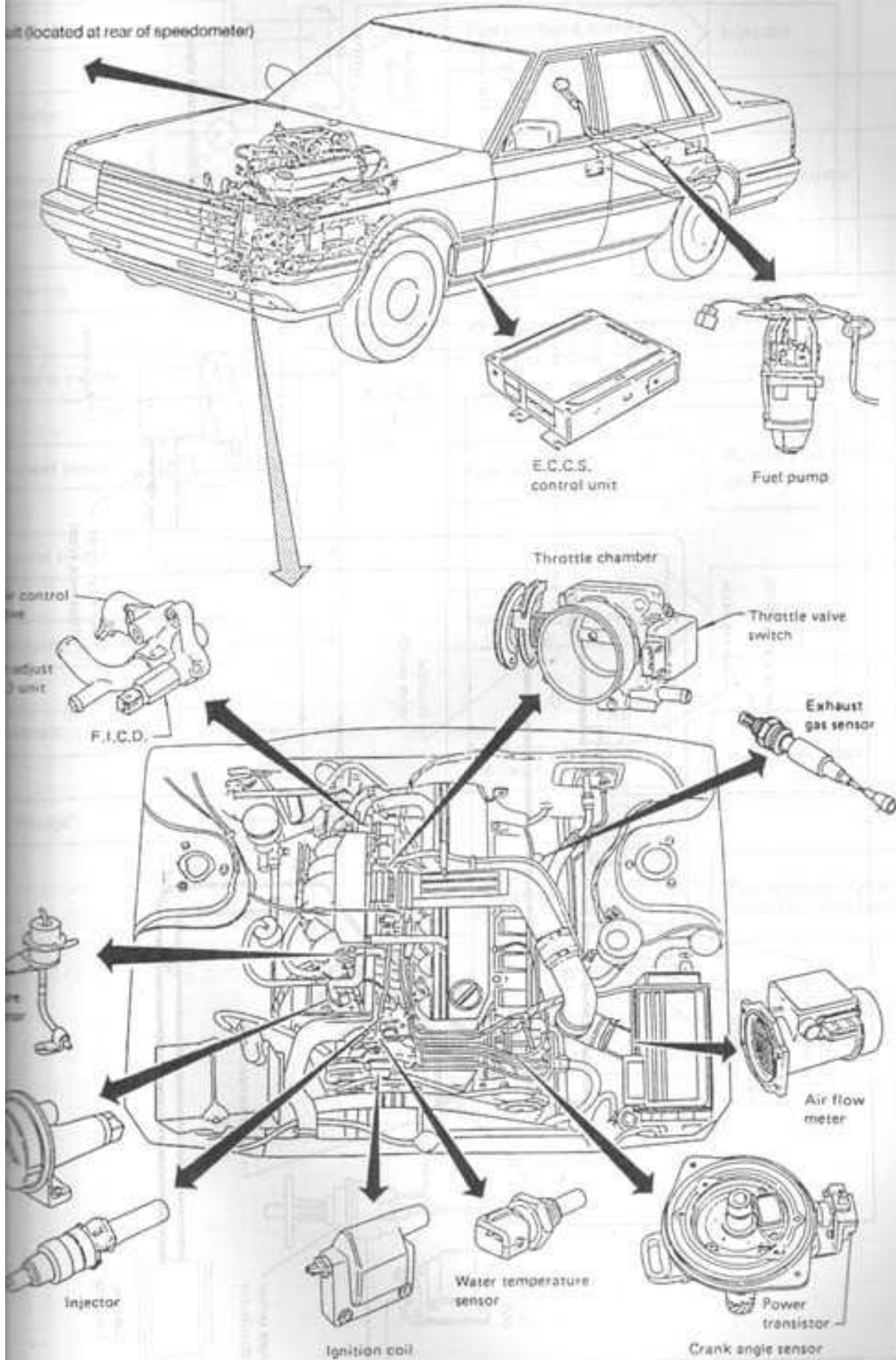


# **R31 SKYLINE SERVICE MANUAL**

# COMPONENT PARTS LOCATION

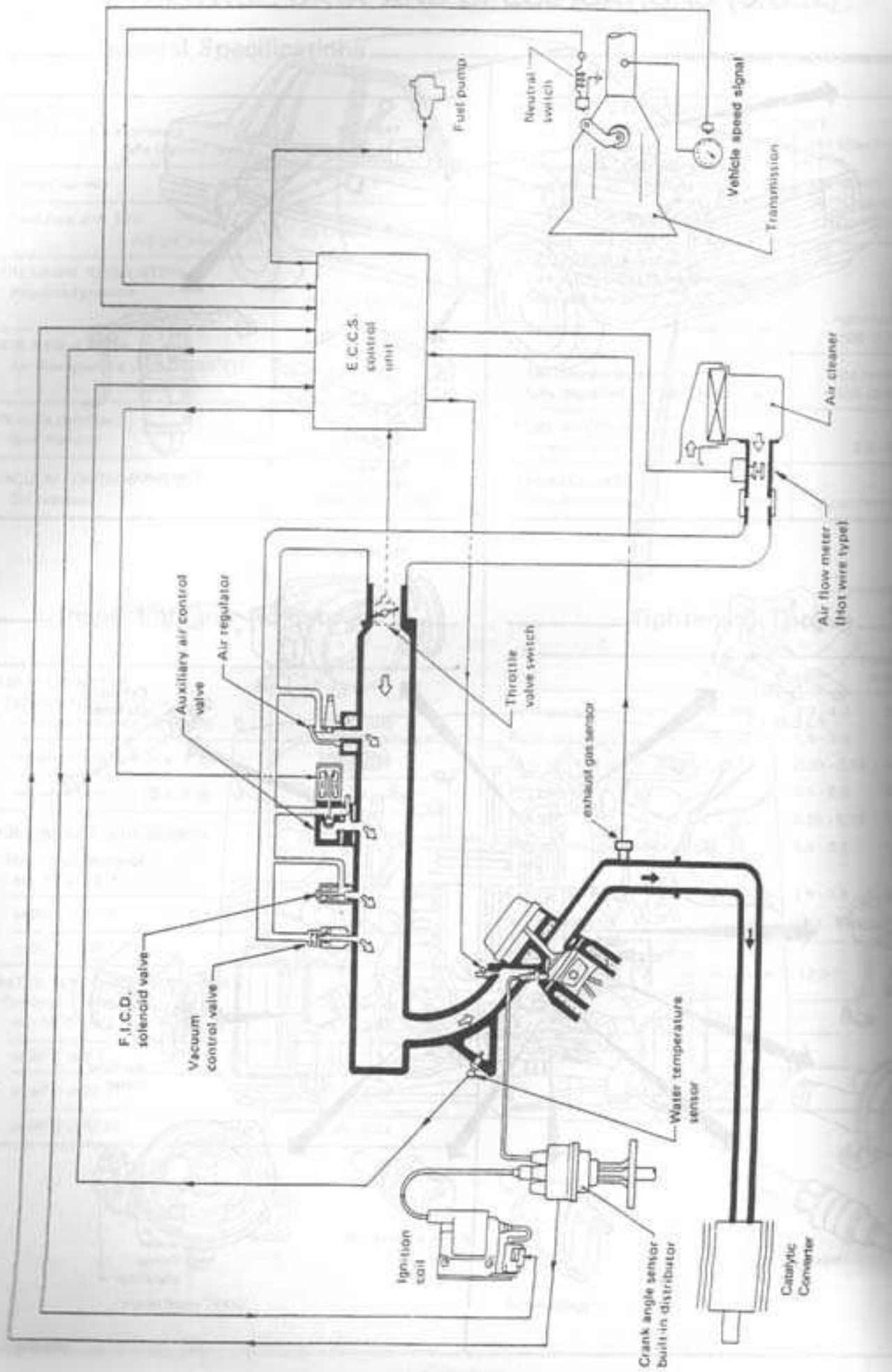
RB30E

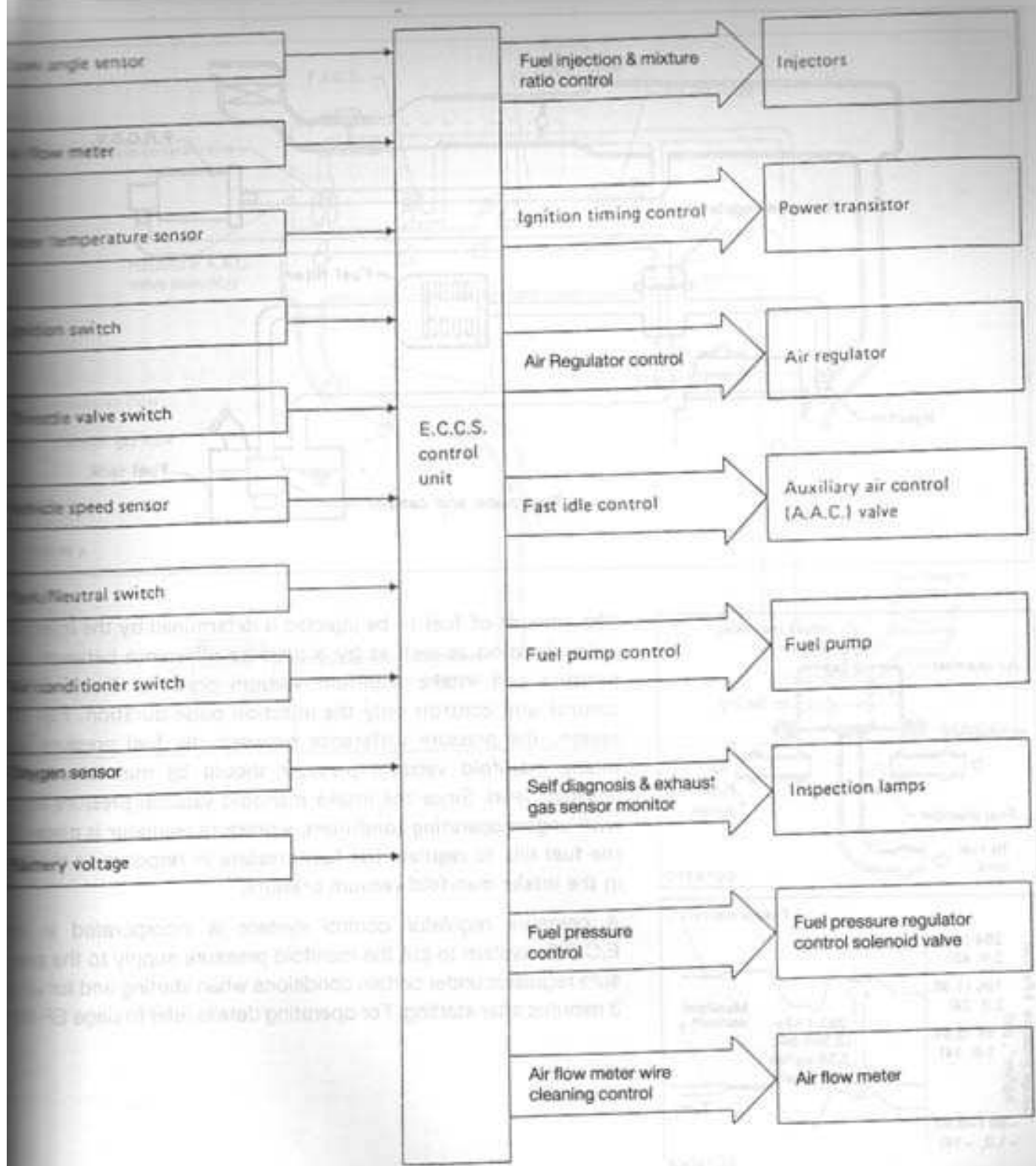
Oil (located at rear of speedometer)

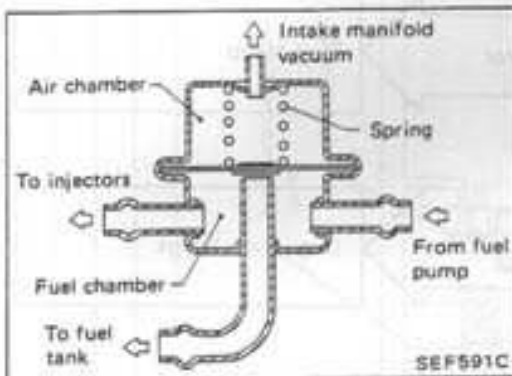
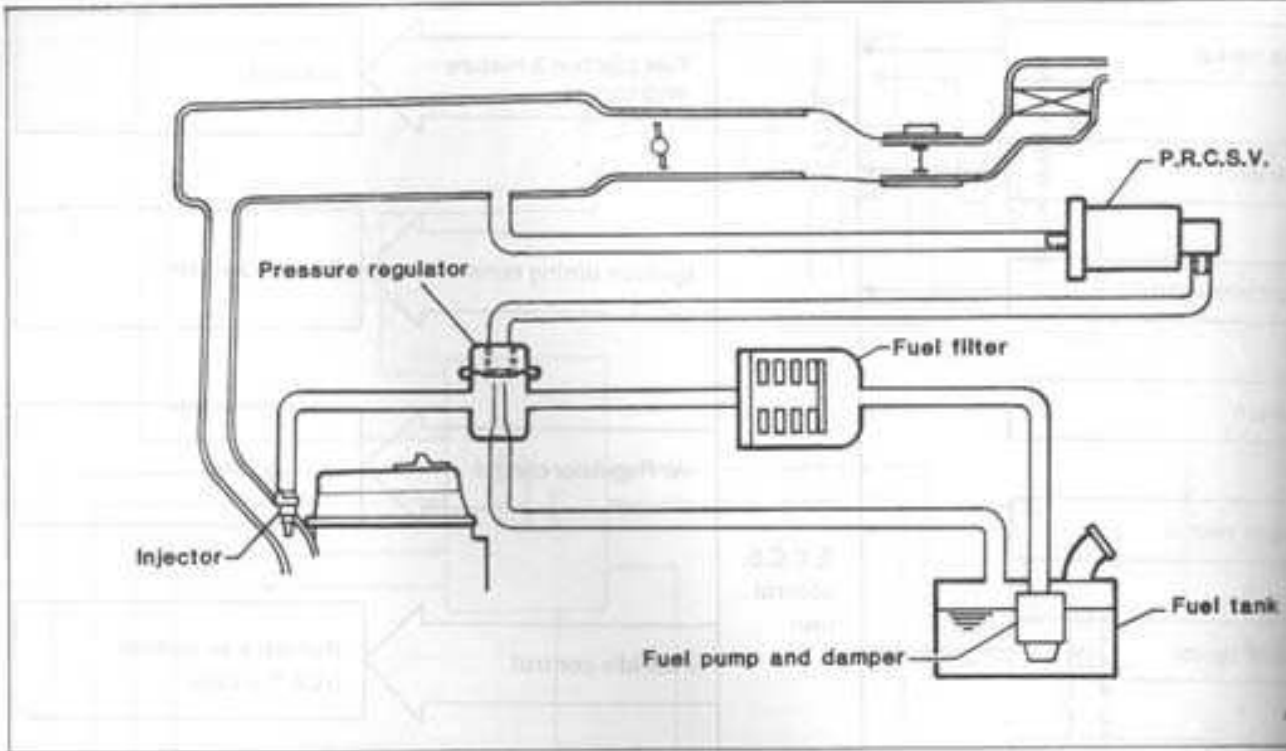


SEF602D

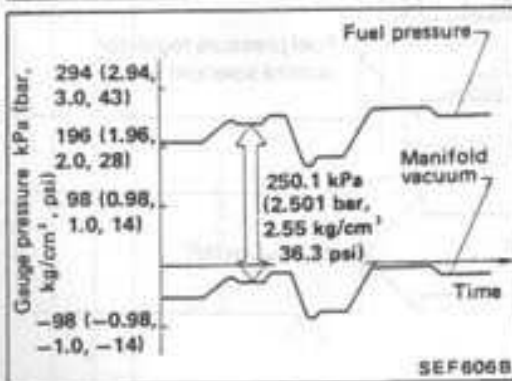
# E.C.C.S. DIAGRAM







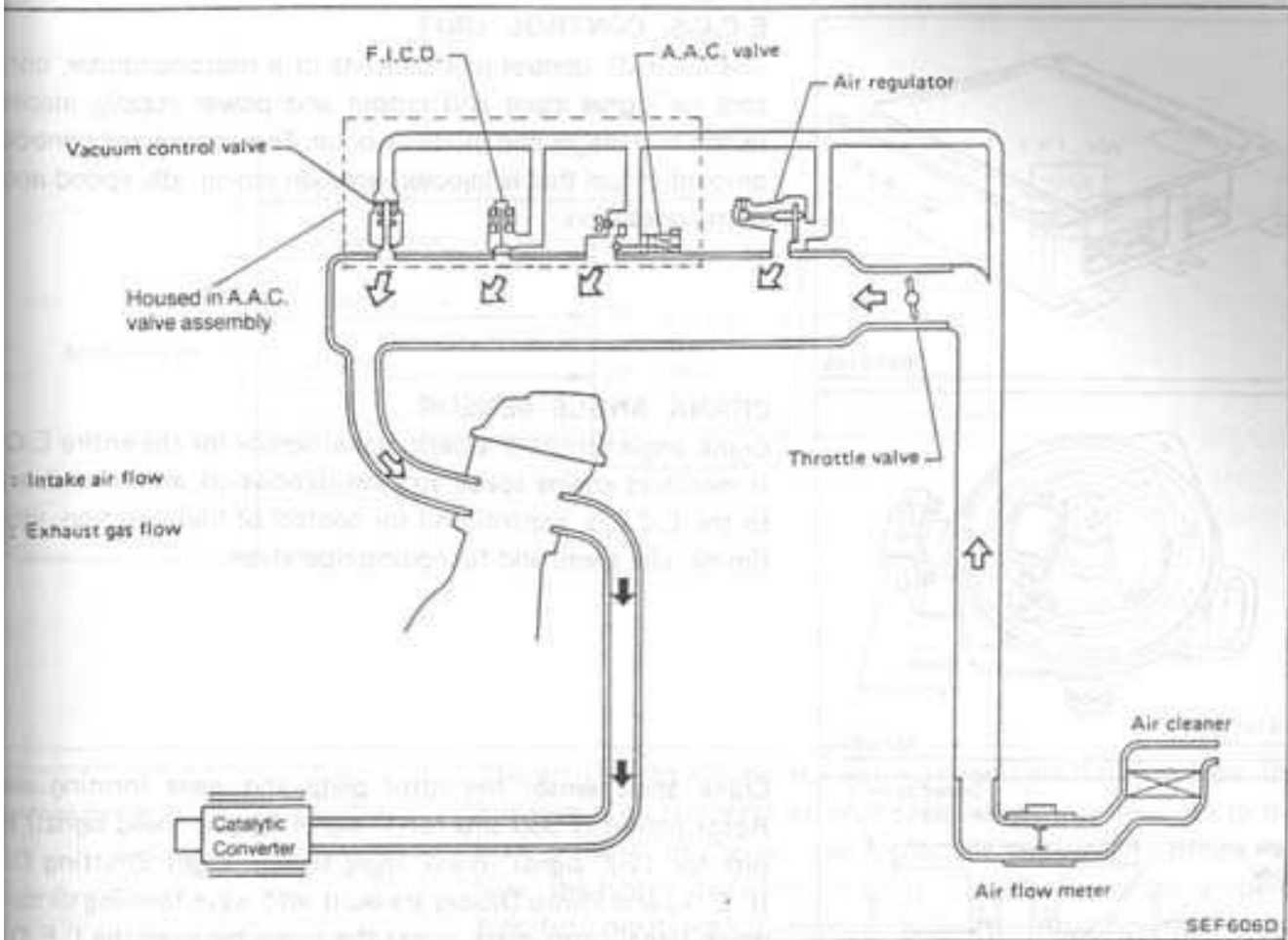
The amount of fuel to be injected is determined by the injection pulse duration as well as by a pressure difference between the fuel pressure and intake manifold vacuum pressure. The E.C.C.S. control unit controls only the injection pulse duration. For this reason, the pressure difference between the fuel pressure and intake manifold vacuum pressure should be maintained at a constant level. Since the intake manifold vacuum pressure varies with engine operating conditions, a pressure regulator is placed in the fuel line to regulate the fuel pressure in response to changes in the intake manifold vacuum pressure.

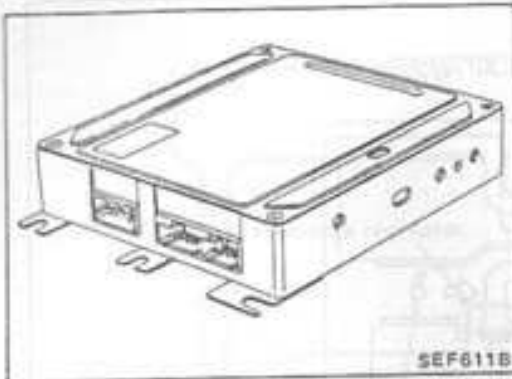


A pressure regulator control system is incorporated into the E.C.C.S. system to cut the manifold pressure supply to the pressure regulator under certain conditions when starting and for 3 minutes after starting. For operating details refer to page EF-54.

# AIR FLOW SYSTEM DESCRIPTION

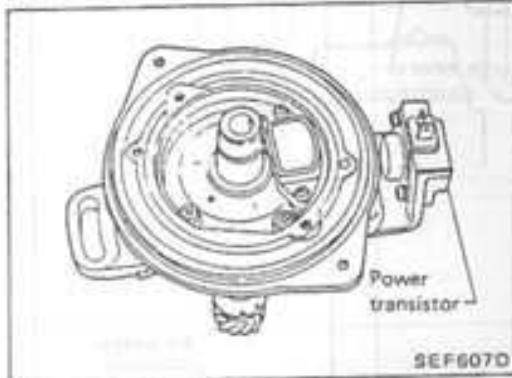
RB30E





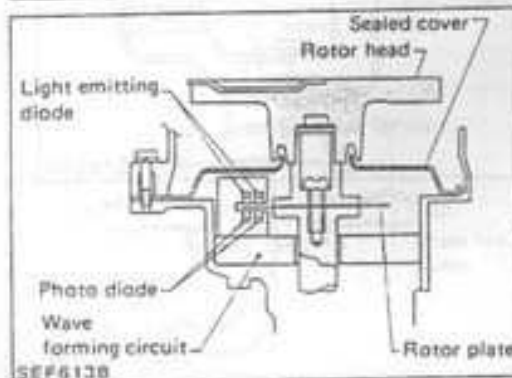
**E.C.C.S. CONTROL UNIT**

The E.C.C.S. control unit consists of a microcomputer, connectors for signal input and output and power supply, inspection lamps and diagnostic mode selector. The control unit controls the amount of fuel that is injected, ignition timing, idle speed and fuel pump operation.

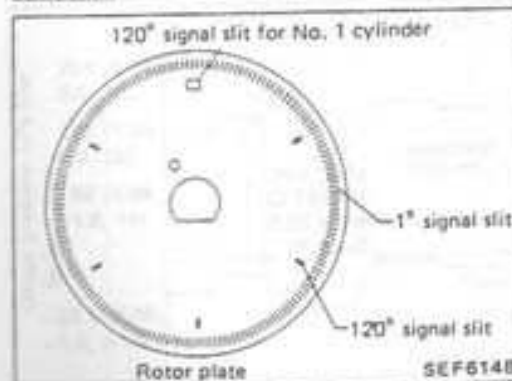


**CRANK ANGLE SENSOR**

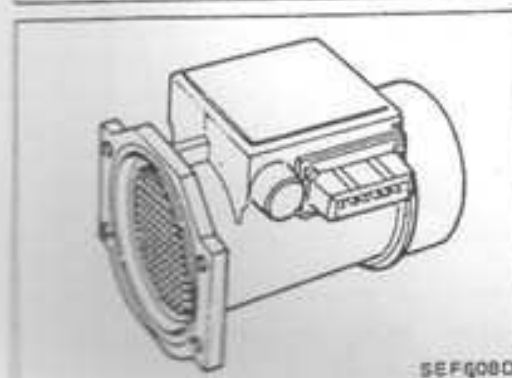
Crank angle sensor is a basic signal sensor for the entire E.C.C.S. It monitors engine speed and piston position, and it sends signals to the E.C.C.S. control unit for control of fuel injection, ignition timing, idle speed and fuel pump operation.



Crank angle sensor has rotor plate and wave forming circuit. Rotor plate has 360 slits for 1° signal (engine speed signal) and slits for 120° signal (crank angle signal). Light Emitting Diode (L.E.D.) and Photo Diodes are built into wave forming circuit. When signal rotor plate passes the space between the L.E.D. and Photo Diode, the slit of the signal rotor plate alternately cuts off light which is sent to the photo diode from the L.E.D. This causes an alternative voltage and it is then converted into an on-off pulse by the wave forming circuit, which is sent to the control unit.

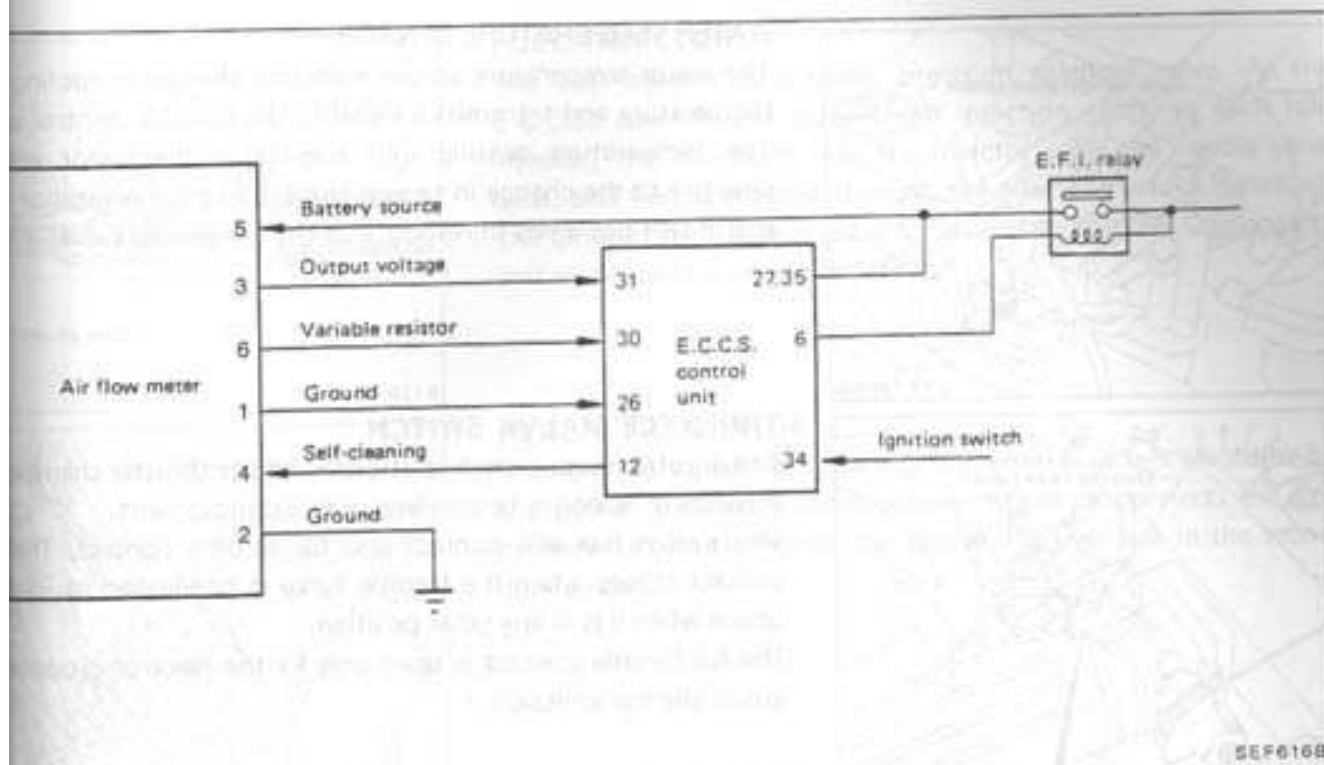


A primary frequency control signal is produced by the L.E.D. and Photo Diode. The signal is sent to the wave forming circuit which produces an on-off pulse. For operation, see the manual page 10.

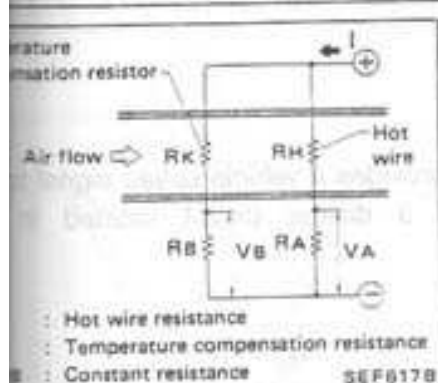


**AIR FLOW METER**

The air flow meter measures the mass flowrate of intake air. Measurements are made in such a manner that the control circuit emits an electrical output signal in relation to the amount of heat dissipated from the hot wire placed in the stream of intake air.



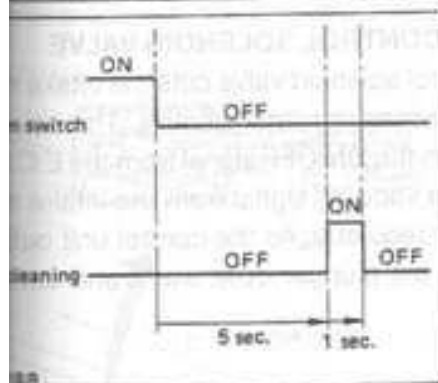
SEF616B



The air flowing around the hot wire removes the heat from the hot wire. The temperature of the hot wire is very sensitive to the mass flowrate of the air. The higher the temperature of the hot wire, the higher its resistance value. This change in the temperature (or: resistance) is determined by the mass flowrate of the air. The control circuit accurately regulates current (I) in relation to the varying resistance value ( $R_H$ ) so that  $V_A$  always equals  $V_B$ . The air flow meter transmits an output for voltage  $V_A$  to the control unit where the output is converted into an intake air signal.

**Self-cleaning**

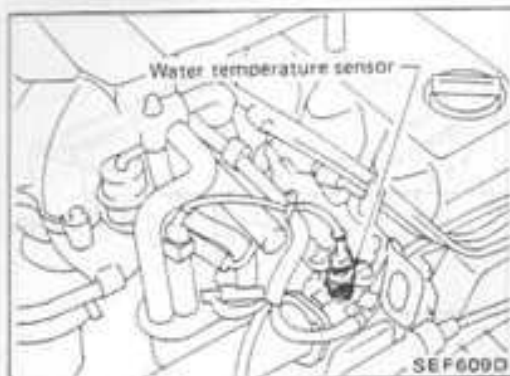
After engine is stopped, the E.C.C.S. control unit heats up the hot wire to approximately 1,000°C (1,832°F) to burn out dust which adhered to the hot wire.



**Self-cleaning operation**

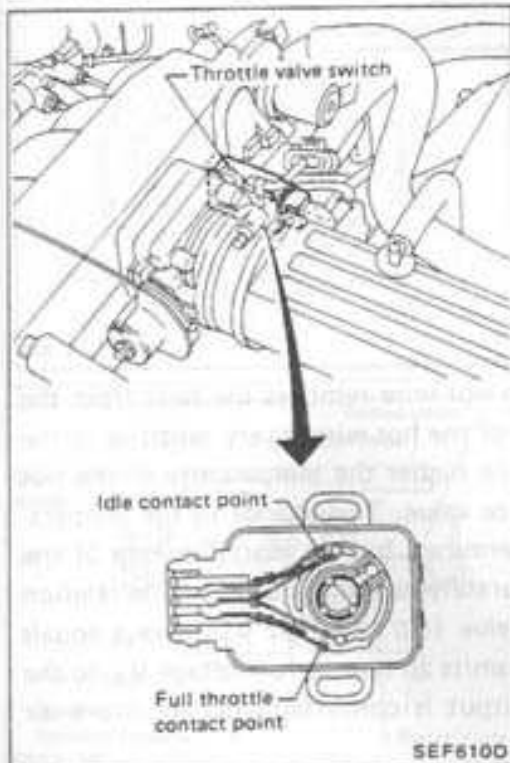
Condition	Operation
After running engine at above 1,500 rpm	Operates
After driving vehicle at above 20 km/h	
Water temperature is less than 115°C (239°F)	Does not operate
Except above	





#### WATER TEMPERATURE SENSOR

The water temperature sensor monitors changes in cooling water temperature and transmits a signal to the E.C.C.S. control unit. The temperature sensing unit employs a thermistor which is sensitive to the change in temperature. Electrical resistance of the thermistor decreases in response to the temperature rise.



#### THROTTLE VALVE SWITCH

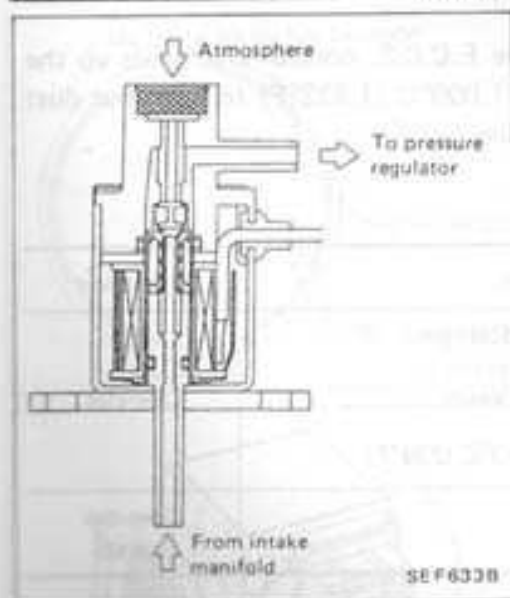
The throttle valve switch is attached to the throttle chamber and actuates in response to accelerator pedal movement.

This switch has idle contact and full throttle contact. The idle contact closes when the throttle valve is positioned at idle and opens when it is at any other position.

The full throttle contact is used only for the electronic controlled automatic transmission.

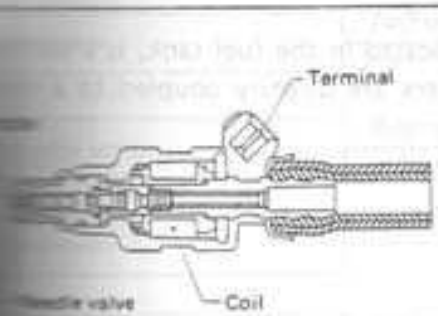
#### VEHICLE SPEED SENSOR

The vehicle speed sensor provides a vehicle speed signal to the E.C.C.S. control unit via a divider circuit located in the speedometer circuit.



#### PRESSURE REGULATOR CONTROL SOLENOID VALVE

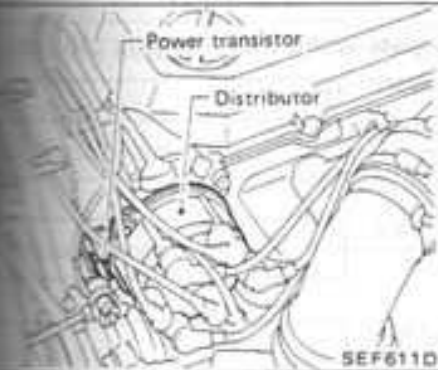
The pressure regulator control solenoid valve cuts the intake manifold vacuum signal for pressure regulator control. The solenoid valve actuates in response to the ON/OFF signal from the E.C.C.S. control unit. When it is off, a vacuum signal from the intake manifold is fed into the pressure regulator. As the control unit outputs an ON signal, the coil pulls the plunger downward, and cuts the vacuum signal.



SEF627B

### FUEL INJECTOR

The fuel injector is a small, precision solenoid valve. As the E.C.C.S. control unit outputs an injection signal to each fuel injector, the coil built into the injector pulls the needle valve back, and fuel is injected through the nozzle to intake manifold. The amount of fuel injected is controlled by the E.C.C.S. control unit as an injection pulse duration.



SEF611D

### POWER TRANSISTOR

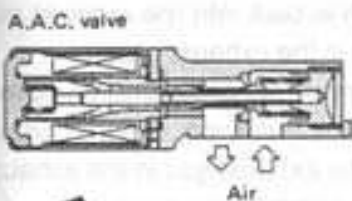
The ignition signal from the E.C.C.S. control unit is amplified by the power transistor, which connects and disconnects the coil primary circuit to induce the proper high voltage in the secondary circuit.



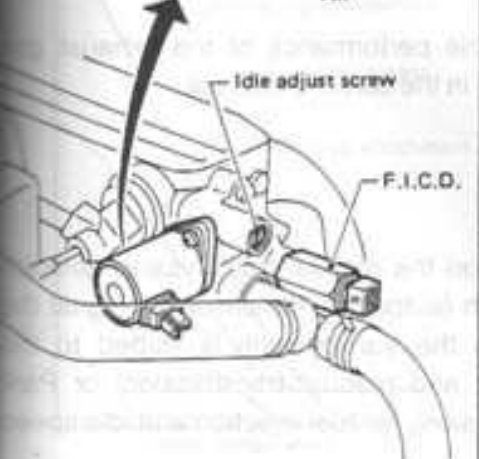
SEF629B

### IGNITION COIL

The ignition coil is a moulded type.



Air



SEF612D

### IDLE AIR ADJUST (I.A.A.) UNIT

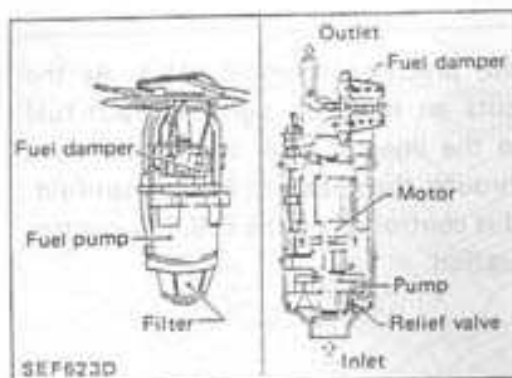
#### Auxiliary air control (A.A.C.) valve

The A.A.C. valve is attached to the intake collector. The E.C.C.S. control unit actuates A.A.C. valve by a variable ON/OFF pulse of approximately 160 Hz. The longer the ON pulse the larger the amount of air flow through the A.A.C. valve.

#### F.I.C.D.

The F.I.C.D. is attached to the intake collector.

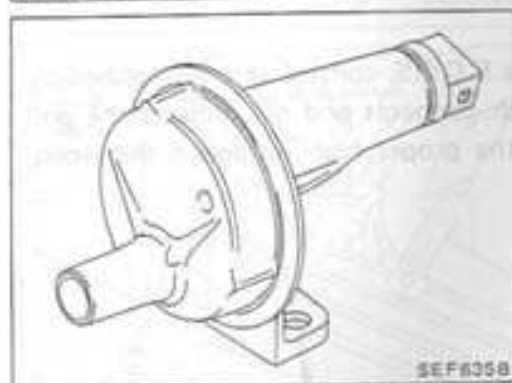
The solenoid valve opens an auxiliary air passage when air conditioner switch is turned "ON", to raise the idle speed.



SEF623D

**FUEL PUMP**

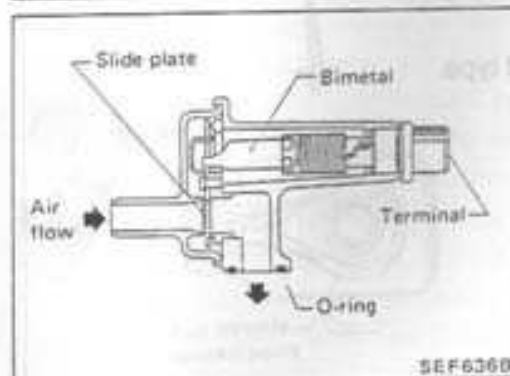
The fuel pump, which is located in the fuel tank, is a wet type pump where the vane rollers are directly coupled to a motor which is filled with fuel.



SEF635B

**AIR REGULATOR**

Air regulator gives an air by-pass when the engine is cold for the purpose of a fast idle during warm-up.



SEF636B

A bimetal, heater and rotary shutter are built into the air regulator. When the bimetal temperature is low, the air by-pass port is open. As the engine starts and electric current flows through a heater, the bimetal begins to rotate the shutter to close off the by-pass port. The air passage remains closed until the engine is stopped and the bimetal temperature drops.



SEF631A

**EXHAUST GAS SENSOR**

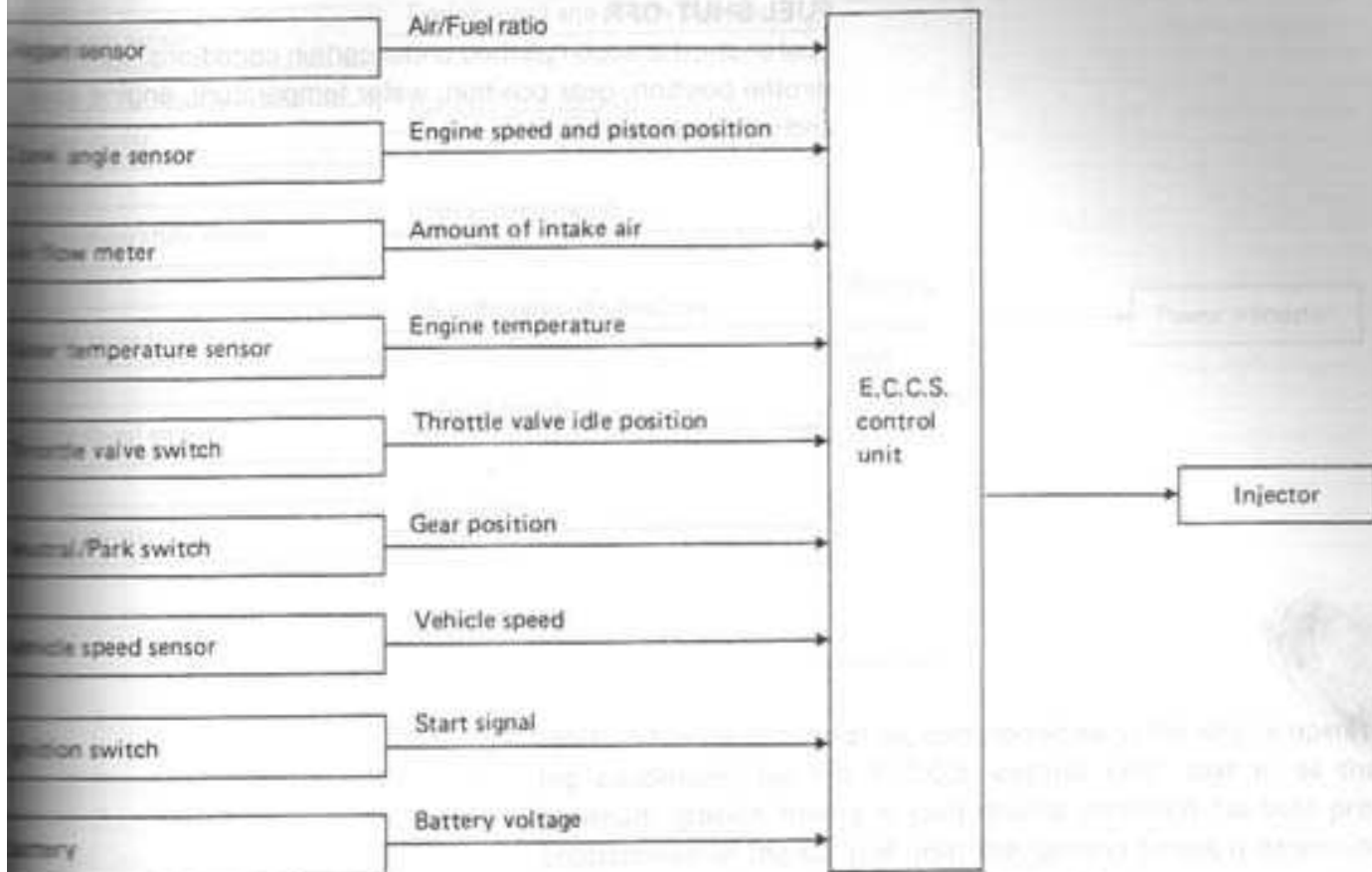
The exhaust gas sensor, which is built into the exhaust manifold, monitors the density of oxygen in the exhaust gases.

It consists of ceramic titania (major sensor), ceramic alumina and other components. The ceramic alumina which contains the ceramic titania is exposed to the exhaust gas in the exhaust manifold.

In order to ensure the stable performance of the exhaust gas sensor, a heater is employed in the ceramic alumina.

**NEUTRAL/PARK SWITCH**

A neutral switch (mounted on the manual transmission selector housing) and inhibitor switch (automatic transmission) signal the E.C.C.S. control unit when the transmission is shifted to the Neutral position (automatic and manual transmission) or Park position (automatic transmission), for fuel injection and idle speed control.



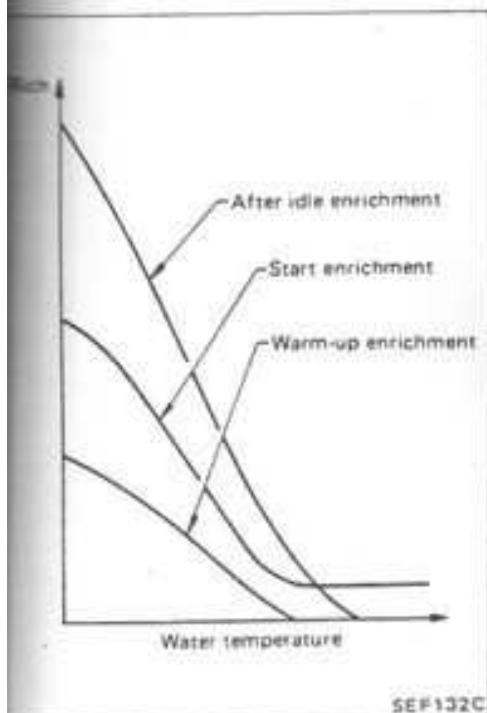
The E.C.C.S. control unit calculates basic injection pulse width by processing signals from crank angle sensor and air flow meter. Receiving signals from each sensor which detects various engine conditions, E.C.C.S. control unit adds various enrichments, which are pre-programmed in the control unit, to the basic injection amount. Thus, the optimum amount of fuel is injected through the injectors.

### FUEL ENRICHMENT

In each of the following conditions, fuel is enriched.

- During warm-up
- When starting
- After idle
- When accelerating
- With heavy load
- When water temperature is high.

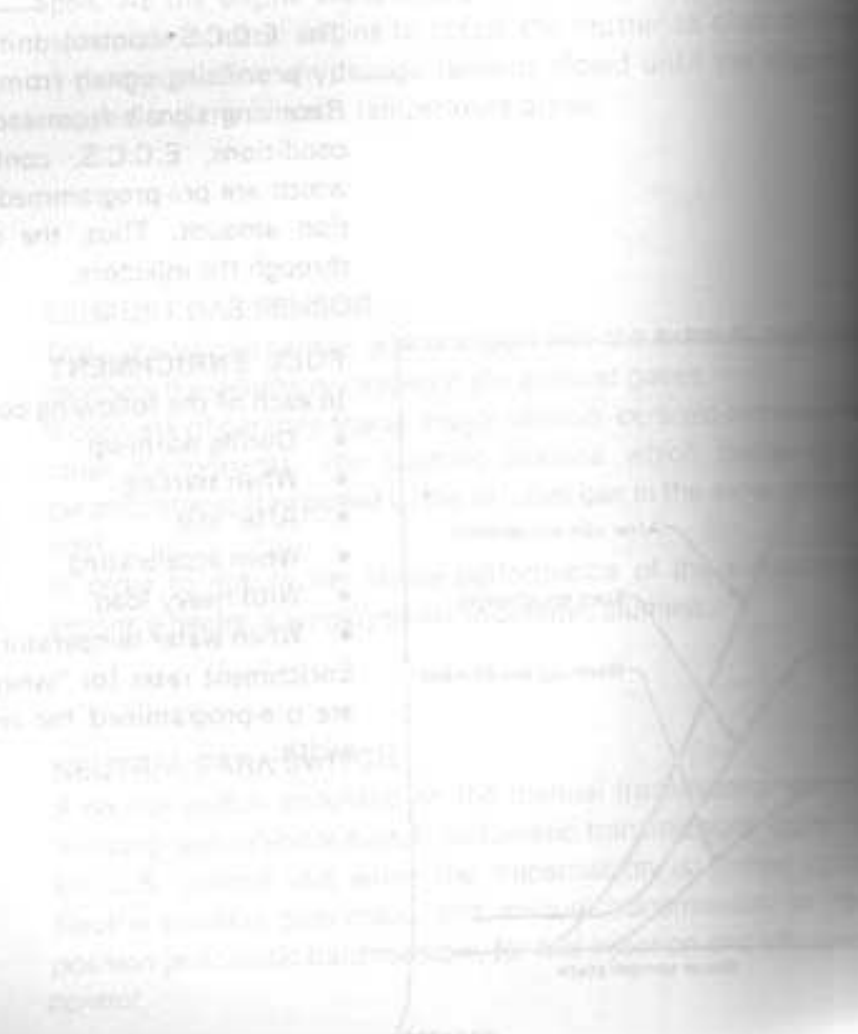
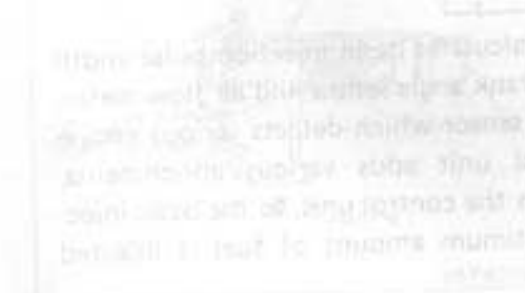
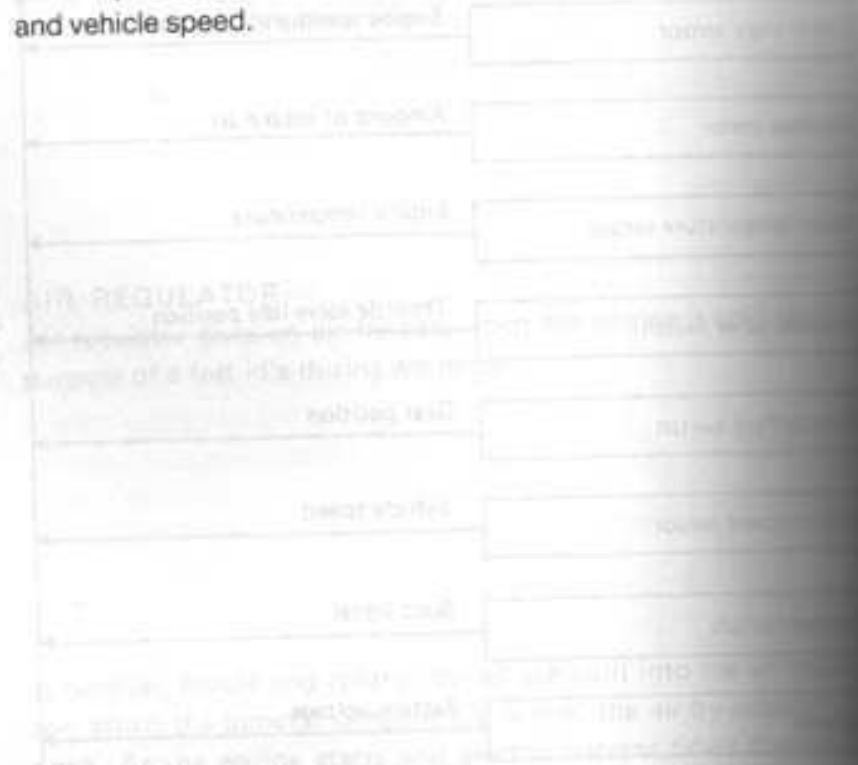
Enrichment rates for "when accelerating" and "with heavy load" are pre-programmed for engine speed and basic injection pulse width.

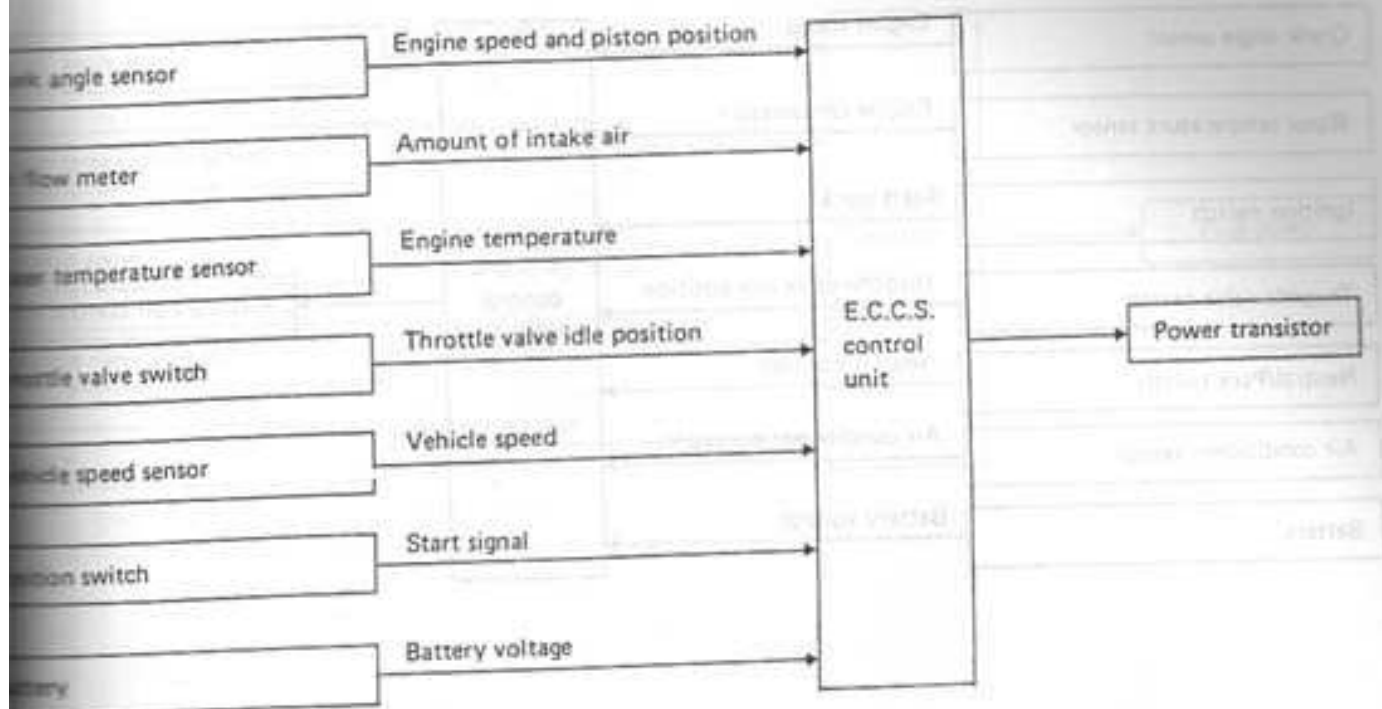


SEP132C

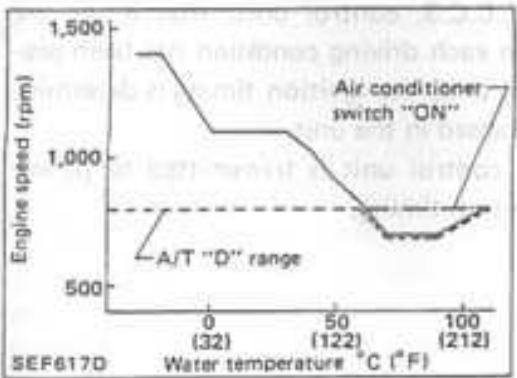
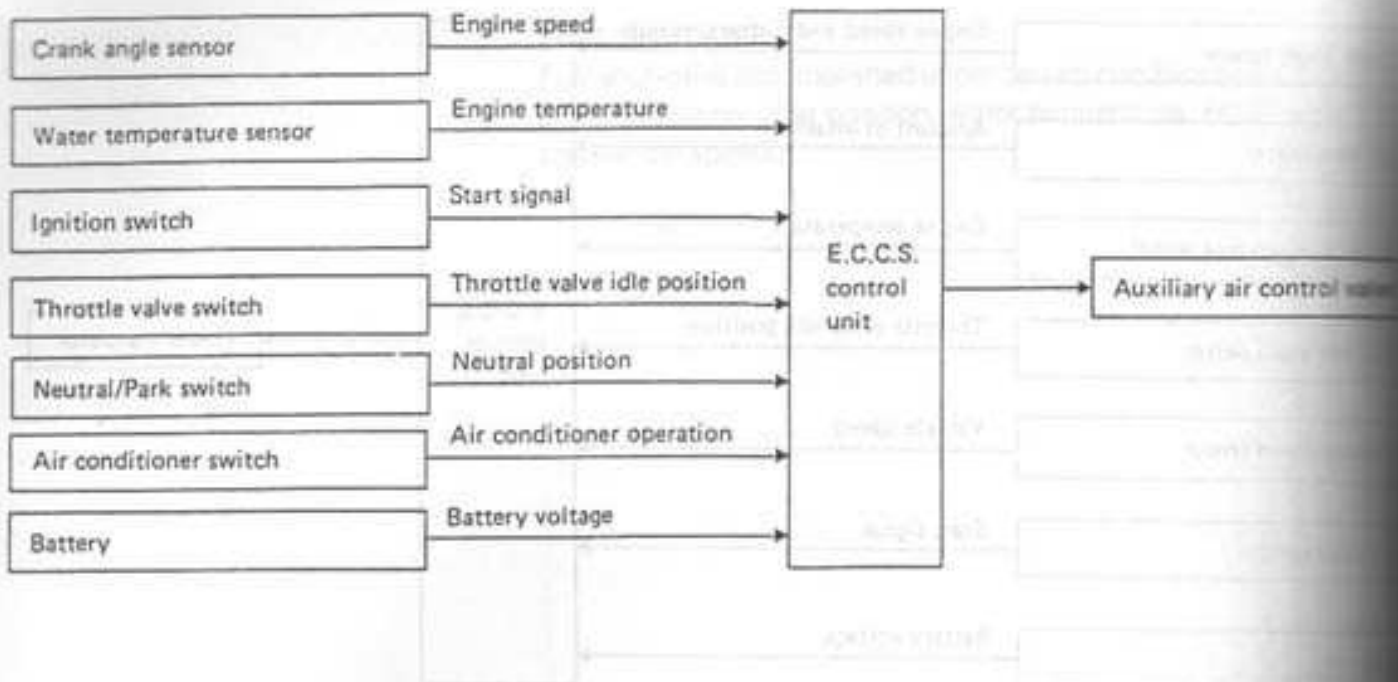
## FUEL SHUT-OFF

Fuel shut-off is accomplished under certain conditions: deflected throttle position, gear position, water temperature, engine speed and vehicle speed.

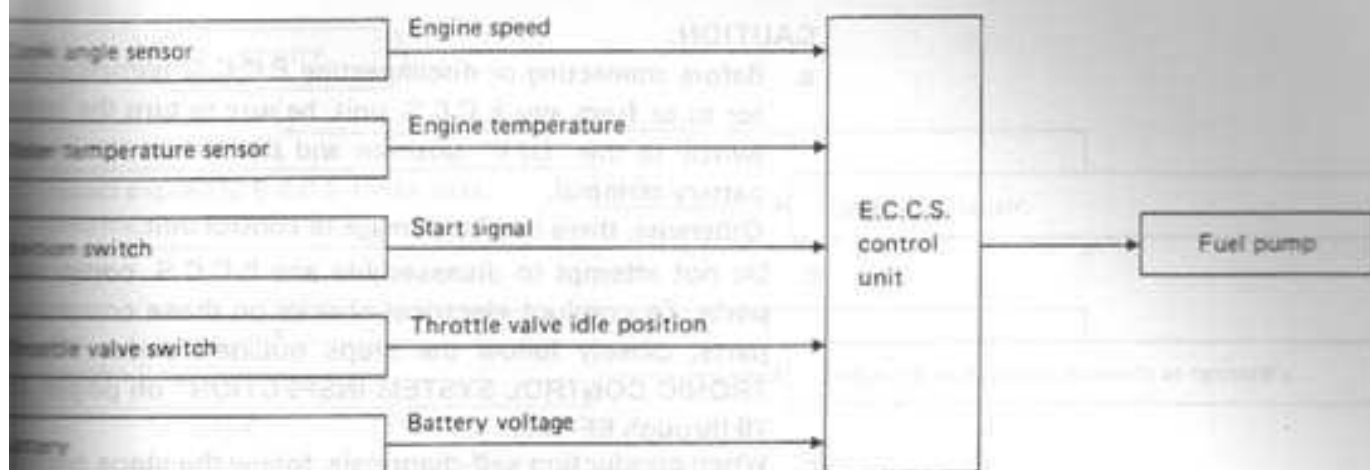




Ignition timing is controlled, corresponding to the engine operating conditions, by the E.C.C.S. control unit: that is, as the optimum ignition timing in each driving condition has been programmed in the control unit, the ignition timing is determined by electrical signals processed in the unit. The signal from E.C.C.S. control unit is transmitted to power transistor, and controls ignition timing.



The idle speed is controlled by the E.C.C.S. control unit, corresponding to the engine operating conditions. The E.C.C.S. control unit senses the engine condition and determines the best idle speed at each water temperature and gear position. The control unit then sends an electronic signal, corresponding to the difference between the best idle speed and the actual idle speed, to the A.A.C. valve.



The fuel pump is controlled by the E.C.C.S. control unit adjusting the output voltage supplied to the fuel pump.

#### Fuel pump ON-OFF control

Fuel pump operates under the following conditions.

- 5 seconds after ignition switch is turned to ON.
- While engine is running.
- 1 second after stall.

#### Fuel pump voltage control

Conditions	Voltage
5 seconds after ignition switch is turned to ON Engine cranking	Approximately 13.4 [V]
30 seconds after engine start [above 50°C (122°F)]	
Engine temp. above 90°C (194°F)	
Engine temp. below 10°C (50°F)	
Except above	9.4 ~ 13.4 [V]

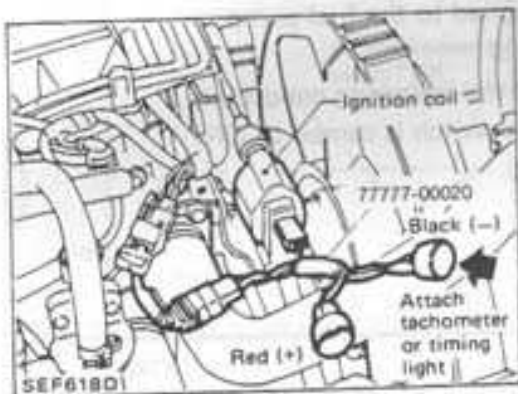


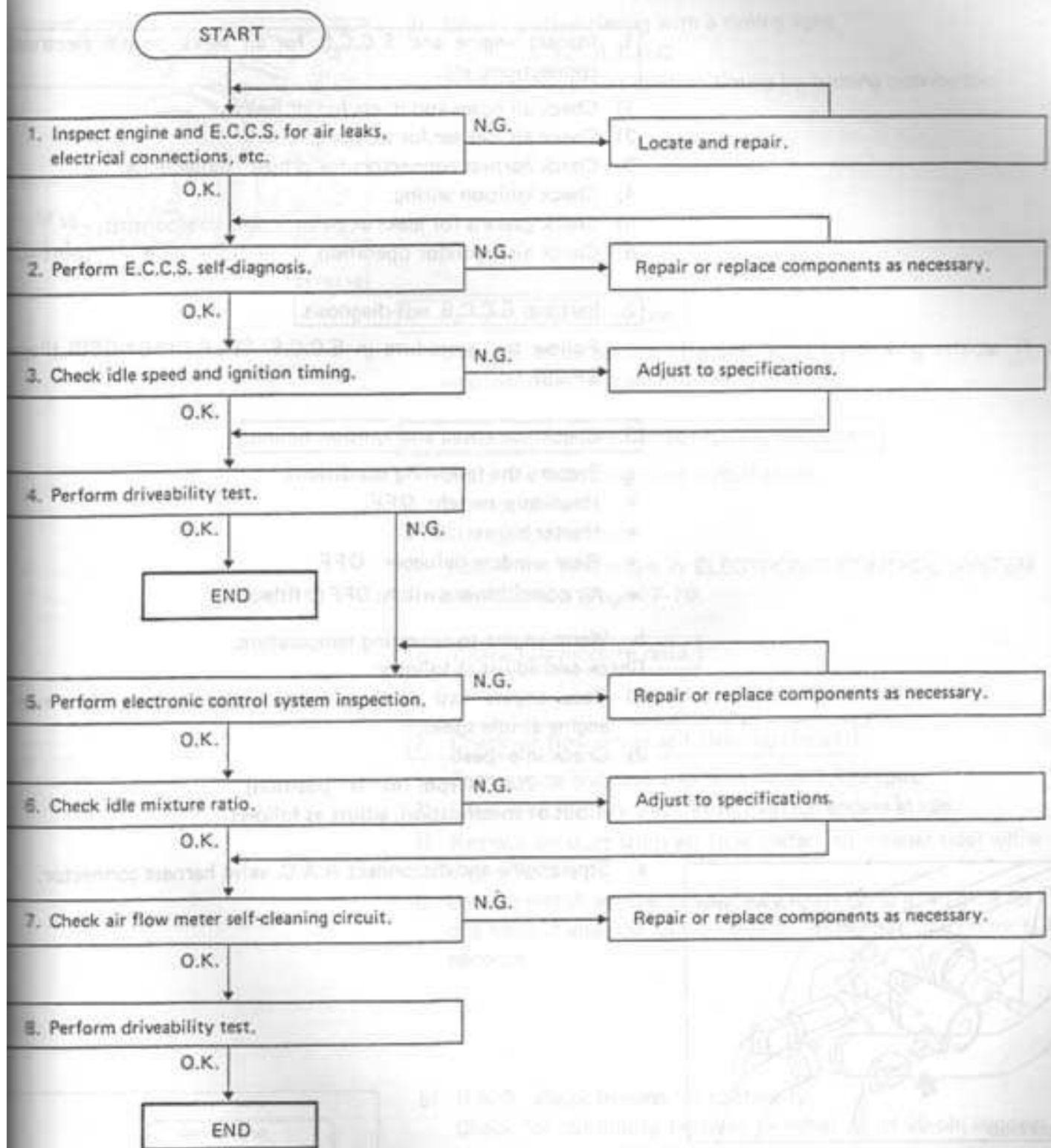
**CAUTION:**

- a. Before connecting or disconnecting E.C.C.S. harness connector to or from any E.C.C.S. unit, be sure to turn the ignition switch to the "OFF" position and disconnect the negative battery terminal. Otherwise, there may be damage to control unit.
- b. Do not attempt to disassemble any E.C.C.S. component parts. To conduct electrical checks on these component parts, closely follow the steps outlined under "ELECTRONIC CONTROL SYSTEM INSPECTION" on pages EF-79 through EF-107.
- c. When conducting self-diagnosis, follow the steps outlined under "SELF-DIAGNOSIS" on pages EF-73 through EF-79 in order to obtain accurate diagnosing results. After self diagnosis has been completed, erase the memory properly.
- d. Always turn the diagnosis mode selector carefully with screwdriver. If it is turned forcibly, it may be damaged resulting in the inability to perform the self-diagnosis.
- e. Before troubleshooting, ensure that all harness connections are secure.

**Preparation**

When measuring idle speed and ignition timing, use above harness between ignition coil and ignition coil harness connector.





1. Inspect engine and E.C.C.S. for air leaks, proper electrical connections, etc.

- 1) Check all hoses and ducts for air leaks.
- 2) Check air cleaner for clogging.
- 3) Check harness connectors for proper connections.
- 4) Check ignition wiring.
- 5) Check gaskets for leaks at all air intake components.
- 6) Check air regulator operation.

2. Perform E.C.C.S. self-diagnosis.

Follow the procedure in E.C.C.S. SELF-DIAGNOSIS (see EF-29).

3. Check idle speed and ignition timing.

a. Prepare the following conditions:

- Headlamp switch: OFF
- Heater blower: OFF
- Rear window defogger: OFF
- Air conditioner switch: OFF (if fitted)

b. Warm engine to operating temperature.

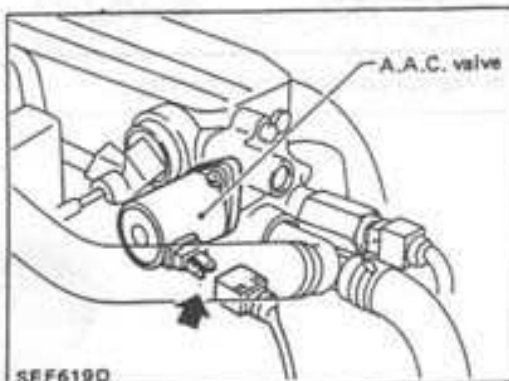
Check and adjust as follows:

- 1) Race engine two or three times under no-load, then let engine at idle speed.
- 2) Check idle speed.

700±50 rpm (in "N" position)

If out of specification, adjust as follows:

a. Stop engine and disconnect A.A.C. valve harness connector.



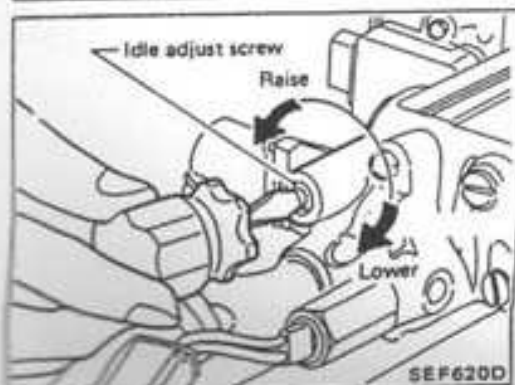
b. Start engine and adjust engine speed by turning idle speed adjusting screw.

650 rpm (in "N" position)

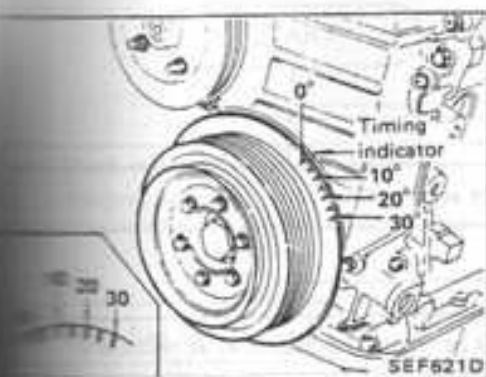
c. Stop engine and connect A.A.C. valve harness connector. Then start engine.

d. Make sure that idle speed is in the specified range.

700±50 rpm



- 3) Check ignition timing with a timing light.  
 $15^{\circ} \pm 2^{\circ}$  B.T.D.C.  
 If necessary, adjust ignition timing by turning distributor.



4. Perform driveability test.

Evaluate effectiveness of adjustments by driving vehicle. If unsatisfactory, proceed to step 5.

5. Perform electronic control system inspection.

Check the following using circuit tester.

- Injector circuits
- Air regulator circuit

Follow the procedure in ELECTRONIC CONTROL SYSTEM INSPECTION (Page EF-79).

6. Check idle mixture ratio.

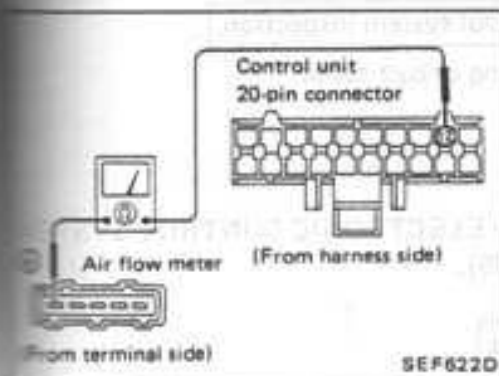
7. Check air flow meter self-cleaning circuit.

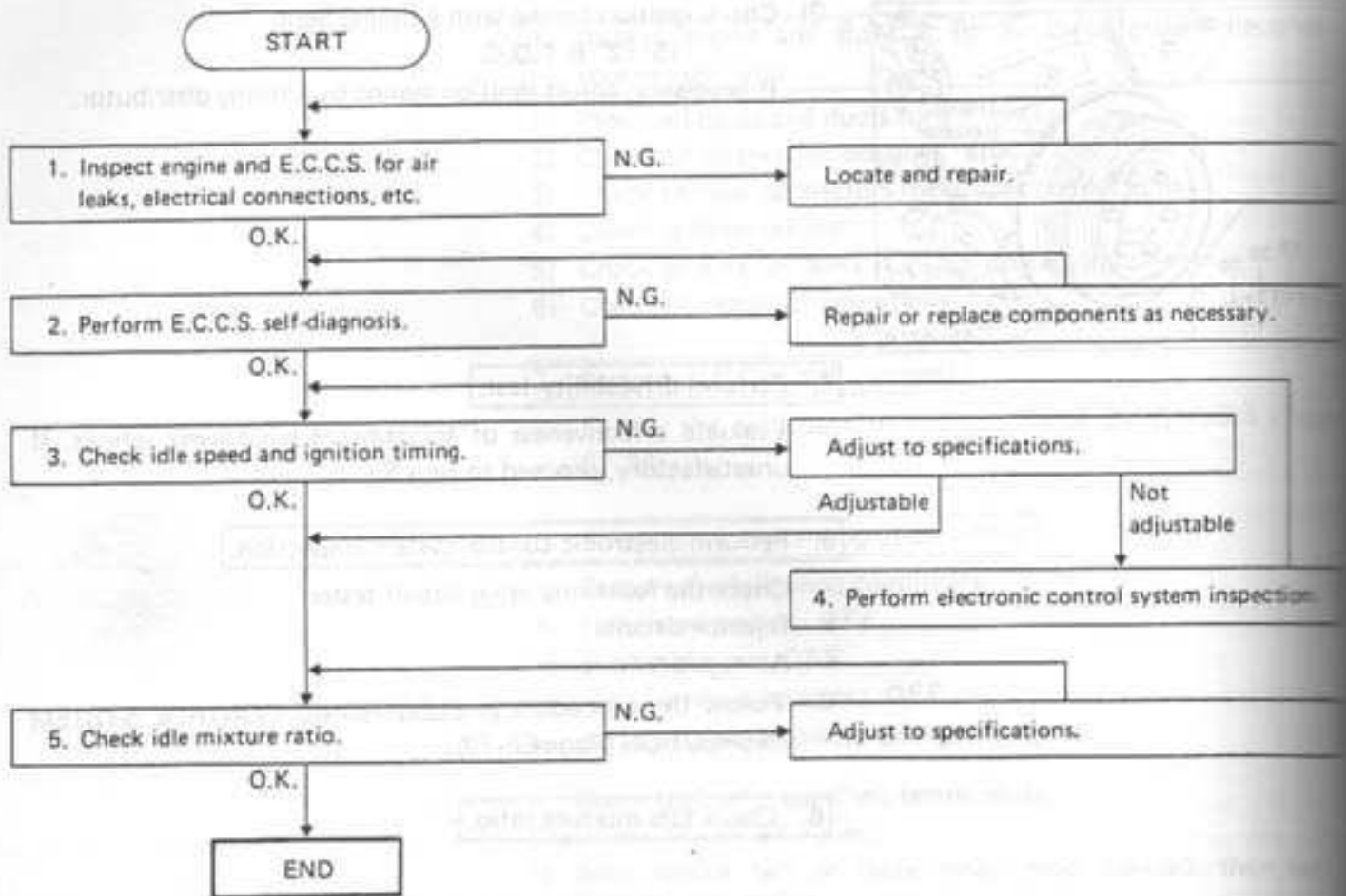
- 1) Start engine and race engine to above 1,500 rpm.
- 2) Drive vehicle at above 20 km/h then run engine at idle.
- 3) Remove air duct from air flow meter (air cleaner side) while engine is idling.
- 4) Using a mirror, ensure that hot wire heats up to a red glow for one second after the ignition switch has been turned off for 5 seconds.

- 5) If N.G., check harness for continuity.  
 Check for continuity between terminal ⑫ of 20-pin connector and terminal ④ of air flow meter harness connector.  
**Continuity should exist.**
- 6) If continuity does not exist, repair or replace harness.  
 If harness is O.K. replace air flow meter.

8. Perform driveability test.

Re-evaluate vehicle performance.





1. Inspect engine and E.C.C.S. for air leaks, electric connections, etc.

Refer to DRIVEABILITY.

2. Perform E.C.C.S. self-diagnosis.

Follow the procedure in E.C.C.S. SELF-DIAGNOSIS (Page EF-73).

3. Check idle speed and ignition timing.

Refer to DRIVEABILITY.

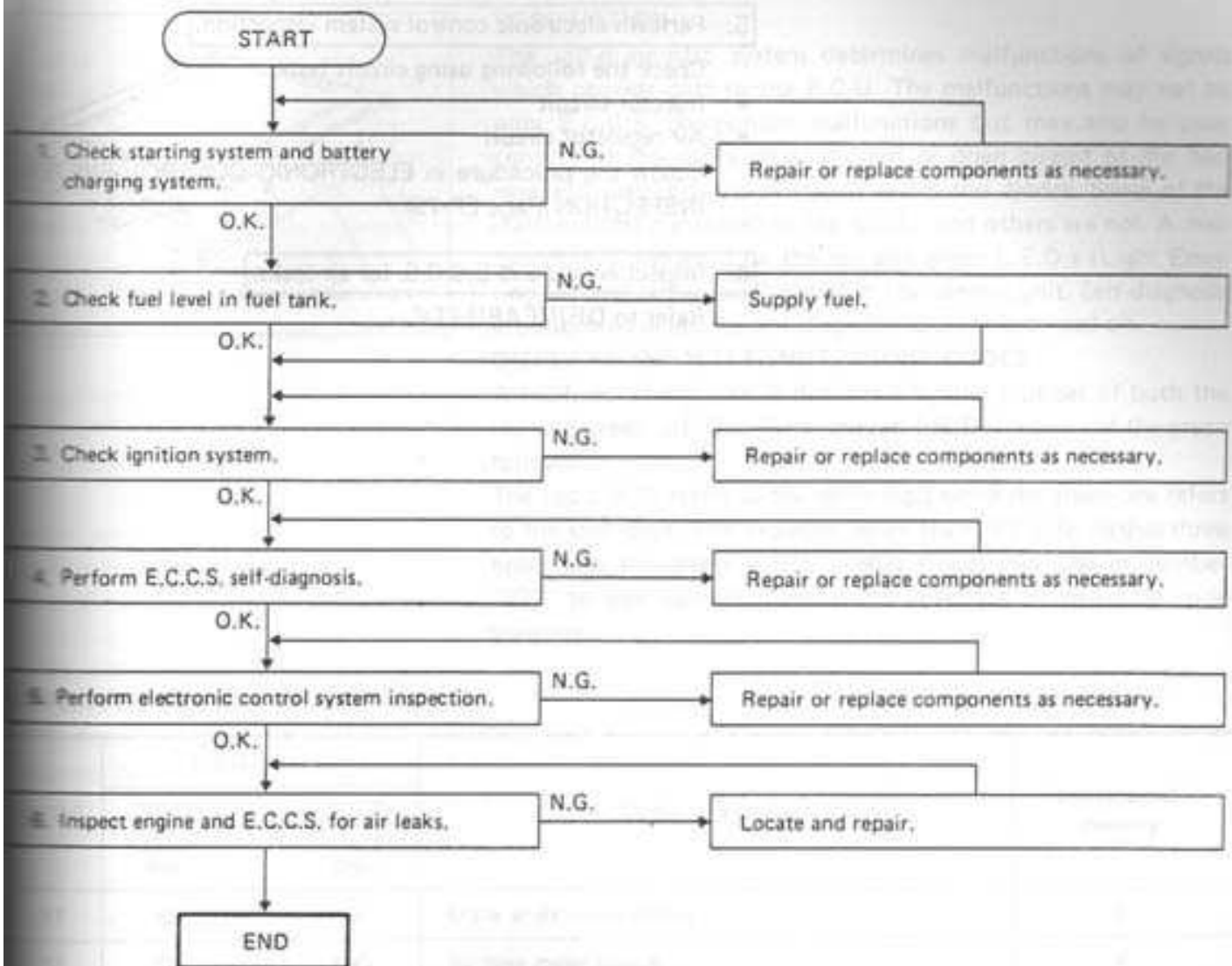
4. Perform electronic control system inspection.

Check the following using circuit tester.

- Injector circuit
- Air regulator circuit
- A.A.C. valve

Follow the procedure in ELECTRONIC CONTROL SYSTEM INJECTION (Page EF-35).

5. Check idle mixture ratio.



**1. Check starting system and battery charging system.**

- 1) Check starter operation.
  - 2) Check battery voltage.
- Repair or replace as necessary.

**2. Check fuel level.**

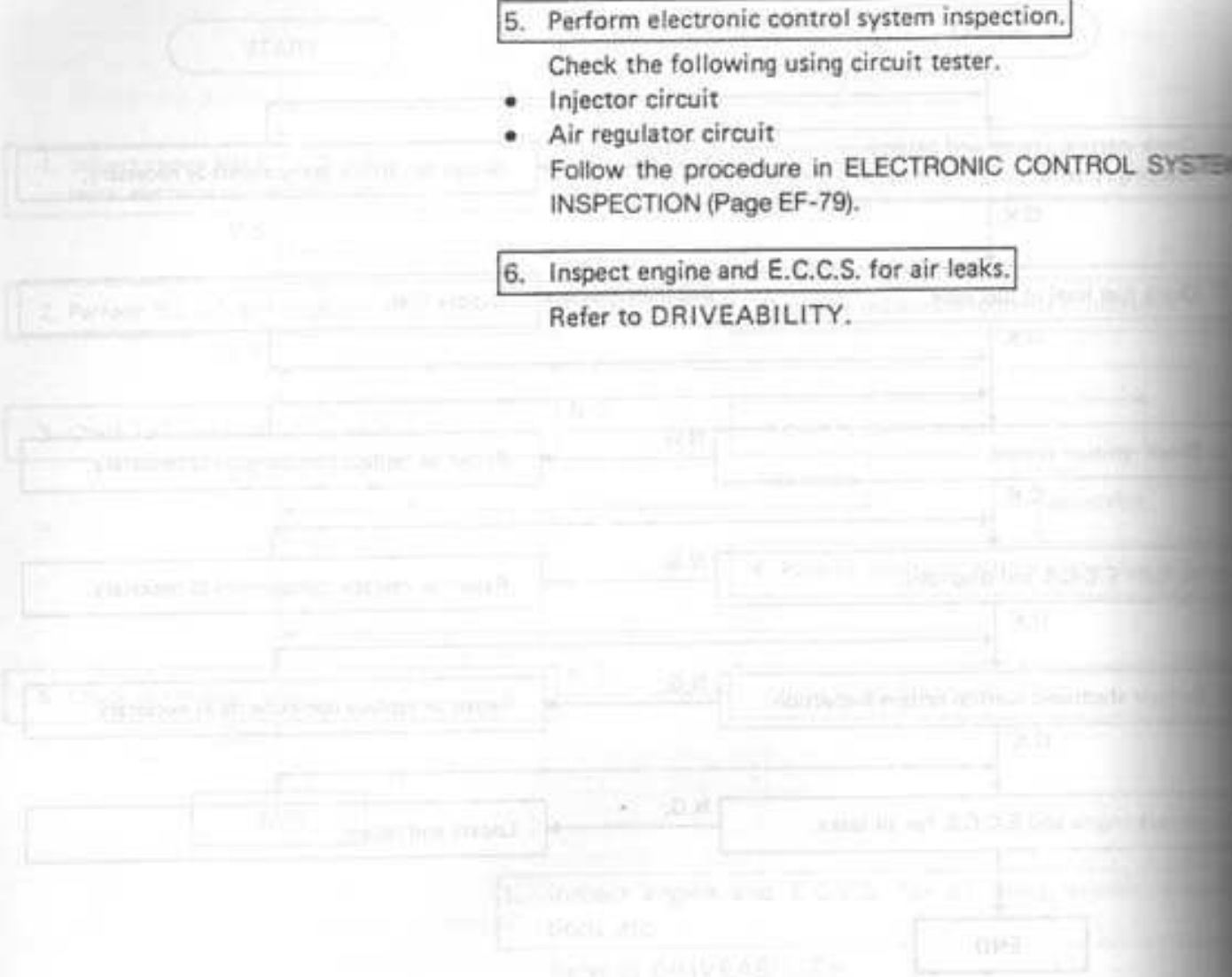
If fuel level is low or empty, add fuel.

**3. Check ignition system.**

- 1) Check ignition wiring.
- 2) Check distributor rotor head.
- 3) Check spark plug.

**4. Perform E.C.C.S. self-diagnosis.**

Follow the procedure in E.C.C.S. SELF-DIAGNOSIS (Page EF-73).



**5. Perform electronic control system inspection.**

Check the following using circuit tester.

- Injector circuit
- Air regulator circuit

Follow the procedure in **ELECTRONIC CONTROL SYSTEM INSPECTION** (Page EF-79).

**6. Inspect engine and E.C.C.S. for air leaks.**

Refer to **DRIVEABILITY**.



**DESCRIPTION**

The self-diagnostic system determines malfunctions of signals which provide data to the E.C.U. The malfunctions may not be only E.C.C.S. component malfunctions but may also be poor contact of the connectors, shorted or open circuit of the harness and malfunctions of transit relays and diodes. Some of the malfunctions are stored in the E.C.U. and others are not. A malfunction is displayed by the red and green L.E.D.s (Light Emitting Diodes) which are located in the control unit. Self-diagnosis is performed when the self-diagnosis selector is turned on.

**DISPLAYS OF MALFUNCTIONING CODES**

A malfunctioning area is displayed by the number of both the red and green L.E.D.s. First, the red L.E.D. flashes and the green follows.

The red L.E.D. refers to the tenth digit while the green one refers to the unit digit. For example, when the red L.E.D. flashes three times and the green L.E.D. flashes twice, this implies number "32". In this way, malfunctioning areas are classified by code numbers.

**DISPLAYED CODE**

CODE	L.E.D. display		Malfunctioning area	Items retained in memory
	Red	Green		
11	○	○	Crank angle sensor circuit	X
12	○	○○	Air flow meter circuit	X
13	○	○○○	Water temperature sensor circuit	X
14	○	○○○○	Vehicle speed signal	-
21	○○	○	Ignition signal missing in primary coil	X
22	○○	○○	Fuel pump circuit	X
23	○○	○○○	Throttle valve switch (Idle switch) circuit	-
24	○○	○○○○	Neutral/Park switch	-
31	○○○	○	Heater/air conditioner switch	-
32	○○○	○○	Starter signal circuit	-
44	○○○○	○○○○	No malfunctioning in the above circuit (Check other electrical systems.)	-

X: Yes - : No



**CAUTION:**

- a. Always turn the diagnosis mode selector carefully with a screwdriver. Do not press hard to turn. Otherwise, the selector may be damaged.
- b. When the engine fails to start, crank the engine more than two seconds before starting the self-diagnosis.
- c. Before starting the self-diagnosis, do not erase the stored memory. Doing so will reduce the self-diagnosis function considerably.
- d. After a malfunctioning area has been corrected, be sure to erase the memory.
- e. The self-diagnosed results are retained in the memory even with a small current flow from the battery. Disconnecting the battery cable or the E.C.C.S.'s 15-pin connector erases the memory stored.
- f. The crank angle sensor signal plays an important role in the E.C.C.S. A malfunctioning of air flow meter is sometimes accompanied by a malfunctioning of the crank angle sensor. So when the crank angle sensor and the air flow meter are both malfunctioning, always start by checking the crank angle sensor first.
- g. Start the self-diagnosis 10 seconds after the ignition switch is turned to "OFF" because the air flow meter self-cleaning system is working.



Malfunction	Code	AIR	FUEL
X	1	0	0
X	2	00	0
X	3	000	0
-	4	0000	0
X	5	0	00
X	6	00	00
-	7	000	00
-	8	0000	00
-	9	0	000
-	0	00	000
-	1	000	0000

INSPECTION START

Verify that diagnosis mode selector is turned fully counterclockwise.



SEF651B

Turn ignition switch to "ON" position.

Make sure that inspection lamps on control unit stay "ON". (Bulb check)

N.G.

Check harness for battery source. (Refer to page EF-99.) If battery is O.K., replace control unit.

O.K.

Turn diagnosis mode selector fully clockwise.



SEF652B

Depress accelerator pedal, then release.



SEF653B

Shift transmission control lever. Neutral → Others → Neutral

Start engine. Apply brakes and shift to "D" position (A/T models).

Drive vehicle at more than 10 km/h



SEF623D

Turn air conditioner switch (if fitted) and heater fan switch. OFF → ON → OFF



SEF624D

Make sure that inspection lamps on control unit are displaying code No. 44. (A/c fitted) or No. 31. (A/c not fitted)

N.G.

Write down the malfunctioning code.

O.K.

Turn diagnosis mode selector fully counterclockwise.



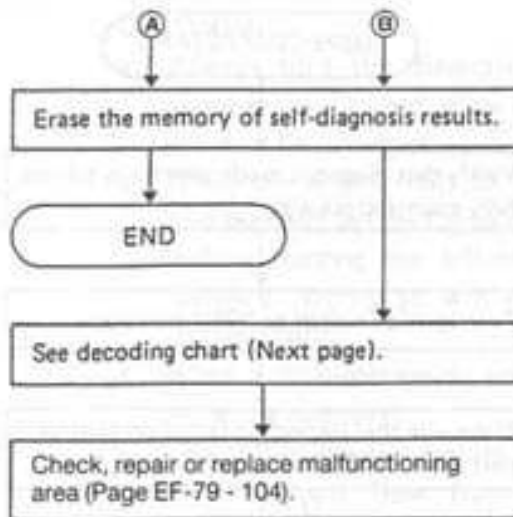
SEF651B

Turn off engine.

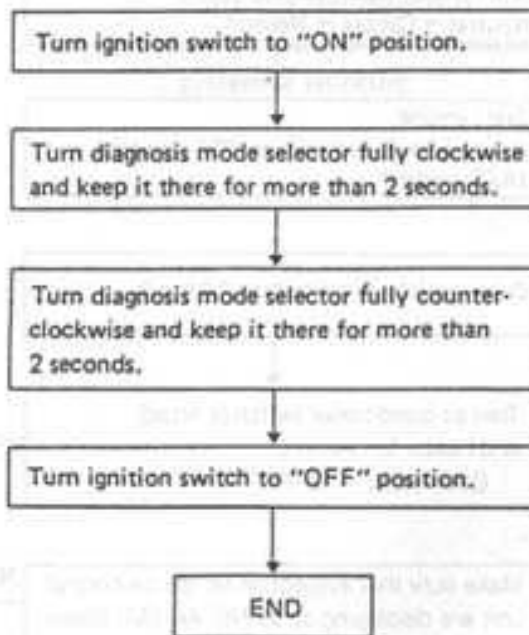
A

B

C



## Procedure for memory erasure



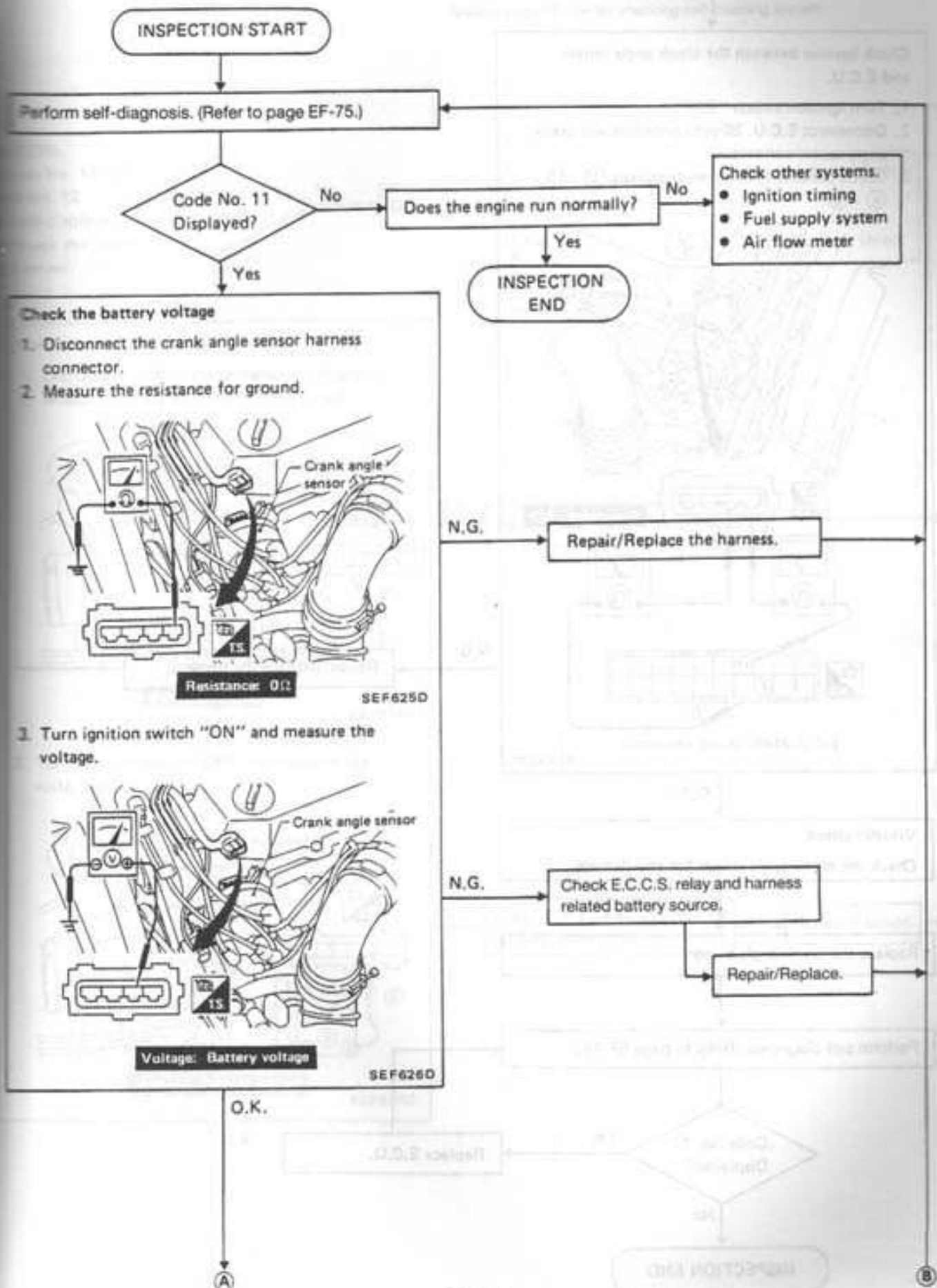
Code No.	Diagnosis	Inspection	Reference page
11	<ul style="list-style-type: none"> <li>● 1° or 120° signal is not entered for one second while engine is running.</li> <li>● 120° signal is not entered for one second during engine cranking.</li> <li>● Either 1° or 120° signal is not entered often enough while the engine speed is higher than 600 rpm.</li> </ul>	<ul style="list-style-type: none"> <li>● Crank angle sensor harness and connectors</li> <li>● Starting system</li> <li>● Crank angle sensor</li> <li>● E.C.U.</li> </ul>	EF-79
12	<ul style="list-style-type: none"> <li>● An abnormally high output voltage is entered while engine is off.</li> <li>● An abnormally low output voltage is entered while the engine speed is higher than 600 rpm.</li> </ul>	<ul style="list-style-type: none"> <li>● Air flow meter harness and connectors</li> <li>● Air flow meter</li> <li>● Air flow meter self-cleaning system</li> <li>● E.C.U.</li> </ul>	EF-81
13	<ul style="list-style-type: none"> <li>● The water temperature sensor circuit is open or shorted. (An abnormally high or low output is entered)</li> </ul>	<ul style="list-style-type: none"> <li>● Water temperature sensor harness and connectors</li> <li>● Water temperature sensor</li> </ul>	EF-84
14	<ul style="list-style-type: none"> <li>● The vehicle speed signal is not entered while the vehicle is running.</li> </ul>	<ul style="list-style-type: none"> <li>● Vehicle speed sensor harness and connectors</li> <li>● Vehicle speed sensor</li> </ul>	EF-86
21	<ul style="list-style-type: none"> <li>● The ignition signal in the primary coil is not entered more than 10 times.</li> </ul>	<ul style="list-style-type: none"> <li>● Harness between E.C.U. and ignition coil.</li> <li>● Power transistor</li> <li>● Ignition coil</li> <li>● High tension cables</li> <li>● Spark plugs</li> <li>● Distributor</li> <li>● E.C.U.</li> </ul>	EF-87
22	<ul style="list-style-type: none"> <li>● The electric current for fuel pump is extremely low or high.</li> </ul>	<ul style="list-style-type: none"> <li>● Fuel pump harness and connectors</li> <li>● Fuel pump</li> <li>● E.C.U.</li> </ul>	EF-90
23	<ul style="list-style-type: none"> <li>● The ON-OFF signal from idle switch is not entered after ignition switch is turned to "ON".</li> </ul>	<ul style="list-style-type: none"> <li>● Throttle valve switch harness and connectors</li> <li>● Throttle valve switch</li> <li>● Idle switch improper adjustment</li> </ul>	EF-91
24	<ul style="list-style-type: none"> <li>● The ON-OFF signal from neutral/park switch is not entered after ignition switch is turned to "ON".</li> </ul>	<ul style="list-style-type: none"> <li>● Neutral/Park switch harness and connectors</li> <li>● Neutral/Park switch</li> </ul>	EF-93

# SELF-DIAGNOSIS — Decoding Chart

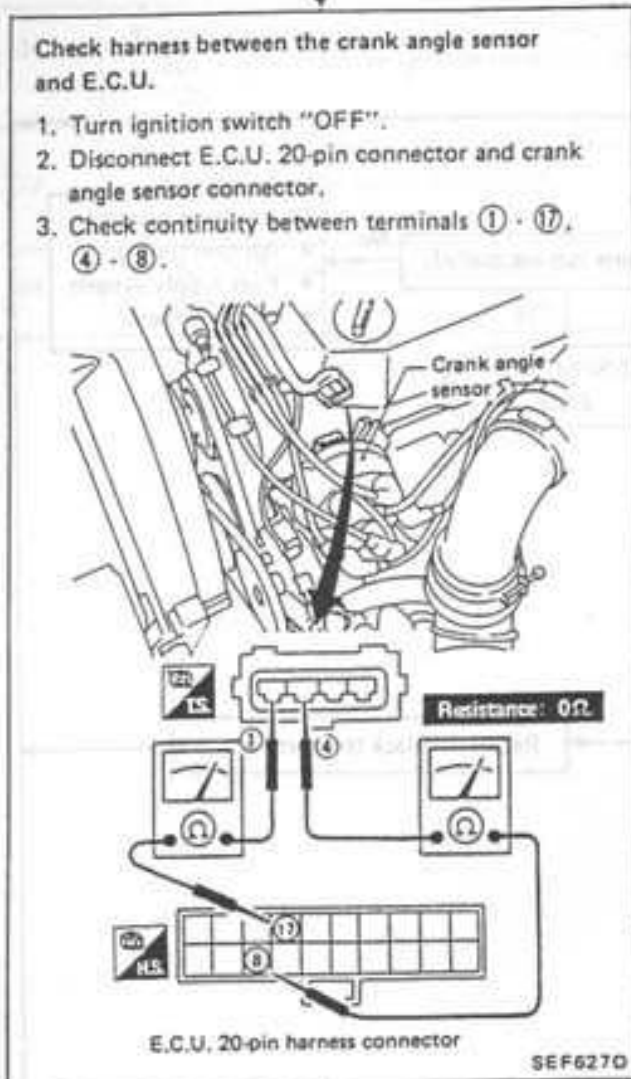
RB30E

Code No.	Diagnosis	Inspection	Reference page
31	<ul style="list-style-type: none"> <li>An ON-OFF signal from the air conditioner system is not entered after the ignition switch is turned to "ON".</li> </ul>	<ul style="list-style-type: none"> <li>Air conditioner system</li> </ul>	EF-94
32	<ul style="list-style-type: none"> <li>The start signal from the ignition switch is not entered after the engine has started.</li> </ul>	<ul style="list-style-type: none"> <li>Ignition switch</li> <li>Ignition system harness and connectors</li> </ul>	EF-95
44	<ul style="list-style-type: none"> <li>The systems which are diagnosed by E.C.U. are working normally.</li> </ul>	<ul style="list-style-type: none"> <li>Inspect other electric control systems.</li> </ul>	—

Crank Angle Sensor



## Crank Angle Sensor (Cont'd)



N.G.

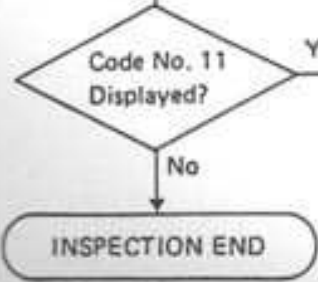
Repair/Replace the harness.

O.K.

Visually check  
Check the crank angle sensor for any damage.

Replace the crank angle sensor.

Perform self-diagnosis. (Refer to page EF-75.)



Replace E.C.U.

Air Flow Meter

Refer to page EF-104 for checking self-cleaning system.

INSPECTION START

Perform self-diagnosis. (Refer to page EF-75.)

**CAUTION:**  
If Code No. 11 and Code No. 12 are both displayed, check the crank angle sensor.

Code No. 12 Displayed?

No

Does the engine run normally?

No

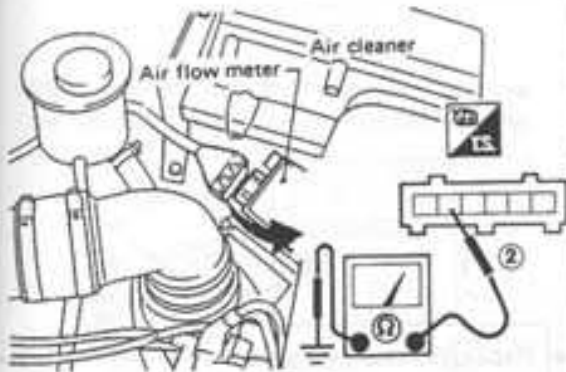
- Check other systems.
- Fuel system
  - Ignition timing
  - Crank angle sensor

Yes

END

Check the battery voltage

1. Disconnect air flow meter harness connector.
2. Measure the resistance of ground circuit.



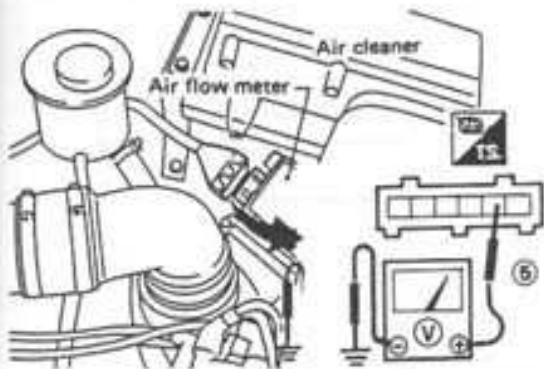
Resistance: 0Ω

SEF679D

N.G.

Repair/Replace the harness.

3. Turn ignition switch "ON" and measure the voltage at ③



Voltage: Battery voltage

SEF680D

N.G.

Check E.F.I. relay and harness related battery source.

Repair/Replace.

O.K.

Ⓐ

Ⓑ

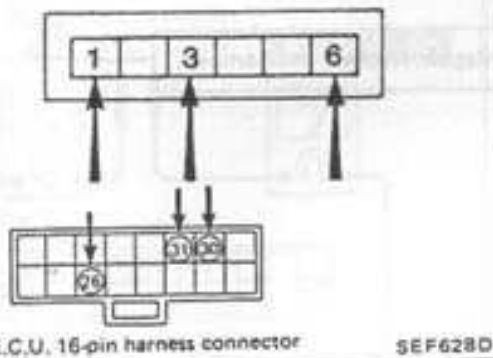


## Air Flow Meter (Cont'd)

(A)

Check harness between the air flow meter and E.C.U.

1. Turn ignition switch "OFF".
2. Disconnect E.C.U. 16-pin connector and air flow meter harness connector.
3. Check continuity between terminals ⑥ - ③①, ③ - ⑤①, ① - ②⑤.



N.G.

Repair/Replace the harness.

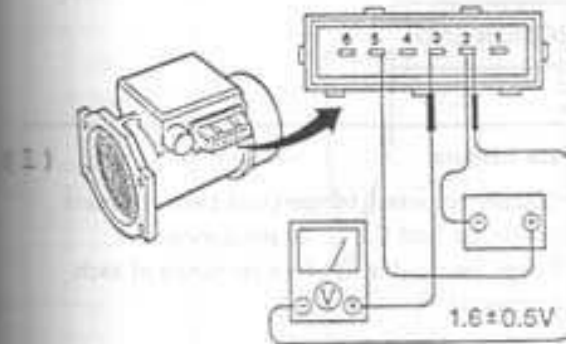
O.K.

(C)

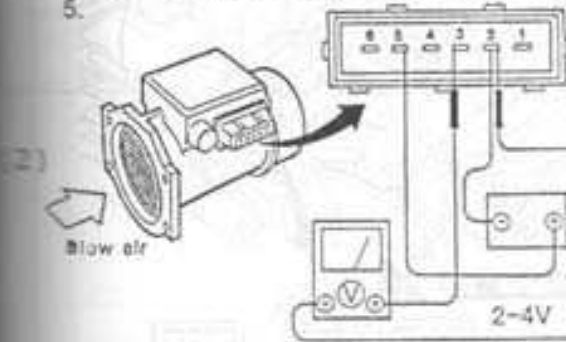
## Air Flow Meter (Cont'd)

## Check air flow meter

1. Remove air flow meter. Apply battery voltage to terminals 2 and 5. Then measure voltage between terminals 3 and 2.



2. Blow air through air flow meter and observe the voltage change between terminals 2 and 5.



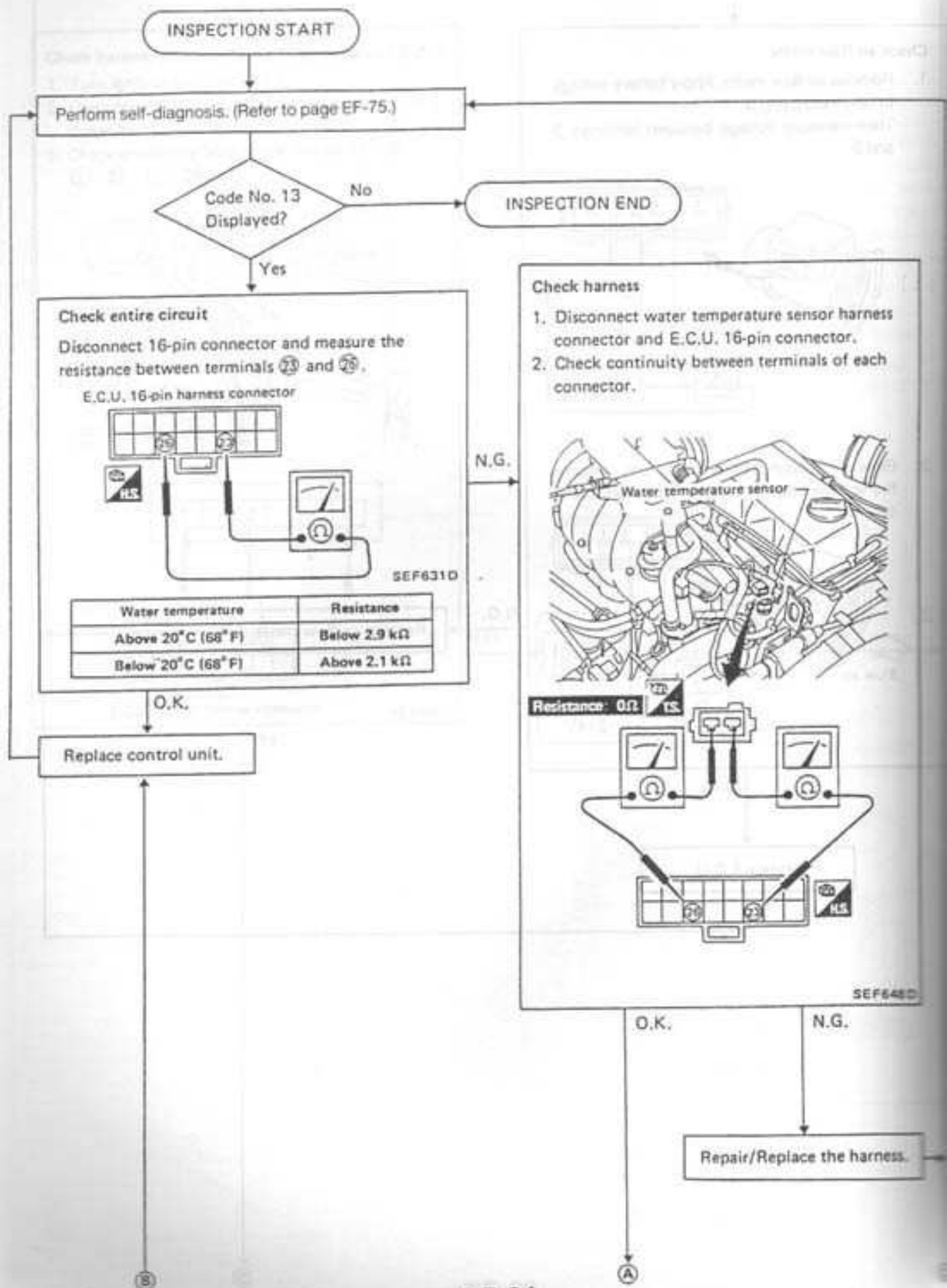
N.G.

Replace air flow meter.

O.K.

Replace E.C.U.

## Water Temperature Sensor

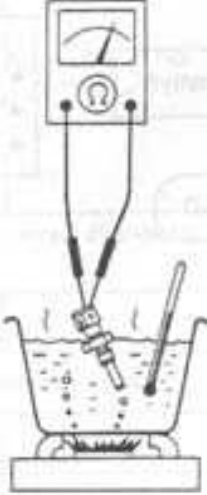


Water Temperature Sensor (Cont'd)

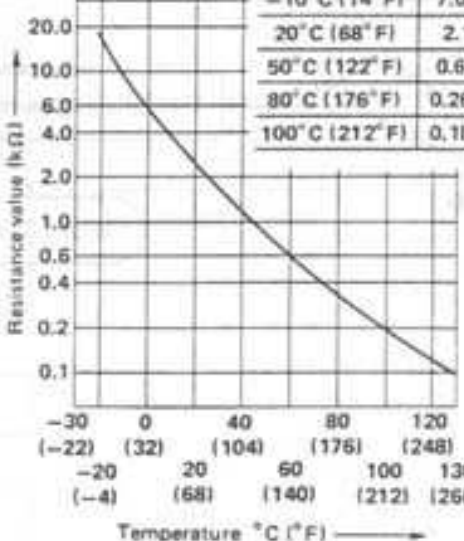
A

**Check water temperature sensor**

Dip the sensor into water maintained at a temperature of 20°C (68°F), 80°C (176°F), etc., and read its resistance.



-10°C (14°F)	7.0 - 11.4 kΩ
20°C (68°F)	2.1 - 2.9 kΩ
50°C (122°F)	0.68 - 1.0 kΩ
80°C (176°F)	0.26 - 0.39 kΩ
100°C (212°F)	0.18 - 0.20 kΩ



5EF677B

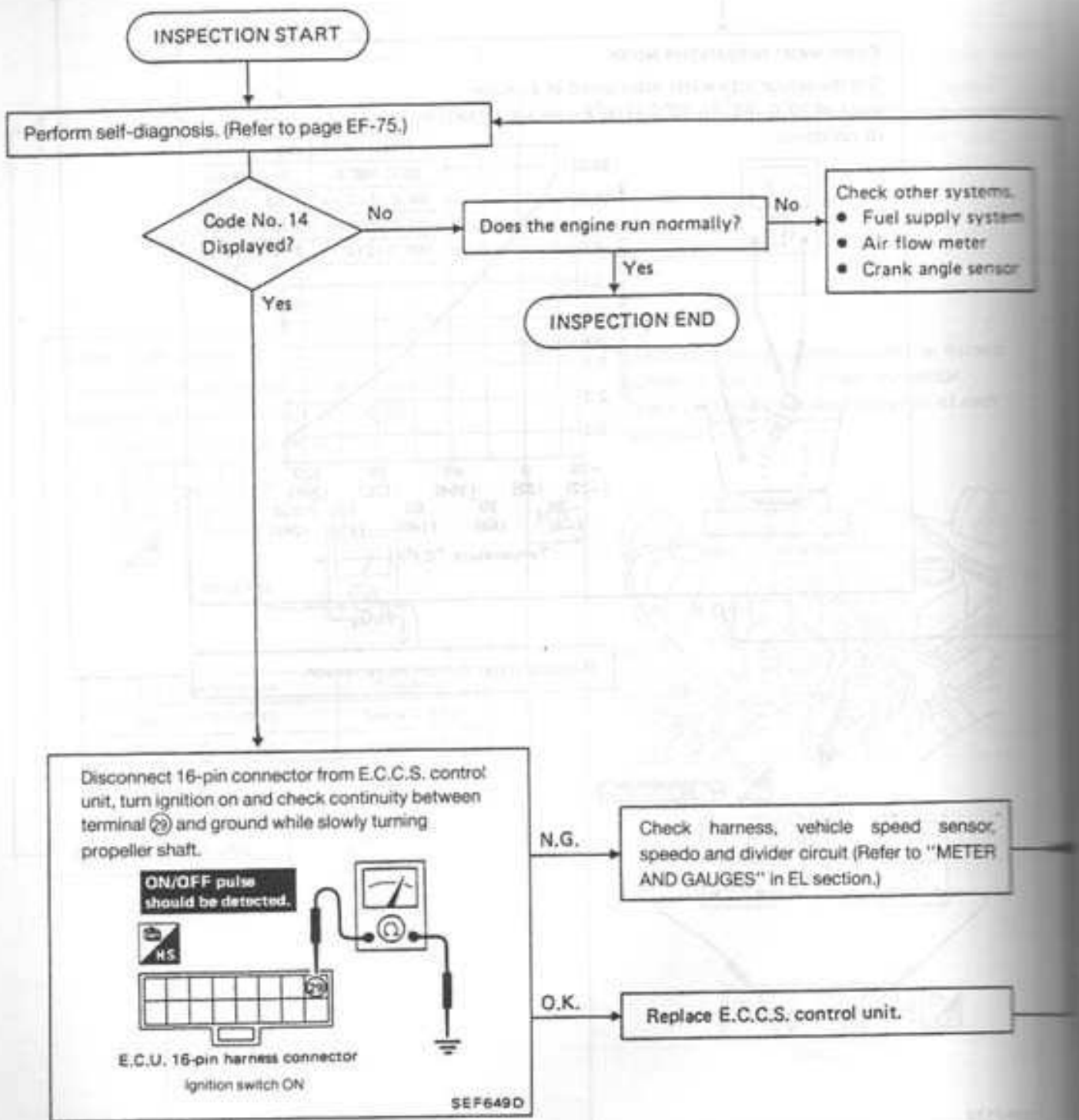
O.K.

N.G.

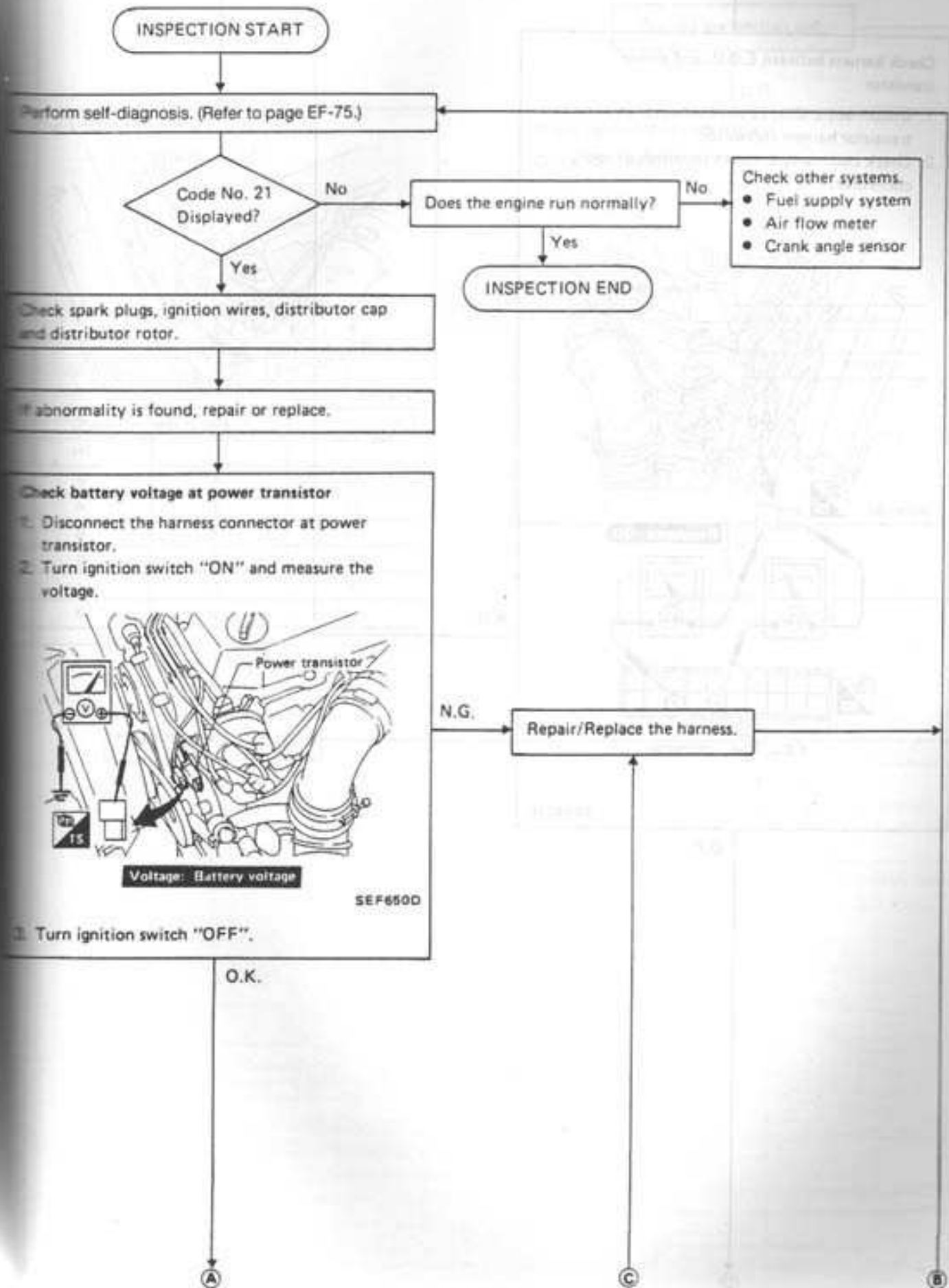
Replace water temperature sensor.

C

## Vehicle Speed Sensor



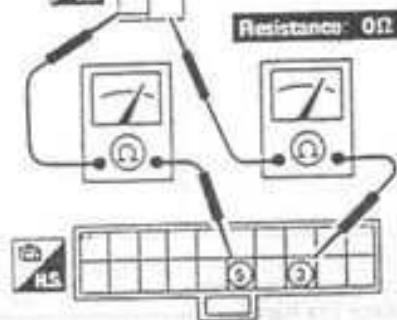
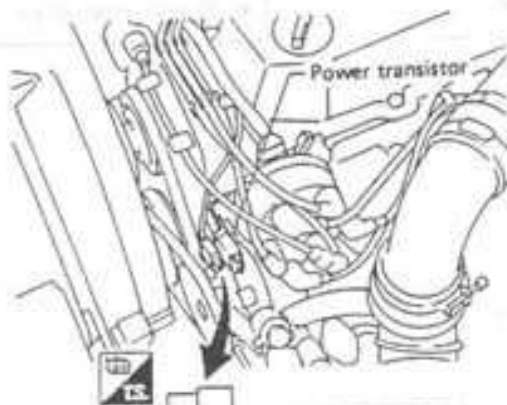
Ignition Signal



## Ignition Signal (Cont'd)

Check harness between E.C.U. and power transistor

1. Disconnect E.C.U. 20-pin connector and power transistor harness connector.
2. Check continuity between terminals of each connector.



E.C.U. 20-pin connector

SEF651D

O.K.

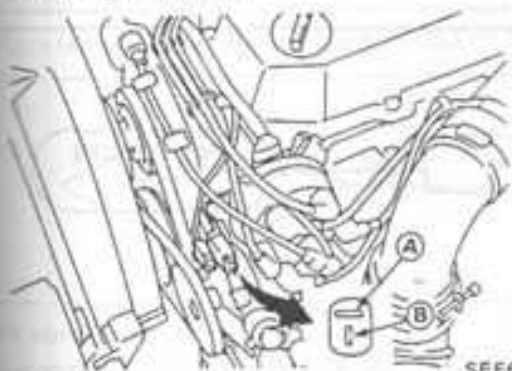
N.G.

Ignition Signal (Cont'd)

D

E

Check power transistor.



SEF652D

Ohmmeter leads to pins		Should read
(+)	(-)	
+	A	0Ω
A	+	∞Ω
A	B	∞Ω
B	A	0Ω
+	B	0Ω
B	+	0Ω

N.G.

Replace power transistor.

O.K.

Check ignition coil with harness  
Check for continuity.



Terminals	Resistance
1 - 2	1Ω
1 - 3	10 kΩ

SEF956C

N.G.

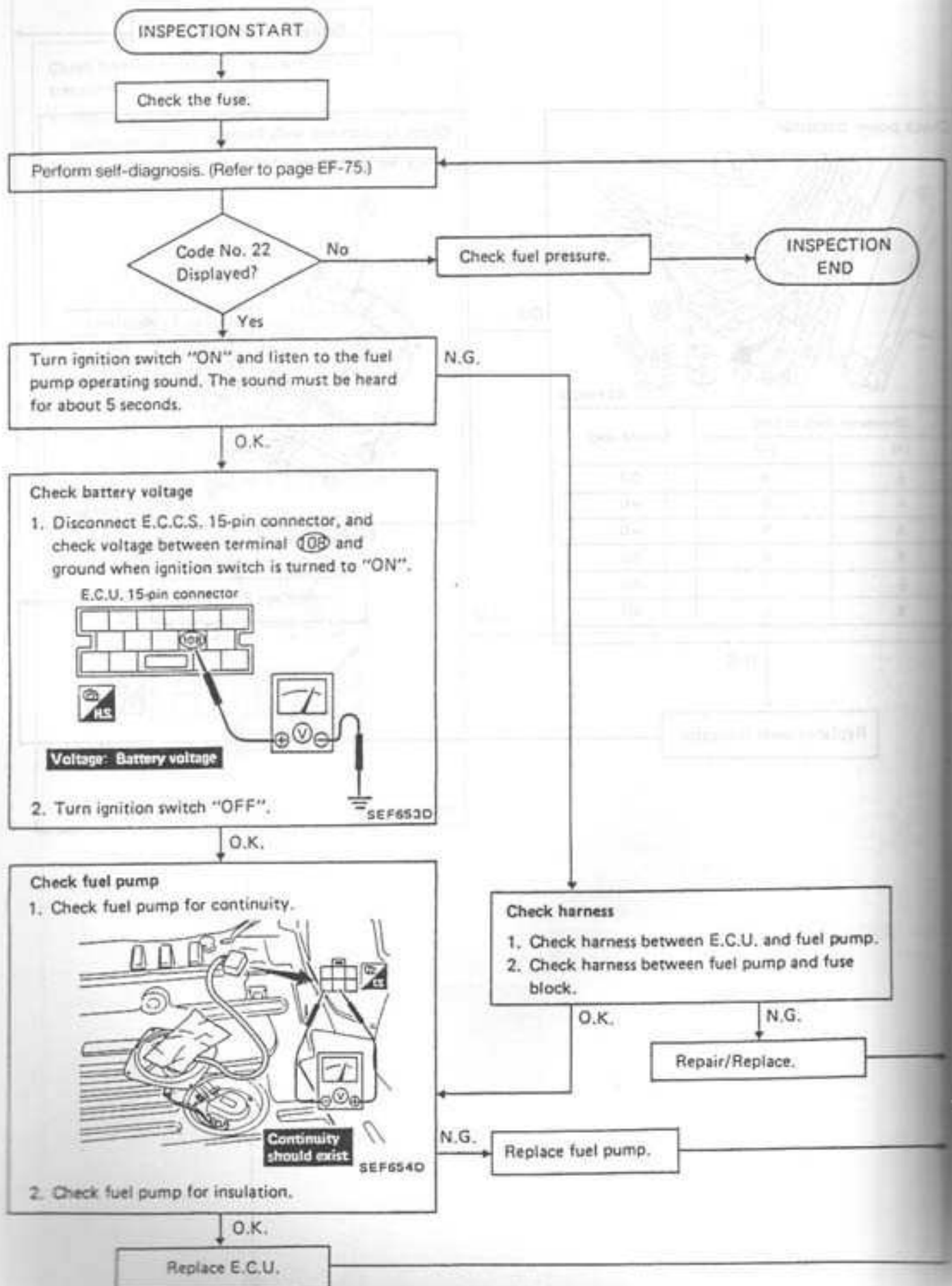
Replace the ignition coil.

O.K.

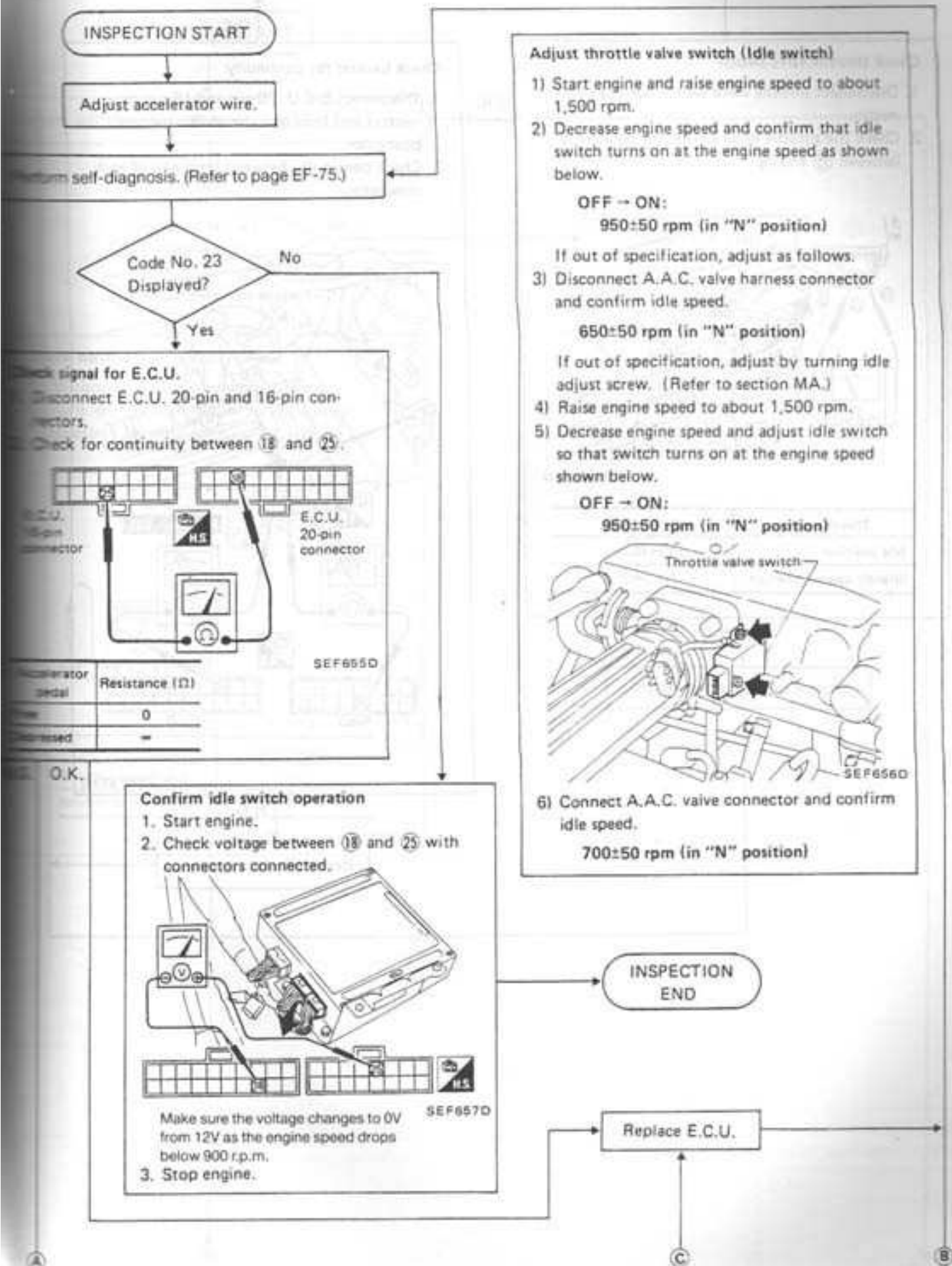
Replace E.C.U.



## Fuel Pump



## Throttle Valve Switch

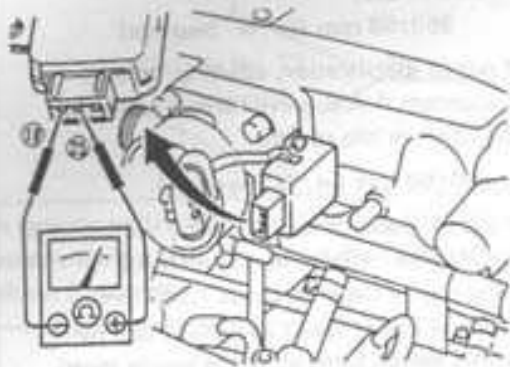


## Throttle Valve Switch (Cont'd)

A

### Check throttle valve switch

1. Disconnect throttle valve switch harness connector.
2. Check the throttle valve switch for continuity between ⑤ and ⑩.



SEF658D

Throttle valve	Continuity
Idle position	Yes (0Ω)
Slightly opened position	No (∞Ω)

N.G.

Replace throttle valve switch.

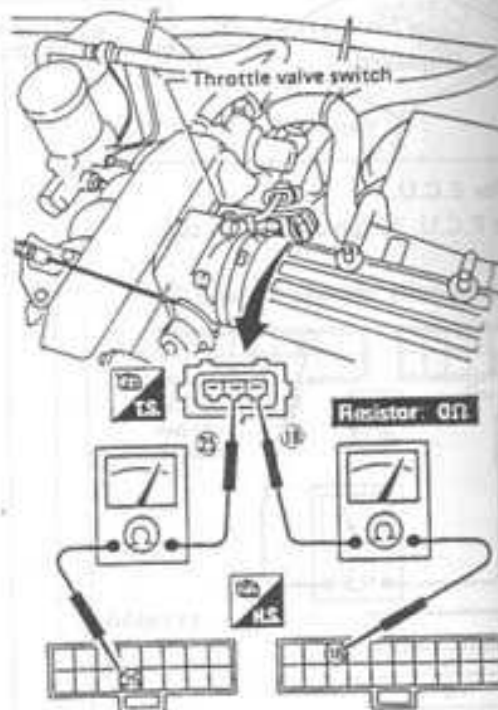
O.K.

C

O.K.

### Check harness for continuity

1. Disconnect E.C.U. 20-pin and 16-pin connectors and throttle valve switch harness connector.
2. Check continuity between terminals of each connector.



SEF659D

N.G.

Repair/Replace harness.

## Neutral Switch

INSPECTION START

Perform self-diagnosis. (Refer to page EF-75.)

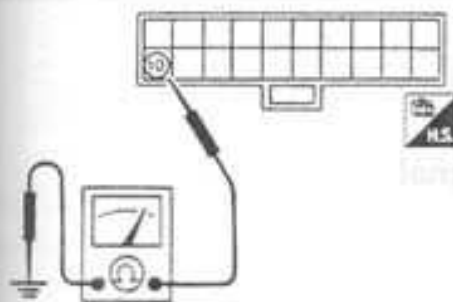
Code No. 24  
Displayed?

No

INSPECTION END

Check neutral/park switch harness.

1. Disconnect 20-pin connector.
2. Turn ignition switch "ON" and measure resistance between terminal ⑩ and ground.



SEF660D

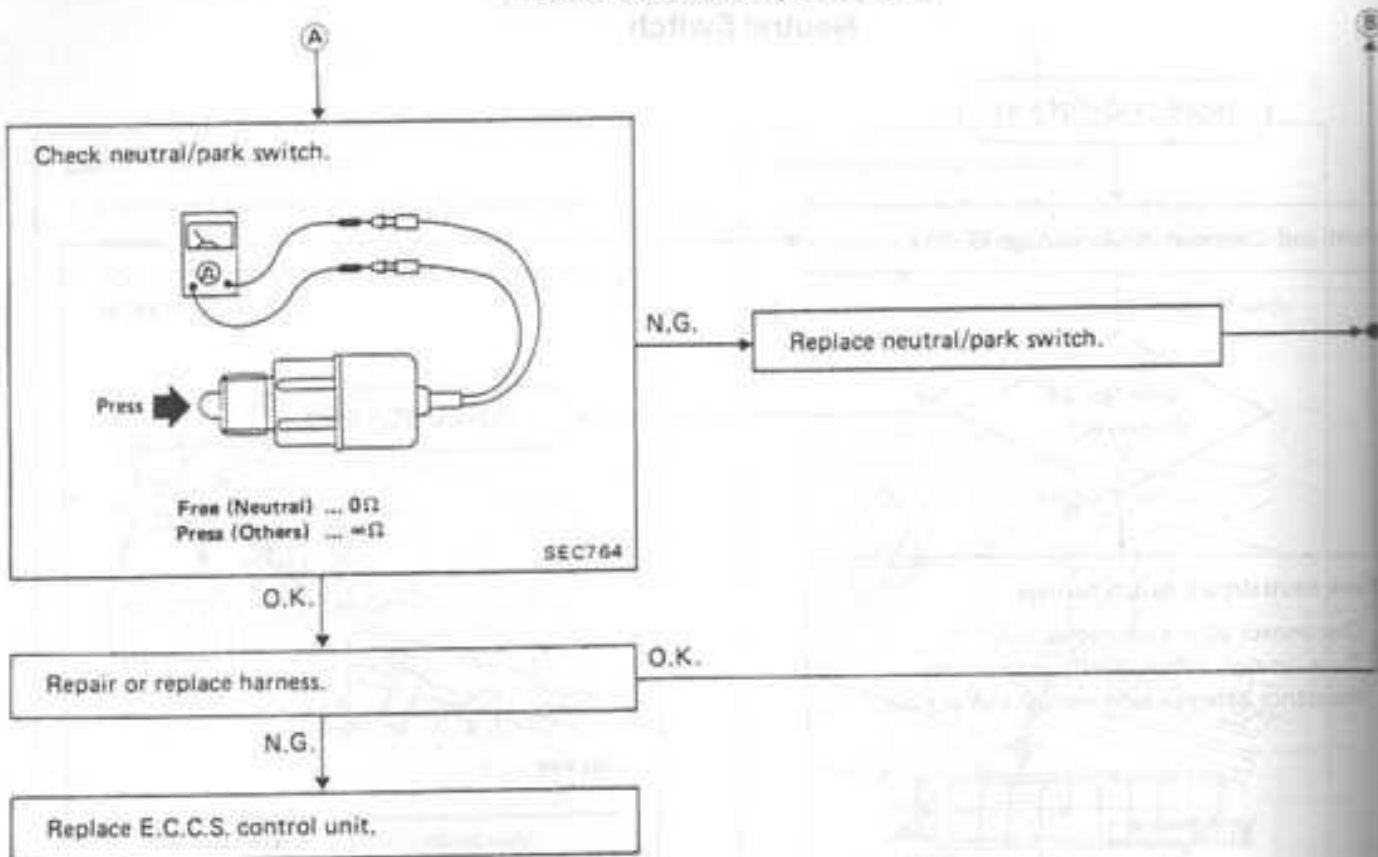
Gear position	Continuity
Except neutral/park	$\infty \Omega$
Neutral/park	$0 \Omega$

SEF512D

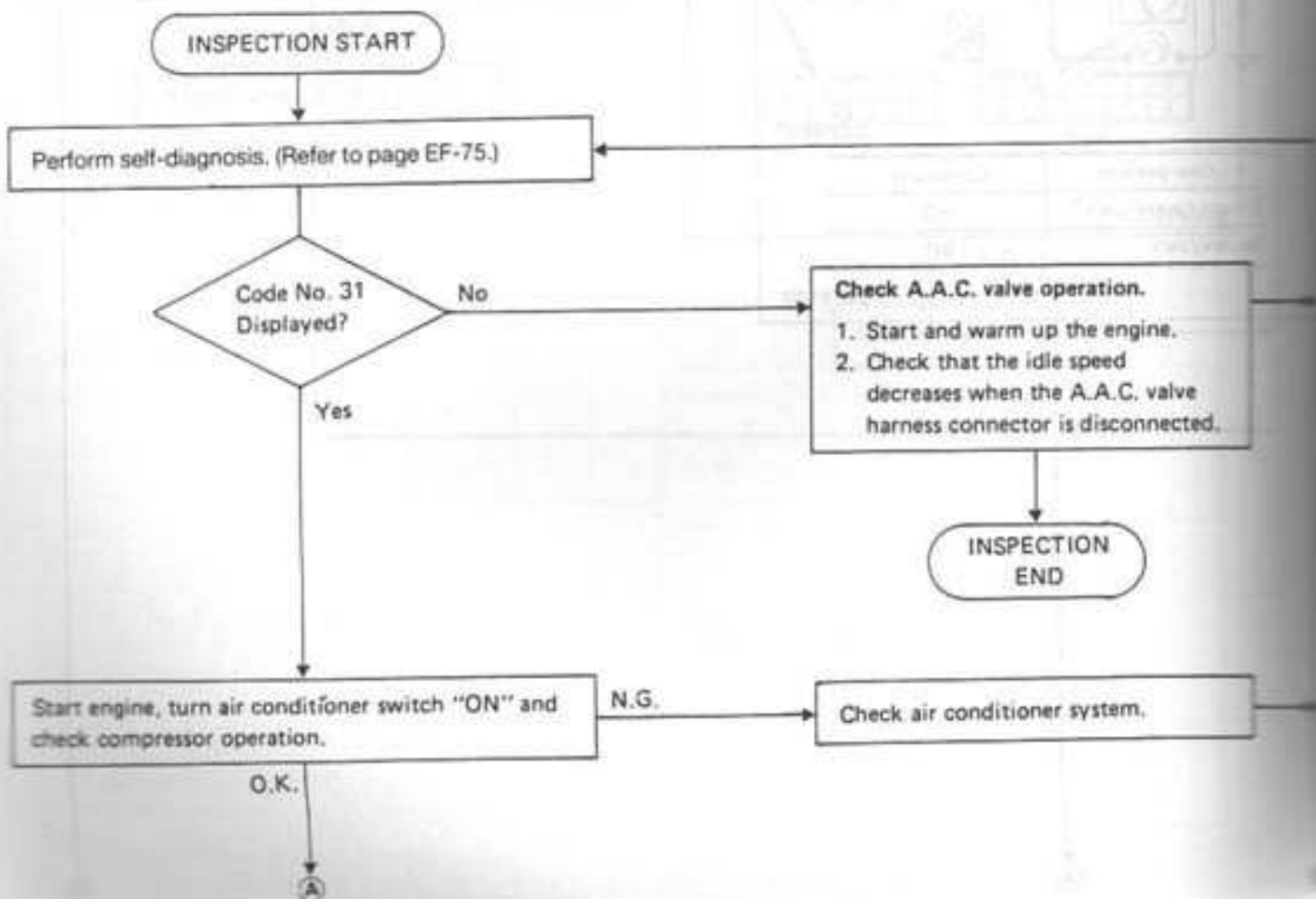
A

B

## Neutral Switch (Cont'd)

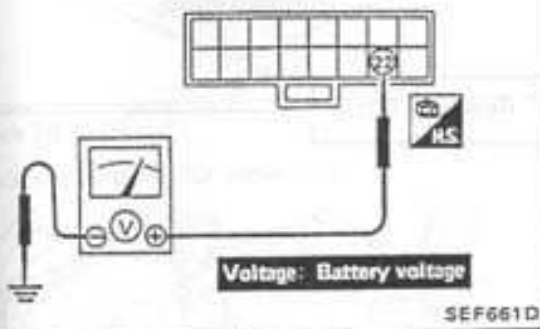


## Air Conditioner Signal



Air Conditioner Signal (Cont'd)

Stop engine and disconnect 16-pin connector. Turn ignition switch "ON" and measure voltage between terminal 23 and ground.



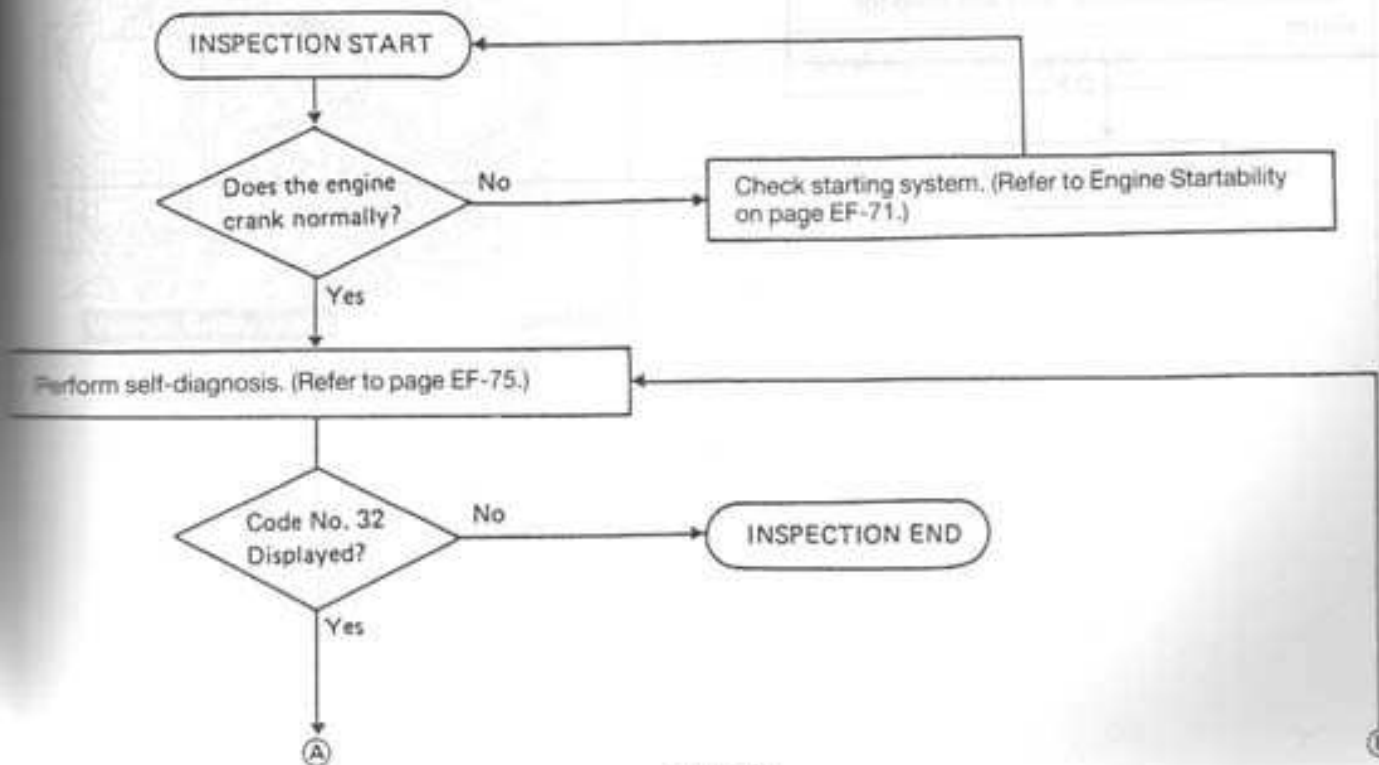
N.G.

Repair harness.

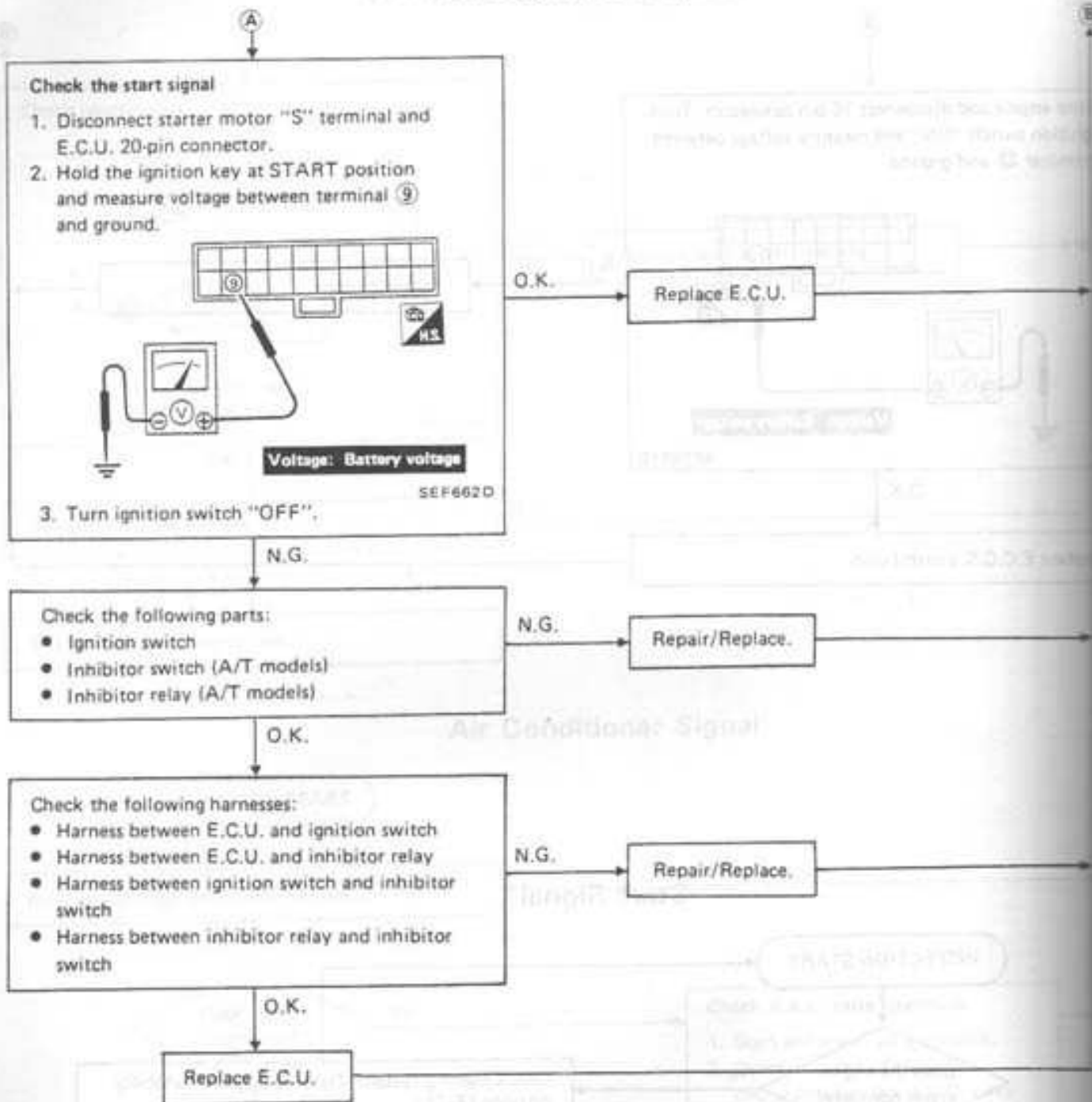
O.K.

Replace E.C.C.S. control unit.

Start Signal

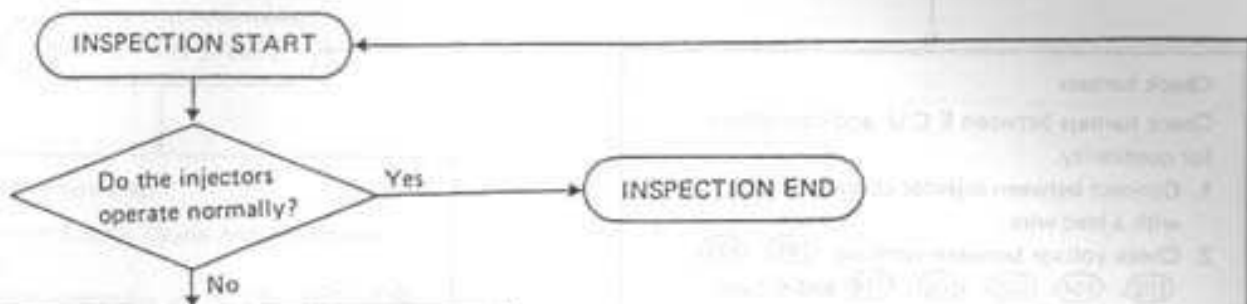


## Start Signal (Cont'd)



## Air Conditioner Signal

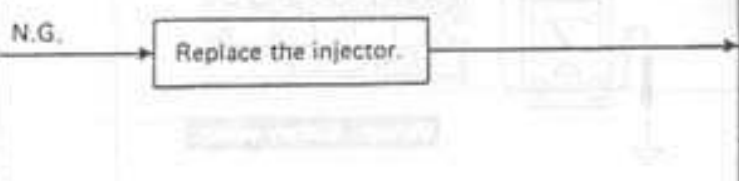
## Injector Battery and Ground Test



**Check injectors**  
Check each injector for continuity.

**Continuity should exist**

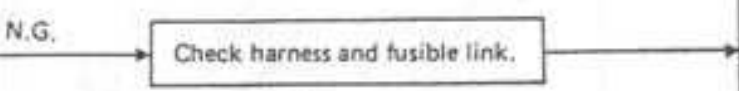
5EF663D



**Check battery voltage at each injector**  
Disconnect E.C.U. 15-pin connector.  
Ignition switch: OFF

**Voltage: Battery voltage**

5EF664D



(A)

(B)



Injector (Cont'd)

**Check harness**  
 Check harness between E.C.U. and connectors for continuity.

1. Connect between injector connector terminals with a lead wire.
2. Check voltage between terminal (101), (102), (103), (104), (105), (106), (114) and ground.

Voltage: Battery voltage

SEF665D

O.K.  
 Replace E.C.U.

N.G.

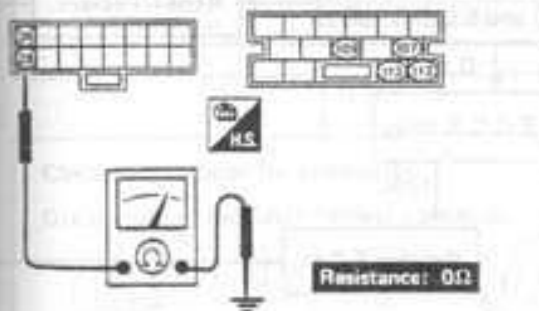
Repair/Replace the harness.

Battery Voltage and Ground Test

INSPECTION START

Check ground terminals

1. Disconnect E.C.U. 15-pin and 16-pin connectors.
2. Check for continuity at ②⑧, ③⑥, ⑩⑦, ⑩⑨, ⑪② and ⑪③.



SEF666D

N.G.

Check that the ground terminal is securely mounted.

O.K.

Repair/Replace ground harnesses.

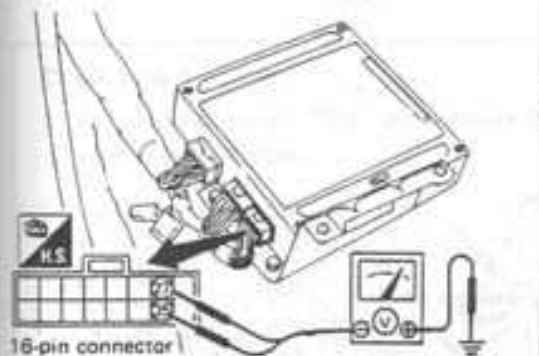
N.G.

Securely mount.

O.K.

Check battery voltage

1. Securely connect E.C.U. 15-pin and 16-pin connectors.
2. Turn ignition switch "ON" and measure the voltage at ②⑦ and ③⑤.

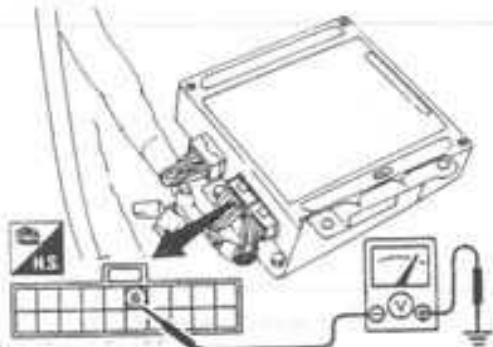


SEF667D

N.G.

Check E.C.C.S. relay control

Measure the voltage at ⑥ for 6 seconds when ignition switch is turned to "OFF" from "ON" position.



20-pin connector

Ignition	Voltage
OFF	12 V
ON	0 V

SEF668D

O.K.

N.G.

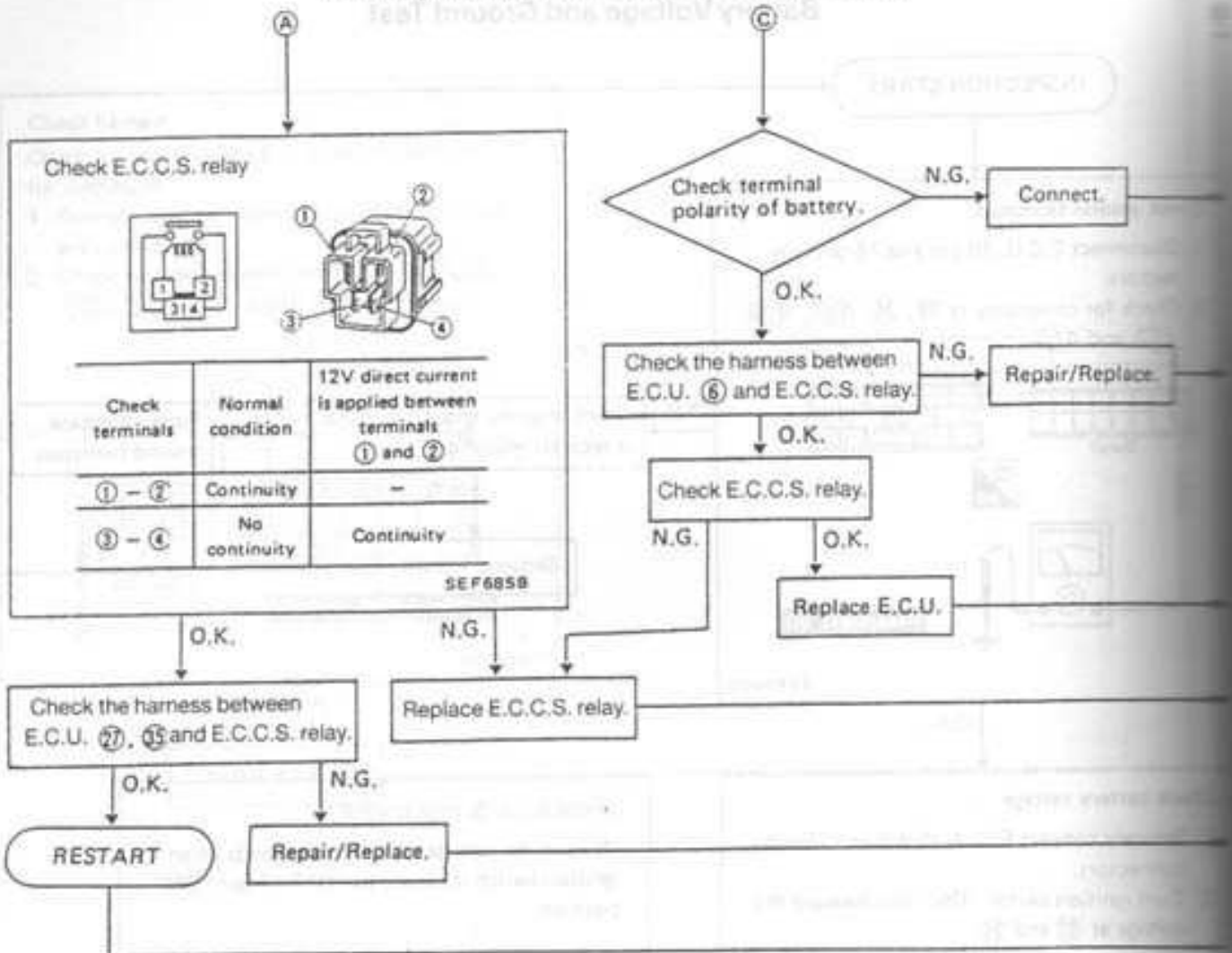
INSPECTION END

A

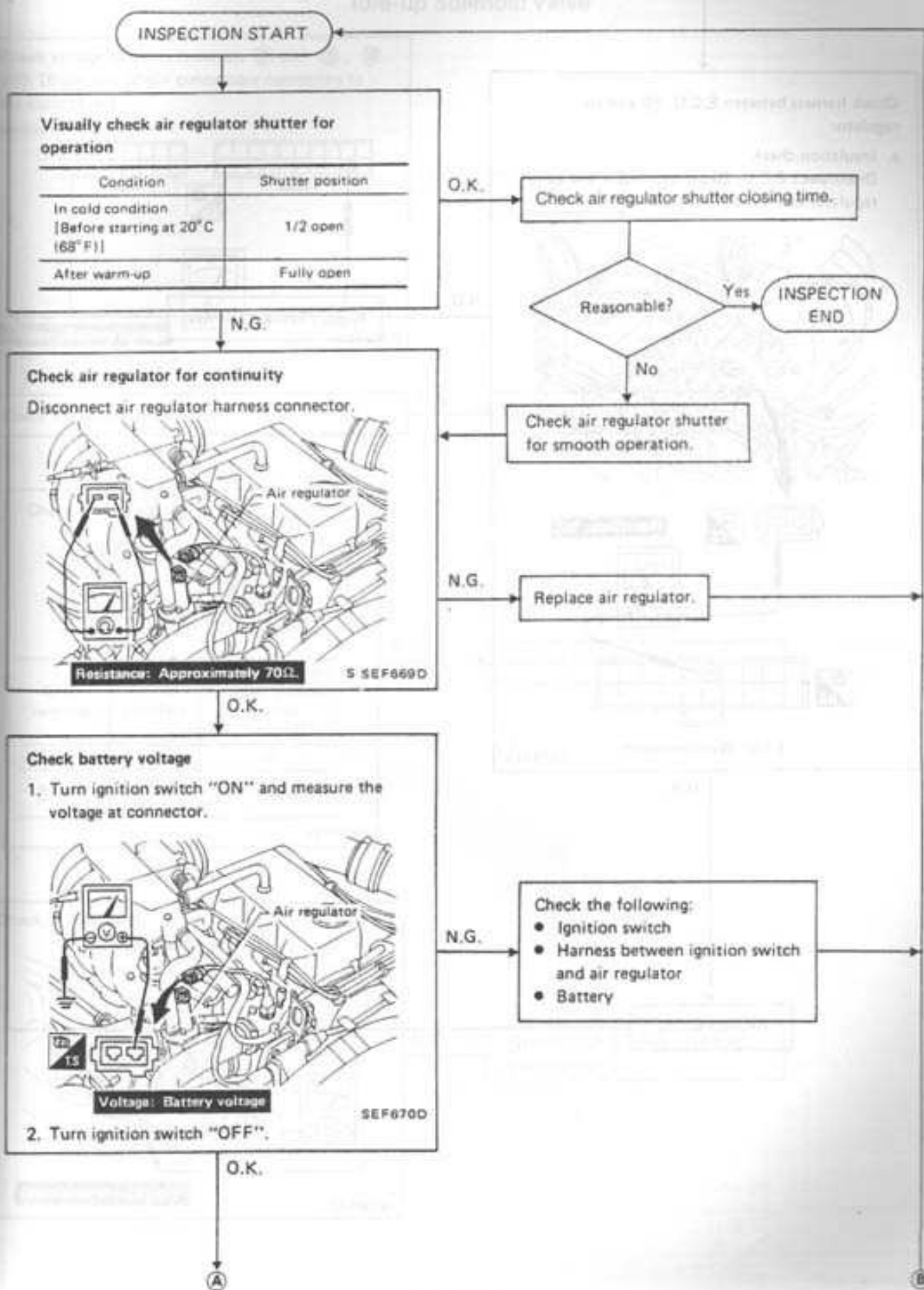
C

B

## Battery Voltage and Ground Test (Cont'd)



## Air Regulator



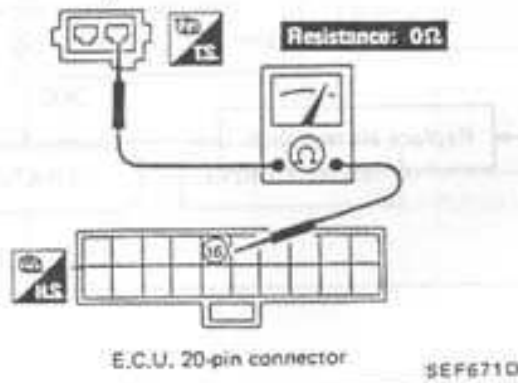
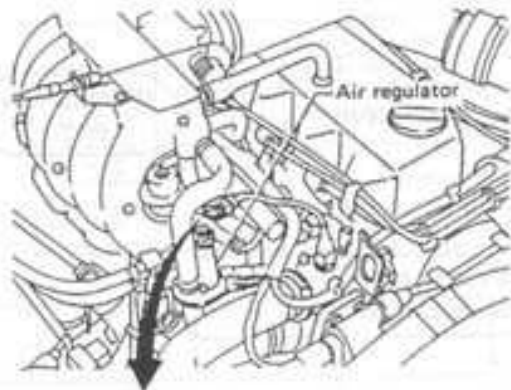
## Air Regulator (Cont'd)

A

B

Check harness between E.C.U. 16 and air regulator

- a. Insulation check  
Disconnect E.C.U. 20-pin connector and air regulator connector.



N.G.

Repair/Replace harness.

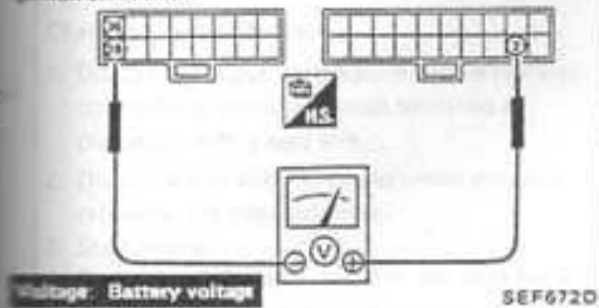
O.K.

Replace E.C.U.

Auxiliary Air Control (A.A.C.) Valve or Idle-up Solenoid Valve

Check voltage between terminals ② and ⑦B, ⑧B with 16-pin and 20-pin connectors connected to the control unit.

Ignition switch: ON



O.K. → END

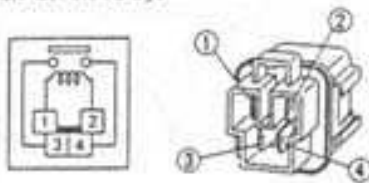
N.G.

Check harness for continuity.

N.G. → Repair harness.

O.K.

Check E.F.I. relay.



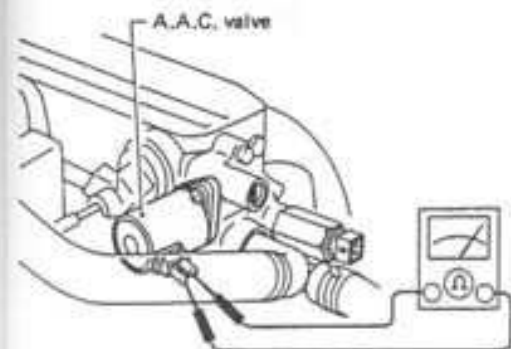
Check terminals	Normal condition	12V direct current is applied between terminals ① and ②
① - ②	Continuity	-
③ - ④	No continuity	Continuity

N.G. → Replace E.C.C.S. relay.

SEF685B

O.K.

Check A.A.C. valve.



Continuity should exist

SEF673D

N.G. → Replace A.A.C. valve or idle-up solenoid valve.

## Self-cleaning Hot Wire

INSPECTION START

Start engine and race engine to above 2,500 rpm.

Drive vehicle at above 20 km/h,  
then run engine at idle.

Remove air duct from air flow meter (air cleaner  
side) while engine is idling.

Using a mirror, ensure that hot wire heats up to a  
red glow for one second after the ignition switch  
has been turned off for five seconds.

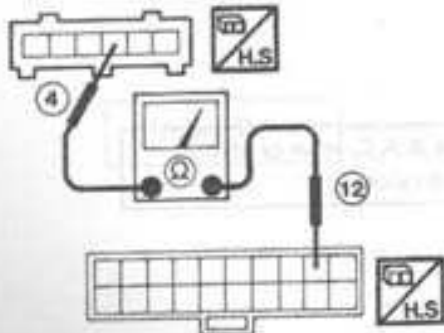
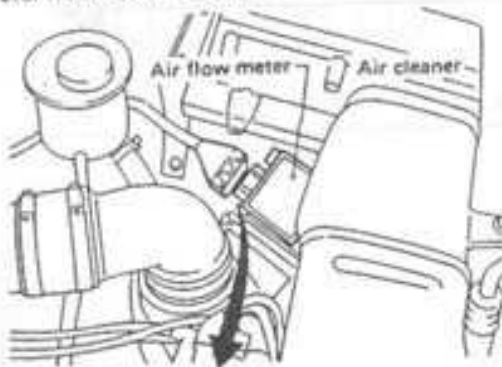
O.K.

INSPECTION END

N.G.

Check harness for continuity.

Check for continuity between terminal ⑫ of  
20-pin connector and terminal ④ of air flow  
meter harness connector.



E.C.U. 20-pin harness connector

SEF674D

N.G.

Repair/replace harness.

O.K.

Replace air flow meter.

# ELECTRONIC CONTROL SYSTEM INSPECTION

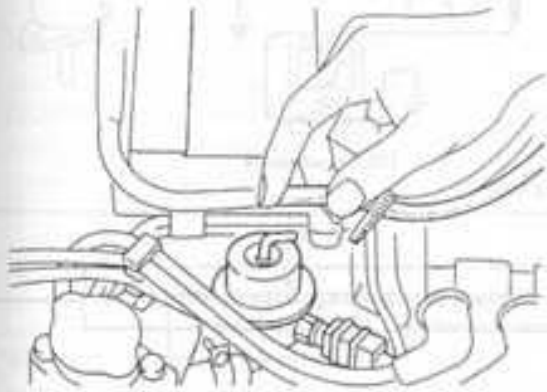
RB30E

## Pressure Regulator Control Solenoid Valve

INSPECTION START

### Check the system operation

1. Disconnect water temperature sensor harness connector and bridge across terminals of connector with a lead wire.
2. Disconnect a vacuum hose between pressure regulator and solenoid valve.
3. Start engine.
4. There should be no vacuum in the hose for 3 minutes.



5. Stop the engine.

O.K.

Check water temperature sensor.

INSPECTION END

N.G.

A

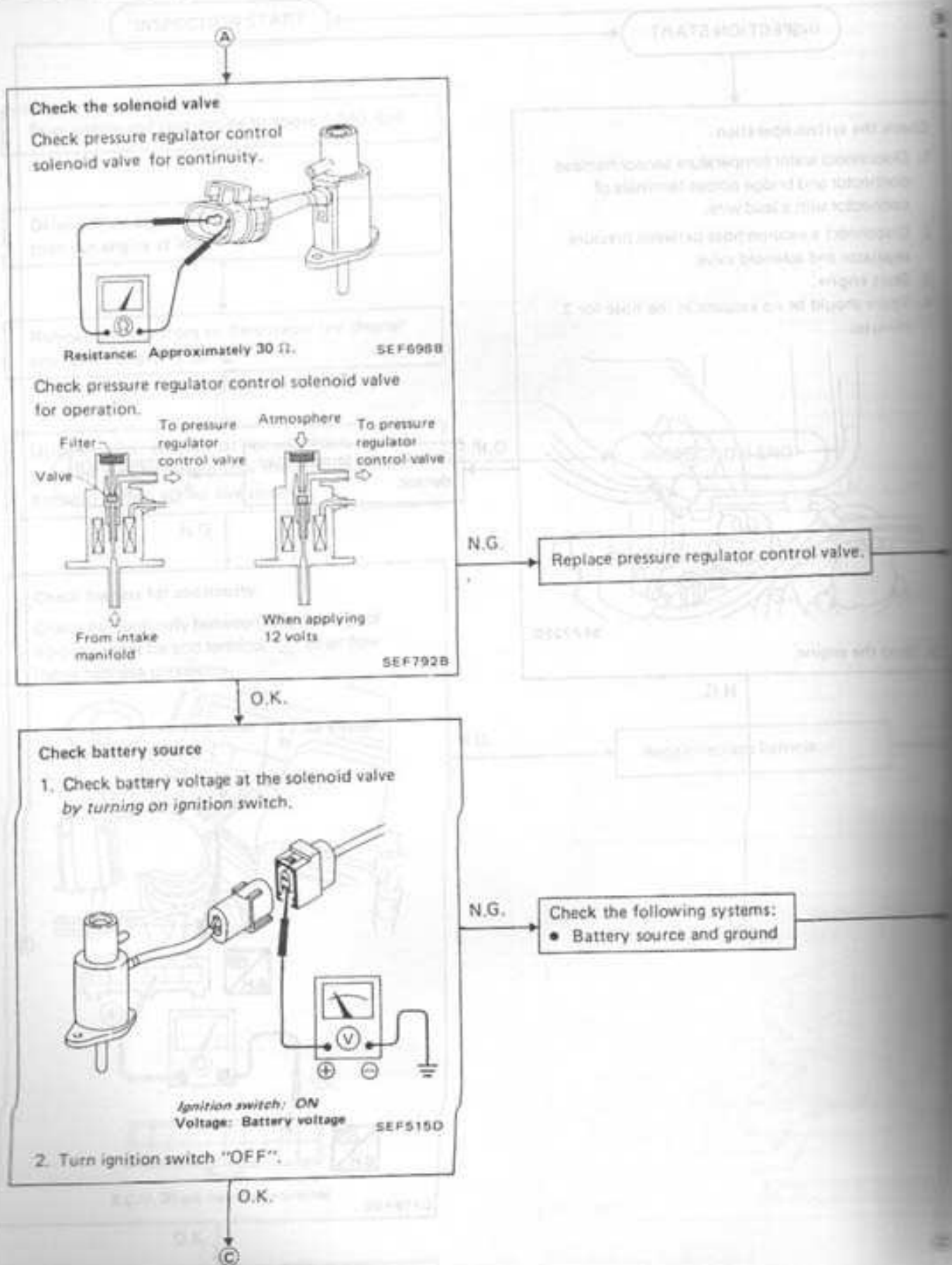
N.G.



# ELECTRONIC CONTROL SYSTEM INSPECTION

RB30E

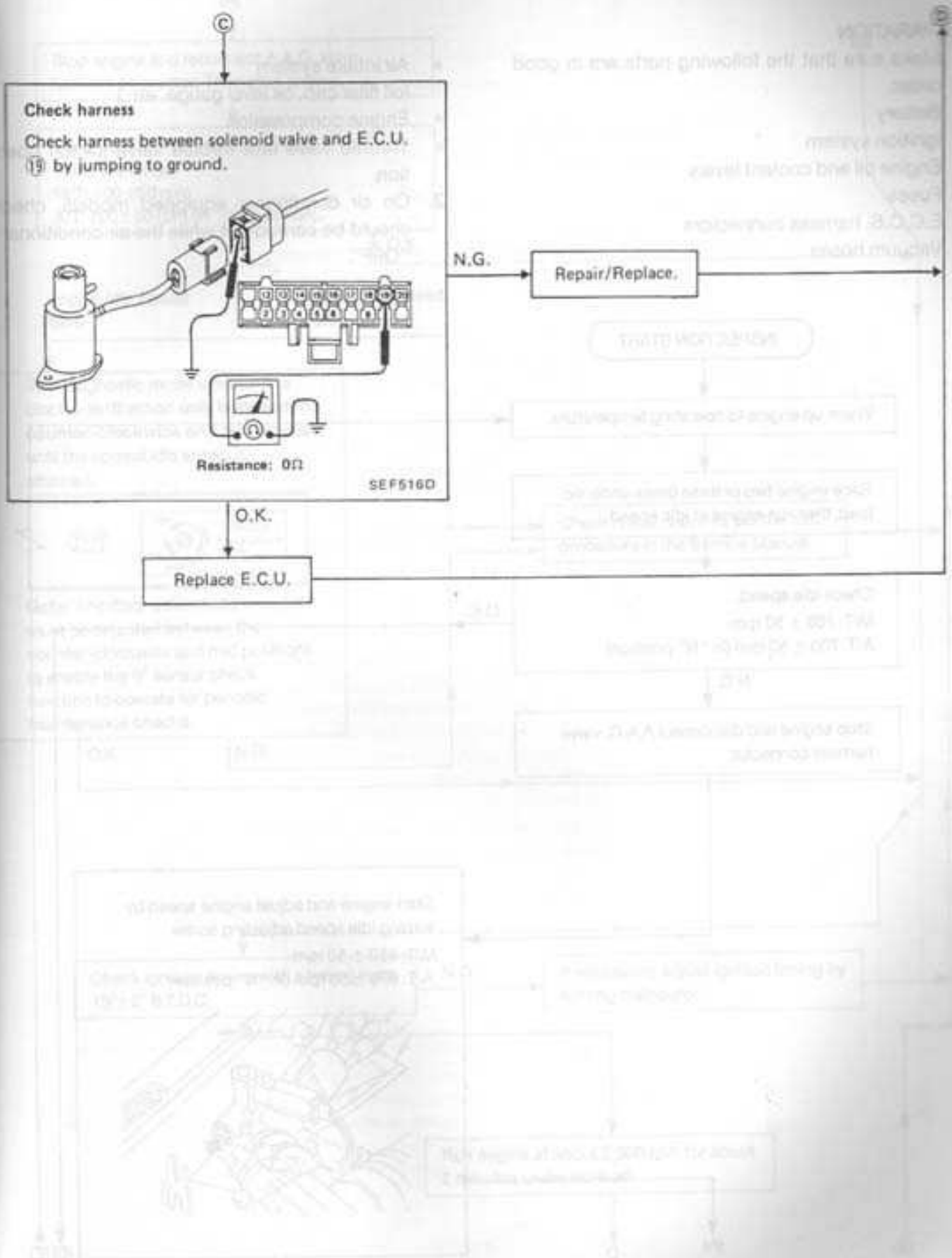
## Pressure Regulator Control Solenoid Valve (Cont'd)



# ELECTRONIC CONTROL SYSTEM INSPECTION

RB30E

## Pressure Regulator Control Solenoid Valve (Cont'd)



# TROUBLE-SHOOTING AND DIAGNOSES

## Preliminary Checks

### FLUID LEAKAGE

To detect a fluid leak:

Raise vehicle.

Clean area suspected of leaking.

Start engine, apply foot brake, place selector lever in "D" range, and wait a few minutes.

Stop engine.

Check for fresh leakage.

### FLUID CONDITION

Dark or Black Fluid:

With a burned odor

—Worn friction material.

2) Milky Pink Fluid: Water Contamination

— Road water entering through filter tube or breather.

3) Varnished Fluid, light to dark brown and tacky: Oxidation

— Over or Underfilling.

— Overheating.

If these conditions exist, check operation of A/T as specified in Road Testing. Especially if the condition as described in 2) exists, it will be necessary to wash all parts in A/T or replace A/T assembly with new one.

## Road Testing



SAT596

- Before starting road tests, install vacuum gauge.
- Perform road tests, using "Symptom" chart, as follows:

### "P" RANGE

Place selector lever in "P" range and start the engine. Stop the engine and repeat the procedure in all other ranges and neutral.

Stop vehicle on a slight upgrade and place control lever in "P" range. Release parking brake to make sure vehicle remains locked.

### "R" RANGE

Shift selector lever from "P" to "R", and note shift quality.

Drive the vehicle in reverse long enough to detect slippage or other abnormalities.

### "N" RANGE

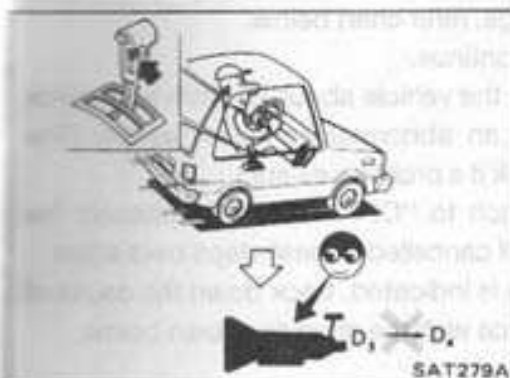
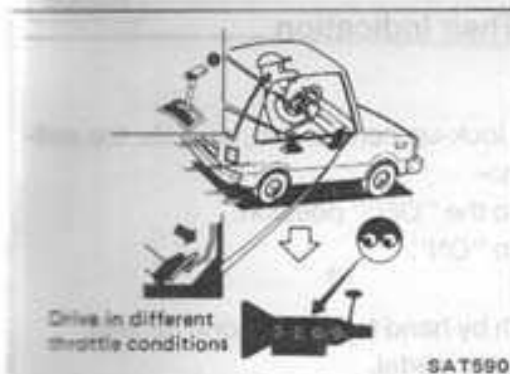
1. Shift selector lever from "R" and "D" to "N" and note quality.

2. Release parking brake with control lever in "N" range. Lightly depress accelerator pedal to make sure vehicle does not move. (When vehicle is new or soon after clutches have been replaced, vehicle may move slightly. This is not a problem.)

## Road Testing (Cont'd)

### "D" RANGE

1. Manually shift selector lever from "N" to "D" range, and note shift quality.
2. Using the shift schedule as a reference, drive vehicle in "D" range. Record, on symptom chart, respective vehicle speeds at which upshifting and downshifting occur. Check that there is not a considerable jolt when shifting gears. Also determine the timing at which shocks are encountered during shifting and which clutches are engaged.
3. Check to determine if shifting to overdrive gear cannot be made while O.D. Control/powershift switch is in the "CANCEL"/"OFF" position.



4. When vehicle is being driven in the 65 to 85 km/h in "D<sub>3</sub>" range at half to light throttle position, fully depress accelerator pedal to make sure it downshifts from 3rd to 2nd gear.
5. When vehicle is being driven in the 25 to 35 km/h ("D<sub>2</sub>" range) at half to light throttle position, fully depress accelerator pedal to make sure it downshifts from 2nd to 1st gear.

### "2" RANGE

1. While vehicle is being driven in "2" range, make sure that it does not shift into 1st or 3rd gear, despite speed changes.
2. Shift control lever to "D" range and allow vehicle to operate at 40 to 50 km/h. Then, shift to "2" range to make sure it downshifts to 2nd gear.

### "1" RANGE

1. Shift selector lever to "1" range and allow vehicle to run. Ensure that it does not upshift from 1st to 2nd gear although vehicle speed increases.
2. While vehicle is being driven in "1" range, release accelerator pedal to make sure that engine compression acts as a brake.
3. Shift selector lever to "D" or "2" range and allow vehicle to run at 20 to 30 km/h. Then, shift selector lever to "1" range to make sure the downshift to 1st gear is made.

# TROUBLE-SHOOTING AND DIAGNOSES

RB30E

## Troubles Detected by Self-diagnosing and Their Indication

### Procedure

Before trouble-shooting the lock-up control unit, operate the self-diagnosis function as follows:-

1. Turn power shift switch to the "OFF" position.
2. Turn the ignition switch to "ON".  
Do not start the engine.
3. Operate kickdown switch by hand for at least one second.

**Do not use the accelerator pedal.**

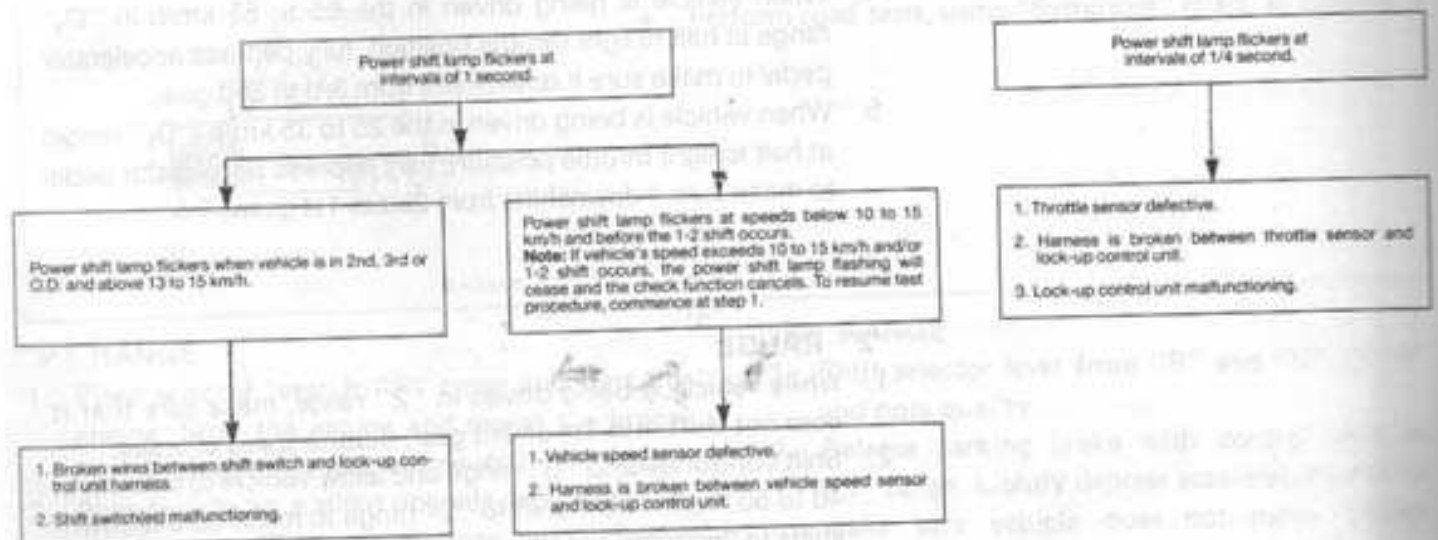
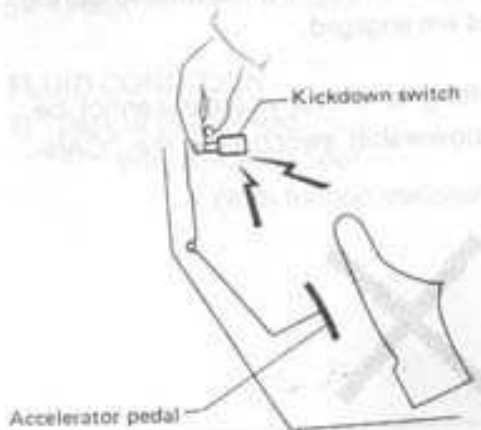
If light flickers at this stage, refer chart below.

If light does not flicker, continue.

4. Start the engine and run the vehicle about 20 km/h and check to see whether or not an abnormal condition exists. (The power shift lamp will blink if a problem exists.)

Turning the ignition switch to "OFF" or "ACC" cancels the self-diagnosis function. If cancelled, repeat steps over again.

5. If an abnormal condition is indicated, track down the cause of the problem in accordance with the chart as shown below.



# TROUBLE-SHOOTING AND DIAGNOSES

RB3

RB3

## Component Faults

### Inspection procedure 1. — Defective vehicle speed signal.

1. Connect tester to connector terminals, Nos. 11 and 22, control unit.
2. Check voltage variation by running vehicle over 1 m (3 ft) very slow speed.

Proper indication:

Voltage must vary from 0V to over 5V.

If voltage does not vary correctly, refer to checking procedure for Speedo Sensor **AND** Speedo Divider Circuit and Wiring (page EL-37).



### Inspection procedure 2. — Defective throttle sensor signal.

1. Connect tester to connector terminals, Nos. 4 and 22, of control units.
2. Measure voltage while operating accelerator pedal.

Proper indication:

Accelerator pedal in full-close throttle position: 0.4V

Accelerator pedal in full-open throttle position: 4V

If voltage does not vary correctly, but voltages at pins 3 and 4 of control unit are correct, proceed as follows:

1. Back probe harness side of throttle sensor connector plug (ignition on, engine not running).
2. Check voltage between L. green/red wire and ground while opening and closing throttle. Voltage should vary between 0.4V and 4V.
- 3a. If OK check continuity of LG/R wire between harness plug and control unit connector pin 4.
- 3b. If N.G. disconnect switch from harness and check for 5V between LG/R wire and ground and for continuity between LG wire and ground.  
If N.G. check wiring.  
If OK replace throttle sensor/switch.

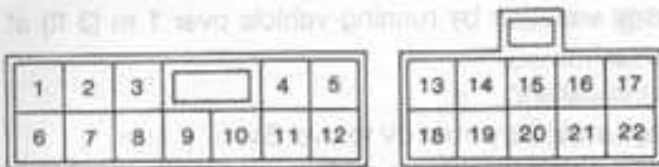
# TROUBLE-SHOOTING AND DIAGNOSES

RB30E

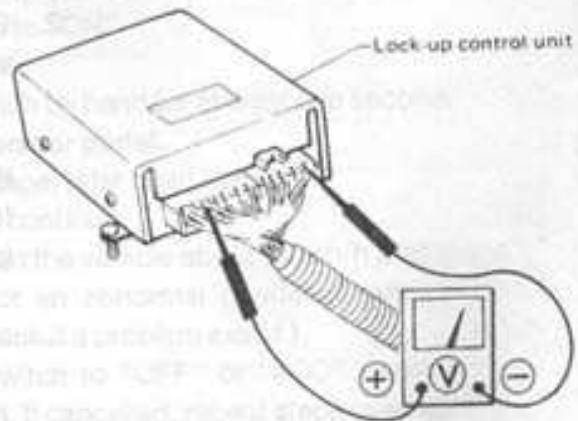
## Inspection of Lock-up Control Unit

Note: When inspecting control unit, be aware that faults can be caused by previous water damage which may not be immediately apparent at the time of testing.

Note: Terminals (14) and (20) are not used as inputs for the lock-up control unit. Early production vehicles have a wire terminated at pin (14), however it is not necessary to check this wiring when performing control unit inspection.



Check voltage between No. 22 terminal (Ground) and each terminal in the following table using tester.



Terminal No.	Wire Colour	Component signal	Test method	Required result
1	PU/W	Downshift solenoid	Depress and release accelerator pedal	0V — pedal depressed 12V — pedal released
2	GR/R	Lock-up solenoid	Drive vehicle in "D" and "2" at constant speeds with less than half throttle	Above 75 kph in "D" — 0V Below 75 kph in "D" — 12V Above 60 kph in "2" — 0V Below 60 kph in "2" — 12V
3	R	Throttle sensor (power source)	Depress and release accelerator pedal	5V at all times
4	LG/R	Throttle sensor	Operate accelerator pedal with engine stopped, ignition on	Full throttle 0.4V Throttle closed 4V
5	G	Throttle sensor (ground)	Use $\Omega$ meter	Check continuity to ground
6	L/R	O.D. cancel solenoid	Operate power shift switch	Powershift on — 0V Powershift off — 12V

# TROUBLE-SHOOTING AND DIAGNOSES

RB30E

## Inspection of Lock-up Control Unit (cont.)

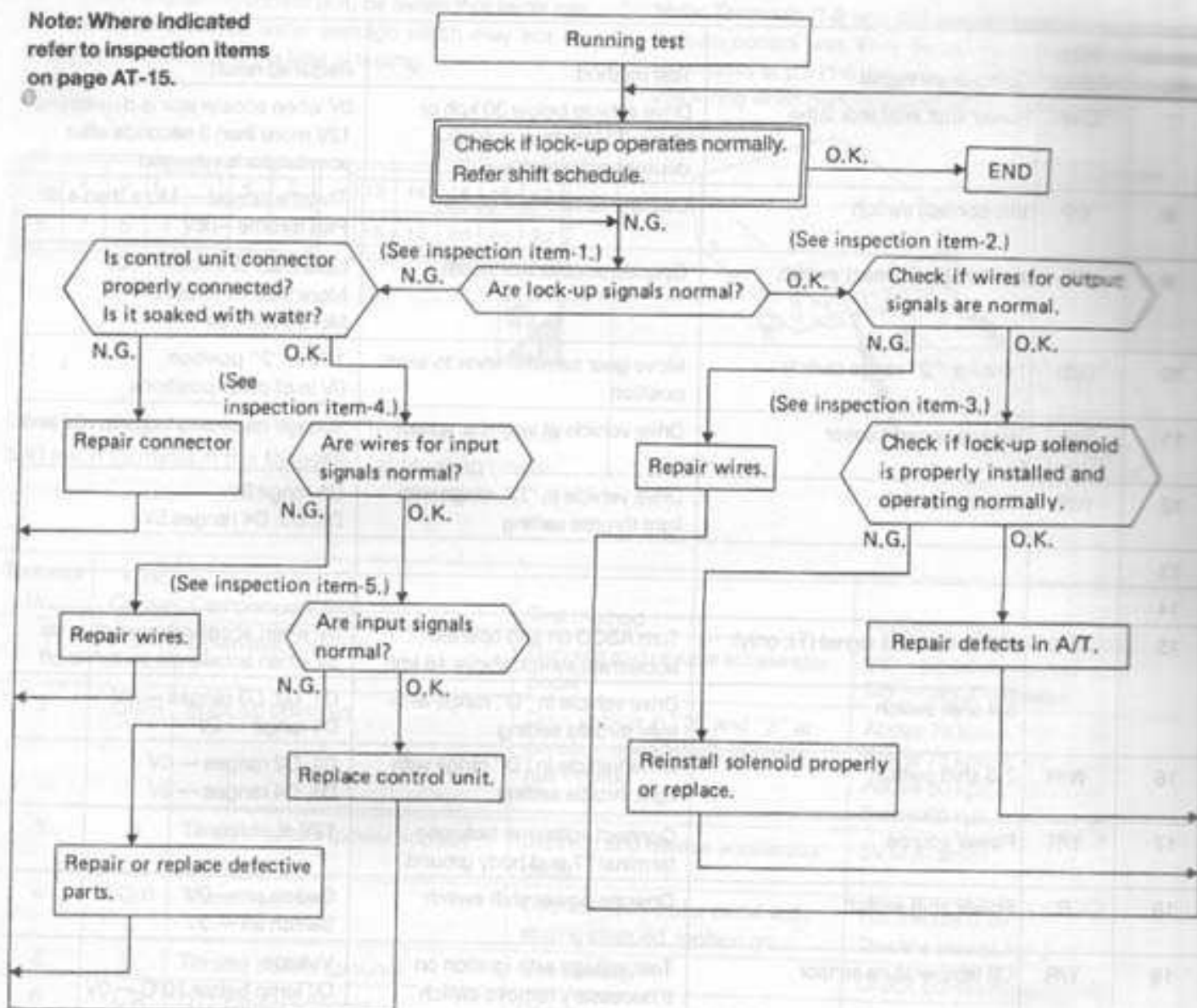
Terminal No.	Wire Colour	Component signal	Test method	Required result
7	L/W	Power shift indicator lamp	Drive vehicle below 30 kph or above 70 kph then quickly depress accelerator	0V when accelerator is depressed 12V more than 3 seconds after accelerator is released
8	Y/P	Idle contact switch	Operate accelerator pedal	Throttle closed — More than 4.5V Part throttle — 0V
9	P/L	Full throttle contact switch	Operate accelerator pedal	Less than 1/4 throttle — 0V More than 1/2 throttle — More than 4.8V
10	G/B	Inhibitor "2" range switch	Move gear selector lever to each position	12V in "2" position 0V in all other positions
11	W/L	Vehicle speed sensor	Drive vehicle at very low speed	Voltage must vary between 0V and 5V
12	W/B	1-2 shift switch	Drive vehicle in "D" range with light throttle setting	D1 range 0V D2, D3, D4 ranges 5V
13				
14				
15	W/G	ASCD O.D. cut signal (T.I. only)	Turn ASCD on and operate accelerate switch above 48 kph	0V when accelerate switch is on 5V when accelerate switch is off
		3-4 shift switch	Drive vehicle in "D" range with light throttle setting	D1, D2, D3 ranges — 0V D4 range — 5V
16	W/R	2-3 shift switch	Drive vehicle in "D" range with light throttle setting	D1, D2 ranges — 0V D3, D4 ranges — 5V
17	Y/R	Power source	Connect voltmeter between terminal 17 and body ground	12V at all times
18	R	Power shift switch	Operate power shift switch	Switch on — 0V Switch off — 5V
19	Y/R	Oil temperature sensor	Test voltage with ignition on If necessary remove switch Conduct continuity test	Voltage Oil temp below 10°C — 0V Oil temp above 20°C — 5V Continuity Below 10°C — Above 20°C —
20				
21	OR	Kickdown switch	Operate accelerator with engine off, ignition on	Full throttle — 0V Other throttle position — 5V
22	B	Ground		



# TROUBLE-SHOOTING AND DIAGNOSES

## Inspection of Lockup Control (Cont'd)

Note: Where indicated refer to inspection items on page AT-15.



# TROUBLE-SHOOTING AND DIAGNOSES

RE30E

## Inspection of Lockup Control (Cont'd)

### INSPECTION POINTS

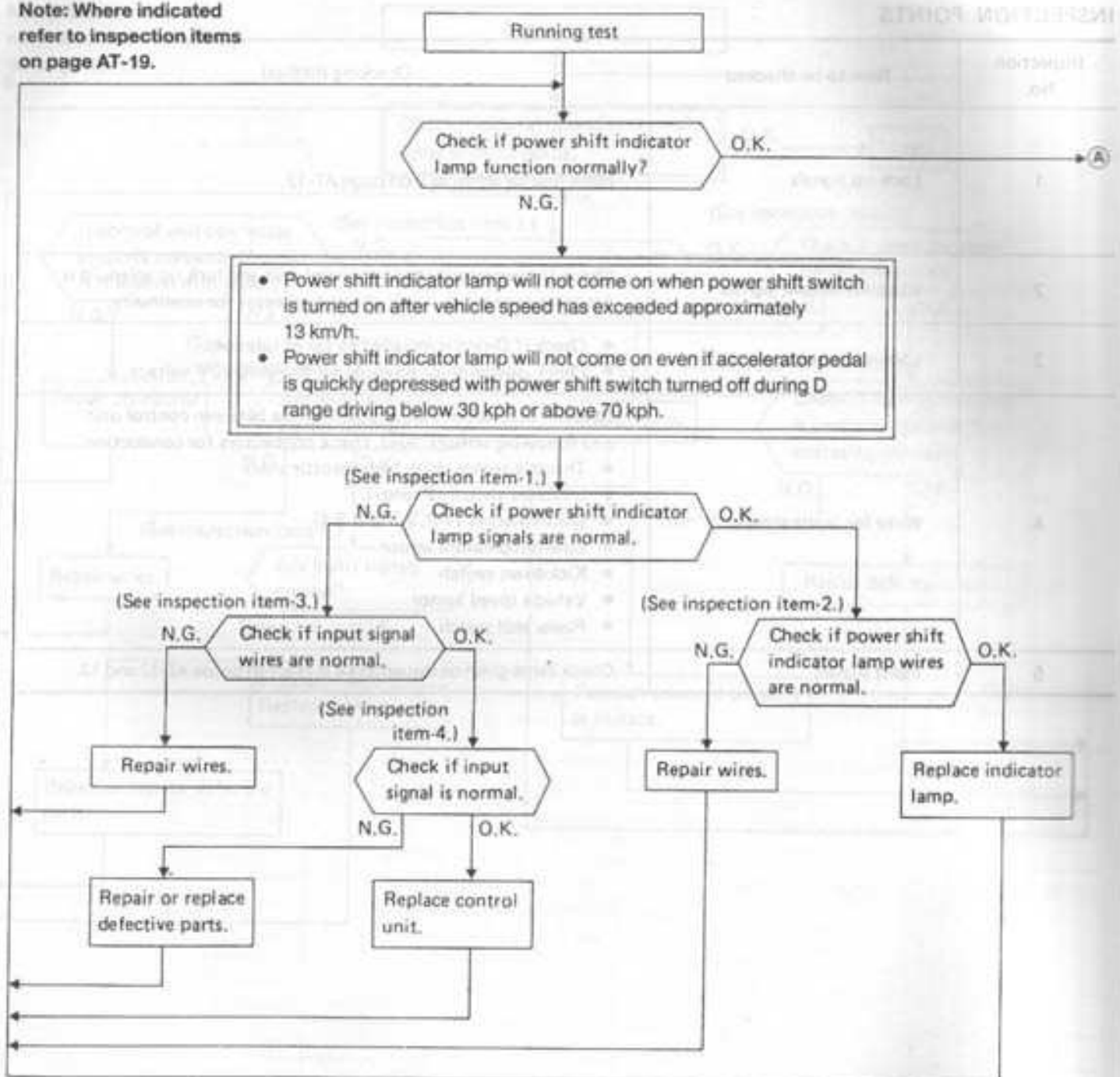
Inspection No.	Item to be checked	Checking method
1	Lock-up signals	Refer test for terminal 2 on page AT-12.
2	Wires for output signals	Check if connector between control unit and lock-up solenoid is properly connected. Also, check connector for continuity.
3	Lock-up solenoid	<ul style="list-style-type: none"> <li>• Check if O-ring is installed to tip of solenoid.</li> <li>• Check operation of solenoid by applying 12V voltage.</li> </ul>
4	Wires for input signals	<p>Check if connections are properly made between control unit and following sensors. Also, check connectors for conduction.</p> <ul style="list-style-type: none"> <li>• Throttle sensor (idle, high-throttle side)</li> <li>• Inhibitor switch (2 range)</li> <li>• Shift switches (1-2, 2-3 and 3-4)</li> <li>• Low-temperature sensor</li> <li>• Kickdown switch</li> <li>• Vehicle speed sensor</li> <li>• Power shift switch</li> </ul>
5	Input signals	Check items given on inspection-4 in chart on pages AT-12 and 13.

# TROUBLE-SHOOTING AND DIAGNOSES

RB30E

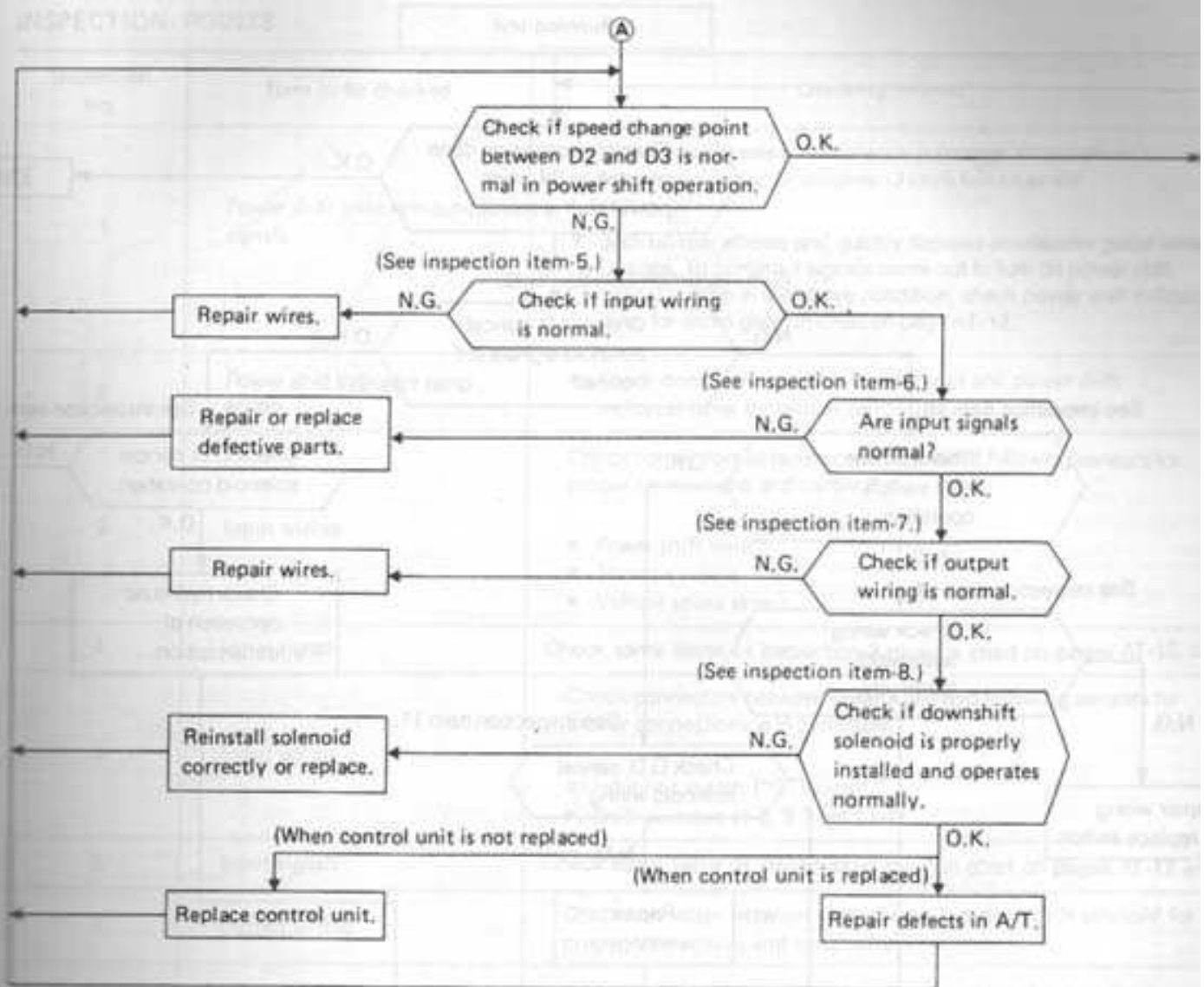
## Inspection of Shift Pattern Change Control

Note: Where indicated refer to inspection items on page AT-19.



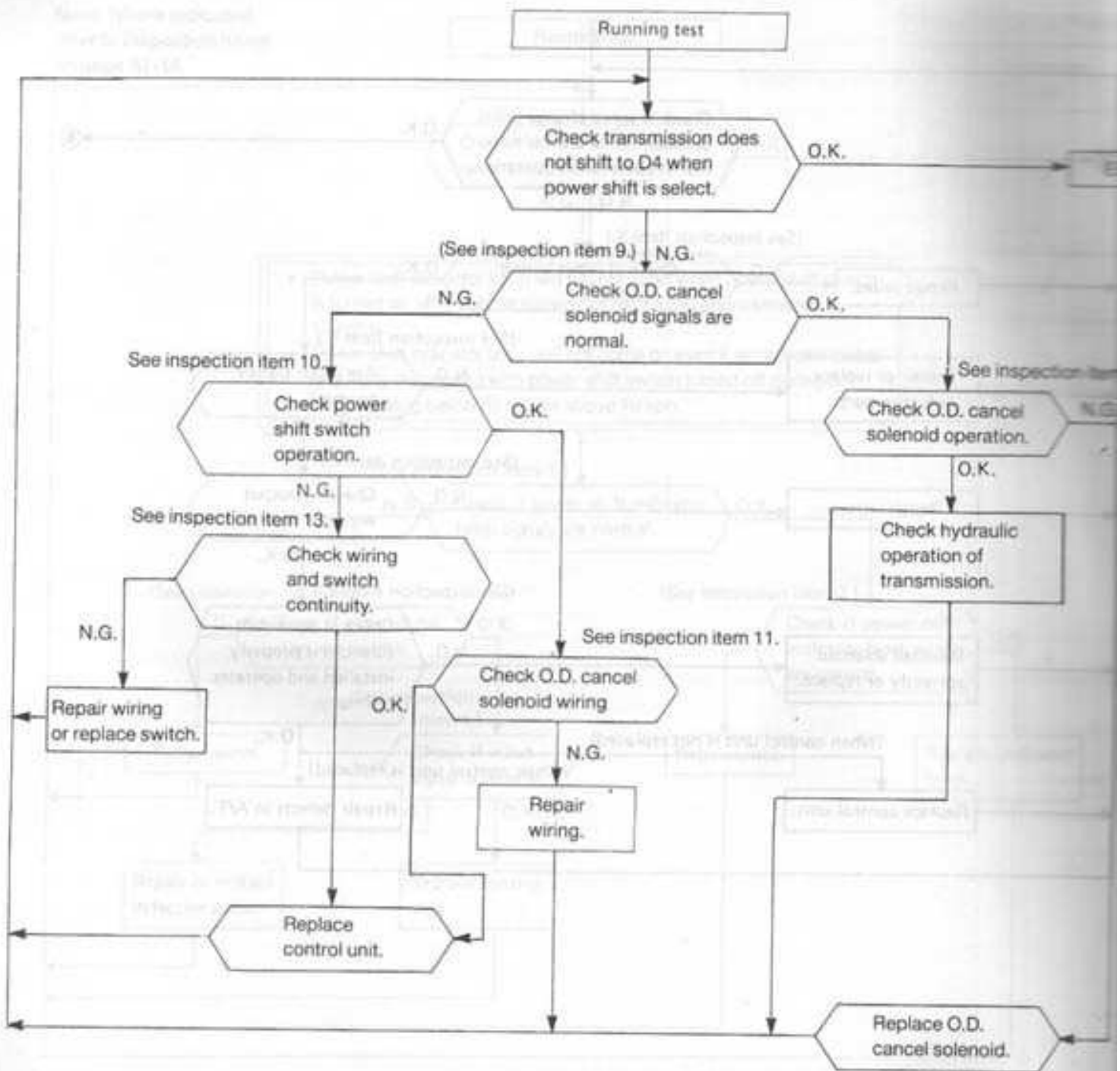
# TROUBLE-SHOOTING AND DIAGNOSES

## Inspection of Shift Pattern Change Control (Cont'd)



# TROUBLE-SHOOTING AND DIAGNOSES

## Inspection of Shift Pattern Change Control (Cont'd)



# TROUBLE-SHOOTING AND DIAGNOSES

## Inspection of Shift Pattern Change Control (Cont'd)

### INSPECTION POINTS

Inspection No.	Item to be checked	Checking method
1	Power shift indicator lamp signals	<ul style="list-style-type: none"> <li>Jack up rear wheels and accelerate in D range. When vehicle speed goes over approximately 13 km/h turn on power shift switch.</li> <li>Jack up rear wheels and quickly depress accelerator pedal while in D range. To confirm if signals come out to turn on power shift indicator lamp in the above condition, check power shift indicator lamp for items given in chart on page AT-12.</li> </ul>
2	Power shift indicator lamp wiring	<ul style="list-style-type: none"> <li>Check connector between control unit and power shift indicator lamp for proper connection and continuity.</li> </ul>
3	Input wiring	<p>Check connectors between control unit and following sensors for proper connections and continuity.</p> <ul style="list-style-type: none"> <li>Power shift switch</li> <li>Throttle sensor</li> <li>Vehicle speed sensor</li> </ul>
4	Input signals	Check same items as inspection-3 given in chart on pages AT-12.
5	Input wiring	<p>Check connectors between control unit and following sensors for proper connections and continuity.</p> <ul style="list-style-type: none"> <li>Inhibitor switch ("2" range)</li> <li>Shift switches (1-2, 2-3, and 3-4)</li> </ul>
6	Input signals	Check same items as inspection-5 given in chart on pages AT-12.
7	Output wiring	Check connector between control unit and downshift solenoid for proper connections and continuity.
8	Downshift solenoid	<ul style="list-style-type: none"> <li>Apply 12V voltage to solenoid proper to see if it functions normally.</li> </ul>
9	Input wiring	<ul style="list-style-type: none"> <li>Check connector between control unit and 3-4 shift switch for proper connections and continuity.</li> </ul>
10	Input signals	Check item "3-4 shift switch" in chart on page AT-13.
11	Output wiring	Check connector between control unit and O.D. cancel solenoid for connections and continuity.
12	O.D. cancel solenoid	Apply 12V voltage to solenoid proper to see if it functions normally.

# TROUBLE-SHOOTING AND DIAGNOSES

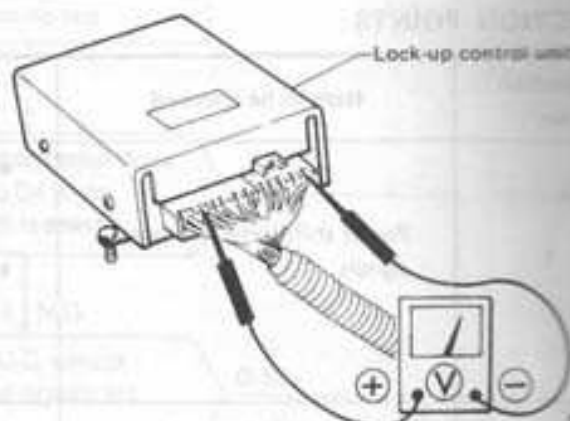
## Inspection of Kickdown Control Unit

1	2	3		4	5
6	7	8	9	10	11

13	14	15	16	17
18	19	20	21	22



Check voltage between No. 22 terminal (Ground) and each terminal in the following table using tester. Ignition on, engine not running.

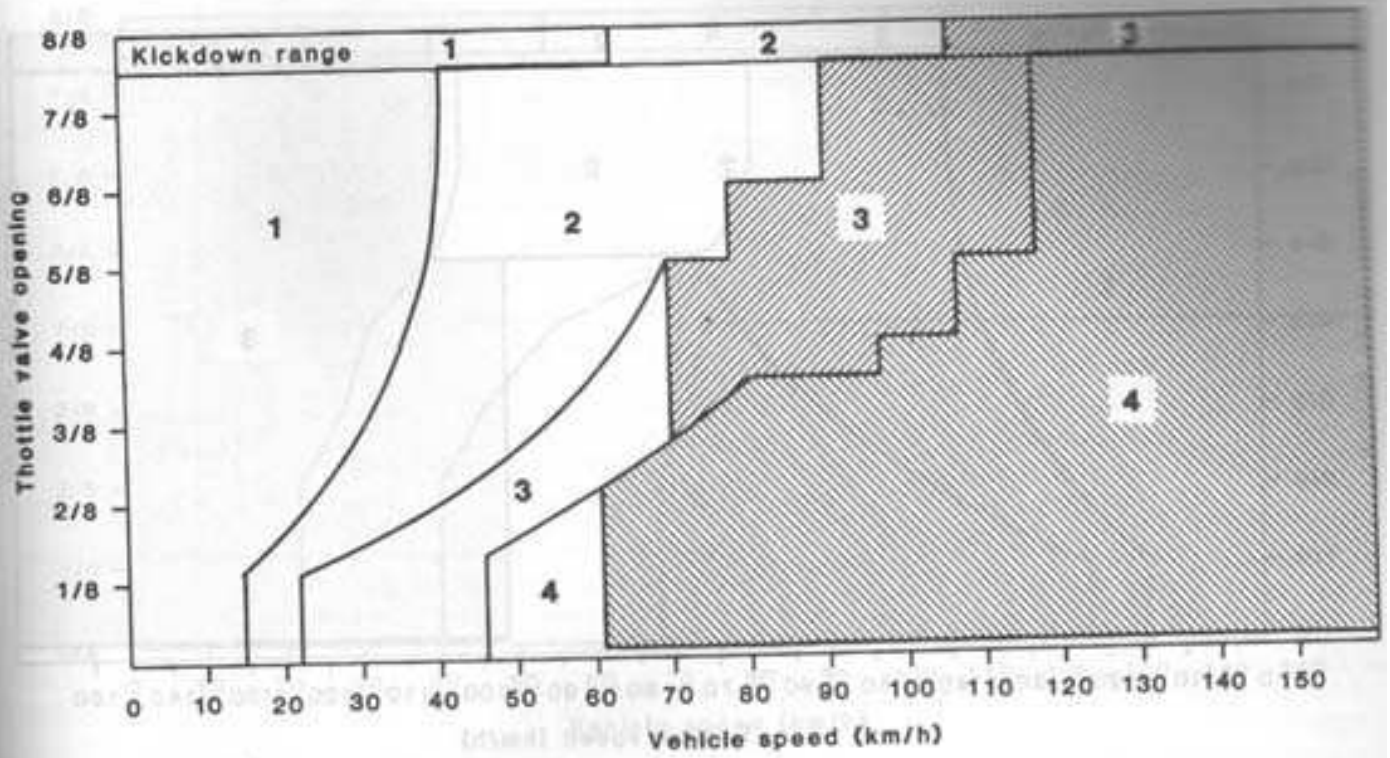


Terminal No.	Wire Colour	Component signal	Test method	Required result
1	PU/W	Kickdown solenoid ground circuit	Run vehicle above 10 kph Operate kickdown switch by hand	Switch off — Battery voltage Switch on — 0V
3	R	Throttle sensor power source		Approximately 5V
4	LG/R	Throttle sensor signal line	Depress accelerator	Approximately 4.0V
			Release accelerator	Approximately 0.4V
5	G	Throttle sensor ground circuit	Use $\Omega$ meter	Check continuity to ground
6	L/R	O.D. cancel solenoid ground circuit	Operate O.D. cancel switch	O.D. on 12v O.D. cancel 1v
11	W/L	Vehicle speed signal	Rotate prop shaft slowly	Voltage varies between 0V and 5V
17	Y	Power supply to control unit		Battery voltage
21	OR	Kickdown switch signal	Depress accelerator	0 volts
			Release accelerator	Approximately 5 volts

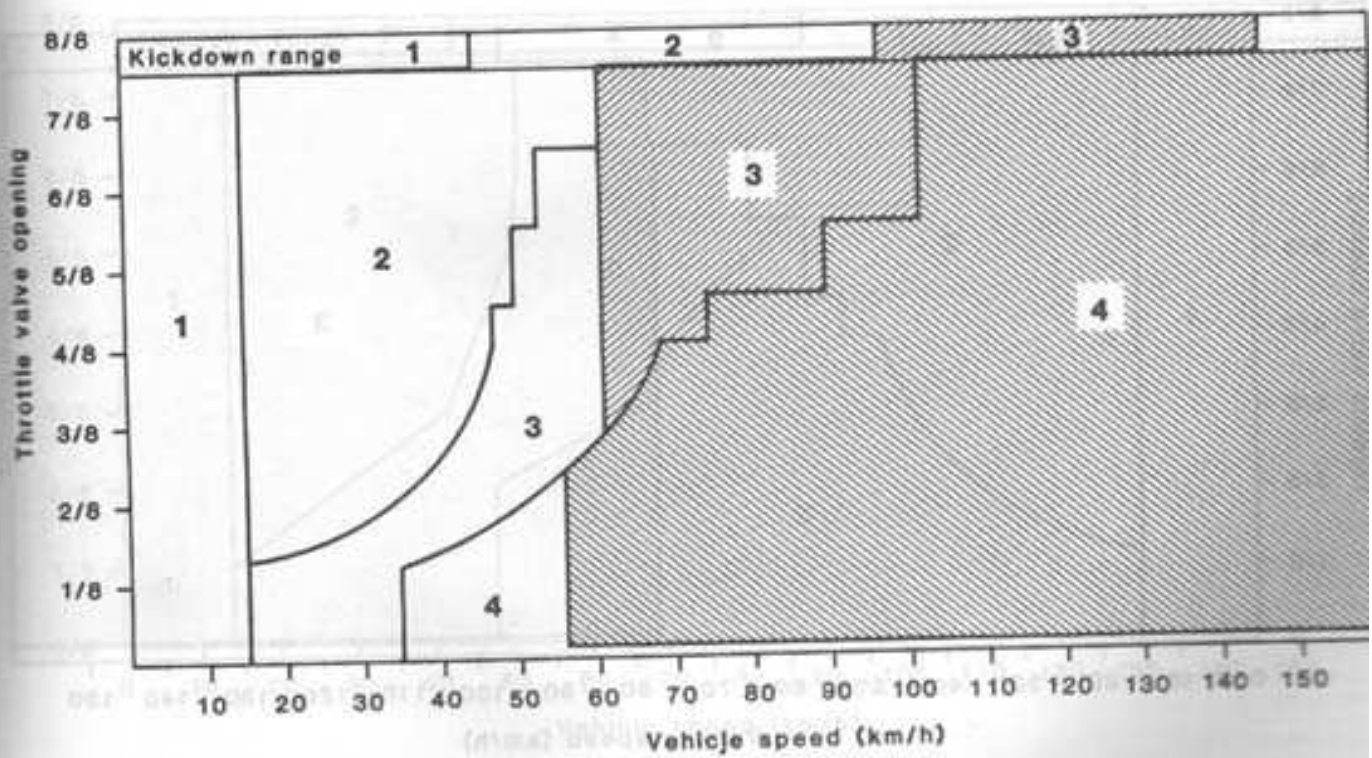
If a fault is detected in vehicle speed or throttle sensor signal, refer to page AT-11 for inspection procedure.

# SERVICE DATA AND SPECIFICATIONS

## Shift Schedule — RB30 Upshift — Powershift "OFF"



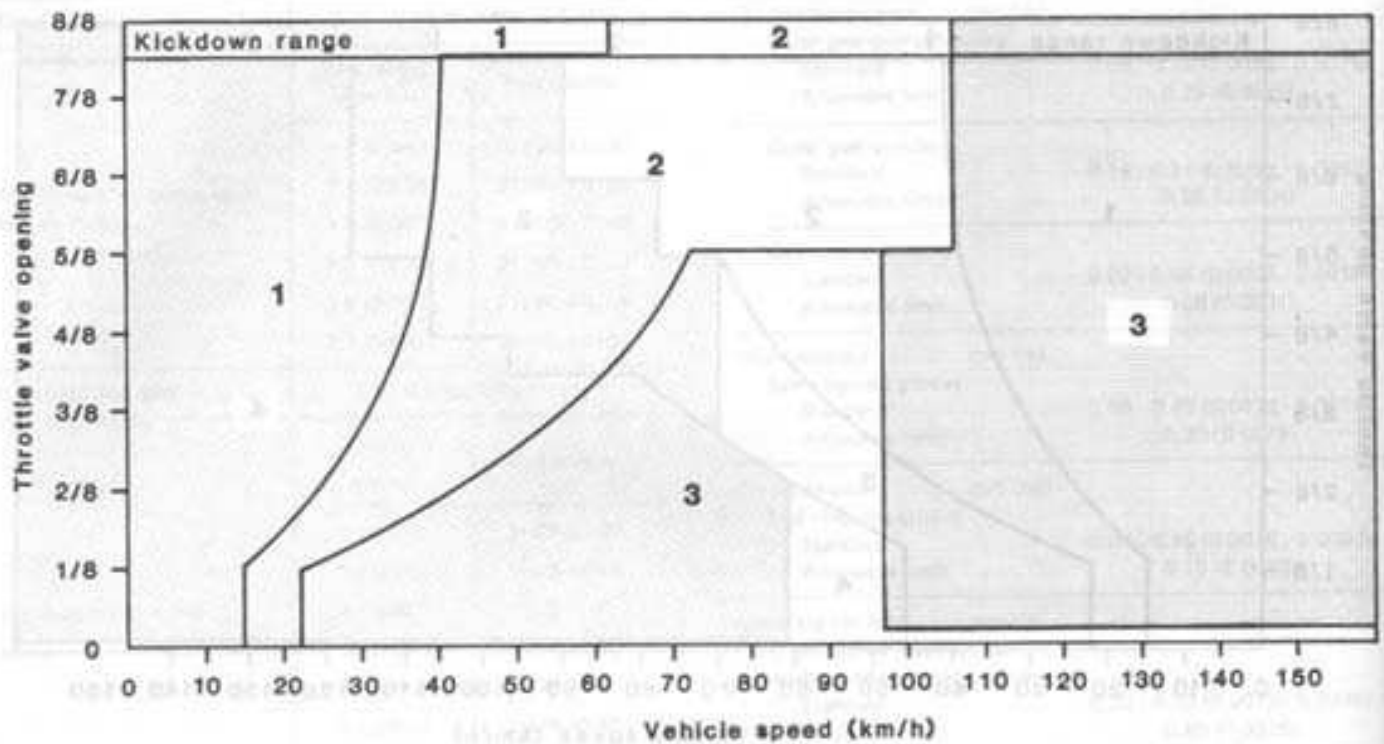
## RB30 Downshift — Powershift "OFF"



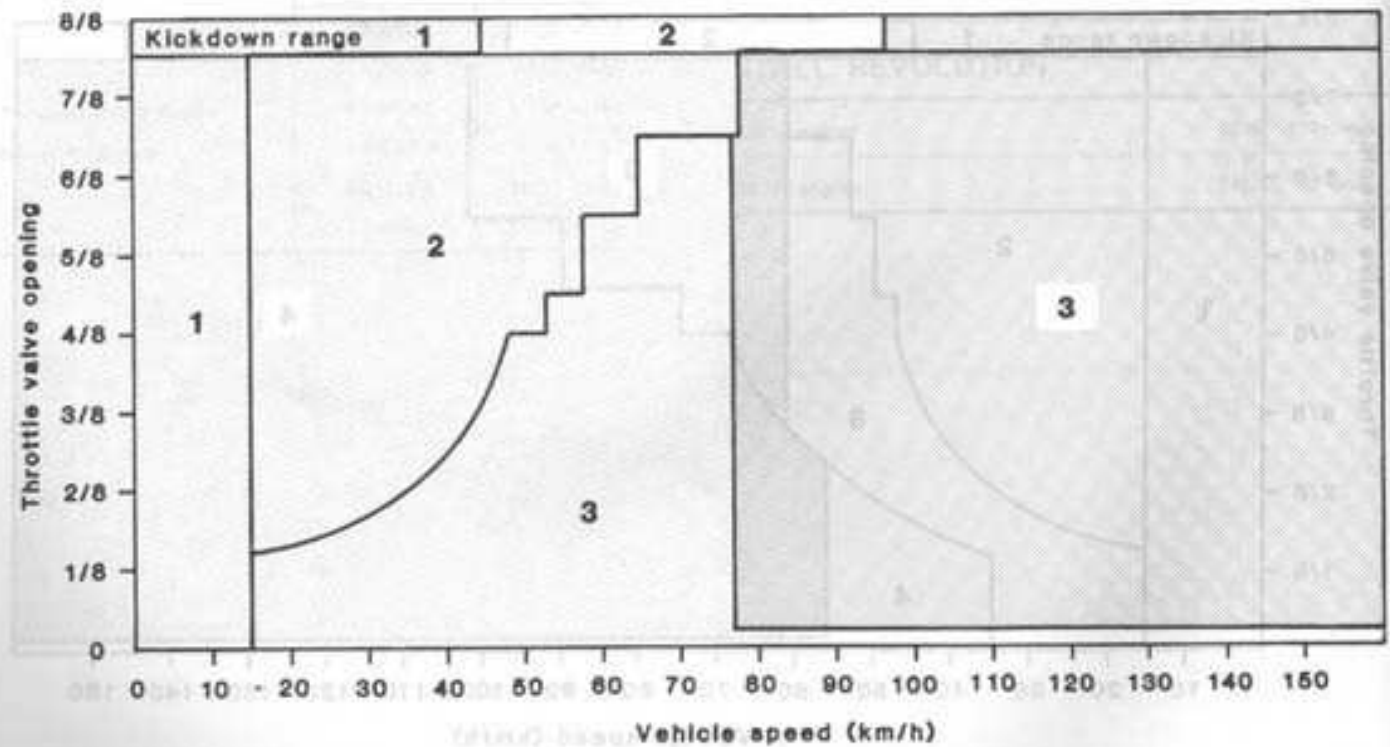


# SERVICE DATA AND SPECIFICATIONS

## Shift Schedule — RB30 Upshift — Powershift "ON"



## RB30 Downshift — Powershift "ON"



## BODY END

- When removing and installing bonnet or boot lid, place a cloth or other padding on bonnet or boot lid corners to avoid scratching vehicle body.
- When removing clip or fastener, refer to CLIP & FASTENER.
- Apply sealing compound where necessary when installing parts.

### Body Front End

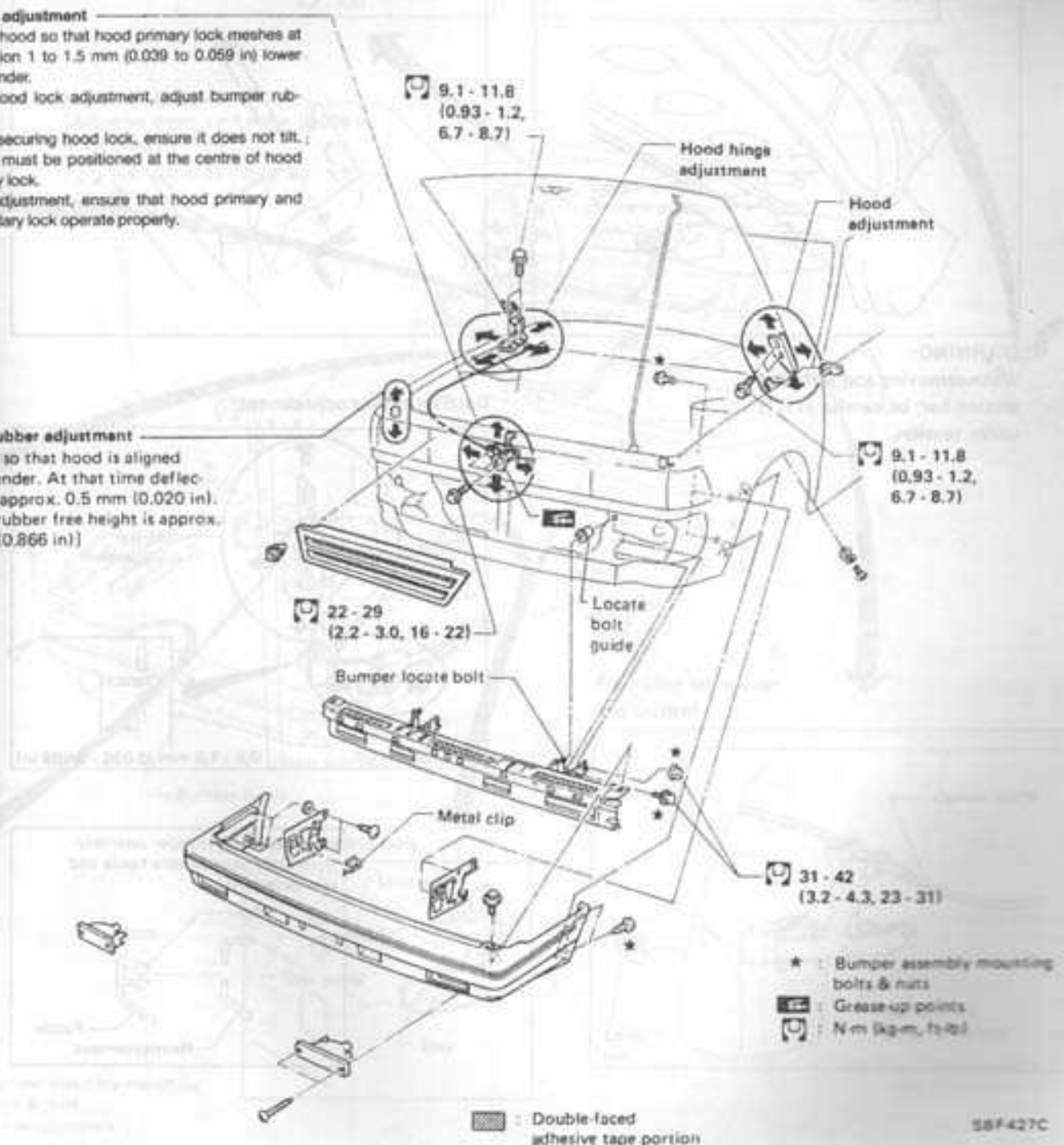
- Hood adjustment: Adjust at hinge portion.
- Hood lock adjustment: After adjusting, check hood lock control operation. Apply a coat of grease to hood lock engaging mechanism.
- Hood opener: Do not attempt to bend cable forcibly. Doing so increases effort required to unlock hood.
- Bumper fascia: It is made of plastic, so do not use excessive force and take care to keep oil away from it.
- Front grille: It is made of plastic, so do not use excessive force and take care to keep oil away from it.

#### Hood lock adjustment

- Adjust hood so that hood primary lock meshes at a position 1 to 1.5 mm (0.039 to 0.059 in) lower than fender.
- After hood lock adjustment, adjust bumper rubbers.
- When securing hood lock, ensure it does not tilt. Striker must be positioned at the centre of hood primary lock.
- After adjustment, ensure that hood primary and secondary lock operate properly.

#### Bumper rubber adjustment

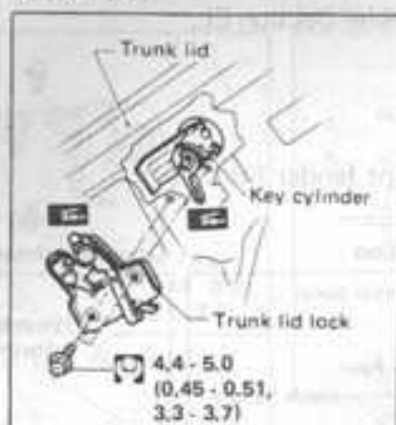
- Adjust so that hood is aligned with fender. At that time deflection is approx. 0.5 mm (0.020 in). Bumper rubber free height is approx. 22.0 mm (0.866 in).



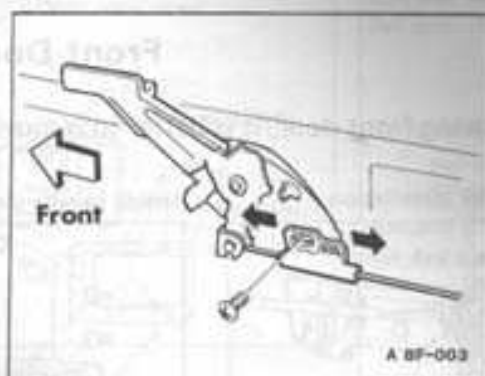
# BODY END

## Body Rear End and Opener (Cont'd)

### Boot lid lock

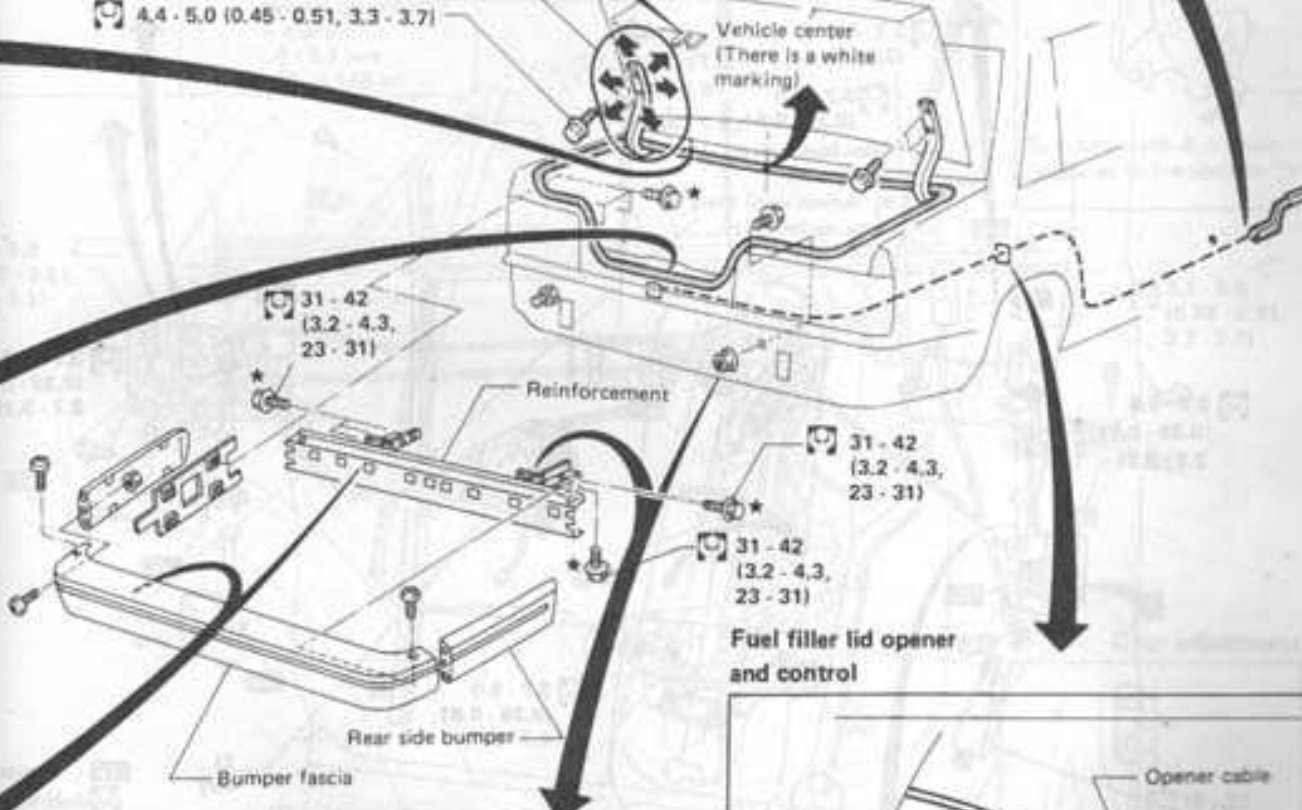


### Opener handle

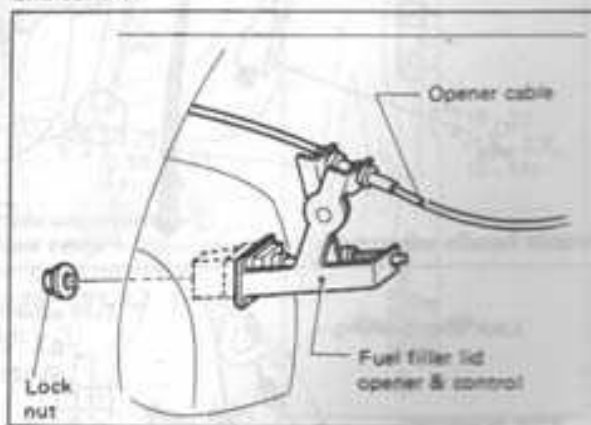
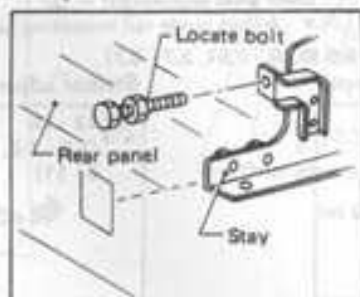


Trunk lid adjustment  
[Adjusting shim:  $t = 1.0 \text{ mm}$  (0.039 in)  
&  $2.0 \text{ mm}$  (0.079 in)]

4.4 - 5.0 (0.45 - 0.51, 3.3 - 3.7)



### Bumper locate bolt



- \* : Bumper assembly mounting bolts & nuts
- ☐ : Grease-up points
- ☑ : N.m (kg-m, ft-lb)

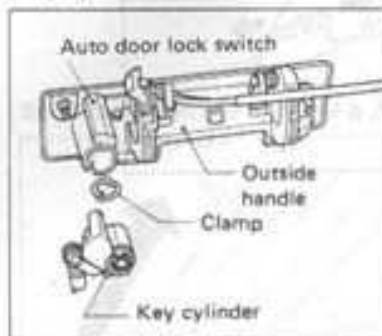
# DOOR

- When removing door, be sure not to scratch vehicle body.
- When removing clip or fastener, refer to CLIP & FASTENER.
- After adjusting door and door lock, check door lock operation.
- For electrical circuits on power locking and windows refer Section EL.

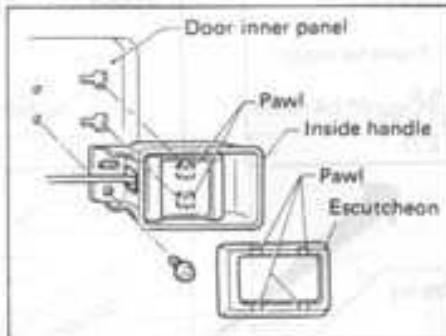
## Front Door

- When removing front door, it is better to remove front fender first.

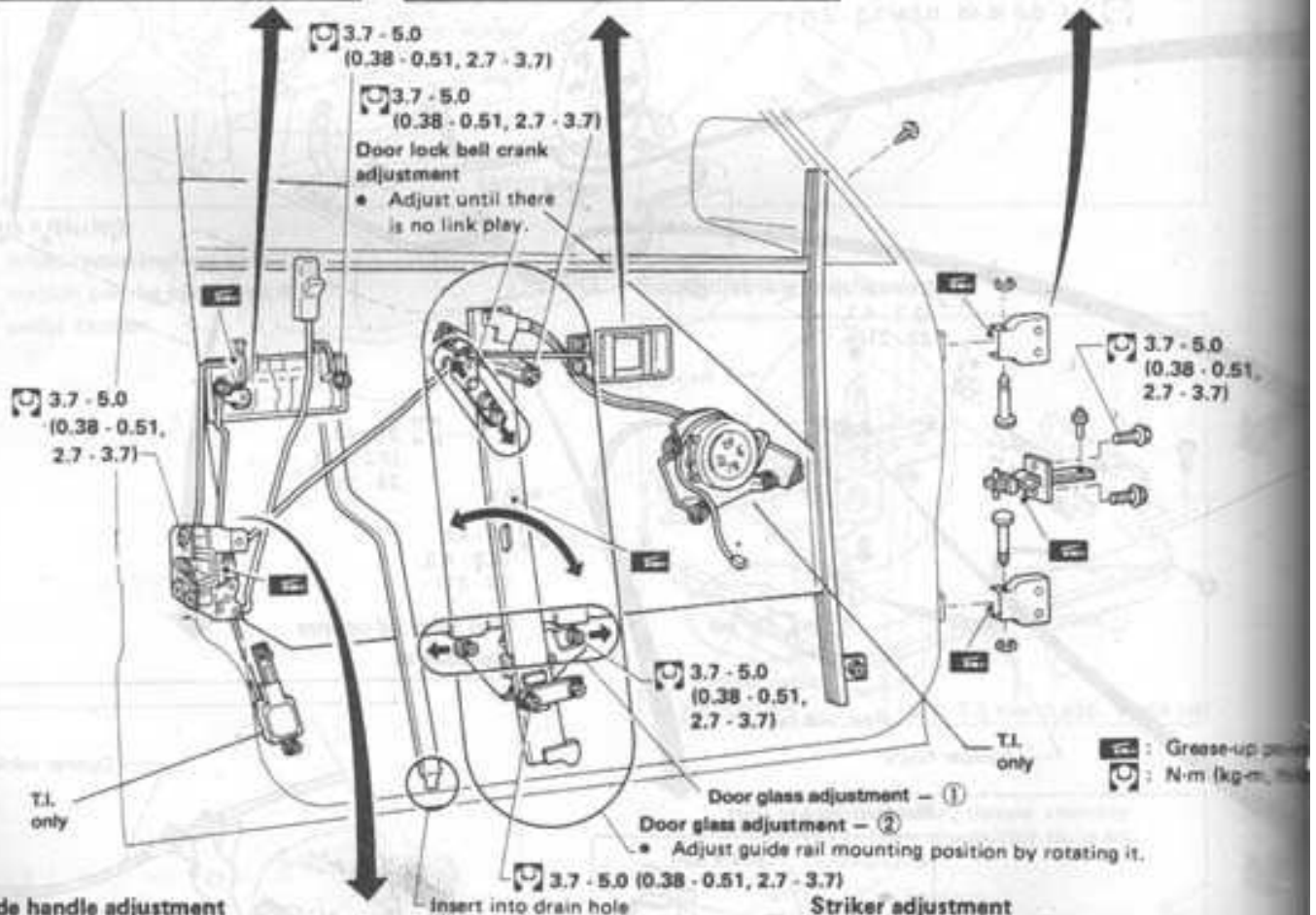
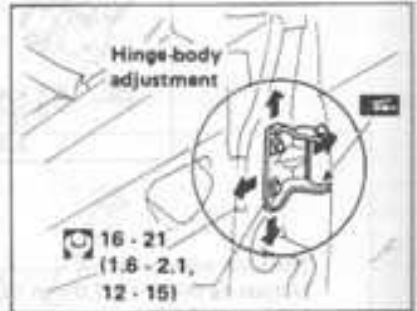
### Key cylinder installation



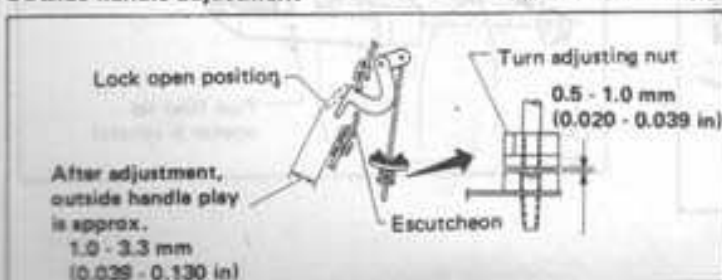
### Inside handle installation



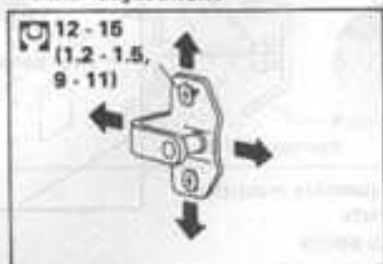
### Door adjustment



### Outside handle adjustment



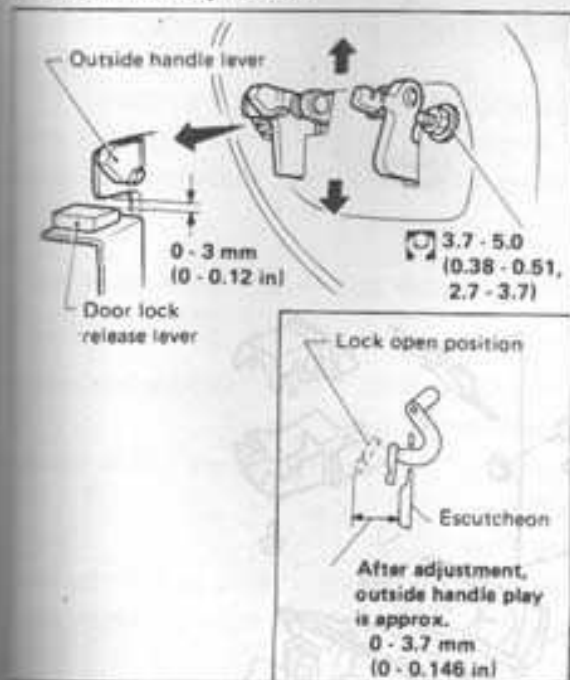
### Striker adjustment



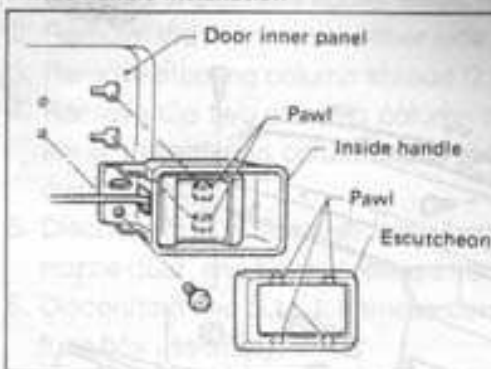
# DOOR

## Rear Door

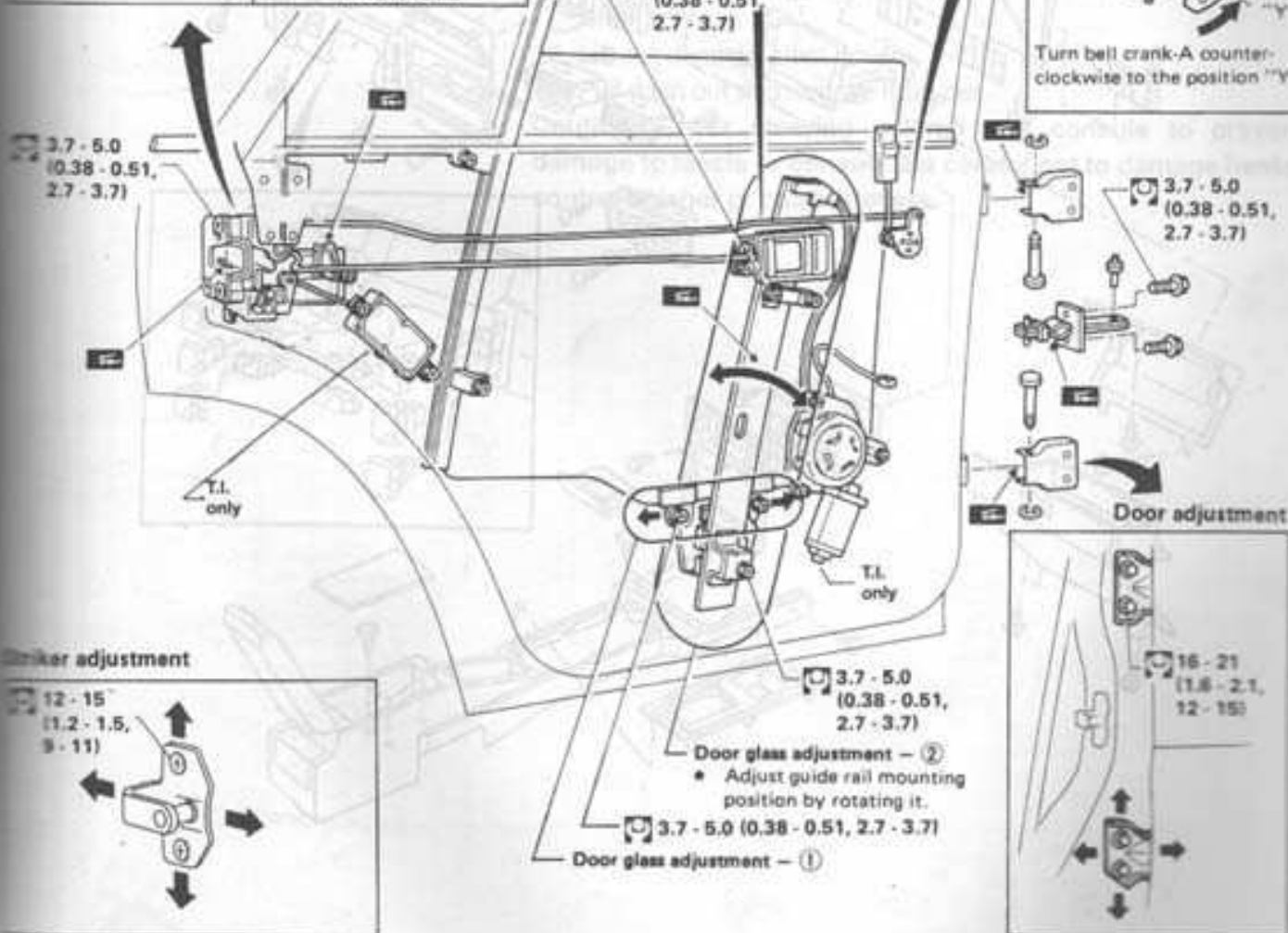
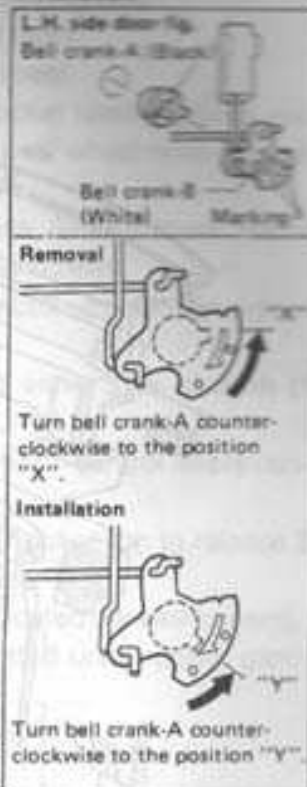
### Outside handle adjustment



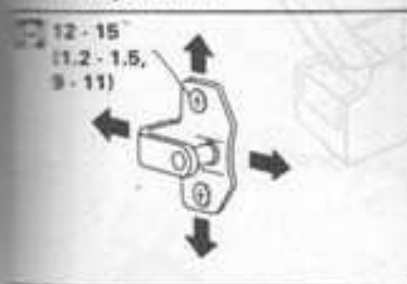
### Inside handle installation



### Bell crank removal & installation



### Striker adjustment

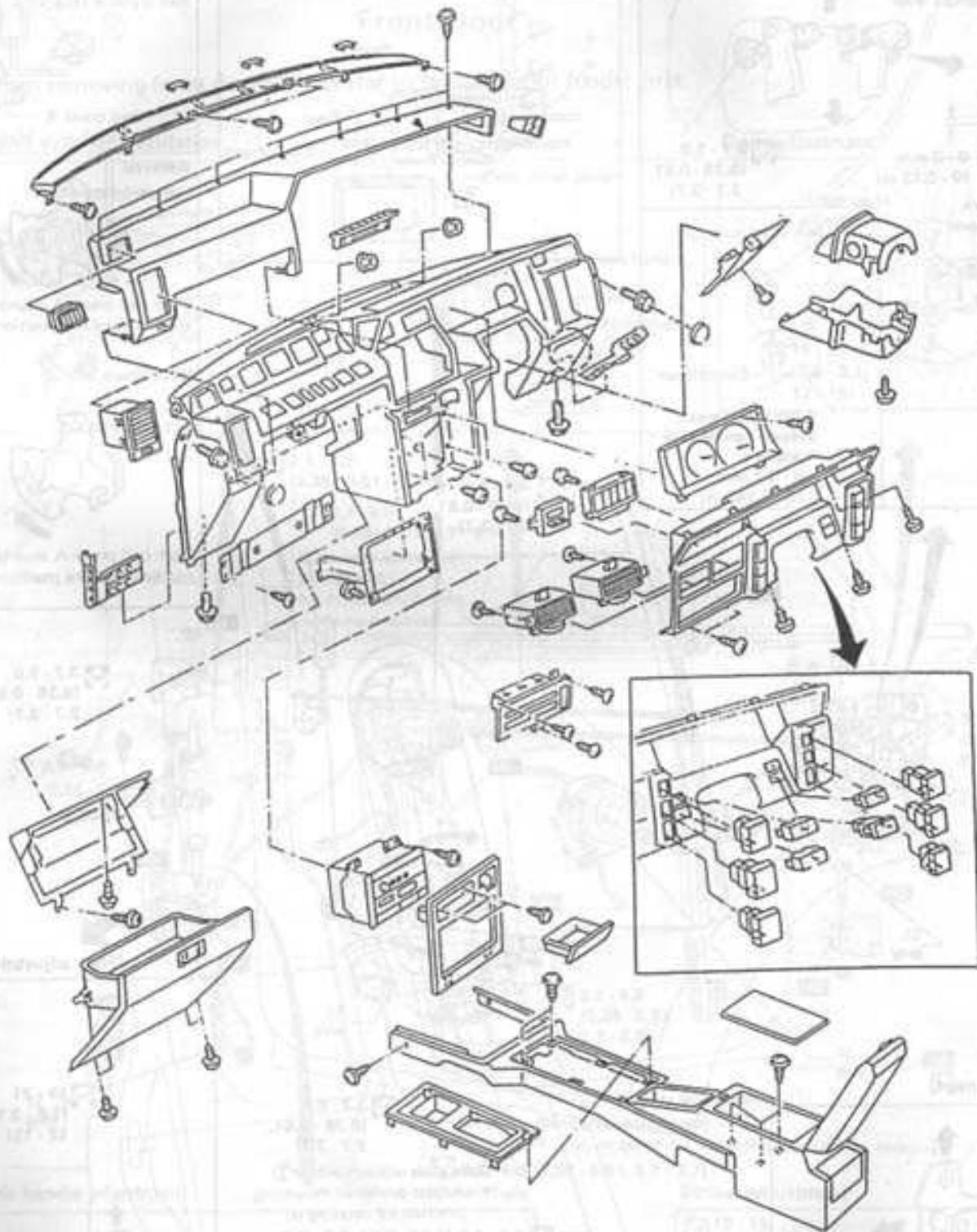


N·m (kg·m, ft·lb)  
 Grease-up points

SBF578C

# INSTRUMENT

- Some parts are made of plastic, so do not use excessive force and be careful not to damage them.



## INSTRUMENT

### Dash Assembly — Removal

1. Remove radio fascia retaining screws, tilt fascia out at top, disconnect cigarette lighter wires, remove fascia.
2. Remove the two screws either side of radio.
3. Remove steering column shroud (2 halves).
4. Remove the two steering column bracket retaining bolts and lower the steering column assembly until wheel rests on seat cushion.
5. Disconnect R.H. footwell lamp harness, remove lower heater nozzle duct, and bonnet release handle screws.
6. Disconnect two S.M.J. harness connectors from lower side of fuse box assembly.
7. Remove two dash retaining bolts at either side of dash (1 facing rearward, 1 downward).
8. Remove heater control knobs and position control levers centrally.
9. Remove both A pillar garnishes. (lever out at top to release 3 upper clips then lift to release lower clip).
10. Remove upper dash garnish (screws located beneath covers).
11. Remove two dash retaining nuts (located under upper garnish).
12. Lift out demister duct covers.
13. Pull dash out and remove from car.

**Caution:** Cover steering column and console to prevent damage to fascia or console. Be careful not to damage heater control finisher or control levers.

Fig. 12 (1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12) (13) (14) (15) (16) (17) (18) (19) (20) (21) (22) (23) (24) (25) (26) (27) (28) (29) (30) (31) (32) (33) (34) (35) (36) (37) (38) (39) (40) (41) (42) (43) (44) (45) (46) (47) (48) (49) (50) (51) (52) (53) (54) (55) (56) (57) (58) (59) (60) (61) (62) (63) (64) (65) (66) (67) (68) (69) (70) (71) (72) (73) (74) (75) (76) (77) (78) (79) (80) (81) (82) (83) (84) (85) (86) (87) (88) (89) (90) (91) (92) (93) (94) (95) (96) (97) (98) (99) (100)



Fig. 13 (1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12) (13) (14) (15) (16) (17) (18) (19) (20) (21) (22) (23) (24) (25) (26) (27) (28) (29) (30) (31) (32) (33) (34) (35) (36) (37) (38) (39) (40) (41) (42) (43) (44) (45) (46) (47) (48) (49) (50) (51) (52) (53) (54) (55) (56) (57) (58) (59) (60) (61) (62) (63) (64) (65) (66) (67) (68) (69) (70) (71) (72) (73) (74) (75) (76) (77) (78) (79) (80) (81) (82) (83) (84) (85) (86) (87) (88) (89) (90) (91) (92) (93) (94) (95) (96) (97) (98) (99) (100)

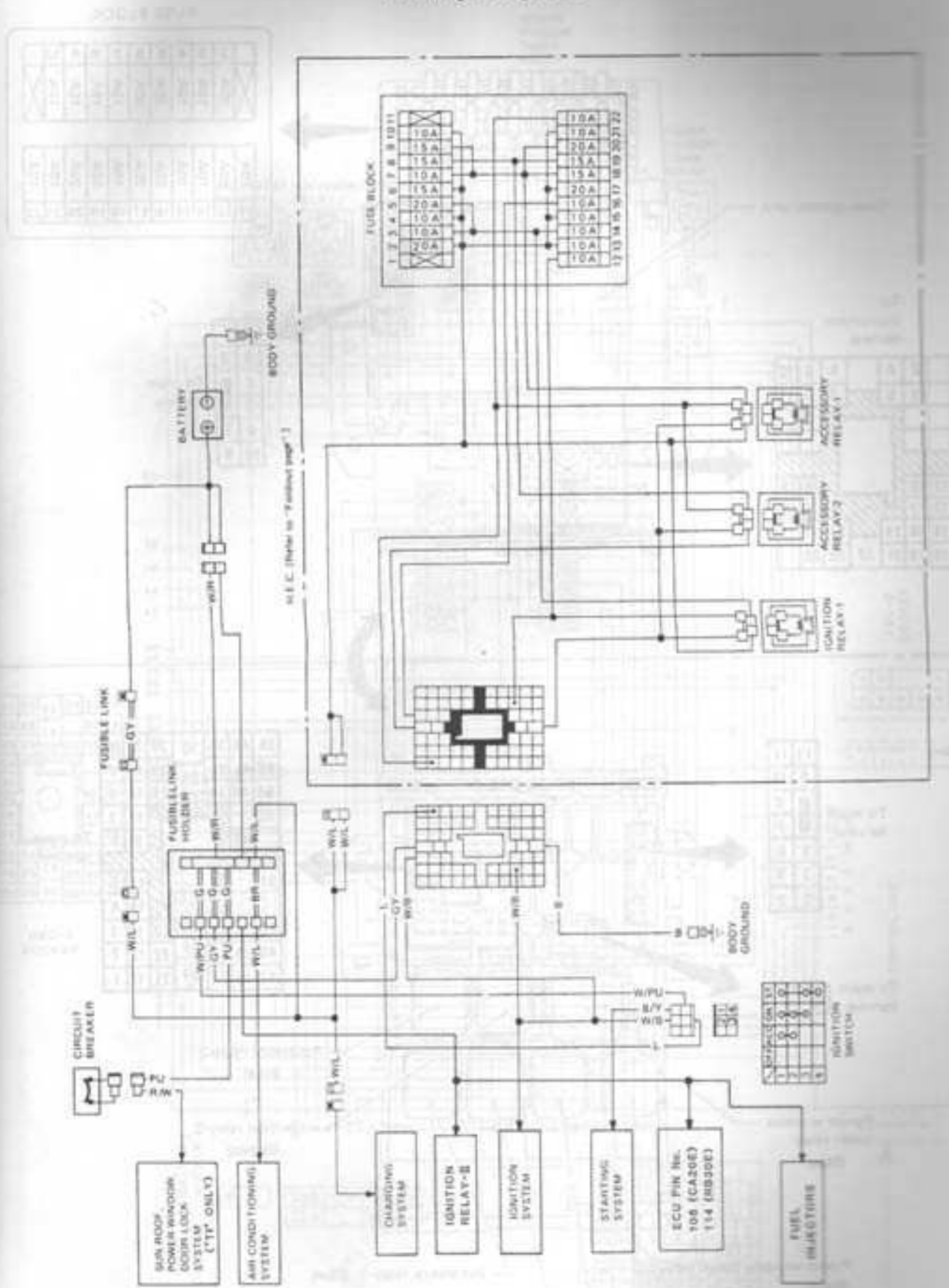


Fig. 14 (1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12) (13) (14) (15) (16) (17) (18) (19) (20) (21) (22) (23) (24) (25) (26) (27) (28) (29) (30) (31) (32) (33) (34) (35) (36) (37) (38) (39) (40) (41) (42) (43) (44) (45) (46) (47) (48) (49) (50) (51) (52) (53) (54) (55) (56) (57) (58) (59) (60) (61) (62) (63) (64) (65) (66) (67) (68) (69) (70) (71) (72) (73) (74) (75) (76) (77) (78) (79) (80) (81) (82) (83) (84) (85) (86) (87) (88) (89) (90) (91) (92) (93) (94) (95) (96) (97) (98) (99) (100)



# POWER SUPPLY ROUTING

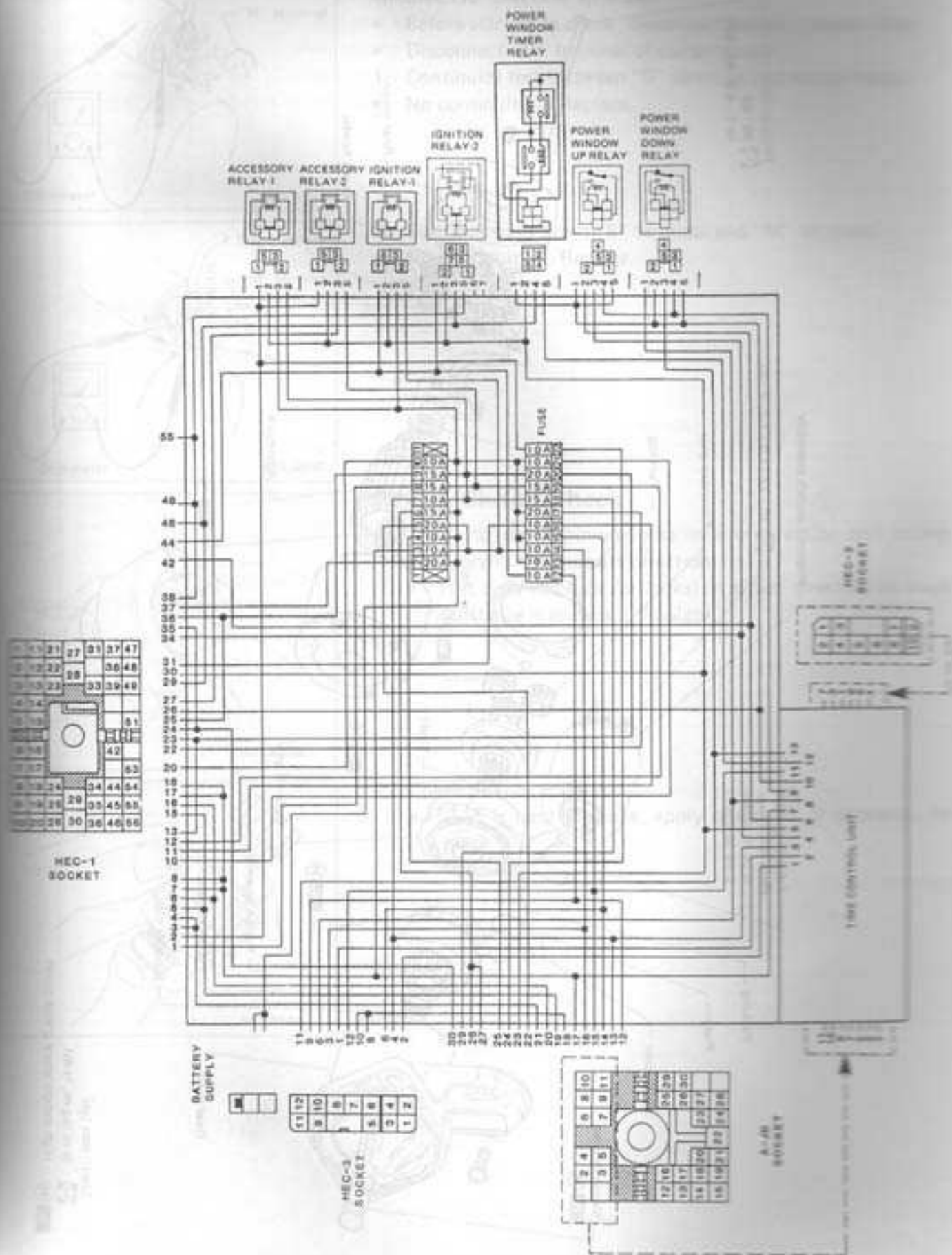
## Wiring Diagram



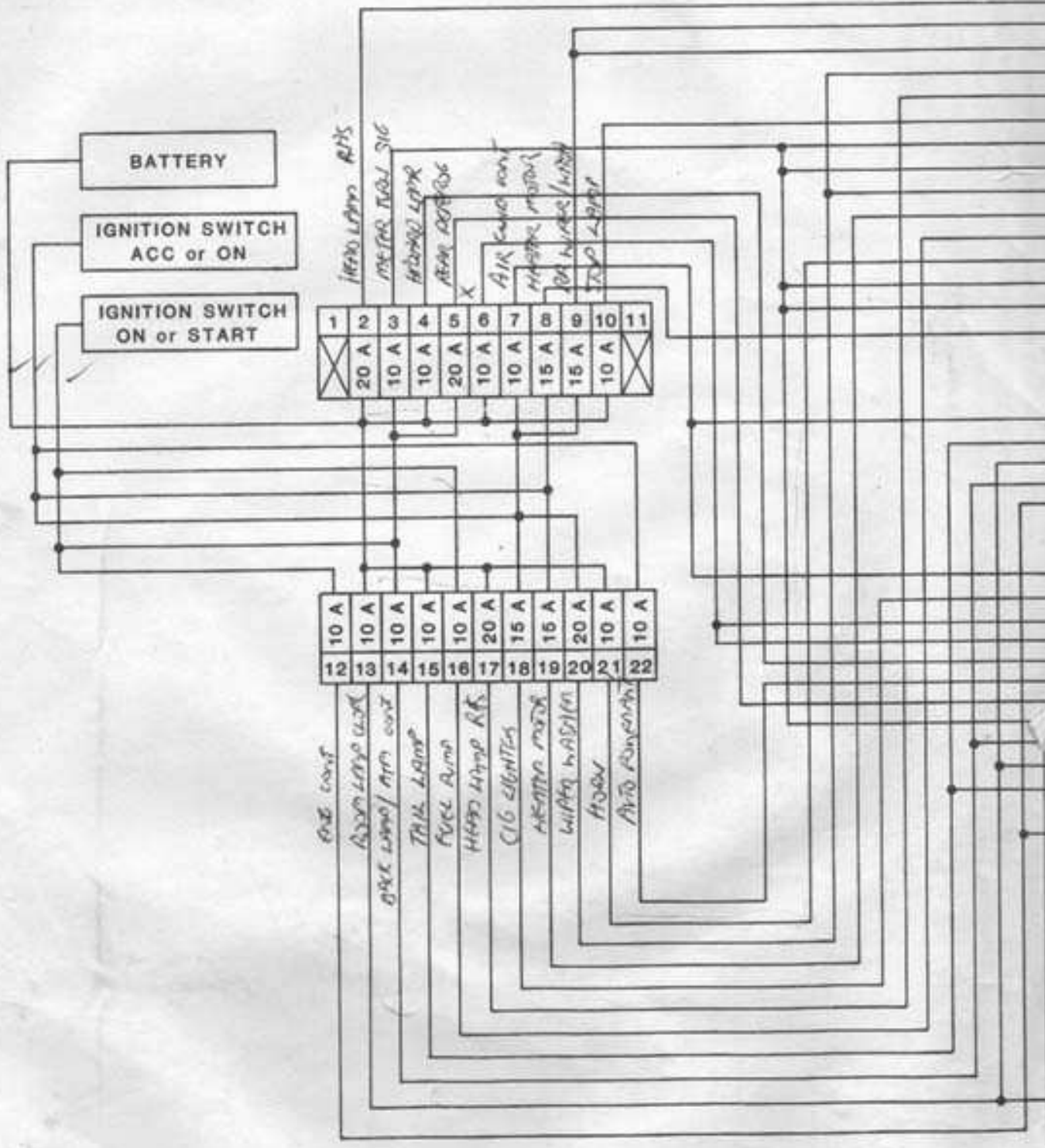


# HYBRID ELECTRIC CONTROL UNIT (H.E.C.)

## Internal Circuit



### HYBRID ELECTRIC CONTROL UNIT



(Main harness)

11	21	27	31	37	47
12	22	28		38	48
13	23		33	39	49
14					
15					51
16			42		
17					53
18	24		34	44	54
19	25	29	35	45	55
20	26	30	36	46	56

47	37	31	27	21	11	1
48	38		28	22	12	2
49	39	33		23	13	3
					14	4
51					15	5
	42				16	6
53					17	7
54	44	34		24	18	8
55	45	35	29	25	19	9
56	46	36	30	26	20	10

2	1
4	3
6	5
7	
8	
10	9
12	11

1	2
3	4
5	6
7	
8	
9	10
11	12

(Main harness)

2	4		6	8	10
3	5		7	9	11
16			25	29	
17			26	30	
18	20		23	27	
19	21	22	24	28	

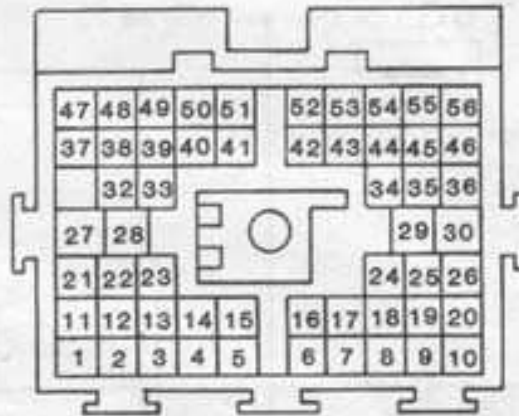
10	8	6		4	2	
11	9	7		5	3	
29	25				16	12
30	26				17	13
	27	23			20	14
	28	24	22		21	15

(Instrument harness)

(A-JB)

### SUPER MULTIPLE JUNCTION

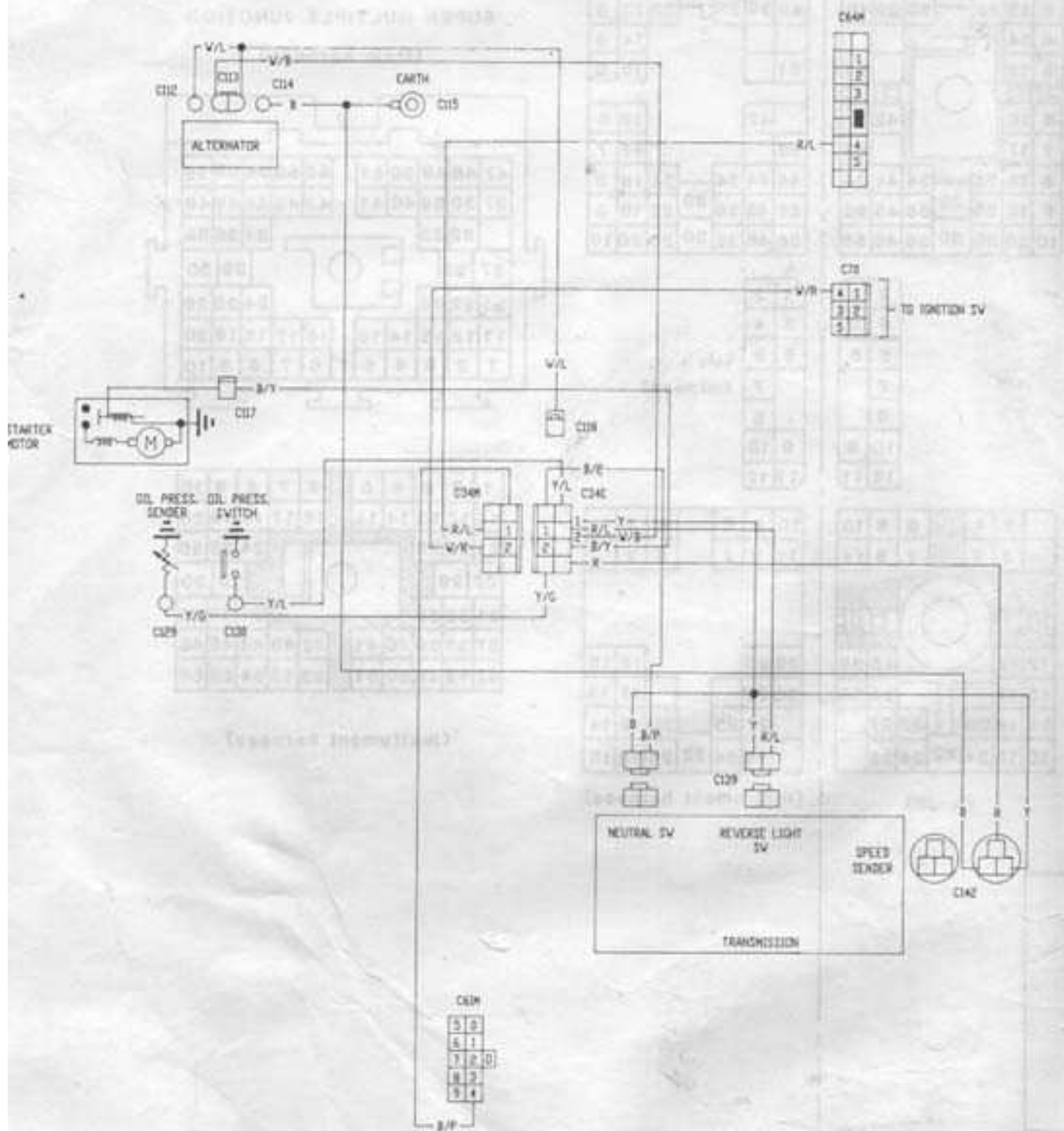
(Main harness)



1	2	3	4	5		6	7	8	9	10	
11	12	13	14	15		16	17	18	19	20	
21	22	23						24	25	26	
27	28								29	30	
31	32	33						34	35	36	
37	38	39	40	41			42	43	44	45	46
47	48	49	50	51			52	53	54	55	56

(Instrument harness)

WIRE COLOR	CODE
BLACK	B
WHITE	W
RED	R
YELLOW	Y
GREEN	G
BLUE	L
LIGHT GREEN	LG
BROWN	BR
GREY	GY
ORANGE	OR
PINK	P
PURPLE	PU
SKY BLUE	SB



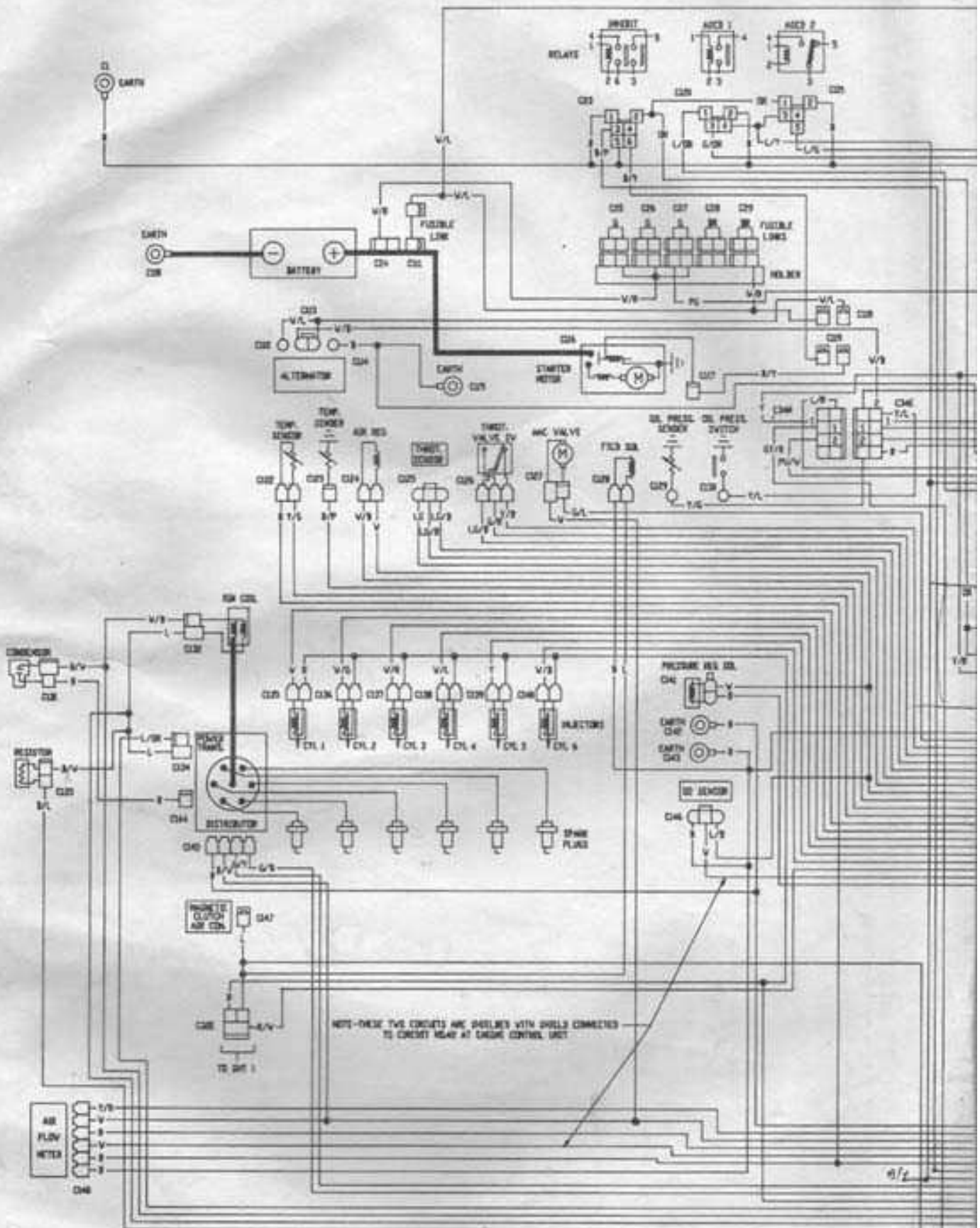
AD41 6-CYL MANUAL GEARBOX ELECTRICAL SCHEMATIC

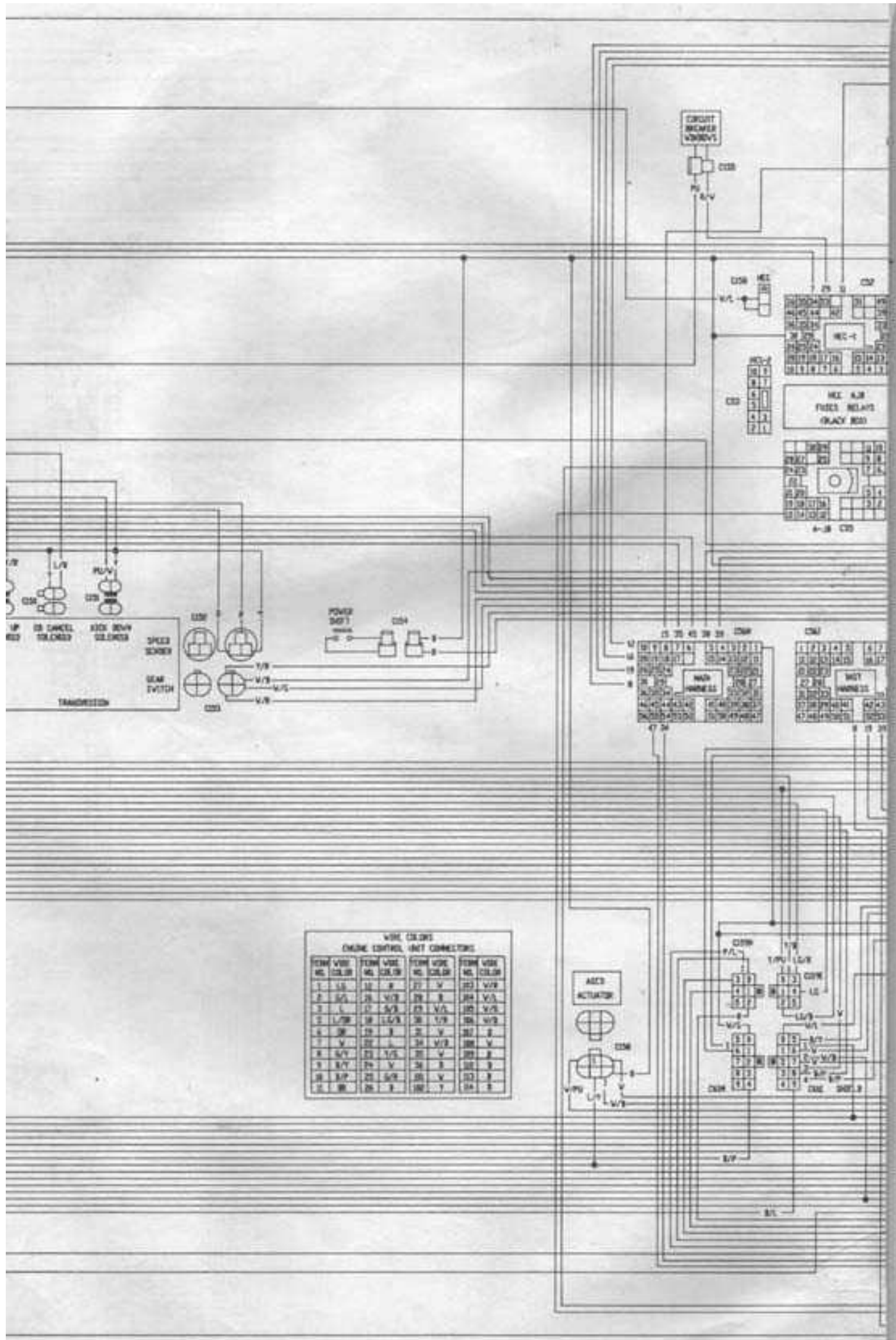
RECTORS ARE SHOWN VIEWED FROM THE FRONT (LOOKING AT TERMINALS)  
OTHERWISE WIREWIRE COLOURS ON EITHER SIDE OF CONNECTORS ARE THE SAME

BY KTR

DWG/No. 24005-J7101- [N]

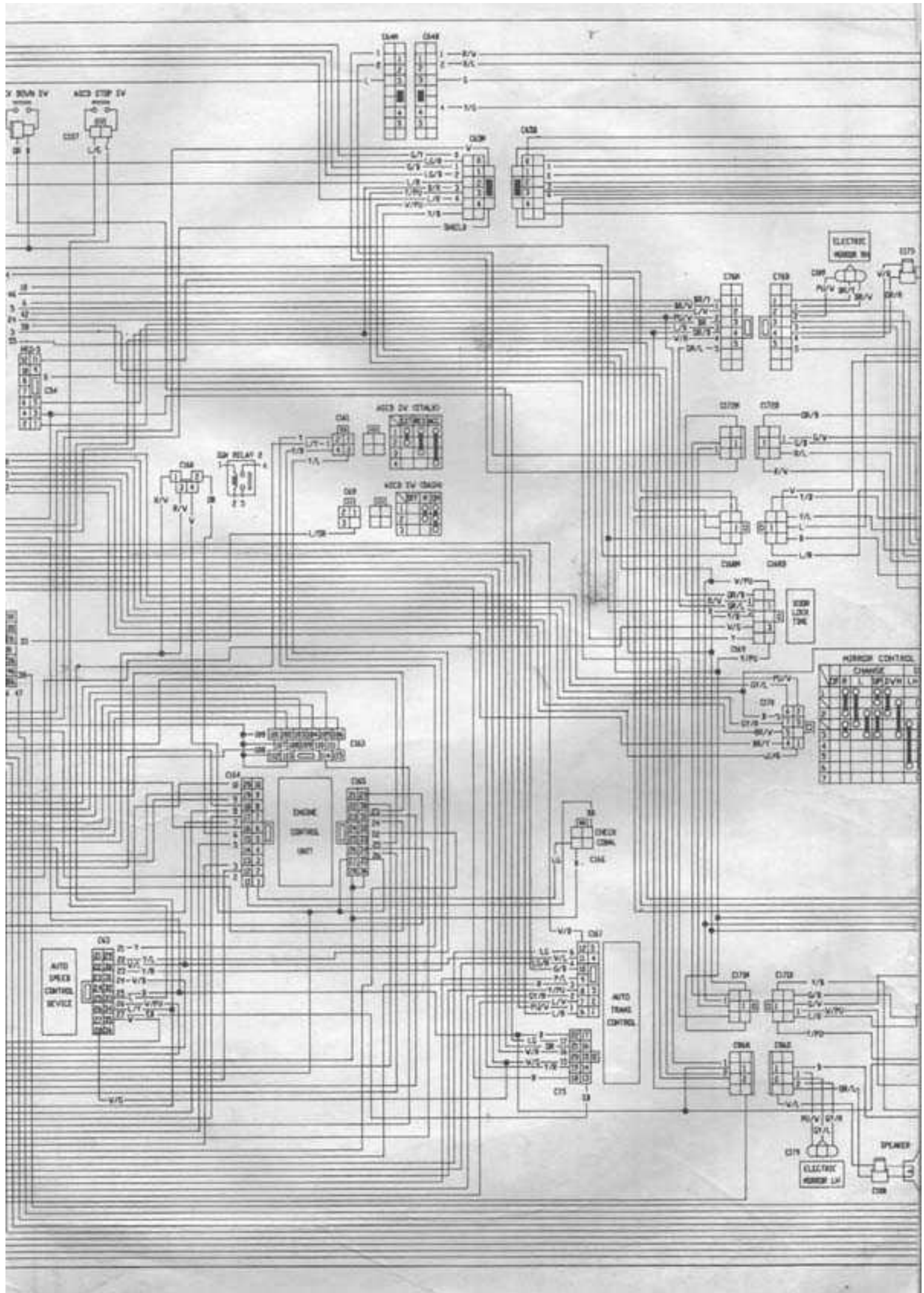
CAR FRONT

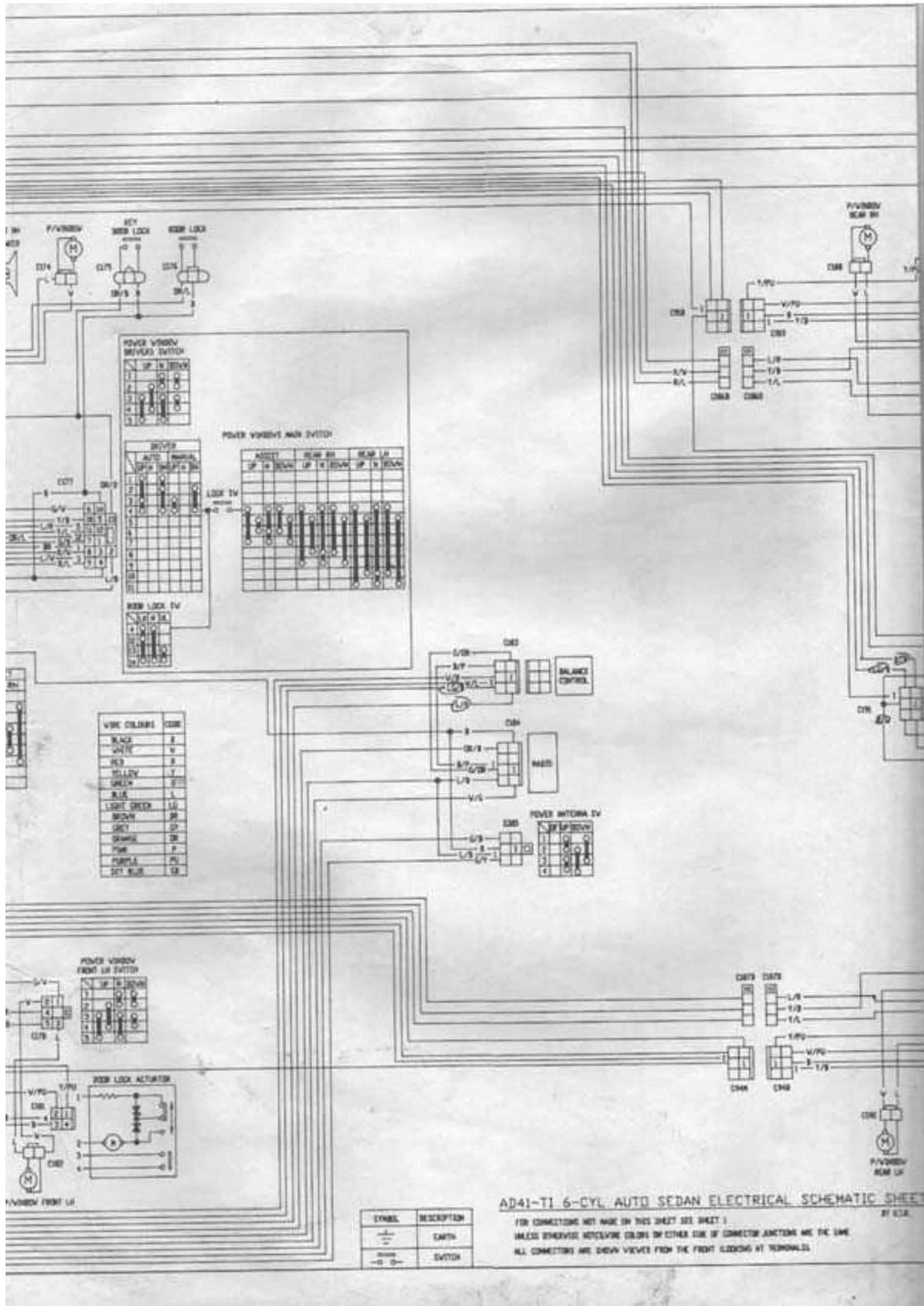




**WIRE COLORS  
ENGINE CONTROL UNIT CONNECTING**

TERM NO.	WIRE COLOR	TERM NO.	WIRE COLOR	TERM NO.	WIRE COLOR	TERM NO.	WIRE COLOR
1	LS	11	R	21	V	31	V/V
2	VS	21	V/S	31	R	41	V/S
3	L	31	V/S	41	V/S	51	V/S
4	L/S	41	V/S	51	V/S	61	V/S
5	R	51	V	61	V	71	V
6	V	61	V	71	V/S	81	V
7	V	71	V/S	81	V	91	V
8	V/V	81	V/S	91	V	101	V
9	V/V	91	V	101	V	111	V
10	V/V	101	V/S	111	V	121	V
11	R	111	V	121	V	131	V
12	R	121	V	131	V	141	V





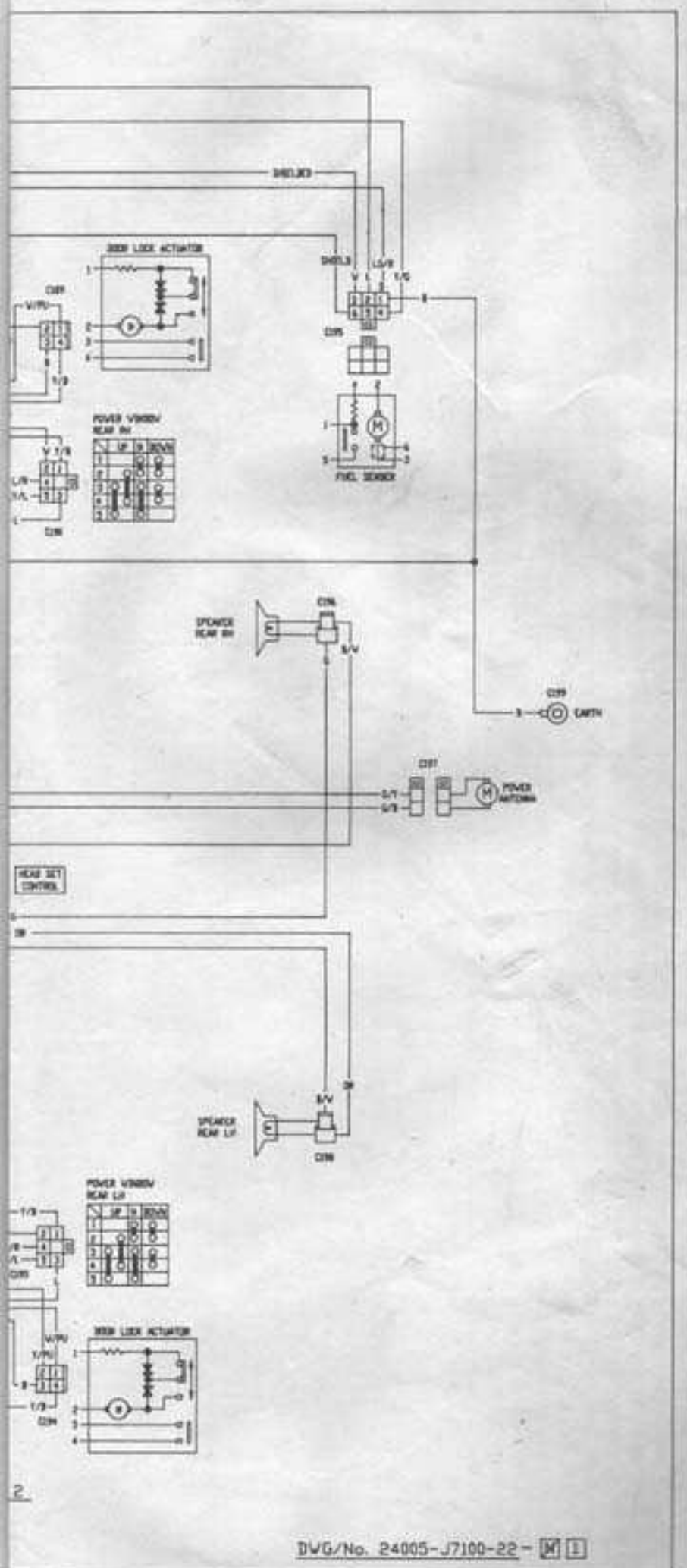
WIRE COLORS	CODE
BLACK	B
WHITE	W
RED	R
YELLOW	Y
GREEN	G
BLUE	L
LIGHT GREEN	LG
BROWN	BR
ORANGE	OR
PINK	P
PURPLE	PV
GREY BLUE	GB

SYMBOL	DESCRIPTION
	EARTH
	SWITCH

**AD41-T1 6-CYL. AUTO SEDAN ELECTRICAL SCHEMATIC SHEET**

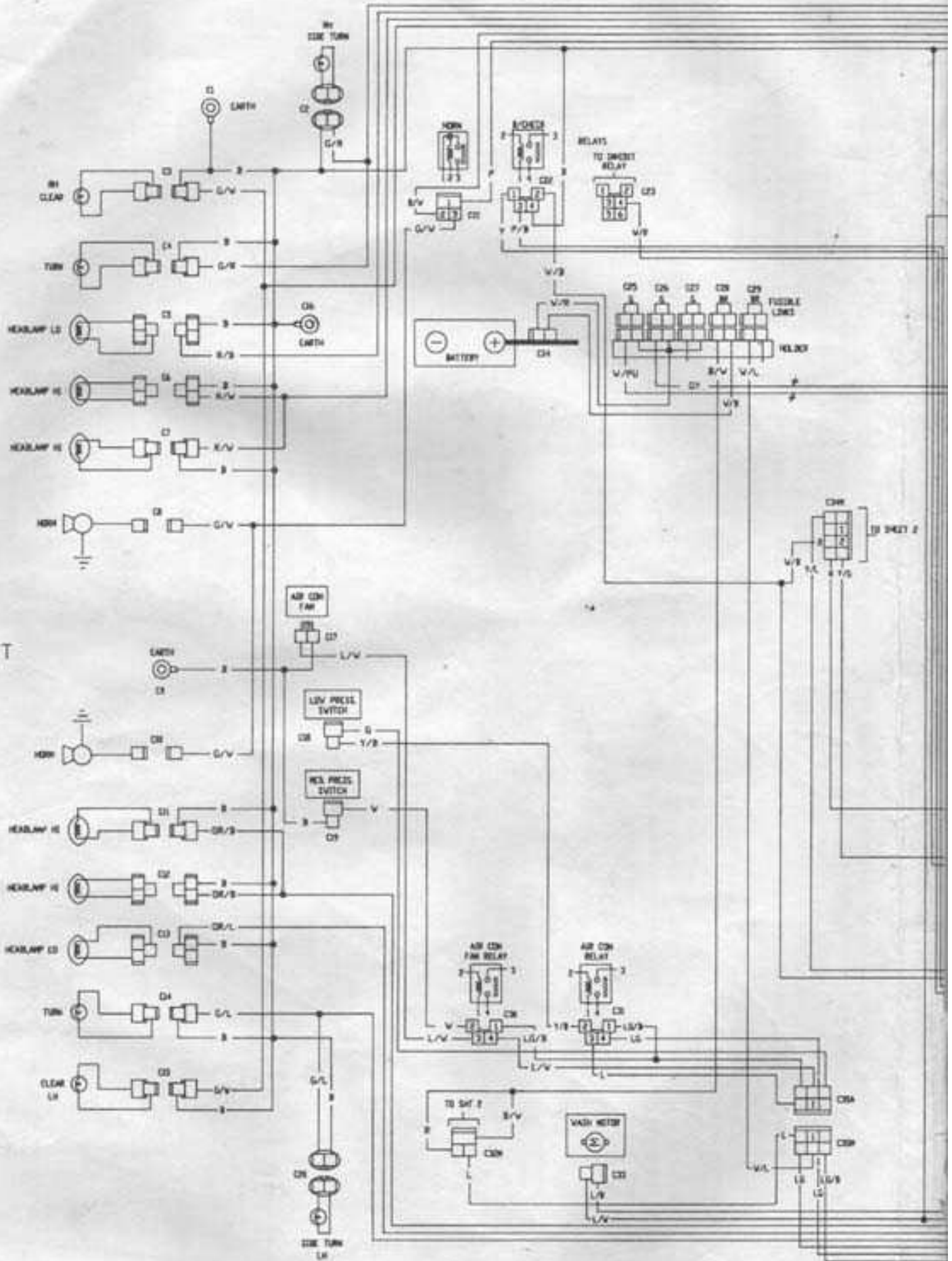
FOR CONNECTIONS NOT MADE ON THIS SHEET SEE SHEET 1  
 UNLESS OTHERWISE NOTICED WIRE COLORS ON EITHER SIDE OF CONNECTOR ANTENNA ARE THE SAME  
 ALL CONNECTORS ARE SHOWN VIEWED FROM THE FRONT LEADING AT TERMINALS



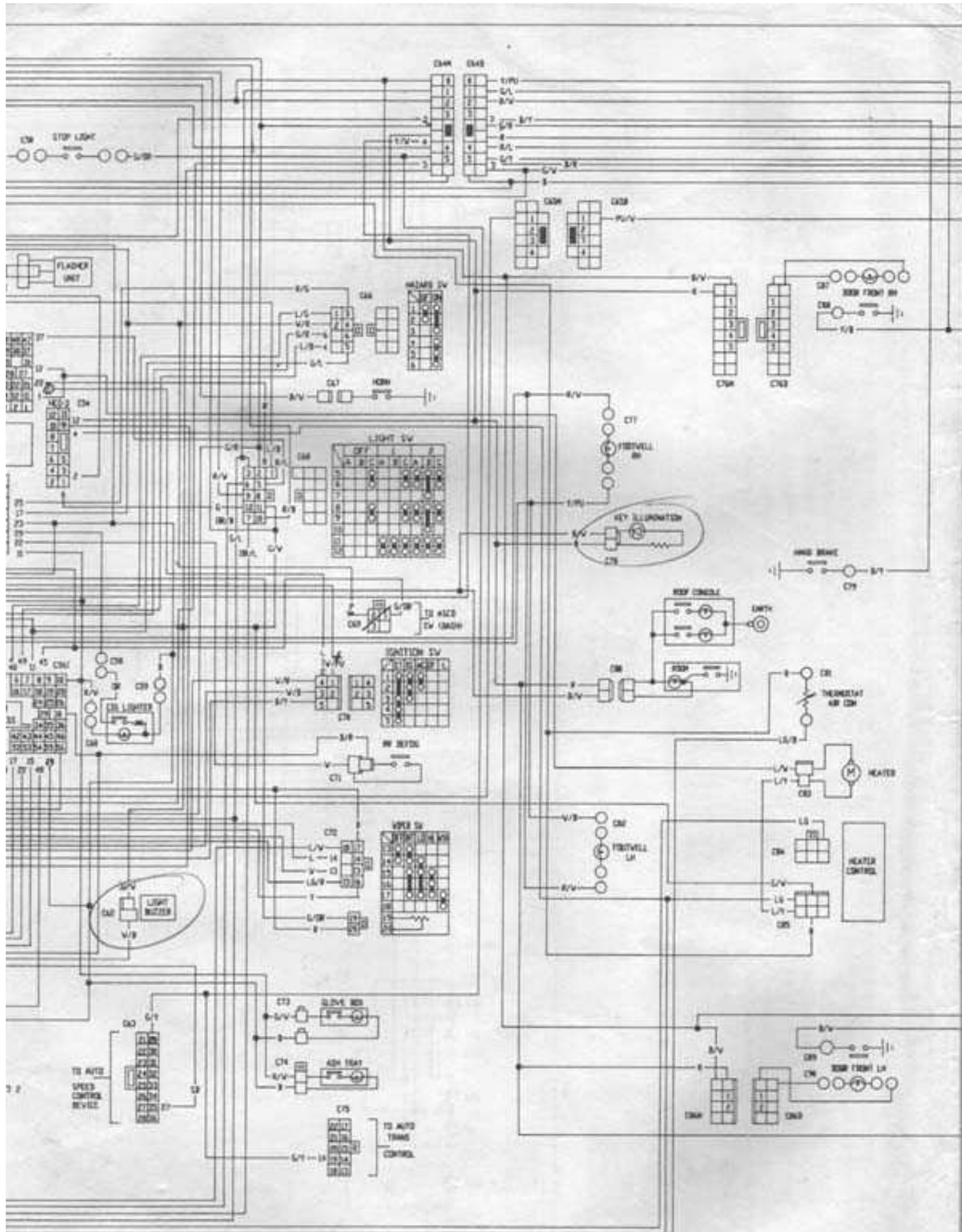


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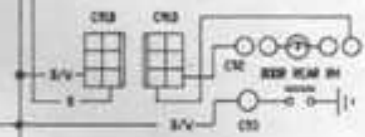
CAR FRONT







SYMBOL	DESCRIPTION
	BATTERY
	SWITCH
	RELAY



**WIRE COLORS**  
HIGH & INSTRUMENT HARNESS CONNECTORS

TERM NO.	WIRE COLOR	TERM NO.	WIRE COLOR	TERM NO.	WIRE COLOR	TERM NO.	WIRE COLOR
1	W/L	22	L/B	23	W/P	44	L/S
2	Y/L	24	L/S	27	R	45	B/V
3	W/B	25	L/B	29	R	46	L
4	Y/P	26	L/B	30	R/B	47	P
5	R/V	28	L/S	31	W	48	L/S
6	B/V	29	L/S	32	L/S	49	W/S
7	W/B	30	L/S	34	L/V	49	V
8	L/V	31	L/S	35	L/S	49	L/S
9	B/V	32	L/S	36	V/S	50	R
10	L/S	33	L/S	37	B/V	-	-

**WIRE COLORS**  
A-B CONNECTOR

TERM NO.	WIRE COLOR	TERM NO.	WIRE COLOR
1	V/B	20	B/V
2	V/B	20	B/V
3	L/S	20	B/V
4	R/P	22	V
5	R/P	22	V
6	R/V	24	L/S
7	L/S	25	R/S
8	R	29	W
9	Y	30	P/W
10	W/S	-	-

**WIRE COLORS**  
H-1 CONNECTOR

TERM NO.	WIRE COLOR	TERM NO.	WIRE COLOR	TERM NO.	WIRE COLOR
1	L/V	26	Y	34	W
2	L	28	B/V	37	B/V
3	W/B	29	R	38	L/B
4	B/V	30	L/B	42	L/V
5	B/V	34	P/W	44	W/B
6	L/S	35	L/B	46	B/V
7	P	37	W	48	L/B
8	S	39	B/V	50	L/B
9	L/V	40	R	-	-
10	L/B	42	V/B	-	-

**FUSE No. LABEL**  
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

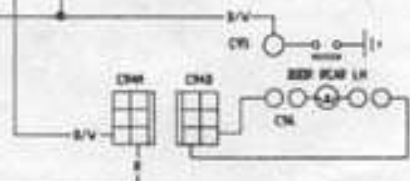
WIRE COLOR	CODE
BLACK	B
WHITE	W
RED	R
YELLOW	Y
GREEN	G
BLUE	L
LIGHT GREEN	LS
BROWN	BR
GREY	GT
ORANGE	OR
PINK	P
PURPLE	PV
SKY BLUE	SB

**H-2 CONNECTOR**

TERM NO.	WIRE COLOR
1	BR
2	L/V
3	L/B
4	W/P
5	L/S
6	L/B
7	B/V
8	L/S
9	L/S
10	L
11	R

**H-3 CONNECTOR**

TERM NO.	WIRE COLOR
1	BR
2	R
3	Y
4	LS
5	L/B
6	S
7	B/V
8	L/S
9	L/S
10	L
11	R



AD41-TI 6-CYL AUTO SEDAN ELECTRICAL SCHEMATIC SHEET 1

BY KJA

FOR CONNECTIONS NOT MADE ON THIS SHEET SEE SHEET 2.

UNLESS OTHERWISE NOTED, WIRE COLORS ON OTHER SIDE OF CONNECTOR SECTION ARE THE SAME.

ALL CONNECTORS ARE SHOWN VIEWED FROM THE FRONT (LOOKING AT TERMINALS).

