SERVICE MANUAL

MODEL

L20A, L24 & L26 SERIES

ENGINES

NISSAN

NISSAN MOTOR CO., LTD.

TOKYO, JAPAN

SECTION ET

ENGINE TUNE-UP

ET

ENGINE TUNE-UP

CONTENTS

DESCRIPTION

It may be needless to say, however, to restore power and performance that has been lost through wear, corrosion, or deterioration, periodical maintenance (engine tune-up) is necessary.

It is even more important that the engine tune-up be done accurately according to the maintenance schedule shown in the applicable Owner's Manual.

This chapter describes actual operating procedures for the maintenance operation of items to be inspected.

BASIC MECHANICAL SYSTEM

ADJUSTING INTAKE AND EXHAUST VALVE CLEARANCE

Valve clearance adjustment should be made while engine is stationary.

To adjust, proceed as follows:

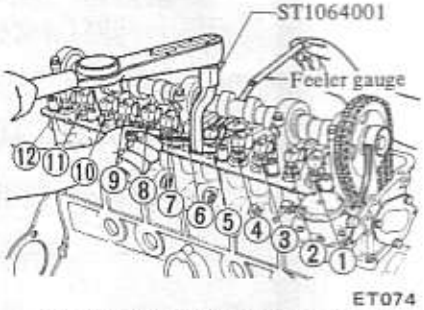


Fig. ET-1 Adjusting valve clearance

1. Loosen pivot lock nut and turn pivot screw until the specified clearance is obtained with engine cold. Using Pivot Adjuster ST10640001, tighten pivot locking nut securely after adjustment, and recheck the clearance.
2. Adjusting order

Valve adjusting can be done by four times rotating the crankshaft.

Note: If Crankshaft is rotated by starter, you must take off the high tension wire from ignition coil. Then the engine turn without ignition.

The first time, the position of ① cam lobe is upward, ③ ⑦ ⑪ cam adjustment is possible.

The second time, ④ cam lobe is upward, ⑤ ⑩ ⑫ is possible.

The third time, ② cam lobe is just upward, ⑥ is possible.

The fourth time, ⑧ cam lobe is just upward, ⑨ is possible.

Note: Numbers in parenthesis agree with those in accompanying sketch (See Figure ET-1).

3. Start engine and run it until it is heated to operating temperature, or at least, more than 80°C (176°F) of engine oil temperature; then stop engine.

Measure the warm engine valve clearance in the same manner as above. If it deviates from the given warm engine valve setting value, make necessary adjustment.

Tightening torque:
Pivot lock nut
5.0 to 6.0 kg-m
(11 to 13 ft-lb)

Valve clearance

Valve Clearance mm (in)	Cold	Intake	0.20 (0.0079)
		Exhaust	0.25 (0.0098)
	Warm	Intake	0.25 (0.0098)
		Exhaust	0.30 (0.0118)

CHECKING AND ADJUSTING FAN BELT

With the engine switched off and the hood up, push the belt gently downward. You should be able to depress it about 10 mm (1/2 in). Midway between fan pulley and alternator pulley by a force 10 kg (22.0 lb). If the fan belt has become slack through wear, loosen the fixing and adjusting bolts, and move the alternator away from the engine. This will eliminate the slack. Tighten the bolts again, and make sure that the belt has been tightened correctly. If tightened excessively it will wear rapidly and also overload the water pump and alternator bearings.

Fan belt deflection:
8 to 12 mm
(0.3150 to 0.4724 in)

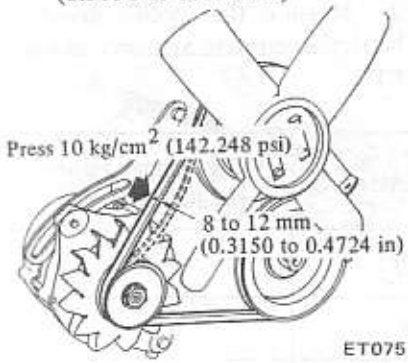


Fig. ET-2 Adjusting fan belt tension

RETIGHTENING CYLINDER HEAD BOLTS, MANIFOLD BOLTS & NUTS AND CARBURETOR SECURING NUTS

Cylinder head bolts:

When the engine is cold, tightening should be made in several steps and in the sequence shown in Figure ET-3, starting with the center and moving toward the ends.

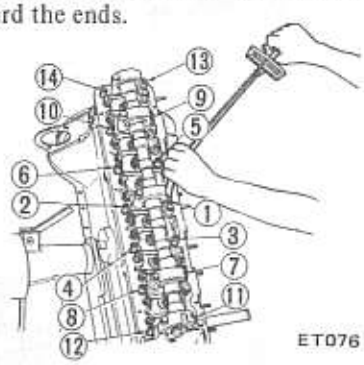


Fig. ET-3 Tightening sequence

Tightening torque (cold)
1st turn:
4.0 kg-m (30 ft-lb)
2nd turn:
6.0 kg-m (43 ft-lb)
3rd turn:
6.5 to 8.5 kg-m
(47 to 61 ft-lb)

Next warm up the engine and retighten the bolts to the specification of hot condition.

Tightening torque (hot)
7.0 to 9.0 kg-m
(51 to 65 ft-lb)

Manifold nuts:

Intake and exhaust manifold bolts and nuts should be tightened to the specified torque.

Tightening torque:
Intake and exhaust manifold:
1.2 to 1.6 kg-m
(9 to 12 ft-lb)

Carburetor nuts:

Carburetor installation nuts should be tightened securely. Leaks at this area may cause rough idle, surging, deceleration popping or deceleration whistle.

Tightening torque:
Carburetor nuts
0.8 to 1.2 kg-m
(6 to 9 ft-lb)

CHECKING ENGINE COMPRESSION

Note: If this test is to be performed, it should be done when plugs are removed for service during basic tune-up procedure.

Unless checking for worn rings or for the cause of low speed miss, compression check should not be necessary.

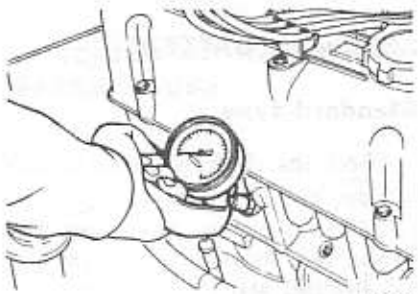


Fig. ET-4 Testing compression pressure

Test compression with engine warm, all spark plugs removed and throttle and choke opened. No cylinder compression should be less than

80% of highest cylinder's. Excessive variation between cylinders, accompanied by low speed missing of the cylinder or cylinders which are low, usually indicates a valve not properly seating or a broken piston ring. Low pressures, even though uniform, may indicate worn rings. This may be accompanied by excessive oil consumption.

Test conclusion

If one or more cylinders read low, inject about one tablespoon of engine oil on top of the pistons in low reading cylinders through spark plug port. Repeat compression check on these cylinders.

1. If compression improves considerably, piston rings are defective.
2. If compression does not improve, valves are sticking or not seating properly.
3. If two adjacent cylinders indicate low compression and injecting oil on pistons does not increase compression, the cause may be a cylinder head gasket leak between the cylinders. Engine oil and coolant in cylinder could result from this problem.

Compression pressure kg/cm^2 (psi) at rpm

	L20A	L24	L26	
	Single carb.	Single carb.	Single carb.	Twin carb.
Standard	12.0 (171)/350	12.0 (171)/350	12.0 (171)/350	12.5 (178)/350
Minimum	9.0 (128)/350	9.0 (128)/350	9.0 (128)/350	9.0 (128)/350

LUBRICATING ACCELERATOR LINKAGE

Apply a light coat of multipurpose grease to all sliding or friction surfaces except ball joints. The entire linkage should be inspected whether or not foot rest returns to normal height smoothly when releasing foot from it. This test should be made with engine running. Added care should be taken in checking items that affect proper linkage function.

IGNITION SYSTEM

CHECKING BATTERY

Standard type

Check the electrolyte level in each battery cell.

1. Unscrew each filler cap and inspect fluid level. If the fluid is low, add distilled water to bring the level up approximately 10 to 20 mm (0.394 to 0.787 in) above the plates. Do not overfill.
2. Measure the specific gravity of battery electrolyte.

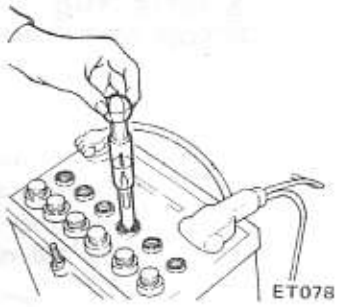


Fig. ET-5 Checking the specific gravity of battery electrolyte

Self-filling battery

In case of self-filling battery.

1. Remove filler cap and inspect the float position. If the float is lower than the normal condition, add distilled water into case attached on battery upper face. The fluid will be equally self-filled for each cell.

After replenishing, install filler cap. Do not overfill over the projections.

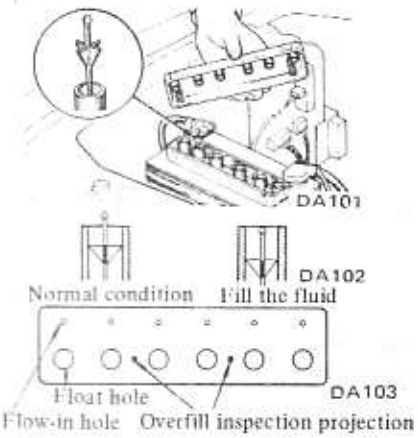


Fig. ET-6 Checking electrolyte level

2. Measure the specific gravity of battery electrolyte as shown in Figure ET-5.

	Permissible value	Fully charged value (at 20°C, 68°F)
Frigid climates	Over 1.22	1.28
Tropical climates	Over 1.18	1.23
Other climates	Over 1.20	1.26

Clean the top of battery and terminals with a solution of baking soda and water. Rinse off and dry with compressed air. The top of battery must be clean to prevent current leakage between terminals and from positive terminal to hold-down clamp.

In addition to current leakage, prolonged accumulation of acid and dirt on the top of battery may cause corrosion of straps. After tightening terminals, coat them with petrolatum (vaseline) to protect them from corrosion.

CHECKING AND ADJUSTING IGNITION TIMING

With distributor vacuum line disconnected and vehicle operating at normal idle speed or below, set ignition timing.

The timing can be observed by the stationary pointer at front cover and the grooves on crankshaft pulley with a device called a stroboscopic light (also referred to as a timing light).

Note that the pulley groove is graduated 5° per scale division in terms of the crank angle. The top dead center is located to the second from left side as viewed from the inspector's side.

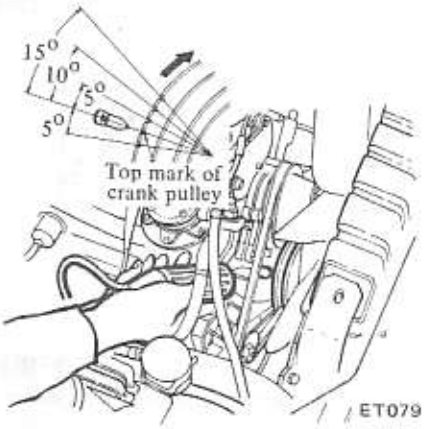


Fig. ET-7 Checking ignition timing

Adjust the timing to the specifications, turning distributor body loosened securing bolts.

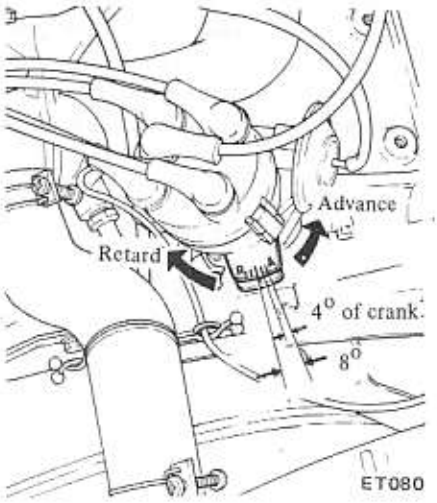


Fig. ET-8 Adjusting ignition timing

Ignition timing (B.T.D.C./rpm)

		L20A	L24	L26	
		Single carb.	Single carb.	Single carb.	Twin carb.
Manual transmission		10°/550	17°/550	10°/550	17°/650
Automatic transmission		10°/650	17°/650	10°/650	17°/700
*	Manual transmission	–	10°/650	10°/650	10°/650
	Automatic transmission	–	10°/650	10°/650	10°/700

* : For cars equipped with device required by E.C.E. air pollution regulations.

Note: On the car equipped with air conditioner, increase engine speed by 150 rpm higher than that indicated in the chart while F.I.C.D. (First Idle Control Device) is in operation.

CHECKING DISTRIBUTOR BREAKER POINT

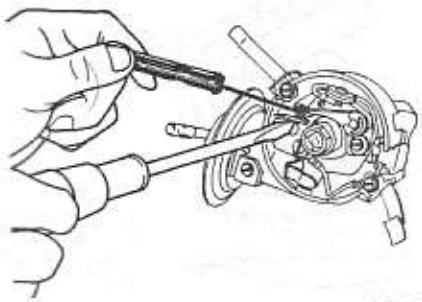


Fig. ET-9 Checking distributor point gap

Remove distributor cap and inspect points for excessive burning or pitting. Replace points if necessary. Use a point file to clean contact area and remove scale from points. Adjust distributor point gap. Filing is for cleaning purposes only. Do not attempt to remove all roughness. Adjust distributor dwell angle on all engines.

Distributor point gap:
0.45 to 0.55 mm
(0.0177 to 0.0217 in)
Dwell angle:
35° to 41°

CHECKING OR REPLACING SPARK PLUGS

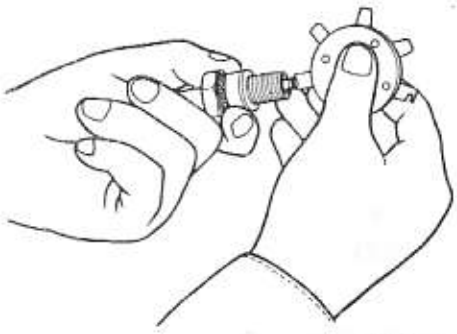


Fig. ET-10 Checking spark plug gap

See that correct spark plugs are used. Spark plug insulators should be thoroughly cleaned to prevent possible flash-over.

Thoroughly clean lower insulator and cavity by blast type cleaner. File both electrodes flat (rounded surfaces increase voltage required to fire plugs) and set gap. Tighten plugs to torque.

Spark plug gap:
0.8 to 0.9 mm
(0.0315 to 0.0354 in)
Tightening torque:
1.5 to 2.0 kg-m
(11 to 14 ft-lb)

CHECKING AND CLEANING HIGH TENSION WIRES, DISTRIBUTOR CAP AND ROTOR

Note: This operation is to be performed while checking distributor points.

External surfaces of all parts of secondary system must be cleaned to reduce possibility of voltage loss. All wires should be removed from distributor cap and coil so that terminals can be inspected and cleaned. Burned or corroded terminals indicate that wires were not fully seated, which causes arcing between end of wire and terminal. When replacing wires in terminal, be sure they are fully seated before pushing rubber nipple down over tower. Check distributor rotor for damage, and distributor cap for cracks.

GREASING DISTRIBUTOR SHAFT AND CAM HEEL

Clean and apply multi-purpose grease to cam and wick.

Note: Do not apply grease excessively.

FUEL SYSTEM

REPLACING AIR CLEANER FILTER (VISCOUS TYPE)

The air cleaner uses a wet paper type cleaner element (viscous type). As this element has been manufactured under special treatment, there is no need of cleaning until it is replaced with a new one. Although the cleaner element looks dirty, do not attempt to clean. The cleaning performance in constantly maintained although it looks contaminated. Care must be taken not to injure cleaner element.

Replace element with a new one at recommended interval, more often under dusty driving conditions.

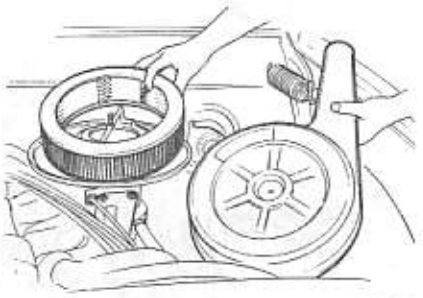


Fig. ET-11 Replacing air cleaner filter

CLEANING OR REPLACING AIR CLEANER FILTER (DRY TYPE)

It is necessary to clean the element or replace it at the recommended interval, more often under dusty driving conditions.

AUTOMATIC TEMPERATURE CONTROL AIR CLEANER (L26(T) ENGINE MODEL ONLY)

RELACING CARBURETOR AIR CLEANER FILTER

Paper element (viscous type) has been specially treated to eliminate cleaning until replacement. It should be replaced at regular intervals, or more often according to operating conditions.

CHECKING HOT AIR CONTROL VALVE

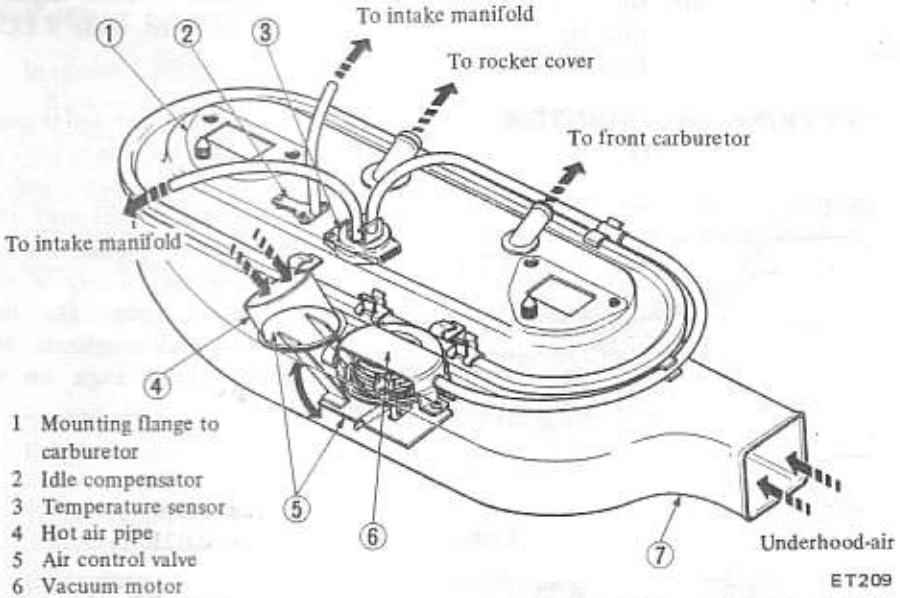
Inspection

Among the possible malfunctions of this device, the most probable is permanent opening of the valve.

This malfunction is not noticeable in warm weather, but in cold weather appears as poor engine performance; tardy acceleration, hesitation or engine stalling. In such a case, first inspect this device before checking the carburetor.

Another possible malfunction is that the underhood-air is kept closely by the valve regardless of the temperature of suction air around the sensor while the engine is running. This malfunction appears in the form of extremely excessive fuel consumption or a decrease in power.

Inspection of this device should proceed as follows:



1 Mounting flange to carburetor
2 Idle compensator
3 Temperature sensor
4 Hot air pipe
5 Air control valve
6 Vacuum motor
7 Underhood-air inlet

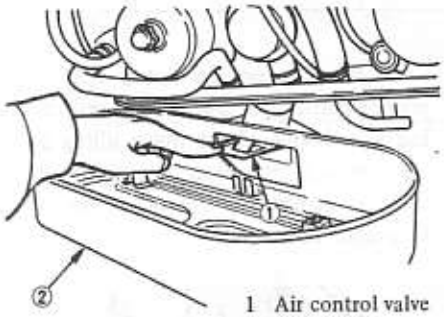
Fig. ET-12 A.T.C. Air cleaner

Appearance

1. First check that vacuum hoses are connected to correct positions.
2. Inspect hoses for cracks, distortion or plugging.

Checking vacuum motor

1. With engine shut down, remove air cleaner cover. Do not lift cover upward.
2. Inspect position of air control valve. The valve is correct if it keeps underhood-air inlet open and hot air inlet closed. Otherwise, inspect the valve linkage.

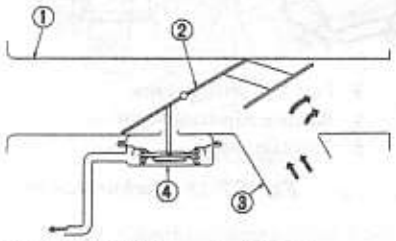


1 Air control valve
2 Air cleaner

ET067

Fig. ET-13 Inspecting valve position

3. Disconnect hose at vacuum motor inlet, and apply vacuum of manifold directly to vacuum motor by connecting another hose; sucking by mouth may be substituted for this process. If underhood-air inlet is closed by valve, valve is in good condition. Inspect linkage if found otherwise. If no malfunction is found even in linkage, it signifies vacuum motor failure.



Connect directly to balance tube connector

1 Air inlet
2 Air control valve
3 Hot air pipe
4 Vacuum motor

ET068

Fig. ET-14 Checking vacuum motor

4. The valve is in good condition if it keeps underhood-air inlet closed when the passage in hose is stopped by twisting or clamping it while applying vacuum. If otherwise, it is an indication of leakage in the vacuum motor.
5. If failure is found in vacuum motor through this check, replace air cleaner assembly.

Checking temperature sensor

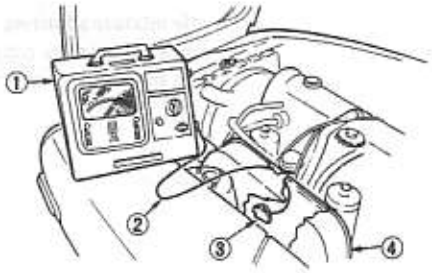
1. Perform engine test with temperature around the sensor maintained below 30°C (86°F). Make sure that the engine is cooled down before test is conducted.
2. Before starting engine, open air cleaner cover and make certain that valve on underhood-air side is fully open.
3. Start engine and operate at idling speed. The valve is in good condition if underhood-air side fully closes immediately after starting.

Note: It is good practice not to leave air cleaner open. Open it only when checking.

4. Carefully watch valve to ascertain that it gradually begins to open as the engine warms up. When ambient temperature is low, it takes considerable time for valve to begin to open, or in some cases it hardly opens. This should not, however, be regarded as failure.

If valve does not operate satisfactorily or if condition of the valve is questionable, conduct the following test:

5. Open air cleaner cover, and put a thermister or a small thermometer as close to the sensor as possible with adhesive tape. Install air cleaner cover again.



ET070

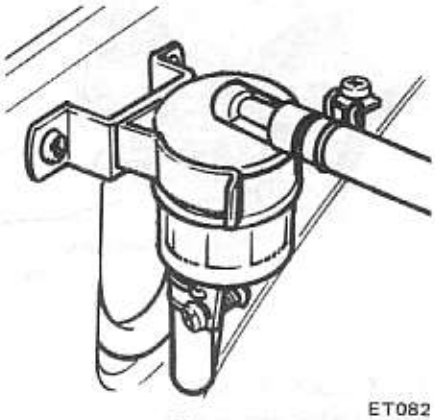
1 Thermister
2 Cord
3 Temperature sensor
4 Air cleaner

Fig. ET-15 Checking temperature sensor

6. Start the engine and continue idling as described under paragraphs 1, 2 and 3 above. When several minutes have passed and valve is partially opened, read the thermister indication. It is correct if the reading falls between 38°C (100°F) and 55°C (131°F). If the reading is erroneous, replace sensor.

REPLACING FUEL FILTER

Check for a contaminated element, and water deposit.

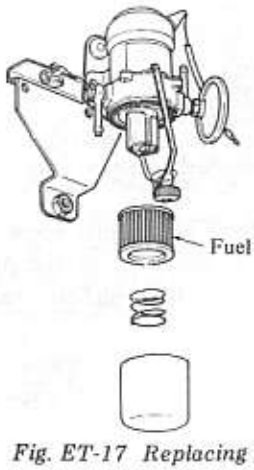


ET082

Fig. ET-16 Fuel strainer

All engines use a cartridge type strainer, so if a malfunction is detected, replace as an assembly.

CLEANING FUEL FILTER COUPLED WITH ELECTRIC PUMP



ET083

Fig. ET-17 Replacing fuel pump filter

Check for a contaminated filter and water deposit. If filter is faulty, replace it with a new one.

Also check packings and O-rings, if they are faulty, replace with new parts.

ADJUSTING CARBURETOR-IDLE RPM MIXTURE RATIO

o SINGLE CARBURETOR

Idle adjustment is made by throttle adjust screw and idle adjust screw after engine is warmed up. See Figure ET-14.

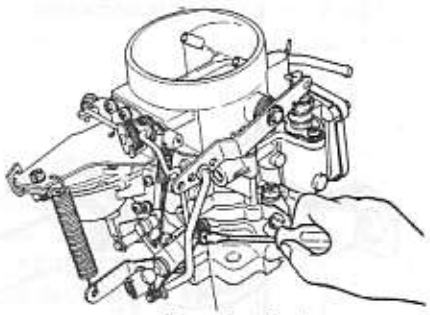


Fig. ET-18 Idling adjustment

1. Check to be sure that float level is correct while engine is at idle speed.
2. Using a suitable screwdriver, turn out idle adjust screw approximately two or three turns, starting from fully closed position. Turn in throttle adjust screw two or three turns and start engine.
3. Turn out throttle adjust screw gently until specified engine idle speed is approximately obtained.
4. Turn in or out idle adjust screw until engine runs smoothly at the highest speed.
5. Turn out throttle adjust screw until specified engine speed is obtained.
6. Readjust idle adjust screw until engine runs smoothly at the highest speed (with the highest vacuum reading).

Repeat these operations until smooth and specified engine speed has been obtained.

Note: Do not attempt to screw down the idle adjust screw completely. If damage to the tip may result which will tend to cause malfunctions.

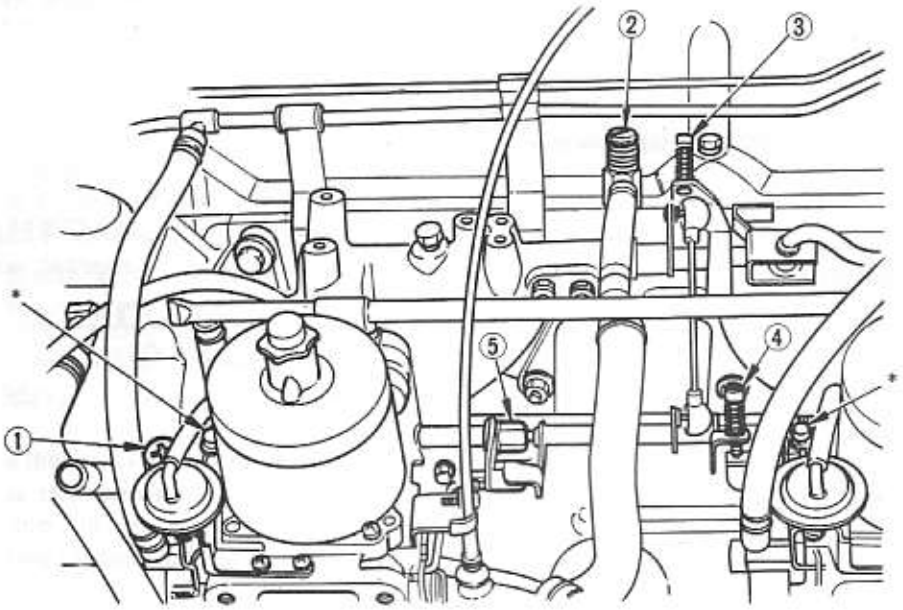
Transmission \ Engine		L20A	L24	L26	
		Single carb.	Single carb.	Single carb.	Twin carb.
Manual transmission		550	550	550	650
Automatic transmission		650	650	650	700
*	Manual transmission	–	650	650	650
*	Automatic transmission	–	650	650	700

* : For cars equipped with device required by E.C.E. air pollution regulations.

TWIN CARBURETOR

The procedure for idling adjustment is described herein. Proper idling adjustment of these two carburetors is extremely important in obtaining peak car performance and in effectively reducing fuel consumption.

It should also be noted that improper carburetor adjustment not only has an adverse effect upon idling but also upon acceleration, engine output, fuel consumption, and other car performance factors.



1 Idle mixture adjusting screw (idle limiter cap)
2 Idle speed adjusting screw
3 Fast idle setting screw
4 Balance adjusting screw
5 Throttle shaft

Fig. ET-19 Carburetor linkage

Notes:

a. **Idle limiter cap equipped with idle mixture adjusting screw must not be removed.**
b. **Screws marked "*" are properly adjusted at factory and required no further adjustment.**

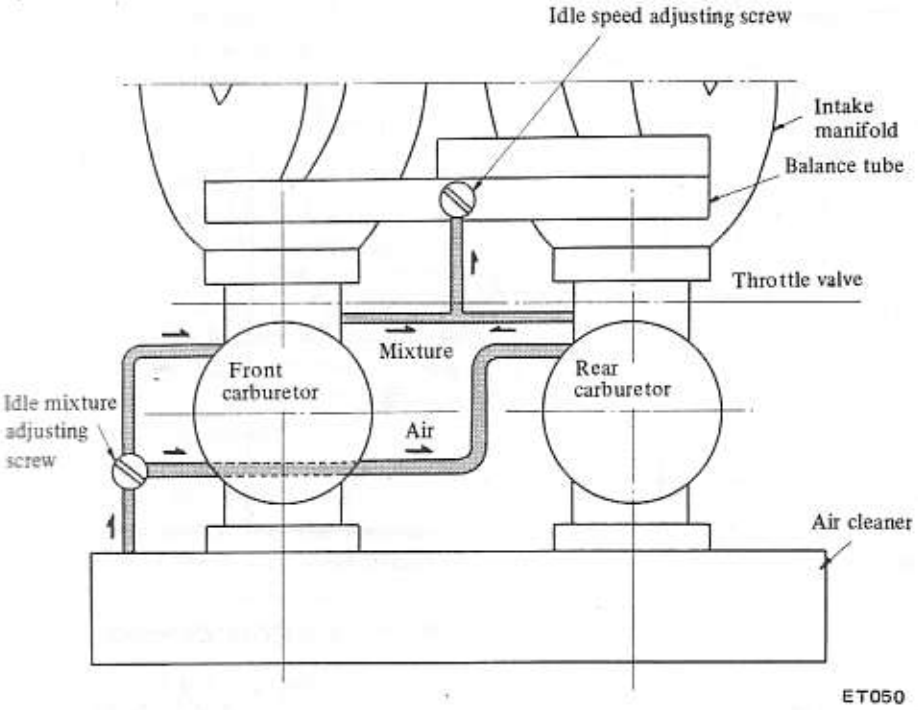


Fig. ET-20 Adjusting idle speed adjusting screw

5. Connect engine tachometer and timing light in proper position.
6. Adjust idling speed by turning idle speed adjusting screw.

L26 (Twin carb.)

Manual transmission ..... 650 rpm
Automatic transmission ..... 700 rpm

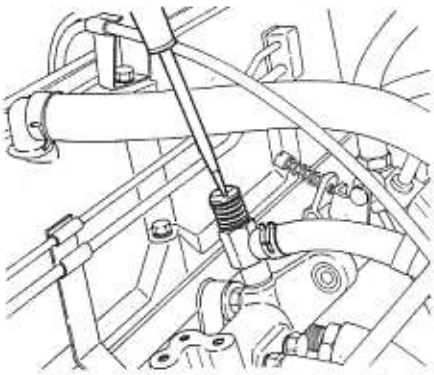


Fig. ET-23 Adjusting idle speed adjusting screw

1. Warm up engine by driving car for more than 20 minutes at a speed of about 48 km/h (30 MPH).
2. Remove air cleaner cover and oil damper cap, raise suction piston with a suitable soft bar. Make sure that suction piston rises smoothly.
3. Check damper oil level and add oil (MS #20 or 10W-30) if necessary.

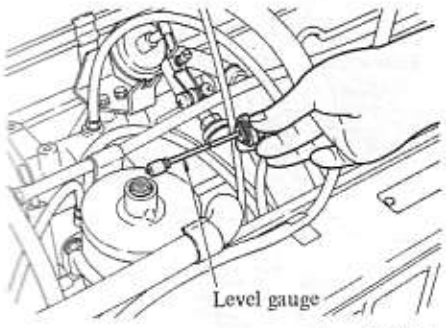


Fig. ET-21 Checking damper oil level

4. Loosen balance adjusting screw and fast idle setting screw.

Note: Make sure operation of front carburetor is separated from rear one.

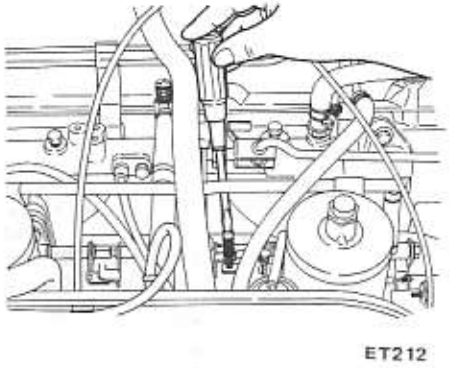


Fig. ET-22 Loosening balance adjusting screw

Notes:

a. When idle speed adjusting screw is turned clockwise, idling speed decreases; it increases when the screw is turned counterclockwise.
b. When idle speed adjusting screw is turned fully clockwise during the above adjustment and engine speed cannot be reduced below 700 rpm, the accelerator linkage is incorrectly adjusted. Under normal conditions, the auxiliary throttle shaft and throttle shaft should have a slight play at idling speed. In other words, the auxiliary throttle shaft should be provided with a play " " which corresponds to the clearance Ta = Tb shown in Figure ET-24.
c. When adjusting in idling condition for 1 to 2 minutes or more, be sure to race the engine beforehand.

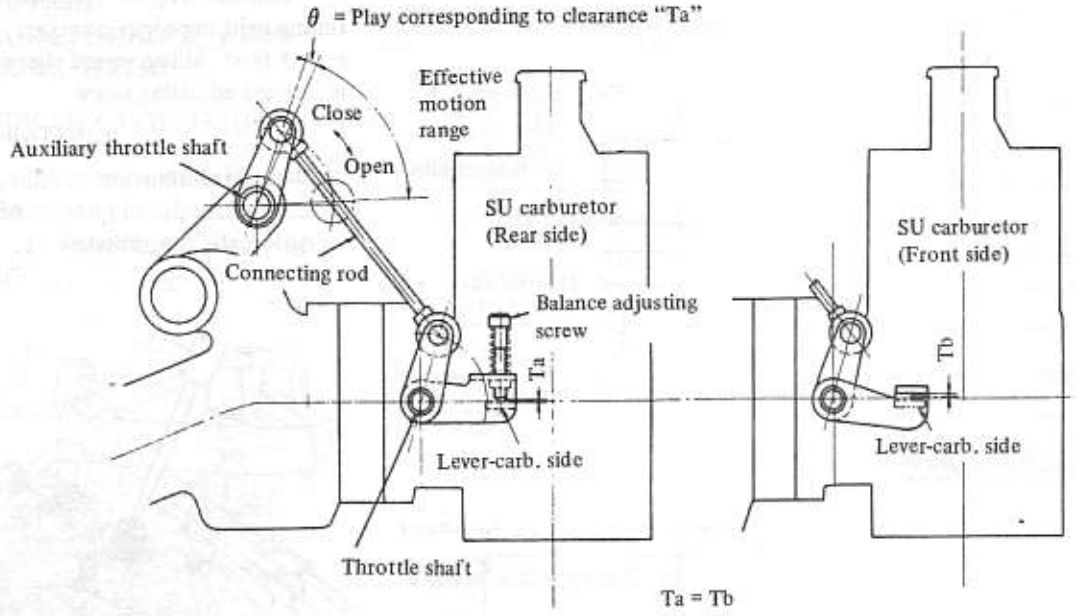


Fig. ET-24 Carburetor linkage

7. Turn idle mixture adjusting screw clockwise or counterclockwise until proper air-fuel mixture ratio is obtained.

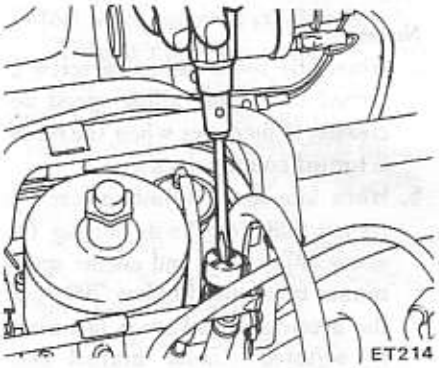


Fig. ET-25 Adjusting idle mixture adjusting screw

Note: Engine speed varies as idle mixture adjusting screw is turned. Optimum air-fuel mixture ratio can be told by the highest engine speed within adjusting range.

8. Turn idle adjust screw until engine runs at specified idle speed.
9. Set ignition timing to specifications by adjusting distributor as shown below.

Ignition timing of the L26 (Twin carb.) engine (B.T.D.C./rpm)

Manual transmission	17/650 (10/650)
Automatic transmission	17/700 (10/700)

Note: ( ) for E.C.E.

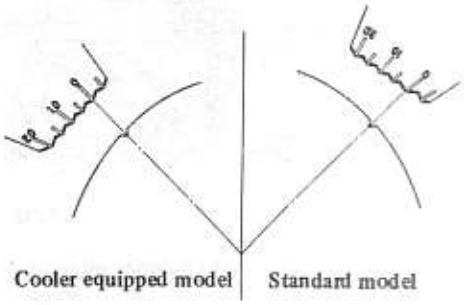


Fig. ET-26 Checking ignition timing

10. If engine speed changes after ignition timing has been adjusted, repeat steps 6, 7 and 8 above.
11. Adjust fast idle setting screw until engine runs at about 1,400 rpm.

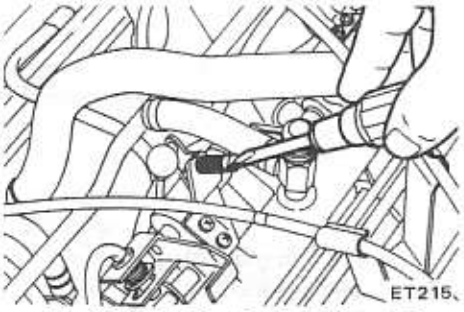


Fig. ET-27 Adjusting fast idle setting screw

12. Using a flow meter, adjust balance adjusting screw so that front and rear carburetor intake air volumes are balanced.

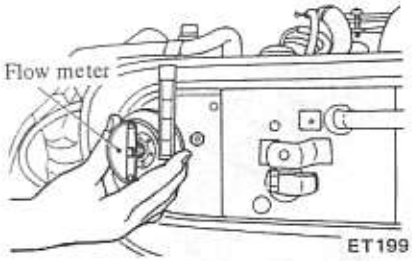


Fig. ET-28 Setting flow meter

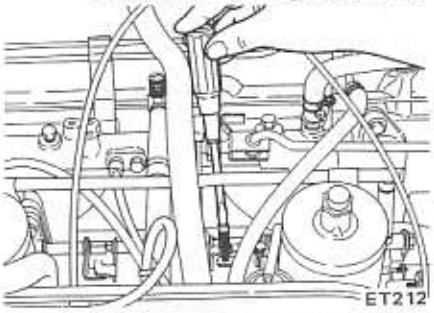


Fig. ET-29 Adjusting balance adjusting screw

Notes:

a. **Attach flow meter to the front side air horn of air cleaner, turn air flow adjusting screw of flow meter, and align the upper end of float in glass tube with scale.**
   Then attach flow meter to the rear side air horn of air cleaner. (Do not adjust air flow adjusting screw of flow meter.) If flow meter float is not aligned with front carburetor scale, turn balance adjusting screw and align float with front carburetor scale.
b. **Stand flow meter float vertically.**
c. **The flow meter is used to hinder engine air intake, it is therefore recommended that the flow meter be used for a very short period of time (one to two seconds).**
   It should not be used continuously.

12. Turn fast idle setting screw out completely until engine runs at the specified idle speed. If necessary, adjust idle speed with idle speed adjusting screw. After adjustment, race engine two or three times to ensure that specified idle speed is obtained each time.

Note: **Make sure that there is a clearance of 2 mm (0.078 in) between lever and tip of screw when fast idle setting screw is turned out.**
To prevent it from falling do not turn fast idle setting screw excessively.

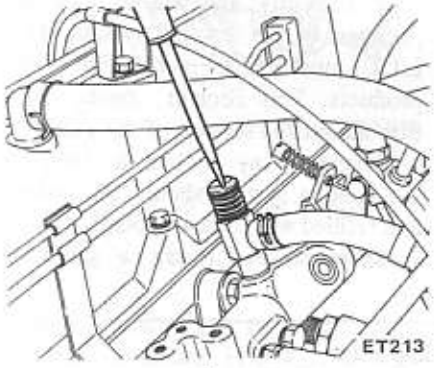


Fig. ET-30 Adjusting idle speed adjusting screw

CHECKING AND ADJUSTING DASH POT

1. It is necessary that the idling speed of engine and mixture have been well turned up and engine is sufficiently warm.
2. Turn throttle valve by hand, and read engine speed when the dash pot just touches the stopper lever.
3. Adjust the position of the dash pot by turning the nut until the engine speed is in the range from 2,300 to 2,500 rpm.
4. Make sure that the engine speed is smoothly reduced from 3,000 to 1,000 rpm within a few seconds.

Dash pots are also used on manual transmission equipped models shipped to ECE teritories where Air Pollution Regulation No. 15 is in effect.

Under no circumstances should these dash pot be adjusted in the field.

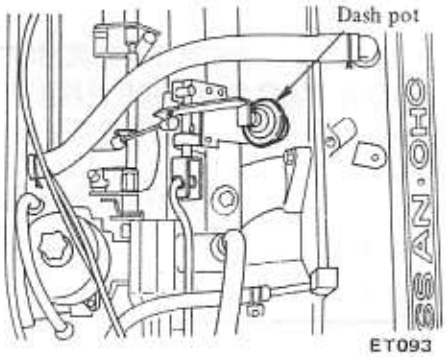


Fig. ET-31 Adjusting dash pot (Twin carb.)

CHECKING TWIN CARBURETOR DAMPER OIL LEVEL

When there is not a sufficient amount of damper oil acceleration and other operating performance features become sluggish. When new carburetors are installed on the engine, or when overhaul is performed, damper oil must be added without fail. Use engine oil MS #20 or SAE 10W-30 for damper oil. Do not use lower or higher weight oils.

To check damper oil level, remove oil cap nut and check oil level marking on the two grooves on plunger rod. No difficulty will be encountered and there is no damper until the oil level reaches the lower line. If the oil level drops below the lower line, add oil. Slowly fill damper oil to upper line.

When removing and replacing oil cap nut, be careful not to bend rod. If oil cap nut is loose, it may fall off. Be sure that it is sufficiently tightened by hand.

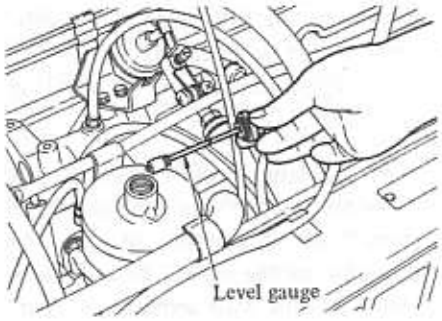


Fig. ET-32 Checking damper oil level

CHECKING FUEL LINES (HOSES, PIPINGS, CONNECTIONS, etc.) FOR LEAKS

Check fuel lines for loose connections, cracks and deterioration. Retighten loose connections; if necessary, replace any damaged or defective parts.

LUBRICANT AND COOLING SYSTEM

REPLACING OIL FILTER

The oil filter is of a full-flow cartridge type. The oil filter element is sealed in the container as a unit.

1. Check for oil leaks at packing flange. If any leakage is discovered, tighten a little, or replace oil filter assembly using Oil Filter Wrench ST1932000. When installing an oil filter, fasten it on cylinder block by hand.
2. The oil filter element should be replaced at recommended intervals.

Notes:

a. **Do not overtighten filter, or oil leakage may occur.**
b. **When assembling oil the seal ring lightly.**

CHANGING ENGINE OIL

1. Check if engine oil has been deteriorated by invading cooling water or gasoline. Drain and refill oil, if necessary.
2. Draining is best done after a good run, when the oil, being thoroughly warm, will flow readily and freely and any foreign matter will be held in suspension.

Place a large bowl or other shallow container under the engine. Then remove the oil pan drain plug. Do this carefully, as the oil will be hot and it will spurt out with some force. After completely draining the dirty oil off securely replace the oil drain plug and finally refill the engine in the usual way up to the "H" mark on the dipstick. Make sure that the car is on a level surface while draining and filling the engine.

Notes:

a. **A milky oil indicates the presence of cooling water.**
   Discover the cause for necessary correction.
b. **An oil with extremely low viscosity suggests dilution with gasoline.**

3. Check oil level, and if it is below the specified level, replenish oil of the same grade up to the H level.

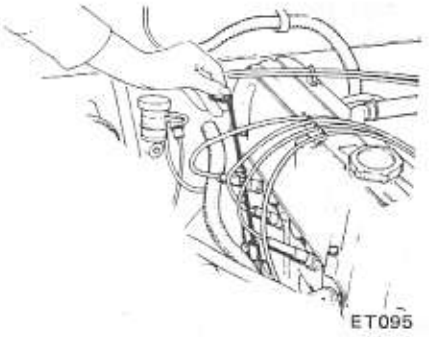


Fig. ET-33 Checking engine oil level

Oil capacity of engine (including oil filter)

			L20A	L24	L26	L26 (Twin carb.)
Capacities liters (US gal, Imp gal)	Engine oil	Oil pan	4.1 (1 3/8, 3 58)	5.0 (1 3/8, 1 1/8)	4.1 (1 7/8, 7/8)	4.0 (1 5/8, 7/8)
		With oil filter	4.7 (1 1/4, 1 3/8)	5.7 (1 1/2, 1 1/4)	4.7 (1 1/4, 1)	4.7 (1 1/4, 1)

CHECKING ENGINE OIL FOR LEAKS

Check cylinder head, front chain cover, oil pan, oil pump rocker cover, oil filter gasket, etc. or other parts for sign of leaks past their gasketed surfaces. If necessary, replace gaskets or damaged parts. After maintenance has been done, check the replaced parts to see if any leaks occur.

CHANGING ENGINE COOLANT

Scale or sediment accumulated in water jacket or radiator harms heat radiation. Thoroughly flush the system after opening two drain plugs, (one at the bottom of the radiator and the other at the left side of the cylinder block,) until clean water comes out.

Always use clean soft water in the radiator. When cold season arrives, the cooling system should be protected against freezing by a good anti-freeze solution such as NISSAN LONG LIFE COOLANT.

To allow for expansion when hot, the level, when cold, should be visible just below the filler neck. Do not overfill the system. This coolant (L.L.C.) should be changed every recommended interval.

CHANGING ENGINE COOLANT (L.L.C.)

Nissan long life coolant

L.L.C. is an ethylene glycol base product containing chemical inhibitors to protect the cooling system from rusting and corrosion. The L.L.C. does not contain any glycerine, ethyl or methyl alcohol. It will not evaporate or boil away and can be used with either high or low temperature thermostat. It flows freely, transfers heat efficiently, and will not clog the passages in the cooling system. The L.L.C. must not be mixed with other products. This coolant can be used throughout the seasons of the year.

Whenever any coolant is changed, the cooling system should be flushed and refilled with a new coolant.

Check the level.

Percent concentration	Boiling point		Freeze protection
	Sea level	0.9 kg/cm^2 cooling system pressure	
30%	106°C (221°F)	124°C (255°F)	−15°C (−5°F)
50%	109°C (228°F)	127°C (261°F)	−35°C (−31°C)

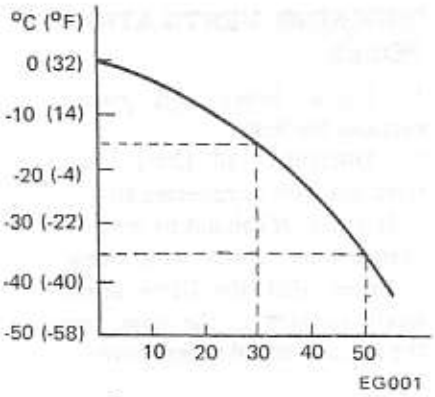


Fig. ET-34 Protection concentration

CHECKING COOLING SYSTEM HOSES AND CONNECTIONS FOR LEAKS

Check cooling system hoses and fittings for loose connections and deterioration. Retighten or replace as necessary.

Inspection of radiator cap

Apply reference pressure [0.9 kg/cm^2 (13 psi)] to radiator cap (not equipped with reservoir tank) or the reservoir tank cap by means of a cap tester to see if it is in good condition. Replace cap assembly if necessary.

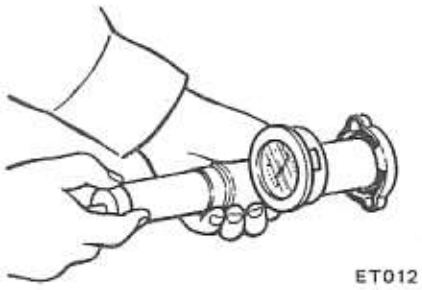


Fig. ET-35 Testing radiator cap

Cooling system pressure test

With radiator cap removed, apply reference pressure [1.6 kg/cm^2 (23 psi)] to the cooling system by means of a tester to check for leaks at the system components.

Water capacity:
with heater:
9.0 ℓ (Except model S30)
(9 ½ US qt, 7 ⅞ Imp qt),
9.4 ℓ (Model S30)
(10 US qt, 8 ¼ Imp qt)
without heater:
8.0 ℓ
(8 ½ US qt, 7 Imp qt)

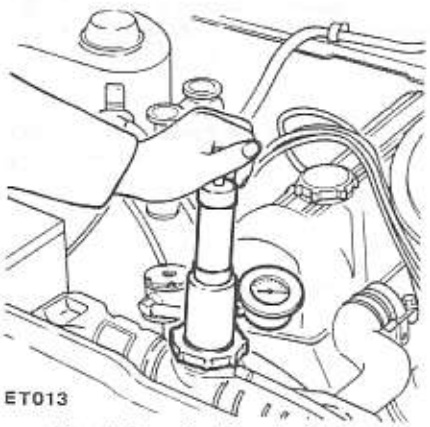


Fig. ET-36 Testing cooling system pressure

CRANKCASE EMISSION CONTROL SYSTEM

DESCRIPTION

This system returns blow-by gas to both the intake manifold and carburetor air cleaner.

The Positive Crankcase Ventilation (P.C.V.) valve is provided to conduct crankcase blow-by gas to the intake manifold. During partial throttle operation of the engine, the intake manifold sucks the blow-by gas through the valve. Normally, the capacity of the valve is sufficient to handle any blow-by and a small amount of ventilating air. The ventilating air is then drawn from the clean side of the carburetor air cleaner, through the tube connecting carburetor air cleaner to rocker cover, into the crankcase.

Under full-throttle condition, the manifold vacuum is insufficient to draw the blow-by flow through the valve, and its flow goes through the tube connection in the reverse direction. In cars with an excessively high blow-by some of the flow will go through the tube connection to the carburetor air cleaner under all conditions.

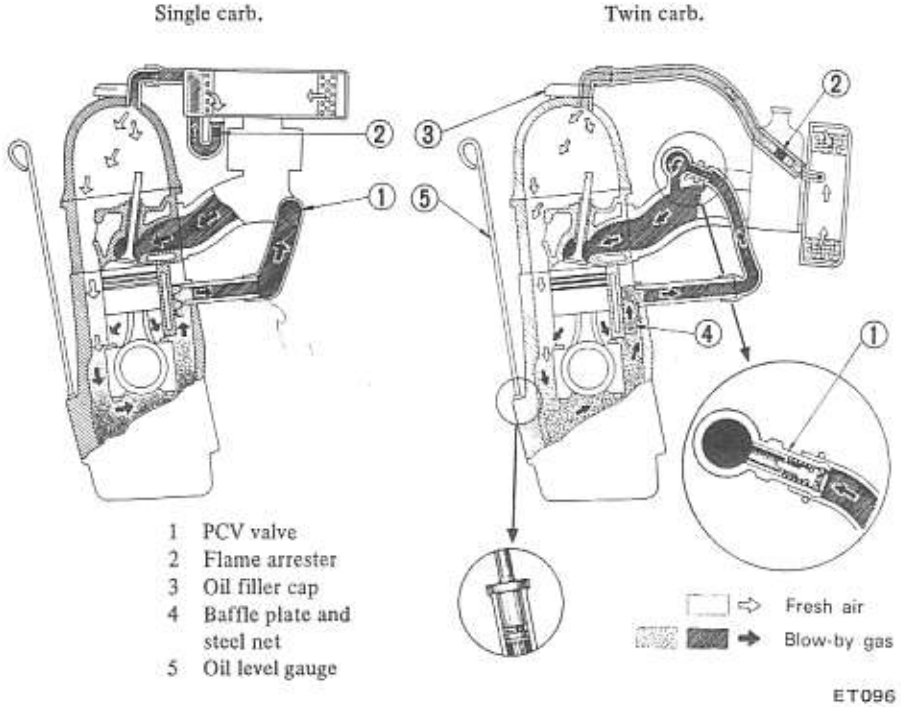


Fig. ET-37 Closed type positive crankcase ventilation system

CHECKING AND REPLACING POSITIVE CRANKCASE VENTILATION (P.C.V.) VALVE

Test PCV valve in accordance with the following method.

With engine running at idle, remove the ventilator hose from PCV valve. If

the valve is working, a hissing noise will be heard as air passes through the valve and a strong vacuum should be felt immediately when a finger is placed over the valve inlet. If the valve is plugged, replace with a new one. Check for deposit plugging in the hose. Clean if necessary.

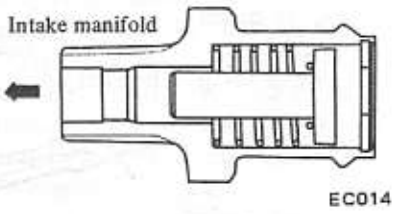


Fig. ET-38 Cross-sectional view of PCV valve

CHECKING VENTILATION HOSES

1. Check hoses and hose connections for leaks.
2. Disconnect all hoses and blow them out with compressed air.

If any hose can not be made free of obstructions, replace with a new one.

Insure that the flame arrester is surely inserted in the hose, between the air cleaner and rocker cover.

SERVICE DATA AND SPECIFICATIONS

Valve clearance mm (in)

Cold	Intake	0.20	(0.0079)
	Exhaust	0.25	(0.0098)
Warm	Intake	0.25	(0.0098)
	Exhaust	0.30	(0.0118)

Fan belt deflection mm/kg (in/lb) ..... 8 to 12/10 (0.31 to 0.47/22)

Compression pressure kg/cm^2 (psi) at rpm

	L20A	L24	L26	
	Single carb.	Single carb.	Single carb.	Twin carb.
Standard	12.0 (171)/350	12.0 (171)/350	12.0 (171)/350	12.5 (178)/350
Minimum	9.0 (128)/350	9.0 (128)/350	9.0 (128)/350	9.0 (128)/350

Battery specific gravity

	Permissible value	Fully charged value (at 20°C, 68°F)
Frigid climates	Over 1.22	1.28
Tropical climates	Over 1.18	1.23
Other climates	Over 1.20	1.26

Ignition timing (B.T.D.C./rpm)

		L20A	L24	L26	
		Single carb.	Single carb.	Single carb.	Twin carb.
Manual transmission		10°/550	17°/550	10°/550	17°/650
Automatic transmission		10°/650	17°/650	10°/650	17°/700
*	Manual transmission	–	10°/650	10°/650	10°/650
	Automatic transmission	–	10°/650	10°/650	10°/700

* : For cars equipped with device required by E.C.E. air pollution regulations.

Distributor point gap	mm (in)	0.45 to 0.55 (0.0177 to 0.0217)
Dwell angle	degree	35 to 41
Spark plug gap	mm (in)	0.8 to 0.9 (0.032 to 0.035)
Twin carb. damper oil		
grade		10W-30
capacity	cc (cu in)	3 (0.183)
Dash pot touching speed	rpm	2,300 to 2,500

Engine oil and engine coolant capacities

			L20A	L24	L26	L26 (Twin carb.)
Capacities liters (US gal, Imp gal)	Engine oil	Oil pan	4.1 (1 1/8, 7/8)	5.0 (1 3/8, 1 1/8)	4.1 (1 1/8, 7/8)	4.0 (1 5/8, 7/8)
		With oil filter	4.7 (1 1/4, 1 3/8)	5.7 (1 1/2, 1 1/4)	4.7 (1 1/4, 1 3/8)	4.7 (1 1/4, 1 3/8)
	Engine coolant	Without heater	8.0 (2 1/8, 1 3/4)	8.5 (2 1/4, 1 7/8)	8.0 (2 1/8, 1 3/4)	–
		With heater	9.0 (2 3/8, 2)	9.5 (2 1/2, 2 3/8)	9.0 (2 3/8, 2)	9.4 (2 1/4, 2 3/4)

Tightening torque

Pivot lock nut	kg-m (ft-lb)	5.0 to 6.0 (36 to 43)
Cylinder head bolt (cold)	kg-m (ft-lb)	6.5 to 8.5 (47 to 61)
Manifold nuts		
Intake and Exhaust	kg-m (ft-lb)	1.2 to 1.6 (9 to 12)
Carburetor securing nuts	kg-m (ft-lb)	0.8 to 1.2 (6 to 9)
Spark plug	kg-m (ft-lb)	1.5 to 2.0 (11 to 14)

TROUBLE DIAGNOSES AND CORRECTIONS

Condition	Probable cause	Corrective action
CANNOT CRANK ENGINE OR SLOW CRANKING	Improper grade oil.	Replace with proper grade oil.
	Discharged battery.	Charge battery.
	Damaged battery.	Replace.
	Loose fan belt.	Adjust.
	Trouble in charge system.	Inspect.
	Wiring connection trouble in starting circuit.	Correct.
	Faulty starter switch.	Repair or replace.
	Faulty starter motor.	Repair or replace.

(Trouble-shooting procedure on starting circuit)
Switch on the starting motor with light "ON."
When light goes off or dims considerably.

a. Check battery.
b. Check connection and cable.
c. Check starter motor.

When light stays bright.

a. Check wiring connection between battery and starter motor.
b. Check starter switch.
c. Check starter motor.

ENGINE WILL CRANK NORMALLY BUT WILL NOT START

In this case, the following trouble causes may exist, but in many cases ignition system or fuel system is in trouble.

Ignition system trouble
Fuel system trouble
Valve mechanism does not work properly
Low compression

(Trouble-shooting procedure)
Check spark plug first by following procedure.
Disconnect high tension cable from one spark plug and hold it about 10 mm (0.3937 in) from the engine metal part and crank the engine.

If good spark occurs.

a. Check spark plug.
b. Check ignition timing.
c. Check fuel system.
d. Check cylinder compression.

If no spark occurs. — Check the current flow in primary circuit.

Very high current. — Inspect primary circuit for short. Check breaker point operation.

Condition	Probable cause	Corrective action
	Low or no current.	Check for loose terminal or disconnection in primary circuit. Check for burned points.
Ignition trouble	Burned distributor point.	Repair or replace.
	Improper point gap.	Adjust.
	Faulty condenser.	Replace.
	Leak at rotor cap and rotor.	Clean or replace.
	Faulty spark plug.	Clean, adjust plug gap or replace.
	Improper ignition timing.	Adjust.
	Damaged ignition coil.	Replace.
	Disconnection of high tension cable.	Replace.
	Loose connection or disconnection in primary circuit.	Repair or replace.
Fuel system trouble	Lack of fuel.	Supply.
	Dirty fuel strainer.	Replace.
	Dirty or clogged fuel pipe.	Clean.
	Fuel pump will not work properly.	Repair or replace.
	Carburetor choke will not work properly.	Check and adjust.
	Improper adjustment of float level.	Correct.
	Improper idling.	Adjust.
	Dirty or clogged carburetor.	Disassemble and clean.
	Clogged breather pipe of fuel tank.	Repair and clean.
	Faulty suction piston (Twin carb.).	Repair or replace.
Low compression	Incorrect spark plug tightening or defective gasket.	Tighten to normal torque or replace gasket.
	Improper grade engine oil or low viscosity.	Replace with proper grade oil.
	Incorrect valve clearance.	Adjust.
	Compression leak from valve seat.	Remove cylinder head and lap valves.
	Sticky valve stem.	Correct or replace valve and valve guide.
	Weak or defective valve springs.	Replace valve springs.
	Compression leak at cylinder head gasket.	Replace gasket.
	Sticking or defective piston ring.	Replace piston rings.
	Worn piston ring or cylinder.	Overhaul engine.
(Trouble shooting procedure) Pour engine oil into plug hole, and then measure cylinder compression.		
	Compression increases.	Trouble in cylinder or piston ring.
	Compression does not change.	Compression leaks from valve, cylinder head or head gasket.

Condition	Probable cause	Corrective action
IMPROPER ENGINE IDLING		
Fuel system trouble	Clogged or damaged carburetor jets.	Clean or replace.
	Incorrect idle adjustment.	Adjust.
	Clogged air cleaner.	Replace element.
	Damaged manifold gaskets or carburetor insulator.	Replace gasket or insulator.
	Improper float level adjustment.	Adjust.
	Faulty suction piston operation (Twin carb.).	Repair or replace.
	Faulty nozzle return (Twin carb.).	Readjust.
	Worn jet needle (Twin carb.).	Replace.
	Worn throttle valve shaft (Twin carb.).	Replace.
	Improper throttle valve interlock adjustment (Twin carb.).	Readjust.
	Loose throttle lever interlock link (Twin carb.).	Readjust or repair.
Low compression		Previously mentioned.
Others	Incorrect valve clearance.	Adjust.
	Extremely low revolution.	Adjust.
	Trouble in PCV valve.	Replace PCV valve.
	Poor acceleration above 1,000 rpm (Twin carb.).	Loosen idling adjusting nuts about a half turn.
ENGINE POWER NOT UP TO NORMAL		
Low compression		Previously mentioned.
Ignition system trouble	Incorrect ignition timing.	Adjust.
	Damaged spark plugs.	Clean, adjust or replace plugs.
	Damaged distributor points.	Dress, or replace points. Also check condenser.
Fuel system trouble	Malfunction of choke system.	Adjust.
	Clogged fuel pipe or floating valve.	Clean.
	Dirty or clogged fuel strainer.	Replace.
	Fuel pump will not work properly.	Repair or replace.
	Clogged carburetor jets.	Disassemble and clean.
	Throttle valve does not open fully.	Readjust.
	Faulty suction piston operation (Twin carb.).	Repair or replace.
	Faulty nozzle return (Twin carb.).	Readjust.
	Clogged nozzle (Twin carb.).	Clean.
	Jet needle not properly installed (Twin carb.).	Readjust.

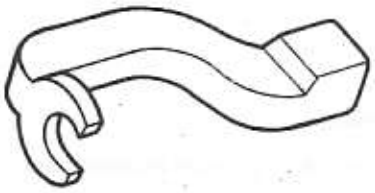
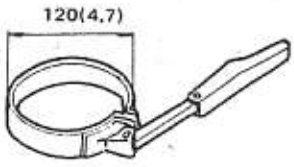
Condition	Probable cause	Corrective action
	Clogged needle valve (Twin carb.).	Clean.
	Fuel pump out of adjustment.	Readjust.
Air intake system trouble	Clogged air cleaner.	Replace element.
	Air inhaling from manifold gasket or carburetor gasket.	Replace gasket.
	Trouble in PCV valve.	Replace PCV valve.
Overheating	Insufficient coolant.	Replenish.
	Loose fan belt.	Adjust fan belt.
	Worn or defective fan belt.	Replace.
	Faulty thermostat.	Replace.
	Faulty water pump.	Replace.
	Clogged or leaky radiator.	Flush, repair or replace.
	Faulty radiator filler cap.	Replace.
	Air in cooling system.	Retighten each part of cooling system.
	Improper engine oil grade.	Replace with proper grade oil.
	Incorrect ignition timing.	Adjust.
	Faulty carburetor (lean mixture).	Overhaul carburetor.
Overcooling	Faulty thermostat.	Replace.
Others	Improper octane fuel.	Replace with specified octane fuel.
	Improper tire pressure.	Inflate to specified pressure.
	Dragging brake.	Adjust.
	Clutch slipping.	Adjust.
NOISY ENGINE		
Car knocking	Overloaded engine.	Use right gear in driving.
	Carbon knocking.	Disassemble cylinder head and remove carbon.
	Timing knocking.	Adjust ignition timing.
	Fuel knocking.	Use specified octane fuel.
	Preignition (misusing of spark plug).	Use specified spark plug.
Mechanical knocking		
Crankshaft bearing knocking.	This strong dull noise increases when engine is accelerated. To locate the place, cause a misfire on each cylinder. If the noise stops by the misfire, this cylinder generates the noise.	This is caused by worn or damaged bearings, or unevenly worn crankshaft. Renew bearings and adjust or change crankshaft. Check lubrication system.

Condition	Probable cause	Corrective action
Connecting rod bearing knocking.	This is a little higher-pitched noise than the crankshaft knocking, and also increases when engine is accelerated. Cause a misfire on each cylinder and if the noise diminishes almost completely, this crankshaft bearing generates the noise.	Same as the case of crankshaft bearings.
Piston and cylinder noise.	When you hear an overlapping metalic noise which increases its magnitude with the revolution of engine and which decreases as engine is warmed up, this noise is caused by piston and cylinder. To locate the place, cause a misfire on each cylinder.	This may cause an abnormal wearing of cylinder and lower compression which in turn will cause a lower out-put power and excessive consumption of oil. Overhaul engine.
Piston pin noise.	This noise is heard at each highest and lowest dead end of piston. To locate the place, causes a misfire on each cylinder.	This may cause a wear on piston pin, or piston pin hole. Renew piston and piston pin assembly.
Water pump noise.	This noise may be caused by worn or damaged bearings, or by the uneven surface of sliding parts.	Replace water pump with a new one.
Others.	An improper adjustment of valve clearance.	Adjust.
	Noise of timing chain.	Adjust the tension of chain.
	An excessive end-play on crankshaft.	Disassemble engine and renew main bearing.
	Note: This noise will be heard when clutch is disengaged.	
	Wear on clutch pilot bushing.	Renew bush and adjust drive shaft.
	Note: This noise will be heard when clutch is disengaged.	
ABNORMAL COMBUSTION (back fire, after fire run-on etc.)		
Improper ignition timing	Improper ignition timing.	Adjust ignition timing.
	Improper heat range of spark plugs.	Use specified spark plugs.
Fuel system trouble	Damaged carburetor or manifold gasket. (back fire, after fire).	Replace them with new parts.
	Faulty carburetor jet.	Disassemble carburetor and check it.
	Improper function of the float.	Adjust the level, and check needle valve.
	Uneven idling. (Run on)	Adjust.
Defective cylinder head, etc.	Improperly adjusted valve clearance.	Adjust.
	Excess carbon in combustion chamber.	Remove head and get rid of carbon.
	Damaged valve spring (back fire, after fire).	Replace it with a new one.

Condition	Probable cause	Corrective action
EXCESSIVE OIL CONSUMPTION		
Oil leakage	Loose oil drain plug.	Tighten it.
	Loose or damaged oil pan gasket.	Renew gasket or tighten it.
	Loose or damaged chain cover gasket.	Renew gasket or tighten it.
	Damaged oil seal in front and rear of crankshaft.	Renew oil seal.
	Loose or damaged locker cover gasket.	Renew gasket or tighten it (but not too much).
	Improper tightening of oil filter.	Renew gasket and tighten it with the proper torque.
	Loose or damaged oil pressure switch.	Renew oil pressure switch or tighten it.
Excessive oil consumption	Cylinder and piston wear.	Overhaul cylinder and renew piston.
	Improper location of piston ring gap or reversely assembled piston ring.	Remount piston rings.
	Damage piston rings.	Renew rings.
		Repair or renew piston and cylinder.
	Worn piston ring groove and ring.	Renew piston and piston ring.
	Fatigue of valve oil seal lip.	Replace seal lip with a new one.
	Worn valve stem.	Renew valve or guide.
Others	Inadequate quality of engine oil.	Use the designated oil.
	Engine overheat.	Previously mentioned.
POOR FUEL ECONOMY		
See the explanation of the power decrease		
Others	Exceeding idling revolution.	Adjust it to the designated rpm.
	Faulty acceleration recovery.	Adjust it.
	Fuel leakage.	Repair or tighten the connection of fuel pipes.
	Poor fuel economy (Twin carb.).	Tighten idling adjusting nuts a quarter to a half turn.
Excessive fuel consumption	Faulty suction piston operation (Twin carb.).	Repair or replace.
	Faulty nozzle return (Twin carb.).	Readjust.
	Worn jet needle (Twin carb.).	Replace.
	Worn nozzle jet (Twin carb.).	Replace.
	Jet needle not properly installed (Twin carb.).	Readjust.
	Improper throttle valve interlock adjustment (Twin carb.).	Readjust.

Condition	Probable cause	Corrective action
TROUBLE IN OTHER FUNCTIONS		
Decreased oil pressure	Inadequate oil quality.	Use the designated oil.
	Overheat.	Previously mentioned.
	Defective function of oil pump regulator valve.	Disassemble oil pump and repair or renew it.
	Functional deterioration of oil pump.	Repair or replace it with a new one.
	Blocked oil filter.	Renew it.
	Increased clearance in various sliding parts.	Disassemble and replace the worn parts with new ones.
	Blocked oil strainer.	Clean it.
	Troubles in oil gauge pressure switch.	Replace it with a new one.
Excessive wear on the sliding parts	Oil pressure decreases.	Previously mentioned.
	Faulty quality or contamination of oil.	Exhange the oil with porper one and change element.
	Defective air cleaner.	Chae element.
	Overheat or overcool.	Previously mentioned.
	Improper fuel mixture.	Check the fuel system.
Scuffing of sliding parts	Decrease in oil pressure.	Previously mentioned.
	Insufficient clearances.	Readjust to the designated clearances.
	Overheat.	Previously mentioned.
	Improper fuel mixture.	Check the fuel system.
Engine operation is irregular or erratic	Worn suction piston (Twin carb.).	Repair or replace.
	Insufficient damper oil, or improper oil used (Twin carb.).	Replenish or replace.
	Improper idling adjustment (Twin carb.).	Readjust.
	Jet needle not properly installed (Twin carb.).	Readjust.

SPECIAL SERVICE TOOLS

No.	Tool number & tool name	Description Unit: mm (in)	For use on	Reference page or figure No.
1.	ST10640001 Pivot adjuster	This tool is used together with a torque wrench in tightening pivot lock nut for valve clearance adjustment.  SE187	All L-series	Fig.ET-1
2.	EG16700000 Flow meter	This tool is used to bring an Twin carburetor into functional synchronization. Synchronization is properly made by keeping equal float (or fuel) levels in this unit.  SE198	Twin car-buretor	Fig.ET-21
3.	ST19320000 Oil filter wrench	This tool is used to take oil filter out of place. In tightening the filter, do not use this tool, to prevent excess tightening.  SE197	All models	Page ET-11