



1. Remove the air filter and clean the air filter housing. 2. Check the air filter for damage and replace if necessary. 3. Check the air filter for dirt and clean if necessary.

4. Check the air filter for damage and replace if necessary. 5. Check the air filter for dirt and clean if necessary.

6. Check the air filter for damage and replace if necessary. 7. Check the air filter for dirt and clean if necessary.

8. Check the air filter for damage and replace if necessary. 9. Check the air filter for dirt and clean if necessary. 10. Check the air filter for damage and replace if necessary.

EFI SYSTEM

11. Check the air filter for damage and replace if necessary. 12. Check the air filter for dirt and clean if necessary.

13. Check the air filter for damage and replace if necessary. 14. Check the air filter for dirt and clean if necessary.

15. Check the air filter for damage and replace if necessary. 16. Check the air filter for dirt and clean if necessary. 17. Check the air filter for damage and replace if necessary.

18. Check the air filter for damage and replace if necessary. 19. Check the air filter for dirt and clean if necessary.

20. Check the air filter for damage and replace if necessary. 21. Check the air filter for dirt and clean if necessary. 22. Check the air filter for damage and replace if necessary.

2. CONNECTING PROCEDURE FOR SST (EFI COMPUTER CHECK SUB-HARNESS)

When the ECU terminal voltage is measured with the ECU connector connected to the engine ECU, connect the SST, following the procedure given below.

NOTE:

- The terminal number of the SST connector is the same as the ECU connector (page EF-20).

- Turn OFF the ignition switch. Or, disconnect the battery ground cable from the negative (-) terminal of the battery with the ignition switch turned OFF. Disconnect the battery ground cable from the negative (-) terminal of the battery.

CAUTION:

- Be sure to memorize the malfunction code before disconnecting the battery cable. Otherwise the malfunction code(s) will be erased by disconnecting the battery cable.

- Remove the glove compartment sub assembly. [M101, M201 & J102]
Remove the EFI-ECU cover [S221]

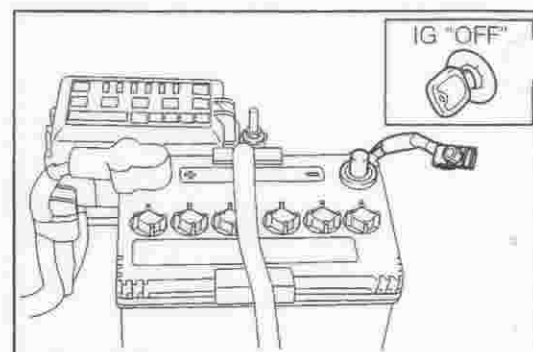
- Disconnect the wire harness connectors from the EFI ECU connectors at the cowl side of the passenger seat.
- Connect the following SST between the wire harness connectors and the EFI ECU connectors.

SST: 09842-97203-000

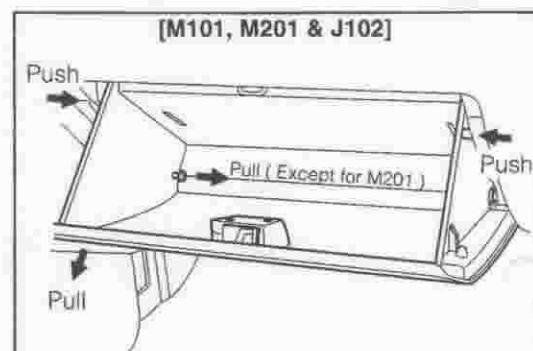
- Reconnect the battery ground cable to the negative (-) terminal of the battery.

CAUTION:

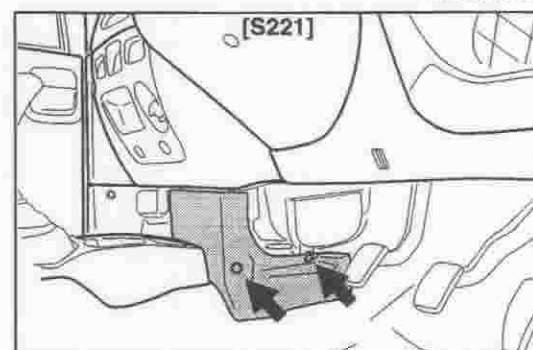
- When disconnecting or reconnecting the EFI ECU connectors, be sure to disconnect the battery ground cable from the negative (-) terminal of the battery with the ignition switch and all accessory switches in the off state.
- When installing a new battery, care must be exercised not to mistake the battery polarity. Failure to observe this caution could cause ECU malfunction.
- Before using the SST, be sure to check to see if short or open wire exists between the terminals of the SST.



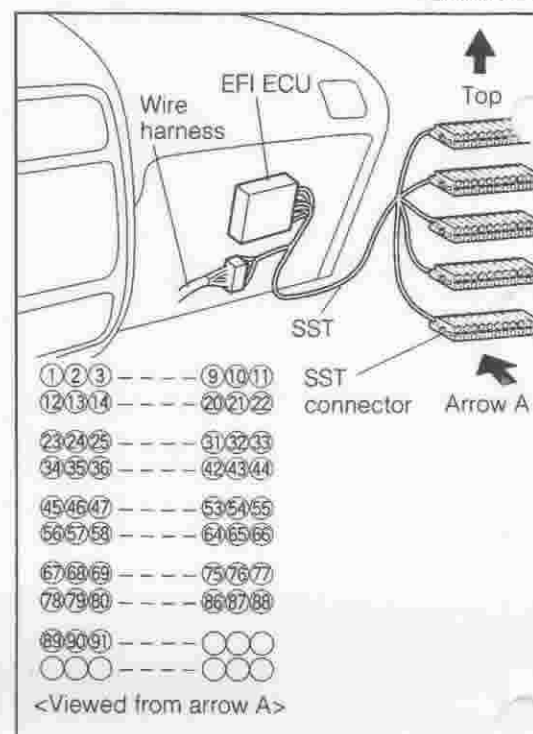
YEF00002-00001



YEF00003-00002



YEF00004-00003

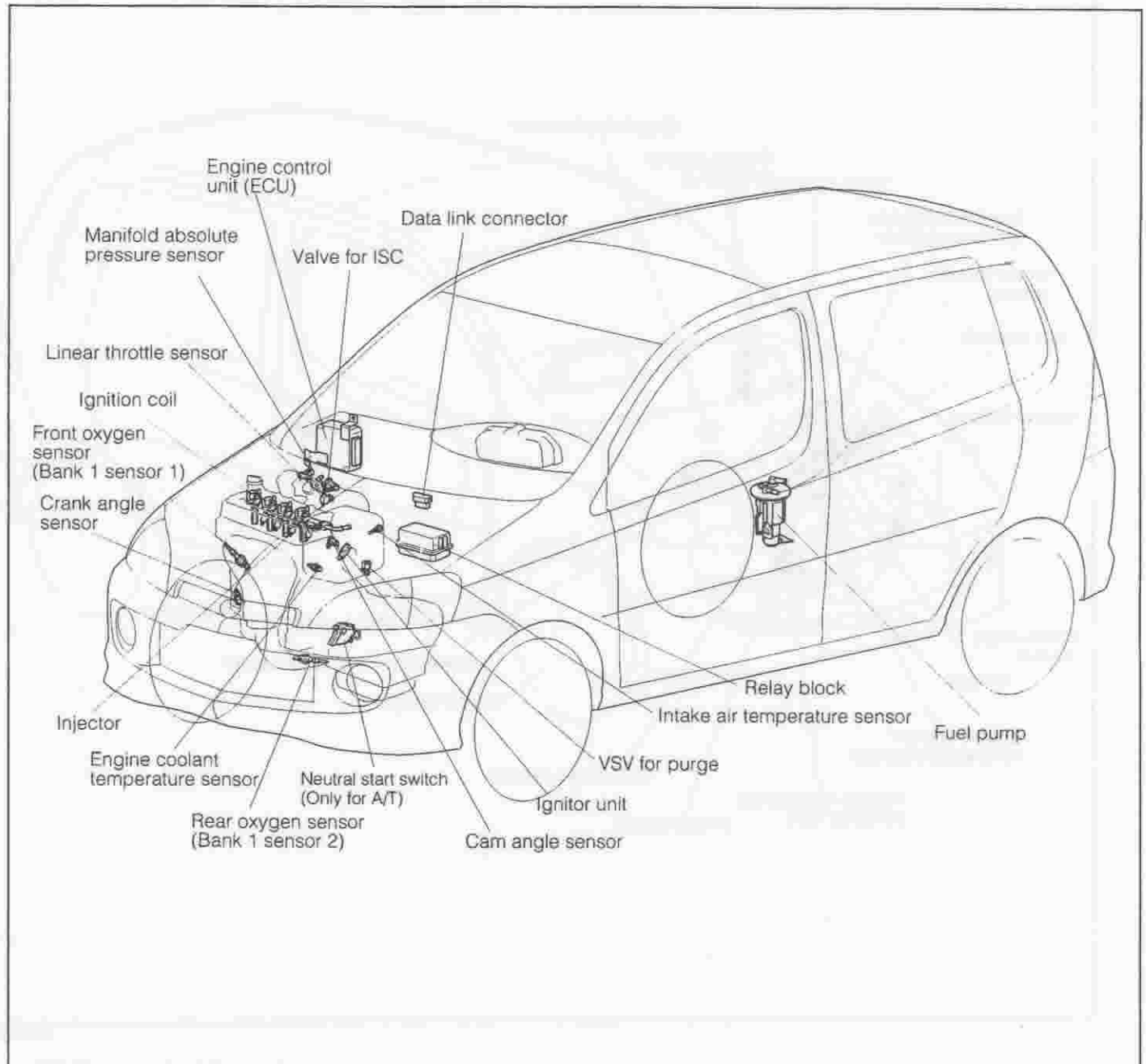


YEF00005-00004

3. SYSTEM DESCRIPTION

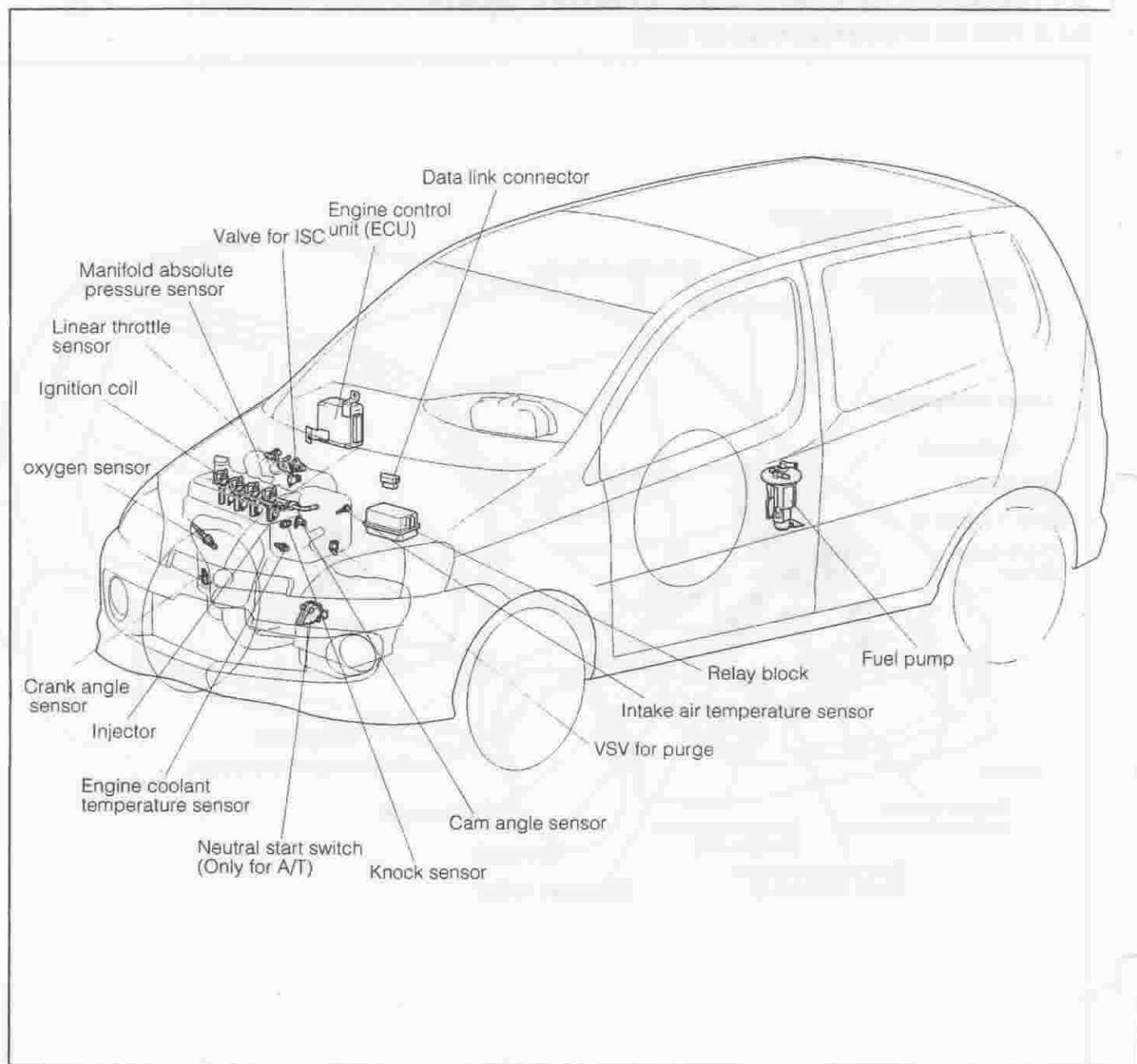
3.1 LOCATION OF ELECTRONIC CONTROL PARTS

3.1.9 FOR EU SPECIFICATIONS OF M201



YEF00006-00005

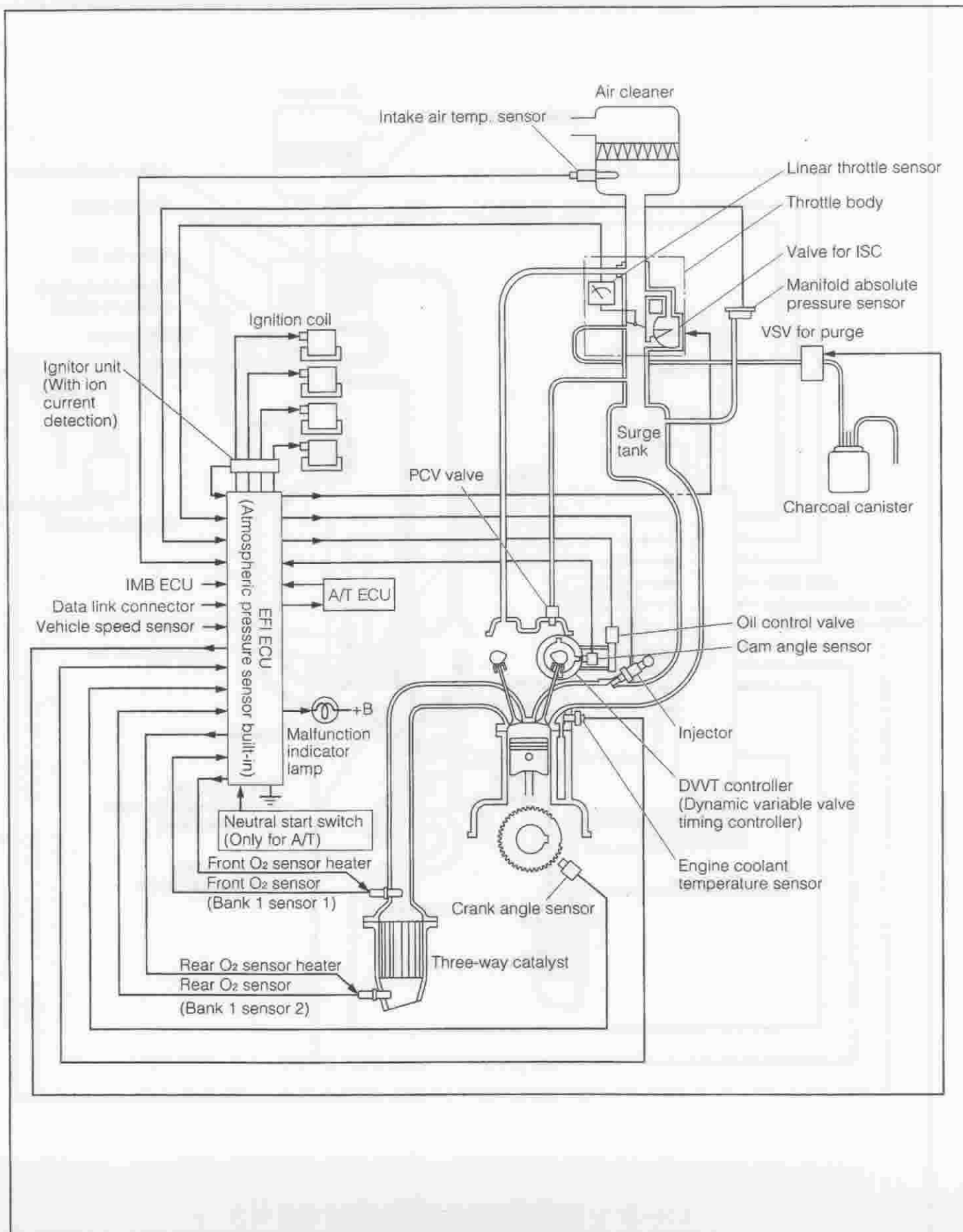
3.1.10 FOR AUS AND GENERAL SPECIFICATIONS OF M201



YEF00007-00006

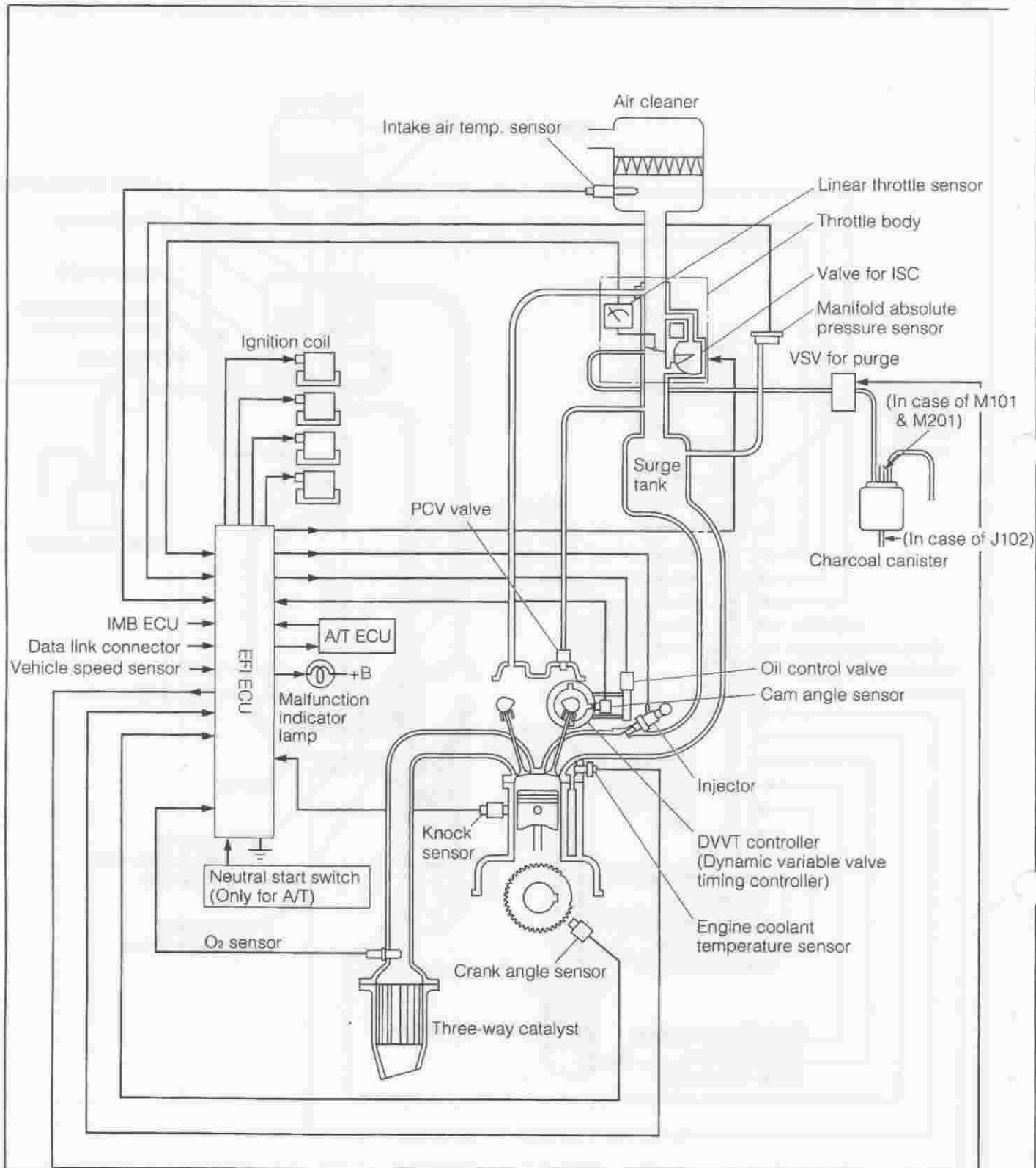
3.2 SYSTEM DIAGRAM

3.2.1 FOR EU SPECIFICATIONS OF M101, M201 and J102



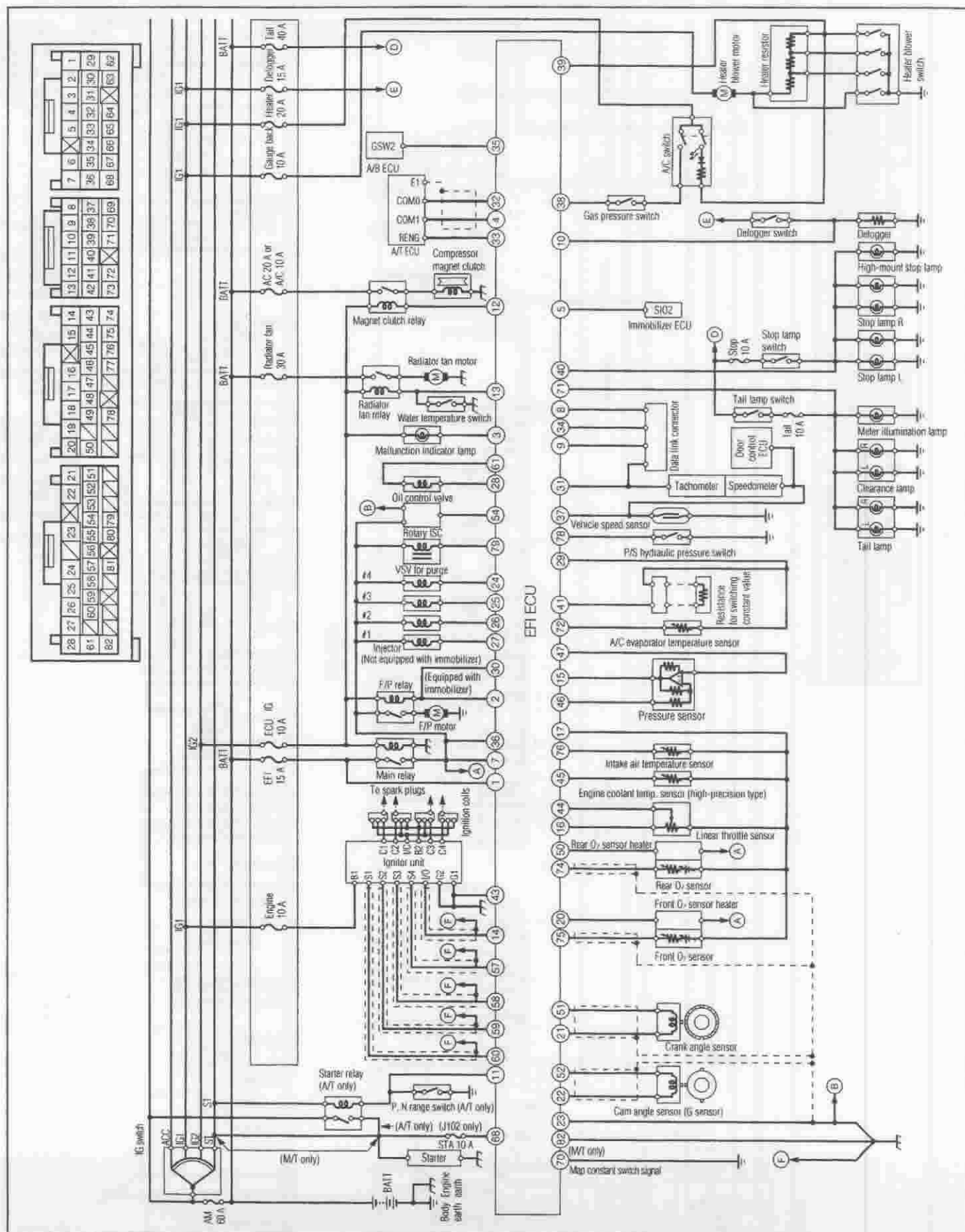
YEF00009-00037

3.2.2 FOR AUS AND GENERAL SPECIFICATIONS OF M101, M201 and J102



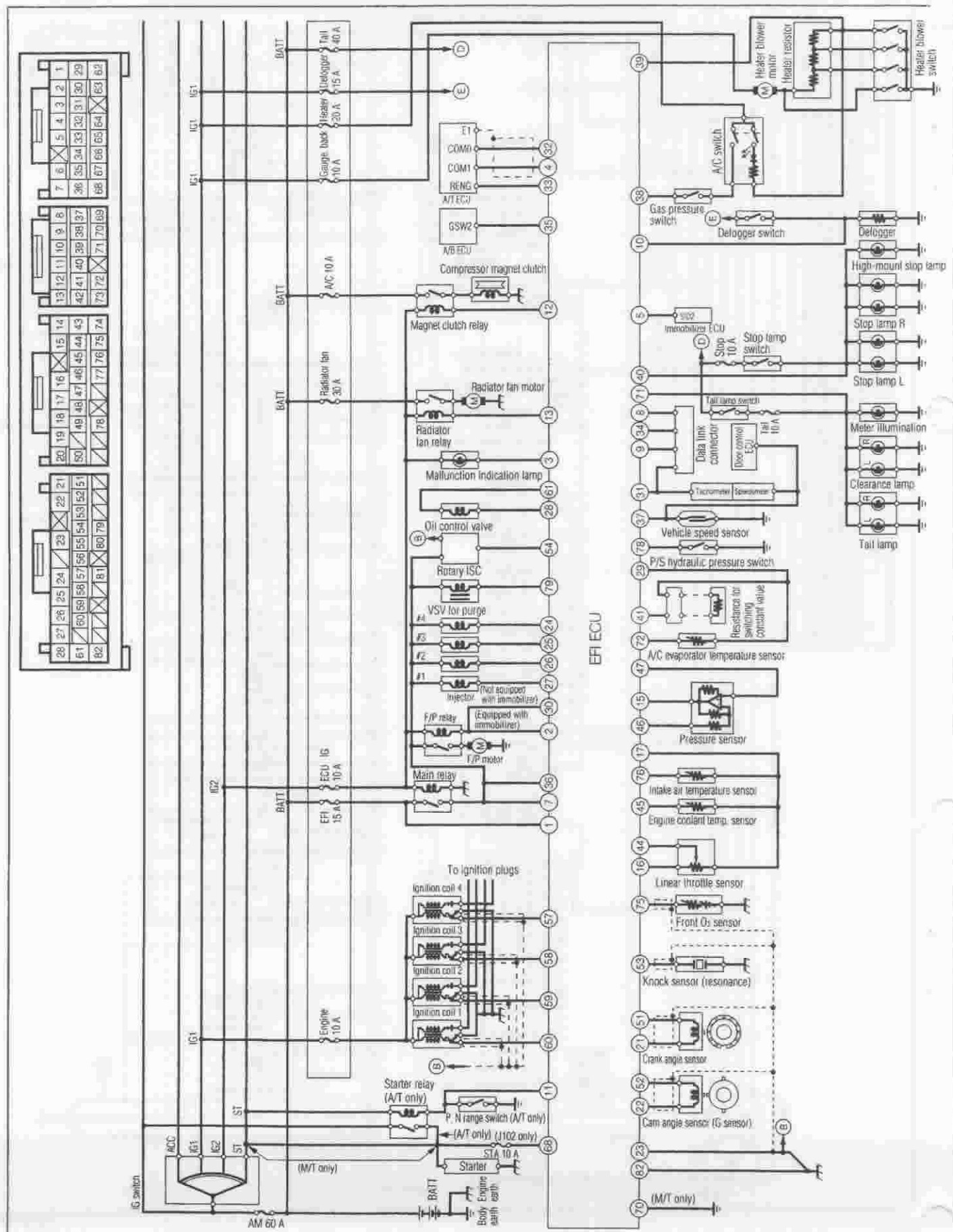
3.3 WIRING DIAGRAM

3.3.1 FOR EU SPECIFICATIONS OF M101, M201, J102 AND S221



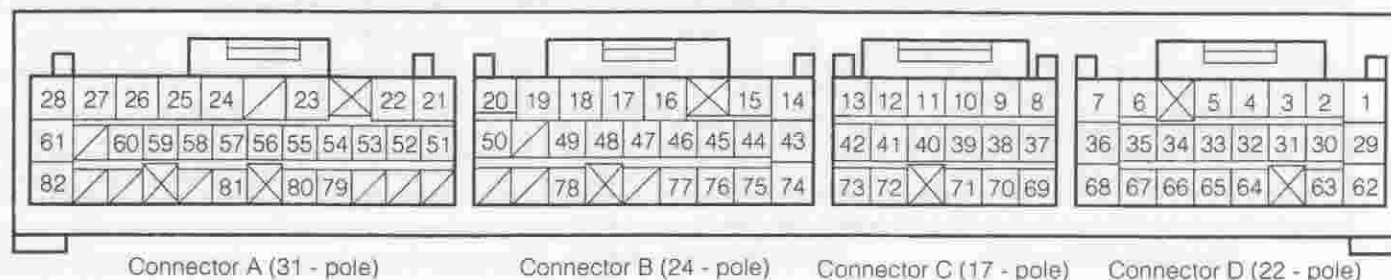
YEF00012-00011

3.3.2 FOR AUS AND GENERAL SPECIFICATIONS OF M101, M201, J102 AND S221



3.4 ARRANGEMENT OF EFI ECU TERMINAL

3.4.1 FOR EU SPECIFICATIONS OF M101, M201, J102 AND S221



YEF00037-00028

CONNECTOR A

No.		Contents of connection	No.		Contents of connection
21	N1+	Crank angle sensor (+)	55	ALTC	—
22	N2+	Cam angle sensor (+)	56	VSV2	—
23	E1	Sensor system ground	57	IG4	Ignition signal (#4 cylinder)
24	#40	Injector (#4 cylinder)	58	IG3	Ignition signal (#3 cylinder)
25	#30	Injector (#3 cylinder)	59	IG2	Ignition signal (#2 cylinder)
26	#20	Injector (#2 cylinder)	60	IG1	Ignition signal (#1 cylinder)
27	#10	Injector (#1 cylinder)	61	OCV-	Oil control valve (-)
28	OCV+	Oil control valve (+)	79	PRG	Purge control VSV
51	N1-	Crank angle sensor (-)	80	VSV1	—
52	N2-	Cam angle sensor (-)	81	ALT	—
53	KNK	—	82	E01	Power supply system ground
54	ISC	Rotary ISC			

YEF00038-00000

CONNECTOR B

No.		Contents of connection	No.		Contents of connection
14	ICMB	Ignitor unit (With ion current detection)	46	VCPM	Pressure sensor power supply
15	PIM	Pressure sensor signal	47	E2PM	Pressure sensor ground
16	VC	Linear throttle sensor power supply	48	ACLK	—
17	E2	Sensor ground	49	ACEN	—
18	FCCP	—	50	OXH2	Rear oxygen sensor heater
19	VFP	—	74	OX2	Rear oxygen sensor
20	OXH1	Front oxygen sensor heater	75	OX1	Front oxygen sensor
43	IE	Ion current sensor ground	76	THA	Intake air temperature sensor
44	VTH	Linear throttle sensor	77	ACVR	—
45	THW	Engine coolant temperature sensor	78	PST	P/S Pressure switch

YEF00039-00000

CONNECTOR C

No.		Contents of connection	No.		Contents of connection
8	SIO1	Diagnosis tester	40	STP	Stop lamp switch
9	T	Test terminal	41	AUX	—
10	DEF	Defogger switch	42	FAN2	—
11	A/T	Neutral start switch (Only for A/T)	69	SEL2	—
12	MGC	A/C Magnet clutch relay	70	SEL1	Map constant switch signal (Only for M/T)
13	FAN1	Radiator fan relay (Without 2-step control)	71	H/L	Tail lamp switch
37	SPD	Vehicle speed sensor	72	ACEV	A/C Evaporator temp. sensor
38	ACSW	A/C Switch	73	OX3	—
39	BLW	Heater blower switch			

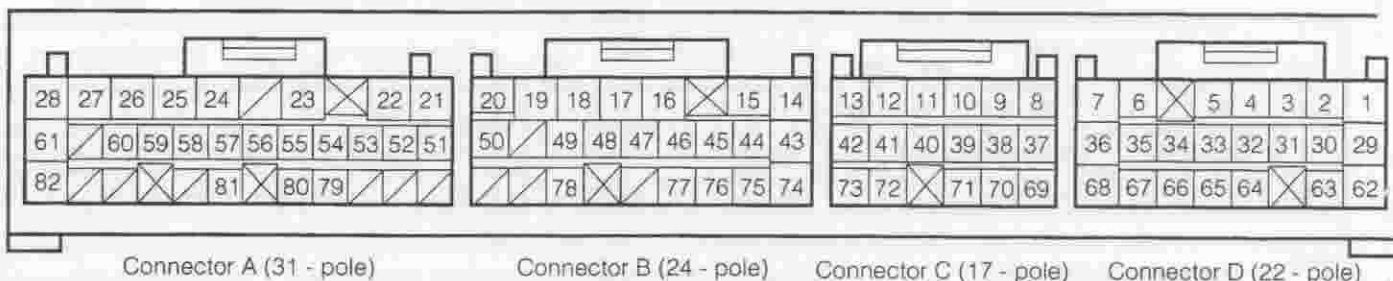
YEF00040-00000

CONNECTOR D

No.		Contents of connection	No.		Contents of connection
1	BAT	Memory back-up supply	33	ATNE	Engine speed signal to A/T ECU
2	FC1	Fuel pump relay (With IMB)	34	VF	VF monitor terminal
3	W	Malfunction indicator lamp	35	FPOF	Fuel pump relay OFF
4	ATTX	Serial data transmission to A/T ECU	36	+B2	Power supply
5	SIO2	Serial port for IMB	62	VCO	—
6	TRRQ	—	63	VTHO	—
7	+B1	Power supply	64	IDLO	—
29	E21	A/C Evaporator temp. sensor ground	65	FCO	—
30	FC2	Fuel pump relay (Without IMB)	66	TRPR	—
31	REV	Engine speed signal	67	ACT	—
32	ATRX	Serial data reception from A/T ECU	68	STA	Starter signal

YEF00041-00000

3.4.2 FOR AUS AND GENERAL SPECIFICATIONS OF M101, M201, J102 AND S221



YEF00042-00029

CONNECTOR A

No.	Contents of connection	No.	Contents of connection
21	N1+ Crank angle sensor (+)	55	ALTC —
22	N2+ Cam angle sensor (+)	56	VSV2 —
23	E1 Sensor system ground	57	IG4 Ignition signal (#4 cylinder)
24	#40 Injector (#4 cylinder)	58	IG3 Ignition signal (#3 cylinder)
25	#30 Injector (#3 cylinder)	59	IG2 Ignition signal (#2 cylinder)
26	#20 Injector (#2 cylinder)	60	IG1 Ignition signal (#1 cylinder)
27	#10 Injector (#1 cylinder)	61	OCV- Oil control valve (-)
28	OCV+ Oil control valve (+)	79	PRG Purge control VSV
51	N1- Crank angle sensor (-)	80	VSV1 —
52	N2- Cam angle sensor (-)	81	ALT —
53	KNK Knock sensor	82	E01 Power supply system ground
54	ISC Rotary ISC		

YEF00043-00000

CONNECTOR B

No.	Contents of connection	No.	Contents of connection
14	ICMB —	46	VCPM Pressure sensor power supply
15	PIM Pressure sensor signal	47	E2PM Pressure sensor ground
16	VC Linear throttle sensor power supply	48	ACLK —
17	E2 Sensor ground	49	ACEN —
18	FCCP —	50	OXH2 —
19	VFP —	74	OX2 —
20	OXH1 —	75	OX1 Oxygen sensor
43	IE —	76	THA Intake air temperature sensor
44	VTH Linear throttle sensor	77	ACVR —
45	THW Engine coolant temperature sensor	78	PST P/S Pressure switch

YEF00044-00000

CONNECTOR C

No.	Contents of connection	No.	Contents of connection
8	SIO1 Diagnosis tester	40	STP Stop lamp switch
9	T Test terminal	41	AUX —
10	DEF Defogger switch	42	FAN2 —
11	A/T Neutral start switch (Only for A/T)	69	SEL2 —
12	MGC A/C Magnet clutch relay	70	SEL1 Map constant switch signal (Only for M/T)
13	FAN1 Radiator fan relay (Without 2-step control)	71	H/L Tail lamp switch
37	SPD Vehicle speed sensor	72	ACEV A/C Evaporator temp. sensor
38	ACSW A/C Switch	73	OX3 —
39	BLW Heater blower switch		

YEF00045-00000

CONNECTOR D

No.	Contents of connection	No.	Contents of connection
1	BAT Memory back-up supply	33	ATNE Engine speed signal to A/T ECU
2	FC1 Fuel pump relay (With IMB)	34	VF VF monitor terminal
3	W Malfunction indicator lamp	35	FPOF Fuel pump relay OFF
4	ATTX Serial data transmission to A/T ECU	36	+B2 Power supply
5	SIO2 Serial port for IMB	62	VCO —
6	TRRQ —	63	VTHO —
7	+B1 Power supply	64	IDLO —
29	E21 A/C Evaporator temp. sensor ground	65	FCO —
30	FC2 Fuel pump relay (Without IMB)	66	TRPR —
31	REV Engine speed signal	67	ACT —
32	ATRX Serial data reception from A/T ECU	68	STA Starter signal

YEF00046-00000

5. ENGINE DIAGNOSIS

5.4 DTC CHART SPECIFICATIONS FOR M101, M201, J102 AND S221

The parameters indicated in the table may vary, depending upon the system types and specifications. This applies to vehicles for all destinations.

For details of the checking of each code, refer to the DTC chart for each code.

YEF00015-00000

5.4.1 DTC CHART SPECIFICATIONS

1. Codes specified by ISO/SAE

DTC No.	Detection item	Trouble area	Malfunction evaluation method	MIL
P0105/31	Manifold absolute pressure/barometric pressure circuit malfunction	• Open wire or short in manifold absolute pressure sensor circuit • Manifold absolute pressure sensor • Engine ECU	1 trip	○
P0110/43	Intake air temp. circuit malfunction	• Open wire or short in intake air temp. sensor circuit • Intake air temp. sensor • Engine ECU	1 trip	○
P0115/42	Engine coolant temp. circuit malfunction	• Open wire or short in water temp. sensor circuit • Engine coolant temperature sensor • Engine ECU	1 trip	○
P0116/42*1	Engine coolant temp. circuit range/performance problem	• Engine coolant temp. sensor • Cooling system	2 trip	○
P0120/41	Throttle/pedal position sensor/switch TM AJ circuit malfunction	• Open wire or short in throttle position sensor circuit • Throttle position sensor • Engine ECU	1 trip	○
P0130/21	Oxygen sensor circuit malfunction (Bank 1 sensor 1)	• Air induction system • Fuel pressure • Injector injection • Open wire or short in heated oxygen sensor circuit • Heated oxygen sensor	2 trip	○
P0133/21*1	Oxygen sensor circuit slow response (Bank 1 sensor 1)	• Air induction system • Fuel pressure • Injector injection • Open wire or short in heated oxygen sensor circuit • Heated oxygen sensor • Engine ECU	2 trip	○
P0135/23*1	Oxygen sensor heater circuit malfunction (Bank 1 sensor 1)	• Open wire or short in heater circuit of oxygen sensor • Oxygen sensor heater • Engine ECU	2 trip	○
P0136/22*1	Oxygen sensor circuit malfunction (Bank 1 sensor 2)	• Open wire or short in heater circuit of oxygen sensor • Oxygen sensor • Engine ECU	2 trip	○
P0141/24*1	Oxygen sensor heater circuit malfunction (Bank 1 sensor 2)	• Same as DTC No. P0135/23	2 trip	○
P0171/25	Fuel trim system too lean (Air-fuel ratio lean malfunction, bank 1)	• Air intake (hose loose) • Fuel line pressure • Injector blockage or leakage • Open wire or short in oxygen sensor circuit • Oxygen sensor	2 trip	○
P0172/26	Fuel trim system too rich (Air-fuel ratio rich malfunction, bank 1)	• Manifold absolute pressure sensor • Engine coolant temperature sensor • Gas leakage on exhaust system • Purge VSV for EVAP • Engine ECU	2 trip	○

YEF00016-00000

NOTE:

- MIL Malfunction indicator lamp.
However, in the case of A/T vehicles of M101 and M201, the 2-digit codes of DTC No. can be read out through the flashing pattern of the D range lamp.
In the other hand, in case of A/T vehicles of J102 and S221, the 2-digit codes of DTC No. can be read out through the flashing pattern of the O/D OFF lamp.
- When the "O" mark is shown in the MIL column, the lamp will go on for that DTC No., but when the "—" mark is shown, the lamp will not go on for that DTC No. However, the data other than the switch signal system (P1520/51) are memorized in the backup memory. Therefore, it is possible to read out the DTC No. by using the diagnosis tester DS-21.
- DTC No. with *1 mark Only for European specifications
But, only in the case of DTC No. P0314, it is possible to read out this DTC No. by means of the "continuous monitoring results" function of the CARB mode.
- DTC No. with *2 mark Only for vehicles with immobilizer
- DTC No. with *3 mark Only for vehicles with electronically-controlled A/T
- DTC No. with *4 mark Not provided only for European specifications
- DTC No. with *5 mark Only for leaded specifications of J102 and S221
- DTC No. with *6 mark Low-grade vehicles of J102 except for A/T vehicle and S221

YEF00017-00000

5.5 FAIL-SAFE FUNCTION FOR M101, M201, J102 AND S221

When any of the following DTC's has been detected, the ECU enters the fail-safe mode in order to make it possible for the vehicle to drive for evacuation and to ensure safety. When the malfunction is remedied to a normal condition, the fail-safe control will be released.

However, the diagnosis results will remain memorized. Hence, it is necessary to determine whether the malfunction still persists or not.

YEP00018-00000

5.5.2 FAIL-SAFE SPECIFICATIONS

DTC No.	Detected item	Fail-safe operation
P0105/31	When the signal from the intake manifold pressure sensor exhibits an open wire or short circuit	- The signal from the intake manifold pressure sensor is set to the value determined from the throttle opening angle, engine revolution speed and ISC opening angle. - The ignition timing is changed to the control based on the pressure determined from the engine revolution speed and the above value. - The fuel will be cut when the throttle opening angle and engine revolution speed exceeds the respective set values.
P0110/43	When the signal from the intake air temperature sensor exhibits an open wire or short circuit	The signal from the water temperature sensor is set to a constant value.
P0115/42	When the signal from the engine coolant temperature sensor becomes open or shorted.	- The signal from the engine coolant temperature sensor becomes a constant value. - At this time, the radiator fan is turned on. (Except for EU spec.)
P0120/41	When the signal from the throttle position sensor exhibits an open wire or short circuit	The signal from the throttle position sensor is set to a constant value.
P0136/22*1	When an abnormality is encountered in the signal from the rear O ₂ sensor	- The feedback of the rear O₂ sensor is stopped - The correction coefficient of the feedback of the rear O₂ sensor is set to the value determined from the engine revolution speed and pressure.
P0325/18*3	When the signal from the knock sensor becomes open or shorted.	The ignition timing is retarded.
P1105/32*1	When the signal from the atmospheric pressure sensor exhibits an open wire or short circuit	The signal from the atmospheric pressure sensor is set to a constant value.
P1300/36*1	When the Ion current signal from the ignitor unit becomes open or shorted.	The ignition timing is retarded.
P1349/73	When an abnormality is encountered in the valve timing control	- The learning of the most retard timing is prohibited. - The control of air-to-fuel ratio learning is prohibited. - The idle speed control is changed.
P1530/44	When the signal from the evaporator temperature sensor exhibits an open wire or short circuit for more than a certain length of time	The air conditioner will be cut.
P1600/83*2	When abnormality occurs in writing and reading-out of the rolling codes into/from the E ² PROM during the immobilizer communication	The injection and ignition are prohibited. (Only for vehicles with the EU, Israel, AUS and Saudi Arabian specifications)
P1601/81*2	When the rolling codes cannot be exchanged between the EFI ECU and the immobilizer ECU or the rolling codes are not matched	

YEP00019-00000

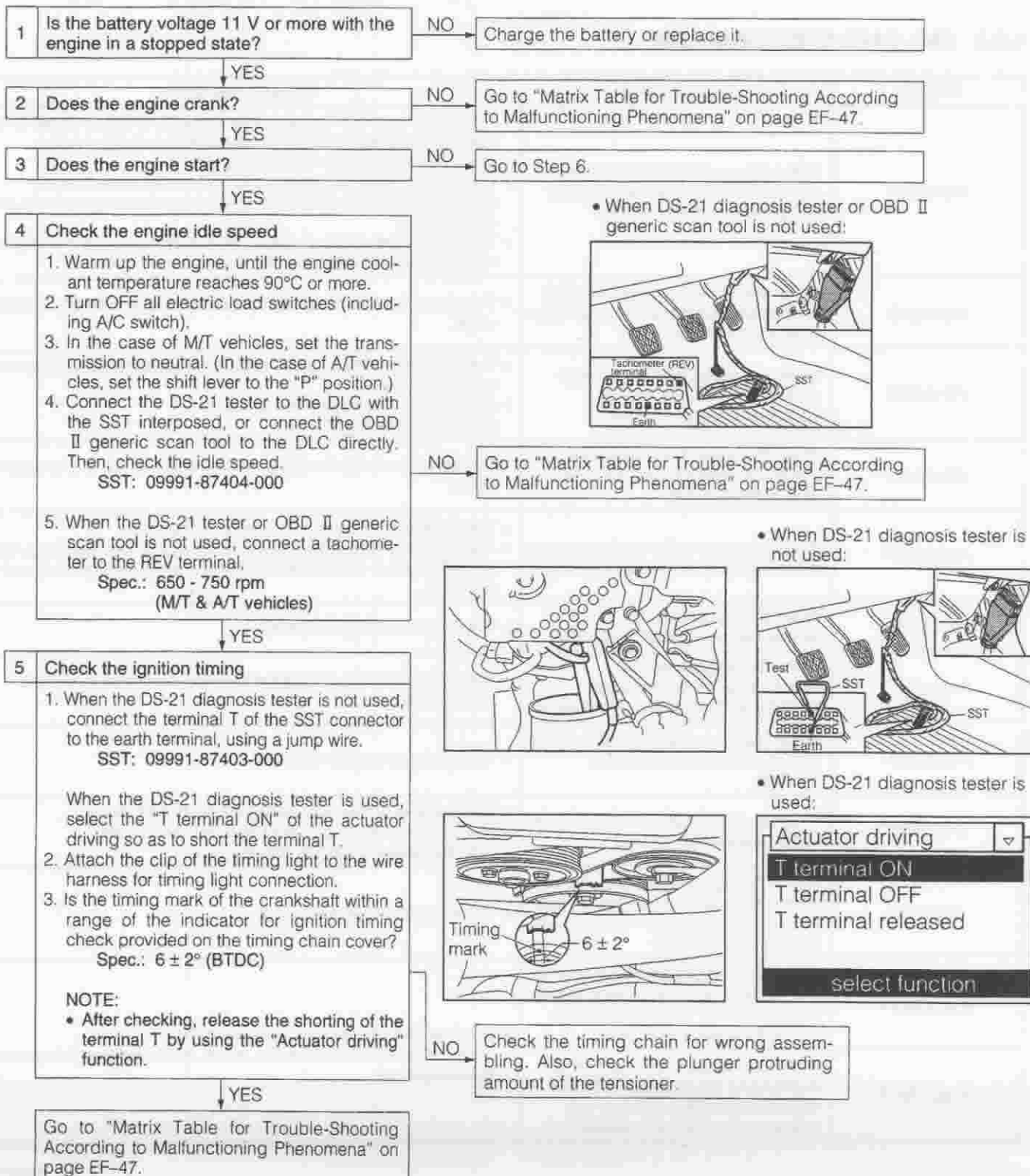
5.10 BASIC ENGINE CHECK FLOW CHART

When the ECU is detecting no DTC during the reproduction test of malfunctioning phenomena and when no abnormality is found by the visual inspection, it is necessary to progressively perform the trouble-shooting for circuits which are most likely causing the malfunctions.

In many cases, sections causing malfunctions can be narrowed down quickly and effectively by performing the basic engine check indicated in the following flow chart. Therefore, it is very important to perform this check for the engine trouble-shooting.

YEF00020-00000

5.10.1 BASIC ENGINE CHECK (page 1 of 3) FOR M101, M201 and J102

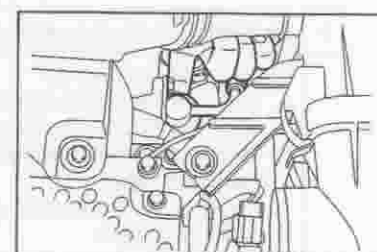
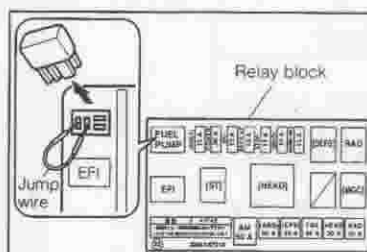


BASIC ENGINE CHECK (page 2 of 3) FOR M101, M201 and J102

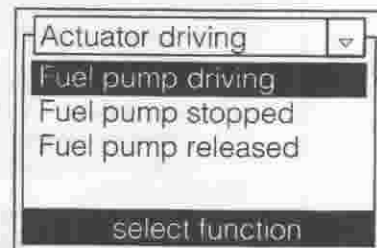
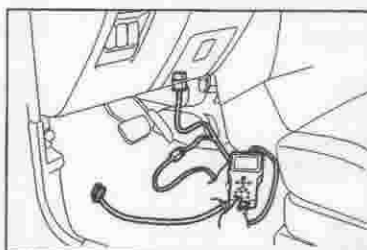
6 Fuel pressure check (simple check)

1. Ensure that the fuel tank is filled with sufficient fuel.
2. When DS-21 diagnosis tester is not used:
 - (1) Remove the fuel pump relay and connect a jump wire, as indicated in the illustration.
SST: 09991-87403-000
 - (2) Check that the pulsation damper screw rises when the ignition switch is turned ON.
3. When DS-21 diagnosis tester is used:
 - (1) Connect the DS-21 diagnosis tester to the DLC with the SST interposed.
SST: 09991-87404-000
 - (2) Turn ON the ignition switch. Then, select the "Fuel pump driving" of the actuator driving among the individual functions so as to drive the fuel pump. Does the pulsation damper screw rise?

• When DS-21 diagnosis tester is not used:



• When DS-21 diagnosis tester is used:



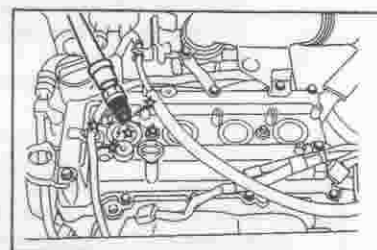
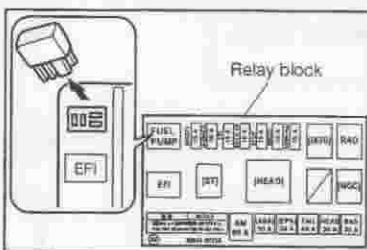
NO

Go to "Check of Fuel Pump and F/P Regulator".

YES

7 Spark check

1. Remove the fuel pump relay from the relay block.
2. Remove the IG coils and spark plugs (all cylinders #1, 2, 3 and 4).
3. Install the spark plug to the IG coil. Connect the IG coil connector to the IG coil.
4. Ground the spark plug.
5. Crank the engine. At this time, check to see if each spark plug sparks. Is it in a good condition?



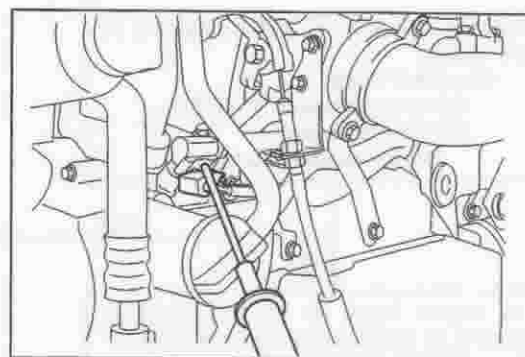
NO

Go to "Check of Ignition System."

YES

8 Confirmation of operation of fuel injector

1. Install the spark plugs, IG coils and fuel pump relay. Connect the connector of the IG coil.
2. Using a sound scope, check each injector for operation sound while the engine is being cranked or idling. Can you hear operation sound of all injectors?



NO

Go to "Check of Fuel Injector Circuit".

YES

Go to Step 9.

BASIC ENGINE CHECK (page 3 of 3) FOR M101, M201 and J102

9 Inspection of compression pressure

1. Warm up the engine.
2. With the IG switch turned OFF, remove all of the IG coils and spark plugs.
3. Temporarily remove the main relay and fuel pump relay.
4. Insert a compression gauge into the spark plug hole.
5. Depress the accelerator pedal fully.
6. While cranking the engine, measure the compression pressure.
7. Repeat the steps 4, 5 and 6 to perform the measurement for all cylinders.

K3-VE engine

Specified Value: 1471 kPa

Limited Value: 1079 kPa

(330 rpm. difference between cylinders is less than 147 kPa)

K3-VE2 engine

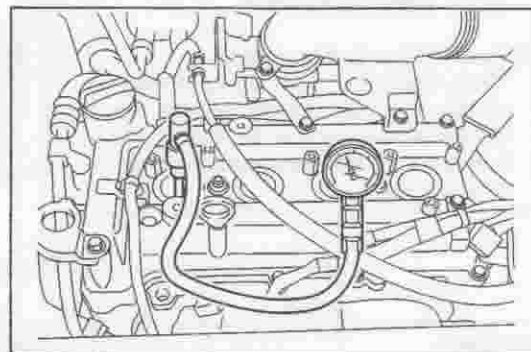
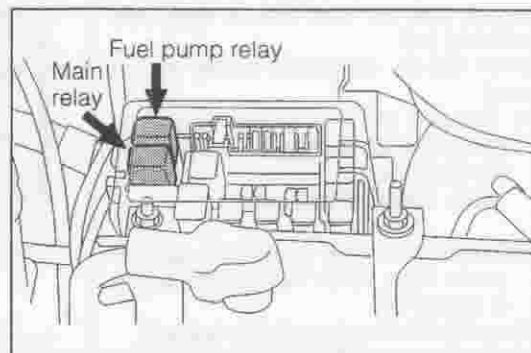
Specified Value: 1285 kPa

Limited Value: 892 kPa

(300 rpm. difference between cylinders is less than 147 kPa)

NOTE:

- Be sure to use a fully-charged battery. Also the measurement should be performed in the shortest possible length of time.



NO

Perform the checks, referring to the section EM.

YES

10 Inspection of idle CO and HC concentrations (only for leaded spec.)

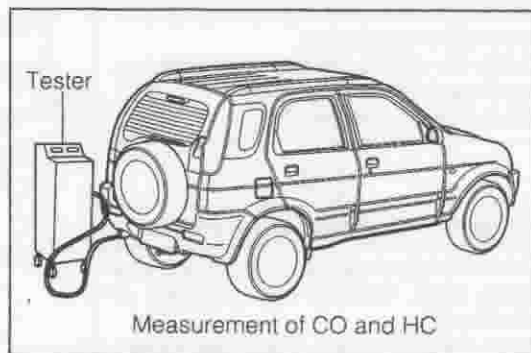
1. Warm up the engine completely.
NOTE:
• Warm up the engine, until the fan motor starts to operate.
2. Measure CO and HC concentrations at idle speed.

Specified Value:

CO concentration: $1 \pm 0.5\%$

HC concentration:

Not to exceed 700 rpm



NO

Perform the checks, referring to the section EM.

YES

Go to "Matrix Table for Trouble-Shooting According to Malfunctioning Phenomena" on page EF-47.

5.11 SCAN TOOL DATA (ECU DATA)

The following data values given below are representative values obtained under the "normal condition," using the scan tool. Please refer to these values.

However, there are cases where the system is functioning normally even if the measured value is different from the values listed here. Therefore, no judgment as to whether any malfunction is occurring or not should be made only on the basis of these data under the "normal condition."

NOTE:

- The data monitor value may vary significantly, depending on slight difference in the measurement, difference in the measurement environment, deterioration due to passage of time in the vehicle, and so forth. Therefore, it is difficult to indicate the definite reference values. Hence, there are cases where malfunctions are occurring even when the measured value is within the reference value.
- With regard to minor phenomenon, such as hesitation and rough idling, it is necessary to make total evaluation, based on all the data monitor items, by sampling the data of the vehicle of the same type under the same conditions and comparing them.
- In the case of the OBD II generic scan tool, it is possible to take a reading of the values with an asterisk mark in the following table.
- When checking the data under a condition where the engine is "idling" or "racing," the shift lever should be placed in the "N" or "P" range, the A/C switch should be turned OFF, and all accessory switches should be turned OFF.

YEF00028-00000

5.11.1 SCAN TOOL DATA FOR K3-VE/K3VE2

1. Items specified by CARB

	DS-21 diagnosis tester display	Signal name	Vehicle condition		Reference values under normal condition
☆	FUEL SYSTEM (Fuel system status)	FSYS	At idle speed after warming up		O2 (Closed loop)
☆	CALC LOAD (Calculated load value)	LOAD	At idle speed with no load after warming up	K3-VE2	1.5 - 2.0 %
				K3-VE	1.7 - 2.2 %
			At 2500 r/min. with no load after warming up	K3-VE2	5.0 - 6.3 %
				K3-VE	5.9 - 7.3 %
☆	COOLANT TEMP (Engine coolant temperature)	ECT	Cold start - Warming-up running		Value should be rising gradually.
			When engine has warmed up completely		80 - 100°C
			During fail-safe function (At time of starting)		20°C
			During fail-safe function (After starting)		80°C
☆	SHORT FT (Short term fuel trim)	SHRT	At idle speed after warming up		-20 - +20 %
☆	LONG FT (Long term fuel trim)	LONG	At idle speed after warming up		-16 - +16 %
☆	ENGINE SPEED	RPM	When engine is running at a constant speed		There should be no remarkable variation, rpm
			At idle speed with no load after warming-up	M/T	M101 J102
				S221	M201
				A/T	All
☆	VEHICLE SPEED	VS	During running (Compared with speedometer)		There should be no remarkable difference, Km/h
☆	IGN ADVANCE (Ignition timing advance for No. 1 cylinder)	ITA	At idle speed with no load after warming up		-2 - 8°
			When idle switch is OFF		Changes should be made according to running conditions, °
☆	INTAKE AIR TEMP	IAT	When engine is running		Changes should be made according to running conditions, °C
☆	MANI ABS PRESS (Intake manifold absolute pressure)	MAP	When ignition switch is ON (Vacuum hose is released to atmosphere)		Around 100 kPa
			When idling (After warming-up, with no load)	K3-VE2	63 - 72 kPa
				K3-VE	65 - 73 kPa

	DS-21 diagnosis tester display	Signal name	Vehicle condition		Reference values under normal condition
☆	MANI ABS PRESS (Intake manifold absolute pressure)	MAP	During fail-safe function	M/T K3-VE2	34 - 72 kPa
				K3-VE	35 - 73 kPa
				A/T K3-VE2	32 - 70 kPa
				K3-VE	33 - 71 kPa
☆	THROTTLE POS (Absolute throttle position)	TP	When accelerator pedal is operated		Changes should be made according to pedal operation. %
☆	OXYGEN SENSOR S1 (Heated oxygen sensor 1)	O ₂ FP	At idle speed after warming up		-5 - 5 %
		O ₂ FV			0.05 - 0.95 V
☆	OXYGEN SENSOR S2* (Heated oxygen sensor 2)	O ₂ RP	When engine is running at 2000 r/min., for 3 min. or longer after warming up.	M101, J102, M201	20 - 77 %
		O ₂ RV		S221	25 - 87.5 %
					0.05 - 0.95 V
☆	MIL ON RUN DIST (Distance since activation of MIL)	DWM	When there is no DTC		0 Km

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2. Items specified by DMC

	DS-21 diagnosis tester display	Signal name	Vehicle condition	Reference values under normal condition
	BATTERY VOLTAGE	BAT	When engine is running at 5000 rpm (25°C)	Approx. 14 V
	ELECTRIC LOAD	DSW	When light, heater blower, defogger or radiator fan switch is ON	"OFF" → "ON"
	AIR CONDITIONING (If equipped)	AC	When air conditioner switch is set to "ECON" or "A/C"	"OFF" → "ON"
	CTP SWITCH (Closed throttle position switch)	IDL	When throttle valve is switched from fully closed state to opened state	"ON" → "OFF"
	INJ PULSE WIDTH (Fuel injection pulse width)	TAU	Cold start ~ Warming-up running	Value should be decreasing gradually.
			When idling (After warming-up, with no load)	1 - 3 ms
	ISC DUTY RATIO	ISC	When ignition switch is ON	0 %
			Cold start ~ Warming-up running	Value should be decreasing gradually
			When idling (After warming-up, with no load)	5 - 15 %
			When air conditioner switch is set to "ON"	18 - 45 %
			When automatic transmission is shifted from  range to  range	9 - 22 %
			When light, heater or defogger switch is ON	7 - 19 %
	ACTUAL DISP ANGLE OF IN CAM (Actual displacement angle of intake cam)	VT	When idling (After warming-up, with no load)	0 - 2 °CA
			During vehicle running	The value changes, depending on the driving conditions. °CA
	TARGET DISP ANGLE OF IN CAM (Target displacement angle of intake cam)	VTT	When idling (After warming-up, with no load)	0 °CA
			During vehicle running	The value changes, depending on the driving conditions. °CA

NOTE:

- The items with an asterisk (*) mark is provided only for the EU specifications. Therefore, in the case of the non-EU specification vehicles, no indication will be made.

STANDARD VOLTAGES FOR M101, M201, J102 AND S221

System to be checked	Terminals	Measurement conditions	Reference values
Power supply system	⑦ (+B1) - ②③ (E1)	When IG is "ON"	Battery voltage
	③⑥ (+B2) - ②③ (E1)	When IG is "ON"	
	① (BAT) - ②③ (E1)	At all times	
Pressure sensor system	④⑥ (VCPM) - ④⑦ (E2PM)	When IG is "ON"	4.5 - 5.5 V
	①⑤ (PIM) - ④⑦ (E2PM)	Sensor released to atmosphere	2.2 - 3.1 V
		After engine starting	Value changes, according to accelerator opening angle
Throttle sensor system	①⑥ (VC) - ①⑦ (E2)	When IG is "ON"	4.5 - 5.5 V
	④④ (VTH) - ①⑦ (E2)	Throttle valve fully closed	0.4 - 0.8 V
		Throttle valve fully opened	3.2 - 5.0 V
Engine coolant temperature sensor system	④⑤ (THW) - ①⑦ (E2)	When warming up engine (Water temperature: 60 - 120°C)	0.2 - 1.0 V
Intake air temperature sensor system	⑦⑥ (THA) - ①⑦ (E2)	When warming up engine	0.1 - 4.8 V
Vehicle speed sensor system	③⑦ (SPD) - ②③ (E1)	Driving wheels are turned slowly	0 ± 5 V
Knock sensor system	⑤③ (KNK) - ②③ (E1)	When idling, racing	Generation of wave form
Cam angle sensor system	②② (N2+) - ⑤② (N2-)	When idling	Generation of wave form
Crank angle sensor system	②① (N1+) - ⑤① (N1-)	When idling	Generation of wave form
O ₂ sensor system	Front ⑦⑤ (OX1) - ①⑦ (E2)	After engine speed is held at 3000 rpm for four minutes	0.05 - 0.95 V
	Rear ⑦④ (OX2) - ①⑦ (E2)	After engine speed is held at 3000 rpm for four minutes	0.05 - 0.95 V
Ignitor unit system (Ion current sensor)	①④ (ICMB) - ④③ (IE)	When idling	Generation of wave form
Injector system	②⑦ (#10) - ②③ (E1)	When IG is "ON"	Battery voltage
	②⑥ (#20) - ②③ (E1)		
	②⑤ (#30) - ②③ (E1)	When cranking	Generation of pulse
	②④ (#40) - ②③ (E1)		
Ignition system	⑥① (IG1) - ②③ (E1)	When IG is "ON"	Battery voltage
	⑤⑨ (IG2) - ②③ (E1)		
	⑤⑧ (IG3) - ②③ (E1)	When cranking	Generation of pulse
	⑤⑦ (IG4) - ②③ (E1)		
ISC driving signal system	⑤④ (ISC) - ②③ (E1)	During idling	Generation of pulse
Oil pressure switch for power steering system	⑦⑧ (PST) - ②③ (E1)	Oil pressure switch "ON"	0 - 0.5 V
		Oil pressure switch "OFF"	Battery voltage
Fuel pump system Equipped with immobilizer/ Not equipped with immobilizer	② (FC1) - ②③ (E1)	With fuel pump in a stopped state	Battery voltage
	③① (FC2) - ②③ (E1)	During idling (or when cranking)	2 V or less
VF monitor system	⑤④ (VF) - ②③ (E1)	After engine speed is held at 3000 rpm for four minutes (Terminal T shorted)	0 ± 5 V (Pulse)
P, N range signal detecting system	①① (A/T) - ②③ (E1)	P, N range	0 - 0.5 V
		Other than P, N range	Approx. 10 V
Evaporator temperature sensor system	⑦② (ACEV) - ②③ (E21)	When air conditioner is "ON"	0.15 - 4.8 V
Air conditioner input signal system	③⑧ (ACSW) - ②③ (E1)	When air conditioner is operating	Battery voltage
		When air conditioner is not operating	0 - 0.5 V
Headlamp system	⑦① (H/L) - ②③ (E1)	Tail lamp illuminated	Battery voltage
		Tail lamp extinguished	0 - 0.5 V
Defogger system	①⑩ (DEF) - ②③ (E1)	When defogger switch is "ON"	Battery voltage
		When defogger switch is "OFF"	0 - 0.5 V
Blower system	③⑨ (BLW) - ②③ (E1)	When heater blower switch is "ON"	0 - 0.5 V
		When heater blower switch is "OFF"	Battery voltage
Radiator fan control system	①③ (RFAN) - ②③ (E1)	When water temperature switch is "ON"	1 V or less
		When water temperature switch is "OFF"	Battery voltage
Stop lamp system	④① (STP) - ②③ (E1)	When stop lamp switch is "ON"	Battery voltage
		When stop lamp switch is "OFF"	0 - 0.5 V

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STANDARD RESISTANCES FOR M101, M201, J102 AND S221

System	Terminals	Circuit	Standard resistance
Front O ₂ sensor system	20 (OXH1) - 7 (+B1)	Front O ₂ sensor heater and main relay	11.7 - 14.5 Ω
Rear O ₂ sensor system	50 (OXH2) - 7 (+B1)	Rear O ₂ sensor heater and main relay	11.7 - 14.5 Ω
Cam angle sensor system	22 (N2+) - 52 (N2-)	Camshaft angle sensor	1850 - 2450 Ω
Crank angle sensor system	22 (N1+) - 51 (N1-)	Crankshaft angle sensor	1850 - 2450 Ω
Injector system	27 (#10) - 7 (+B1)	No. 1 - 4 Fuel injector	13.4 - 14.2 Ω
	26 (#20) - 7 (+B1)		
	25 (#30) - 7 (+B1)		
	24 (#40) - 7 (+B1)		
Variable valve timing system	23 (OCV+) - 61 (OCV-)	Oil control valve	6.9 - 7.9 Ω
Purge VSV system	29 (PRG) - 7 (+B1)	Purge control VSV	30 - 34 Ω
A/F adjuster	62 (VCO) - 29 (E21)	A/F adjuster	3500 - 6500 Ω
Ground system	23 (E1) - Body ground	Ground	10 Ω or less
	62 (E01) - Body ground		

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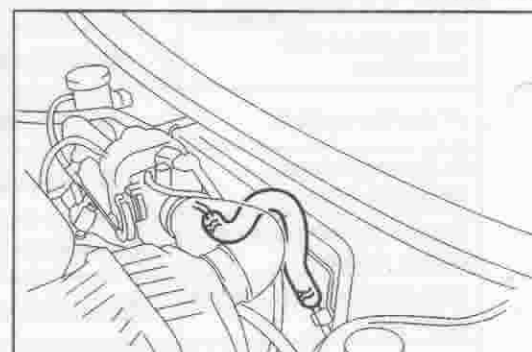
5.13 INSPECTION PROCEDURE FOR FUEL SYSTEM

CAUTION:

- Before you start the check, be sure to conduct the fuel pressure eliminating operation according to the "fuel pressure relieving procedure" at page EF-25. Furthermore, after completion of the check operation, ensure that no fuel leakage is present by performing the check according to the "fuel leak check" at page EF-25.

5.13.1 INSPECTION OF FUEL FLOW

- Loosen the hose band at the fuel pipe. Then remove the fuel hose from the fuel pipe.
- Connect a suitable fuel hose (about 2 meter long) to the fuel pipe.

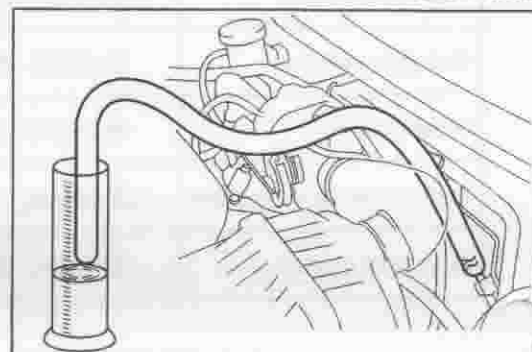


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- Insert one end of the fuel hose in a measuring cylinder.

CAUTION:

- Even after the fuel pressure has been released, the fuel line still has a slight residual pressure. Hence, be sure to gradually remove the pipe so as to prevent fuel from splashing.
- Since the fuel will flow out, be certain to place a suitable container or cloth under the fuel pipe so that no fuel may get to the resin or rubber parts of the vehicle.



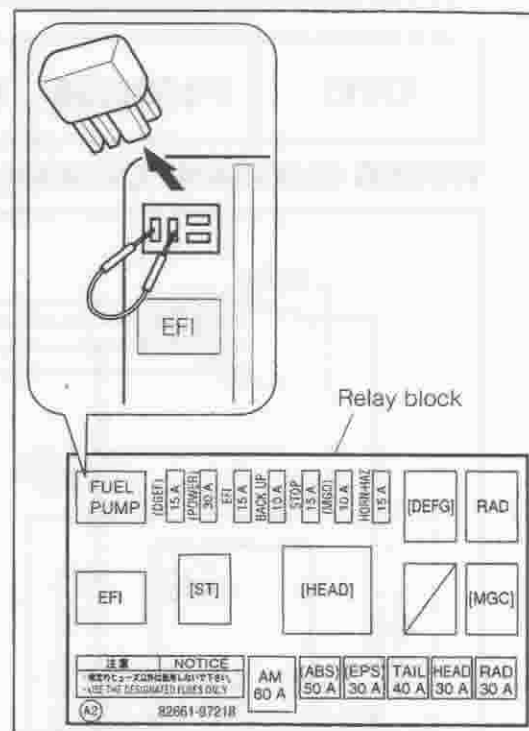
YEF00035-00001

4. Temporarily remove the fuel pump relay. Then, connect the terminal with a jump wire as illustration.
5. Turn the ignition switch to the "ON" position for 10 seconds. Then, turn off the ignition switch.
6. Measure the amount of fuel collected in the measuring cylinder.

Specified Amount of Fuel: 190 ml or more

NOTE:

- Check to see if leakage is present at the fuel lines. Also, check the fuel lines for deformation or choking.



YEF00036-00022

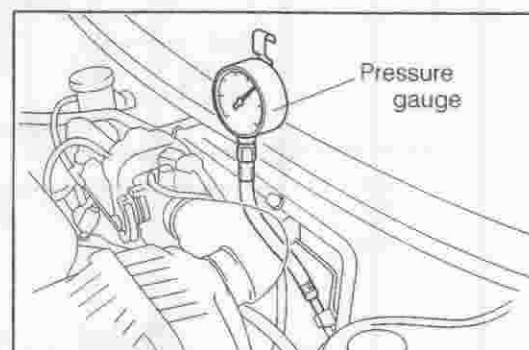
5.13.2 INSPECTION OF FUEL PRESSURE

1. Install a fuel pressure gauge between the delivery pipe and the main pipe.
2. Turn the ignition switch to the "ON" position.
3. Check to see if the fuel pressure conforms to the specified pressure.

Specified Value: 324 ± 5 kPa

NOTE:

- If the fuel pressure is less than the specification, check the fuel pump.



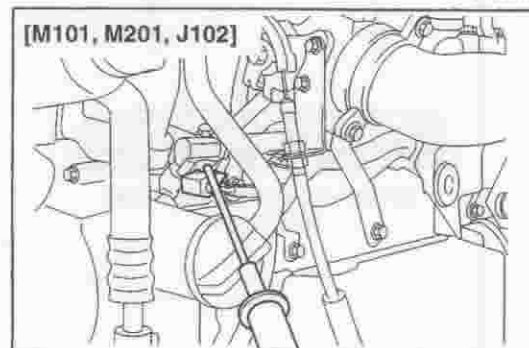
YEF00037-00023

5.13.3 INSPECTION OF FUEL INJECTORS

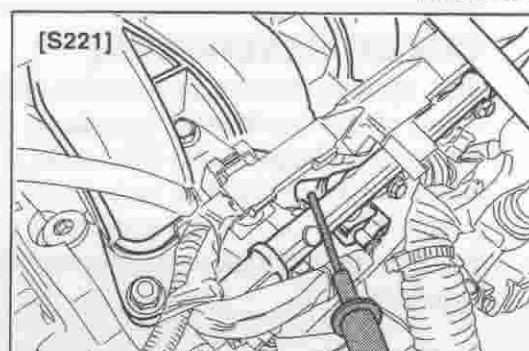
1. Using a sound scope, check to see if each injector emits an operating sound when the engine is being started or cranked.

NOTE:

- If a sound scope is not available, apply a screwdriver or the like to the injector. So you can feel an operating vibration.
- If the injector emits no operating sound, check the wiring or connectors. Then, perform the following procedure.



YEF00038-00024



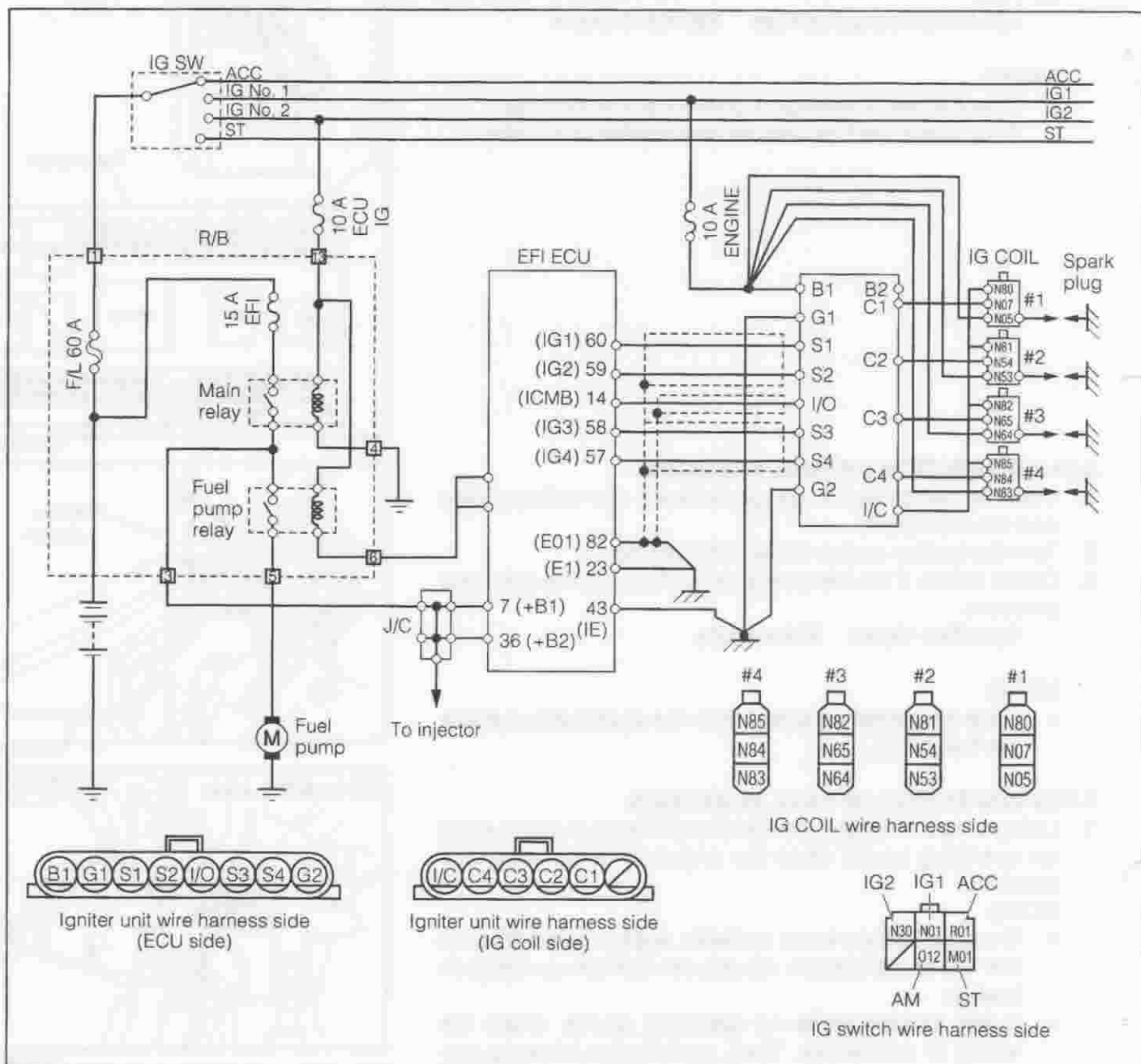
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DTC

P1300/36

Ion System Malfunction

WIRING DIAGRAM FOR M101, M201 AND J102



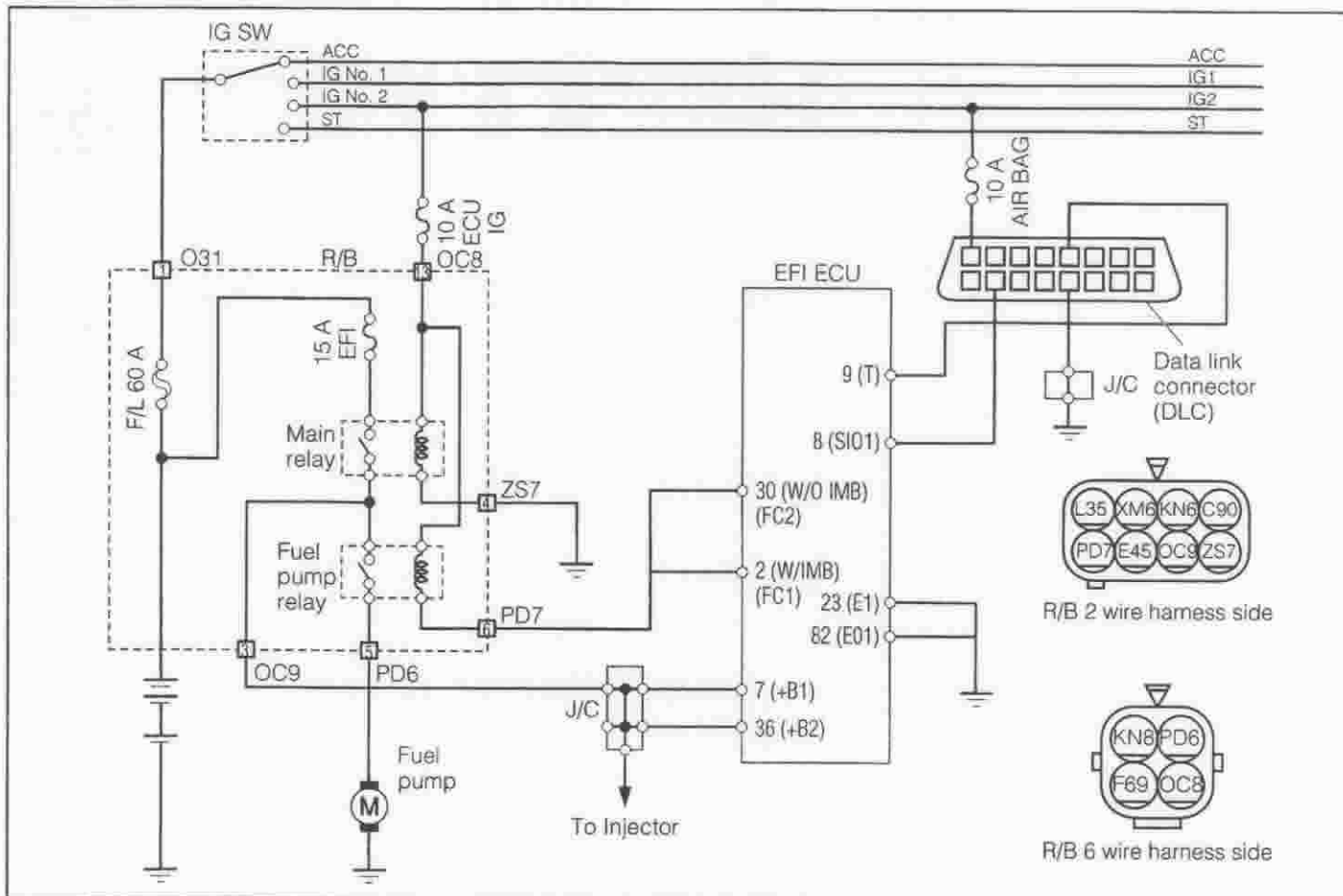
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CIRCUIT DESCRIPTION

This system detects any misfire of the engine by using an ion current which has the same waveforms as those of the combustion pressure. When any misfire takes place, no ion current is produced. Therefore, if the input voltage at the ECU side is below a certain value, it is judged that a misfire took place. Since the detected ion current is very weak, it is amplified in the igniter unit. In addition, a vibration waveform appears in the ion current waveform when knocking takes place. Hence, knocking control is also performed by detecting vibration waveforms. This applies only to vehicles mounted with Type K3 engine with EU specifications.

YEF00043-00000

WIRING DIAGRAM



YFEX051-00035

1. With the IG switch turned OFF, connect the DS-21 diagnosis tester to DLC through the SST.
2. After turning ON the IG switch, turn ON the main switch of the tester. Select the actuator driving.
3. Select the fuel pump ON so as to actuate the fuel pump.
If the DS-21 diagnosis tester is not available, connect a jump wire between the terminal T of the DLC and the earth terminal.
4. Ensure that the screw of the pulsation damper rises in Step 3.
Are the check results OK?

