MITSUBISHI MOTORS

SERVICE BULLETIN

PUBLICATION GROUP, AFTER SALES SERVICE DEP.
MITSUBISHI MOTOR SALES EUROPE BV

SERVICE BULLETIN	No.: ESB-98E13-002	
	Date: 1998-12-15	<Model> (EC,EXP) CARISMA / <M/Y> 98-10
Subject: CHANGES IN TROUBLESHOOTING		
Group: FUEL		
CORRECTION	O. Kai - E.V.P. & G.M. After Sales Service Dept.	

1. Description:

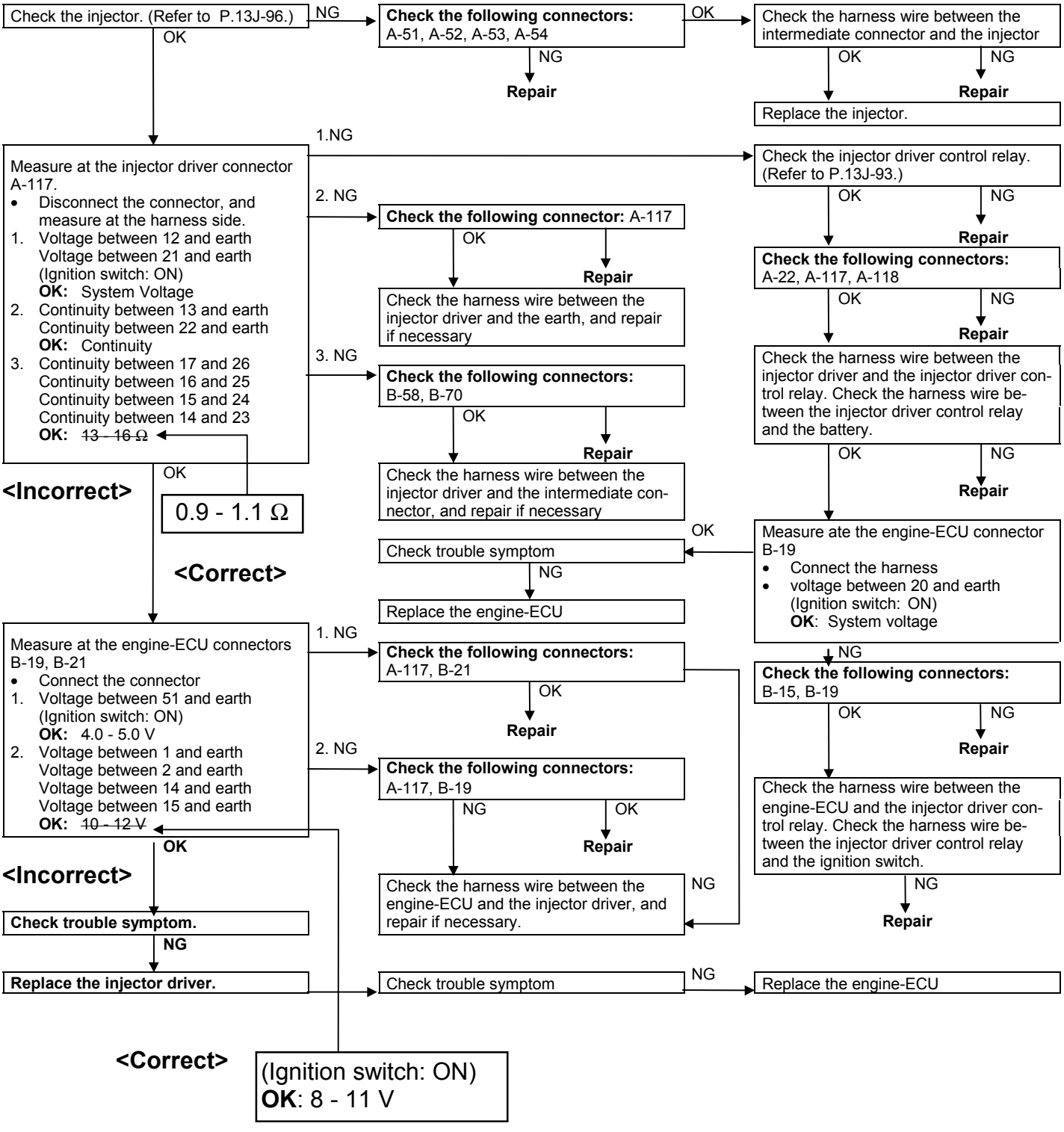
This Service Bulletin informs you of changes in GDI-Troubleshooting described in each of the following Workshop Manuals.

2. Applicable Manuals:

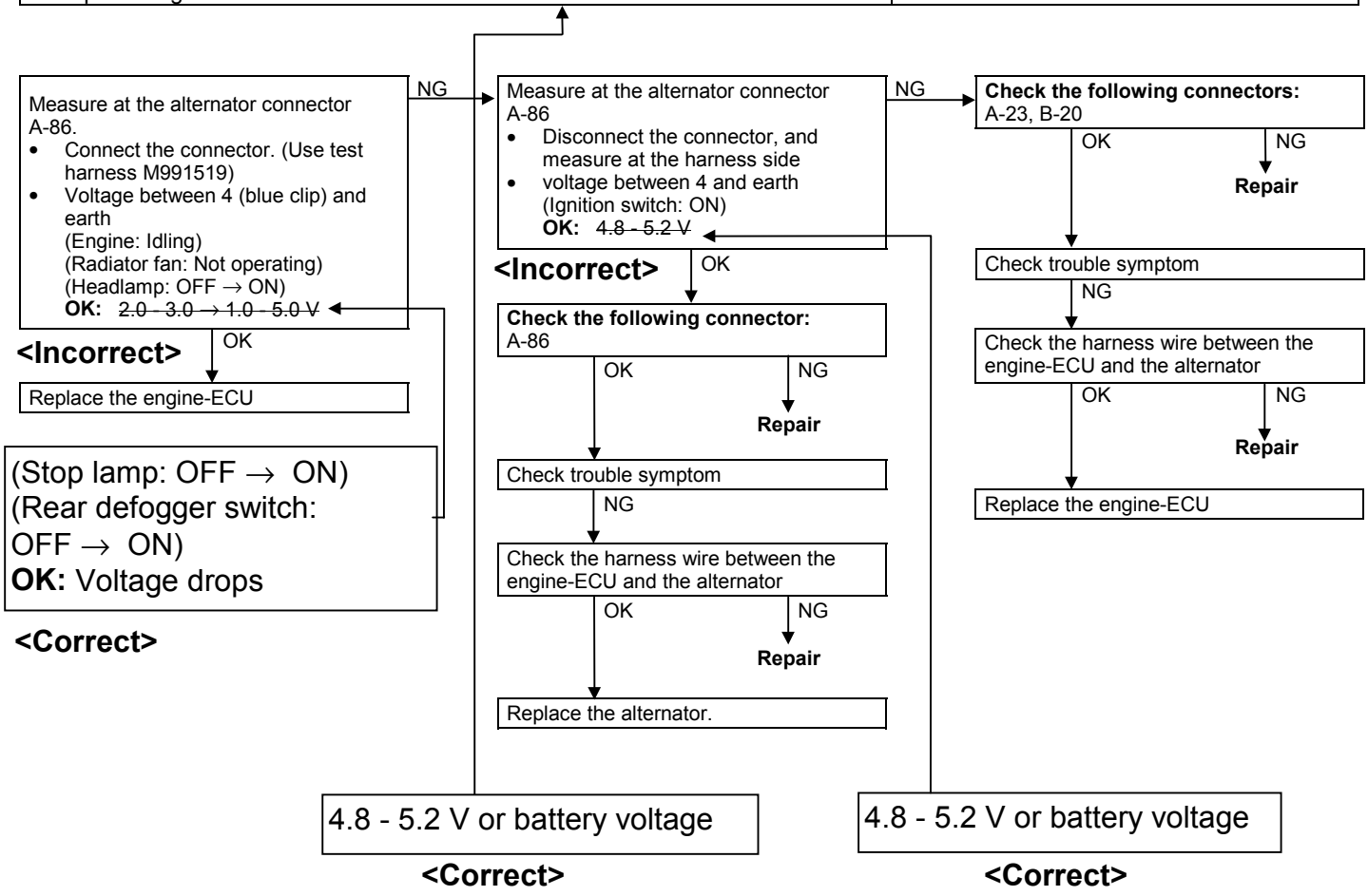
Manual	Pub. No.	Language	Page(s)
'98 CARISMA Workshop Manual Chassis SUPPLEMENT GDI	PWDE9502-C	(English)	13J-22, 27, 28, 47, 65, 67, 68, 69
	PWDS9503-C	(Spanish)	
	PWDF9504-C	(French)	
	PWDG9505-C	(German)	
	PWDD9506-C	(Dutch)	
	PWDW9507-C	(Swedish)	
	PWDI96E1-C	(Italian)	

3. Details:

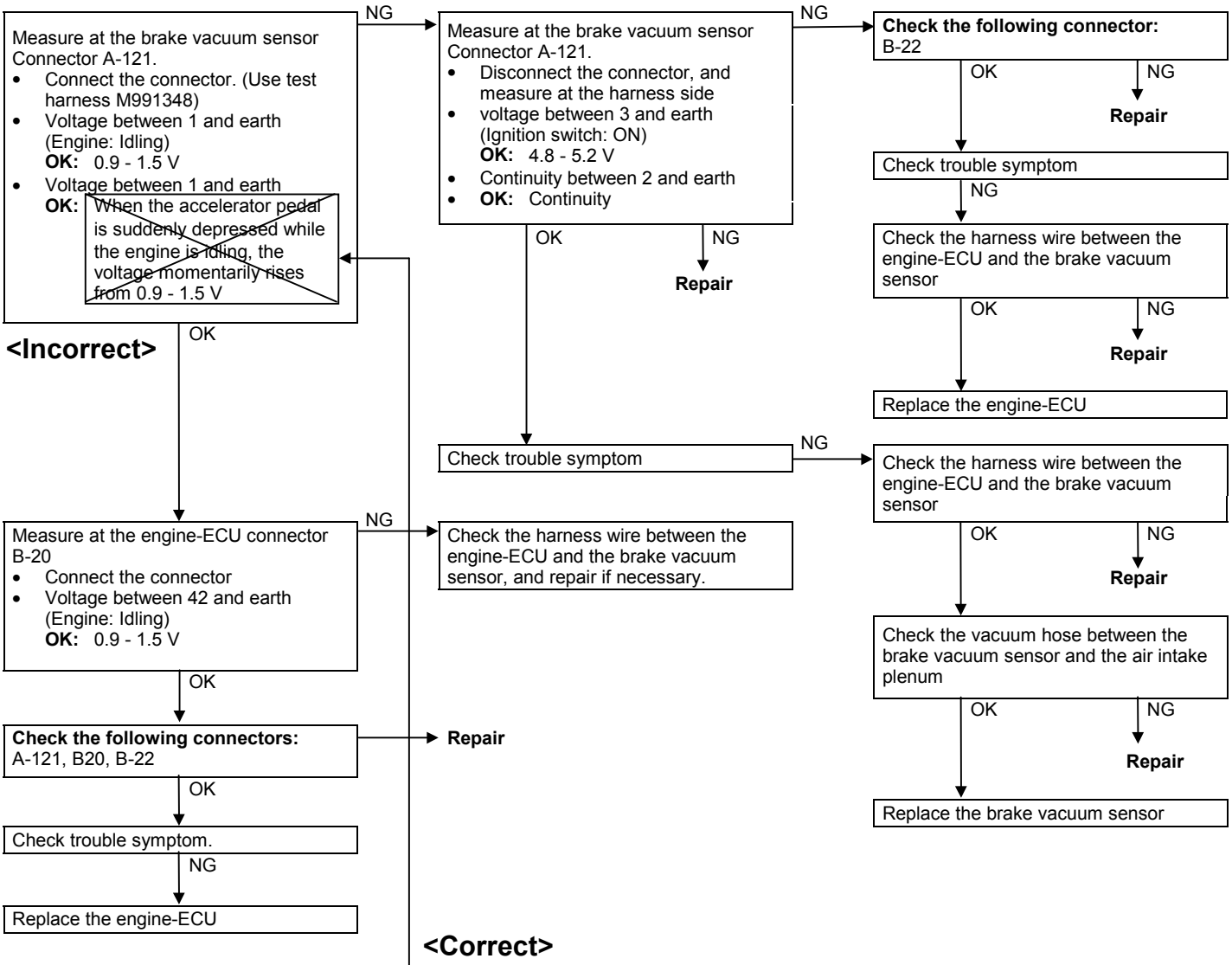
CODE NO.41 INJECTOR SYSTEM	PROBABLE CAUSE
Range of check • While engine is cranking or running • Engine speed is 4,000 r/min or less • System voltage is 10 V or more • While fuel cut and injector forced drive (actuator test) are not being carried out Set conditions • Injector open circuit check signal is not output by the injector driver for a set number of times	• Malfunction of the injector • Malfunction of the injector driver control relay • Malfunction of the injector driver • Open circuit or short-circuited harness wire of the injector drive circuit • Malfunction of the engine-ECU



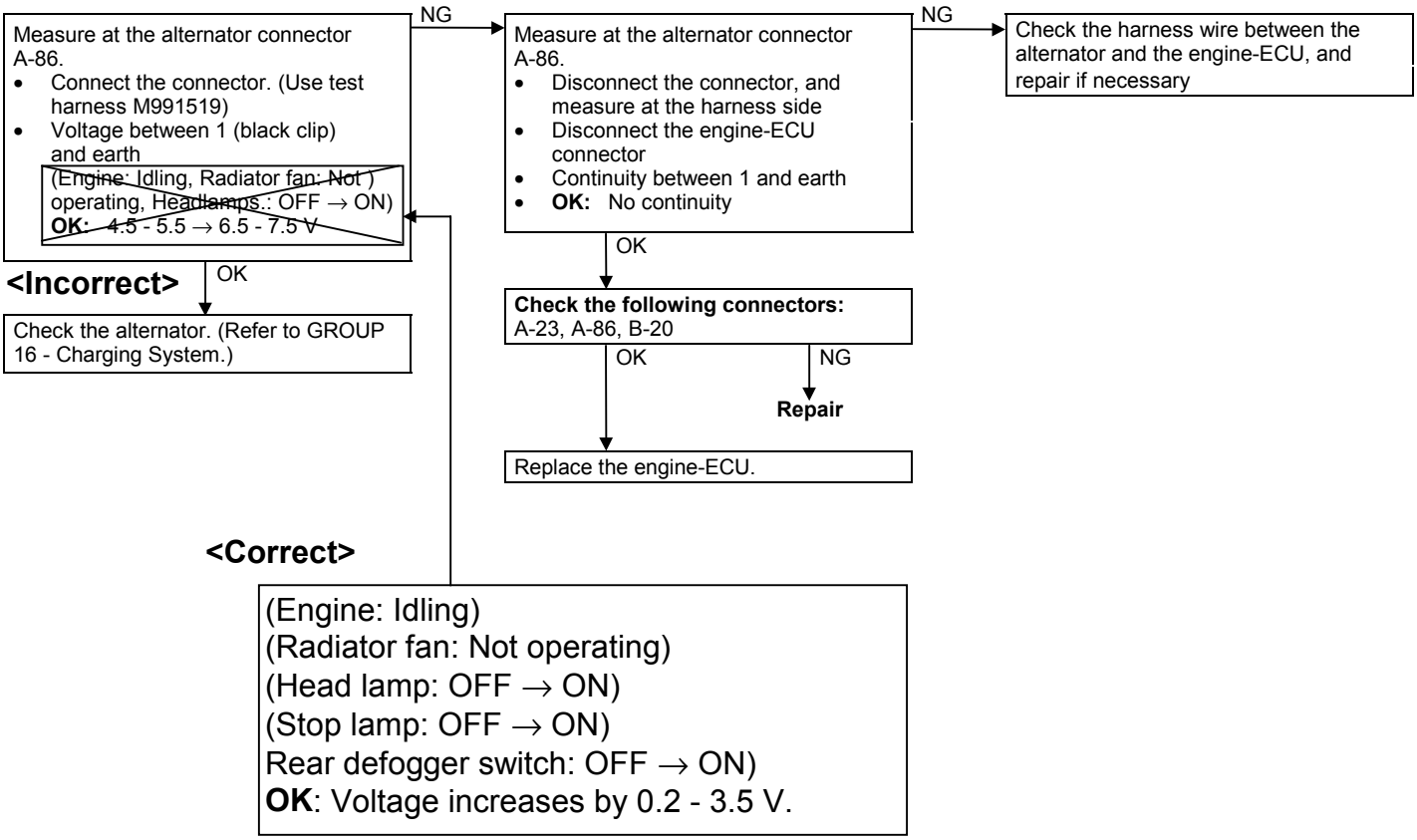
CODE NO.64 ALTERNATOR FR TERMINAL SYSTEM	PROBABLE CAUSE
Range of check • Engine speed is 50 r/min or more. Set conditions • Input voltage from alternator FR terminal is ~~4.5 V or more~~ for 20 seconds.	• Open circuit in alternator FR terminal circuit • Malfunction of the engine-ECU



CODE NO.66 BRAKE VACUUM SENSOR SYSTEM	PROBABLE CAUSE
Range of check • Ignition switch: ON. Set conditions • Sensor output voltage is 4.8 V or more. or • Sensor output voltage is 0.2 V or less.	• Malfunction of the brake vacuum sensor • Improper connector contact, open circuit or short-circuited harness wire of the brake vacuum sensor • Malfunction of the engine-ECU



LOW ALTERNATOR OUTPUT VOLTAGE (APPROX. 12.3 V)	PROBABLE CAUSE
The cause is probably a malfunction of the alternator or one of the problems listed at right.	• Malfunction of the charging system • Open circuit between the alternator G terminal and he engine-ECU • Malfunction of the engine-ECU

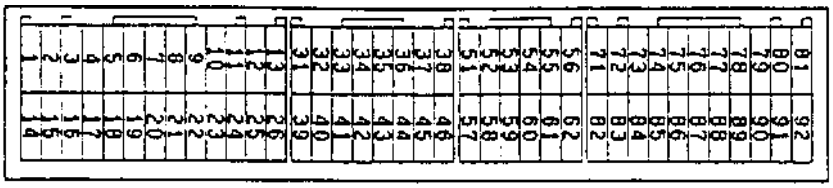


Item No.	Inspection item	Inspection contents		Normal condition	Inspection procedure No.	Reference page
49	A/C relay	Engine: After having warmed up/ Engine is idling	A/C switch: OFF	OFF (Compressor clutch is not operating	Procedure No.32	13J-58
			A/C switch: ON	ON (Compressor clutch is operating)		
66	Brake vacuum sensor	• Engine coolant temperature 80 - 95°C • Lamps, Electric cooling fan and all accessories: OFF • Transmission: Neutral (A/T: P range)	When the engine is running at idle, stop the engine, and then turn the ignition switch to ON and depress the brake pedal several times.	Negative pressure drops <Added> (Indicated pressure increases) <Correct>	Code No. 66	13J-28
67	Stop lamp switch	Ignition switch: ON	Brake pedal: Depressed	~~ON~~ OFF <Incorrect>	Procedure No.34	13J-59
			Brake pedal: Released	~~OFF~~ ON <Incorrect> <Correct>		
68	EGR control servo	• Engine coolant temperature 80 - 95°C • Lamps, Electric cooling fan and all accessories: OFF • Transmission: Neutral (A/T: P range)	Engine is idling	5 - 15 STEP	Procedure No.29	13J-56
			2,500 r/min	0 - 5 STEP		
			When engine is suddenly raced	0 - 5 STEP		
74	Fuel pressure sensor	• Engine coolant temperature 80 - 95°C • Lamps, Electric cooling fan and all accessories: OFF • Transmission: Neutral (A/T: P range)	Engine; Idling	4 - 7 MPa	Code No.56	13J-25
99	Fuel injection mode	Engine: After warmed-up	Engine: Idling (several minutes after engine starts)	Lean compression	-	-
			2,500 r/min	Stoichiometric feedback		
			When engine is idling and the suddenly raced	Open-loop		

CHECK AT THE ENGINE-ECU TERMINALS

TERMINAL VOLTAGE CHECK CHART

ENGINE-ECU CONNECTOR TERMINAL ARRANGEMENT



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Terminal No.	Check item	Check condition (Engine condition)		Normal condition
1	No.1 injector	Engine: ~~Idling after having warmed up~~ ←		~~10 - 12 V~~ ← **<Correct>** Momentarily decreases slightly from 9 - 13 V.
14	No.2 injector			
2	No.3 injector			
15	No.4 injector			
3	Air by-pass control solenoid valve (ON/OFF)	Engine: Idling after having warmed up		System voltage
		Engine: 2,500 r/min		System voltage
16	Air by-pass control solenoid valve (DUTY)	Engine: Idling after having warmed up		System voltage
		Engine: 2,500 r/min		System voltage
4	Idle speed control servo (A)	Engine: Immediately after the warm engine has been started		System voltage ↔ 0 - 0,5 V (changes repeatedly)
17	Idle speed control servo (B)			
5	Idle speed control servo (C)			
18	Idle speed control servo (D)			
7	A/T-ECU communication output	Engine: Idling Selector lever position: D range		Other than 0 V
59	A/T-ECU communication input			
8	A/C relay	Engine: Idling	A/C switch: OFF	0 - 0.1 V
			A/C switch: ON	Momentarily system voltage or momentarily 6 V or more
10	No.1 ignition coil	Engine: 2,500 r/min		0.1 - 0.3 V
11	No.2 ignition coil			
23	No.3 ignition coil			
24	No.4 ignition coil			

<Correct>

When the engine is at idle after it has been warmed up, suddenly depress the accelerator pedal.

Terminal No.	Check item	Check condition (Engine condition)		Normal condition
12	Power supply	Ignition switch: ON		System voltage
25	Power supply			
13	Earth	At all times		0 V
28	Earth			
19	Air flow sensor reset signal	Engine: Idling		0 - 0.1 V
		Engine: 4,000 r/min		6 - 9 V
90	Air flow sensor	Engine: Idling		2.2 - 3.2 V
		Engine: 2,500 r/min		
20	Injector driver control relay	Ignition switch: OFF		0 - 0.1 V
		Ignition switch: ON		0.5 - 1 V
21	Fan motor relay (LO)	Radiator fan and condenser fan are not operating (Engine coolant temperature is 90 °C or less)		System voltage
		Radiator fan and condenser fan are operating (Engine coolant temperature is 90 - 105 °C)		0 - 3 V
22	Fuel pump relay	Ignition switch: ON	Engine: Stopped	System voltage
			Engine: Idling	0 - 1 V
39	EGR control servo (A)	Engine: Immediately after the warm engine has been started		System voltage ↔ 0 - 0.5 V (changes repeatedly) **<Incorrect>**
40	EGR control servo (B)			
31	EGR control servo (C)			
32	EGR control servo (D)			
33	Alternator G terminal	Engine: Idling after having warmed up Radiator fan: Not operating Headlamp: OFF → ON Stop lamp: OFF → ON Rear defogger switch: OFF → ON		~~4.5 - 5.5 V → 6.5 - 7.5 V~~ Voltage increases by 0.2 - 3.5 V **<Correct>**
41	Alternator FR terminal	Engine: Idling after having warmed up Radiator fan: Not operating Headlamp: OFF → ON Stop lamp: OFF → ON Rear defogger switch: OFF → ON		~~2.0 - 3.0 V → 1.0 - 2.0 V~~ **<Incorrect>** **<Correct>** Voltage decreases
35	Stop lamp switch	Brake pedal: Depressed		System voltage
		Brake pedal: Released		0 - 0.1 V

Terminal No.	Check item	Check condition (Engine condition)		Normal condition
36	Engine warning lamp	Ignition switch: OFF → ON		0 - 0.1 V → System voltage (after several seconds have passed)
37	Power steering fluid pressure switch	Steering wheel: Neutral position		System voltage
		Steering wheel: Turned		0 - 0.1 V
38	Control relay	Ignition switch: ON		0 - 1 V
42	Brake vacuum sensor	~~Engine: Accelerator pedal is suddenly depressed while the engine is idling after having warmed up~~		~~Voltage drops slightly~~ Voltage increases.
45	Brake vacuum sensor	Engine: Idling	A/C switch: OFF	0 - 0.1 V
			A/C switch: ON	System voltage
51	Injector open circuit check signal	Engine: Idling		0 ↔ 5 V
52	Electrical load switch	Engine: Idling	Turn off the lighting switch	0 - 3 V
			Turn on the lighting switch	System voltage
54	Fan motor relay (HI)	Radiator fan and condenser fan are not operating (Engine coolant temperature is 90 °C or less)		System voltage
		Radiator fan and is operating (Engine coolant temperature is 105°C or more)		0 - 3 V
56	Diagnosis control terminal	-		-
62	Diagnosis output terminal	Ignition switch: ON At normal condition (no diagnosis output)		4 - 5 V
57	Purge control solenoid valve	Ignition switch: ON	Engine: Stopped	System voltage
			Engine: Running at 2,500 r/min after having warmed up	0 - 3 V
58	Tachometer	Engine: Cranking		0 ↔ 5 V (changes repeatedly)
60	Oxygen sensor heater control	Ignition switch: ON	Engine: Stopped	System voltage
			Engine: After starting	0 - 0.5 V
76	Oxygen sensor	Engine: Running at 2,500 r/min after having warmed up		0 ↔ 1 V (changes repeatedly)

<Incorrect>

<Correct>

When the engine is running at idle, stop the engine, and then turn the ignition switch to ON and depress the brake pedal several times.

<Correct>