignition switch failure tests

STEP 53 Ignition switch off
Test for battery voltage between ECU connector terminals 3 and 1. Terminal 1 is ground
0V
Yes, good ----> STEP 55
No, failure --> STEP 56

STEP 54 Ignition switch on
Test for battery voltage between ECU connector terminals 3 and 1. Terminal 1 is ground
Battery voltage
Yes, good ---> STEP 55
No, failure -> STEP 56

STEP 55 Repair the circuit between ECU connector terminal 3 and diagnostic connector terminal D1-2
switch off -----> STEP 3
switch on -----> STEP 7

STEP 56 Repair the ignition switch circuit
switch off -----> STEP 3
switch on -----> STEP 7

8.3. Power latch relay failure tests

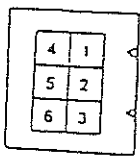
STEP 57 Ignition switch on
 With the ignition switch off,
 connect voltmeter probes
 between ECU connector
 terminals 7 and 1.
 Terminal 1 is ground
 Turn the ignition switch on.

- 1*) The voltage may be very high (spike) for a fraction of a second
- 2*) The voltage decreases to 1V or less for 1 second
- 3*) The voltage increases to battery voltage level (+/- 1 volt)

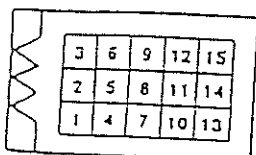
Yes, good --> STEP 60
 No, failure
 If voltage remains at 12 V -----> STEP 62
 If not ----> STEP 58

STEP 58 Turn the ignition switch off and measure the resistance between ECU wire harness connector terminals 7 and 19.
 Negative test probe at 19

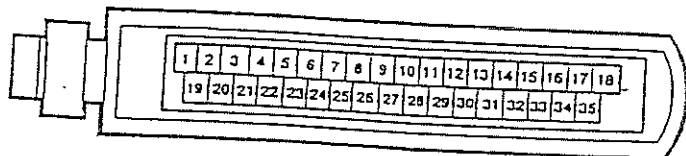
Resistance value between 80Ω and 120Ω
 Yes ---> STEP 62
 No ----> STEP 59



CONNECTOR 01



CONNECTOR 02



ECU CONNECTOR :

STEP 59 Remove the power relay and measure the resistance between relay terminals 85 and 86.
Negative test probe at 86

Resistance value between 80 Ω and 120 Ω
Yes ----> STEP 60
No -----> STEP 61

STEP 60 Repair the wire harness -----> STEP 8 between the system power relay and the ECU

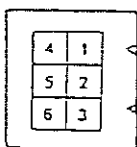
STEP 61 Replace the power latch -----> STEP 8 relay

STEP 62 Replace the ECU switch off -> STEP 1
switch on --> STEP 8

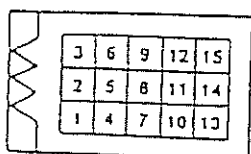
STEP 63 Test for voltage between ECU wire harness connector terminals 19 and 1.
Terminal 1 is ground
Battery voltage
Yes, good -> STEP 64
No, failure -> STEP 65

STEP 64 Repair the circuit between ECU connector terminal 19 and diagnostic connector terminal D2-4 -----> STEP 9

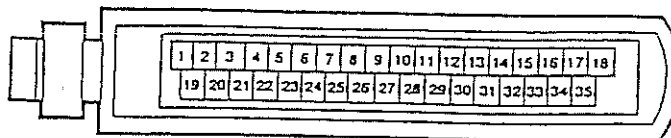
STEP 65 Check the battery to -----> STEP 9 power relay circuit and repair



CONNECTOR 01



CONNECTOR 02



ECU CONNECTOR :

8.4. Fuel pump failure tests

STEP 66 Ignition switch on

Fuel pumps operates continuously
 Yes --> STEP 67
 No ----> STEP 70

STEP 67 Check voltage between ECU wire harness connector terminals 6 and 1 Terminal 1 is ground

Voltage less than 1 Volt
 Yes.-----> STEP 68
 No -----> STEP 69

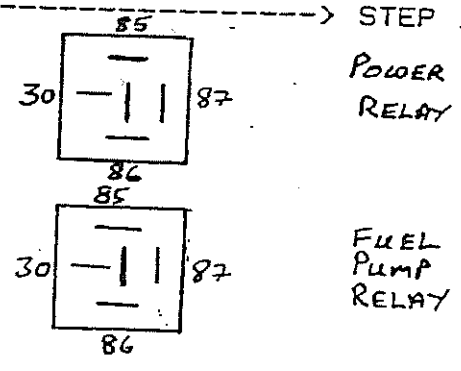
STEP 68 Disconnect the ECU wire harness connector and test the voltage between connector terminals 6 and 1 with the ignition switch on.

Voltage less than 1 Volt
 Yes ----> STEP 74
 No -----> STEP 75

STEP 69 Check the fuel pump relay and associated wire harness

-----> STEP 10

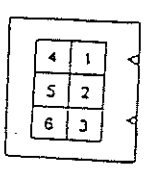
STEP 70. Turn the ignition switch off and remove the fuel pump relay. Install a jumper wire across the relay connector terminals 30 and 87. Turn the ignition switch on.



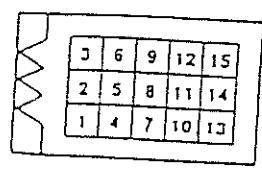
Fuel pump operates
 Yes --> STEP 71
 No ----> STEP 76

STEP 71. Install the fuel pump relay. Test the voltage between ECU wire harness connector terminals 6 and 1. Turn the ignition switch off and then on

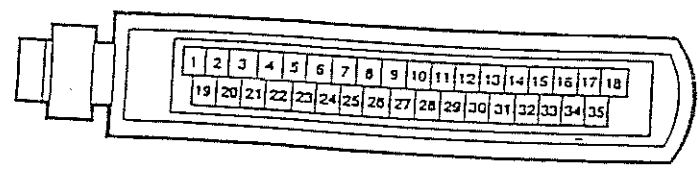
Voltage less than 1 Volt during the first second after turning on the switch
 Yes -----> STEP 72
 No -----> STEP 75



CONNECTOR D1



CONNECTOR D2



ECU CONNECTOR

STEP 72

After 1 second battery voltage indicated on the voltmeter

Yes -----> STEP 73

No -----> STEP 74

STEP 73. Replace the fuel pump relay -----> STEP 10

STEP 74 Repair the wire harness between ECU wire harness connector terminal 6 and fuel pump relay terminal 85 -----> STEP 10

STEP 75 Replace the ECU -----> STEP 10

STEP 76 Remove the jumper wire
Test for voltage between the relay connector terminals 30 and 87

Voltage

Yes -----> STEP 77

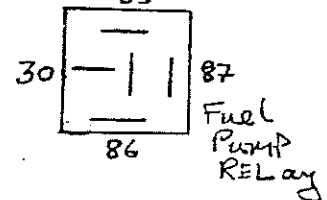
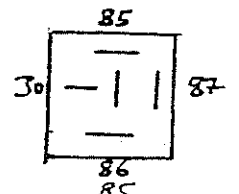
No -----> STEP 82

STEP 77 Install the relay
Install a jumper wire across the fuel pump ballast resistor.
Turn the ignition switch on.

Fuel pump operates

Yes -----> STEP 78

No -----> STEP 79



STEP 78 Replace the fuel pump ballast resistor -----> STEP 10

STEP 79 Check the ballast resistor to fuel pump wire harness.

Wire harness correct

Yes -----> STEP 80

No -----> STEP 81

STEP 80 Remove and test the fuel pump.
Replace it if defective -----> STEP 10

STEP 81 Repair the wire harness -----> STEP 10

STEP 82 Repair the injection switch to fuel pump relay wire harness -----> STEP 10

8.5. Starting failure test

STEP 83 Engage the starter motor and test the voltage between ECU connector terminals 29 and 1. Terminal 1 is ground.

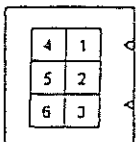
Voltage greater than 7 Volts
 Yes -----> STEP 84.
 No -----> STEP 85

STEP 84 Repair the wire harness between diagnostic connector terminal D1-4 and ECU connector terminal 29.

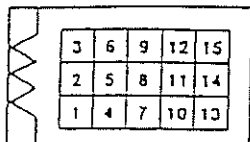
-----> STEP 26

STEP 85 Repair the starter motor and ignition switch circuits and/or wiring harness.

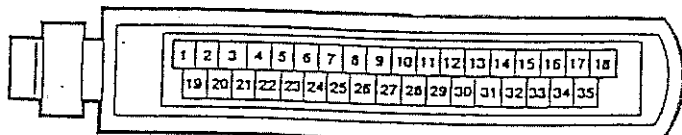
-----> STEP 26



CONNECTOR D1



CONNECTOR D2



ECU CONNECTOR

8.6. Coolant temperature sensor failure tests

STEP 86 Ground continuity

Check and repair the wire harness for ground of both temperature sensors (air and coolant) ----->

STEP 4

STEP 87 Test the voltage between diagnostic connector terminals D2-12 and D2-7

Ground potential -> STEP 88
Approximately 2.5 V --> STEP 90

STEP 88 Test for continuity between diagnostic connector terminal D2-12 and ECU connector terminal 15

Continuity
Yes -----> STEP 89
No -----> STEP 92

STEP 89 Test for short circuit to ground between ECU connector terminal 15 and diagnostic connector terminal D2-12

Short circuit
Yes -----> STEP 92
No -----> STEP 94

STEP 90 Disconnect the coolant temperature sensor wire harness connector and test the voltage in reference to ground.

Approximately 2.5. Volts
Yes -----> STEP 91.
No -----> STEP 92

STEP 91 Test for continuity between sensor connector ground terminal and ECU connector terminal 32

Continuity
Yes -----> STEP 93
No -----> STEP 92

STEP 92 Repair the wire harness ----->

STEP 95

STEP 93 Replace the coolant temperature sensor ----->

STEP 95

STEP 94 Replace the ECU ----->

STEP 95

STEP 95 Ignition on tests ----->

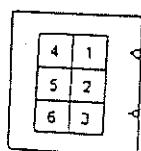
STEP 12

Ignition off tests ----->

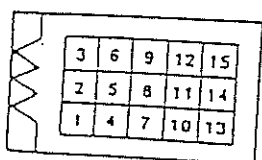
STEP 5

Engine running tests ----->

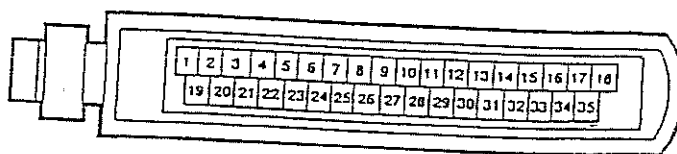
STEP 29



CONNECTOR
01



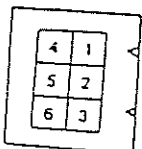
CONNECTOR
D2



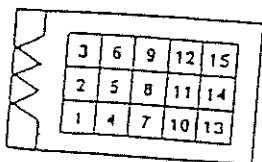
ECU CONNECTOR

8.7. Air temperature sensor failure tests

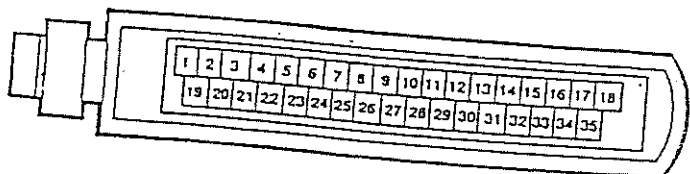
- | | |
|---|---|
| STEP 96 Test the voltage between diagnostic connector terminals D2-8 and D2-7 | Ground potential -> STEP 97.
Approximately 2.5 Volts
-----> STEP 99 |
| STEP 97 Test for continuity between diagnostic connector terminal D2-8 and ECU connector terminal 14 | Continuity
Yes -----> STEP 98
No -----> STEP 101 |
| STEP 98 Test for short circuit to ground between ECU connector terminal 14 and diagnostic connector terminal D2-8 | Short circuit
Yes -----> STEP 101
No -----> STEP 103 |
| STEP 99 Disconnect the air temperature sensor wire harness connector and test the voltage in reference to ground | Approximately 2.5 Volts
Yes -----> STEP 100
No -----> STEP 101 |
| STEP 100 Test for continuity between sensor connector ground terminal and ECU connector terminal 32 | Continuity
Yes -----> STEP 102
No -----> STEP 101 |
| STEP 101 Repair the wire harness -----> | STEP 104 |
| STEP 102 Replace the air temperature sensor -----> | STEP 104 |
| STEP 103 Replace the ECU -----> | STEP 104 |
| STEP 104 Ignition on tests -----> | STEP 15 |
| Ignition off tests -----> | STEP 6 |
| Engine running tests -----> | STEP 30 |



CONNECTOR
01



CONNECTOR
02



ECU CONNECTOR :

8.8. Closed throttle switch failure tests

STEP 105. Inspect the throttle cable. Ensure that the cable is fully released. Repair the throttle cable assembly if necessary. -----> STEP 107

STEP 106. Disconnect the Idle speed actuator wire harness connector
Depress the throttle

Test for continuity between Idle speed actuator terminals A and B

Continuity
Yes -----> STEP 111
No -----> STEP 108

STEP 107. Test for continuity between idle speed actuator terminals A and B

Continuity
Yes -----> STEP 109
No -----> STEP 111

STEP 108. Disconnect the ECU wire harness connector.
Connect the idle speed actuator connector
Depress the throttle
Test for continuity between idle speed actuator terminals A and B

Continuity
Yes -----> STEP 110
No -----> STEP 112

STEP 109. Repair the wire harness between diagnostic connector terminal D2-13 and closed throttle switch ----->

STEP 18

STEP 110. Repair the short circuit to ground in the wire harness between ECU, diagnostic connector and idle speed actuator ----->

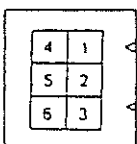
STEP 18

STEP 111. Replace the idle speed actuator.
Adjust it as described in § 10.2 ----->

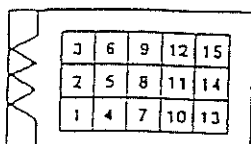
STEP 18

STEP 112. Replace the ECU ----->

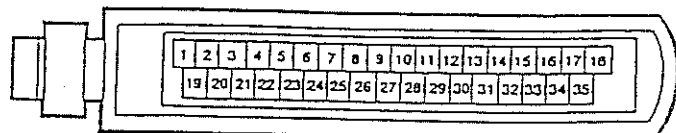
STEP 18



CONNECTOR 01



CONNECTOR 02



ECU CONNECTOR :

8.9. Throttle position sensor failure tests

STEP 113. Disconnect the wire harness connector at the TPS.

Check voltage at TPS wire harness connector between terminals B (ground) and C (5 Volts supply) with the ignition on.

Voltage 5 Volts
Yes -----> STEP 114
No -----> STEP 116

STEP 114. Connect the wire harness connector to the sensor.

Check voltage between terminals A (+) and B (ground) with ignition on and wide open throttle

Voltage 4.6-4.7 Volts
Yes -----> STEP 22
No -----> STEP 115.

STEP 115. Adjust TPS as described in § 10.1

Adjustement possible
Yes -----> STEP 22
No -----> STEP 120

STEP 116. Turn ignition switch off.

Check for continuity between ECU connector terminal 16 and TPS connector terminal C

Continuity
Yes -----> STEP 117
No -----> STEP 119

STEP 117. Check for continuity between ECU connector terminal 13 and TPS connector terminal B

Continuity
Yes -----> STEP 118.
No -----> STEP 119

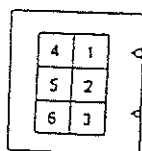
STEP 118. Check for continuity between ECU connector terminal 31 and TPS connector terminal A

Continuity
Yes -----> STEP 121.
No -----> STEP 119.

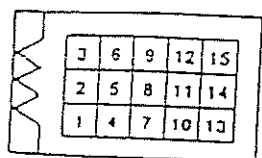
STEP 119. Repair wire harness between ECU and TPS -----> STEP 22

STEP 120. Replace the throttle position sensor.
Adjust it as described in § 10.1 -----> STEP 22

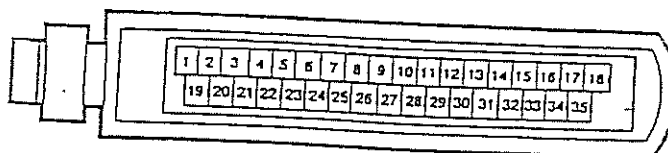
STEP 121. Replace the ECU -----> STEP 22



CONNECTOR
01



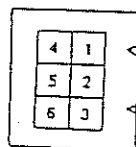
CONNECTOR
02



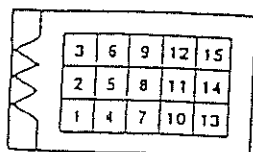
ECU CONNECTOR

8.10. Manifold absolute pressure sensor failure tests

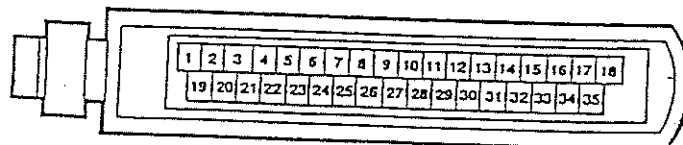
- STEP 122. Check for supply voltage between MAP wire harness connector terminals C and A. Terminal A is ground
- Voltage greater than 4V
 Yes -----> STEP 127
 No -----> STEP 123
- STEP 123. Turn ignition switch off check for continuity between ECU connector terminal 16 and MAP connector terminal C.
- Continuity
 Yes -----> STEP 124
 No -----> STEP 128
- STEP 124. Check for continuity between ECU connector terminal 33 and MAP connector terminal B
- Continuity
 Yes -----> STEP 125
 No -----> STEP 128
- STEP 125. Check for continuity between ECU connector terminal 17 and MAP connector terminal A
- Continuity
 Yes -----> STEP 126
 No -----> STEP 128
- STEP 126. Check for short circuit to ground at ECU connectors terminals 16 and 33.
- Short circuit to ground
 Yes -----> STEP 128
 No -----> STEP 130
- STEP 127. Remove the hose. Connect a vacuum pump with gauge to the MAP sensor. Apply 67.5 KPa (500 mm Hg) Check the voltage between MAP wire harness connector terminals B and A
- Voltage less than 1V
 Yes -----> STEP 131
 No -----> STEP 129
- STEP 128. Repair wire harness -----> STEP 24 or 32.
- STEP 129. Replace the MAP sensor -----> STEP 24 or 32.
- STEP 130. Replace the ECU -----> STEP 24 or 32.
- STEP 131. Connect the MAP sensor hose. Ensure that the hose is not twisted or kinked -----> STEP 24 or 32.



CONNECTOR
01



CONNECTOR
02



ECU CONNECTOR

8.11. Magnetic sensor failure tests

STEP 132. Turn the ignition switch on and test the voltage at ECU connector terminals 11 and 28. Use ECU connector terminal 1 for the ground reference.

If the voltage is between 2V and 4V go to STEP 137.
If not, go to STEP 133.

STEP 133. Test the speed sensor resistance.

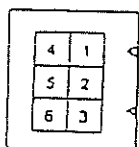
If this resistance is not in the range from 150 Ω to 250 Ω , replace the speed sensor and go to STEP 26.

If the resistance is correct, ----> STEP 134.

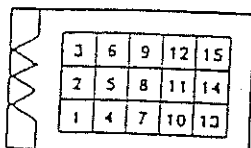
STEP 134. Test the continuity between ECU connector terminals 11 and 28, and the speed sensor connector. Refer to the wiring diagram for wire colors.

If continuity, reconnect the ECU and go to STEP 26.

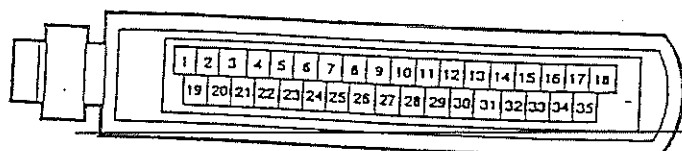
If no continuity, repair the wire harness and go to STEP 26.



CONNECTOR
01



CONNECTOR
02



ECU CONNECTOR :

8.12. Oxygen sensor failure tests

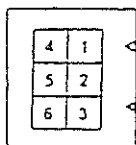
STEP 135. Test the continuity between ECU connector terminal 35 and the O2 sensor connector.

If no continuity, repair the wire harness and retest.
If continuity -----> STEP 136.

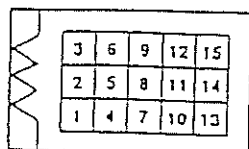
STEP 136. Inspect for exhaust leaks between the engine and the O2 sensor.

If exhaust leaks, repair and retest.

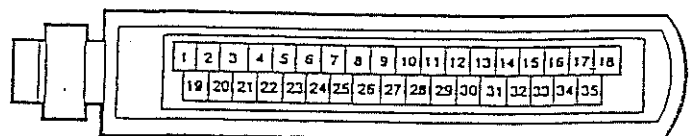
If no exhaust leaks, replace the O2 sensor and retest.



CONNECTOR
01



CONNECTOR
02



ECU CONNECTOR :