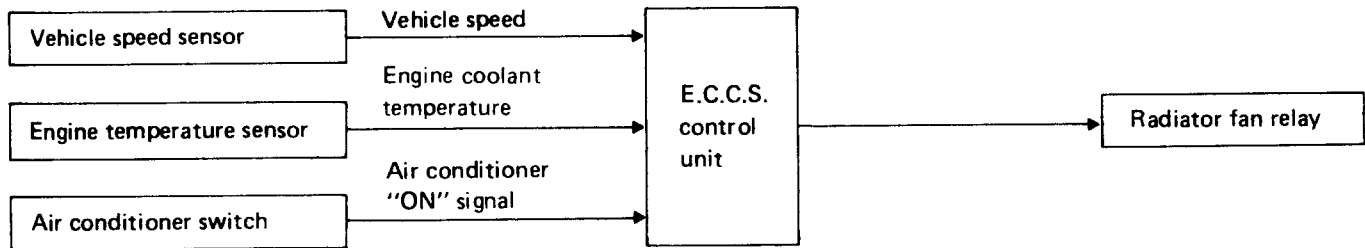


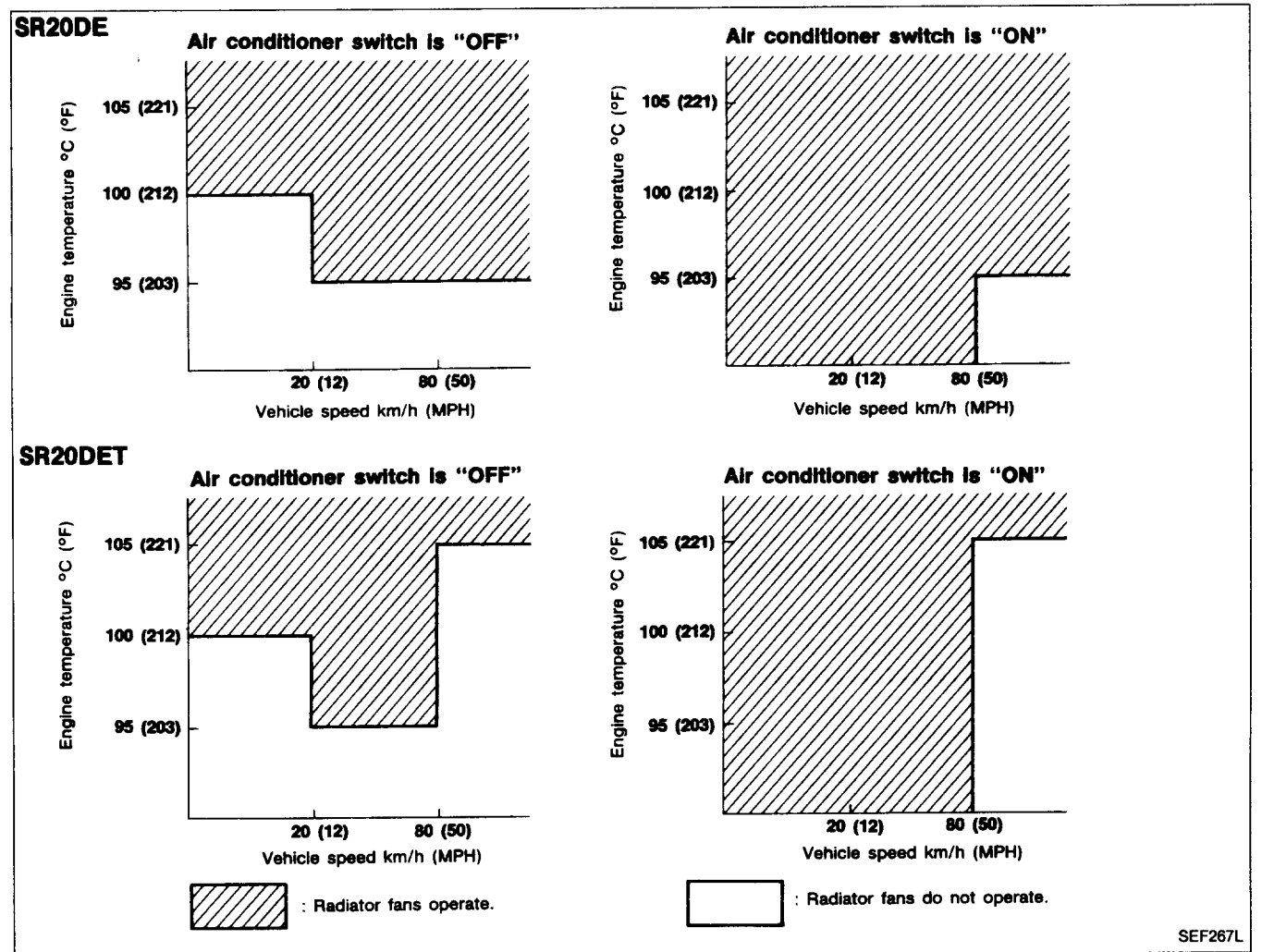
Radiator Fan Control

INPUT/OUTPUT SIGNAL LINE



The E.C.U. controls the radiator fan corresponding to the vehicle speed, engine temperature, and air conditioner ON signal. The control system has 2-step control [ON/OFF].

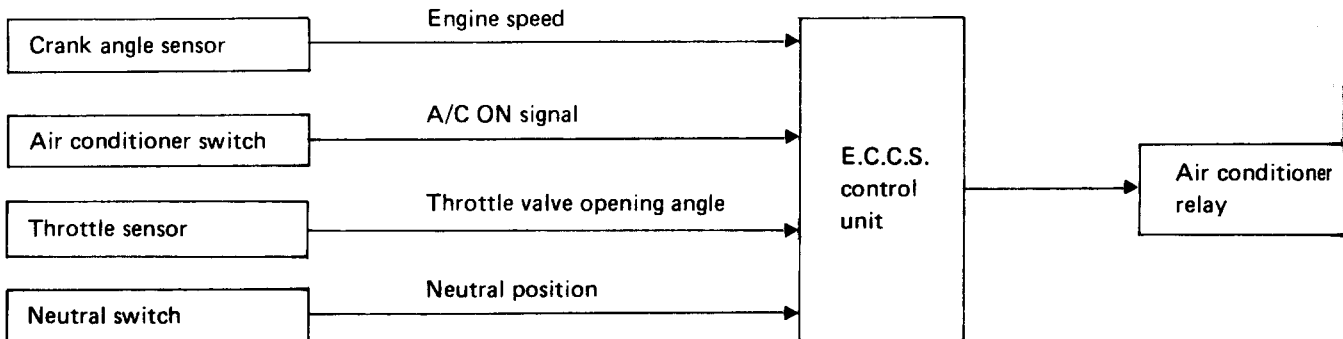
OPERATION



SEF267L

Acceleration Cut Control

INPUT/OUTPUT SIGNAL LINE



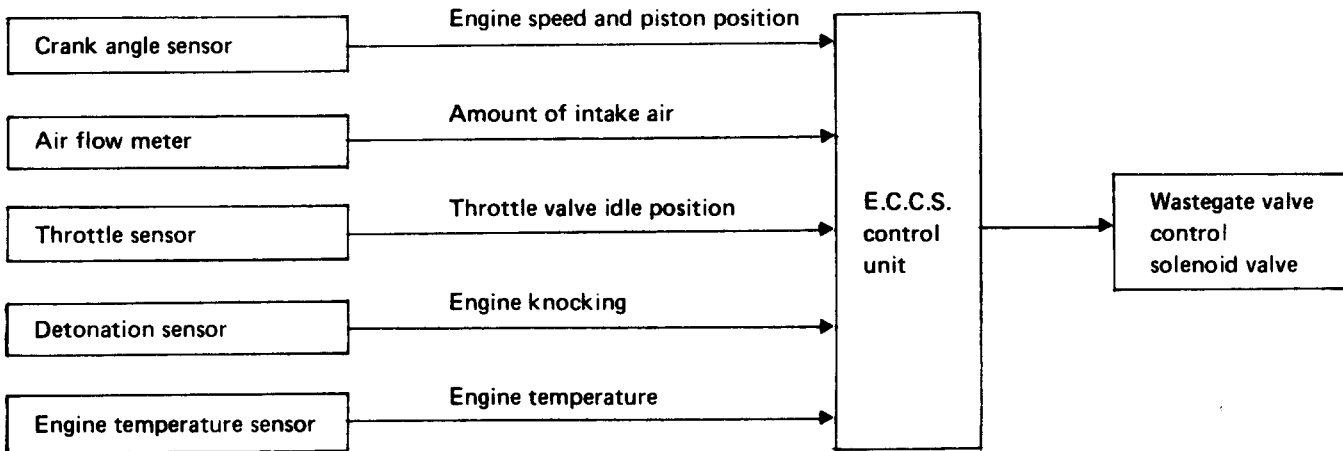
SYSTEM DESCRIPTION

When the accelerator pedal is fully depressed, the air conditioner is turned off for a few seconds.

This system improves acceleration when the air conditioner is used.

Wastegate Valve Control (SR20DET only)

INPUT/OUTPUT SIGNAL LINE



SYSTEM DESCRIPTION

The wastegate valve control solenoid valve changes the source vacuum which activates the actuator. This results in a suitable turbo-pressure.

When detonation signs are detected, which means a low octane fuel is being used, the solenoid valve turns OFF, and turbocharger pressure becomes low.

OPERATION

Engine conditions	Wastegate valve control solenoid valve	Vacuum to wastegate valve actuator	Turbocharger pressure
<ul style="list-style-type: none"> ● Engine stopped. ● C.P.U. of E.C.U. is malfunctioning. ● Detonation sensor is malfunctioning. ● Throttle valve is in idle position. ● Judged fuel quality: low octane (Detecting sign of detonation) 	<p>OFF</p> <p>(When any of the conditions at left are present.)</p>	<p>Leads to wastegate valve actuator.</p>	<p>Low</p>
<p>Except the above</p>	<p>ON</p>	<p>Leads to suction pipe & wastegate valve actuator.</p>	<p>High</p>

Fail-safe System

C.P.U. MALFUNCTION OF E.C.U.

Outline

The fail-safe system makes engine starting possible if there is something malfunctioning in the E.C.U.'s C.P.U. circuit. In former models, engine starting was difficult under the conditions mentioned above. But with the provisions provided in this fail-safe system, it is possible to start the engine.

Fail-safe system activating condition when E.C.U. is malfunctioning

The computing function of the E.C.U. was judged to be malfunctioning.

When the fail-safe system activates, i.e. if the E.C.U. detects a malfunction condition in the C.P.U. of E.C.U., the CHECK ENGINE LIGHT on the instrument panel lights to warn the driver.

Engine control, with fail-safe system, operates when E.C.U. is malfunctioning

When the fail-safe system is operating, fuel injection, ignition timing, fuel pump operation, A.A.C. valve operation and radiator fan operation are controlled under certain limitations.

Operation

	Operation
Fuel injection	Simultaneous injection
Ignition timing	Ignition timing is fixed at the preset valve.
Fuel pump	Fuel pump relay is "ON" when engine is running and "OFF" when engine stalls.
A.A.C. valve	Full open
Radiator fans	Radiator fan relay "ON"

Cancellation of fail-safe system when E.C.U. is malfunctioning

Activation of the fail-safe system is canceled each time the ignition switch is turned OFF. The system is reactivated if all of the above-mentioned activating conditions are satisfied after turning the ignition switch from OFF to ON.

AIR FLOW METER MALFUNCTION

If the air flow meter output voltage is above or below the specified value, the E.C.U. senses an air flow meter malfunction. In case of a malfunction, the throttle sensor substitutes for the air flow meter.

Though air flow meter is malfunctioning, it is possible to drive the vehicle and start the engine. But engine speed will not rise more than 2,400 rpm in order to inform the driver of fail-safe system operation while driving.

Operation

Engine condition	Starter switch	Fail-safe system	Fail-safe functioning
Stopped	ANY	Does not operate	—
Cranking	ON	Operates	Engine will be started by a pre-determined injection pulse on E.C.U.
Running	OFF		Engine speed will not rise above 2,400 rpm

Fail-safe System (Cont'd)

ENGINE TEMPERATURE SENSOR MALFUNCTION

When engine temperature sensor output voltage is below or above the specified value, water temperature is fixed at the preset value as follows:

Operation

Condition	Engine temperature decided
Just as ignition switch is turned ON or Start	20°C (68°F)
More than 6 minutes after ignition ON or Start	80°C (176°F)
Except as shown above	20 - 80°C (68 - 176°F) (Depends on the time)

DETONATION SENSOR MALFUNCTION

When the output signal of the detonation sensor is abnormal, the E.C.U. judges it to be malfunctioning. When detonation sensor is malfunctioning, ignition timing will retard according to operating conditions.

THROTTLE SENSOR MALFUNCTION

Description

When the output signal of throttle sensor is abnormal the E.C.U. judges it as a malfunctioning of throttle sensor.

The E.C.U. does not use the throttle sensor signal, but judges the idle position by the amount of fuel injected and the engine rpm.

Operation

	Driving condition
When engine is idling	Normal
When accelerating	Poor acceleration

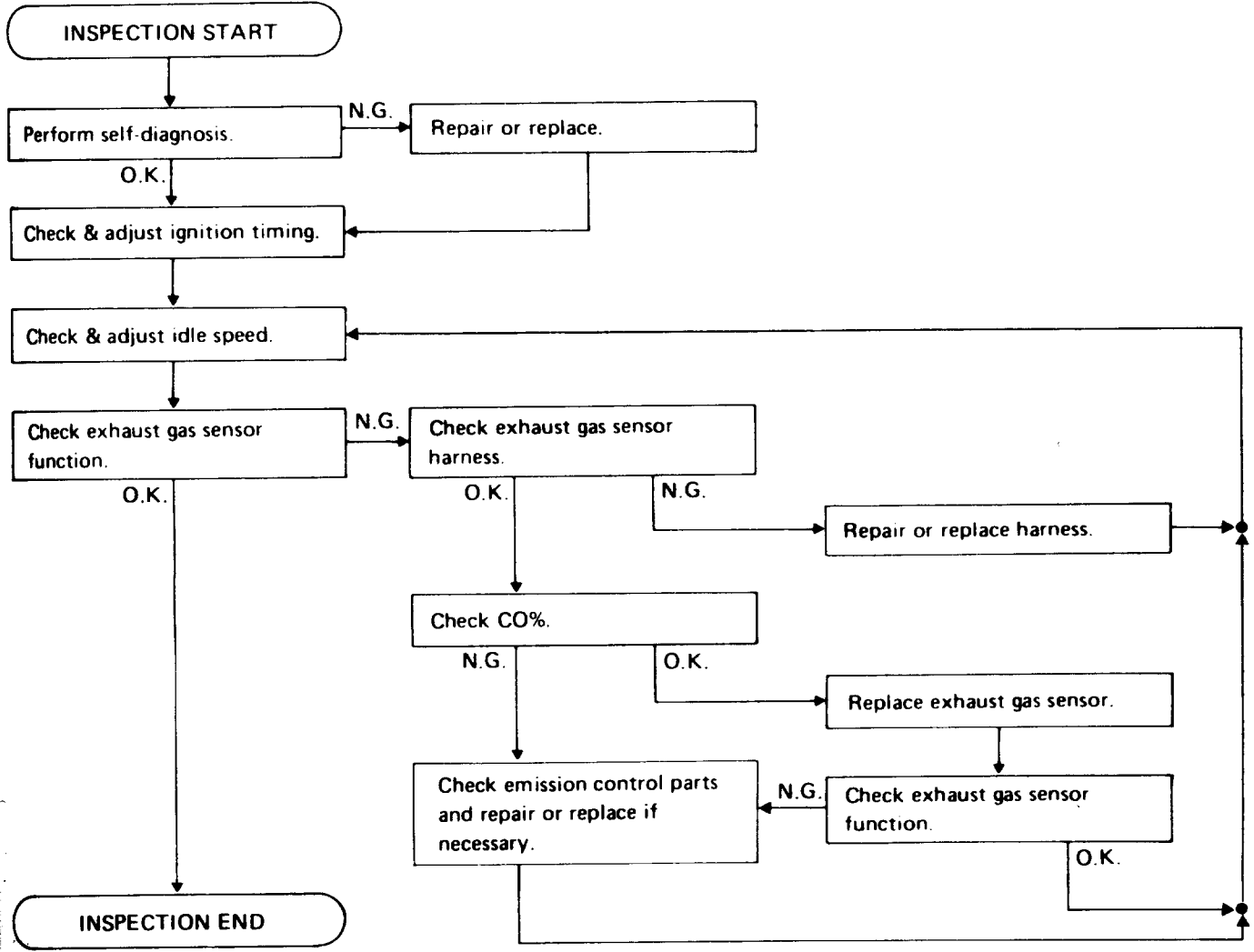
PREPARATION

1. Make sure that the following parts are in good order.
 - Battery
 - Ignition system
 - Engine oil and coolant levels
 - Fuses
 - E.C.U. harness connector
 - Vacuum hoses
 - Air intake system (Oil filler cap, oil level gauge, etc.)
 - Fuel pressure
 - Engine compression
 - Throttle valve

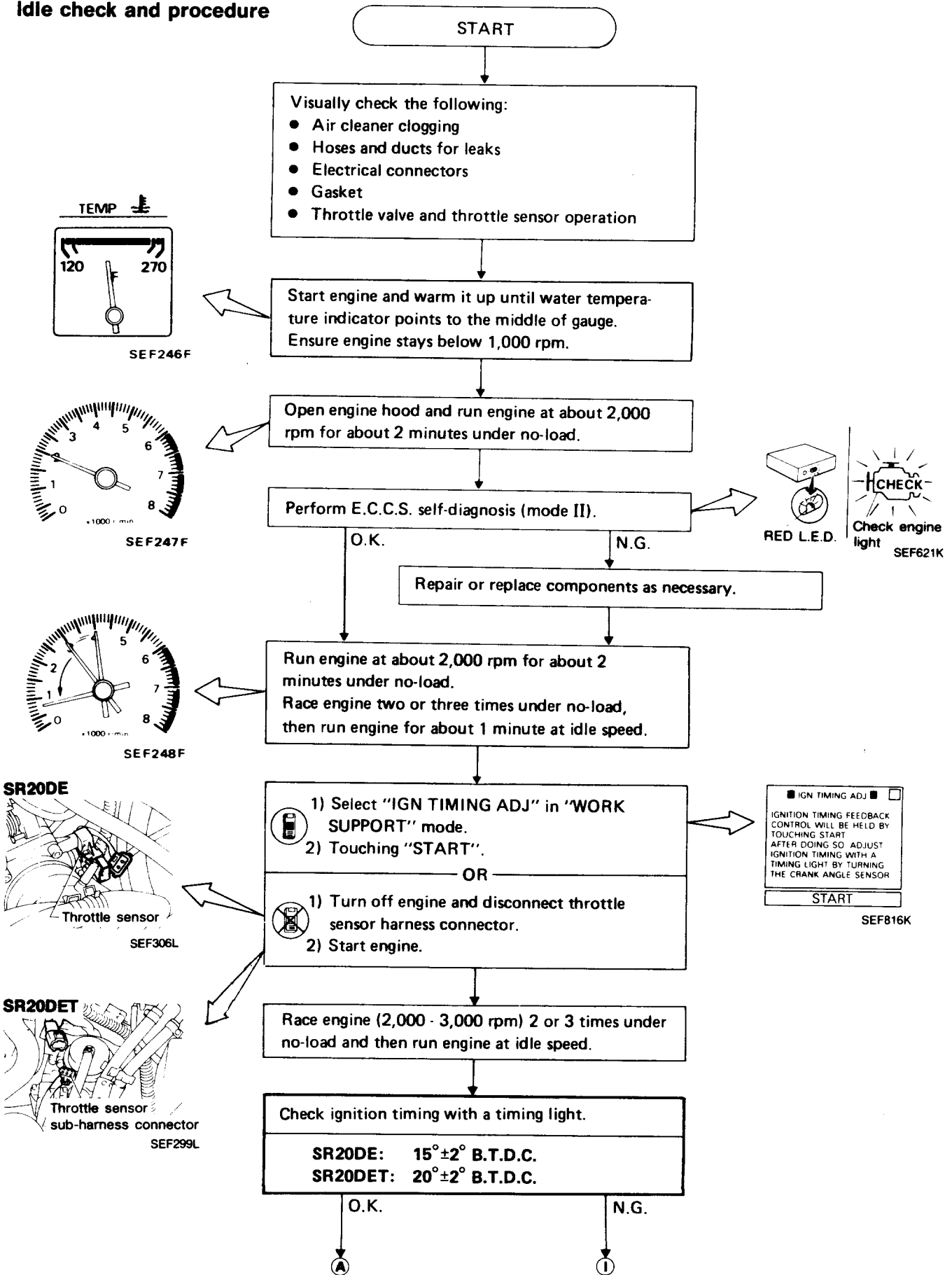
2. On air conditioner equipped models, checks should be carried out while the air conditioner is "OFF".
3. On automatic transaxle equipped models, when checking idle rpm, ignition timing and mixture ratio, checks should be carried out while shift lever is in "N" position.
4. When measuring "CO" percentage, insert probe more than 40 cm (15.7 in) into tail pipe.
5. Turn off headlamps, heater blower, rear defogger.
6. Keep front wheels pointed straight ahead.
7. Make the check after the radiator fan has stopped.

FOR MODELS WITH CATALYZER

Overall inspection sequence



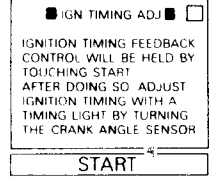
Idle check and procedure



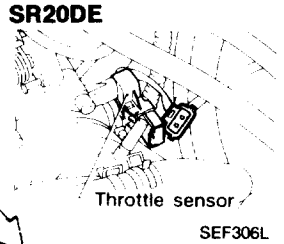
Adjust ignition timing to the specified value by turning distributor after loosening bolts which secure distributor.

SR20DE: 15° B.T.D.C.
SR20DET: 20° B.T.D.C.

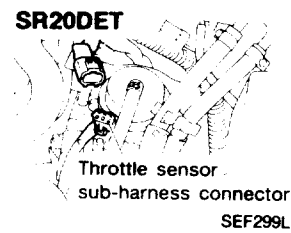
- 1) Select "IGN TIMING ADJ" in "WORK SUPPORT" mode.
 2) Touching "START".
- OR
- 1) Turn off engine and disconnect throttle sensor harness connector.
 2) Start engine.



SEF316L



SEF306L



SEF299L

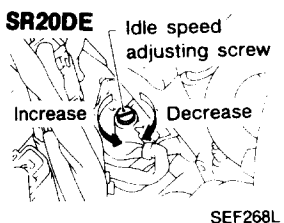
<input checked="" type="checkbox"/>	IGN TIMING ADJ	<input type="checkbox"/>
-- CONDITION SETTING --		
IGN/T FEEDBACK	HOLD	
***** MONITOR *****		
CAS-RPM (REF)	762rpm	
IGN TIMING	15BTDC	
IDLE POSITION	ON	

SEF786K

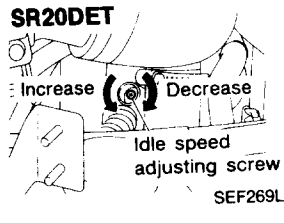
Check idle speed.

• Read idle speed in "IGN TIMING ADJ" in "WORK SUPPORT" mode.
 OR
 • Check idle speed.

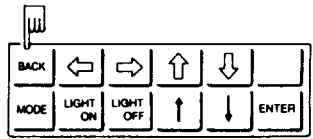
SR20DE: 800±50 rpm
SR20DET: 850±50 rpm



SEF268L



SEF269L



SEF913J

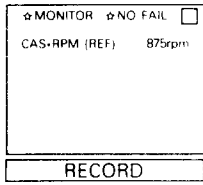
Race engine (2,000 - 3,000 rpm) 2 or 3 times under no-load and run engine at idle speed.

Adjust idle speed by turning idle speed adjusting screw.

SR20DE: 800 rpm
SR20DET: 850 rpm

- 1) Touch "BACK".
 OR
 1) Turn off engine and connect throttle sensor harness connector.
 2) Start engine.

Race engine (2,000 - 3,000 rpm) 2 or 3 times under no-load and run engine at idle speed.



SEF317L

J

Check idle speed.

- Read idle speed in "DATA MONITOR" mode with CONSULT.
- Check idle speed.

SR20DE: 850±50 rpm
SR20DET: 925 ⁺²⁵/₋₇₅ rpm

O.K.

N.G.

Check A.A.C. valve and replace if necessary.

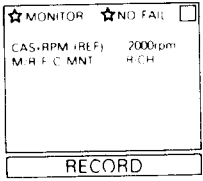
Check A.A.C. valve harness and repair if necessary.

Check E.C.U. function* by substituting another known good E.C.U.

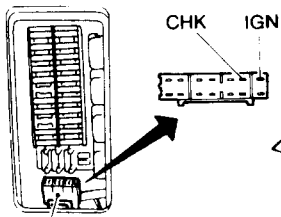
* E.C.U. may be the cause of a problem, but this is rarely the case.

B

B

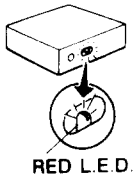


SEF818K



Diagnostic connector for CONSULT
(Connect CHK and IGN terminals with a suitable harness.)

SEF265L




RED L.E.D.



Check engine light

SEF621K




1. See "M/R F/C MNT" in "Data monitor" mode.
2. Run engine at about 2,000 rpm for about 2 minutes under no-load.
3. Maintaining engine at 2,000 rpm under no-load (engine is warmed up sufficiently.), check that the monitor fluctuates between "LEAN" and "RICH" more than 5 times during 10 seconds.

RICH → LEAN → RICH →
LEAN → RICH

1 time 2 times

OR

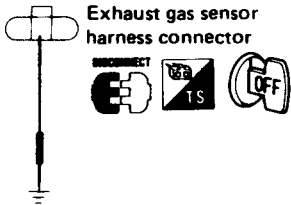


1. Set "Exhaust gas sensor monitor" in the self-diagnostic mode II.
(See page EF & EC-412.)
2. Run engine at about 2,000 rpm for about 2 minutes under no-load.
3. Maintaining engine at 2,000 rpm under no-load, check to make sure that the RED L.E.D. on the E.C.U. or the check engine light on the instrument panel goes ON and OFF more than 5 times during 10 seconds.

N.G.

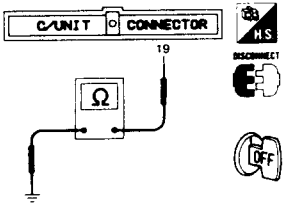
C

END



As for the location of exhaust gas sensor harness connector, refer to pages EF & EC-486, 582.

SEC240B



SEF587K

Check exhaust gas sensor harness:

- 1) Turn off engine and disconnect battery ground cable.
- 2) Disconnect E.C.U. S.M.J. harness connector from E.C.U.
- 3) Disconnect exhaust gas sensor harness connector and connect main harness side terminal for exhaust gas sensor to ground with a jumper wire.
- 4) Check for continuity between terminal No. 19 of E.C.U. S.M.J. harness connector and body ground.

Continuity exists O.K.
Continuity does not exist N.G.

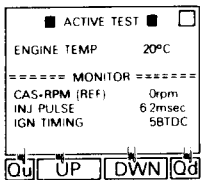
O.K.

N.G.

Repair or replace harness.

Connect E.C.U. S.M.J. harness connector to control unit.

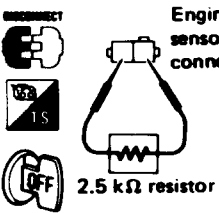
Connect battery ground cable.



SEF788K

1) Select "ENG TEMPERATURE" in "ACTIVE TEST" mode.
2) Set "ENGINE TEMP" to 20°C (68°F) by touching "Qu" and "Qd" and "UP", "DOWN".

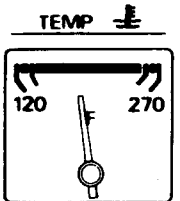
OR



SEC242B

1) Disconnect engine temperature sensor harness connector.
2) Connect a resistor (2.5 kΩ) between terminals of engine temperature sensor harness connector.

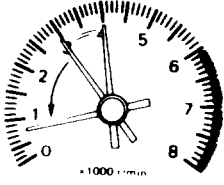
Start engine and warm it up until water temperature indicator points to middle of gauge.



SEF246F

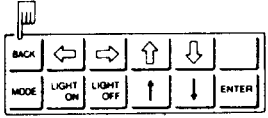
D

D



SEF248F

Race engine two or three times under no-load, then run engine at idle speed.



SEF913J

Check "CO" %.

Idle CO: Less than 10%

After checking CO%,

- 1) Touch "BACK".
- 2) Disconnect the resistor from terminals of engine temperature sensor harness connector.
- 3) Connect engine temperature sensor harness connector to engine temperature sensor.

O.K.

N.G.

Replace exhaust gas sensor.

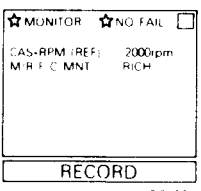
- 1. See "M/R F/C MNT" in "Data monitor" mode.
- 2. Maintaining engine at 2,000 rpm under no-load (engine is warmed up sufficiently), check that the monitor fluctuates between "LEAN" and "RICH" more than 5 times during 10 seconds.

RICH → LEAN → RICH →
 1 time 2 times

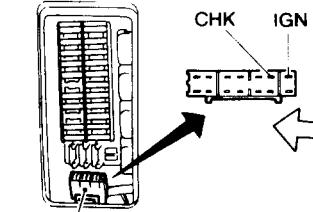
LEAN → RICH

OR

- 1. Set "Exhaust gas sensor monitor" in the self-diagnostic mode II. (See page EF & EC-412.)
- 2. Maintaining engine at 2,000 rpm under no-load, check to make sure that the RED L.E.D. on the E.C.U. or the check engine light on the instrument panel goes ON and OFF more than 5 times during 10 seconds.

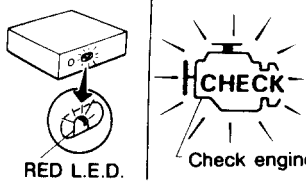


SEF818K



Diagnostic connector for CONSULT (Connect CHK and IGN terminals with a suitable harness.)

SEF265L

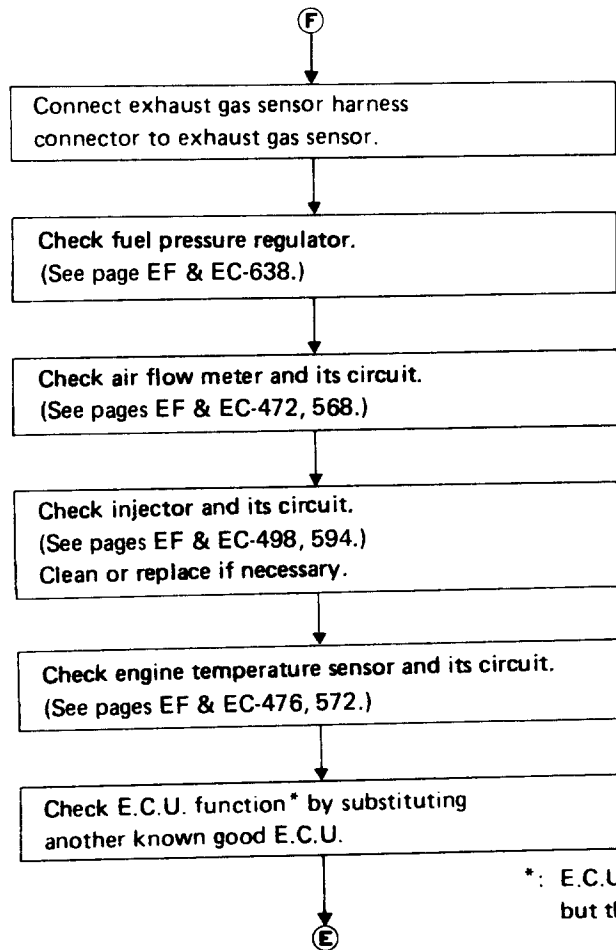


Check engine light

SEF621K

F

E



*: E.C.U. may be the cause of a problem, but this is rarely the case.

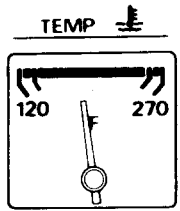
FOR MODELS WITHOUT CATALYZER (SR20DE only)

Checking and adjusting idle rpm and ignition timing

START

Visually check the following:

- Air cleaner clogging
- Hoses and ducts for leaks
- Electrical connectors
- Gasket
- Throttle valve and throttle sensor operation



SEF246F

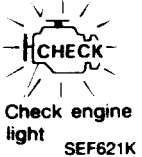
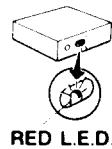
Start engine and warm it up until water temperature indicator points to the middle of gauge. Ensure engine stays below 1,000 rpm.



SEF247F

Open engine hood and run engine at about 2,000 rpm for about 2 minutes under no-load.

Perform E.C.C.S. self-diagnosis (mode II).

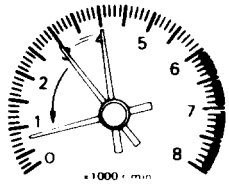


SEF621K

O.K.

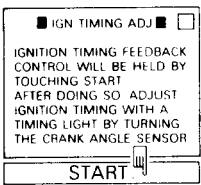
N.G.

Repair or replace components as necessary.



SEF248F

Run engine at about 2,000 rpm for about 2 minutes under no-load. Race engine two or three times under no-load, then run engine for about 1 minute at idle speed.

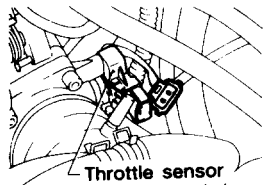


SEF316L

1) Select "IGN TIMING ADJ" in "WORK SUPPORT" mode.
2) Touching "START".

OR

1) Turn off engine and disconnect throttle sensor harness connector.
2) Start engine.



SEF317L

Race engine (2,000 - 3,000 rpm) 2 or 3 times under no-load and then run engine at idle speed.

Check ignition timing with a timing light.

15° ± 2° B.T.D.C.

O.K.

N.G.



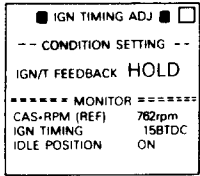
Adjust ignition timing to the specified value by turning distributor after loosening bolts which secure distributor.

15° B.T.D.C.

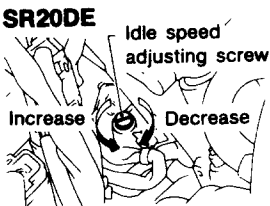
Check idle speed.

- Read idle speed in "IGN TIMING ADJ" in "WORK SUPPORT" mode.
- OR
- Check idle speed.

800±50 rpm



SEF786K



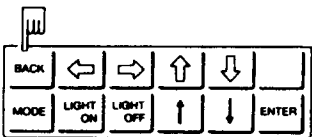
SEF268L

O.K. →

N.G. → Race engine (2,000 - 3,000 rpm) 2 or 3 times under no-load and run engine at idle speed.

Adjust idle speed by turning idle speed adjusting screw.

800 rpm



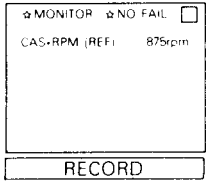
SEF913J

1) Touch "BACK".

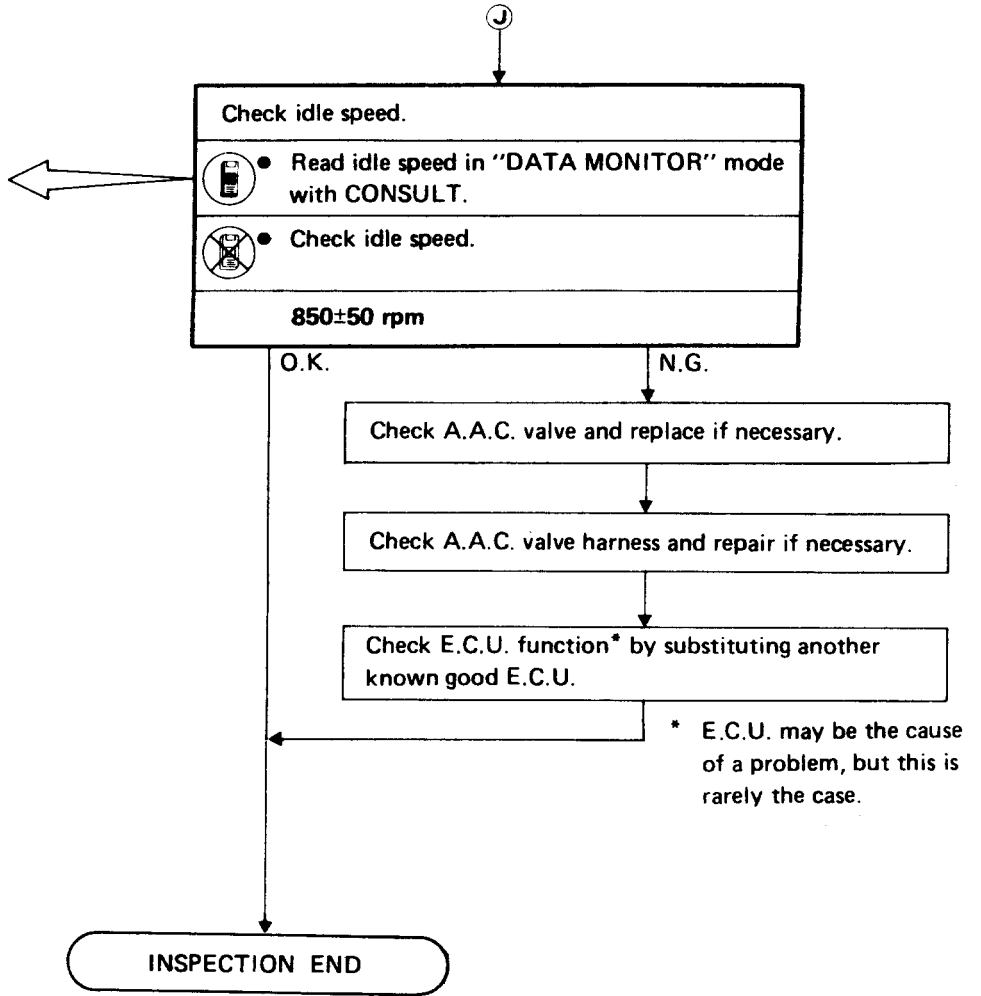
OR

1) Turn off engine and connect throttle sensor harness connector.
2) Start engine.

Race engine (2,000 - 3,000 rpm) 2 or 3 times under no-load and run engine at idle speed.



SEF317L



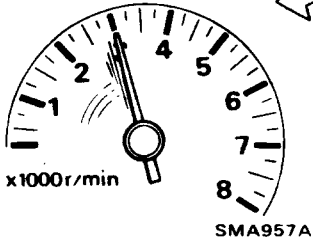
Checking and adjusting mixture ratio [With "CO"-meter]

INSPECTION START

Check and adjust idle speed and ignition timing.
(Refer to EF & EC-397.)

Idle speed: 850±50 rpm
Ignition timing: 15°±2° B.T.D.C.

Race engine (2,000 - 3,000 rpm) 2 or 3 times under no-load, then run engine at idle speed.



Check "CO" with "CO"-meter.

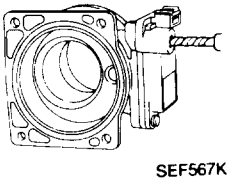
Idle "CO" %
Below 2.0

O.K.

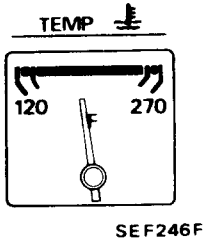
N.G.

Turn off engine and remove air flow meter from vehicle.

Drill a hole in seal plug which seals variable resistor of air flow meter and remove seal plug.



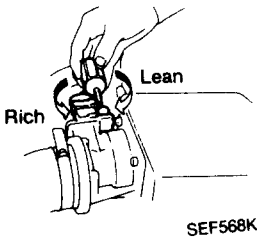
Install air flow meter on vehicle. Start engine and warm it up until water temperature indicator reads normal operating temperature.



Race engine (2,000 - 3,000 rpm) 2 or 3 times under no-load, then run engine at idle speed.

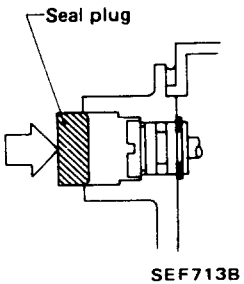
Adjust "CO"% by turning variable resistor on air flow meter.

Idle "CO" %
0.5±0.5



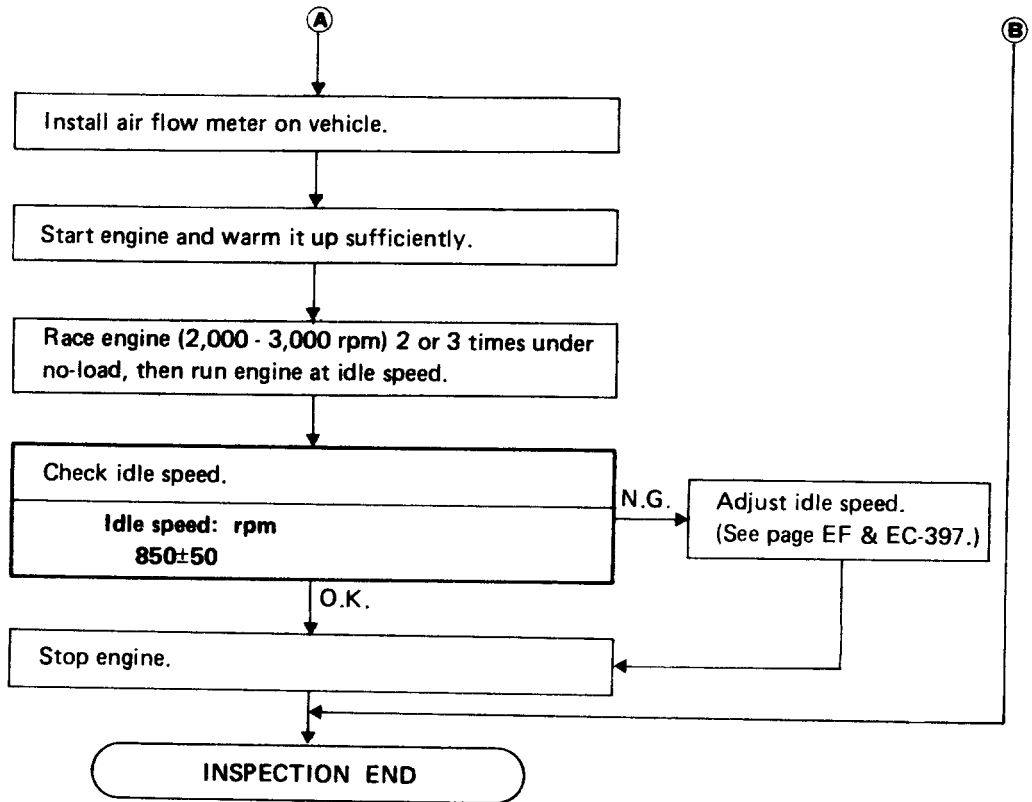
Turn off engine and remove air flow meter from vehicle.

Insert new seal plug into variable resistor hole. Tap seal plug with a suitable bar, thereby installing seal plug on air flow meter.



Ⓐ

Ⓑ



[Without "CO"-meter]

INSPECTION START

Check and adjust idle speed and ignition timing.
(Refer to EF & EC-397.)

Idle speed: 850±50 rpm
Ignition timing: 15°±2° B.T.D.C.

Race engine (2,000 - 3,000 rpm) 2 or 3 times under no-load, then run engine at idle.

Turn off engine and remove air flow meter from vehicle.

Drill a hole in seal plug which seals variable resistor of air flow meter and remove seal plug.

Install air flow meter on vehicle. Start engine and warm it up until water temperature indicator reads normal operating temperature.

Race engine (2,000 - 3,000 rpm) 2 or 3 times under no-load, then run engine at idle speed.

Adjust mixture ratio with engine speed set at maximum by turning variable resistor.

Turn variable resistor of air flow meter one full turn counterclockwise.

Turn off engine and remove air flow meter from vehicle.

Insert new seal plug into variable resistor hole. Tap seal plug with a suitable bar, thereby installing seal plug on air flow meter.

Install air flow meter on vehicle.

A

