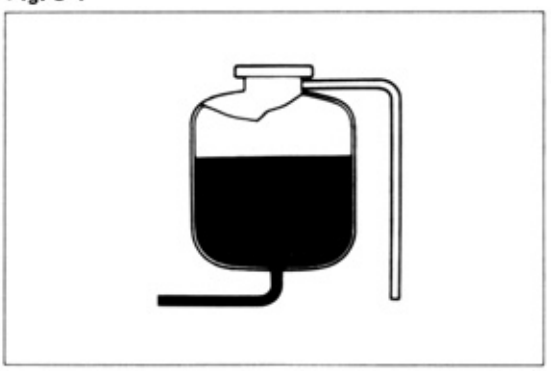
2T-G ENGINE TUNE-UP

	ITEM		REMARK
1	COOLING SYSTEM	Coolant level check	Full line
		Quality check	
		Coolant capacity (w/heater)	8.7 liters 9.2 US qt 7.7 Imp. qt
2	DRIVE BELT	Tension Fan – Alternator	
		New	6 – 8 mm 0.2 – 0.3 in.
		Used	8 – 12 mm 0.3 – 0.5 in.
		A/C Compressor–	
		Crankshaft	11 – 14 mm 0.4 – 0.6 in.
3	AIR CLEANER	Element cleaning	
4	BATTERY	Specific gravity	1.25 – 1.27 at 20°C (68°F)
		Electrolyte level	
5	SPARK PLUG	Visual check	
		Cleaning	
		Plug gap	0.7 – 0.8 mm 0.028 – 0.031 in.
6	HIGH TENSION CORD	Resistance	Less than 25 kΩ per cord
7	DISTRIBUTOR	Distributor cap	
		Rubbing block gap	0.4 – 0.5 mm 0.016 – 0.020 in.
		Damping spring gap	0.1 – 0.4 mm 0.004 – 0.016 in.
8	ENGINE OIL	Oil level check	Full line
		Oil replenishment	API sevices SE classification
		Oil capacity	
		Dry refill w/Oil filter	4.5 liters 4.8 US qt 4.0 Imp. qt
		Drain & refill w/Oil filter	3.8 liters 4.0 US qt 3.3 Imp. qt
		w/o Oil filter	3.2 liters 3.4 US qt 2.8 Imp. qt
		Quality check	
		Oil filter replacement	SST[09228-44010]
9	DWELL ANGLE		52°
		Variation	within 3° (at idling to 2,000 rpm)
	[COLD CONDITION]		
10	IGNITION TIMING		12° BTDC (Reference)
11	NO.2 CHAIN TENSIONER	Back stroke	0.5 – 1.0 mm at 3 – 5 kg
			0.02 – 0.04 in. at 6.6 – 11.0 lb
12	VALVE TIMING		SST[09248-27010]

	ITEM		REMARK
13	VALVE CLEARANCE	IN	0.29 ± 0.05 mm (0.011 ± 0.002 in.)
		EX	0.34 ± 0.05 mm (0.013 ± 0.002 in.)
	WARM UP ENGINE [HOT CONDITION]		
14	IGNITION TIMING	at Engine stop	12° BTDC/1,000 rpm
15	DISTRIBUTOR	Governor advancer	
		Vacuum advancer	
16	CARBURETOR	Float level	SST[09243-00010] or [09243-00020] 20 – 21 mm 0.79 – 0.83 in.
17	ACCELERATION PUMP	Fuel discharging time	1.1 – 1.7 second
		Fuel injection direction	
		Starter wire	50° (at rotary disc)
		Throttle valve full open	
18	IDLE SPEED & IDLE MIXTURE ADJUSTMENT		SST[09243-00010] or [09243-00020]
		Idle speed	1,000 ± 50 rpm
		Manifold vacuum (at Idle speed)	More than 385 mmHg (15.2 in.Hg)
		Front and rear difference (Idle to 2,000 rpm)	Below 10 mmHg (0.4 in.Hg)
		Idle mixture adjusting screw preset position	Screw out 1-1/2 turn
		CO Concentration (at Idle speed)	1.0 – 1.5 %
19	COMPRESSION PRESSURE		
		STD	11.6 kg/cm² 165 psi
		Limit	10.0 kg/cm² 142 psi
	Difference between each cylinder		Less than 1.0 kg/cm² (14 psi)

COOLING SYSTEM

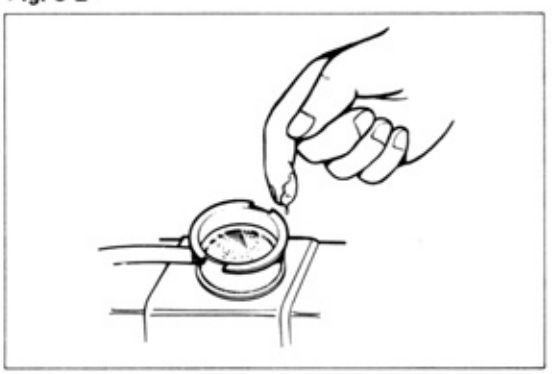
Fig. 3-1



COOLANT LEVEL CHECK & REPLENISHMENT

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

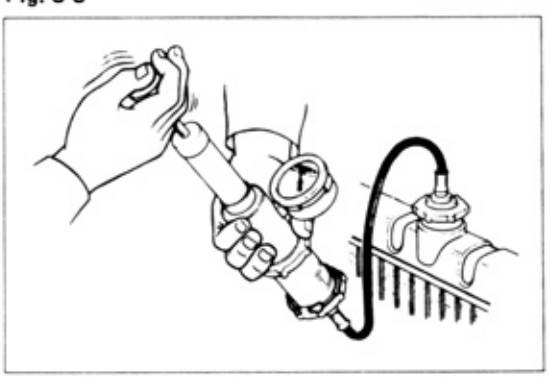
Fig. 3-2



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. 3-3

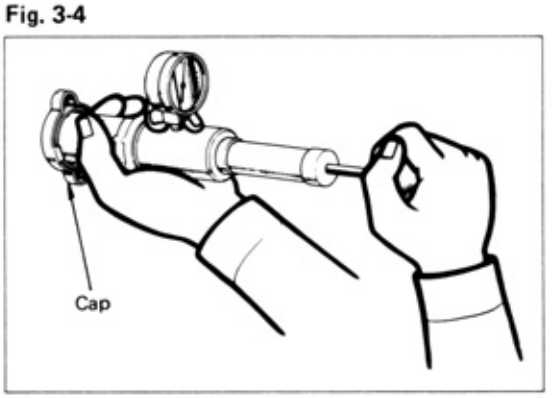


INSPECTION OF COOLING SYSTEM PARTS

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. 3-4

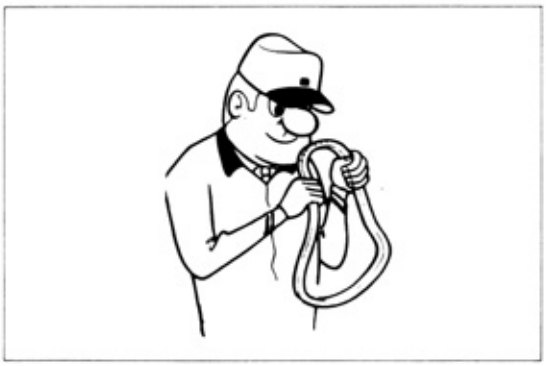


5. Faulty operation of radiator cap.
   Inspect the radiator cap pressure regulating and vacuum valves for spring tension and seating condition. If the valve opens at a pressure level below the specified value or is otherwise defective, replace the radiator cap.

Valve opening pressure:

STD	**0.9 kg/cm² (12.8 psi)**
Limit	**0.6 kg/cm² (8.5 psi)**

Fig. 3-5



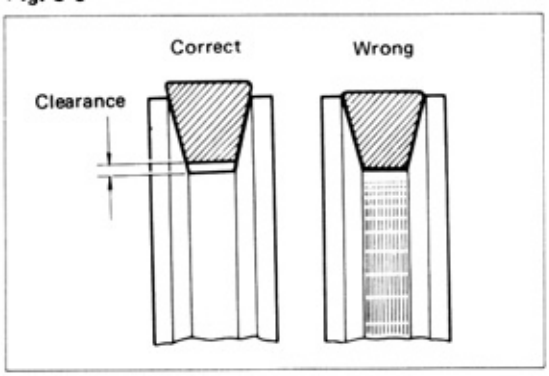
DRIVE BELT

VISUAL CHECK

There should be no defects such as listed below:

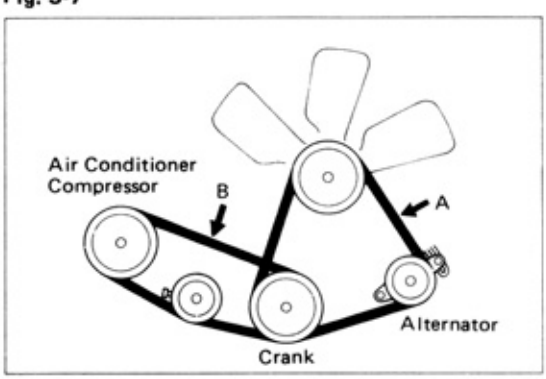
1. Cracked, deteriorated, stretched, or worn belt.
2. Adherence of oil or grease.

Fig. 3-6



3. Improper contacting of belt against the pulley.

Fig. 3-7



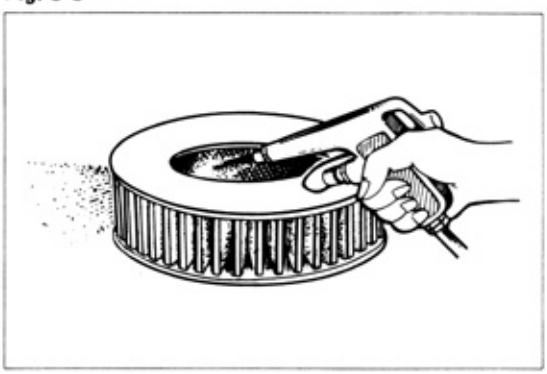
TENSION CHECK & ADJUSTMENT

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

Drive belt tension:

A	**New**	**6 – 8 mm (0.2 – 0.3 in.)**
	Used	**8 – 12 mm (0.3 – 0.5 in.)**
B		**11 – 14 mm (0.4 – 0.6 in.)**

Fig. 3-8

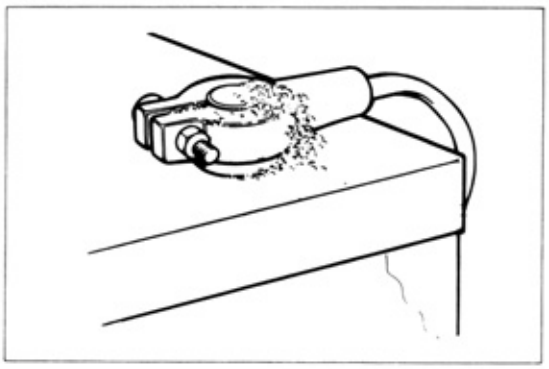


AIR CLEANER

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 one.

Fig. 3-9



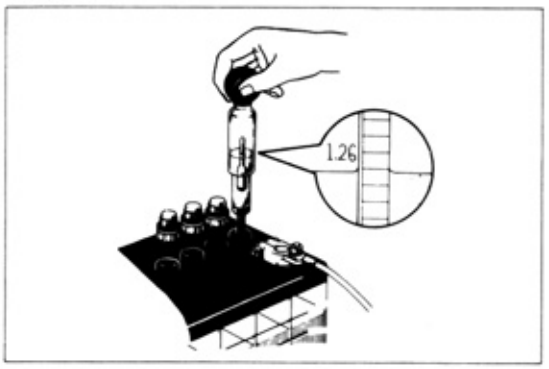
BATTERY

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.

Fig. 3-10

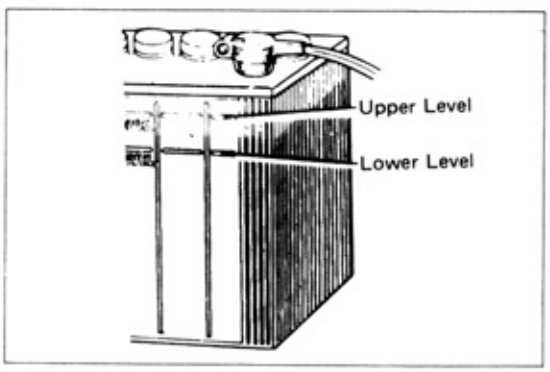


SPECIFIC GRAVITY MEASUREMENT

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

Specific gravity: 1.25 – 1.27 at 20°C (68°F)

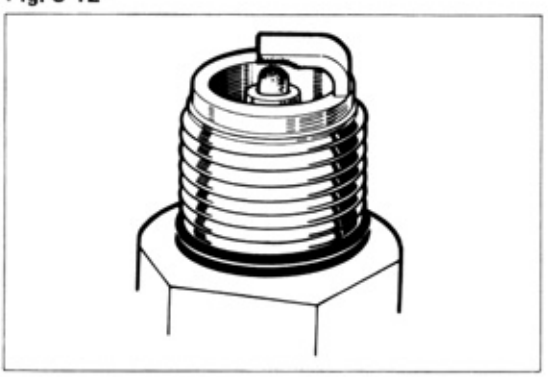
Fig. 3-11



ELECTROLYTE LEVEL CHECK & REPLENISHMENT

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

Fig. 3-12



SPARK PLUG

VISUAL CHECK

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

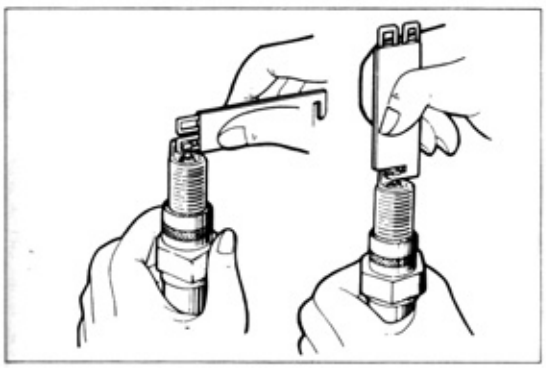
1. Cracks or damages in the threads or insulator.
2. Wear on the electrodes.
3. Damaged or deteriorated gaskets.
4. Burnt condition of electrode and undesirable carbon deposit.

Fig. 3-13

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 dirt from the outer surface of insulator and threads.

Fig. 3-14

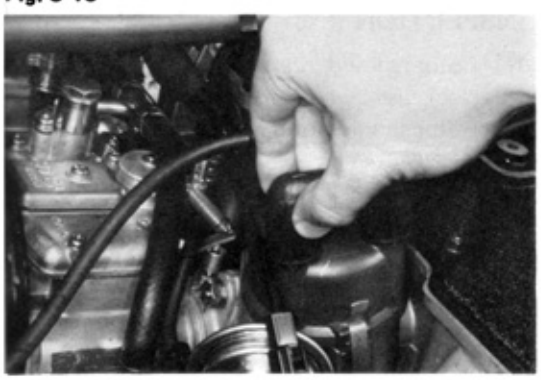


GAP ADJUSTMENT

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.)

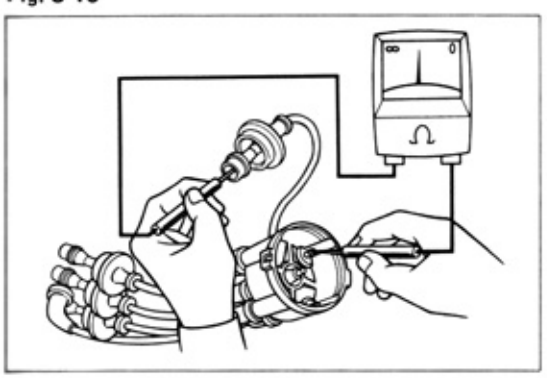
Fig. 3-15



HIGH TENSION CORD

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

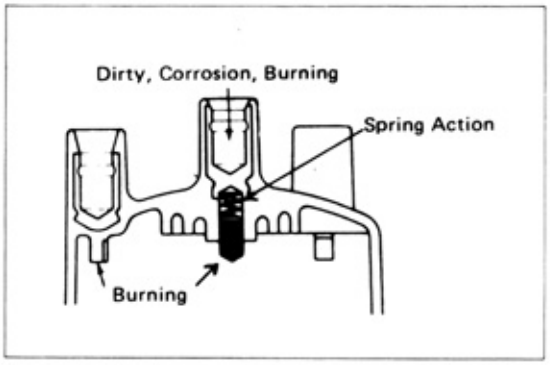
Fig. 3-16



Check the resistance of resistivity cord.

Resistance: Less than 25 kΩ per cord

Fig. 3-17



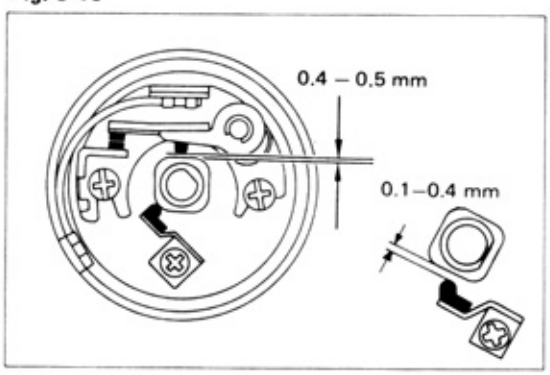
DISTRIBUTOR

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. 3-18



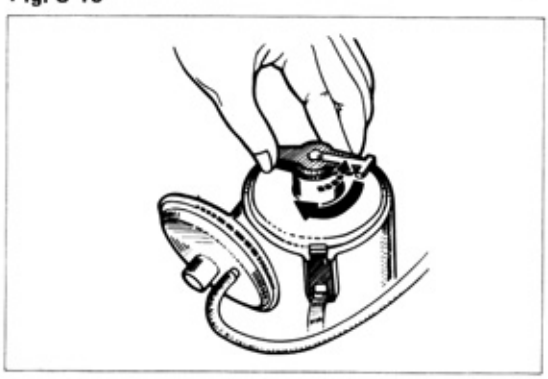
POINT GAP ADJUSTMENT

1. If the points are excessively burnt or pitted, replace the breaker points.
2. Adjust rubbing block gap and damping spring.

Rubbing block gap:
0.4 – 0.5 mm
(0.016 – 0.020 in.)

Damping spring gap:
0.1 – 0.4 mm
(0.004 – 0.016 in.)

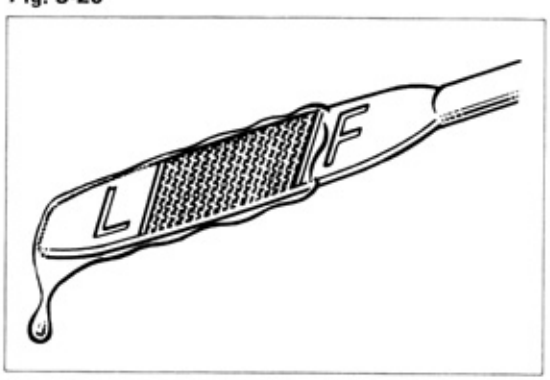
Fig. 3-19



GOVERNOR OPERATIONAL INSPECTION

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

Fig. 3-20

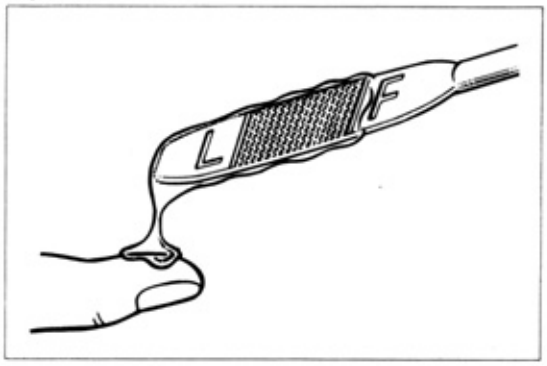


ENGINE OIL

LEVEL CHECK & 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. 3-21



QUALITY CHECK

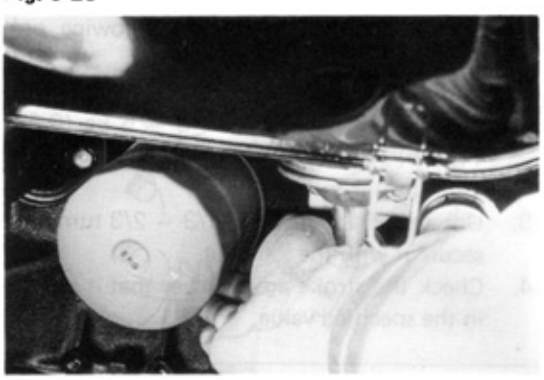
Pull out the oil level gauge and examine the oil adhering on the graduated part. The oil should not be discolored or thin.

Fig. 3-22

OIL FILTER REPLACEMENT

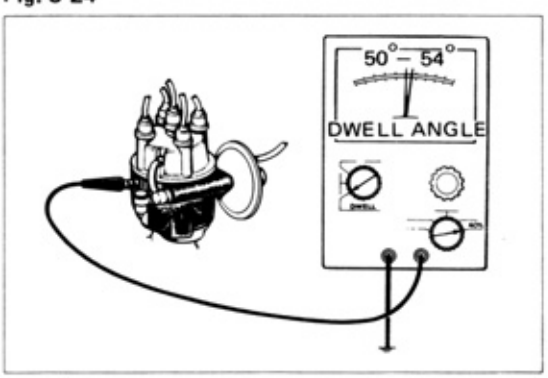
1. Remove the oil filter by using SST.
   SST [09228-44010]
2. For installation, tighten firmly the oil filter by hand.

Fig. 3-23



3. After starting the engine, check for oil leak and recheck the oil level.

Fig. 3-24

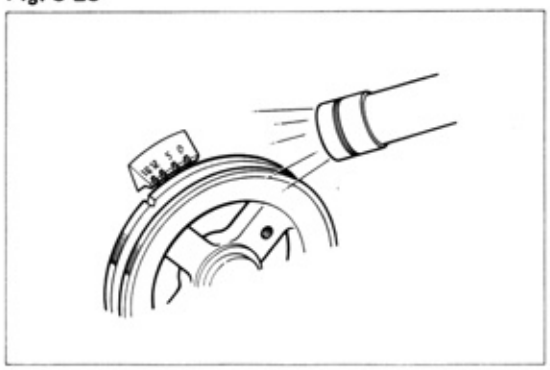


DWELL ANGLE

Check if dwell angle is within the specified value.

Dwell angle: **52°**
Variation: **Within 3°**
(at idling to 2,000 rpm)

Fig. 3-25



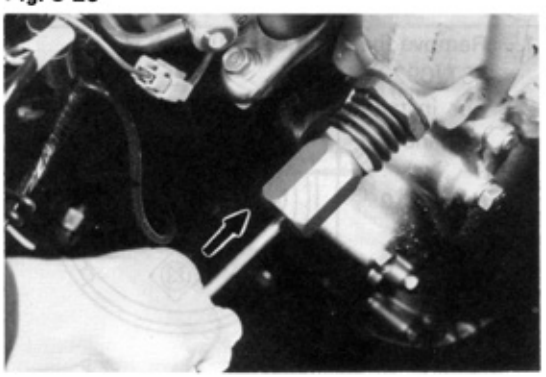
(COLD CONDITION) IGNITION TIMING

INSPECTION

Set the engine revolution at idle speed, the octane selector must be set at standard position.

Ignition timing:
12° BTDC (Reference)

Fig. 3-26



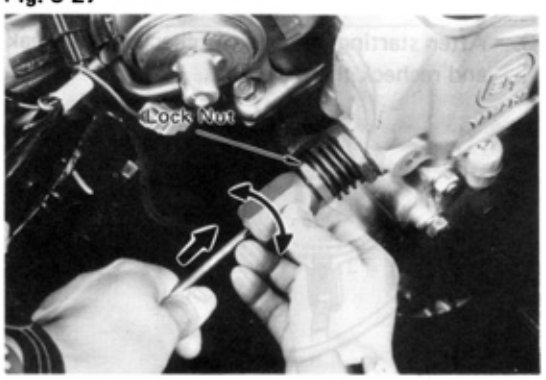
NO.2 CHAIN TENSIONER

CHECK THE BACK STROKE

With a screwdriver, press in the plunger with 3 – 5 kg (6.6 – 11.0 lb) of force and measure the stroke length.

Back stroke: 0.5 – 1.0 mm (0.02 – 0.04 in.)

Fig. 3-27

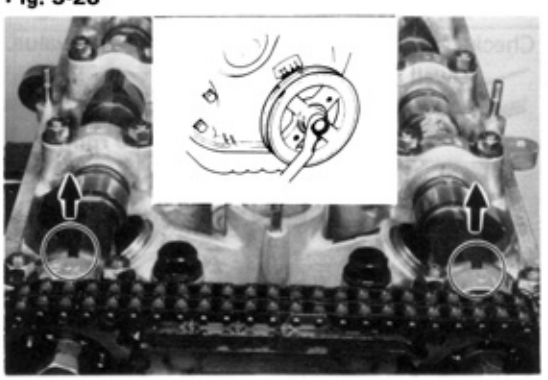


ADJUSTMENT

Adjust the back stroke by the following procedure:

1. Loosen the lock nut.
2. Press in the plunger with 3 – 5 kg (6.6 – 11.0 lb) of force, and screw in the adjust nut until it rests on the plunger.
3. Unscrew the adjust nut 1/3 – 2/3 turns and secure it with the lock nut.
4. Check the stroke again to see that it is within the specified value.

Fig. 3-28

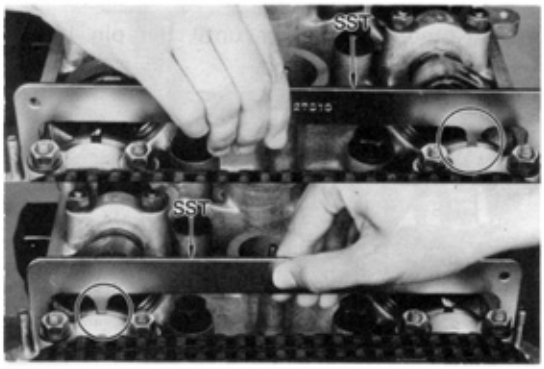


VALVE TIMING

INSPECTION

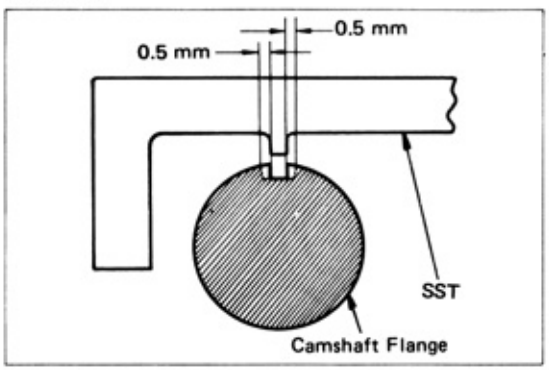
1. Remove the engine cylinder head cover.
2. Set the No.1 cylinder to TDC/compression. In this position, the timing slits in the flange of the camshaft are positioned upward.

Fig. 3-29



3. Check the positions of camshaft No.1 and No.2 with SST.
SST [09248-27010]

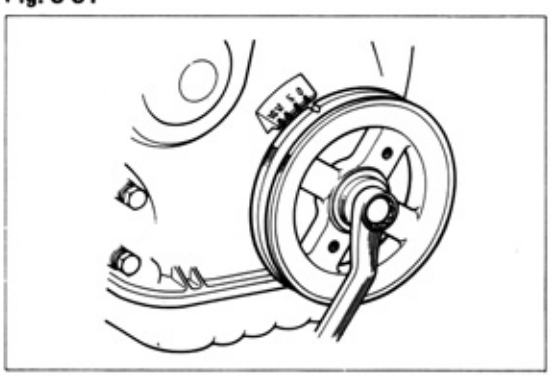
Fig. 3-30



4. Valve timing permissible error: (on the camshaft outer flange):

± 2°	Camshaft rotation angle
± 0.5 mm (0.02 in.)	Camshaft flange outer perimeter.

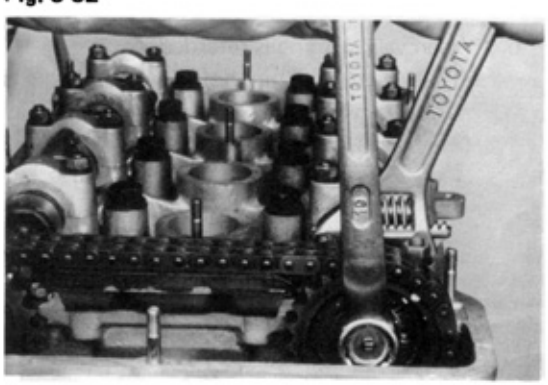
Fig. 3-31



ADJUSTMENT

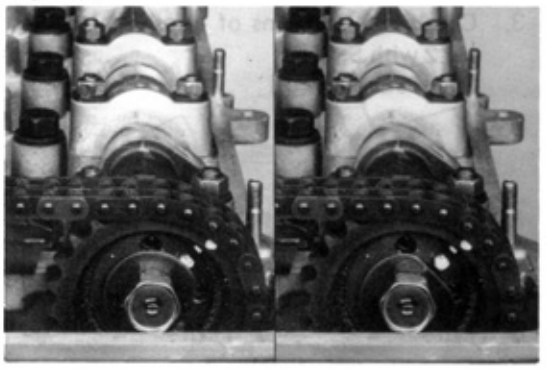
1. Reset No.1 cylinder TDC/compression.

Fig. 3-32



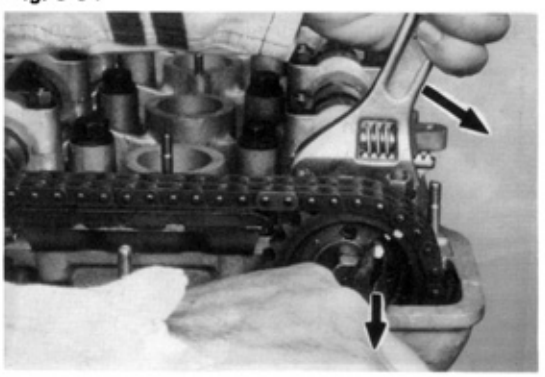
2. Loosen the camshaft mounting bolt.

Fig. 3-33



3. Rotate the washer until the pin head is completely exposed.

Fig. 3-34



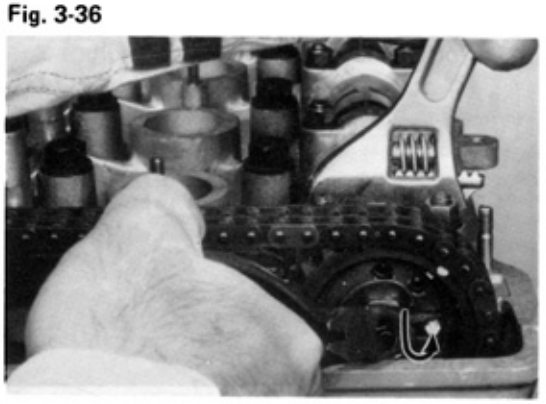
4. Pull out the pin.

– Note –
This will be easier if the camshaft is turned slightly forward to provide some play.

Fig. 3-35

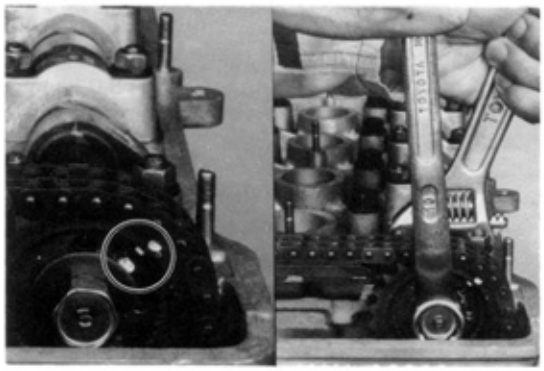
5. When valve timing is advanced.
   (1) Align with the pin hole in counter-clockwise direction.
   (2) Turn the camshaft so that the slit is aligned with the adjust gauge and insert the pin.

Fig. 3-36



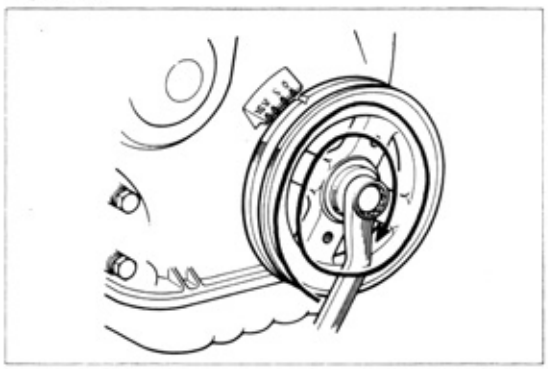
6. When valve timing is retarded.
   (1) Align the pin hole in the clockwise direction.
   (2) Turn the camshaft so that the slit is aligned with the adjust gauge and insert the pin.

Fig. 3-37



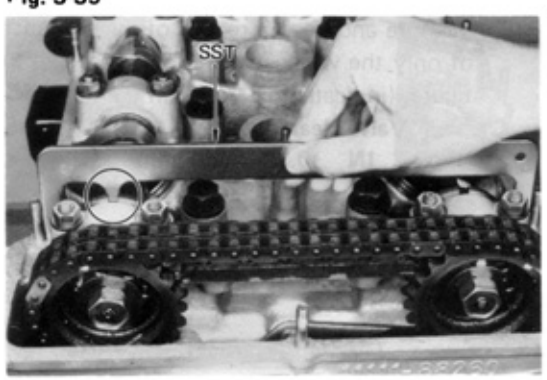
7. Support the pin with the washer and temporarily tighten the camshaft mounting bolt.

Fig. 3-38



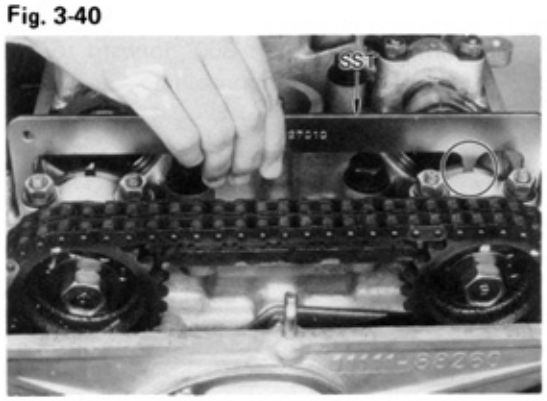
8. Rotate the crankshaft in the clockwise direction until No.1 cylinder is at TDC/compression.

Fig. 3-39



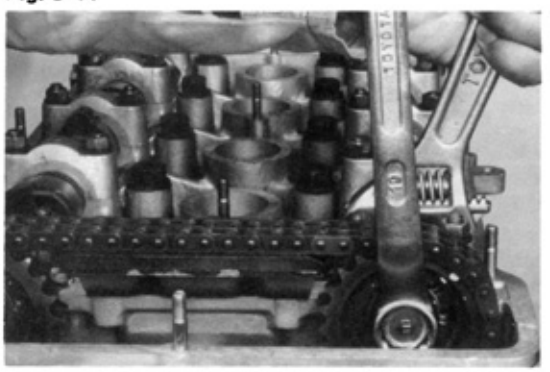
9. Recheck the No.1 camshaft valve timing.
The camshaft and SST protrusion should line up.
SST [09248-27010]

Fig. 3-40



10. Recheck the No.2 camshaft valve timing.
The camshaft slit and SST protrusion should line up.
SST [09248-27010]

Fig. 3-41



11. Hold the camshaft with a wrench and tighten the camshaft mounting bolt.

Tightening torque: 7.0 – 8.0 kg-m (51 – 57 ft-lb)

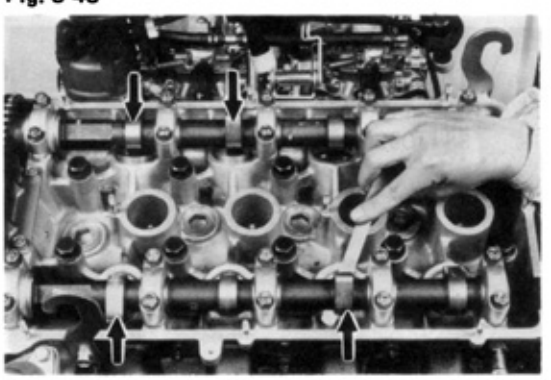
Fig. 3-42

VALVE CLEARANCE

INSPECTION

1. Set the No.1 cylinder to TDC/compression. In this position, the timing check slits in the camshaft flange are facing upward.

Fig. 3-43



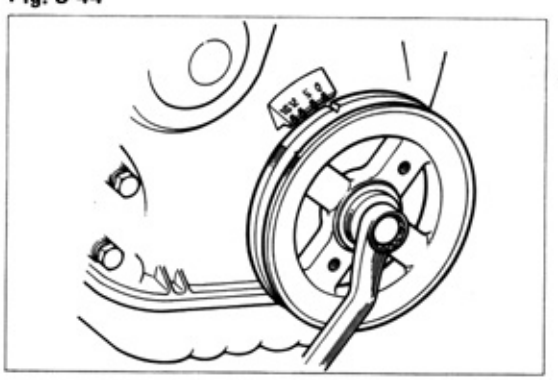
2. Measure and keep a record of the clearances of only the valves indicated by arrows in the figure. (indicated by arrows in the figure)

Valve clearance:

IN 0.29 ± 0.05 mm (0.011 ± 0.002 in.)

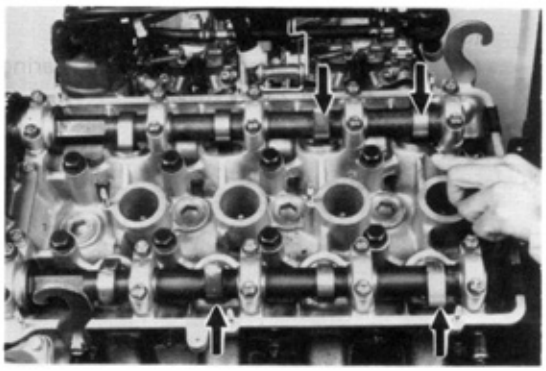
EX 0.34 ± 0.05 mm (0.013 ± 0.002 in.)

Fig. 3-44



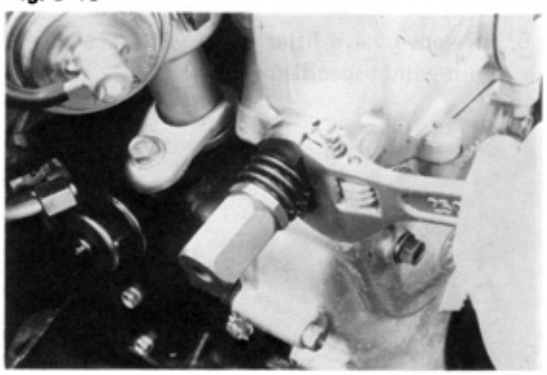
3. Turn the crankshaft 360° forward to No.4 cylinder is TDC/compression.

Fig. 3-45



4. Check the remaining valve clearances of the remaining valves (indicated by arrows) in the figure).

Fig. 3-46

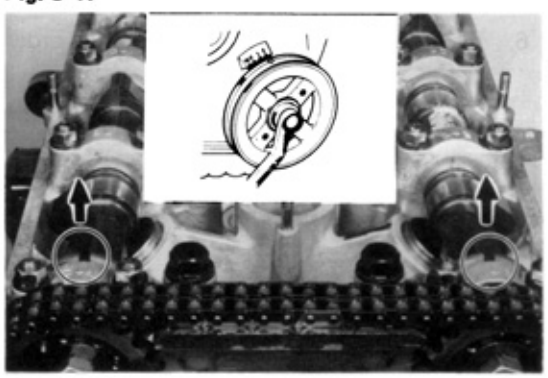


ADJUSTMENT

Adjust the clearance of any valve not within specification.

1. Remove the No.2 chain tensioner.

Fig. 3-47



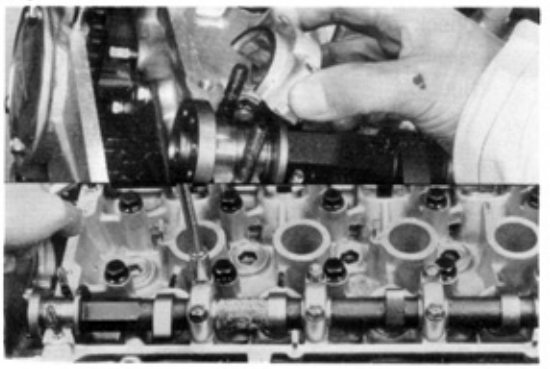
2. Set No.1 cylinder to TDC/compression.

Fig. 3-48

3. Place aligning marks between No.2 chain and gears and between the respective gears and pin holes for correct reassembly.

4. Remove parts as follows.
   (1) No.2 chain damper.
   (2) Camshaft timing gear.

Fig. 3-49

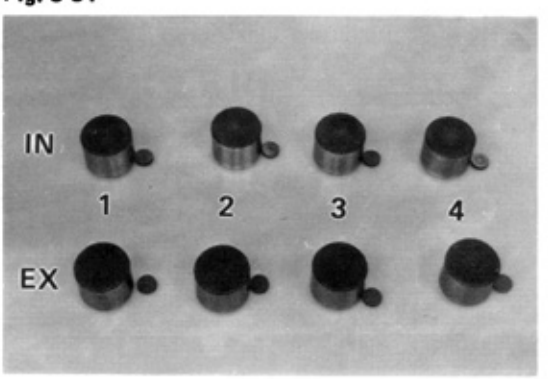


(3) Camshaft No.1 bearing cap.
(4) Gradually loosen No.2 to No.5 bearing cap nuts in 2 to 3 stages.
(5) Camshaft.

Fig. 3-50

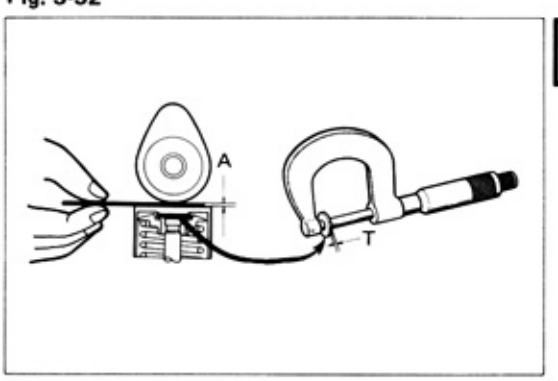
5. Remove valve lifter when valve clearance is not within specified valve.

Fig. 3-51



6. Keep the valves and adjusting pads in order.

Fig. 3-52



7. Select a new pad that will give the specified valve clearance as follows.
   (1) Measure the pad that was off with a micrometer.

(2) Calculate thickness of new pad so valve clearance comes within specified valve.

T ..... Thickness of pad used

A ..... Valve clearance measured

Intake side

New pad thickness

= T + (A – 0.29 mm)

(0.011 in.)

Exhaust side

New pad thickness

= T + (A – 0.34 mm)

(0.013 in.)

(3) Select a pad with a thickness as close as possible to the valve calculated. Pads are available in 41 sizes, in increments of 0.05 mm (0.002 in.), from 1.00 mm (0.039 in.) to 3.00 mm (0.118 in.).

Fig. 3-53

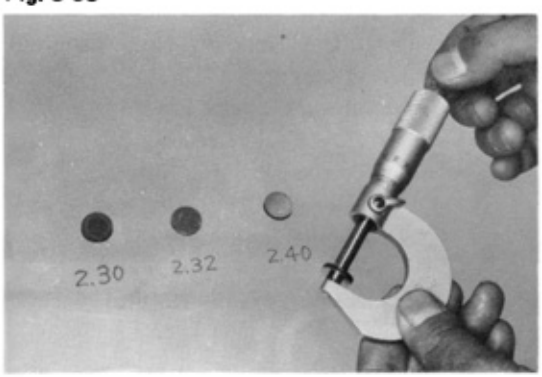
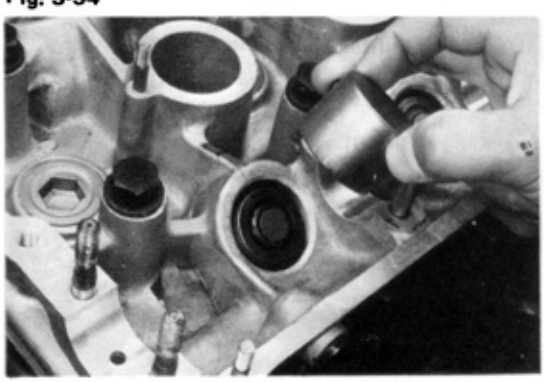
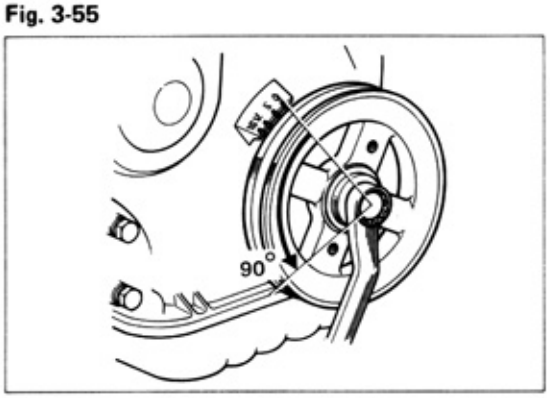


Fig. 3-54



8. Install the pad and valve lifter.

Fig. 3-55



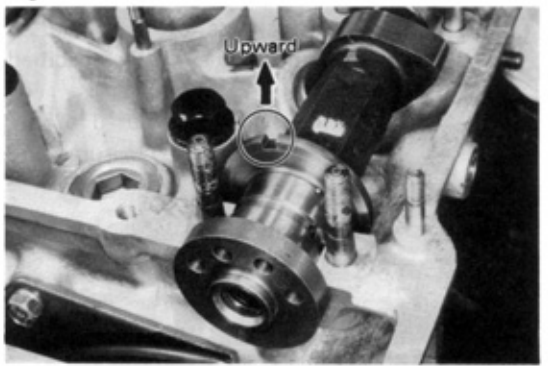
9. Install the camshaft.

(1) Rotate the crankshaft about 90° the reverse direction.

– Caution –

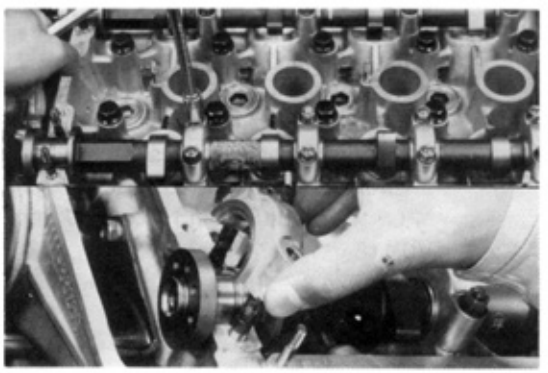
Lower piston to prevent interference of piston head and valve.

Fig. 3-56



(2) Position slit of camshaft upward as shown in the figure.

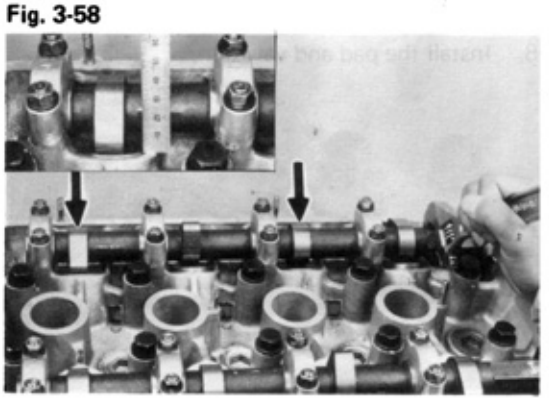
Fig. 3-57



(3) Install the No.2 to No.5 camshaft bearing caps.
Face the arrow mark toward front.
(4) Gradually tighten bearing cap nuts in 3 to 4 stages.
(5) Then tighten No.1 bearing cap.

Tightening torque:
1.2 – 1.8 kg-m
(9 – 13 ft-lb)

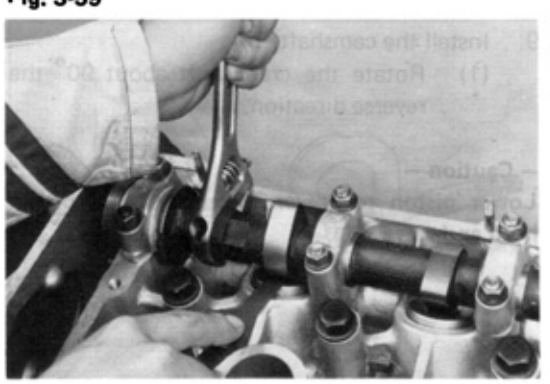
Fig. 3-58



10. Recheck intake side valve clearance.
(1) Exhaust side valve lifter No.2 and No.4 should protrude the same amount.

Approx. 1.6 mm
(0.06 in.)

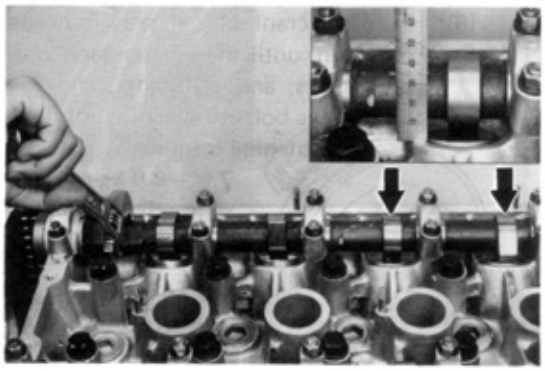
Fig. 3-59



(2) Measure intake side valve clearance. If outside the specified valve, choose another pad.

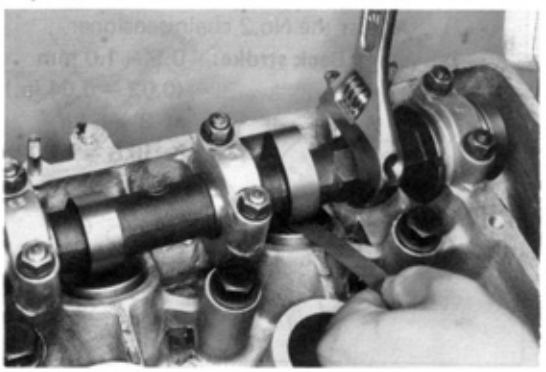
Valve clearance:
IN 0.29 ± 0.05 mm
(0.011 ± 0.002 in.)
EX 0.34 ± 0.05 mm
(0.013 ± 0.002 in.)

Fig. 3-60



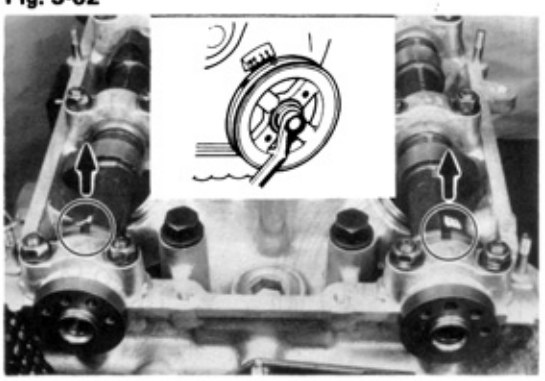
11. Recheck exhaust side valve clearance.
    (1) Intake side valve lifter No.3 and No.4 should protrude the same amount.
    Approx. 1.6 mm (0.06 in.)

Fig. 3-61



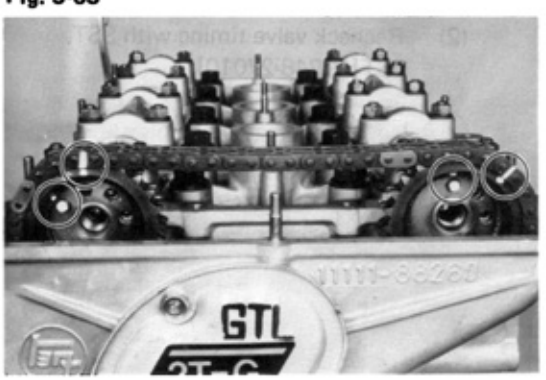
    (2) Measure exhaust side valve clearance. If outside the specified value, choose another pad.
    Valve clearance:
    IN 0.29 ± 0.05 mm (0.011 ± 0.002 in.)
    EX 0.34 ± 0.05 mm (0.013 ± 0.002 in.)

Fig. 3-62



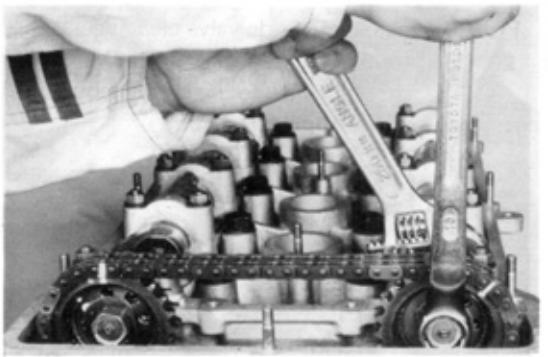
12. Install the No.2 chain and camshaft gears.
    (1) Position the No.1 and No.2 camshaft slit vertically upward with SST.
    SST [09248-27010]
    (2) Set the No.1 cylinder to TDC/compression.

Fig. 3-63



    (3) Align the chain and gear with marking made before disassembly.
    (4) Align the camshaft and gear pin hole to position before disassembly and insert pin.
    (5) Hold the pin with the washer.

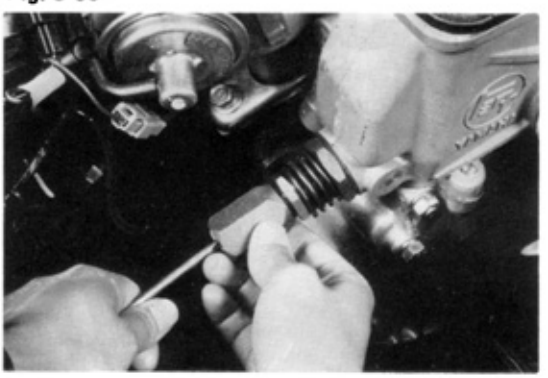
Fig. 3-64



(6) Turn the crankshaft slightly in normal direction, until there is no slack in the pins, gears, and camshafts, and then tighten the bolts to specified torques.

Tightening torque:
7.0 – 8.0 kg-m
(51 – 57 ft-lb)

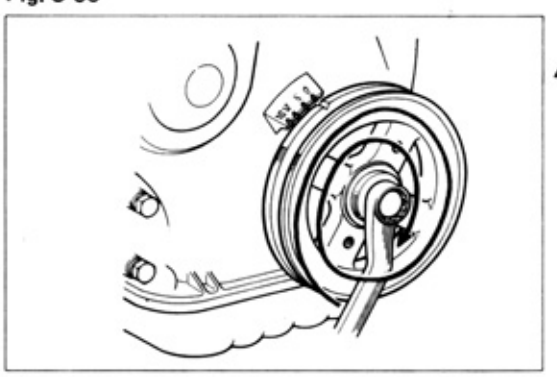
Fig. 3-65



(7) Adjust the No.2 chain tensioner.

Back stroke: 0.5 – 1.0 mm
(0.02 – 0.04 in.)
at 3 – 5 kg
(6.6 – 11.0 lb)

Fig. 3-66

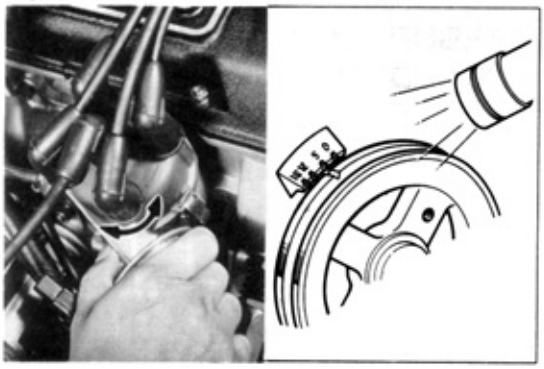


13. Recheck valve timing.
    (1) Rotate the crankshaft two turns in the normal direction until No.1 cylinder is TDC/compression.

Fig. 3-67

(2) Recheck valve timing with SST.
SST [09248-27010]

Fig. 3-68



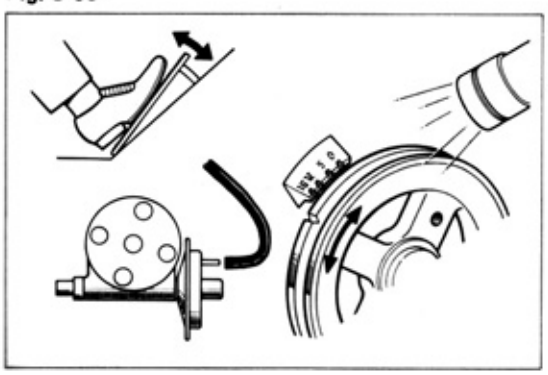
(HOT CONDITION) IGNITION TIMING

INSPECTION

Align the timing marks by turning the distributor body.

Ignition timing:
12° BTDC/1,000 rpm

Fig. 3-69

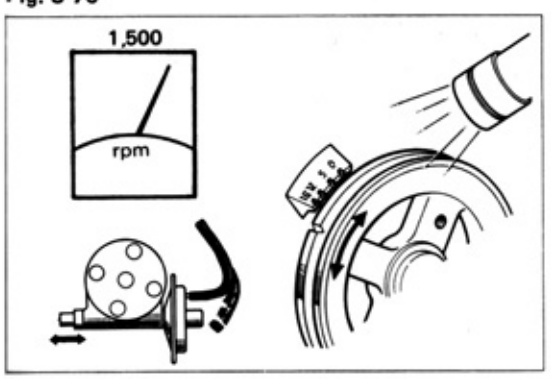


DISTRIBUTOR

GOVERNOR ADVANCER OPERATION

Start the engine and disconnect the vacuum hose from the distributor. The timing mark should vary in accordance with the engine rpm.

Fig. 3-70



VACUUM ADVANCE OPERATION

While running the engine at about 1,500 rpm, disconnect and connect the octane selector hose and insure that the timing mark moves.

CARBURETOR

CARBURETOR ADJUSTMENT PROCEDURES

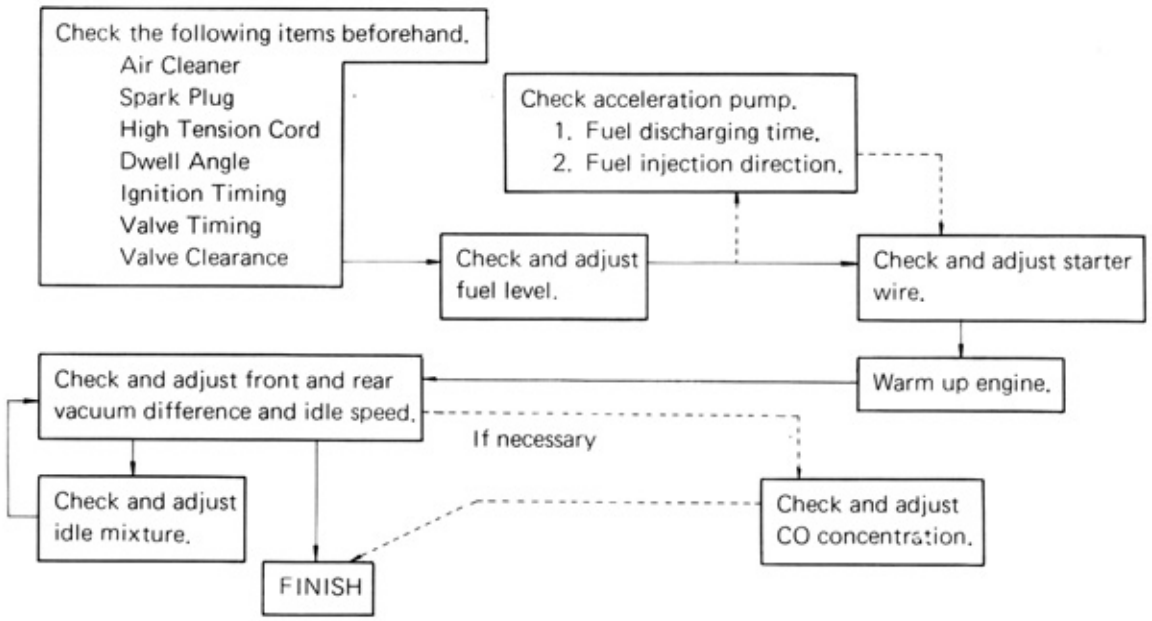
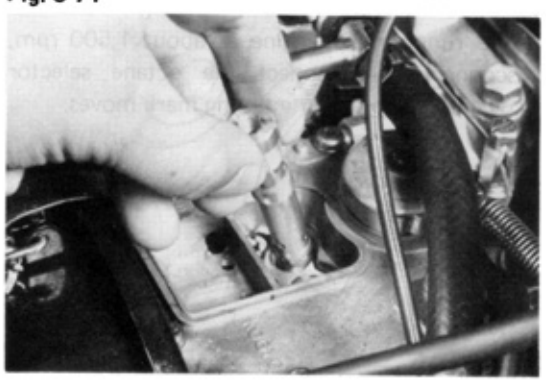


Fig. 3-71

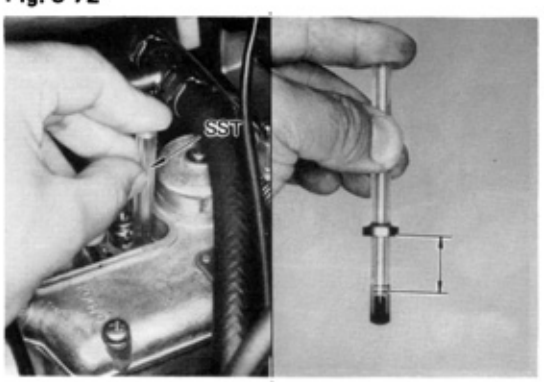


FLOAT LEVEL

INSPECTION

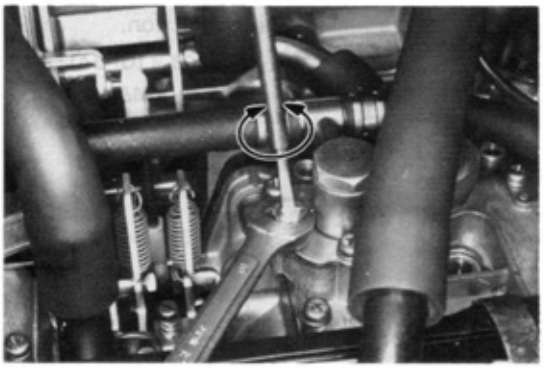
1. Start the engine and idle.
   About 1,000 rpm
2. Take out one of the main jet holders in assembled form.

Fig. 3-72



3. Insert SST in the hole from which the main jet holder was removed.
   SST [09240-27010]
4. Check the gasoline level inside the gauge to see if within the limit.
   Float level: 20 – 21 mm (0.79 – 0.83 in.)

Fig. 3-73

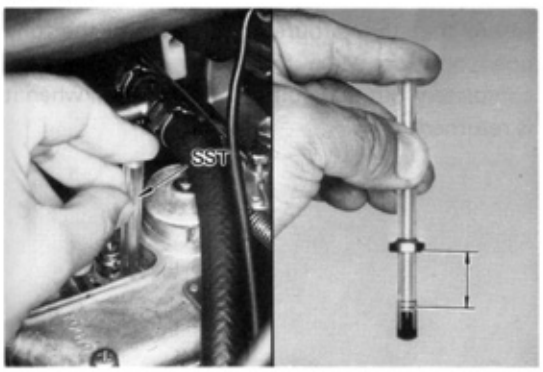


ADJUSTMENT

1. Adjust by turning the float level adjusting screw.

One turn:
Float level change to 1.8 mm (0.07 in.)

Fig. 3-74



2. Recheck the float level.
Condition where the fuel pump is operating and applying fuel pressure.

Float level: 20 – 21 mm (0.79 – 0.83 in.)

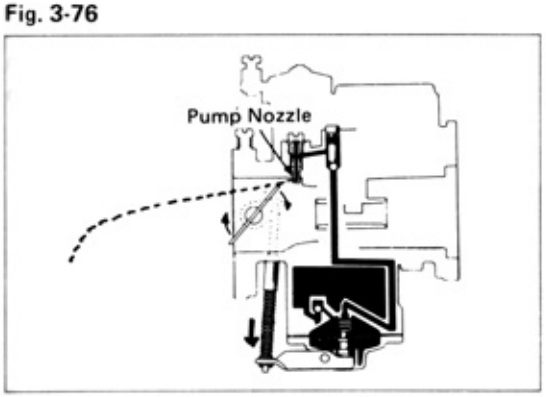
Fig. 3-75

ACCELERATION PUMP

INSPECTION

1. Remove the carburetor.
2. Check the fuel in the float chamber.

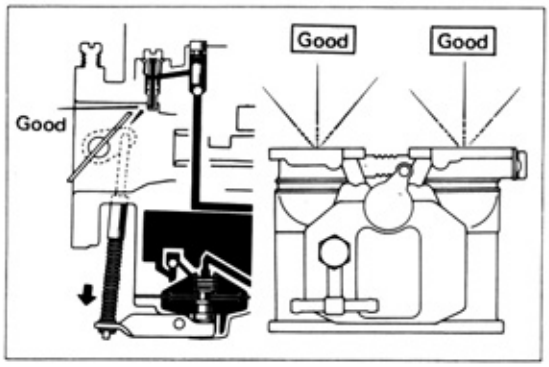
Fig. 3-76



3. Check the fuel discharging time.

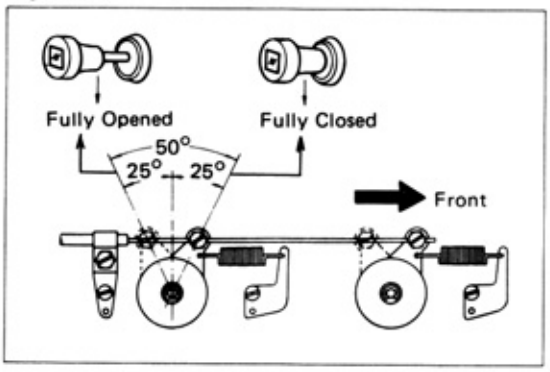
Discharging time: 1.1 – 1.7 second

Fig. 3-77



4. Check the fuel injection direction.

Fig. 3-78



STARTER WIRE

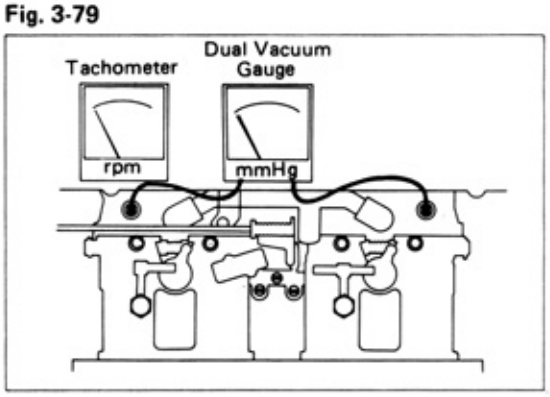
Insure that the carburetor discs are in the fully open position when the starter knob is pulled completely out and fully closed position when it is returned.

IDLE SPEED & IDLE MIXTURE ADJUSTMENT

INSPECTION

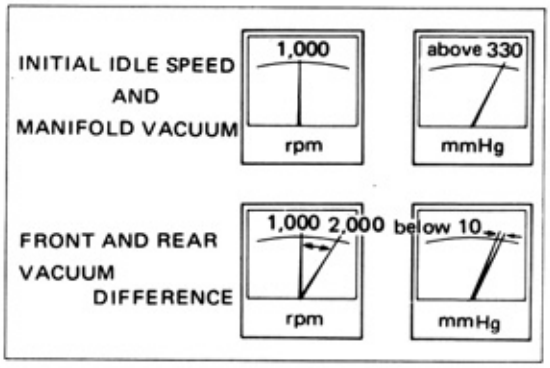
1. The adjusting and measuring conditions should be as follows:
   (1) Air cleaner installed
   (2) Normal operating coolant temperature
   (3) All accessories switched off
   (4) All vacuum lines connected
   (5) Transmission in N range
   (6) Ignition timing set
   (7) Zero setting of CO meter warmed up

Fig. 3-79



2. Mount the tachometer and the dual vacuum gauge to the vacuum take off connection on the No.1 and No.4 intake manifolds.

Fig. 3-80



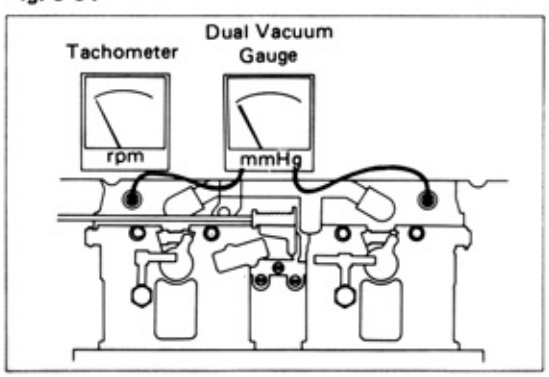
3. Check the idle speed and the difference between front and rear manifold vacuum.

Idle speed: 1,000 ± 50 rpm
Manifold vacuum:
(at Idle speed)
More than 385 mmHg
(15.2 in.Hg)
Front and rear vacuum difference:
(idle to 2,000 rpm)
Below 10 mmHg
(0.4 in.Hg)

ADJUSTMENT

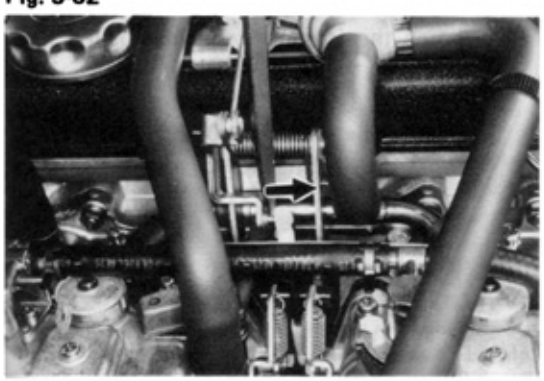
1. The adjusting and measuring conditions should be as follows:
   (1) Air cleaner installed
   (2) Normal operating coolant temperature
   (3) All accessories switched off
   (4) All vacuum lines connected
   (5) Transmission in N range
   (6) Ignition timing set
   (7) Zero setting of CO meter warmed up

Fig. 3-81



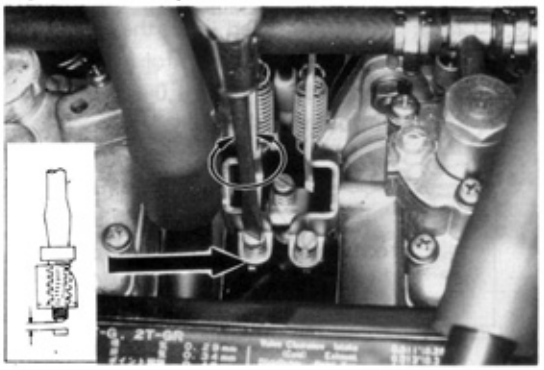
2. Mount the tachometer and the dual vacuum gauge to the vacuum take off connection on the No.1 and No.4 intake manifolds.

Fig. 3-82



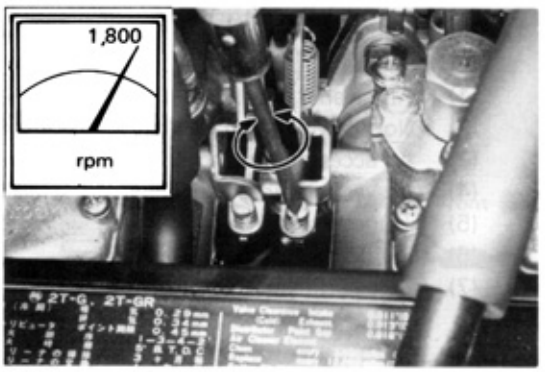
3. Disconnect the connecting rod at the body.

Fig. 3-83



4. Loosen the rear idle speed adjusting screw until it is free from the lever.

Fig. 3-84

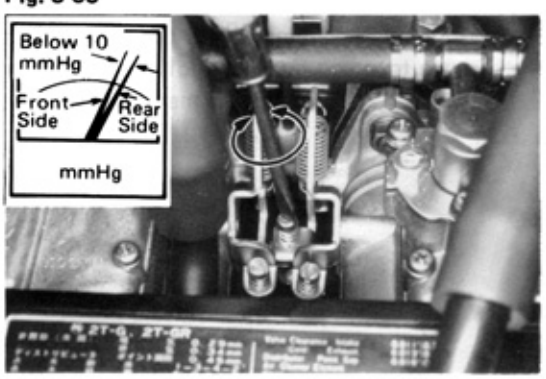


5. Set to 1,800 rpm by turning the front idle speed adjusting screw.

Engine speed: 1,800 rpm

Check the engine speed after raising the engine speed.

Fig. 3-85

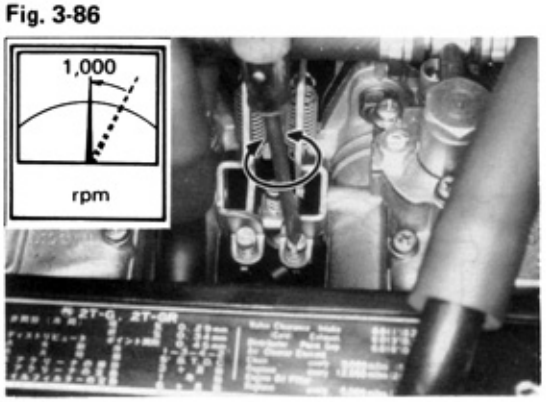


6. Set to front and rear vacuum difference to within 10 mmHg (0.4 in.Hg) by turning the synchronizing screw.

Front and rear vacuum difference:
Below 10 mmHg
(0.4 in.Hg)

Check the vacuum difference after raising the engine speed.

Fig. 3-86

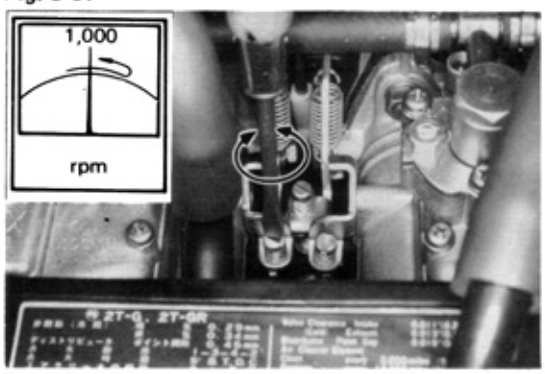


7. Loosen the front idle speed adjusting screw and lower the engine speed to 950 – 1,050 rpm.

Engine speed: 1,000 ± 50 rpm

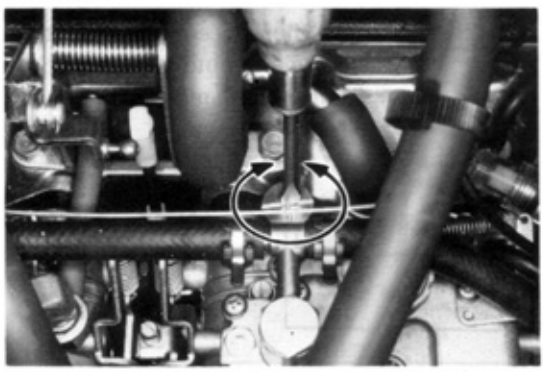
Check the engine speed after raising the engine speed.

Fig. 3-87



8. Slightly screw in the rear idle speed adjusting screw and raise the engine speed, then adjust the engine speed to 950 – 1,050 rpm.
   Engine speed: 1,000 ± 50 rpm
   Check the engine speed after raising the engine speed.
9. Readjust front and rear vacuum difference.
   Front and rear vacuum difference:
   Below 10 mmHg
   (0.4 in.Hg)

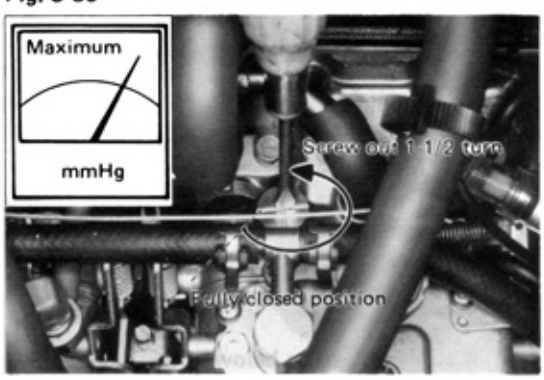
Fig. 3-88



10. Adjust the idle mixture adjusting screw with SST.
    SST [09243-00010] or
    [09243-00020]
    Screw out all of the idle mixture adjusting screws 1-1/2 turn from fully closed position.

– Note –
Screw in gently until fully closed, taking care not to damage the carburetor idle port or the screw tapered point.

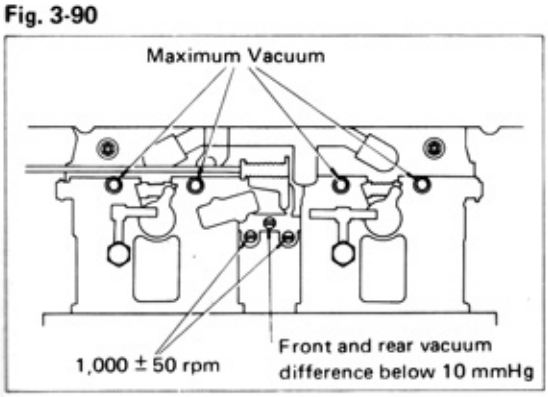
Fig. 3-89



11. Set to the maximum vacuum reading by turning each idle mixture adjusting screw.

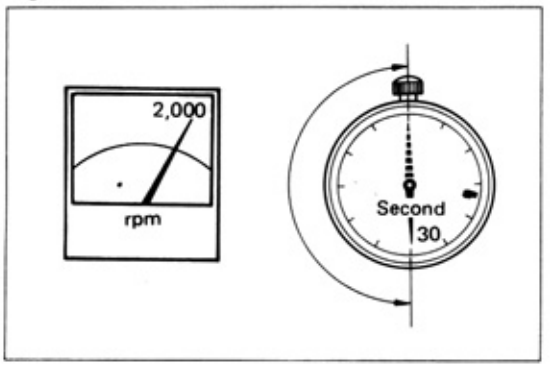
– Caution –
Repeat the adjustment 2 or 3 times to obtain maximum vacuum setting.
Idle speed: 1,000 rpm
Manifold vacuum: More than 385 mmHg (15.2 in.Hg)

Fig. 3-90



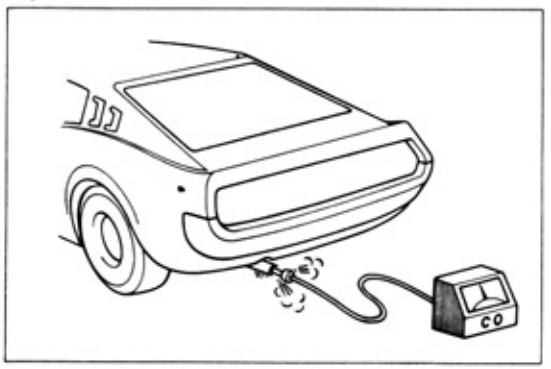
12. Readjust the following 2 or 3 times:
    (1) Idle speed adjusting screw
    Idle speed: 1,000 ± 50 rpm
    (2) Synchronizing screw (Idle to 2,000 rpm)
    Front and rear vacuum difference:
    Below 10 mmHg
    (0.4 in.Hg)
    (3) Idle mixture adjusting screw
    Manifold vacuum:
    More than 385 mmHg
    (15.2 in.Hg)

Fig. 3-91



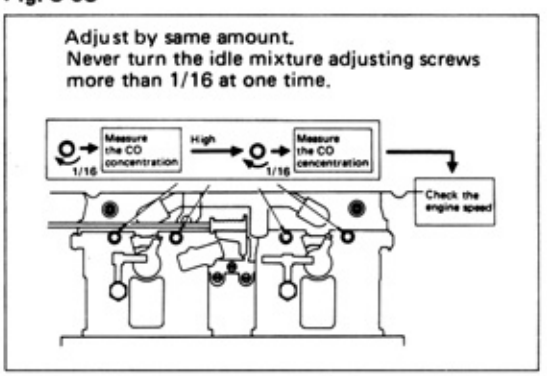
13. Measure the CO concentration.
    (1) Before measuring, race the engine at about 2,000 rpm for 30 – 60 seconds.

Fig. 3-92



    (2) To allow the concentration to stabilize, wait one minute after racing the engine but take the measurement within 3 minutes.

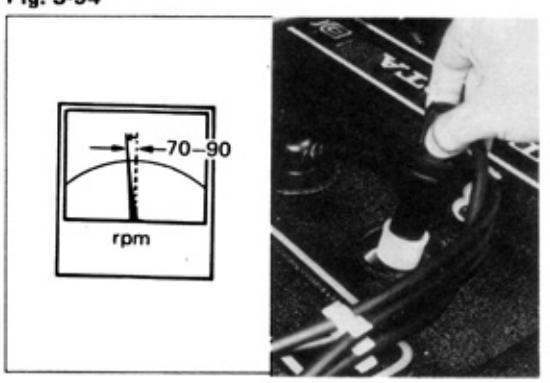
Fig. 3-93



14. Adjust the CO concentration.
    When the concentration is high.
    (1) 4 idle mixture adjusting screws 1/16 turn.
    (2) Measure the CO concentration again.
    (3) If still high, 4 idle mixture adjusting screws another 1/16 turn.
    (4) Check the engine speed.

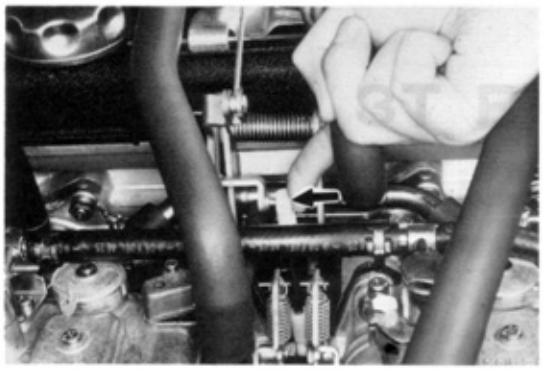
– Note –
Do not allow rpm to be below idle speed.

Fig. 3-94



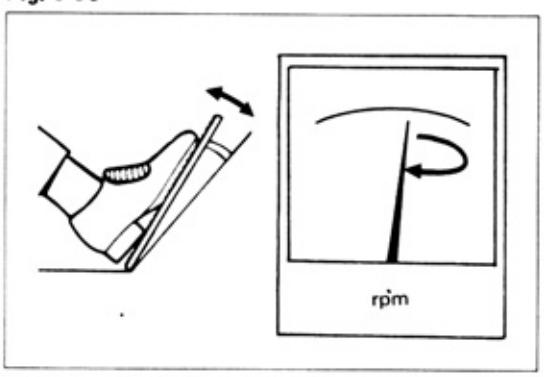
15. Check rpm of each cylinder when if misfires.
    Decrease in rpm approximately 70 – 90 rpm. All four cylinders should show same decrease.
    (1) When one plug misfires, raise rpm and clean.
    (2) When decrease in rpm is not uniform, adjust with the idle mixture adjusting screw.

Fig. 3-95



16. Connect the connecting rod.

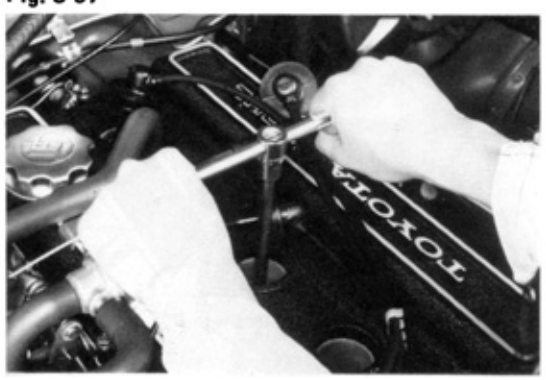
Fig. 3-96



17. Check to see that the engine returns to idle speed when both suddenly and slowly accelerated.
    Opening throttle valve gradually should cause the engine to speed up smoothly in relation to amount of the valve opening.

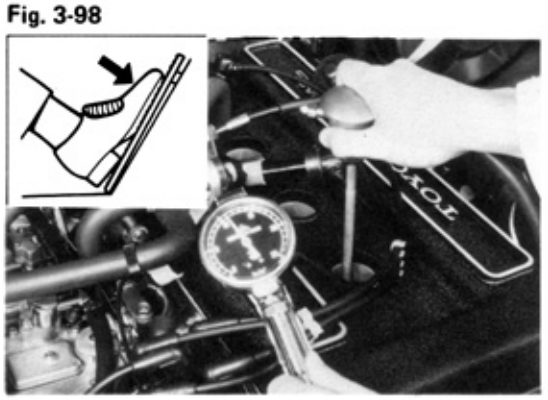
COMPRESSION PRESSURE

Fig. 3-97



1. Warm up the engine.
2. Remove all spark plugs.
3. Disconnect the high tension cord from ignition coil to cutoff the secondary circuit.

Fig. 3-98



4. Insert a compression gauge into the spark plug hole, open the throttle valve fully, and measure the compression pressure while cranking the engine with starter motor.

Compression pressure (at 200 rpm):

STD	**11.6 kg/cm² (165 psi)**
Limit	**10.0 kg/cm² (142 psi)**

Difference between each cylinder:
Less than 1.0 kg/cm² (14 psi)