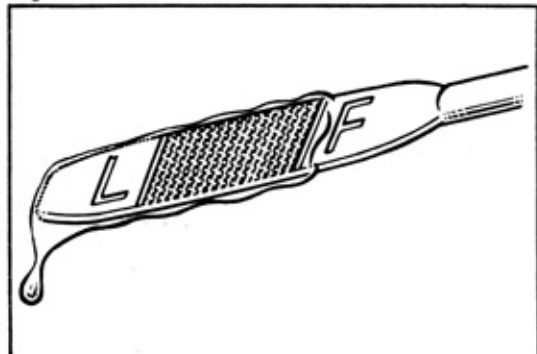


ENGINE TUNE-UP

	page
ENGINE OIL	2-2
COOLING SYSTEM	2-2
DRIVE BELT	2-3
AIR CLEANER	2-4
BATTERY	2-5
SPARK PLUG	2-5
HIGH TENSION CORD	2-6
DISTRIBUTOR	2-7
VALVE TIMING	2-9
CHAIN TENSIONER	2-9
VALVE CLEARANCE	2-10
CARBURETOR	2-11
INITIAL IDLE SPEED [W/AI SYSTEM]	2-12
INITIAL IDLE SPEED [W/O AI SYSTEM]	2-15
FAST IDLE	2-16
THROTTLE POSITIONER	2-16
DASH POT	2-17
COMPRESSION PRESSURE	2-17

Fig. 2-1



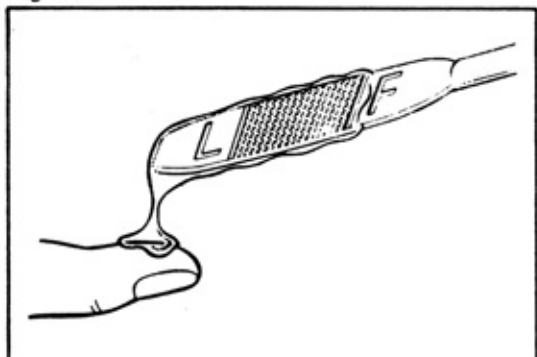
ENGINE OIL

LEVEL CHECK AND REPLENISHMENT

Oil level should be up to the F line on the level gauge. If low, add oil up to the F line.

Use API service SE classification engine oil.

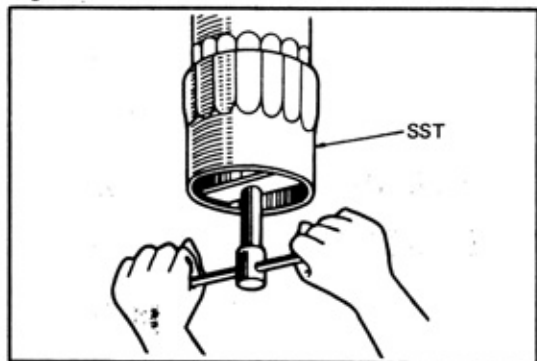
Fig. 2-2



QUALITY CHECK

Pull out the oil level gauge and examine the oil adhering on the graduated part. The oil should not be discolored or thin.

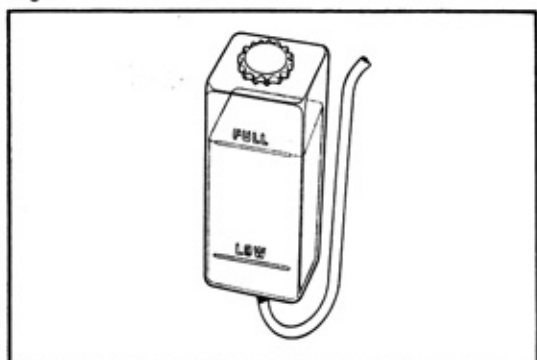
Fig. 2-3



OIL FILTER REPLACEMENT

1. Remove the oil filter by using SST [09228-44010].
2. For installation, tighten firmly the oil filter by hand.
3. Add engine oil.
4. After starting the engine, check for oil leak and recheck the oil level.

Fig. 2-4

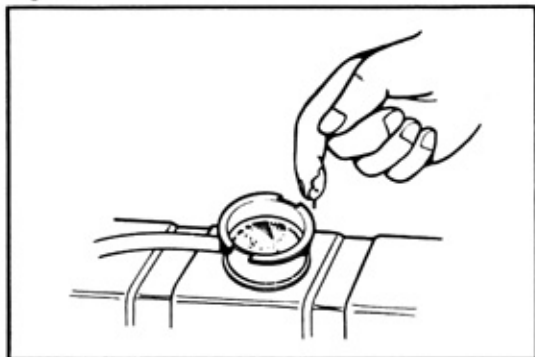


COOLING SYSTEM

COOLANT LEVEL CHECK AND REPLENISHMENT

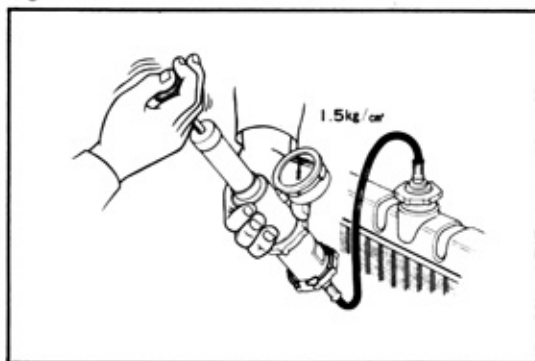
If coolant is low, fill, reservoir tank up to "Full" line.

Fig. 2-5

**COOLANT QUALITY CHECK**

There should not be any excessive deposit of rust or scales around the radiator cap or radiator filler hole, and the coolant should also be free from oil. Replace the coolant if excessively dirty.

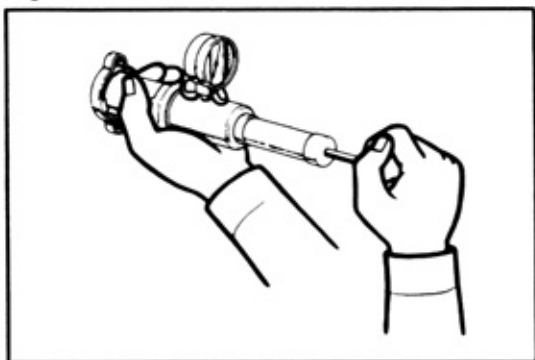
Fig. 2-6

**INSPECTION OF COOLING SYSTEM PARTS**

There should be no defects such as listed below:

1. Damage, deterioration, or loose clamps in radiator hoses, water hoses.
2. Leakage due to corrosion or damage in radiator core.
3. Leakage due to loose water drain cock.
4. Leakage from water pump.

Fig. 2-7



5. Faulty operation of radiator cap.

Inspect the radiator cap pressure regulating and vacuum valves for spring tension and seating condition. If the valve opens at a pressure level below the specified value or is otherwise defective, replace the radiator cap.

Valve opening pressure limit

	0.6 kg/cm² (8.5 psi)
Standard	0.75 – 1.05 kg/cm² (10.7 – 14.9 psi)

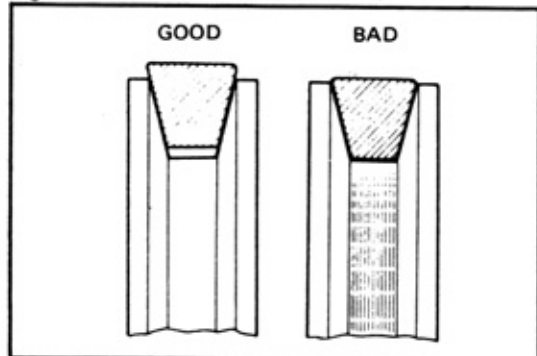
Fig. 2-8

**DRIVE BELT****VISUAL CHECK**

There should be no defects such as listed below:

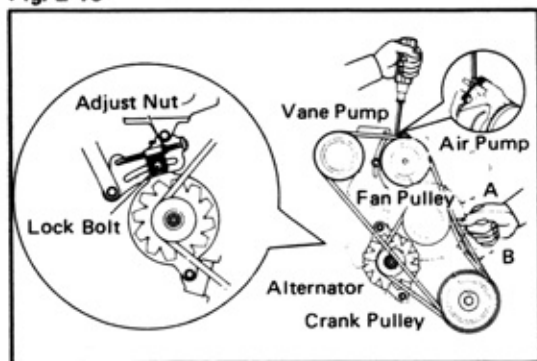
1. Cracked, deteriorated, stretched, or worn belt.
2. Adherence of oil or grease.

Fig. 2-9



3. Improper contacting of belt against the pulley.

Fig. 2-10

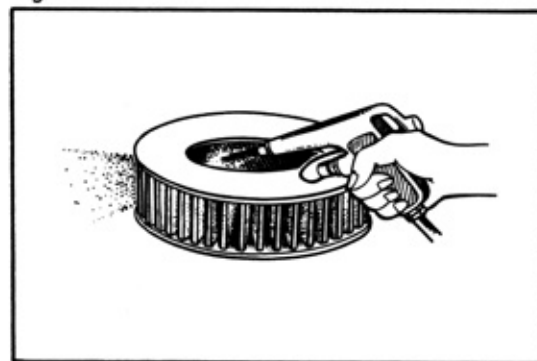


TENSION CHECK AND ADJUSTMENT

When the belt is pressed down with 10 kg (22 lb) force, the belt should deflect the specified amount.

- A : 18 – 21.5 mm (0.71 – 0.85 in.)
- B : 8 – 12 mm (0.31 – 0.47 in.)

Fig. 2-11

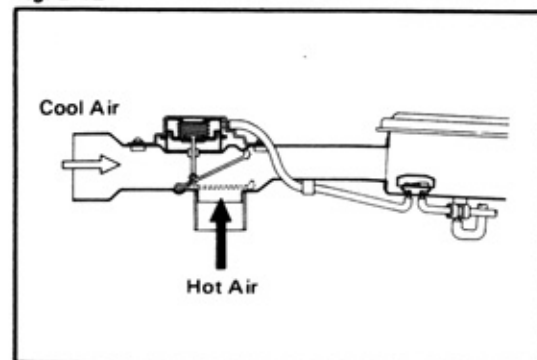


AIR CLEANER

ELEMENT CLEANING

1. In removing the air cleaner or element, and after removal, use care not to drop dirt and dust down into the carburetor.
2. In cleaning the element, blow air from the inner side.
3. In case the element is torn or excessively dirty, replace with new element.

Fig. 2-12



INSPECTION OF HOT AIR INTAKE

Check air control valve operation with engine idling.

Valve should close cold air intake when cold, hot air intake when warm.

Fig. 2-13

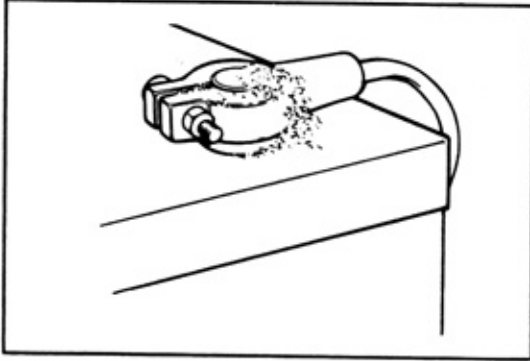


Fig. 2-14

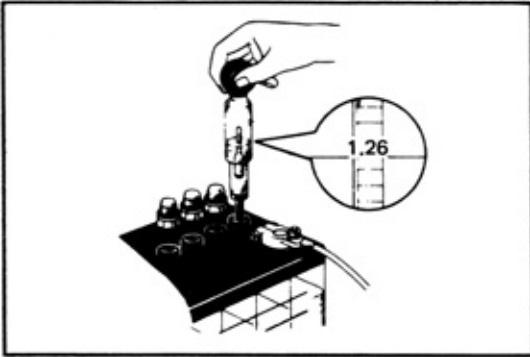


Fig. 2-15

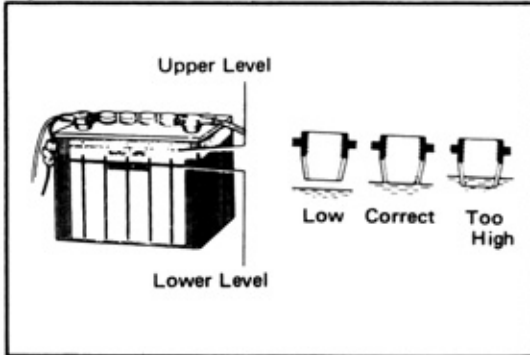
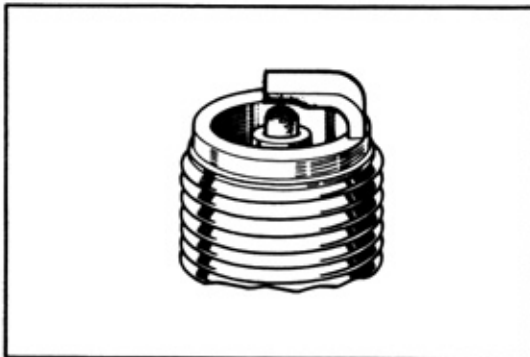


Fig. 2-16



BATTERY



VISUAL CHECK

If very dirty, remove and clean before checking. There should be no defects such as listed below:

1. Rusted battery mounting hardware.
2. Damage or leakage in battery.
3. Loose connection, rusting, deterioration, or corrosion of battery terminals.

SPECIFIC GRAVITY MEASUREMENT



Hold the hydrometer so that the float will not contact against the cylinder wall and read the graduation.

Specific gravity

1.25 to 1.27

ELECTROLYTE LEVEL CHECK AND REPLENISHMENT



The electrolyte level should be up to the upper level. If low, add distilled water (or purified water).

SPARK PLUG



VISUAL CHECK

Condition is good if none of the following defects are present:

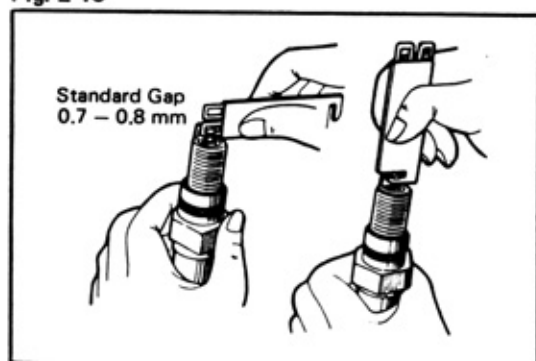
1. Cracks or damages in the threads or insulator.
2. Wear in the electrodes.
3. Damaged or deteriorated gaskets.
4. Burnt condition of electrode and undesirable carbon deposit.

Fig. 2-17

**CLEANING**

1. Do not use spark plug cleaner longer than necessary.
2. Blow off cleaning compound and carbon on the threads thoroughly with air.
3. Clean off the dirt from the outer surface of insulator and threads.

Fig. 2-18

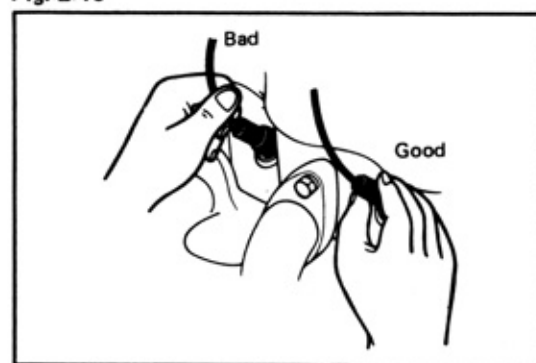
**GAP ADJUSTMENT**

Check the plug gap with plug gap gauge. If not to specified value, adjust by bending the ground (outer) electrode.

Plug gap 0.7 – 0.8 mm (0.028 – 0.031 in.)
Recommended spark plug

	Exc. ECE	For ECE
ND	W16EP	W20EPR
NGK	BP5ES-L	BPR6ES

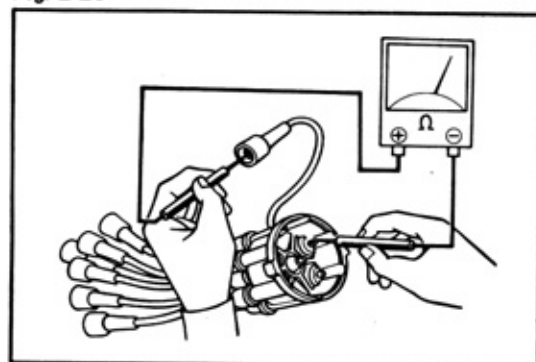
Fig. 2-19

**HIGH TENSION CORD**

– Note –

When pulling out the spark plug cord from the plug, always grip the end of plug cord.

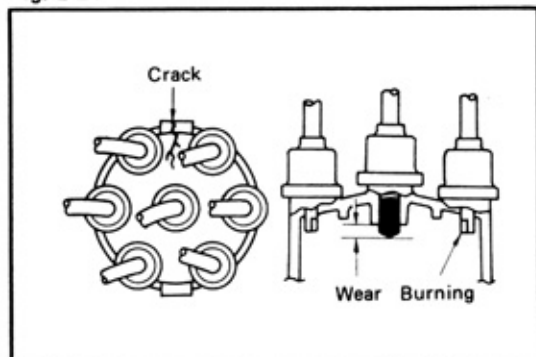
Fig. 2-20



Check the resistance of resistivity cord.

Resistance Less than 25 kΩ per cord.

Fig. 2-21



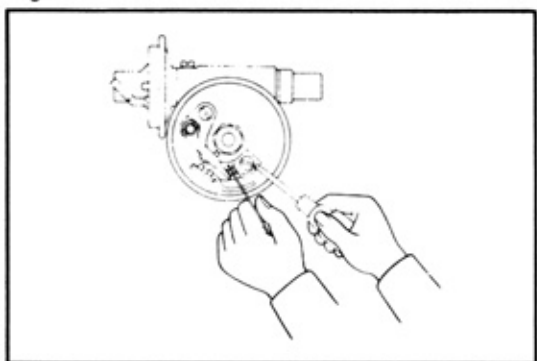
DISTRIBUTOR

CAP INSPECTION

Clean the distributor cap and inspect the cap and rotor for:

1. Cracks, damage, dirty cord hole, corrosion, burning.
2. Center piece spring action.
3. Burnt electrode terminal.

Fig. 2-22



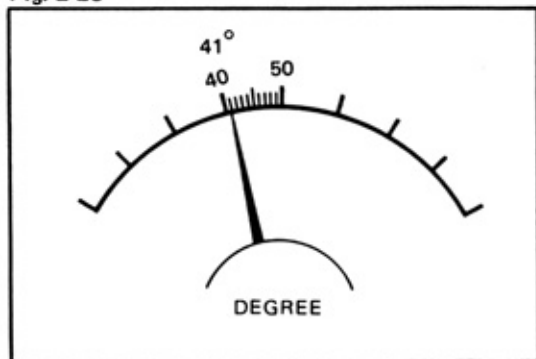
POINT GAP ADJUSTMENT

1. If the points are excessively burnt or pitted, replace the breaker points.
2. Adjust point gap and dwell angle should be within 38° to 44° (41°).

Point gap 0.4 to 0.5 mm

(0.016 to 0.020 in.)

Fig. 2-23



DWELL ANGLE MEASUREMENT

Check if dwell angle is within the specified value when the engine is running at low and high speed.

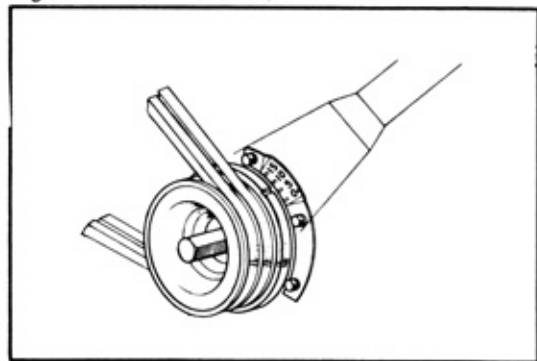
Dwell angle

38° to 44°

– Caution –

Do not connect dwell, tacho tester lead to distributor terminal, but to ignition coil terminal to prevent misfire.

Fig. 2-24



IGNITION TIMING

INSPECTION

Set the engine revolution at idle speed.

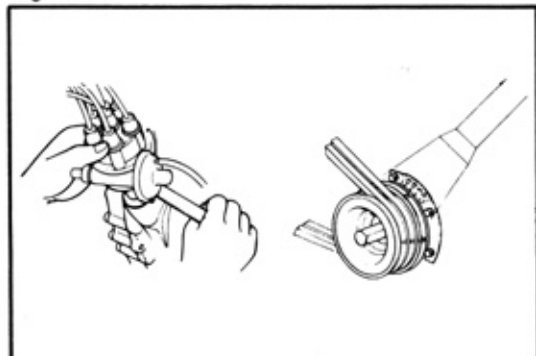
The octane selector must be set at standard position.

Ignition timing

8° BTDC (Exc. ECE)

12° BTDC (For ECE)

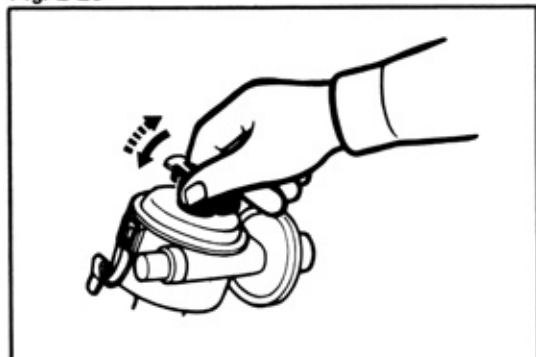
Fig. 2-25

**ADJUSTMENT**

Set the engine revolution at idle speed, and inspect the ignition timing using a timing light. Adjust by turning the distributor housing or octane selector to either side.

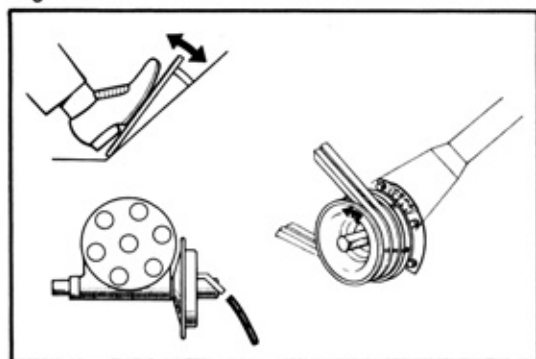
Ignition timing **8° BTDC (Exc. ECE)**
 12° BTDC (For ECE)

Fig. 2-26

**GOVERNOR OPERATIONAL INSPECTION**

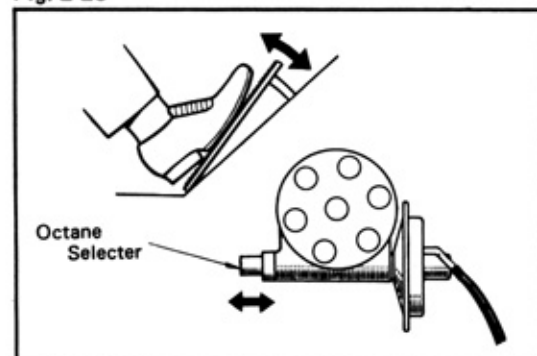
1. Rotor should return quickly when turned clockwise by hand and released.
2. Rotor should not be excessively loose.

Fig. 2-27



3. Start the engine and disconnect the vacuum hose from the distributor. The timing mark should vary in accordance with the opening and closing of throttle valve.

Fig. 2-28

**VACUUM ADVANCE OPERATIONAL INSPECTION**

Connect the distributor vacuum hose. The octane selector should vary in accordance with the opening and closing of throttle valve.

Fig. 2-29

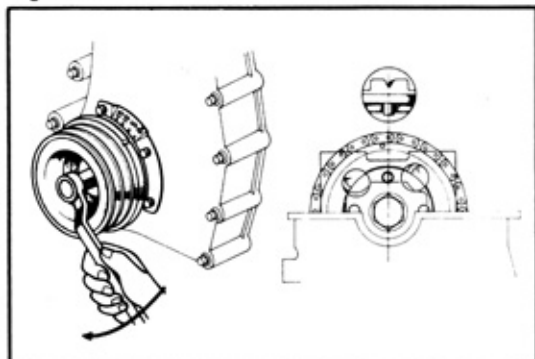


Fig. 2-30

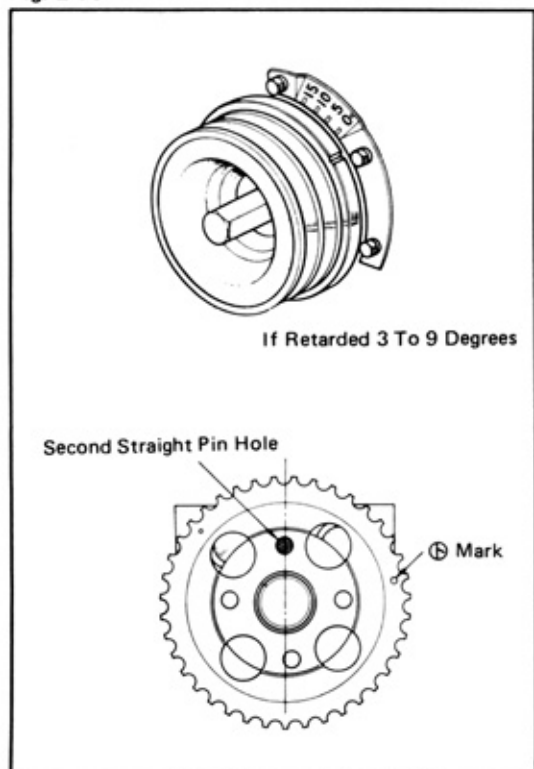
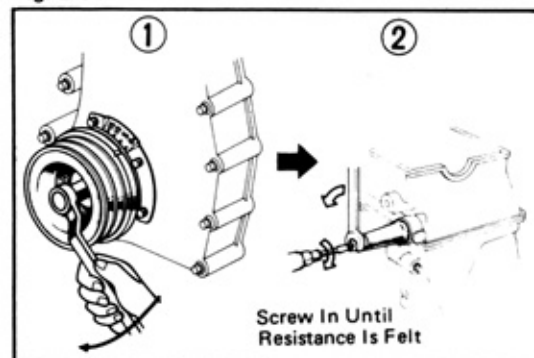


Fig. 2-31



VALVE TIMING

INSPECTION

1. Turn the crankshaft in normal direction until the No.1 piston is set at TDC/compression.
2. Check to see that the flange timing pin in camshaft is within the embossed mark on valve rocker support No.1.

ADJUSTMENT

Adjust the valve timing in the following sequence:

1. Turn the crankshaft in normal direction until the flange timing pin in camshaft is aligned with the embossed mark on valve rocker support No.1.
2. At this position, read the timing chain cover graduation.
3. Remove the chain tensioner.
4. Loosen the camshaft timing gear set bolt (LH threads) and remove the camshaft timing gear.
5. After resetting the position of straight pin hole as instructed below, install the camshaft timing gear.
 - a. If retarded 3 to 9 degrees
Align the camshaft timing gear to the second straight pin hole.

– Note –

When fitting, has the No.1 piston set at TDC/compression.

6. Install the chain tensioner.
Recheck the valve timing.

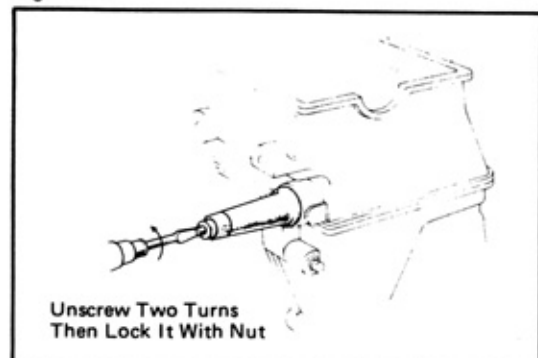
CHAIN TENSIONER

ADJUSTMENT

Adjustment method with engine stopped.

1. Turn the crankshaft in normal direction until the chain slack side is at the most slacked condition.
2. Loosen the locknut, and turn the screw clockwise until resistance is felt.

Fig. 2-32

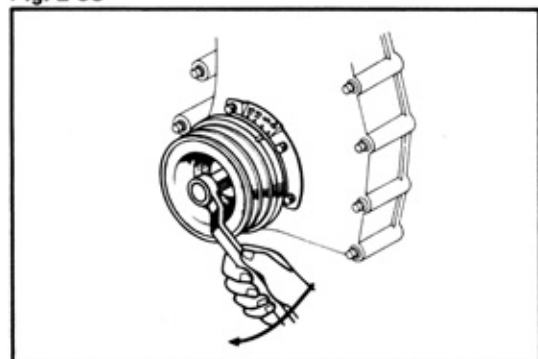


3. Then, loosen the screw two turns.
4. Tighten the lock nut.

– Note –

Run the engine and if the chain is noisy, loosen the screw about half turn more.

Fig. 2-33

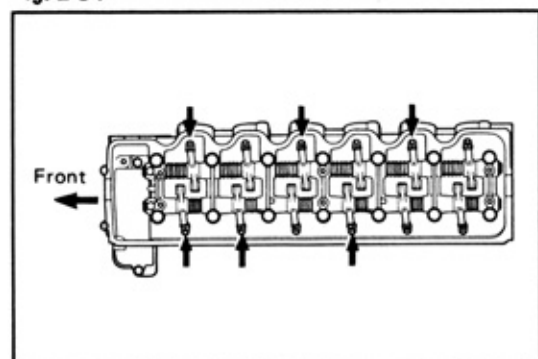


VALVE CLEARANCE

ADJUSTMENT

1. Warm up engine, then stop.
2. Set No.1 cylinder to TDC/compression. At TDC compression position, rocker arms on No.1 cylinder should be loose and rockers on No.6 should be tight.

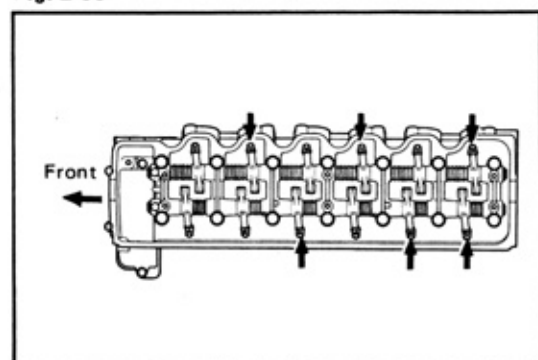
Fig. 2-34



3. Adjust valve clearance. Valve clearance is measured between valve stem and rocker arm. Adjust valves indicated by arrows only.

Intake	0.28 mm (0.011 in.)
Exhaust	0.35 mm (0.014 in.)

Fig. 2-35



4. Rotate crankshaft 360°
Turn crankshaft one complete revolution and align timing marks at pulley. Adjust remaining valve as indicated by arrows.

Fig. 2-36

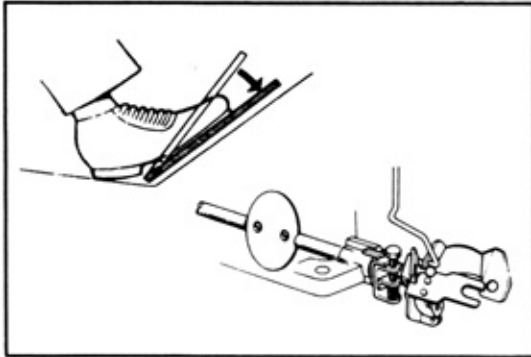


Fig. 2-37

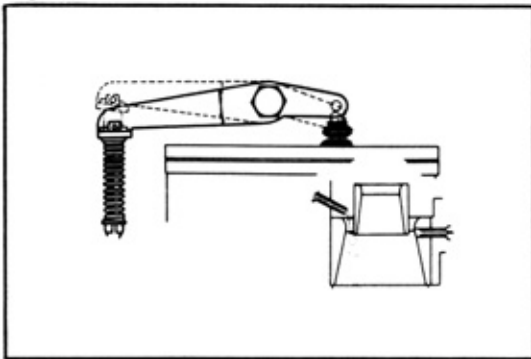
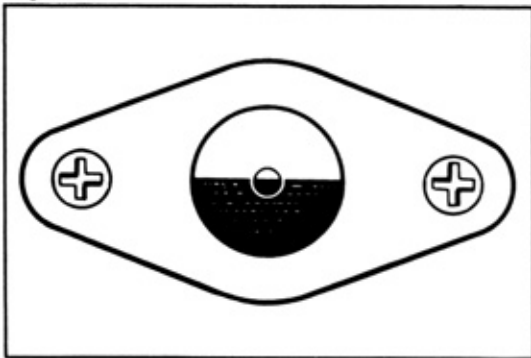


Fig. 2-38



CARBURETOR

LOOSENESS AND OPERATIONAL CHECK

1. The various set screws, plugs, and union bolts should be in properly tightened state and in correctly installed state.
2. The links should be free from excessive wear, the snap rings (ring pins) should all be present, and the throttle shaft should not be worn.
3. The throttle valve should open fully when the accelerator pedal is stepped all the way down.
4. Check the accelerating pump operation. Gasoline should shoot out with good force from the jet when the throttle valve is opened.

FLOAT LEVEL CHECK

Float level is satisfactory if the fuel level is up to the standard line when the engine is idling.

INITIAL IDLE SPEED (W/AI SYSTEM)

ADJUSTMENT

[When CO Meter Is Used]

1. Adjusting and Measuring Conditions.
 - (1) Engine shall be warmed up sufficiently. (Radiator coolant temperature must be about 82°C).
 - (2) Zero setting of CO meter shall be made after warming up for the time specified by the meter manufacturer.
 - (3) Choke valve shall be fully open.
 - (4) All accessory parts (wipers, heater, lights, air conditioner, etc.) shall be turned off.
 - (5) Air cleaner shall remain installed when measuring.
 - (6) Attach the following test equipment.
 - Tachometer
 - Vacuum gauge
 - (7) All vacuum line shall be connected.
 - (8) Transmission shall be in neutral position when measuring.
 - (9) CO meter shall be operated in accordance with the instructions supplied by the meter manufacturer.

Fig. 2-39

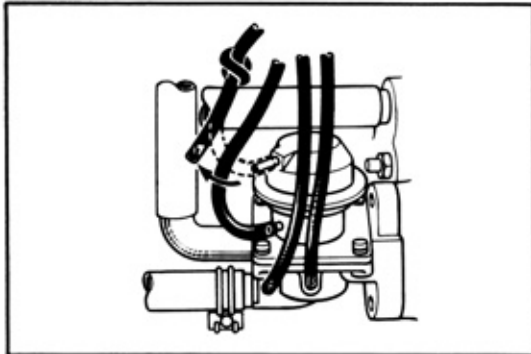
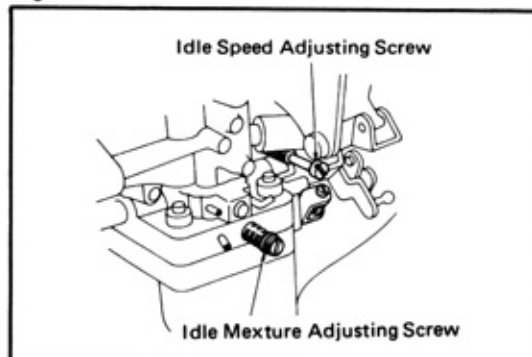


Fig. 2-40



2. Idle speed Adjustment
 - (1) Have the AI system "OFF" by disconnecting the hose (No.17) from the ASV chamber "A" pipe and shutting the hose end.
 - (2) Turn the idle speed adjusting screw and the idle mixture adjusting screw, and obtain the maximum vacuum reading at the specified idle speed. (Maximum Boost Method).
 - (3) Race the engine momentarily by manipulating the accelerator link to verify that engine will return to TP RPM and then specified IDLE RPM when released.
If at this time the engine fails, to rotate smoothly, make the idle adjustment once more.

Standard Adjustment Values
[At AI System "OFF"]

Idle Speed	rpm	750 ± 50
Specified Idle Co	%	1 – 2
Ignition Timing	°/BTDC	8°
Transmission Range		N

- (4) Measure the CO concentration in the exhaust gases with CO meter and if found within the specified values, the adjustment is completed.

– **Caution** –

1. Be sure to race the engine before measuring concentration from 30 to 60 seconds at about 2,000 rpm.
2. Measure the concentration less than 1 to 3 minutes after racing the engine to allow the concentration to stabilize.

- (5) If the measured concentration exceeds the specified value, tighten the idle mixture adjusting screw, until the concentration is within the specified value.

– **Caution** –

1. When the idle mixture adjusting screw is tightened, there will be a point where the engine speed drops rapidly in relation to the amount screwed in. Further adjustment must not be attempted by screwing in beyond this point.
2. Allowable engine idle speed is ±50 rpm of the specified speed.
3. If the CO concentration is extremely low and even though the idle seems to be stable, caution should be taken because trouble might show up, such as the engine running poorly at high speeds, stalling, and decreased starting performance.

- (6) If the CO concentration still exceeds the specified value after performing the above adjustments or if the engine loses smoothness of operation, keep repeating the above adjustments or check over other places (valve clearance, compression, ignition system, fuel system) for possible cause.

- (7) After completing adjustment, perform road test to make certain that the engine performance has not changed.

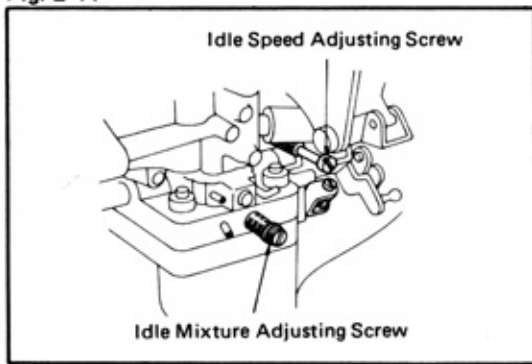
- (8) Connect the hose (No.17) to the ASV chamber "A" pipe.

[Alternate Method]

To be used only if CO meter is not available.

1. Adjusting and Measuring Conditions.
 - (1) Engine shall be warmed up sufficiently. (Radiator coolant temperature must be about 82°C).
 - (2) Choke valve shall be fully open.
 - (3) All accessory parts (wipers, heater, lights, air conditioner, etc.) shall be turned off.
 - (4) Air cleaner shall remain installed when measuring.
 - (5) Attach the following test equipment.
 - o Tachometer
 - o Vacuum gauge
 - (6) All vacuum line shall be connected.
 - (7) Transmission shall be in neutral position when measuring.

Fig. 2-41



2. Idle Speed Adjustment.
 - (1) Set to the maximum speed by turning the idle Mixture Adjusting Screw.
 - (2) Set to the idle mixture speed by turning the Idle Speed Adjusting Screw.
 - (3) Keep on repeating the adjustments (1) and (2) until the maximum speed will not rise any further no matter how much the Idle Mixture Adjusting Screw is adjusted before moving to the next steps.
 - (4) Set to the initial idle speed by screwing in the Idle Mixture Adjusting Screw.

– Note –

Brake the idle limiter cap to adjust the idle speed, if installed.

Initial Idle Speed & Idle Mixture Speed

Initial Idle Speed	rpm	750
Idle Mixture Speed	rpm	820

Fig. 2-45

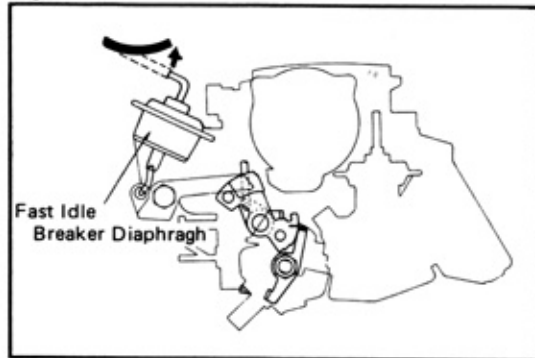


Fig. 2-46

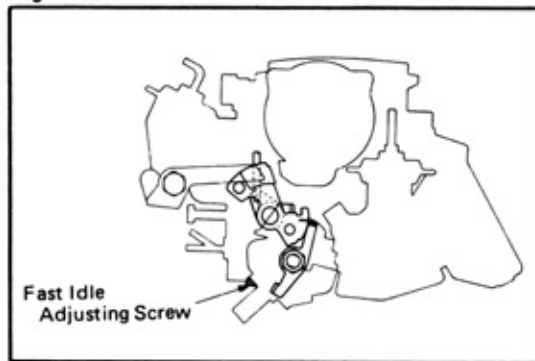


Fig. 2-47

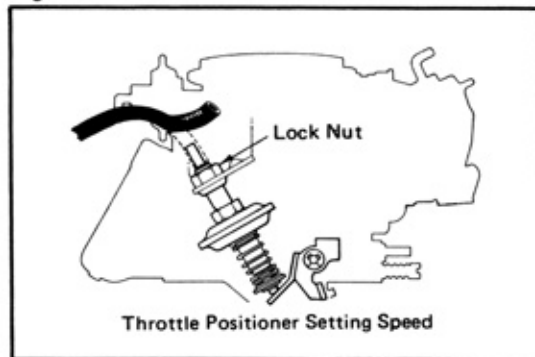
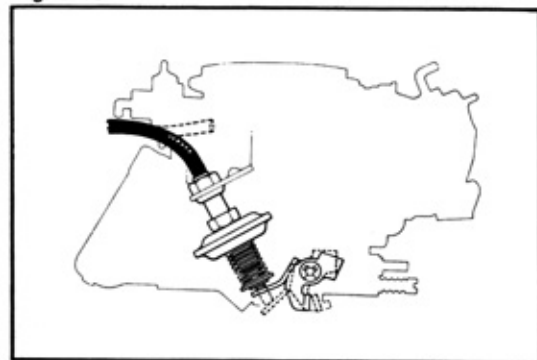


Fig. 2-48



FAST IDLE

ADJUSTMENT

1. Warm up engine
2. Stop engine and disconnect vacuum hose from choke opener diaphragm, and then close vacuum hose.
3. With the throttle valve slightly open, close the choke valve with finger, and then close the throttle valve.
4. Start engine without stepping on the accelerator pedal.
5. Check the engine speed to see if it is at the specified fast idle speed. If not, correct by turning the fast idle adjusting screw.

Fast idle speed 2500 ± 200 rpm
6. After adjustment, reconnect the vacuum hose.

THROTTLE POSITIONER

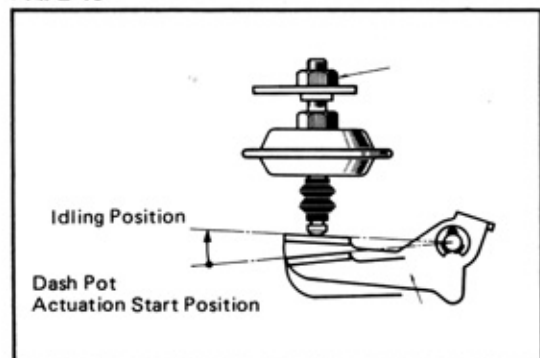
ADJUSTMENT

1. After warming up, check the idle speed.
2. Disconnect the throttle positioner diaphragm sensing hose.
3. Race the engine and then remove the foot from accelerator pedal.
4. Check the engine speed at this time and if not at specified speed, correct by turning the throttle positioner body.

Throttle positioner setting speed
[At Cooler OFF]
1050 ± 50 rpm (Australia)
1150 ± 50 rpm (ECE)
5. Connect the hose to diaphragm. Check to see that idling speed should be restored in following seconds.

w/ Cooler 8 – 20 Seconds
w/o Cooler 5 – 15 Seconds

Fig. 2-49



DASH POT

INSPECTION AND ADJUSTMENT

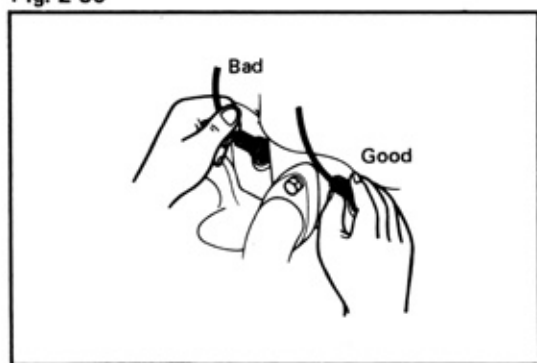
- (1) Measure the time required for the engine to start idling after the throttle lever (1) touches the dash pot.

Actuating time:

Standard 1 – 2 seconds

- (2) To adjust, loosen the locknut (2) and turn the dash pot body.

Fig. 2-50



COMPRESSION PRESSURE

PRESSURE MEASUREMENT

Measure compression pressures in the following manners.

1. Remove all spark plugs, and disconnect the high tension cord from the ignition coil to cut-off secondary circuit.
2. Insert a compression gauge into the spark plug hole, open the throttle valve fully, and measure the compression pressure of each cylinder while cranking the engine with the starter motor.
3. Always use a fully charged battery to obtain the engine revolution of more than 250 rpm.

Fig. 2-51



compression pressure

11 kg/cm² (156 psi) [Exc. ECE]

12 kg/cm² (171 psi) [For ECE]

Limit 9 kg/cm² (128 psi)

Difference of pressure between cylinders

Less than 1.0 kg/cm² (14.2 psi)

MEMO

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