Katana 1100

SUZUKI

SERVICE MANUAL

99500-39080-03E
(英)

SUZUKI MOTOR CO., LTD. PRINTED IN JAPAN OCTOBER '87 ©

FOREWORD

The SUZUKI GSX1100F has been developed as a new generation motorcycle to the GS-models. It is packed with highly advanced design concepts including a Suzuki Power Shield, a Suzuki Advanced Cooling System, a new highly efficient combustion system (TSCC), a fully transistorized ignition system and a improved full-floater rear suspension. Combined with precise control and easy handling the GSX1100F provides excellent performance and outstanding riding comfort.

This service manual has been produced primarily for experienced mechanics whose job is to inspect, adjust, repair and service SUZUKI motorcycles. Apprentice mechanics and do-it-yourself mechanics, will also find this manual an extremely useful repair guide. This manual contains the most up-to-date information at the time of publication. The rights are reserved to update or make corrections to this manual at any time.

IMPORTANT

All street-legal Suzuki motorcycles with engine displacement of 50cc or greater are subject to Environmental Protection Agency emission regulations. These regulations set specific standards for exhaust emission output levels as well as particular servicing requirements. This manual includes specific information required to properly inspect and service the GSX1100F in accordance with all EPA regulations. It is strongly recommended that the chapter on Emission Control, Periodic Servicing and Carburetion be thoroughly reviewed before any type of service work is performed.

Further information concerning the EPA emission regulations and U.S. Suzuki's emission control program can be found in the U.S. SUZUKI EMISSION CONTROL PROGRAM MANUAL/SERVICE BULLETIN.

SUZUKI MOTOR CO., LTD.

Technical Department
Motorcycle Service Division

GROUP INDEX

GENERAL INFORMATION

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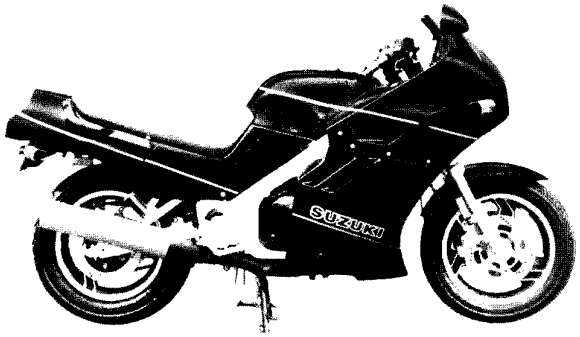
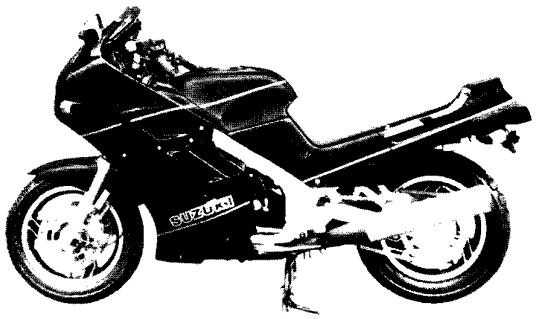
VIEW OF GSX1100F



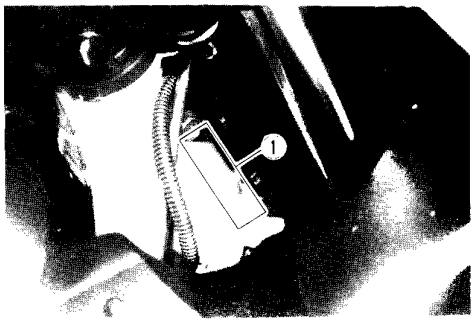
RIGHT SIDE

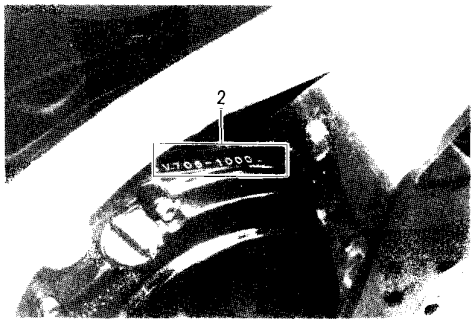


LEFT SIDE

SERIAL NUMBER LOCATION

The frame serial number or V.I.N. (Vehicle Identification Number) ① is stamped on the steering head pipe. The engine serial number ② is located on the right side of the crankcase. These numbers are required especially for registering the machine and ordering spare parts.





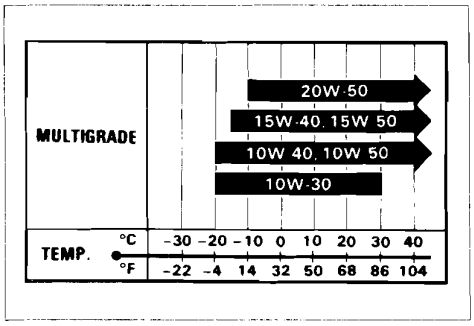
FUEL AND OIL RECOMMENDATION

FUEL

Use only unleaded or low-lead type gasoline of at least 85-95 pump octane ($\frac{R+M}{2}$) method or 89 octane or higher rated by the Research Method.

ENGINE OIL

SUZUKI recommends the use of SUZUKI PERFORMANCE 4 MOTOR OIL or an oil which is rated SE or SF under the API (American Petroleum Institute) classification system. The viscosity rating is SAE 10W/40. If an SAE 10W/40 motor oil is not available, select an alternate according to the following chart.



BRAKE AND CLUTCH FLUID

Specification and classification: DOT4

WARNING:

* Since the brake system of this motorcycle is filled with a glycol-based brake fluid by the manufacturer, do not use or mix different types of fluid such as silicone-based and petroleum-based fluid for refilling the system, otherwise serious damage will result.
* Do not use any brake fluid taken from old or used or unsealed containers.
* Never re-use brake fulid left over from the previous servicing and stored for a long period.

FRONT FORK OIL

Use fork oil #10.

BREAK-IN PROCEDURES

During manufacture only the best possible materials are used and all machined parts are finished to a very high standard but it is still necessary to allow the moving parts to "BREAK-IN" before subjecting the engine to maximum stresses. The future performance and reliability of the engine depends on the care and restraint exercise during its early life. The general rules are as follows.

- Keep to these break-in engine speed limits:.

Intial 800 km (500 miles): Below 4000 r/min
Up to 1600 km (1000 miles): Below 6000 r/min
Over 1600 km (1000miles): Below 11300 r/min

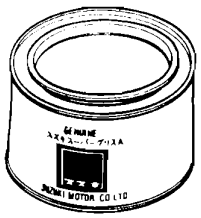
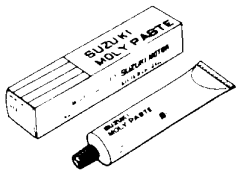
- Upon reaching an odometer reading of 1600 km (1000 miles) you can subject the motorcycle to full throttle operation.
  However, do not exceed 11300 r/min at any time.

CYLINDER IDENTIFICATION

The four cylinders of this engine are identified as No. 1, No. 2, No. 3 and No. 4 cylinder, as counted from left to right. (as viewed by the rider on the seat)

SPECIAL MATERIALS

The materials listed below are needed for maintenance work on the GSX1100F, and should be kept on hand for ready use. They supplement such standard materials as cleaning fluids, lubricants, emery cloth and the like. How to use them and where to use them are described in the text of this manual.

MATERIAL	PART	PAGE	PART	PAGE
 SUZUKI SUPER GREASE "A" 99000-25030	• Driveshaft oil seal • Generator O-ring • Starter motor O-ring • Engine oil pipe O-ring • Generator oil seal • Starter motor oil seal • Wheel bearing • Steering stem bearing	3-45 3-56 3-56 3-59 6-6 6-14 7-8 7-34 7-25	• Sprocket mounting drum bearing • Swingarm bearing and dust seal • Cushion lever/rod bearing, and dust seal • Shock absorber dust seal	7-35 7-46 7-46 7-47
 SUZUKI MOLY PASTE 99000-25140	• Valve stem • Conrod big end bearing • Countershaft and driveshaft • Crankshaft journal • Camshaft journal • Starter motor armature end • Generator damper • Clutch lever push rod	3-26 3-35 3-44 3-50 3-60 6-13 6-5 7-49		
 SUZUKI BOND NO. 1207B 99104-31140	• Crankcase mating surface • Clutch cover mating surface • Oil pressure switch • Signal generator lead wire grommet • Starter clutch cover mating surface • Cylinder head cover • Cam end cap	3-50 3-54 3-54 3-54 3-56 3-64	• Signal generator cover mating surface	3-64
 THREAD LOCK SUPER "1333B" 99000-32020	• Cam chain guide bolt	3-30		
 THREAD LOCK SUPER"1303" 99000-32030	• Cam sprocket bolt • Starter clutch mounting bolt	3-29 3-55		

MATERIAL	PART	PAGE	PART	PAGE
 THREAD LOCK "1360" 99000-32130	• Disc plate mounting bolt	7-9 7-35		
 THREAD LOCK "1342" 99000-32050	• Gearshift cam stopper bolt • Oil pump mounting bolt • Countershaft bearing retainer screw • Gearshift cam guide/pawl lifter screw • Starter motor mounting bolt • Generator bearing retainer screw	3-19 3-48 3-51 3-51 3-56 6-6	• Starter motor housing screw • Front fork damper rod bolt	6-14 7-19
 SUZUKI BRAKE FLUID 99000-23110	• Clutch • Brakes			
 SUZUKI FORK OIL #10 99000-99044-10G				
 THREAD LOCK CEMENT 99000-32040	• Carburetor set plate screw	4-10		

PRECAUTIONS AND GENERAL INSTRUCTIONS

Observe the following items without fail when servicing, disassembling and reassembling motorcycles.

☐ Do not run engine indoors with little or no ventilation.

☐ Be sure to replace packings, gaskets, circlips, O-rings and cotter pins with new ones.

CAUTION:
Never reuse a circlip. After a circlip has been removed from a shaft, it should be discarded and a new circlip must be installed.
When installing a new circlip, care must be taken not to expand the end gap larger than required to slip the circlip over the shaft.
After installing a circlip, always insure that it is completely seated in its groove and securely fitted.

☐ Tighten cylinder head and case bolts and nuts beginning with larger diameter and ending with smaller diameter, and from inside to out-side diagonally, to the specified tightening torque.

☐ Use special tools where specified.

☐ Use genuine parts and recommended oils.

☐ When 2 or more persons work together, pay attention to the safety of each other.

☐ After the reassembly, check parts for tightness and operation.

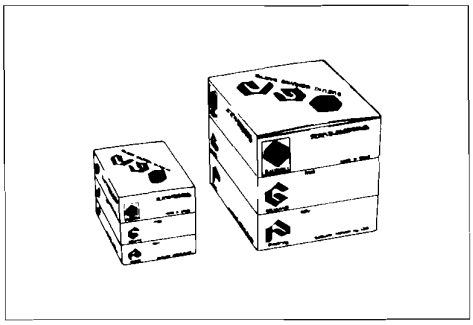
☐ Treat gasoline, which is extremely flammable and highly explosive, with greatest care. Never use gasoline as cleaning solvent.

Warning, Caution and Note are included in this manual occasionally, describing the following contents.

WARNING..... When personal safety of the rider is involved, disregard of the information could result in injury.
CAUTION..... For the protection of the motorcycle, the instruction or rule must be strictly adhered to.
NOTE..... Advice calculated to facilitate the use of the motorcycle is given under this heading.

USE OF GENUINE SUZUKI PARTS

To replace any part of the machine, use a genuine SUZUKI replacement part. Imitation parts or parts supplied from any other source than SUZUKI, if used to replace SUZUKI parts can reduce the machine's performance and, even worse, could induce costly mechanical troubles.



SPECIFICATIONS

DIMENSIONS AND DRY MASS

Overall length	2185 mm (86.0 in)
Overall width	765 mm (30.1 in)
Overall height	1290 mm (50.8 in)
Wheelbase	1490 mm (58.7 in)
Ground clearance	130 mm (5.1 in)
Dry mass	244 kg (537 lbs)
	246 kg (542 lbs)..... California model only

ENGINE

Type	Four-stroke, Air-Cooled with SACS, DOHC, TSCC
Number of cylinders	4
Bore	78.0 mm (3.07 in)
Stroke	59.0 mm (2.32 in)
Piston displacement	1127cm³ (68.8 cu.in)
Carburetor	MIKUNI BST34SS, four
Air cleaner	Polyester fiber element
Starter system	Electric
Lubrication system	Wet sump

TRANSMISSION

Clutch	Wet multi-plate type
Transmission	5-speed constant mesh
Gearshift pattern	1-down, 4-up
Primary reduction	1.522 (67/44)
Final reduction	3.466 (52/15)
Gear ratios, Low	2.384 (31/13)
2nd	1.631 (31/19)
3rd	1.250 (25/20)
4th	1.045 (23/22)
Top	0.913 (21/23)
Drive chain	DAIDO: D.I.D. 532ZLV 118 links

CHASSIS

Front suspension	Telescopic, coil spring, oil damped
Rear suspension	Full-floating suspension system, spring preload fully adjustable, damping force 4-way adjustable
Steering angle	34° (right & left)
Caster	62°00′
Trail	112 mm (4.4in)
Turning radius	3.0 m (9.8ft)
Front brake	Disc brake, twin
Rear brake	Disc brake
Front tire size	120/80V 16 V250
Rear tire size	150/80V 16 V250
Front fork stroke	140mm (5.5in)
Rear wheel travel	125mm (4.9in)

ELECTRICAL

Ignition type	Fully Transistorized
Ignition timing	13° B.T.D.C. below 1500 r/min and 32° B.T.D.C. above 2 375 r/min
Spark plug	N.G.K.: JR9B or J9B
Battery	12V 50.4 kC (14Ah)/10HR
Generator	Three-phase A.C. Generator
Fuse	10/10/10/10/10A
Circuit breaker	30A

CAPACITIES

Fuel tank	21.0 L (5.5 US gal) 19.5 L (5.2 US gal).....California model only
Engine oil, Oil change with oil filter change	4.5 L (4.8 US qt)
Front fork oil	478 ml (16.2 US oz)

These specifications are subject to change without notice.

PERIODIC MAINTENANCE AND TUNE-UP PROCEDURES

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CONTENTS

PERIODIC MAINTENANCE SCHEDULE

IMPORTANT: The periodic maintenance intervals and service requirements have been established in accordance with EPA regulations. Following these instructions will ensure that the motorcycle will not exceed emission standards and it will also ensure the reliability and performance of the motorcycle.

NOTE:
More frequent servicing may be performed on motorcycles that are used under severe conditions however, it is not necessary for ensuring emission level compliance.

The chart below lists the recommended intervals for all the required periodic service work necessary to keep the motorcycle operating at peak performance and to maintain proper emission levels. Mileages are expressed in terms of kilometer, miles and time for your convenience.

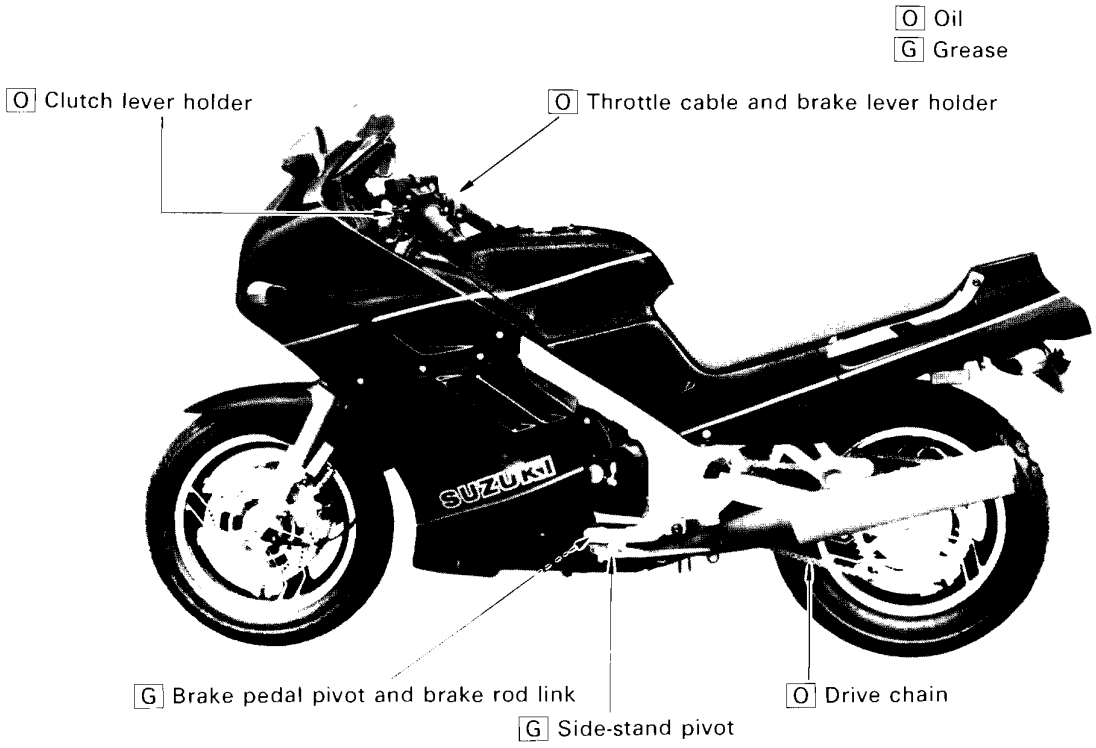
PERIODIC MAINTENANCE CHART

Interval / Item	km	1000	6000	12000	18000	24000
	miles	600	4000	7500	11000	15000
	months	2	12	24	36	48
Battery		-	I	I	I	I
Cylinder head nuts & exhaust pipe bolts		T	T	T	T	T
Air cleaner		Clean every 3000 km (2000 miles) and replace every 12000 km (7500 miles)				
Valve clearance		I	I	I	I	I
Spark plugs		-	I	R	I	R
Fuel line (Fuel line and vapor hose... California version only)		I	I	I	I	I
		Replace every four years				
Engine oil and filter		R	R	R	R	R
Carburetors (Idle rpm)		I	I	I	I	I
Clutch hose		I	I	I	I	I
		Replace every four years				
Clutch fluid		I	I	I	I	I
		Replace every two years				
Drive chain		I	I	I	I	I
		Clean and lubricate every 1000km (600 miles)				
Brake hoses		I	I	I	I	I
		Replace every four years				
Brake fluid		I	I	I	I	I
		Replace every two years				
Brakes		I	I	I	I	I
Tires		I	I	I	I	I
Steering		I	I	I	I	I
Front fork		I	-	I	-	I
Rear suspension		I	-	I	-	I
Chassis bolts and nuts		T	T	T	T	T

NOTE: T = Tighten, I = Inspect, R = Replace

LUBRICATION POINTS

Proper lubrication is important for smooth operation and long life of each working part of the motorcycle. Major lubrication points are indicated below.



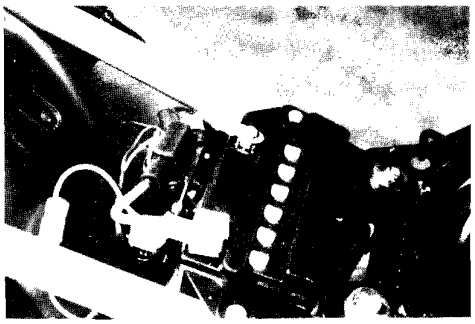
NOTE:

** Before lubricating each part, clean off any rusty spots and wipe off any grease, oil, dirt or grime.*

** Lubricate exposed parts which are subject to rust, with oil or grease.*

MAINTENANCE AND TUNE-UP PROCEDURES

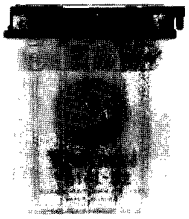
This section describes the servicing procedures for each item of the Periodic Maintenance requirements.



BATTERY

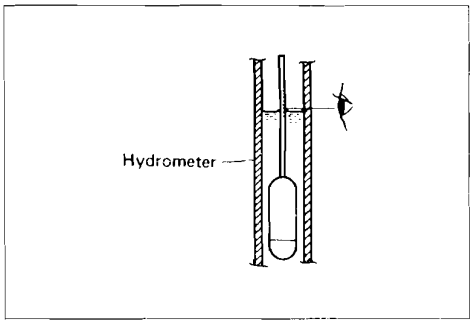
Inspect Every 6000 km (4000 miles, 12 months).

- Remove the seat.
- Remove the battery ⊖ and ⊕ lead wires from the battery terminals.
- Remove the battery from its case.
- Check the electrolyte for level and specific gravity. Add distilled water, as necessary, to keep the surface of the electrolyte above the MIN. level line but not above the MAX. level line.
- For checking specific gravity, use a hydrometer to determine the charged condition.



09900-28403: Hydrometer

Standard specific gravity: 1.28 at 20°C (68°F)

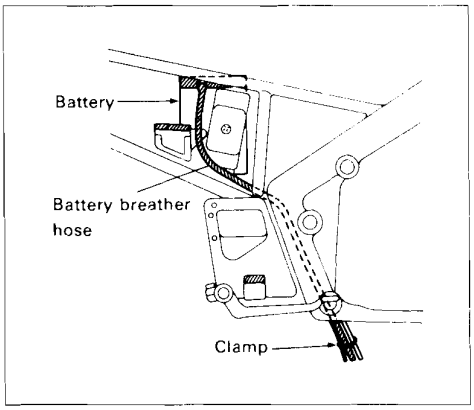


An S.G. reading of 1.22 (at 20°C) or under means that the battery needs recharging. Remove the battery from the machine and charge it with a battery charger.

CAUTION:
Never charge a battery while still in the machine as damage may result to the battery or regulator/rectifier.

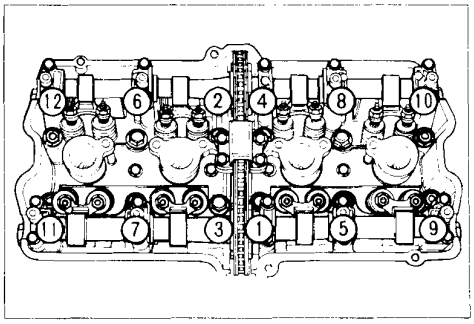
- Charge at a maximum of 1.4 amps.
- To install the battery, reverse the procedure described above.

WARNING:
When installing the battery lead wires, fix the ⊕ lead first and ⊖ lead last.



- Make sure that the breather hose is tightly secured and undamaged, and is routed as shown in the figure.

CYLINDER HEAD NUTS AND EXHAUST PIPE BOLTS

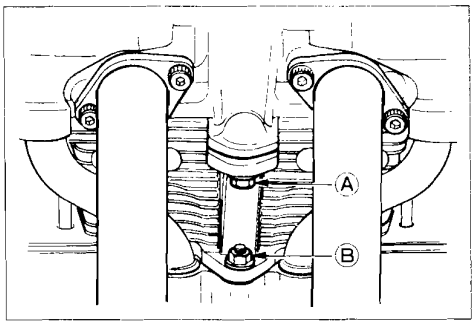


Tighten Initially at 1000 km (600 miles, 2 months) and Every 6000 km (4000 miles, 12 months) thereafter.

CYLINDER HEAD

- Remove the seat, frame covers and fuel tank. (Refer to page 3-3.)
- Remove the cylinder head cover.
- First loosen and retighten the nuts to the specified torque with a torque wrench sequentially in ascending numerical order with the engine cold.

Cylinder head nut: 35 – 40N·m (3.5 – 4.0 kg-m, 25.5 – 29.0 lb-ft)



- After firmly tightening the 12 nuts, tighten the bolt and nut (indicated as Ⓐ and Ⓑ) to the torque value below:

Cylinder head bolt Ⓐ: 7 – 11 N·m (0.7 – 1.1 kg-m, 5.0 – 8.0 lb-ft)

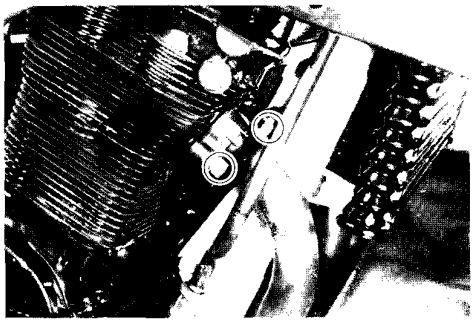
Cylinder head nut Ⓑ: 7 – 11 N·m (0.7 – 1.1 kg-m, 5.0 – 8.0 lb-ft)

- When installing the cylinder head cover, apply SUZUKI Bond No. 1207B to the head cover groove and cam end caps. (Refer to page 3-64.)
- Tighten the head cover bolts to the specified torque.

Tightening torque: 13 – 15 N·m (1.3 – 1.5kg-m, 9.5 – 11.0 lb-ft)

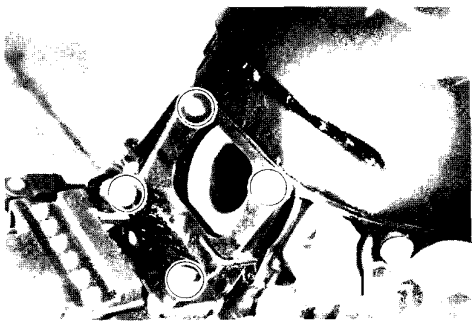
EXHAUST PIPE

- Tighten the exhaust pipe clamp bolts to the specified torque with a torque wrench.



Exhaust pipe clamp bolt: 9 – 12 N·m (0.9 – l.2kg-m, 6.5 – 8.5 lb-ft)

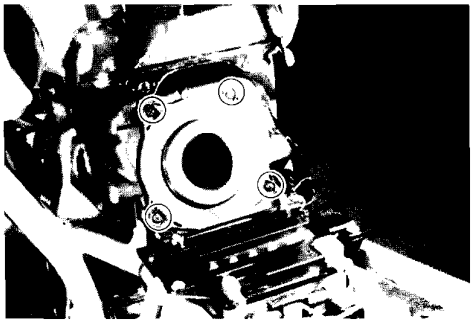
AIR CLEANER



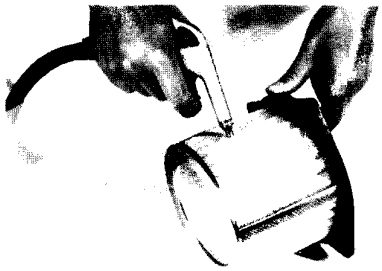
Clean Every 3000 km (2000 miles) and Replace Every 12000 km (7500 miles).

- Remove the seat and frame covers.
- Remove the fuel tank bracket by removing the bolts.
- Lift up the rear end of the fuel tank and remove the air cleaner element by removing the screws.

(Continued on next page.)

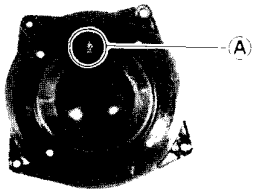


- Carefully use air hose to blow the dust from the cleaner element.



CAUTION:
Always use air pressure on the outside of the cleaner element. If air pressure is used on the inside, dirt will be forced into the pores of the cleaner element thus restricting air flow through the cleaner element.

- Reinstall the cleaned or new cleaner element in the reverse order of removal.
- When installing the air cleaner element in the cleaner case, make sure that the arrow mark Ⓐ comes upward.

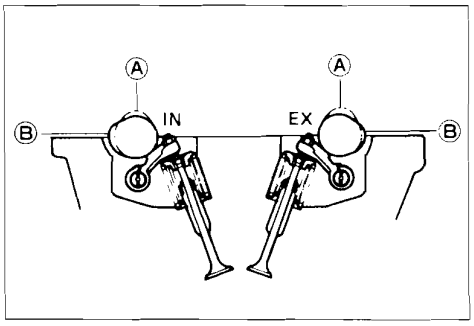


CAUTION:
If driving under dusty conditions, clean the air cleaner element more frequently. The surest way to accelerate engine wear is to use the engine without the element or to use a ruptured element. Make sure that the air cleaner is in good condition at all times. Life the engine depends largely on this component!

VALVE CLEARANCE

Inspect Initially at 1000 km (600 miles, 2 months) and Every 6000 km (4000 miles, 12 months) thereafter.

- Remove the seat, frame covers and fuel tank.
- Remove the cylinder head cover.



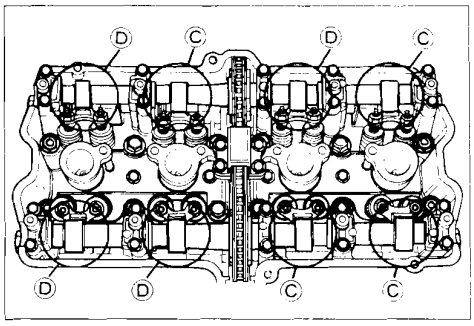
The valve clearance specification is the same for both intake and exhaust valves.
Valve clearance adjustment must be checked and adjusted, 1) at the time of periodic inspection, 2) when the valve mechanism is serviced, and 3) when the camshafts are disturbed by removing them for servicing.

Valve clearance (when cold): 0.10 – 0.15 mm
(0.004 – 0.006 in)

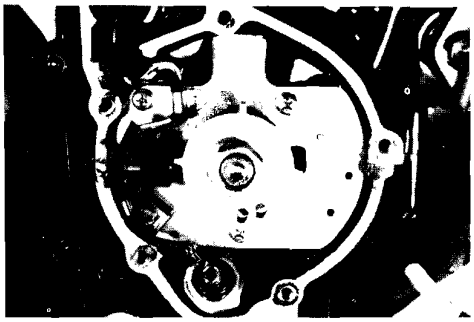
(Continued on next page.)

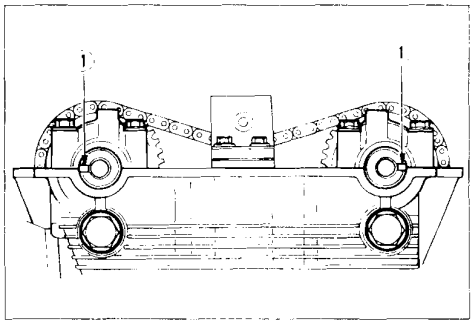
NOTE:

- ** The cam must be at positions, Ⓐ or Ⓑ, in order to check the valve clearance or to adjust valve clearance. Clearance readings should not be taken with the cam in any other position than these two positions.*
- ** The clearance specification is for COLD state.*
- ** To turn the crankshaft for clearance checking, be sure to use a 19-mm wrench and to rotate in the normal running direction. All spark plugs should be removed.*



- Turn crankshaft to bring the "T" mark on the rotor to the center of pick-up coil and also to bring the notches ① in the right ends of both camshafts (Ex and In) to the positions shown. In this condition, read the valve clearance at the valves Ⓒ (In and Ex of No. 1 cylinder, Ex of No. 2 and In of No. 3).



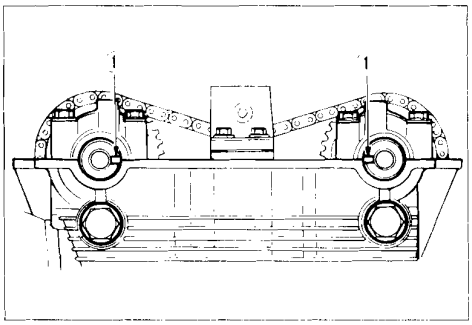


- Use a thickness gauge between the adjusting screw and the valve stem end. If the clearance is off the specification, bring it into the specified range by using the special tool.

09900-20803: Thickness guage
09917-14910: Valve adjust driver

CAUTION:
Both the right and left valve clearances, should be as closely set as possible.

- Turn the crankshaft 360° (one rotation) to bring the"T" mark on the rotor to the center of pick-up coil and also to bring the notches ① to the positions shown.
- Read the clearance at the remaining valves Ⓓ and adjust the clearance if necessary.



(Continued on next page.)

Cam Position	Notch ① position	
	Intake Camshaft	Exhaust Camshaft
Ⓒ	⊖	⊕
Ⓓ	⊕	⊖

- When installing the cylinder head cover, apply SUZUKI Bond No. 1207B to the head cover groove and cam end caps. (Refer to page 3-64.)
- Tighten the head cover bolts to the specified torque.

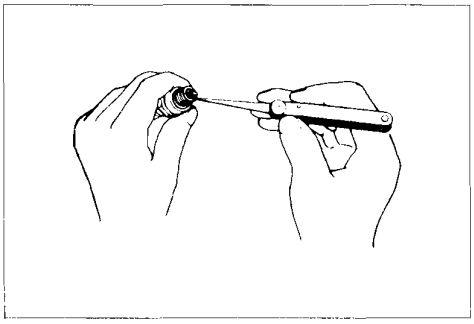
Tightening torque: 13 – 15 N·m
(1.3 – 1.5 kg-m, 9.5 – 11.0 lb-ft)

SPARK PLUGS

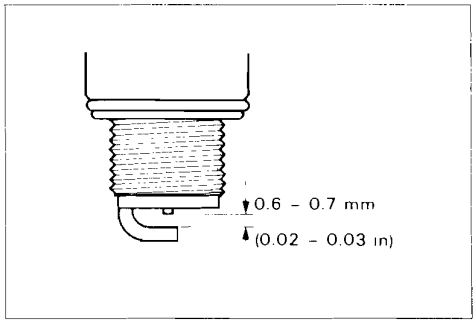
Inspect at 6000 km (4000 miles, 12 months), 18000 km (11000 miles, 36 months) and Replace Every 12000 km (7500 miles, 24 months).

- Remove the seat, frame covers and fuel tank mounting bolts.
- Slide the fuel tank backward and lift up the front end of the fuel tank.
- Remove the spark plugs with spark plug wrench.

CAUTION:
Take care not to damage the fuel hoses when raising the fuel tank.



The plug gap is adjusted to 0.6 – 0.7 mm (0.02 – 0.03 in) The gap is correctly adjusted by using a thickness gauge. When carbon is deposited on the spark plug, remove the carbon with a spark plug cleaning machine or by carefully using a tool with a pointed end. If the electrodes are extremely worn or burnt, replace the plug. Also replace the plug if it has a broken insulator, damaged thread, etc.



NGK JR9B as listed in the table should be used as the standard plug. However, the heat range of the plug should be selected to meet the requirements of speed, actual load, fuel, etc. If the plugs need be replaced, it is recommended that ones having a heat range closest to the standard plug in the table be selected. Remove the plugs and inspect the insulators. Proper heat range would be indicated if all insulators were light brown in color. If they are baked white, they should be replaced by a cold type NGK JR10B.

Recommended spark plug

	Standard	Cold type
NGK	JR9B or J9B	JR10B or J10B

09930-13210: Spark plug socket wrench
09930-14530: Universal joint
09914-24510: T handle
09900-20803: Thickness gauge

CAUTION:
Confirm the thread size and reach when replacing the plug. If the reach is too short, carbon will be deposited on the screw portion of the plug hole and engine damage may result.

NOTE:
"R" type spark plug is installed for some specifications. "R" type spark plug has a resister located at the center electrode to prevent radio noise.

ENGINE OIL AND OIL FILTER

Replace Initially at 1000 km (600 miles, 2 months) and Every 6000 km (4000 miles, 12 months) thereafter.

Oil should be changed while the engine is hot. Oil filter replacement at the above intervals should be done together with engine oil change.

- Keep the motorcycle upright and remove the lower fairing. (Page 7-1)
- Place an oil pan below the engine and drain oil by removing the drain plug ① and filler cap ②.
- Remove the oil filter ③ by using the oil filter wrench. (Special tool Ⓐ)
- Apply engine oil lightly to the gasket of the new filter before installation.
- Install the new filter turning it by hand until you feel that the filter gasket contacts the mounting surface. Then tighten 2 turns using the oil filter wrench. (Special tool Ⓐ)

09915-40611: Oil filter wrench

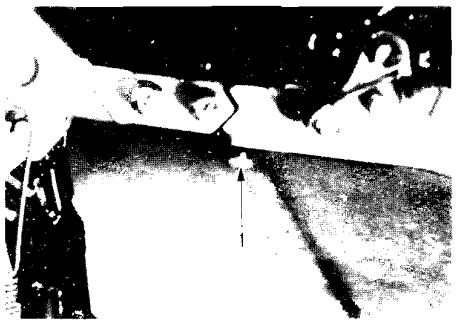
NOTE:
To properly tighten the filter, use the spacial tool. Never tighten the filter by hand.

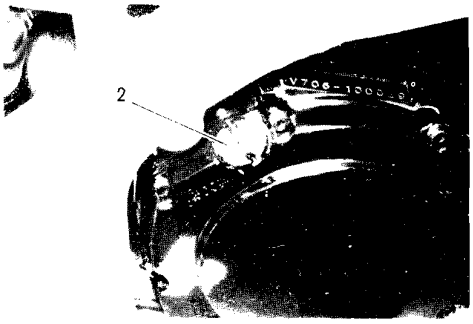
- Fit the drain plug ① securely, and add fresh oil through the oil filler. The engine will hold about 4.5 L (4.8 US qt) of oil. Use an API classification of SE or SF oil with SAE 10W/40 viscosity.
- Start up the engine and allow it to run for several seconds at idling speed.
- Turn off the engine and wait about one minute, then check the oil level through the inspection window ④. If the level is below mark"F", add oil to that level.

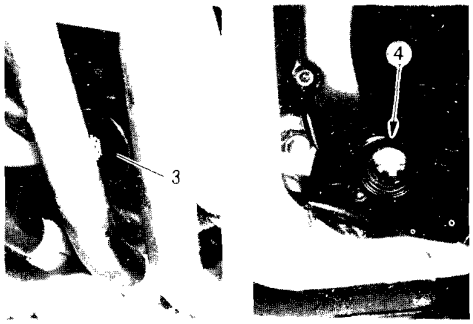
NECESSARY AMOUNT OF ENGINE OIL

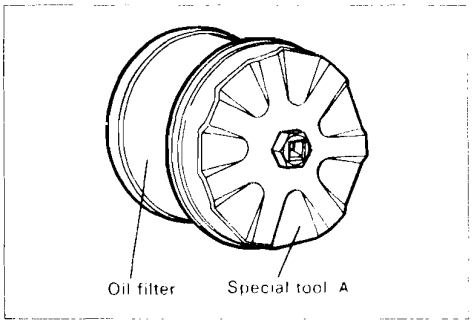
Oil change: 4.3 L (4.5 US qt)
Filter change: 4.5 L (4.8 US qt)
Overhaul engine: 5.5 L (5.8 US qt)

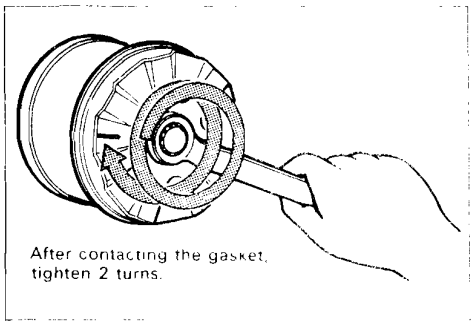
CAUTION:
Use SUZUKI MOTORCYCLE GENUIN OIL FILTER only, since the other make's genuine filters and after-market parts may differ in thread specifications (thread diameter and pitch), filtering performance and durability, which could cause engine damage or oil leaks. Suzuki automobile genuine oil filter is also not usable for the motorcycles.











FUEL LINE (FUEL LINE AND VAPOR HOSE... California Version only)

Inspect Initially at 1000 km (600 miles, 2 months) and Every 6000 km (4000 miles, 12 months) thereafter. Replace Every four years.

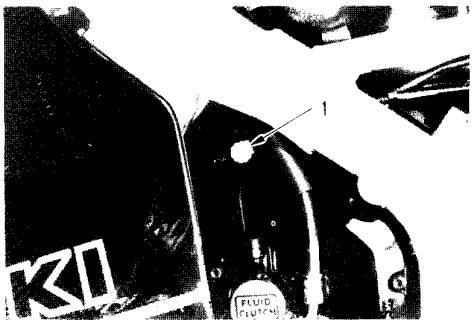
CARBURETOR

IDLE RPM (Idling adjustment)

Inspect Initially at 1000 km (600 miles, 2 months) and Every 6000 km (4000 miles, 12 months) thereafter.

NOTE:
Make this adjustment when the engine is hot.

- Connect a tachometer.
- Start up the engine and set its speed at anywhere between 1000 and 1200 r/min by turning throttle stop screw ①.



Engine idle speed: 1100 ± 100 r/min

THROTTLE CABLE PLAY

There should be 0.5 – 1.0 mm (0.02 – 0.04 in) play Ⓐ on the throttle cable. Adjust the throttle cable play with the following procedure.

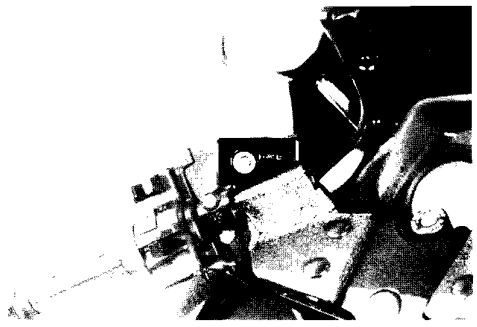
- Loosen the lock nut ① and turn the adjuster ② in or out until the specified play is obtained.
- Tighten the lock nut ① while holding the adjuster.

Throttle cable play Ⓐ: 0.5 – 1.0mm (0.02 – 0.04in)

WARNING:
After the adjustment is completed, check that handlebar movement does not raise the engine idle speed and that the throttle grip returns smoothly and automatically.

CLUTCH

Inspect Initially at 1000 km (600 miles, 2 months) and Every 6000 km (4000 miles, 12 months) thereafter. Replace hose every four years. Replace fluid every two years.



CLUTCH FLUID LEVEL

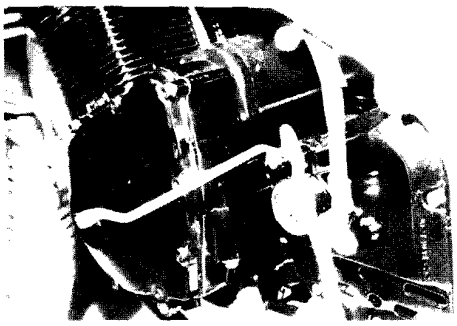
- Keep the motorcycle upright, and place the handlebars straight.
- Check the clutch fluid level in the reservoir.
- If the level is found to be lower than the lower mark, replenish with BRAKE FLUID that meets the following specification.

Specification and classification: DOT4

(Continued on next page.)

WARNING:
The clutch system of this motorcycle is filled with a glycol-based brake fluid. Do not use or mix different types of fluid such as silicone-based and petroleum-based. Do not use any brake fluid taken from old, used or unsealed containers. Never re-use brake fulid left over from the last servicing or stored for long periods.

BLEEDING AIR FROM THE CLUTCH FLUID CIRCUIT



The clutch fluid circuit may be purged of air in the following manner.

- Fill up the master cylinder reservoir to the upper end of the inspection window. Replace the reservoir cap to prevent entry of dirt.
- Attach a pipe to the bleeder valve and insert the free end of the pipe into a receptacle.
- Squeeze and release the clutch lever several times in rapid succession, and squeeze the lever fully without releasing it. Loosen the bleeder valve by turning it a quarter of a turn so that the fluid runs into the receptacle; this will remove the tension of the clutch lever causing it to touch the handlebar grip. Then, close the valve, pump and sqeeze the lever, and open the valve. Repeat this process until the fluid flowing into the receptacle no longer contains air bubbles.

NOTE:
Replenish the clutch fluid reservoir as necessary while bleeding the clutch system. Make sure that there is always some fluid visible in the reservoir.

- Close the bleeder valve, and disconnect the pipe. Fill the reservoir to the upper end of the inspection window.

Bleeder valve
tightening torque: 6 – 9 N·m
(0.6 – 0.9kg-m, 4.5 – 6.5 lb-ft)

CAUTION:
Handle brake fluid with care: the fluid reacts chemically with paint, plastics, rubber materials, etc.

DRIVE CHAIN

Inspect Initially at 1000 km (600 miles, 2 months) and Every 6000 km (4000 miles, 12 months) thereafter. Clean and Lubricate Every 1000 km (600 miles).

Visually check the drive chain for the possible defects, listed below. (Support the motorcycle by center stand, and turn the rear wheel slowly by hand with the transmission shifted to Neutral.)

- Loose pins
- Damaged rollers
- Dry or rusted links
- Kinked or binding links
- Excessive wear
- Improper chain adjustment
- Missing O-ring seals

If any defects are found, the drive chain must be replaced.

CHECKING

- Loosen the axle pinch bolts ①.
- Remove the cotter pin.
- Loosen axle nut ②.
- Loosen the chain adjusting lock nuts ③.
- Tension the drive chain fully by tightening the chain adjusting bolts ④.
- Count out 21 pins (20 pitches) on the chain and measure the distance between the two points. If the distance exceeds following limit, the chain must be replaced.

Service Limit: 319.4mm(12.6in)

ADJUSTING

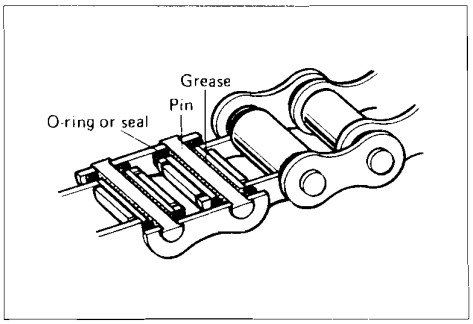
- Loosen the chain adjusting bolts ④ until the chain has 20 – 25 mm (0.8 – 1.0 in) of slack at the middle between engine and rear sprockets. The mark ⑤ on both chain adjusters must be at the same position on the scale to ensure that the front and rear wheels are correctly aligned. Place on side stand for accurate adjustment.
- After adjusting the drive chain slack, tighten the loosened bolts and nuts securely.
- Replace the cotter pin with a new one.

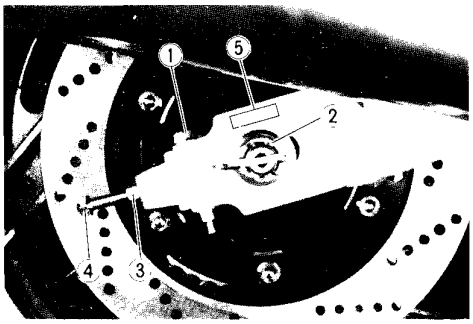
Rear axle nut
Tightening torque: 94 – 127 N·m
(9.4 – 12.7 kg-m, 68.0 – 92.0 lb-ft)

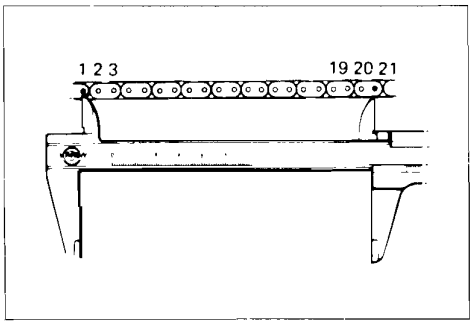
CLEANING AND LUBRICATIING

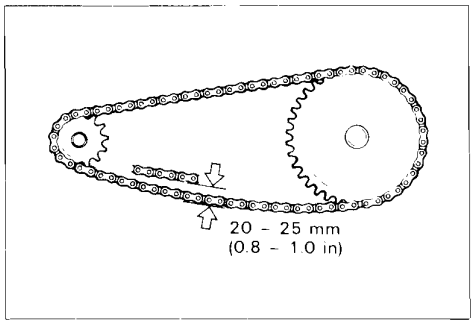
- Wash the chain with kerosene. If the chain tends to rust faster, the intervals must be shortened.

CAUTION:
Do not use trichlene, gasoline or any similar fluids: These fluids have too great a dissolving power for this chain and, what is more important, can damage the "O" rings (or seals) confining the grease in the bush to pin clearance. Remember, high durability comes from the presence of grease in that clearance.









(Continued on next page.)

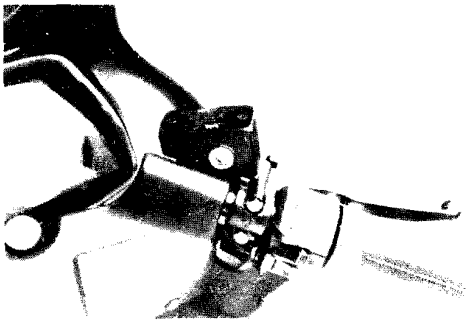
- After washing and drying the chain, oil it with a heavy-weight motor oil.

CAUTION:
Do not use any oil sold commercially as 'drive chain oil". Such oil can damage the "O" rings (or seals).

CAUTION:
The standard drive chain is DAIDO D.I.D 532ZLV. SUZUKI recommends that the above-mentioned standard drive chain be used for the replacement.

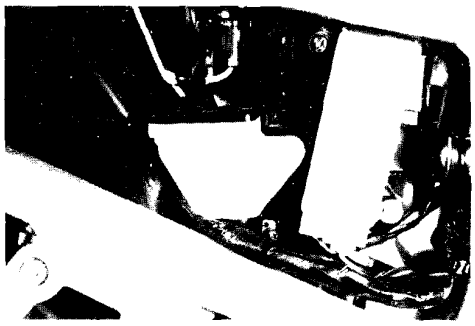
BRAKES

Inspect Initially at 1000 km (600 miles, 2 months) and Every 6000 km. (4000 miles, 12 months) thereafter. Replace hoses Every four years. Change fluid Every two years.



BRAKE FLUID LEVEL

- Keep the motorcycle upright and place the handlebars straight.
- Remove the seat and right frame cover.
- Check the brake fluid level by observing the upper (Only for rear brake) and lower (Both front and rear brakes) limit lines on the brake fluid reservoirs.
- When the level is below the lower limit line, replenish with brake fluid that meets the following specification.



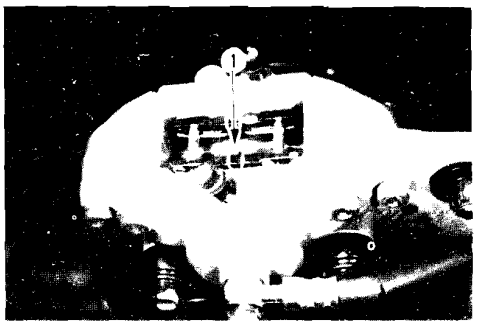
Specification and Classification: DOT4

WARNING:
The brake system of this motorcycle is filled with a glycol-based brake fluid. Do not use or mix different types of fluid such as silicone-based and petroleum-based. Do not use any brake fluid taken from old, used or unsealed containers. Never re-use brake fluid left over from the last servicing or stored for long periods.

WARNING:
Brake fluid, if it leaks, will interfere with safe running and immediately discolor painted surfaces. Check the brake hoses and hose joints for cracks and oil leakage before riding.

BRAKE PADS

The extent of brake pad wear can be checked by observing the limit line ① marked on the pad. When the wear exceeds the limit line, replace the pads with new ones. (Refer to pages 7-10 and 7-26.)

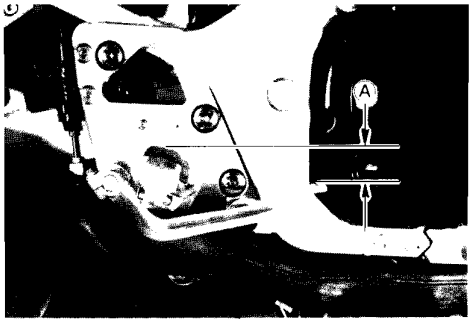


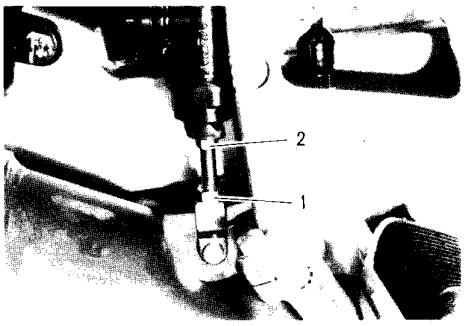
CAUTION:
Replace the brake pad as a set, otherwise braking performance will be adversely affected.

BRAKE PEDAL HEIGHT

- Loosen the lock nut ①, and rotate the push rod ② to locate brake pedal 50 mm (2.0 in) Ⓐ below the top face of the footrest.
- Retighten the lock nut ① to secure the push rod ② in the proper position.

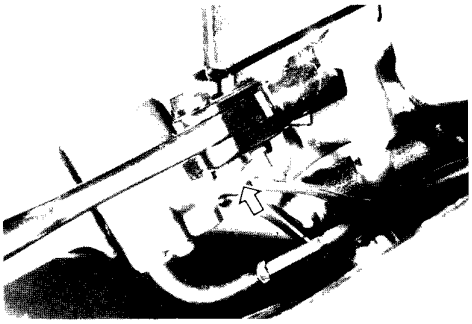
Brake pedal height Ⓐ: 50 mm (2.0 in)

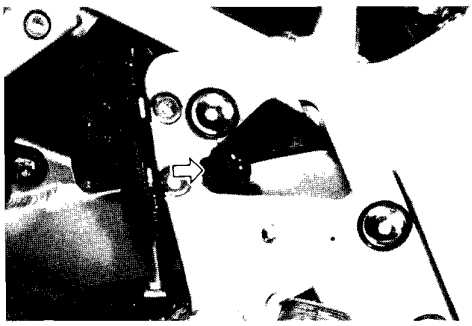




BRAKE LIGHT SWITCHES

Adjust both brake light switches, front and rear, so that the brake light will come on just before a pressure is felt when the brake lever is squeezed, or the brake pedal is depressed.





AIR BLEEDING THE BRAKE FLUID CIRCUIT

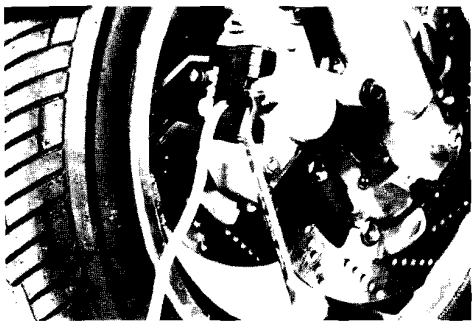
Air trapped in the fluid circuit acts like a cushion to absorb a large proportion of the pressure developed by the master cylinder and thus interferes with the full braking performance of the brake caliper. The presence of air is indicated by"sponginess" of the brake lever and also by lack of braking force. Considering the danger to which such trapped air exposes the machine and rider, it is essential that, after remounting the brake and restoring the brake system to the normal condition, the brake fluid circuit be purged of air in the following manner:

(Continued on next page.)

- Fill up the master cylinder reservoir to the upper end of the inspection window, (for front brake) and "UPPER" line. (for rear brake) Replace the reservoir cap to prevent entry of dirt.
- Attach a pipe to the caliper bleeder valve, and insert the free end of the pipe into a receptacle.

Bleeder valve tightening torque: 6 – 9 N·m (0.6 – 0.9 kg-m, 4.5 – 6.5 lb-ft)

- Front brake: Bleed the air from the inboard valve first, and then outboard valve.
- Squeeze and release the brake lever several times in rapid succession and squeeze the lever fully without releasing it. Loosen the bleeder valve by turning it a quarter of a turn so that the brake fluid runs into the receptacle; this will rernove the tension of the brake lever causing it to touch the handlebar grip. Then, close the valve, pump and squeeze the lever, and open the valve. Repeat this process until the fluid flowing into the receptacle no longer contains air bubbles.



NOTE:
Replenish the brake fluid reservoir as necessary while bleeding the brake system. Make sure that there is always some fluid visible in the reservoir.

- Close the bleeder valve, and disconnect the pipe. Fill the reservoir to the upper end of the inspection window (for front brake) and"UPPER" line. (for rear brake)

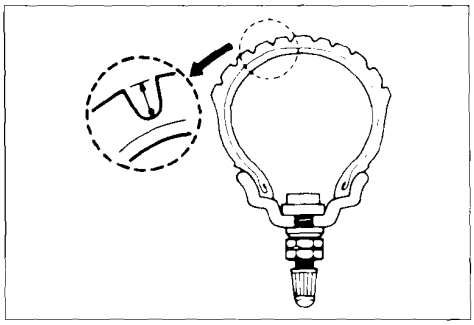
CAUTION:
Handle brake fluid with care: the fluid reacts chemically with paint, plastics, rubber materials etc.

- The only difference between bleeding the front and rear brakes is that the rear master cylinder is actuated by a pedal.

TIRES

Inspect Initially at 1000 km (600 miles, 2 months) and Every 6000 km (4000 miles, 12 months) thereafter.

(Continued on next page.)



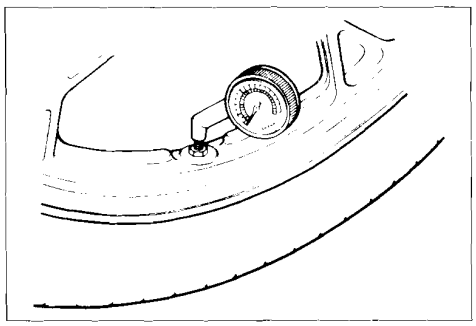
TIRE TREAD CONDITION

Operating the motorcycle with excessively worn tires will decrease riding stability and consequently invite a dangerous situation. It is highly recommended to replace a tire when the remaining depth of tire tread reaches the following specification.

Tire tread depth limit: FRONT 1.6 mm (0.06 in)
REAR 2.0 mm (0.08 in)

TIRE PRESSURE

If the tire pressure is too high or too low, steering will be adversely affected and tire wear increased. Therefore, maintain the correct tire pressure for good roadability or shorter tire life will result. Cold inflation tire pressure is as follows.

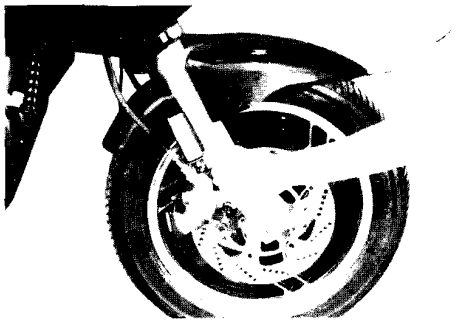


FRONT			REAR		
kg/cm²	kPa	psi	kg/cm²	kPa	psi
2.50	250	36	2.90	290	42

CAUTION:
The standard tire fitted on this motorcycle is 120/80 V16 V250 for front (METZELER ME33) and 150/80 V16 V250 for rear (METZELER ME99A). The use of tires other than those specified may cause instability. It is highly recommended to use a SUZUKI Genuine Tire.

STEERING

Inspect Initially at 1000 km (600 miles, 2 months) and Every 6000 km (4000 miles, 12 months) thereafter.



Taper roller type bearings are used on the steering system for better handling. Steering should be adjusted properly for smooth turning of handlebars and safe running. Overtight steering prevents smooth turning of the handlebars and too loose steering will cause poor stability. Check that there is no play in the front fork assembly by supporting the machine so that the front wheel is off the ground, with the wheel straight ahead, grasp the lower fork tubes near the axle and pull forward. If play is found, perform steering bearing adjustment as described in page 7-25 of this manual.

FRONT FORKS

Inspect Initially at 1000 km (600 miles, 2 months) and Every 12000 km (7500 miles, 24 months) thereafter.

Inspect the front forks for oil leakage, scoring or scratches on the outer surface of the inner tubes. Replace any defective parts, if necessary. (Refer to page 7-16.)

REAR SUSPENSION

Inspect Initially at 1000 km (600 miles, 2 months) and Every 12000 km (7500 miles, 24 months) thereafter.

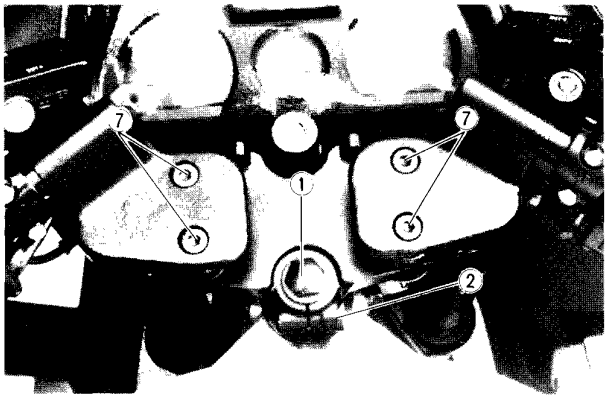
Inspect the rear shock absorber for oil lakage and check that there is no play in the swingarm assembly.

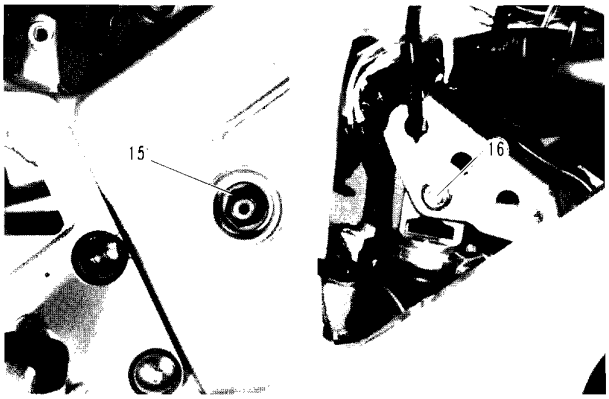
CHASSIS BOLTS AND NUTS

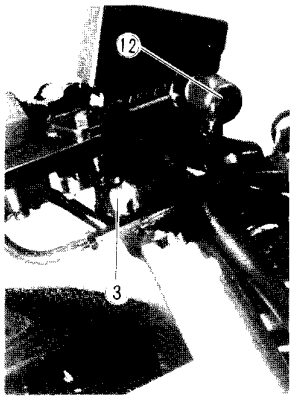
Tighten Initially at 1000 km (600 miles, 2 months) and Every 6000 km (4000 miles, 12 months) thereafter.

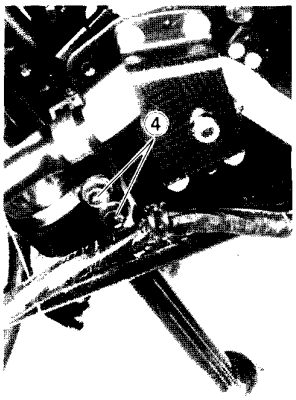
The nuts and bolts listed below are important safety parts. They must be retightened when necessary to the specified torque with a torque wrench. (Refer to page 2-18 for the locations of the following nuts and bolts on the motorcycle.)

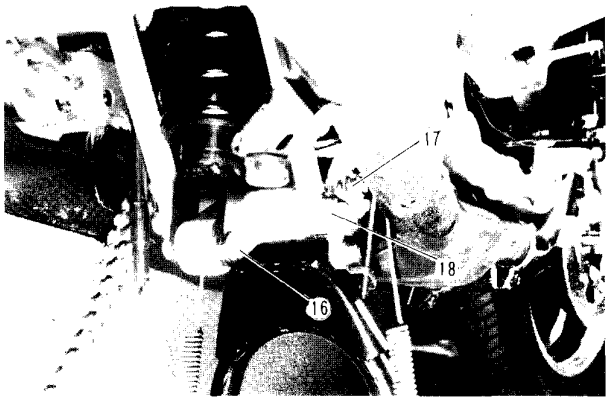
Item	N·m	kg-m	lb-ft
① Steering stem head bolt	35 – 55	3.5 – 5.5	25.5 – 40.0
② Steering stem head clamp bolt	15 – 25	1.5 – 2.5	11.0 – 18.0
③ Front fork upper clamp bolt	20 – 30	2.0 – 3.0	14.5 – 21.5
④ Front fork lower clamp bolt	15 – 25	1.5 – 2.5	11.0 – 18.0
⑤ Front axle nut	55 – 88	5.5 – 8.8	40.0 – 63.5
⑥ Front axle pinch nut	15 – 25	1.5 – 2.5	11.0 – 18.0
⑦ Handlebar mounting bolt	25 – 35	2.5 – 3.5	18.0 – 25.5
⑧ Clutch master cylinder mounting bolt	8 – 12	0.8 – 1.2	6.0 – 8.5
⑨ Front brake master cylinder mounting bolt	8 – 12	0.8 – 1.2	6.0 – 8.5
⑩ Front brake caliper mounting bolt	25 – 40	2.5 – 4.0	18.0 – 29.0
⑪ Front brake caliper housing bolt	18 – 23	1.8 – 2.3	13.0 – 16.5
⑫ Brake/clutch hose union bolt	20 – 25	2.0 – 2.5	14.5 – 18.0
⑬ Air bleeder valve	6 – 9	0.6 – 0.9	4.5 – 6.5
⑭ Front and rear disc bolt	15 – 25	1.5 – 2.5	11.0 – 18.0
⑮ Swingarm pivot nut	55 – 88	5.5 – 8.8	40.0 – 63.5
⑯ Rear shock absorber upper/lower mounting nut	40 – 60	4.0 – 6.0	29.0 – 43.5
⑰ Rear cushion lever mounting nut	70 – 100	7.0 – 10.0	50.5 – 72.5
⑱ Rear cushion rod upper/lower nut	70 – 100	7.0 – 10.0	50.5 – 72.5
⑲ Rear brake caliper mounting bolt	25 – 40	2.5 – 4.0	18.0 – 29.0
⑳ Rear brake caliper housing bolt	18 – 23	1.8 – 2.3	13.0 – 16.5
㉑ Rear torque link nut	22 – 33	2.2 – 3.3	16.0 – 24.0
㉒ Rear brake master cylinder mounting bolt	15 – 25	1.5 – 2.5	11.0 – 18.0
㉓ Rear axle nut	94 – 127	9.4 – 12.7	68.0 – 92.0
㉔ Rear sprocket nut	48 – 72	4.8 – 7.2	35.0 – 52.0

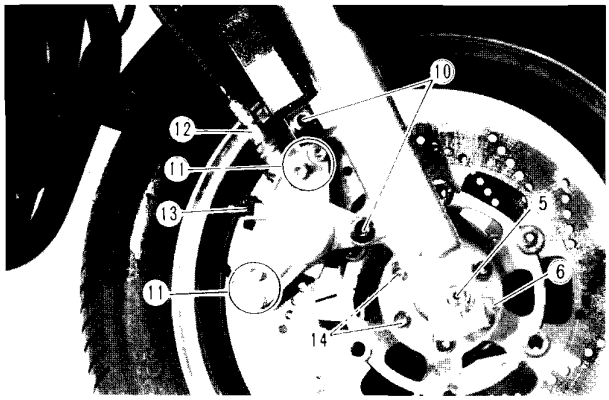


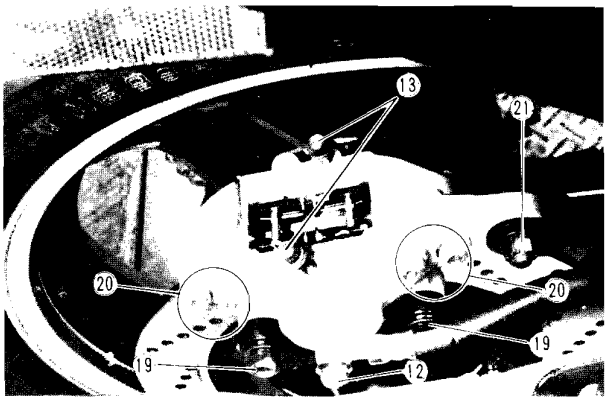


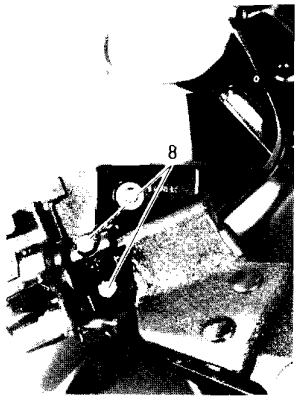


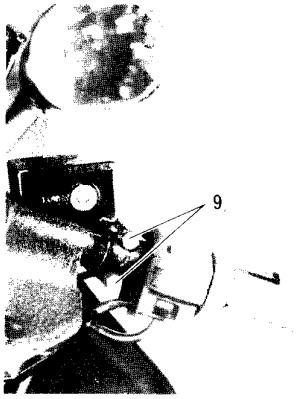


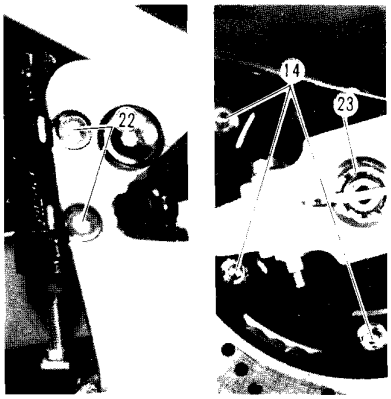


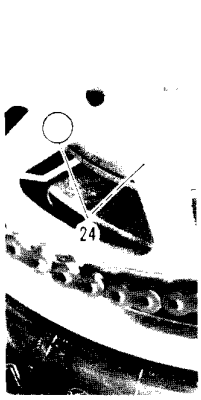












ENGINE

CONTENTS

3

COMPRESSION CHECK

The compression of a cylinder is a good indicator of its internal condition. The decision to overhaul the cylinders is often based on the results of a compression test. Periodic maintenance records kept at your dealership should include compression readings for each maintenance service.

COMPRESSION

Standard	Limit	Difference
1100 – 1500 kPa (11 – 15 kg/cm²) (156 – 213 psi)	900 kPa (9 kg/cm²) (128 psi)	200 kPa (2 kg/cm²) (28 psi)

Low compression pressure can indicate any of the following conditions:

* Excessively worn cylinder wall
* Worn-down piston or piston rings
* Piston rings stuck in the grooves
* Poor seating of valves
* Ruptured or otherwise defective cylinder head gasket

Overhaul the engine in the following cases:

* Compression pressure in one of the cylinders is less than 900 kPa (9 kg/cm², 128 psi).
* Difference in compression pressure between any two cylinders is more than 200 kPa (2 kg/cm², 28 psi).
* All compression pressure are below 1100 kPa (11 kg/cm², 156 psi) (standard) even when they measure than 900 kPa (9 kg/cm², 128 psi).

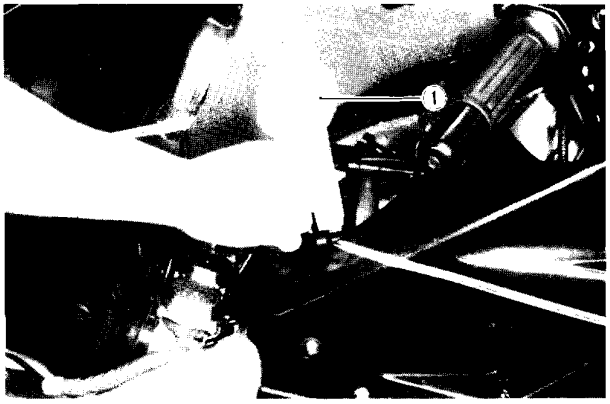
COMPRESSION TEST PROCEDURE

NOTE:

* *Before testing the engine for compression pressure, make sure that the cylinder head nuts and bolt are tightened to the specified torque values and valves are properly adjusted.*
* *Warm up the engine before testing.*

- Remove the seat.
- Remove the left and right frame covers.
- Remove the fuel tank mounting bolts at rear end of the fuel tank and slide the fuel tank backward, and lift up the fuel tank with a proper block.
- Remove the all spark plugs.
- Fit the compression gauge ① in one of the plug holes, while taking care that the connection is tight.
- Twist the throttle grip full open.
- Crank the engine a few seconds with the starter, and record the maximum gauge reading as the compression of that cylinder.
- Repeat this procedure with the other cylinders.

09915-64510: Compression gauge
09915-63210: Adaptor



ENGINE COMPONENTS REMOVABLE WITH THE ENGINE IN PLACE

The parts listed below can be removed and reinstalled without removing the engine from the frame. Refer to the page listed in this section for removal and reinstallation instructions

ENGINE LEFT SIDE

ENGINE CENTER

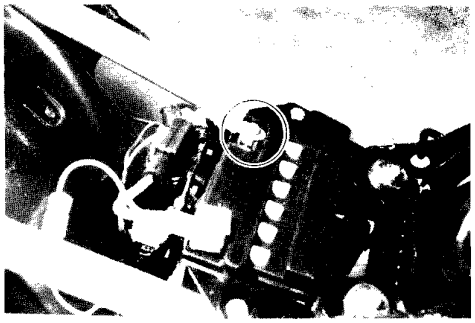
ENGINE RIGHT SIDE

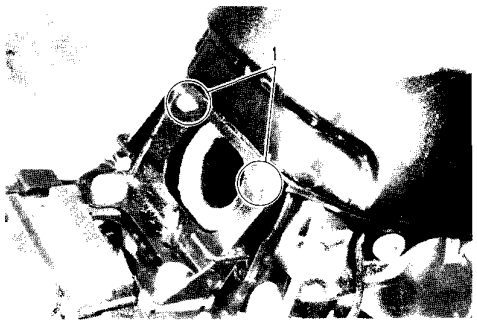
ENGINE REMOVAL AND REINSTALLATION

ENGINE REMOVAL

Before taking the engine out of the frame, wash the engine with a steam cleaner. The procedure of engine removal is sequentially explained in the following steps, and engine installation is effected by reversing the removal procedure.

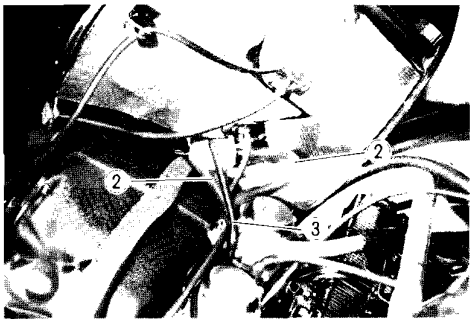
- Remove the seat.
- Remove the left and right frame covers.
- Remove the lower fairing.
- Disconnect the battery ⊖ lead wire from the battery terminal.
- Remove the fuel tank mounting bolts ①.



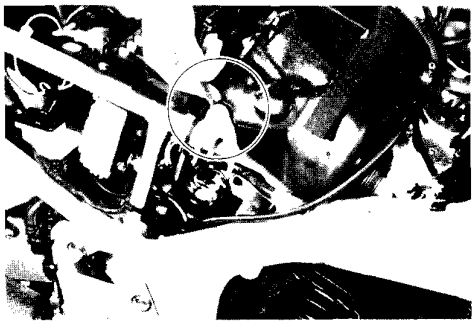


- Lift the fuel tank, and then disconnect the two fuel hoses ② and vacuum hose ③ from the fuel cock.

NOTE:
Do not lose the fuel hose clips.

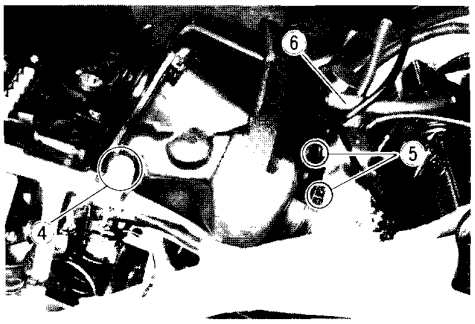


- Disconnect the fuel level gauge sending unit lead wires, and remove the fuel tank.

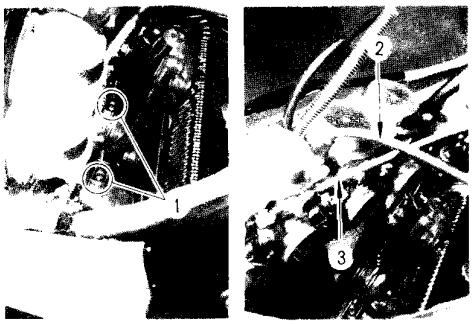


- Remove the left and right air cleaner case mounting screws ④.
- Loosen each carburetor clamp screw ⑤ at the air cleaner side.
- Remove the breather hose ⑥, and then remove the air cleaner case assembly.

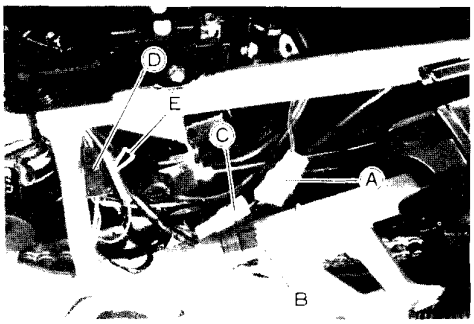
NOTE:
Do not lose the breather hose clips.



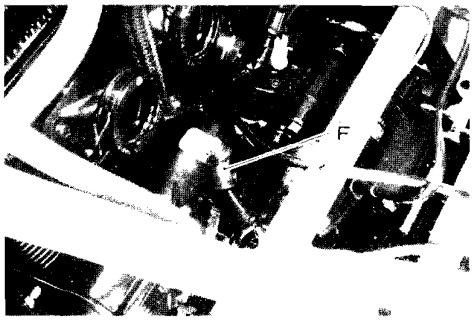
- Loosen each carburetor clamp screw ①.
- Remove the carburetor assembly and disconnect the throttle cable ② and starter cable ③.



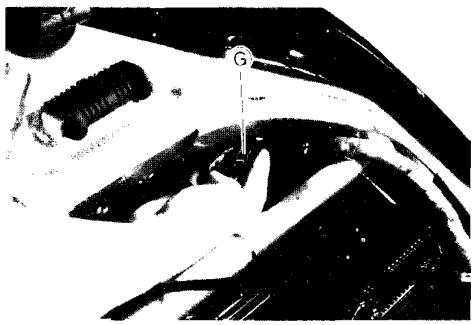
- Disconnect the various lead wires.
  - * Battery ⊖ lead wire (coupler Ⓐ).
  - * Generator lead wires (coupler Ⓑ).
  - * Neutral indicator switch lead wire (coupler Ⓒ).
  - * Signal generator lead wires (coupler Ⓓ).
  - * Oil pressure indicator switch lead wire Ⓔ.



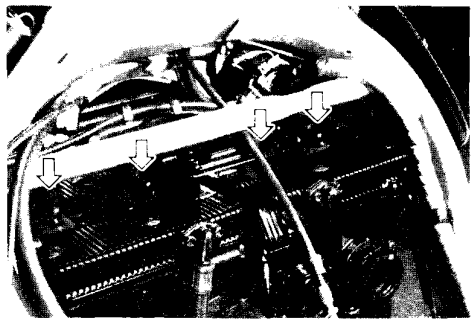
- * Starter motor lead wire Ⓕ.



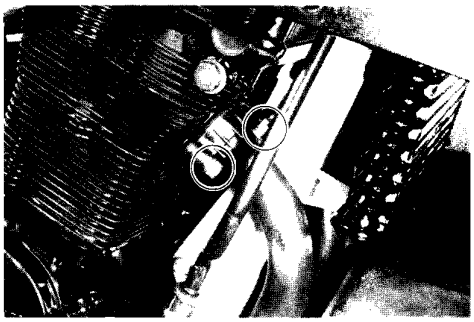
- * Side-stand switch lead wires (coupler Ⓖ).



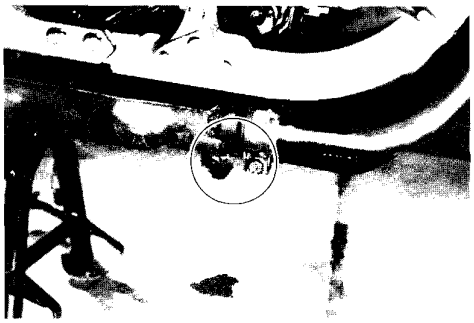
- Disconnect the spark plug caps out of each spark plug.



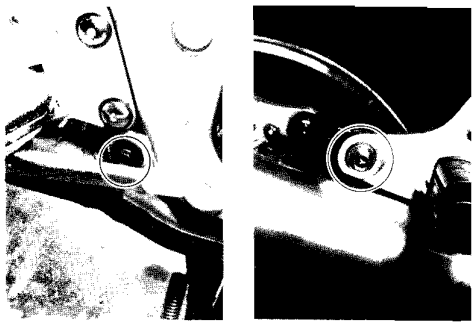
- Remove the eight exhaust pipe clamp bolts with a 6-mm hexagon wrench.



- Loosen the exhaust pipe/muffler connection bolts, left and right.



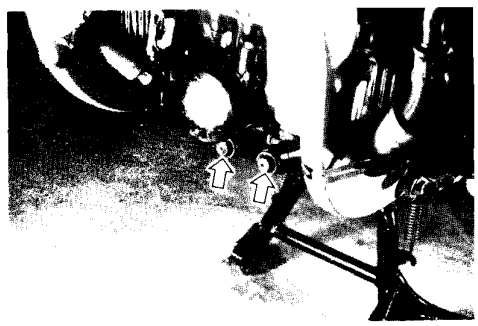
- Remove the muffler mounting bolts, left and right.
- Remove the left and right exhaust pipe/muffler.



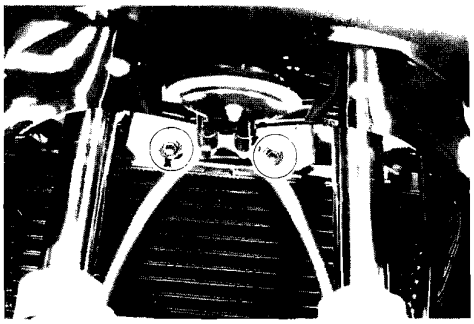
- Place an oil pan under the engine and remove the oil drain plug to drain out engine oil.

- Place an oil pan under the engine and remove the two oil cooler hoses by removing the union bolts.

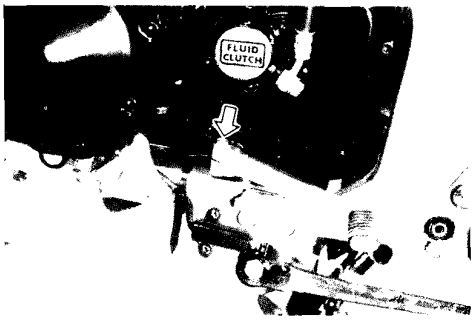
Tightening torque
Union bolt: 25 – 30 N·m
(2.5 – 3.0 kg-m, 18.0 – 21.5 lb-ft)



- Remove the oil cooler by removing the mounting bolts.

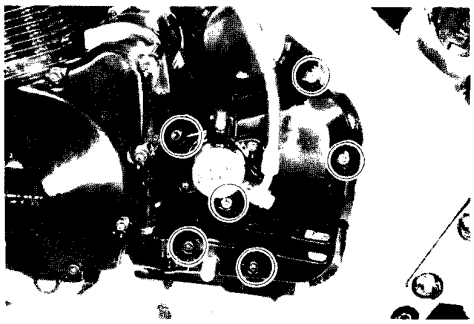


- Remove the gearshift lever by removing the mounting bolt.

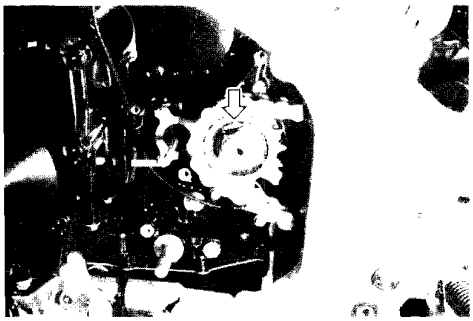


- Remove the engine sprocket cover by removing the bolts.

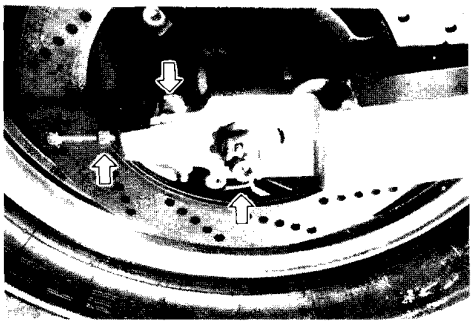
CAUTION:
Do not operate the clutch lever to prevent clutch piston retainer damage.



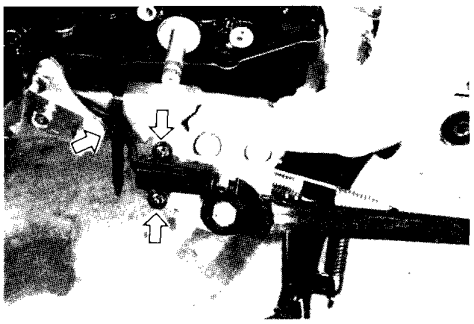
- Flatten the engine sprocket nut lock washer by using chisel.
- Remove the engine sprocket nut while depressing the brake pedal.



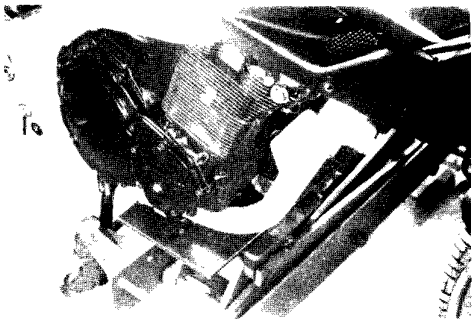
- Loosen the axle shaft pinch bolts, right and left, and pull out the cotter pin and loosen the axle nut.
- Loosen the drive chain adjusting lock nuts, right and left, and push the rear wheel forward.
- Disengage the drive chain and engine sprocket from the driveshaft.



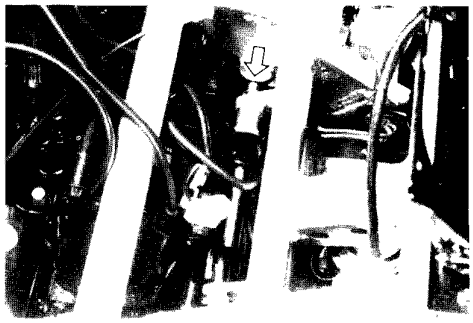
- Remove the side-stand switch assembly by removing the screws and clamps.

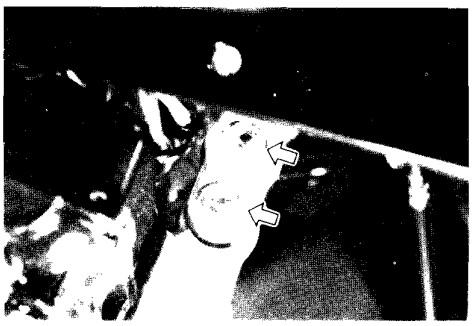


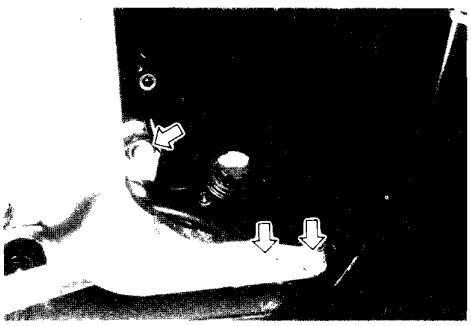
- Support the engine with a proper engine jack.



- Remove the engine mounting bolts, nuts and spacer at the engine rear side.
- Remove the frame down tube mounting bolts and nuts, right and left.



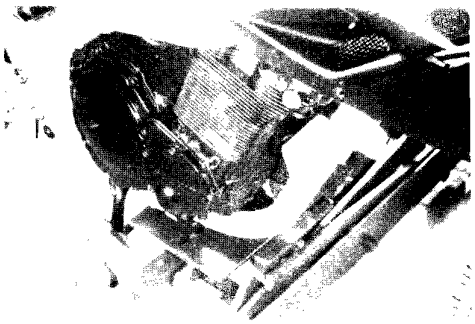




- Gradually lower the engine assembly along with the frame down tubes.

NOTE:

After removing the engine assembly from the frame, remove the frame down tubes from the engine.



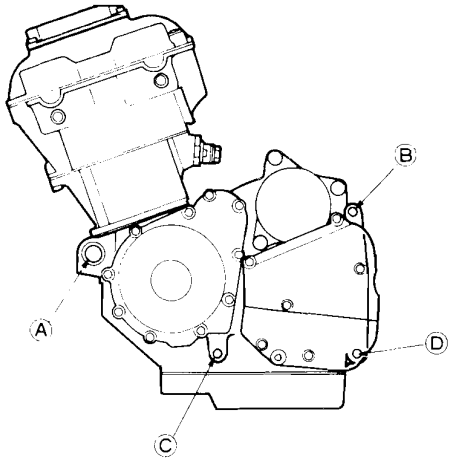
ENGINE REINSTALLATION

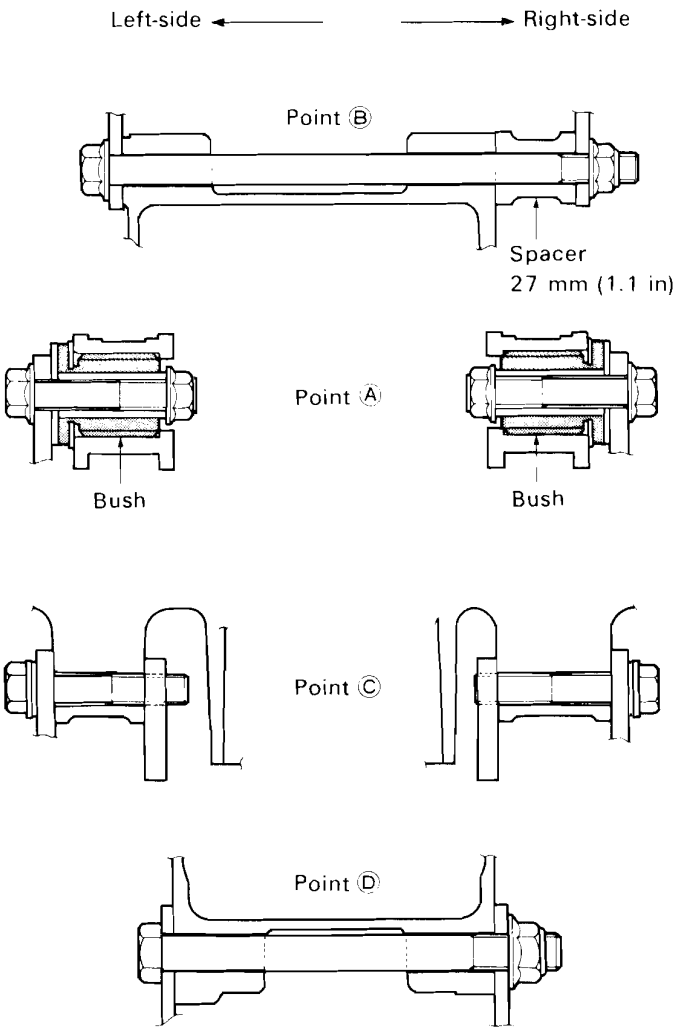
Reinstall the engine in the reverse order of engine removal.

- Install the brackets, spacers, bushes, bolts and nuts properly, as shown in the following illustration.

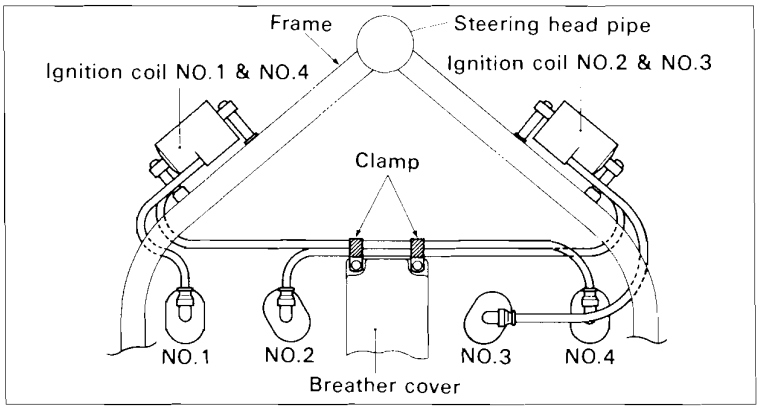
NOTE:
The engine mounting nuts are self-locking. Once the nut has been removed, it is no longer of any use. Be sure to use new nuts and tighten them to the specified torque.

	Bolt Length	Tightening torque
Ⓐ	55 mm (2.2 in)	50 – 60 N·m (5.0 – 6.0 kg-m, 36.0 – 43.5 lb-ft)
Ⓒ	55 mm (2.2 in)	
Ⓑ	180 mm (7.1 in)	70 – 80 N·m (7.0 – 8.0 kg-m, 50.5 – 58.0 lb-ft)
Ⓓ	140 mm (5.5 in)	
Down tube mounting bolt 25 – 38 N·m (2.5 – 3.8 kg-m, 18.0 – 27.5 lb-ft)		

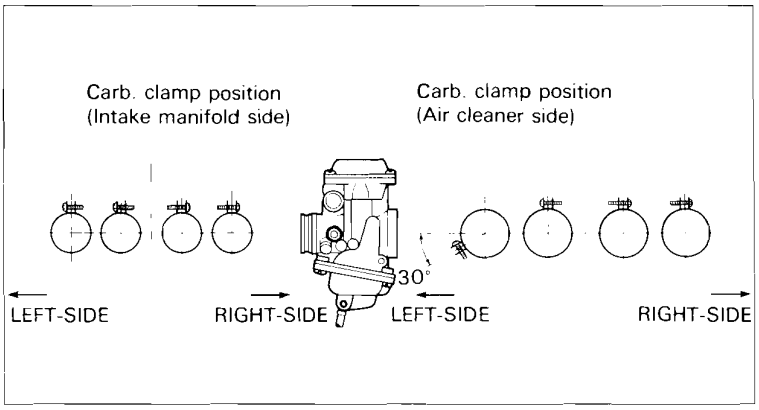




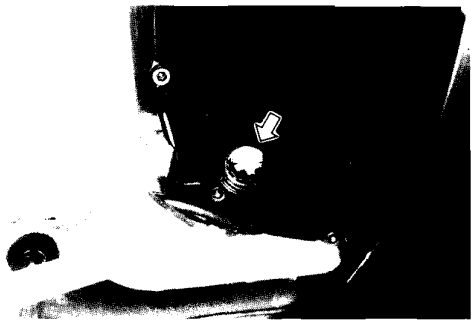
- Replace the plug caps on the spark plugs so that their code markings correspond to the cylinder numbers arranged in the order of **1, 2, 3** and **4** from the left.



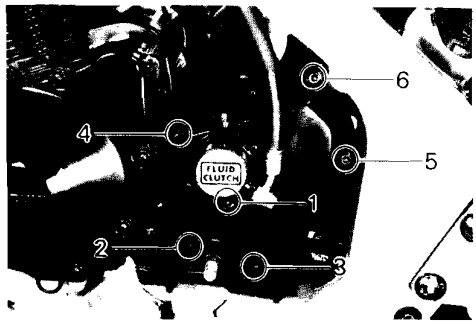
- Locate the carburator clamps, as shown in the illustration.



- Pour 5.5L of engine oil SAE 10W/40 under API classification SF into the engine.
  Several minutes after starting and stopping engine, check that the oil level remains between the marks of oil inspection window.
  OIL CHANGE: 4300 ml (4.5/3.8 US/Imp qt)
  OIL AND FILTER CHANGE: 4500 ml (4.8/4.0 US/Imp qt)
  OVERHAUL: 5500 ml (5.8/4.8 US/Imp qt)



- Tighten the engine sprocket cover bolts sequentially in the ascending order of numbers.



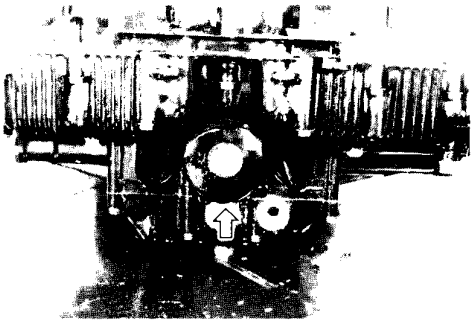
- After remounting the engine, route wirig harness, cables and hoses properly by referring to the sections, for wire routing, cable routing and hose routing. (see pages 8-10 through 18)
- Adjust the following items to the specification.

ENGINE DISASSEMBLY

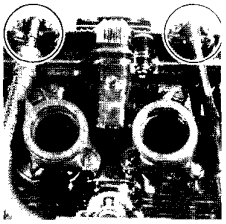
- Remove the oil filter by using the special tool.

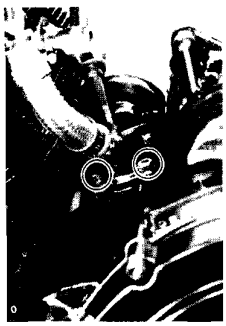
09915-40611: Oil filter wrench

NOTE:
Refer to page 2-8 for installation procedures.



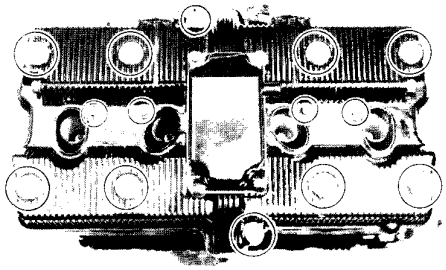
- Remove the cylinder head cooling oil hoses by removing the bolts.





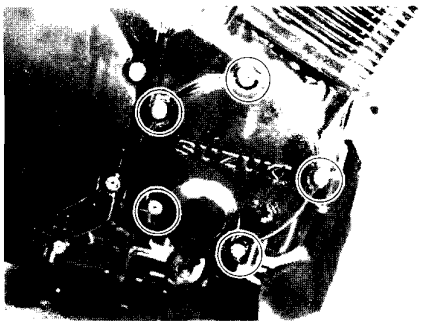
- Remove the cylinder head cover by removing the bolts.

09914-25811: 6 mm "T" type hexagon wrench



- Remove the signal generator cover by removing the bolts.

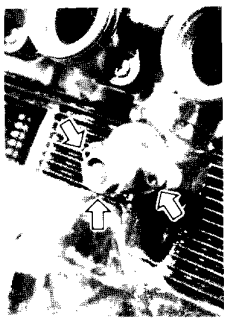
09911-73730: 5 mm "T" type hexagon wrench

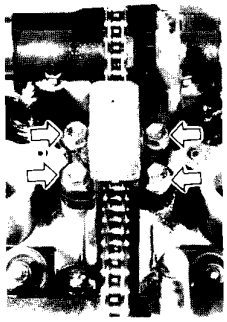


- Remove the spring holder bolt and spring, and then remove the cam chain tensioner by removing the bolts.

09911-73730: 5 mm "T" type hexagon wrench

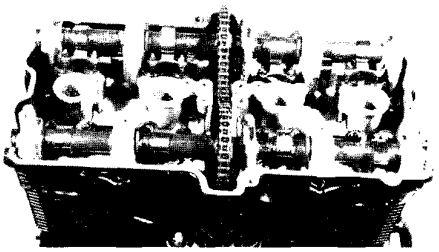
- Remove the cam chain idler by removing the bolts.



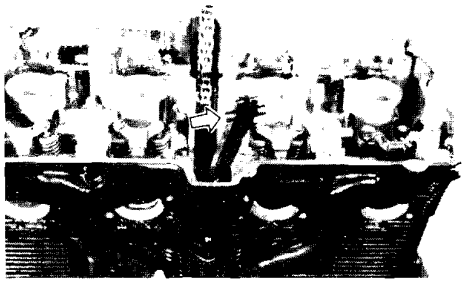


- Remove the ten camshaft journal holders by removing the bolts.

NOTE:
Be sure to loosen camshaft journal holder bolts evenly by shifting the wrench diagonally.



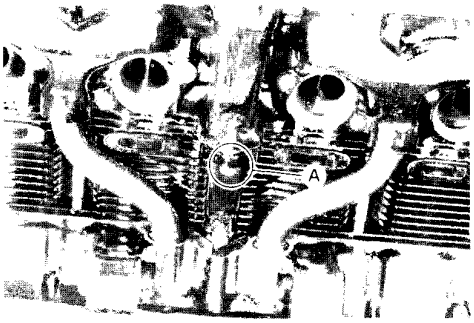
- Remove the two camshafts, intake and exhaust.
- Pull out the cam chain guide.



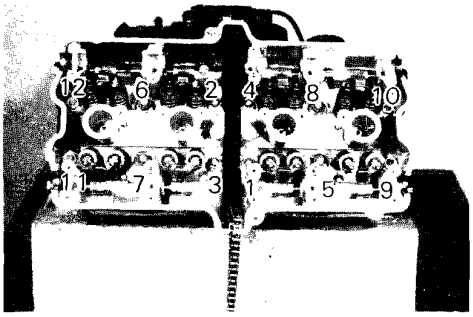
- The cylinder head becomes free for removal when its one 6-mm bolt Ⓐ and twelve 10-mm nuts are removed.

09911-74510: Long socket 14 mm

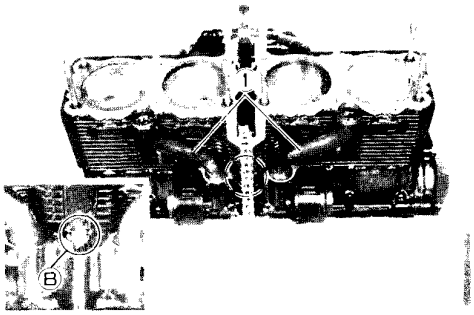
09914-24510: T handle



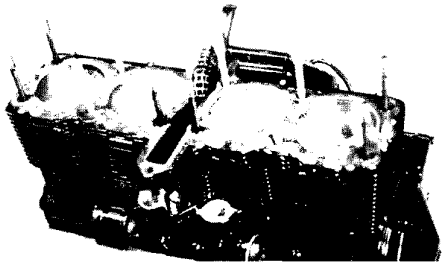
NOTE:
When loosening the cylinder head nuts, break each nut loosen a little at a time in a descending order according to the numbers cast on a cylinder head.



- Remove the right and left oil pipes ①.
- Remove the cylinder nut Ⓑ.

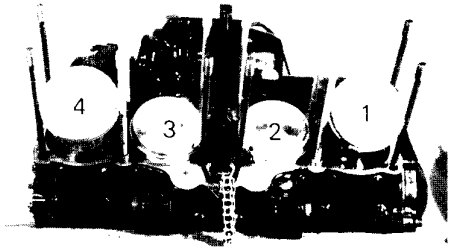


- Firmly grip the cylinder block at both ends, and lift it straight up. If the block does not come off, lightly tap on the finless portions of the block with a plastic mallet to shake the gasketed joint loose.

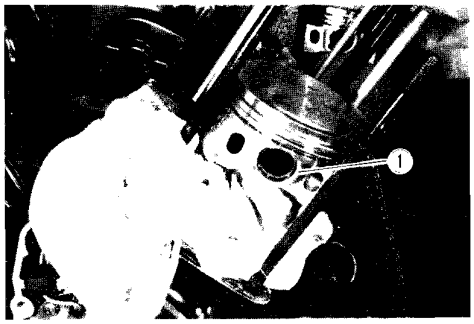


CAUTION:
Be careful not to damage the fins when removing or handling the cylinder block. This precaution applies to the cylinder head also.

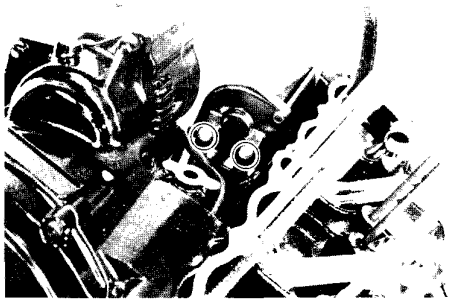
- Scribe the cylinder No. on the head of the respective pistons.



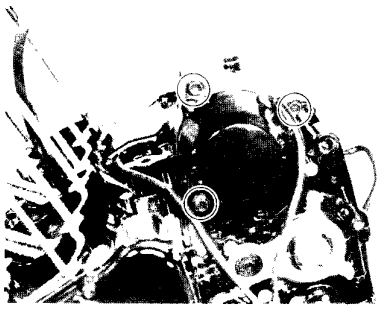
- Place a cloth beneath the piston so as not to drop the parts in the crankcase, and remove the circlip ① with long-nose pliers.
- Draw out the piston pin. Place each piston pin in the same piston as that it was removed from.



- Remove the starter motor by removing the bolts.

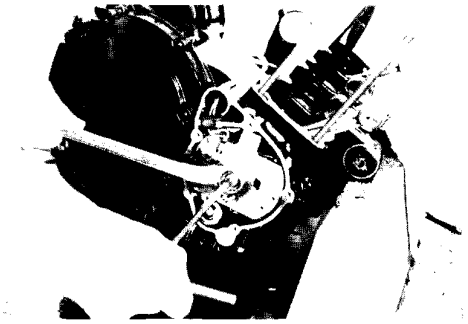


- Remove the generator by removing the bolts.

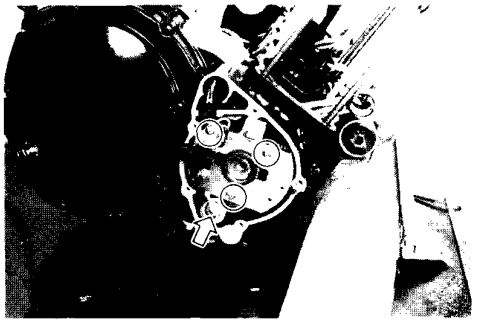


- Remove the signal generator rotor by removing the bolt.

09914-25811: 6 mm "T" type hexagon wrench

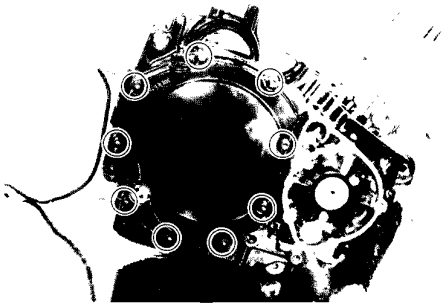


- Disconnect the oil pressure switch lead wire.
- Remove the signal generator stator by removing the three screws.



- Remove the clutch cover by removing the bolts.

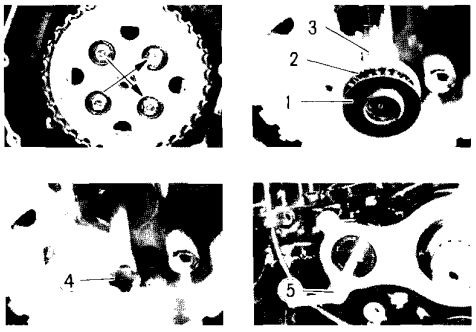
09911-73730: 5 mm "T" type hexagon wrench



- By holding the conrod with a conrod stopper, remove the clutch spring set bolts in a criss-cross manner.

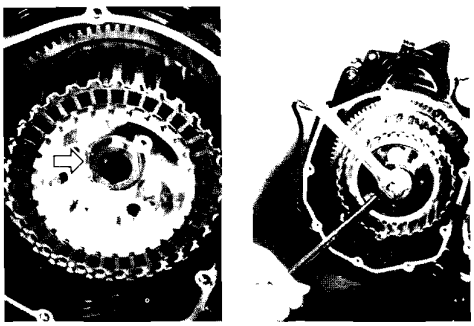
09910-20116: Conrod stopper

- After removal of pressure plate, remove the thrust washer ①, bearing ② and clutch push piece ③, and draw out the clutch push rods, ④ and ⑤.

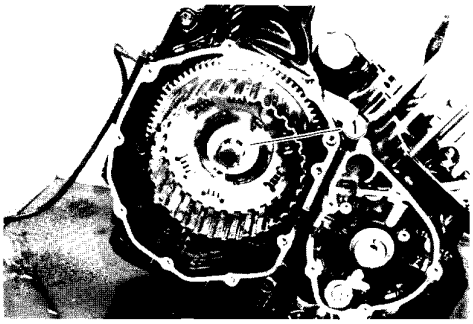


- Flatten the clutch sleeve hub nut lock washer by using chisel.
- Firmly secure clutch sleeve hub to remove mounting nut with a clutch sleeve hub holder, and then remove the several clutch drive and driven plates along with the clutch sleeve hub.

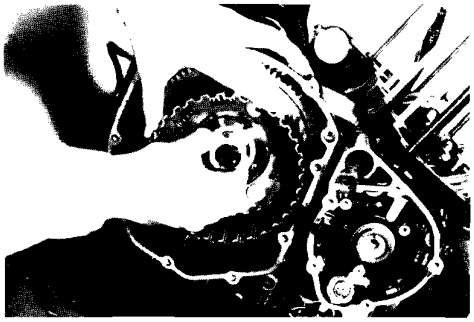
09920-53722: Clutch sleeve hub holder



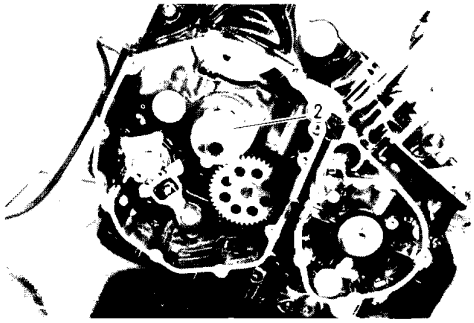
- Remove the thrust washer ①.



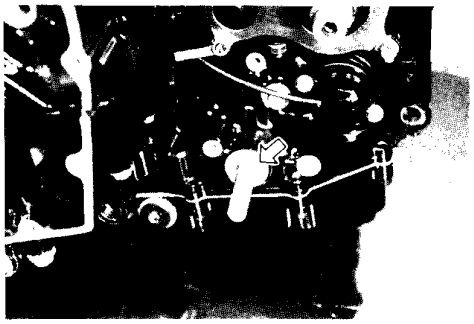
- With the spacer removed, the primary driven gear (integral with the clutch housing) is free to disengage from the primary drive gear.
- Remove the primary driven gear assembly with the generator/oil pump drive gears.



- Remove the thrust washer ②.



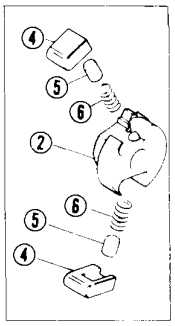
- Remove the clip and washer from the gearshift shaft.

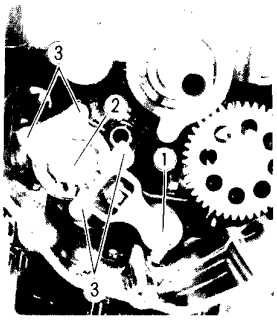


- Draw out the gearshift shaft ①, and then remove the cam driven gear ② by removing the screws ③.

09900-09003: Impact driver set

NOTE:
When removing the cam driven gear, do not lose gear shifting pawl ④, pin ⑤ and spring ⑥.

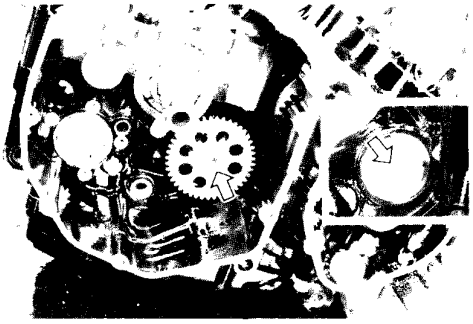




- Remove the oil pump driven gear by removing the circlip.

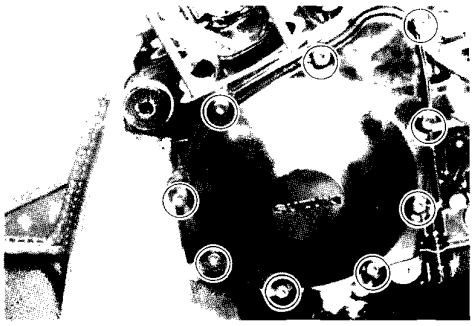
09900-06107: Snap ring pliers

NOTE:
Do not lose the circlip, pin and washers.

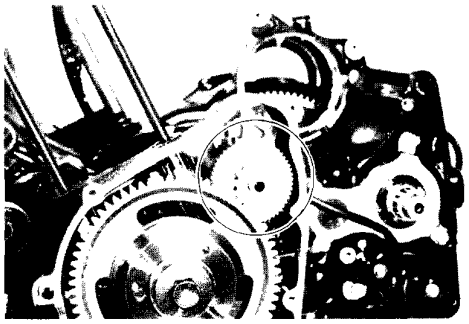


- Remove the starter clutch cover by removing the bolts.

09911-73730: 5 mm "T" type hexagon wrench



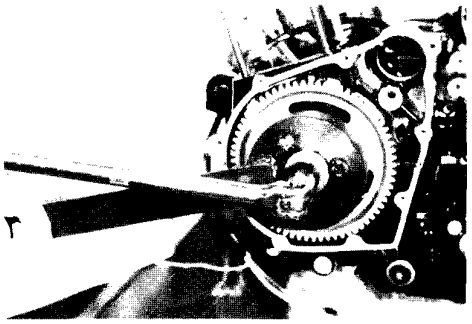
- Remove the starter idle gear and its shaft.



- Loosen the starter clutch mounting bolt by using the special tool.

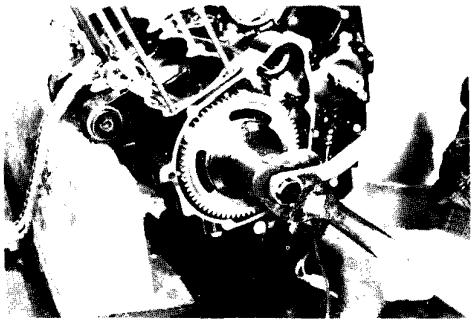
09920-34810: Starter clutch holder

NOTE:
When removing the starter clutch assembly from the crankshaft, do not remove the starter clutch mounting bolt after loosening the bolt. The starter clutch mounting bolt is used in conjunction with the special tool.



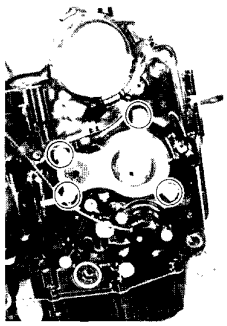
- Remove the starter clutch assembly from the crankshaft by using the special tool.

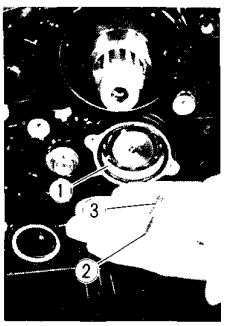
09930-33720: Rotor remover



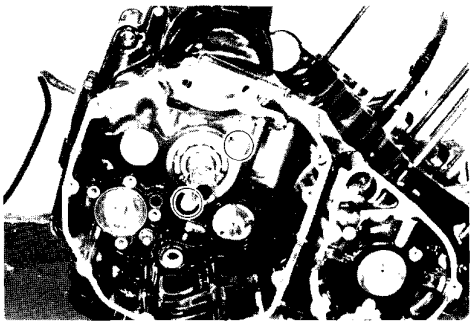
- Flatten the lock portion of the oil seal retainer and remove it by removing the four bolts.
- Remove the neutral position indicator switch by removing the screws.

NOTE:
Do not lose the O-ring ①, switch contact ② and its spring ③.



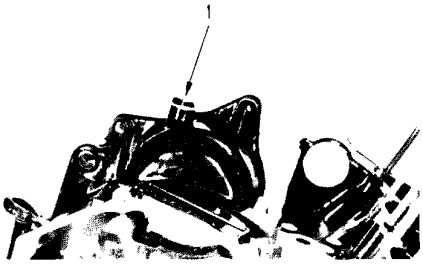


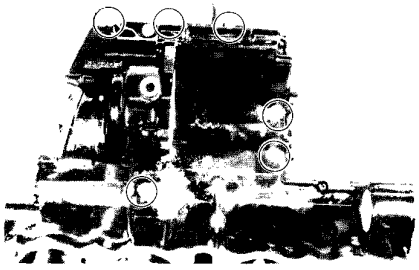
- Remove the countershaft bearing retainer by removing the two screws.

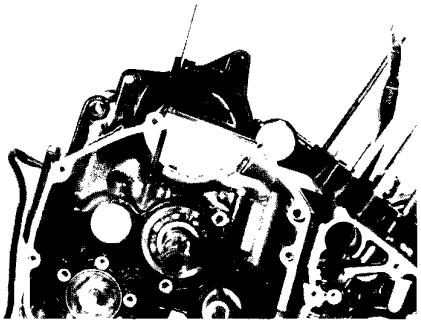


- Remove the plug ① on the upper crankcase.
- Remove the upper crankcase securing bolts and nut.

09911-73730: 5 mm "T" type hexagon wrench

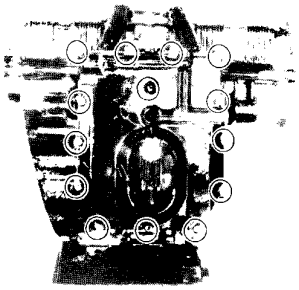




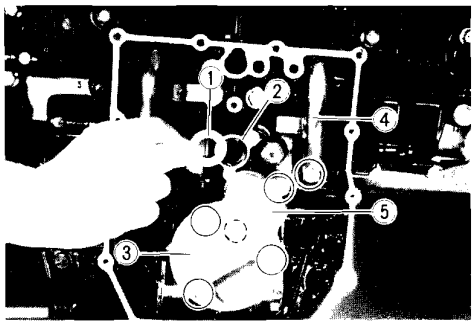


- Remove the oil pan by removing the bolts.

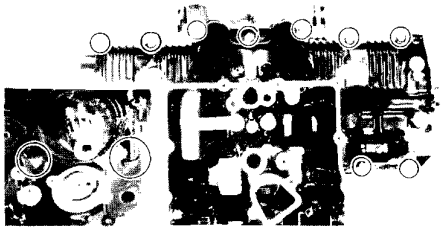
09911-73730: 5 mm "T" type hexagon wrench



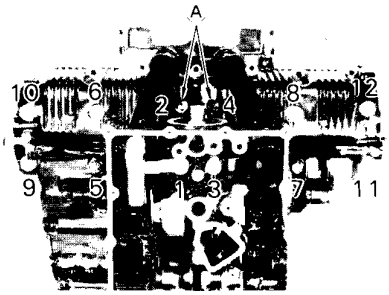
- Remove the shim ① and O-ring ②.
- Remove the oil sump filter ③ by removing the three bolts.
- Remove the left oil pipe ④ by removing the bolt.
- Remove the oil sump filter guide ⑤ by removing the two bolts.



- Remove the lower crankcase securing bolts and nut.



- When removing the crankshaft tightening bolts, loosen them in the descending order of numbers assigned to these bolts.

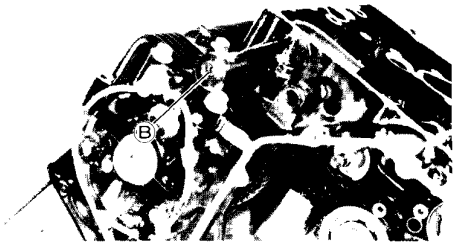


NOTE:

* *Two allen bolts are used for tightening crankshaft at the portion Ⓐ.*
* *Before removing the crankshaft tightening bolts, remove the main oil gallery plug Ⓑ.*
* *When installing the main oil gallery plug Ⓑ, replace the O-ring with new one and tighten it to the specified torque.*

09914-25811: 6 mm "T" type hexagon wrench

09900-00401: "L" type hexagon wrench set

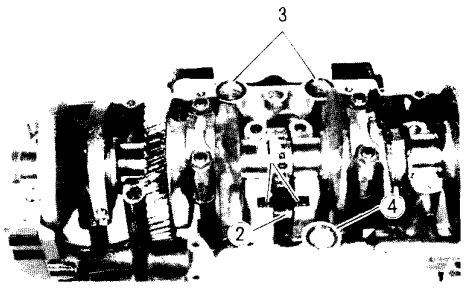


Tightening torque
Main oil gallery plug Ⓑ: 35 – 45 N·m
(3.5 – 4.5 kg-m, 25.5 – 32.5 lb-ft)

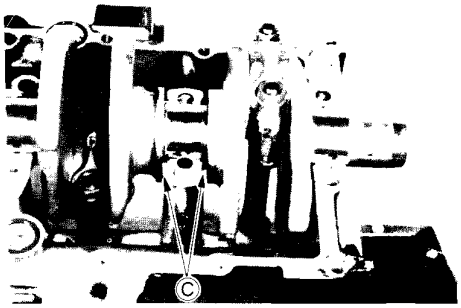
- Make sure that all bolts are removed without fail. Hammer lightly the lower crankcase side with a plastic hammer to separate the upper and lower crankcase halves and then lift the latter.

CAUTION:
Do not drop the crankshaft journal bearings from the lower crankcase.

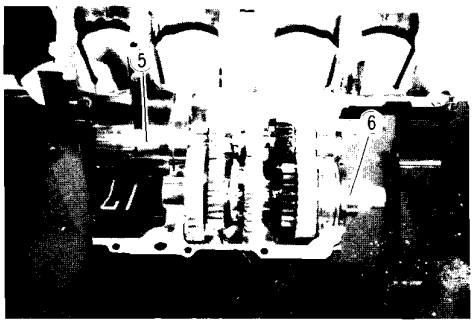
- Remove the crankshaft assembly from the upper crankcase.
- Pull out the two dampers ① and cam chain guide ②.
- Remove the O-rings, ③ and ④.



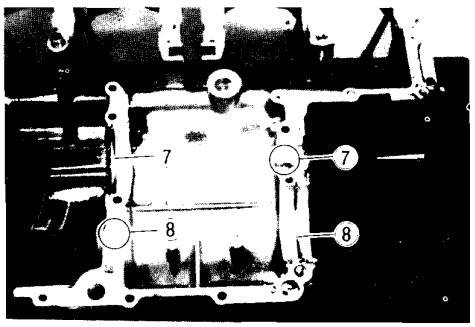
NOTE:
Bear in mind that the crankshaft thrust bearings Ⓒ are located between shaft and case.



- Remove the countershaft assembly ⑤ and driveshaft assembly ⑥.

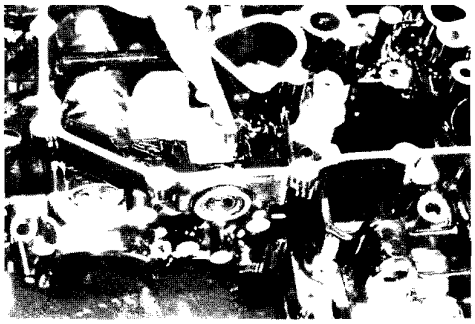


NOTE:
Do not lose the C-rings ⑦ and bearing pins ⑧.

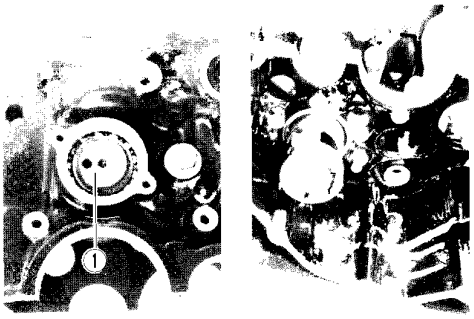


- Hold the gearshift forks by hand to draw out the gearshift fork shaft from the lower crankcase.

- Unhook the gearshift cam stopper spring from the lower crankcase.



- Remove the circlip ① from the gearshift cam, and then draw out the gearshift cam from the other side.

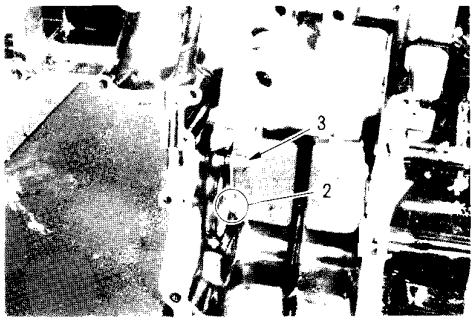


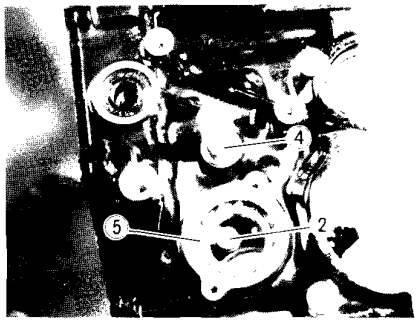
- Remove the gearshift cam stopper ② by removing the circlip ③.

09900-06107: Snap ring pliers

NOTE:

* *When replacing the gearshift cam stopper bolt ④, apply a small quantity of THREAD LOCK "1342" to the bolt.*
* *Rotate the bearing ⑤ by hand to inspect for abnormal noise and smooth rotation. Replace the bearing if there is anything unusual.*

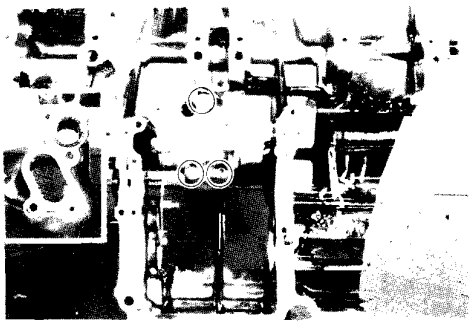




- Remove the oil pump by removing the mounting bolts.

09900-00401: "L" type hexagon wrench set

- Remove the O-rings and dowel pins.

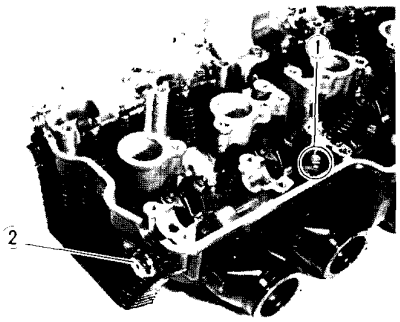


ENGINE COMPONENTS INSPECTION AND SERVICING

CYLINDER HEAD SERVICING

CAUTION:
Be sure to identify each removed part as to its location, and lay the parts out in groups designated as "No. 1", "No. 2", "Exhaust", "Inlet", so that each will be restored to the original location during assembly.

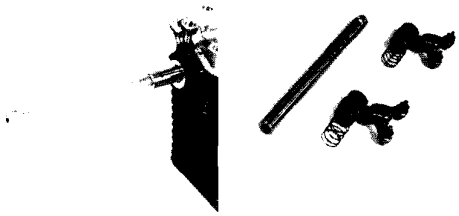
NOTE:
* *When removing rocker arm shaft, remove the rocker arm shaft set bolt ① and plug ②, and screw 8 mm bolt into the rocker arm shaft end and pull it out.*
* *Tighten the set bolt ① and plug ② to the specified torque.*
* *Removal of valves completes ordinary disassembling work. If valve guides have to be removed for replacement after inspecting related parts, carry out the steps shown in valve guide servicing.*



Tightening torque

Set bolt ①: 8 – 12 N·m (0.8 – 1.2 kg-m, 6.0 – 8.5 lb-ft)

Plug ② : 25 – 30 N·m (2.5 – 3.0 kg-m, 18.0 – 21.5 lb-ft)

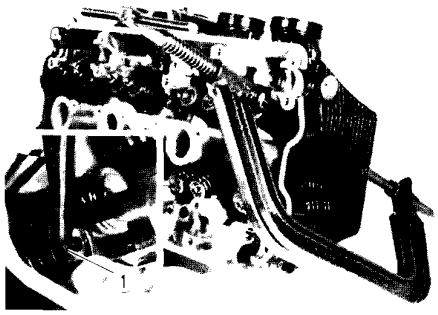


- Using special tools, compress the valve springs and take off the two cotter halves ① from valve stem.

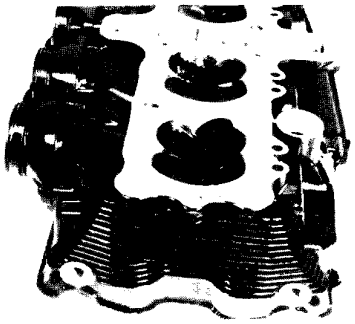
09916-14510: Valve lifter

09916-14910: Valve lifter attachment

09916-84510: Tweezers



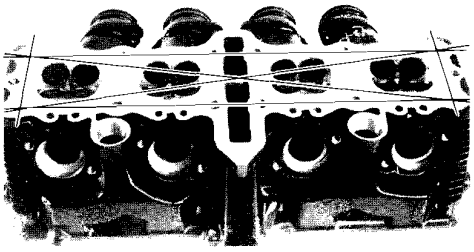
- Take out the spring retainer, inner and outer springs.
- Pull out the valve from the other side.



CYLINDER HEAD DISTORTION

Decarbonize the combustion chambers.
Check the gasketed surface of the cylinder head for distortion with a straightedge and thickness gauge, taking a clearance reading at several places indicated. If the largest reading at any position of the straightedge exceeds the limit, replace the cylinder head.

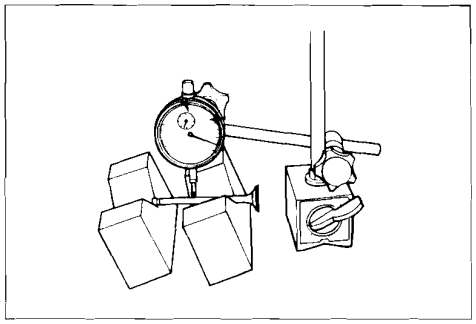
09900-20803: Thickness gauge
Service Limit : 0.2 mm (0.008 in)



VALVE STEM RUNOUT

Support the valve with "V" blocks, as shown, and check it runout with a dial gauge.
The valve must be replaced if the runout exceeds the limit.

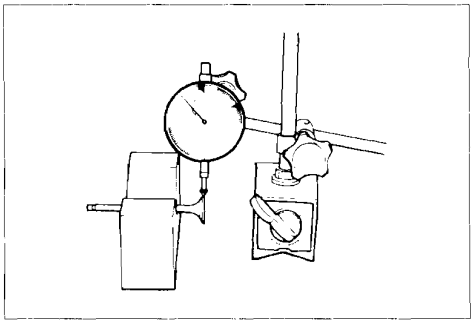
Service Limit: 0.05 mm (0.002 in)



VALVE HEAD RADIAL RUNOUT

Place the dial gauge at right angles to the valve head face, and measure the valve head radial runout.
If it measures more than the limit, replace the valve.

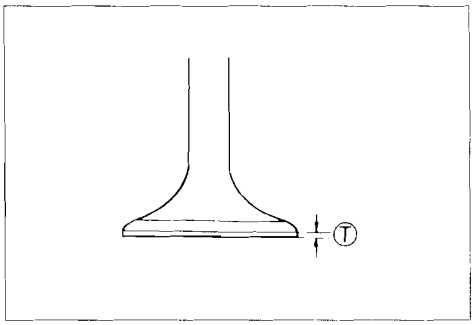
Service Limit: 0.03 mm (0.001 in)



VALVE FACE WEAR

Visually inspect each valve for wear of its seating face. Replace any valve with an abnormally worn face.
The thickness Ⓣ decreases as the wear of the face advances. Measure the thickness and , if the thickness is found to have been reduced to the limit, replace it.

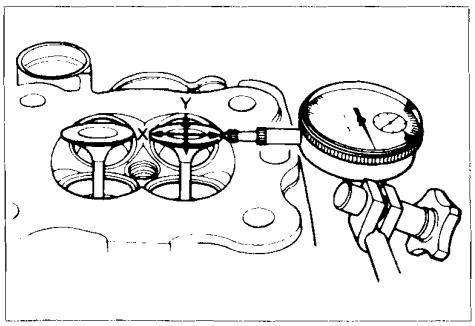
Service Limit Ⓣ: 0.5 mm (0.02 in)



VALVE GUIDE-VALVE STEM CLEARANCE

Measure the clearance in two directions, "X" and "Y", perpendicular to each other, by positioning the dial gauge as shown.
If the clearance measured exceeds the limit, (see below) then determine whether the valve or the guide should be replaced to reduce the clearance to the standard range:

Service Limit
Intake valves : 0.35 mm (0.014 in)
Exhaust valves: 0.35 mm (0.014 in)



VALVE STEM WEAR

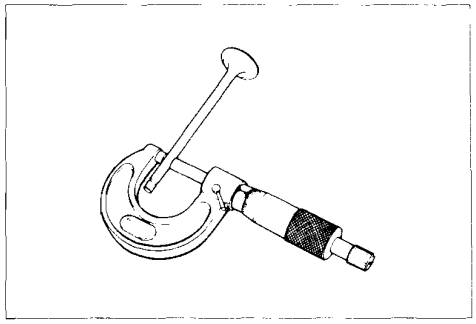
If the valve stem is worn down to the limit, as measured with a micrometer, where the clearance is found to be in excess of the limit indicated, replace the valve; if the stem is within the limit, then replace the guide. After replacing valve or guide, be sure to recheck the clearance.

09900-20205: Micrometer (0 – 25 mm)

Standard

Intake valves : 4.965 – 4.980 mm (0.1955 – 0.1961 in)

Exhaust valves: 4.945 – 4.960 mm (0.1947 – 0.1953 in)



VALVE GUIDE SERVICING

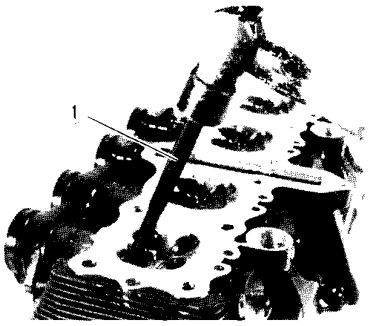
- Using the valve guide remover ①, drive the valve guide out toward intake or exhaust camshaft side.

09916-44310: Valve guide remover/installer

NOTE:

** Discard the removed valve guide subassemblies.*

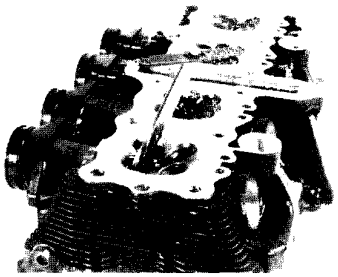
** Only oversized valve guides are available as replacement parts. (Part No. 11116-06B70)*



- Re-finish the valve guide holes in cylinder head with the reamer and handle.

09916-34580: Valve guide reamer

09916-34541: Reamer handle

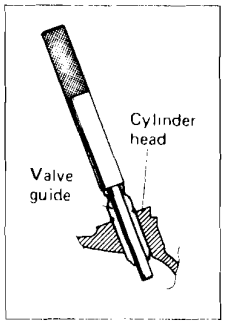


- Fit a ring to each valve guide. Be sure to use new rings and valve guides. Rings and valve guides removed in disassembly must be discarded.
- Oil the stem hole, too, of each valve guide and drive the guide into the guide hole with the valve guide installer.

09916-44310: Valve guide remover/installer

CAUTION:

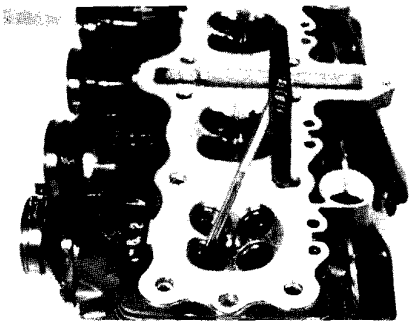
Failure to oil the valve guide hole before driving the new guide into place many result in a damaged guide or head.



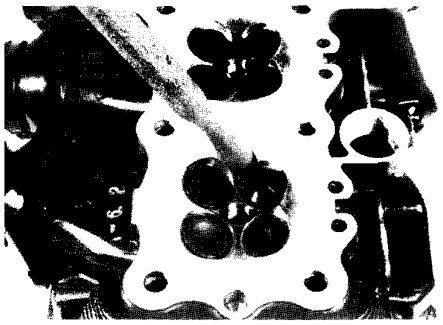
- After fitting the valve guides, re-finish their guiding bores with the reamer. Be sure to clean and oil the guides after reaming.

09916-34570: Valve guide reamer

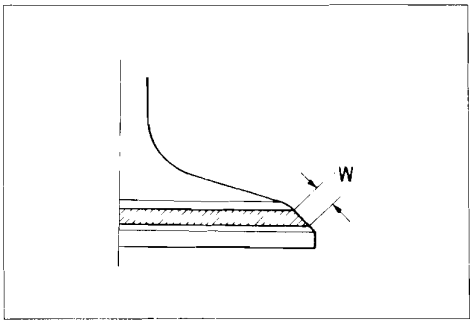
09916-34541: Reamer handle



VALVE AND SEAT CONDITION VALVE SEAT WIDTH



- Coat the valve seat with Prussian blue uniformly. Fit the valve and tap the coated seat with the valve face in a rotating manner, in order to obtain a clear impression of the seating contact. In this operation, use the valve lapper to hold the valve head.
- The ring-like dye impression left on the valve face must be continuous-without any break. In addition, the width of the dye ring, which is the visualized seat "width", must be within the following specification:

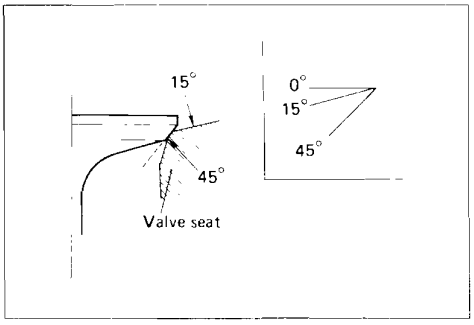


Standard
Valve seat width Ⓦ: 0.9 – 1.1 mm (0.035 – 0.043 in)

If either requirement is not met, correct the seat by servicing it as follows:

VALVE SEAT SERVICING

The valve seats for both intake and exhaust valves are machined to two different angles. The seat contact surface is cut 45° and the area above the contact surface (closest to the combustion chamber) is cut to 15°.



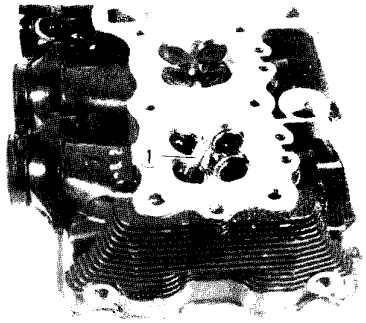
	Intake side	Exhaust side
45°	N-116 or 122	N-116 or 122
15°	N-116 or 121	N-120 or 121

Valve seat cutter: (N-116, 120, 121 and 122)
Solid pilot : (N-100-5.0)

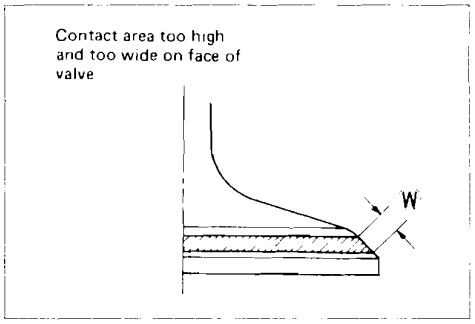
NOTE:
The valve seat contact area must be inspected after each cut.

- Insert the solid pilot ① with a slight rotation. Seat the pilot snugly. Install the 45° cutter, attachment and T handle.
- Using the 45° cutter, descale and clean up the seat with one or two turns.
- Inspect the seat by the previously described seat width measurement procedure. If the seat is pitted or burned, additional seat conditioning with the 45° cutter is required.

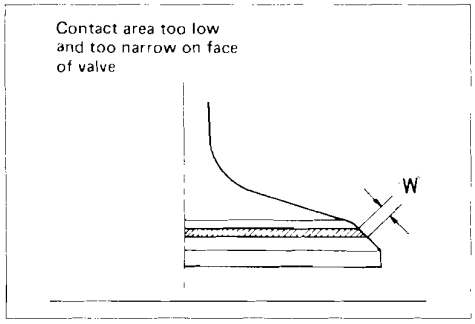
NOTE:
Cut only the minimum amount necessary from the seat to prevent the possibility of the valve stem becoming too close to the rocker arm for correct valve contact angle.



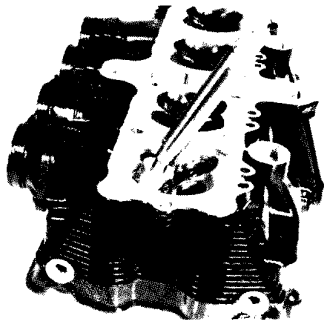
If the contact area is too high on the valve, or if it is too wide, use the 15° cutter to lower and narrow the contact area.



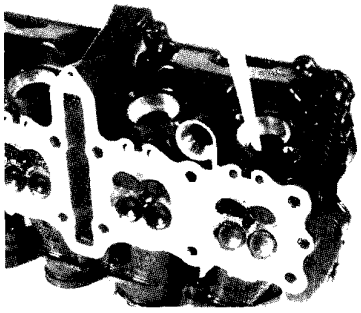
If the contact area is too low or too narrow, use the 45° cutter to raise and widen the contact area.



- After the desired seat position and width is achieved, use the 45° cutter very lightly to clean up any burrs caused by the previous cutting operations. DO NOT use lapping compound after the final cut is made. The finished valve seat should have a velvety smooth finish and not a highly polished or shiny finish. This will provide a soft surface for the final seating of the valve which will occur during the first few seconds of engine operation.



- Clean and assemble the head and valve components. Fill the intake and exhaust ports with gasoline to check for leaks. If any leaks occur, inspect the valve seat and face for burrs or other things that could prevent the valve from sealing.



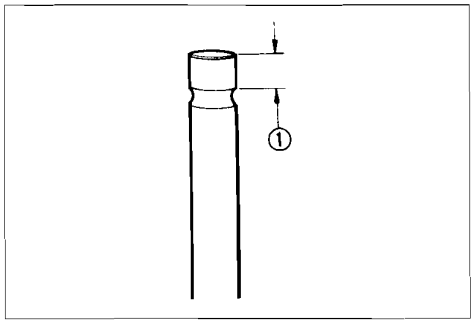
WARNING:
Always use extreme caution when handling gasoline.

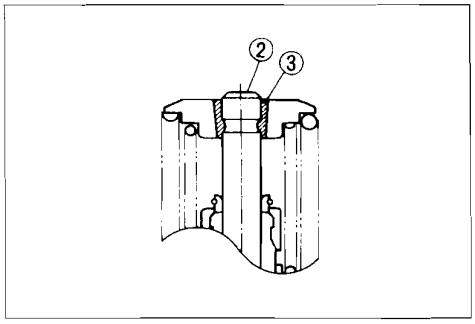
NOTE:
After servicing the valve seats, be sure to adjust the valve clearance after the cylinder head has been reinstalled. (see page 2-6)

VALVE STEM END CONDITION

CAUTION:

* Refacing valve stem end face is permissible where the length ① will not be reduced to less than 2.5 mm. If this length becomes shorter than 2.5 mm, then the valve must be replaced.
* After installing the valve whose stem end has been ground off as above, check that the face ② of valve stem end is above the valve cotter ③.





VALVE SPRINGS

The force of the two coil springs keeps the valve seat tight. Weakened springs result in reduced engine power output, and often account for the chattering noise coming from the valve mechanism.

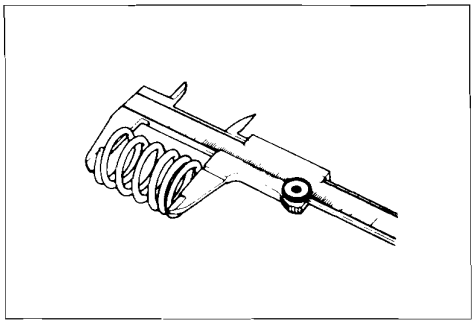
Check the valve springs for proper strength by measuring their free lengths and also by the force required to compress them. If the spring length is less than the service limit, or if the force required to compress the spring does not fall within the range specified, replace both the inner and outer springs as a set.

CAUTION:

Replace both the valve springs, inner and outer, at a time, if any one of these is found to be beyond the limit.

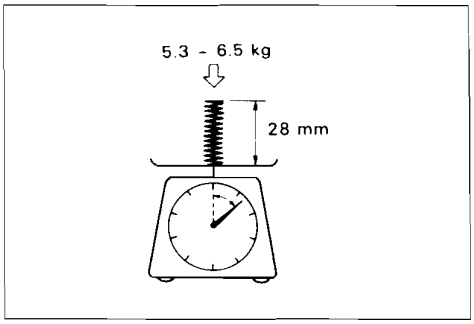
Valve spring free length

Service Limit	INNER : 35.0 mm (1.38 in)
	OUTER: 37.8 mm (1.49 in)

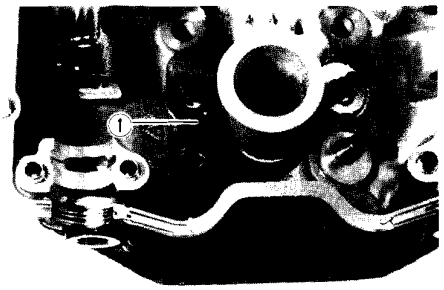


Valve spring tension

Standard	INNER : 5.3 – 6.5 kg/28 mm (11.7 – 14.3 lbs/1.10 in)
	OUTER: 13.1 – 15.1 kg/31.5 mm (28.9 – 33.3 lbs/1.24 in)



REASSEMBLY

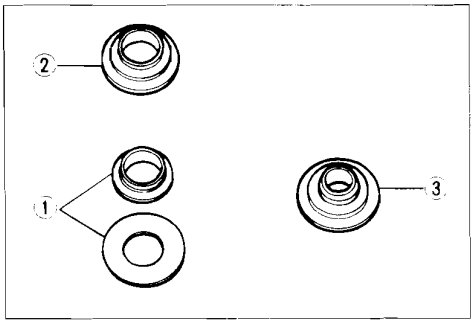


- Oil each oil seal, and press-fit them into position with the finger tip.

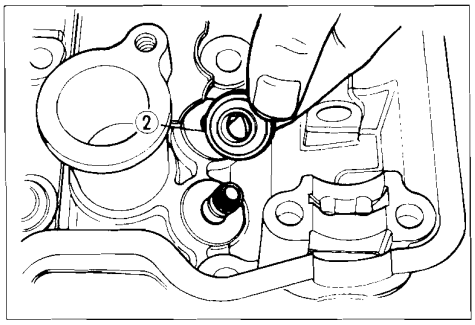
CAUTION:
Do not reuse the oil seals.

NOTE:
Be sure to restore the plate ① on the cylinder head of exhaust side.

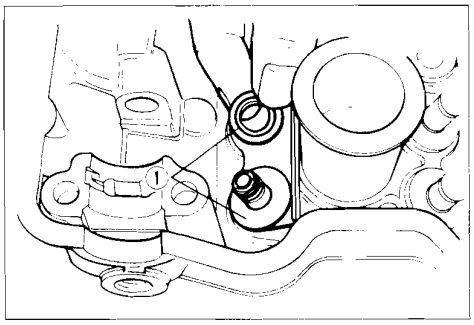
- Install the valve spring lowr seats, ① (for exhaust) and ② (for intake). Be careful not to confuse the lower seat with the spring retainer ③.



For Intake side



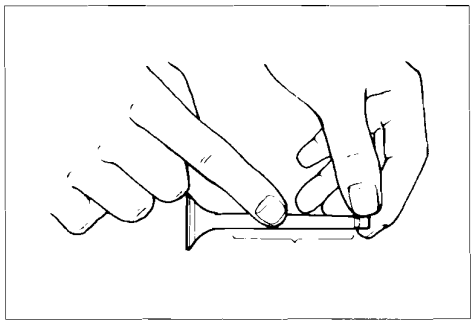
For Exhaust side



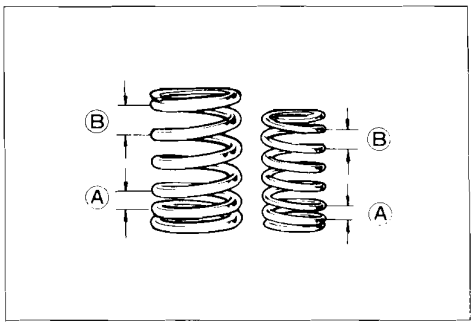
- Insert the valves, with their stems coated with high quality molybdenum disulfide lubricant (SUZUKI MOLY PASTE) all around and along the full stem length without any break.

CAUTION:
When inserting each valve, take care not to damage the lip of the stem seal.

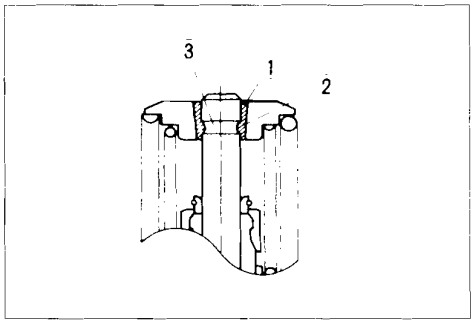
99000-25140: SUZUKI Moly Paste



- Install the valve springs with the small-pitch portion Ⓐ facing cylinder head. Ⓑ Large-pitch portion.

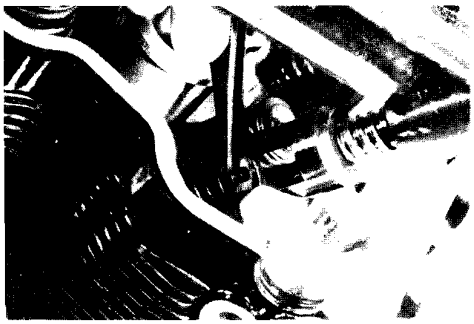


- Put on the valve spring retainer and, using the valve lifter, press down the springs, fit the cotter halves to the stem end, and release the lifter to allow the cotter ① to wedge in between retainer and stem. Be sure that the rounded lip ② of the cotter fits snugly into the groove ③ in the stem end.



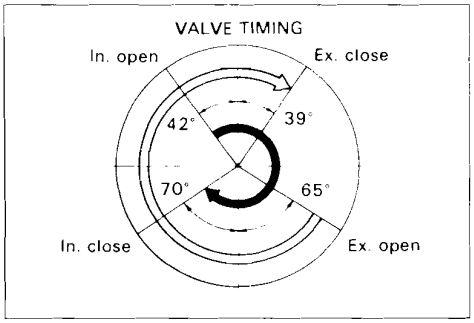
09916-14510: Valve lifter
09916-14910: Valve lifter attachment
09916-84510: Tweezers

CAUTION:
Be sure to restore each spring and valve to their original positions.

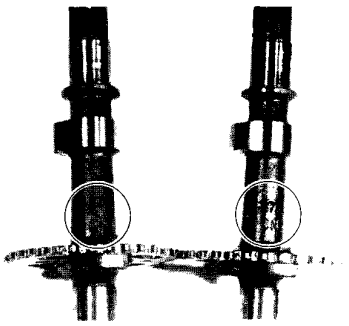


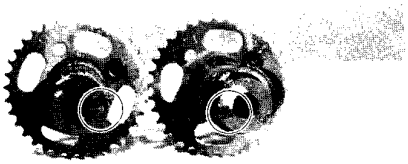
CAMSHAFT

Both camshafts should be checked for runout and also for wear of cams and journals if the engine has been noted as giving abnormal noise or vibration or lack power output. Any of these conditions may be caused by camshafts worn down or distorted to the service limit.



The exhaust camshaft can be distinguished from that of the intake by the embossed letters "EX" (for exhaust) as against letters "IN" (for intake).
Similarly, the right end can be distinguished by the notch from the left end.

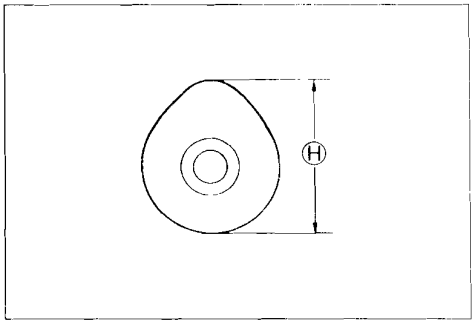




CAM WEAR

Worn-down cams are often the cause of mistimed valve operation resulting in reduced power output.
The limit of cam wear is specified for both intake and exhaust cams in terms of cam height Ⓗ, which is to be measured with a micrometer. Replace camshafts if found worn down to the limit. (Continued on next page.)

09900-20202: Micrometer (25 – 50 mm)

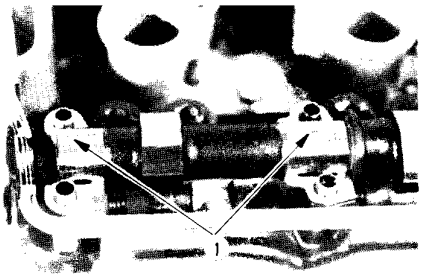


Cam height Ⓗ

Service Limit **Intake cams : 33.580 mm (1.3220 in)**
Exhaust cams: 33.240 mm (1.3087 in)

CAMSHAFT JOURNAL WEAR

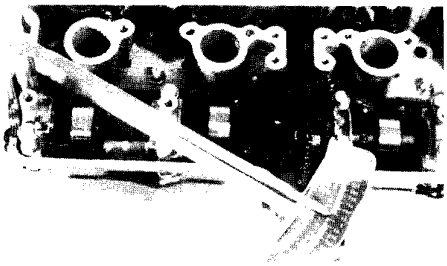
Determine whether or not each journal is worn down to the limit by measuring the oil clearance with the camshaft installed in place. Use plastigauge ① to read the clearance at the widest portion, which is specified as follows:



Camshaft-Journal oil clearance (IN & EX)

Service Limit: 0.150 mm (0.0059 in)
09900-22301: Plastigauge (Not available in U.S.A.)

NOTE:
Install each holder to their original positions. (page 3 - 62)

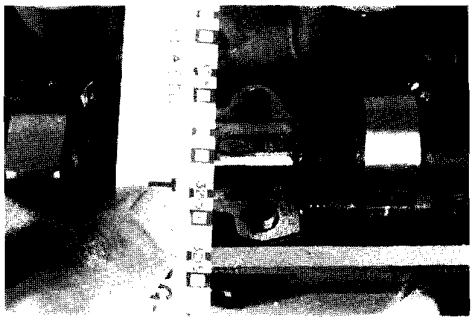


Tighten the camshaft holder bolts evenly and diagonally to the specified torque.

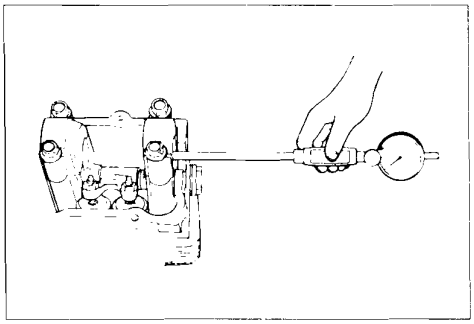
Tightening torque: 8 - 12 N·m
(0.8 - 1.2 kg-m, 6.0 - 8.5 lb-ft)

NOTE:
Do not rotate the camshafts with plastigauge inplace.

Remove the camshaft holders, and read the width of compressed plastigauge with envelope scale. This measurement should be taken at the widest part.



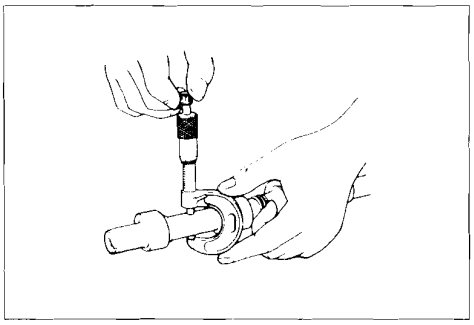
If the camshaft journal oil clearance measured exceed the limit, measure the inside diameter of camshaft journal holder and outside diameter of the camshaft journal. Replace the camshaft or cylinder head depending on which one exceeds the specification.



Standard
Journal holder I.D. (IN & EX): 22.012 - 22.025 mm
(0.8666 - 0.8671 in)

09900-20205: Micrometer (0 – 25 mm)

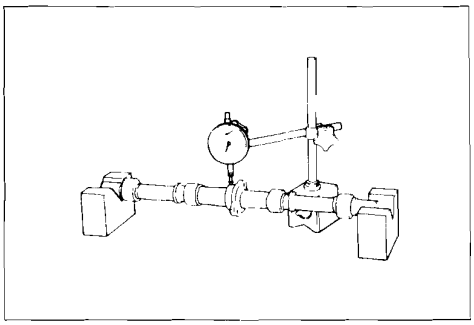
Standard
Camshaft journal O.D. (IN & EX): 21.959 – 21.980 mm (0.8645 – 0.8654 in)



CAMSHAFT RUNOUT

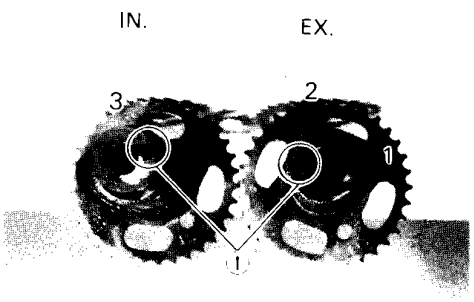
Measure the runout with a dial gauge. Replace the camshaft if the runout exceeds the limit.

Camshaft runout (IN & EX)
Service Limit: 0.1 mm (0.004 in)



CAM SPROCKET

It is very important that each sprocket be positioned angularly on its camshaft as illustrated. Its correct position is determined by arrow mark "3" (on INTAKE sprocket) or arrow marks "1" and "2" (on EXHAUST sprocket) located (as shown) in reference to the notch ① in the camshaft right end.

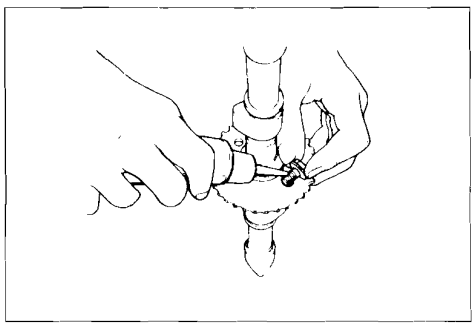


REASSEMBLY

- Apply THREAD LOCK SUPER "1303" to the threads of cam sprocket bolts, and tighten them to the following torque value:

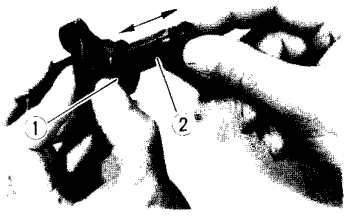
99000-32030: Thread lock super "1303"

Tightening torque: 24 – 26 N·m (2.4 – 2.6 kg-m, 17.5 – 19.0 lb-ft)



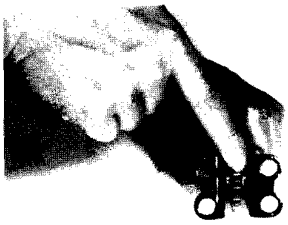
CAM CHAIN TENSIONER

The cam chain tensioner is maintained at the proper tension by an automatically adjusted tensioner.
Unlock the rachet mechanism ①, and move the push rod ② in place to see if it slides smoothly. If any stickiness is noted or rachet mechanism is faulty, replace the cam chain tensioner assembly with a new one.



CAM CHAIN IDLER

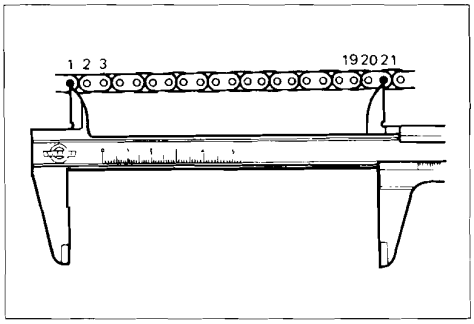
Rotate the sprocket by hand to inspect for an abnormal noise and a smooth rotation. If defect is found, replace the cam chain idler assembly with a new one.



CAM CHAIN 20-PITCH LENGTH

Pull the chain tight to remove any slack, then using vernire calipers, measure the 20-pitch length of cam chain. If it measures more than the limit, replace the cam chain.

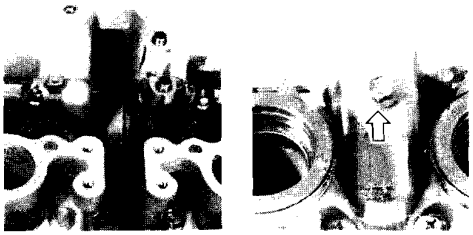
Srvice Limit: 158.0 mm (6.22 in)



CAM CHAIN GUIDE

NOTE:
When replacing the cam chain guide, apply SUZUKI Thread lock "1333B" to threads of bolt.

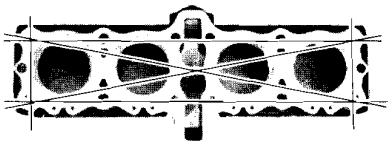
99000-32020: Thread lock super "1333B"



CYLINDER DISTORTION

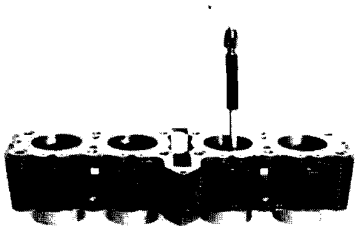
Check the gasketed surface of the cylinder for distortion with a straightedge and thickness gauge, taking a clearance reading at several places as indicated. If the largest reading at any position of the straightedge exceeds the limit, replace the cylinder.

Cylinder distortion specification
Service Limit: 0.2 mm (0.008 in)



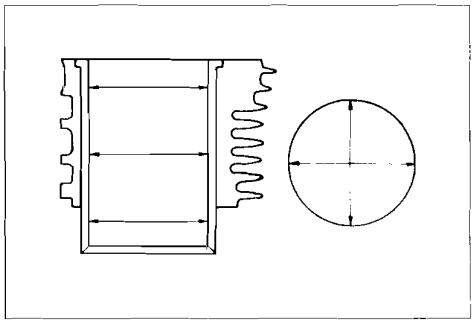
CYLINDER BORE

Measure the cylinder bore diameter at six places. If any one of the measurements exceeds the limit, overhaul the cylinder and replace the piston with an oversize, or replace the cylinder. Once the remaining cylinders must be also rebored accordingly. Otherwise, the imbalance might cause excess vibration.



Cylinder bore
Service Limit : 78.080 mm (3.0740 in)

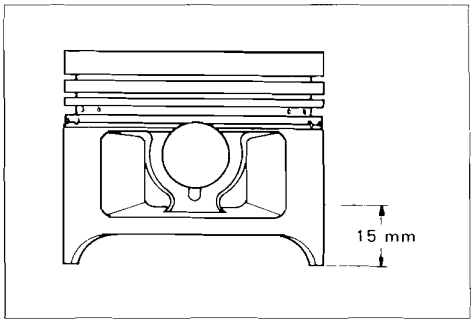
09900-20508: Cylinder gauge set



PISTON DIAMETER

Using a micrometer, measure the piston outside diameter at the place shown in Fig. If the measurement is less than the limit, replace the piston.

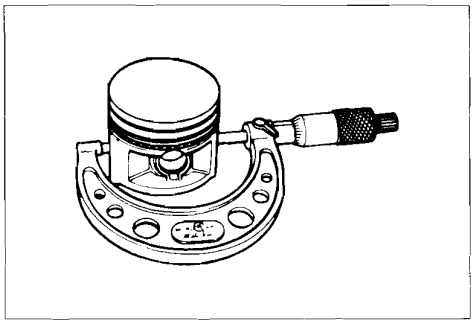
Service Limit : 77.880 mm (3.0661 in)
09900-20204: Micrometer (75 – 100 mm)



PISTON-CYLINDER CLEARANCE

As a result of the above measurement , if the piston clearance exceeds the following limit, overhaul the cylinder and use an oversize piston, or replace both cylinder and piston.

Service Limit : 0.12 mm (0.0047 in)
Piston oversize: 0.5, 1.0 mm

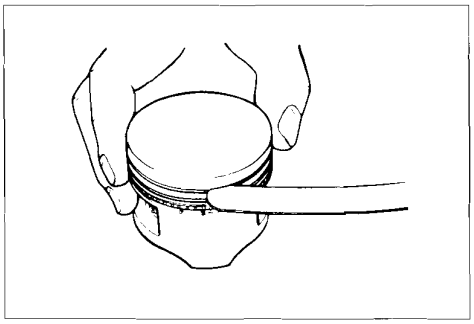


PISTON RING-GROOVE CLEARANCE

Using a thickness gauge, measure the side clearances of the 1st and 2nd rings. If any of the clearances exceeds the limit, replace both piston and piston rings.

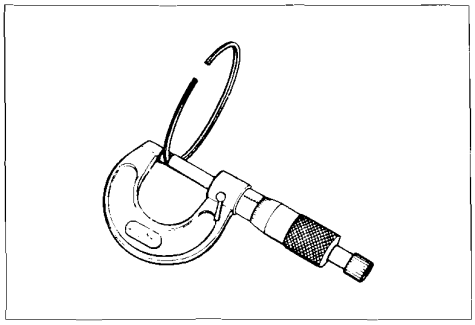
09900-20803: Thickness gauge

Pinston ring-groove clearance
Service Limit 1st : 0.18 mm (0.007 in)
2nd: 0.15 mm (0.006 in)



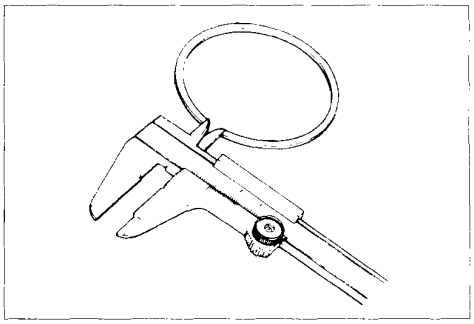
Pinston ring groove width
Standard 1st & 2nd: 1.01 – 1.03 mm (0.039 – 0.040 in)
Oil : 2.01 – 2.03 mm (0.079 – 0.080 in)

Pinston ring thickness
Standard
1st & 2nd: 0.97 – 0.99 mm (0.038 – 0.039 in)



PISTON RING FREE END GAP AND PISTON RING END GAP

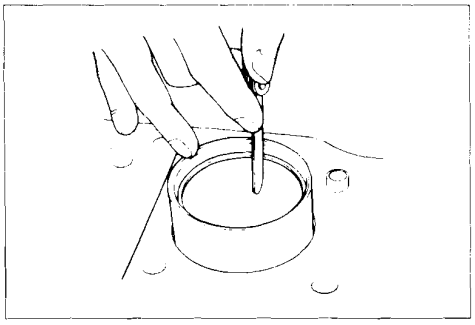
Before installing piston rings, measure the free end gap of each ring using vernier calipers. Next, fit the ring in the cylinder, and measure each ring end gap using a thickness gauge.
If any ring has an excess end gap, replace the ring.



Piston ring free end gap

Service Limit 1st : 8.0 mm (0.31 in)
2nd: 9.2 mm (0.36 in)

09900-20102: Vernier calipers



Piston ring end gap

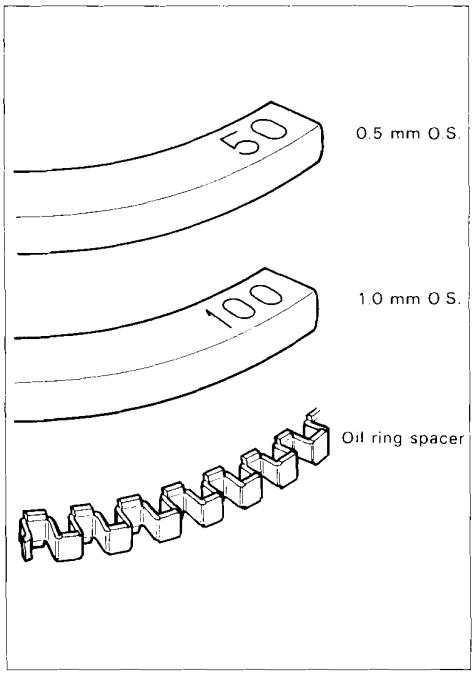
Service Limit 1st : 0.7 mm (0.03 in)
2nd: 1.0 mm (0.04 in)

09900-20803: Thickness gauge

Oversize piston ring

The following two types of oversize piston rings are used. They bear the following identification numbers.

	1st	2nd
0.5 mm	N50	2N50
1.0 mm	N100	2N100



Oversize oil ring

The following two types of oversize oil rings are available as optional parts. They bear the following identification marks.

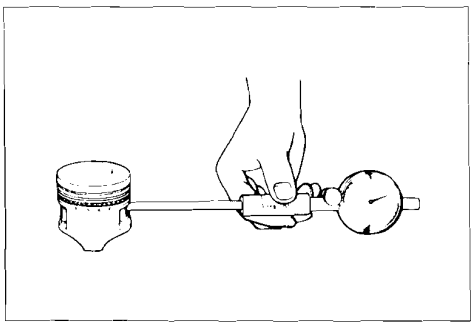
SIZE	COLOR
STD	Painted red
0.5 mm O.S.	Painted blue
1.0 mm O.S.	Painted yellow

Oversize side rail

Just measure out side diameter to identify the size.

PISTON PIN AND PIN BORE

Using a small bore gauge, measure the piston pin bore inside diameter, and using a micrometer, measure the piston pin outside diameter. If the difference between these two measurements is more than the limits, replace both piston and piston pin.

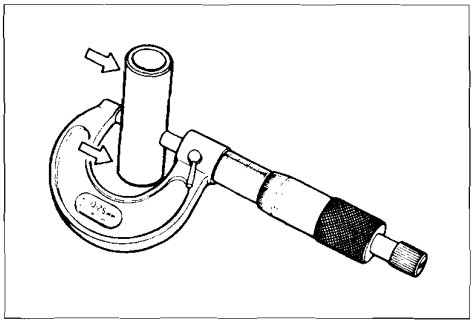


Piston pin bore I.D.
Service Limit: 20.030 mm (0.7886 in)

Using a micrometer, measure the piston pin outside diameter at three positions.

Piston pin O.D.
Service Limit: 19.980 mm (0.7866 in)

09900-20205: Micrometer (0 – 25 mm)

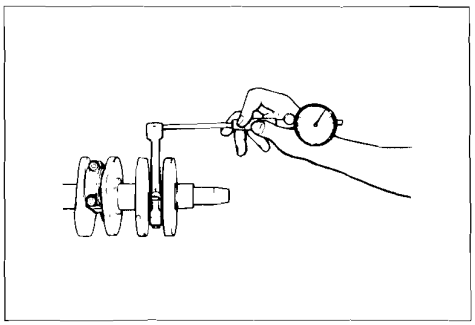


CONROD SMALL END I.D.

Using a small bore gauge, measure the conrod small end inside diameter.

Conrod small end I.D.
Service Limit: 20.040 mm (0.7890 in)

If the conrod small end inside diameter exceeds the above-mentioned limit, replace the conrod.

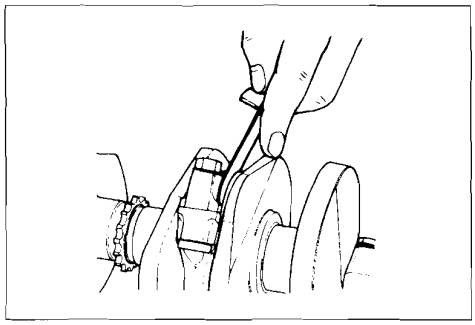


CONROD BIG END SIDE CLEARANCE

Check the conrod side clearance by using a thickness gauge. If the clearance exceeds the limit, replace conrod or crankshaft.

Service Limit: 0.3 mm (0.01 in)

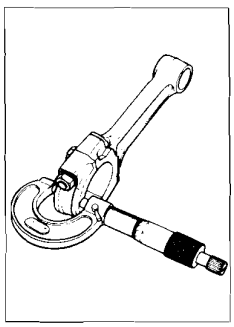
09900-20803: Thickness gauge

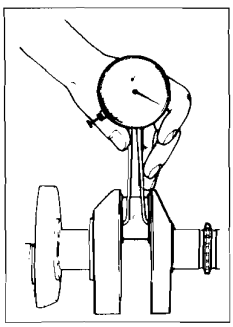


Standard
Big end width: 20.95 – 21.00 mm (0.825 – 0.827 in)

Standard
Crank pin width: 21.10 – 21.15 mm (0.831 – 0.833 in)

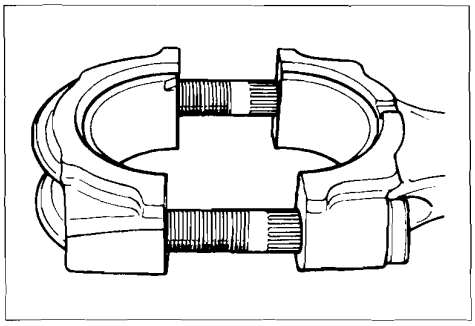
09900-20205: Micrometer (0 – 25 mm)
09900-20605: Dial calipers





CONROD-CRANK PIN BEARING SELECTION

- Loosen the bearing cap nuts, and tap the bolt end lightly with plastic hammer to remove bearing cap.
- Remove the rods, and mark them to identify the cylinder position.
- Inspect the bearing surfaces for any sign of fusion, pitting, burn, or flaws. If any, replace them with a specified set of bearings.

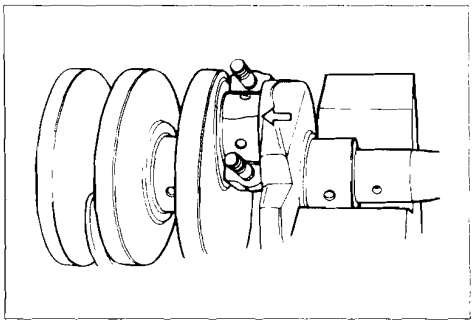


NOTE:
Never try to remove or loosen the conrod cap bolts due to their possible loosening in the rod. Once displaced, the bearing cap will not be fitted properly.

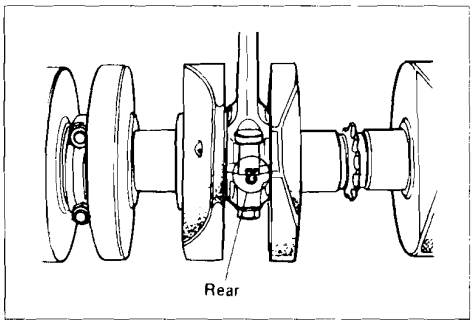
- Place plastigauge axially on the crank pin avoiding oil hole and at the TDC or BDC side as shown.
- Tighten the bearing cap with two-step torque values.

Initial tightening torque: 22 – 28 N·m
(2.2 – 2.8 kg-m, 16.0 – 20.0 lb-ft)
Final tightening torque: 49 – 53 N·m
(4.9 – 5.3 kg-m, 35.5 – 38.5 lb-ft)

09900-22301: Plastigauge (Not available in U.S.A.)

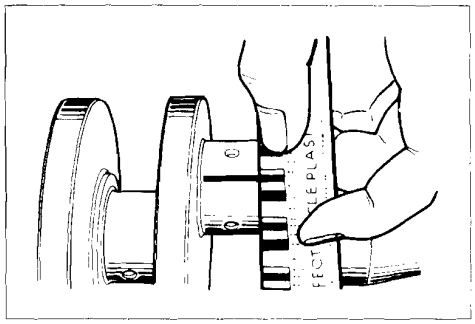


NOTE:
When fitting bearing cap to crank pin, be sure to discriminate one end from the other, namely front and rear.



NOTE:
Never rotate the crankshaft or conrod when a piece of Plastigauge is in the clearance.

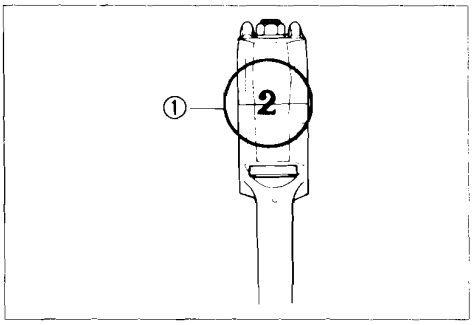
- Remove the caps, and measure the width of compressed plastigauge with envelope scale. This measurement should be taken at the widest part.



Crank pin bearing oil clearance

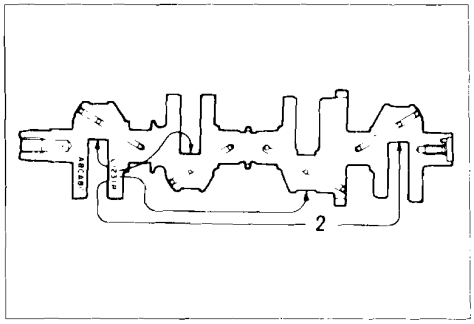
Standard: 0.032 – 0.056 mm (0.0013 – 0.0022 in)
Service Limit: 0.080 mm (0.0031 in)

- If oil clearance exceeds the service limit, select the specified bearings from the following table.
- Check the corresponding rod I.D. code number ①, "1" or "2".
- Check the corresponding crank pin O.D. code number ②, "1", "2" or "3".



Bearing selection table

		Crank pin O.D. ②		
	Code	1	2	3
Conrod I.D.①	1	Green	Black	Brown
	2	Black	Brown	Yellow

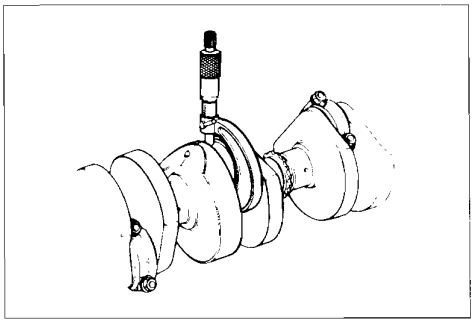


Conrod I.D. specification

Code	I.D. specification
1	41.000 – 41.008 mm (1.6142 – 1.6145 in)
2	41.008 – 41.016 mm (1.6145 – 1.6148 in)

Crank pin O.D. specification

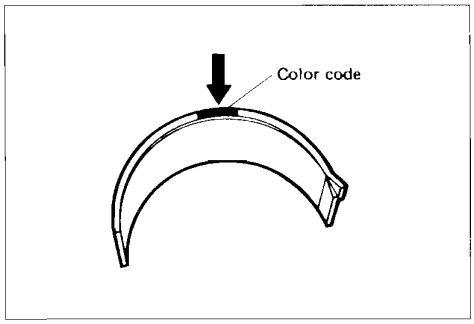
Code	O.D. specification
1	37.992 – 38.000 mm (1.4957 – 1.4961 in)
2	37.984 – 37.992 mm (1.4954 – 1.4957 in)
3	37.976 – 37.984 mm (1.4951 – 1.4954 in)



09900-20202: Micrometer (25 – 50 mm)

Bearing thickness

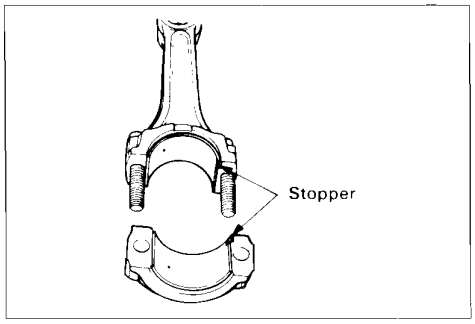
Color (Part No.)	Thickness
Green (12164-06B00-0A0)	1.480 – 1.484 mm (0.0583 – 0.0584 in)
Black (12164-06B00-0B0)	1.484 – 1.488 mm (0.0584 – 0.0586 in)
Brown (12164-06B00-0C0)	1.488 – 1.492 mm (0.0586 – 0.0587 in)
Yellow (12164-06B00-0D0)	1.492 – 1.496 mm (0.0587 – 0.0589 in)



CAUTION:
Bearing should be replace as a set.

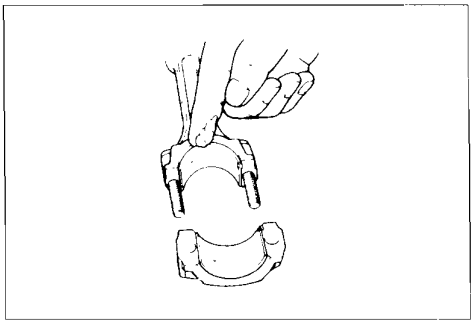
BEARING ASSEMBLY

- When fitting the bearings to the bearing cap and conrod, be sure to fix the stopper part first, and press the other end.

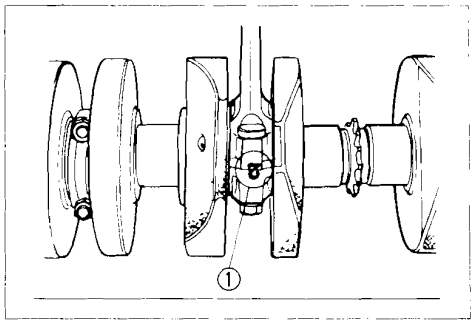


- Apply engine oil or SUZUKI Moly Paste to the crank pin and bearing surface.

99000-25140: SUZUKI Moly Paste



- When mounting the conrod on the crankshaft, make sure that numeral figure ① of the conrod faces rearward.
- Tighten the conrod fitting nuts with specified torque.

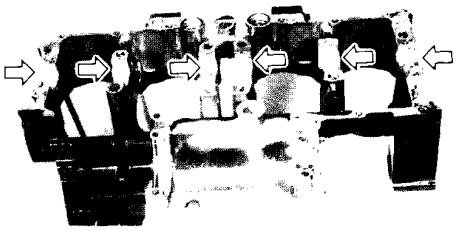


Tightening torque: 49 – 53 N·m
(4.9 – 5.3 kg-m, 35.5 – 38.5 lb-ft)

- Check the control for smooth turning.

CRANKCASE-CRANKSHAFT BEARING SELECTION

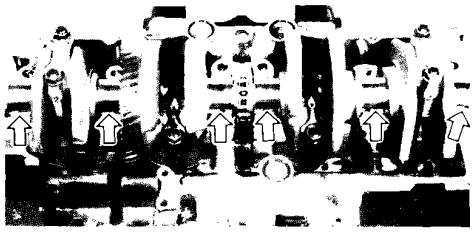
- Inspect each bearing of upper and lower crankcases for any damage.



- Place plastigauge on each crankshaft journal in the usual manner.

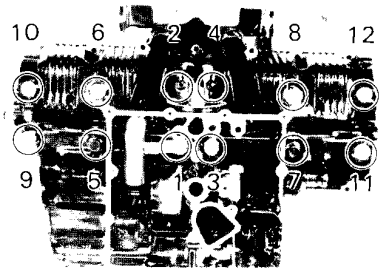
09900-22301: Plastigauge (Not available in U.S.A.)

NOTE:
Do not place the plastigauge on the oil hole, and do not rotate the shaft when plastigauge is in place.



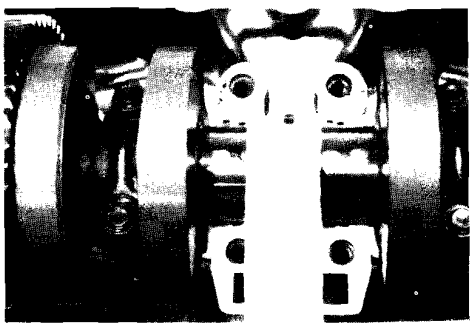
- Mate the lower crankcase with the upper crankcase, and tighten the crankshaft tightening bolts with specified torque value in the indicated order.

Tightening torque	Initial Tightening	Final Tightening
8 mm bolt	13 N·m (1.3 kg-m, 9.5 lb-ft)	20 – 24 N·m (2.0 – 2.4 kg-m, 14.5 – 17.5 lb-ft)



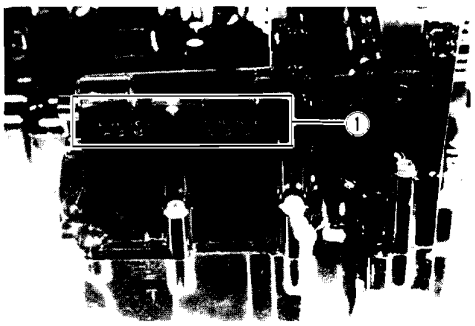
- Remove the lower crankcase, and measure the width of compressed plastigauge in the usual manner.

Crank journal bearing oil clearance
Standard: 0.020 – 0.044 mm (0.0008 – 0.0017 in)
Service Limit: 0.08 mm (0.0031 in)



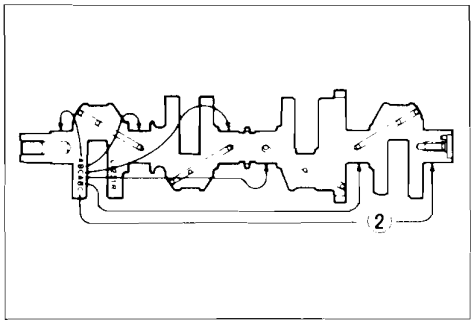
- If the width at the widest part exceeds the limit, replace the set of bearings with new ones by referring to the selection table.

- Check the corresponding crankcase journal I.D. code number ①, "A" or "B" which are stamped on the rear of upper crankcase.
- Check the corresponding crankshaft journal O.D. code number ②, "A", "B" or "C".



Bearing selection table

		Crankshaft O.D. ②		
	Code	A	B	C
Crankcase I.D.①	A	Green	Black	Brown
	B	Black	Brown	Yellow



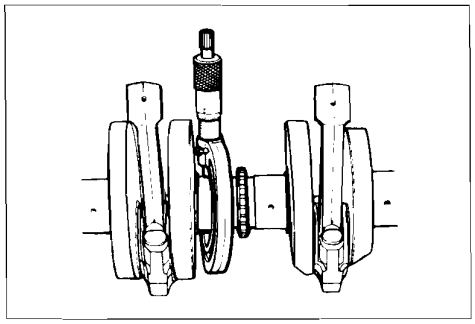
Crankcase I.D. specification

Code	I.D. specification
A	39.000 – 39.008 mm (1.5354 – 1.5357 in)
B	39.008 – 39.016 mm (1.5357 – 1.5361 in)

Crankshaft journal O.D. specification

Code	O.D. specification
A	35.992 – 36.000 mm (1.4170 – 1.4173 in)
B	35.984 – 35.992 mm (1.4167 – 1.4170 in)
C	35.976 – 35.984 mm (1.4164 – 1.4167 in)

09900-20202: Micrometer (25 – 50 mm)

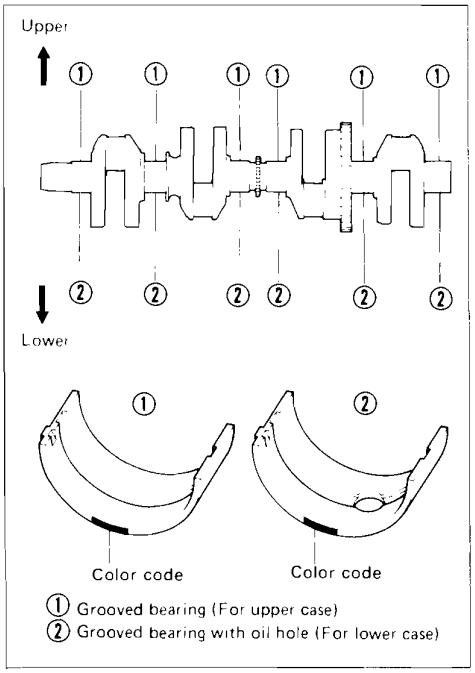


Bearing thickness specification
(Grooved bearing with oil hole ... For lower case)

Color (Part No.)	Specification
Green (12229-06B00-0A0)	1.486 – 1.490 mm (0.0585 – 0.0587 in)
Black (12229-06B00-0B0)	1.490 – 1.494 mm (0.0587 – 0.0588 in)
Brown (12229-06B00-0C0)	1.494 – 1.498 mm (0.0588 – 0.0590 in)
Yellow (12229-06B00-0D0)	1.498 – 1.502 mm (0.0590 – 0.0591 in)

NOTE:

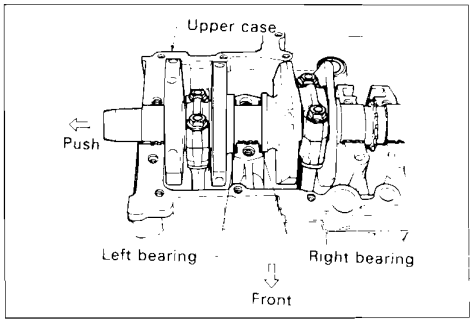
* *Grooved bearings have the same specification as the Grooved bearing with oil hole.*
* *These parts numbers are shown as follows. 12229-06B10-XXX. (Grooved bearing)*



CRANKSHAFT THRUST CLEARANCE

- With the crankshaft, right-side thrust bearing and left-side thrust bearing inserted in the upper crankcase, use a thickness gauge to measure the thrust clearance on the left-side.

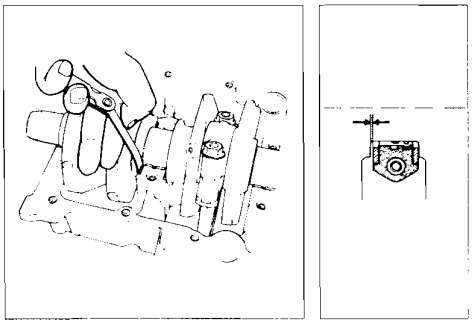
NOTE:
Push the crankshaft to the starter clutch side, so that there is no clearance on the right-side thrust bearing.



Thurst clearance

Standard: 0.04 – 0.08 mm (0.002 – 0.003 in)

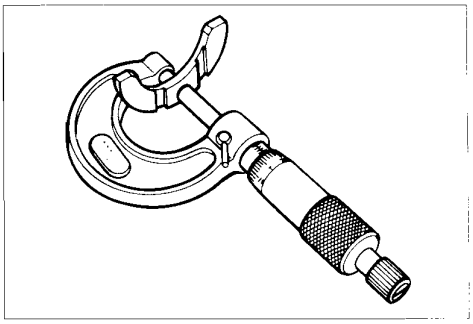
If the thrust clearance exceeds the standard range, adjust the thrust clearance by the following procedures:



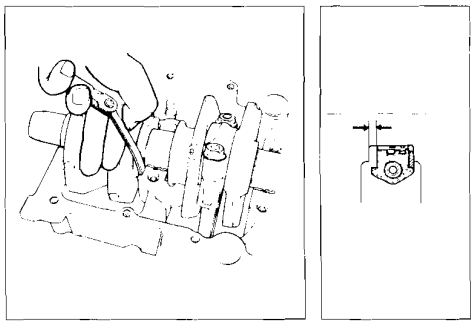
- Remove the right-side thrust bearing, and measure its thickness with a micrometer. If the thickness of the right-side thrust bearing is below standard, replace with a new bearing and once again perform the thrust clearance measurement listed above, checking to make sure it is within standard.

Right-side thrust bearing thickness

Standard: 2.44 – 2.46 mm (0.096 – 0.097 in)



- If the right-side thrust bearing is within the standard range, reinsert the right-side thrust bearing, and remove the left-side thrust bearing.
- As shown in the illustration, use a thickness gauge to measure the clearance before inserting of the left-side thrust bearing, and select a left-side thrust bearing from the selection table.



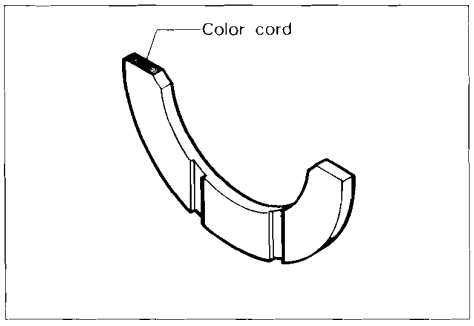
Thrust bearing selection table

Clearance before inserting left-side thrust bearing	Color (Part No.)	Thrust bearing thickness	Thrust clearance
2.42 – 2.44 mm (0.0953 – 0.0961 in)	Black (12228-48B00-0H0)	2.36 – 2.38 mm (0.0929 – 0.0937 in)	0.04 – 0.08 mm (0.002 – 0.003 in)
2.44 – 2.46 mm (0.0961 – 0.0969 in)	Orange (12228-48B00-0G0)	2.38 – 2.40 mm (0.0937 – 0.0945 in)	
2.46 – 2.48 mm (0.0969 – 0.0976 in)	Blue (12228-48B00-0F0)	2.40 – 2.42 mm (0.0945 – 0.0953 in)	
2.48 – 2.50 mm (0.0976 – 0.0984 in)	Green (12228-48B00-0E0)	2.42 – 2.44 mm (0.0953 – 0.0961 in)	
2.50 – 2.52 mm (0.0984 – 0.0992 in)	Yellow (12228-48B00-0D0)	2.44 – 2.46 mm (0.0961 – 0.0969 in)	
2.52 – 2.54 mm (0.0992 – 0.1000 in)	Red (12228-48B00-0C0)	2.46 – 2.48 mm (0.0969 – 0.0976 in)	
2.54 – 2.56 mm (0.1000 – 0.1008 in)	Brown (12228-48B00-0B0)	2.48 – 2.50 mm (0.0976 – 0.0984 in)	
2.56 – 2.57 mm (0.1008 – 0.1012 in)	Pink (12228-48B00-0A0)	2.50 – 2.52 mm (0.0984 – 0.0992 in)	0.04 – 0.07 mm (0.002 – 0.003 in)

- After selecting a left-side thrust bearing, insert it and again perform the thrust clearance measurement to make sure it falls wihin the standard range.

NOTE

Right-side thrust bearing has the same specification as the Yellow of left-side thrust bearing.

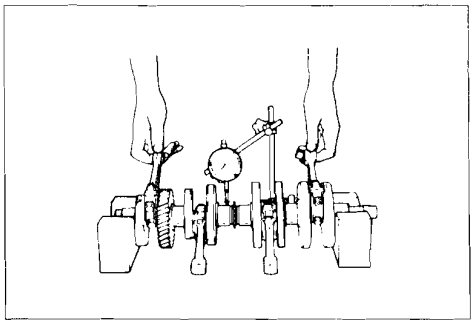


CRANKSHAFT RUNOUT

Support the crankshaft with "V" blocks as shown, with the two end journals resting on the blocks. Set up the dial gauge, as shown, and rotate the crankshaft slowly to read the runout. Replace the crankshaft if the runout is greater than the limit.

Crankshaft runout specification

Service Limit: 0.05 mm (0.002 in)

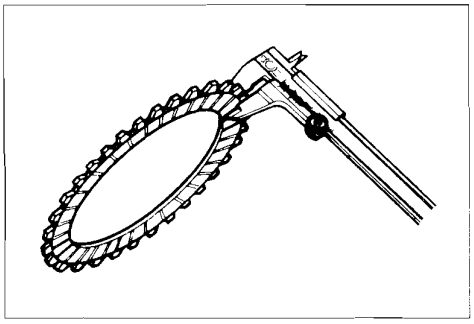


CLUTCH DRIVE PLATES AND DRIVEN PLATES

Clutch plates in service remain in oily condition as they are lubricated with oil. Because of this condition, both drive and driven plates are subject to little wearing action and therefore last much longer. Their life depends largely on the quality of oil used in the clutch and also on the way the clutch is operated.

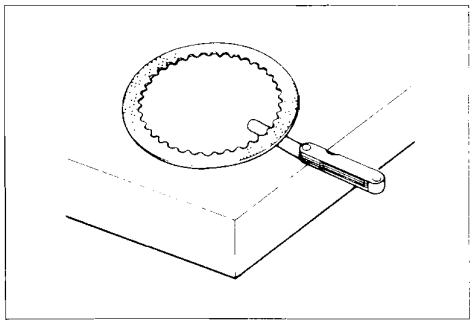
These plates are expendable: they are meant to be replaced when found worn down or distorted to the respective limit: use a caliper to check thickness and a thickness gauge and surface plate to check distortion.

09900-20102: Vernier calipers
09900-20803: Thickness gauge



Checking thickness

	Standard	Service Limit
Drive plate thickness (No.1 & No.2)	2.52 – 2.68 mm (0.100 – 0.106 in)	2.22 mm (0.087 in)
Driven plate distortion	———	0.10 mm (0.004 in)

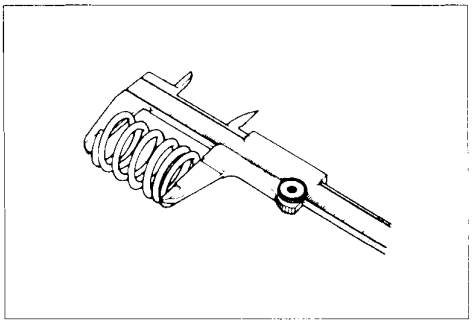


Checking distortion

CLUTCH SPRING FREE LENGTH

Measure the free length of each coil spring with vernier calipers, and compare the elastic strength of each with the specified limit. Replace all the springs if any one of springs is not within the limit.

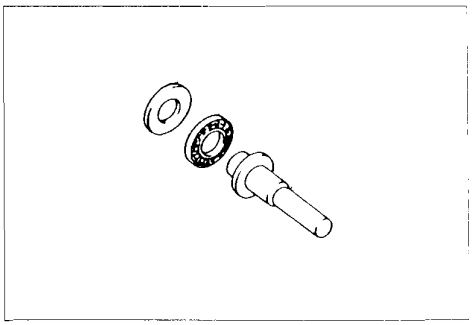
Clutch spring free length
Service Limit: 38.1 mm (1.50 in)



CLUTCH BEARING

Inspect the clutch release bearing for any abnormality, particularly cracks, to decide whether it can be reused or should be replaced.

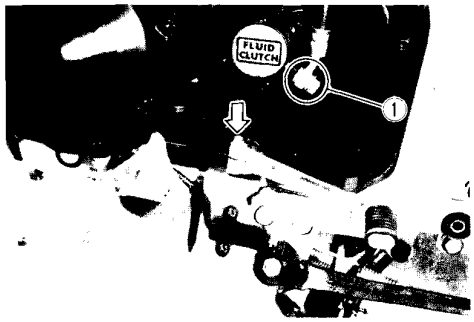
Smooth engagement and disengagement of the clutch depends much on the condition of this bearing.



CLUTCH RELEASE CYLINDER

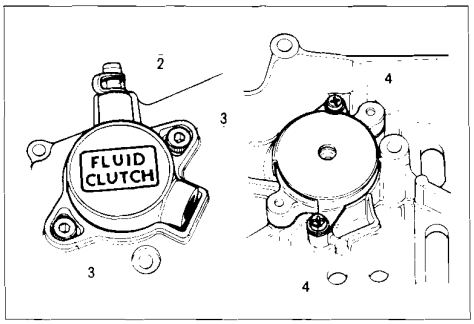
DISASSEMBLY

- Remove the gearshift lever and engine sprocket cover. (Refer to page 3-6.)
- Remove the clutch hydraulic line by removing the union bolt ①.



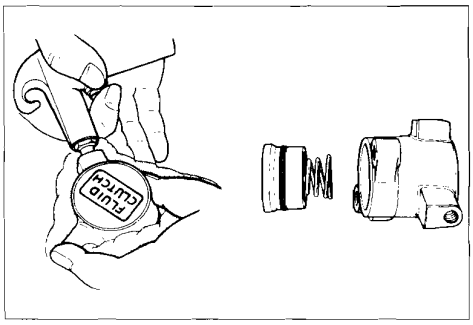
NOTE:
Completely wipe off any clutch fluid adhering to any part of motorcycle.
The fluid reacts chemically with paint, plastics, rubber materials, etc.

- Remove the air bleeder valve ②.
- Remove the clutch release cylinder by removing the mounting bolts ③ and piston retainer screws ④.



- Place a rag over the piston to prevent popping up. Force out the piston by using air gun.

CAUTION:
Do not use high pressure air to prevent piston damage.



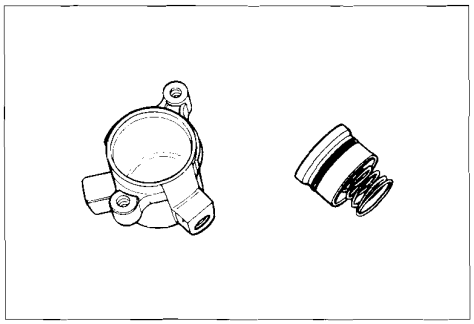
INSPECTION

Inspect the clutch cylinder bore wall for nicks, scratches or other damage. Inspect the oil seal for damage and wear. Inspect the piston surface for any scratches or other damage.

REASSEMBLY

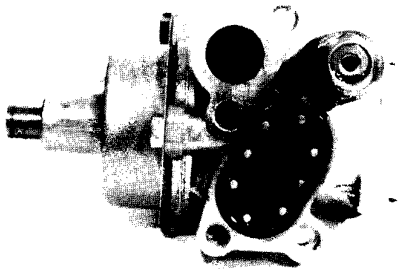
Reassemble the clutch cylinder in the reverse order of disassembly and by taking the following steps:

CAUTION:
- *** Wash the clutch cylinder components with fresh brake fluid before reassembly.**
- *** Never use cleaning solvent or gasoline to wash them.**
- *** Apply brake fluid to the cylinder bore and piston to be inserted into the bore.**

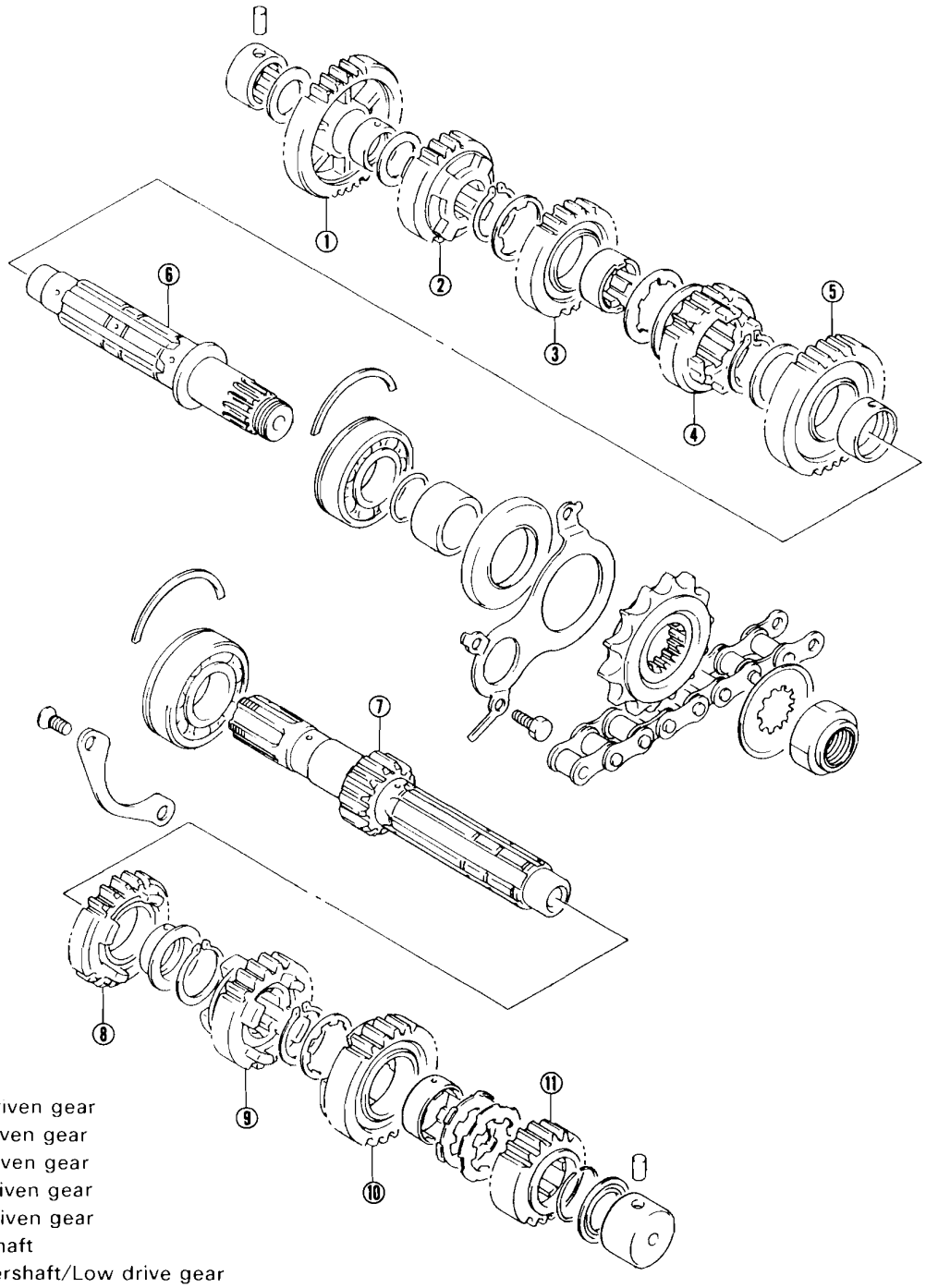


OIL PUMP

CAUTION:
Do not attempt to disassemble the oil pump assembly.
The oil pump is available only as an assembly.



TRANSMISSION

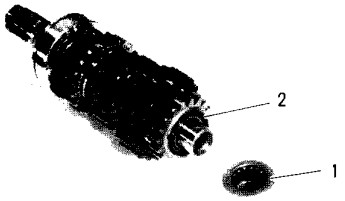


① Low driven gear
② 4th driven gear
③ 3rd driven gear
④ Top driven gear
⑤ 2nd driven gear
⑥ Driveshaft
⑦ Countershaft/Low drive gear
⑧ 4th drive gear
⑨ 3rd drive gear
⑩ Top drive gear
⑪ 2nd drive gear

COUNTERSHAFT

DISASSEMBLY

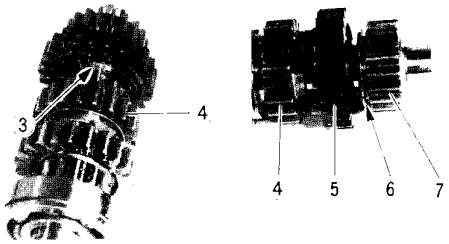
- Remove the left end bearing ① and oil seal ②.



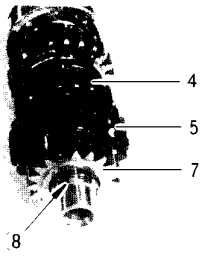
- Remove the Top drive gear circlip ③ from the groove and slide the circlip ③ toward the 3rd drive gear ④.

09900-06104: Snap ring pliers

- Slide the Top drive gear ⑤ toward the 3rd drive gear ④ and remove the pair of the lock washers ⑥ from the groove and slide the pair of the lock washers ⑥ and 2nd drive gear ⑦ toward the Top drive gear ⑤.

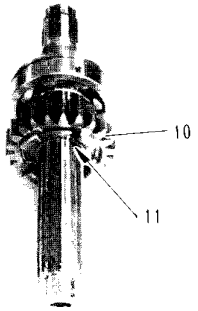


- Remove the 2nd drive gear circlip ⑧, and then remove the 2nd drive gear ⑦, Top drive gear ⑤ and 3rd drive gear ④.



- Remove the 4th drive gear ⑩ by removing the circlip ⑪.

09900-06107: Snap ring pliers

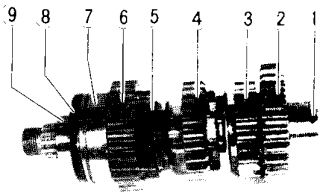


DRIVESHAFT

DISASSEMBLY

- Each driven gear on the driveshaft is easily removed by using snap ring pliers.

09900-06107: Snap ring pliers



The order of disassembling is as follows:

① Right end bearing	⑤ Top driven gear
② Low driven gear	⑥ 2nd driven gear
③ 4th driven gear	⑦ Left end bearing
④ 3rd driven gear	⑧ Oil seal
	⑨ Spacer

COUNTERSHAFT AND DRIVESHAFT

REASSEMBLY

Assemble the countershaft and driveshaft in the reverse order of disassembly. Pay attention to following points:

NOTE:

* *Before installing the gears, rotate the bearing by hand to inspect for abnormal noise and smooth rotation. Replace the bearing if there is anything unusual.*
* *Before installing the gears, coat lightly moly paste or engine oil to the driveshaft and countershaft.*

99000-25140: SUZUKI Moly paste

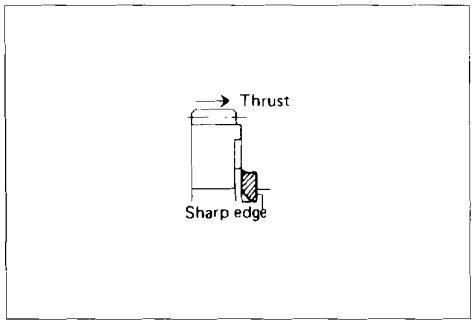
CAUTION:

* **Never reuse a circlip. After a circlip has been removed from a shaft, it should be discarded and a new circlip must be installed.**
* **When installing a new circlip, care must be taken not to expand the end gap larger than required to slip the circlip over the shaft.**
* **After installing a circlip, always insure that it is completely seated in its groove and securely fitted.**

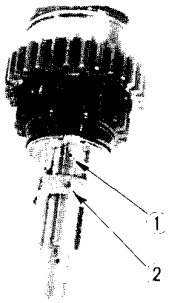
NOTE:

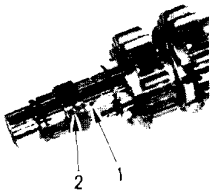
In reassembling the transmission, attention must be given to the locations and positions of washers and circlips. The cross sectional view given here will serve as a reference for correctly mounting the gears, washers and circlips. (Refer to page 3-46.)

- When installing a new circlip, pay attention to the direction of the circlip. Fit it to the side where the thrust is as shown in the illustration.

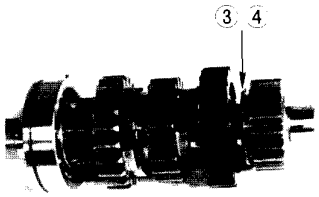


- When installing the gear bushing onto the shaft, align the oil hole ① of the shaft with the bushing oil hole ②.



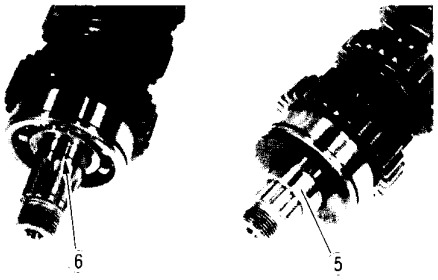


- When installing the pair of the lock washers ③ and ④, be sure to align the three grooves of the lock washer ③ with the three tabs of the lock washer ④.

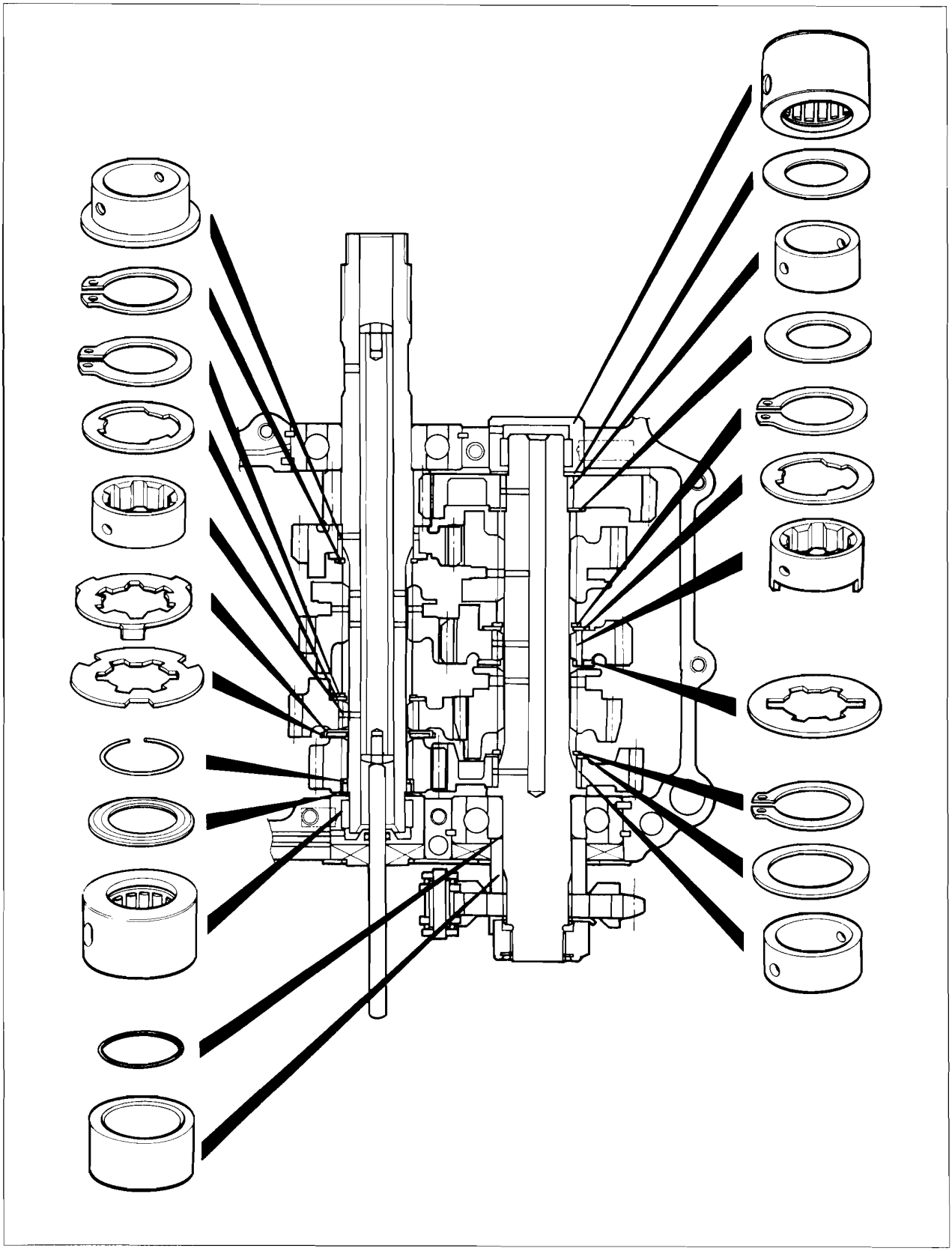


- Before installing the spacer ⑤, fit a new O-ring ⑥ onto the driveshaft.
- Apply grease to the oil seal lip and install it onto the driveshaft.

99000-25030: SUZUKI super grease "A"



TRANSMISSION



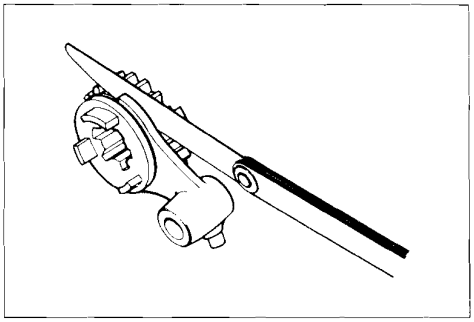
GEARSHIFT FORK-GROOVE CLEARANCE

Using a thickness gauge, check the gearshift fork clearance in the groove of its gear.
The clearance for each of the three gearshift forks plays an important role in the smoothness and positiveness of shifting action.

Gearshift fork-Groove clearance
Standard : 0.10 – 0.30 mm (0.004 – 0.012 in)
Service Limit: 0.50 mm (0.020 in)

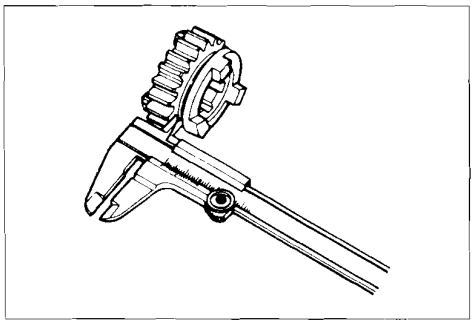
If the clearance checked is noted to exceed the limit specified, replace the fork or its gear, or both.

09900-20803: Thickness gauge
09900-20102: Vernier calipers


Checking clearance

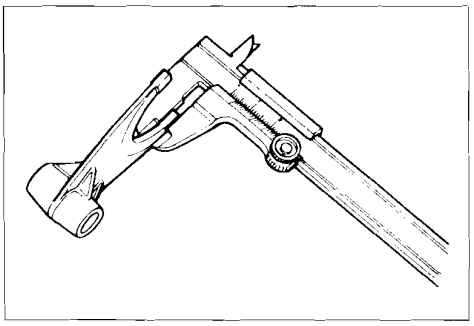
Shift fork groove width

Standard
(No.1, No.2 & No.3): 5.00 – 5.10 mm (0.197 – 0.201 in)


Checking groove width

Shift fork thickness

Standard
(No.1, No.2 & No.3): 4.80 – 4.90 mm (0.189 – 0.193 in)

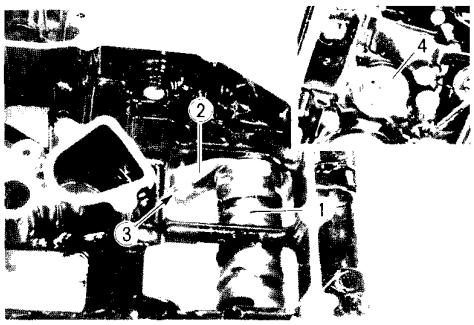

Checking thickness

ENGINE REASSEMBLY

The engine is reassembled by carrying out the steps of disassembly in the reversed order, but there are a number of steps which demand special descriptions or precautionary measures.

NOTE:
Apply engine oil to each running and sliding part before reassembling.

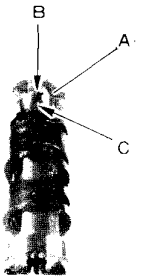
- Install the gearshift cam related parts.
  ① Gearshift cam
  ② Gearshift cam stopper
  ③ Circlip
  ④ Circlip
  ⑤ Spring



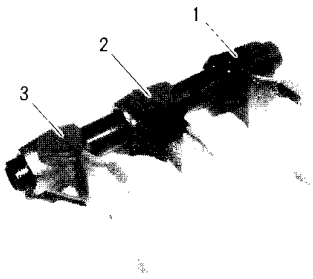
CAUTION:
Always use new circlips ③ and ④.

- Position the gearshift cam as shown in Fig. so that the gearshift forks and transmission can be installed easily.

NOTE:
When installing the cam stopper plate Ⓐ, align the pin groove Ⓑ with the pin Ⓒ as shown in the Fig.



- Install the gearshift forks to the crankcase in the correct positions and directions.
  ① For 4th driven gear
  ② For 3rd driven gear
  ③ For Top driven gear



- Fit the O-rings (① and ②) and dowel pins ③ to the correct positions, as shown in the Figs.

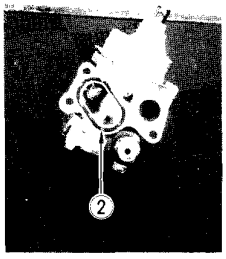
CAUTION:
Replace the O-rings with new ones to prevent oil leakage.

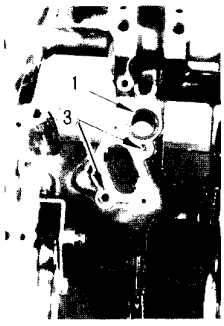
- Install the oil pump to the lower crankcase with three bolts and tighten them to the specified torque.

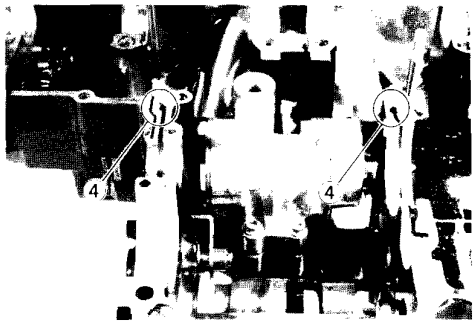
NOTE:
Apply a small quantity of THREAD LOCK "1342" to the bolts.

99000-32050: Thread lock "1342"
Tightening torque: 8 – 12 N·m
(0.8 – 1.2 kg-m, 6.0 – 8.5 lb-ft)

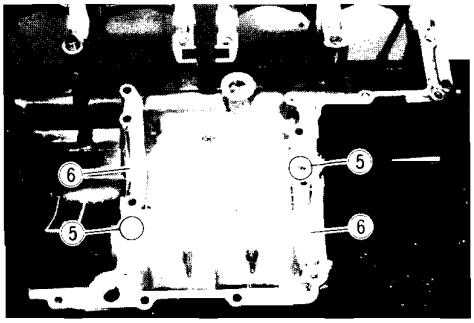
NOTE:
Check the oil jets ④ fitted on the lower crankcase for clogging.







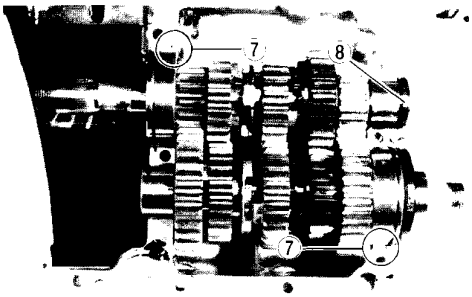
- Fit the bearing pins ⑤ and C-rings ⑥ on the upper crankcase.



- Install the countershaft assembly and driveshaft assembly on the upper crankcase.

NOTE:

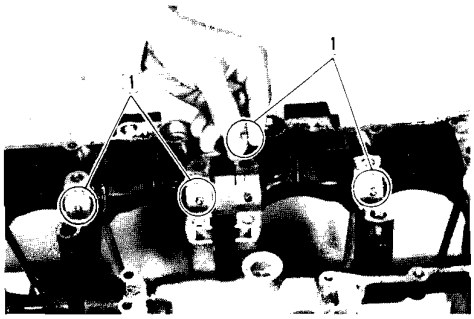
* *Be sure to install the bearing dowel pins ⑦ in the respective positions.*
* *Install the countershaft end cap to the position ⑧.*
* *Make sure that the countershaft turns freely while holding the driveshaft. If not, shift the gear which is engaged to the neutral position.*



NOTE:

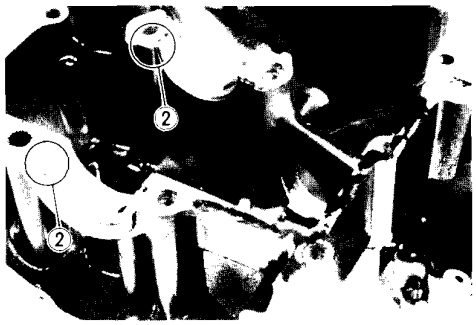
Before fitting the crankshaft journal bearings, check the nozzles ① fitted on the upper crankcase for clogging.

① Nozzle (4 pcs)..... For upper case



- When fitting the crankshaft journal bearings to the upper and lower crankcases, be sure to fix the stopper part ② first and press the other end.
  (Refer to page 3-38.)

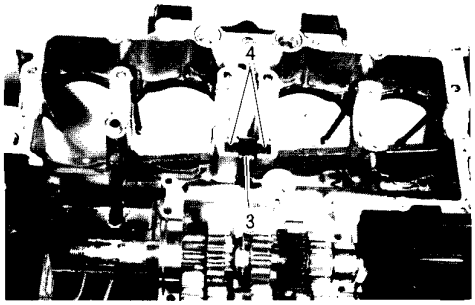
CAUTION:
Do not touch the bearing surfaces with your hands. Grasp by the edge of the bearing shell.



- Install the cam chain guide ③ and two dampers ④ properly.

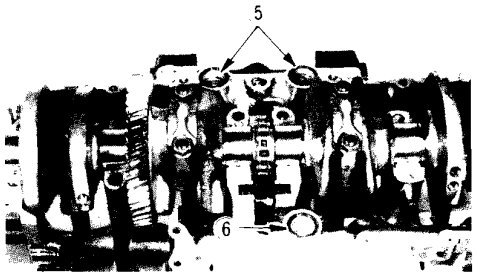
NOTE:

Be sure to face the arrow mark on the damper to the front.



- Fit the O-rings, ⑤ and ⑥.

CAUTION:
Replace the O-rings with new ones to prevent oil leakage.



- Before installing the crankshaft, apply SUZUKI Moly paste to each journal bearing lightly.
- Install the crankshaft with the cam chain to the upper crankcase.
- Insert the right and left-thrust bearings with oil grooved facing the crank web.

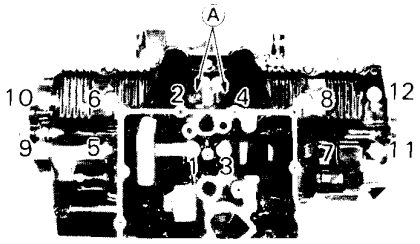
99000-25140: SUZUKI Moly paste

- Clean the mating surfaces of the crankcases before matching the upper and lower ones.
- Install the dowel pins to the upper crankcase.
- Apply SUZUKI BOND NO. 1207B to the mating surface of the lower crankcase in the following procedure.

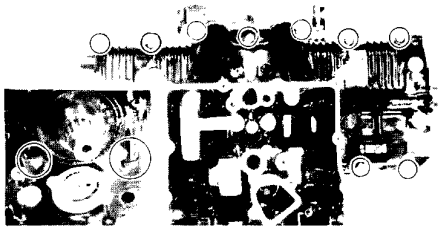
99104-31140: SUZUKI Bond No. 1207B

NOTE:
Use of SUZUKI BOND No. 1207B is as follows:

* *Make surfaces free from moisture, oil, dust and other foreign materials.*
* *Spread on surfaces thinly to form an even layer, and assemble the cases within few minutes.*
* *Take extreme care not to apply any bond No. 1207B to the bearing surfaces.*
* *Apply to distorted surface as it forms a comparatively thick film.*



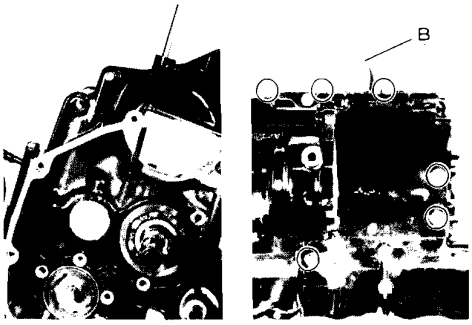
- Fit up the right oil pipe with No. 1 bolt.
- Fit up the copper washers to the No. 9 and No. 11 bolts.
- Locate the two allen bolts at position Ⓐ and ten 8-mm bolts.
- Tighten the crankshaft tightening 8-mm bolts in the ascending order of numbers assigned to these bolts, tightening each bolt a little at a time to equalize the pressure. Tighten the lower and upper crankcase securing bolts and nuts to the specified torque values.



Tightening torque	Initial tightening			Final tightening		
	kg-m	N·m	lb-ft	kg-m	N·m	lb-ft
6 mm bolt	0.6	6	4.5	1.3	13	9.5
8 mm bolt	1.3	13	9.5	2.4	24	17.5

NOTE:

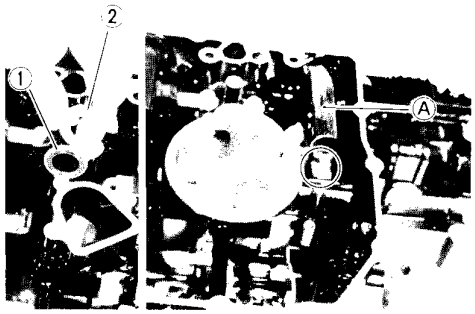
* *Install the main oil gallery plug. (Refer to page 3-17.)*
* *Fit up the engine ground wire Ⓑ to the correct position as shown in Fig.*



09914-25811: 6-mm T-type hexagon wrench

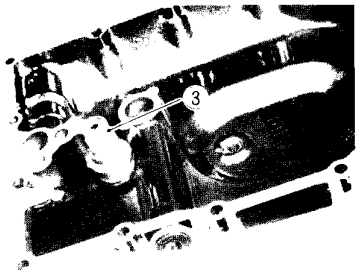
- Install the left oil pipe Ⓐ with bolt.
- Fit a new O-ring ① and shim ②.
- Fit a new gasket and install the oil sump filter to the lower crankcase to face the arrow mark to the front.

CAUTION:
Replace the gasket and O-ring with new ones to prevent oil leakage.



- Seat the washer and install the oil pressure regulator ③ to the oil pan.
- Tighten the regulator to the specified torque.

Tightening torque: 25 – 30 N·m
(2.5 – 3.0 kg-m, 18.0 – 21.5 lb-ft)

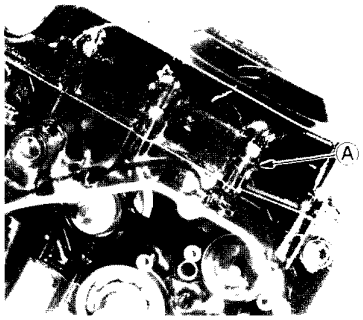


- Fit a new gasket and install the oil pan with bolts. Tighten the oil pan bolts to the specified torque.

Tightening torque: 12 – 16 N·m
(1.2 – 1.6 kg-m, 8.5 – 11.5 lb-ft)

NOTE:
** Fit a new gasket Ⓐ to the correct position as shown.*

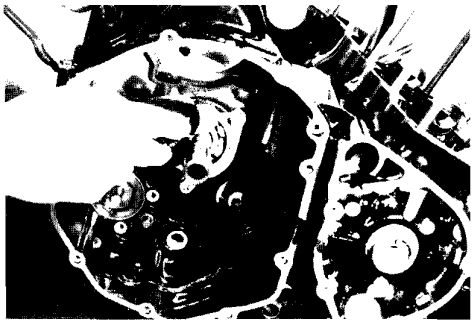
CAUTION:
Use a new gasket to prevent oil leakage.



- Tighten the engine oil drain plug to the specified torque. (Refer to page 8-22.)
- Install the countershaft bearing retainer with two screws.

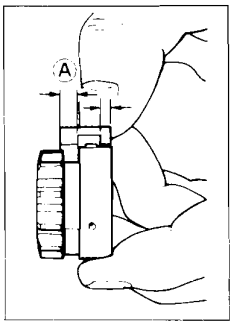
NOTE:
Apply a small quantity of THREAD LOCK "1342" to the two screws.

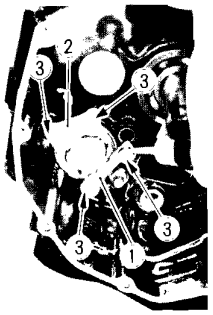
99000-32050: Thread lock "1342"



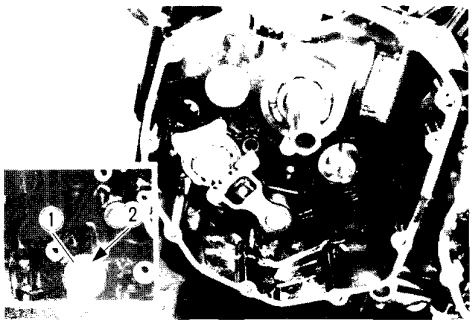
- Install each gear shifting pawl into the cam driven gear. The large shoulder Ⓐ must face to the outside as shown.
- When installing the cam guide ① and pawl lifter ②, apply a small quantity of THREAD LOCK "1342" to the screws ③.

99000-32050: Thread lock "1342"
09900-09003: Impact driver set



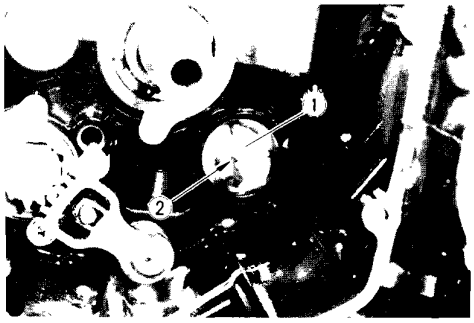


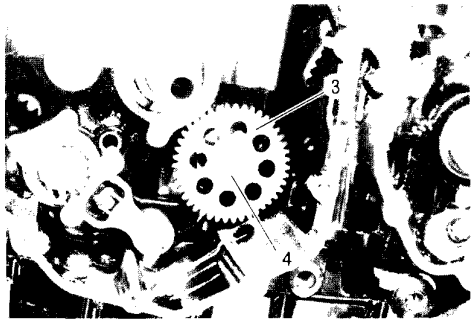
- Install the gearshift shaft with the center of the gear on shaft side aligned the center of gearshift cam driven gear.
- Install the washer ① and fix the gearshift shaft with the clip ②.



- Install the washer ①, pin ②, oil pump driven gear ③ and washer ④.
- Fix the oil pump driven gear with the circlip.

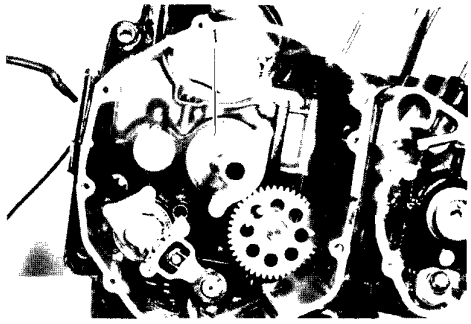
09900-06107: Snap ring pliers



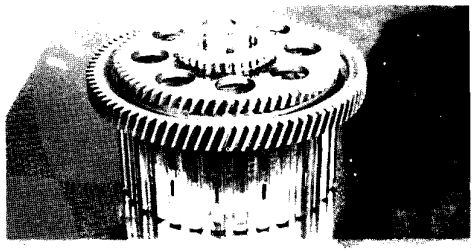


- Install the thrust washer ① onto the countershaft.

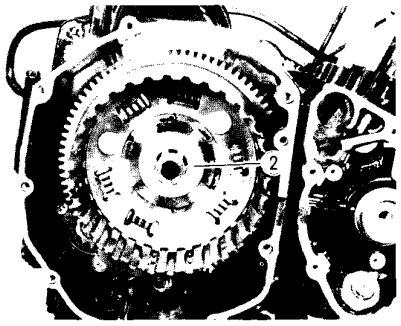
NOTE:
Flat surface of washer is positioned outside.



- Install the genrator/oil pump drive gears onto the primary driven gear.

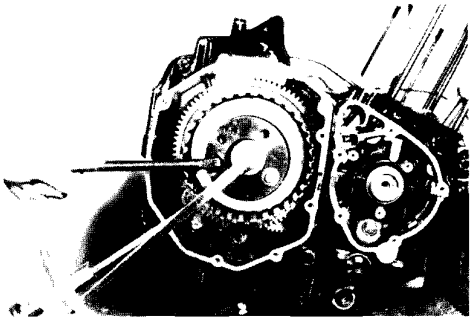


- Install the primary driven gear assembly onto the countershaft, and apply engine oil to the needle bearing and spacer.
- Install the thrust washer ② onto the countershaft.



- Install the clutch sleeve hub onto the countershaft.
- After tightening the clutch sleeve hub nut, be sure to lock the nut by firmly bending the tongue of the washer. Tightening torque for the nut is specified.

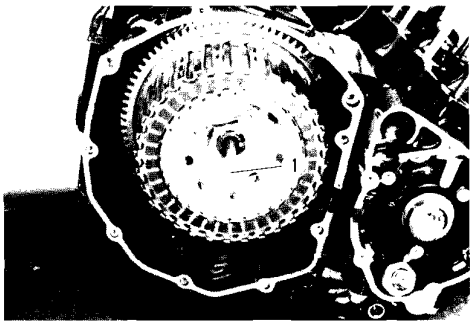
Tightening torque: 50 – 70 N·m
(5.0 – 7.0 kg-m, 36.0 – 50.5 lb-ft)
09920-53722: Clutch sleeve hub holder

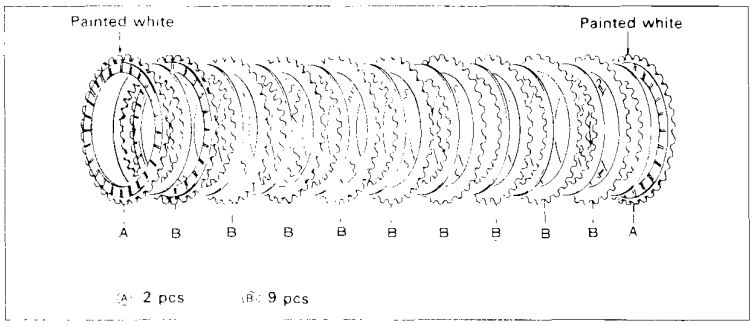


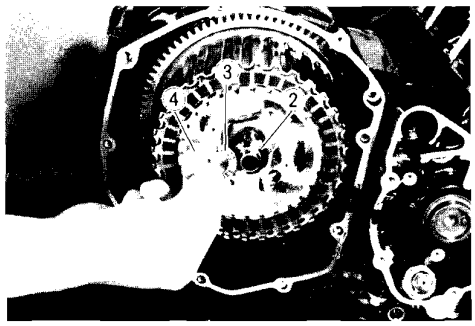
- Insert the clutch drive plate and driven plate one by one into the sleeve hub in the prescribed order, drive plate first.

NOTE:
Two kinds of drive plate, Ⓐ and Ⓑ, are used, they resemble each other in external appearance and configuration. But, drive plates, Ⓐ and Ⓑ, can be distinguished by the painted (white).

- Install the clutch push rod ①, clutch push piece ②, bearing ③ and thrust washer ④ into the countershaft. Then, fit the pressure plate onto the sleeve hub.



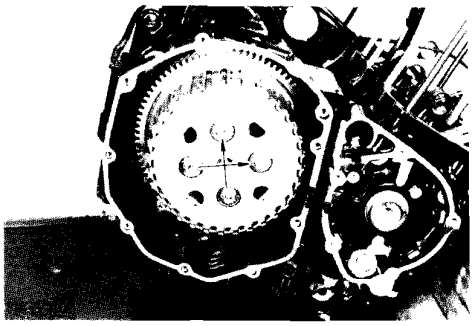




- Tighten the clutch spring set bolts in the order as shown in the Fig.

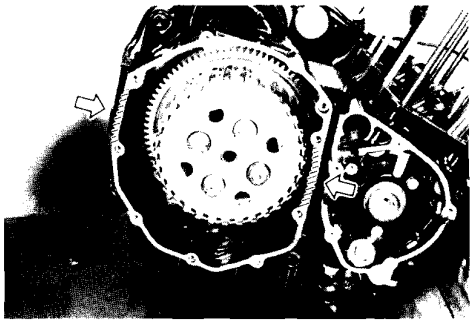
NOTE:
Tighten the clutch spring set bolts in the manner indicated, tightening them by degrees until they attain a uniform tightness.

Tightening torque: 11 – 13 N·m
(1.1 – 1.3 kg-m, 8.0 – 9.5 lb-ft)



- Coat SUZUKI Bond No. 1207B lightly to the portion around mating surface between upper and lower crankcases as shown in the Fig.

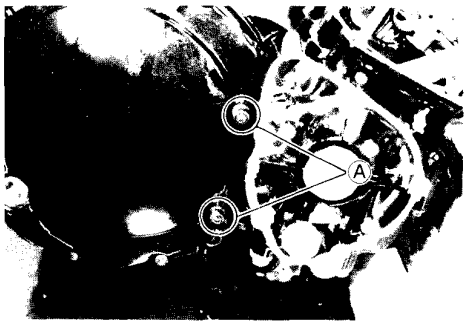
99104-31140: SUZUKI Bond No. 1207B



- Install the dowel pins, a new gasket and clutch cover, and tighten the cover bolts securely.

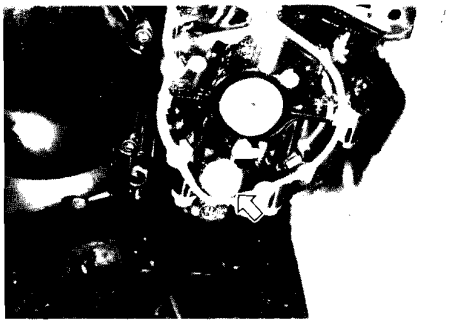
NOTE:
Fit up the two gaskets to the clutch cover bolts Ⓐ correctly as shown in the Fig.

CAUTION:
Use only new gasket to prevent oil leakage.



NOTE:
When replacing the oil pressure switch, apply SUZUKI Bond No. 1207B to its thread lightly.

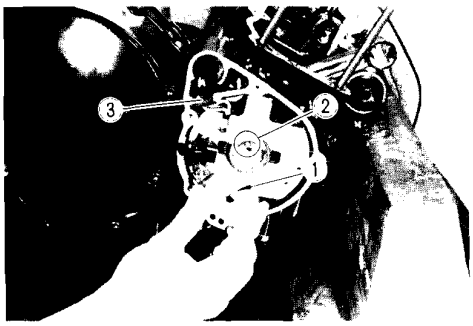
99104-31140: SUZUKI Bond No. 1207B



- Install the signal generator stator with three screws.
- Connect the oil pressure switch lead wire to the oil pressure switch terminal.
- Make sure to fit the slot ① on the back surface of the signal generator rotor over the locating pin ② at the end of crankshaft.

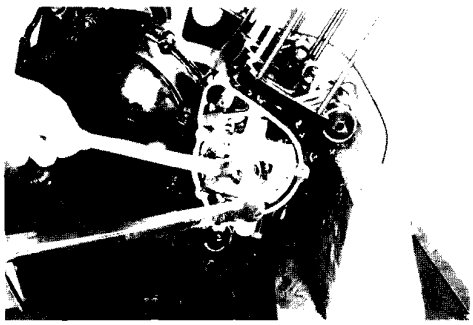
NOTE:
Bond No. 1207B should be applied to the groove of the signal generator lead wire grommet ③.

99104-31140: SUZUKI Bond No. 1207B



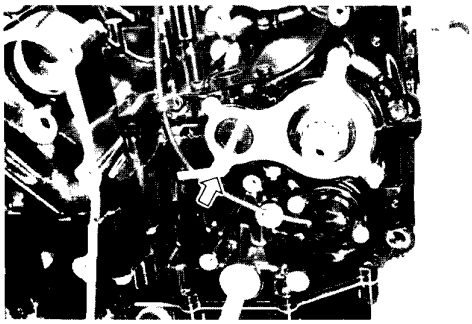
- Hold the crankshaft turning nut and tighten the rotor bolt with specified torque using 6-mm hexagon wrench.

09914-25811: 6 mm "T" type hexagon wrench
Tightening torque: 25 – 35 N·m
(2.5 – 3.5 kg-m, 18.0 – 25.5 lb-ft)

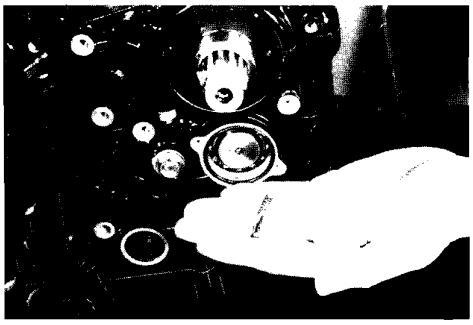


- Pass the signal generator lead wire through upper crankcase as shown in the Fig.

- Install the oil seal retainer with four bolts and positively bend the lock portion of the retainer.
- Insert the clutch push rod into the countershaft.
- Install the neutral position indicator switch with two screws.



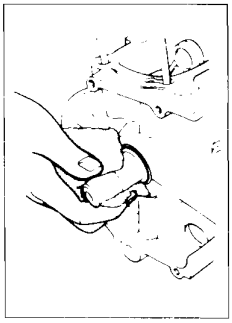
NOTE:
When installing the neutral position indicator switch, be sure to locate the spring, switch contact and O-ring.



- Degrease the tapered portion of the starter clutch and also the crankshaft. Use nonflammable cleanig solvent to wipe off the oily or greasy matter to make these surfaces completely dry.

NOTE:
Apply a small quantity of THREAD LOCK SUPER "1303" to the starter clutch mounting bolt.

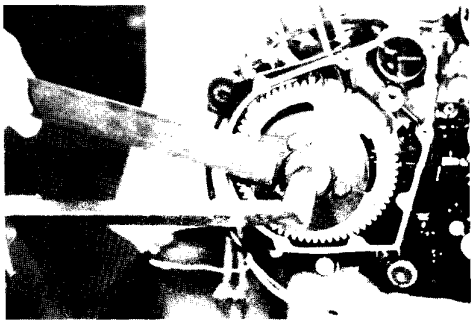
99000-32030: Thread lock super "1303"



- Tighten the starter clutch mounting bolt to the specified torque by using the special tool and torque wrench.

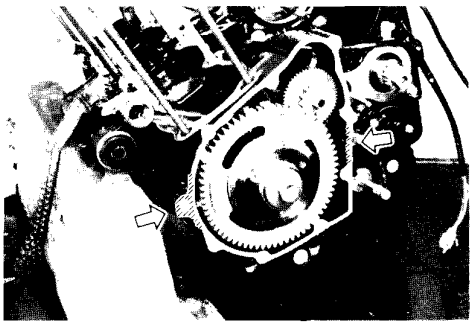
Tightening torque: 143 – 157 N·m
(14.3 – 15.7 kg-m, 103.5 – 113.5 lb-ft)

09920-34810: Starter clutch holder



- Install the starter idle gear and its shaft.
- Coat SUZUKI Bond No. 1207B lightly to the portion around mating surface between upper and lower crankcases as shown in the Fig.

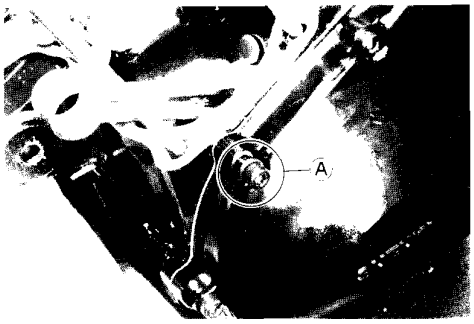
99104-31140: SUZUKI Bond No. 1207B



- Install the dowel pin, a new gasket and starter clutch cover, and tighten the cover bolts securely.

NOTE:
Fit up the gasket to the starter clutch cover bolt Ⓐ correctly as shown in the Fig.

CAUTION:
Use a new gasket to prevent oil leakage.

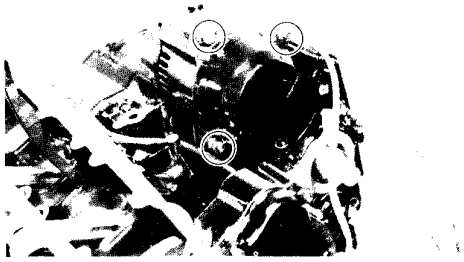


- Install the generator with three bolts.

Tightening torque: 21 – 29 N·m
(2.1 – 2.9 kg-m, 15.0 – 21.0 lb-ft)

NOTE:
Apply SUZUKI super grease "A" to the generator O-ring.

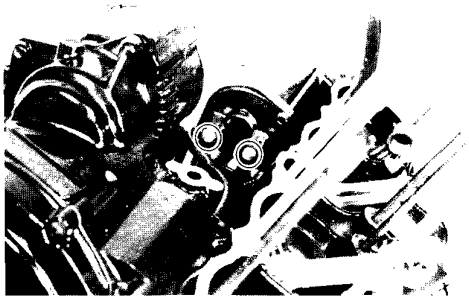
99000-25030: SUZUKI super grease "A"



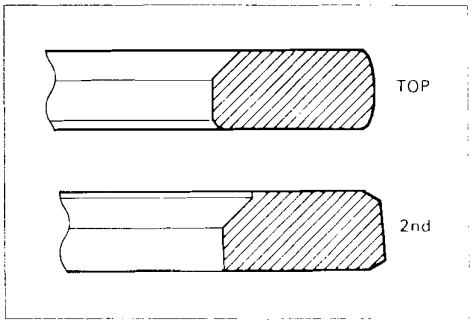
- Install the starter motor with two bolts.

NOTE:
Apply SUZUKI super grease "A" to the starter motor O-ring.
Apply a small quantity of THREAD LOCK "1342" to the bolts.

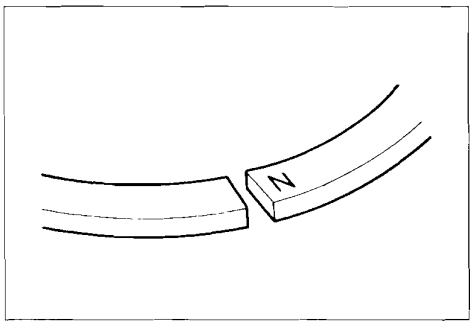
99000-32050: Thread lock "1342"



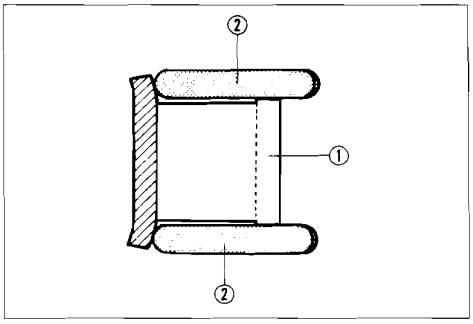
- Install the piston rings in the order of oil ring, 2nd ring and top ring.
- Top ring and 2nd ring differ in the shape of ring face.



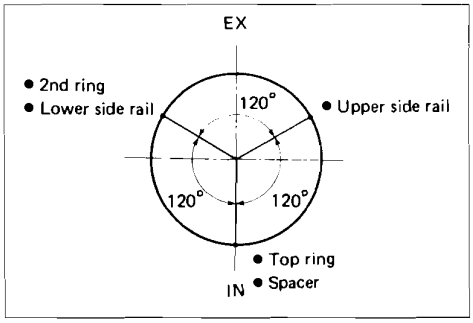
- Top and 2nd rings have letter "N" marked on the side. Be sure to bring the marked side to top when fitting them to the piston.



- The first member to go into the oil ring groove is spacer ①. After placing spacer, fit the two side rails ②. Side designations, top and bottom, are not applied to the spacer and side rails: you can position each either way.



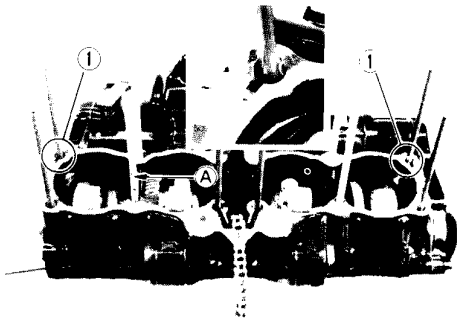
- Position the gaps of the three rings as shown. Before inserting each piston into the cylinder, check that the gaps are so located.



NOTE:
Check the oil jets ① fitted on the crankcase for clogging.

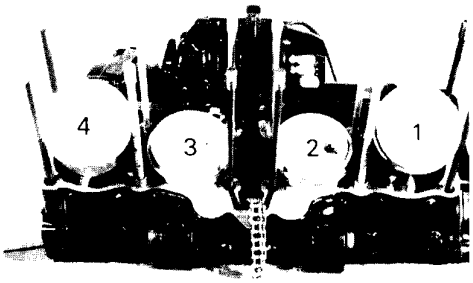
NOTE:
When reinstalling the cylinder stud bolt Ⓐ, apply SUZUKI Bond No. 1207B lightly to its thread.
Tightening torque: 13 – 16 N·m
(1.3 – 1.6 kg-m, 9.5 – 11.5 lb-ft)

99104-31140: SUZUKI Bond No. 1207B

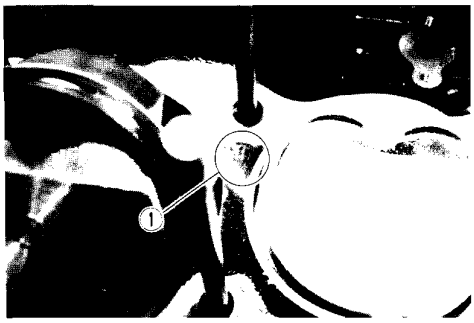


NOTE:
When fitting the piston, turn the triangle mark on the piston head to exhaust side.

- Be sure to install the pistons in the cylinder from which they were taken out in disassembly, refer to the letter mark, "1" through "4", scribed on the piston.
- Have each piston pin oiled lightly before installing it.
- Place a cloth beneath the piston, and install the circlips.
- Be sure to use new circlips.
- Before putting on the cylinder block, oil the big and small ends of each conrod and also the sliding surface of each piston.
- Place the dowel pins and new cylinder gasket on the crankcase.

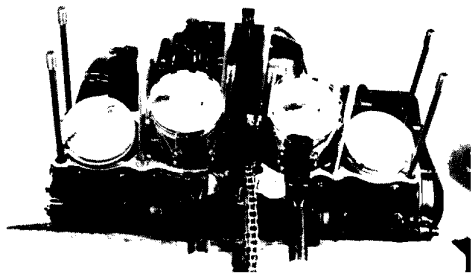


NOTE:
Be sure to identify the top surface by "UP" mark ① on the cylinder gasket as shown in the Fig.

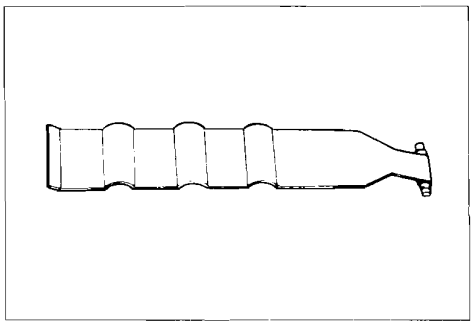


- Install piston ring holders in the indicated manner. Some light resistance must be overcome to lower the cylinder block.
- With No.2 and No. 3 pistons in place, install No. 1 and No. 4 pistons, and insert them into the cylinder.

09916-74521: Holder body
09916-74540: Band

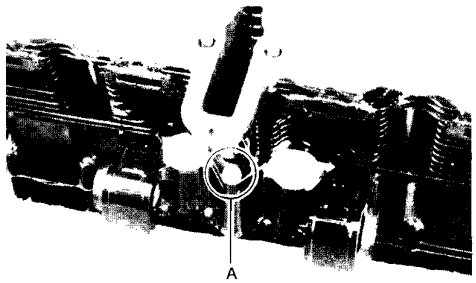


NOTE:
** Do not overtighten the special tool bands or the cylinders will resist to admit the pistons.*



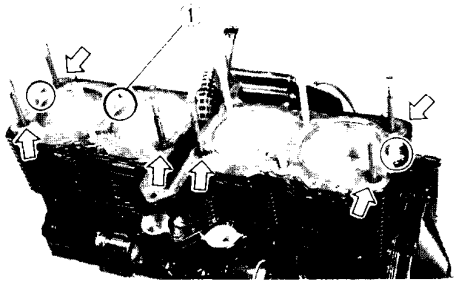
- Tighten the cylinder nut Ⓐ to the specified torque.

Tightening torque: 7 – 11 N·m
(0.7 – 1.1 kg-m, 5.0 – 8.0 lb-ft)



- Place the six O-rings and two dowel pins on the cylinder.

CAUTION:
Replace the O-rings with new ones to prevent oil leakage.



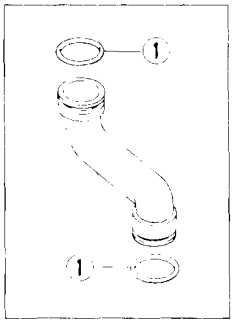
- Be sure to replace the cylinder head gasket with new one to prevent gas leakage.

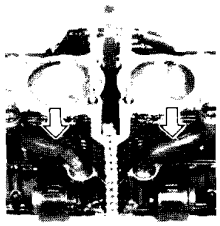
NOTE:
Be sure to identify the top surface by "UP" mark ① on the cylinder head gasket as shown in the Fig.

- Fit up the new O-rings onto the oil pipes and apply SUZUKI super grease "A" to the O-rings.
- Install the right and left oil pipes.

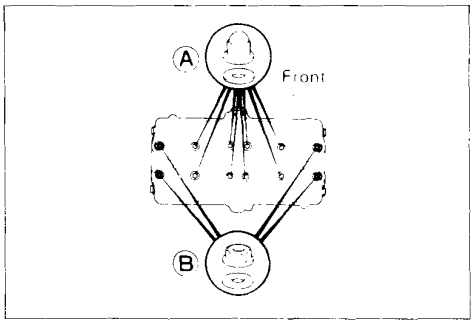
99000-25030: SUZUKI super grease "A"

CAUTION:
Replace the O-rings ① with new one to prevent oil leakage.



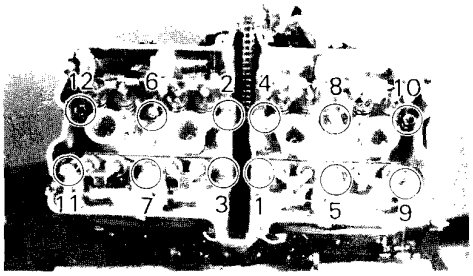


- Place the cylinder head on the cylinder.
- Cylinder head nuts and washers must be fitted in the correct positions, as shown in the illustration.
  Ⓐ Copper washer with cap nut (8 pcs)
  Ⓑ Copper washer with normal nut (4 pcs)



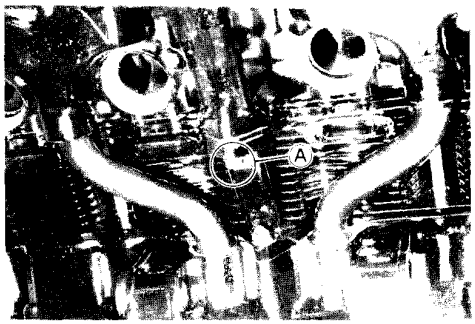
- Tighten the twelve 10-mm nuts to the specification with a torque wrench sequentially in the ascending order of numbers.

Tightening torque: 35 – 40 N·m
(3.5 – 4.0 kg-m, 25.5 – 29.0 lb-ft)

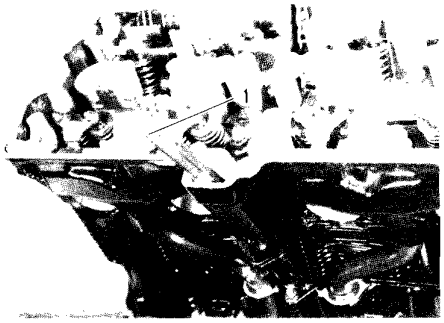


- After firmly tightening the twelve 10-mm nuts, install one 6-mm bolt Ⓐ and tighten it to the specified torque.

Tightening torque: 7 – 11 N·m
(0.7 – 1.1 kg-m, 5.0 – 8.0 lb-ft)

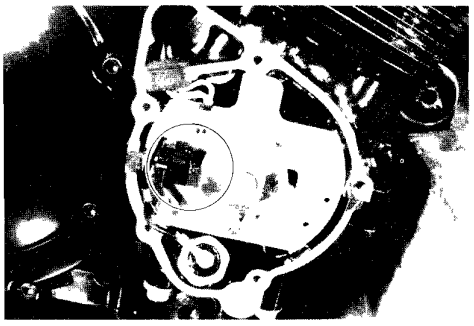


- Place the cam chain guide ① properly.



- While holding down the cam chain, rotate the crankshaft in normal direction to bring the "T" mark on the rotor to the center of pick-up coil.

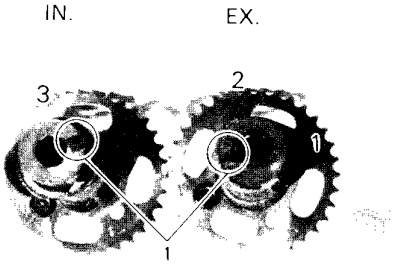
CAUTION:
To turn over crankshaft, torque nut with a 19 mm wrench. Never try to rotate crankshaft by putting a 6 mm T-type wrench to bolt.



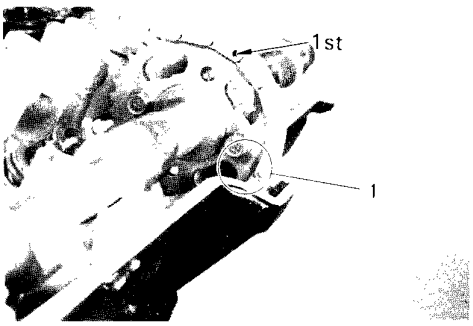
NOTE:
Just before placing the camshaft on the cylinder head, apply SUZUKI Moly paste to its journals, fully coating each journal Ⓐ with the paste taking care not to leave any dry spot. Apply engine oil to the camshaft journal holders.

99000-25140: SUZUKI Moly paste

- The exhaust camshaft can be distinguished from that of the intake by the embossed letters "EX" (for exhaust) as against letters "IN" (for intake). Similarly, the right end can be distinguished by the notch ① at the right end.



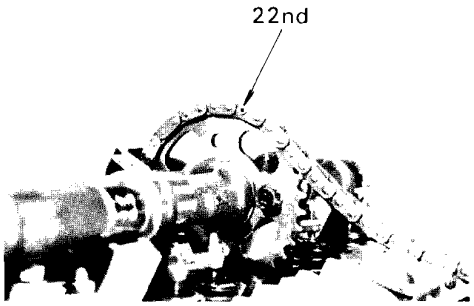
- With "T" mark accurately lined up with the timing mark, hold the camshaft steady and lightly pull up the chain to remove the slack between the crank sprocket and exhaust sprocket.
- Exhaust sprocket bears an arrow marked "1" indicated as ①. Turn over the exhaust camshaft so that the arrow points flush with the gasketed surface of the cylinder head. Engage the cam chain with this sprocket.

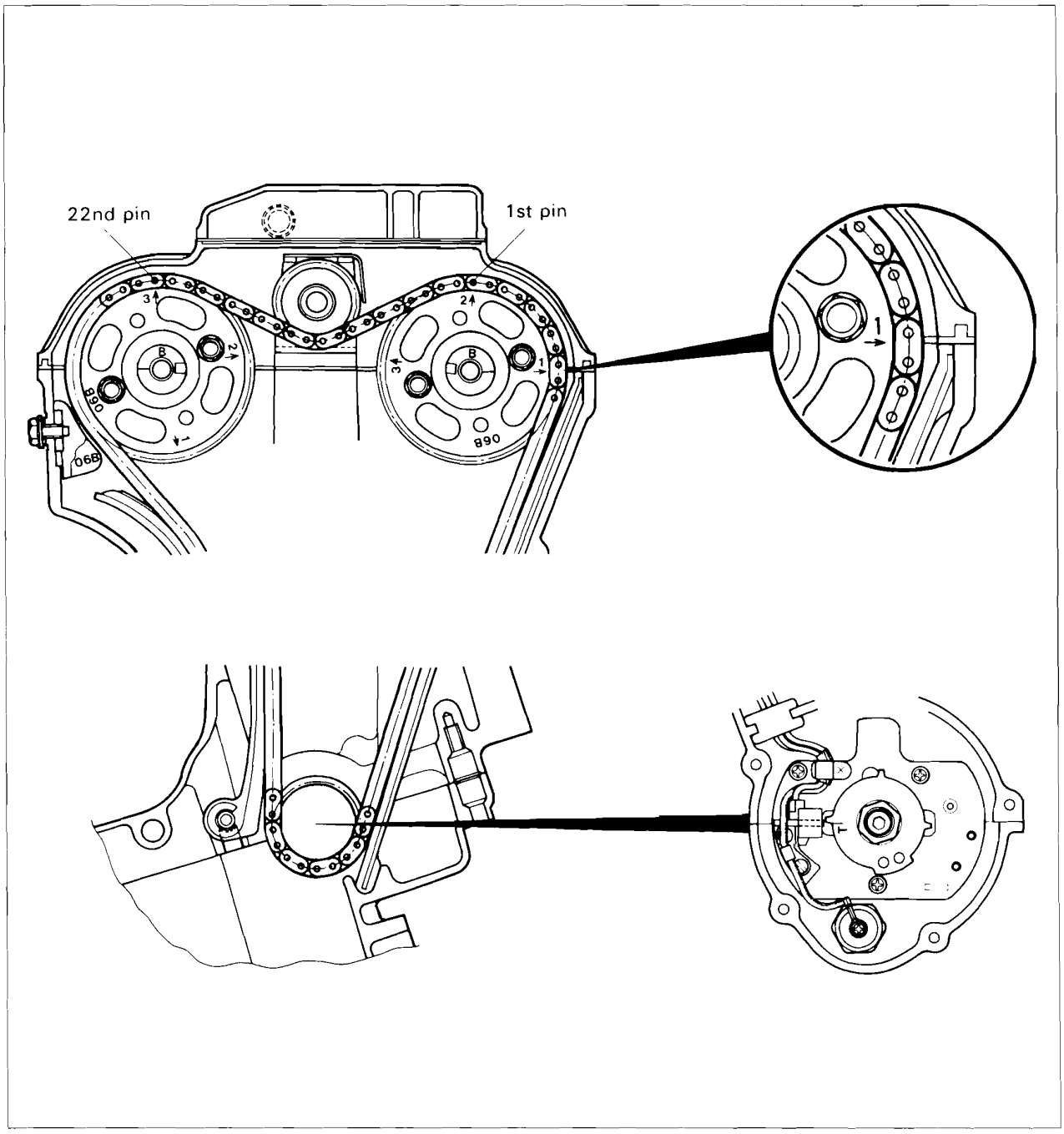


- The other arrow marked "2" is now pointing straight upward. Count the chain roller pins toward the intake camshaft, starting from the roller pin directly above this arrow marked "2" and ending with the 22nd roller pin. Engage the cam chain with intake sprocket, locating the 22nd pin at the above the arrow marked "3" on the intake sprocket.

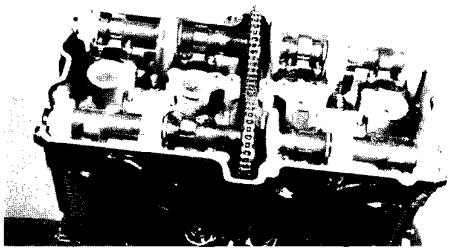
NOTE:

The cam chain is now riding on all three sprockets. Be careful not to disturb the crankshaft until the ten camshaft journal holders, cam chain idler and cam chain tensioner are secured.





- Each camshaft journal holder is identified with a cast-on letter. Install the dowel pins to each camshaft journal holder.
- Secure the ten camshaft journal holders evenly by tightening the camshaft journal holder bolts sequentially. Try to equalize the pressure by moving the wrench diagonally from one bolt to another and from one camshaft journal holder to another, to push shafts down evenly.

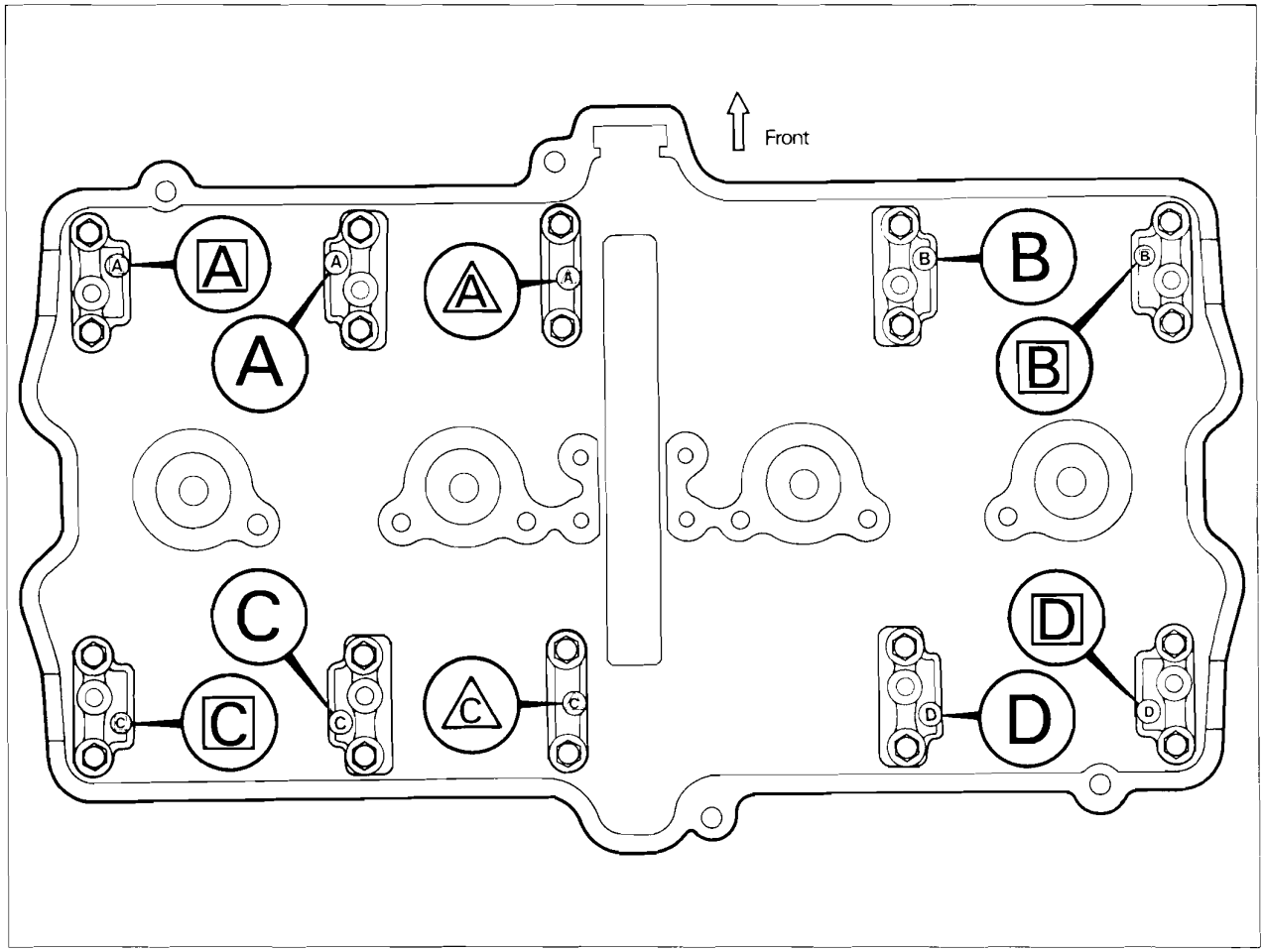


NOTE:
Damage to head or camshaft journal holder thrust surfaces may result if the camshaft journal holders are not drawn down evenly.

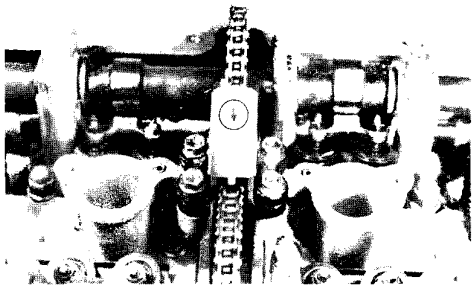
- Tighten the camshaft journal holder bolts to the specified torque.

Tightening torque: 8 – 12 N.m
(0.8 – 1.2 kg-m, 6.0 – 8.5 lb-ft)

CAUTION:
The camshaft journal holder bolts are made of special material and much superior in strength compared with other type of high strength bolts.
Take special care not to use other types of bolts instead of these special bolts. To identify these bolts, each of them has a figure "9" on its head.



NOTE:
Be sure to face the arrow mark on the cam chain idler to the front.

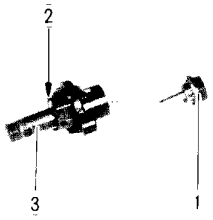


- Tighten the four bolts to the specified torque.

Tightening torque: 9 – 11 N·m
(0.9 – 1.1 kg-m, 6.5 – 8.0 lb-ft)

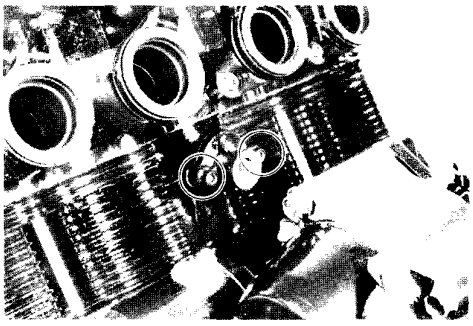
- Pour about 50 ml of engine oil in each oil pocket in the head.

- After removing the spring holder bolt ① and spring, unlock the rachet mechanism ② and push in the push rod ③ all the way.



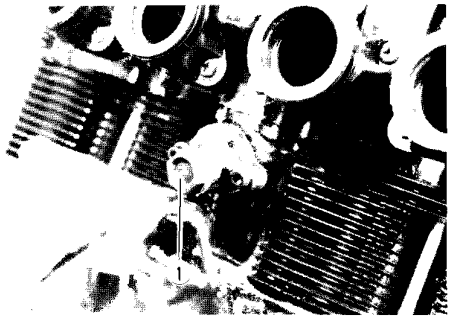
- Install a new gasket and the cam chain tensioner to the cylinder block with two bolts and tighten them to the specified torque.

Tightening torque: 6 – 8 N·m
(0.6 – 0.8 kg-m, 4.5 – 6.0 lb-ft)



- Insert the spring into the cam chain tensioner and tighten the spring holder bolt ① to the specified torque.

Tightening torque: 30 – 45 N·m
(3.0 – 4.5 kg-m, 21.5 – 32.5 lb-ft)



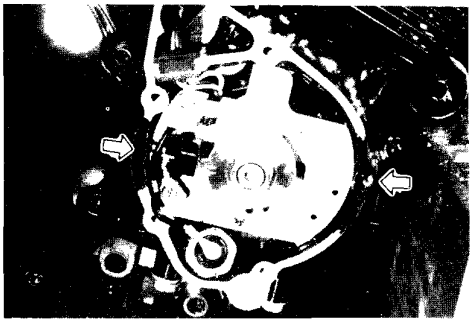
CAUTION:
After installing the cam chain tensioner, check to be sure that the tensioner work properly by checking the slack of cam chain.

NOTE:
Turn the crankshaft and check that all the moving parts such as cam follower, camshaft, work properly.

CAUTION:
Be sure to check and adjust the valve clearance. (Refer to page 2-5.)

- Coat SUZUKI Bond No. 1207B lightly to the portion around mating surface between upper and lower crankcases as shown in the Fig.

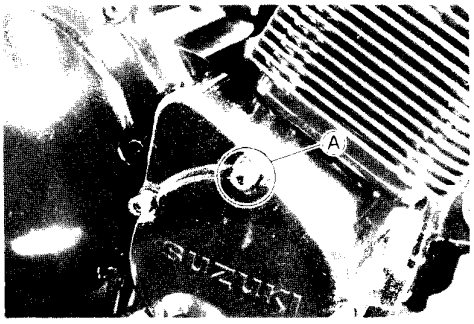
99104-31140: SUZUKI Bond No. 1207B



- Install a new gasket and the signal generator cover with five bolts.

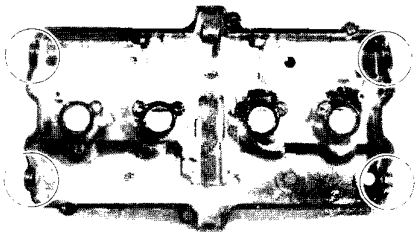
NOTE:
Fit up the gasket to the signal generator cover bolt Ⓐ correctly as shown in the Fig.

CAUTION:
Use a new gasket to prevent oil leakage.



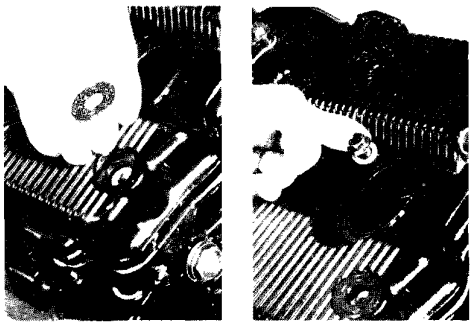
- Before installing the cylinder head cover gaskets on the cylinder head cover, apply SUZUKI Bond No. 1207B to the grooves of the head cover.
- Apply SUZUKI Bond No. 1207B to the four cam end caps of the gasket and shown in the Fig.

99104-31140: SUZUKI Bond No. 1207B



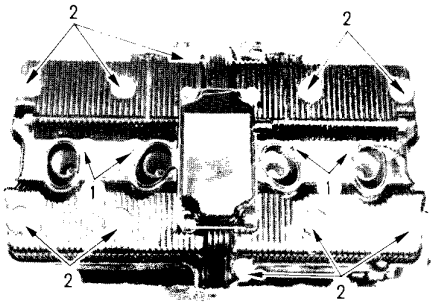
- Place the cylinder head cover on the cylinder head.
- Fit up the four gaskets to each head cover union bolt.
- Seat the eight gaskets to each exact position.

CAUTION:
Replace the gaskets with new ones to prevent oil leakage.



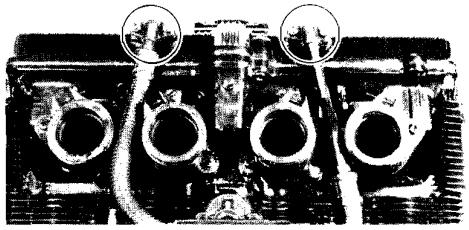
- After tightening the head cover union bolts ① to the specified torque, tighten the head cover bolts ② to the specified torque.

Tightening torque
Head cover union bolt ①: 13 – 15 N·m
(1.3 – 1.5 kg-m, 9.5 – 11.0 lb-ft)
Head cover ②: 13 – 15 N·m
(1.3 – 1.5 kg-m, 9.5 – 11.0 lb-ft)

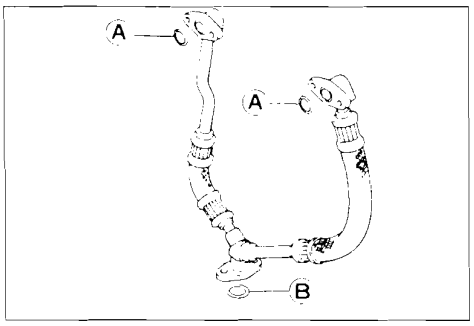


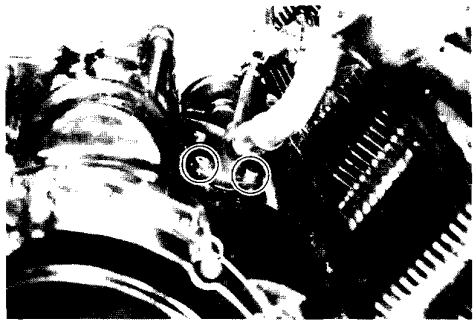
- Place the right and left oil hoses and tighten the bolts to the specified torque.

Tightening torque: 8 – 12 N·m
(0.8 – 1.2 kg-m, 6.0 – 8.5 lb-ft)

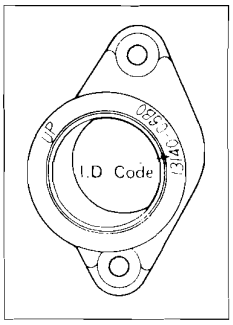


CAUTION:
Replace the O-rings (Ⓐ and Ⓑ) with new ones to prevent oil leakage.





NOTE:
When replacing the intake pipes, identify the four different intake pipes according to each I.D. code.
(13110-06B0 for No. 1)
(13120-06B0 for No. 2)
(13130-06B0 for No. 3)
(13140-06B0 for No. 4)



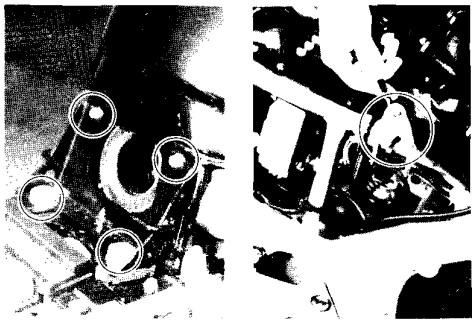
CAUTION:
Use a new O-ring to prevent sucking air from the joint.

FUEL AND LUBRICATION SYSTEM

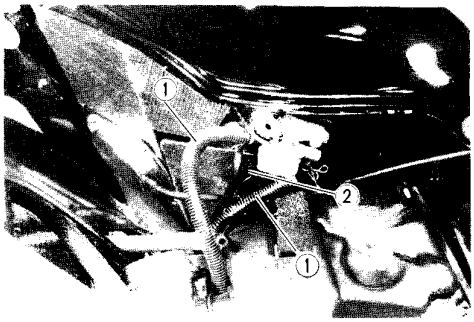
CONTENTS

FUEL TANK, FUEL COCK AND FUEL LEVEL GAUGE

FUEL TANK REMOVAL

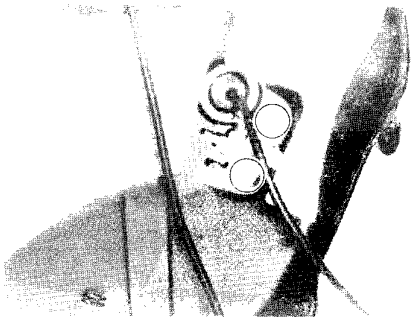


- Remove the seat and frame covers.
- Turn the fuel cock to "ON" position.
- Remove the fuel tank bracket by removing the bolts.
- Disconnect the fuel level gauge lead wires.



- Slide the fuel tank backward and lift up it, and disconnect the fuel hoses ① by sliding the clips and vacuum hose ②.
- Remove the fuel tank assembly.

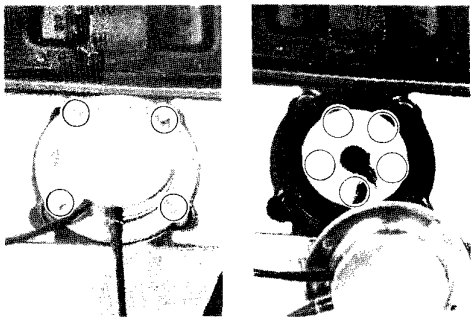
FUEL COCK REMOVAL



- Remove the fuel cock assembly by removing the two bolts.

WARNING:
Gasoline is very explosive. Extreme care must be taken. Gasket must be replaced with a new one to prevent fuel leakage.

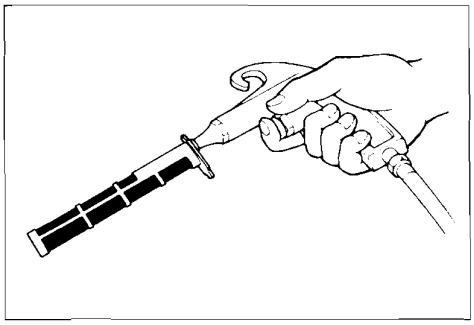
FUEL GAUGE REMOVAL



- Remove the fuel level gauge assembly by removing the four screws and five bolts.

WARNING:
Gasoline is very explosive. Extreme care must be taken. Gasket must be replaced with a new one to prevent fuel leakage.

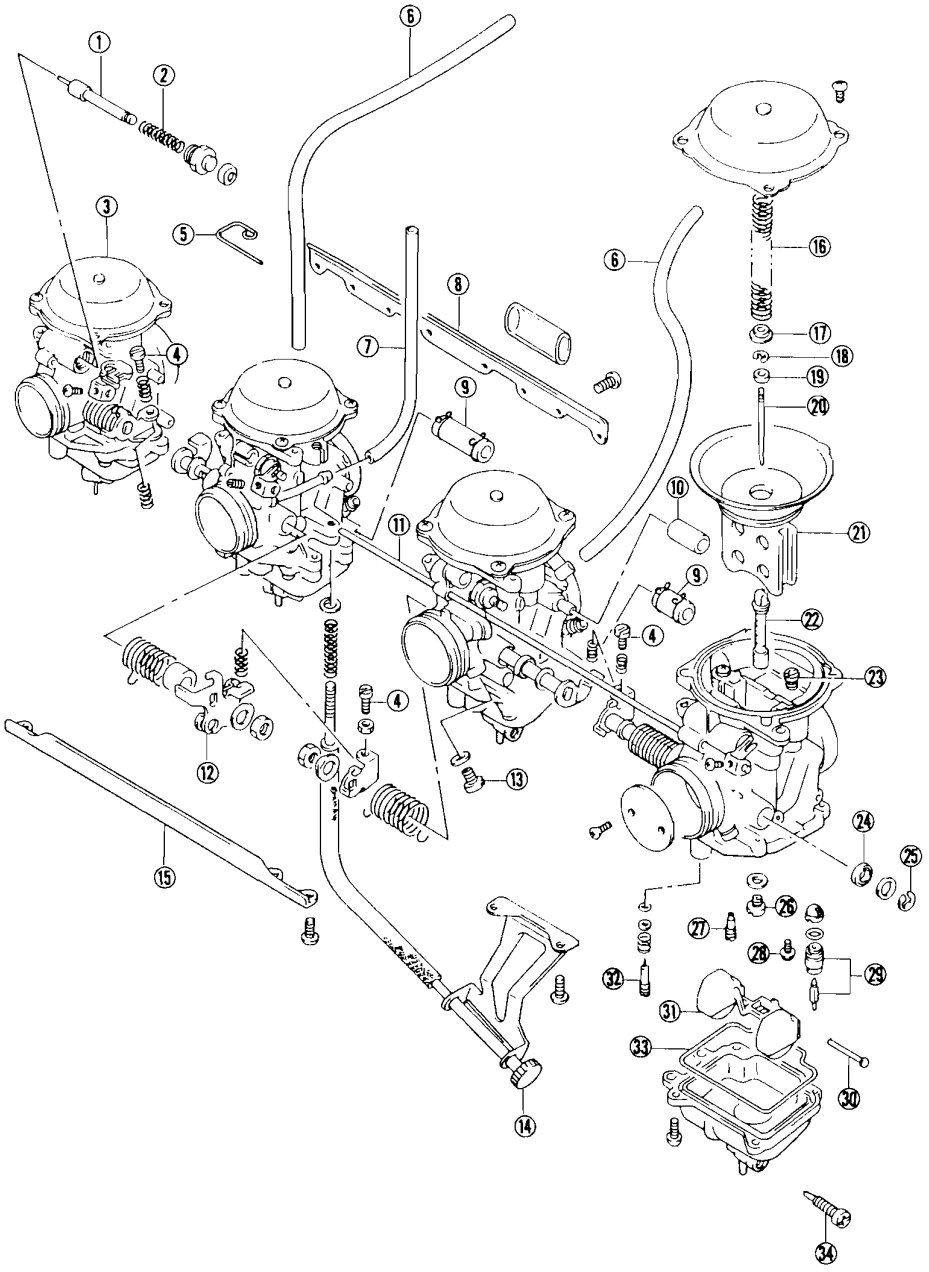
INSPECTION AND CLEANING



If the fuel strainer is dirty with sediment or rust, fuel will not flow smoothly and loss in engine power may result. Clean the fuel strainer with compressed air.

CARBURETOR

CARBURETOR CONSTRUCTION



① Starter Plunger
② Spring
③ Top cap
④ Balance screw
⑤ Throttle cable guide
⑥ Air vent hose
⑦ Vacuum hose
⑧ Carb. set upper plate
⑨ Fuel hose connector
⑩ Air vent connector
⑪ Starter shaft
⑫ Throttle lever
⑬ Vacuum inspection screw
⑭ Throttle stop screw
⑮ Carb. set lower plate
⑯ Spring
⑰ Spring seat
⑱ E-ring
⑲ Washer
⑳ Jet needle
㉑ Piston valve
㉒ Needle jet
㉓ Pilot air jet
㉔ Oil seal
㉕ E-ring
㉖ Main jet
㉗ Pilot jet
㉘ Retainer screw
㉙ Needle valve
㉚ Float arm pin
㉛ Float
㉜ Pilot screw
㉝ O-ring
㉞ Drain screw

SPECIFICATIONS

ITEM		SPECIFICATIONS	
		E-03	E-33
Type		MIKUNI BST34SS	←
I.D. NO.		48B11	48B21
Bore		34 mm (1.3 in)	←
Idle r/min.		1100 ± 100 r/min	←
Float height		14.6 ± 1.0 mm (0.57 ± 0.04 in)	←
Main jet	(M.J.)	No.1 & No.4: # 112.5 No.2 & No.3: # 110	←
Main air jet	(M.A.J.)	0.6 mm	←
Jet needle	(J.N.)	5DL11	5DL16
Needle jet	(N.J.)	P-2	P-0
Pilot jet	(P.J.)	# 32.5	# 42.5
By-pass	(B.P.)	0.8, 0.8, 0.8 mm	←
Pilot outlet	(P.O.)	0.8 mm	←
Valve seat	(V.S.)	2.8 mm	←
Starter jet	(G.S.)	# 42.5	←
Pilot screw	(P.S.)	PRE-SET	←
Throttle valve	(Th.V.)	#125	#130
Pilot air jet	(P.A.J.)	#135	#155
Throttle cable play		0.5 – 1.0 mm (0.02 – 0.04 in)	←

E-33: California model
E-03: Other state models

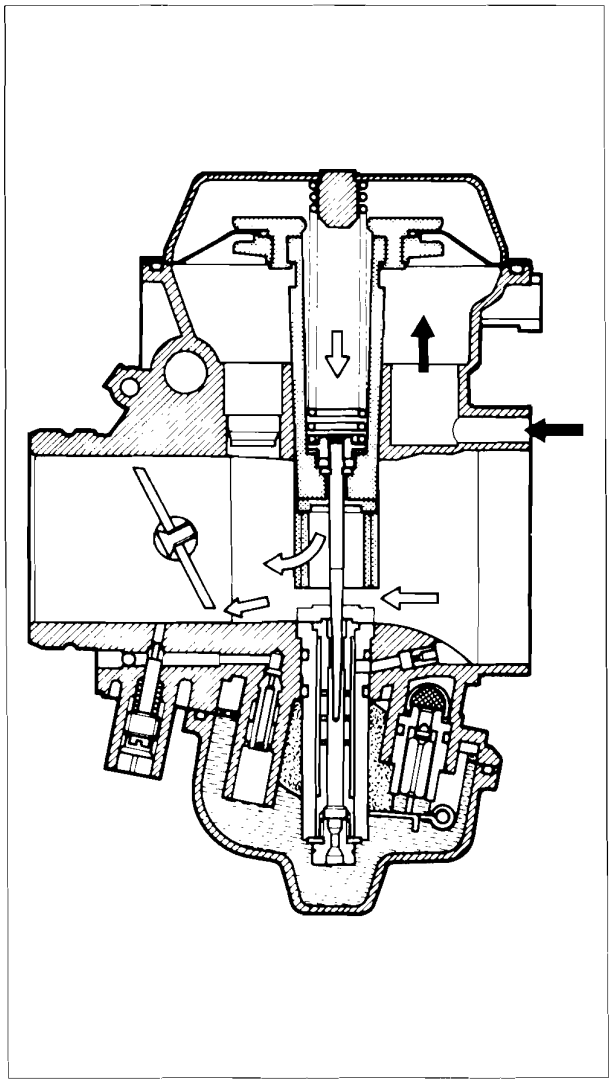
I.D. NO. LOCATION

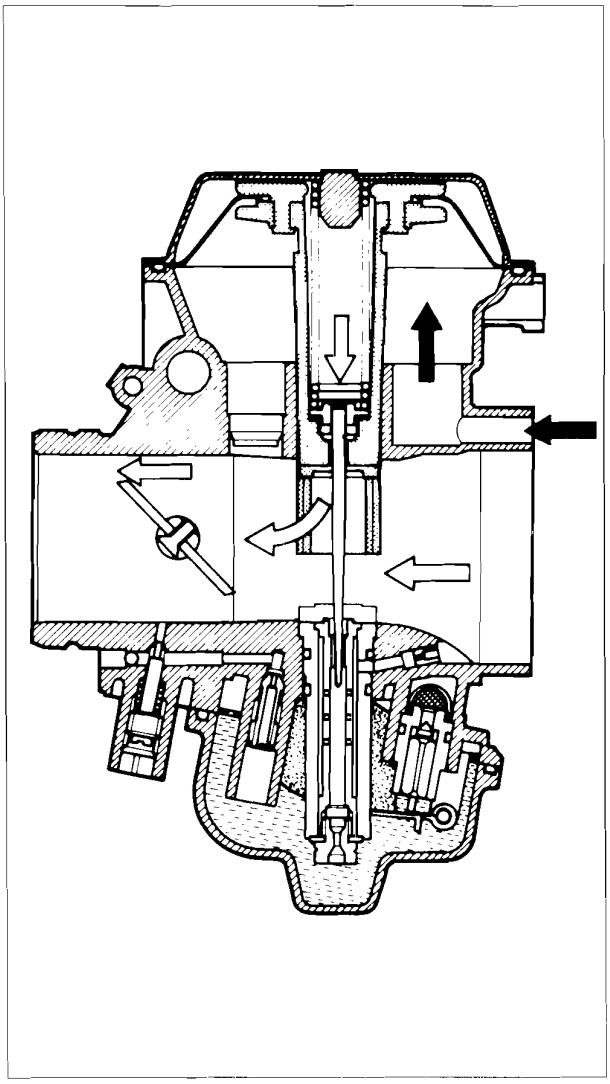
Each carburetor has I.D. Number ① printed on the carburetor body according to its specifications.

DIAPHRAGM AND PISTON OPERATION

The carburetor is a variable-venturi type, whose venturi cross section area is increased or decreased automatically by the piston according to the vacuum present on the downstream side of the venturi. Vacuum is admitted into the diaphragm chamber through an orifice provided in the piston.

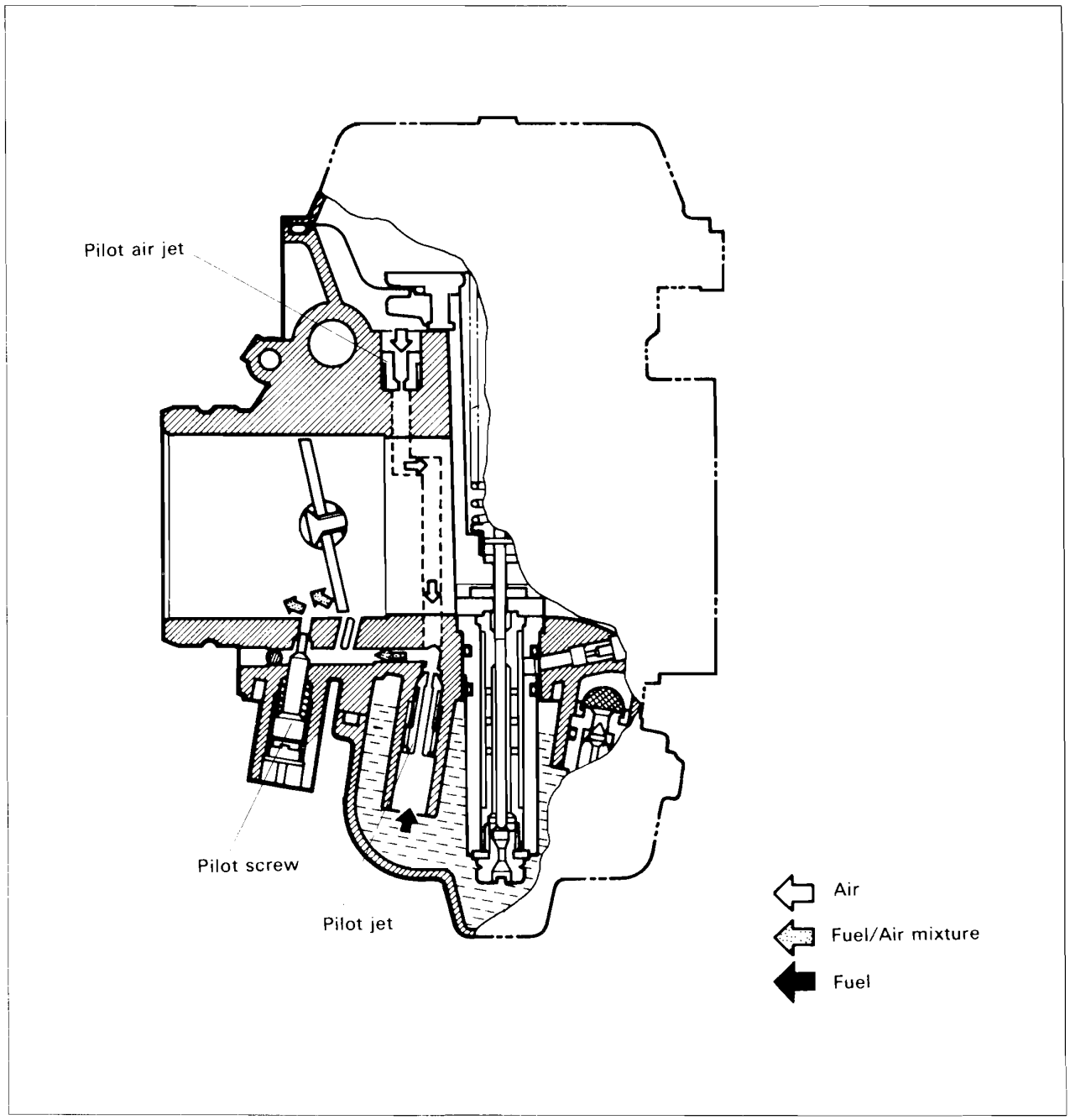
Rising vacuum overcomes the spring force, causing the piston to rise to increase the said area and thus prevent the air velocity from increasing. Thus, air velocity in the venturi passage is kept relatively constant for improved fuel atomization and for securing and optimum ratio of fuel to air in the mixture.





SLOW SYSTEM

This system supplies fuel during engine operation with throttle valve closed or slight opened.
The fuel from float chamber is metered by pilot jet where it mixes with air coming in through pilot air jet. This mixture, rich with fuel , then goes up through pilot pipe to pilot screw. A part of the mixture is discharged into the main bore out of bypass ports. The remainder is then metered by pilot screw and sprayed out into the main bore through pilot outlet.



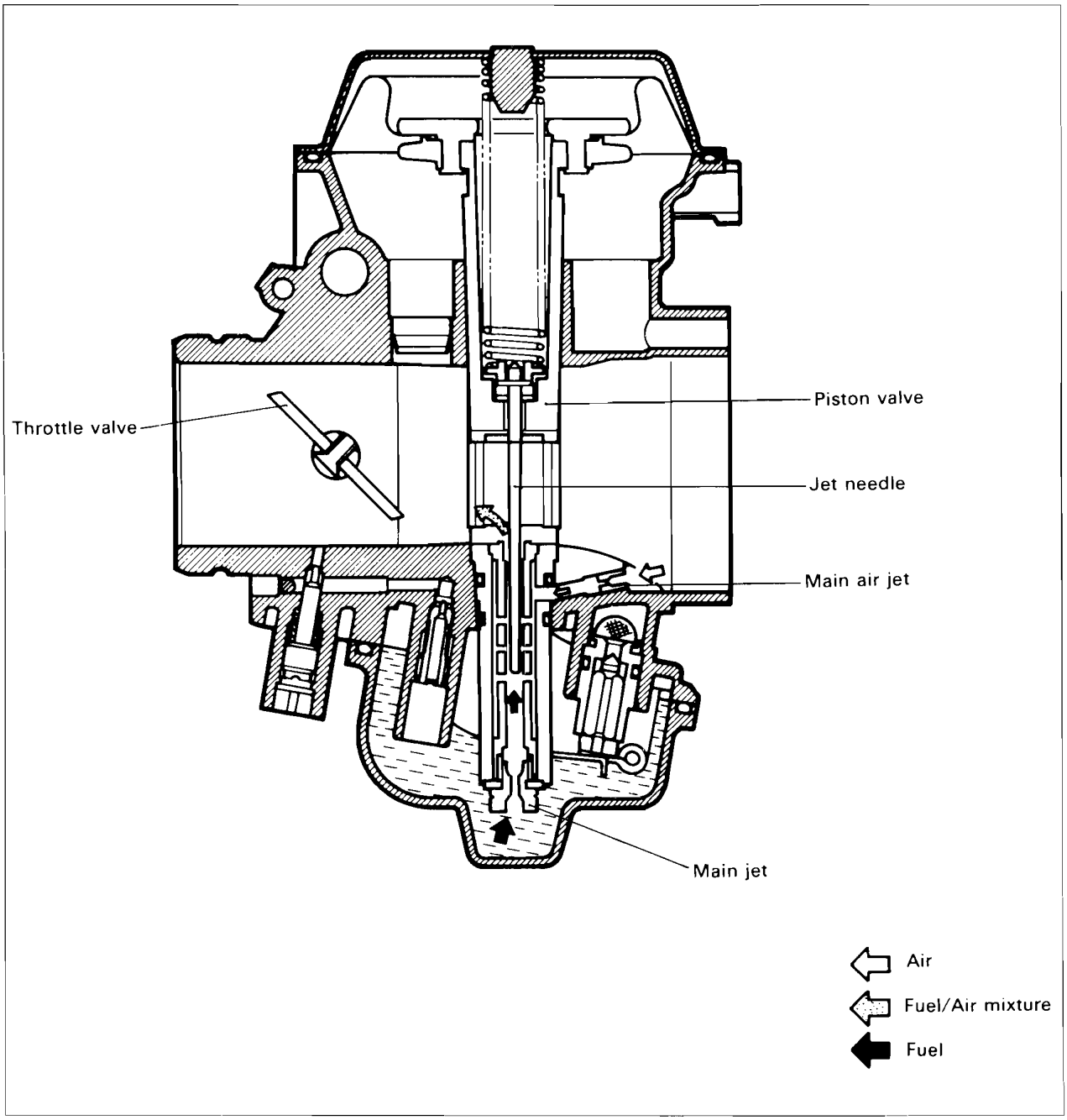
MAIN SYSTEM

As throttle valve is opened, engine speed rises, and this increases vacuum in the venturi. Consequently the piston valve moves upward.

Meanwhile, the fuel in float chamber is metered by main jet, and the metered fuel enters needle jet, in which it mixes with the air admitted through main air jet to form an emulsion.

The emulsified fuel then passes through the clearance between needle jet and jet needle, and is discharged into the venturi, in which it meets main air stream being drawn by the engine.

Mixture proportioning is accomplished in needle jet; the clearance through which the emulsified fuel must flow is large or small, depending ultimately on throttle position.

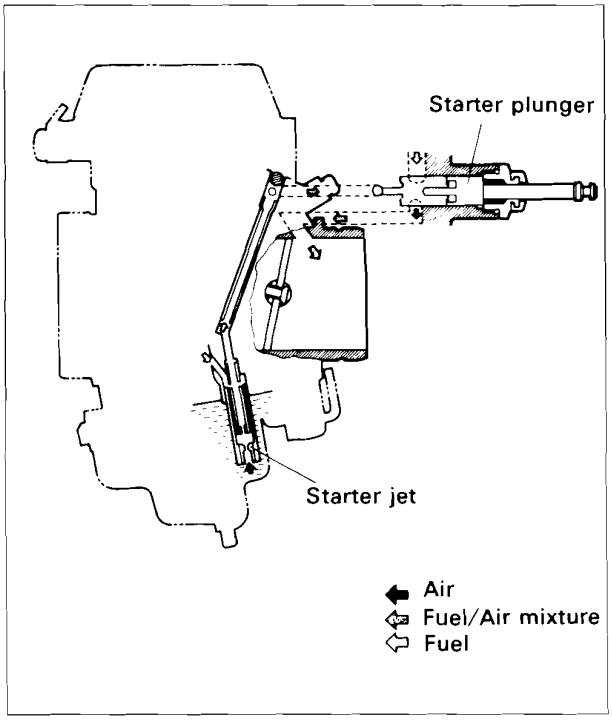


STARTER SYSTEM

Turning the choke (or starter) lever allows starting plunger to draw fuel into the starter circuit from the float chamber.

Starter jet meters this fuel, which then flows into starter pipe and mixes with the air coming from the float chamber. The mixture, rich in fuel content, reaches starting plunger and mixes again with the air coming through a passage extending from behind the diaphragm.

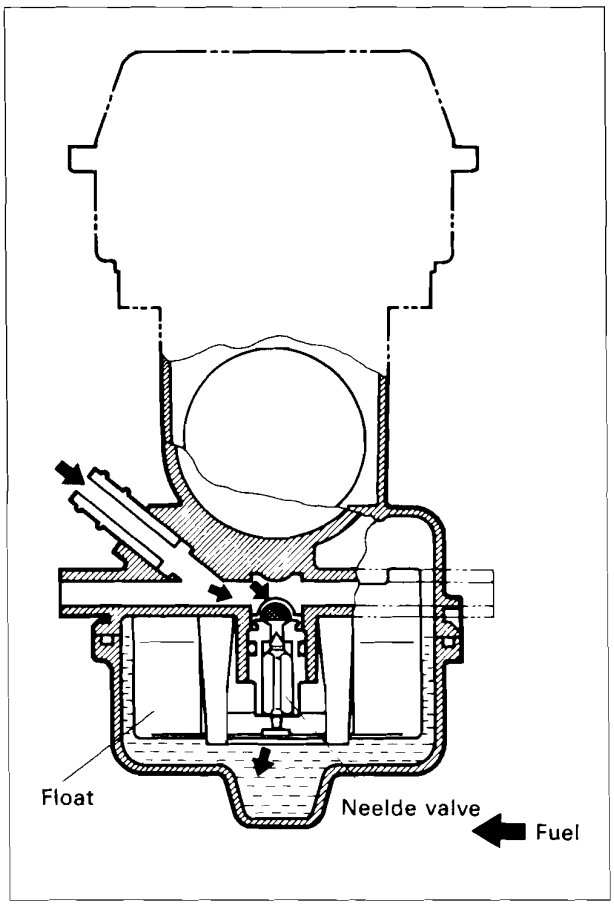
The two successive mixings of fuel with air are such that proper fuel/air mixture for starting is produced when the mixture is sprayed out through starter outlet into the main bore.



FLOAT SYSTEM

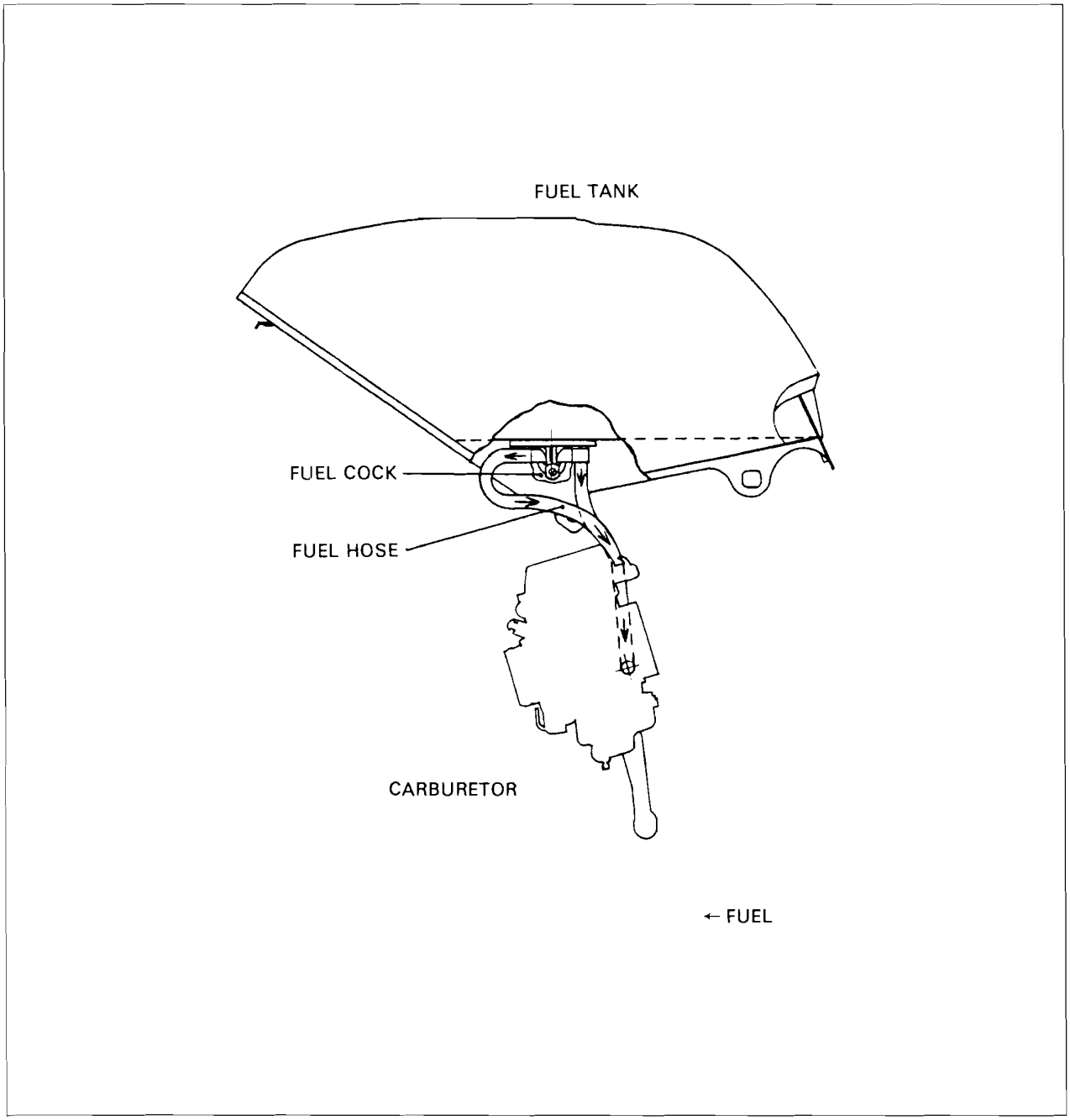
Floats and needle valve are associated with the same mechanism, so that, as the floats move up and down, the needle valve too moves likewise. When fuel level is up in float chamber , floats are up and needle valve remains pushed up against valve seat. Under this condition, no fuel enters the float chamber.

As the fuel level falls, floats go down and needle valve unseats itself to admit fuel into the chamber. In this manner, needle valve admits and shuts off fuel alternately to maintain a practically constant fuel level inside the float chamber.



FUEL SYSTEM

When turning starter motor, negative pressure is generated in the combustion chamber. This negative pressure works on the diaphram of fuel cock through passageway provided in the carburetor main bore and vacuum pipe, and diaphragm builds up a negative pressure which is higher than the spring pressure. Fuel valve is forced to open due to diaphragm operation , and thus allows fuel to flow into carburetor float chamber.



REMOVAL

Refer to page 3-4.

DISASSEMBLY

Disassemble the carburetor as shown in the illustration on page 4-2.

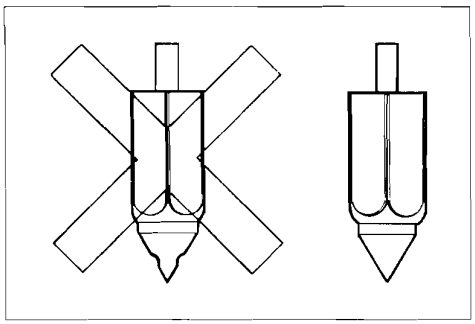
INSPECTION

Check following items for any damage or clogging.

* Pilot jet
* Main jet
* Pilot air jet
* Main air jet
* Needle jet air bleeding holes
* Float
* Needle valve mesh and O-ring
* Diaphragm
* Gasket and O-ring
* Throttle valve shaft oil seals
* Pilot screw bleeding holes
* Pilot outlet and bypass holes

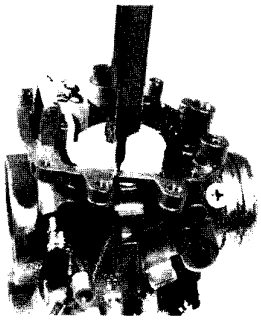
NEEDLE VALVE INSPECTION

If foreign matter is caught between the valve seat and the needle, the gasoline will continue flowing and cause it to overflow. If the seat and needle are worn beyond the permissible limits, similar trouble will occur. Conversely, if the needle sticks, the gasoline will not flow into the float chamber. Clean the float chamber and float parts with gasoline. If the needle is worn as shown in the illustration, replace it together with a valve seat. Clean the fuel passage of the mixing chamber with compressed air.

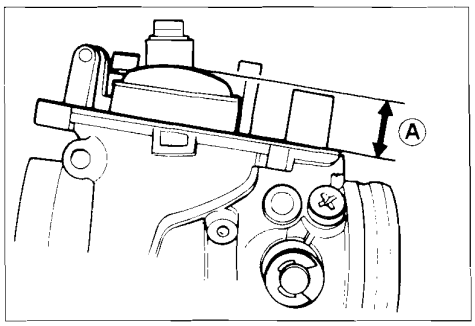


FLOAT HEIGHT ADJUSTMENT

To check the float height, invert the carburetor body, with the float arm kept free, measure the height Ⓐ while float arm is just in contact with needle valve by using calipers.
Bend the tongue ① as necessary to bring the height Ⓐ to this value.



Float height Ⓐ: 14.6 ± 1.0 mm
09900-20102: Vernier calipers

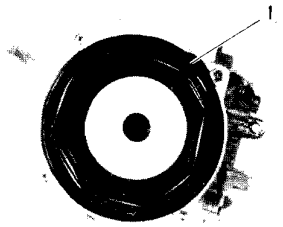


REASSEMBLY AND REMOUNTING

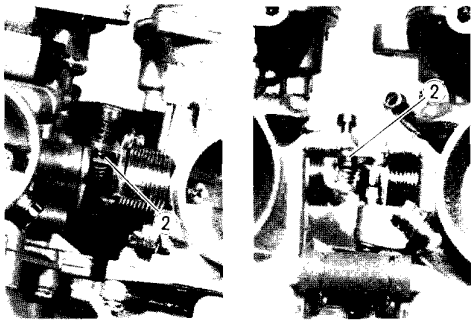
Reassemble and remount the carburetor assembly in the reverse order of disassembly and removal.

Pay attention to the following points:

- Place the tongue ① of diaphragm to carburetor body properly.

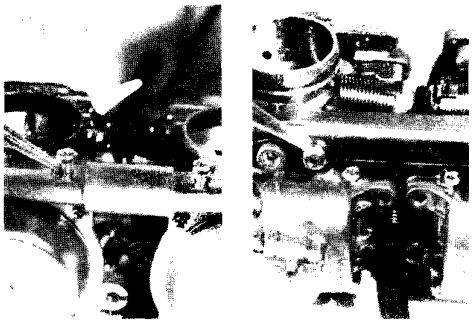


- When engaging two carburetors or two pairs of carburetors, position the throttle valve control lever ② correctly.

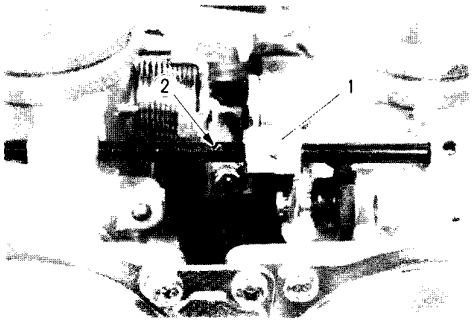


- Apply thread lock cement to the upper and lower plates' screws.

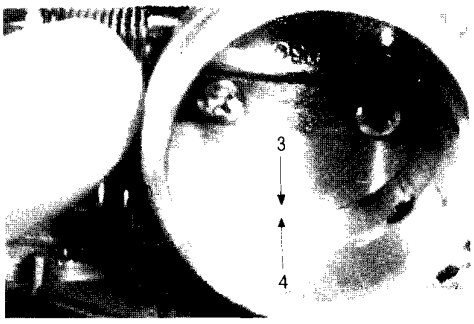
99000-32040: Thread lock cement



- Align the starter shaft securing screw ① with dent mark ② on the starter shaft and grease sliding portions.



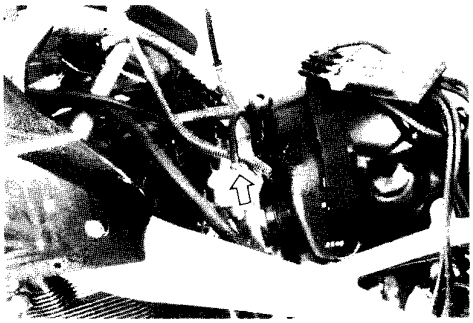
- Set each throttle valve in such a way that its top end ③ meets the foremost by-pass ④. This is accomplished by turning the throttle stop screw and throttle valve balance screws.
- After all work is completed, mount the carburetors on the engine and the following adjustments are necessary.
  - * Engine idle r/min ..... Page 2-9
  - * Throttle cable play ..... Page 2-9
  - * Balancing carburetors ..... Page 4-11



BALANCING CARBURETORS

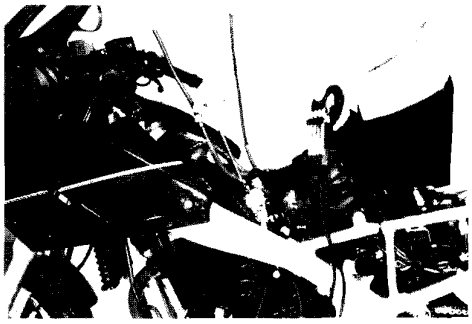
Check the four carburetors for balancing according to the following procedures.

NOTE:
When balancing the carburetors, remove the fuel tank and fuel should be supplied by a separate fuel tank and be sure to plug the fuel cock vacuum line.



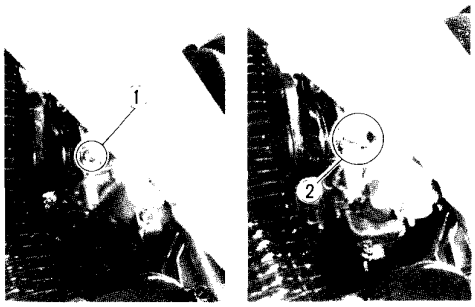
As the first step, calibrate the carburetor balancer gauge as follows.

09913-13121: Carburetor balancer
09913-13180: Adaptor (For No.1 & No.4 carb.)
09913-13190: Adaptor (For No.2 & No.3 carb.)

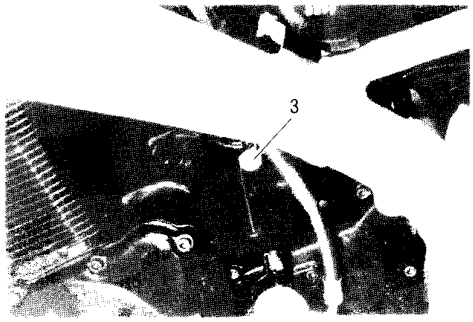


- Start up the engine and run it in idling condition for warming up.
- Stop the warmed-up engine. Remove the vacuum inlet screw ① for No.1 or No.4 cylinder and install adaptor ② with O-ring.

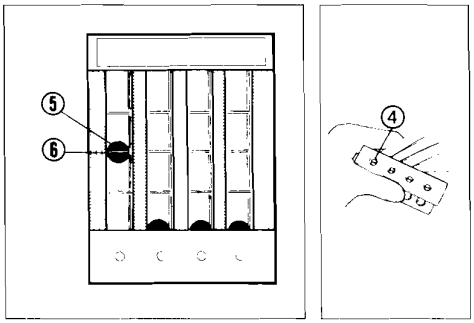
NOTE:
When removing the vacuum inlet screws, be careful not to drop them.



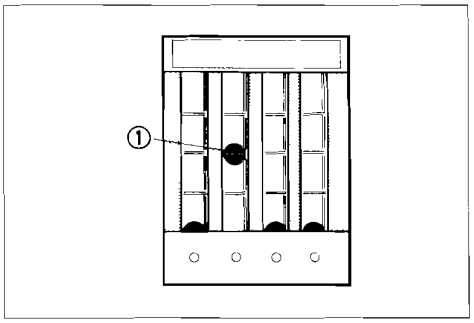
- Connect one of the four rubber hoses of the balancer gauge to this adaptor, and start up the engine, and keep it running at 1750 r/min by turning throttle stop screw ③.



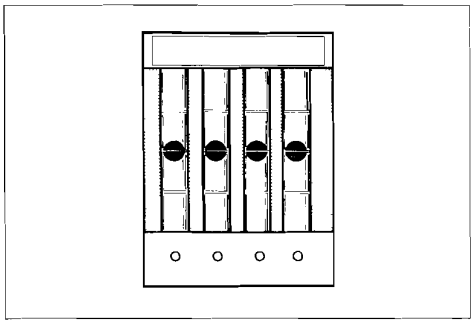
- Turn the air screw ④ of the gauge so that the vacuum acting on the tube of that hose will bring the steel ball ⑤ in the tube to the center line ⑥.



- After making sure that the steel ball stays steady at the center line, disconnect the hose from the adaptor and connect the next hose to the adaptor. Turn air screw to bring the other steel ball ① to the center line.
- Repeat the process on the third and forth tubes. The balancer gauge is now ready for use in balancing the carburetors.



- Remove the respective vacuum inlet screws and insert the adaptors in the holes. Connect the balancer gauge hoses to these adaptors, and balance the four carburetors as follows.
- Start up the engine , and keep it running at 1750 r/min.
- A correctly adjusted carburetor has the steel balls in the Nos.1 through 4 tubes at the same level, as shown.
- If the steel balls are not in correct positions, adjust the throttle valve balance screws correctly. After adjusting, tighten its lock nut securely.

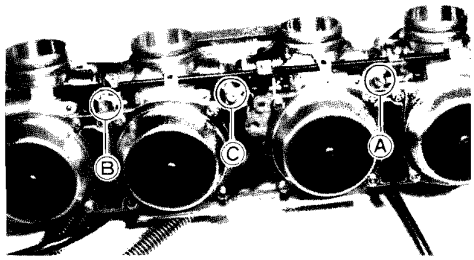


09913-14911: Throttle valve adjust wrench

NOTE:

When adjusting the throttle valve balance screws, adjusting order is as follows:

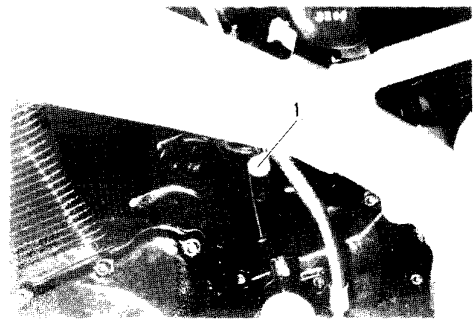
Ⓐ → Ⓑ → Ⓒ



- After balancing the carburetors, set its speed between 1000 and 1200 r/min by turning the throttle stop screw ①.

CAUTION:

Do not disturb the pilot screw. This component is pre-set at the factory by the very specialized equipment.

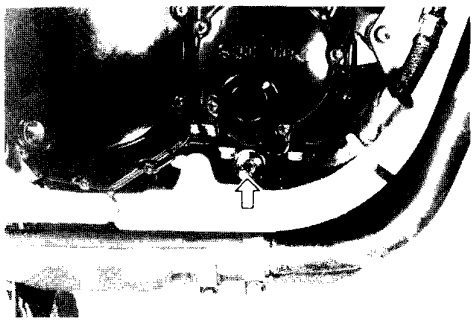


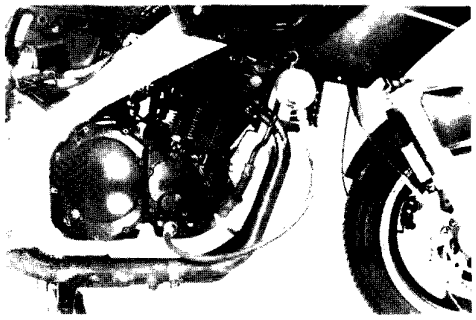
LUBRICATION SYSTEM

OIL PRESSURE

Start the engine and check if the oil pressure indicator light is turned on. If it keeps on lighting, check the oil pressure indicator light circuit. If it is in good condition, check the oil pressure in the following manner:

- Install the oil pressure gauge with the adaptor in the position shown in the figure.
- Warm up the engine as follows:
  Summer 10 min. or so at 2000 r/min
  Winter 20 min. or so at 2000 r/min
- After warming up operation , increase the engine speed to 3000 r/min, and read the oil pressure gauge.





Oil pressure specification
Above 300 kPa (3.0 kg/cm²)
Below 600 kPa (6.0 kg/cm²)
at 3000 r/min. Oil temp. at 60°C (140°F)

09915-74510: Oil pressure gauge
09915-77330: Meter (for high pressure)
09915-74540: Adaptor

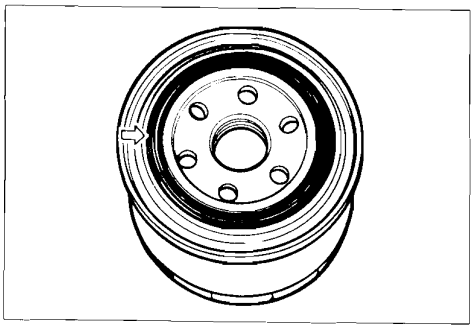
NOTE:
Engine oil must be warmed up to 60°C (140°F) when checking the oil pressure.

If the oil pressure is lower or higher than the specifications, several causes may be considered.

* Low oil pressure is usually the result of a clogged oil filter, oil leakage from the oil passage way, damaged oil seal, a defective oil pump or a combination of these items.
* High oil pressure is usually caused by a engine oil which is too heavy a weight, a clogged oil passage, improper installation of the oil filter or a combination of these items.

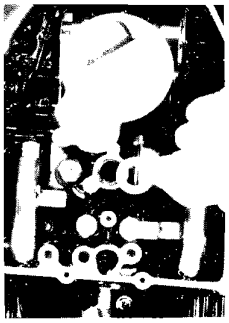
OIL FILTER

NOTE:
Coat the O-ring of oil filter with grease.



OIL SUMP FILTER

At the same time wash the oil pan. Check to be sure that the strainer is free from any sign of rupture and wash the strainer clean periodically. When installing oil sump filter, be sure to face the arrow mark on its oil guide to the front.

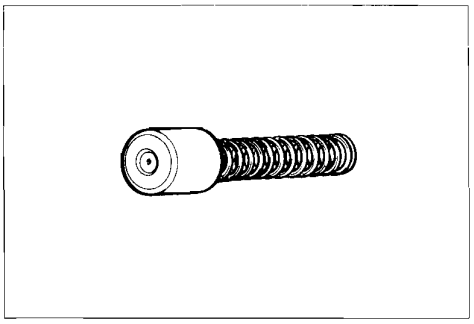


CAUTION:

Replace the oil pan gasket and O-ring with new ones to prevent oil leakage.

RELIEF VALVE

Check the hole of the relief valve for clogging.



OIL COOLER

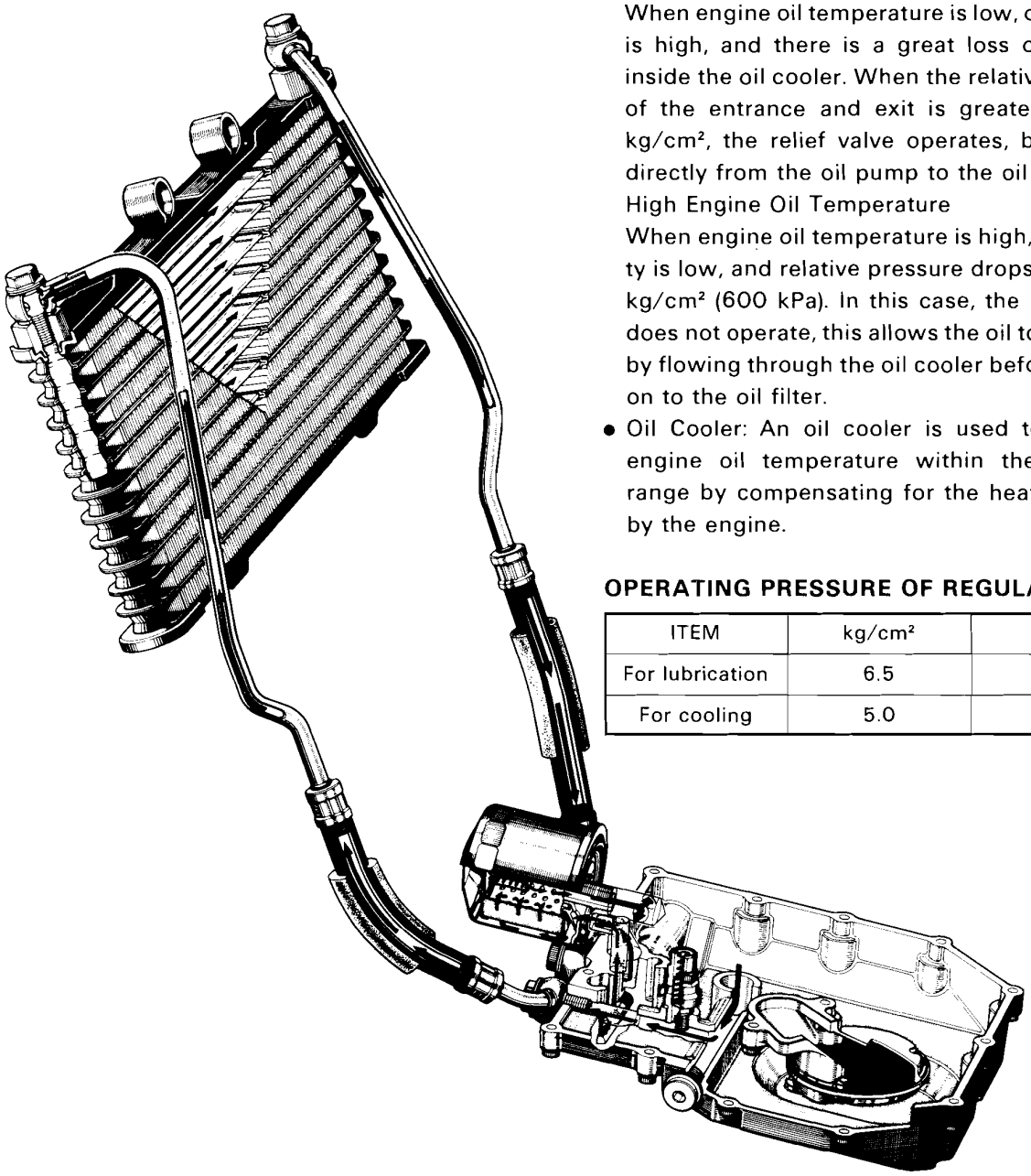
- Oil Pressure Regulator: The oil pressure regulator is threaded into the oil passage in the oil pan.
- Relief Valve: A relief valve is mounted in the oil pan, in a parallel circuit with the oil cooler; when the relative oil pressure between the entrance and exit to the oil cooler exceeds 6.0 kg/cm² (600 kPa), the relief valve operates.

  Low Engine Oil Temperature

  When engine oil temperature is low, oil viscosity is high, and there is a great loss of pressure inside the oil cooler. When the relative pressure of the entrance and exit is greater than 6.0 kg/cm², the relief valve operates, bringing oil directly from the oil pump to the oil filter.

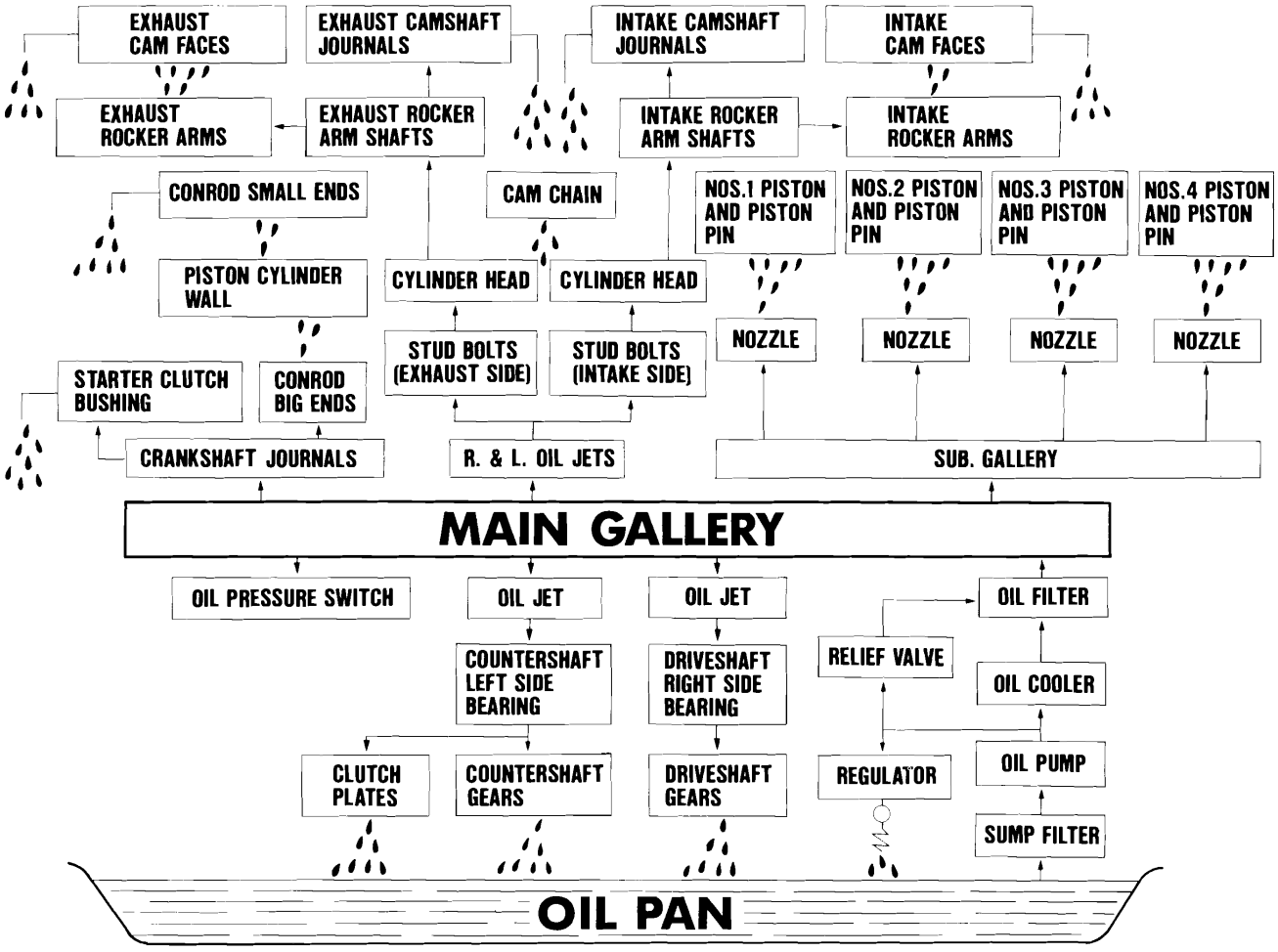
  High Engine Oil Temperature

  When engine oil temperature is high, oil viscosity is low, and relative pressure drops below 6.0 kg/cm² (600 kPa). In this case, the relief valve does not operate, this allows the oil to be cooled by flowing through the oil cooler before passing on to the oil filter.
- Oil Cooler: An oil cooler is used to maintain engine oil temperature within the optimum range by compensating for the heat produced by the engine.

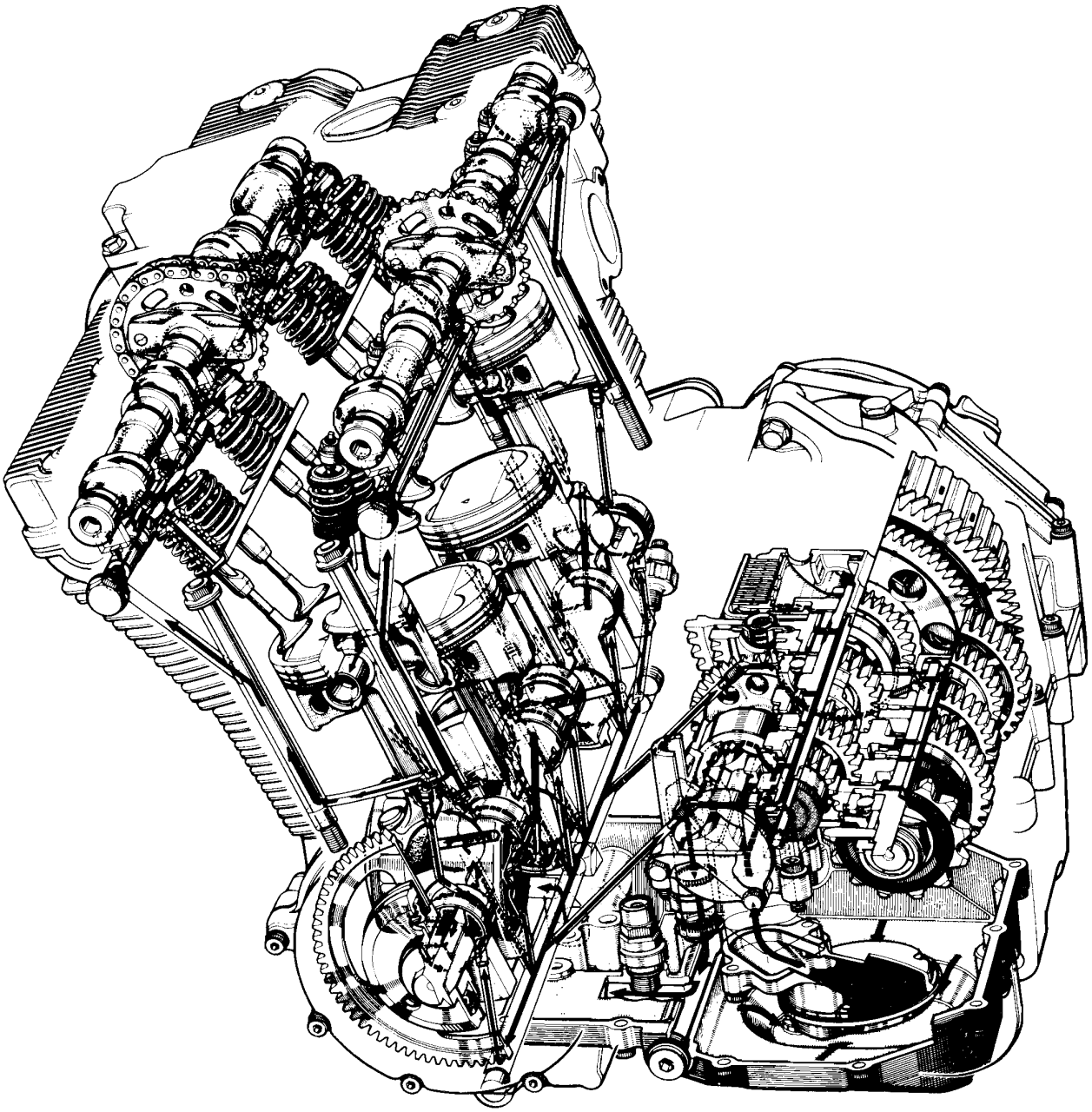


OPERATING PRESSURE OF REGULATORS

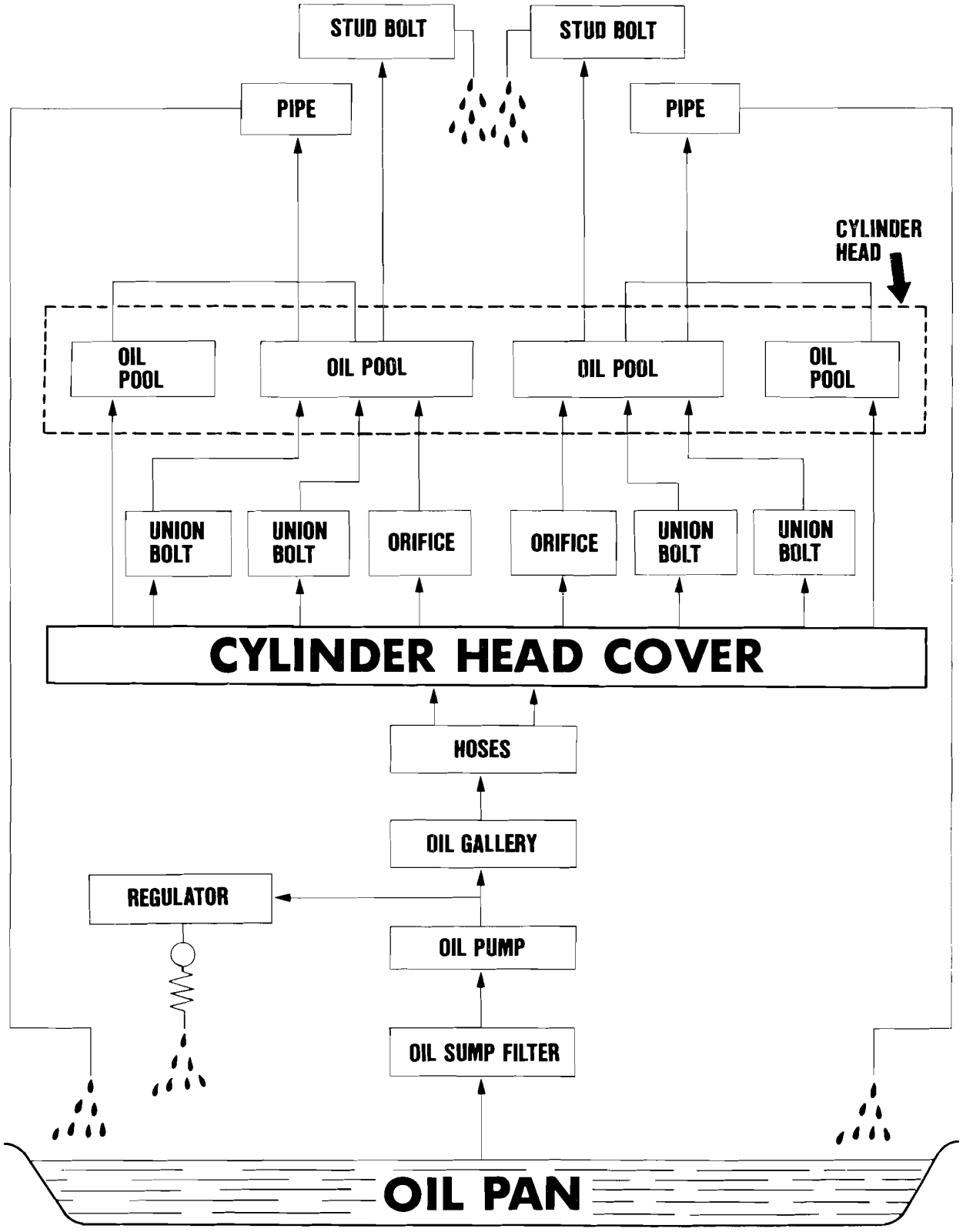
ITEM	kg/cm²	kPa
For lubrication	6.5	650
For cooling	5.0	500



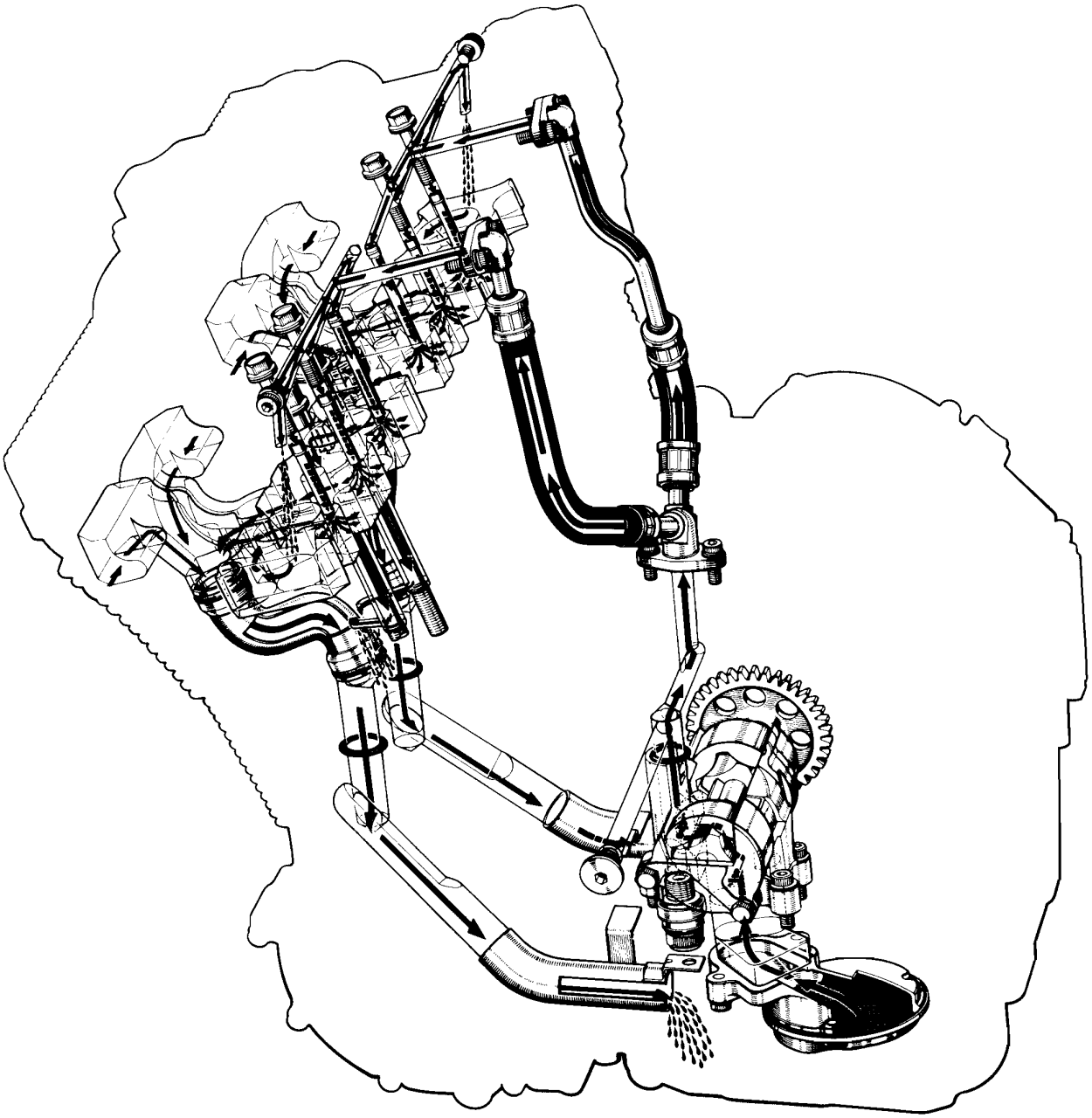
ENGINE LUBRICATION SYSTEM



CYLINDER HEAD COOLING SYSTEM CHART



CYLINDER HEAD COOLING SYSTEM



EMISSION CONTROL INFORMATION

CONTENTS

5

EMISSION CONTROL CARBURETOR COMPONENTS

GSX1100F motorcycles are equipped with precision, manufactured carburetors for emission level control. These carburetors require special mixture control components and other precision adjustments to function properly.

There are several carburetor mixture control components in each carburetor assembly. Three (3) of these components are machined to much closer tolerances than standard machined carburetor jets. These three (3) particular jets – MAIN JET, NEEDLE JET, PILOT JET – must not be replaced by standard jets. To aid in identifying these three (3) jets a different design of letter and number are used. If replacement of these close tolerance jets becomes necessary, be sure to replace them with the same type close tolerance jets marked as in the examples shown below.

The jet needle is also of special manufacture. Only one clip position is provided on the jet needle. If replacement becomes necessary the jet needle may only be replaced with an equivalent performing replacement component. Suzuki recommends that Genuine Suzuki Parts be utilized whenever possible for the best possible performance and durability.

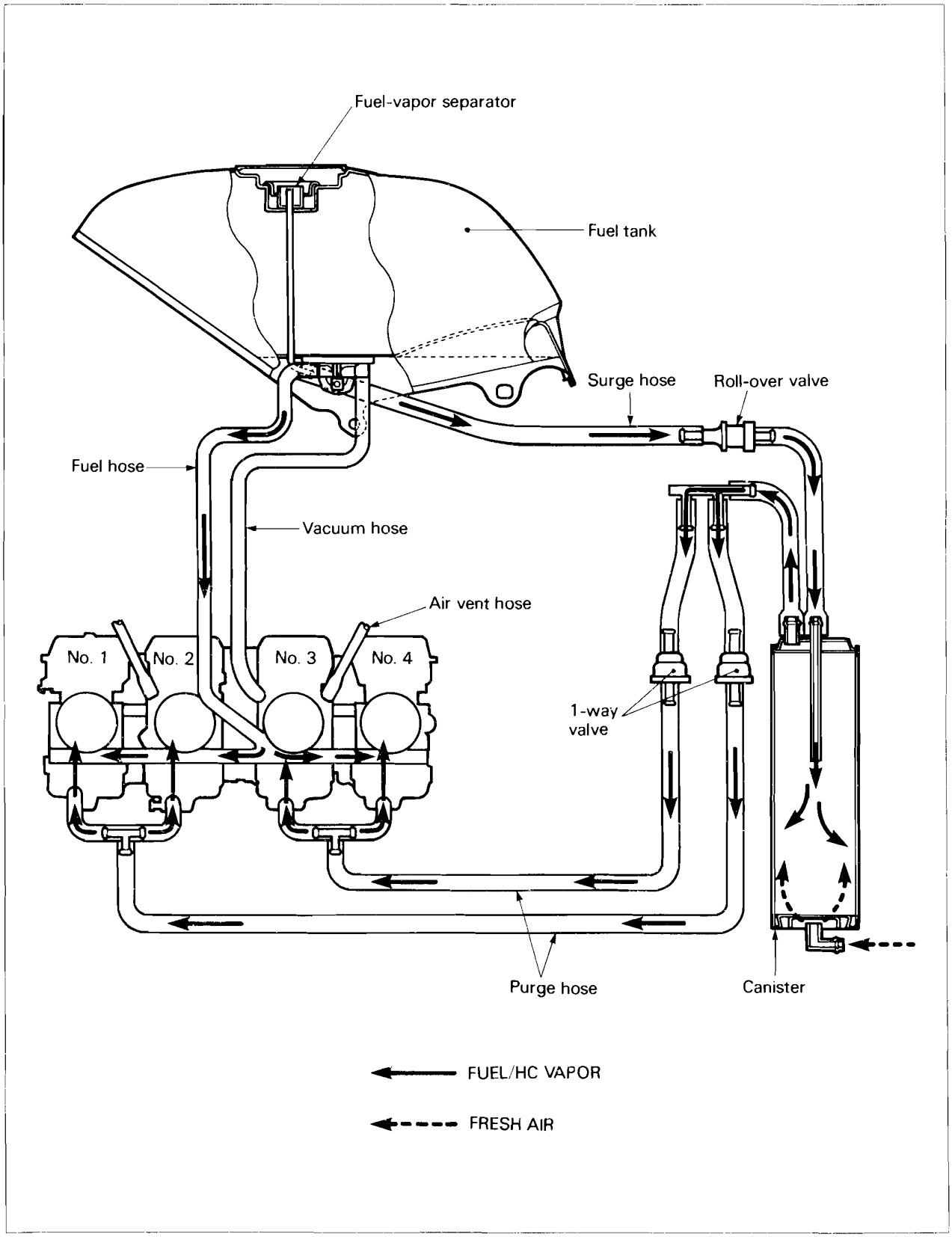
Conventional Figures Used on Standard Tolerance Jet Components	1 2 3 4 5 6 7 8 9 0
Emission Type Figures Used On Close Tolerance Jet Components	1 2 3 4 5 6 7 8 9 0

The carburetor specification for the emission-controlled GSX1100F are as follows.

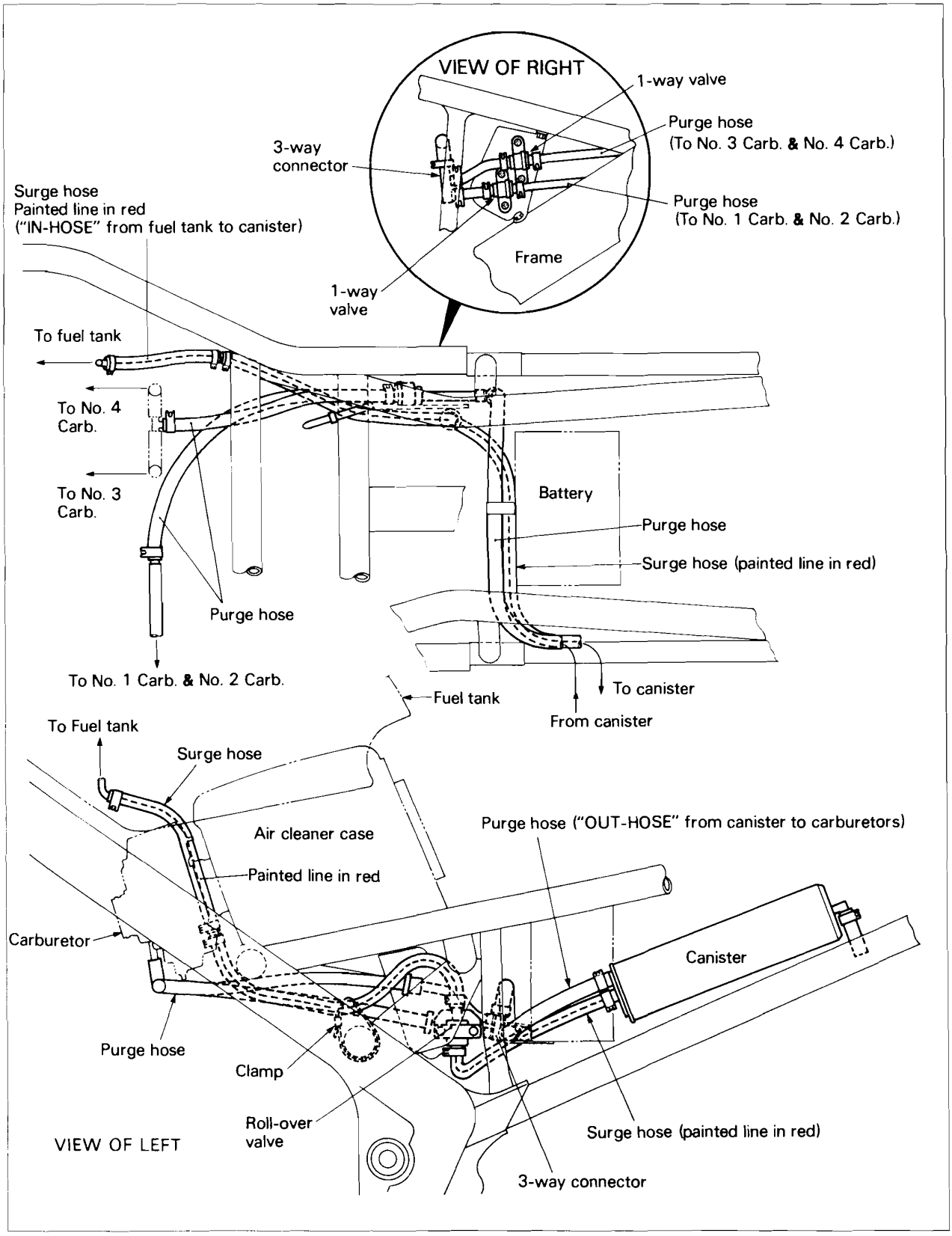
Carburetor I.D. No.	Main Jet	Needle Jet	Jet Needle	Pilot Jet	Pilot Screw
48B11 (Other state models)	No.1 & No.4 : # 112.5	P-2	5DL11	# 32.5	PRE-SET DO NOT ADJUST
48B21 (California model)	No.2 & No.3 : # 110	P-0	5DL16	# 42.5	

The pilot screw is pre-set by the factory utilizing specialized testing and adjusting procedures. The pilot screw is not adjustable as the idle circuit is "sealed" after factory adjustment. Adjusting, interferring with, improper replacement, or resetting of any of the carburetor components may adversely affect carburetor performance and cause the motorcycle to exceed the exhaust emission level limits. If persons, who are unaware of these special carburetor servicing requirements tamper with the carburetors the Suzuki dealer should restore the carburetors to their original condition or if unable to effect repairs, contact the distributors representative for further technical information and assistance.

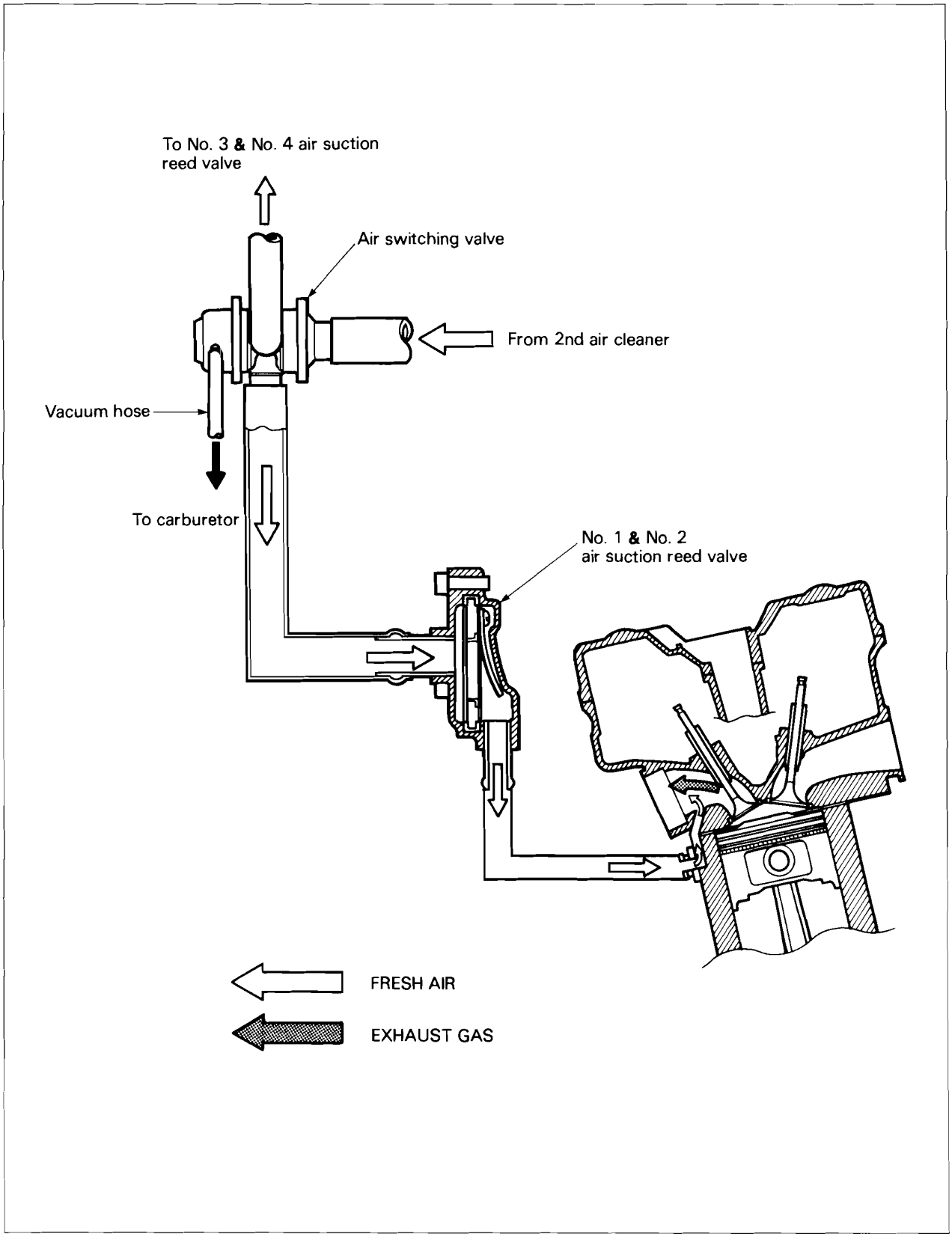
EVAPORATIVE EMISSION CONTROL SYSTEM
(Only for California model)



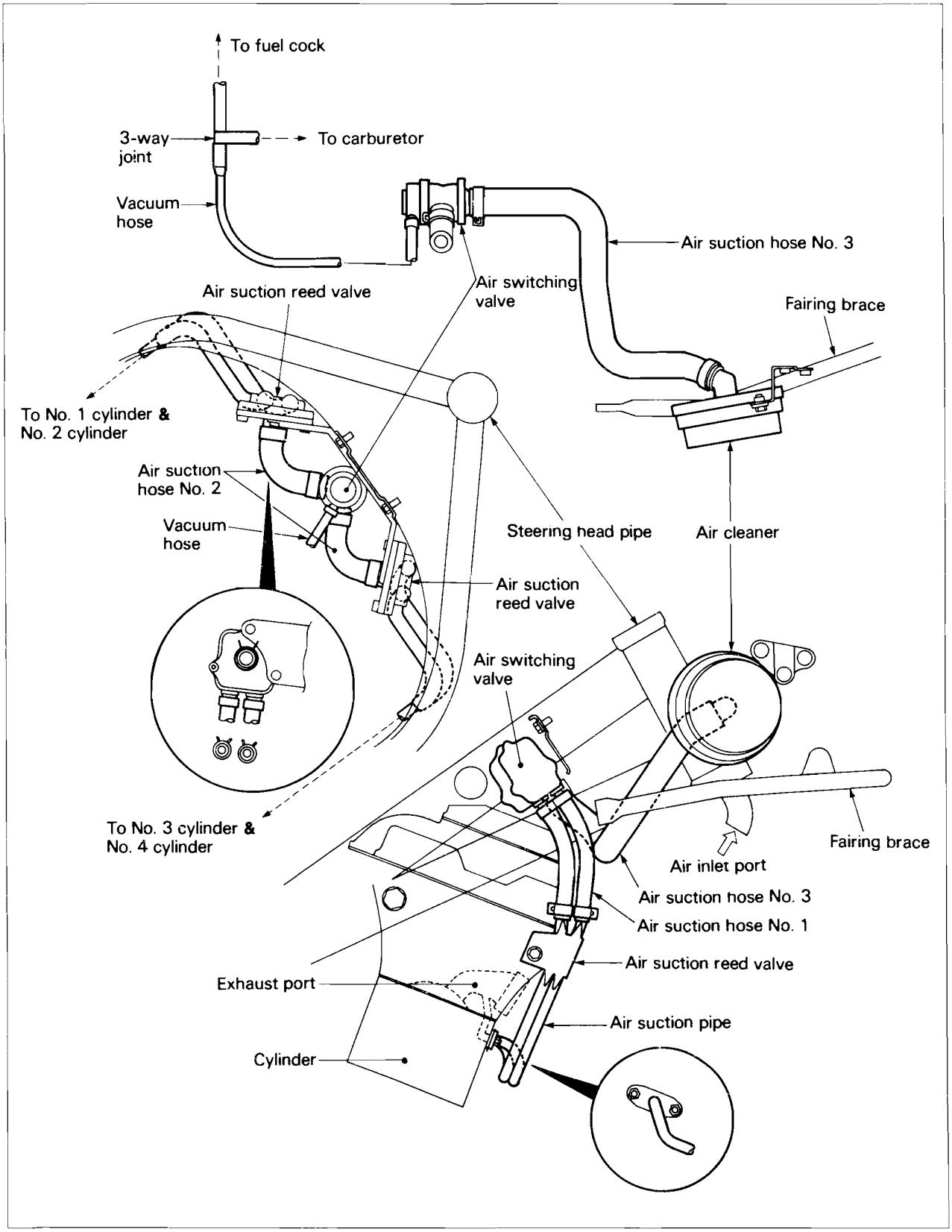
CANISTER HOSE ROUTING (Only for California model)



AIR SUCTION SYSTEM (Only for California model)



AIR SUCTION HOSE ROUTING (Only for California model)



ELECTRICAL SYSTEM

CONTENTS

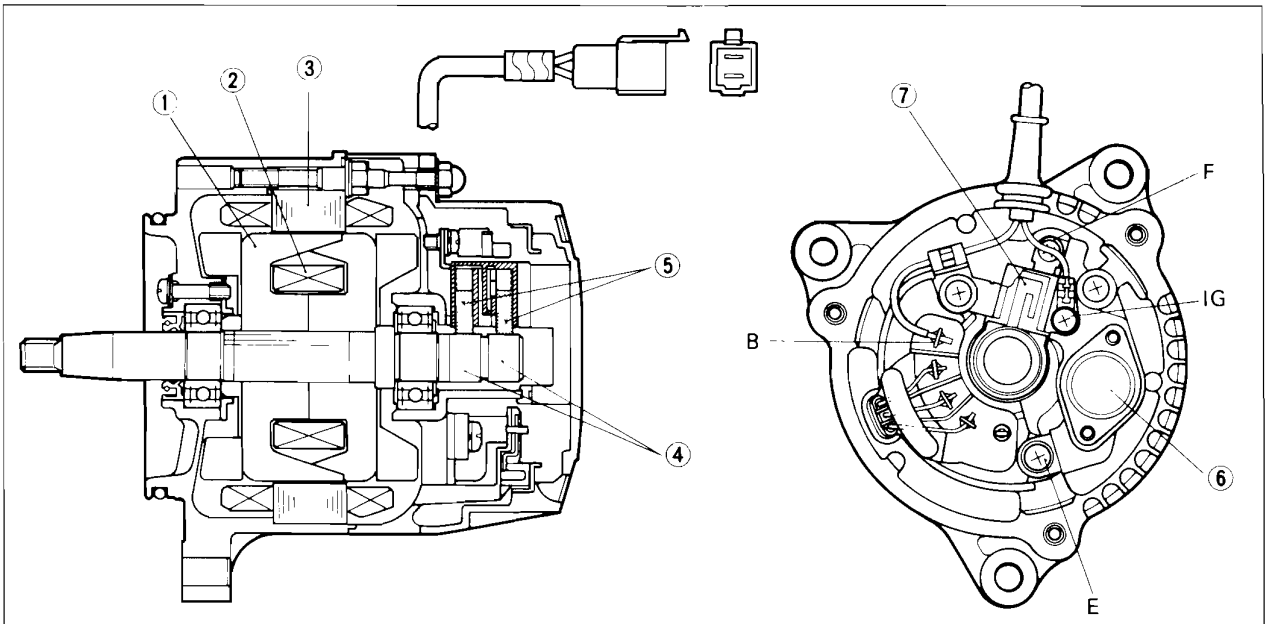
CHARGING SYSTEM

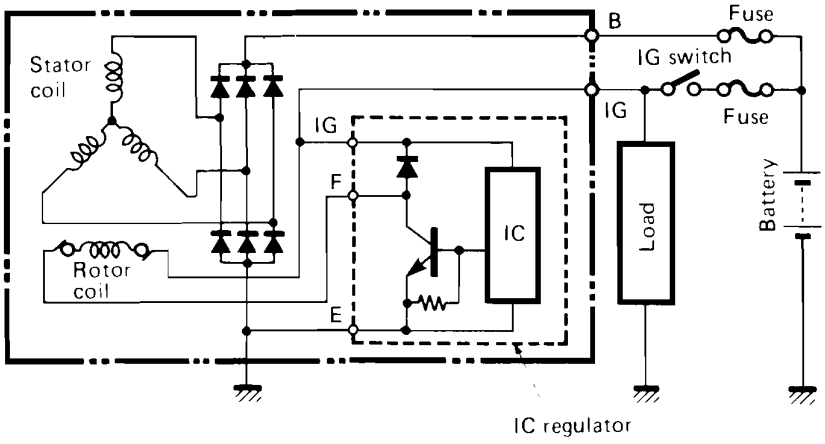
DESCRIPTION (GENERATOR WITH IC REGULATOR)

The generator features a solid state regulator that is mounted inside the generator. All regulator components are enclosed into a solid mold, and this unit is attached to the brush holder frame. The regulator voltage setting cannot be adjusted.

Two brushes carry current through the two slip rings to the rotor coil mounted on the rotor.

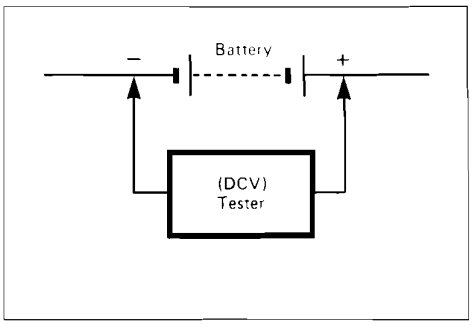
The stator windings are assembled on the inside of a laminated core that forms part of the generator housing. A rectifier bridge connected to the stator windings contains six diodes, and electrically changes the stator A.C. voltages to a D.C. voltage which appears at the generator output terminal.





① Rotor
② Rotor coil
③ Stator coil
④ Slip ring
⑤ Brush
⑥ IC regulator
⑦ Brush holder
B: Battery terminal
IG: Ignition terminal
F: Rotor coil terminal
E: Ground

CHARGING OUTPUT CHECK



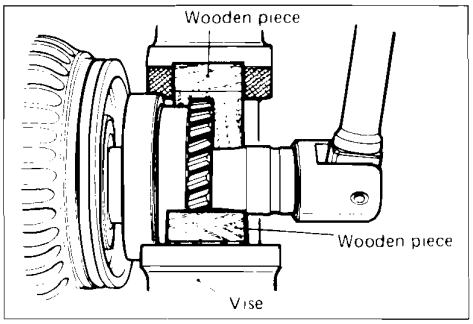
- Remove the seat.
- Start the engine and keep it running at 5000 r/min.
- Using the pocket tester, measure the DC voltage the between the battery terminals , ⊕ and ⊖.
  If the tester reads under 13.5 V, check the generator, regulator and rectifier.

NOTE:
When making this test, be sure that the battery is fully-charged condition.

STD charging output: Above 13.5V (DC) at 5 000 r/min.
09900-25002: Pocket tester

GENERATOR REMOVAL AND DISASSEMBLY

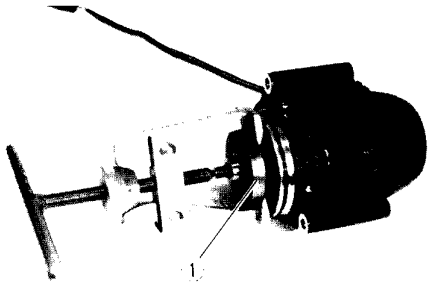
- Disconnect the generator lead wires. (Refer to page 3-4.)
- Remove the engine sprocket cover. (Refer to page 3-6.)
- Remove the generator. (Refer to page 3-12.)
- Use a vise and proper pieces of woods to hold the generator driven gear as shown in the illustration, and remove the generator driven gear nut.



CAUTION:
Do not hold the damper housing with a vise, or damage or breakage of damper housing will result.

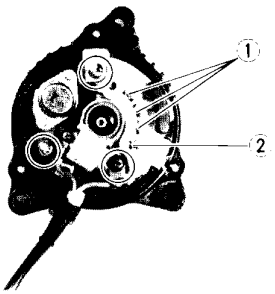
- After removing the generator driven gear, remove the damper housing ① by using the bearing puller.

  09913-61510: Bearing puller

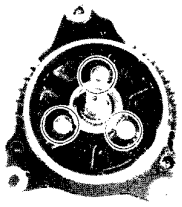


- Remove the generator end cover by removing the three nuts.

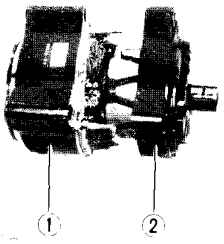
- Disconnect the stator coil lead wires ① and battery lead wire ② by using a soldering iron.
- Remove the brush holder, IC regulator and rectifier by removing the three screws.

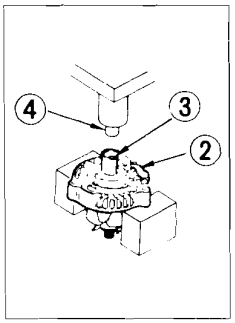


- Remove the bearing retainer screws.



- Separate the generator housing ① from the generator end housing ②.
- Remove the rotor ③ from the generator end housing ② by using the hand press ④.





INSPECTION

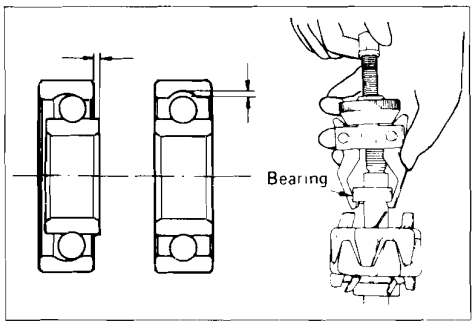
ROTOR BEARING

Rotate the rotor bearings by hand to inspect for abnormal noise and smooth rotation. Replace the bearing if there is anything unusual.

Remove the bearings by using the bearing puller.

CAUTION:

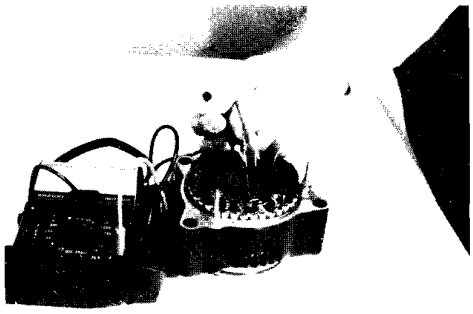
The removed bearing should be replaced.

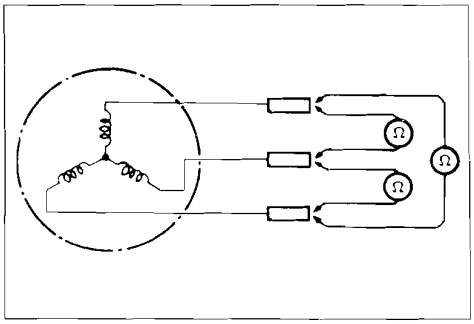


STATOR COIL CONTINUITY CHECK

Using the pocket tester, check the continuity between the lead wires of the stator. If there is no continuity, replace the stator. Also check that the stator core is insulated.

09900-25002: Pocket tester

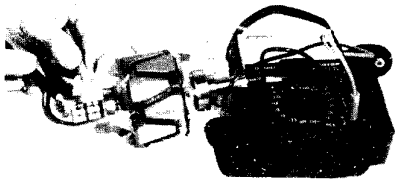




ROTOR COIL CONTINUITY CHECK

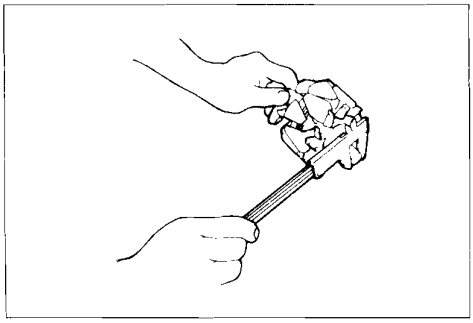
Using the pocket tester, check the continuity between the two slip rings of the rotor. If there is no continuity, replace the rotor. Also check that the rotor is insulated.

09900-25002: Pocket tester



SLIP RING

If the slip ring surfaces are dirty, charging performance decreases. Polish the slip ring with #400 or similar fine emery paper when it is dirty. After polishing it, wipe the slip ring with a clean dry cloth.



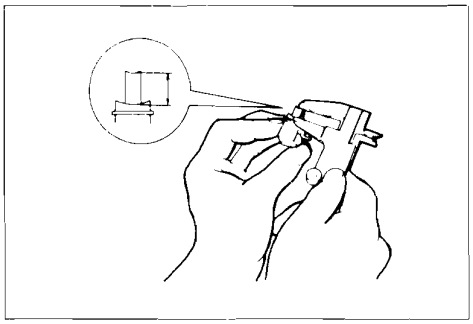
SLIP RING O.D.

Standard : 14.4 mm (0.57 in)
Service Limit: 14.0 mm (0.55 in)

CARBON BRUSH

If the brushes are worn down, charging performance decreases. Measure the length of the brushes, replacing them when they are too short or chipping.

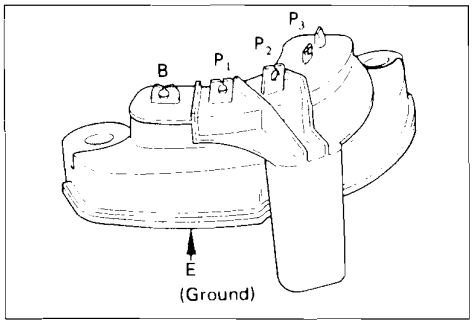
Service Limit: 4.5 mm (0.18 in)

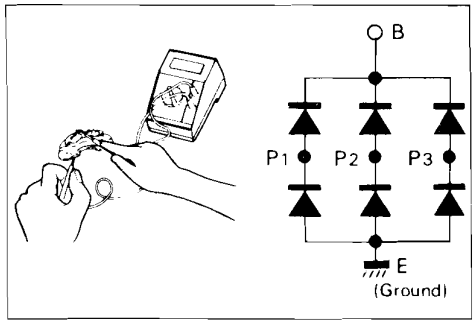


RECTIFIER

Check the continuity between terminals and ground. Put one tester lead to terminal "B" and the other lead to ground or other terminals ; then swap the two leads. Of the two tester indications, one should be continuity, and the other should be infinity (non continuity). If not, replace the rectifier assembly.

09900-25002: Pocket tester





IC REGULATOR

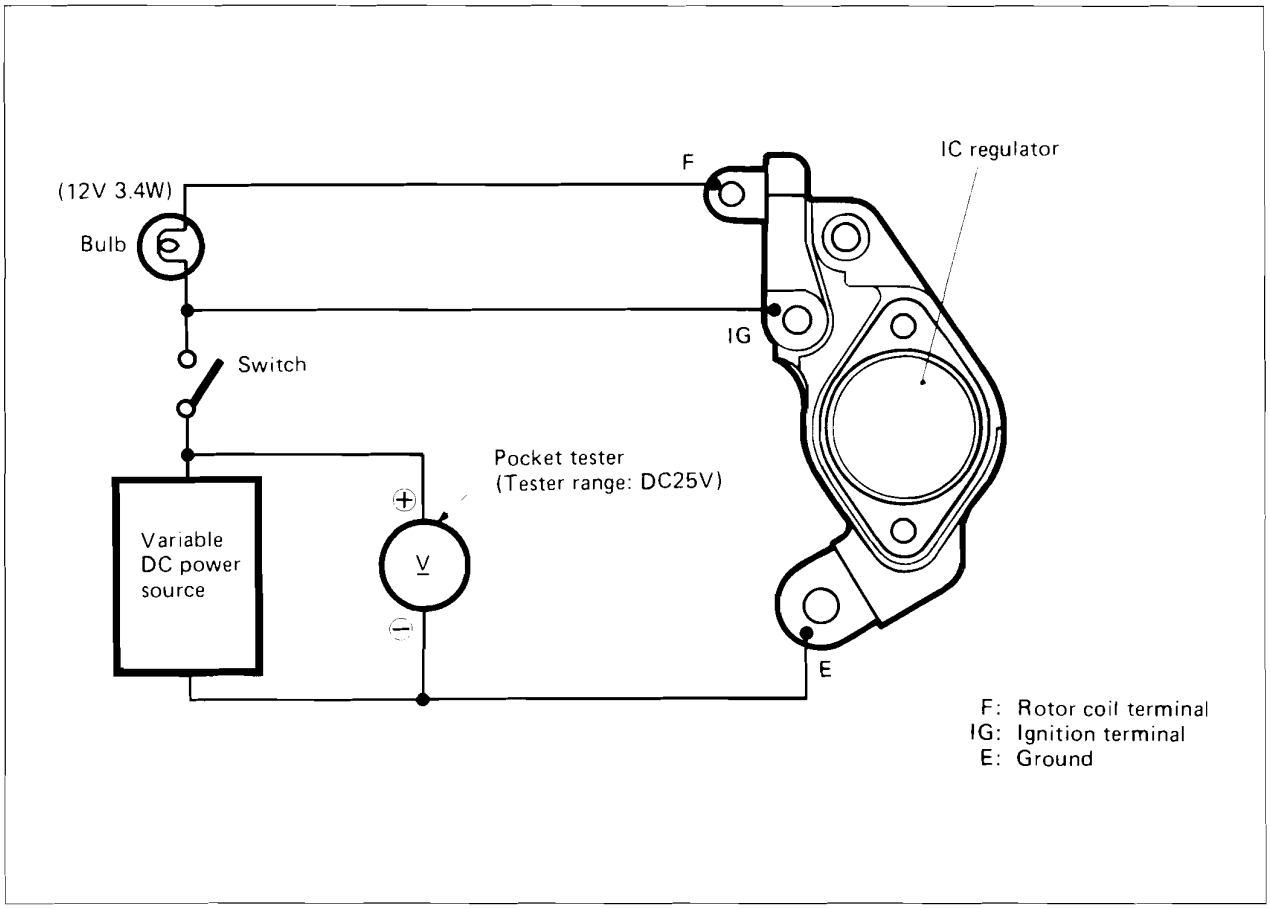
Use a variable DC power source, switch and bulb to check the IC regulator, which requires two steps described below:

First check:

Set the variable DC power source to the 12 V, turn the switch ON position. If the bulb does not light, replace the IC regulator. If the bulb is lighting on, this IC regulator has passed the first check.

Second check:

Under the above condition, set the variable DC power source to the 14.5 V, if the bulb goes out, IC regulator is in good condition. If the bulb remains lit, replace the IC regulator.



GENERATOR DRIVEN GEAR DAMPER

Inspect the dampers for wear and damage. If any defects are found, replace the dampers as a set.

NOTE:
When installing the dampers, apply Moly Paste to the damper surface.

99000-25140: SUZUKI Moly Paste

REASSEMBLY AND REMOUNTING

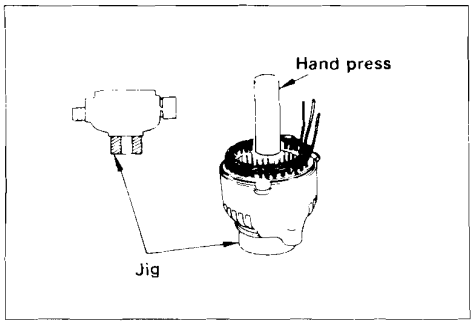
Reassemble and remount the generator in the reverse order of disassembly and removal. Pay attention to the following points:

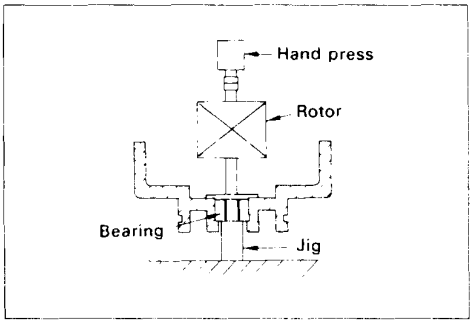
CAUTION:
The removed oil seal and O-rings should be replaced with new ones.

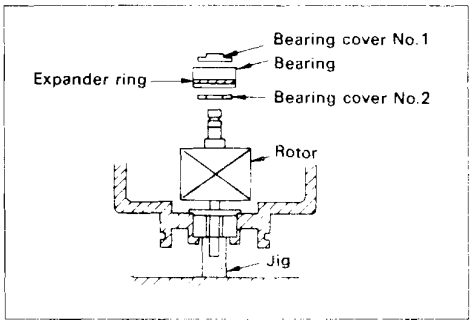
- Apply grease to the lip of the oil seal.

99000-25030: SUZUKI super grease "A"

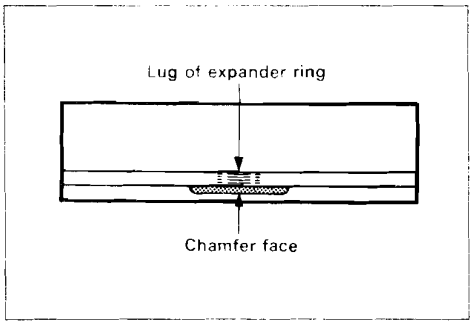
- Install the bearings and rotor by using a hand press.





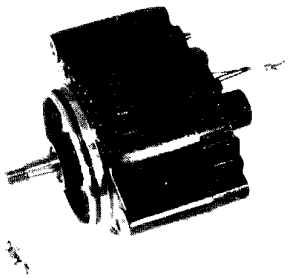


NOTE:
Before reinstalling the slip ring side bearing to the generator end housing, turn the expander ring and align the expander ring lug with the center of the chamfer of the bearing outer race.

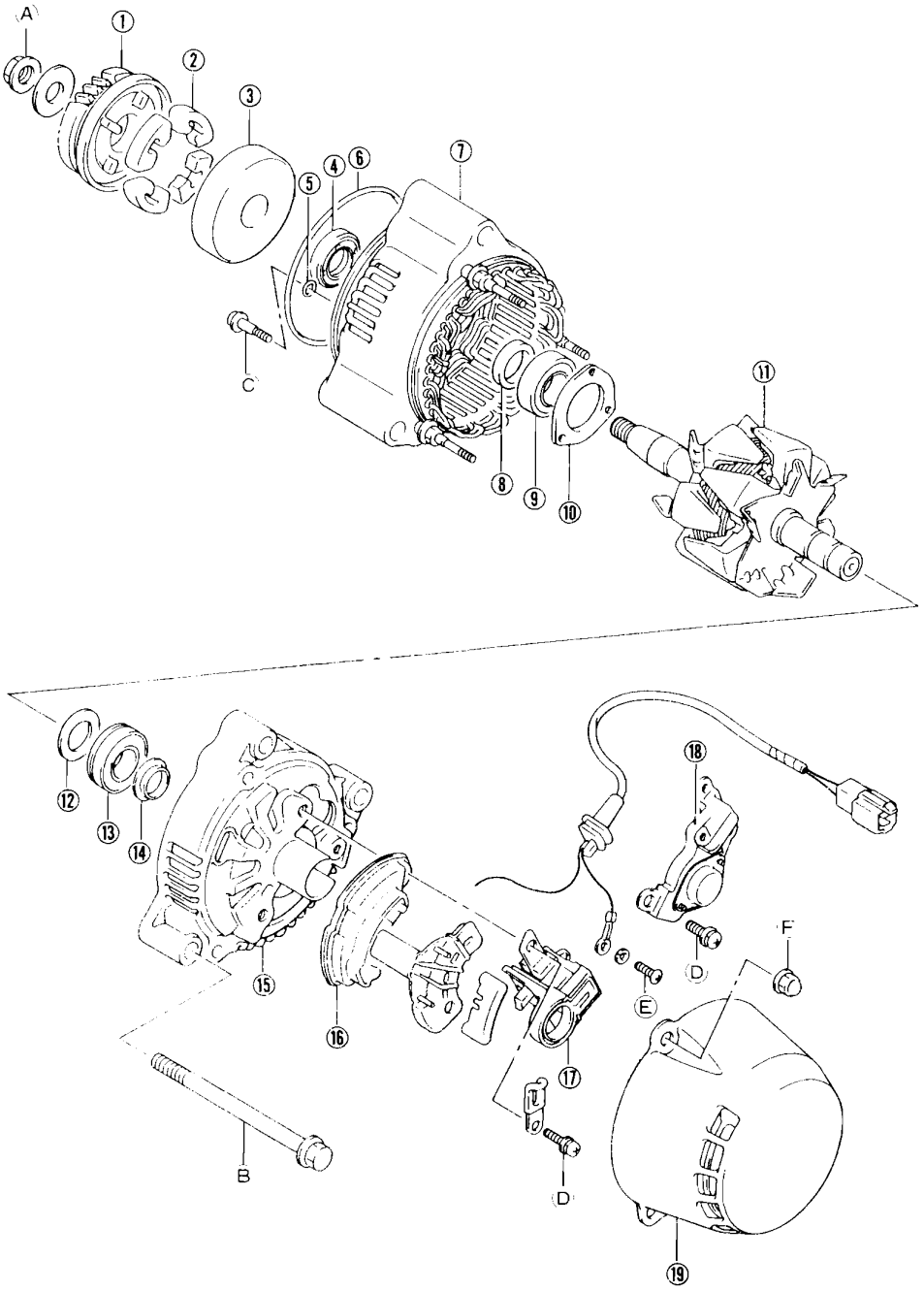


- Fit the three O-rings to the bearing retainer screws.
- Apply a small quantity of Thread Lock "1342" to the bearing retainer screws.

99000-32050: Thread Lock "1342"



REASSEMBLY INFORMATION



① Generator driven gear
② Damper (4 pcs)
③ Damper housing
④ Oil seal
⑤ O-ring (3 pcs)
⑥ O-ring
⑦ Generator housing
⑧ Washer
⑨ Bearing (Gear side)
⑩ Bearing retainer
⑪ Rotor
⑫ Bearing cover No.2
⑬ Bearing (Slip ring side)
⑭ Bearing cover No.1
⑮ Generator end housing
⑯ Rectifier
⑰ Brush holder frame
⑱ IC regulator
⑲ Generator end cover

Tightening torque			
Item	N·m	Kg-m	lb-ft
Ⓐ	55 – 65	5.5 – 6.5	40.0 – 47.0
Ⓑ	21 – 29	2.1 – 2.9	15.0 – 21.0
Ⓒ	2.2 – 3.3	0.22 – 0.33	1.5 – 2.5
Ⓓ	2.9 – 4.1	0.29 – 0.41	2.0 – 3.0
Ⓔ	1.6 – 2.3	0.16 – 0.23	1.0 – 1.5
Ⓕ	3.7 – 5.5	0.37 – 0.55	2.5 – 4.0

IGNITION SYSTEM

DESCRIPTION

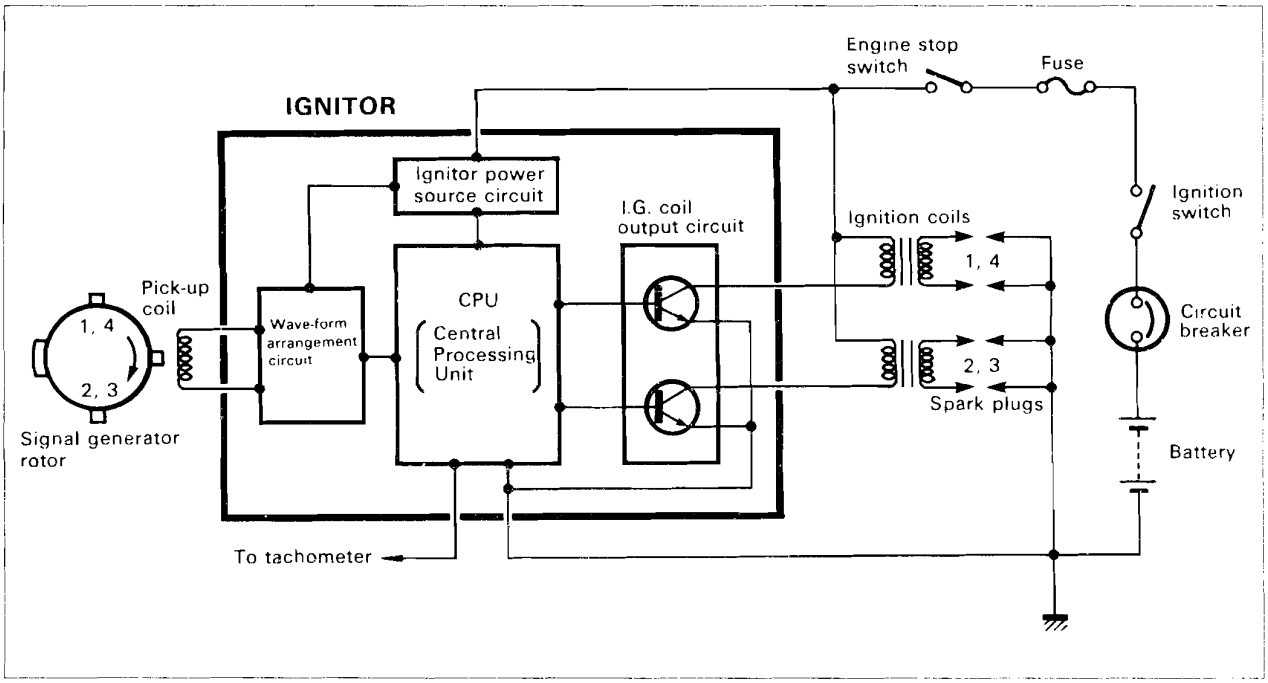
The fully transistorized ignition system consists of a signal generator, ignitor, ignition coils, and spark plugs. The signal generator comprises rotor tip and pick-up coil.

The signal generator is mounted at the right end of the crankshaft. The output of the signal generator goes to the ignitor unit, where it turns ON and OFF the transistor alternately. As the transistor is turned ON and OFF, the current passing through the primary windings of the ignition coil is also turned OFF and ON accordingly, thus it induces the secondary current on the ignition coil secondary windings and produce the spark between spark plug gaps.

Ignition cut-off circuit is incorporated in the ignitor unit to prevent over-running engine. If engine r/min. reaches 10,900 r/min., this circuit cuts off the ignition primary current for all spark plugs.

CAUTION:

Engine can run over 10,900 r/min. without load, even if the ignition cut-off circuit is effective, and it may cause engine damage. Do not run the engine without load over 10,900 r/min. at anytime.

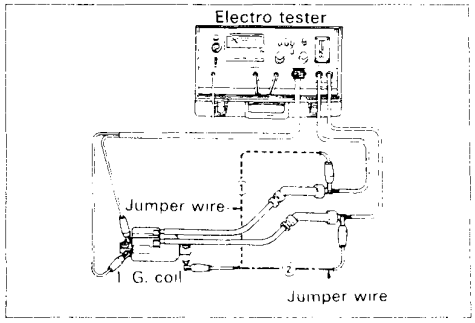


INSPECTION

IGNITION COIL (Checking with Electro Tester)

NOTE:

Make sure that the three-needle sparking distance of electro tester is set at 8 mm (0.3 in).

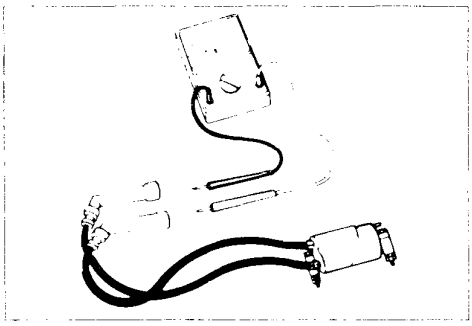


- With the tester and jumper wire, test the ignition coil for sparking performance in accordance with the following two steps.
  STEP ① : Connect the jumper wire to the spark plug cap and ignition coil ground.
  STEP ② : Switch over the jumper wire to the other plug cap and ground.
  If no sparking or orange color sparking occures in the above conditions, it may be caused by defective coil.

09900-28106: Elelctro tester
STD Spark performance: 8 mm (0.3 in)

IGNITION COIL (Checking with Pocket Tester)

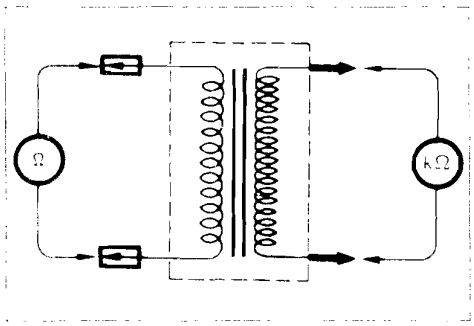
- A SUZUKI pocket tester or an ohm meter may be used, instead of the electro tester. In either case, the ignition coil is to be checked for continuity in both primary and secondary windings. Exact ohmic readings are not necessary, but, if the windings are in sound condition, their continuity will be noted with these approximate ohmic values.



09900-25002: Pocket tester

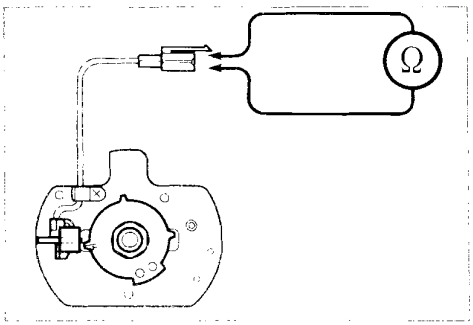
Ignition coil resistance
Primary : ⊕ tap – ⊖ tap 3 – 5 Ω
Tester range: (1 Ω)

Secondary: Plug cap – Plug cap 25 – 45 kΩ
Tester range: (1 kΩ)



SIGNAL GENERATOR
(Checking with Pocket Tester)

- Remove the seat and left frame cover.
- Measure the resistance between lead wires. If the resistance is infinity or less than the specifications, the signal generator must be replaced.

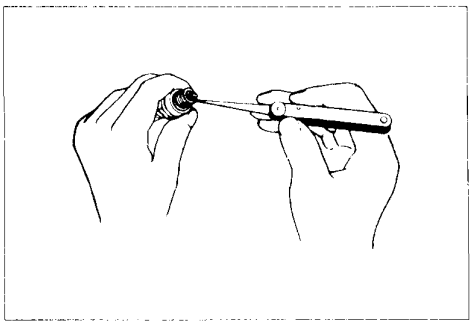


09900-25002: Pocket tester

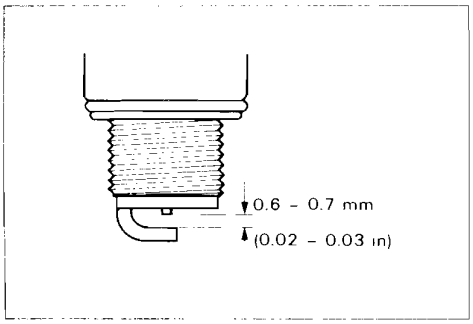
STD resistance
Blue – Yellow: 135 – 200 Ω
Tester range: (100Ω)

SPARK PLUG

The plug gap is adjusted to 0.6 – 0.7 mm (0.02 – 0.03 in). The gap is correctly adjusted by using a thickness gauge. When carbon is deposited on the spark plug, remove the carbon with a spark plug cleaning machine or by carefully using a tool with a pointed end. If the electrodes are extremely worn or burnt, replace the plug. Also replace the plug if it has a broken insulator, damaged thread, etc.



NGK JR9B as listed in the table should be used as the standard plug. However, the heat range of the plug should be selected to meet the requirements of speed, actual load, fuel, etc. If the plugs need be replaced, it is recommended that ones having a heat range closest to the standard plug in the table be selected. Remove the plugs and inspect the insulators. Proper heat range would be indicated if all insulators were light brown in color. If they are baked white, they should be replaced by a cold type NGK JR10B.



Recommended spark plug

	Standard	Cold type
NGK	JR9B	JR10B

NOTE:
"R" type spark plug is installed for some specifications. "R" type spark plug has a resister located at the center electrode to prevent radio noise.

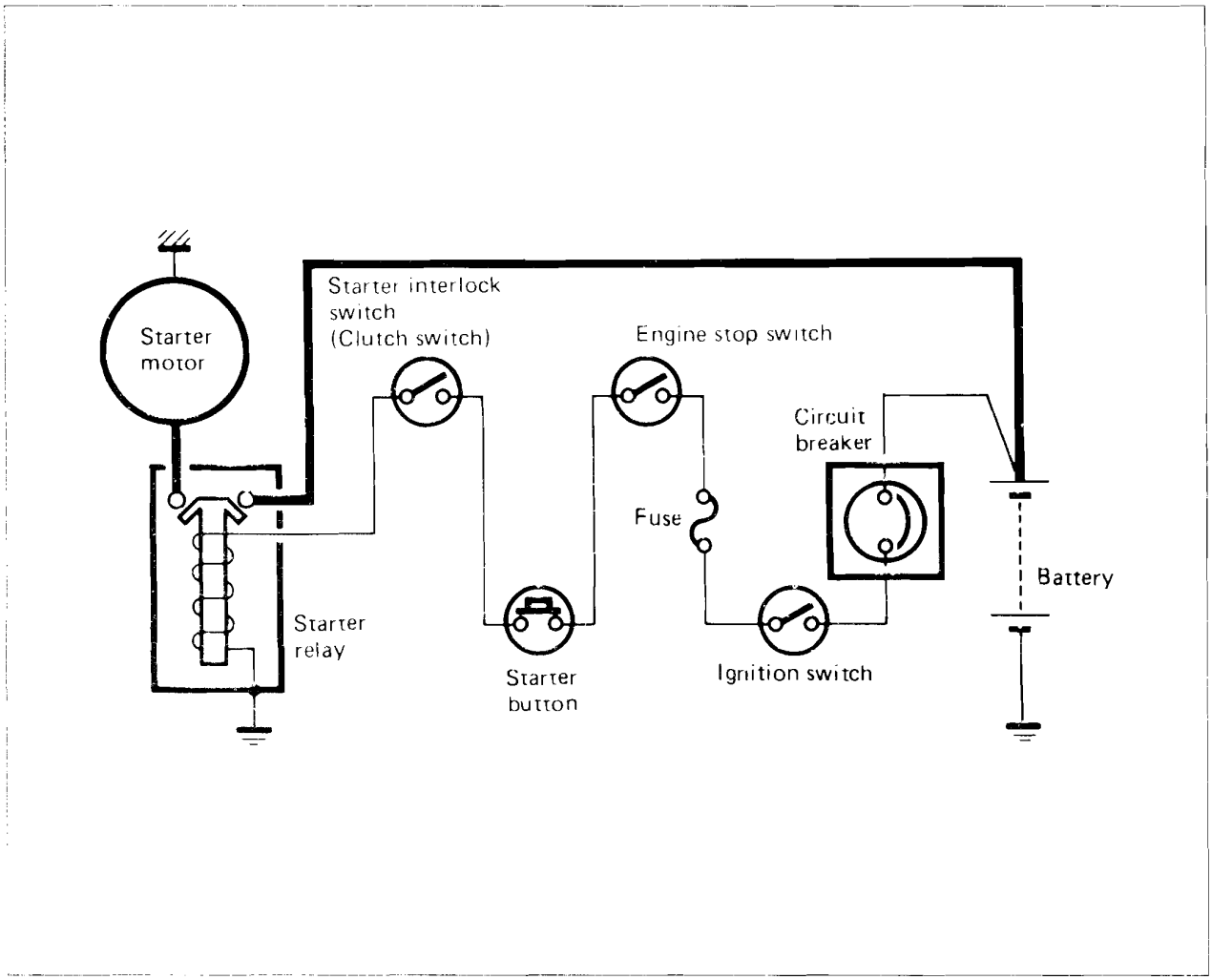
IGNITOR UNIT

- Remove the spark plugs from Nos.1 and 2 cylinders and place the spark plugs on the cylinder head.
- Start the engine and check the sparks of respective spark plugs. If no sparking at spark plug gap, replace the IGNITOR UNIT or inspect the signal generator, ignition coils and spark plugs. If the signal generator, ignition coils and spark plugs checked are correct, the IGNITOR UNIT may be faulty, replace it with a new one.

STARTER SYSTEM

DESCRIPTION

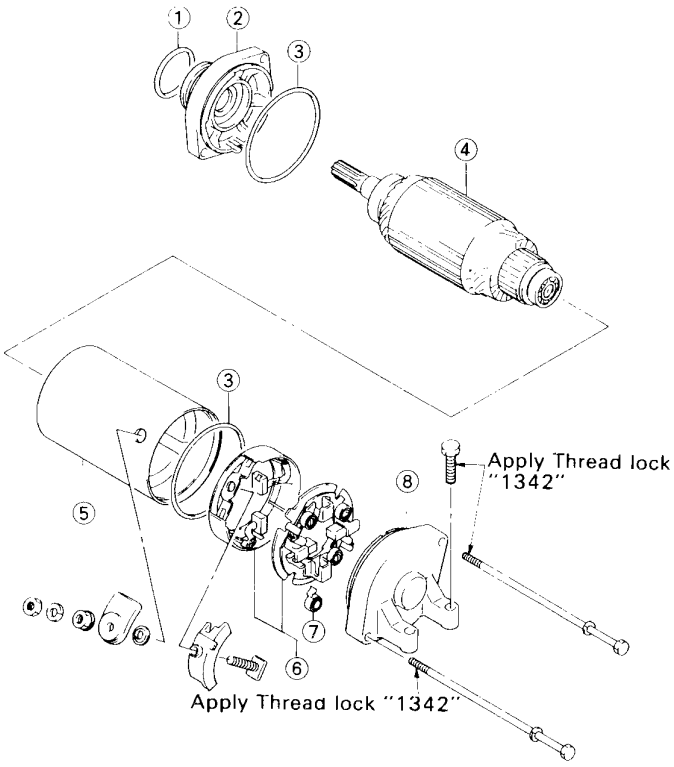
The starter system is shown in the diagram below: namely, the starter motor, relay, interlock switch, starter button, engine stop switch, IG switch and battery. Depressing the starter button (on the right handlebar switch box) energizes the relay, causing the contact points to close which connects the starter motor to the battery. The motor draws about 80 amperes to start the engine.



STARTER MOTOR REMOVAL AND DISASSEMBLY

- Remove the engine sprocket cover and generator. (Refer to pages 3-6 and 12.)
- Disconnect the starter motor lead wire by removing the nut, then remove the starter motor by removing the mounting bolts. (Refer to pages 3-4 and 12.)

- Disassemble the starter motor as shown in the illustration.

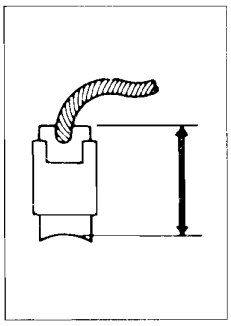


① O-ring
② Housing end (Gear-side)
③ O-ring (2 PCS)
④ Armature
⑤ Starter motor case
⑥ Brush holder set
⑦ Brush spring (4 PCS)
⑧ Housing end (Brush-side)

STARTER MOTOR INSPECTION

CARBON BRUSH

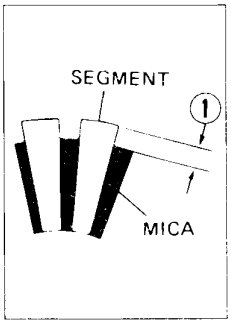
When the brushes are worn, the motor will be unable to produce sufficient torque, and the engine will be difficult to turn over. To prevent this, periodically, measure the length of the brushes, replacing them when they are too short or chipping.



Service Limit: 6 mm (0.2 in)

COMMUTATOR

If the commutator surface is dirty, starting performance decreases. Polish the commutator with #400 or similar fine emery paper when it is dirty. After polishing it, wipe the commutator with a clean dry cloth.
Measure the commutator under cut ①.

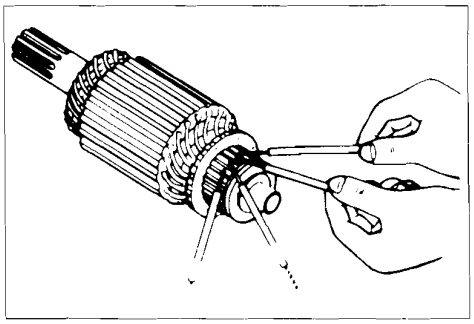


Service Limit: 0.2 mm (0.008 in)

ARMATURE COIL

Using a pocket tester, check the coil for open and ground by placing probe pins on each commutator segment and rotor core (to test for ground) and on any two segments at various places (to test for open), with the brushes lifted off the commutator surface.

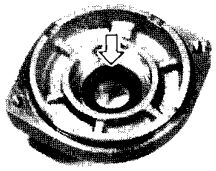
If the coil is found to be open-circuited or grounded replace the armature. Continuous use of a defective armature will cause the starter motor to suddenly fail.



09900-25002: Pocket tester

OIL SEAL

Check the seal lip for damage or oil leakage. If any damage is found, replace it.

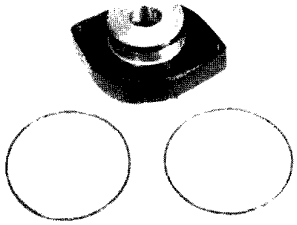


STARTER MOTOR REASSEMBLY

O-RING

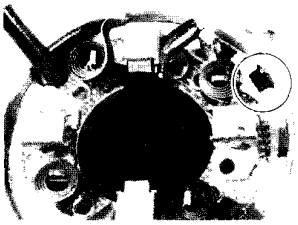
CAUTION:

Replace the O-rings with new ones to prevent oil leakage and moisture.



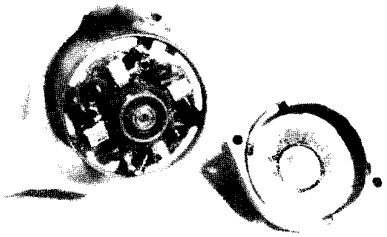
BRUSH HOLDER

- Align the groove of brush holder with the lug on the starter motor case.



HOUSING END (Brush-side)

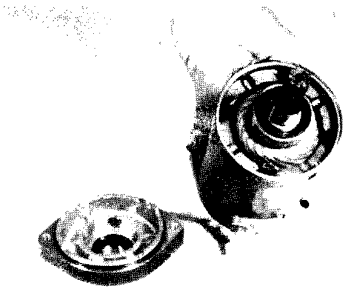
- Apply a small quantity of moly paste to the armature end.
  99000-25140: SUZUKI Moly paste



HOUSING END (Gear-side)

- Apply grease to the lip of the oil seal.

99000-25030: SUZUKI super grease "A"



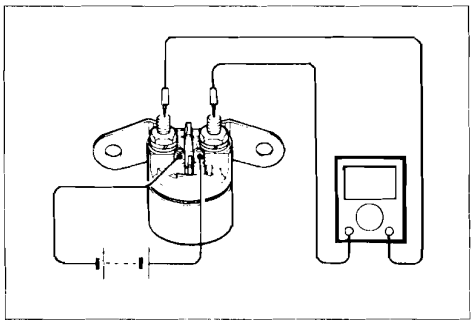
- Apply a small quantity of Thread Lock "1342" to the starter motor housing screws and install both housing ends. (See page 6-12.)

99000-32050: Thread lock "1342"

STARTER RELAY INSPECTION

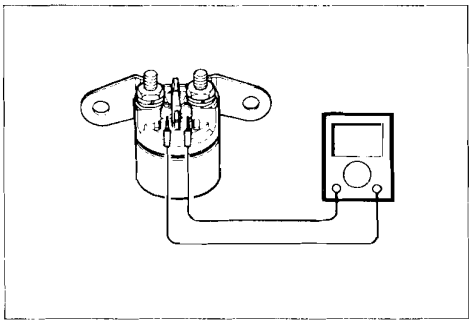
- Remove the seat.
- Disconnect the lead wire of the starter motor at starter relay.
- Turn on the ignition switch, inspect the continuity between the terminals, positive and negative, when squeezing the clutch lever and pushing the starter button.
  If the starter relay is in sound condition, continuity is found.

09900-25002: Pocket tester



- Disconnect the lead wires from the starter relay.
- Check the coil for "open", "ground" and ohmic resistance.
  The coil is in good condition if the resistance is as follows.

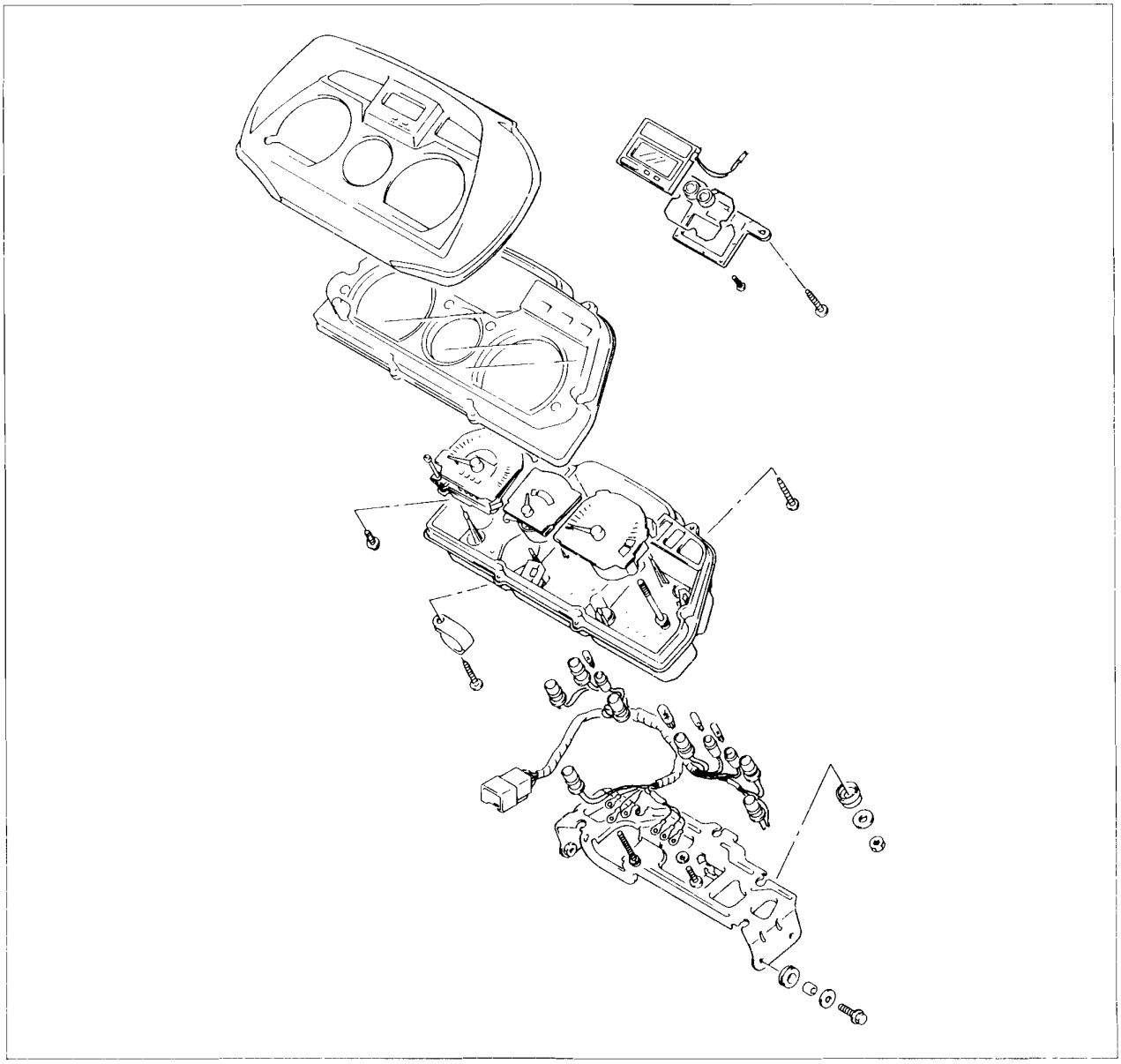
09900-25002: Pocket tester
STD resistance: 3 – 5 Ω



COMBINATION METER

REMOVAL AND DISASSEMBLY

- Remove the lower and upper fairings.
- Remove the headlight.
- Remove the combination meter.
- Disassemble the combination meter as follows.

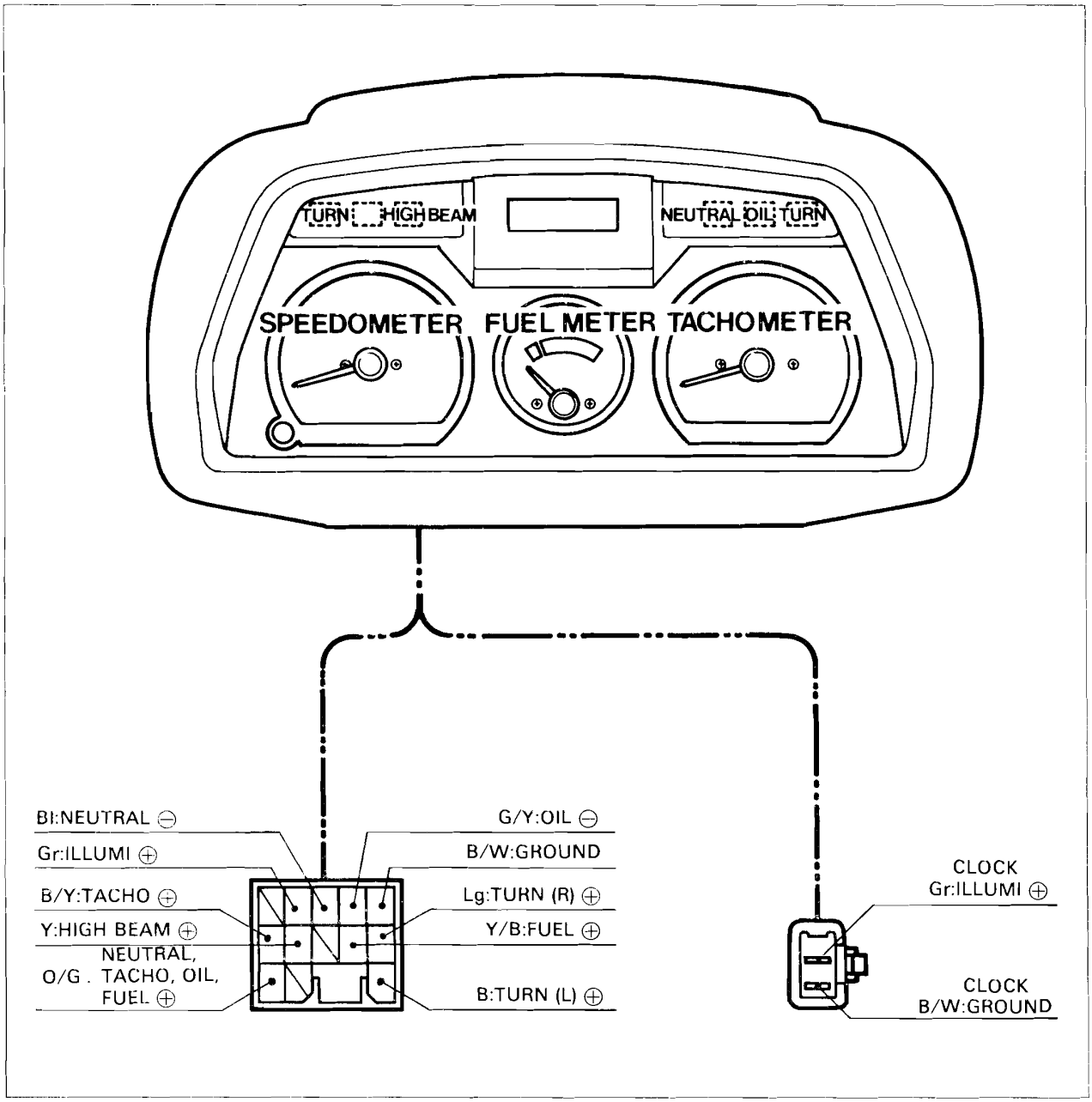


INSPECTION

Using the pocket tester, check the continuity between lead wires in the following diagram.
If the continuity measured is incorrect, replace the respective parts.

09900-25002: Pocket tester

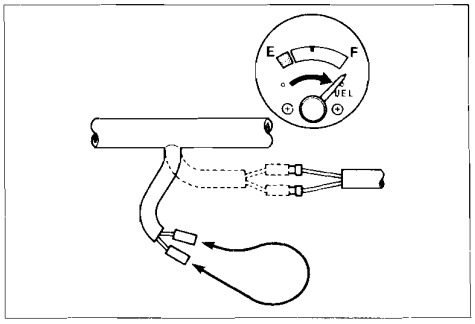
NOTE:
When making this test, it is not necessary to remove the combination meter.



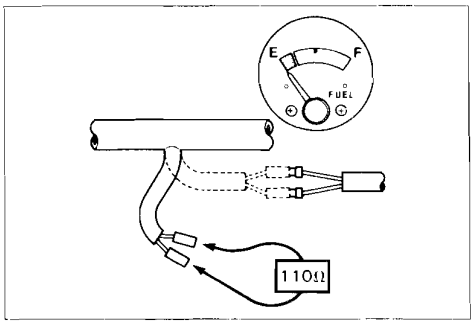
FUEL LEVEL METER/GAUGE

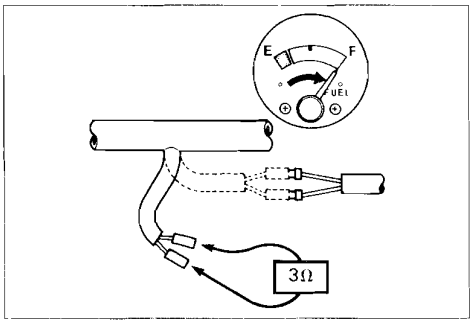
FUEL METER INSPECTION

To test the Fuel Meter two different checks may be used. The first, and simplest test will tell if the meter is operating but will not indicate the meters accuracy throughout the range. To perform this test, remove the seat and right frame cover and disconnect the B/W and Y/B lead wires of the fuel gauge sending unit. Connect a jumper wire between B/W and Y/B wires coming from the main wiring harness. With the ignition switch turned ON, the fuel meter should indicate "F".



The second test will check the accuracy of the meter in the full and empty positions. Connect a 110-ohm resistor between the Y/B lead wire of the fuel gauge and the ground lead wire. The fuel meter is normal if its pointer indicates the E (empty) position when the specified voltage is applied to the circuit and if its pointer indicates the F (full) position when the resistor is changed to 3 ohms. If either one or both indications are abnormal, replace the fuel meter with a new one.

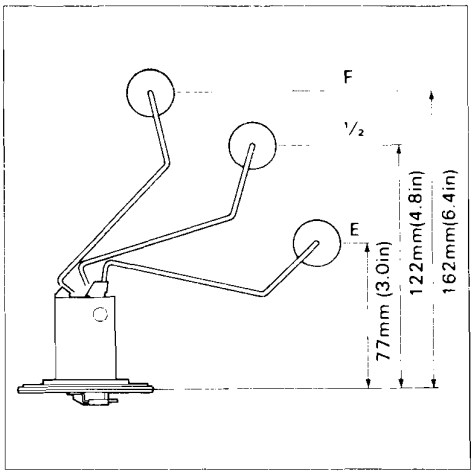




FUEL GAUGE SENDING UNIT INSPECTION

- Remove the lead wires coming out of the fuel gauge and check resistance of each position.
- If the resistance measured is incorrect, replace the fuel gauge assembly with a new one.
- The relation between the position of the fuel gauge float and resistance is shown in the following table.

Float position	Resistance
F (Full)	Approx. 3 Ω
1/2	Approx. 32.5 Ω
E (Empty)	Approx. 110 Ω

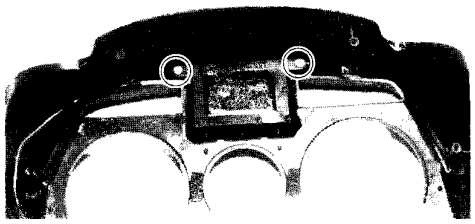


DIGITAL CLOCK

BATTERY REPLACEMENT

This clock is powered by built-in long-life lithium batteries. If the clock loses the function, replace the battery as follows.

- Remove the lower and upper fairings.
- Remove the headlight.
- Remove the combination meter.
- Remove the clock by removing two screws.
- Remove the cover by removing eight screws.
- Replace the two batteries with new ones.

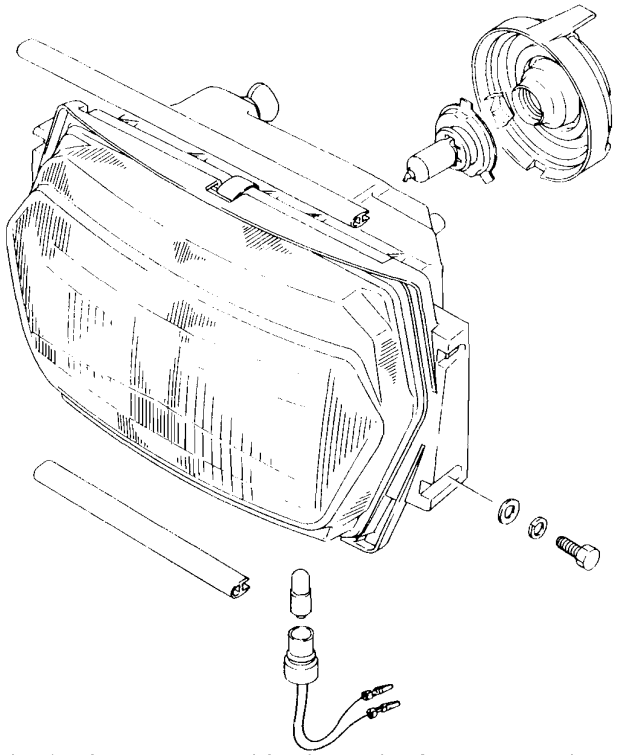


NOTE:

The stamped ⊕ mark on the battery is positioned outside.

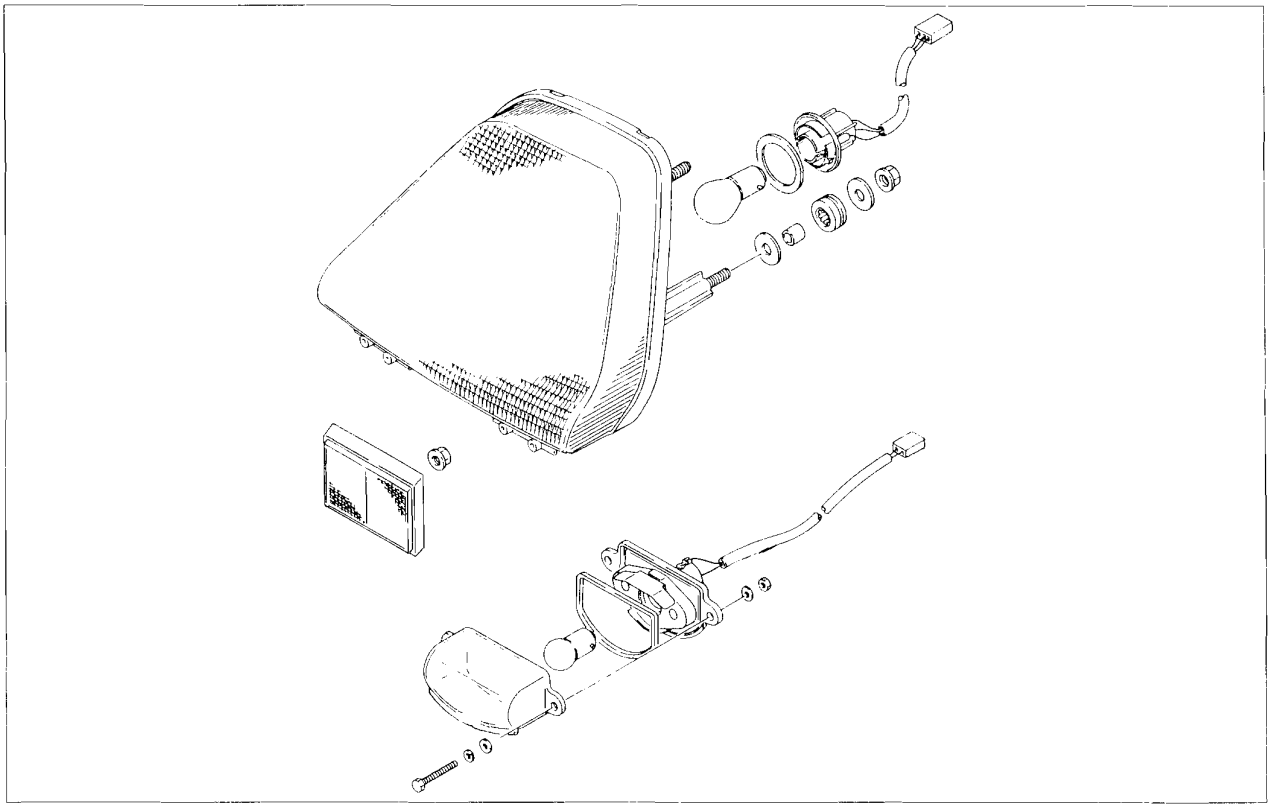
LAMPS

HEADLIGHT

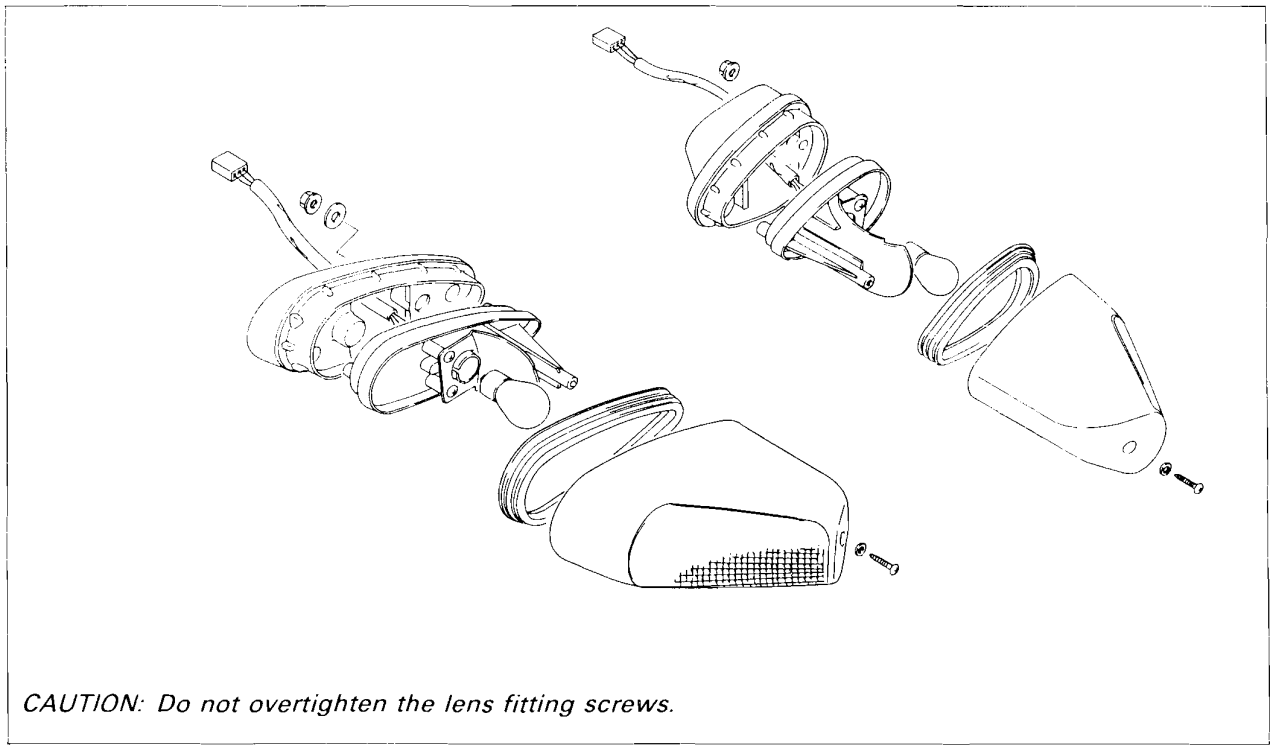


NOTE: Adjust the headlight, both vertical and horizontal, after reassembling.

TAIL/BRAKE LIGHT



TURN SIGNAL LIGHT



CAUTION: Do not overtighten the lens fitting screws.

SWITCHES

Inspect each switch for continuity with the pocket tester referring to the chart. If any abnormality is found, replace the respective switch assemblies with new ones.

09900-25002: Pocket tester

IGNITION SWITCH

	R/W	O	Gr	Br
OFF				
ON	○	○	○	○
P	○			○

DIMMER SWITCH

	W	Y	Y/W
HI		○	○
LO	○		○

TURN SIGNAL SWITCH

	B	Lbl	Lg
R		○	○
•			
L	○	○	

HORN SWITCH

	G	B/W
ON (Push)	○	○
OFF		

ENGINE STOP AND START SWITCH

	O/Bl	O/W	Y/G
OFF			
RUN	○	○	
START (Push)		○	○

CLUTCH SWITCH

	Y/G	Y/G
ON (Squeeze lever)	○	○
OFF		

FRONT BRAKE SWITCH

	O/G	W/B
ON (Squeeze lever)	○	○
OFF		

REAR BRAKE SWITCH

	O/G	W/B
ON (Depress pedal)	○	○
OFF		

NEUTRAL INDICATOR SWITCH

	Bl	Ground
ON (Neutral position)	○	○
OFF		

SIDE STAND SWITCH

	G	B/W
ON (Upright position)	○	○
OFF (Down position)		

OIL PRESSURE SWITCH

- Continuity, when engine is stopped.
- No continuity, when engine is running.

	G/Y	Ground
ON	○———	———○
OFF		

NOTE:
Before inspecting the oil pressure switch, check the engine oil level at oil inspection window.

WINDOW SCREEN SWITCH

	W/G	O	W/R
UP		○———	———○
•			
DOWN	○———	———○	

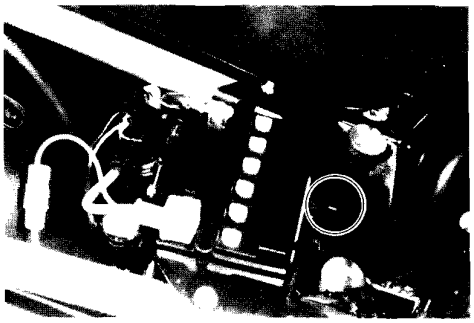
WIRE COLOR

Gr ..... Gray
Br ..... Brown
W ..... White
Y ..... Yellow
Y/W ..... Yellow with White tracer
B ..... Black
Lbl ..... Light blue
Lg ..... Light green
G ..... Green
B/W ..... Black with White tracer
O/W ..... Orange with White tracer
Y/G ..... Yellow with Green tracer
O/G ..... Orange with Green tracer
Bl ..... Blue
G/Y ..... Green with Yellow tracer
W/B ..... White with Black tracer
O/Bl ..... Orange with Blue tracer
R/W ..... Red with White tracer
O ..... Orange
W/G ..... White with Green tracer
W/R ..... White with Red tracer

RELAY

SIDE-STAND RELAY

The side-stand relay is located on the battery holder of front side.



INSPECTION

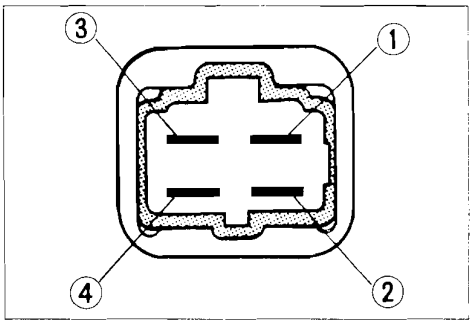
First:

Check the insulation between ③ and ④ terminals with pocket tester.

Second:

Apply 12 volts to ① and ② terminals, ⊕ to ① and ⊖ to ②, and check the continuity between ③ and ④ with pocket tester. If there is no continuity, replace it with a new one.

09900-25002: Pocket tester



WIND-SHIELD MOTOR RELAY

The wind-shield motor relay is located on the fairing brace of right side.

INSPECTION

First:

Check the insulation between terminals (① and ②, ① and ③) with pocket tester.

Second:

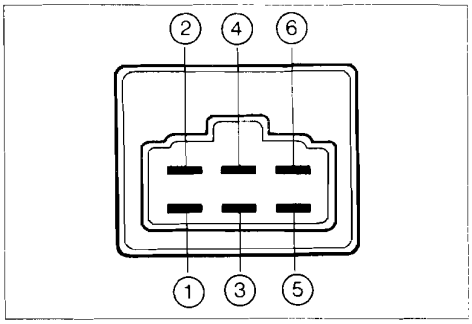
Apply 12 volts to ⑥ and ④ terminals, ⊕ to ⑥ and ⊖ to ④, and check the continuity between ① and ② terminals.

Third:

Apply 12 volts to ⑤ and ④ terminals, ⊕ to ⑤ and ⊖ to ④, and check the continuity between ① and ③ terminals.

If there is no continuity, replace it with a new one.

09900-25002: Pocket tester

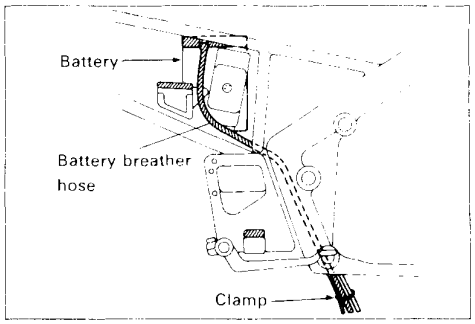


BATTERY

SPECIFICATIONS

Type designation	YB14L-B2 or FB14L-B2
Capacity	12V, 50.4 kC (14 Ah)/10HR
Standard electrolyte S.G.	1.28 at 20°C (68°F)

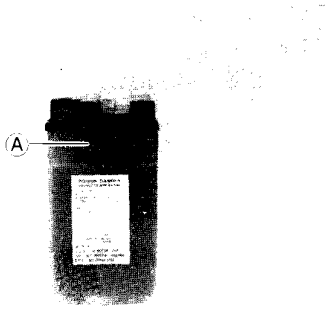
In fitting the battery to the motorcycle, connect the breather hose to the battery vent.



INITIAL CHARGING

Filling electrolyte

Remove the short sealed tube before filling electrolyte. Fill the battery with electrolyte (dilute sulfuric acid solution with acid concentration of 35.0% by weight, having a specific gravity of 1.28 at 20°C (68°F)) up to indicated MAX. LEVEL. Electrolyte should be always cooled below 30°C (86°F) before filling into battery. Leave battery standing for half an hour after filling. Add additional electrolyte if necessary. Charge battery with current as described in the tables shown below.



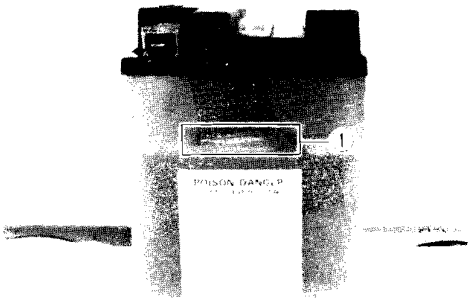
Maximum charging current: 1.4A (Sealed tube Ⓐ)

Charging time

The charging time for a new battery is determined by the number of months that have elapsed since the date of manufacture.

Confirmation for date of manufacture

Date of manufacture is indicated by a three-part number ①, as shown in the photograph, each indicating month, date and year.



Near the end of charging period, adjust the specific gravity of electrolyte to value specified. After charging, adjust the electrolyte level to the MAX. LEVEL with DISTILLED WATER.

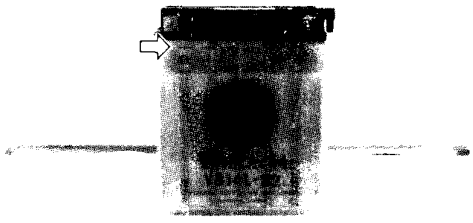
SERVICING

Visually inspect the surface of the battery container. If any signs of cracking or electrolyte leakage from the sides of the battery have occurred, replace the battery with a new one.

If the battery terminals are found to be coated with rust or an acidic white powdery substance, then this can be cleaned away with sandpaper.

Check the electrolyte level and add distilled water, as necessary to raise the electrolyte to each cell's MAX. level.

Check the battery for proper charge by taking an electrolyte S.G. reading. If the reading is 1.22 or less, as corrected to 20°C (68°F), it means that the battery is still in a run-down condition and needs recharging.

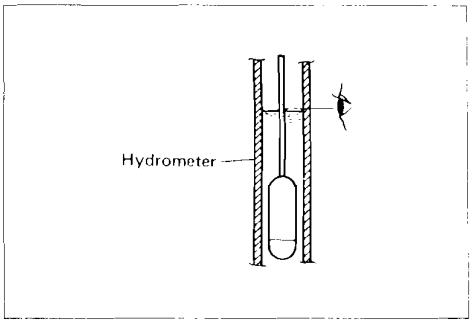


NOTE:
First, remove the ⊖ lead wire.

Months after manufacturing	Within 6	Within 9	Within 12	Over 12
Necessary charging hours	20	30	40	60

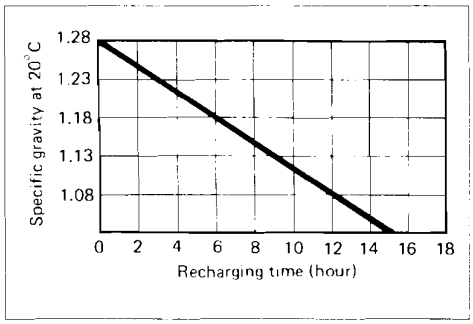
RECHARGING OPERATION BASED ON S.G. READING

To read the S.G. on the hydrometer, bring the electrolyte in the hydrometer to eye level and read the graduation on the float scale bordering on the meniscus (curved-up portion of electrolyte surface), as shown in figure.



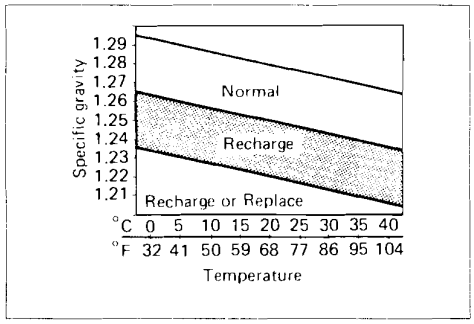
09900-28403: Hydrometer

Check the reading (as corrected to 20°C) with chart to determine the recharging time in hour by constant-current charging at a charging rate of 1.4 amperes (which is tenth of the capacity of the present battery).



Be careful not to permit the electrolyte temperature to exceed 45°C (113°F), at any time, during the recharging operation. Interrupt the operation, as necessary, to let the electrolyte cool down. Recharge the battery to the specification.

Electrolyte specific gravity: 1.28 at 20°C (68°F)



CAUTION:

Constant-voltage charging, otherwise called "quick" charging, is not recommendable for it could shorten the life of the battery.

SERVICE LIFE

Lead oxide is applied to the pole plates of the battery which will come off gradually during the service. When the bottom of the battery case becomes full of the sediment, the battery cannot be used any more. If the battery is not charged for a long time, lead sulfate is generated on the surface of the pole plates and will deteriorate the performance (sulfation). Replace the battery with new one in such a case.

When a battery is left for a long term without using, it is apt to subject to sulfation. When the motorcycle is not used for more than 1 month (especially during the winter season), recharge the battery once a month at least.

WARNING:

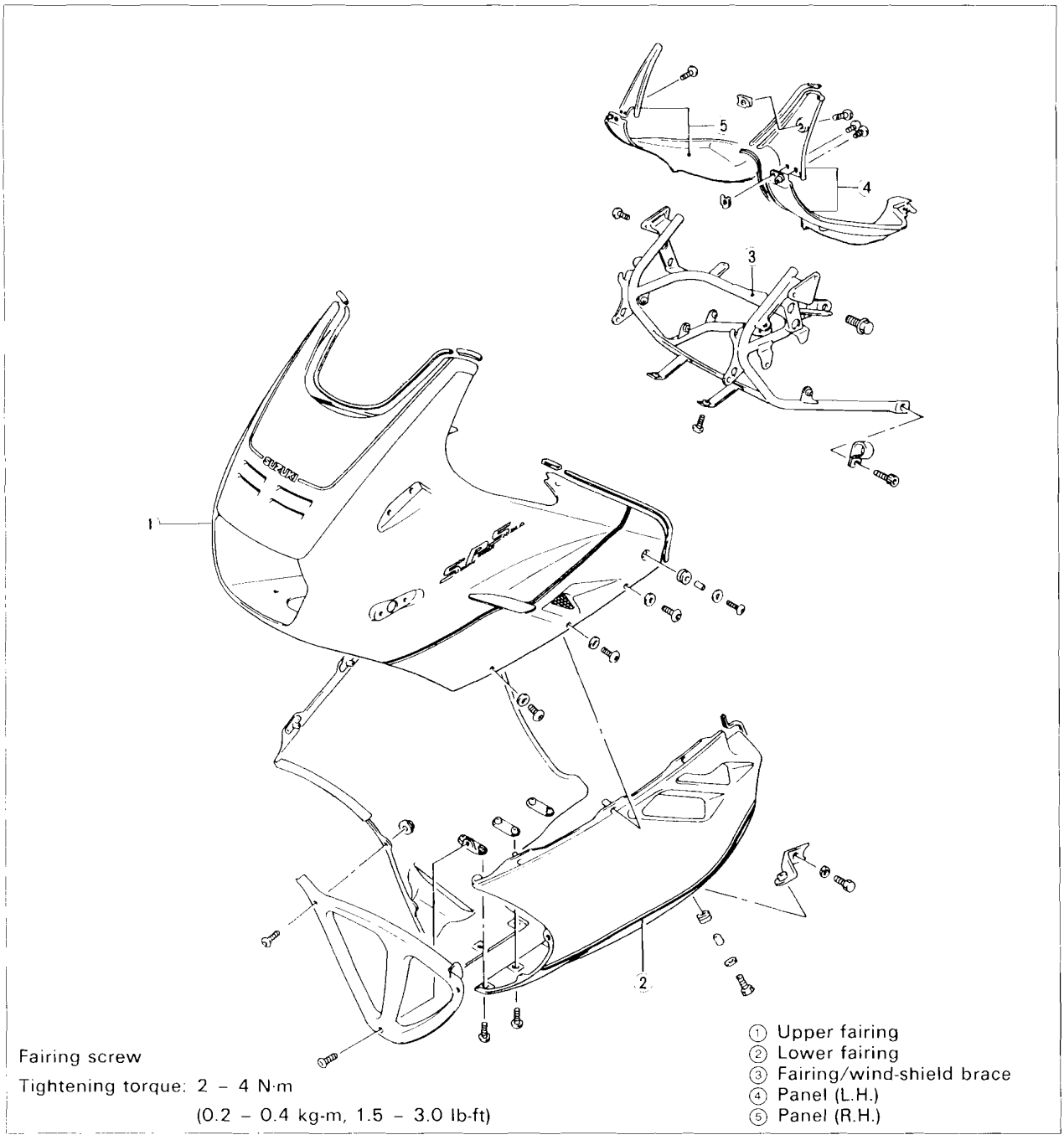
- **Before charging a battery, remove the seal cap from each cell.**
- **Keep fire and sparks away from a battery being charged.**
- **When removing a battery from the motorcycle, be sure to remove the ⊖ terminal first.**

CHASSIS

CONTENTS

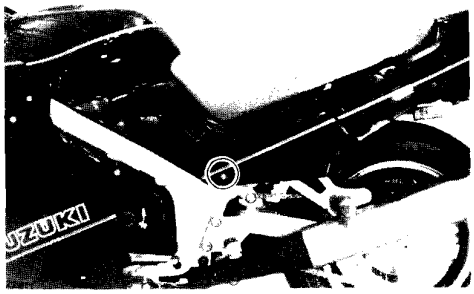
7

FAIRING



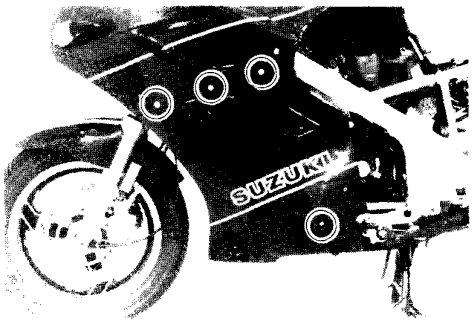
REMOVAL

- Remove the seat.
- Remove the left and right frame covers by removing the screws.



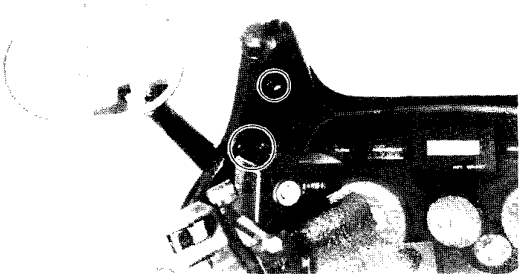
- Remove the lower fairing assembly by removing the screws.

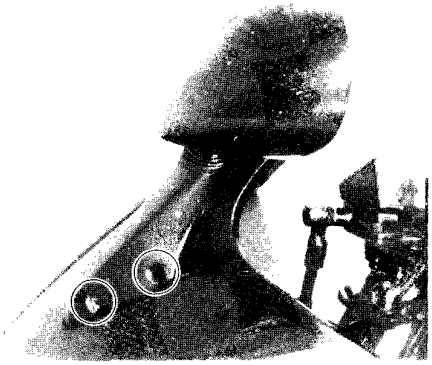
09900-00401: L-type hexagon wrench set

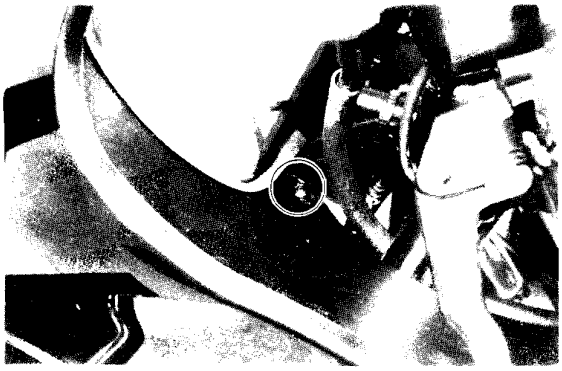


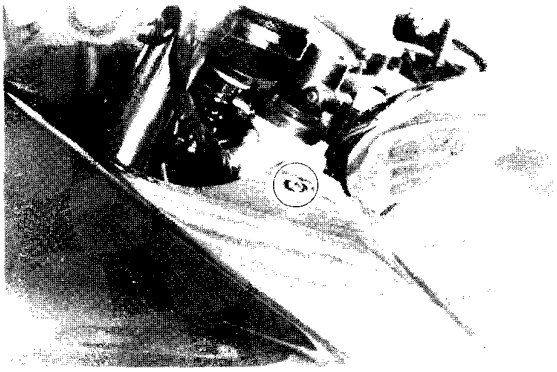
- Remove the upper fairing assembly by removing the screws.

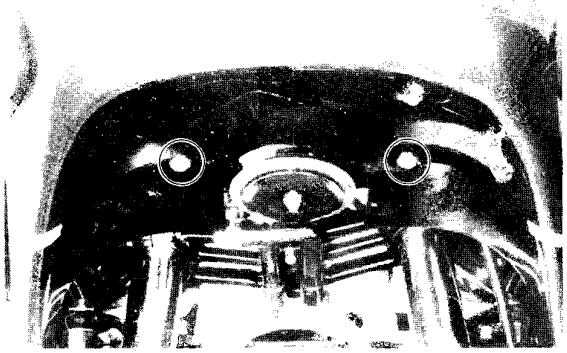
09900-00401: L-type hexagon wrench set

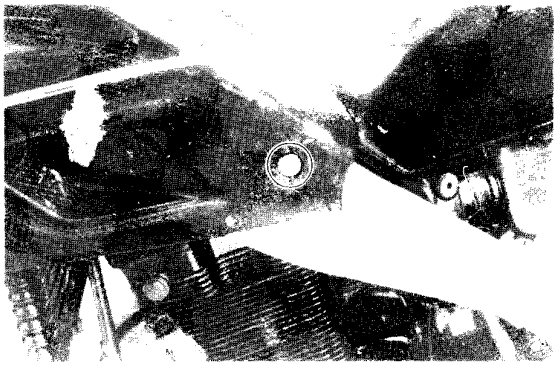








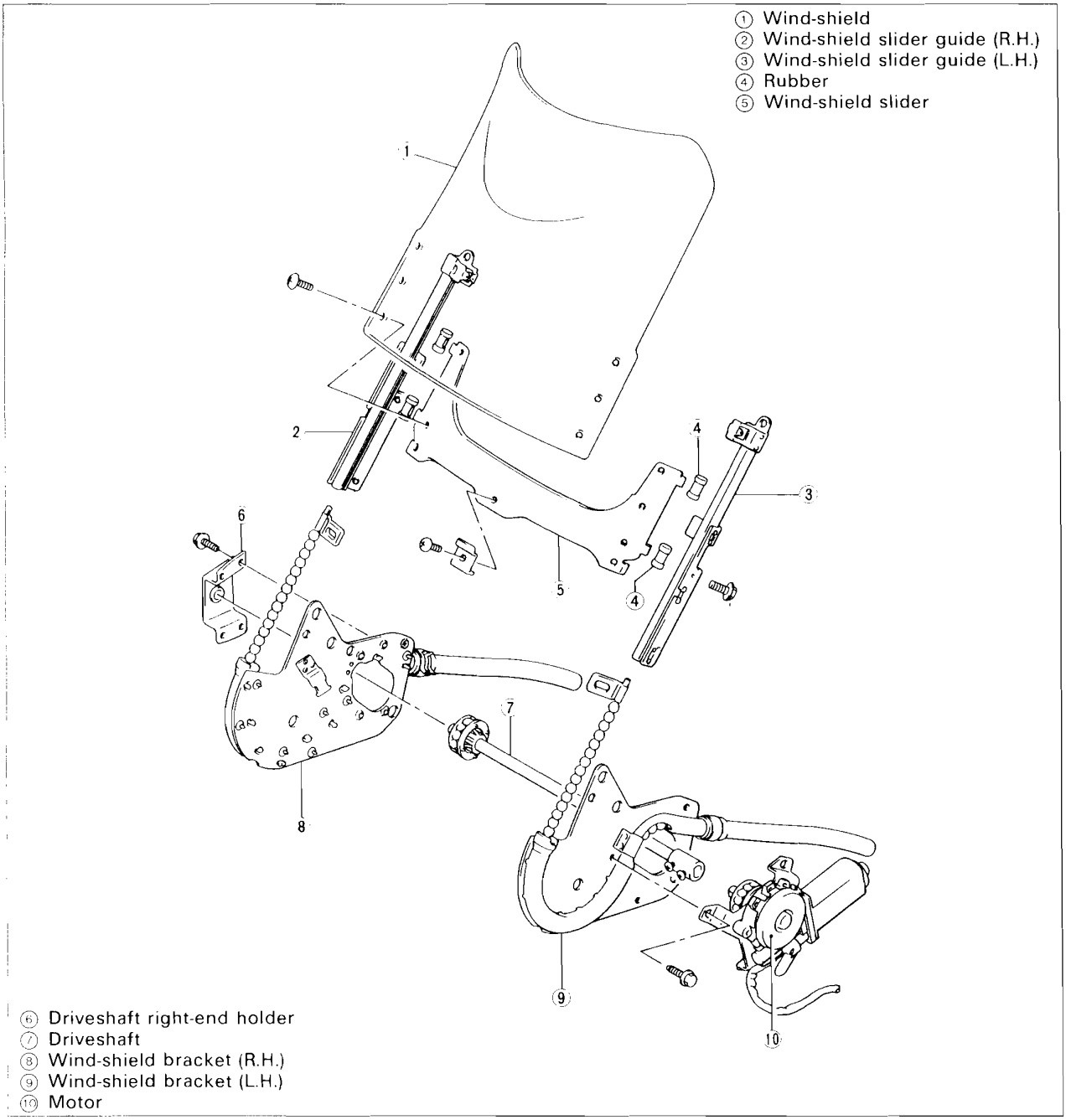




REINSTALLATION

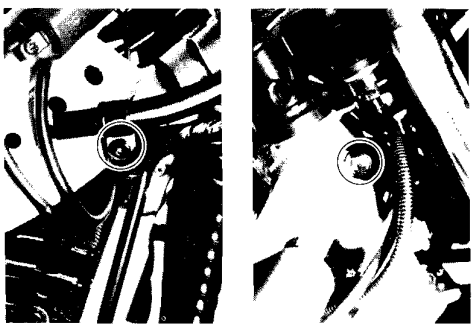
Reinstall the fairing in the reverse order of removal.

WIND-SHIELD

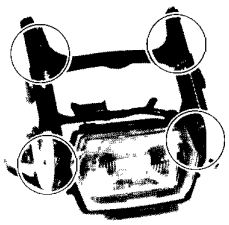


REMOVAL AND DISASSEMBLY

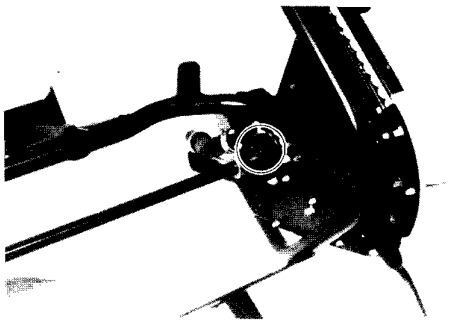
- Remove the upper and lower fairings. (Page 7-1, 7-2)
- Remove the wind-shield assembly along with the fairing brace by removing the fairing brace mounting bolts.



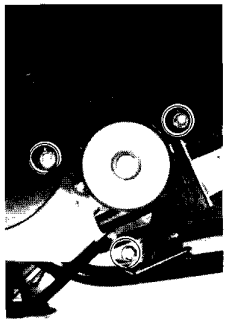
- Remove the wind-shield by removing the screws.
- Remove the headlight assembly by removing the bolts.

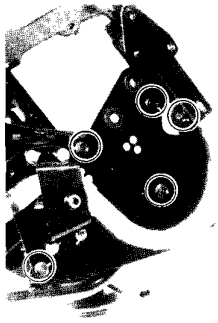


- Loosen the driveshaft joint screws.

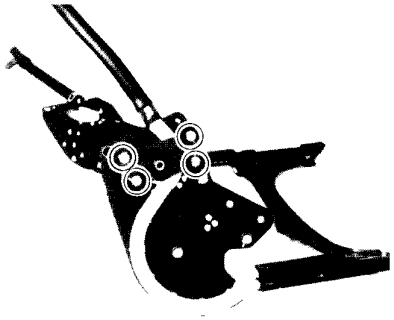


- Remove the motor assembly by removing the bolts.
- Remove the left and right wind-shield brackets by removing the bolts.

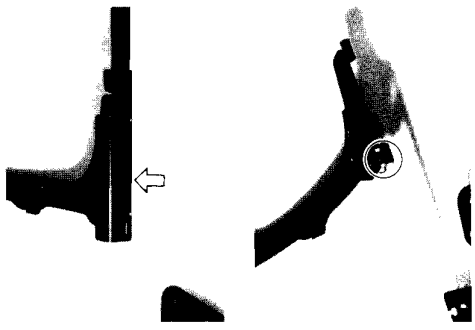




- Remove the driveshaft right-end holder by removing the bolts and remove the driveshaft.



- Remove the left and right wind-shield slider guides.
- Remove the left and right wind-shield brackets from the wind-shield slider by removing the bolts.

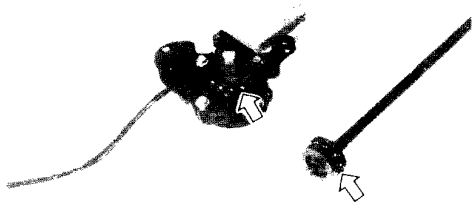


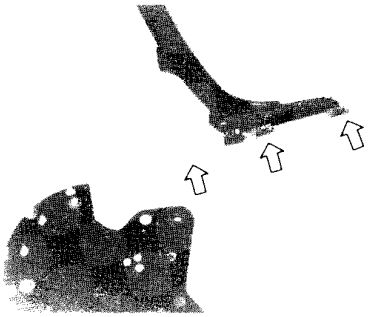
REASSEMBLY AND REMOUNTING

Reassemble and remount the wind-shield in the reverse order of disassembly and removal. Pay attention to the following points:

- Apply grease to each sliding part before reassembling.

99000-25030: SUZUKI super grease "A"





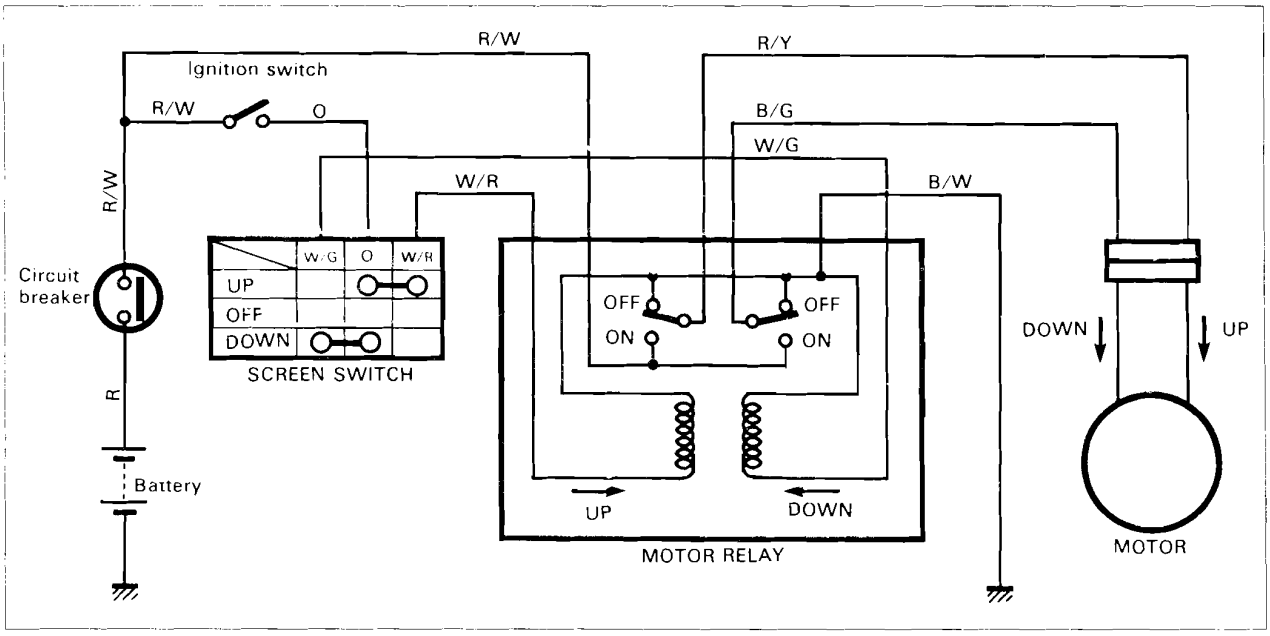
- Before remounting the wind-shield assembly, check the wind-shield for smooth operation by using the 12V battery and jumper wires.

NOTE:

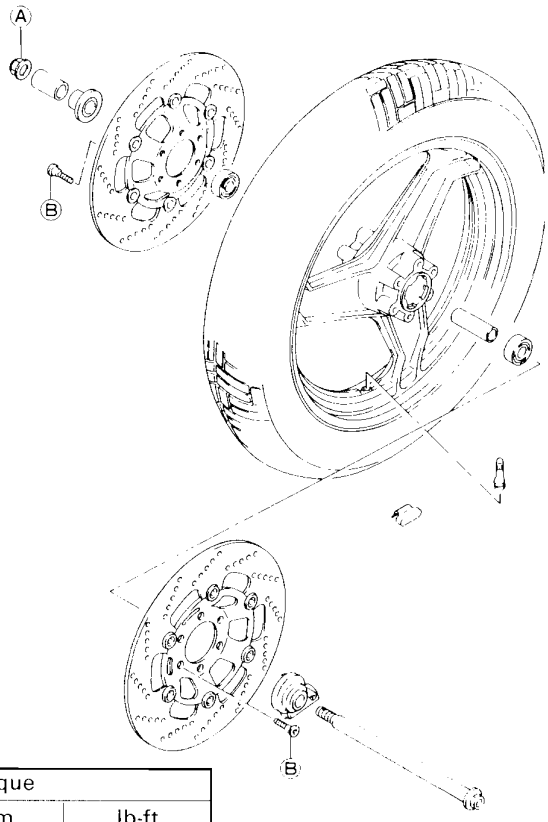
Put one jumper wire to ⊕ terminal and other jumper wire to ⊖ terminal, then swap the two jumper wires.

* *When checking the wind-shield motor relay, refer to page 6-22.*

WIRING DIAGRAM

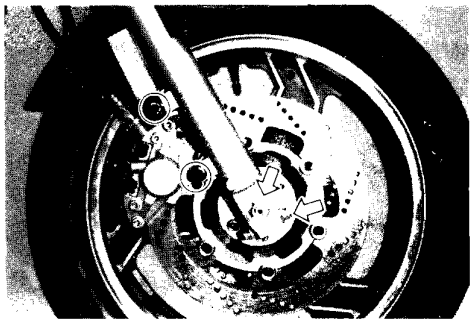


FRONT WHEEL



Tightening torque			
Item	N·m	kg-m	lb-ft
Ⓐ	55 – 88	5.5 – 8.8	40.0 – 63.5
Ⓑ	15 – 25	1.5 – 2.5	11.0 – 18.0

REMOVAL

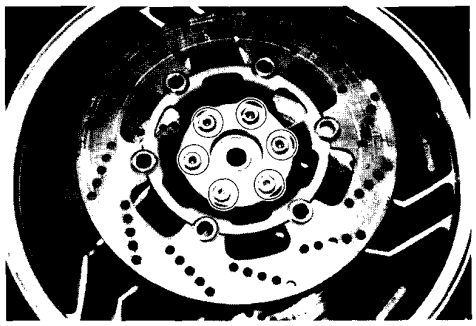


- Place the motorcycle on the center stand.
- Place a wooden block under the exhaust pipe.
- Loosen the axle pinch bolt.
- Remove the cotter pin.
- Remove the axle nut.
- Remove both brake calipers by removing the mounting bolts.
- Remove the axle shaft and front wheel.

NOTE:
Do not operate the brake lever while dismounting the brake calipers.

CAUTION:
Hang the brake caliper from the motorcycle frame by using the string etc., taking care not to bend the brake hose.

- Remove both brake discs off the front wheel by removing the mounting bolts.

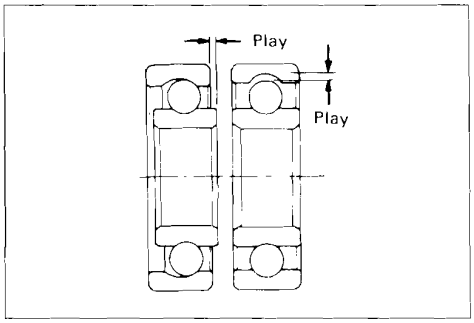


INSPECTION AND DISASSEMBLY

TIRE..... Refer to page 7-36.

WHEEL BEARINGS

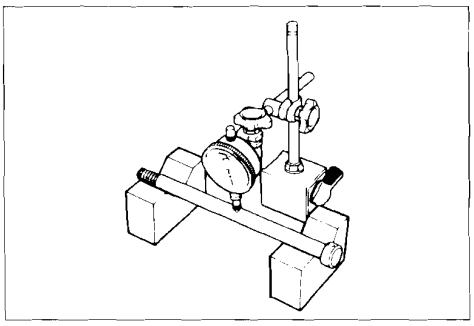
Inspect the play of the wheel bearing inner race by hand while it is in the wheel. Rotate the inner race by hand to inspect for abnormal noise and smooth rotation. Replace the bearing if there is anything unusual.



AXLE SHAFT

Using a dial gauge, check the axle shaft for runout and replace it if the runout exceeds the limit.

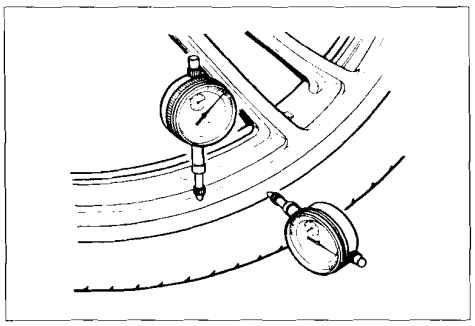
09900-20606: Dial gauge (1/100)
09900-20701: Magnetic stand (Not available in U.S.)
Service Limit: 0.25 mm (0.010 in)



WHEEL

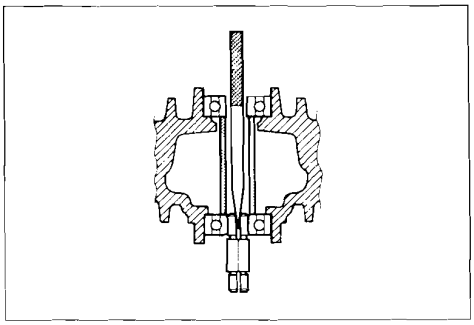
Make sure that the wheel runout checked as shown does not exceed the service limit. An excessive runout is usually due to worn or loose wheel bearings and can be reduced by replacing the bearings. If bearing replacement fails to reduce the runout, replace the wheel.

Service Limit (Axial and Radial): 2.0 mm (0.08 in)



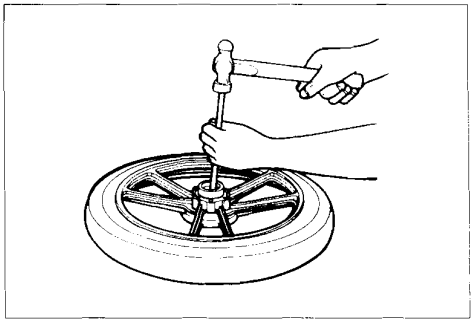
- Drive out the both wheel bearings by using the special tool in the following procedures.

09941-50110: Bearing remover



- Insert the adaptor into the wheel bearing.
- After inserting the wedge bar from the opposite side, lock the wedge bar in the slit of the adaptor.
- Drive out the wheel bearing by knocking the wedge bar.

CAUTION:
The removed bearings should be replaced with new ones.



REASSEMBLY AND REMOUNTING

Reassemble and remount the front wheel in the reverse order of removal and disassembly. Pay attention to the following points:

WHEEL BEARING

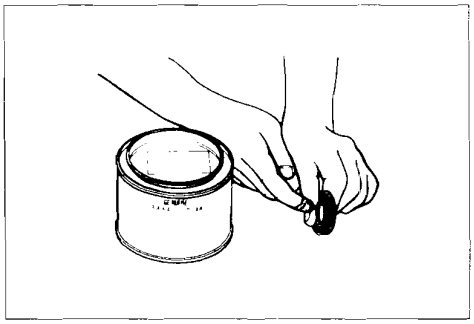
- Apply grease to the bearings before installing.

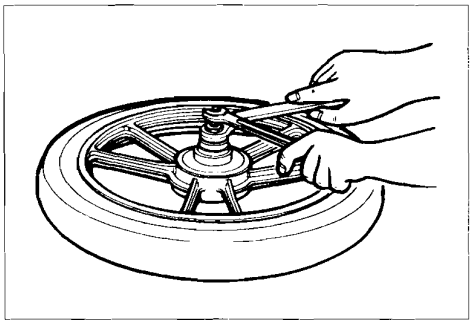
99000-25030: SUZUKI super grease "A"

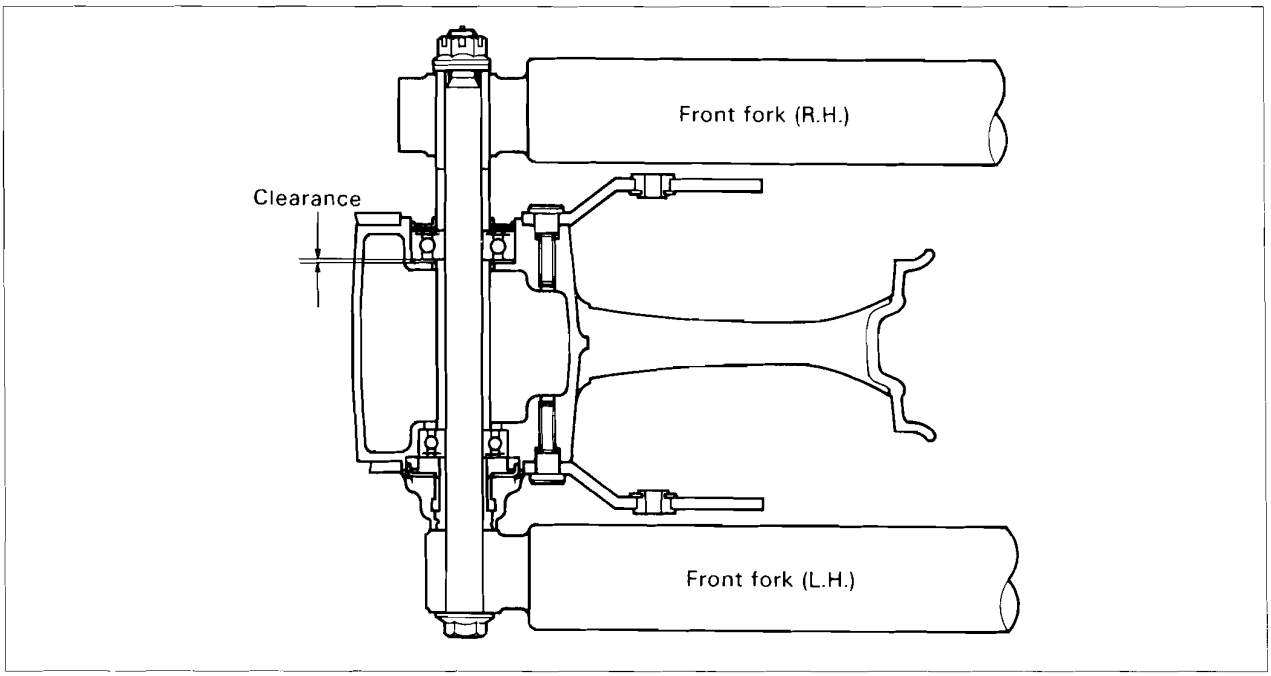
- Install the wheel bearings as follows by using the special tool.

NOTE:
First install the left wheel bearing, then install the right wheel bearing. The sealed cover on the bearing is positioned outside.

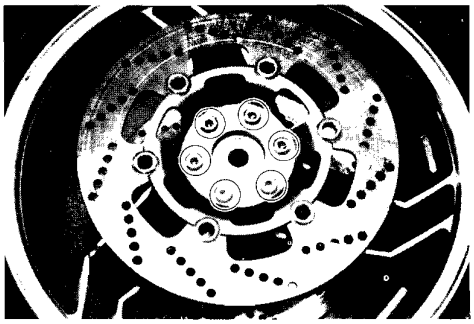
09924-84510: Bearing installer set







BRAKE DISC

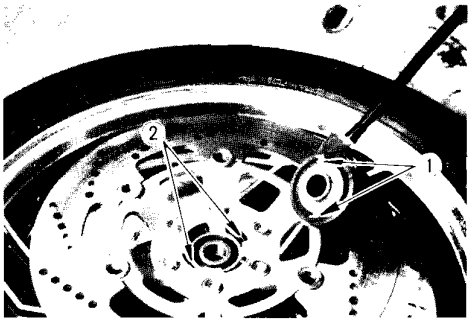


- Make sure that the brake disc is clean and free of any greasy matter. Apply Thread Lock "1360" to the disc mounting bolts and tighten them to the specified torque.

Tightening torque: 15 – 25 N·m
(1.5 – 2.5 kg-m, 11.0 – 18.0 lb-ft)

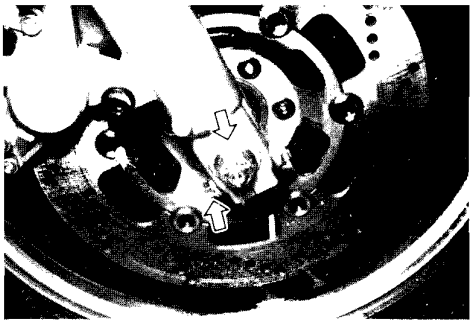
99000-32130: Thread Lock "1360"

SPEEDOMETER GEARBOX



- Before installing the speedometer gearbox, grease it and align the drive lugs ① to the recesses ② of the wheel hub and attach the speedometer gearbox to the wheel hub. When tightening the front axle, check to be sure that the speedometer gearbox is in the position so that the speedometer cable does not bend sharply.

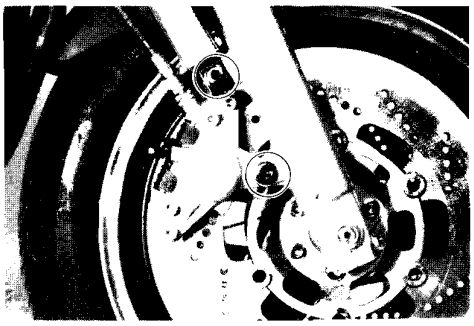
AXLE SHAFT



- Tighten the axle nut and axle pinch nut to the specified torque.

Tightening torque
Axle nut : 55 – 88 N·m
(5.5 – 8.8 kg-m, 40.0 – 63.5 lb-ft)
Axle pinch nut: 15 – 25 N·m
(1.5 – 2.5 kg-m, 11.0 – 18.0 lb-ft)

BRAKE CALIPER

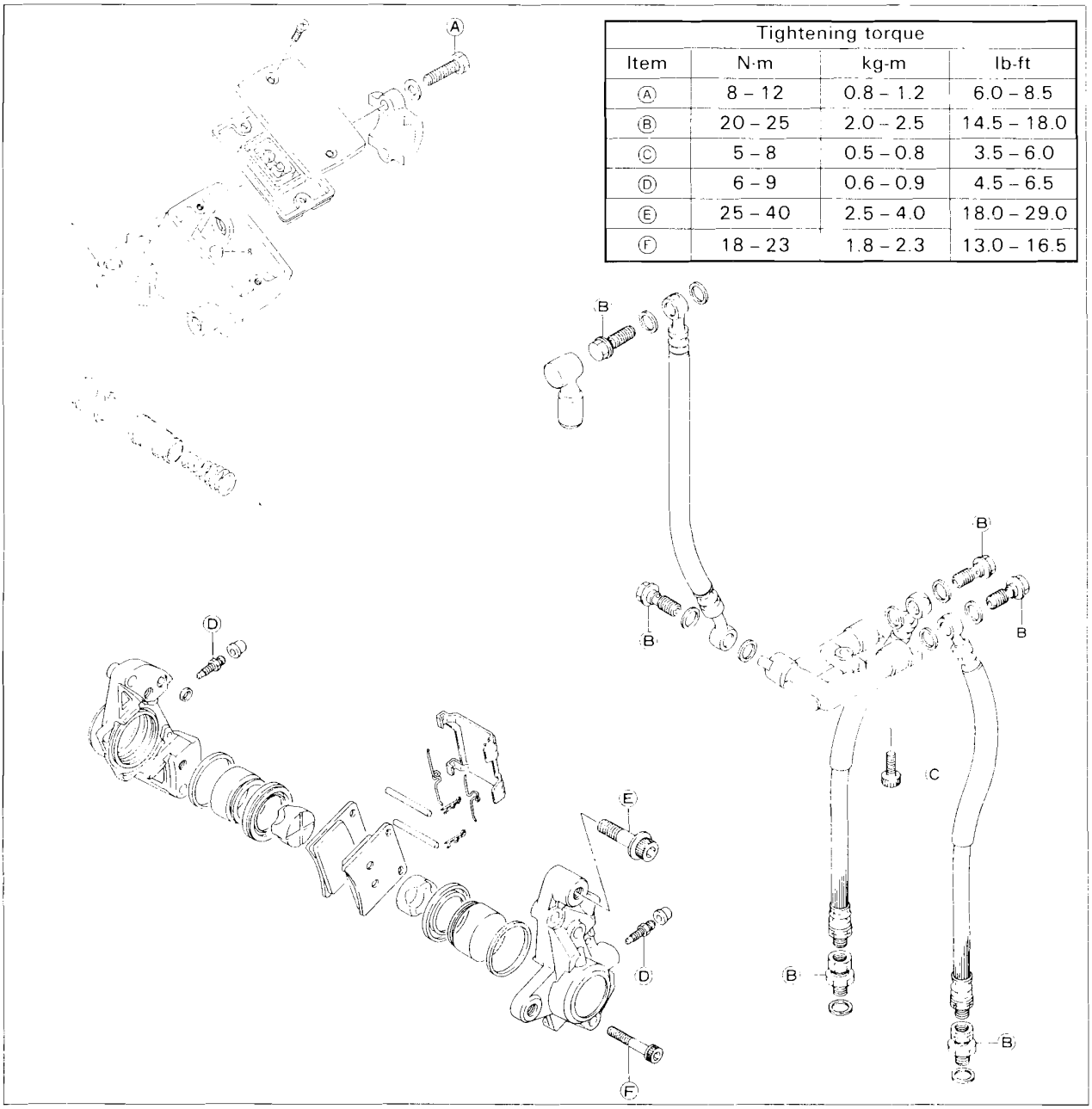


- Tighten the brake caliper mounting bolts to the specified torque.

Tightening toque: 25 – 40 N·m
(2.5 – 4.0 kg-m, 18.0 – 29.0 lb-ft)

NOTE:
Push the pistons all the way into the caliper and remount the calipers.

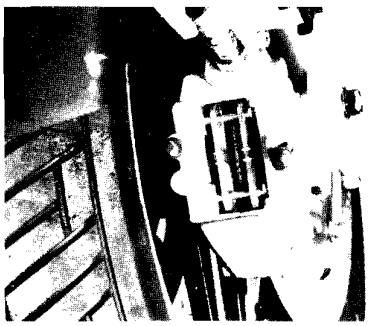
FRONT BRAKE



Item	Tightening torque		
	N·m	kg-m	lb-ft
Ⓐ	8 – 12	0.8 – 1.2	6.0 – 8.5
Ⓑ	20 – 25	2.0 – 2.5	14.5 – 18.0
Ⓒ	5 – 8	0.5 – 0.8	3.5 – 6.0
Ⓓ	6 – 9	0.6 – 0.9	4.5 – 6.5
Ⓔ	25 – 40	2.5 – 4.0	18.0 – 29.0
Ⓕ	18 – 23	1.8 – 2.3	13.0 – 16.5

BRAKE PAD REPLACEMENT

- Remove the dust seal cover.
- Remove the clips, pins and springs.
- Remove the pads.

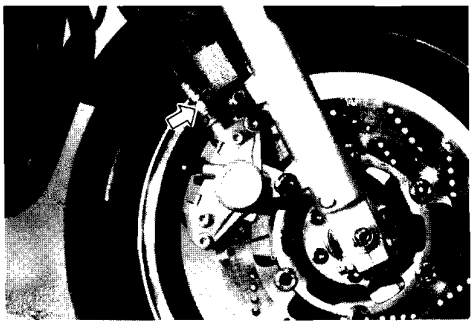


CAUTION:

*** Do not operate the brake lever while dismounting the pads.**

*** Replace the brake pad as a set, otherwise braking-performance will be adversely affected.**

CALIPER REMOVAL AND DISASSEMBLY



- Disconnect the brake hose off the brake caliper and catch the brake fluid in a suitable receptacle.

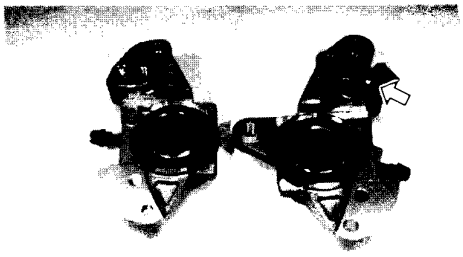
CAUTION:
Never re-use the brake fluid left over from the servicing and stored for long periods.

WARNING:
Brake fluid, if it leaks, will interfere with safe running and discolor painted surfaces. Check the brake hose and hose joint for cracks and oil leakage.

- Remove the caliper mounting bolts and remove the caliper.

NOTE:
Slightly loosen the caliper housing bolts to facilitate later disassembly before removing the caliper mounting bolts.

09900-00410: Hexagon wrench set



- Remove the pads. (Page 7-10)
- Separate the caliper halves by removing the caliper housing bolts.
- Remove the O-ring.

NOTE:
Once separate the caliper halves, replace the O-ring with a new one.

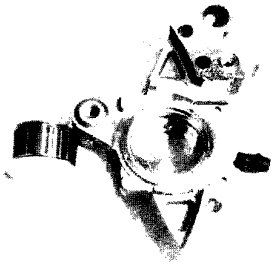
- Place a rag over the piston to prevent it from popping out and push out the piston by using air gun.

CAUTION:
Do not use high pressure air to prevent piston damage.

- Remove the dust seal and piston seal.

CALIPER INSPECTION

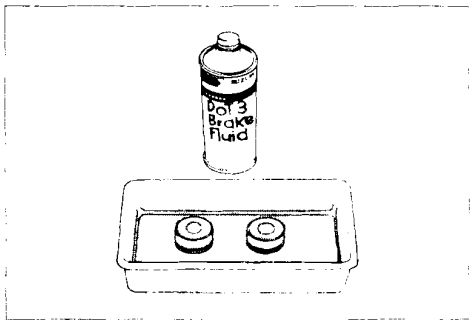
Inspect the caliper bore wall for nicks, scratches or other damage.
Inspect the piston surface for any scratches or other damage.



Inspect each rubber part for damage and wear.

CALIPER REASSEMBLY AND REMOUNTING

Reassemble and remount the caliper in the reverse order of removal and disassembly. Pay attention to the following points:



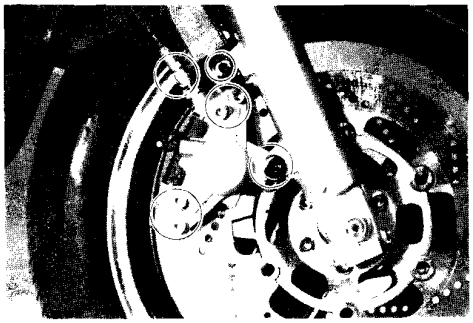
CAUTION:

- *** Wash the caliper components with fresh brake fluid before reassembly.**
- *** Never use cleaning solvent or gasoline to wash them.**
- *** Apply brake fluid to the caliper bore and piston to be inserted into the bore.**

CALIPER BOLTS

Tighten the bolts to the specified torque.

Item	N·m	kg-m	lb-ft
Brake hose union	20–25	2.0–2.5	14.5–18.0
Caliper mounting bolt	25–40	2.5–4.0	18.0–29.0
Caliper housing bolt	18–23	1.8–2.3	13.0–16.5



CAUTION:

Bleed air after reassembling the caliper. (Refer to page 2-15.)

DISC SERVICING

- Remove the front wheel. (page 7-6)
- Remove the brake caliper. (page 7-6)
- Remove the disc. (page 7-7)
- Install the disc. (page 7-9)

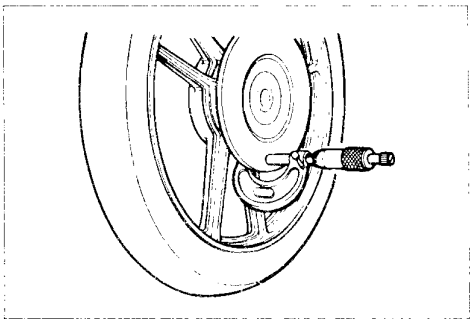
DISC INSPECTION

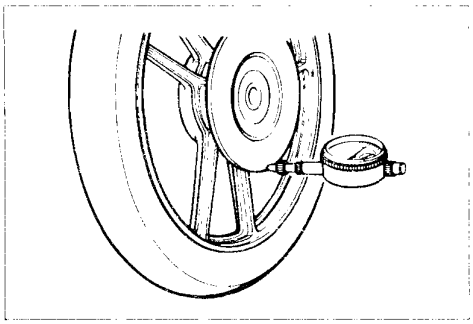
Using a micrometer, check the disc for wear. Its thickness can be checked with disc and wheel in place. The service limits for the thickness of the discs are shown below.

09900-20205: Micrometer (0 – 25 mm)
Service Limit (Front disc): 4.0 mm (0.15 in)
Service Limit (Rear disc) : 6.0 mm (0.24 in)

With the disc mounted on the wheel, check the disc for face runout with a dial gauge, as shown.

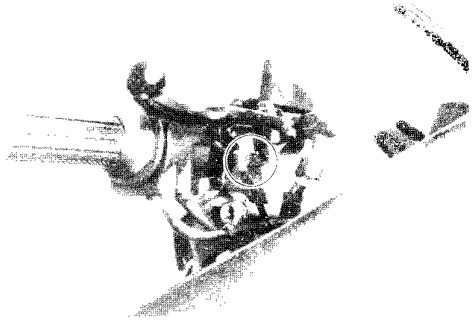
09900-20606: Dial gauge (1/100 mm)
09900-20701: Magnetic stand (Not available in U.S.)
Service Limit : 0.30 mm (0.01 in)



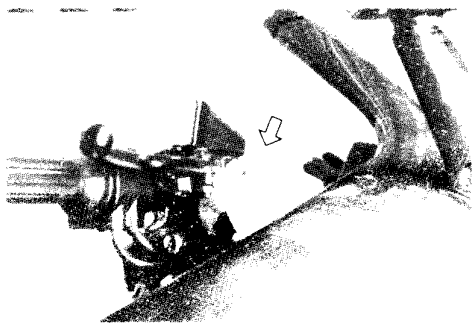


MASTER CYLINDER REMOVAL AND DISASSEMBLY

- Remove the front brake light switch.

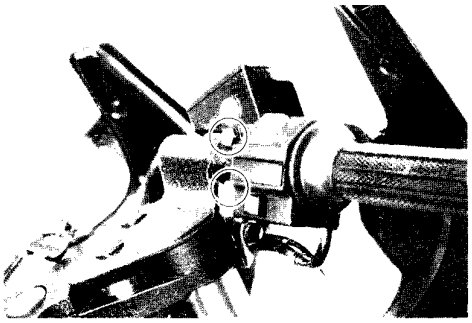


- Place a rag underneath the union bolt on the master cylinder to catch the spilled drops of brake fluid. Unscrew the union bolt and disconnect the brake hose off the master cylinder.

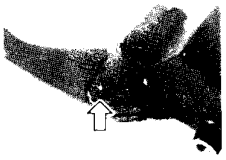


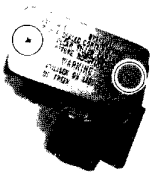
CAUTION:
Completely wipe off any brake fluid adhering to any parts of motorcycle. The fluid reacts chemically with paint, plastics, rubber materials, etc and will damage them severely.

- Remove the master cylinder assembly by removing the two clamp bolts.



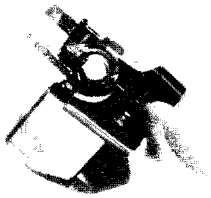
- Remove the brake lever by removing the bolt.
- Remove the reservoir cap and diaphragm by removing the two screws.
- Drain brake fluid.



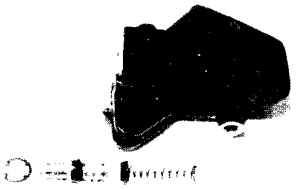


- Remove the dust seal boot.
- Remove the circlip with the snap ring pliers.

09900-06108: Snap ring pliers

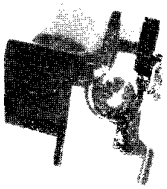


- Remove the spring/primary cup/piston/secondary cup out of the master cylinder.



MASTER CYLINDER INSPECTION

Inspect the master cylinder bore for any scratches or other damage.
Inspect the piston surface for any scratches or other damage.
Inspect the primary cup, secondary cup and dust seal boot for wear or damage.

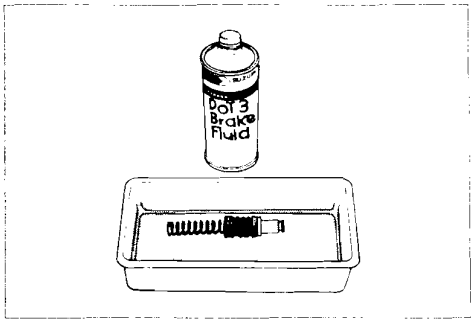


MASTER CYLINDER REASSEMBLY AND REMOUNTING

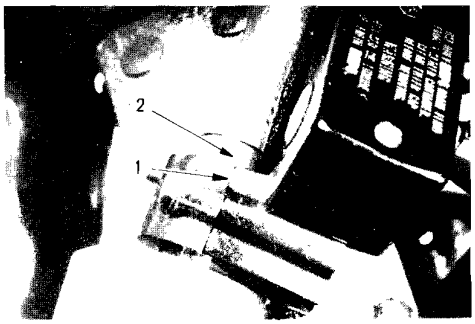
Reassemble and remount the master cylinder in the reverse order of removal and disassembly. Pay attention to the following points:

CAUTION:

- **Wash the master cylinder components with fresh brake fluid before reassembly.**
- **Never use cleaning solvent or gasoline to wash them.**
- **Apply brake fluid to the cylinder bore and all the internal parts to be inserted into the bore.**



When remounting the master cylinder on the handlebar, align the master cylinder holder mating surface ① with punched mark ② on the handlebar, and tighten the upper clamp bolt first as shown.

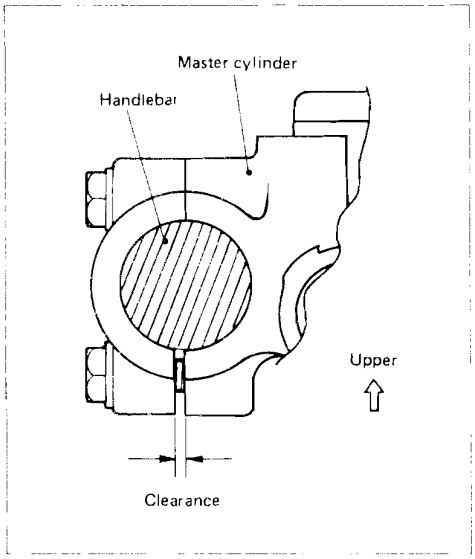


Tightening torque: 8 – 12 N·m
(0.8 – 1.2 kg-m, 6.0 – 8.5 lb-ft)

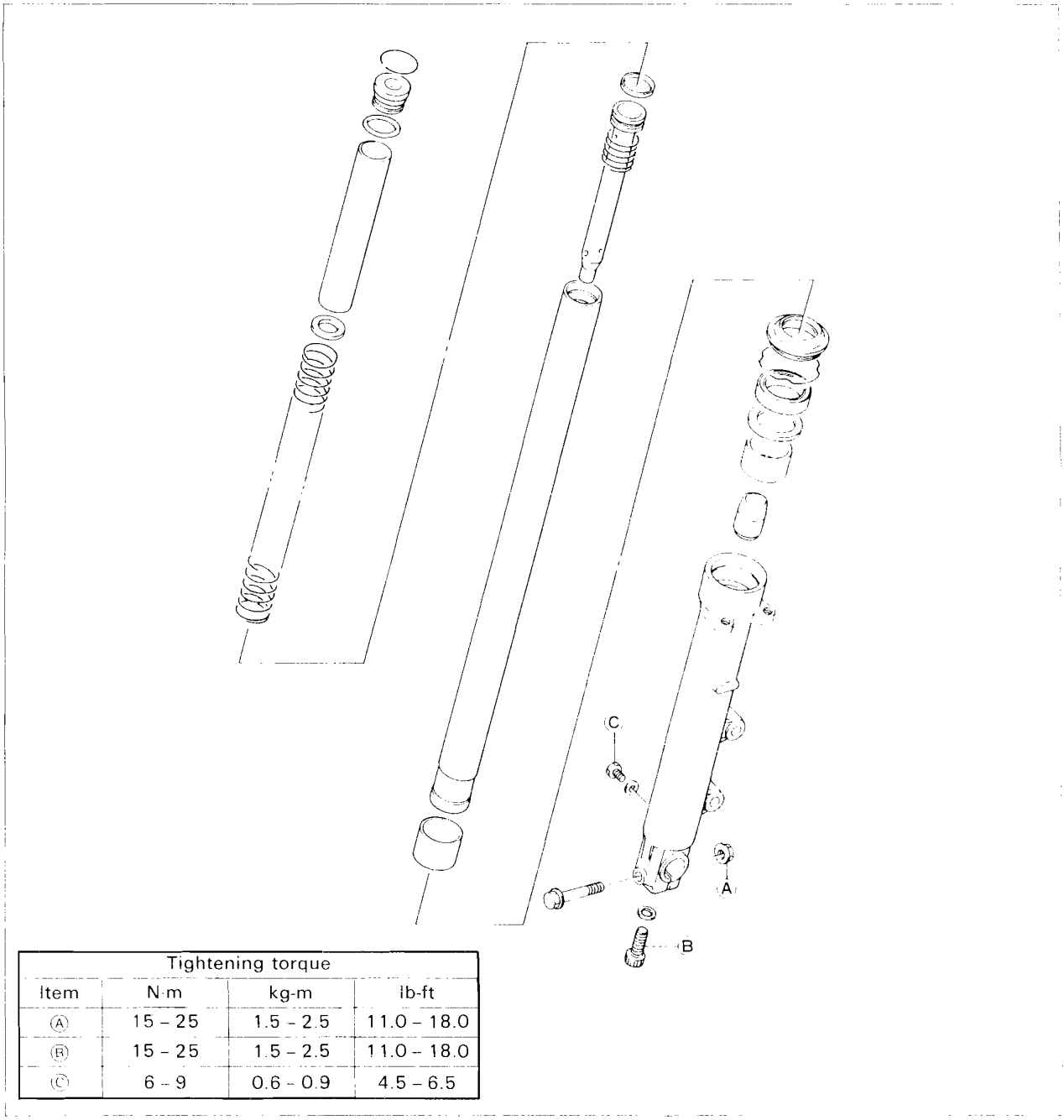
CAUTION:

Bleed air after reassembling master cylinder. (Refer to page 2-15.)

Adjust the front brake light switch after installation.



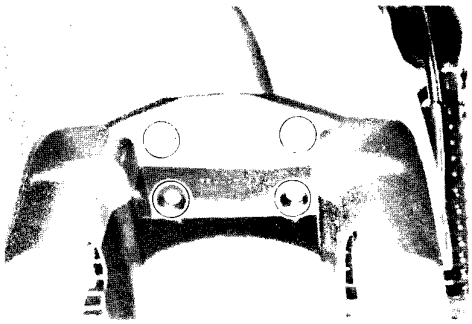
FRONT FORK



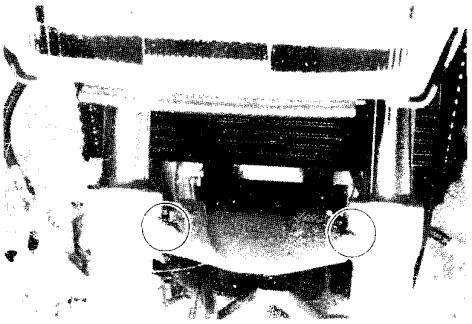
Tightening torque			
Item	N·m	kg-m	lb-ft
Ⓐ	15 – 25	1.5 – 2.5	11.0 – 18.0
Ⓑ	15 – 25	1.5 – 2.5	11.0 – 18.0
Ⓒ	6 – 9	0.6 – 0.9	4.5 – 6.5

REMOVAL AND DISASSEMBLY

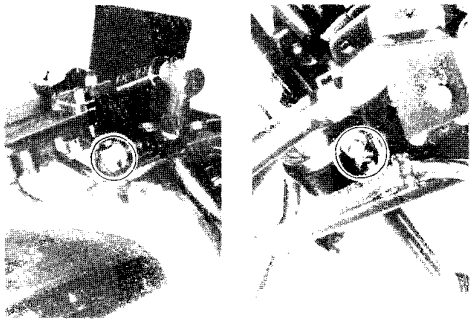
- Remove the upper and lower fairings. (Page 7-1, 7-2)
- Remove the brake calipers, left and right. (Page 7-6)
- Remove the front wheel. (Page 7-6)
- Remove the front fender by removing screws.



- Remove the front fork stabilizer by removing the screws.



- Loosen the front fork upper and lower mounting bolts, left and right.
- Remove the front forks, left and right.

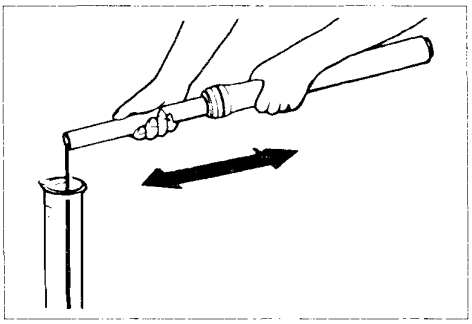


- Remove the rubber cap, stopper ring and front fork cap.

NOTE
To remove the stopper ring, it will be necessary to push the front fork cap inwards, to remove the spring pressure from the stopper ring.

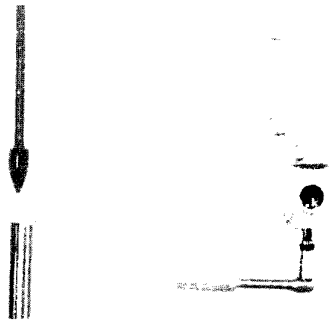
- Remove the spacer, spring seat and spring out of the inner tube.

- Invert the fork and stroke it several times to let out fork oil.
- Hold the fork inverted for a few-minutes to drain oil.



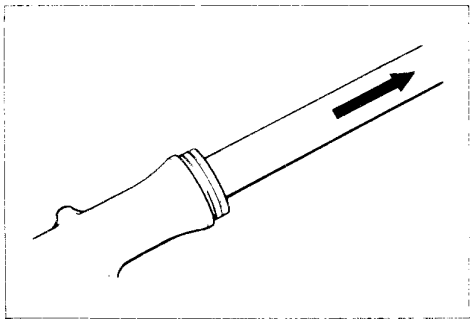
- Remove the dust seal and oil seal stopper ring.

- Remove the damper rod bolt by using the special tools.
  ① **09940-34520: "T" handle**
  ② **09940-34530: Attachment "A"**
  ③ **09900-00410: Hexagon wrench set**
- Remove the damper rod and rebound spring out of the inner tube.

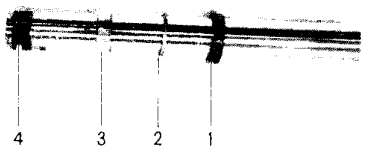


- Separate the inner tube out of the outer tube.

CAUTION:
The outer tube and inner tube "ANTI-FRICTION" metals must be replaced along with the oil seal and dust seal.



① Oil seal
② Oil seal retainer
③ Anti-friction metal (outer)
④ Anti-friction metal (Inner)



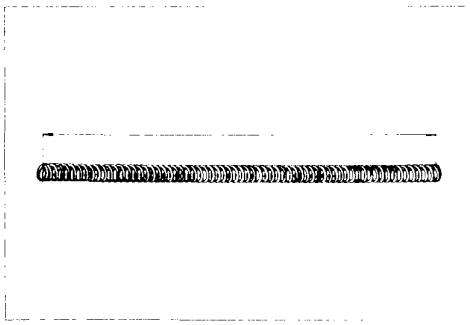
- Remove the inner and outer anti-friction metals.

INSPECTION

FORK SPRING

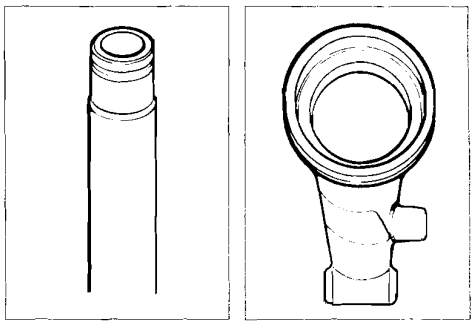
Measure the fork spring free length. If it is shorter than the service limit, replace it with a new one.

Service Limit: 342 mm (13.5 in)



INNER AND OUTER TUBE

Inspect the inner tube sliding surface and outer tube sliding surface for any scuffing.



DAMPER ROD RING

Inspect the damper rod ring for wear and damage.

REASSEMBLY AND REMOUNTING

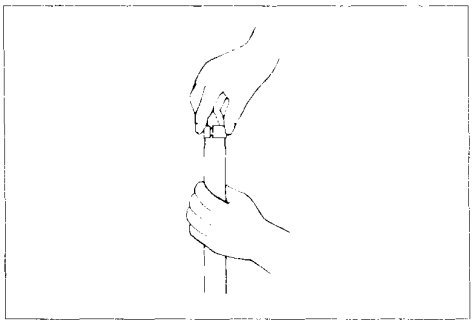
Reassemble and remount the front fork in the reverse order of removal and disassembly. Pay attention to the following points:

INNER TUBE METAL

- Hold the inner tube vertically and clean the metal groove.
- Clean the metal inner and outer surfaces and install it to the metal groove of the inner tube as shown.

CAUTION:

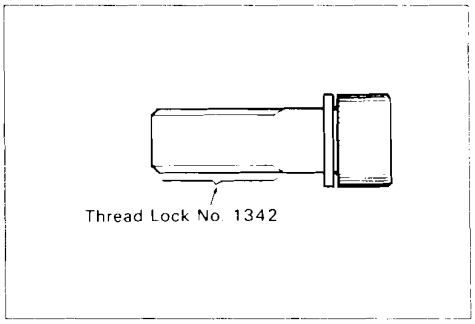
Use special care to prevent damage to the "Teflon" coated surface of the Anti-friction metal when mounting it.



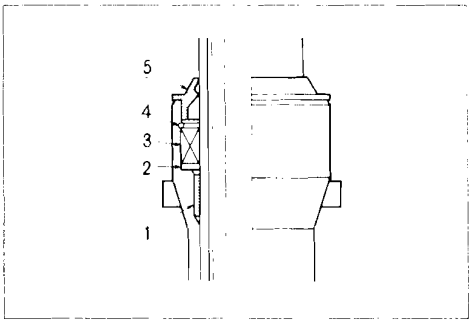
DAMPER ROD BOLT

- Apply Thread Lock "1342" to the damper rod bolt and tighten it to the specified torque.

99000-32050: Thread Lock "1342"
Tightening torque: 15 - 25 N·m
(1.5 - 2.5 kg-m, 11.0 - 18.0 lb-ft)



OUTER TUBE METAL, OIL SEAL AND DUST SEAL



- Clean the metal groove of outer tube and metal outer surface.
- Install the outer tube metal ①, oil seal retainer ② and oil seal ③.

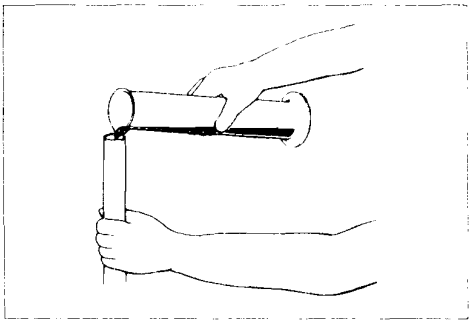
CAUTION:
Use special care to prevent damage to the "Teflon" coated surface of the Anti-friction metal when mounting it.

09940-50112: Front fork oil seal installer

- After installing the oil seal ③, install the oil seal stopper ring ④.
- Install the dust seal ⑤.

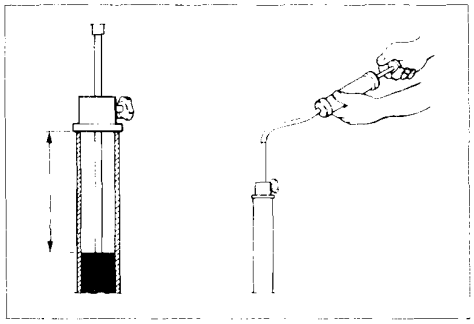
① : Anti-friction metal
② : Oil seal retainer
③ : Oil seal
④ : Oil seal stopper ring
⑤ : Dust seal

FORK OIL



- Use front fork oil whose viscosity rating meets specifications below.

Fork oil type: Fork oil #10
Fork oil capacity: 478 ml (16.2 US OZ)
(each leg)

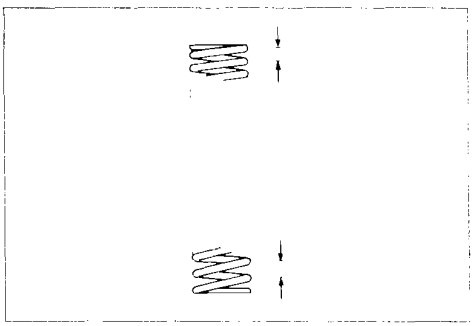


- Hold the front fork vertical and adjust the fork oil level with the special tool.

NOTE:
When adjusting oil level, remove the fork spring and compress the inner tube fully.

09943 -74111: Fork oil level gauge
Oil level: 126 mm (4.96 in)

FORK SPRING



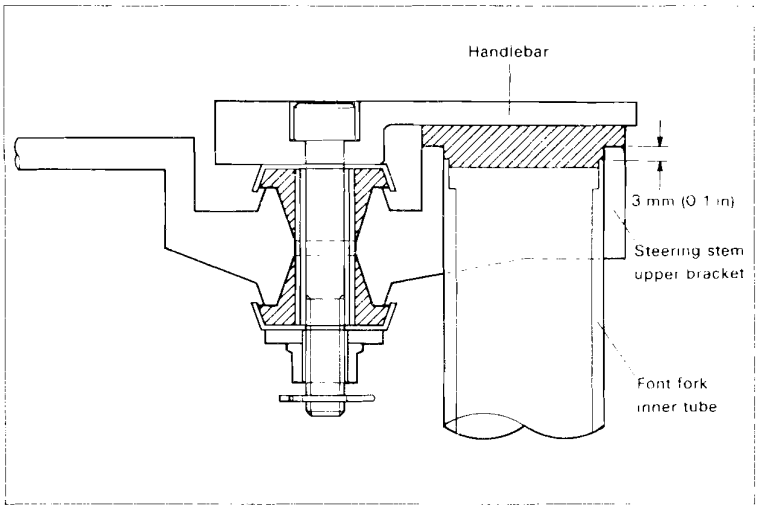
- When installing the fork spring, insert it with the smaller pitch to the top.

FRONT FORK CAP

- Install the fork cap stopper ring into the ring groove.

CAUTION:
Always insure that it is completely seated in stopper ring groove and securely fitted.

- Set the upper surface of the inner tube at 3 mm depth from the upper surface of the steering stem upper bracket.

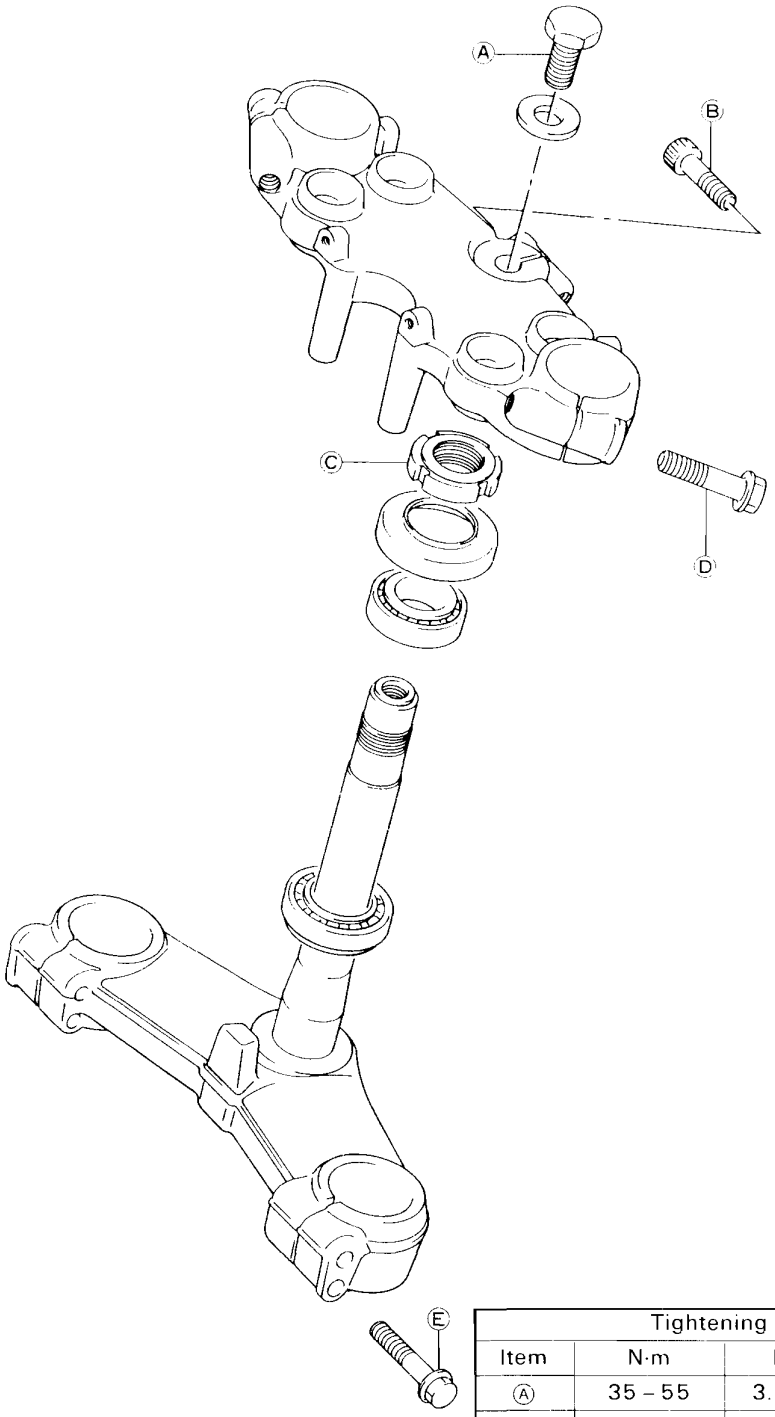


TIGHTENING TORQUE

Item	N·m	kg-m	lb-ft
Front fork upper clamp bolt	20–30	2.0–3.0	14.5–21.5
Front fork lower clamp bolt	15–25	1.5–2.5	11.0–18.0

NOTE:
Before installing the front fork stabilizer, move the front fork up and down 4 or 5 times.

STEERING

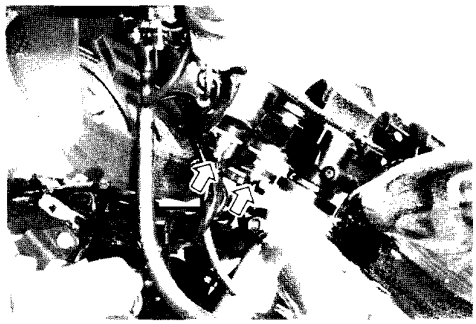


Tightening torque			
Item	N·m	kg-m	lb-ft
Ⓐ	35 – 55	3.5 – 5.5	25.5 – 40.0
Ⓑ	15 – 25	1.5 – 2.5	11.0 – 18.0
Ⓒ	40 – 50	4.0 – 5.0	29.0 – 36.0
Ⓓ	20 – 30	2.0 – 3.0	14.5 – 21.5
Ⓔ	15 – 25	1.5 – 2.5	11.0 – 18.0

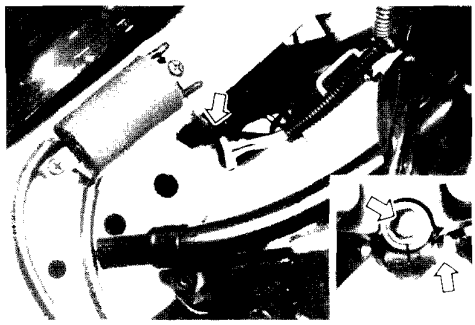
REMOVAL AND DISASSEMBLY

- Remove the upper and lower fairings. (Page 7-1, 7-2)
- Remove the brake calipers, left and right. (Page 7-6)
- Remove the front wheel. (Page 7-6)
- Remove the front fender and front fork stabilizer. (Page 7-16, 7-17)
- Remove the front forks, left and right. (page 7-17)

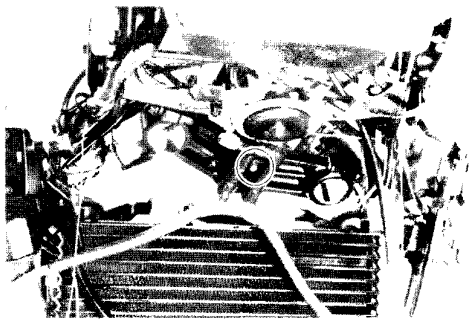
- Remove the steering head cover by removing the four screws.
- Remove the left and right handlebars by removing their mounting bolts.



- Disconnect the ignition switch lead wires coupler.
- Remove the steering stem upper bracket by removing the stem head bolt and stem clamp bolt.



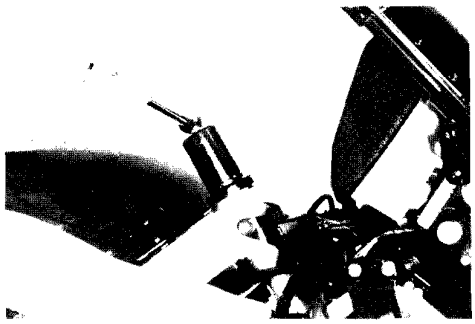
- Remove the brake hose joint off the steering stem lower bracket by removing the bolt.



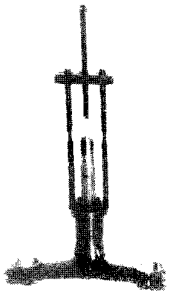
- Remove the steering stem nut by using the special tool, then remove the steering stem lower bracket.

09940-14911: Steering stem nut wrench

NOTE:
Hold the steering stem lower bracket by hand to prevent it from falling.



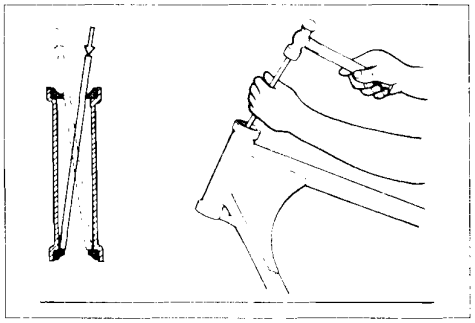
- Install a proper bolt onto the steering stem head.
- Remove the steering stem lower bearing by using the special tool.



CAUTION:
The removed bearing should be replaced with new one.

09941-84510: Bearing remover

- Drive out the steering stem bearing races, upper and lower by using a proper drift.



INSPECTION

Inspect the removed parts for the following abnormalities.

* Handlebar distortion
* Race wear and brinelling
* Bearing wear or damage
* Abnormal noise of bearing
* Distortion of steering stem

Inspect the play of steering dampers by hand while it is in the steering stem upper bracket. If play can be found, replace the dampers.

REASSEMBLY AND REMOUNTING

Reassemble and remount the steering stem in the reverse order of removal and disassembly. Pay attention to the following points:

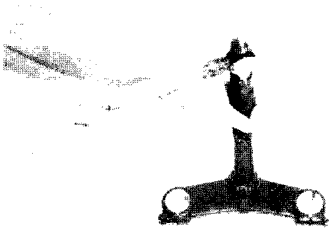
OUTER RACES

- Press in the upper and lower outer races by using the special tool.

09941-34513: Steering outer race installer

BEARING

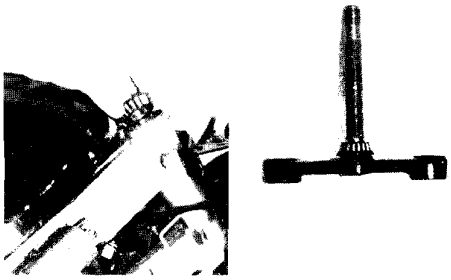
- Press in the lower bearing by using the special tool.



09941-74910: Steering bearing installer

- Apply grease to the upper and lower bearings.

99000-25030: SUZUKI super grease "A".

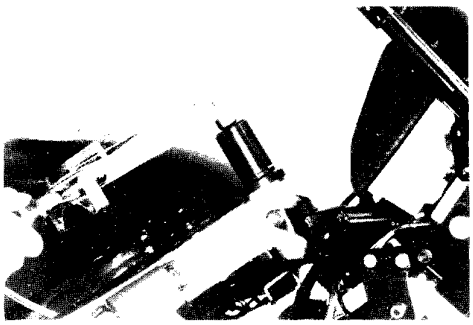


STEM NUT

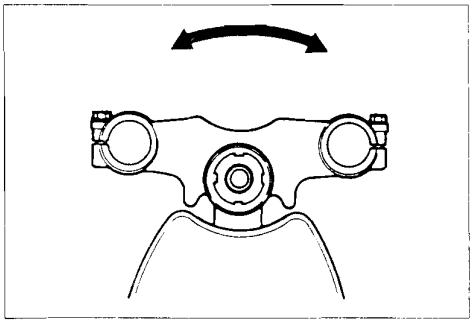
- Tighten the steering stem nut to the specified torque.

Tightening torque: 40 – 50 N·m
(4.0 – 5.0 kg-m, 29.0 – 36.0 lb-ft)

09940-14911: Steering stem nut wrench

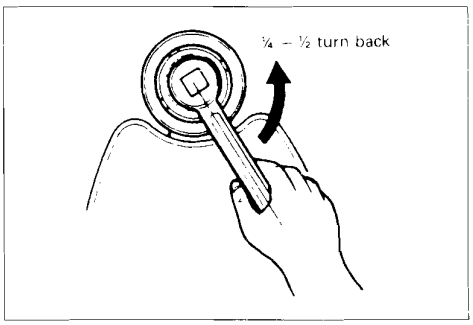


- Turn the steering stem lower bracket about five or six times to the left and right so that the taper roller bearing will be seated properly.



- Turn back the stem nut by 1/4 – 1/2 turn.

NOTE:
This adjustment will vary from motorcycle to motorcycle.



NOTE:
Hold the front fork leg, move it back and forth and make sure that the steering is not loose.

Tightening torque

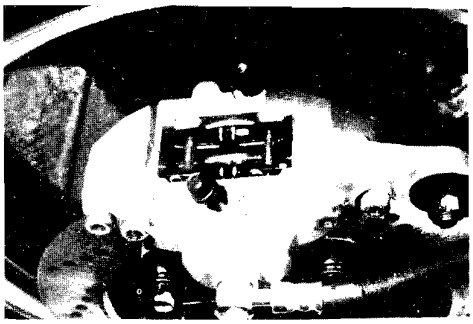
Steering stem head bolt	35–55 N·m (3.5–5.5 kg-m, 25.5–40.0 lb-ft)
Steering stem clamp bolt	15–25 N·m (1.5–2.5 kg-m, 11.0–18.0 lb-ft)
Handlebar mounting bolt	25–35 N·m (2.5–3.5 kg-m, 18.0–25.5 lb-ft)

REAR BRAKE

Item	Tightening torque		
	N·m	kg-m	lb-ft
Ⓐ	20 – 25	2.0 – 2.5	14.5 – 18.0
Ⓑ	15 – 25	1.5 – 2.5	11.0 – 18.0
Ⓒ	6 – 9	0.6 – 0.9	4.5 – 6.5
Ⓓ	18 – 23	1.8 – 2.3	13.0– 16.5
Ⓔ	25 – 40	2.5 – 4.0	18.0 – 29.0

BRAKE PAD REPLACEMENT

- Remove the dust seal cover.
- Remove the clips, pins and springs.
- Remove the pads.

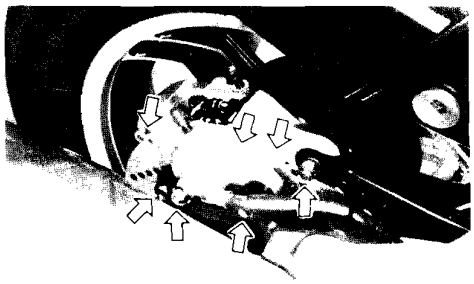


CAUTION:

*** Do not operate the brake pedal while dismounting the pads.**

*** Replace the brake pad as a set, otherwise braking-performance will be adversely affected.**

CLIPER REMOVAL AND DISASSEMBLY



- Remove the union bolt and catch the brake fluid in a suitable receptacle.

CAUTION:
Never reuse the brake fluid left over from the servicing and stored for long periods.

WARNING:
Brake fluid, if it leaks, will interfere with safe running and discolor painted surfaces.
Check the brake hose and hose joint for cracks and oil leakage.

- Remove the caliper mounting bolts.
- Remove the torque link bolt and nut, and remove the caliper.

NOTE:
Slightly loosen the caliper housing bolts to facilitate later disassembly before removing the caliper mounting bolts.

09900-00410: Hexagon wrench set

- Remove the pads. (Page 7-26)
- Remove the caliper housing bolts and separate the caliper halves. (Page 7-11)
- Remove the O-ring. (Page 7-11)

NOTE
Once separate the caliper halves, replace the O-ring with a new one.

- Remove the dust seal and piston seal. (Page 7-11)

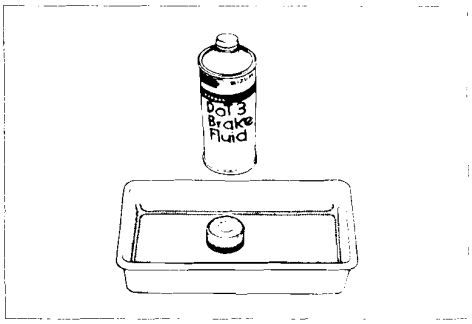
INSPECTION

DISC SERVICING

- Remove the rear wheel. (Page 7-13)
- Remove the brake caliper. (This page)
- Remove the disc. (Page 7-32)
- Install the disc. (Page 7-35)

REASSEMBLY AND REMOUNTING

Reassemble and remount the caliper in the reverse order of removal and disassembly. Pay attention to the following points:



CAUTION:

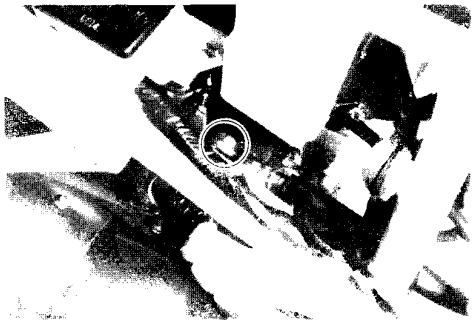
*** Wash the caliper components with fresh brake fluid before reassembly.**
*** Never use cleaning solvent or gasoline to wash them.**
*** Apply brake fluid to the caliper bore and piston to be inserted into the bore.**
*** Bleed air after reassembling the caliper. (Refer to page 2-15.)**

TIGHTENING TORQUE

Item	N-m	kg-m	lb-ft
Union bolt	20–25	2.0–2.5	14.5–18.0
Torque link nut	22–33	2.2–3.3	16.0–24.0
Caliper housing bolt	18–23	1.8–2.3	13.0–16.5
Caliper mounting bolt	25–40	2.5–4.0	18.0–29.0

MASTER CYLINDER REMOVAL AND DISASSEMBLY

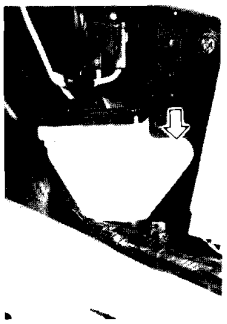
- Remove the right frame cover.
- Place a rag underneath the union bolt on the master cylinder to catch spilled drops of brake fluid. Unscrew the union bolt and disconnect the brake hose off the master cylinder.

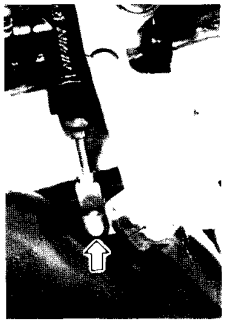


CAUTION:

Immediately and completely wipe off any brake fluid contacting any parts of the motorcycle. The fluid reacts chemically with paint, plastics and rubber materials, etc. and will damage them severely.

- Remove the reservoir tank mounting bolt.
- Remove the push rod pin by removing the cotter pin.

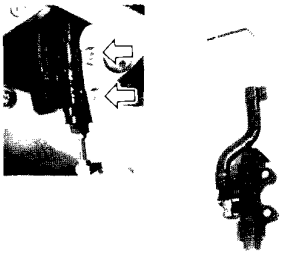




NOTE:

If it is difficult to remove the push rod pin, remove the brake pedal.

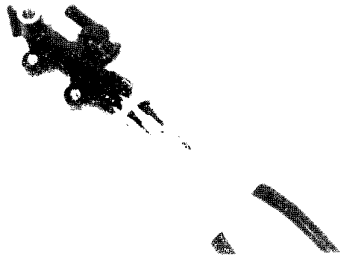
- Remove the master cylinder assembly by removing the two mounting bolts.



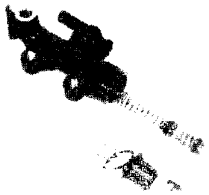
- Remove the reservoir tank and its hose from the master cylinder.
- Drain brake fluid from reservoir tank.

- Slide the dust seal boot sideways and remove the push rod by using the snap ring pliers.

09900-06108: Snap ring pliers

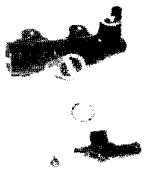


- Remove the spring/primary cup/ piston/ secondary cup out of the master cylinder.



- Remove the reservoir tank hose connector by removing the screw.

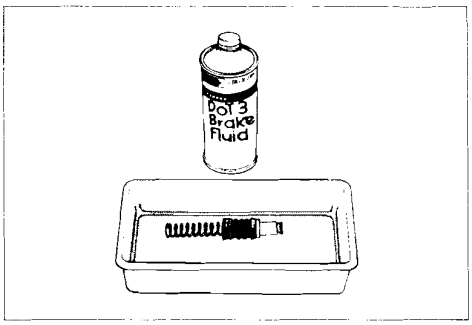
CAUTION:
The removed O-ring should be replaced with new one.



MASTER CYLINDER INSPECTION

Inspect the cylinder bore wall for any scratches or other damage.
Inspect the piston surface for any scratches or other damage.
Inspect the cup set and each rubber part for wear or damage.

MASTER CYLINDER REASSEMBLY AND REMOUNTING



Reassemble and remount the master cylinder in the reverse order of removal and disassembly. Pay attention to the following points:

CAUTION:

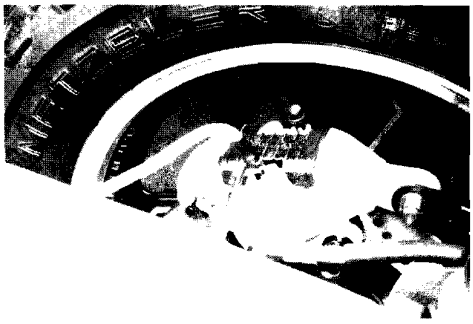
- **Wash the master cylinder components with fresh brake fluid before reassembly.**
- **Never use cleaning solvent or gasoline to wash them.**
- **Apply brake fluid to the cylinder bore and all the internal parts to be inserted into the bore.**

CAUTION:

Bleed air after reassembling master cylinder. (Refer to page 2-15.)

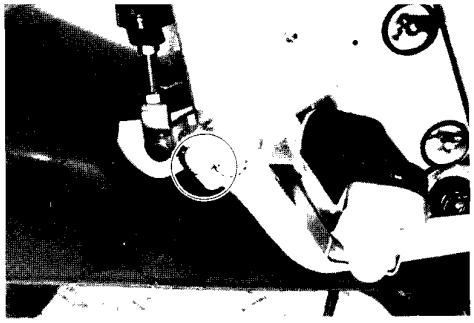
Adjust the rear brake light switch and brake pedal height after installation.

(Refer to page 2-14.)



REAR BRAKE PEDAL

When reinstalling the brake pedal, align the punched mark on the brake pedal shaft with the slit of the brake pedal.



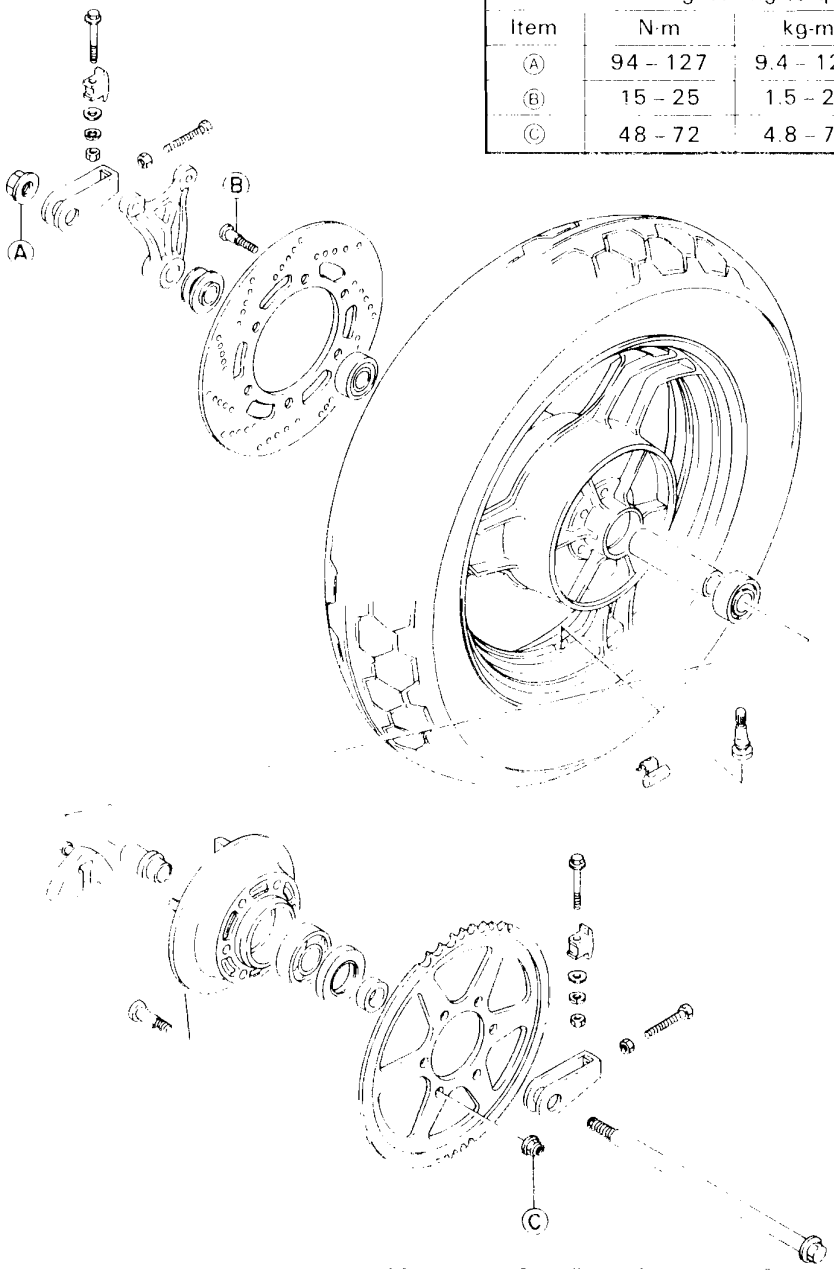
TIGHTENING TORQUE

Tighten the bolts to the specified torque.

Item	N·m	kg-m	lb-ft
Master cylinder mouning bolt	8 – 12	0.8 – 1.2	6.0 – 8.5
Union bolt	20 – 25	2.0 – 2.5	14.5 – 18.0
Brake pedal bolt	15 – 25	1.5 – 2.5	11.0 – 18.0

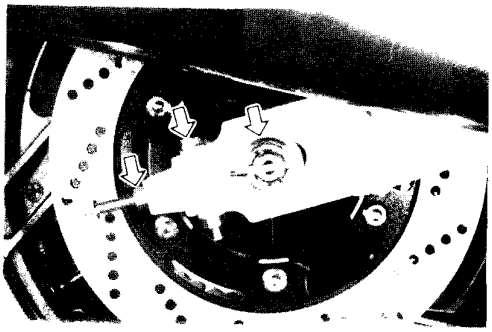
REAR WHEEL

Item	Tightening torque		
	N·m	kg-m	lb-ft
Ⓐ	94 – 127	9.4 – 12.7	68.0 – 92.0
Ⓑ	15 – 25	1.5 – 2.5	11.0 – 18.0
Ⓒ	48 – 72	4.8 – 7.2	35.0 – 52.0

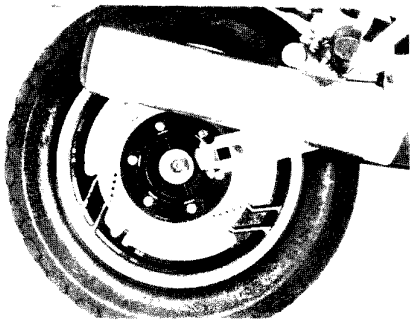


REMOVAL

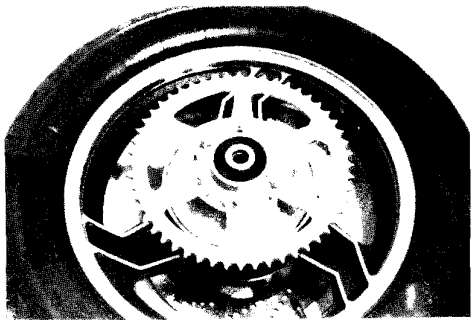
- Place the motorcycle on the center stand.
- Remove the brake caliper mounting bolts (Page 7-27).
- Remove the torque link bolt and nut and remove the brake caliper (Page 7-27).
- Loosen the axle pinch bolts, left and right.
- Remove the cotter pin.
- Remove the axle nut.
- Loosen the chain adjusting lock nuts, left and right.



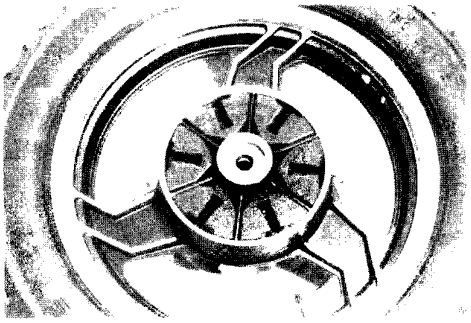
- Remove the axle shaft and disengage the drive chain from the rear sprocket.
- Remove the rear wheel.



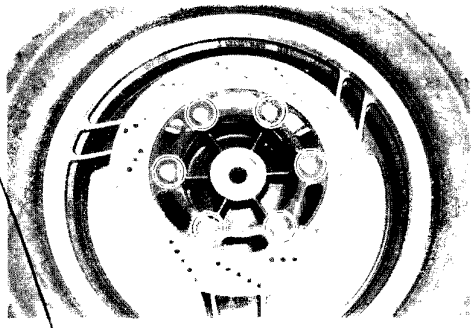
- Remove the rear sprocket along with its mounting drum off the wheel hub.



- Remove the dampers out of the wheel hub.



- Remove the brake disc by removing the mounting bolts.

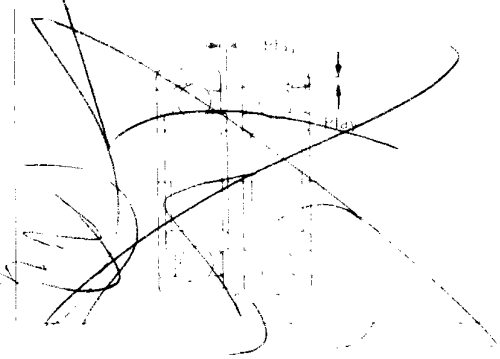


INSPECTION AND DISASSEMBLY

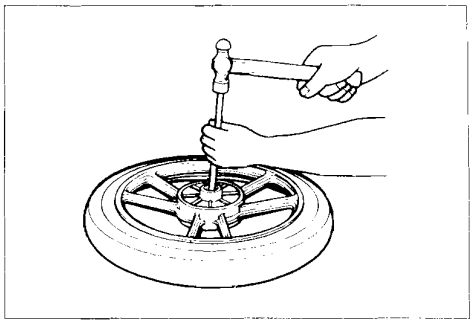
TIRE ..... **Refer to page 7 36.**

WHEEL AND SPROCKET DRUM BEARINGS

Inspect the play of respective bearings by hand while they are in the wheel and sprocket drum. Rotate the inner race by hand to inspect for abnormal noise and smooth rotation. Replace the bearing if there is anything unusual.



- Drive out the wheel bearings and sprocket drum bearing by using a proper tool.

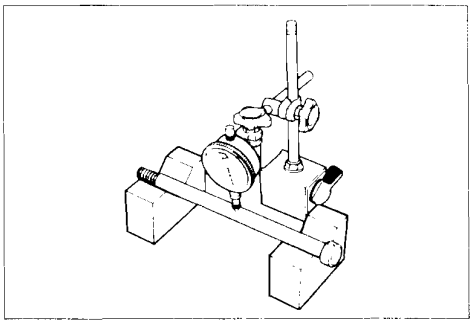


CAUTION:
The removed bearings and oil seal should be replaced with new ones.

AXLE SHAFT

Using a dial gauge, check the axle shaft for runout and replace it if the runout exceeds the limit.

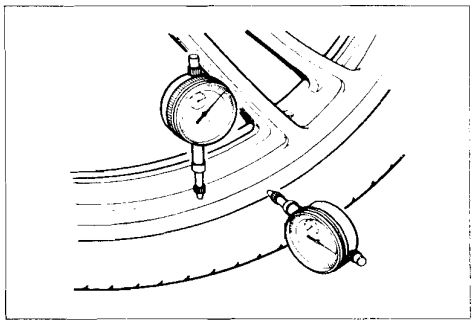
09900-20606: Dial gauge (1/100)
09900-20701: Magnetic stand (Not available in U.S.A.)
Service Limit: 0.25 mm (0.010 in)



WHEEL

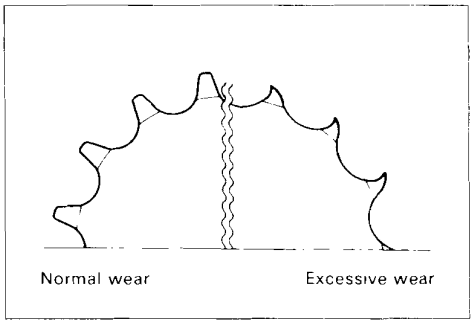
Make sure that the wheel runout checked as shown does not exceed the service limit. An excessive runout is usually due to worn or loose wheel bearings and can be reduced by replacing the bearings. If bearing replacement fails to reduce the runout, replace the wheel.

Service Limit (Axial and Radial): 2.0 mm (0.08 in)

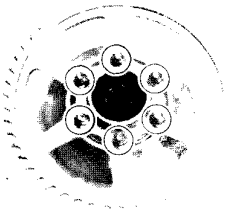


SPROCKET

Inspect the sprocket teeth for wear. If they are worn as illustrated, replace the sprocket and drive chain.

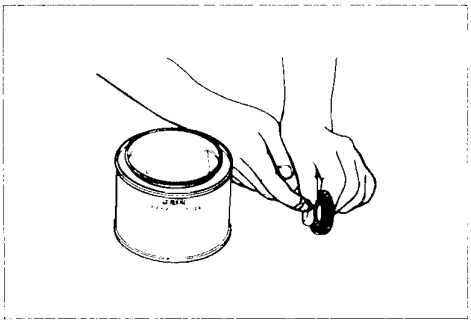


- Remove the rear sprocket by removing the mounting nuts.



DAMPER
Inspect the dampers for wear and damage.

REASSEMBLY AND REMOUNTING
Reassemble and remount the rear wheel in the reverse order of removal and disassembly. Pay attention to the following points:



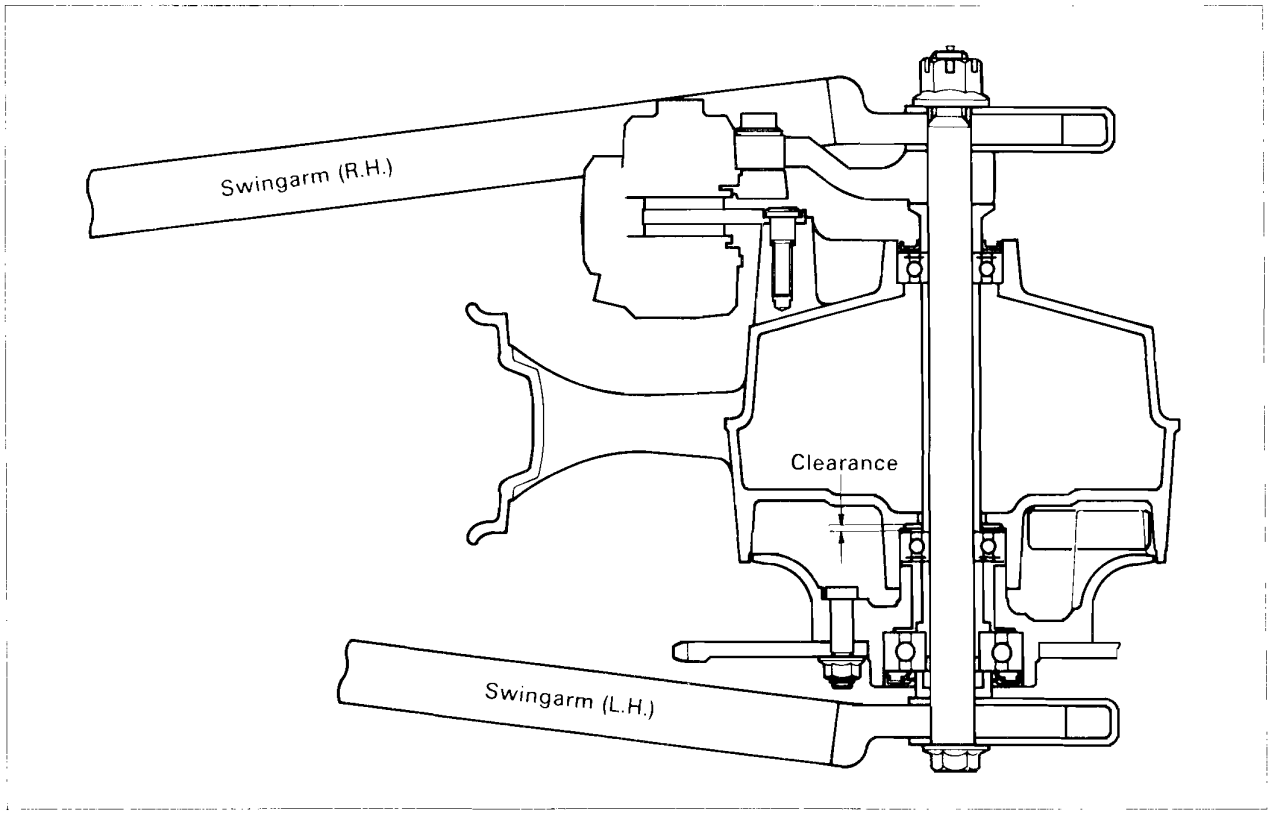
WHEEL BEARING
- Apply grease to the bearings before installing.

99000-25030: SUZUKI super grease "A"

- Install the wheel bearings by using the special tools.

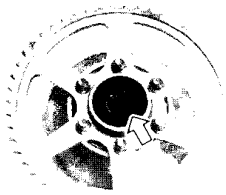
09941-34513: Bearing installer set

NOTE:
First install the right wheel bearing, then install the left wheel bearing. The sealed cover on the bearing is positioned outside.



SPROCKET DRUM BEARING AND SPROCKET

- Install the bearing by using the special tool.



09913-75520: Bearing installer

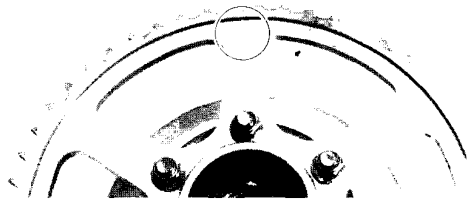
- Apply grease to the bearing and oil seal lip.

99000-25030: SUZUKI super grease "A"

NOTE:
When installing the rear sprocket on its mounting drum, the stamped mark on the sprocket is positioned outside.

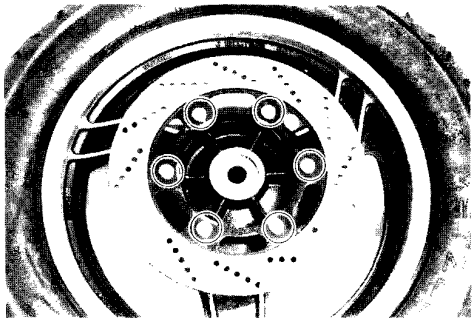
- Tighten the sprocket mounting nuts to the specified torque.

Tightening torque: 48 – 72 N·m
(4.8 – 7.2 kg-m, 35.0 – 52.0 lb-ft)



BRAKE DISC

- Make sure that the brake disc is clean and free of any greasy matter.
- Apply Thread Lock "1360" to the disc bolts and tighten them to the specified torque.



99000-32130: Thread Lock "1360"
Tightening torque: 15 – 25 N·m
(1.5 – 2.5 kg-m, 11.0 – 18.0 lb-ft)

TIGHTENING TORQUE

Item	N·m	kg-m	lb-ft
Rear axle nut	94 – 127	9.4 – 12.7	68.0 – 92.0
Brake caliper mounting bolt	25 – 40	2.5 – 4.0	18.0 – 29.0
Torque link nut	22 – 33	2.2 – 3.3	16.0 – 24.0

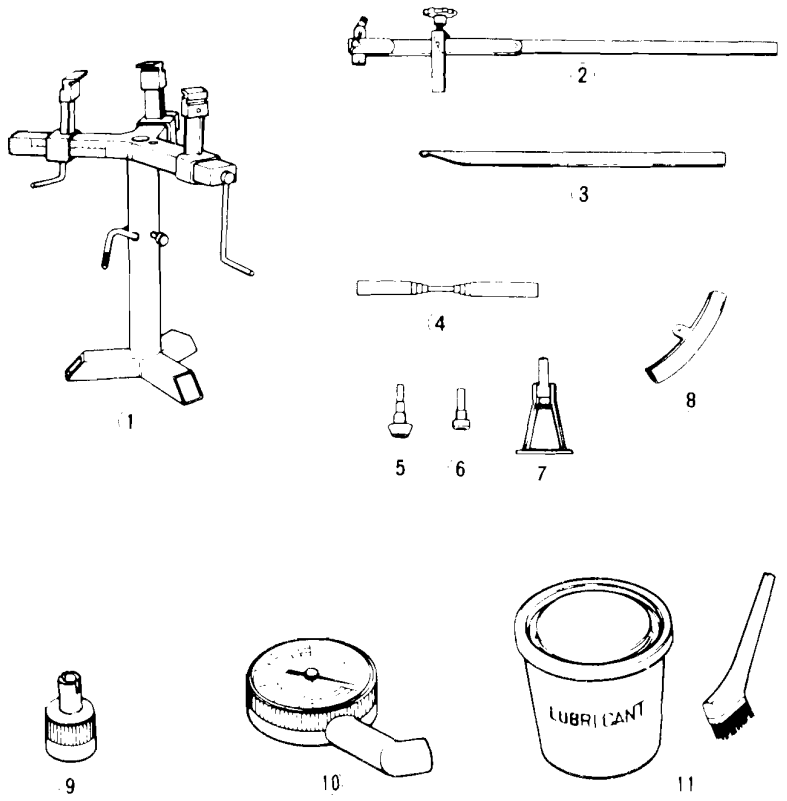
ADJUSTMENT

- Adjust the chain slack after rear wheel installation. (Page 2-11)

TIRE AND WHEEL

REMOVAL

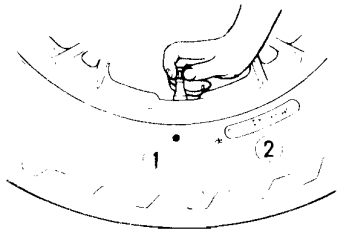
The most critical factor of a tubeless tire is the seal between the wheel rim and the tire bead. Because of this, we recommend using a tire changer which is also more efficient than tire levers.
For tire removal the following tools are required.



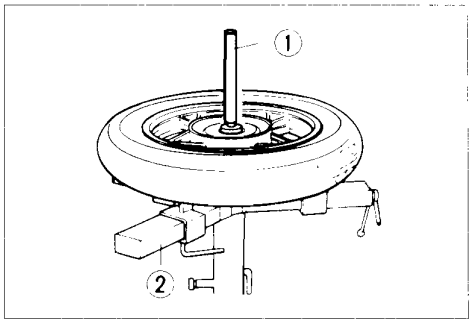
① Tire changer stand
② Operation arm
③ Tire lever
④ Center shaft
⑤ Bead pushing roller
⑥ Rim guide roller
⑦ Bead breaker
⑧ Rim protector
⑨ Core remover
⑩ Air pressure gauge
⑪ Tire lubricant

- Remove the valve core from the valve stem, and deflate the tire completely.

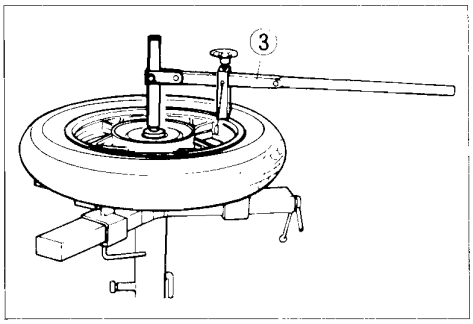
NOTE:
Mark tire with chalk to note the position ① of the tire on the rim and rotational direction ② of the tire.



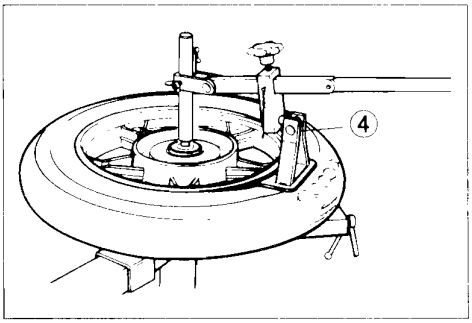
- Place the center shaft ① to the wheel, and fix the wheel firm by the rim holder ②.



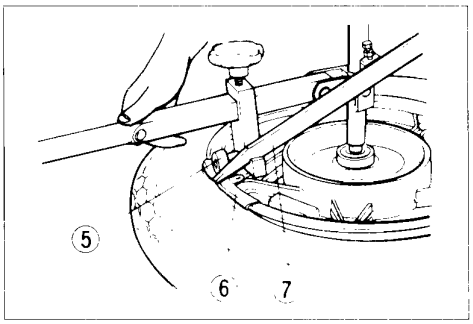
- Attach the operation arm ③ to the center shaft.



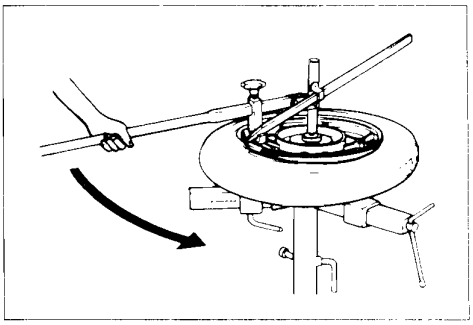
- Attach the bead breaker ④ to the operation arm, and dismount the bead from the rim. Turn the wheel over and dismount the other bead from the rim.



- Install the rim guide roller ⑤.
- Install the rim protector ⑥, and raise the tire bead with the tire lever ⑦.

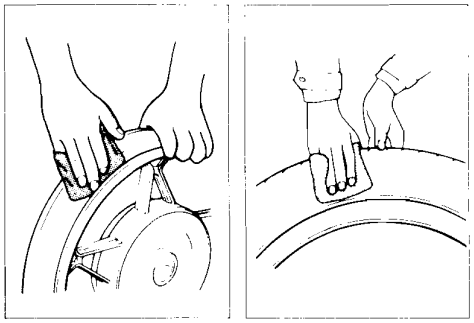


- Set the tire lever against the operation arm, and rotate the lever around the rim. Repeat this procedure to remove the other bead from the rim.



INSPECTION

WHEEL



Wipe off any rubber substance or rust from the wheel, and inspect the wheel rim. If any one of the following items is observed, replace it with a new wheel.

* A distortion or crack.
* Any scratches or flaws in the bead seating area.
* Wheel runout (Axial & Radial) of more than 2.0 mm (0.08 in).

TIRE

Thoroughly inspect the removed tire, and if any one of the following items is observed, do not repair the tire. Replace with the new one.

* A puncture or a split whose total length or diameter exceeds 6 mm (0.24 in).
* A scratch or split at the side wall.
* Tread depth less than 1.6mm (0.06 in) in the front tire and less than 2.0 mm (0.08 in) in the rear tire.
* Ply separation.
* Tread separation.
* Tread wear is extraordinarily deformed or distributed around the tire.
* Scratches at the bead.
* Cord is cut.
* Damage from skidding (flat spots).
* Abnormality in the inner liner.

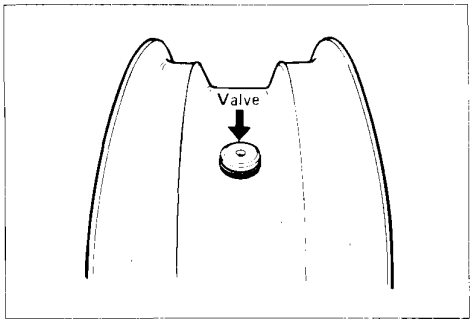
REPAIR

NOTE:

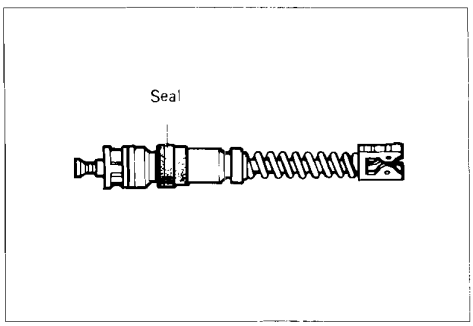
When repairing a flat tire, follow the repair instructions and use only recommended repairing materials.

VALVE

INSPECTION



Inspect the valve after the tire is removed from the rim, and replace with a new valve if the seal rubber has any splits or scratches.

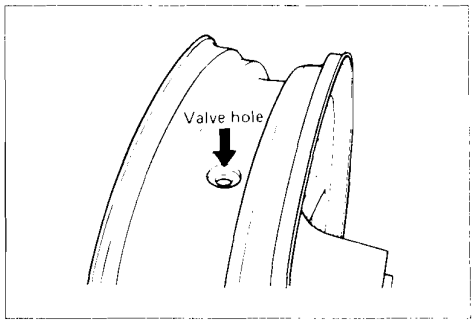


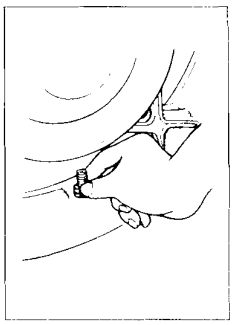
Inspect the removed valve core and replace with the new one if the seal rubber is abnormally deformed or worn.

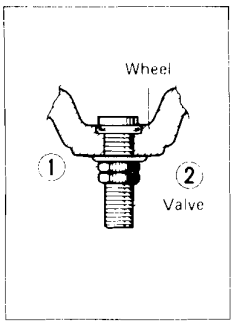
INSTALLATION

Any dust or rust around the valve hole must be cleaned off. Then install the valve in the rim.

CAUTION:
When installing the valve, tighten the nut ① by hand as much as possible. Holding the nut under this condition, tighten the lock nut ②. Do not overtighten nut ① as this may distort the rubber packing and cause an air leak.



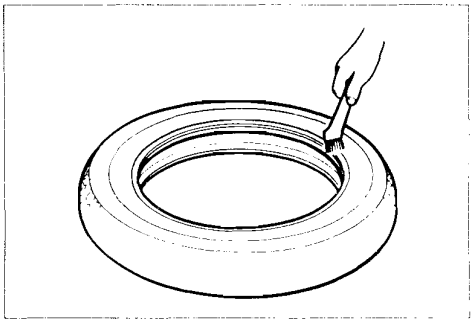




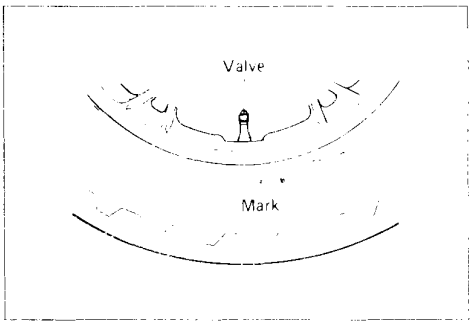
TIRE MOUNTING

- Apply a special tire lubricant or neutral soapy liquid to the tire bead.

CAUTION:
Never apply grease, oil or gasoline.

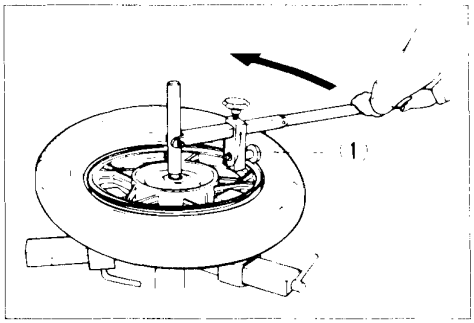


- When installing the tire, make certain that the directional arrow faces the direction of wheel rotation and align the balancing dot of the tire with the valve stem as shown.

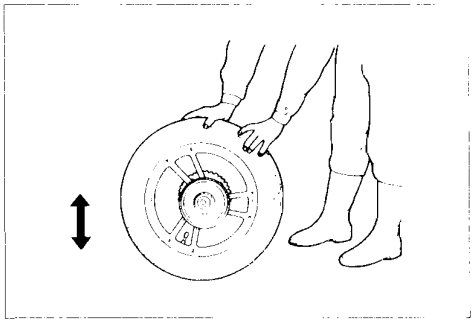


- Set the bead pushing roller ①.
- Rotate operation arm around the rim to mount the bead completely. Do the bottom bead first, then the upper bead.
- Remove the wheel from the tire changer, and install the valve core in the valve stem.

NOTE:
Before installing the valve core, inspect the core.

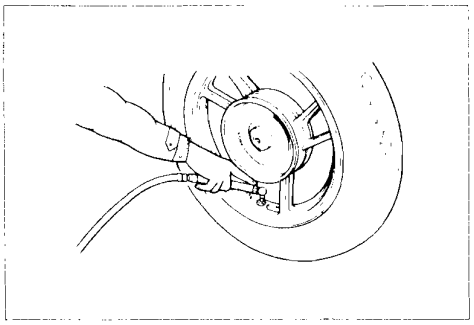


- Bounce the tire several times while rotating. This makes the tire bead expand outwards, and thus makes inflation easier.



NOTE:
Before inflating, confirm that the balance mark lines up with the valve stem.

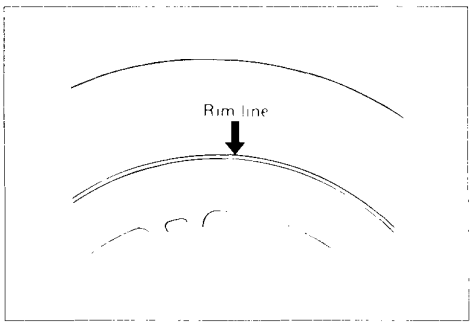
- Pump up the tire with air.



WARNING:
Do not inflate the tire to more than 4.0 kg/cm² (56 psi). The tire could burst with sufficient force to cause severe injury. Never stand directly over the tire while inflating it.

NOTE:
Check the "rim line" cast on the tire side walls. It must be equidistant from the wheel rim all the way around. If the distance between the rim line and wheel rim vaires, this indicates that the bead is not properly seated. If this is so, deflate the tire completely, and unseat the bead for the both sides. Coat the bead with lubricant, any try again.

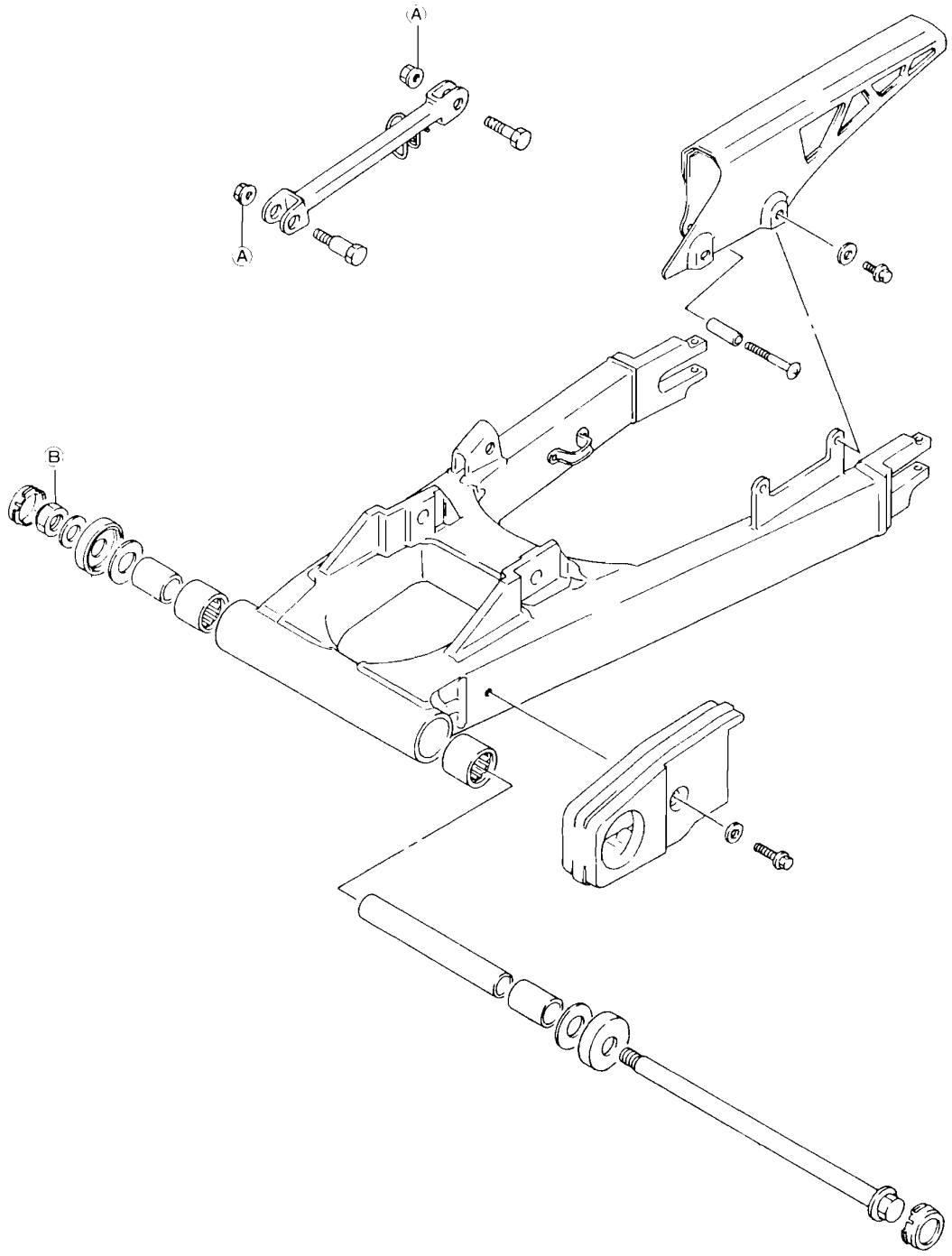
- After tire is properly seated to the wheel rim, adjust the pressure to the recommended pressure. Correct the wheel balance if necessary.



WARNING:
Do not run a repaired tire more than 50 km/h (30 mps) within 24 hours after tire repairing, since the patch may not be completely cured. Do not exceed 130 km/h (80 mph) with a repaired tire.

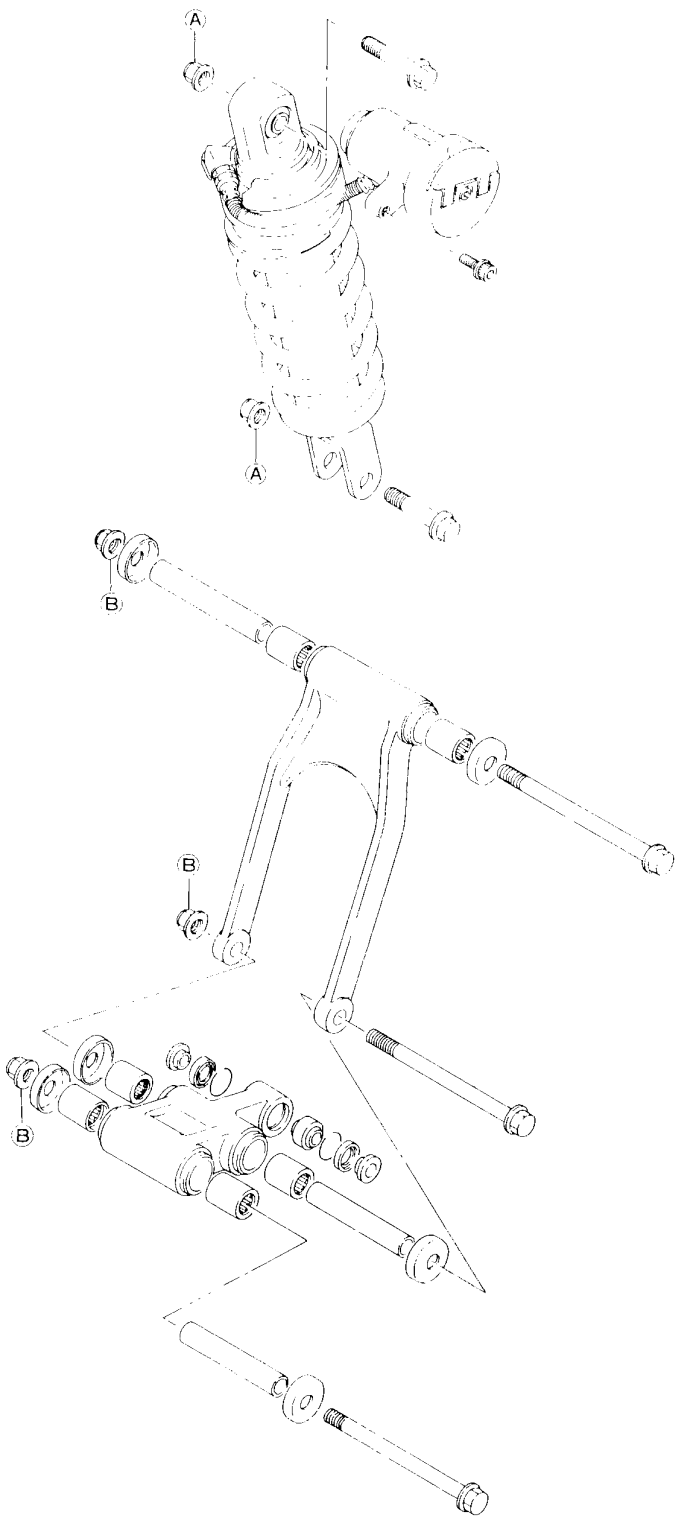
REAR SUSPENSION

SWINGARM



Tightening torque			
Item	N·m	kg-m	lb-ft
Ⓐ	22 – 33	2.2 – 3.3	16.0 – 24.0
Ⓑ	55 – 88	5.5 – 8.8	40.0 – 63.5

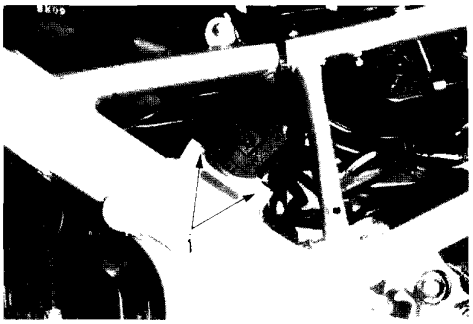
SHOCK ABSORBER AND CUSHION LEVER



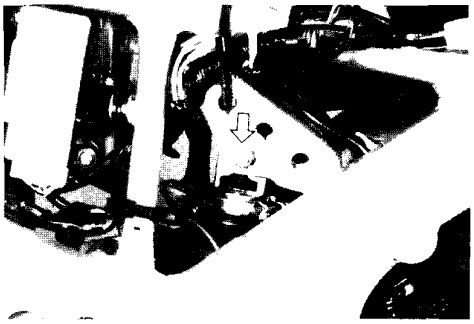
Tightening torque			
Item	N·m	kg-m	lb-ft
Ⓐ	40 – 60	4.0 – 6.0	29.0 – 43.5
Ⓑ	70 – 100	7.0 – 10.0	50.5 – 72.5

REMOVAL

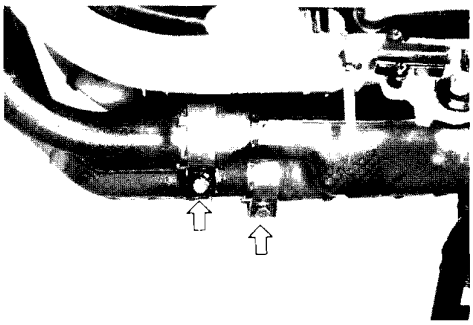
- Remove the left and right frame covers.
- Remove the rear wheel. (Page 7-31)
- Disconnect the brake hose from its clamps on the swingarm.
- Remove the spring pre-load adjuster mounting bolts ①.

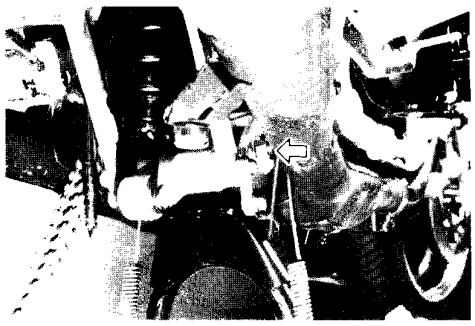


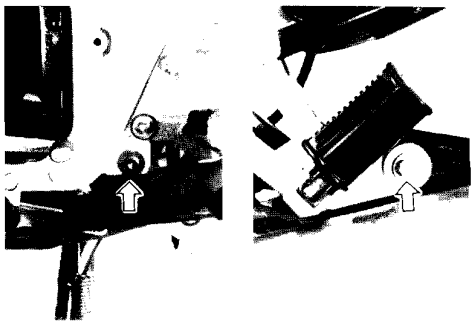
- Remove the shock absorber upper end bolt and nut.



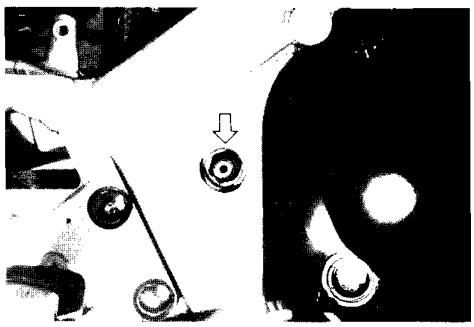
- Remove the left-side muffler by removing its connection bolts and mounting bolts.
- Remove the cushion lever mounting bolt and nut.



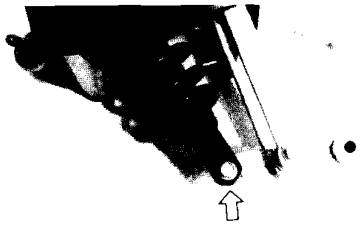




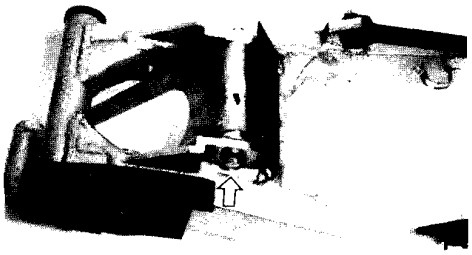
- Remove the swingarm pivot shaft and nut.
- Remove the shock absorber and cushion lever/rod along with the swingarm.



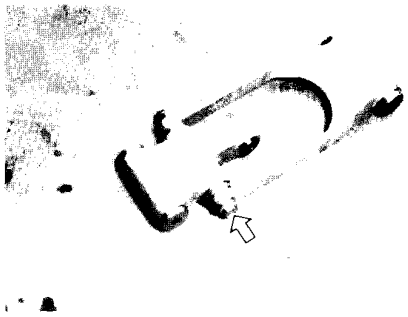
- Remove the shock absorber by removing its lower end bolt and nut.



- Remove the cushion lever/rod out of the swingarm by removing the bolt and nut.



- Separate the cushion rod and cushion lever by removing the bolt and nut.



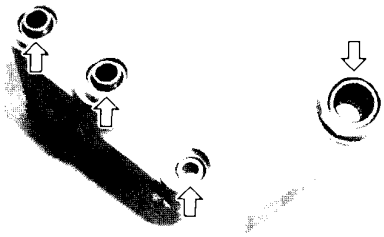
INSPECTION AND DISASSEMBLY

SHOCK ABSORBER

Inspect the shock absorber body and hose joints for damage and oil leakage. If any defects are found, replace the shock absorber assembly with new one.

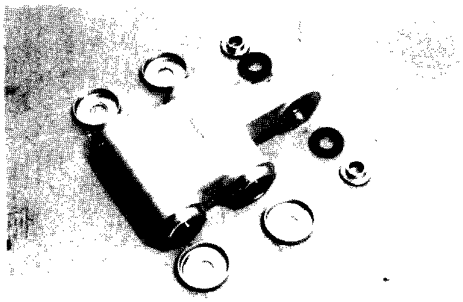
CUSHION LEVER/ROD

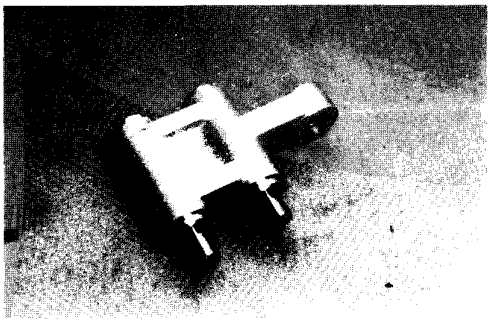
Inspect the respective cushion lever and rod bearings by hand while they are in the cushion lever and rod. Rotate each bearing spacer to inspect for abnormal noise and smooth rotation. Replace the bearing if there is anything unusual. Inspect the dust seals. If they are found to be damaged, replace them with new ones.



- Remove the covers, spacers and dust seals out of the cushion lever and rod.
- Drive out the respective bearings with proper socket wrench.

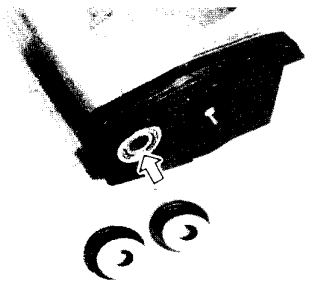
CAUTION:
The removed dust seals, stopper rings and bearings should be replaced with new ones.





SWINGARM

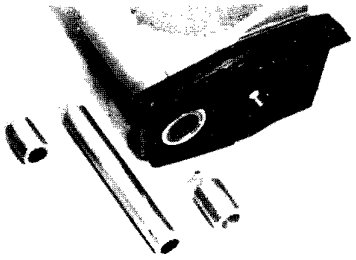
Inspect the swingarm pivot bearings by hand while they are in the swingarm. Rotate the bearing spacer to inspect for abnormal noise and smooth rotation. Replace the bearing if there is anything unusual.
Inspect the dust seals. If they are found to be damaged, replace them with new ones.

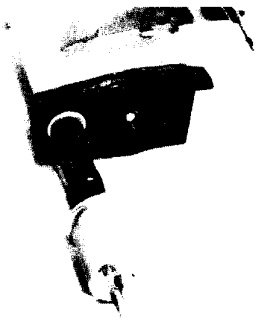


- Remove the dust seals and spacers.
- Remove the swingarm pivot bearings with the special tools.

09923-74510: Bearing puller
09930-30102: Sliding shaft

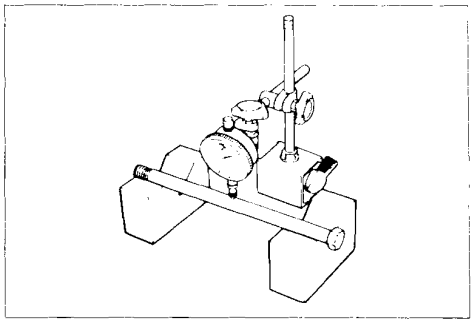
CAUTION:
The removed dust seals and bearings should be replaced with new ones.



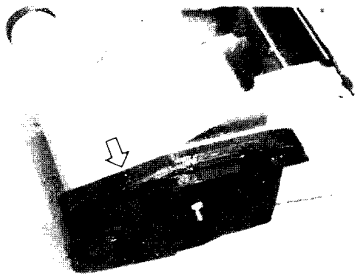


Inspect the swingarm pivot shaft runout with the dial gauge. The swingarm pivot shaft must be replaced if the runout exceeds the limit.

09900-20606: Dial gauge (1/100)
09900-20701: Magnetic stand (Not available in U.S.A.)
09900-21304: V-block (Not available in U.S.A.)
Service Limit: 0.3 mm (0.01 in)

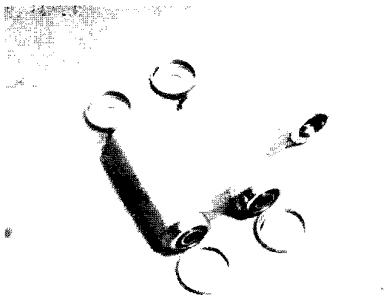


Inspect the drive chain buffer for wear and damage.



REASSEMBLY AND REMOUNTING

Reassemble and remount the rear suspension in the reverse order of disassembly and removal. Pay attention to the following points:



CUSHION LEVER/ROD

- Apply grease to the bearings and dust seals.

99000-25030: SUZUKI super grease "A".

- Install the respective cushion lever and rod bearings with proper socket wrench.
  (Refer to page 7-47 for details.)

NOTE:
When installing the bearing, the stamped mark on the bearing is positioned outside.

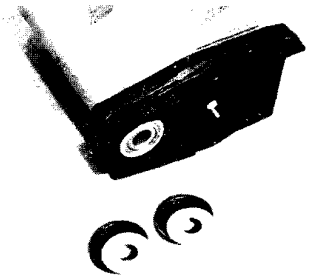
SWINGARM

- Apply grease to the bearings and dust seals.

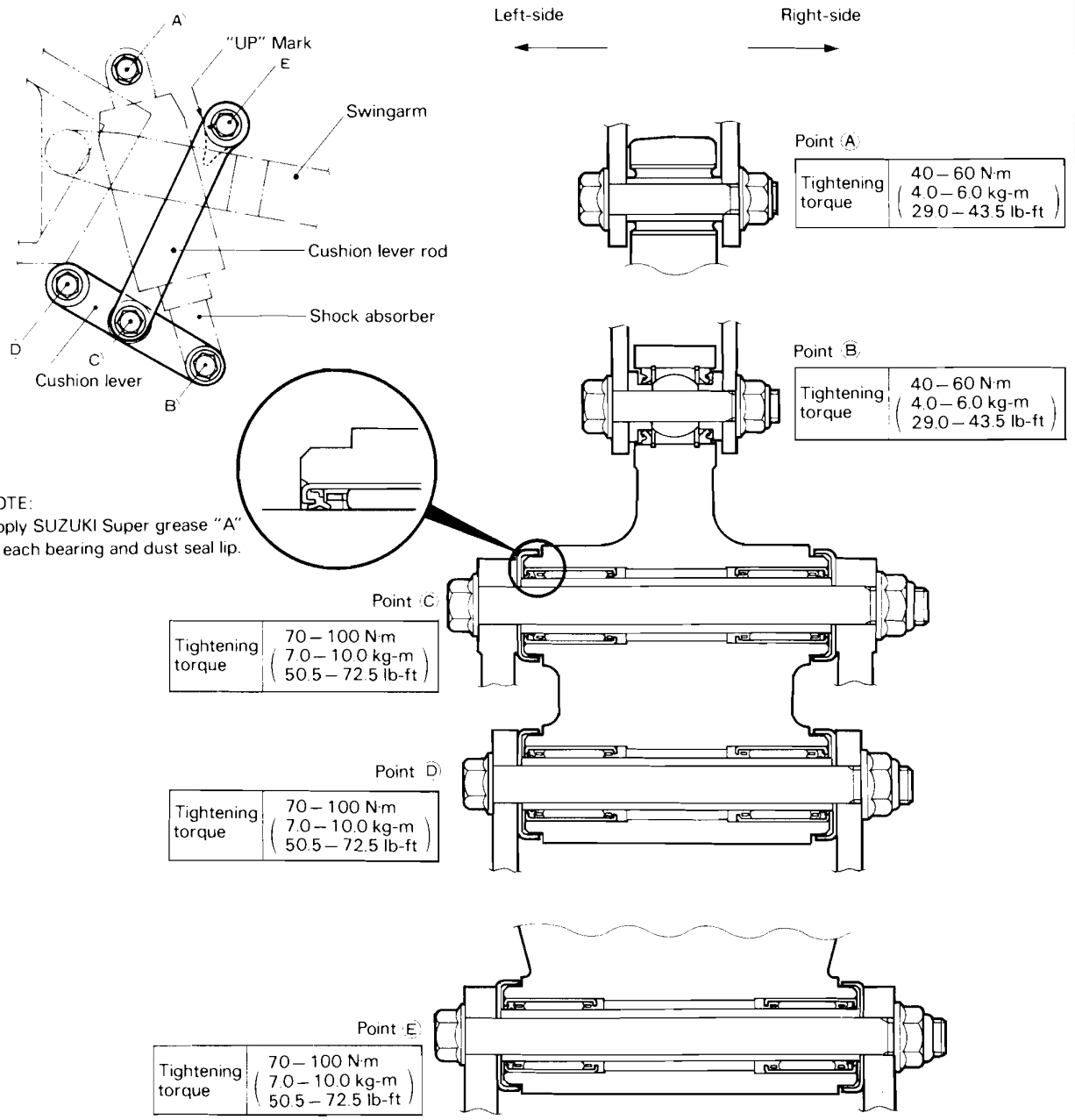
99000-25030: SUZUKI super grease "A"

- Install the swingarm pivot bearings with proper socket wrench.

NOTE:
When installing the bearing, the stamped mark on the bearing is positioned outside.



REASSEMBLING INFORMATION



FINAL INSPECTION AND ADJUSTMENT

After installing the rear suspension and rear wheel, the following adjustments are required before driving motorcycle.

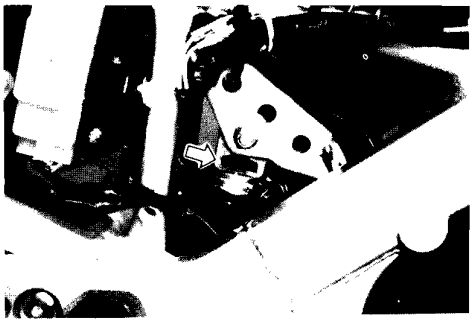
* Drive chain
* Rear brake
* Tire pressure
* Shock absorber

REAR SUSPENSION SETTING

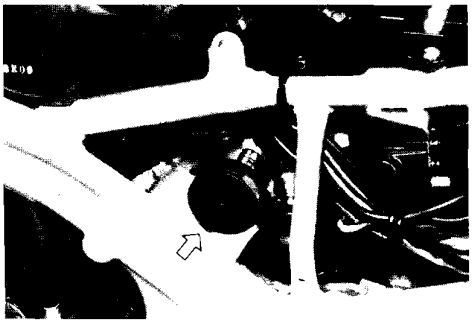
Rear suspension is adjustable according to the rider's requirements. The high speed capability of this motorcycle makes proper suspension setting and balance very important.
Use the following table to adjust the rear suspension.

SETTING TABLE

	Damping force	Spring pre-load
STD (Factory setting)	2/4	2/5
Dual riding	3/4	3.5/5
Solo riding added weight 30kg (66.1 lbs)	3/4	3.5/5
Dual riding added weight 30kg (66.1 lbs)	4/4	4/5

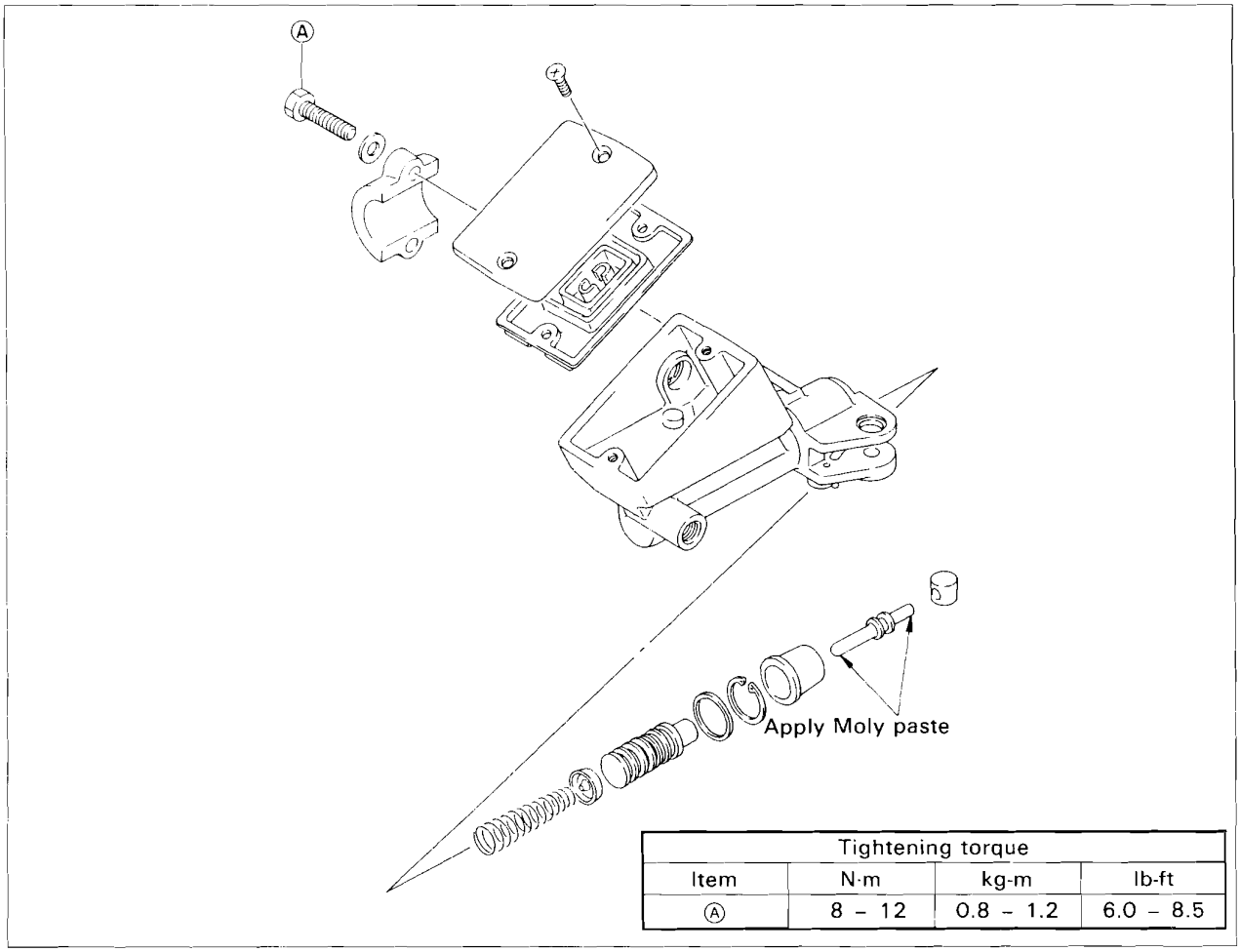


* Position "1" provides the softest damping force.
* Position "4" provides the stiffest damping force.



* Position "1" provides the softest spring pre-load.
* Position "5" provides the stiffest spring pre-load.

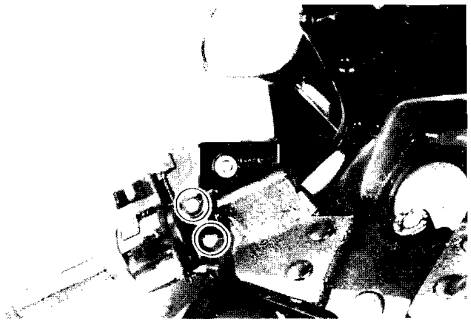
CLUTCH MASTER CYLINDER



	Tightening torque		
Item	N·m	kg-m	lb-ft
A	8 – 12	0.8 – 1.2	6.0 – 8.5

REMOVAL

- Remove the starter interlock switch.
- Place a rag underneath the union bolt on the master cylinder to catch spilled drops of brak fluid. Unscrew the union bolt and disconnect the clutch hose from the master cylinder.



CAUTION:

Completely wipe off any brake fluid adhering to any parts of motorcycle. The fluid reacts chemically with paint, plastics, rubber materials, etc. and will damage them severely.

- Remove the clutch master cylinder by removing its clamp bolts.

DISASSEMBLY AND REASSEMBLY

Disassemble and reassemble the clutch master cylinder in the same manner of the front brake master cylinder.

(Refer to pages 7-13 through 7-15 for details.)

SERVICING INFORMATION

CONTENTS

TROUBLESHOOTING

ENGINE

Complaint	Symptom and possible causes	Remedy
Engine will not start, or is hard to start.	**Compression too low**	
	1. Valve clearance out of adjustment.	Adjust.
	2. Worn valves guides or poor seating of valves.	Repair, or replace.
	3. Valves mistiming.	Adjust.
	4. Piston rings excessively worn.	Replace.
	5. Worn-down cylinder bores.	Replace, or rebore.
	6. Starter motor cranks but too slowly.	Consult "electrical complaints".
	7. Poor seating of spark plugs.	Retighten.
	Plugs not sparking	
	1. Fouled spark plugs.	Clean.
	2. Wet spark plugs.	Clean and dry.
	3. Defective ignition coil.	Replace.
	4. Open or short in high-tension cords.	Replace.
	5. Defective signal generator of ignition unit.	Replace.
	No fuel reaching the carburetors	
	1. Clogged fuel tank vent hose.	Clean or replace.
	2. Clogged or defective fuel/cock.	Clean or replace.
	3. Defective carburetor float valve.	Replace.
	4. Clogged fuel hose or fuel filter.	Clean or replace.
Engine stalls easily.	1. Fouled spark plugs.	Clean.
	2. Defective signal generator or ignitor unit.	Replace.
	3. Clogged fuel hose.	Clean.
	4. Clogged jets in carburetors.	Clean.
	5. Valve clearance out of adjustment.	Adjust.
Noisy engine.	**Excessive valve chatter**	
	1. Valve clearance too large.	Adjust.
	2. Weakened or broken valve springs.	Replace.
	3. Worn down rocker arm or rocker arm shaft.	Replace.
	Noise appears to come from pistons.	
	1. Pistons or cylinders worn down.	Replace.
	2. Combustion chambers fouled with carbon.	Clean.
	3. Piston pins or piston pin bore worn.	Replace.
	4. Piston rings or ring groove worn.	Replace.
	Noise seems to come from timing chain	
	1. Stretched chain.	Replace.
	2. Worn sprockets.	Replace.
	3. Tension adjuster not working.	Repair, or replace.
	Noise seems to come from clutch.	
	1. Worn splines of countershaft or hub.	Replace.
	2. Worn teeth of clutch plates.	Replace.
	3. Distorted clutch plates, driven and drive.	Replace.
	4. Worn clutch release bearing.	
	5. Clutch dampers weakened.	Replace the primary driven gear.

Complaint	Symptom and possible causes	Remedy
Noisy engine.	**Noise seems to come from crankshaft**	
	1. Rattling bearings due to wear.	Replace.
	2. Big-end bearings worn and burnt.	Replace.
	3. Journal bearings worn and burnt.	Replace.
	4. Thrust clearance to large.	Replace the thrust bearing.
	Noise seems to come from transmission	
	1. Gears worn or rubbing.	Replace.
	2. Badly worn splines.	Replace.
	3. Primary gears worn or rubbing.	Replace.
	4. Badly worn bearings.	Replace.
Slipping clutch.	1. Clutch control out of adjustment or loss of play.	Adjust.
	2. Weakened clutch springs.	Replace.
	3. Worn or distorted pressure plate.	Replace.
	4. Distorted clutch plates, driven and drive.	Replace.
Dragging clutch.	1. Clutch control out of adjustment or too much play.	Adjust.
	2. Some clutch springs weakened while others are not.	Replace.
	3. Distorted pressure plate or clutch plate.	Replace.
Transmission will not shift	1. Broken gearshift cam.	Replace.
	2. Distorted gearshift forks.	Replace.
	3. Worn gearshift pawl.	Replace.
Transmission will not shift back	1. Broken return spring on shift shaft.	Replace.
	2. shift shaft is rubbing or sticky.	Repair.
	3. Distorted or worn gearshift forks.	Replace.
Transmission jumps out of gear.	1. Worn shifting gears on driveshaft or countershaft.	Replace.
	2. Distorted or worn gearshift forks.	Replace.
	3. Weakened stopper spring on gearshift stopper.	Replace.
	4. Worn gearshift pawl.	Replace.
Engine idles poorly.	1. Valve clearance out of adjustment.	Adjust.
	2. Poor seating of valves.	Replace.
	3. Defective valve guides.	Replace.
	4. Worn rocker arms or arm shafts.	Replace.
	5. Spark plug gaps too wide.	Adjust or replace.
	6. Defective ignition coil.	Replace.
	7. Defective signal generator or ignitor unit.	Replace.
	8. Float-chamber fuel level out of adjustment in carburetors.	Adjust.
	9. Clogged jets or imbalance of carburetors.	Clean or adjust.
Engine runs poorly in high speed range.	1. Valve springs weakened.	Replace.
	2. Worn cams or rocker arms.	Replace.
	3. Valve timing out of adjustment.	Adjust.
	4. Spark plug gaps too narrow.	Adjust.
	5. Ignition not advanced sufficiently due to poorly working timing advance circuit.	Replace.
	6. Defective ignition coil.	Replace.
	7. Defective signal generator or ignitor unit.	Replace.
	8. Float-chamber fuel level too low.	Adjust.
	9. Clogged air cleaner element.	Clean.
	10. Clogged fuel hose, resulting in inadequate fuel supply to carburetors.	Clean, and prime.

Complaint	Symptom and possible causes	Remedy
Dirty or heavy exhaust smoke.	1. Too much engine oil in the engine.	Check with level window, drain out excess oil.
	2. Worn piston rings or cylinders.	Replace.
	3. Worn valve guides.	Replace.
	4. Cylinder walls scored or scuffed.	Rebore or replace.
	5. Worn valves stems.	Replace.
	6. Defective stem seal.	Replace.
	7. Worn oil ring side rails.	Replace.
Engine lacks power.	1. Loss of valve clearance.	Adjust.
	2. Weakened valve springs.	Replace.
	3. Valve timing out of adjustment.	Adjust.
	4. Worn piston rings or cylinders.	Replace.
	5. Poor seating of valves.	Repair.
	6. Fouled spark plug.	Clean or replace.
	7. Spark plug gaps incorrect.	Adjust or replace.
	8. Clogged jets in carburetors.	Clean.
	9. Float-chamber fuel level out of adjustment.	Adjust.
	10. Clogged air cleaner element.	Clean.
	11. Carburetor balancing screw loose.	Retighten.
	12. Sucking air from intake pipe.	Retighten or replace.
	13. Too much engine oil.	Drain out excess oil.
Engine overheats.	1. Heavy carbon deposit on piston crowns.	Clean.
	2. Not enough oil in the engine.	Add oil.
	3. Defective oil pump or clogged oil circuit.	Replace or clean.
	4. Fuel level too low in float chambers.	Adjust.
	5. Sucking air from intake pipes.	Retighten or replace.
	6. Use incorrect engine oil.	Change.

CARBURETOR

Complaint	Symptom and possible causes	Remedy
Trouble with starting.	1. Starter jet is clogged.	Clean.
	2. Starter pipe is clogged.	Clean.
	3. Air leaking from a joint between starter body and carburetor.	Check starter body and carburetor for tightness, adjust and replace gasket.
	4. Air leaking from carburetor's joint or vacuum gauge joint.	Check and adjust.
	5. Starter plunger is not operating properly.	Check and adjust.
Idling or low-speed trouble	1. Pilot jet, pilot air jet are clogged or loose.	Check and clean.
	2. Air leaking from carburetor's joint, vacuum gauge joint, or starter.	Check and clean.
	3. Pilot outlet or bypass is clogged.	Check and clean.
	4. Starter plunger is not fully closed.	Check and adjust.
Medium-or high speed trouble	1. Main jet or main air jet is clogged.	Check and clean.
	2. Needle jet is clogged.	Check and clean.
	3. Throttle valve is not operating properly.	Check throttle valve for operation.
	4. Fuel filter is clogged.	Check and clean.
Overflow and fuel level fluctuations.	1. Needle valve is worn or damaged.	Replace.
	2. Spring in needle valve is broken.	Replace.
	3. Float is not working properly.	Check and adjust.
	4. Foreign matter has adhered to needle valve.	Clean.
	5. Fuel level is too high or low.	Adjust float height.

ELECTRICAL

Complaint	Symptom and possible causes	Remedy
No sparking or poor sparking.	1. Defective ignition coil. 2. Defective spark plugs. 3. Defective signal generator or ignitor unit.	Replace. Replace. Replace.
Spark plugs soon become fouled with carbon.	1. Mixture too rich. 2. Idling speed set to high. 3. Incorrect gasoline. 4. Dirty element in air cleaner. 5. Spark plugs too cold.	Adjust carburetors. Adjust carburetors. Change. Clean. Replace by hot type plugs.
Spark plugs become fouled too soon.	1. Worn piston rings. 2. Piston or cylinders worn. 3. Excessive clearance of valve stems in valve guides. 4. Worn stem oil seal.	Replace. Replace. Replace. Replace.
Spark plug electrodes overheat or burn	1. Spark plugs too hot. 2. The engine overheats. 3. Spark plugs loose. 4. Mixture too lean.	Replace by cold type plugs. Tune up. Retighten. Adjust carburetors.
Generator does not charge	1. Open or short lead wires, or loose lead connections. 2. Shorted, grounded or open generator coils. 3. Shorted or panctured regulator and rectifier. 4. Brushes not seating properly on slip ring in rotor.	Repair or replace or retighten. Replace. Replace. Repair, or replace.
Generator does charge, but charging rate is below the specification.	1. Lead wires tend to get shorted or open-circuited or loosely connected at terminals. 2. Grounded or open-circuited stator coils of generator. 3. Defective regulator and rectifier. 4. Not enough electrolyte in the battery. 5. Defective cell plates in the battery.	Repair, or retighten. Replace. Replace. Add distilled water to the upper level. Replace the battery.
Generator overcharges	1. Internal short-circuit in the battery. 2. Resistor element in the regulator damaged or defective. 3. Regulator poorly grounded.	Replace the battery. Replace. Clean and tighten ground connection.
Unstable charging.	1. Lead wire insulation frayed due to vibration, resulting in intermittent shorting. 2. Generator internally shorted. 3. Defective regulator and rectifier.	Repair, or replace. Replace. Replace.
Starter button is not effective	1. Battery run down. 2. Defective switch contacts. 3. Brushes not seating properly on commutator in starter motor. 4. Defective starter relay.	Repair, or replace. Replace. Repair, or replace. Replace.

BATTERY

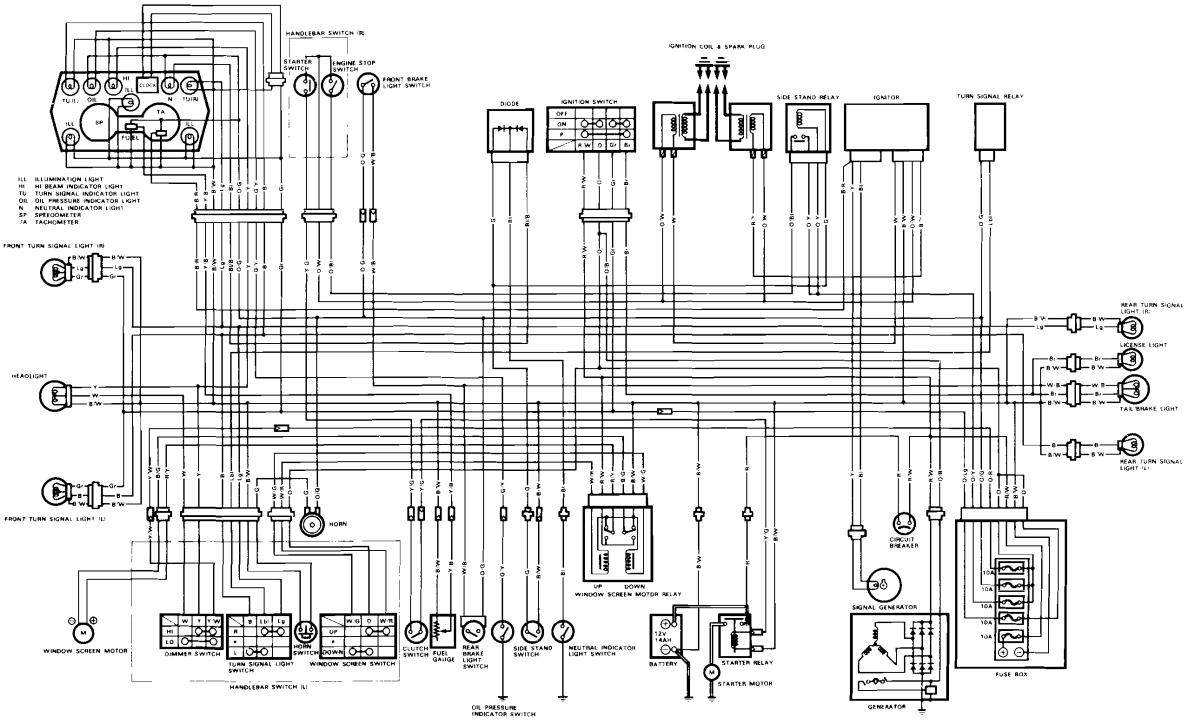
Sympton	Probable cause	Remedy
"Sulfation", acidic white powdery substance or spots on surfaces of cell plates.	1. Not enough electrolyte.	Add distilled water, if the battery has not been damaged and "sulfation" has not advanced too far, and recharge.
	2. Battery case is cracked.	Replace the battery.
	3. Battery has been left in a run-down condition for a long time.	Replace the battery.
	4. Contaminated electrolyte (Foreign matter has entered the battery and become mixed with the electrolyte).	If "sulfation" has not advanced too far, try to restore the battery by replacing the electrolyte, recharging it fully with the battery detached from the motorcycle and then adjusting electrolyte S.G.
Battery runs down quickly	1. The charging method is not correct.	Check the generator, regulator/rectifier and circuit connections, and make necessary adjustments to obtain specified charging operation.
	2. Cell plates have lost much of their active material as a result of overcharging.	Replace the battery, and correct the charging system.
	3. A short-circuit condition exists within the battery due to excessive accumulation of sediments caused by the high electrolyte S.G.	Replace the battery.
	4. Electrolyte S.G. is too low.	Recharge the battery fully and adjust electrolyte S.G.
	5. Contaminated electrolyte.	Replace the electrolyte, recharge the battery and then adjust S.G.
	6. Battery is too old.	Replace the battery.
Reversed battery polarity.	The battery has been connected the wrong way round in the system, so that it is being charged in the reverse direction.	Replace the battery and be sure to connect the battery properly.
Battery "sulfation".	1. Charging rate too low or too high. (When not in use batteries should be recharged at least once a month to avoid sulfation.)	Replace the battery.
	2. Battery electrolyte excessive or insufficient, or its specific gravity too high or too low.	Keep the electrolyte up to the prescribed level, or adjust the S.G. by consulting the battery maker's directions.
	3. The battery left unused for too long in cold climate.	Replace the battery, if badly sulfated.
Battery discharges too rapidly.	1. Dirty container top and sides.	Clean.
	2. Impurities in the electrolyte or electrolyte S.G. is too high.	Change the electrolyte by consulting the battery maker's direction.

CHASSIS

Complaint	Symptom and possible causes	Remedy
Heavy steering	1. Steering stem nut overtightened.	Adjust.
	2. Broken bearing in steering stem.	Replace.
	3. Distorted steering stem.	Replace.
	4. Not enough pressure in tires.	Adjust.
	5. Incorrect mounting of steering damper.	Adjust.
Wobbly handle	1. Loss of balance between right and left front forks.	Replace.
	2. Distorted front fork.	Repair, or replace.
	3. Distorted front axle or crooked tire.	Replace.
	4. Incorrect front fork air pressure.	Adjust.
	5. Oil leakage of steering damper.	Replace.
Wobbly front wheel.	1. Distorted wheel rim.	Replace.
	2. Worn-down front wheel bearings.	Replace.
	3. Defective or incorrect tire.	Replace.
	4. Loose nut on axle.	Retighten.
	5. Incorrect front fork oil or air pressure.	Adjust.
Front suspension too soft	1. Weakened springs.	Replace.
	2. Not enough fork oil.	Refill.
Front suspension too stiff	1. Fork oil too viscous.	Replace.
	2. Too much fork oil.	Drain excess oil.
	3. Incorrect air pressure in front fork.	Adjust.
Noisy front suspension.	1. Not enough fork oil.	Refill.
	2. Loose nuts on suspension.	Retighten.
Wobbly rear wheel.	1. Distorted wheel rim.	Replace.
	2. Worn-down rear wheel bearings or swingarm bearings.	Replace.
	3. Defective or incorrect tire.	Replace.
	4. Worn swingarm and rear cushion related bearings.	Replace.
	5. Loose nuts or bolts on rear suspensions.	Retighten.
Rear suspension too soft.	1. Weakened shock absorber spring.	Replace.
	2. Rear suspension adjuster improperly set.	Adjust.
	3. Oil leakage of shock absorber.	Replace.
	4. Gas leakage of shock absorber.	Replace.
Rear suspension too stiff	1. Rear suspension adjuster improperly set.	Adjust.
	2. Shock absorber shaft bent.	Replace.
	3. Swingarm bent.	Replace.
	4. Worn swingarm and rear cushion related bearings.	Replace.
Noisy rear suspension.	1. Loose nuts or bolts on rear suspension.	Retighten.
	2. Worn swingarm and rear cushion related bearings.	Replace.

BRAKES

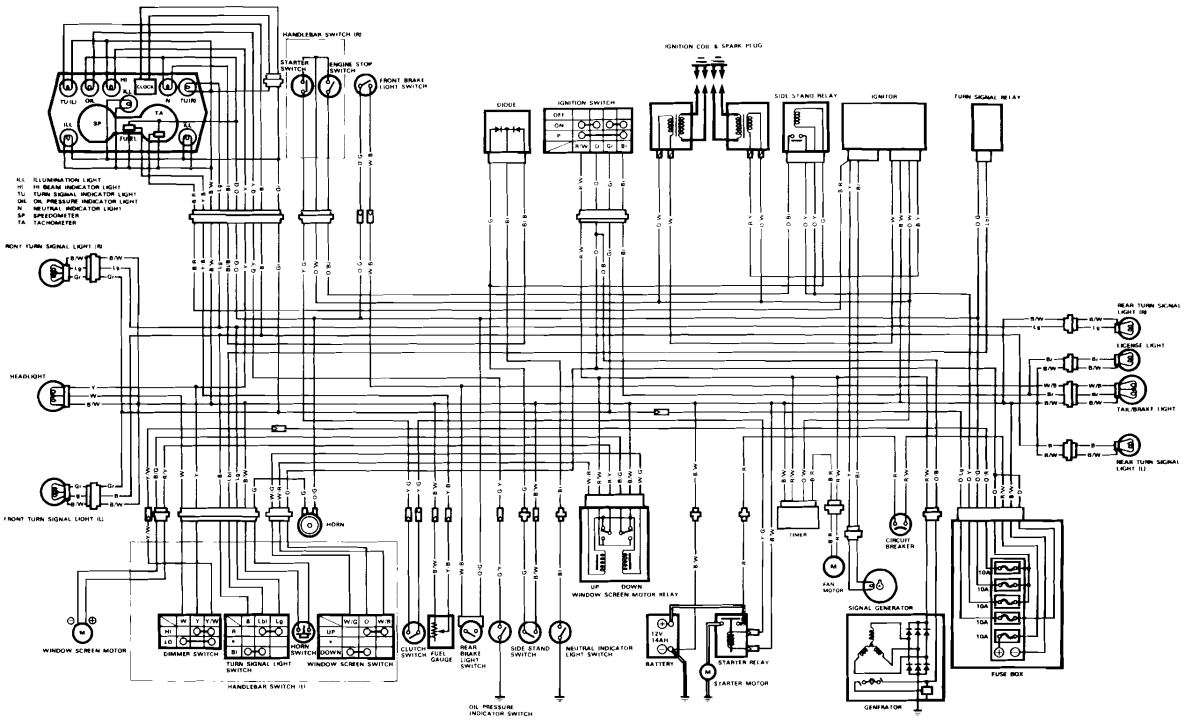
Complaint	Symptom and possible causes	Remedy
Insufficient brake power	1. Leakage of brake fluid from hydraulic system. 2. Worn pads. 3. Oil adhesion on engaging surface of pads. 4. Worn disc. 5. Air in hydraulic system.	Repair, or replace. Replace. Clean disc and pads. Replace. Bleed air.
Brake squeaking.	1. Carbon adhesion on pad surface. 2. Tilted pad. 3. Damaged wheel bearing. 4. Loose front-wheel axle or rear-wheel axle. 5. Worn pads. 6. Foreign material in brake fluid. 7. Clogged return port of master cylinder.	Repair surface with sandpaper. Modify pad fitting. Replace. Tighten to specified torque. Replace. Replace brake fluid. Disassemble and clean master cylinder.
Excessive brake lever stroke.	1. Air in hydraulic system. 2. Insufficient brake fluid. 3. Improper quality of brake fluid.	Bleed air. Replenish fluid to specified level; bleed air. Replace with correct fluid.
Leakage of brake fluid	1. Insufficient tightening of connection joints. 2. Cracked hose. 3. Worn piston and/or cup.	Tighten to specified torque. Replace. Replace piston and/or cup.



WIRE COLOR

B . . . . . Black	B/G . . . Black with Green tracer	O/W . . Orange with White tracer
Bl . . . . Blue	B/R . . . Black with Red tracer	O/Y . . . Orange with Yellow tracer
Br . . . . Brown	B/W . . Black with White tracer	R/W . . Red with White tracer
G . . . . Green	B/Y . . . Black with Yellow tracer	R/Y . . . Red with Yellow tracer
Gr . . . . Gray	Bl/B . . . Blue with Black tracer	W/B . . White with Black tracer
Lbl . . . Light blue	G/Y . . . Green with Yellow tracer	W/G . . White with Green tracer
Lg . . . . Light green	O/B . . . Orange with Black tracer	W/R . . White with Red tracer
O . . . . Orange	O/Bl . . . Orange with Blue tracer	Y/B . . . Yellow with Black tracer
R . . . . . Red	O/G . . . Orange with Green tracer	Y/G . . . Yellow with Green tracer
W . . . . White	O/Lg . . Orange with Light green tracer	Y/W . . Yellow with White tracer
Y . . . . . Yellw	O/R . . . Orange with Red tracer	

CALIFORNIA MODEL ONLY

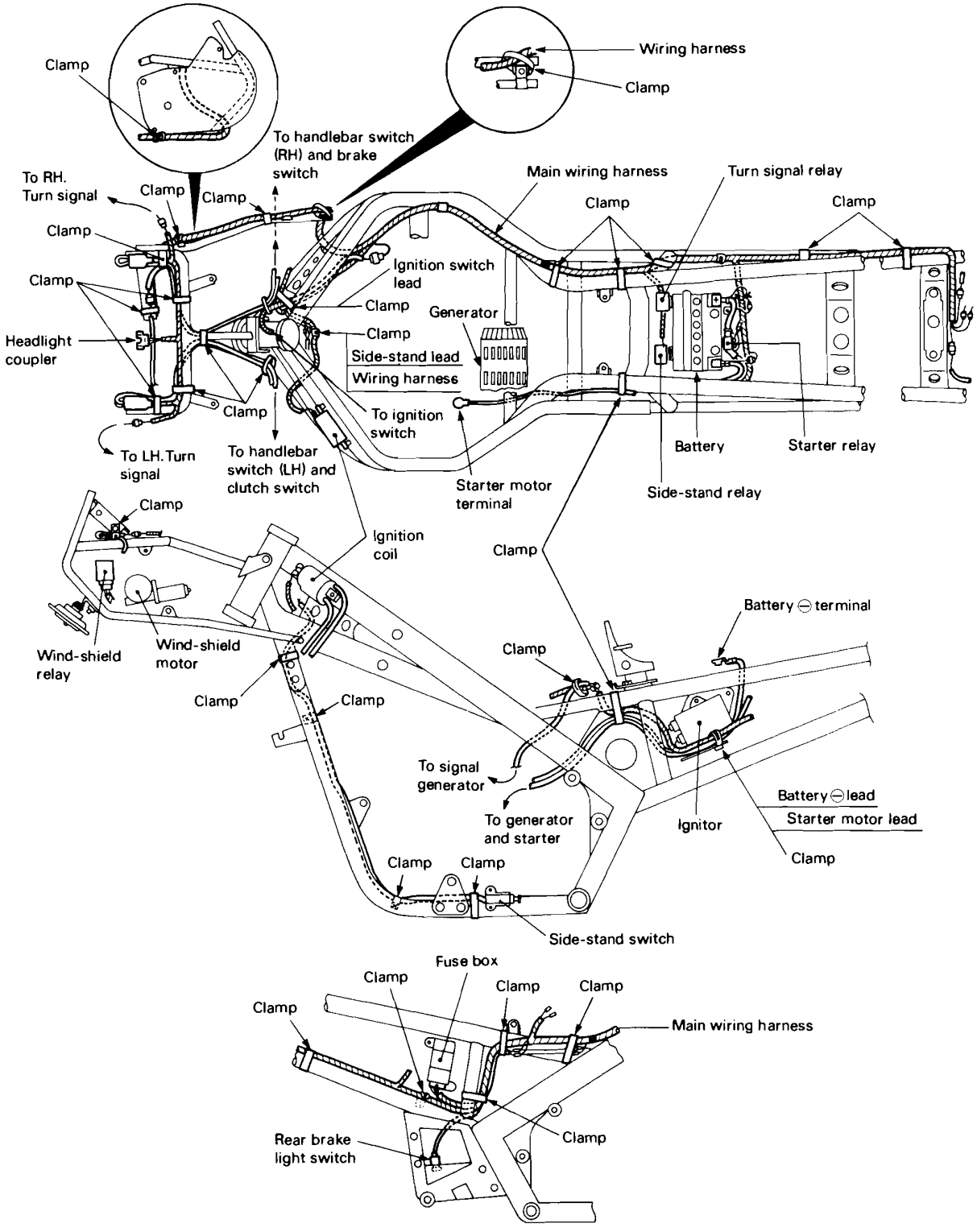


WIRE COLOR

B	Black	B/G . . .	Black with Green tracer	O/W . .	Orange with White tracer
Bl	Blue	B/R . . .	Black with Red tracer	O/Y . . .	Orange with Yellow tracer
Br	Brown	B/W . .	Black with White tracer	R/W . .	Red with White tracer
G	Green	B/Y . . .	Black with Yellow tracer	R/Y . . .	Red with Yellow tracer
Gr	Gray	Bl/B . . .	Blue with Black tracer	W/B . .	White with Black tracer
Lbl . . .	Light blue	G/Y . . .	Green with Yellow tracer	W/G . .	White with Green tracer
Lg	Light green	O/B . . .	Orange with Black tracer	W/R . .	White with Red tracer
O	Orange	O/Bl . .	Orange with Blue tracer	Y/B . . .	Yellow with Black tracer
R	Red	O/G . . .	Orange with Green tracer	Y/G . . .	Yellow with Green tracer
W	White	O/Lg . .	Orange with Light green tracer	Y/W . .	Yellow with White tracer
Y	Yellw	O/R . . .	Orange with Red tracer		

WIRE, CABLE AND HOSE ROUTING

WIRE ROUTING



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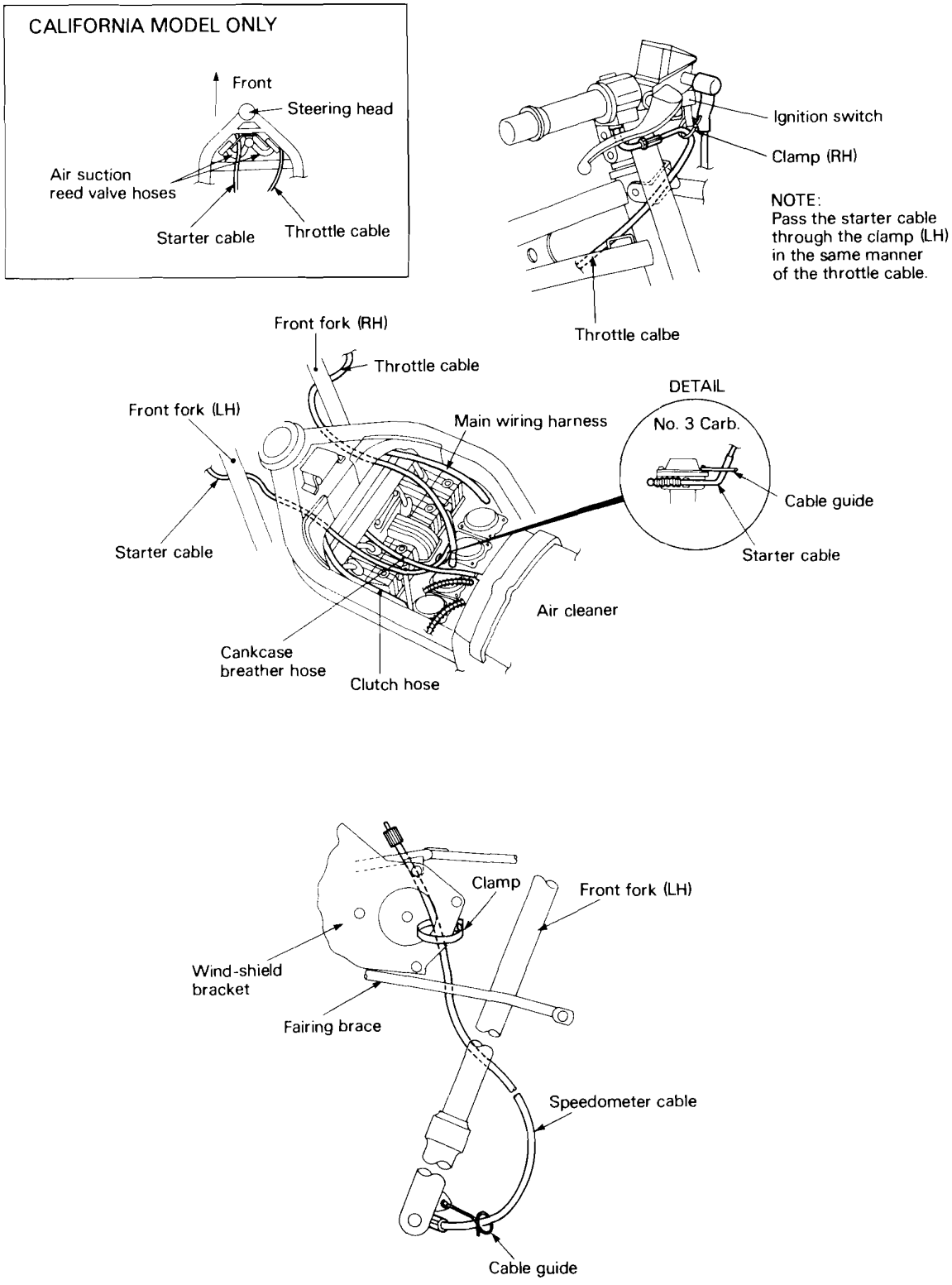
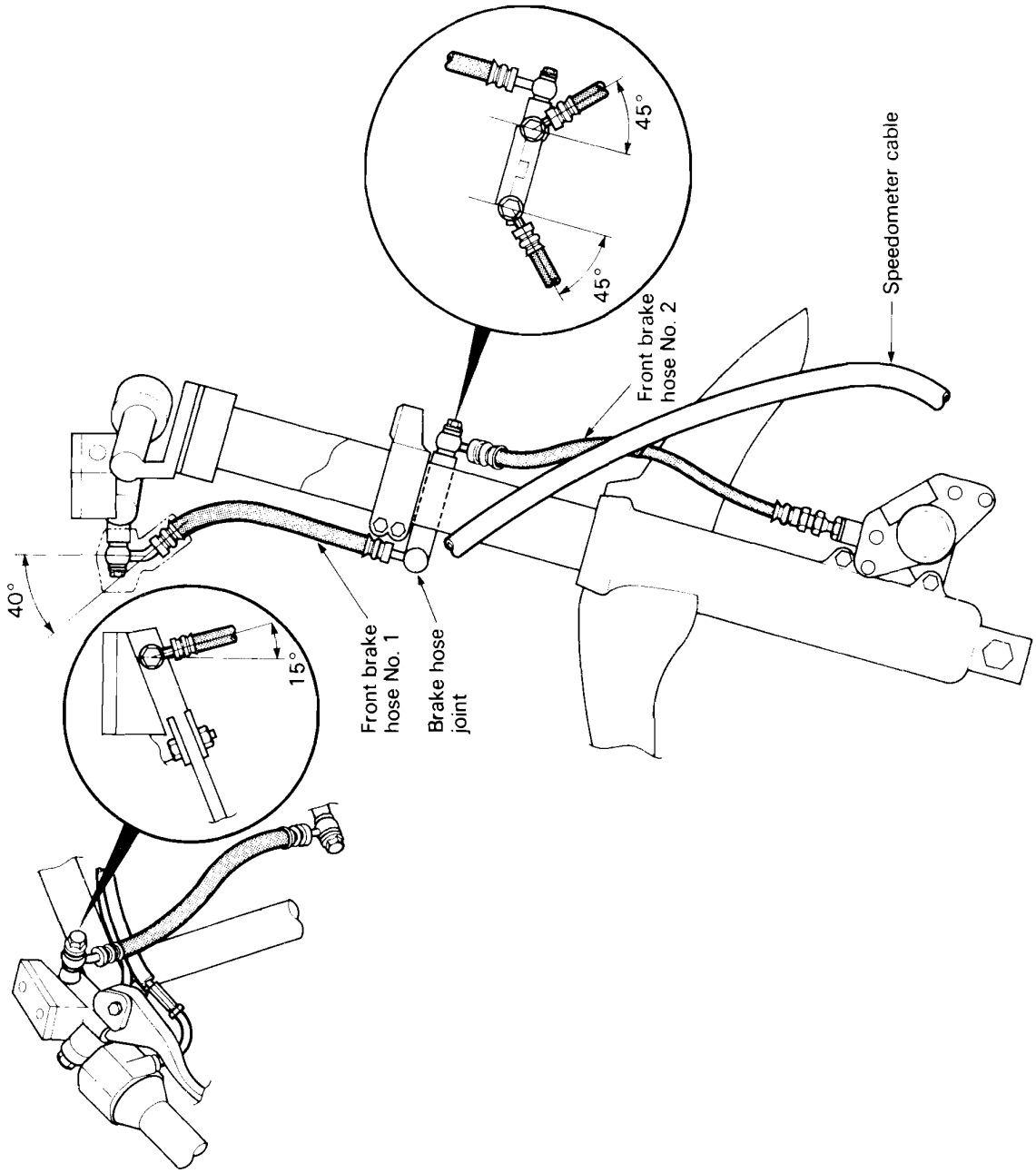


FRONT BRAKE HOSE ROUTING



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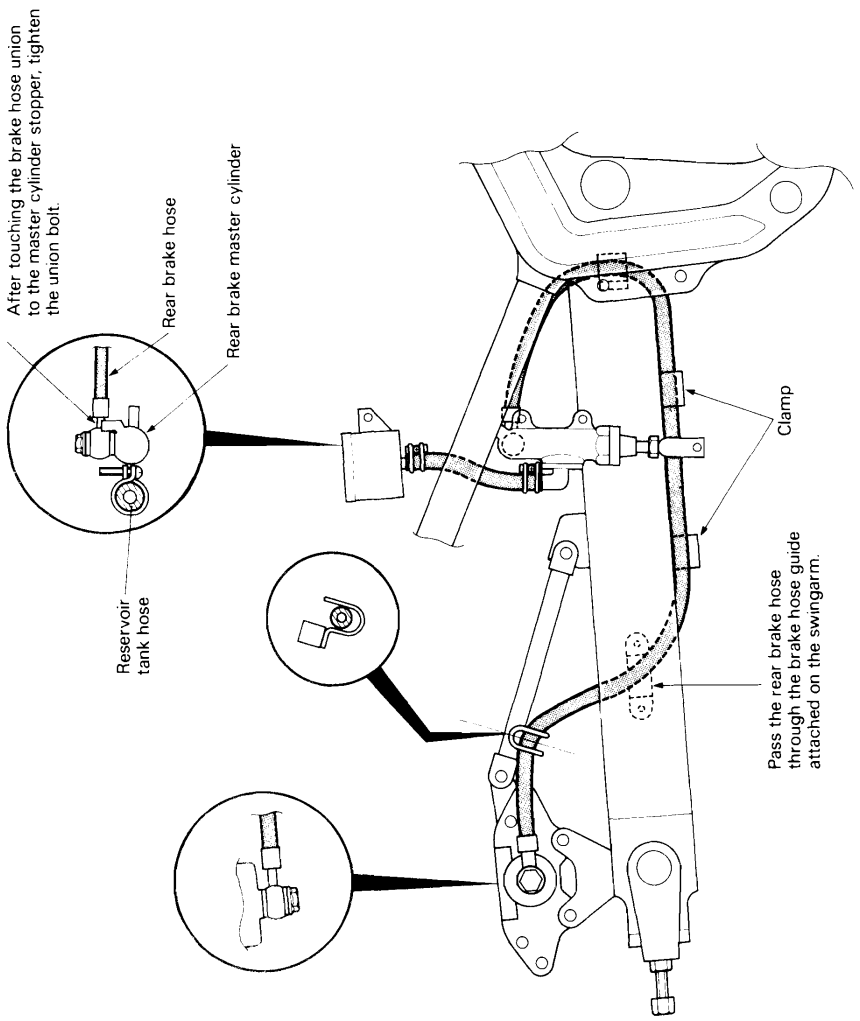
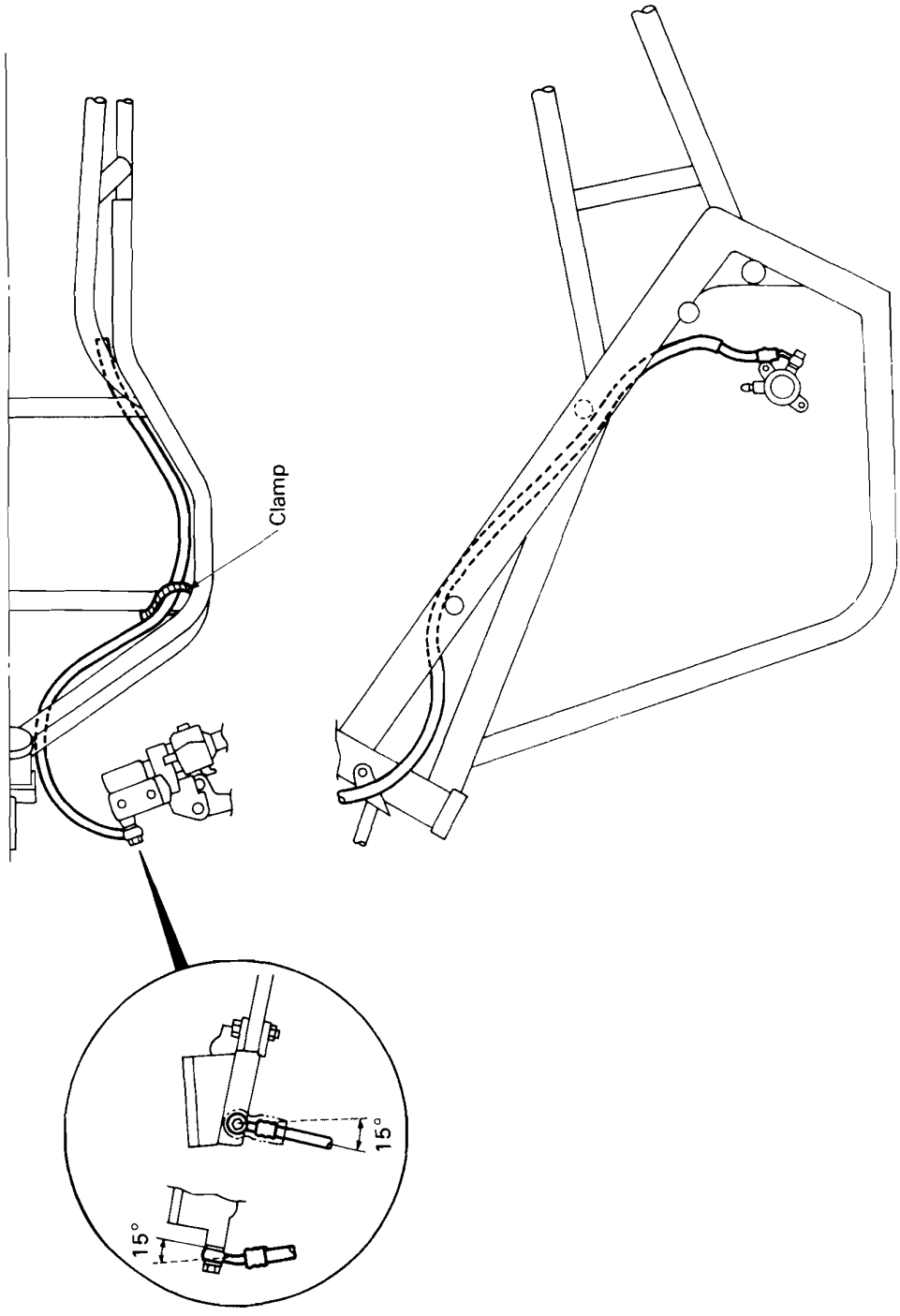
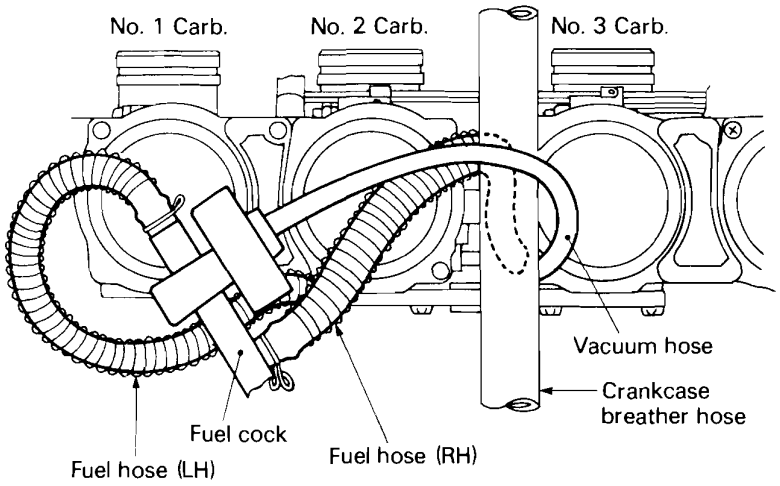
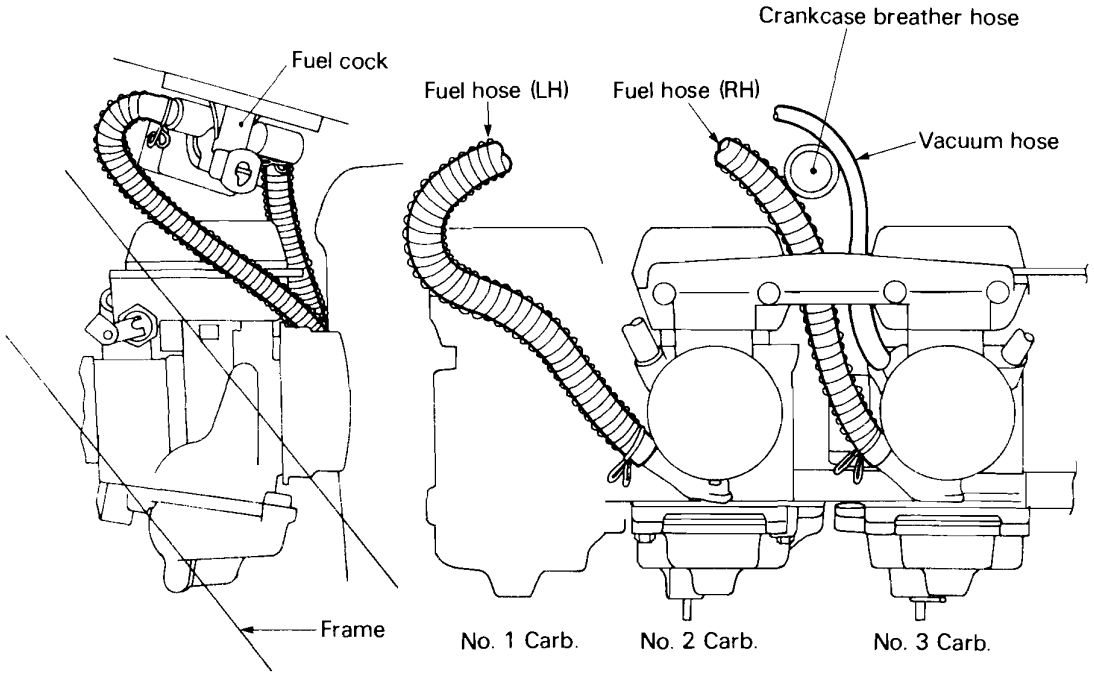


CLUTCH HOSE ROUTING

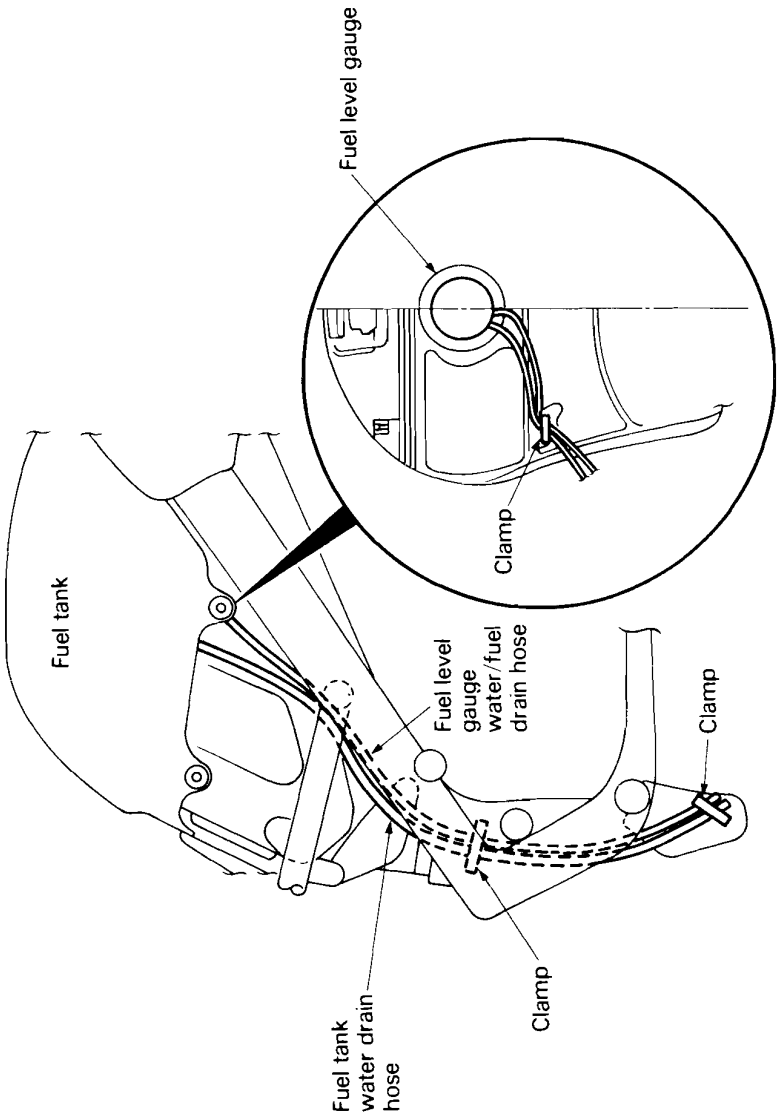


FUEL HOSE/VACUUM HOSE ROUTING

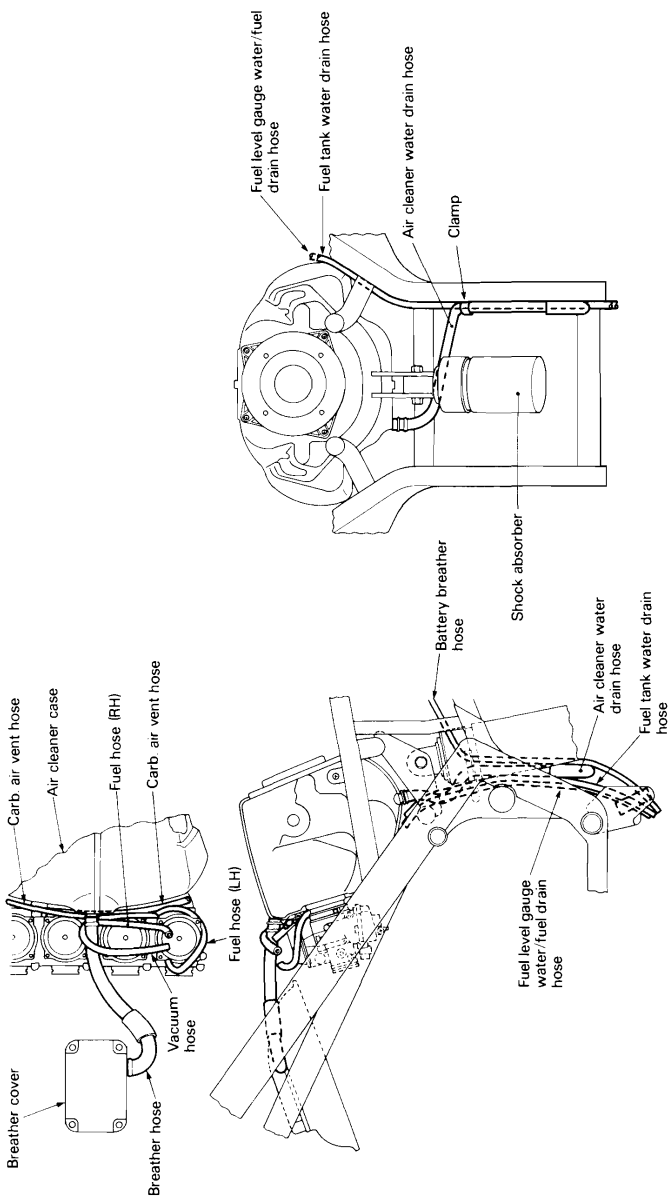




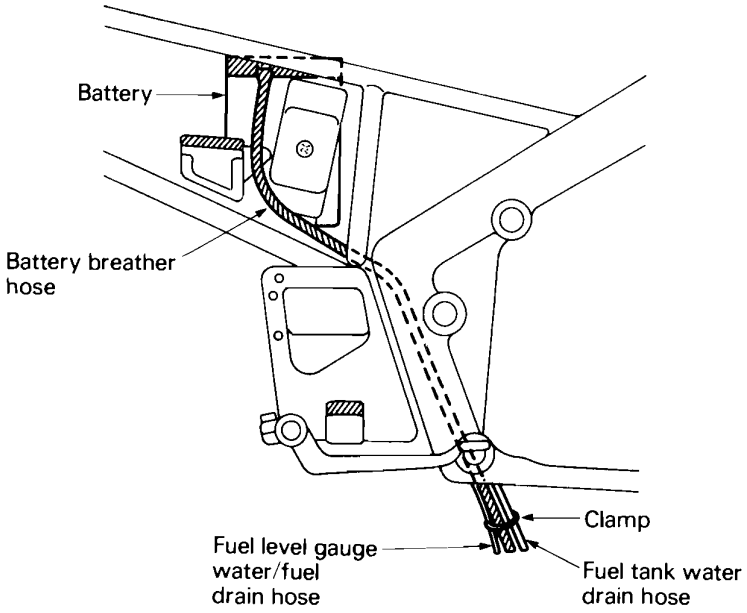
FUEL TANK HOSE ROUTING



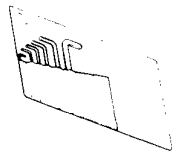
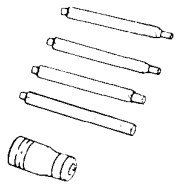
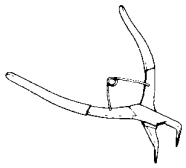
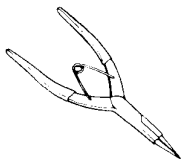
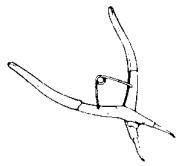
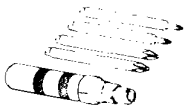
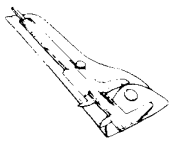
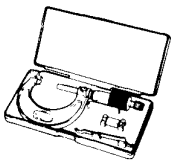
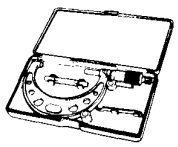
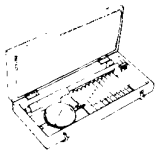
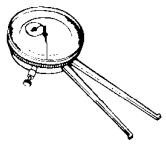
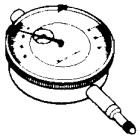
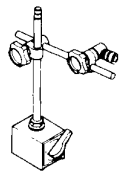
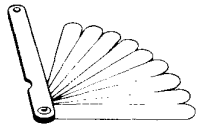
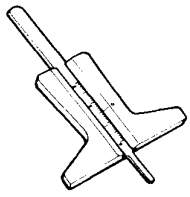
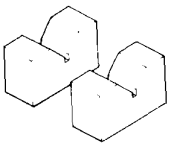
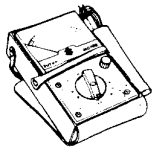
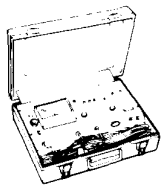
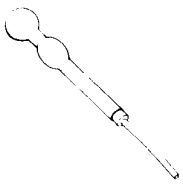
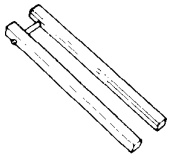
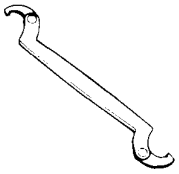
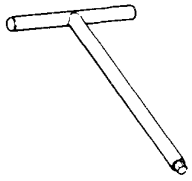
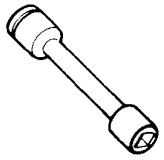
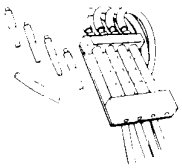
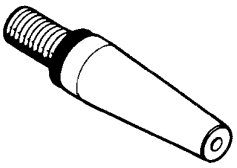
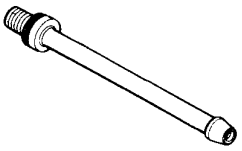
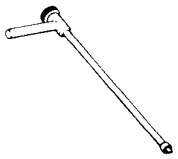
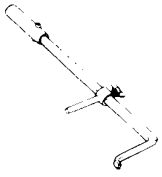
OTHER HOSES ROUTING

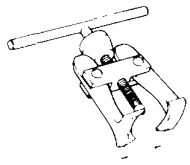
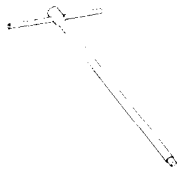
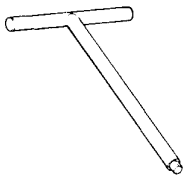
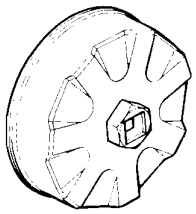
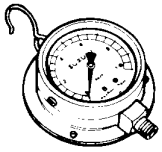
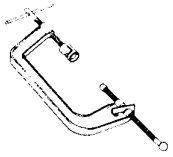
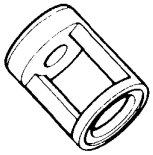
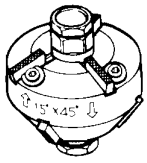
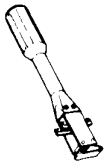
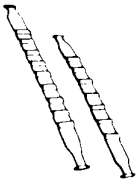
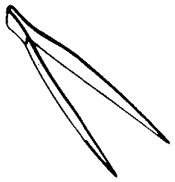
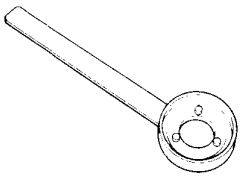
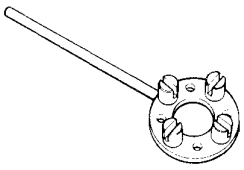
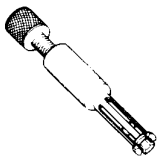
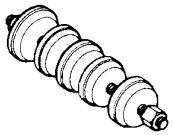
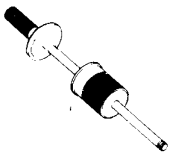
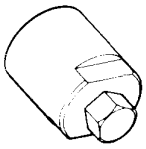
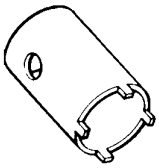
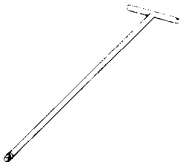
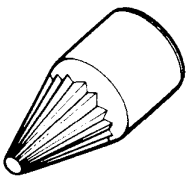


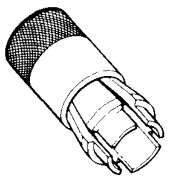
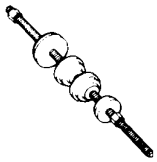
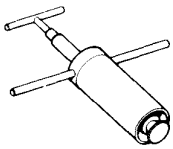
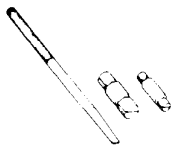
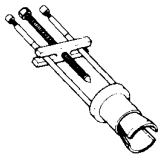
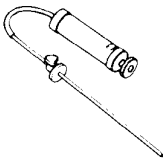
BATTERY BREATHER HOSE ROUTING



SPECIAL TOOLS

 09900-00401 "L" type hexagon wrench set	*  09900-00410 Hexagon bit wrench set	 09900-06105 Snap ring pliers	 09900-06107 Snap ring pliers	 09900-06108 Snap ring pliers
 09900-09003 Impact driver set	 09900-20102 Vernier calipers	 09900-20202 Micrometer (25 – 50 mm)	 09900-20204 Micrometer (75 – 100 mm)	 09900-20205 Micrometer (0 – 25 mm)
 09900-20508 Cylinder bore gauge set	*  09900-20605 Dial calipers	 09900-20606 Dial gauge (1/100)	*  09900-20701 Magnetic stand	 09900-20803 Thickness gauge
*  09900-20805 Tire depth gauge	*  09900-21304 V-block (100 mm)	*  09900-22301 Plastigauge	 09900-25002 Pocket tester	 09900-28106 Electro tester
 09900-28403 Hydrometer	 09910-20116 Conrod holder	 09910-60611 Universal clamp wrench	 09911-73730 5 mm"T" type hexagon wrench	 09911-74510 Long socket wrench
 09913-13121 Carbureter balancer gauge	 09913-13180 Carbureter balancer gauge adaptor	 09913-13190 Carbureter balancer gauge adaptor	 09913-14911 Throttle valve adjust wrench	 09913-50121 Oil seal remover

 09913-61510 Bearing puller	 09914-24510 T-handle	 09914-25811 6 mm "T" type hexagon wrench	 09915-40611 Oil filter wrench	 09915-63210 Compression gauge adaptor
 09915-64510 Compression gauge	 09915-74510 Oil pressure gauge	 09915-74540 Oil pressure gauge adaptor	 09915-77330 Meter (for high pressure)	 09916-14510 Valve lifter
 09916-14910 Valve lifter attachment	 Solid pilot (N-100-5.0)	 Valve seat cutter head N-116, N-120 or N-121, N-122	 09916-34541 Reamer handle	 09916-34570 Valve guide reamer (5.0 mm)
 09916-34580 Valve guide reamer (10.8 mm)	 09916-44310 Valve guide remover/ installer	 09916-74521 Piston holder handle	 09916-74540 Piston holder	 09916-84510 Tweezers
 09917-14910 Tappet adjust driver	 09920-34810 Starter clutch holder	 09920-53722 Clutch sleeve hub holder	 09923-73210 Bearing puller	 09924-84511 Bearing installer set
 09930-30102 Sliding shaft	 09930-33720 Rotor remover	 09940-14911 Steering stem nut wrench	 09940-34520 "T" handle	 09940-34530 Attachment "A" (Front fork disassembling tool)

 09940-50112 Front fork oil seal installer	 09941-34513 Steering race installer	 09941-44510 Swingarm bearing remover	*  09941-50110 Bearing remover	 09941-74910 Steering bearing installer
 09941-84510 Bearing remover	 09943-74111 Fork oil level gauge			

* : Not available in U.S.A.

TIGHTENING TORQUE

ENGINE

ITEM	N·m	kg-m	lb-ft
Cylinder head cover bolt and union bolt	13 – 15	1.3 – 1.5	9.5 – 11.0
Cylinder head nut	35 – 40	3.5 – 4.0	25.5 – 29.0
Cylinder head bolt	7 – 11	0.7 – 1.1	5.0 – 8.0
Cylinder base nut	7 – 11	0.7 – 1.1	5.0 – 8.0
Cylinder stud bolt	13 – 16	1.3 – 1.6	9.5 – 11.5
Valve clearance adjuster lock nut	9 – 11	0.9 – 1.1	6.5 – 8.0
Camshaft journal holder bolt	8 – 12	0.8 – 1.2	6.0 – 8.5
Cam sprocket bolt	24 – 26	2.4 – 2.6	17.5 – 19.0
Rocker arm shaft set bolt	8 – 10	0.8 – 1.0	6.7 – 7.0
Oil hose mounting bolt (Cylinder head side)	8 – 12	0.8 – 1.2	6.0 – 8.5
Oil hose mounting bolt (Crankcase side)	8 – 12	0.8 – 1.2	6.0 – 8.5
Cam chain tensioner mounting bolt	6 – 8	0.6 – 0.8	4.5 – 6.0
Cam chain tensioner spring holder bolt	30 – 45	3.0 – 4.5	21.5 – 32.5
Cam chain idler mounting bolt	8 – 12	0.8 – 1.2	6.0 – 8.5
Conrod bearing cap nut	49 – 53	4.9 – 5.3	35.5 – 38.5
Starter clutch mounting bolt	143 – 157	14.3 – 15.7	103.5 – 113.5
Signal generator bolt	25 – 35	2.5 – 3.5	18.0 – 25.5
Crankcase bolt (6 mm)	9 – 13	0.9 – 1.3	6.5 – 9.5
(8 mm)	20 – 24	2.0 – 2.4	14.5 – 17.5
Oil pump mounting bolt	8 – 12	0.8 – 1.2	6.0 – 8.5
Oil drain plug	20 – 25	2.0 – 2.5	14.5 – 18.0
Oil pan bolt	12 – 16	1.2 – 1.6	8.5 – 11.5
Gearshift cam stopper bolt	15 – 23	1.5 – 2.3	11.0 – 16.5
Clutch sleeve hub nut	80 – 100	8.0 – 10.0	58.0 – 72.5
Clutch spring bolt	11 – 13	1.1 – 1.3	8.0 – 9.5
Exhaust pipe bolt	9 – 12	0.9 – 1.2	6.5 – 8.5
Exhaust pipe/Muffler connecting bolt	25 – 30	2.5 – 3.0	18.0 – 21.5
Muffler mounting bolt (Front side)	18 – 28	1.8 – 2.8	13.0 – 20.0
Muffler mounting bolt (Rear side)	22 – 35	2.2 – 3.5	16.0 – 25.5
Engine sprocket nut	100 – 130	10.0 – 13.0	72.5 – 94.0
Engine mounting bolt (L: 55 mm)	50 – 60	5.0 – 6.0	36.0 – 43.5
(L: 140 mm and 180 mm)	70 – 80	7.0 – 8.0	50.0 – 58.0

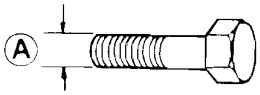
CHASSIS

ITEM	N-m	kg-m	lb-ft
Front axle nut	55 – 88	5.5 – 8.8	40.0 – 63.5
Front axle pinch nut	15 – 25	1.5 – 2.5	11.0 – 18.0
Front fork upper clamp bolt	20 – 30	2.0 – 3.0	14.5 – 21.5
Front fork lower clamp bolt	15 – 25	1.5 – 2.5	11.0 – 18.0
Front fork damper rod bolt	15 – 25	1.5 – 2.5	11.0 – 18.0
Steering stem head bolt	35 – 55	3.5 – 5.5	25.5 – 40.0
Handlebar mounting bolt	25 – 35	2.5 – 2.5	18.0 – 25.5
Clutch master cylinder mounting bolt	8 – 12	0.8 – 1.2	6.0 – 8.5
Front brake master cylinder mounting bolt	8 – 12	0.8 – 1.2	6.0 – 8.5
Brake/clutch air bleeder	6 – 9	0.6 – 0.9	4.5 – 6.5
Brake/clutch hose union bolt	20 – 25	2.0 – 2.5	14.5 – 18.0
Front brake caliper mounting bolt	25 – 40	2.5 – 4.0	18.0 – 29.0
Front brake caliper housing bolt	18 – 23	1.8 – 2.3	13.0 – 16.5
Front brake lever nut	8 – 12	0.8 – 1.2	6.0 – 8.5
Brake pedal bolt	15 – 25	1.5 – 2.5	11.0 – 18.0
Rear torque link nut (Front and Rear)	22 – 33	2.2 – 3.3	16.0 – 24.0
Swingarm pivot nut	55 – 88	5.5 – 8.8	40.0 – 63.5
Rear brake caliper mounting bolt	25 – 40	2.5 – 4.0	18.0 – 29.0
Rear shock absorber mounting nut (Upper & Lower)	40 – 60	4.0 – 6.0	29.0 – 43.5
Rear sprocket mounting nut	48 – 72	4.8 – 7.2	35.0 – 52.0
Disc plate mounting bolt (Front and Rear)	15 – 25	1.5 – 2.5	11.0 – 18.0
Rear brake caliper housing bolt	18 – 23	1.8 – 2.3	13.0 – 16.5
Rear cushion level mounting nut	70 – 100	7.0 – 10.0	50.5 – 72.5
Rear cushion rod nut (Upper & Lower)	70 – 100	7.0 – 10.0	50.5 – 72.5
Rear axle nut	94 – 127	9.4 – 12.7	68.0 – 92.0
Rear brake master cylinder mounting bolt	15 – 25	1.5 – 2.5	11.0 – 18.0

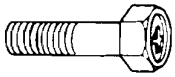
TIGHTENING TORQUE CHART

For other bolts and nuts not listed above, refer to this chart:
Tightening torque

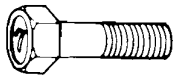
Bolt Diamter (mm)	Conventional or "4" marked bolt			"7" marked bolt		
	N·m	kg-m	ib-ft	N·m	kg-m	ib-ft
4	1 – 2	0.1 – 0.2	0.7 – 1.5	1.5 – 3	0.15 – 0.3	1.0 – 2.0
5	2 – 4	0.2 – 0.4	1.5 – 3.0	3 – 6	0.3 – 0.6	2.0 – 4.5
6	4 – 7	0.4 – 0.7	3.0 – 5.0	8 – 12	0.8 – 1.2	6.0 – 8.5
8	10 – 16	1.0 – 1.6	7.0 – 11.5	18 – 28	1.8 – 2.8	13.0 – 20.0
10	22 – 35	2.2 – 3.5	16.0 – 25.5	40 – 60	4.0 – 6.0	29.0 – 43.5
12	35 – 55	3.5 – 5.5	25.5 – 40.0	70 – 100	7.0 – 10.0	50.5 – 72.5
14	50 – 80	5.0 – 8.0	36.0 – 58.0	110 – 160	11.0 – 16.0	79.5 – 115.5
16	80 – 130	8.0 – 13.0	58.0 – 94.0	170 – 250	17.0 – 25.0	123.0 – 181.0
18	130 – 190	13.0 – 19.0	94.0 – 137.5	200 – 280	20.0 – 28.0	144.5 – 202.5



Conventional Bolt



"4" Marked Bolt



"7" Marked Bolt

SERVICE DATA

VALVE + GUIDE

Unit: mm (in)

ITEM	STANDARD		LIMIT
Valve diam.	IN.	28.5 (1.12)	———
	EX.	25 (1.0)	———
Valve lift	IN.	8.8 (0.35)	———
	EX.	8.2 (0.32)	———
Valve clearance (when cold)	IN. & EX.	0.10 – 0.15 (0.004 – 0.006)	———
Valve guide to valve stem clearance	IN.	0.020 – 0.047 (0.0008 – 0.0019)	0.35 (0.014)
	EX.	0.040 – 0.067 (0.0016 – 0.0026)	0.35 (0.014)
Valve guide I.D.	IN. & EX.	5.000 – 5.012 (0.1969 – 0.1973)	———
Valve stem O.D.	IN.	4.965 – 4.980 (0.1955 – 0.1961)	———
	EX.	4.945 – 4.960 (0.1947 – 0.1953)	———
Valve stem runout	IN. & EX.	———	0.05 (0.002)
Valve head thickness	IN. & EX.	———	0.5 (0.02)
Valve stem end length	IN. & EX.	———	2.5 (0.10)
Valve seat width	IN. & EX.	0.9 – 1.1 (0.035 – 0.043)	———
Valve head radial runout	IN. & EX.	———	0.03 (0.001)
Valve spring free length IN. & EX.)	INNER	———	35.0 (1.38)
	OUTER	———	37.8 (1.49)
Valve spring tension (IN. & EX.)	INNER	5.3 – 6.5 kg (11.7 – 14.3 lbs) at length 28 mm (1.1 in)	———
	OUTER	13.1 – 15.1 kg (28.9 – 33.3 lbs) at length 31.5 mm (1.2 in)	———

CAMSHAFT + CYLINDER HEAD

Unit: mm (in)

ITEM	STANDARD		LIMIT
Cam height	IN.	33.878 – 33.918 (1.3338 – 1.3354)	33.580 (1.3220)
	EX.	33.533 – 33.573 (1.3202 – 1.3218)	33.240 (1.3087)
Camshaft journal oil clearance	IN. & EX.	0.032 – 0.066 (0.0013 – 0.0026)	0.150 (0.0059)
Camshaft journal holder I.D.	IN. & EX.	22.012 – 22.025 (0.8666 – 0.8671)	———

ITEM	STANDARD		LIMIT
Camshaft journal O.D.	IN. & EX.	21.959 – 21.980 (0.8645 – 0.8654)	———
Camshaft runout	IN. & EX.	———	0.10 (0.004)
Cam chain 20 – pitch length	———		158.0 (6.22)
Cam chain pin (at arrow "3")	22nd pin		———
Rocker arm I.D.	IN. & EX.	12.000 – 12.018 (0.4724 – 0.4731)	———
Rocker arm shaft O.D.	IN. & EX.	11.973 – 11.984 (0.4714 – 0.4718)	———
Cylinder head distortion	———		0.20 (0.008)

CYLINDER + PISTON + PISTON RING

Unit: mm (in)

ITEM			STANDARD	LIMIT
Compression pressure	1100 – 1500 kPa 11 – 15 kg/cm² 156 – 213 psi			900 kPa 9 kg/cm² 128 psi
Compression pressure difference	———			200 kPa 2 kg/cm² 28 psi
Piston to cylinder clearance	0.050 – 0.060 (0.0020 – 0.0024)			0.120 (0.0047)
Cylinder bore	78.000 – 78.015 (3.0709 – 3.0715)			78.080 (3.0740)
Piston diam.	77.945 – 77.960 (3.0687 – 3.0693) Measure at 15 mm (0.6 in) from the skirt end.			77.880 (3.0661)
Cylinder distortion	———			0.20 (0.008)
Piston ring free end gap	1st	N	Approx. 10 (0.39)	8 (0.31)
	2nd	N	Approx. 11.5 (0.45)	9.2 (0.36)
Piston ring end gap	1st		0.20 – 0.35 (0.008 – 0.014)	0.7 (0.03)
	2nd		0.35 – 0.50 (0.014 – 0.020)	1.0 (0.04)
Piston ring to groove clearance	1st		———	0.180 (0.007)
	2nd		———	0.150 (0.006)
Piston ring groove width	1st		1.01 – 1.03 (0.039 – 0.040)	———
	2nd		1.01 – 1.03 (0.039 – 0.040)	———
	Oil		2.01 – 2.03 (0.079 – 0.080)	———
Piston ring thickness	1st		0.97 – 0.99 (0.038 – 0.039)	———
	2nd		0.97 – 0.99 (0.038 – 0.039)	———

ITEM	STANDARD	LIMIT
Piston pin bore	20.002 – 20.008 (0.7875 – 0.7877)	20.030 (0.7886)
Piston pin O.D.	19.996 – 20.000 (0.7872 – 0.7874)	19.980 (0.7866)

CONROD + CRANKSHAFT

Unit: mm (in)

ITEM	STANDARD		LIMIT
Conrod small end I.D.	20.010 – 20.018 (0.7878 – 0.7881)		20.040 (0.7890)
Conrod big end side clearance	0.10 – 0.20 (0.004 – 0.008)		0.30 (0.01)
Conrod beg end width	20.95 – 21.00 (0.825 – 0.827)		———
Crank pin width	21.10 – 21.15 (0.831 – 0.833)		———
Conrod big end oil clearance	0.032 – 0.056 (0.0013 – 0.0022)		0.080 (0.0031)
Crank pin O.D.	37.976 – 38.000 (1.4951 – 1.4961)		———
Crankshaft journal oil clearance	0.020 – 0.044 (0.0008 – 0.0017)		0.080 (0.0031)
Crankshaft journal O.D.	35.976 – 36.000 (1.4164 – 1.4173)		———
Crankshaft thrust clearance	0.04 – 0.08 (0.002 – 0.003)		———
Crankshaft thrust bearing clearance	Left side	2.36 – 2.52 (0.093 – 0.099)	———
	Right side	2.44 – 2.46 (0.096 – 0.097)	———
Crankshaft runout	———		0.05 (0.002)

OIL PUMP

ITEM	STANDARD	LIMIT
Oil pump reduction ratio	1.769 (67/44 × 43/37)	———
Oil pressure (at 60°C, 140°F)	Above 300 kPa (3.0 kg/cm², 43 psi) Below 600 kPa (6.0 kg/cm², 85 psi) at 3000 r/min.	———

CLUTCH

Unit: mm (in)

ITEM	STANDARD		LIMIT
Drive plate thickness	No. 1 & No. 2	2.52 - 2.68 (0.100 – 0.106)	2.22 (0.087)
Driven plate distortion	———		0.10 (0.004)
Clutch spring free length	———		38.1 (1.50)
Clutch master cylinder bore	14.000 – 14.043 (0.5511 – 0.5529)		———

ITEM	STANDARD	LIMIT
Clutch master cylinder piston diam.	13.957 – 13.984 (0.5495 – 0.5506)	———
Clutch release cylinder bore	38.100 – 38.162 (1.4999 – 1.5024)	———
Clutch release cylinder piston diam.	38.042 – 38.075 (1.4977 – 1.4990)	———

TRANSMISSION + DRIVE CHAIN

Unit: mm (in) Except ratio

ITEM		STANDARD		LIMIT
Primary reduction ratio		1.522 (67/44)		———
Final reduction ratio		3.466 (52/15)		———
Gear ratios	Low	2.384 (31/13)		———
	2nd	1.631 (31/19)		———
	3rd	1.250 (25/20)		———
	4th	1.045 (23/22)		———
	Top	0.913 (21/23)		———
Shift fork to groove clearance		No.1, No.2 & No.3	0.1 – 0.3 (0.004 – 0.012)	0.50 (0.020)
Shift fork groove width		No.1, No.2 & No.3	5.0 – 5.1 (0.197 – 0.201)	———
Shift fork thickness		No.1, No.2 & No.3	4.8 – 4.9 (0.189 – 0.193)	———
Drive chain		Type	DAIDO: DID532ZLV	———
		Links	118 links	———
		20 – pitch length	———	319.4 (1.26)
Drive chain slack		20 – 25 (0.8 – 1.0)		———

CARBURETOR

ITEM	SPECIFICATION	
		California model only
Carburetor type	MIKUNI BST34SS	←
Bore size	34 mm (1.3 in)	←
I.D. No.	48B11	48B21
Idle r/min.	1100 ± 100 r/min.	←
Float height	14.6 ± 1.0 mm (0.58 ± 0.04 in)	←
Main jet (M.J.)	No. 1 & No. 4: #112.5 No. 2 & No. 3: #110	←
Main air jet (M.A.J.)	0.6 mm	←
Jet needle (J.N.)	5DL11	5DL16
Needle jet (N.J.)	P-2	P-0
Pilot jet (P.J.)	#32.5	#42.5
By – pass (B.P.)	#1 0.8, #2 0.8, #3 0.8 mm	←

ITEM		SPECIFICATION	
			California model only
Pilot outlet	(P.O.)	0.8 mm	←
Valve seat	(V.S.)	2.8 mm	←
Starter jet	(G.S.)	#42.5	←
Pilot screw	(P.S.)	PRE – SET	←
Throttle valve	(Th.V.)	#125	#130
Pilot air jet	(P.A.J.)	#135	#155
Throttle cable play		0.5 – 1.0 mm (0.02 – 0.04 in)	←

ELECTRICAL

Unit: mm (in)

ITEM		SPECIFICATION		NOTE
Ignition timing		13° B.T.D.C. Below 1500 r/min. and 32° B.T.D.C. Above 2375 r/min.		
		7° B.T.D.C. Below 1500 r/min. and 32° B.T.D.C. Above 2500 r/min.		California model only
Firing order		1.2.4.3		
Spark plug		Type	NGK: JR9B or J9B	
		Gap	0.6 – 0.7 (0.024 – 0.028)	
Spark performance		Over 8 (0.3) at 1 atm.		
Signal coil resistance		Approx. 135 – 200Ω		Tester range: (× 100Ω)
Ignition coil resistance		Primary	⊕ tap – ⊖ tap Approx. 3 – 5Ω	Tester range: (× 1Ω)
		Secondary	Plug cap – Plug cap Approx. 25 – 45 kΩ	Tester range: (× 1 kΩ)
Generator		Slip ring O.D.	Limit: 14.0 (0.55)	N.D.
		Brush length	Limit: 4.5 (0.18)	
Regulated voltage		Above 13.5 V at 5000 r/min.		
Starter motor		Brush length	Limit: 6 (0.2)	
		Commutator under-cut	Limit: 0.2 (0.008)	
Starter relay resistance		3–5 Ω		
Battery	Type designation	FB14L – B2 or YB14L – B2		
	Capacity	12V 50.4 kC (14 Ah)/10 HR		
	Standard electrolyte S.G.	1.28 at 20°C (68°F)		
Fuse size	Headlight	10A		
	Turn signal	10A		
	Ignition	10A		
	Taillight	10A		
	Power source	10A		
Circuit breaker		30A		

WATTAGE

Unit: W

ITEM		SPECIFICATION
Headlight	HI	60
	LO	55
Tail/Brake light		5/21
Running/Turn signal light		5/21
Speedometer light		3
Tachometer light		3
Fuel meter light		3
Turn signal indicator light		3
High beam indicator light		1.7
Neutral indicator light		3
Oil pressure indicator light		3
License light		5

BRAKE + WHEEL

Unit: mm (in)

ITEM	STANDARD		LIMIT
Rear brake pedal height	50 (2.0)		———
Brake disc thickness	Front	5.0 ± 0.2 (0.197 ± 0.008)	4.0 (0.15)
	Rear	6.7 ± 0.2 (0.264 ± 0.008)	6.0 (0.24)
Brake disc runout	———		0.30 (0.012)
Master cylinder bore	Front	14.000 – 14.043 (0.5511 – 0.5529)	———
	Rear	12.700 – 12.743 (0.5000 – 0.5017)	———
Master cylinder piston diam.	Front	13.957 – 13.984 (0.5495 – 0.5506)	———
	Rear	12.657 – 12.684 (0.4983 – 0.4994)	———
Brake caliper cylinder bore	Front & Rear	38.180 – 38.256 (1.5031 – 1.5061)	———
Brake caliper piston diam.	Front & Rear	38.098 – 38.148 (1.5000 – 1.5019)	———
Wheel rim runout	Axial	———	2.0 (0.08)
	Radial	———	2.0 (0.08)
Wheel axle runout	Front	———	0.25 (0.010)
	Rear	———	0.25 (0.010)
Tire size	Front	120/80V16 V250	———
	Rear	150/80V16 V250	———

ITEM	STANDARD		LIMIT
Tire tread depth	Front	———	1.6 (0.06)
	Rear	———	2.0 (0.08)

SUSPENSION

Unit: mm (in)

ITEM	STANDARD	LIMIT	NOTE
Front fork stroke	140 (5.5)	———	
Front fork spring free length	———	342 (13.5)	
Front fork oil level	126 (4.96)	———	
Rear wheel travel	125 (4.92)	———	
Swingarm pivot shaft runout	———	0.3 (0.01)	

TIRE PRESSURE

COLD INFLATION TIRE PRESSURE	kPa	kg/cm²	psi
FRONT	250	2.50	36
REAR	290	2.90	42

FUEL + OIL

ITEM	SPECIFICATION		LIMIT
Fuel type	Use only unleaded or low-lead type gasoline of at least 85 - 95 pump octane ($\frac{R+M}{2}$ method) or 89 octane or higher rated by the Research Method.		
Fuel tank capacity	21.0 L (5.5 US gal)		
	19.5 L (5.2 US gal)		California model only
Engine oil type	SAE 10W/40, API SE or SF		
Engine oil capacity	Change	4300 ml (4.5 US qt)	
	Filter change	4500 ml (4.8 US qt)	
	Overhaul	5500 ml (5.8 US qt)	
Front fork oil type	Fork oil #10		
Front fork oil capacity (each leg)	478 ml (16.2 US oz)		
Brake fluid type	DOT4		

Prepared by

SUZUKI MOTOR CO., LTD.

Technical Department
Motorcycle Service Division
1st Ed. October, 1987

Part No.: 99500-39080-03E

Printed in Japan