Function and System Application

Diagnostic test mode	Function	ENGINE	A/T	Air bag	ABS
Work support	This mode enables a technician to adjust some devices faster and more accurately by following the indications on CONSULT.	×	—	—	—
Self-diagnostic results	Self-diagnostic results can be read and erased quickly.	×	×	×	×
Trouble diagnostic record	Current self-diagnostic results and all trouble diagnostic records previously stored can be read.	—	—	×	—
ECU discriminated No.	Classification number of a replacement ECU can be read to prevent an incorrect ECU from being installed.	—	—	×	—
Data monitor	Input/Output data in the ECM can be read.	×	×	—	×
Active test	Diagnostic Test Mode in which CONSULT drives some actuators apart from the ECMs and also shifts some parameters in a specified range.	×	—	—	×
ECM part number	ECM part number can be read.	×	×	—	×
Function test	Conducted by CONSULT instead of a technician to determine whether each system is "OK" or "NG".	×	—	—	—

×: Applicable

Lithium Battery Replacement

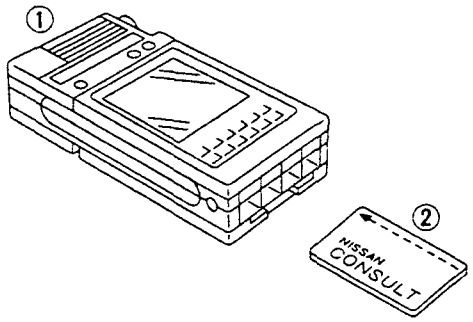
CONSULT contains a lithium battery. When replacing the battery obey the following:

WARNING:

Replace the lithium battery with SANYO Electric Co., Ltd., CR2032 only. Use of another battery may present a risk of fire or explosion. The battery may present a fire or chemical burn hazard if mistreated.
Do not recharge, disassemble or dispose of in fire.
Keep the battery out of reach of children and discard used battery conforming to the local regulations.

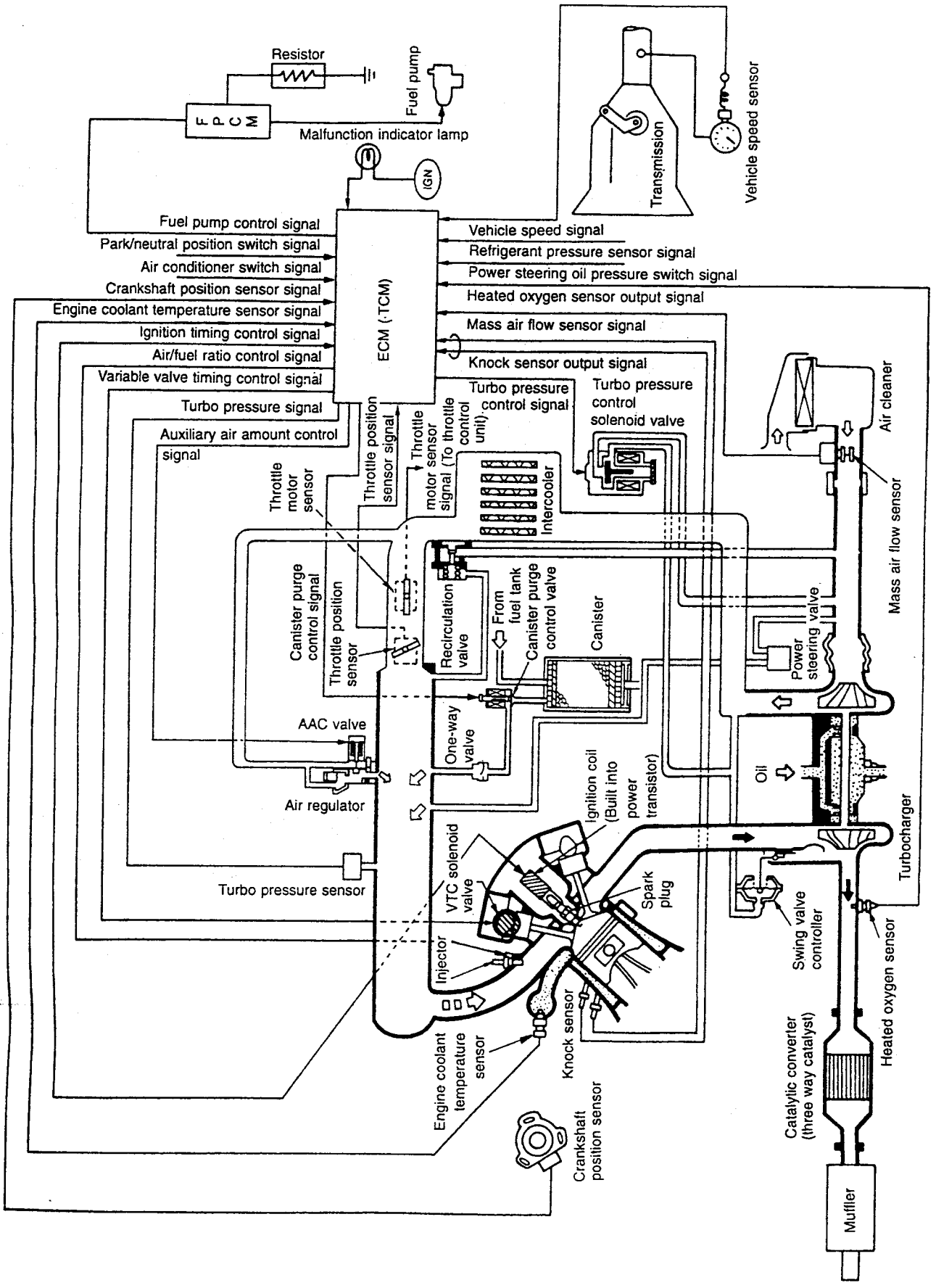
Checking Equipment

When ordering the below equipment, contact your NISSAN distributor.

Tool name	Description
NISSAN CONSULT ① CONSULT unit and accessories ② Program card UE990: For Automatic transmission of Dual matic M-ATx EE980: Except for Automatic transmission of Dual matic M-Atx	 NT004

System Diagram (Cont'd)

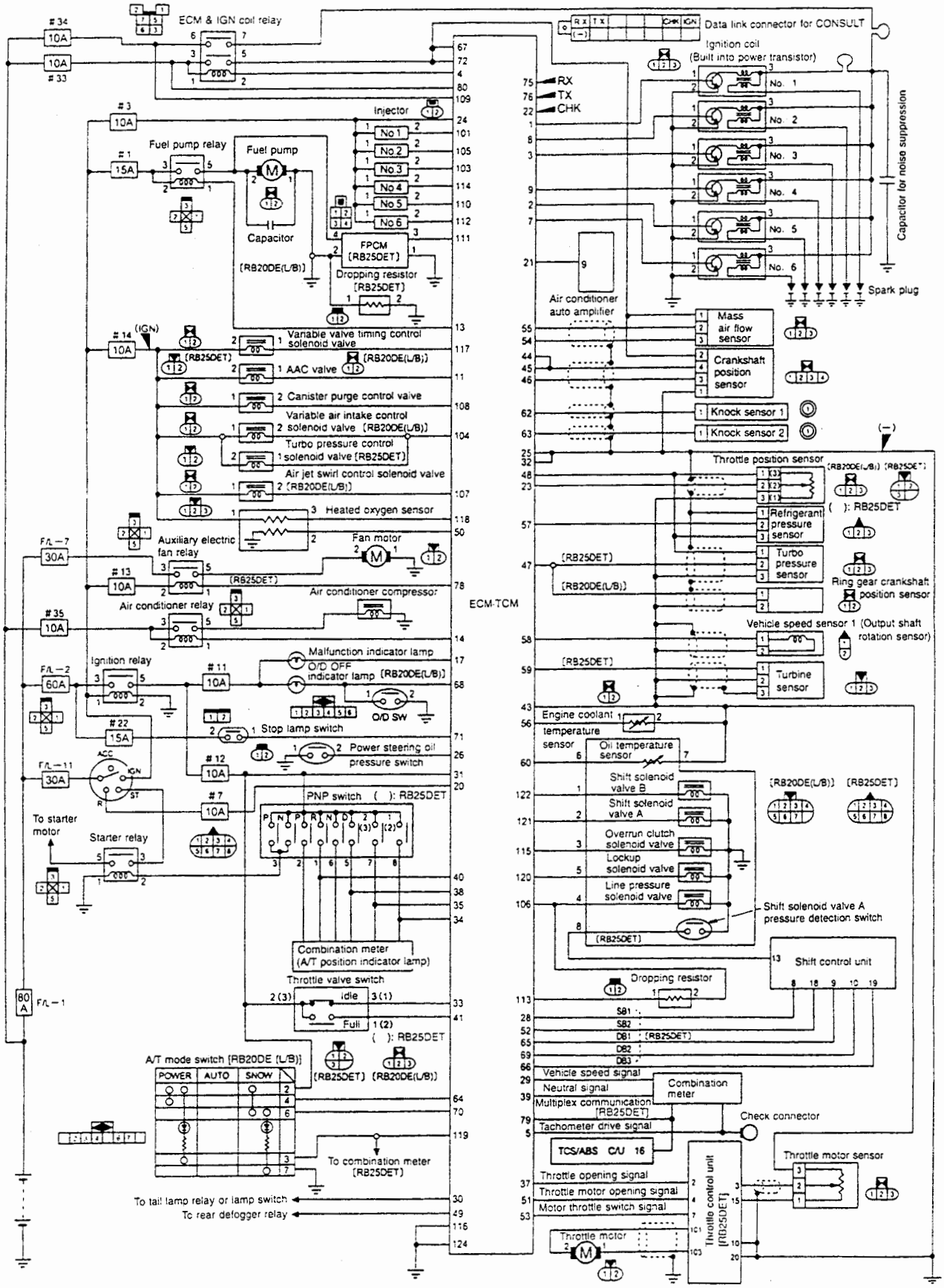
RB25DET



ECL1776D

Circuit Diagram (Cont'd)

RB20DE (L/B)·A/T, RB25DET·A/T MODELS



ECL1783D

FUNCTION

Diagnostic test mode	Function
Work support	A technician can adjust some devices faster and more accurately by following indications on CONSULT.
Self-diagnostic results	Self-diagnostic results can be read and erased quickly.
Data monitor	Input/Output data in the ECM can be read.
Active test	CONSULT drives some actuators apart from the ECM's and also shifts some parameters in a specified range.
Function test	Conducted by CONSULT instead of a technician to determine whether each system is "OK" or "NG".
ECM part number	ECM part number can be read.

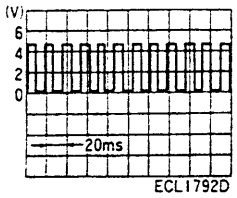
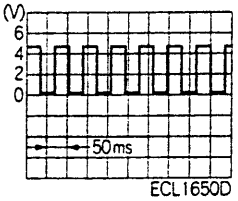
WORK SUPPORT MODE

WORK ITEM	CONDITION	USAGE
THRTL POS SEN ADJ	CHECK THE THROTTLE POSITION SENSOR SIGNAL. ADJUST IT TO THE SPECIFIED VALUE BY ROTATING THE SENSOR BODY UNDER THE FOLLOWING CONDITIONS. • IGN SW "ON" • ENG NOT RUNNING • ACC PEDAL NOT PRESSED	When adjusting throttle position sensor initial position
IACV-AAC VALVE ADJ	SET ENGINE SPEED AT THE SPECIFIED VALUE UNDER THE FOLLOWING CONDITIONS. • ENGINE WARMED UP • NO-LOAD	
FUEL PRESSURE RELEASE	• FUEL PUMP WILL STOP BY TOUCHING "START" DURING IDLING. CRANK A FEW TIMES AFTER ENGINE STALLS.	When releasing fuel pressure from fuel line

Symptom Matrix Chart (Cont'd)

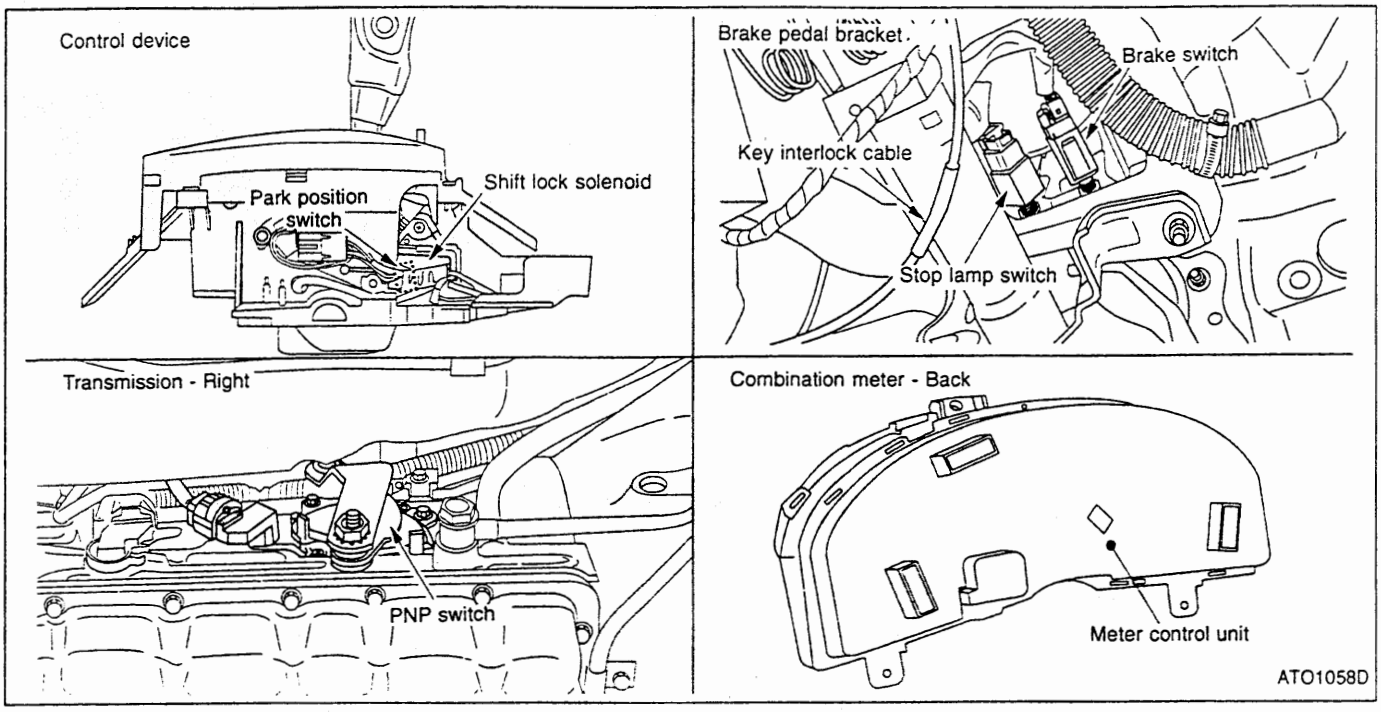
Sensor-related problems			Symptom characteristics and inspection hints
Crankshaft position sensor (POS, REF)		Open	Engine will not start when either REF signal circuit or POS signal circuit is open. Neither fuel system nor ignition system outputs control signals.
		Instantaneous break	Symptoms vary with the break time and the vehicle's driving conditions. Light shock or surging will occur while the vehicle is being driven, and the engine will stall at idle speed.
Ring gear crankshaft position sensor [RB20DE (L/B)]		Open	No air/fuel ratio compensation is carried out during lean burn status. Drivability may be affected.
Mass air flow sensor	Signal	Open	Enters fail-safe mode. Driving under 2,400 rpm is allowed.
		High output	Air/fuel ratio becomes rich. Black smoke may be noted. Poor contact at the ground could be the cause.
		Low output	Air/fuel ratio becomes lean. Dirty hot wire or air entering the system could be the cause.
	Ground	Open	Air/fuel ratio becomes over-rich.
	Power	Open	Same symptom as when signal wire is open.
Engine coolant temperature sensor		Open/short	Enters fail-safe mode. Malfunction indicator lamp comes ON. Ordinary driving is allowed. Problems tend to occur when engine is cold or engine coolant temperature is high.
		High resistance	Detects low engine coolant temperature. Problems tend to occur after engine warm-up.
		Low resistance	Detects high engine coolant temperature. Problems tend to occur when engine is cold.
Heated oxygen sensor		Open/short	Base air/fuel ratio is used.
Knock sensor		Open/short	Ignition timing is retarded within the knock control range. Lack of power may be noted.
		High output	Ignition timing is retarded within the knock control range. Lack of power may be noted.
		Low output	Ignition timing may not be retarded when knock is detected.
Vehicle speed sensor		Open/short	Fuel cut time becomes shorter, or no fuel cut is observed.
Throttle position sensor		Open/short	Base idle speed is used. Fuel injection is not increased during acceleration. A/T shift point changes for A/T vehicles.
		Unstable output	Unnecessary cut-in fuel injection could be the cause. Poor contact at the ground or control unit could be the cause.
		Poor adjustment	Idle judgment is "OFF" while idling. Condition returns normal by turning the ignition switch ON and OFF repeatedly.
Turbo pressure sensor (T/C)		Open	Turbo pressure is judged zero. No remarkable malfunction will be detected.
Refrigerant pressure sensor		Open	Refrigerant pressure is judged high. Idle speed remains high while the air conditioner is ON.
		Short	Refrigerant pressure is judged low. Idle speed remains low while the air conditioner is ON.
Ignition switch (IGN)		Open	Engine will not start because neither fuel system nor ignition system outputs control signals.
Ignition switch (START)		Open	Engine starts in normal condition. Engine may not start when temperature is extremely low.
Air conditioner switch		Open	Air conditioner will not operate. No other malfunction will be noted.
Park/neutral position switch		Open	Park/neutral position switch is judged "OFF". Target engine speed for cold engine in N or P position is reduced.
		Short	Park/neutral position switch is judged "ON". Fast idle is effective when the engine is cold and the gear is in other than N and P positions. Vehicle excessively creeps.
Power steering oil pressure switch		Open	Engine may stall when the steering wheel is turned while the vehicle is standstill and the accelerator pedal is lightly pressed, or when the steering wheel is turned during deceleration.
		Short	Power steering switch is judged "ON." Value will be compensated constantly.
Electrical load switch		Open	Idle speed drops so that the engine can stall when electrical load is applied.
Multiplex communication line		Open/short	Torque reduction control is not performed. Therefore, shift shock becomes greater.
Control unit power supply		Open	Engine will not start because neither fuel system nor ignition system outputs control signals.
Sensor ground		Open/short	Same symptoms as when sensor harness is open.
Control unit and connector		Poor contact Water intrusion	In case of poor contact, the connector fitting may be loose. In case of water intrusion, the engine stalls and become inoperative for a while. The engine may restart soon in some cases.

ECM (·TCM) Input/Output Signal Reference Value (Cont'd)

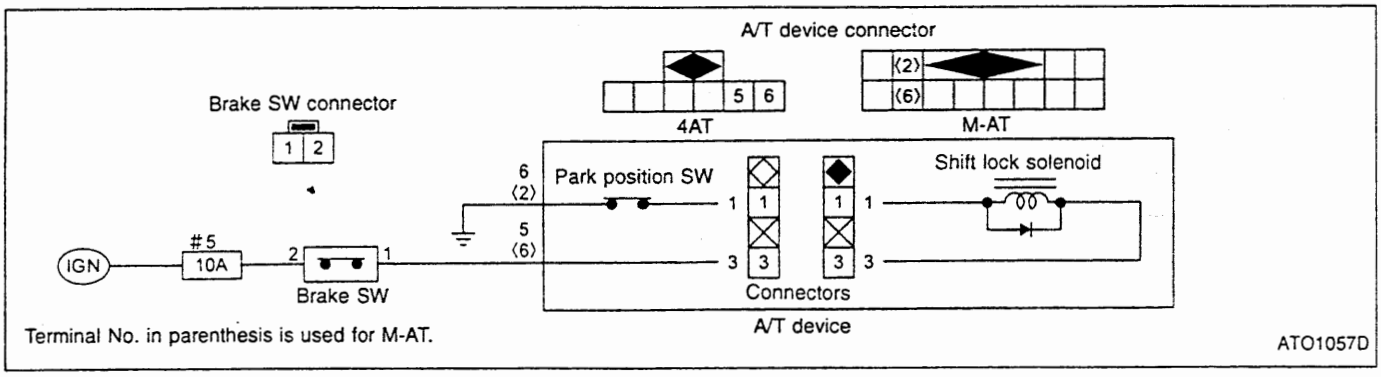
Terminal No.	Signal name	At idle	At approx. 2,000 rpm
29	Vehicle speed sensor signal	Approx. 4.7V or approx. 0V (when parked)	[RB20DE (L/B)] When driving at approx. 40 km/h: Approx. 2.4V  ECL1792D [RB25DE, RB25DET] When driving at approx. 40 km/h: Approx. 2.4V  ECL1650D
30	Head lamp switch signal	Light switch OFF: Approx. 0V Light switch ON: Battery voltage	←
31	Ignition power supply	Ignition switch OFF: Approx. 0V Ignition switch ON: Battery voltage	←
33	Idle position switch signal [RB20DE (L/B), RB25DET·A/T]	Battery voltage	Approx. 0V (When accelerator pedal is depressed)
37	Throttle opening signal [RB25DE·4WD·M/T, RB25DE·A/T, BR25DET]	Accelerator pedal released: Approx. 0.5V Accelerator pedal fully depressed: Approx. 4.2V (Ignition switch ON, engine not running)	Approx. 0.7V
39	Neutral signal (Park/Neutral position switch)	Selector lever in Neutral or in N or P position: Approx. 0V Selector lever in other positions: Approx. 4.8V	←
41	Full switch signal [RB20DE (L/B), RB25DET·A/T]	Accelerator pedal released: Approx. 0V Accelerator pedal fully depressed: Battery voltage (Ignition switch ON, engine not running)	←

NOTE: Above voltages are measured values obtained by analog circuit tester.

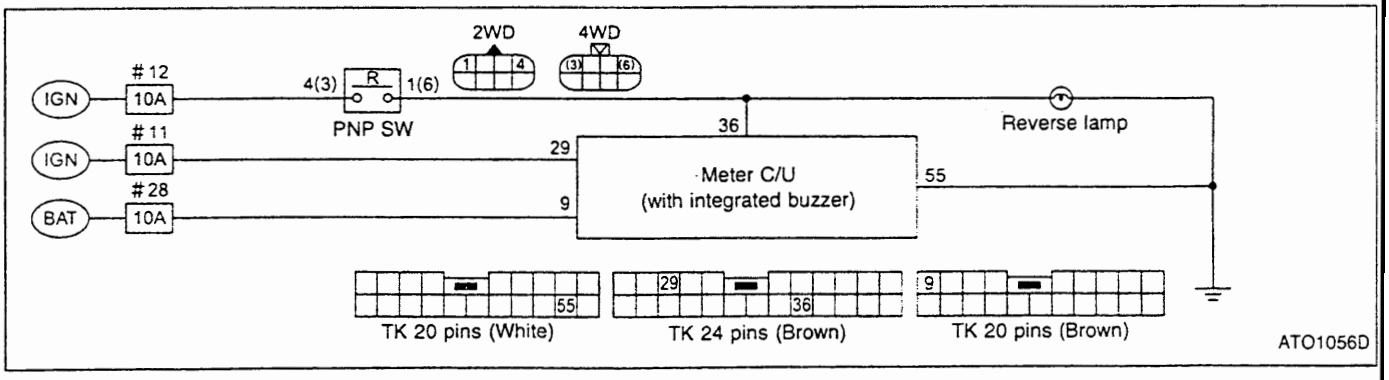
Component Parts Location



Shift Lock Circuit Diagram



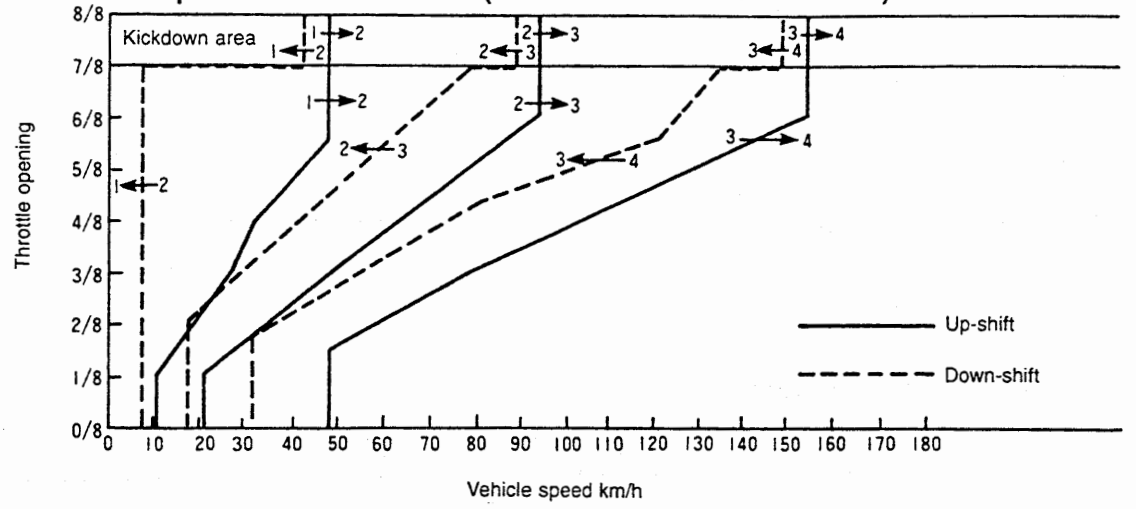
Reverse Buzzer Circuit Diagram



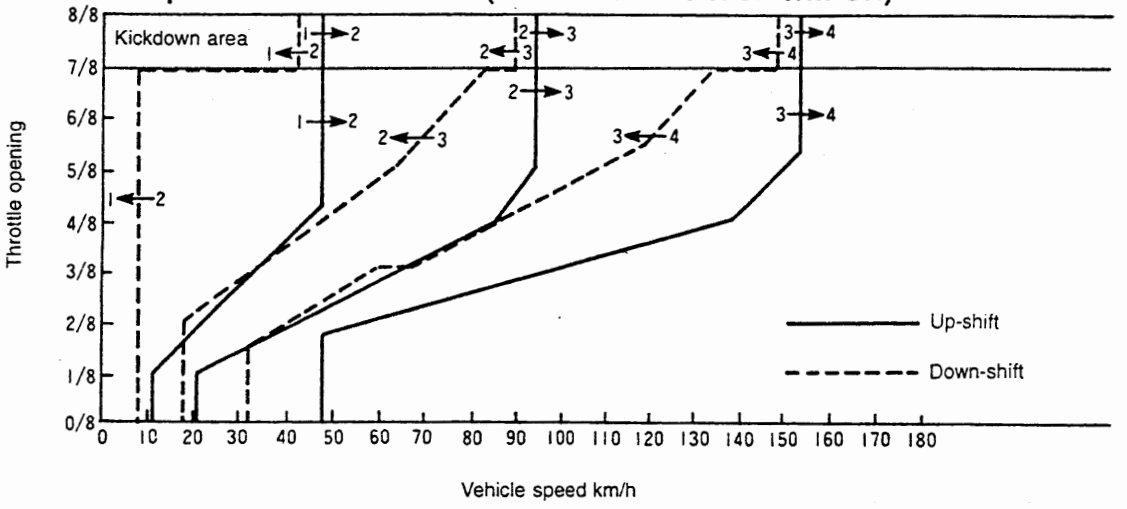
Shift Pattern

RB20DE ENGINE (4AX03 model)

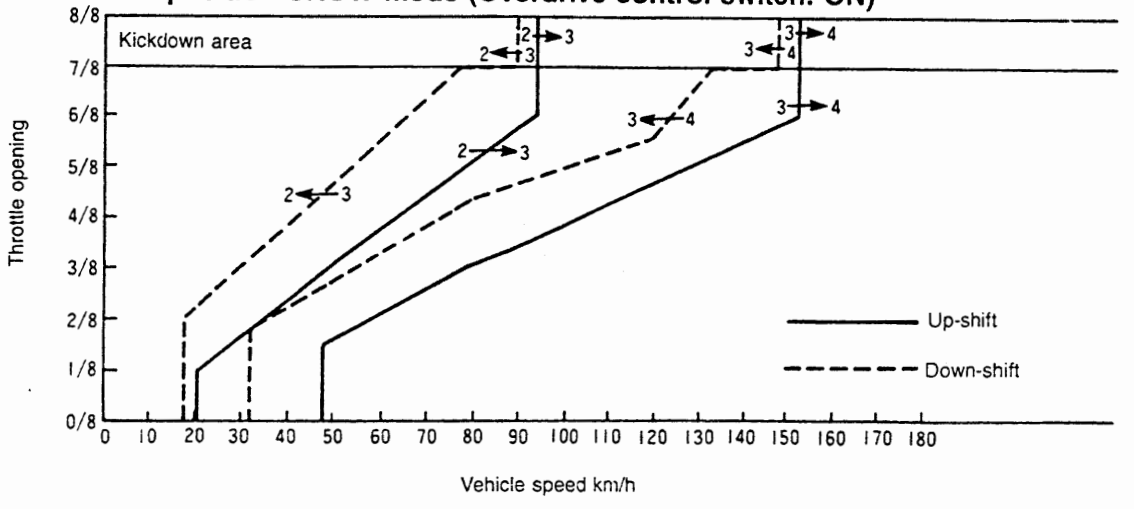
"D" position normal mode (Overdrive control switch: ON)



"D" position POWER mode (Overdrive control switch: ON)

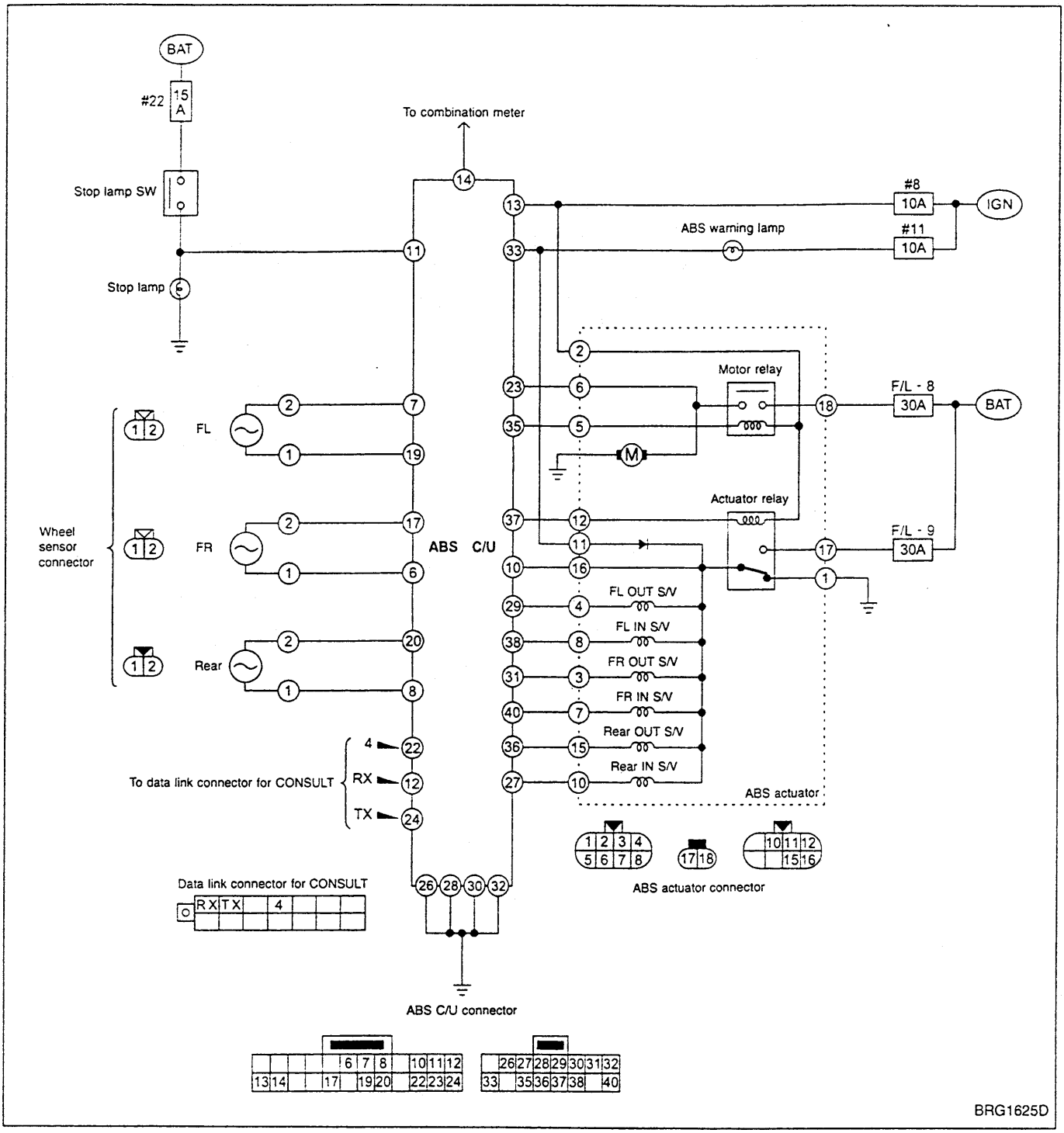


"D" position SNOW mode (Overdrive control switch: ON)



ATN1988D

Circuit Diagram



Precautions for Trouble Diagnosis

- After performing trouble diagnosis, be sure to erase trouble stored in memory.
  Refer to "CONSULT for TCS/ABS Control Unit Control System" (BR-27), "Self-diagnosis for TCS/ABS Control Unit Control System" (BR-34), "CONSULT for Throttle Control Unit Control System" (BR-37) or "Self-diagnosis for Throttle Control Unit Control System" (BR-41).
- The concerns that are difficult to duplicate may be caused by faulty electrical connections. Move harnesses or harness connectors by hand to check if there is any poor mating of connector halves or faulty connection.
- Do not force to open a connector terminal when using a circuit tester for inspection.
- Read GI section thoroughly in advance and make sure of all the general precautions.

Basic Inspection

BASIC INSPECTION 1 — Brake fluid level and leakage

1. Check brake fluid level in reservoir tank. Replenish brake fluid if necessary.
2. Check for leakage at or around brake piping and ABS actuator. If leakage or seepage is noted, proceed as follows:

- If ABS actuator connectors are loose, tighten to specified torque. Recheck to ensure that leakage is no longer present.
- If flare nut threads at piping connectors or actuator threads are damaged, replace faulty parts with new ones. Recheck to ensure that leakage is no longer present.
- If brake fluid leaks through areas other than actuator connectors, wipe off using a clean cloth. Recheck for leakage or seepage. If necessary, replace faulty parts with new ones.
- If brake fluid leaks at or seeps through ABS actuator, wipe off using a clean cloth.
  Recheck for leakage or seepage. If necessary, replace ABS actuator with new one.

CAUTION:
ABS actuator cannot be disassembled. Do not attempt to disassemble it.

3. Check brake disc rotors and pads for proper operation.

BASIC INSPECTION 2 — Loose power line terminal

Check battery terminals (positive and negative) and battery mounting (ground) for looseness. If necessary, tighten to specified torque. Check the battery for lower voltage.

BASIC INSPECTION 3 — SLIP indicator lamp, TCS OFF indicator lamp and ABS warning lamp

1. Turn ignition switch "ON" to ensure that TCS OFF indicator lamp lights up. If TCS OFF indicator lamp does not light, check TCS OFF indicator lamp circuit.
2. Turn ignition switch "ON" to ensure that SLIP indicator lamp lights up. If SLIP indicator lamp does not light, check SLIP indicator lamp circuit.
3. Turn ignition switch "ON" to ensure that ABS warning lamp lights up. If ABS warning lamp does not light, check ABS warning lamp circuit.
4. Check that the SLIP indicator lamp and the ABS warning lamp go off approx. 1 second after the engine has started. If either of the lamps still remains on, perform the self-diagnosis for TCS/ABS control unit control system and the self-diagnosis for throttle control unit control system.
5. After driving vehicle at approx. 30 km/h for approx. 1 minute, check to ensure that the SLIP indicator lamp and the ABS warning lamp are off. If either of the lamps still remains on, perform the self-diagnosis for TCS/ABS control unit control system and the self-diagnosis for throttle control unit control system.
6. Check that the TCS OFF indicator lamp turns ON and OFF when the TCS OFF switch is turned to ON and OFF respectively, with the engine running. If the lamp status does not correspond to the switch position, check the TCS OFF switch circuit.
7. Check that the TCS OFF indicator lamp goes off when the engine has started with the TCS OFF switch OFF. If the TCS OFF indicator lamp does not go off even 10 seconds after the engine has started, perform the self-diagnosis for TCS/ABS control unit control system and the self-diagnosis for throttle control unit control system.
8. After driving vehicle at approx. 30 km/h for approx. 1 minute with the TCS OFF switch OFF, check to ensure that the TCS OFF indicator lamp is off. If the TCS OFF indicator lamp lights up, perform the self-diagnosis for TCS/ABS control unit control system and the self-diagnosis for throttle control unit control system.
9. After performing self-diagnosis procedures, be sure to erase trouble stored in memory.

Self-diagnosis for TCS/ABS Control Unit Control System (Cont'd)

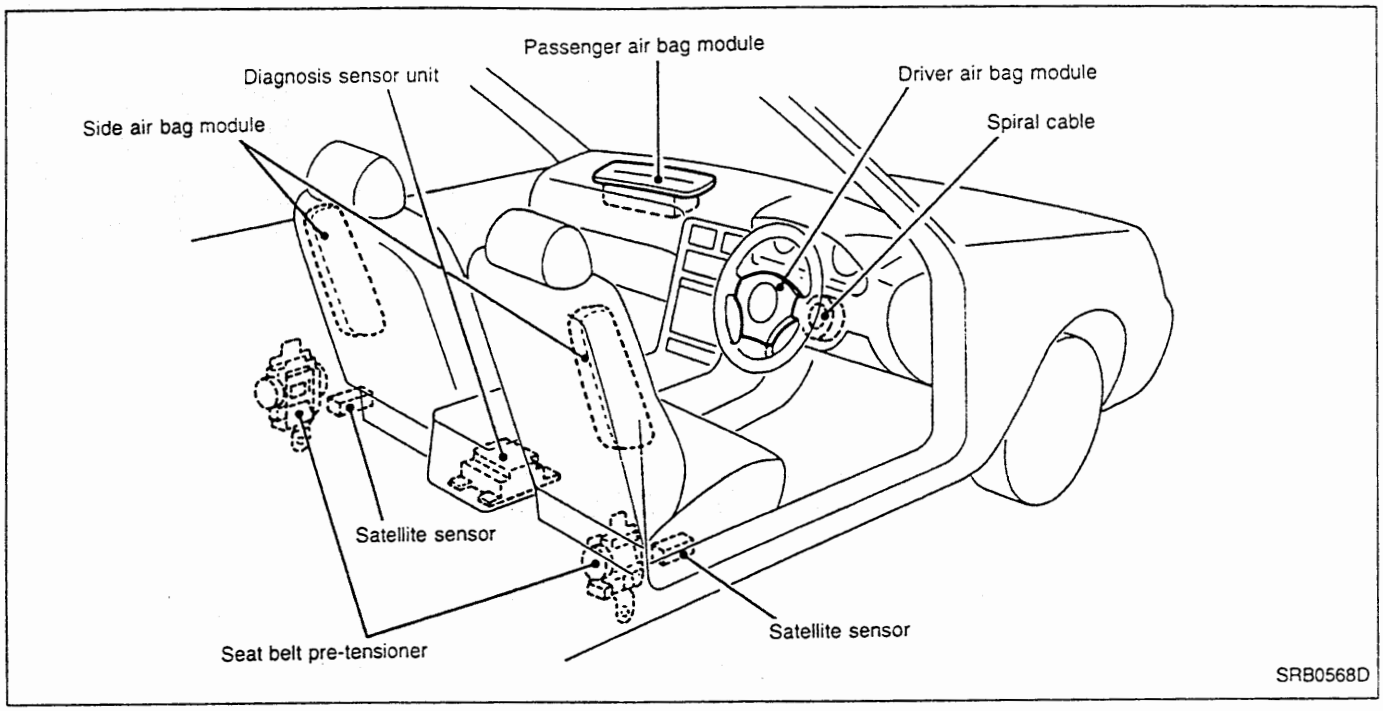
MALFUNCTION CODE/SYMPTOM CHART

Malfunction code No.	Check item	Detection time		Lamp ON			Fail-safe operation
		Engine running	In driving	ABS	TCS OFF	SLIP	
12	Normal	—	—	—	—	—	—
21	Front right wheel sensor (open-circuit)	○	○	○	○	○	○
22	Front right wheel sensor (short-circuit)	—	○	○	○	○	○
25	Front left wheel sensor (open-circuit)	○	○	○	○	○	○
26	Front left wheel sensor (short-circuit)	—	○	○	○	○	○
31	Rear right wheel sensor (open-circuit)	○	○	○	○	○	○
32	Rear right wheel sensor (short-circuit)	—	○	○	○	○	○
35	Rear left wheel sensor (open-circuit)	○	○	○	○	○	○
36	Rear left wheel sensor (short-circuit)	—	○	○	○	○	○
41	Front right outlet solenoid valve and circuit	○	○	○	○	○	○
42	Front right inlet solenoid valve and circuit	○	○	○	○	○	○
45	Front left outlet solenoid valve and circuit	○	○	○	○	○	○
46	Front left inlet solenoid valve and circuit	○	○	○	○	○	○
55	Rear outlet solenoid valve and circuit	○	○	○	○	○	○
56	Rear right inlet solenoid valve and circuit	○	○	○	○	○	○
57	Battery voltage (low)	○	○	○	○	○	—*1
58	Throttle control unit system or circuit for the communication line between TCS/ABS control unit and throttle control unit	○	○	—*2	○	○	○
61	Actuator motor and motor relay circuit	○	○	○	○	○	○
63	Actuator relay circuit	○	○	○	○	○	○
71	TCS/ABS control unit	○	○	○*5	○	○*5	○
75	Total control signal (multiple signal) for engine, A/T and TCS/ABS	○	○	—	○	○	○
80	Engine speed signal	—	○*3	—	○	○	○
83	Monitoring of total control signal (multiple signal) for engine, A/T and TCS/ABS	○	○	—	○	○	○
84	Engine system component fuel condition	○	○	—	○	○	○
85	Incomplete start process of total control signal (multiple signal) for engine, A/T and TCS/ABS	○	○	—	○	○	○
86	Continuous start process of total control signal (multiple signal) for engine, A/T and TCS/ABS	○	○	—	○	○	○
No indication (no blinking)	Remains OFF: Data link connector circuit	○	○	—	—	—	—*4
	Remains ON: SLIP indicator lamp circuit shorted, TCS/ABS control unit or self-diagnostic check terminal circuit open	○	○	○	○	○	—*4

NOTE:
When the malfunction code No. 58 is indicated, perform the throttle control unit self-diagnosis. When the malfunction code Nos. 75, 80, 83, 84, 85 or 86 is indicated, perform the self-diagnosis for ECM·TCM or ECM.

*1: Fail-safe operation is not activated. A signal from control unit suspends TCS and ABS control operation. Brakes operate conventionally and the vehicle operates in the same manner as a vehicle without the TCS. After specified battery voltage resumes, the TCS OFF indicator lamp and the ABS warning lamp go off, allowing for TCS and ABS control operation.
*2: TCS operation only stops and fail-safe operation is activated, allowing for ABS control operation.
*3: Malfunction is detected only when TCS is in operation.
*4: When there are malfunctions in the self-diagnostic check terminal circuit (terminal 4 of the data link connector for CONSULT) and SLIP indicator lamp circuit, fail-safe operation is not activated.
*5: Some malfunctions in the TCS/ABS control unit cause the SLIP indicator lamp and the ABS warning lamp to go off separately.

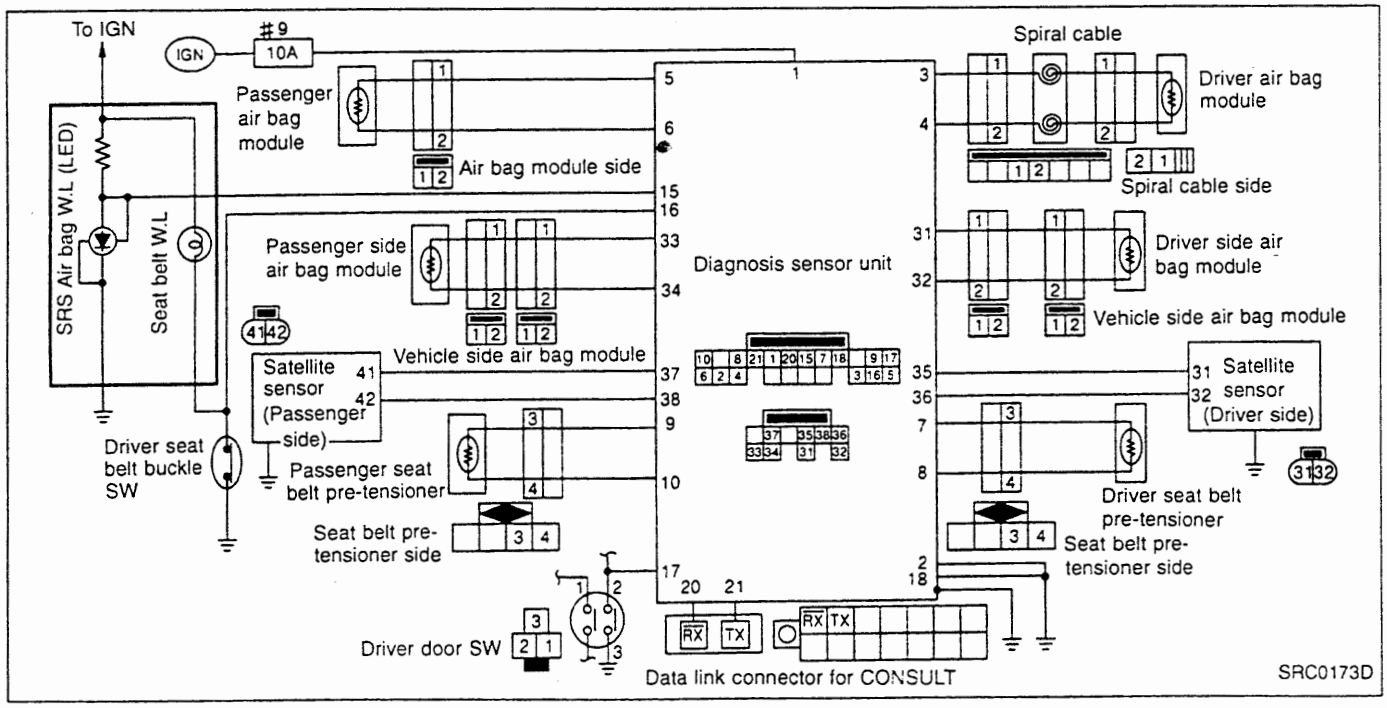
Component Parts Location

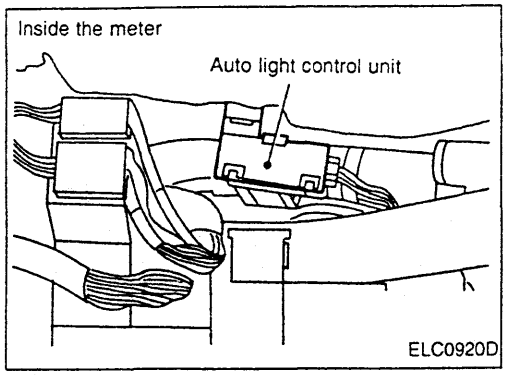


Precautions

- To perform system diagnosis, use self-diagnosis function and CONSULT.
- Do not use electrical test equipment such as a circuit tester because any wrong operation caused by a weak electric current of a tester must be prevented.

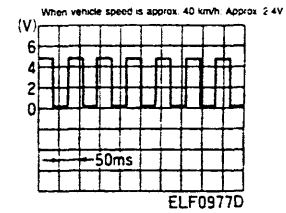
Circuit Diagram



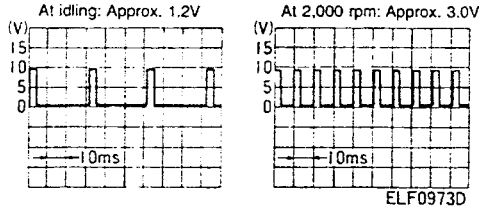
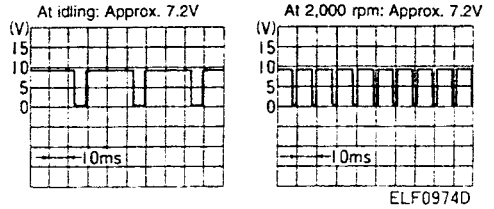
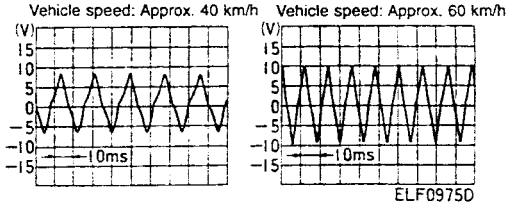
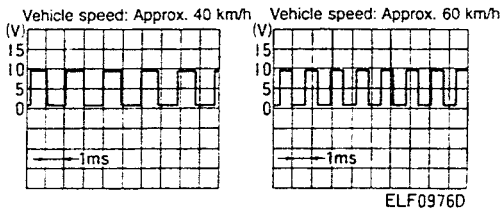
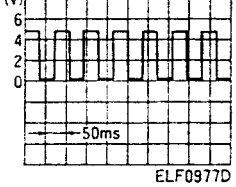


Component Parts Location

Auto Light Control Unit Input/Output Signal Specifications

Terminal No.	Signal name	Measuring condition			Specification
		Ignition switch	Operation or condition		
2	Tail lamp relay control signal	ON	Lighting switch: AUTO	Light is applied to the light sensor.	Approx. 12V
				Light is not applied to the light sensor.	Approx. 0V
3	Vehicle speed signal (2 pulses)	ON	Speedometer is in operation. (Vehicle speed is approximately 40 km/h.)		
4	Navigation screen dimming signal	ON	Lighting switch: 1ST	Light is applied to the light sensor.	Approx. 0V
				Light is not applied to the light sensor.	Approx. 12V
5	Ignition power supply	ON	—		Approx. 12V
6	Headlamp relay control signal	ON	Lighting switch: AUTO	Light is applied to the light sensor.	Approx. 12V
				Light is not applied to the light sensor.	Approx. 0V
7	Lighting switch AUTO signal	ACC	Lighting switch	OFF	Approx. 12V
				AUTO	Approx. 0V
8	Ground	ON	—		Approx. 0V
9	Driver door switch signal	ACC	Driver door switch	ON (Open)	Approx. 0V
				OFF (Closed)	Approx. 12V
10	ACC power supply	ACC	—		Approx. 12V

Combination Meter Input/Output Signal Specifications

Terminal No. +	Terminal No. −	Signal name	Measuring condition: Ignition switch	Measuring condition: Operation or condition	Specification
6	Body ground	Tachometer drive signal	ON	Disconnect ECM connector.	Approx. 8 - 10V
				Engine is idling or running at 2,000 rpm.	RB20DE, RB25DE At idling: Approx. 1.2V At 2,000 rpm: Approx. 3.0V  ELF0973D
					RB25DET At idling: Approx. 7.2V At 2,000 rpm: Approx. 7.2V  ELF0974D
7		Fuel gauge signal	—	—	Refer to "Component Parts Inspection" (EL-27).
9		Battery	OFF	—	Approx. 12V
19		Vehicle speed input signal	ON	Speedometer is in operation. (Vehicle speed is approx. 40 km/h.) (Vehicle speed is approx. 60 km/h.)	With TCS Vehicle speed: Approx. 40 km/h Vehicle speed: Approx. 60 km/h  ELF0975D
					Without TCS Vehicle speed: Approx. 40 km/h Vehicle speed: Approx. 60 km/h  ELF0976D
20		Thermal transmitter signal	—	—	Refer to "Component Parts Inspection" (EL-27).
29		Ignition power supply	ON	—	Approx. 12V
30		Vehicle speed signal (2 pulses)	ON	Speedometer is not in operation.	Approx. 4.8V or 0V
				Speedometer is in operation. (Vehicle speed is approx. 40 km/h.)	Vehicle speed is approx. 40 km/h: Approx. 2.4V  ELF0977D

Voltage of the upper part of the wave form indicates the value checked with analogue circuit tester.

BACKLASH

Items	Standard mm
Main drive gear	0.05 - 0.10
1st gear	0.05 - 0.20
2nd gear	0.05 - 0.20
3rd gear	0.05 - 0.20
4th gear	—
5th gear	0.05 - 0.20
Reverse idler gear	0.05 - 0.20

END PLAY

Items	Standard mm
1st gear	0.31 - 0.41
2nd gear	0.11 - 0.21
3rd gear	0.11 - 0.21
4th gear	—
5th gear	0.24 - 0.41
Reverse idler gear	0.05 - 0.50
Counter gear	0 - 0.16
Main drive gear end play	0 - 0.13
Mainshaft high-synchro side	0 - 0.18
Rear end of mainshaft end bearing	0 - 0.14

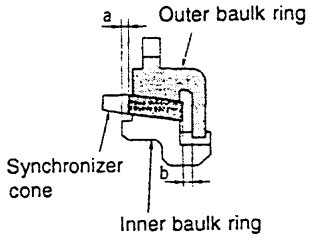
SNAP RING

Selective parts		Thickness mm	Parts number
Main drive gear		1.87 1.94 2.01	32204 78001 32204 78002 32204 78003
Counter drive gear		1.4 1.5 1.6	32215 E9000 32215 E9001 32215 E9002
Mainshaft	High-synchro side	2.4 2.5	32263 V5200 32263 V5201
	Rear end of shaft	1.1 1.2 1.3 1.4	32228 20100 32228 20101 32228 20102 32228 20103

ADJUSTING SHIMS

Selective parts	Measurement height mm	Thickness mm	Parts number
Counter shaft front bearing	4.52 - 4.71	—	—
	4.42 - 4.51	0.1	32218 V5000
	4.32 - 4.41	0.2	32218 V5001
	4.22 - 4.31	0.3	32218 V5002
	4.12 - 4.21	0.4	32218 V5003
	4.02 - 4.11	0.5	32218 V5004
	3.92 - 4.01	0.6	32218 V5005

BAULK RING CLEARANCE

Measurement position	Standard mm	Wear limit mm
1st	1.20 - 1.60	Less than 0.8
2nd and 3rd		
Inner baulk ring clearance "a"	0.70 - 0.90	Less than 0.2
Outer baulk ring clearance "b"	0.60 - 1.10	Less than 0.2
 MTA0004D		
4th and 5th	1.20 - 1.60	Less than 0.8
Reverse gear	1.10 - 1.55	Less than 0.7

TIGHTENING TORQUE

Unit: N·m (kg-m)

Transmission to engine mounting bolt	T/M side to engine side	40 - 49 (4.0 - 5.0)
	Engine side to T/M side	30 - 39 (3.0 - 4.0)