

### ECM Terminals and Reference Value

#### PREPARATION

1. ECM is located behind the center console. For this inspection, remove the front passenger center console panel.
2. Remove ECM harness protector.
3. When checking ECM output voltages perform all voltage measurements with the connectors connected. Extend tester probe as shown to perform tests easily.

#### ECM HARNESS CONNECTOR TERMINAL LAYOUT

101	102	103	104	105	106	107	108	1	2	3	4	5	6	7	15	16	17	18	19	20	21	22	31	32	33	34	35	36	37	38	39
109	110	111	112	113	114	115	116	8	9	10	11	12	13	14	23	24	25	26	27	28	29	30	40	41	42	43	44	45	46	47	48



SEF877K

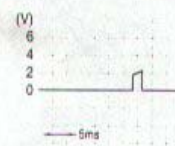
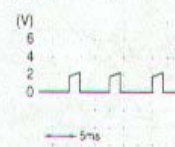
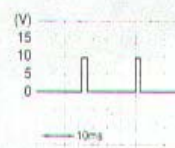
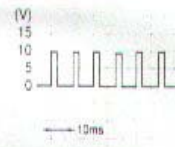
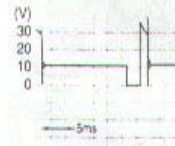
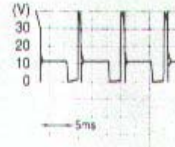
# TROUBLE DIAGNOSIS — General Description

**SR20De/DE**

## ECM Terminals and Reference Value (Cont'd)

ECM inspection table

\*Data are reference values.

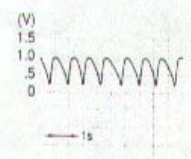
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	*DATA
1  ✓	W/B	Ignition signal	Engine is running (Warm-up condition) ↳ Idle speed	0.2 - 0.3V 
			Engine is running ↳ Engine speed is 2,000 rpm.	Approximately 0.6V 
2  ✓	L/B	Tachometer	Engine is running (Warm-up condition) ↳ Idle speed	Approximately 1.2V 
			Engine is running ↳ Engine speed is 2,000 rpm.	Approximately 3.0V 
3	Y/PU	Ignition check	Engine is running (Warm-up condition) ↳ Idle speed	Approximately 13V 
			Engine is running ↳ Engine speed is 2,000 rpm.	Approximately 13V 
4	W/G	ECCS relay (Self-shutoff)	Engine is running Ignition switch "LOCK" ↳ For a few seconds after turning ignition switch "LOCK"	0 - 1V
			Ignition switch "LOCK" ↳ Following a few seconds delay after turning ignition switch "LOCK" and thereafter	BATTERY VOLTAGE (11 - 14V)

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### ECM Terminals and Reference Value (Cont'd)

\*Data are reference values.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	*DATA
6	B	ECCS ground	<div style="border: 1px solid black; padding: 2px; display: inline-block;">Engine is running.</div> └ Idle speed	Engine ground
7	G/B	Data link connector for CONSULT	<div style="border: 1px solid black; padding: 2px; display: inline-block;">Engine is running.</div>	Approximately 0V
14	G/W		└ Idle speed (DATA MONITOR screen)	Approximately 3.5V
15	GY/L			Approximately 5V
23	G/R			Approximately 0V
9	LG/R	Cooling fan relay (Low speed)	<div style="border: 1px solid black; padding: 2px; display: inline-block;">Engine is running.</div> └ Cooling fan is not operating.	BATTERY VOLTAGE (11 - 14V)
			<div style="border: 1px solid black; padding: 2px; display: inline-block;">Engine is running.</div> └ Cooling fan is operating.	Approximately 0V
11	G/Y	Air conditioner cut relay	<div style="border: 1px solid black; padding: 2px; display: inline-block;">Engine is running.</div> └ Both A/C switch and blower fan switch are on.	Approximately 0V
			<div style="border: 1px solid black; padding: 2px; display: inline-block;">Engine is running.</div> └ A/C switch is off.	BATTERY VOLTAGE (11 - 14V)
13	B	ECCS ground	<div style="border: 1px solid black; padding: 2px; display: inline-block;">Engine is running.</div> └ Idle speed	Engine ground
16	OR	Mass air flow sensor	<div style="border: 1px solid black; padding: 2px; display: inline-block;">Engine is running.</div> (Warm-up condition) └ Idle speed	0.8 - 1.2V
			<div style="border: 1px solid black; padding: 2px; display: inline-block;">Engine is running.</div> (Warm-up condition) └ Engine speed is 2,000 rpm.	1.2 - 1.6V
17	W	Mass air flow sensor ground	<div style="border: 1px solid black; padding: 2px; display: inline-block;">Engine is running.</div> └ Idle speed	Approximately 0V
18	L/OR	Engine coolant temperature sensor	<div style="border: 1px solid black; padding: 2px; display: inline-block;">Engine is running.</div>	Approximately 0 - 4.8V Output voltage varies with engine coolant temperature.
19	L/W	Heated oxygen sensor	<div style="border: 1px solid black; padding: 2px; display: inline-block;">Engine is running.</div> (warm-up condition) └ Engine speed is 2,000 rpm.	0 - Approximately 1.0V  
20	R	Throttle position sensor	<div style="border: 1px solid black; padding: 2px; display: inline-block;">Ignition switch "ON"</div> (Warm-up condition) └ Accelerator pedal released	0.35 - 0.65V
			<div style="border: 1px solid black; padding: 2px; display: inline-block;">Ignition switch "ON"</div> └ Accelerator pedal fully depressed	Approximately 4V
21	B	Sensor's ground	<div style="border: 1px solid black; padding: 2px; display: inline-block;">Engine is running.</div> └ Idle speed	Approximately 0V

# TROUBLE DIAGNOSIS — General Description

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## ECM Terminals and Reference Value (Cont'd)

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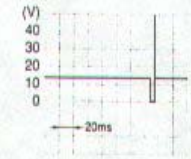
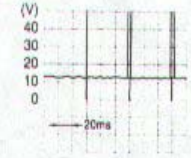
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	*DATA
22 30	B/W	Camshaft position sensor (Position signal)	Engine is running. (Warm-up condition) └ Idle speed	2.0 - 3.0V (V)  NEF353
			Engine is running. └ Engine speed is 2,000 rpm.	2.0 - 3.0V (V)  NEF354
24	OR	Malfunction indicator lamp	Ignition switch "ON"	Approximately 1.5V
			Engine is running.	BATTERY VOLTAGE (11 - 14V)
27	Y	Knock sensor	Engine is running. └ Idle speed	Approximately 2.4V
28	W/R	Throttle position signal (For A/T control unit)	Ignition switch "ON" └ Accelerator pedal released	Approximately 0.4V
			Ignition switch "ON" └ Accelerator pedal fully depressed	Approximately 3V
29	B	Sensor's ground	Engine is running. └ Idle speed	Approximately 0V
31 40	L	Camshaft position sensor (Reference signal)	Engine is running. (Warm-up condition) └ Idle speed	0.1 - 0.4V (V)  NEF355
			Engine is running. └ Engine speed is 2,000 rpm.	0.1 - 0.4V (V)  NEF356
32	Y/G	Vehicle speed sensor	Engine is running. └ Lift up the vehicle. └ In 2nd gear position └ Vehicle speed is 40 km/h (25 mph).	0-Approximately 4.2V  NEF357
33	R	Electrical load signal	Engine is running. └ Rear window defogger is operating. └ Lighting switch is "ON".	BATTERY VOLTAGE (11 - 14V)
			Engine is running. └ Rear window defogger is not operating. └ Lighting switch is "OFF".	0V

# TROUBLE DIAGNOSIS — General Description

**SR20De/DE**

## ECM Terminals and Reference Value (Cont'd)

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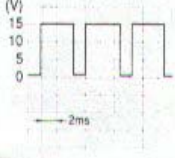
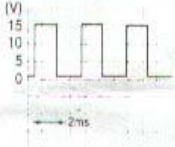
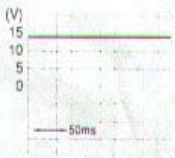
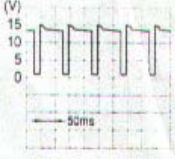

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	*DATA
34	B/Y	Start signal	Ignition switch "ON"	Approximately 0V
			Ignition switch "START"	BATTERY VOLTAGE (11 - 14V)
35	G/OR (M/T) B/W (A/T)	Neutral position switch/inhibitor switch	Ignition switch "ON" └ "N" or "P" position (A/T) └ Neutral position (M/T)	0V
			Ignition switch "ON" └ Except the above gear position	BATTERY VOLTAGE (11 - 14V)
36	B/R	Ignition switch	Ignition switch "LOCK"	0V
			Ignition switch "ON"	BATTERY VOLTAGE (11 - 14V)
37	P/L	Throttle position sensor power supply	Ignition switch "ON"	Approximately 5V
38 47	W/R	Power supply for ECM	Ignition switch "ON"	BATTERY VOLTAGE (11 - 14V)
39	B	ECCS ground	Engine is running. └ Idle speed	Engine ground
41	L/OR	Air conditioner switch	Engine is running. └ Both air conditioner switch and blower fan switch are on.	Approximately 0V
			Engine is running. └ Air conditioner switch is off.	BATTERY VOLTAGE (11 - 14V)
43	PU/W	Power steering oil pressure switch	Engine is running. └ Steering wheel is being turned.	0V
			Engine is running. └ Steering wheel is not being turned.	4 - 6V
46	W/L	Power supply (Back-up)	Ignition switch "LOCK"	BATTERY VOLTAGE (11 - 14V)
48	B	ECCS ground	Engine is running. └ Idle speed	Engine ground
109	W/R	Current return	Ignition switch "LOCK"	BATTERY VOLTAGE (11 - 14V)
101	R/B	Injector No. 1	Engine is running (Warm-up condition) └ Idle speed	BATTERY VOLTAGE (11 - 14V)
103	G/B	Injector No. 3		 <p style="text-align: right;">NEF358</p>
110	Y/B	Injector No. 2		BATTERY VOLTAGE (11 - 14V)
112	L/B	Injector No. 4	Engine is running. └ Engine speed is 2,000 rpm.	 <p style="text-align: right;">NEF359</p>

# TROUBLE DIAGNOSIS — General Description

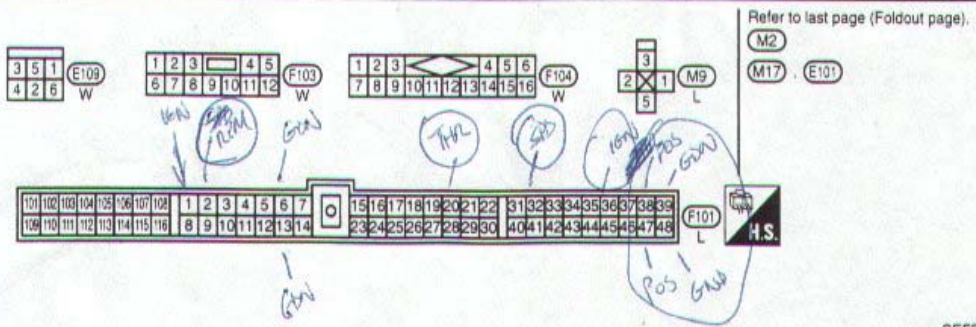
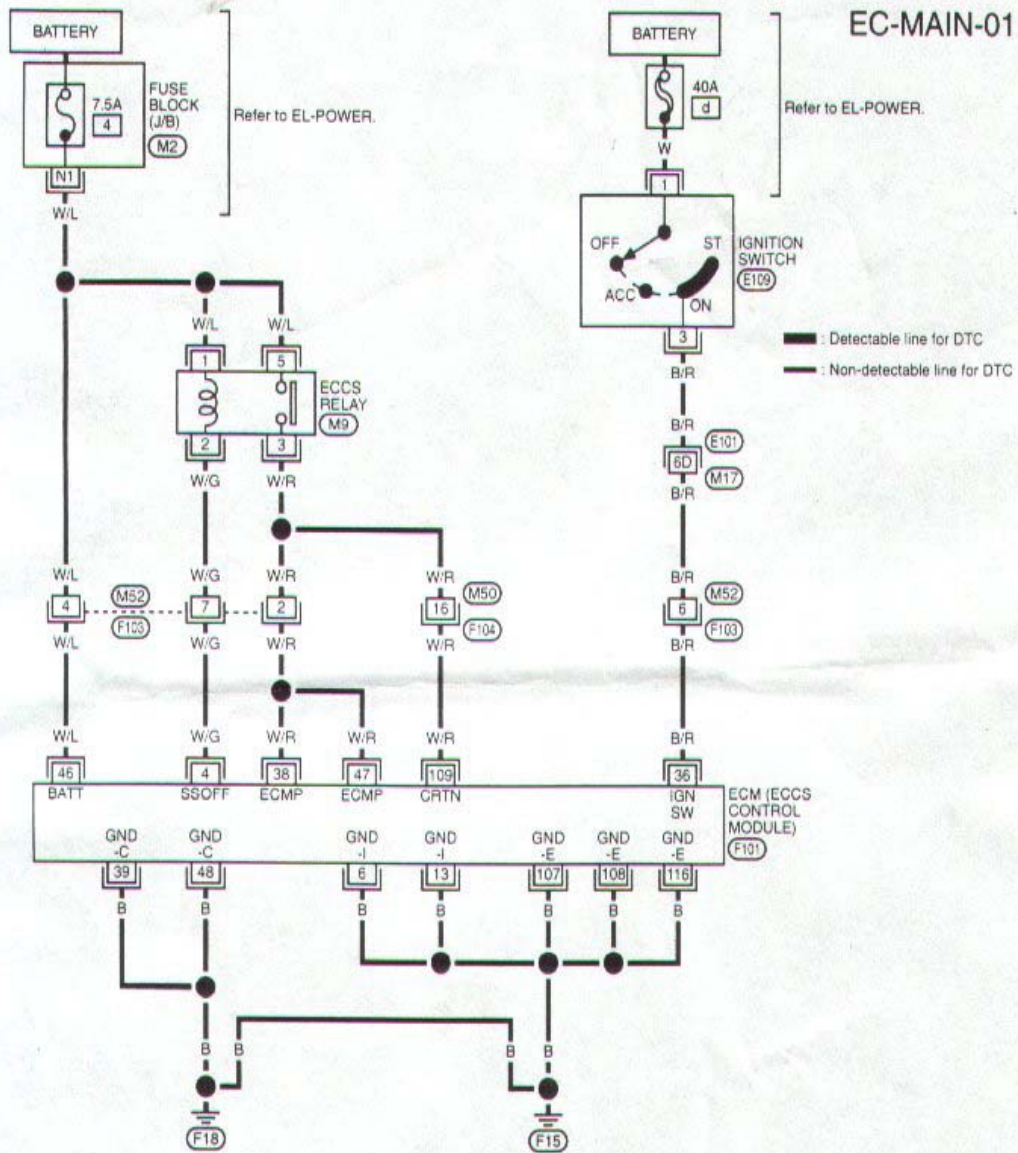
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## ECM Terminals and Reference Value (Cont'd)

\*Data are reference values.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	*DATA
106	B/P	Fuel pump relay	Ignition switch "ON" └ For 5 seconds after turning ignition switch "ON" Engine is running.	Approximately 0V
			Ignition switch "ON" └ Following a 5 seconds delay after turning ignition switch "ON" and thereafter	BATTERY VOLTAGE (11 - 14V)
107 108	B	ECCS ground	Engine is running. └ Idle speed	Engine ground
111	R/Y	Heated oxygen sensor heater	Engine is running. └ Engine speed is below 3,200 rpm.	Approximately 0.2V
			Engine is running. └ Engine speed is above 3,200 rpm.	BATTERY VOLTAGE (11 - 14V)
113	SB	IACV-AAC valve	Engine is running. └ Idle speed	8 - 14V  NEF360
			Engine is running. └ Steering wheel is being turned. └ Engine speed is 2,000 rpm. └ Rear window defogger switch is "ON". └ Lighting switch is "ON".	2 - 8V  NEF361
114	P	EVAP canister purge volume control solenoid valve	Engine is running. └ Idle speed.	BATTERY VOLTAGE (11 - 14 V)  NEF362
			Engine is running. (Warm-up condition) └ Idle speed └ Air conditioner is operating.	12 - 13V  NEF363
			Engine is running. └ Engine speed is 3,000 rpm.	5 - 8V  NEF356
116	B	ECCS ground	Engine is running. └ Idle speed	Engine ground

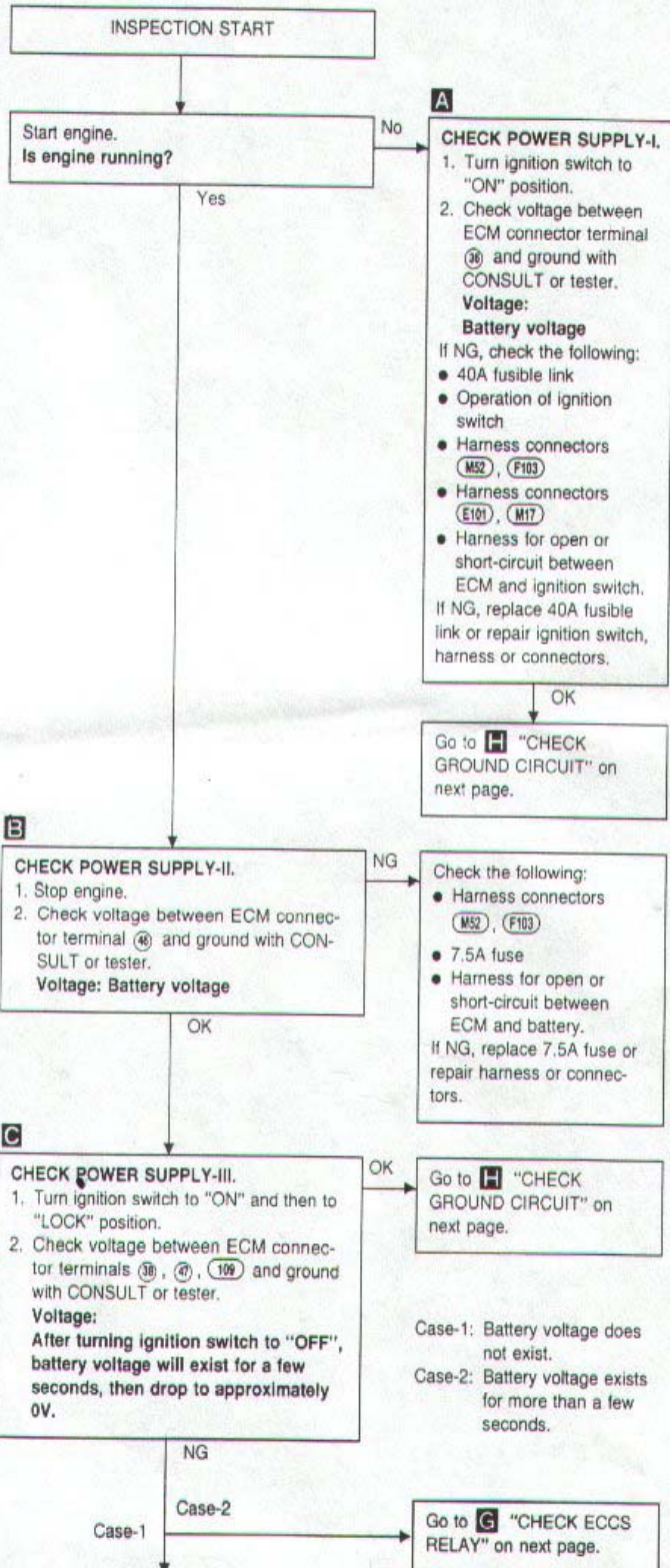
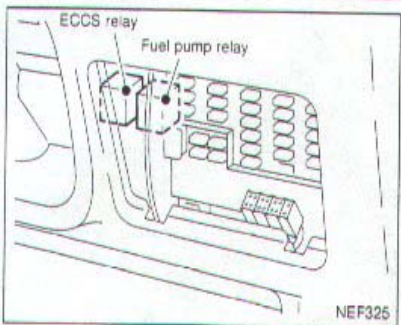
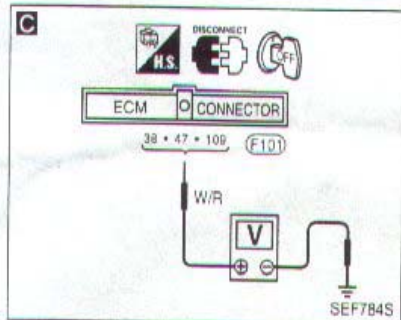
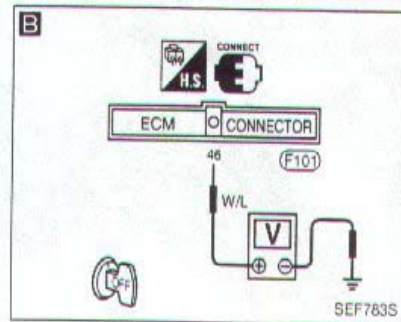
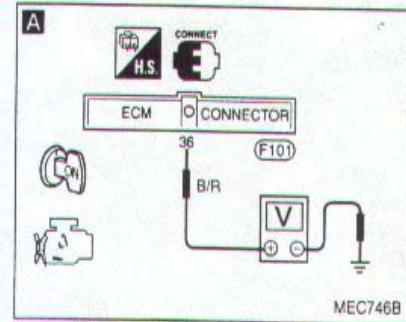
Main Power Supply and Ground Circuit



# TROUBLE DIAGNOSIS FOR POWER SUPPLY

SR20De/DE

## Main Power Supply and Ground Circuit (Cont'd)

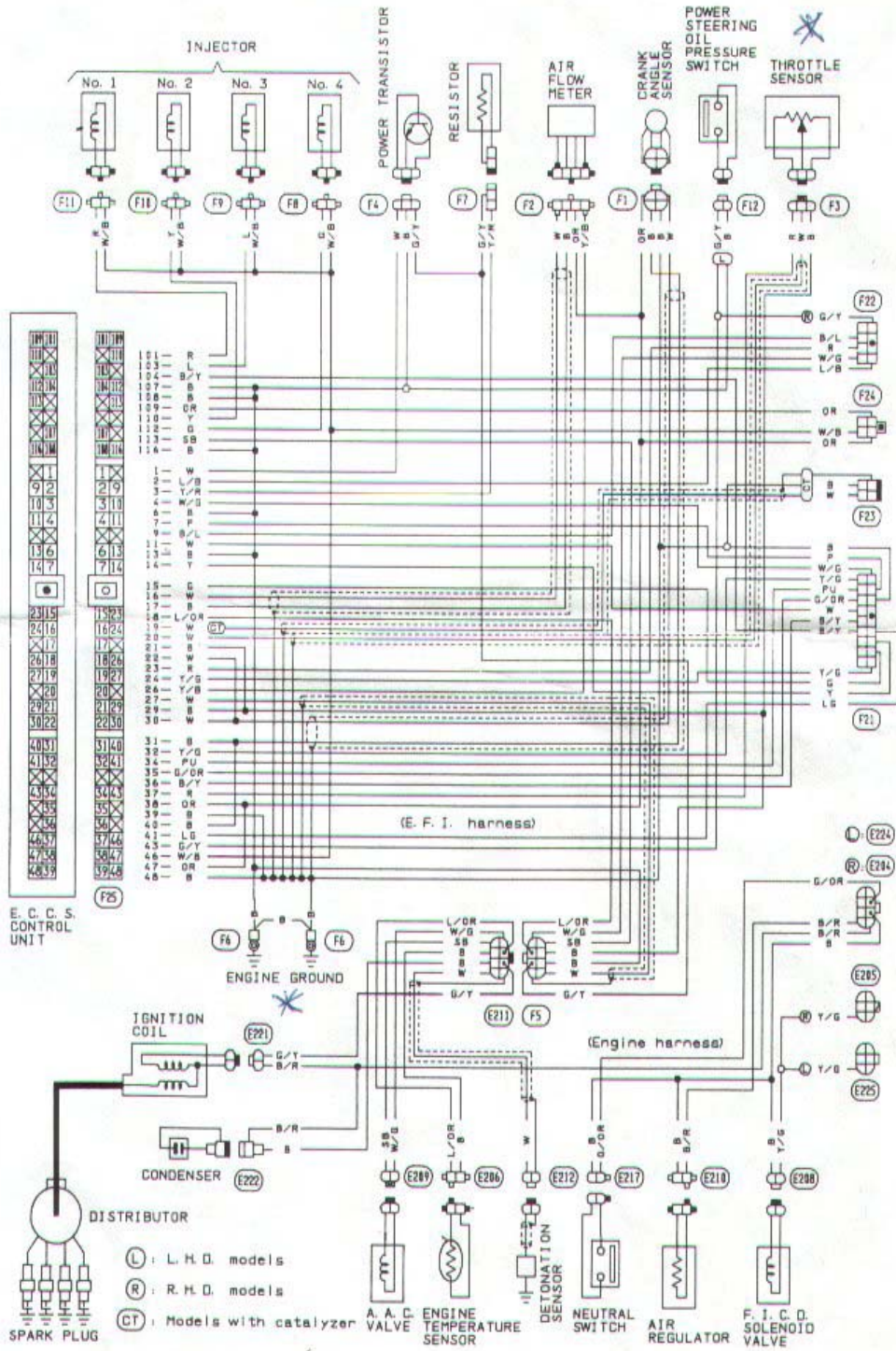




# ENGINE AND EMISSION CONTROL OVERALL SYSTEM

SR20DE

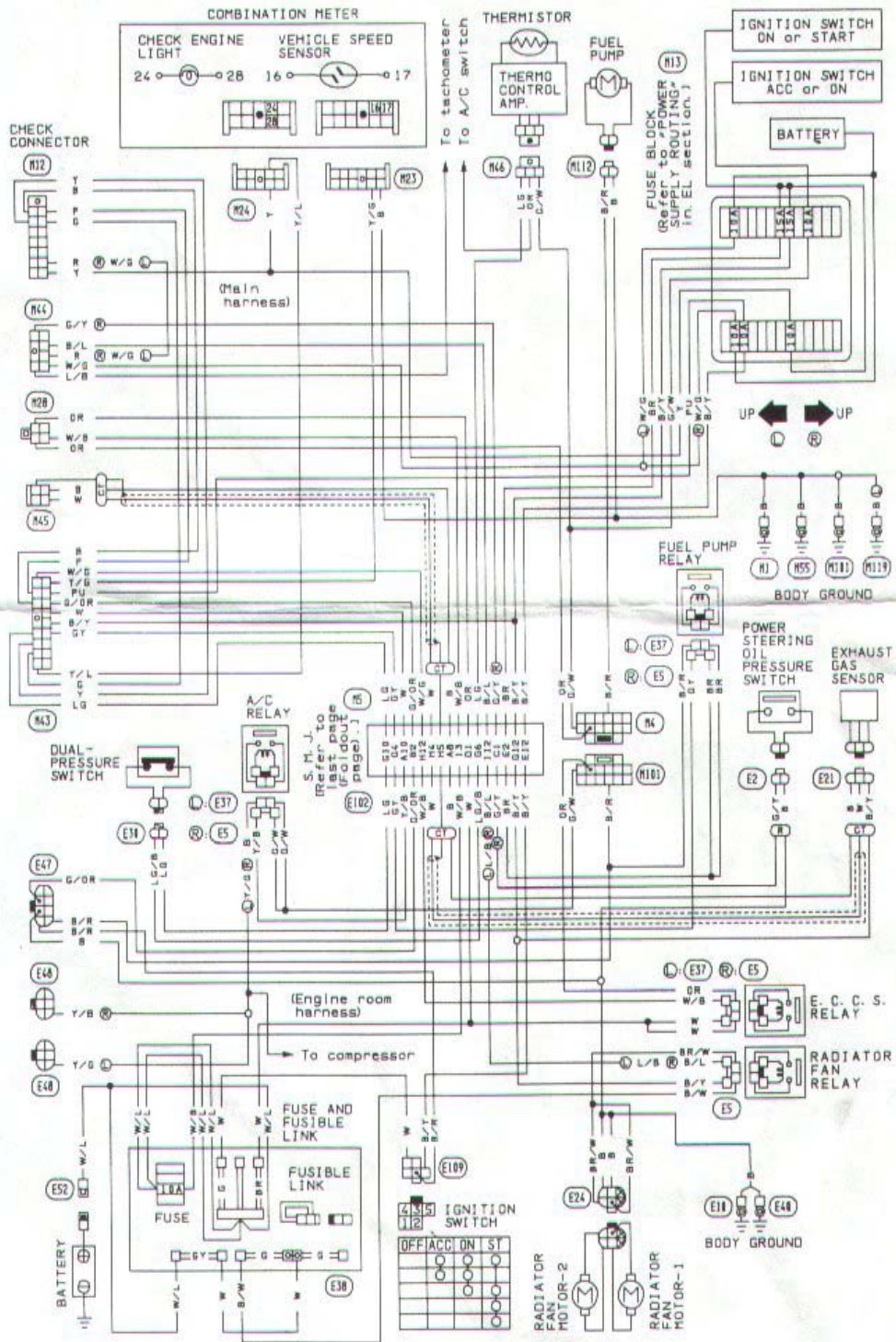
## Wiring Diagram

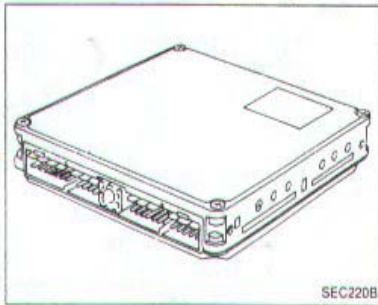


# ENGINE AND EMISSION CONTROL OVERALL SYSTEM

SR20DE

## Wiring Diagram (Cont'd)

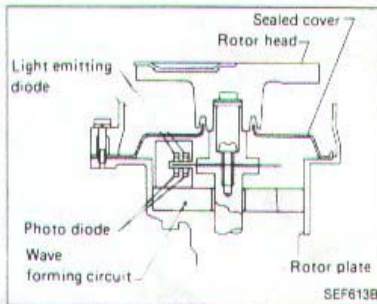




SEC220B

### E.C.C.S. Control Unit (E.C.U.)

The E.C.U. consists of a microcomputer, inspection lamp, a diagnostic mode selector, and connectors for signal input and output and for power supply. The unit controls the engine.

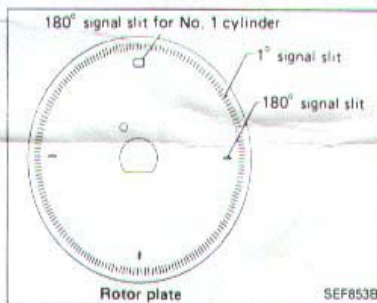


SEF613B

### Crank Angle Sensor

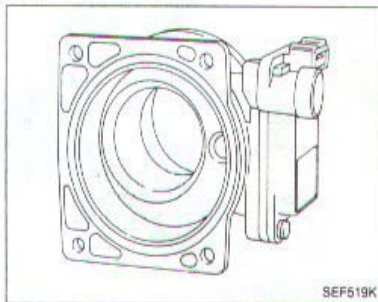
The crank angle sensor is a basic component of the entire E.C.C.S. It monitors engine speed and piston position, and sends signals to the E.C.U. to control fuel injection, ignition timing and other functions.

The crank angle sensor has a rotor plate and a wave-forming circuit. The rotor plate has 360 slits for 1° signal and 4 slits for 180° signal. Light Emitting Diodes (L.E.D.) and photo diodes are built in the wave-forming circuit.



SEF853B

When the rotor plate passes between the L.E.D. and the photo diode, the slits in the rotor plate continually cut the light being transmitted to the photo diode from the L.E.D. This generates rough-shaped pulses which are converted into on-off pulses by the wave-forming circuit, which are sent to the E.C.U.



SEF519K

### Air Flow Meter

The air flow meter measures the intake air flow rate by taking a part of the entire flow. Measurements are made in such a manner that the E.C.U. receives electrical output signals varied by the amount of heat emitting from the hot wire placed in the stream of the intake air.

When intake air flows into the intake manifold through a route around the hot wire, the heat generated from the hot wire is taken away by the air. The amount of heat depends on the air flow. On the other hand, the temperature of the hot wire is automatically controlled to a certain number of degrees.

Therefore, it is necessary to supply the hot wire with more electric current in order to maintain the temperature of the hot wire. The E.C.U. knows the air flow by means of the electric change.