SUZUKI

GS1100G

SERVICE MANUAL

99500-39020-03E

GS1100G SUZUKI MOTOR CO., LTD. APRIL, '82 PRINTED IN JAPAN 99500-39020-03E

FOREWORD

The SUZUKI GS1100G has been developed as a companion motorcycle to the GS-models. It is packed with highly advanced design concepts including a maintenance free shaft drive mechanism and a fully transistorized ignition system with electronic advance. Combined with precise control and easy handling, the GS1100G 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 guide.

Model GS1100G manufactured to standard specifications is the main subject matter of this manual. However, the GS1100G machines distributed in your country might differ in minor respects from the standard-specification and, if they do, it is because some minor modifications (which are of no consequence in most cases as far as servicing is concerned) had to be made to comply with the statutory requirements of your country. This manual contains up-to-date information at the time of its issue.

SUZUKI MOTOR CO.,LTD.

Administration Department
Overseas Service Division

VIEW OF SUZUKI GS1100G

Right side

Left side

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GENERAL INFORMATION

1

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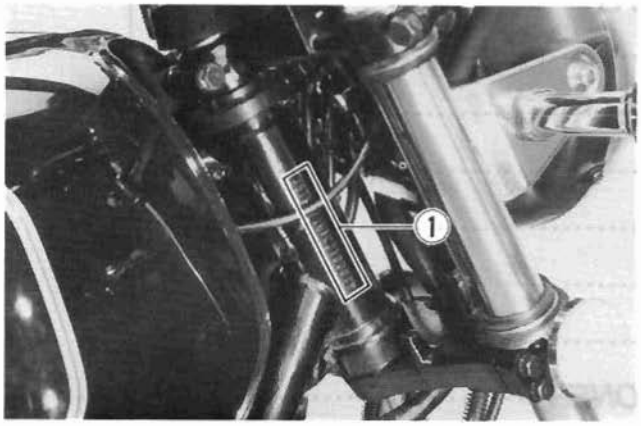
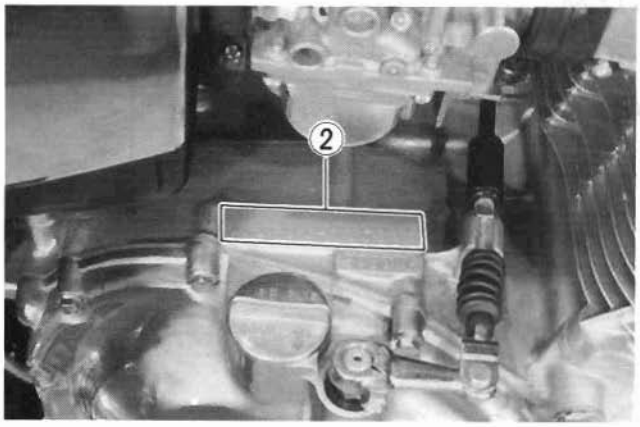
SERIAL NUMBER LOCATIONS

The VIN (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.





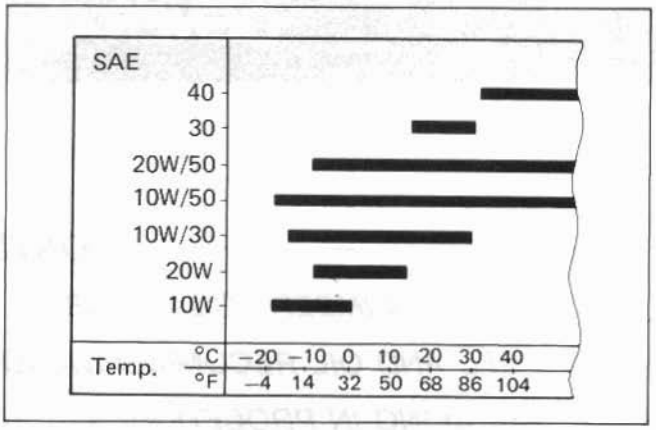
FUEL AND OIL RECOMMENDATIONS

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

Be sure that the engine oil you use comes under API classification of SE or SF and that its viscosity rating is SAE 10W/40. If SAE 10W/40 motor oil is



GEAR OIL (SECONDARY AND FINAL GEARBOXES)

Use SAE 90 hypoid gear oil which is rated GL-5 under API classification system. If you operate the motorcycle where ambient temperature is below 0°C (32°F), use SAE 80 hypoid gear oil.

BRAKE FLUID

Specification and classification:	DOT3, 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 fluid left over from the previous servicing and stored for a long period.**

FRONT FORK OIL

Fork oil #15

BREAKING-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 exercised during its early life. The general rules are as follows:

- Keep to these breaking-in engine speed limits:

Initial 800 km (500 mi)	Below 4,000 r/min
Up to 1,600 km (1,000 mi)	Below 6,000 r/min
Over 1,600 km (1,000 mi)	Below 9,000 r/min

- Upon reaching an odometer reading of 1,600 km (1,000 miles) you can subject the motorcycle to full throttle operation.
  However, do not exceed 9,000 r/min at any time.
- Do not maintain constant engine speed for an extended time period during any portion of the break-in. Try to vary the throttle position.

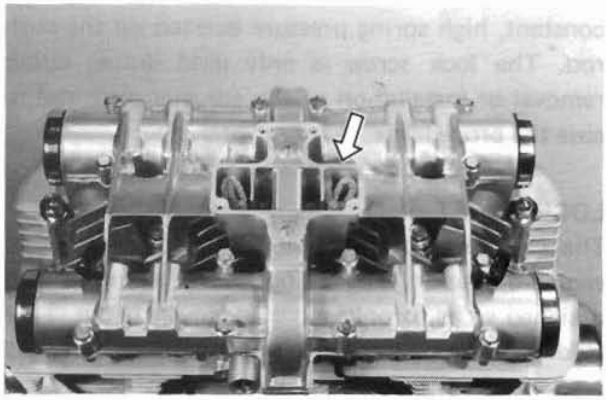
CYLINDER IDENTIFICATION

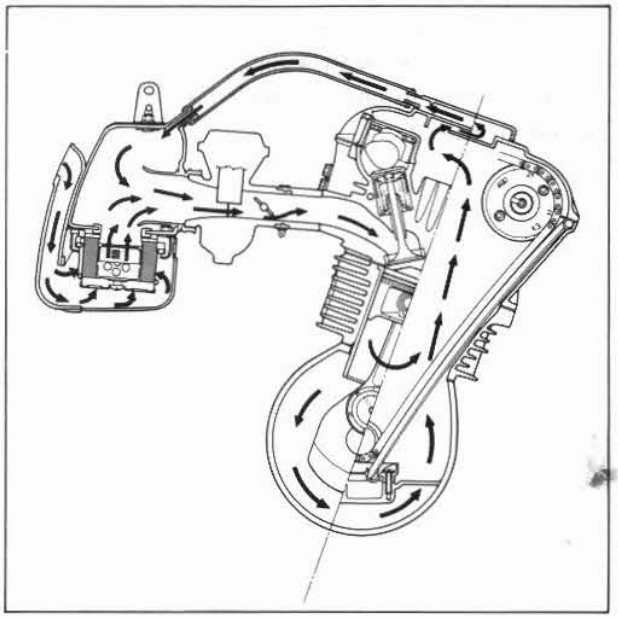
The four cylinders of this engine are identified as No. 1, No. 2, No. 3 and No. 4 cylinder, as counted from left to right (as viewed by the rider on the seat).

SPECIAL FEATURES

BLOWBY GAS RECYCLING

Blowby gases in the crankcase are constantly drawn into the chain chamber provided in the middle section of the cylinder block. The top section of this chamber is connected with the air chamber assembly through a rubber tube. In the air chamber, the gases merge with incoming air and thus are recycled to the engine through the normal intake system.



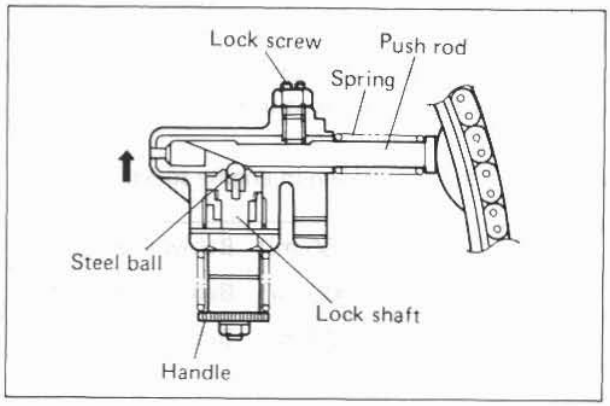


CAMSHAFT DRIVE CHAIN TENSIONER

The chain tensioner used in the Model GS1100G is of self-adjusting type in that it adjusts itself to apply a constant tensioning force to the chain by compensating for the stretch of the chain.

PUSH ROD AND LOCK SCREW

During normal service the cam drive chain will stretch. A spring controlled push rod is used to constantly reposition the cam chain guide firmly against the chain to prevent slack from occurring. A lock screw and nut are utilized to eliminate the constant, high spring pressure exerted on the push rod. The lock screw is only used during either removal or installation of the adjuster push rod to ease the procedures.

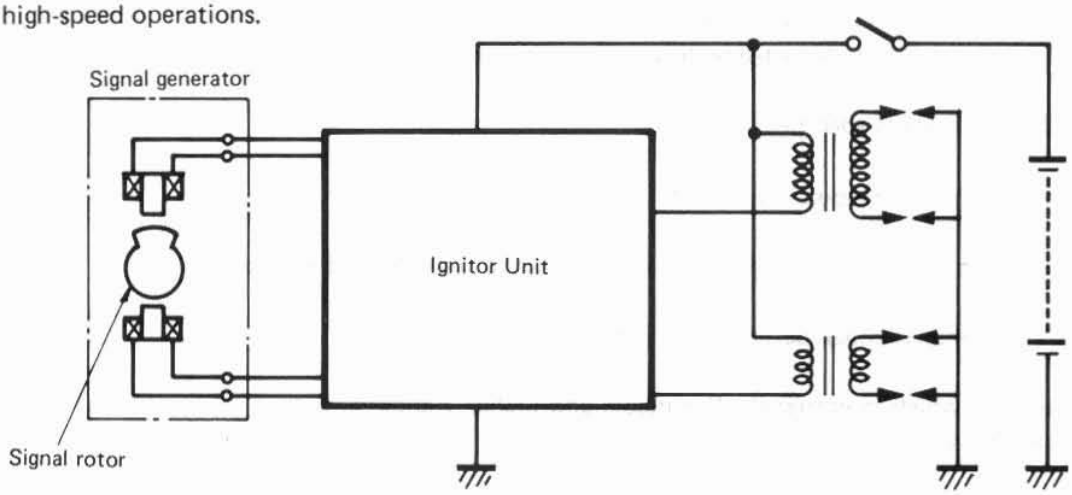


LOCK SHAFT

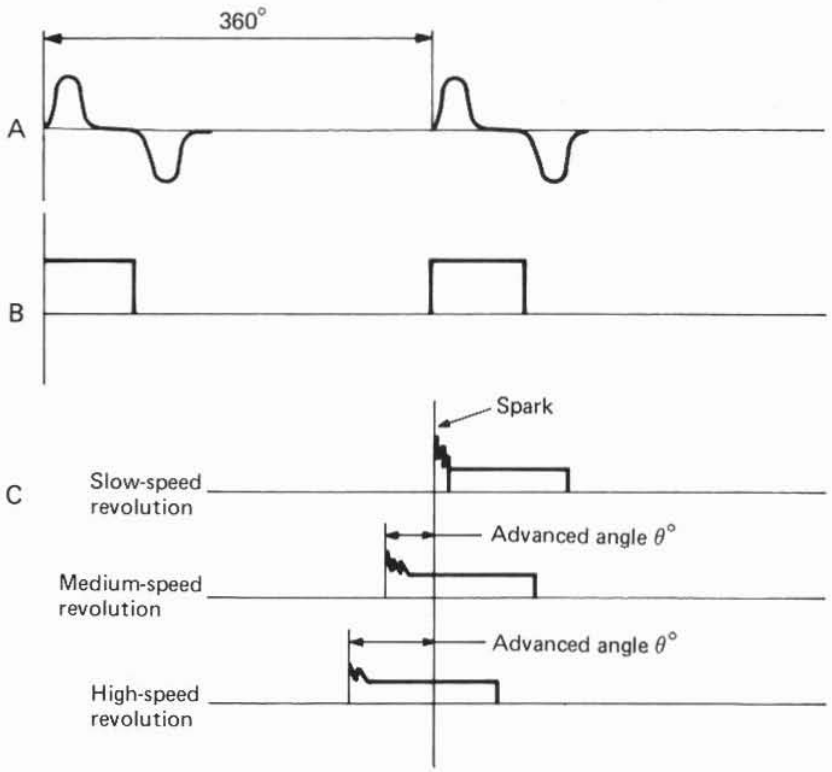
The cam drive chain tension tries to vary during engine operation. The spring controlled push rod is designed so as to only move in, towards the chain guide preventing slack from occurring if the spring pressure on the push rod were overcome. A steel ball is "jammed" against a angled surface preventing backwards movement of the push rod. The lock shaft is preloaded with a light spring ① which keeps the ball in contact with the push rod and angled surface ② .

TRANSISTORIZED IGNITION SYSTEM WITH ELECTRONIC ADVANCE

On the Model GS1100G, the timing advance characteristics of the ignition timing have been changed from the previously-employed mechanical timing advance system incorporating a centrifugal advance governor to an electronic timing advance system. The introduction of this new electronic timing advance system minimizes fluctuations in the ignition timing and also has improved the timing advance performance during high-speed operations.



When the signal rotor is rotated in the system block diagram above, the signal "A" is generated in the pick-up coil. The thus-generated signal will be converted to the signal waveform "B" at the inside of the ignitor unit. Based on this "B" waveform, control is made by means of the advancing control circuit and the closing angle control circuit. As a result, the timing advance takes place, as shown in Fig. "C".



PRECAUTIONS AND GENERAL INSTRUCTIONS

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

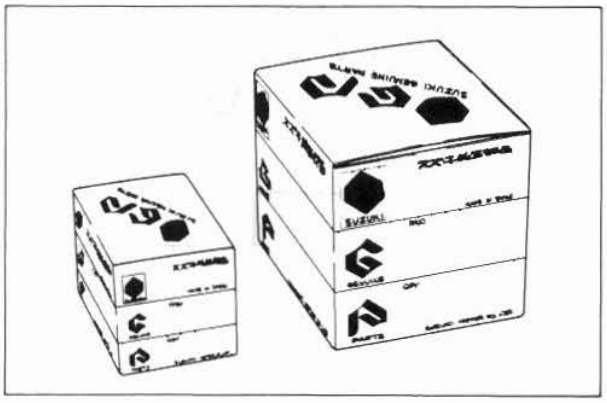
- Be sure to replace packings, gaskets, circlips, O rings and cotter pins with new ones.
- Tighten cylinder head and case bolts and nuts beginning with larger diameter and ending with smaller diameter, and from inside to out-side diagonally, to the specified tightening torque.
- Use special tools where 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.

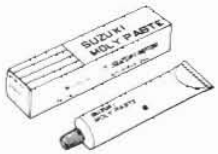
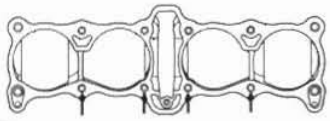
USE OF GENUINE SUZUKI PARTS

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.



SPECIAL MATERIALS

The materials listed below are needed for maintenance work on the GS1100G, 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 this manual.

MATERIAL	PART	PAGE	PART	PAGE
 SUZUKI SUPER GREASE "A" 99000-25030	• Oil seals • Throttle grip • Cables (speedometer and tachometer) • Front wheel bearings • Center stand spacer • Final gear spline and drive shaft coupling	 8- 4 8-28 8-39	• Swinging arm bearing and dust seal • Brake pedal shaft • Steering stem bearing	8-38 8-23
 SUZUKI SILICONE GREASE 99000-25100	• Caliper axle shaft	8- 9		
 SUZUKI MOLY PASTE 99000-25140	• Valve stem • Cam shaft journal • Chain tensioner adjuster shaft • Drive shaft • Countershaft washer • Outer countershaft • Input cam dog	3-29 3-66 3-34 3-48 3-45 3-45 3-46		
 SUZUKI BOND NO.1215 99104-31110	• Mating surface of upper and lower crankcase • Mating surface of swing arm and final gearcase	3-53 8-39	• Front fork damper rod bolt • Cylinder stud bolt (Apply a small quantity to the threads of cylinder stud bolts) 	8-17
 THREAD LOCK SUPER "1361A" 99104-32020	• Cam chain guide screw • Starter clutch allen bolt • Gearshift stopper • Thread portion of secondary driven gear • Thread portion of final drive gear	3-36 3-43 4-14 4-29		

MATERIAL	PART	PAGE	PART	PAGE
 THREAD LOCK SUPER "1363A" 99104-32030	• Cam sprocket bolt • Engine oil pump case securing screw • Universal joint bolt	3-32 3-43 3- 7		
 THREAD LOCK CEMENT 99000-32040	• Carburetor upper bracket plate set screw • Carburetor lower bracket plate screw • Carburetor starter shaft lock screw • Camshaft end cap screw • Front fork damper rod bolt	5-15 5-15 5-15 8-17	• Oil filter cap nut	2-16
 THREAD LOCK "1363C" 99104-32050	• Generator stator securing screw • Generator stator lead wire screw • Gearshift cam stopper bolt • Starter motor securing bolt • Drive shaft plate screw • Countershaft bearing retainer screw • Engine oil pump set screw	3-42 3-42 3-56 3-57 3-57 3-58	• Gearshift cam pawl screw • Gearshift cam guide screw • Carburetor throttle stop plate screw • Starter motor securing screw • Secondary drive and driven gear housing bolts	3-52 3-52 5-14 7- 8 3-54
 THREAD LOCK SUPER "1332B" 99104-32090	• Generator rotor nut	3-55		

SPECICATIONS

DIMENSIONS AND DRY MASS

Overall length	2 210 mm (87.0 in)
Overall width	830 mm (32.7 in)
Overall height	1 150 mm (45.3 in)
Wheelbase	1 500 mm (59.1 in)
Ground clearance	165 mm (6.5 in)
Dry mass	247 kg (545 lbs)

ENGINE

Type	Four-stroke, air-cooled, DOHC
Number of cylinders	4
Bore	72.0 mm (2.835 in) 76mm
Stroke	66.0 mm (2.598 in)
Piston displacement	1 074 cm^3 (65.5 cu.in) 1198 cm^3
Compression ratio	8.8 : 1 10.5:1
Carburetor	MIKUNI BS34SS, four
Air cleaner	Polyurethane foam 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		1.775 (87/49)
Gear ratios,	Low	2.500 (35/14)
	2nd	1.777 (32/18)
	3rd	1.380 (29/21)
	4th	1.125 (27/24)
	Top	0.961 (25/26)

SECONDARY DRIVE

Type	Shaft drive
Secondary reduction	0.941 (16/17)
Final reduction	3.090 (34/11)

CHASSIS

Front suspension	Telescopic, pneumatic/coil spring, oil dampened
Rear suspension	Swinging arm, oil dampened, damper 4-way/spring 5-way adjustable
Steering angle	40° (right and left)
Caster	62° 10′
Trail	116 mm (4.57 in)
Turning radius	2.5 m (8.2 ft)
Front brake	Disc brake, twin
Rear brake	Disc brake
Front tire size	3.50H19 4PR
Rear tire size	4.50H17 4PR
Front tire pressure	1.75 kg/cm² (24 psi) (Normal solo riding)
Rear tire pressure	2.00 kg/cm² (28 psi) (Normal solo riding)

ELECTRICAL

Ignition type	Transistorized
Ignition timing	17° B.T.D.C. below 1 500 r/min and 37° B.T.D.C. above 2 350 r/min
Spark plug	NGK B8ES or NIPPON DENSO W24ES-U
Spark plug gap	0.6 – 0.8 mm (0.02 – 0.03 in) both NGK and NIPPON DENSO
Battery	12V 50.4 kC (14 Ah)/10 HR
Generator	Three-phase A.C. generator
Fuse	10/10/10/10/15A

CAPACITIES

Fuel tank including reserve	22 L (5.8 US gal)
reserve	4.2 L (4.4 US qt)
Engine	
oil change	3.0 L (3.17 US qt)
filter change	3.3 L (3.49 US qt)
overhaul	3.7 L (3.91 US qt)
Secondary bevel gear oil	340 – 400 ml (11.5 – 13.5 US oz)
Final bevel gear oil	280 – 330 ml (9.5 – 11.2 US oz)
Front fork air pressure	60 kPa (0.6 kg/cm², 8.5 psi)
Front fork oil (each leg)	255 ml (8.62 US oz)

Specifications subject to change without notice.

PERIODIC MAINTENANCE AND TUNE-UP PROCEDURES

2

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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:
Vehicles operated under severe conditions may require more frequent servicing.

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 kilometers, miles and time for your convenience.

Interval: This interval should be judged by odometer reading or months, whichever comes first.						
	miles	600	4,000	7,500	11,000	15,000
	km	1,000	6,000	12,000	18,000	24,000
	months	2	12	24	36	48
Battery (Specific gravity of electrolyte)		–	I	I	I	I
Cylinder head nuts & exhaust pipe bolts		T	T	T	T	T
Air cleaner element		–	C	C	C	C
Tappet clearances		I	I	I	I	I
Spark plugs		–	C	R	C	R
Fuel line		I	I	I	I	I
		Replace every four years				
Engine oil and oil filter		R	R	R	R	R
Carburetor idle rpm		I	I	I	I	I
Clutch		I	I	I	I	I
Secondary and Final Gear oil		Change oil at initial 600 miles (1,000 km) and thereafter every 7,500 miles (12,000 km)				
Brake hoses		I	I	I	I	I
		Replace every four years				
Brake fluid		Change every two years				
Brakes		I	I	I	I	I
Tires		I	I	I	I	I
Steering stem		I	I	I	I	I
Chassis bolts and nuts		T	T	T	T	T
Front fork		–	–	I	–	I
		Check air pressure every 6 months.				

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

MAINTENANCE AND TUNE-UP PROCEDURES

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

AIR CLEANER

Clean Every 6 000 km (4 000 miles)

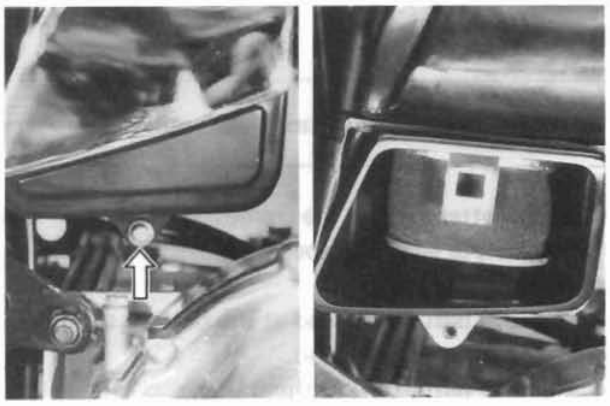
If the air cleaner is clogged with dust, intake resistance will be increased with a resultant decrease in output and an increase in fuel consumption. Check and clean the element in the following manner.

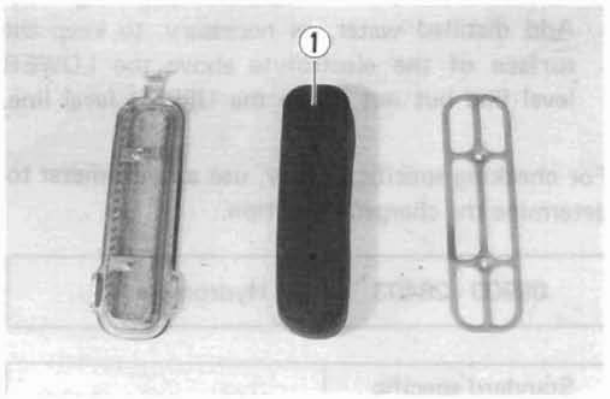
- Take out air cleaner element ① from the air cleaner case by removing right frame cover and air cleaner case cover.
- Fill a washing pan of a proper size with non-flammable cleaning solvent. Immerse the element in the cleaning solvent and wash it clean.
- Squeeze the cleaning solvent out of the washed element by pressing it between the palms of both hands: do not twist or wring the element or it will develop tears.
- Immerse the element in motor oil, and squeeze the oil out of the element leaving it slightly wet with oil.
- Fit the cleaner element to frame properly.

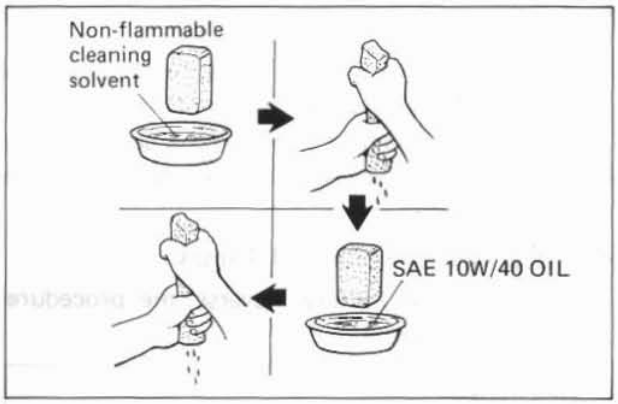
CAUTION:

*** Before and during the cleaning operation, inspect the element for tears. A torn element must be replaced.**

*** Be sure to position the element snugly and correctly, so that no incoming air will bypass it. Remember, rapid wear of piston rings and cylinder bore is often caused by a defective or poorly fitted element.**



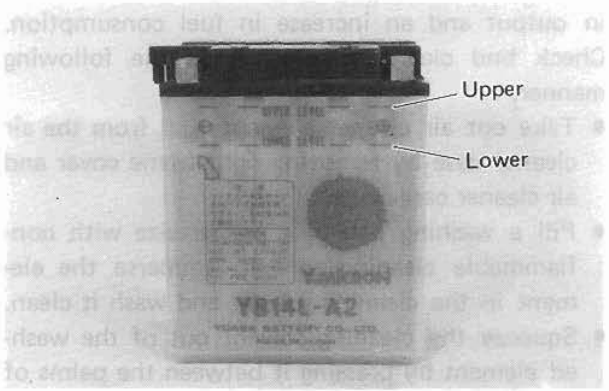




BATTERY

Inspect Every 6 000 km (4 000 miles)

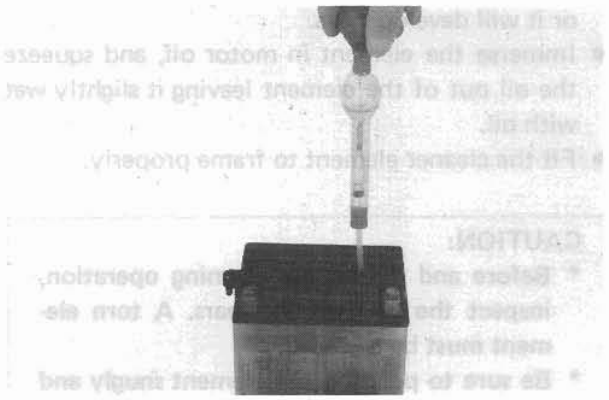
- The battery must be removed to check the electrolyte level and specific gravity.
- Remove the seat.
- Remove battery ⊖ lead at the battery terminal.
- Remove battery ⊕ lead.
- Remove battery from the frame.
- Check electrolyte for level and specific gravity. Add distilled water, as necessary, to keep the surface of the electrolyte above the LOWER level line but not above the UPPER 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)

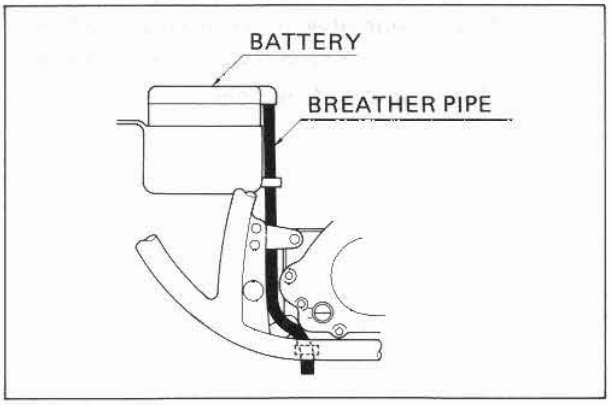


An S.G. reading of 1.22 (at 20°C) or under means that the battery needs recharging off the machine: take it off and charge it from a recharger. Charging the battery in place can lead to failure of the regulator/rectifier.

- 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 pipe is tightly secured and undamaged, and is routed as shown in the figure.



CYLINDER HEAD NUTS AND EXHAUST PIPE BOLTS

Tighten Initial 1 000 km (600 miles) and Every 6 000 km (4 000 miles)

CYLINDER HEAD

- Remove the fuel tank.
- First loosen and retighten the twelve 10 mm nuts (14 mm wrench) to the specified torque with a torque wrench sequentially in ascending numerical order with the engine cold.

Cylinder head nut	3.5 – 4.0 kg-m (25.5 – 29.0 lb-ft)

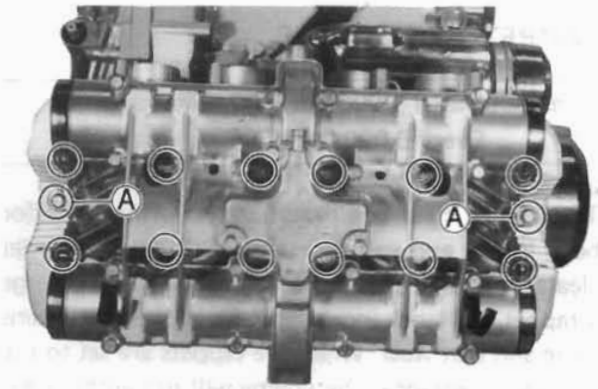
- After firmly tightening the 12 nuts, tighten three 6 mm bolts (indicated as Ⓐ) to the torque value below:

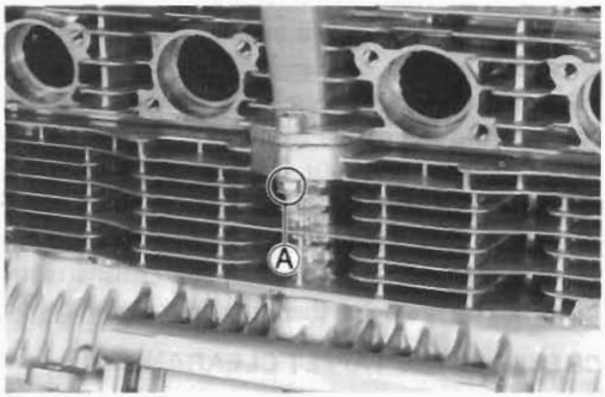
Cylinder head bolt Ⓐ	0.9 – 1.1 kg-m (6.5 – 8.0 lb-ft)

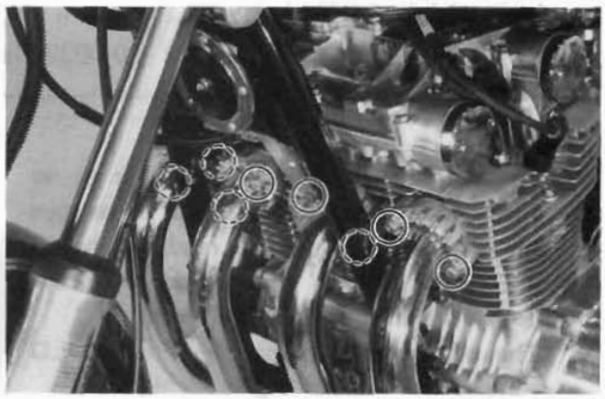
EXHAUST PIPE

- Tighten the exhaust pipe bolts and coupler tube bolts to the specified torque with a torque wrench.

Exhaust pipe clamp bolt	1.0 – 1.6 kg-m (7.0 – 11.5 lb-ft)
Exhaust pipe connector bolt	0.9 – 1.4 kg-m (6.5 – 10.0 lb-ft)







TAPPET CLEARANCE

Inspect Initial 1 000 km (600 miles) and Every 6 000 km (4 000 miles)

The tappet clearance specification is the same for both intake and exhaust valves. Too small a tappet clearance may reduce the engine power; too large a tappet clearance increases valve noise and hastens valve and seat wear. When the tappets are set to the specified clearance, the engine will run without excessive noise from the valve mechanism and will deliver full power. In this engine, the tappet clearance is increased or decreased by replacing the shim disc, made of a special wear-resistant material, fitted to the top of the tappet. The shim discs are easy to remove and refit. Tappet 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.

CHECKING THE TAPPET CLEARANCE

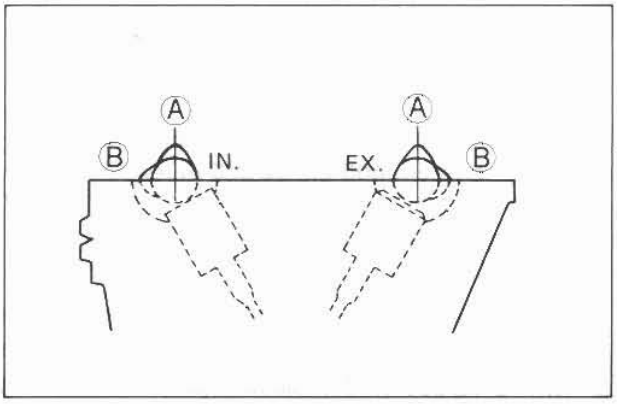
Tappet clearance specification (for both intake and exhaust valves)	0.03 – 0.08 mm (0.0012 – 0.0032 in)

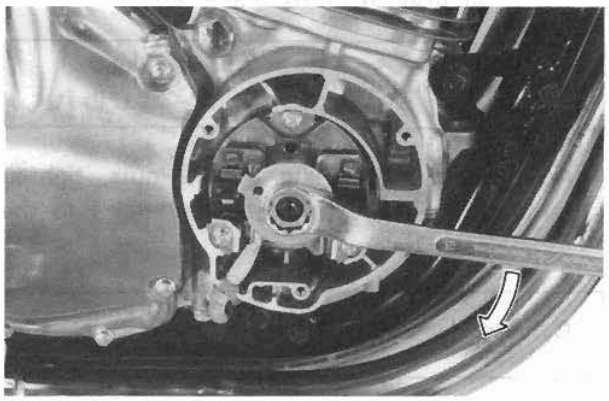
NOTE:

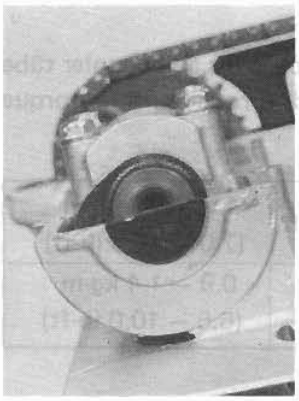
- *** The cam must be at position Ⓐ or Ⓑ to check the tappet clearance or to remove the shim disc. Clearance readings should not be taken with the cam in any other position than these two positions.**
- *** The clearance specification is for COLD state. Check it when engine is cold.**
- *** To turn the 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.**

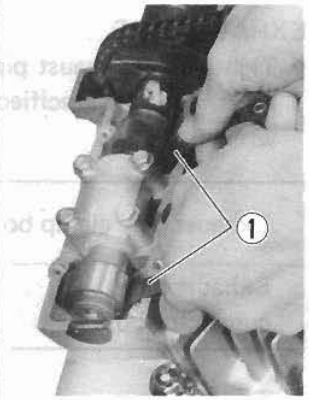
1. Turn crankshaft to bring the exhaust cam of No. 1 cylinder to this position. In this condition, read the clearance at the exhaust tappets of Nos. 1 and 2 cylinders. Use special tool ① on all tappets.

09900 - 20803	Thickness gauge

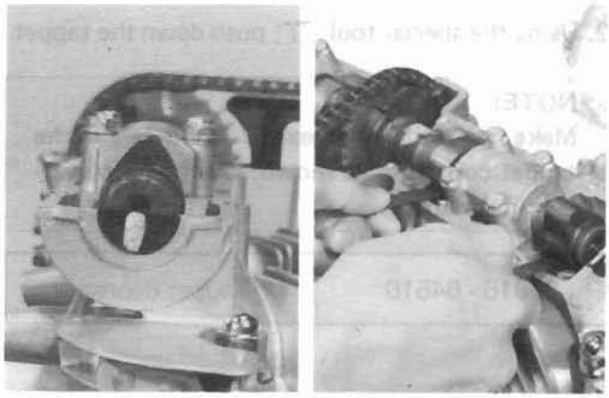




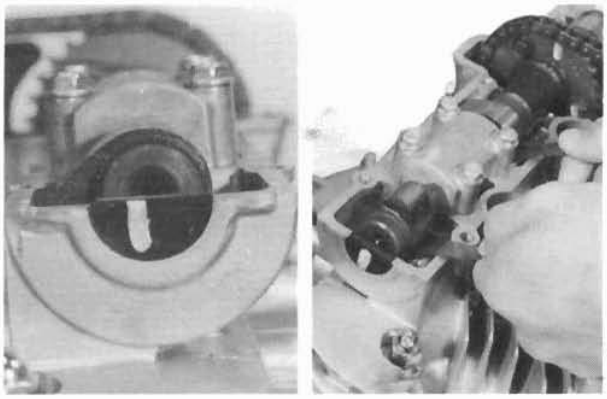




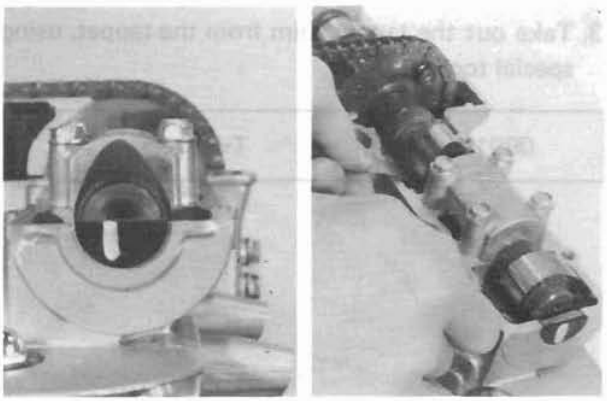
2. After setting the clearance to the specification at the exhaust tappets of Nos. 1 and 2 cylinders, turn the crankshaft 180° (half rotation) to bring the intake cam of No. 1 cylinder to the position indicated. Read the clearance at the intake tappets of Nos. 1 and 2 cylinders and, if necessary, adjust the clearance to each specification.



3. Turn the crankshaft a further 180°, bringing the exhaust cam of No. 4 cylinder to the position indicated. Under this condition, repeat the checking and adjusting process outlined in step "1" at the exhaust tappets of Nos. 3 and 4 cylinders.



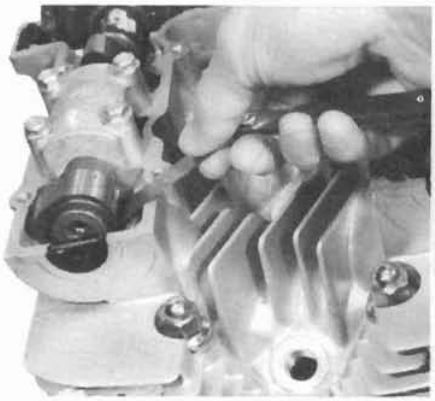
4. Again turn the crankshaft a further 180°, bringing the intake cam of No. 4 cylinder to the position indicated. Similarly check and adjust the clearance at the intake tappets of Nos. 3 and 4 cylinders.

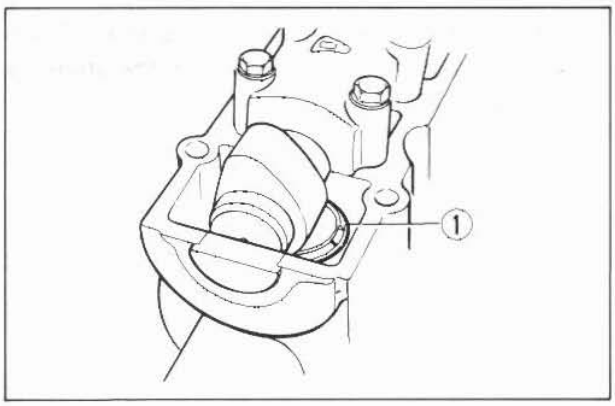


TAPPET CLEARANCE ADJUSTMENT

The clearance is adjusted by replacing the existing tappet shim by a thicker or thinner disc.

1. Place a fingertip on the tappet, and turn it in place to bring notch ① to the position indicated.

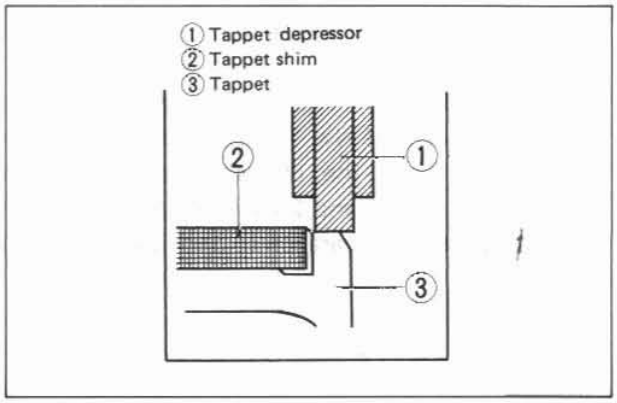




2. Using the special tool ① , push down the tappet.

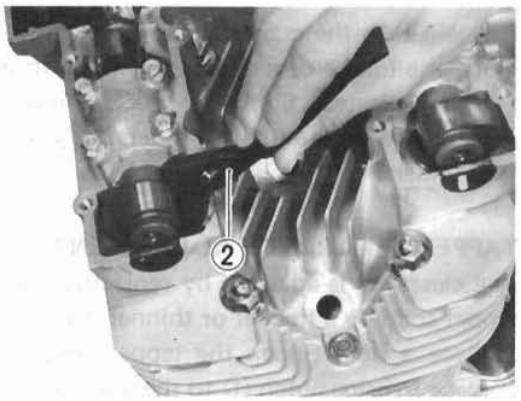
NOTE:
Make sure the tool exerts pressure on the tappet correctly, as shown, with the tip overlapping securely.

09916 - 64510	Tappet depressor

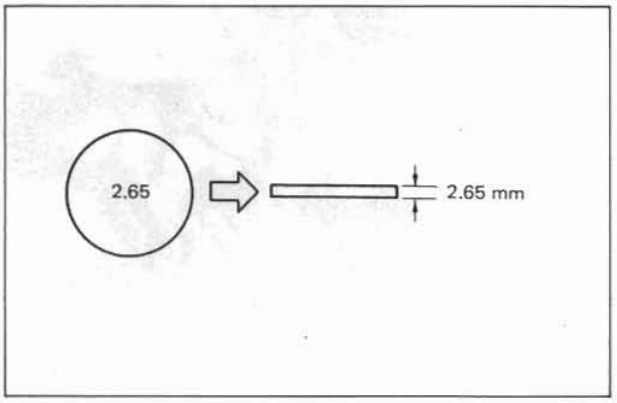


3. Take out the tappet shim from the tappet, using special tool ② .

09916 - 84510	Tweezers



4. Check the figures printed on the shim. These figures indicate the thickness of the shim, as illustrated.



5. Select a replacement shim that will provide a clearance within the specified range (0.03 – 0.08 mm). For the purpose of this adjustment, a total of 20 sizes of tappet shim are available ranging from 2.15 to 3.10 mm in steps of 0.05 mm. Fit the selected shim to the tappet, with numbers toward tappet. Be sure to check shim size with micrometer to insure its size.

> NOTE:
> **Before fitting the tappet shim to the tappet, be sure to apply engine oil to its top and bottom faces.**

6. After replacing the tappet shim, rotate the engine so that the tappet is depressed fully. This will squeeze out oil trapped between the shim and the tappet that could cause an incorrect measurement, then check the clearance again to confirm that it is within the specified range.

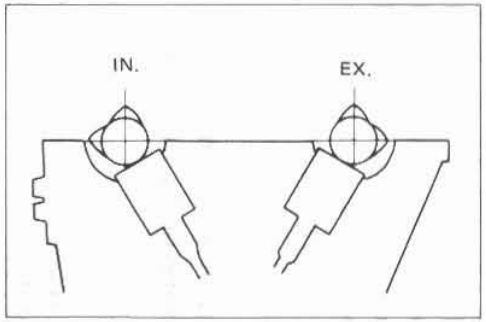
Tappet shim size chart

No.	Thickness (mm)	Part No.
1	2.15	12892-45000
2	2.20	12892-45001
3	2.25	12892-45002
4	2.30	12892-45003
5	2.35	12892-45004
6	2.40	12892-45005
7	2.45	12892-45006
8	2.50	12892-45007
9	2.55	12892-45008
10	2.60	12892-45009
11	2.65	12892-45010
12	2.70	12892-45011
13	2.75	12892-45012
14	2.80	12892-45013
15	2.85	12892-45014
16	2.90	12892-45015
17	2.95	12892-45016
18	3.00	12892-45017
19	3.05	12892-45018
20	3.10	12892-45019

SHIM SELECTION CHART

PART NUMBER – PREFIX 12892

P/NO. SUFFIX	45000	45001	45002	45003	45004	45005	45006	45007	45008	45009	45010	45011	45012	45013	45014	45015	45016	45017	45018	45019
Tappet Clearance (mm)	PRESENT SHIM SIZE – mm																			
	2.15	2.20	2.25	2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10
0.00 – 0.02		2.15	2.20	2.25	2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05
0.03 – 0.08	SPECIFIED CLEARANCE/NO. ADJUSTMENT REQUIRED																			
0.09 – 0.13	2.20	2.25	2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	
0.14 – 0.18	2.25	2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10		
0.19 – 0.23	2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10			
0.24 – 0.28	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10				
0.29 – 0.33	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10					
0.34 – 0.38	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10						
0.39 – 0.43	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10							
0.44 – 0.48	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10								
0.49 – 0.53	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10									
0.54 – 0.58	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10										
0.59 – 0.63	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10											
0.64 – 0.68	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10												
0.69 – 0.73	2.80	2.85	2.90	2.95	3.00	3.05	3.10													
0.74 – 0.78	2.85	2.90	2.95	3.00	3.05	3.10														
0.79 – 0.83	2.90	2.95	3.00	3.05	3.10															
0.84 – 0.88	2.95	3.00	3.05	3.10																
0.89 – 0.93	3.00	3.05	3.10																	
0.94 – 0.98	3.05	3.10																		
0.99 – 1.03	3.10																			



I. Measure tappet clearance. **"ENGINE IS COLD"**

II. Measure present shim size.

III. Match clearance in vertical column with present shim size in horizontal column.

EXAMPLE

Tappet clearance is – 0.55 mm
Present shim size – 2.40 mm
Shim size to be used – 2.90 mm

SPARK PLUG

Clean and adjust Every 6 000 km (4 000 miles)
Replace Every 12 000 km (7 500 miles)

The plug gap is adjusted to 0.6 – 0.8 mm. The gap is correctly adjusted using a thickness gauge (special tool). When carbon is deposited on the spark plug, remove the carbon with a spark plug cleaning machine or carefully using tool with a pointed end. If electrodes are extremely worn or burnt, replace the plug. Also replace the plug if it has a broken insulator, damaged thread, etc.

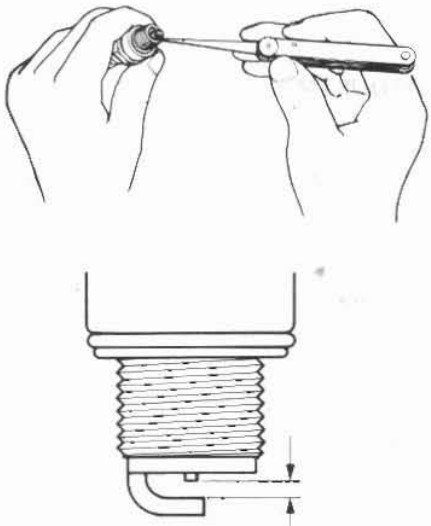
09930 - 14520	Socket wrench
09930 - 14530	Universal joint
09914 - 24510	T handle
09900 - 20804	Thickness gauge

NGK B8ES or NIPPON DENSO W24ES-U 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 to be replaced, it is recommended that the standard plugs listed in the table be selected. Remove the plugs and inspect the insulators. Proper heat range would be indicated if both insulators were light brown in color. If they are blackened by carbon, they should be repalced by a hot type NGK B7ES or NIPPON DENSO W22ES-U and if baked white, by NGK B9ES or NIPPON DENSO W27ES-U.

Plugs with high heat range number are used for high speed running. These plugs are designed to be sufficiently cooled to prevent overheating and are called cold type plugs.

NOTE:
To check the spark plugs, first make sure that the fuel tank contains unleaded gasoline, and after test ride if the plugs are either sooty with carbon or burnt white, replace them altogether.

NOTE:
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.



NGK	NIPPON DENSO	REMARKS
B7ES	W22ES-U	If the standard plug is apt to get wet, replace with this plug. Hot type.
B8ES	**W24ES-U**	**Standard**
B9ES	W27ES-U	If the standard plug is apt to overheat, replace with this plug. Cold type.

CABURETOR

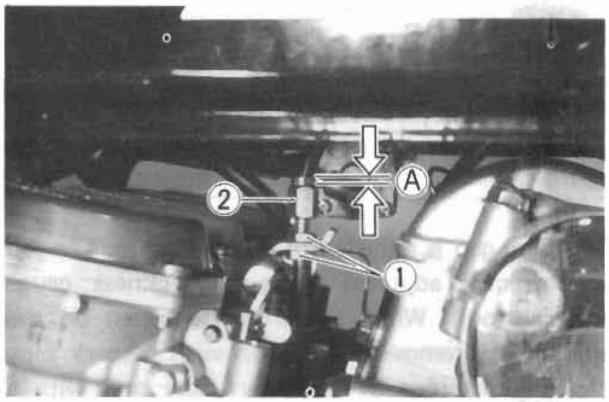
Inspect Initial 1 000 km (600 miles) and Every 6 000 km (4 000 miles)

THROTTLE CABLE PLAY

There should be 0.5 mm play Ⓐ on the throttle cable. To adjust the throttle cable play:

- Tug on the throttle cable to check the amount of play.
- Loosen the two lock nuts ① and turn the adjuster ② in or out until the specified play is obtained.
- Secure the lock nuts while holding the adjuster in place.

Throttle cable play Ⓐ	0.5 mm (0.02 in)

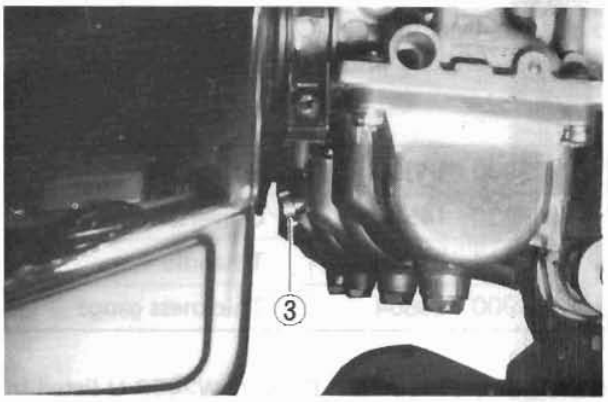


IDLING ADJUSTMENT

NOTE: **Make this adjustment when the engine is hot.**

- Start up the engine and set its speed at anywhere between 950 and 1 150 r/min by turning throttle stop screw ③.

Engine idle speed	1 050 ± 100 r/min

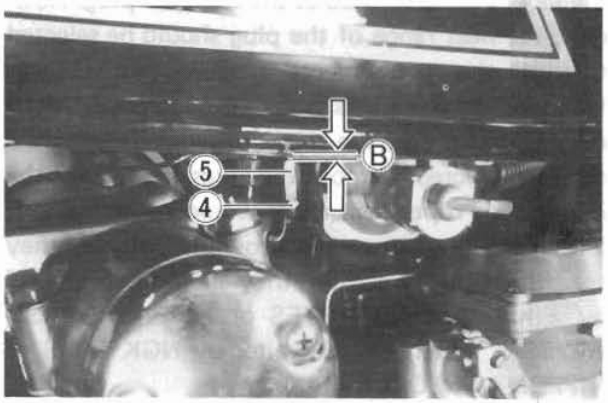


CHOKE CABLE PLAY

- Tug on the choke cable to check the amount of play Ⓑ.
- Loosen the lock nut ④ and turn the adjuster ⑤ in or out.

Choke cable play	0.5 mm (0.02 in)

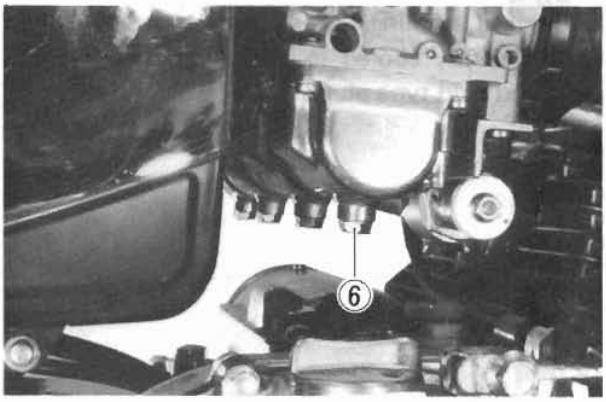
- Secure the lock nut while holding the adjuster.



FUEL LEVEL INSPECTION

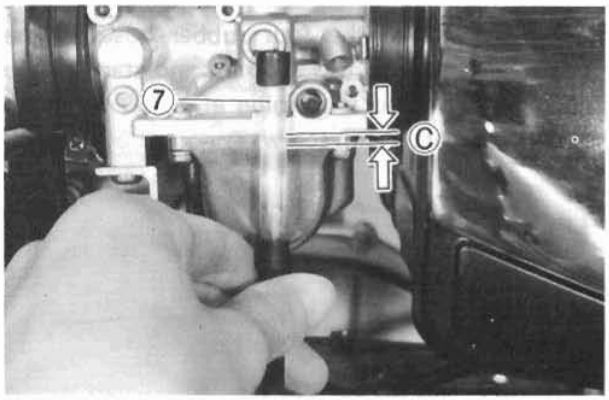
- Place machine on center stand.
- Remove carburetor drain plug ⑥ and install the fuel level gauge ⑦.

09913 - 14511	Fuel gauge set

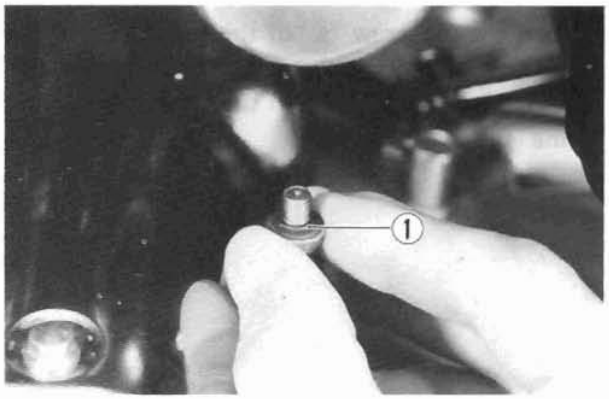


- Run the engine at the idling speed (950 – 1 150 r/min), and measure the distance with the middle line of the level gauge aligned with the lower surface of carburetor body as shown in photo. Ⓒ should be within the specified range.

Distance Ⓒ	5.0 ± 0.5 mm (0.20 ± 0.02 in)



- Repeat the procedure on each carburetor.



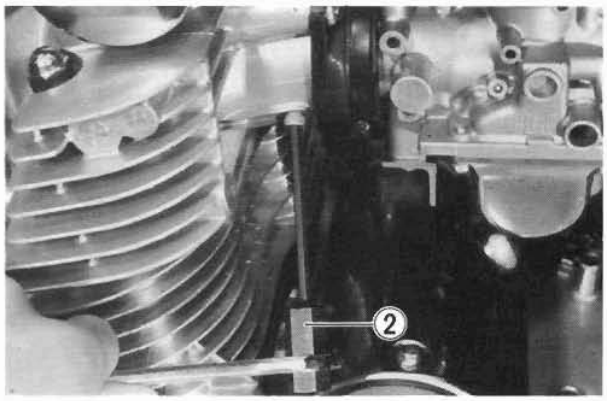
NOTE:
When refitting the screw, be sure to reinstall the "O" ring ① .

- If fuel level readjustment is necessary, see page 5-12 for adjusting float height.

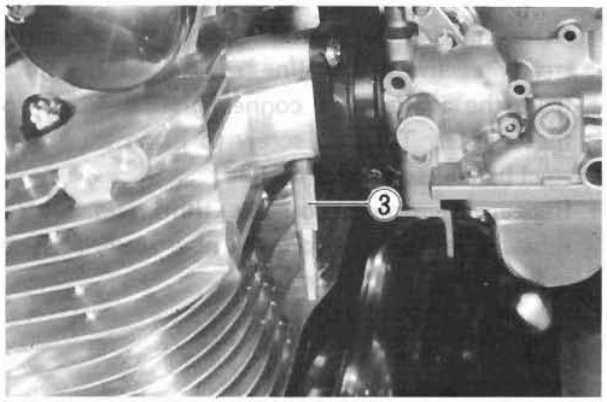
BALANCING CARBURETORS

Check the four carburetors for balance according to the following procedures.
As the first step, calibrate the carburetor balancer gauge as follows:

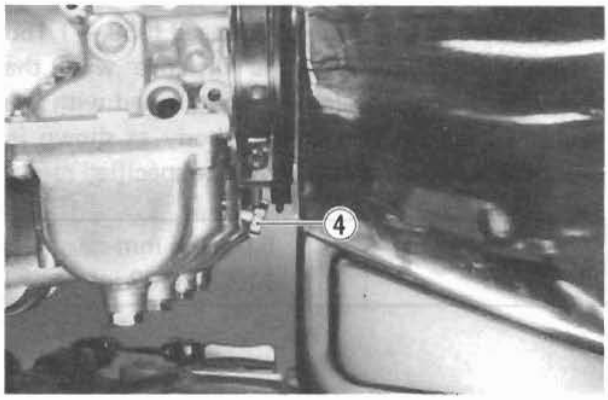
09913 - 13121	Carburetor balancer
09913 - 13140	Adapter
09911 - 70130	4 mm Hexagon wrench



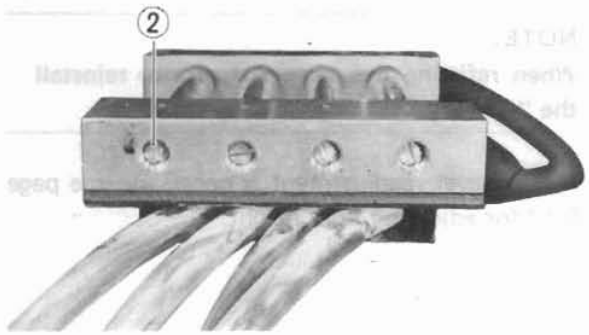
- Start up the engine and run it in idling condition for warming up.
- Stop the warmed-up engine. By using special tool ② , remove vacuum inlet screw for No. 1 or No. 4 cylinder and install adapter ③ with O ring.

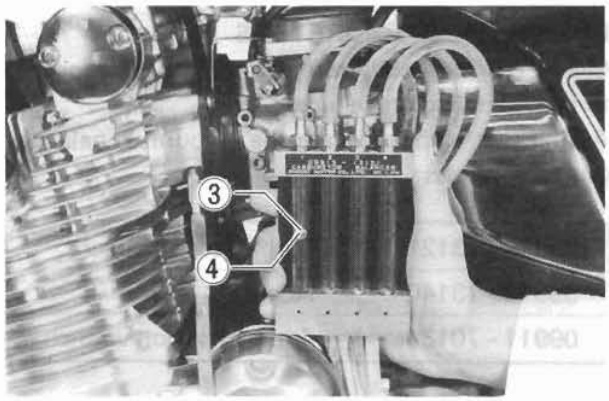


- Connect one of the four rubber hoses of the balancer gauge to this adapter, and start up the engine, and keep it running at 1 750 r/min by turning throttle stop screw ① .

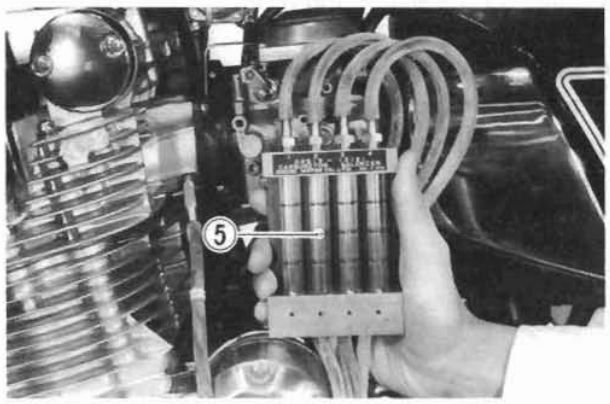


- Turn the air screw ② of the gauge so that the vacuum acting on the tube of that hose will bring the steel ball ③ in the tube to the center line ④ .



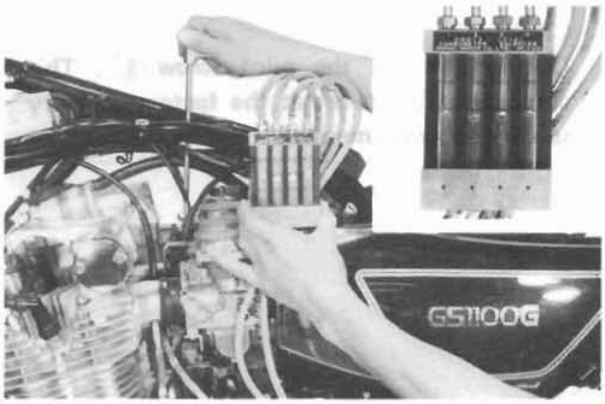


- After making sure that the steel ball stays steady at the center line, disconnect the hose from the adapter and connect the next hose to the adapter. Turn air screw to bring the other steel ball ⑤ to the center line.
- Repeat the process on the third and fourth tubes. The balancer gauge is now ready for use in balancing the carburetors.



Remove the respective vacuum inlet screws and insert the adapters in the holes. Connect the balancer gauge hoses to these adapters, and balance the four carburetors as follows:

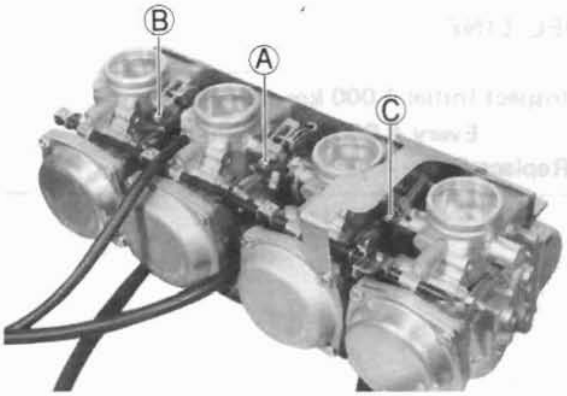
- Start up the engine, and keep it running at 1 750 r/min.
- A correctly adjusted carburetor has the steel balls in the Nos. 1 and 4 tubes at the same level, and those in the Nos. 2 and 3 tubes also at the same level, but lower by one half of the ball diameter than the Nos. 1 and 4 tubes as shown.
- If the steel balls are not in correct positions, adjust the throttle valve adjusting screw correctly by using throttle valve adjust wrench.



09913 - 14911	Throttle valve adjust wrench

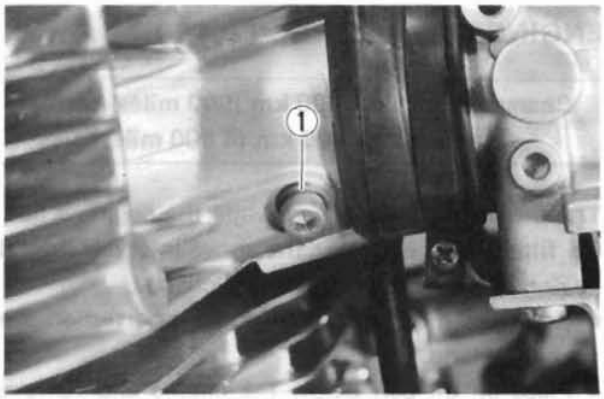
Adjusting order:

Ⓐ → (for No. 2 Carb) → Ⓑ (for No. 1) → Ⓒ (for No. 4)

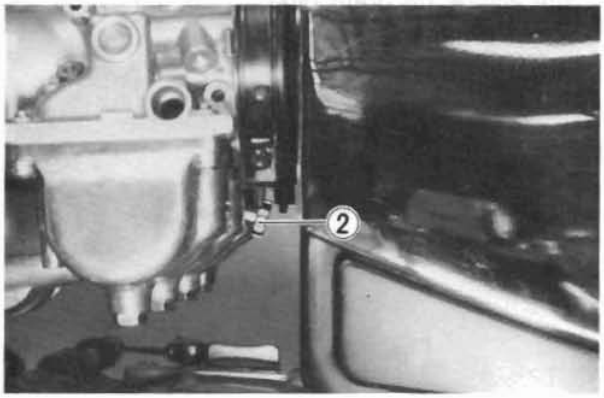


NOTE:

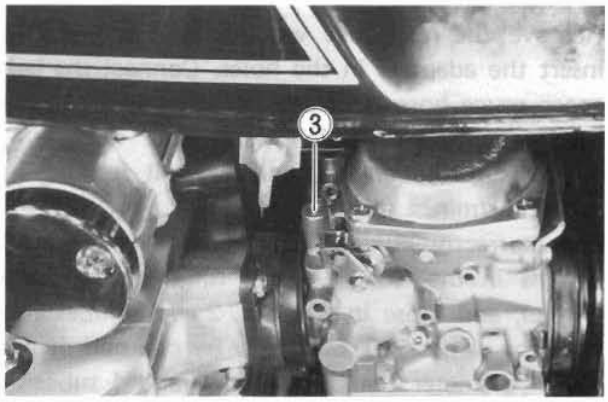
*** If an adjustment is required, it is suggested that the fuel tank is removed, and fuel should be supplied by a separate fuel tank.**
*** Be sure to plug the fuel cock vacuum line.**
*** Each vacuum inlet screw has a gasket. Be careful not to leave out this gasket ① .**



- After balancing carburetors, set its speed at anywhere between 950 and 1 150 r/min by turning throttle stop screw ② .

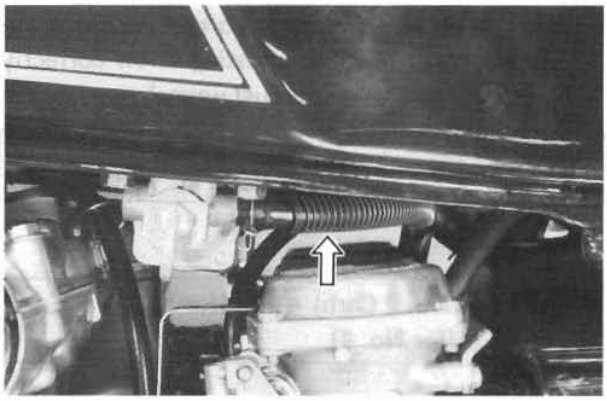


CAUTION:
Do not disturb the pilot screw ③ . This component is pre-set at the factory by very specialized equipment.



FUEL LINE

Inspect Initial 1 000 km (600 miles) and
Every 6 000 km (4 000 miles)
Replace Every 4 years

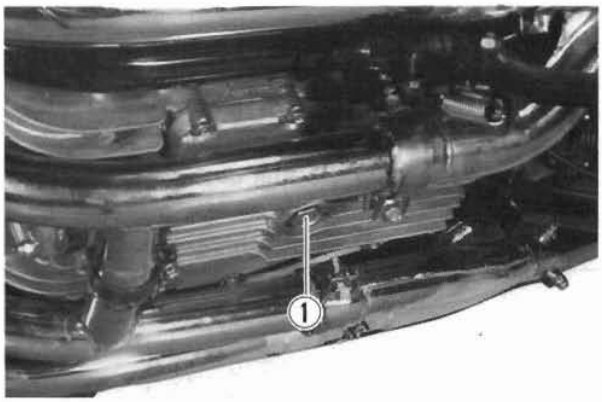


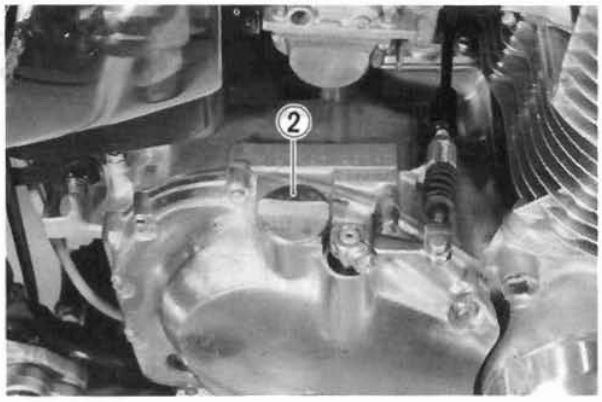
ENGINE OIL AND OIL FILTER

Change oil Initial 1 000 km (600 miles) and
Every 6 000 km (4 000 miles)

The 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, supported on the center stand.
- Place an oil pan below the engine and remove the engine oil drain plug ① and oil filter cap ② to drain off engine oil.





- Remove three nuts ③ and remove the filter cover.
- Pull out old filter ④ , and replace with new one.
- Replace O-ring and filter cover, and secure nuts ③ with applying thread lock cement.

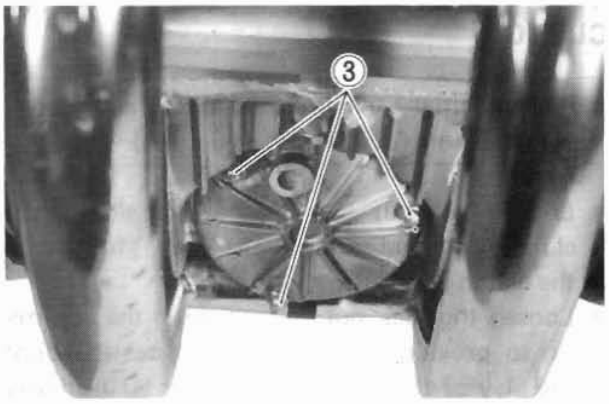
99000 - 32040	Thread lock cement

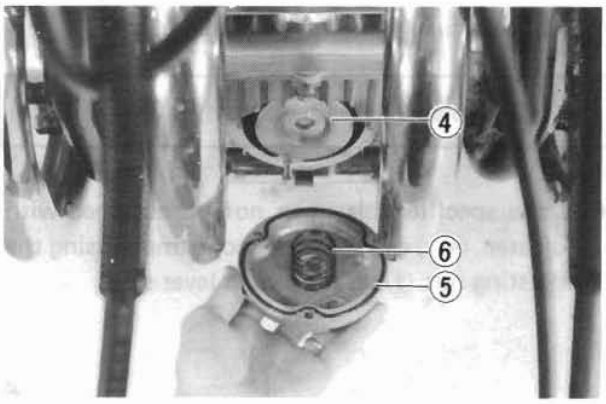
- Fit drain plug ① securely, and add fresh oil through the filler. The engine will hold about 3.3 L (3.49 US qt) of oil.
  Use API classification of SE or SF oil with SAE 10W/40 viscosity.
- Start up the engine and allow it to run for several seconds at idling speed.
- Turn off the engine and wait about one minute, then check the oil level through the inspection window ⑦ . If the level is below mark "F", supply oil to that level.

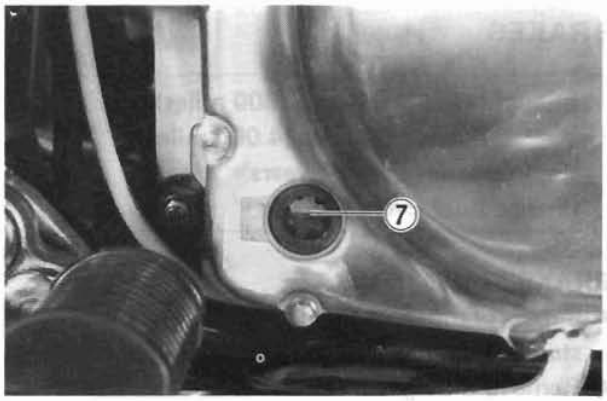
NECESSARY AMOUNT OF ENGINE OIL

Oil change	3.0 L (3.17 US qt)
Filter change	3.3 L (3.49 US qt)
Overhaul engine	3.7 L (3.91 US qt)

NOTE:
Be sure to take care of O-ring ⑤ to prevent any damage and be sure that filter spring ⑥ is properly in place.







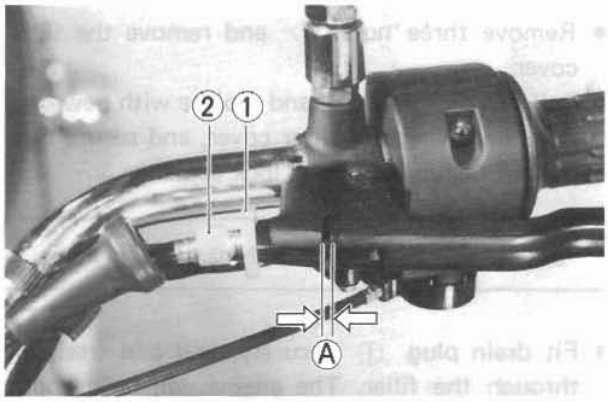
CLUTCH

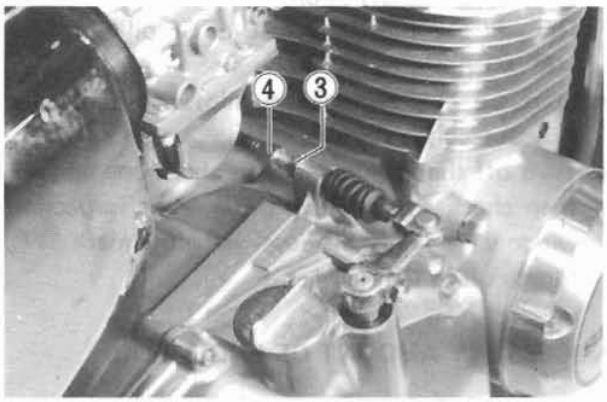
Inspect Initial 1 000 km (600 miles) and Every 6 000 km (4 000 miles)

- Loosen lock nut ① on the lever side of the clutch cable and screw adjust nut ② fully in on the clutch lever side.
- Loosen the lock nut ③ , tighten the adjuster ④ to provide play in the outer cable. Adjust the play of the cable with adjuster ④ until play Ⓐ of the clutch lever is 2 – 3 mm (0.08 – 0.12 in). Next firmly secure lock nut ③ .

Cable play Ⓐ	2 – 3 mm (0.08 – 0.12 in)

- If the specified play can not be obtained with adjuster ④ , carry out the adjustment using the adjusting nut ② on the clutch lever side.





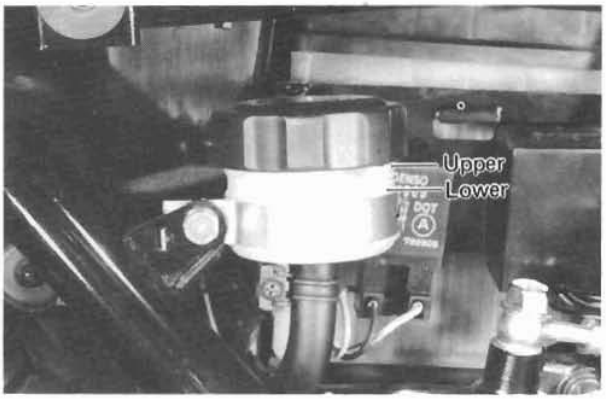
BRAKES

Insepct Initial 1 000 km (600 miles) and Every 6 000 km (4 000 miles)
Replace hoses Every 4 years
Change fluid Every 2 years

BRAKE FLUID LEVEL

- Support the motorcycle body on the center stand, and place the handlebars straight.
- Remove the right frame cover.
- Check the brake fluid level by observing the upper and lower limit lines on the brake fluid reservoirs, both front and rear.
- When the level is below the lower limit line, replenish with brake fluid that meets the following specification.

Specification and Classification	DOT3, DOT4

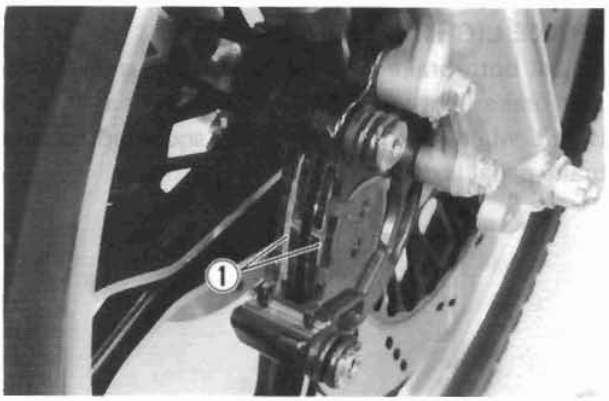


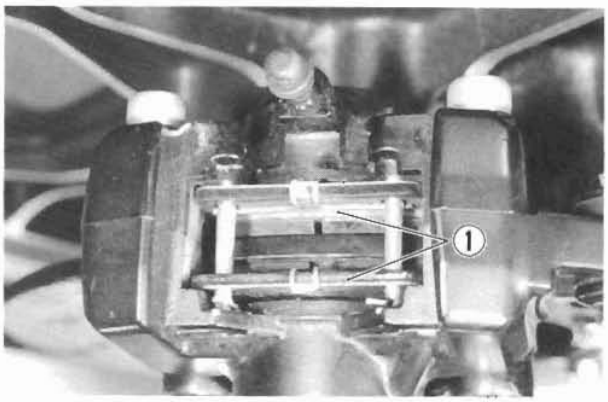
WARNING:
The brake system of this motorcycle is filled with a glycol-based brake fluid. Do not use or mix different types of fluid such as silicone-based and petroleum-based fluid for refilling the system, otherwise serious damage will be caused. Do not use any brake fluid taken from old or used or unsealed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

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

BRAKE PADS

Wearing condition of brake pads can be checked by observing the red limit line ① marked on the pad. When the wear exceeds the limit line, replace the pads with new ones. (see pages 8-5 and 8-29).

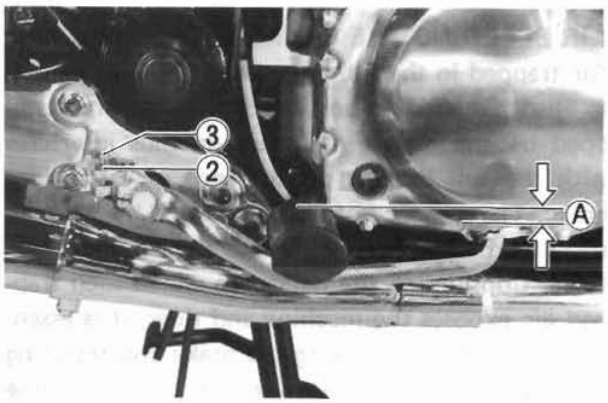


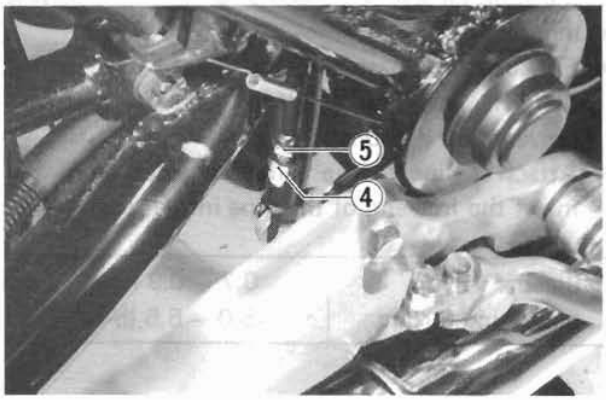


BRAKE PEDAL HEIGHT

- Loosen lock nut ② , and turn stopper bolt ③ away from the stopper.
- Loosen lock nut ④ , and rotate push rod ⑤ to locate brake pedal 20 mm (0.8 in) Ⓐ below the top face of the footrest.
- Turn the stopper bolt ③ in so that the clearance between the stopper bolt and stopper is zero.
- Retighten both lock nuts ② and ④ .

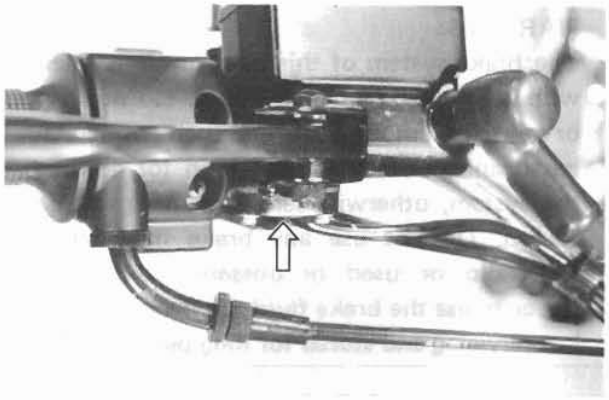
Brake pedal height Ⓐ	20 mm (0.8 in)





BRAKE LIGHT SWITCHES

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

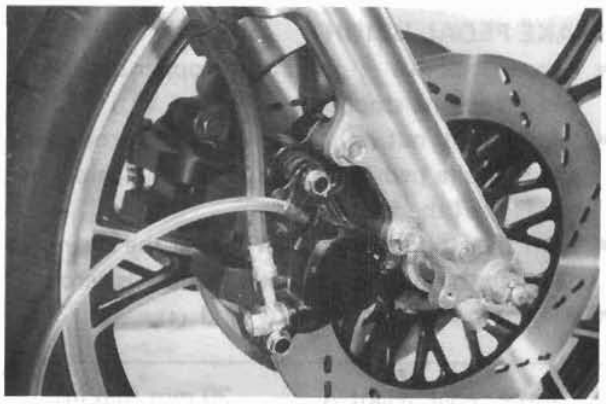


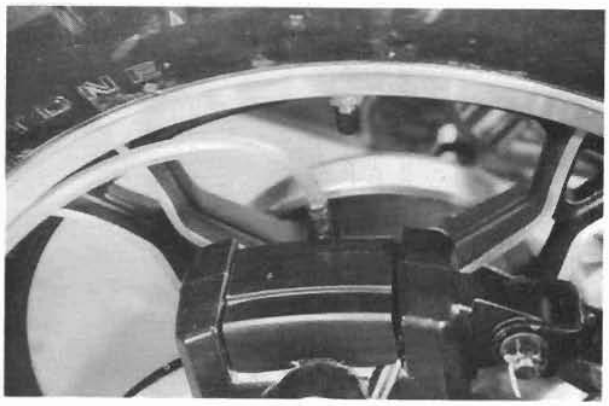
AIR BLEEDING THE BRAKE FLUID CIRCUIT

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 caliper brake. 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:

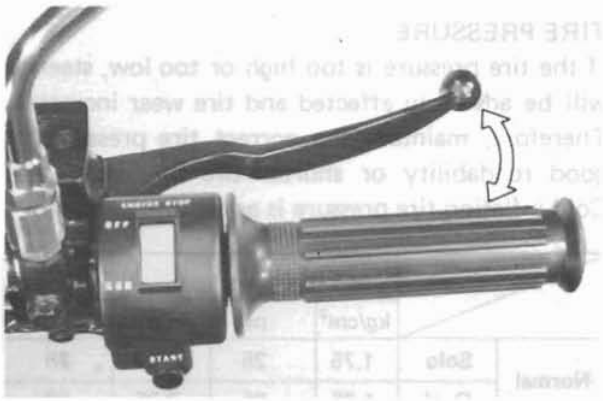
- Fill up the master cylinder reservoir to the "HIGH" level line. Replace the reservoir cap to prevent entry of dirt.
- Attach a pipe to the caliper bleeder valve, and insert the free end of the pipe into a receptacle.

Bleeder valve tightening torque	0.7 – 0.9 kg-m (5.0 – 6.5 lb-ft)





- Bleed the left caliper first, and then the right caliper.
- 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 remove 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 "HIGH" level line.

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

- Differences between front and rear are that the master cylinder is actuated by a pedal.

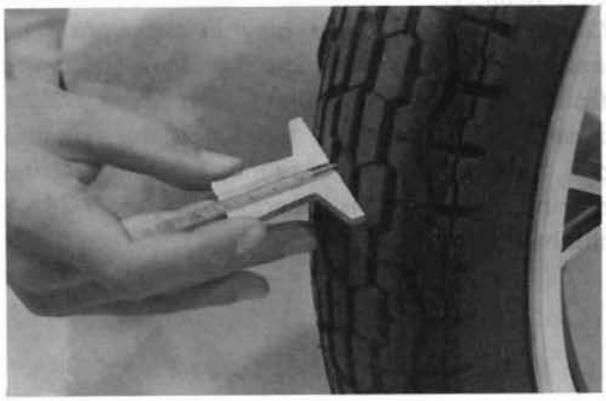
TIRES

Inspect Initial 1 000 km (600 miles)
Every 6 000 km (4 000 miles)

TIRE TREAD CONDITION

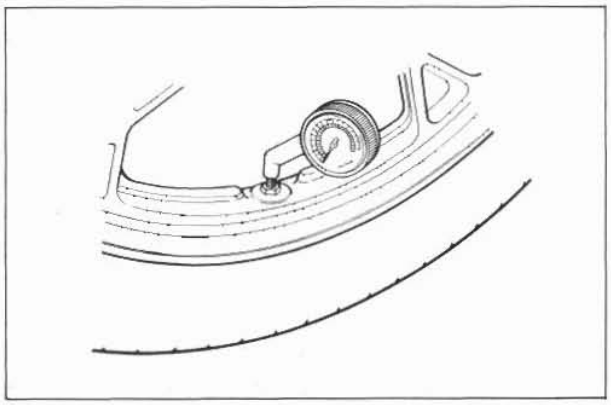
Operating the motorcycle with excessively worn tires will decrease riding stability and consequently invite a dangerous situation. It is highly recommended to replace the tire when the remaining depth of tire tread reaches the following specifications.

FRONT	REAR
1.6 mm (0.06 in)	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.

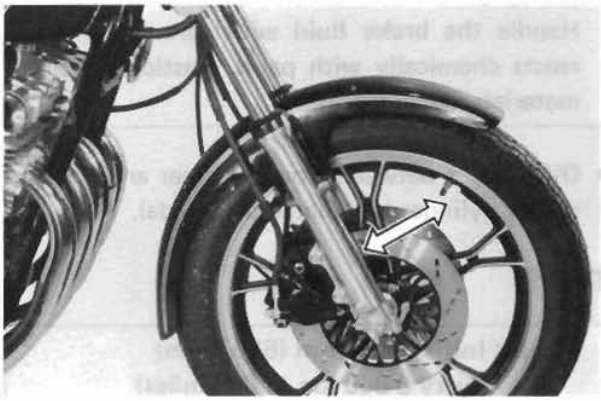


		FRONT		REAR	
		kg/cm²	psi	kg/cm²	psi
Normal	Solo	1.75	25	2.00	28
	Dual	1.75	25	2.25	32
High-speed	Solo	2.00	28	2.25	32
	Dual	2.00	28	2.80	40

CAUTION:
The standard tire fitted on this motorcycle is 3.50H19 4PR for front and 4.50H17 4PR for rear. The use of a tire other than the standard may cause instability. It is highly recommended to use a SUZUKI Genuine Tire.

STEERING

Inspect Initial 1 000 km (600 miles) and Every 6 000 km (4 000 miles)



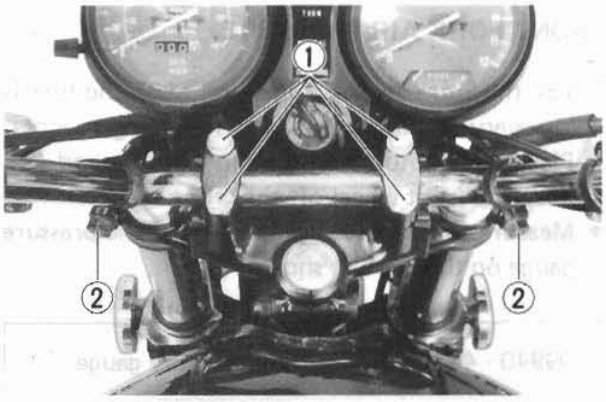
Taper roller type bearings are applied on the steering system for better handling.
Steering should be adjusted properly for smooth manipulation of handlebars and safe running. Too stiff steering prevents smooth manipulation of handlebars and too loose steering will cause poor stability.
Check that there is no play in the front fork assembly by supporting the machine so that the front wheel is off the ground, with wheel straight ahead, grasp lower fork tubes near the axle and pull forward. If play is found, perform steering bearing adjustment as described in page 7-24 of this manual.

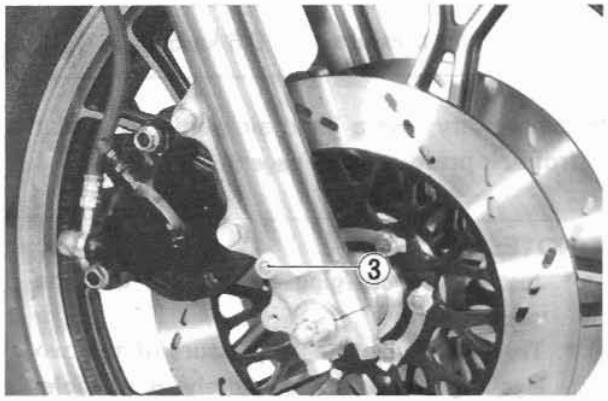
FRONT FORK

Inspect Every 12 000 km (7 500 miles)
Check air pressure Every 6 months

FRONT FORK OIL

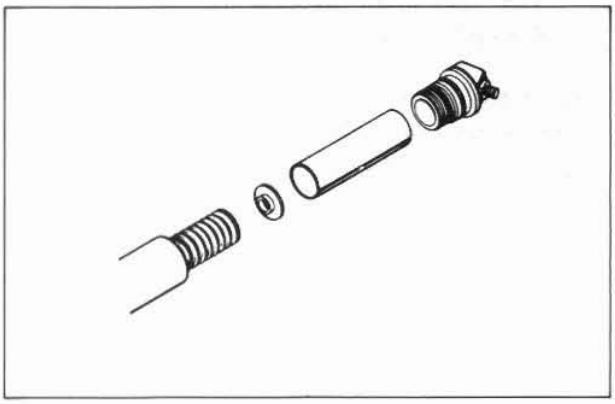
- Place a jack under the engine and lift the front wheel off the floor and remove the front wheel.
- Remove four handlebar clamp bolts ① and take down the handlebar from the upper bracket.
- Loosen two front fork upper bracket bolts ② and remove front fork top caps, both right and left.
- Unscrew front fork oil drain bolts ③ , right and left, and drain oil in the fork tube completely by moving the front fork outer tube up and down.
- Loosen the lower clamp bolts and remove the front fork assembly. (See page 8-13)
- Mount the drain screw and washer onto the outer tube and pour specified amount of oil into the top of the inner tube.

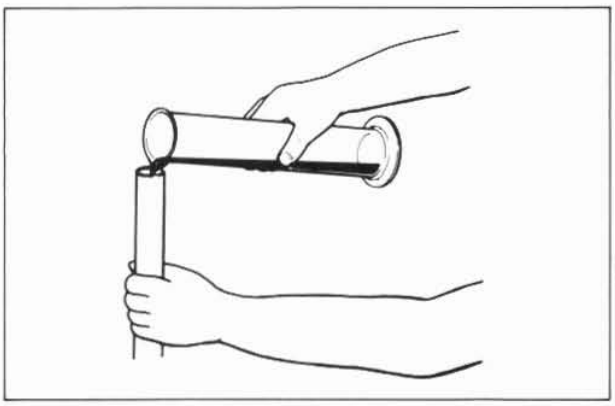




Specified amount (each leg)	255 ml (8.62 US oz)

Specification	Fork oil #15





TIGHTENING TORQUE

Item	kg-m	lb-ft
Handlebar clamp bolt	1.2 – 2.0	8.5 – 14.5
Upper clamp bolt	2.0 – 3.0	14.5 – 21.5
Fork top cap	1.5 – 3.0	11.0 – 21.5
Steering stem head bolt	2.0 – 3.0	14.5 – 21.5
Steering stem clamp bolt	1.5 – 2.5	11.0 – 18.0

FRONT FORK AIR PRESSURE

Check the front fork air pressure, when the fork is cold, every 6 months by the following manner.

- Place the motorcycle on the center stand and keep the front wheel off the ground.
- Measure the air pressure by placing the pressure gauge on the valve as shown.

09940 - 44120	Air pressure gauge

Specified air pressure	0.6 kg/cm² (8.5 psi)

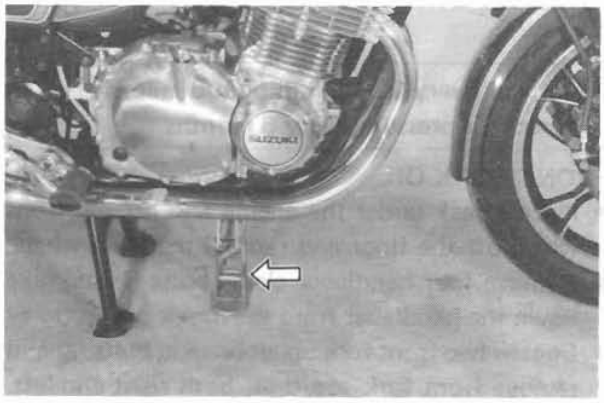
- If necessary, use a hand air pump to raise the front air pressure. (See page 8-19).

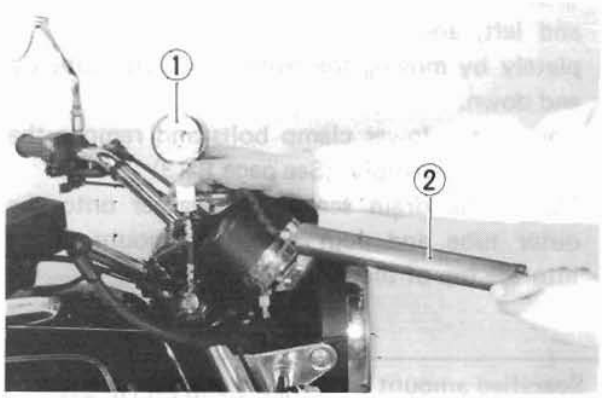
NOTE:

*** Just before charging air confirm that the valve is tight.**

*** Try to equalize the air pressure of the two legs, right and left, as closely as possible. The maximum permissible difference is 0.1 kg/cm² (1.4 psi).**

Inspect the front fork for oil leakage, scoring and scratches on the outer surface of the inner tube and replace the defective parts, if necessary.





① Air pressure gauge
② Hand air pump

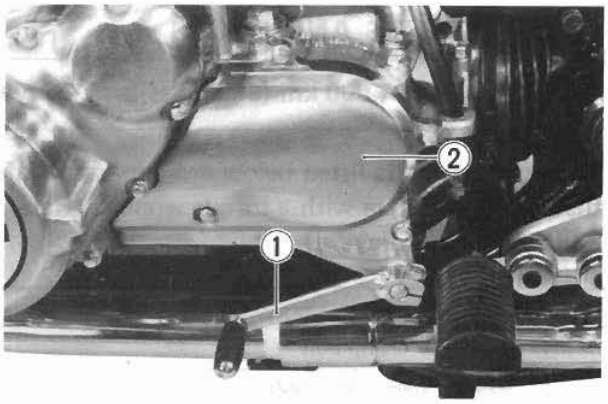
SECONDARY AND FINAL GEAR BOX OIL

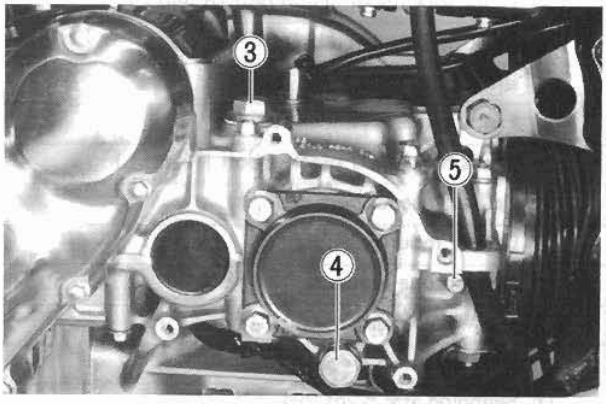
Change Initial 1 000 km (600 miles) and Every 12 000 km (7 500 miles)

Change the secondary and final gear box oil in the following way. Use SAE #90 hypoid gear oil which is rated GL-5 under API classification system.

SECONDARY GEAR OIL

- Keep the motorcycle erect, supporting it on the center stand.
- Remove gearshift lever ① and secondary cover ② .
- Drain oil by removing filler cap ③ and drain plug ④.
- Refit drain plug ④ , remove oil level screw ⑤ and pour the specified oil in through the filler hole until it runs out from the oil level hole.
- Refit oil level screw ⑤ , filler cap ③ , secondary cover ② and gearshift lever ① .

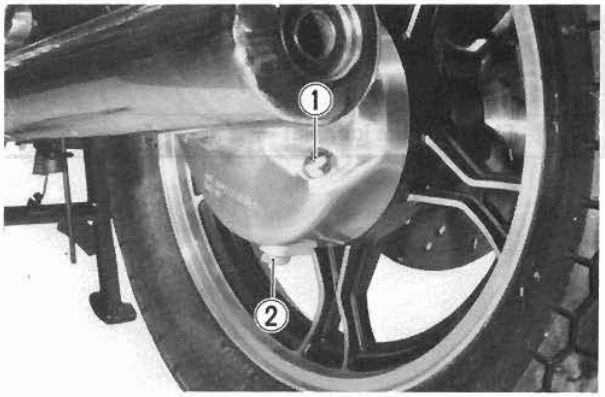




NOTE:
The amount of oil to be replaced is 340 – 400 ml (11.5 – 13.5 US oz).

FINAL BEVEL GEAR OIL

- Keep the motorcycle erect, supporting it on the center stand.
- Drain oil by removing filler cap ① and drain plug ②.
- Refit drain plug ② and pour the specified oil in through the filler hole until it runs out from the filler hole.
- Refit filler cap ① .



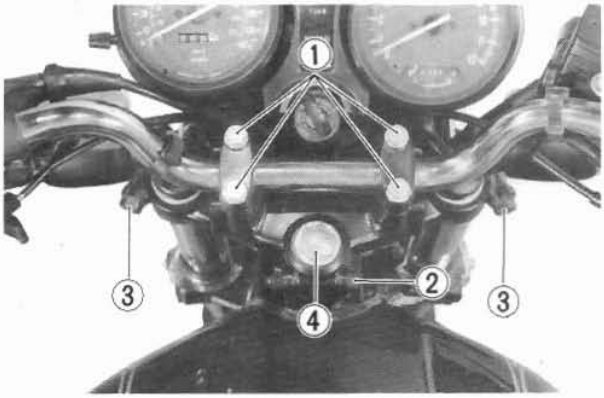
NOTE:
The amount of oil to be replaced is 280 – 330 ml (9.5 – 11.2 US oz).

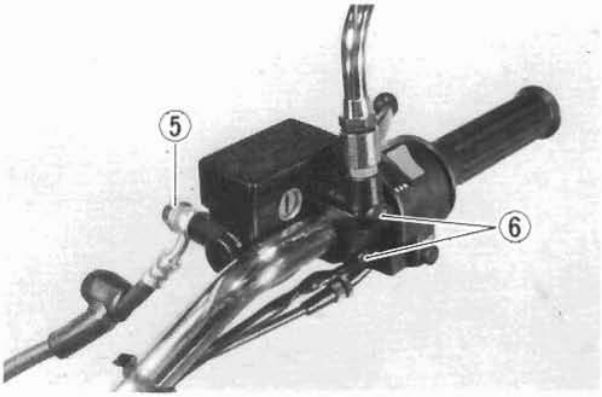
CHASSIS NUTS AND BOLTS

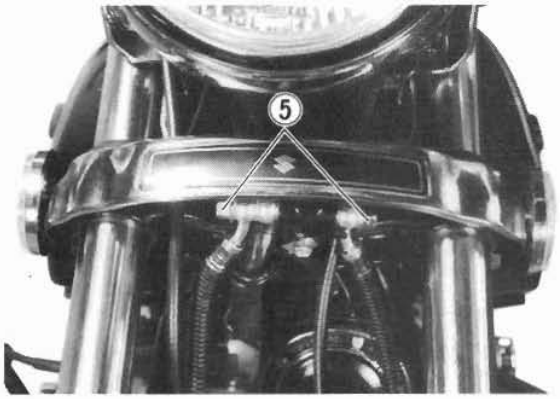
Tighten Initial 1 000 km (600 miles) and Every 6 000 km (4 000 miles).

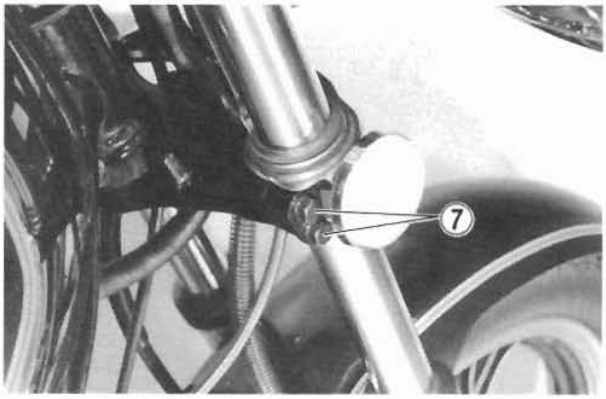
The nuts and bolts listed below are important safety parts. They must be retightened when necessary to the specified torque with a torque wrench. (Refer to page 3-19 for the locations of the following nuts and bolts on the motorcycle.)

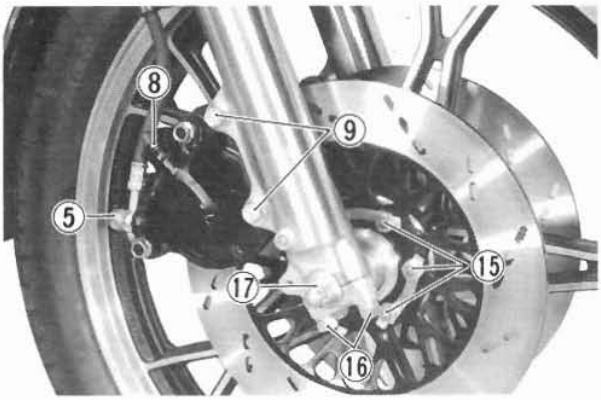
	kg-m	lb-ft
① Handlebar clamp bolt	1.2 – 2.0	8.4 – 14.5
② Steering stem clamp bolt	1.5 – 2.5	11.0 – 18.0
③ Front fork upper clamp bolt (R and L)	2.0 – 3.0	14.5 – 21.5
④ Steering stem head bolt	2.0 – 3.0	14.5 – 21.5
⑤ Brake hose union bolt	2.0 – 2.5	14.5 – 18.0
⑥ Front master cylinder bolt	0.5 – 0.8	3.5 – 6.0
⑦ Front fork lower bracket bolt (R and L)	1.5 – 2.5	11.0 – 18.0
⑧ Caliper bleeder bolt	0.7 – 0.9	5.0 – 6.5
⑨ Caliper mounting bolt	2.5 – 4.0	14.5 – 29.0
⑩ Rear torque link nut	2.0 – 3.0	14.5 – 21.5
⑪ Rear shock absorber nut	2.0 – 3.0	14.5 – 21.5
⑫ Rear axle nut	8.5 – 11.5	61.5 – 83.0
⑬ Swinging arm pivot lock nut	0.35 – 0.45	2.5 – 3.0
⑭ Swinging arm pivot bolt	11.0 – 13.0	79.5 – 94.0
⑮ Disc bolt	1.5 – 2.5	11.0 – 18.0
⑯ Front axle holder nut	1.5 – 2.5	11.0 – 18.0
⑰ Front axle nut	3.6 – 5.2	26.0 – 37.5
⑱ Final gearcase joint nut	3.5 – 5.0	25.5 – 36.0

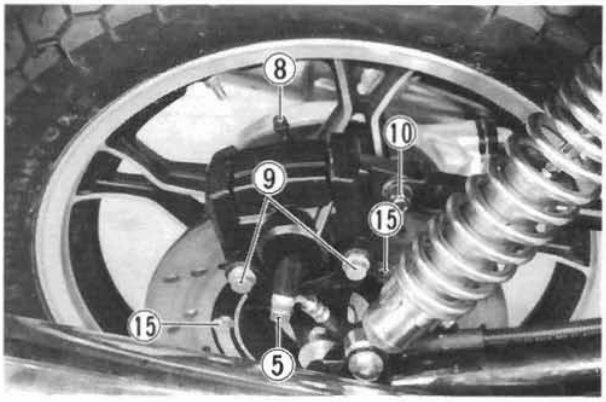


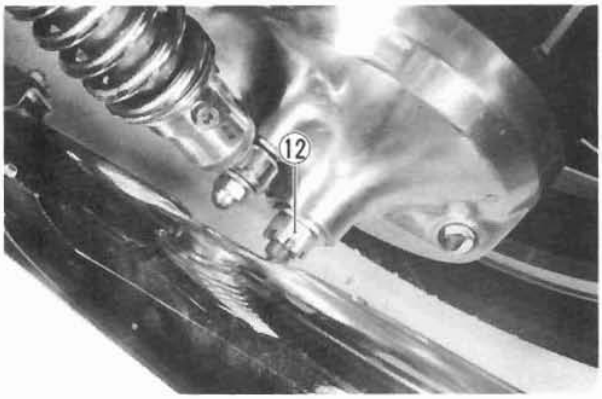


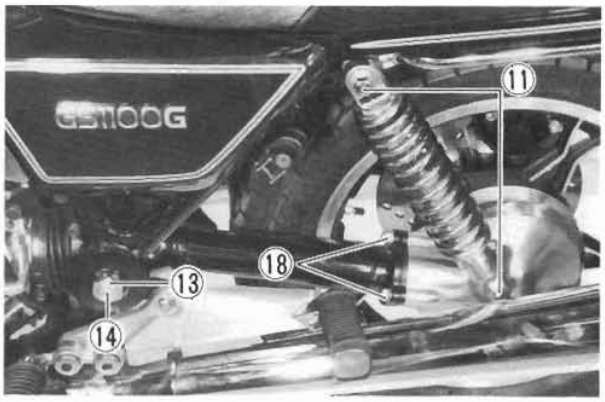












SERVICING ENGINE

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3

ENGINE COMPONENTS REMOVABLE WITH 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

	See page
Gearshift lever	3-2
Secondary gearbox cover	3-2
Gear position indicator	3-16
Generator cover	3-16
Generator rotor	3-17
Starter clutch	3-17

ENGINE CENTER

	See page
Air cleaner	2-3
Oil filter	2-17
Fuel tank	3-3
Tachometer cable	3-4
Carburetor and throttle cable	3-4
Exhaust pipe and muffler	3-5
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Cylinder head cover	3-11
Camshaft	3-11
Cylinder head	3-12
Cylinder	3-12
Piston	3-12
Starter motor	3-15
Oil pan	3-18
Sump filter	3-18

- Generator cover and starter motor lead wire should be removed from the starter motor relay side.

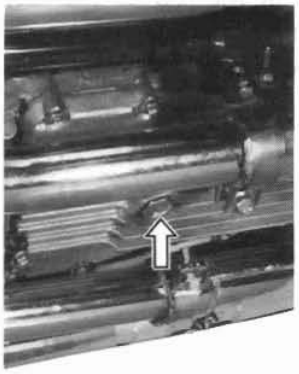
ENGINE RIGHT SIDE

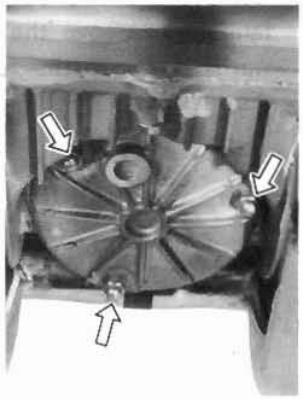
	See page
Clutch cable	3-5
Clutch cover	3-13
Clutch plates	3-14
Clutch sleeve hub	3-14
Primary driven gear	3-14
Oil pump drive gear	3-14
Oil pump ass'y	3-15
Gear shifting shaft	3-15

ENGINE REMOVAL AND REINSTALLATION

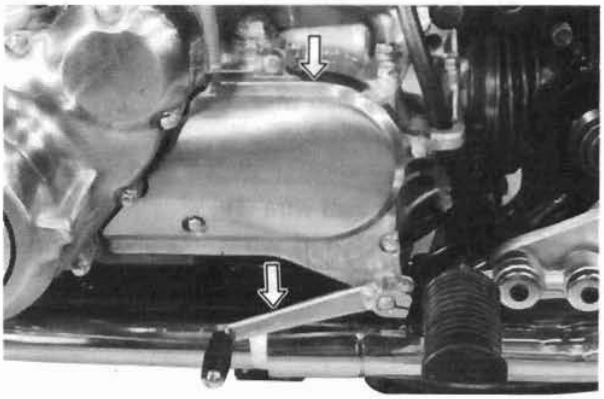
ENGINE REMOVAL

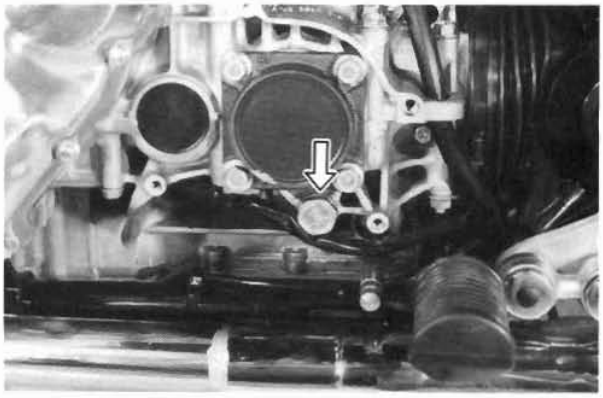
Before taking the engine out of the frame, wash the engine with a steam cleaner and drain engine oil etc. The procedure of engine removal is sequentially explained in the following steps, and engine installation is effected by reversing the removal procedure.



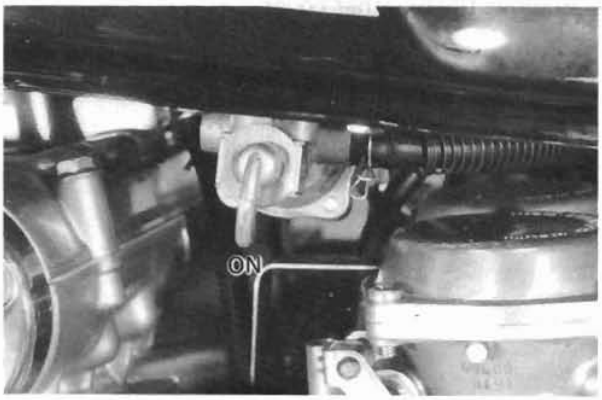


- Place an oil pan under the engine and remove the engine oil drain plug and oil filter cap to drain off engine oil.
- Place an oil pan under the secondary drive drain plug and remove the gearshift lever and secondary drive unit cover. Next, remove the drain plug and drain off the secondary gear oil.

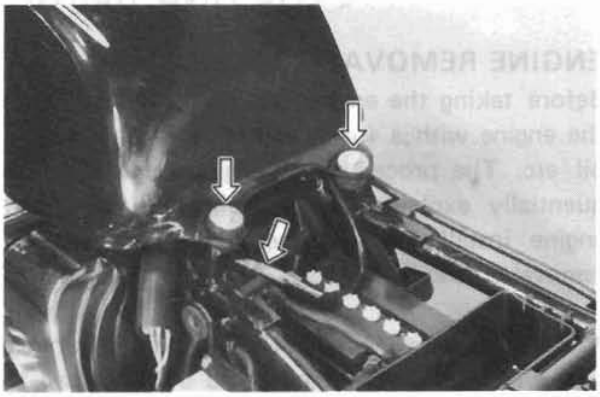




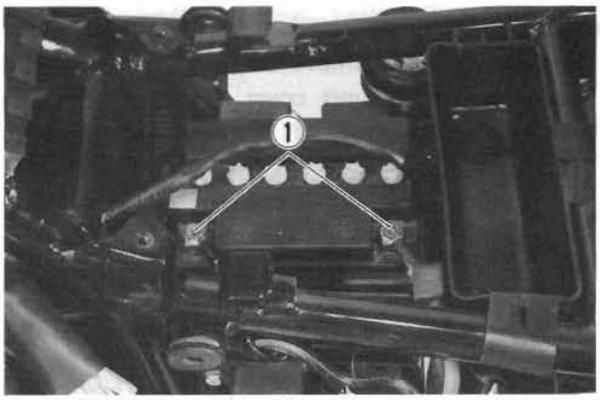
- Take off the seat.
- Set the fuel cock in the "ON" position and shift the fuel hose clip sideways to remove the two hoses (fuel and vacuum) from the fuel cock.

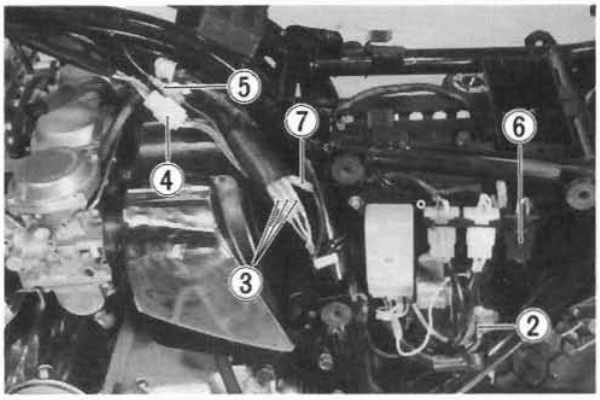


- Remove the two bolts at the rear of the fuel tank and remove the tank by moving it rearwards. Remove the fuel meter lead wire from the fuel tank.



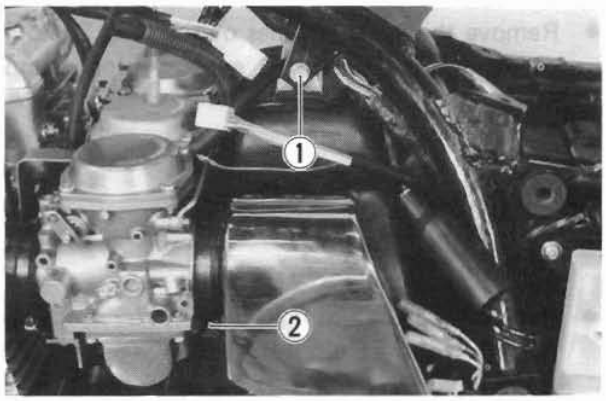
- Remove the left and right frame covers and disconnect various lead wires.
  - Battery ⊖ and ⊕ lead wires ①.
  - Starter relay ⊖ lead wire ②.
  - Generator lead wires ③.
  - Gear position indicator switch lead wires ④.
  - Neutral switch lead wire ⑤.
  - Signal generator lead wires ⑥ and oil pressure switch lead wire ⑦.



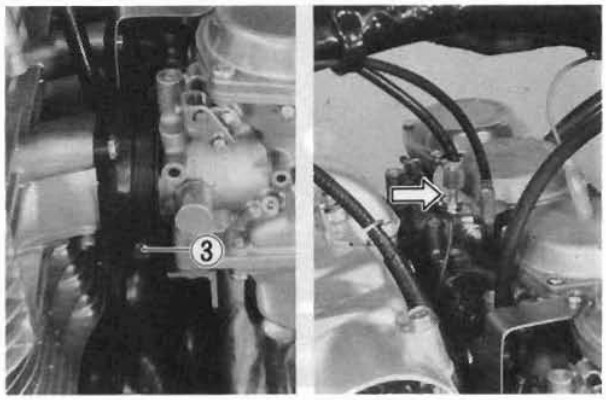


- Remove the breather cover.

- Remove the right and left bolts ① securing the air cleaner body to the frame.
- Loosen the four air cleaner clamp screws ② , move the air cleaner a little rearward, and remove it from the carburetors. Next, remove the air cleaner to the right.

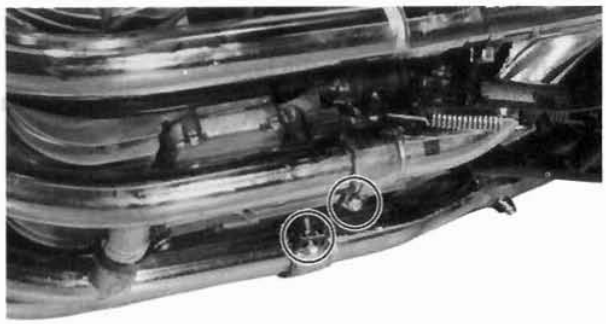


- Loosen the respective clamp screws ③ .
- Remove the carburetors from right side after removing the throttle cable and choke cable from the carburetor assembly.

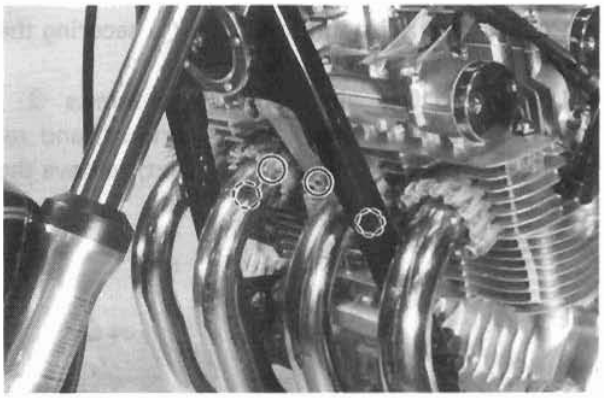


- Pull out the spark plug caps from spark plugs.
- Remove the tachometer cable from the cylinder head cover.

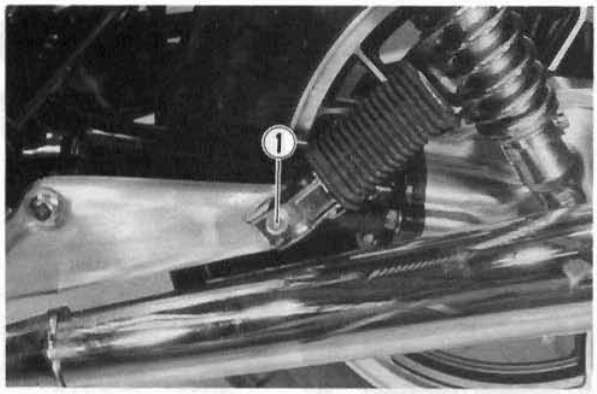
- Remove the exhaust pipe coupler tube bolts.

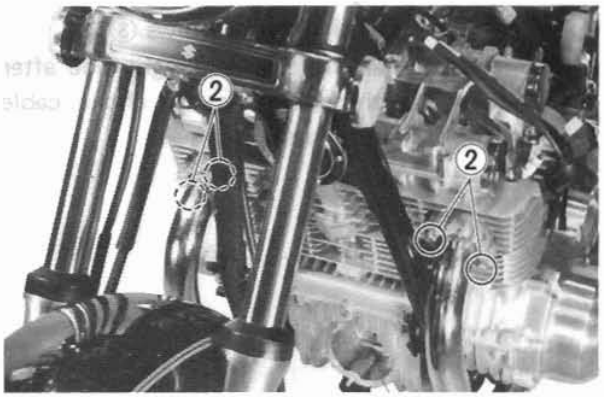


- Remove the exhaust pipes of the Nos. 2 and 3 cylinders by unscrewing exhaust pipe clamp bolts.

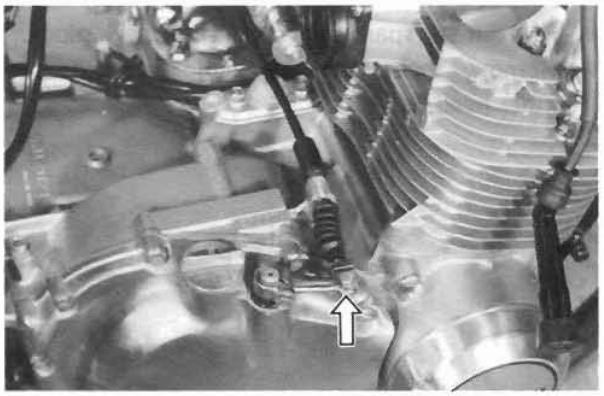


- Remove the left and right mufflers by unscrewing rear footrest mounting bolts ① and exhaust pipe clamp bolts ② .

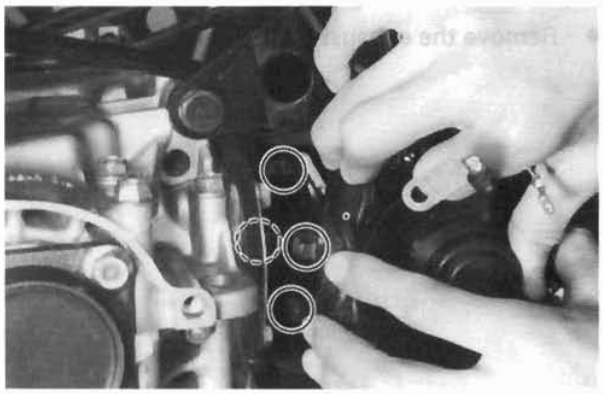




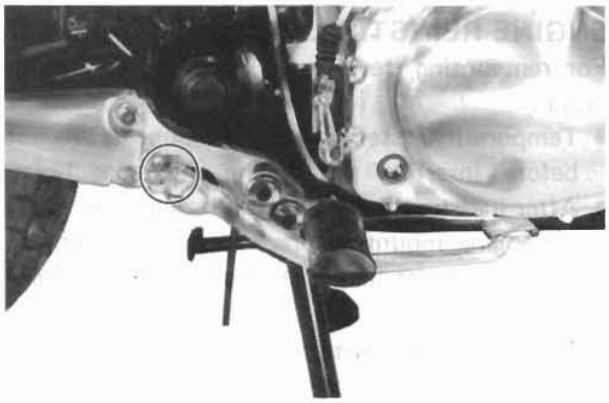
- Remove the clutch cable.

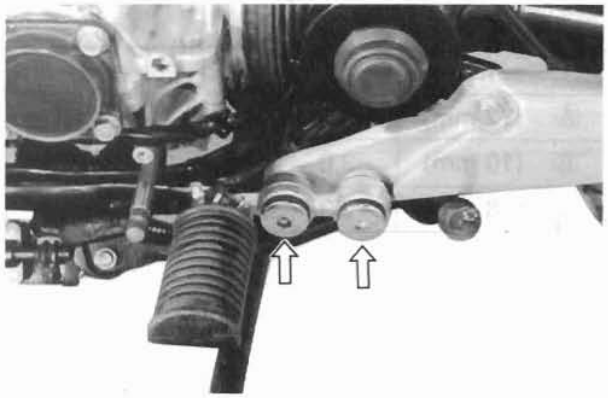


- Loosen the clamp screw of the secondary drive shaft boot and slide the boot.
  Remove the four universal joint bolts while applying rear brake pedal.



- Remove the rear brake pedal and left front footrest.





- Remove the engine mounting bolts and brackets.

- Gradually lift up the engine and lower the engine ass'y on the right side making sure that it does not make contact with the rear bracket. Remove the engine through the right side of the frame.

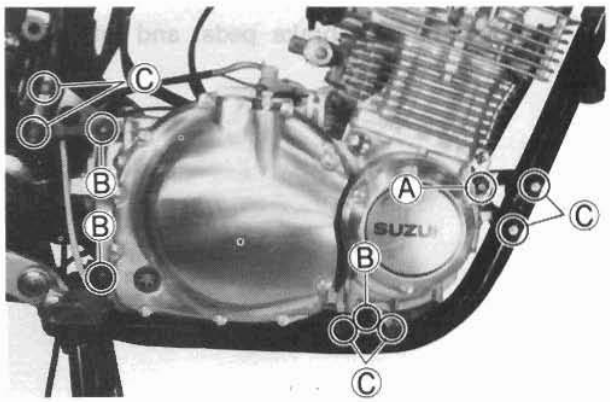
ENGINE REINSTALLATION

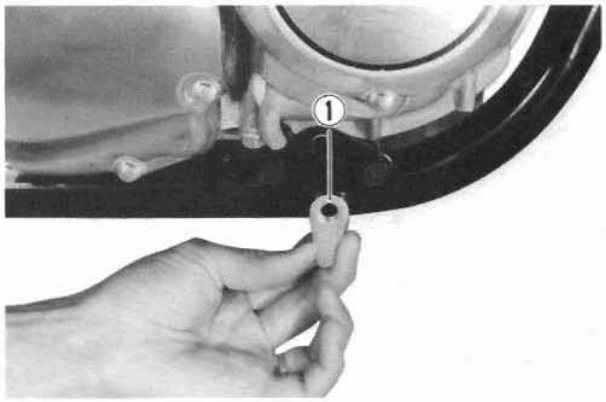
For remounting, reverse the order of engine removal.

- Temporarily fasten the engine mounting bracket before inserting the engine mounting bolts.
- After inserting the engine mounting bolts, tighten engine mounting bracket bolts and engine mounting bolts. Insert all three long bolts from the left side.
- The nut ① takes its position in the place indicated.

Tightening torque for engine mounting bolts

	kg-m	lb-ft
Ⓐ (12 mm)	4.5 – 5.5	32.5 – 40.0
Ⓑ (10 mm)	3.0 – 3.7	21.5 – 27.0
Ⓒ (8 mm)	2.0 – 3.0	14.5 – 21.5

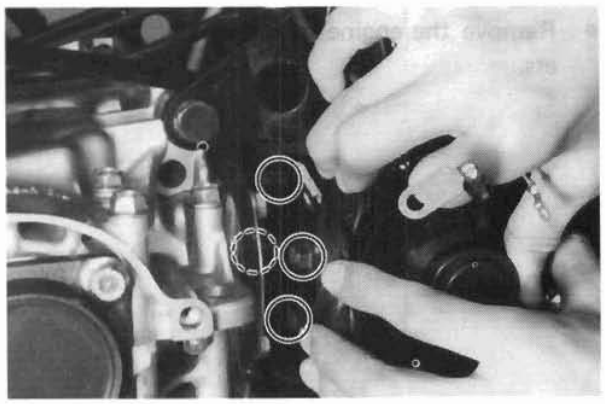




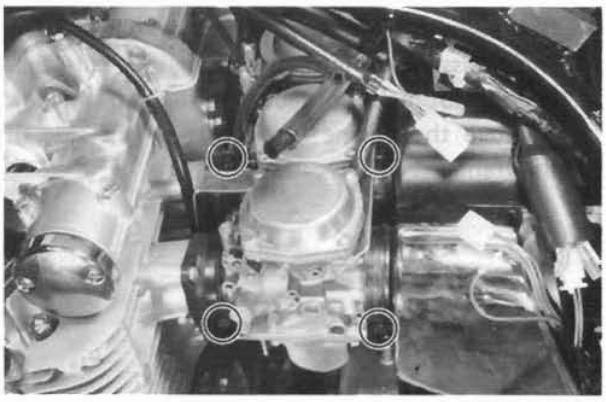
- Secure the universal joint flange and propeller shaft with four bolts at four places. Be sure to apply THREAD LOCK SUPER "1363A" to the bolts.

99104 - 32030	Thread lock super "1363A"

Tightening torque	3.0 – 4.0 kg-m (21.5 – 29.0 lb-ft)



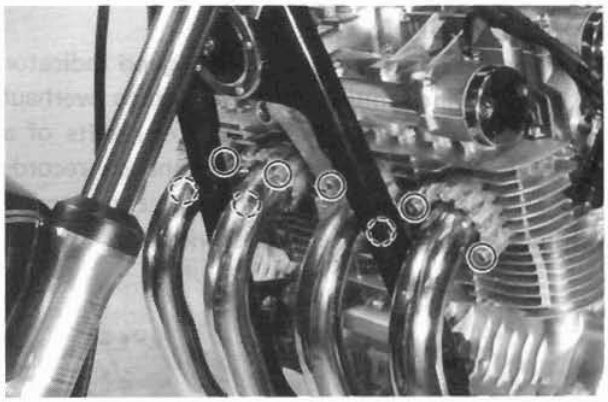
- Install the propeller shaft boot with the two clamps.
- Firmly secure the carburetor with the clamps. If the carburetor is not firmly secured, gas leakage, incorrect air-fuel ratio and unsatisfactory engine operation may result.
- Mount the front footrest and the gearshift lever.

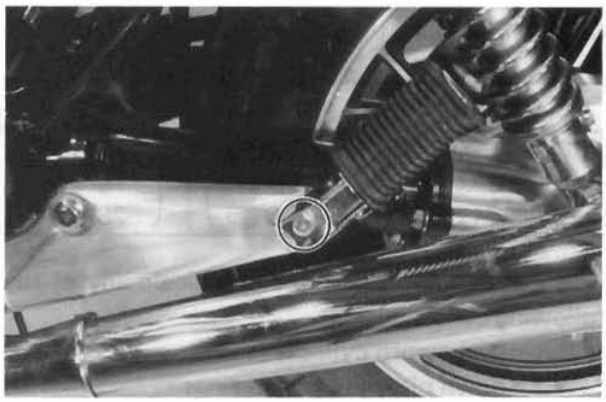


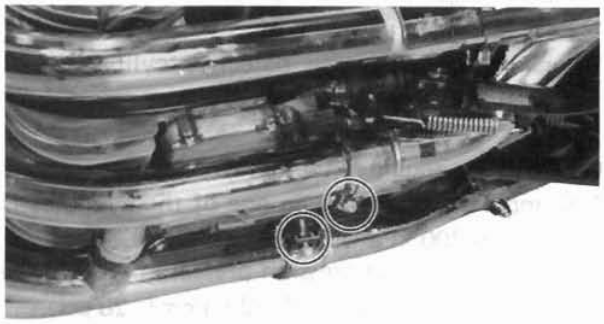
- Before tightening the exhaust pipe clamp bolts, install both right and left rear footrest mounting bolts loosely.
- After tightening the exhaust pipe clamp bolts, tighten both right and left rear footrest mounting bolts and exhaust pipe connector bolts.

Tightening torque

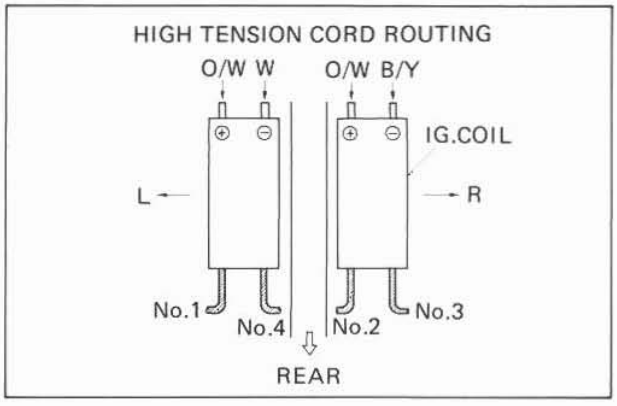
	kg-m	lb-ft
Exhaust pipe clamp bolt	1.0 – 1.6	7.0 – 11.5
Rear footrest mounting bolt	2.7 – 4.3	19.5 – 31.0
Exhaust pipe connector bolt	0.9 – 1.4	6.5 – 10.0







- 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.
- After remounting the engine, adjust the rear brake pedal (page 2-18), brake light switch, clutch (page 2-19), throttle cable (page 2-11) and choke cable (2-11).
- Before starting the engine, make sure the amount of oil required, according to the type of work done, has been put in. Refer to page 2-16 for quantities.
- Route the lead wires and cables properly. (See 9-10, 11 and 12).



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
800 – 1 200 kPa (8 – 12 kg/cm², 114 – 170 psi)	700 kPa (7 kg/cm², 100 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 sealing of valves
* Leaking or otherwise defective cylinder head gasket

Overhaul the engine in the following cases:

* Compression pressure in one of the cylinders is less than 700 kPa (7 kg/cm², 100 psi).
* Difference in compression pressure between the two is more than 200 kPa (2 kg/cm², 28 psi).
* All compression pressure are below 800 kPa (8 kg/cm², 114 psi) (standard) even when they measure more than 700 kPa (7 kg/cm², 100 psi).

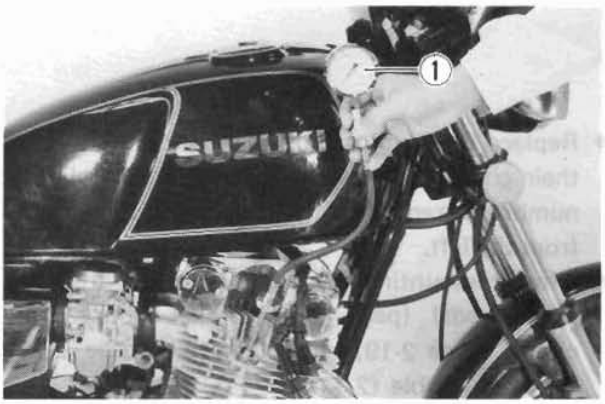
COMPRESSION TEST PROCEDURE

NOTE:

* **Before testing the compression of the engine, make sure that the cylinder head nuts and bolts are torqued to specification.**
* **Warm up the engine before testing.**

- Remove 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 cylinder.

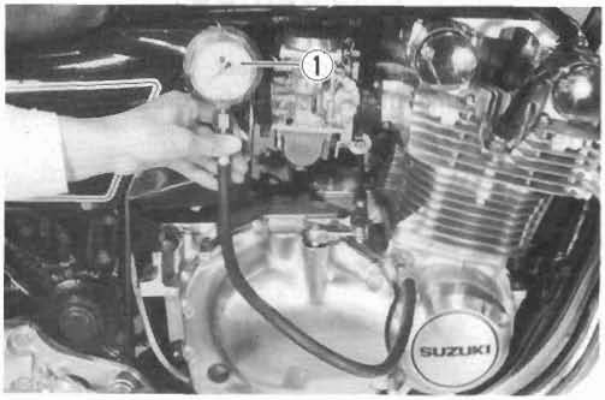
09915 - 64510	Compression gauge



OIL PRESSURE

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

- Install the oil pressure gauge ① in the position shown in the figure.
- Warm up the engine as follows:
  Summer 10 min. or so at 2 000 r/min
  Winter 20 min. or so at 2 000 r/min
- After warming up operation, increase the engine speed to 3 000 r/min, and read the oil pressure gauge.



OIL PUMP PRESSURE SPECIFICATION

Above 10 kPa (0.1 kg/cm², 1.4 psi) Below 50 kPa (0.5 kg/cm², 7.1 psi) at 3 000 r/min

09915 - 74510	Oil pressure gauge

If the pressure is too low, it means that the oil pump is internally worn or otherwise defective and needs to be replace with new one.

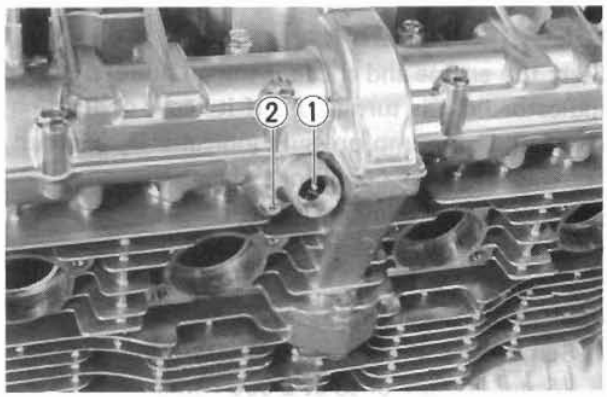
OIL SUMP FILTER

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

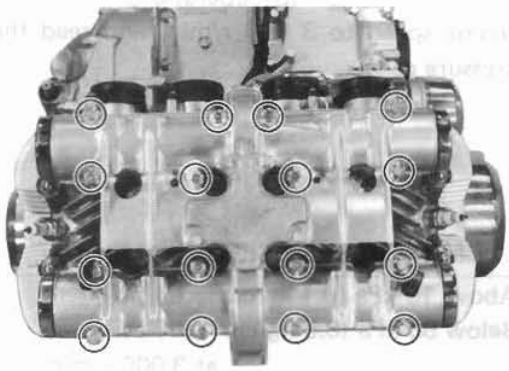
NOTE:
Replace oil pan gasket with new one to prevent oil leakage.

ENGINE DISASSEMBLY

- Remove tachometer drive gear ① by pulling it off after removing its stopper (secured by a cross-recessed screw ②).

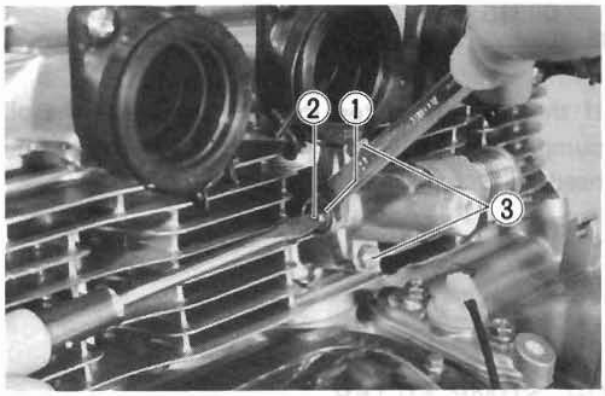


- Remove cylinder head cover and its gasket.



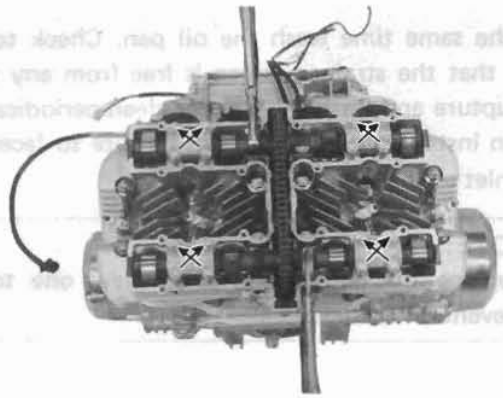
- Loosen the lock nut ① and tighten the stop screw ② and then remove two cam chain tensioner mounting bolts ③ .

NOTE:
Screw ② locks the spring loaded tensioner push rod inside.

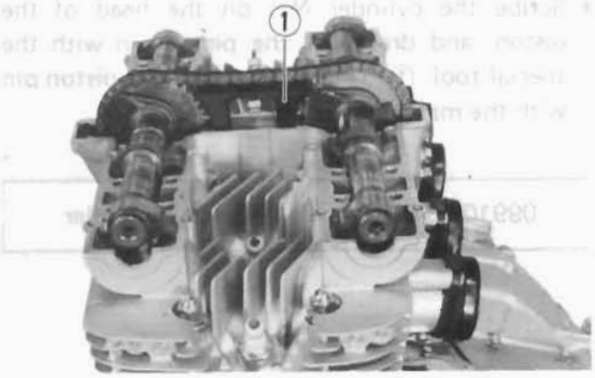


- Remove the four camshaft holders.

NOTE:
* **Be sure to loosen camshaft holder bolts evenly by shifting the wrench diagonally.**
* **Hold down each camshaft with vice pliers, and remove the bolts securing the camshaft holders, two on each camshaft. Then, remove the pliers and take off the camshaft.**



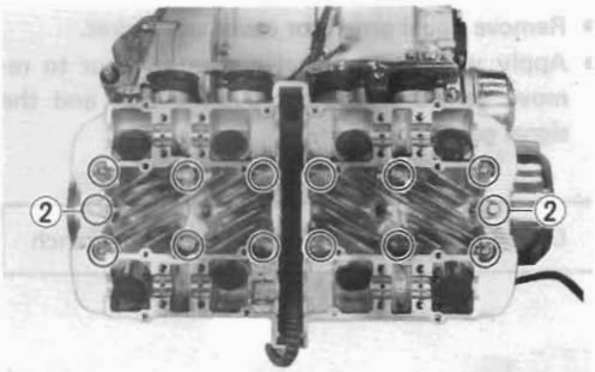
- Pull out the cam chain guide ① and remove the two camshafts, intake and exhaust.



- The cylinder head can be removal when its three 6-mm bolts ② and twelve 10-mm nuts are removed.

09911 - 74510	Long socket 14 mm
09914 - 24510	T handle

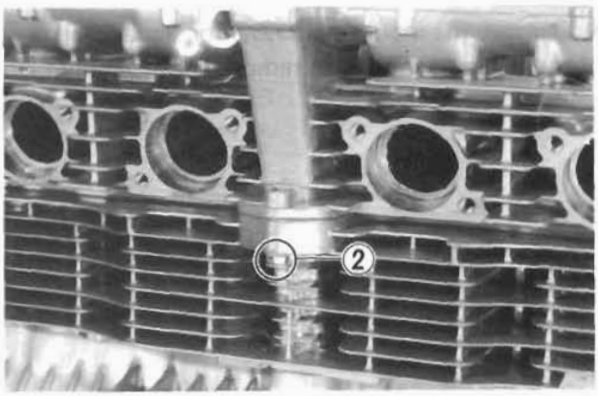
NOTE:
Be sure to use the special tool ("T" wrench) designed to enter the pockets formed in the head and reach the nuts down below to loosen the 10-mm, and to shift the tool sequentially in the descending order of numbers in order to reduce the pressure equally and evenly.



- 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.

NOTE:
Cylinder removal from crankcase is made easier by the use of the cylinder disassembling tool. This tool can be used on the cylinder head and crankcase, too.

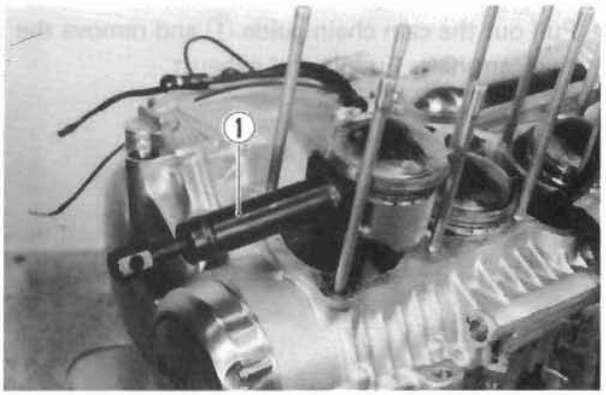
09912 - 34510	Cylinder disassembling tool



- Place a cloth beneath the piston so as not to drop the parts in the crankcase, and remove the circlip with pliers.

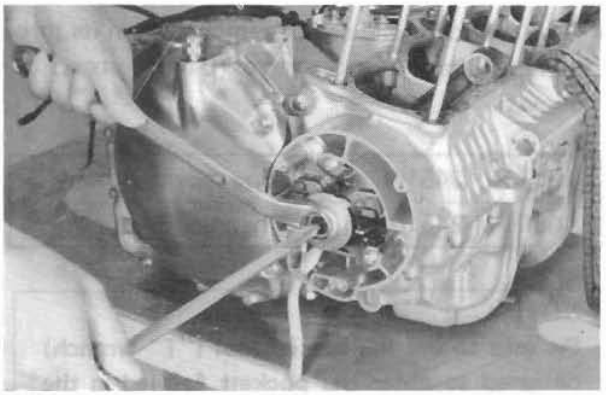
- Scribe the cylinder No. on the head of the piston, and draw out the piston pin with the special tool ① . Place the drawn-out piston pin with the matching piston.

09910 - 34510	Piston pin puller

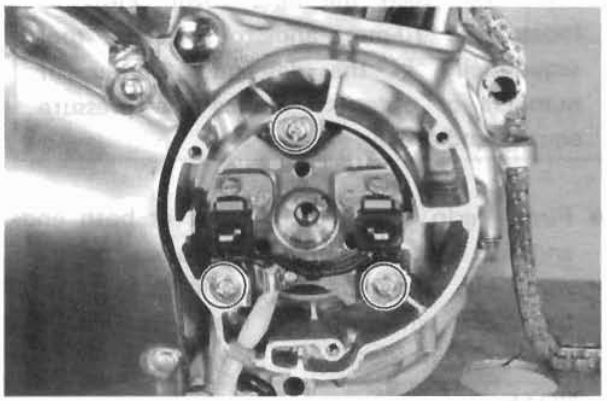


- Remove signal generator cover and gasket.
- Apply wrench to signal generator rotor to remove generator rotor mounting bolt and the signal generator rotor.

09914 - 25811	"T" type hexagon wrench

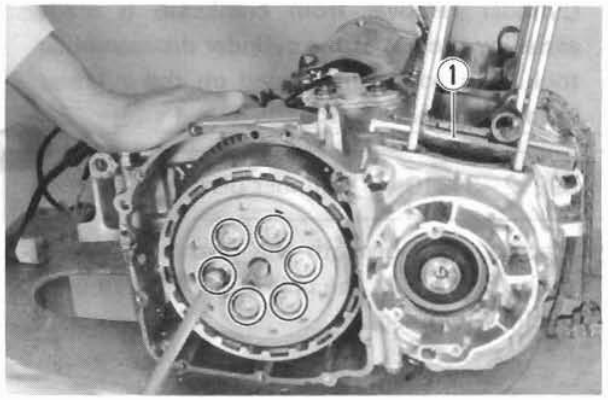


- Remove the mounting screws for signal generator assembly, and then remove the assembly.

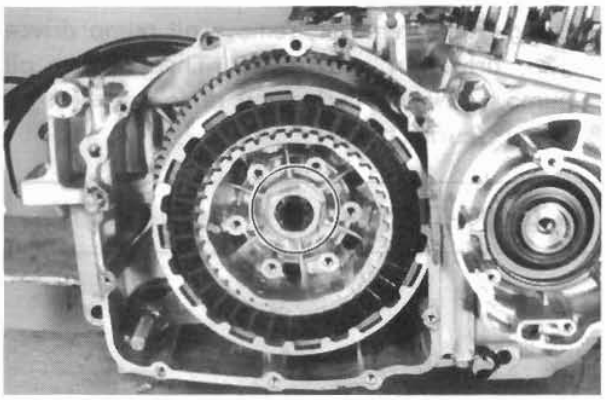


- Remove clutch cover and gasket.
- By holding the crankshaft with conrod stopper ① , remove clutch spring mounting bolts in a criss cross manner.
- Remove clutch springs and pressure plate with clutch release rack.

09910 - 20115	Conrod stopper

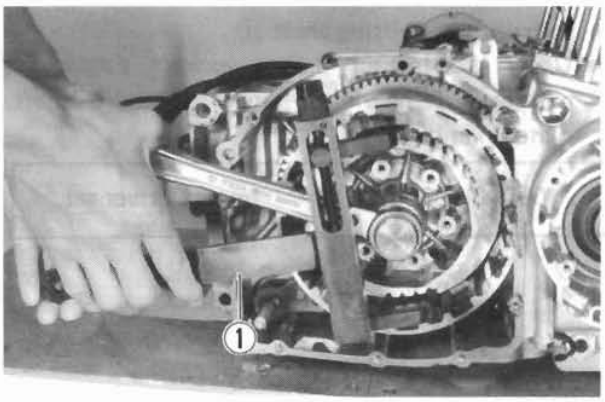


- After removal of several clutch driven and drive plates, flatten clutch sleeve hub nut lock washer by using chisel.

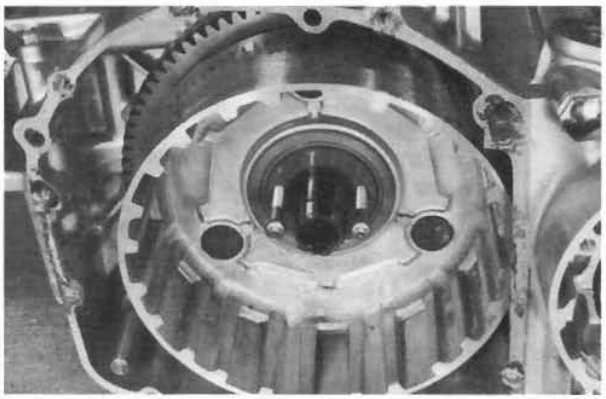


- Firmly secure clutch sleeve hub to remove mounting nut with clutch sleeve hub holder ① .

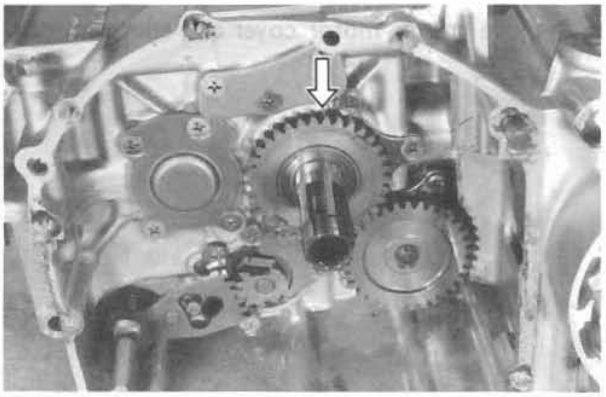
09920 - 53710	Clutch sleeve hub holder



- Remove washer, clutch hub, and the remaining plates.
- Run two 6-mm screws into the primary driven gear spacer to ease out the spacer by pulling. With the spacer removed, the primary driven gear (integral with the clutch housing) is free to disengage from the primary drive gear.

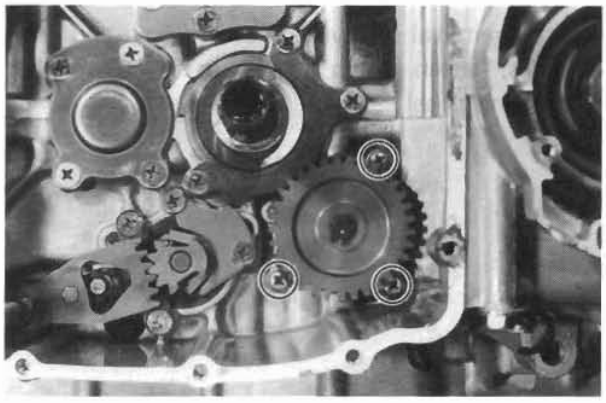


- Pull out oil pump drive gear, its spacer, bearing and thrust washer.



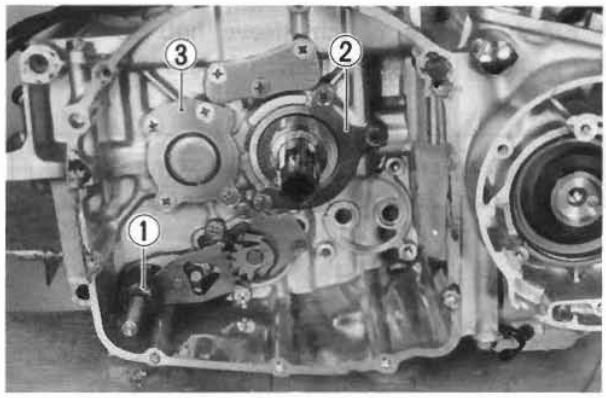
- Using circlip remover, remove oil pump driven gear, drive pin and washer. Then remove oil pump with two O-rings by removing three oil pump securing bolts.

09900 - 06107	Snap ring pliers



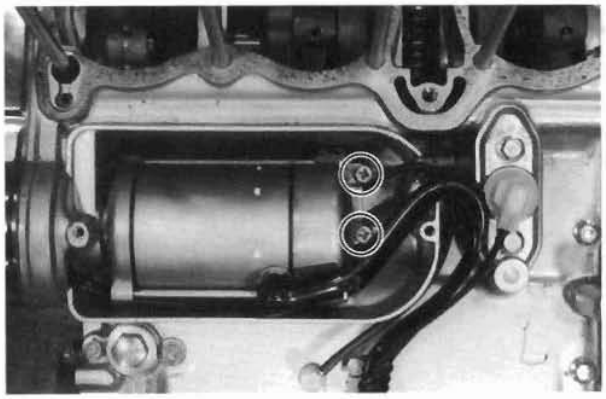
- Extract gear shifting shaft ① .
- Using the impact driver, extract screws for countershaft bearing retainer ② , driveshaft plate ③ and gasket.

09900 - 09003	Impact driver set

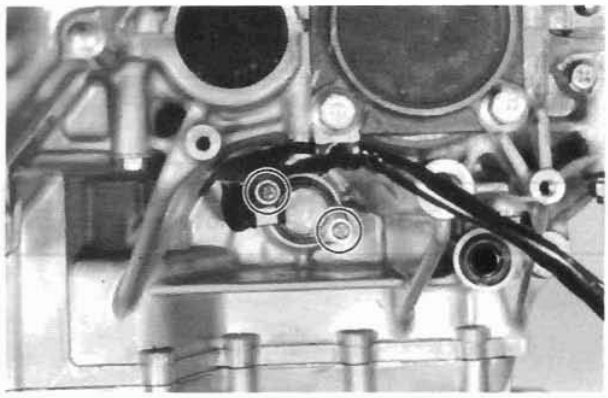


- Remove the cam chain guide.

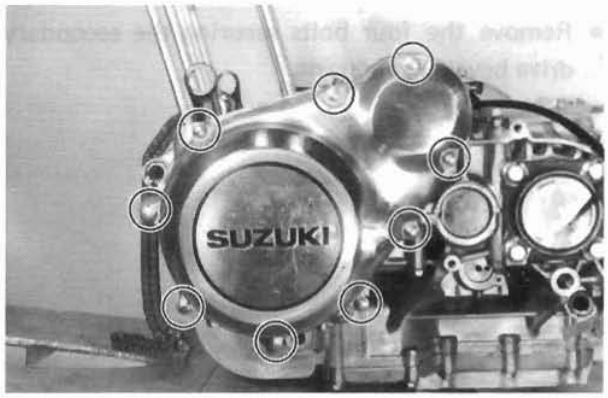
- Remove starter motor cover and starter motor.



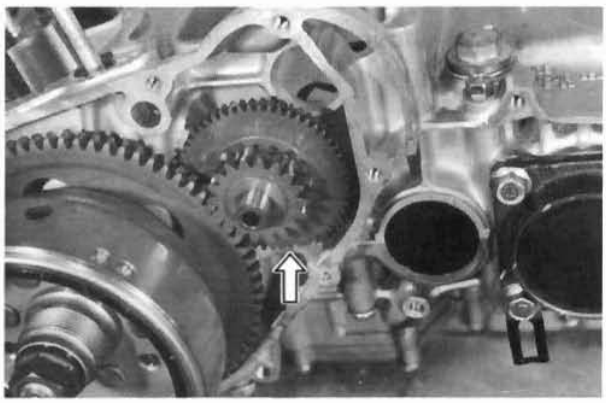
- Remove the gear position indicator switch housing.



- Remove the generator cover and its gasket.

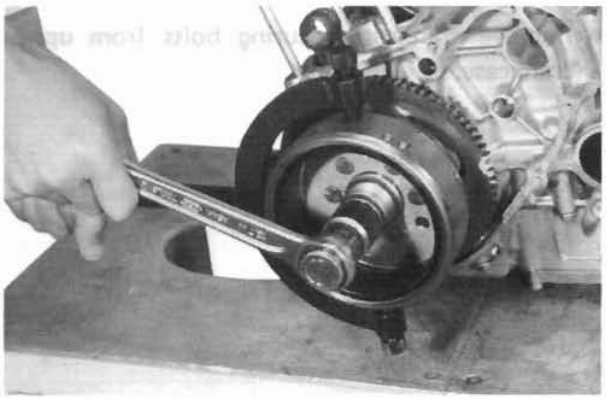


- Remove the starter idle gear shaft and idle gear.



- Using the rotor holder, remove rotor securing bolt.

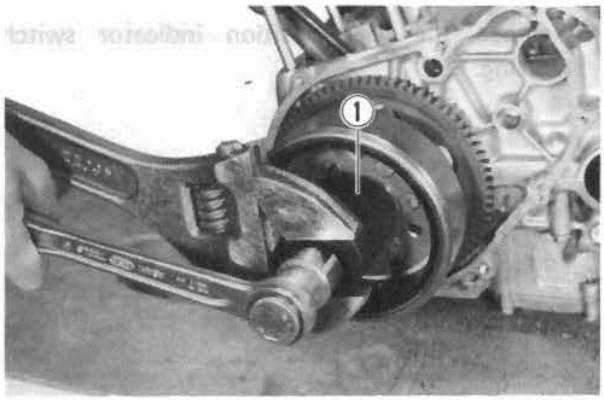
09930-44911	Rotor holder



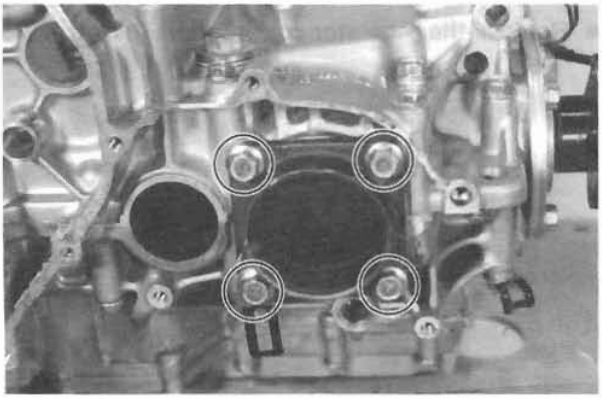
- Install the rotor remover ① and remove the rotor.

NOTE:
Do not hit the rotor with a hammer.

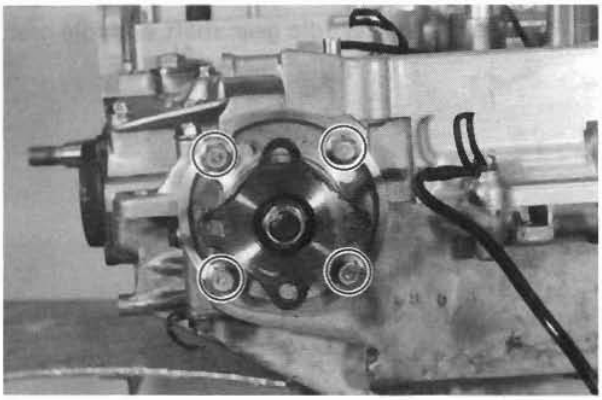
09930 - 34911	Rotor remover



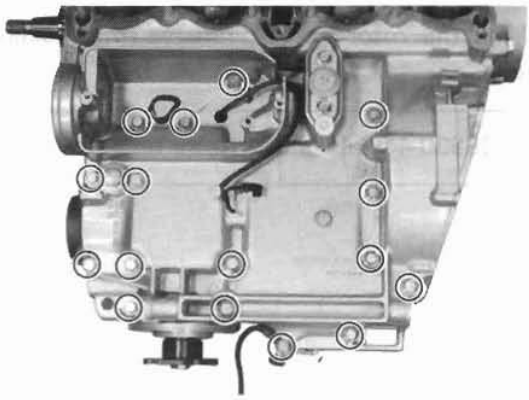
- Remove the four bolts securing the secondary drive bevel gear housing.



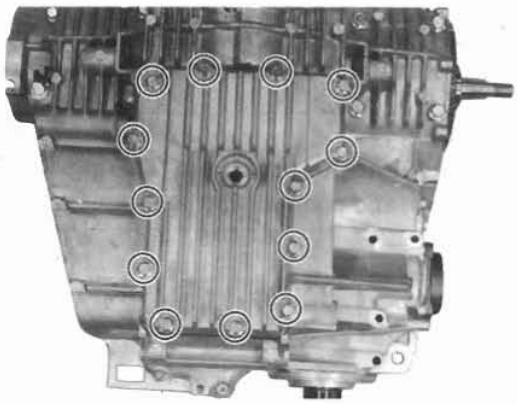
- Remove the four bolts securing the secondary driven bevel gear housing.



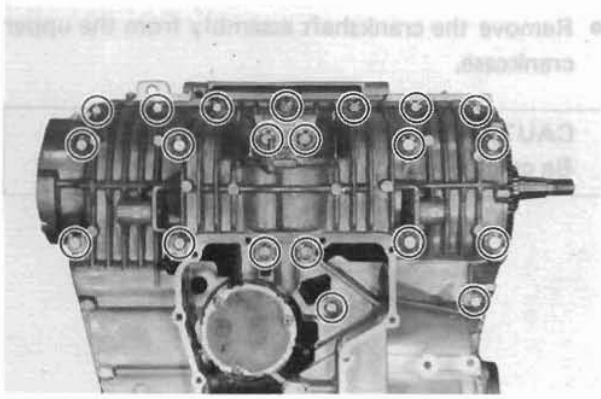
- Remove crankcase securing bolts from upper crankcase.



- Turn engine up side down and remove oil pan.



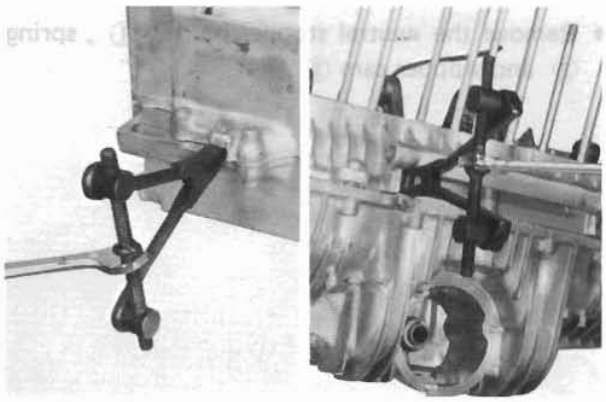
- Remove crankcase tightening bolts.



- 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.

NOTE:
To separate the crankcases is made easier by the use of the cylinder disassembling tool.

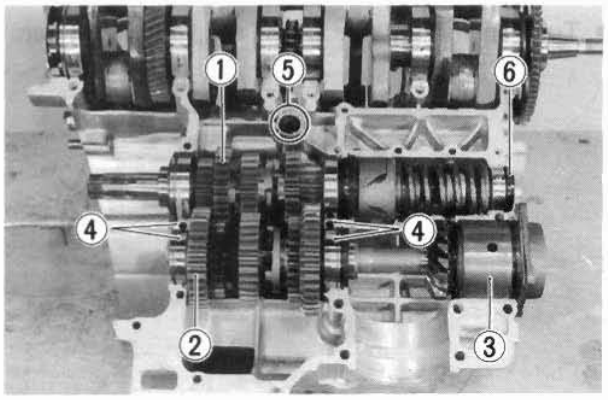
09912 - 34510	Cylinder disassembling tool



- Remove the secondary driven bevel gear assembly.

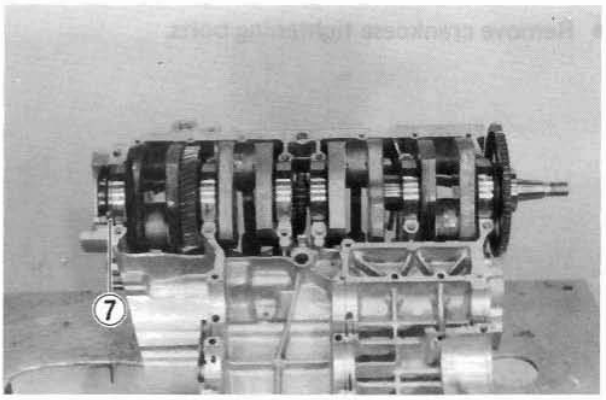
- Remove the countershaft assembly ① , drive-shaft assembly ② and secondary drive gear ③ .

NOTE:
Be careful not to drop four "C"-rings ④ one O-ring ⑤ and countershaft end cap ⑥ .

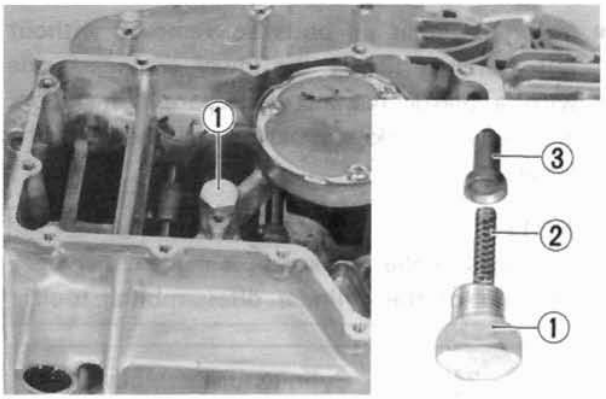


- Remove the crankshaft assembly from the upper crankcase.

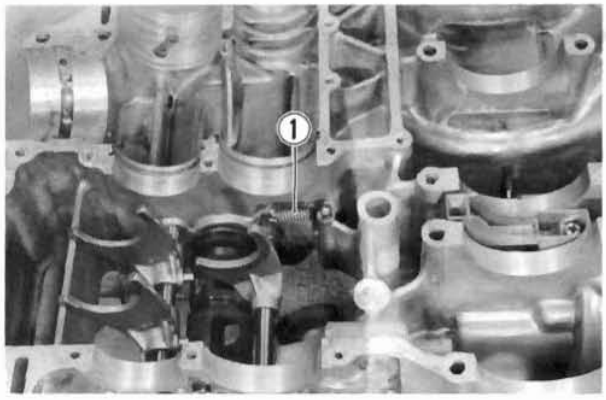
CAUTION:
Be careful not to drop one "C"-ring ⑦ .



- Remove the neutral stopper holder ① , spring ② and stopper cam ③ .

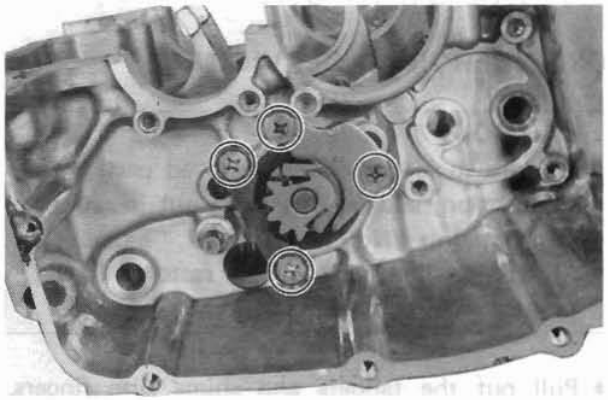


- Unhook the cam stopper spring ① from the lower crankcase.

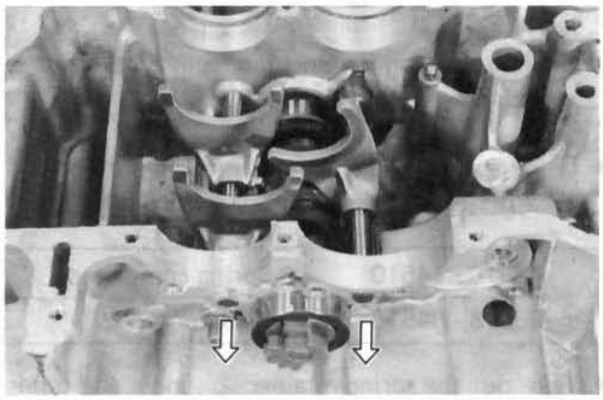


- Using the impact driver, remove gearshift cam guide and gearshift pawl screws.

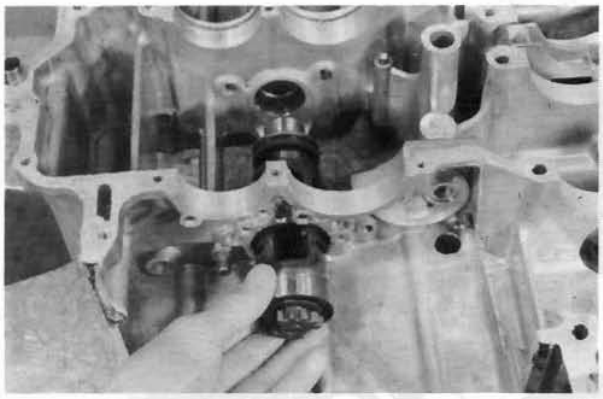
09900 - 09003	Impact driver set



- Hold gear shifting forks by hand to extract two gear shifting fork shafts from the lower crankcase.

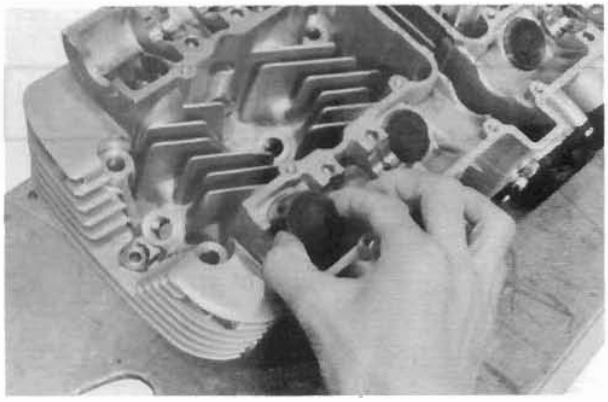


- Extract gear shifting cam from the lower crankcase.



ENGINE COMPONENTS INSPECTION AND SERVICING

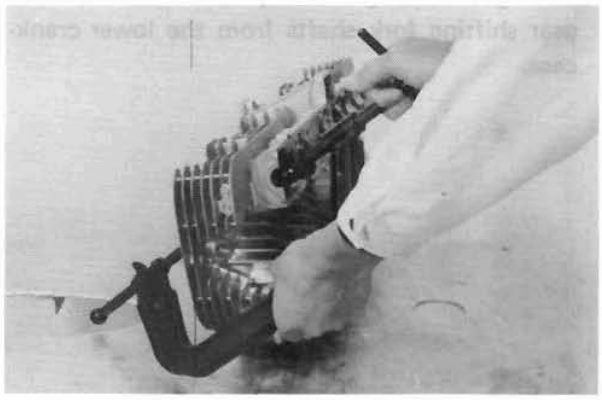
CYLINDER HEAD SERVICING



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.

- Pull out the tappets and shims with fingers.

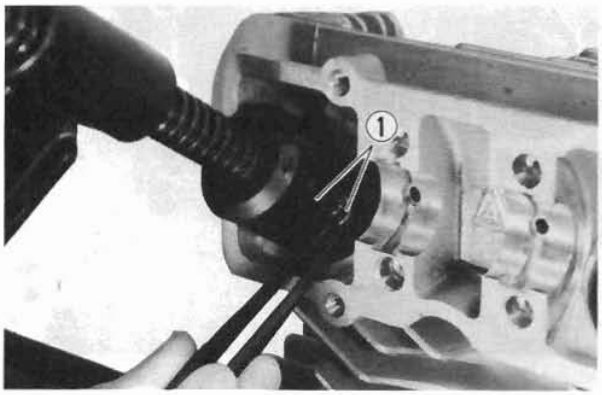
NOTE:
Exercise caution in removing tappets so as not to nick them.

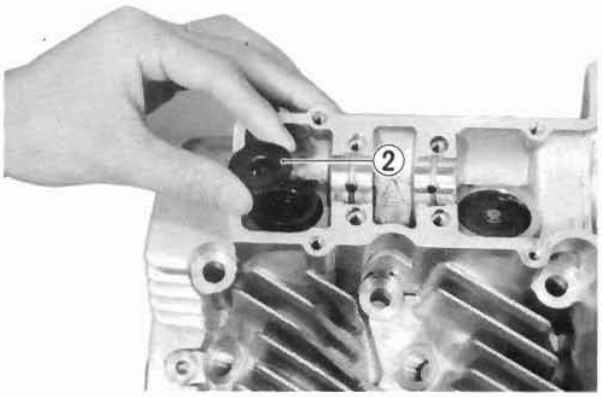


- Using special tools, compress valve springs and take off two cotter halves ① from valve stem.

09916 - 14510	Spring compressor
09916 - 84510	Tweezers

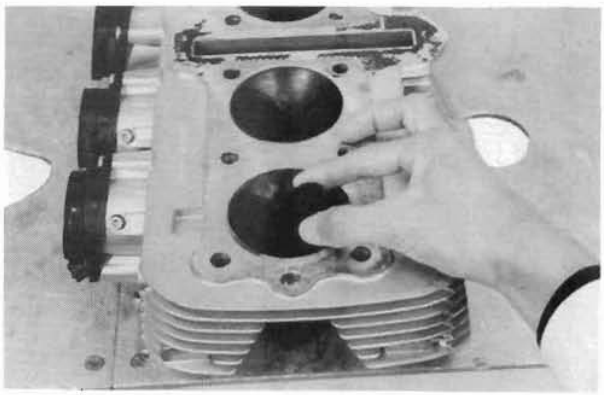
- Take out the spring retainer ② , inner and outer springs.





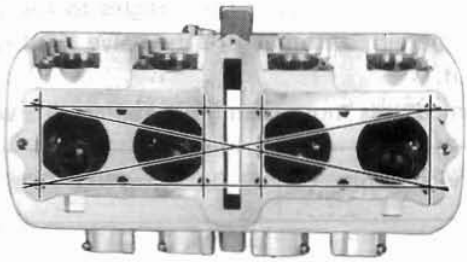
- From the other side, pull out the valve.

NOTE:
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.



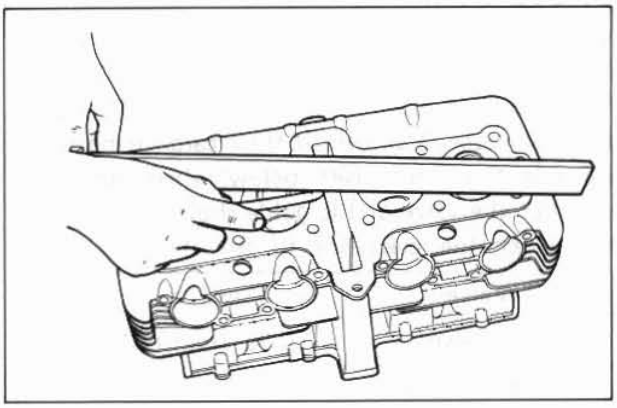
CYLINDER HEAD DISTORTION

- 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

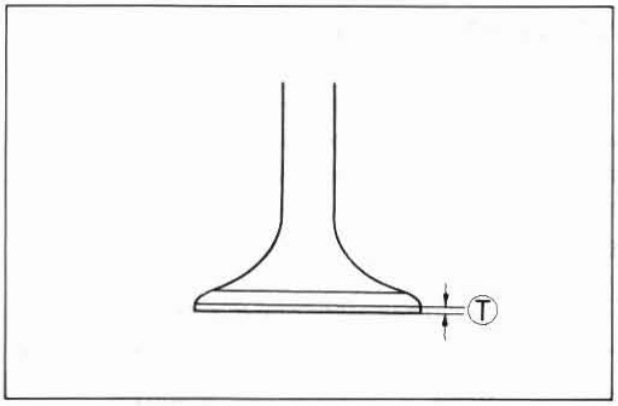
Service Limit	0.2 mm (0.008 in)



VALVE HEAD THICKNESS

- 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.

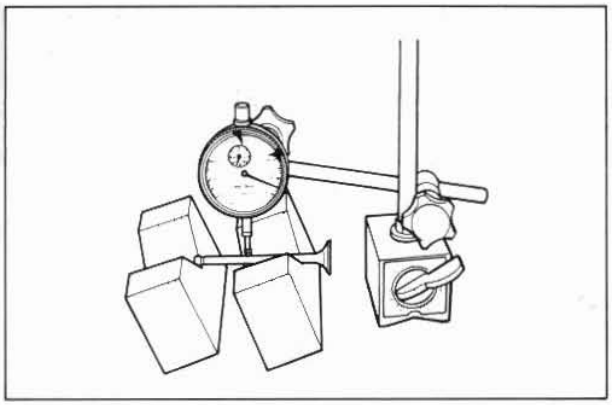
Service Limit Ⓣ	0.5 mm (0.02 in)



VALVE STEM RUNOUT

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

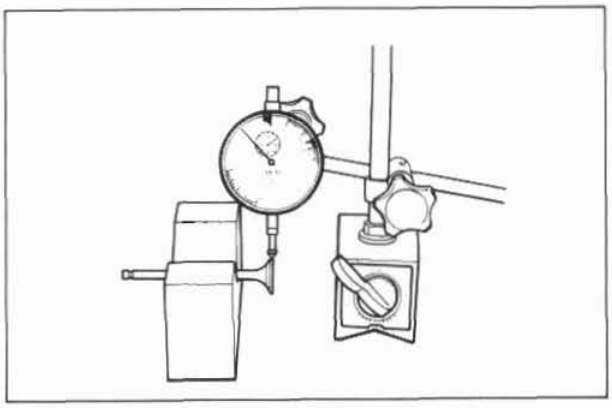
Service Limit	0.05 mm (0.002 in)



VALVE HEAD RADIAL RUNOUT

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

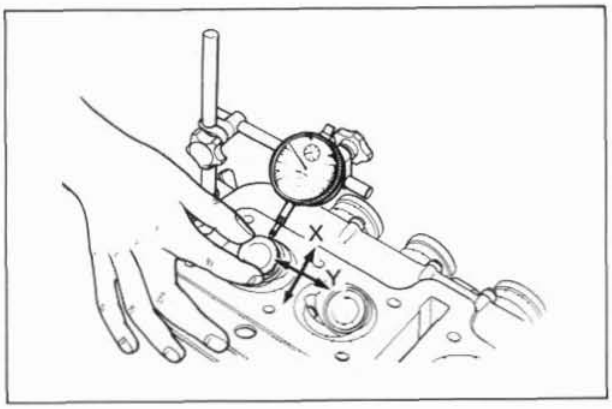
Service Limit	0.03 mm (0.001 in)



VALVE GUIDE TO VALVE STEM CLEARANCE

Measure the clearance in two directions, "X" and "Y", perpendicular to each other, by rigging up 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:

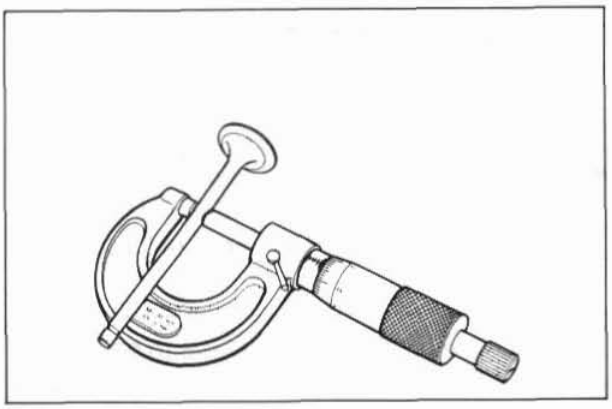
Valve	Service Limit
Intake valves	0.35 mm (0.014 in)
Exhaust valves	0.35 mm (0.014 in)



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)



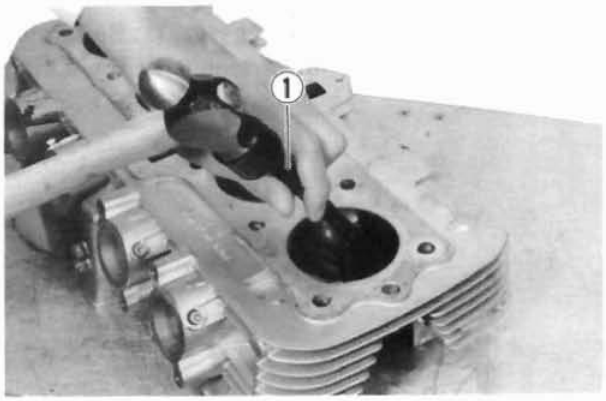
Valve	Standard
Intake valves	6.960 – 6.975 mm (0.2740 – 0.2746 in)
Exhaust valves	6.945 – 6.960 mm (0.2734 – 0.2740 in)

VALVE GUIDE SERVICING

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

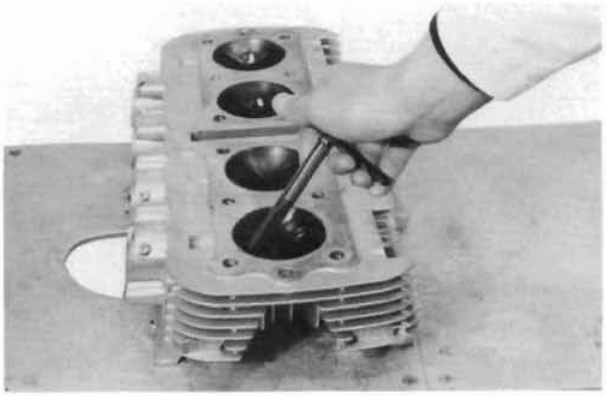
09916 - 44511	Valve guide remover

NOTE:
* **Discard the removed valve guide subassemblies.**
* **Only oversized valve guide is available.**



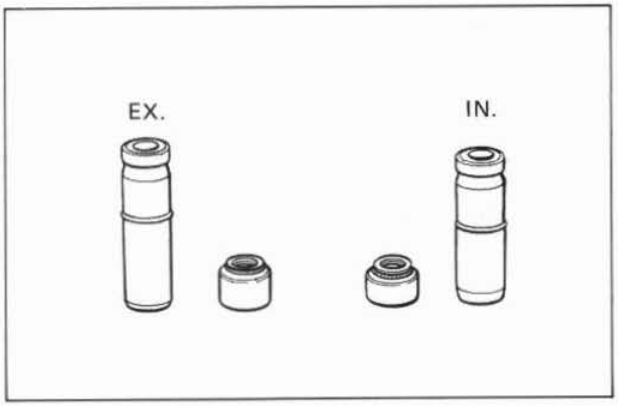
- Re-finish the valve guide holes in cylinder head with a 12.2 mm reamer and handle.

09916 - 34530	12.2 mm reamer
09916 - 34540	Reamer handle



- Fit a ring to each valve guide. Be sure to use new rings and valve guides. Reuse of rings and valve guides removed during disassembly is prohibited. Remember that the guide and oil seal for intake valve differs in shape from those of the exhaust valve in production, however, the replacements of oil seal are identical in shape.

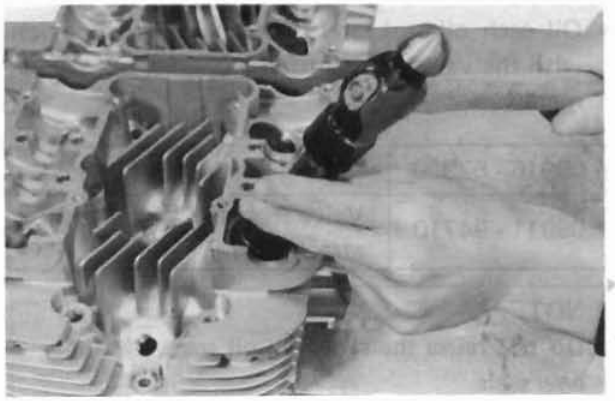
11115 - 45740	Intake valve guide
11116 - 45740	Exhaust valve guide
09289 - 07002	Valve guide oil seal



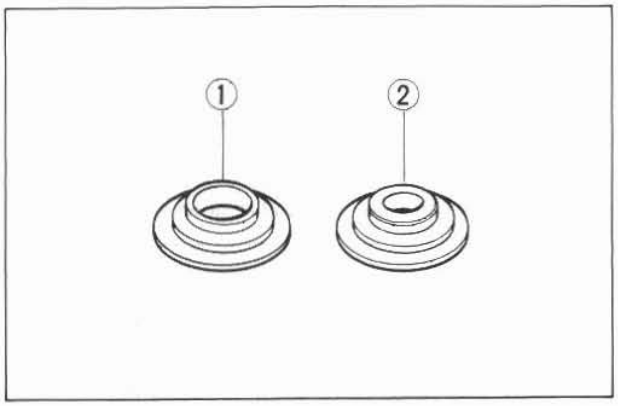
- Oil the stem hole, too, of each valve guide and drive the guide into the guide hole with the valve guide installer handle and attachment.

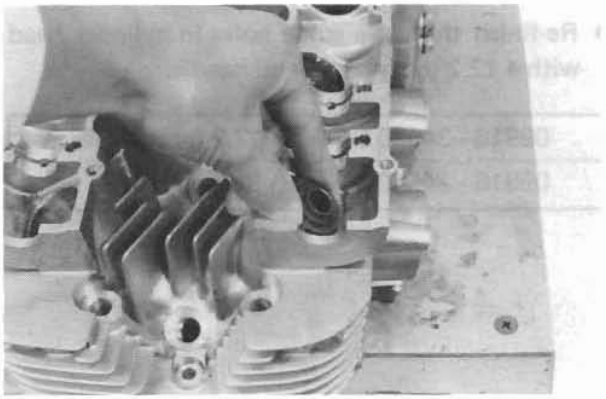
09916 - 57320	Valve guide installer handle
09916 - 54530	Valve guide installer attachment

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



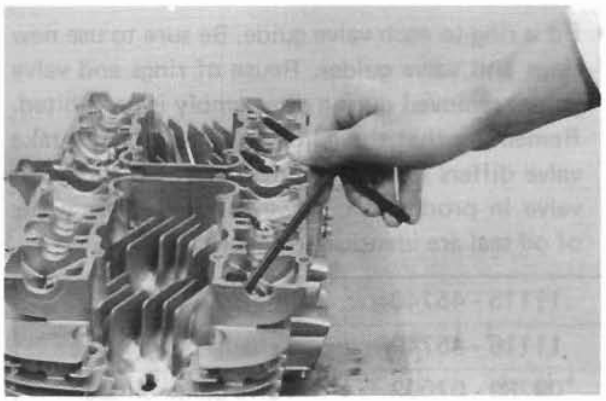
- Install the valve spring lower seat ①. Be careful not to confuse the lower seat with the spring retainer ②.





- After fitting all valve guides, refinish their guiding bores with a 7 mm reamer. Be sure to clean and oil the guide after reaming.

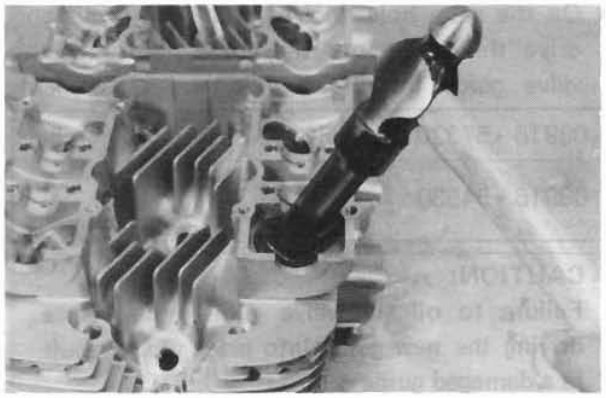
09916 - 34520	7 mm reamer
09916 - 34540	Handle



- Oil each oil seal, and drive them into position with the valve guide installer handle and attachment.

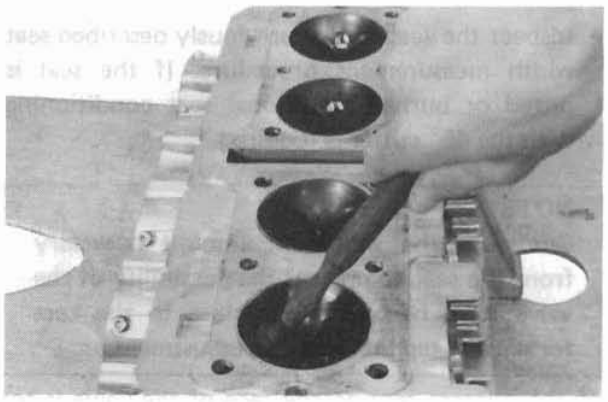
09916 - 57320	Valve guide installer handle
09911 - 94710	Valve stem seal installer attachment

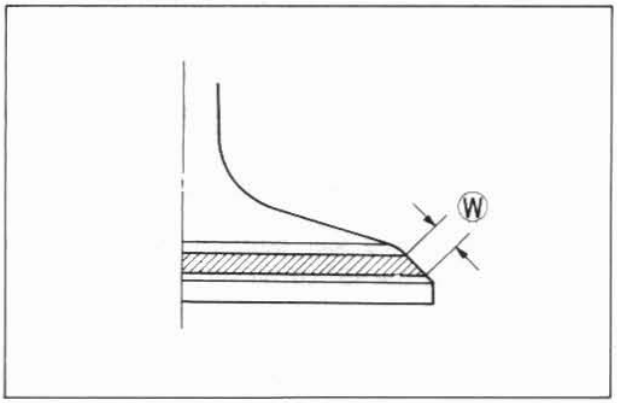
NOTE:
Do not reuse the removed oil seals. Use only new seals.



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—and, in addition to this requirement, the width of the dye ring, which is the visualized seat "width", must be within the following specification:





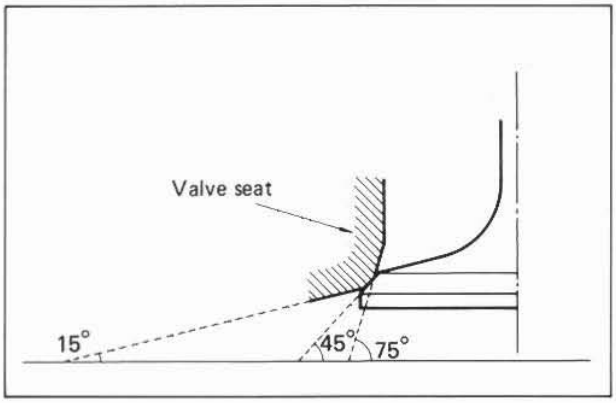
Valve seat width

Seat width	Standard
Ⓦ	1.1 – 1.3 mm (0.04 – 0.05 in)

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

VALVE SEAT SERVICING

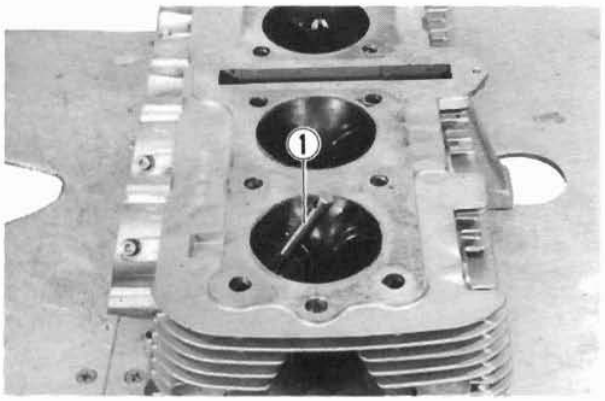
- The valve seats for both intake and exhaust valves are angled to present three bevels, 15°, 45° (seat contact surface) and 75°. To reface the seat, proceed as follows:



99103-45014-001	Valve seat cutter head (45°)
99103-45011-001	Valve seat cutter head (15° x 75°)

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 cleanup the seat with one or two turns.



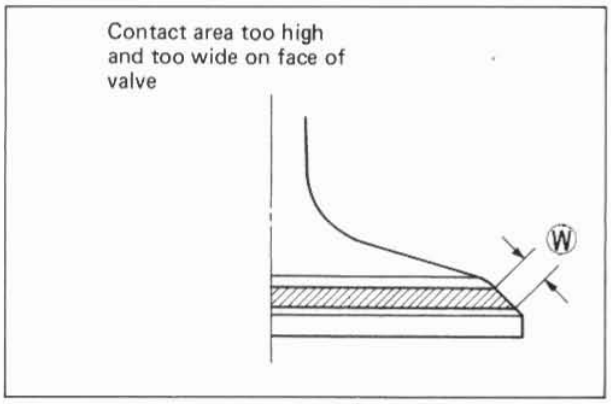
- Inspect the seat by the previously described seat width measurement procedure. If the seat is pitted or burned, additional seat conditioning with the 45° cutter is required.

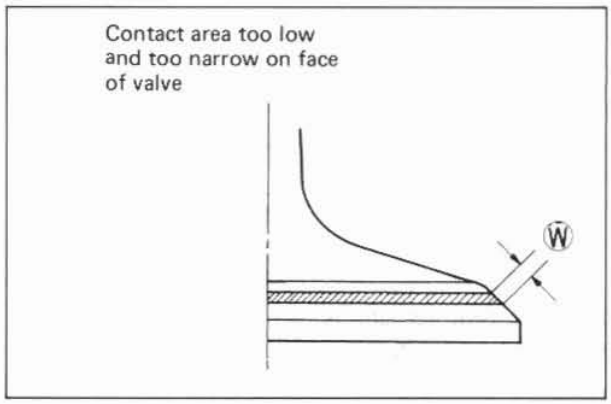
NOTE:
Cut only the minimum amount necessary from the seat to prevent the possibility of the valve stem becoming too close to the cam for correct tappet clearance adjustment.

If the contact area on the face of the valve is too low, use 75° cutter to raise the contact area. If the contact area is too high, use 15° cutter to lower the contact area. After cutting the 75° and 15° angles, it is possible that the valve seat (45°) is too narrow.

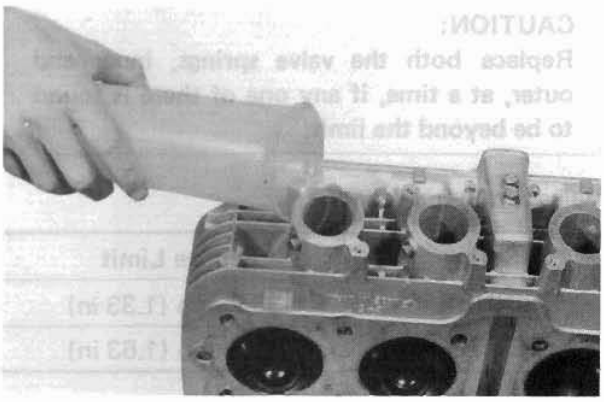
If so, re-cut the seat to the correct width.

- After the desired seat position and width are 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.

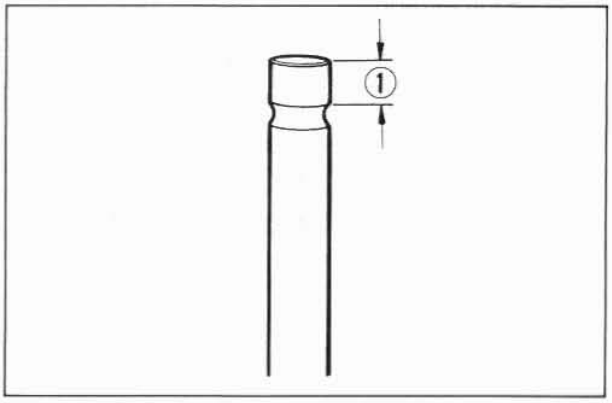




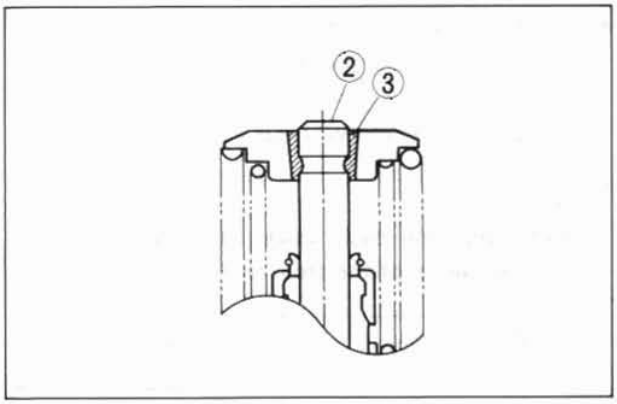
- Clean and assemble the head and valve components. Fill the intake and exhaust ports with gasoline to check for leaks. If any leaks occur, inspect the valve seat and face for burrs or other things that could prevent the valve from sealing.



NOTE:
* **Always use extreme caution when handling gasoline.**
* **After servicing the valve seats, be sure to adjust the tappet clearance after the cylinder head has been reinstalled. (see page 2-6)**

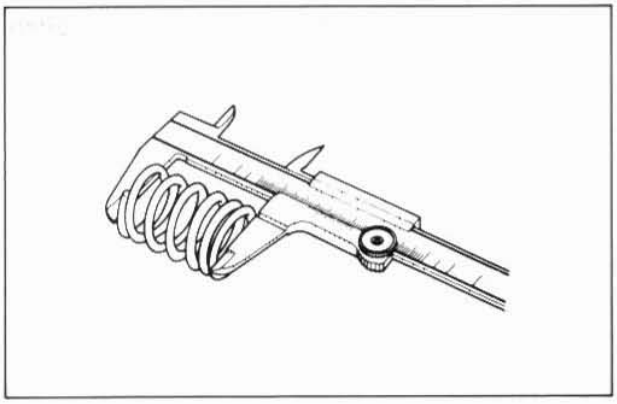


CAUTION:
* **Refacing valve stem end face is permissible where the length ① will not be reduced to less than 4.0 mm (0.16 in). If this length becomes shorter than 4.0 mm (0.16 in), then the valve must be replaced.**
* **After installing the valve whose stem end has been ground off as above, check that the face ② of valve stem end is above the valve cotter ③ .**



VALVE SPRINGS

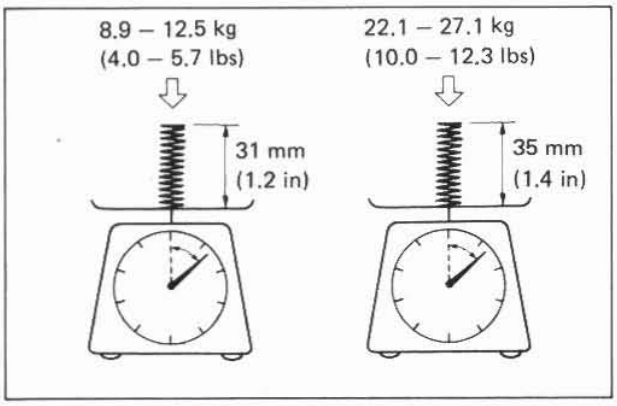
- The force of the two coil springs keeps the valve seat tight. Weakened springs result in reduced engine power output, and often account for the chattering noise coming from the valve mechanism.
- Check the springs for strength by measuring their free lengths and also the force required to compress them. If the limit indicated is exceeded by the free length reading or if the measured force does not fall within the range specified, replace with a SUZUKI spring.



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

Spring	Service Limit
INNER	33.9 mm (1.33 in)
OUTER	41.3 mm (1.63 in)



Valve spring tension

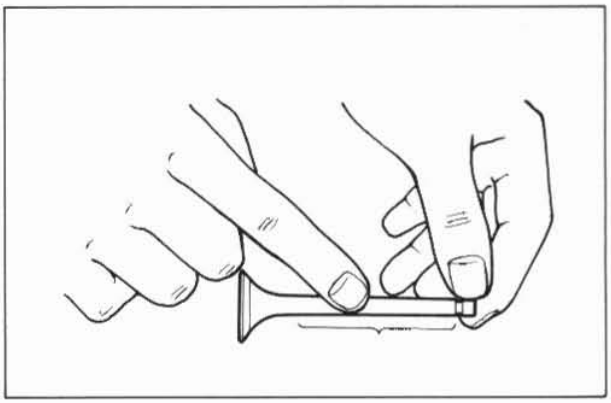
Spring	Standard
INNER	8.9 – 12.5 kg/ 31 mm (4.0 – 5.7 lbs/ 1.2 in)
OUTER	22.1 – 27.1 kg/ 35 mm (10.0 – 12.3 lbs/ 1.4 in)

REASSEMBLY

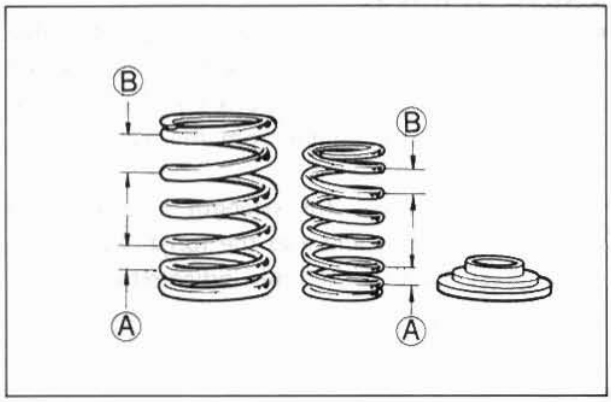
- Insert the valves, with their stems coated with high quality molybdenum disulfide lubricant (SUZUKI MOLY PASTE) all around and along the full stem length without any break.

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

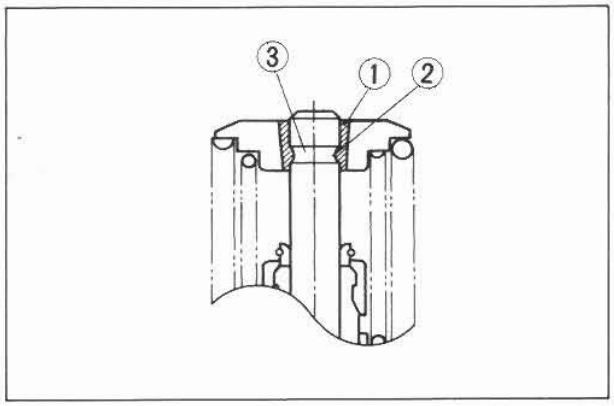
99000 - 25140	SUZUKI Moly Paste



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



- Put on the valve 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.

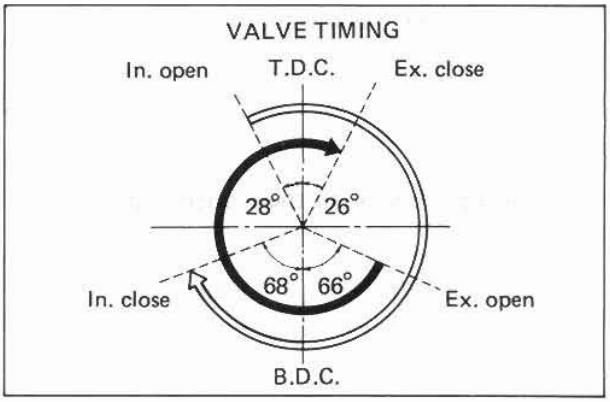


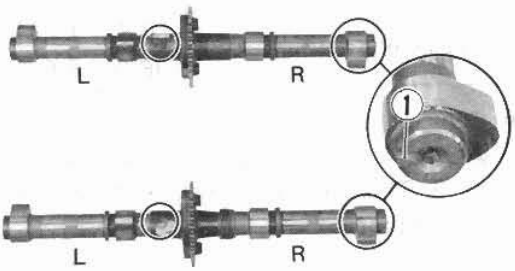
09916 - 14510	Valve spring compessor
09916 - 84510	Tweezer

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 engien has an abnormal noise or vibration or lack of power output. any of these conditions may be caused by camshafts worn down or distorted beyond 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 ① from the left end.



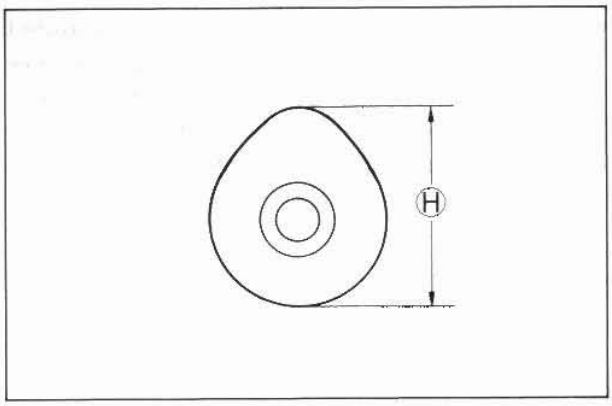


CAM WEAR

- Worn-down cams are often the cause of mistiming 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.

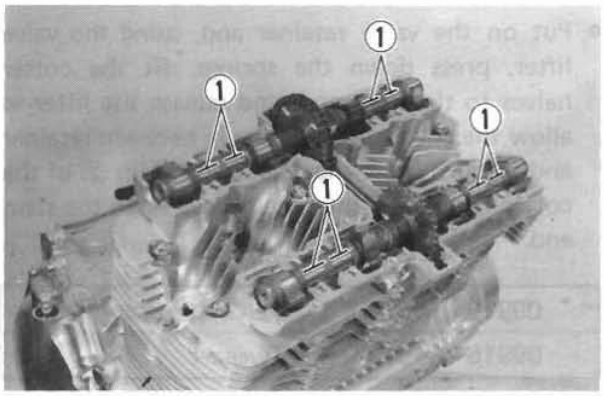
Cam height

Height Ⓗ	Service Limit
Intake cams	36.020 mm (1.4181 in)
Exhaust cams	35.470 mm (1.3965 in)



CAMSHAFT JOURNAL WEAR

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

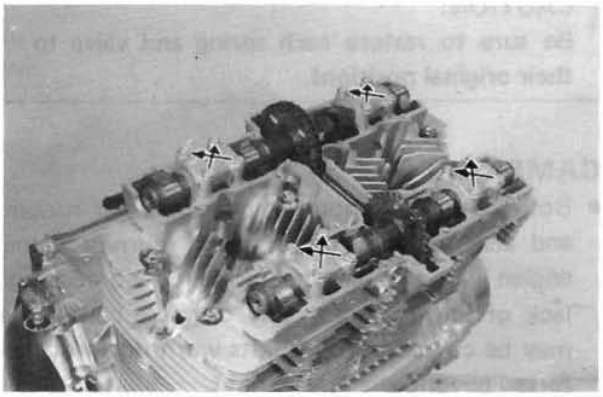


Camshaft journal oil clearance (In & Ex)

Service Limit	0.15 mm (0.006 in)

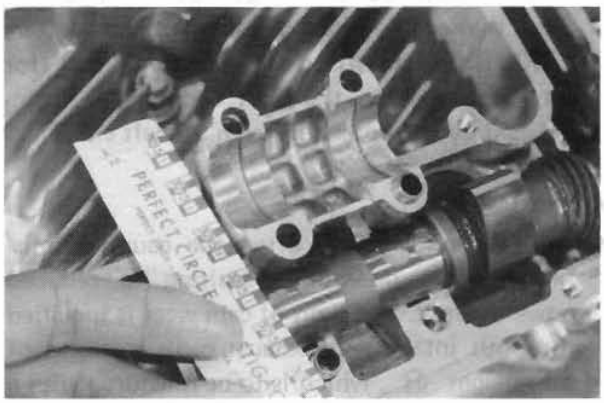
NOTE:
Install each holder to their original positions.

09900 - 22301	Plastigauge



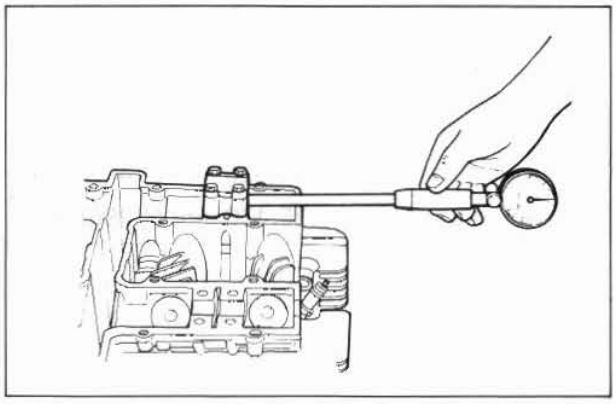
- Tighten the camshaft holder bolts evenly and diagonally to the specified torque.

Tightening torque	0.8 – 1.2 kg-m (6.0 – 8.5 lb-ft)



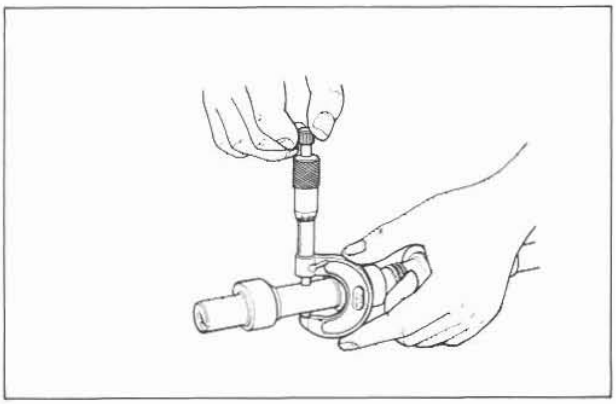
- Remove the camshaft holders, and read the width of compressed plastigauge with envelope scale. This measurement should be taken at the widest part.

- If the camshaft journal clearance measured exceed the limit, measure the inside diameter of camshaft bearing holder and outside diameter of the camshaft journal, note whichever difference from specification is greater.



09900 - 20205	Micrometer (0 – 25 mm)

	Standard
Journal holder I.D. (In & Ex)	22.012 – 22.025 mm (0.8666 – 0.8671 in)
Camshaft journal O.D. (In & Ex)	21.960 – 21.975 mm (0.8646 – 0.8652 in)

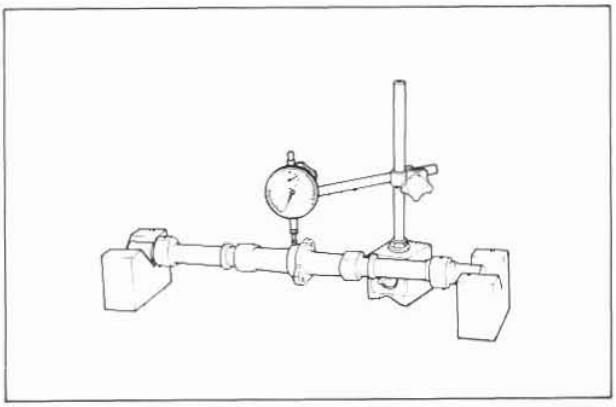


CAMSHAFT RUNOUT

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

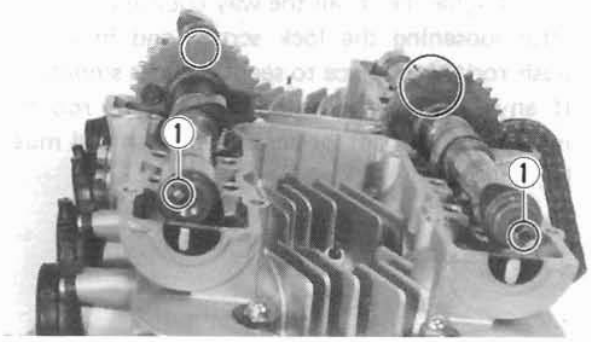
Camshaft runout (IN & EX)

Service Limit	0.1 mm (0.004 in)



CAM SPROCKET REASSEMBLY

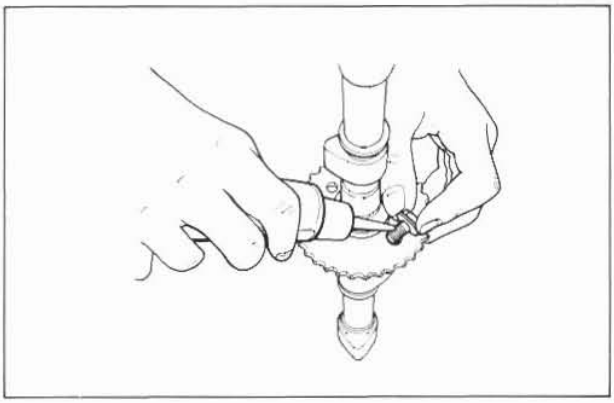
- It is very important that each sprocket be positioned angularly on its camshaft as illustrated. Its correct position is determined by arrow mark "3" (on INTAKE sprocket) or arrow marks "1" and "2" (on EXHAUST sprocket) located (as shown) in reference to the notch ① in the camshaft end.



- Apply THREAD LOCK SUPER "1363A" (99000-32030) to the threads of Allen-head bolts, and tighten them to the following torque value:

99104 - 32030	Thread lock super "1363A"

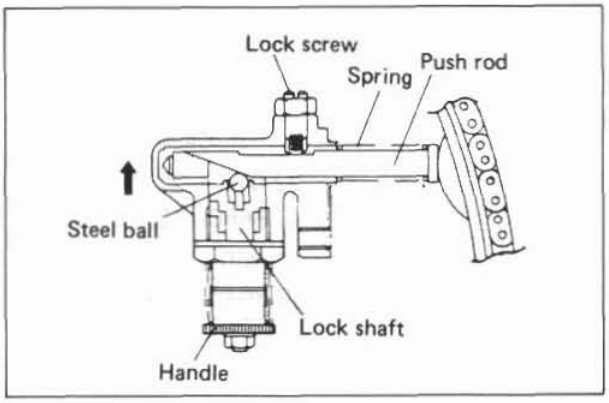
Tightening torque	2.4 – 2.6 kg-m (17.5 – 19.0 lb-ft)

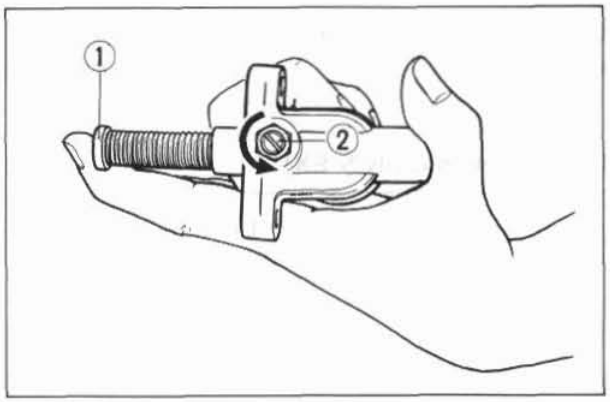


CAM CHAIN TENSIONER

DISASSEMBLY

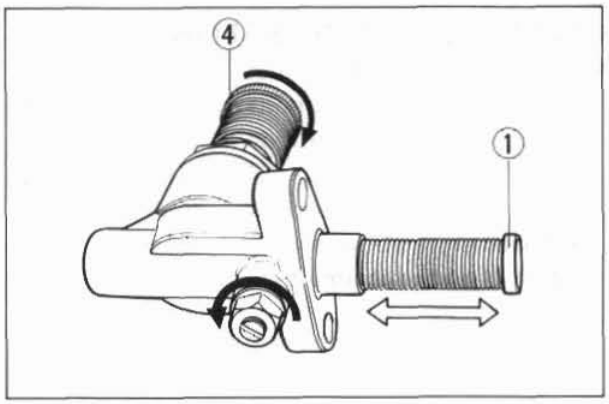
- The tension adjuster used in Model GS1100G is an automatic type that adjusts itself to apply a constant tensioning force to the chain by compensating for the stretch of the chain.
- The spring-loaded pushrod exerts a constant pressure on the camshaft chain. As the chain stretches, it yields to this pressure and remains in a state of tension. Once the adjuster is set after installation, there is no need to make any further adjustment.
- The pushrod is prevented from withdrawing. As a result, the pushrod effectively contends with the tendency of the camshaft chain to shake or vibrate during rough driving conditions.
- While pushing the push rod ①, loosen the lock screw ② and extract the push rod.



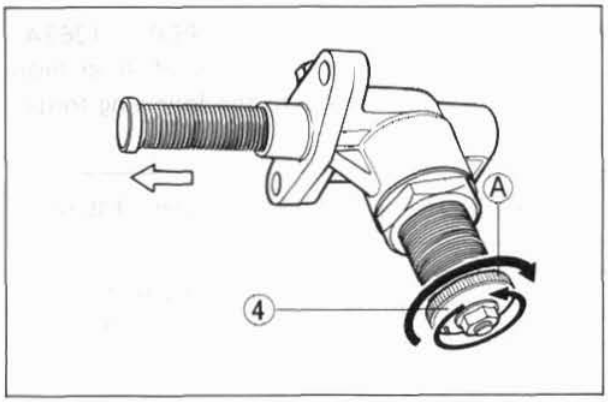


INSPECTION

- Turn the handle ④ all the way counterclockwise after loosening the lock screw, and move the push rod ① in place to see if it slides smoothly. If any stickiness is noted, remove the rod for inspection. A bent or scratched push rod must be replaced.

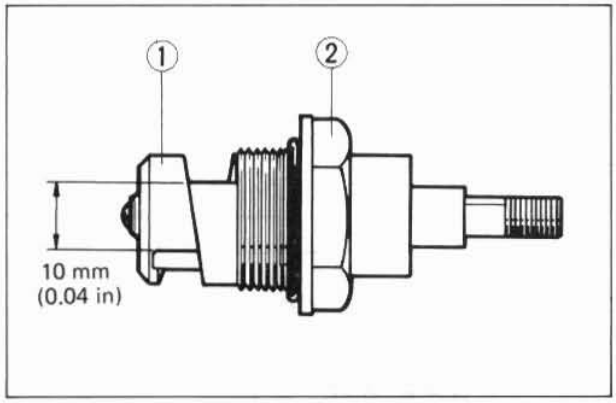


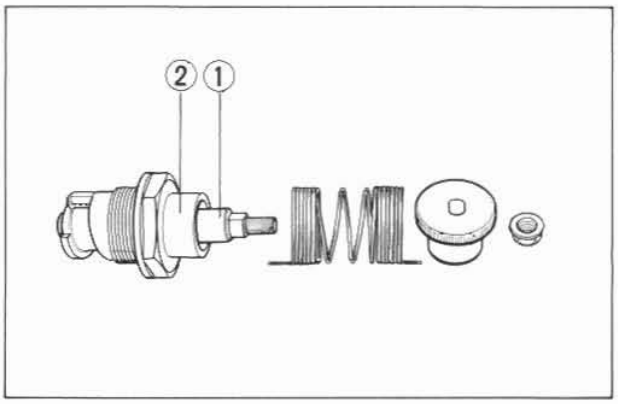
- Turn handle ④ all the way counterclockwise against the force of its coil spring and then turn it back as assisted by spring force to see if the handle returns to the original position Ⓐ without exhibiting any sticking on the way. Repeat this process several times. If any excessive sticking is felt or if the self-adjusting action is faulty, replace the whole tensioner.



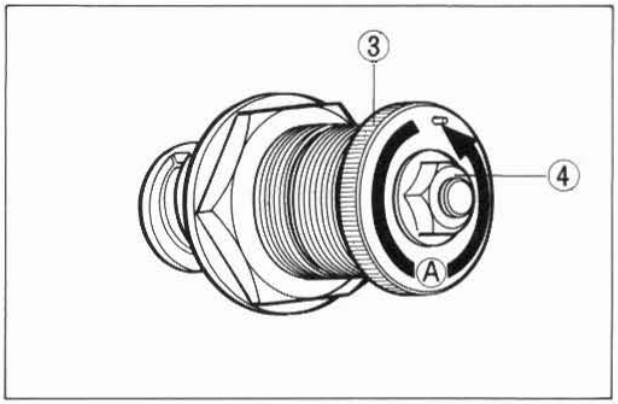
REASSEMBLING

- Apply engine oil to the lock shaft ①. Insert the shaft into the holder ②, and bring the two into the relative position indicated.





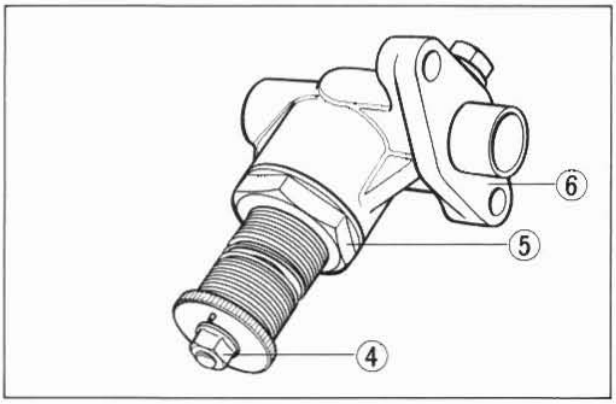
- Hook the spring onto the holder and handle ③, twist the spring by one complete rotation counterclockwise Ⓐ, fit the handle onto the shaft, and then tighten it by nut ④.



- After tightening the lock shaft nut ④, install the lock shaft assembly ⑤ on the tensioner body ⑥. Be sure to adhere to the following torque specifications:

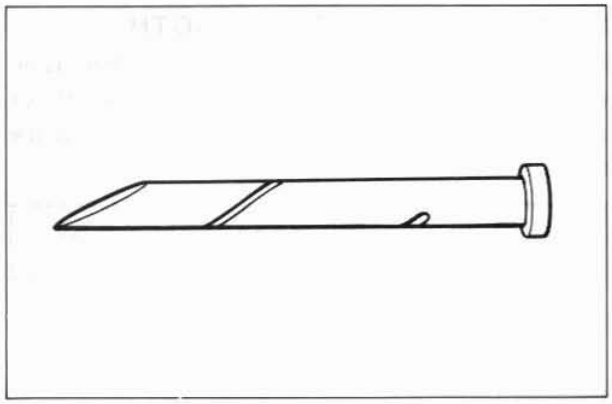
Lock shaft nut tightening torque	0.9 – 1.4 kg-m (6.5 – 10.0 lb-ft)

Shaft assembly tightening torque	3.1 – 3.5 kg-m (22.5 – 25.0 lb-ft)

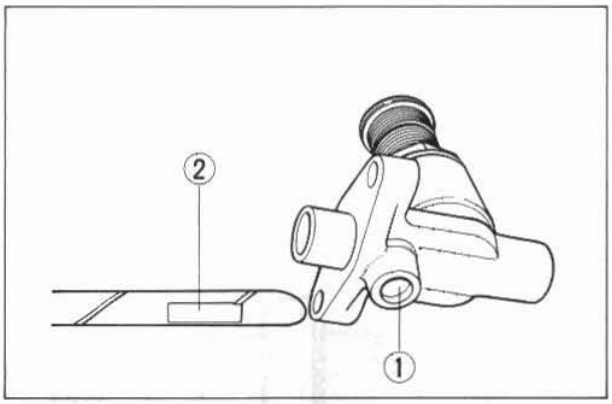


- Apply a high quality molybdenum disulfide lubricant (SUZUKI MOLY PASTE) to the push rod and engine oil to the push rod guide hole.

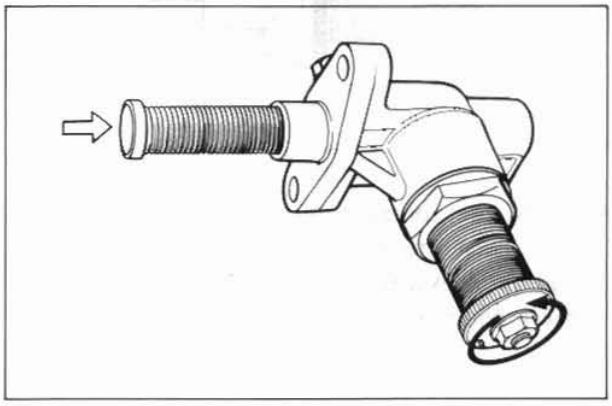
99000 - 25140	SUZUKI Moly Paste



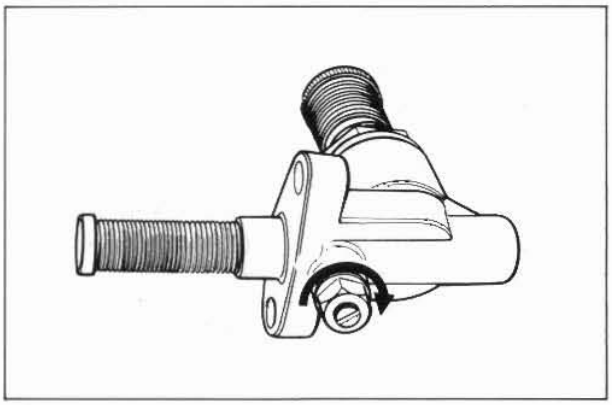
- Match the lock screw hole ① to the long groove ② in the push rod, as shown.
- Slide the push rod spring on the pushrod.



- While turning lock shaft handle counterclockwise, push in the pushrod all the way. Keep on turning the handle until it refuses to turn further.



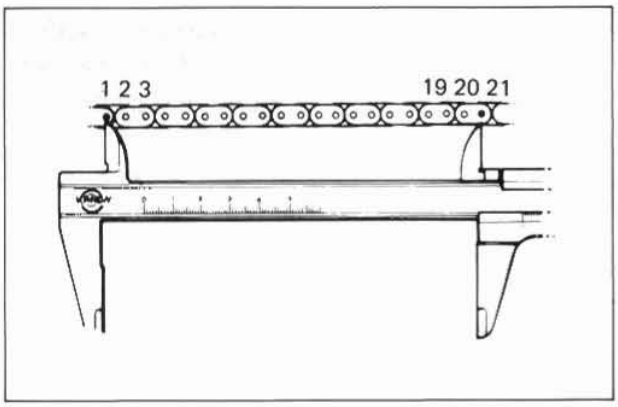
- Tighten the lock screw to lock the pushrod, so that the pushrod will not plunge out.



CAM CHAIN 20-PITCH LENGTH

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

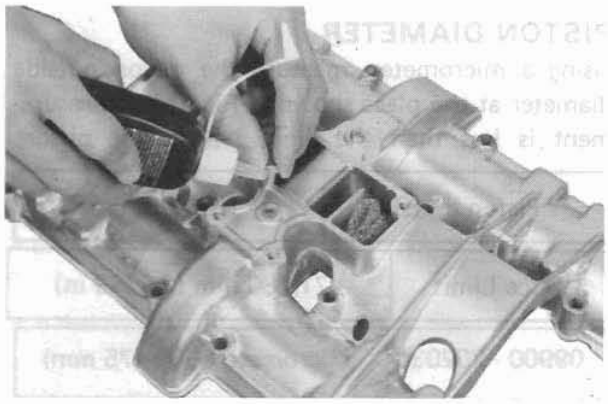
Service Limit	157.80 mm (6.213 in)



CAM CHAIN GUIDE

NOTE:
When replacing the following chain guide, apply SUZUKI Thread lock cement "1361A" to screw thread.

99104 - 32020	Thread lock super "1361A"

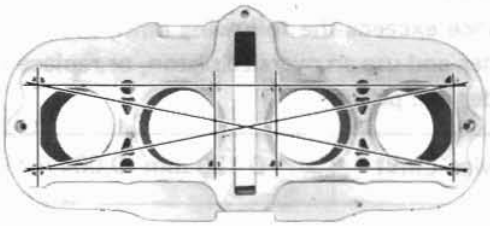


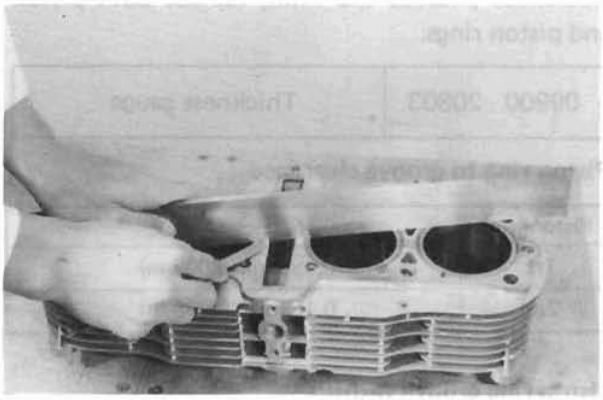
CYLINDER DISTORTION

Check the gasketed surface of the cylinder 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.

Cylinder distortion specification

Service Limit	0.2 mm (0.008 in)





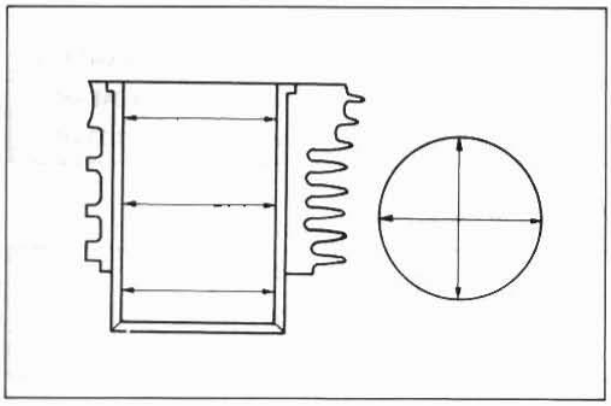
CYLINDER BORE

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 reboring is done on any one cylinder which measurement is beyond the limit, the remaining cylinders must be also rebored accordingly. Otherwise the imbalance might causes excess vibration.

Cylinder bore

Service Limit	72.080 mm (2.8378 in)

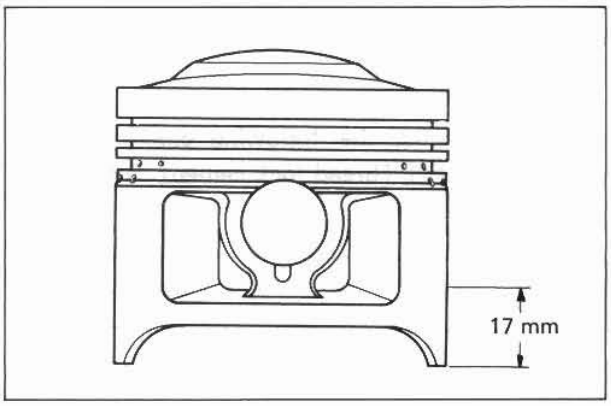
09900 - 20508	Cylinder gauge set



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.

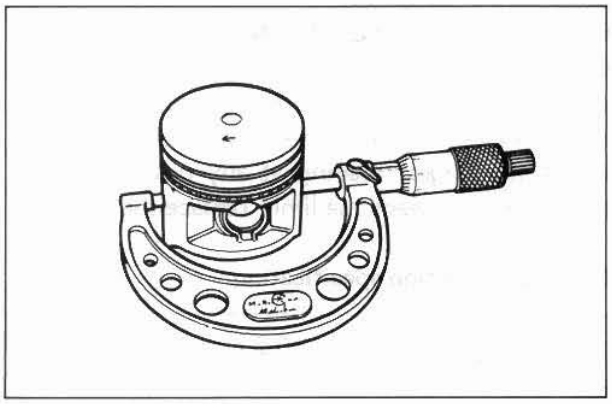
Piston oversize	0.5, 1.0 mm
Service Limit	71.880 mm (2.8299 in)
09900 - 20203	Micrometer (50 – 75 mm)



PISTON TO 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.

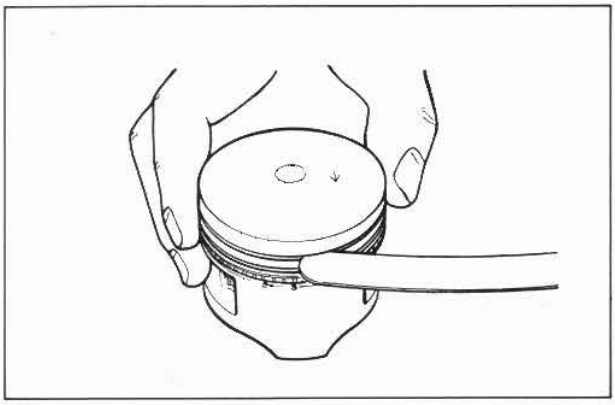
Service Limit	0.120 mm (0.0047 in)



PISTON RING TO 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

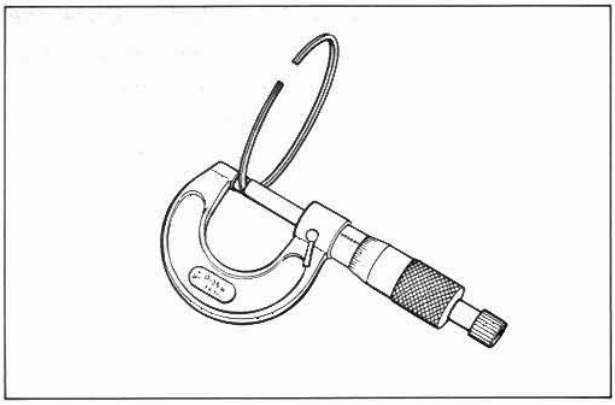


Piston ring to groove clearance

Piston ring	Service Limit
1st	0.18 mm (0.007 in)
2nd	0.15 mm (0.006 in)

Piston ring groove width

Piston ring	Standard
1st	1.025 – 1.045 mm (0.0404 – 0.0411 in)
2nd	1.21 – 1.23 mm (0.047 – 0.048 in)
Oil	2.51 – 2.53 mm (0.099 – 0.100 in)

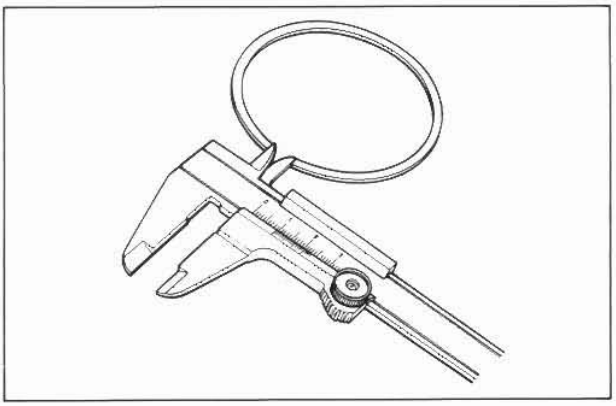


Piston ring thickness

Piston ring	Standard
1st	0.975 – 0.990 mm (0.0384 – 0.0390 in)
2nd	1.170 – 1.190 mm (0.0460 – 0.0469 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 bottom of the cylinder, and measure each ring end gap using a thickness gauge.
If any ring has an excess end gap, replace the ring.

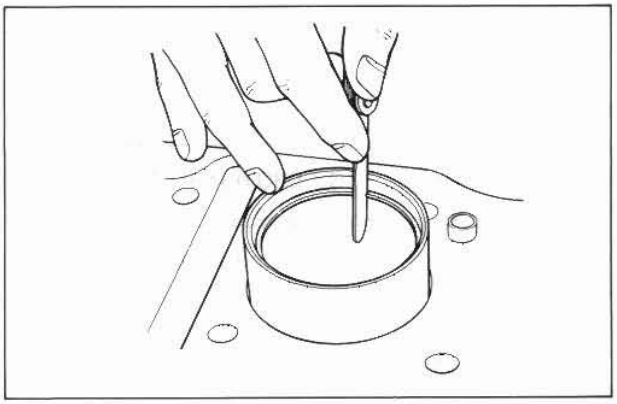


Piston ring free end gap

Piston ring	Service Limit
1st	Not under 7.6 mm (0.30 in)
2nd	Not under 8.8 mm (0.35 in)

Piston ring end gap

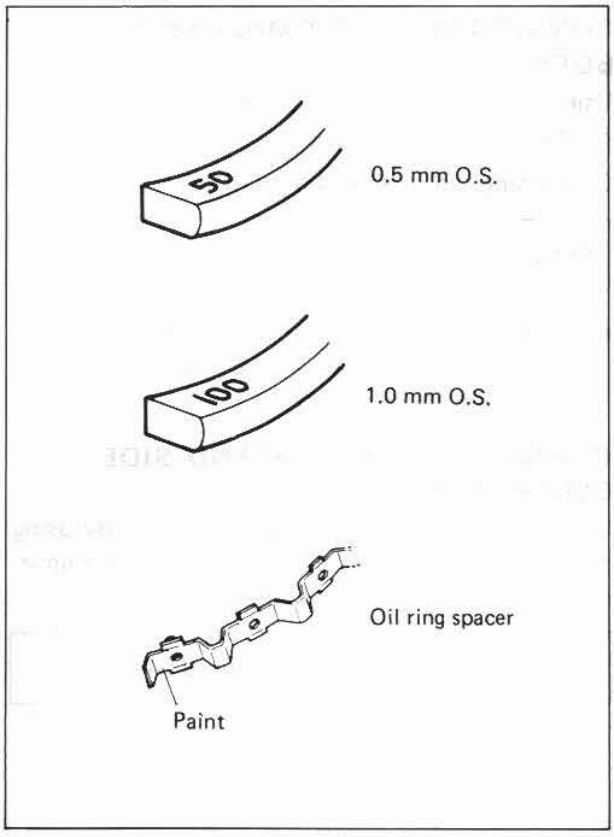
Piston ring	Service Limit
1st & 2nd	Not over 0.7 mm (0.03 in)



09900 - 20803	Thickness gauge

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

	1st	2nd
0.5 mm	50	50
1.0 mm	100	100



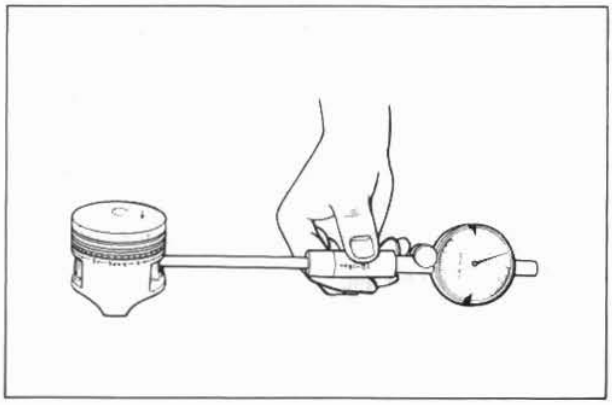
- **Oversize oil ring spacers**
  The following two types of oversize oil ring spacers are used. They bear the following identification marks.

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

- **Oversize side rail**
  Just measure outside diameter.

PISTON PIN AND PIN BORE

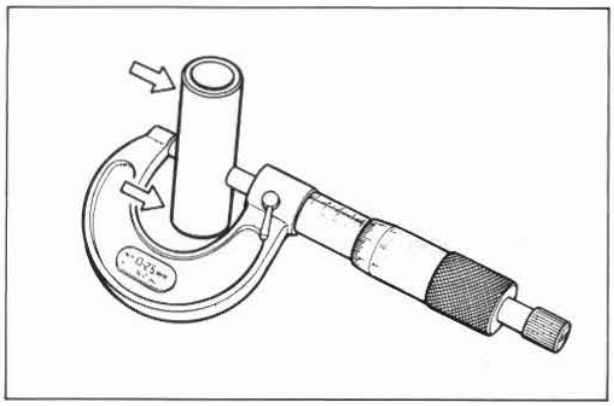
Using a small bore gauge, measure the piston pin bore inside diameter. If the reading exceeds the following limit, replace the pisotn.



Piston pin bore I.D.

Service Limit	18.030 mm (0.7098 in)

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

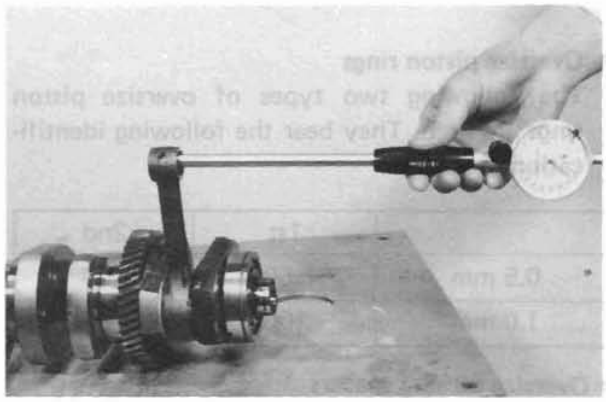


Piston pin O.D.

Service Limit	17.980 mm (0.7079 in)
09900 - 20205	Micrometer (0 – 25 mm)

CONNECTING ROD SMALL END BORE I.D.

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



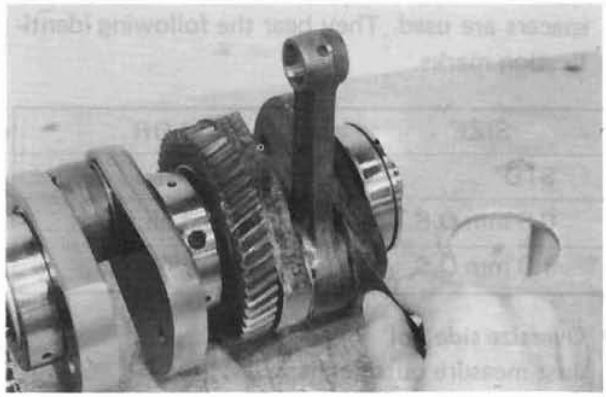
Connecting rod small end bore I.D.

Service Limit	18.040 mm (0.7102 in)

- If the connecting rod small end bore inside diameter exceeds the above mentioned limit, replace the connecting rod.

CONNECTING ROD BIG END SIDE CLEARANCE

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



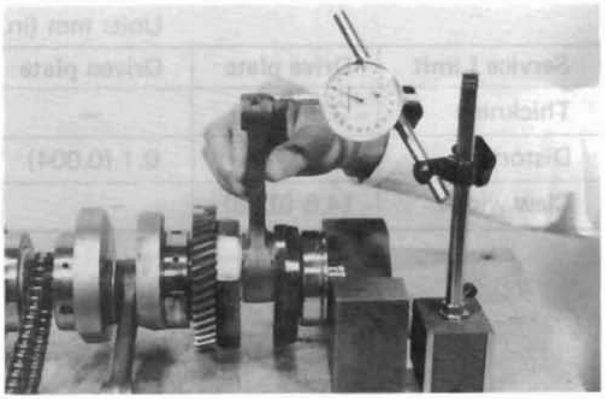
Service Limit	1.0 mm (0.04 in)

CRANK PIN WEAR AND BIG END BEARING

Check the wear of each crankpin in terms of connecting rod movement using a dial gauge as shown.

Service Limit	3.0 mm (0.12 in)

Where the limit is exceeded, replace crankshaft assembly or reduce the deflection and the side clearance within the limit by replacing the worn parts — connecting rod, big end bearing, crankpin and thrust washer etc.

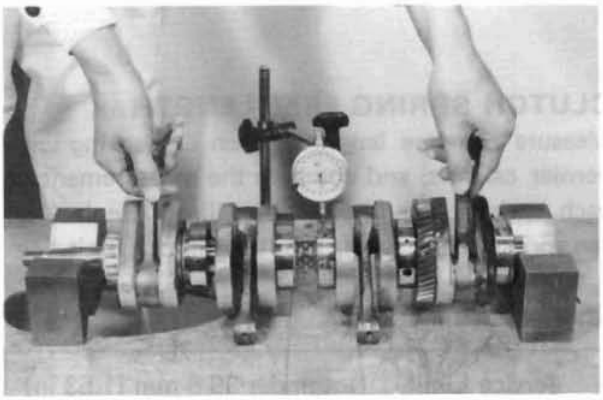


CRANKSHAFT RUNOUT

Support the crankshaft with "V" blocks as shown, with the two end bearing journals resting on the blocks. Rig 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.

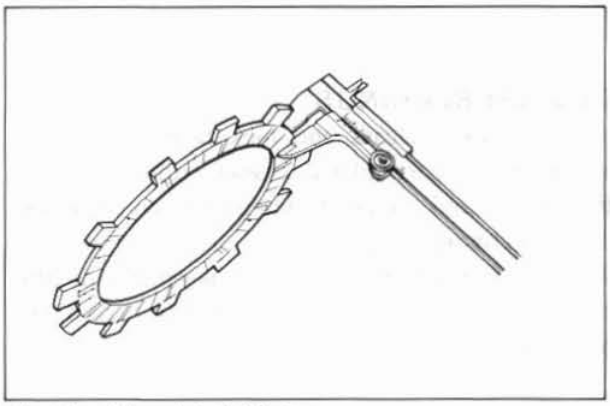
Crankshaft runout specification

Service Limit	0.10 mm (0.004 in)



CLUTCH DRIVE PLATES AND DRIVEN PLATES

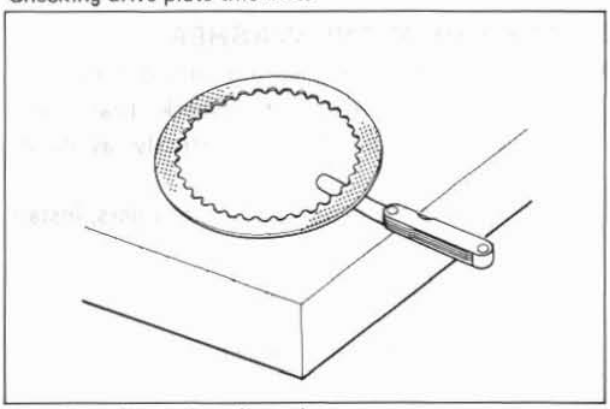
Clutch plates in service are lubricated with oil. Because of this condition, both drive fiber and driven metal plates are subject to little wear. Their life depends largely on the quality of oil used in the clutch and also on the way the clutch is operated.



Checking drive plate thickness

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

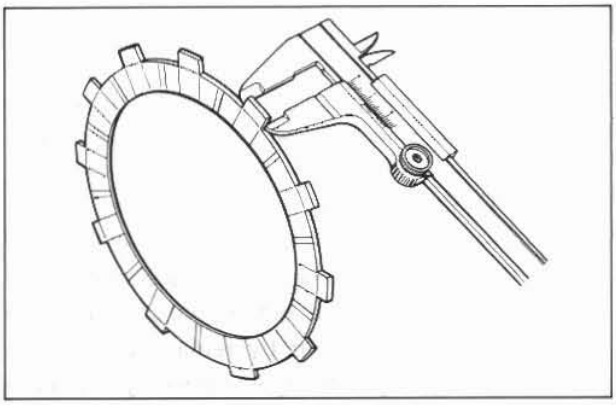
09900 - 20101	Vernier calipers
09900 - 20803	Thickness gauge



Checking driven plate distortion

Unit: mm (in)

Service Limit	Drive plate	Driven plate
Thickness	2.6 (0.10)	–
Distortion	–	0.1 (0.004)
Claw width	14.8 (0.58)	–



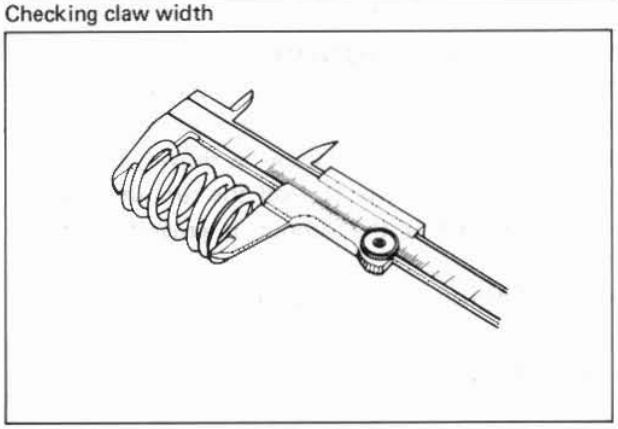
Checking claw width

CLUTCH SPRING FREE LENGTH

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

Clutch spring free length

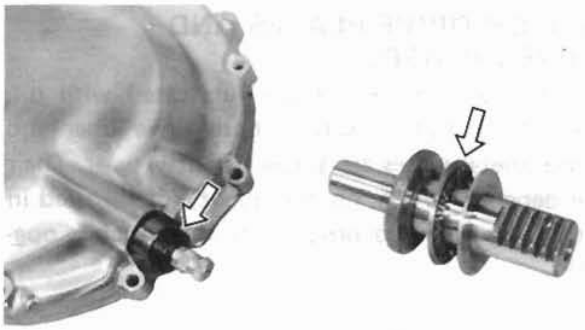
Service Limit	Not under 38.8 mm (1.53 in)



CLUTCH BEARINGS

Inspect clutch release and rack bearings for any abnormality, particularly cracks, upon removal from the clutch, to decide whether it can be reused or should be replaced.

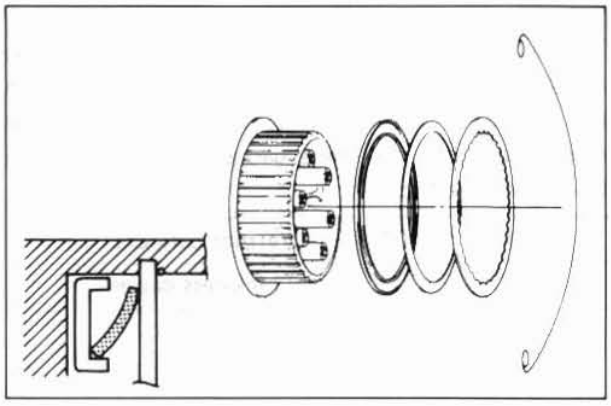
Smooth engagement and disengagement of the clutch depends much on the condition of these bearings.



SLEEVE HUB WAVE WASHER

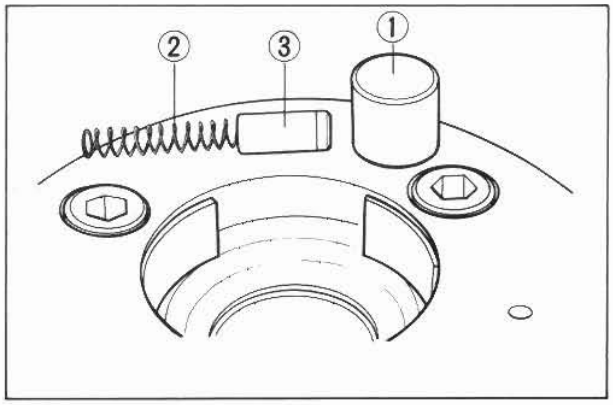
- Install the spring seat, spring, and driven plate in the clutch sleeve hub. Check that these three parts are positioned correctly as illustrated.
  While holding the driven plate with pliers, install the piano wire clip.

NOTE:
Always use a new piano wire clip.



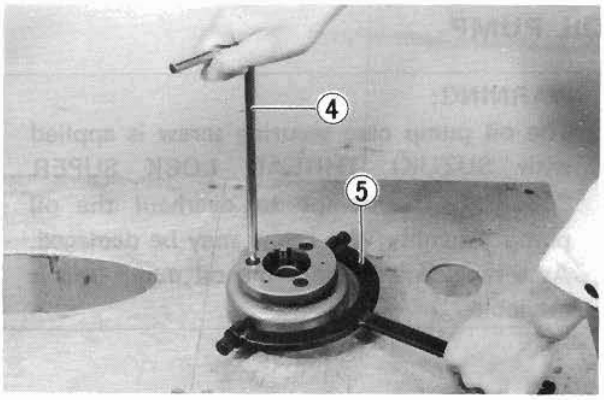
STARTER CLUTCH REMOVAL

- Remove roller ① , spring ② , and push piece ③ from starter clutch.



- Clamp the rotor with a vise taking care not to damage it and separate starter clutch from the rotor using the T type hexagon wrench ④ and rotor holder ⑤ .

09914 - 25811	"T" type hexagon wrench (6 mm)
09930 - 44910	Rotor holder

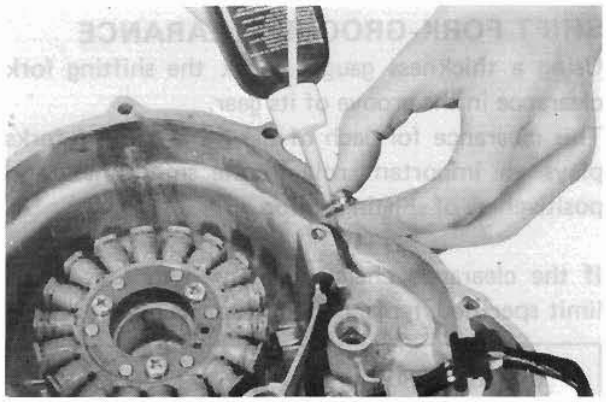


ASSEMBLY

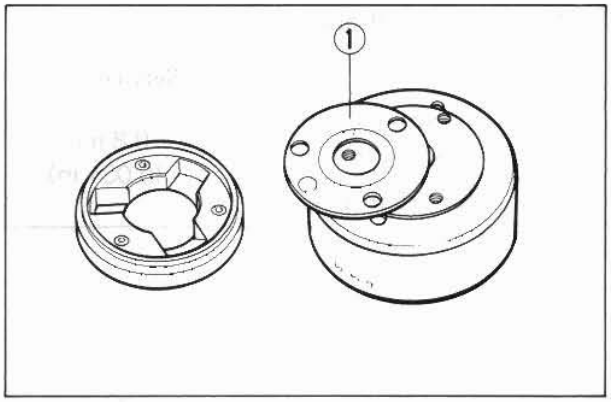
- Apply THREAD LOCK "1363C" to the stator set screws and its lead wire guide screws.

99104 - 32050	THREAD LOCK "1363C"

NOTE:
Wipe off oil and grease on screw completely, and then apply the screw lock.



- Mount the lead wire clamp as shown in the photo.
- Locate the shim ① to the proper position.

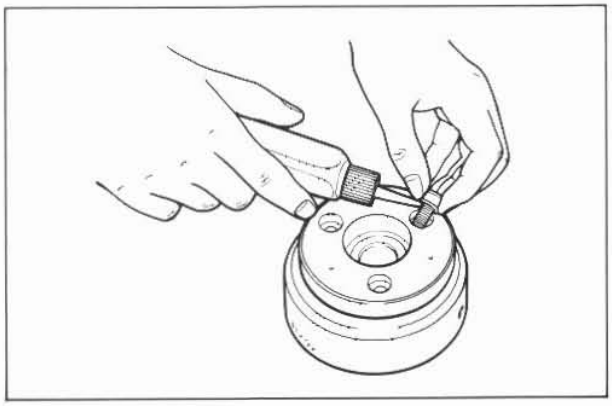


- Apply THREAD LOCK SUPER "1361A" to allen bolts and tighten with specified torque.

99104 - 32020	Thread lock super "1361A"

09914 - 25811	T-type hexagon wrench

Tightening torque	1.5 – 2.0 kg-m (11.0 – 14.5 lb-ft)



OIL PUMP

WARNING:
The oil pump case securing screw is applied with SUZUKI THREAD LOCK SUPER "1363A". If attempt to overhaul the oil pump assembly, the screw may be damaged. As a replacement, only the oil pump unit is available.

SHIFT FORK-GROOVE CLEARANCE

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

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

09900 - 20803	Thickness gauge

Shift fork-Groove clearance

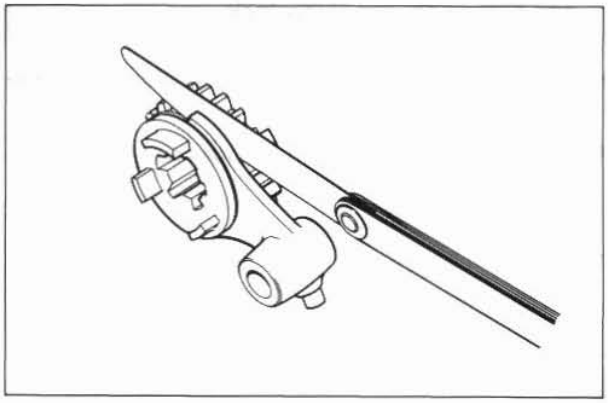
		Service Limit
No. 1	for 4th and 5th driven gears	0.8 mm (0.031 in)
No. 2	for 3rd drive gear	

Shift fork groove width

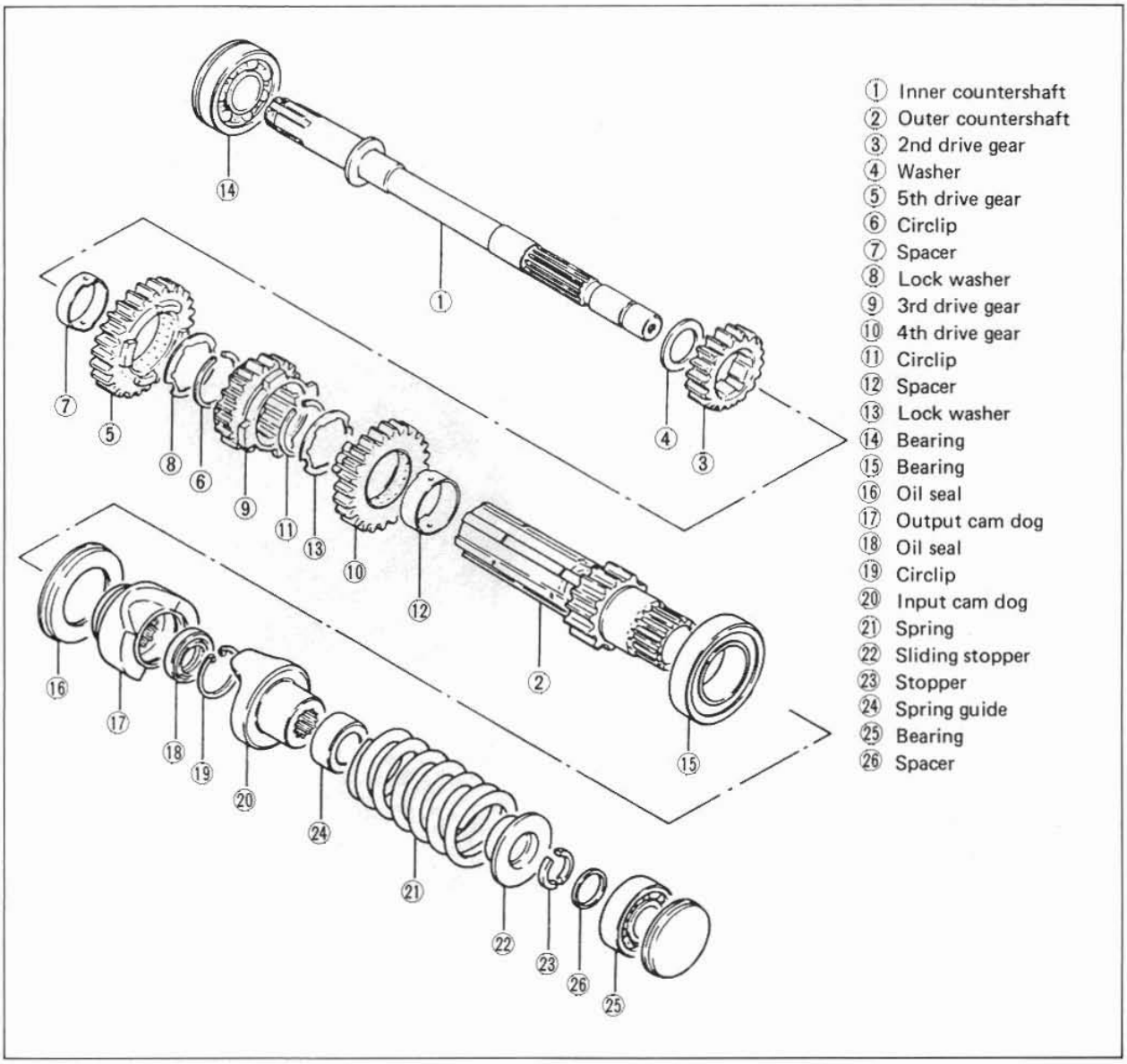
Standard	5.45 – 5.55 mm (0.216 – 0.219 in)

Shift fork thickness

Standard	4.95 – 5.05 mm (0.195 – 0.199 in)



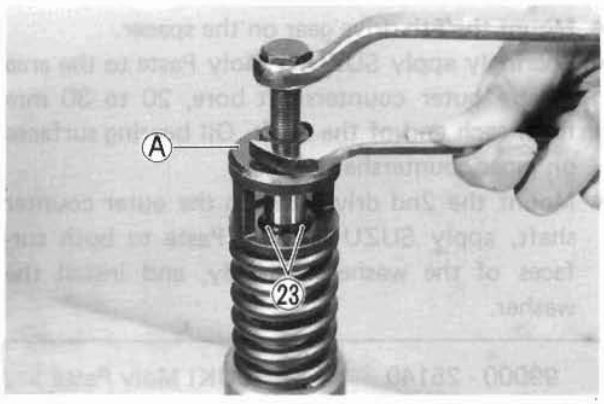
COUNTERSHAFT GEARS



COUNTERSHAFT DISASSEMBLY

- Remove the bearing ㉕ and spacer ㉖, compress the spring with the special tool Ⓐ, and remove two stoppers ㉓.

09924 - 44510	Dog cam stopper set tool



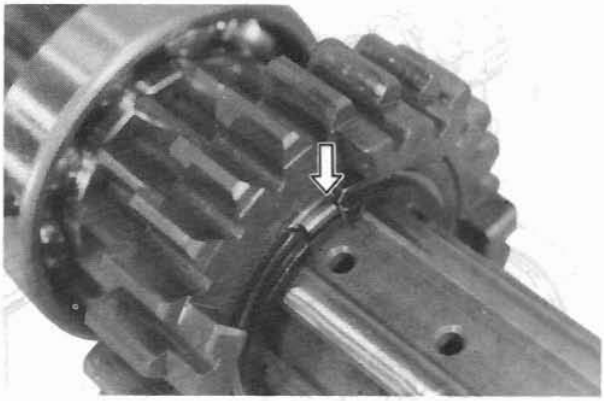
COUNTERSHAFT REASSEMBLY

- Before installing the gears, wash and clean each component with cleaning solvent.

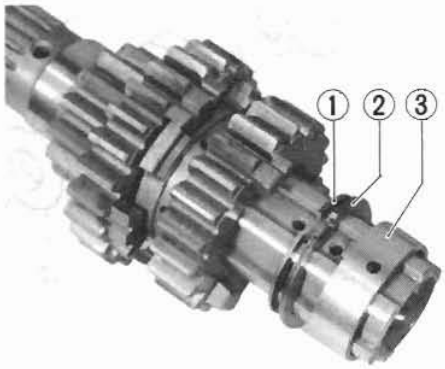
> **CAUTION:**
> **Always use new circlip when reassembling.**

- When installing 4th drive gear spacer, align the oil hole of the outer countershaft and the spacer oil hole.

- Mount the 4th drive gear.
- Install the lock washer to the spacer dogs.
  Take special care so that the circlip is correctly installed, fit it to the side where the thrust is as shown in the figure.

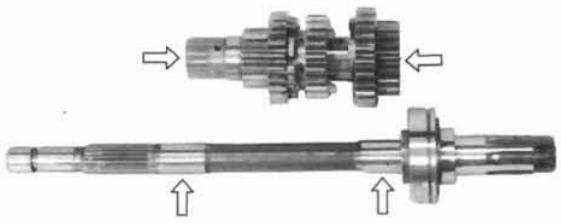


- Mount the 3rd drive gear on the outer countershaft.
- Mount the circlip ① and the lock washer ②.
- When installing 5th drive gear spacer ③, align the oil hole of the outer countershaft and the spacer oil hole.

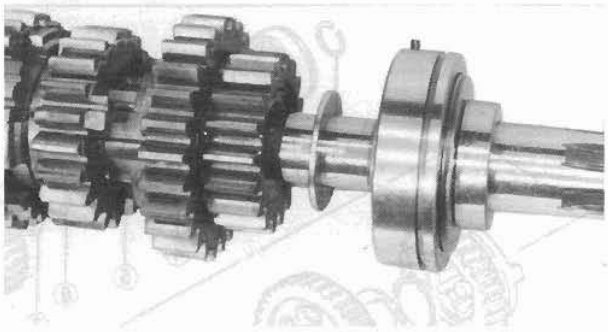


- Mount the 5th drive gear on the spacer.
- Sparingly apply SUZUKI Moly Paste to the area of the outer countershaft bore, 20 to 30 mm from each end of the shaft. Oil bearing surfaces on inner countershaft.
- Mount the 2nd drive gear on the outer counter shaft, apply SUZUKI Moly Paste to both surfaces of the washer sparingly, and install the washer.

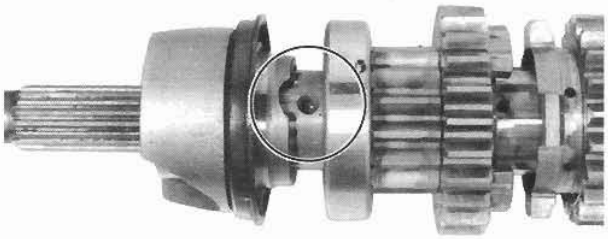
99000 - 25140	SUZUKI Moly Paste



- Now install inner shaft into outer shaft.

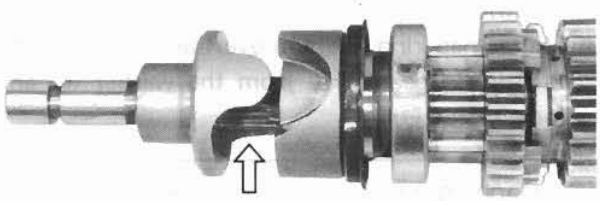


- Mount the oil seal and the output cam dog on the outer countershaft.
  Align the cut on the cam dog with the oil hole in the countershaft.



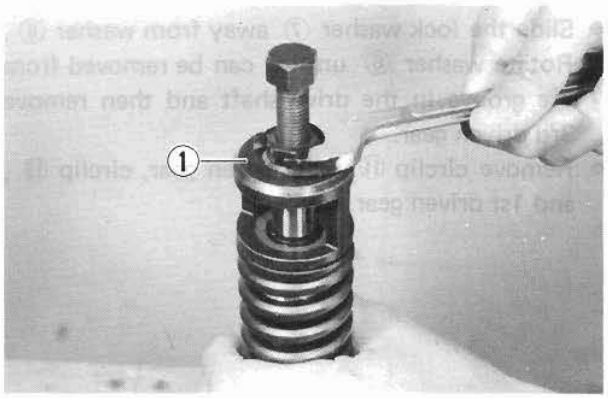
- Apply SUZUKI MOLY PASTE to the splines of the input cam dog, and mount it on the inner countershaft.

99000 - 25140	SUZUKI Moly Paste

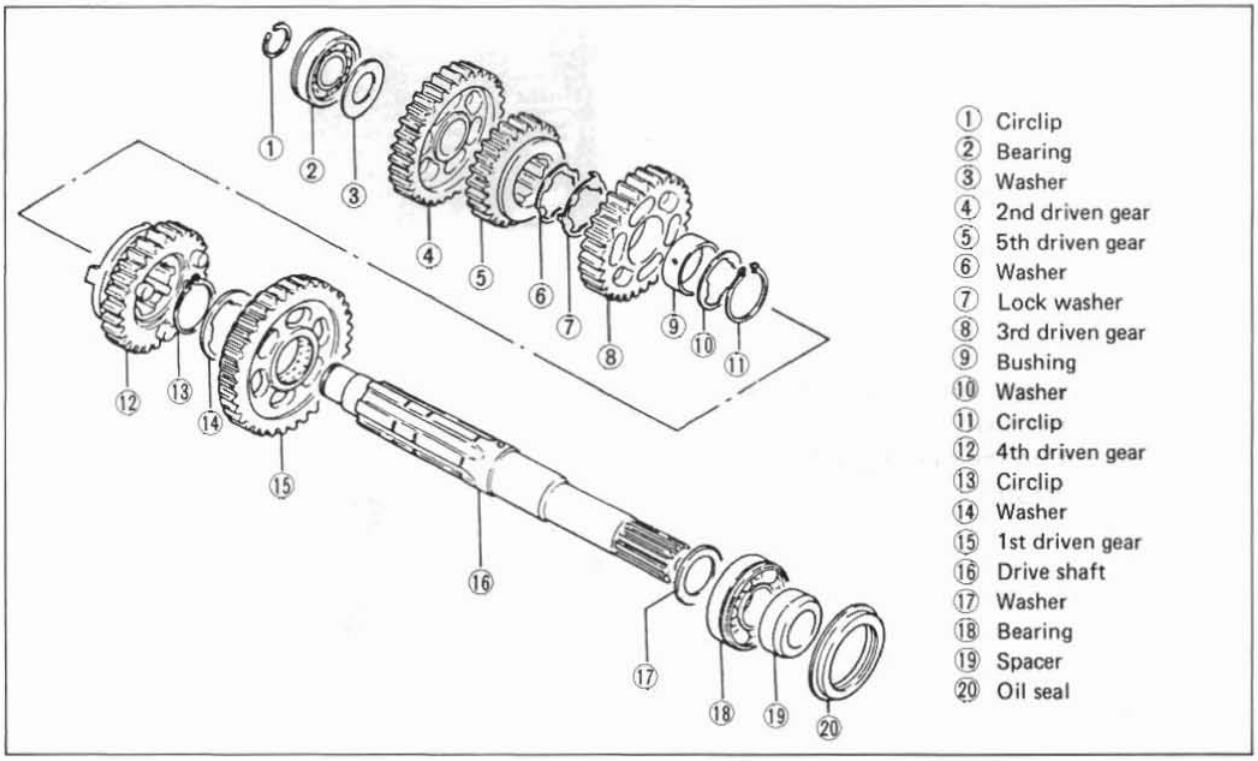


- Mount the spring, spring guide, and sliding stopper on the inner countershaft, and compress the spring with the special tool ① , and install the two stoppers.

09924 - 44510	Dog cam stopper set tool



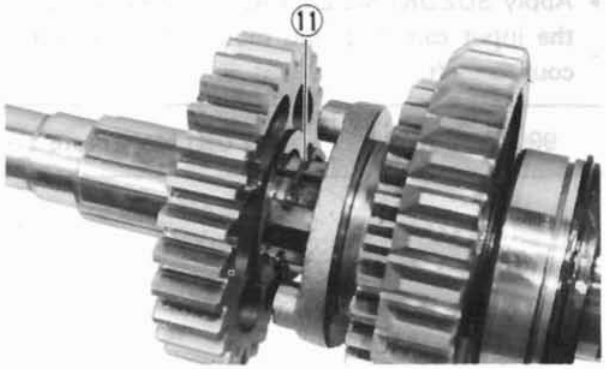
DRIVE SHAFT GEARS



DRIVE SHAFT DISASSEMBLY

- Remove circlip ①, bearing ② and washer ③.
- Remove 2nd driven and 5th driven gears from the drive shaft.
- Using snap ring pliers, move the circlip ⑪ and 3rd driven gear away from the washer ⑥ and lock washer ⑦.

09900 - 06104	Snap ring pliers

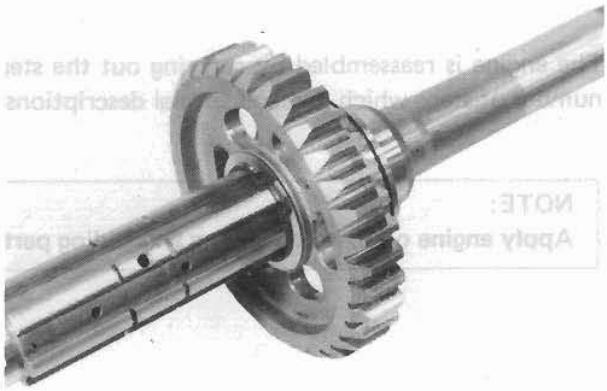


- Slide the lock washer ⑦ away from washer ⑥. Rotate washer ⑥ until it can be removed from the groove in the drive shaft and then remove 3rd driven gear.
- Remove circlip ⑪, 4th driven gear, circlip ⑬, and 1st driven gear.

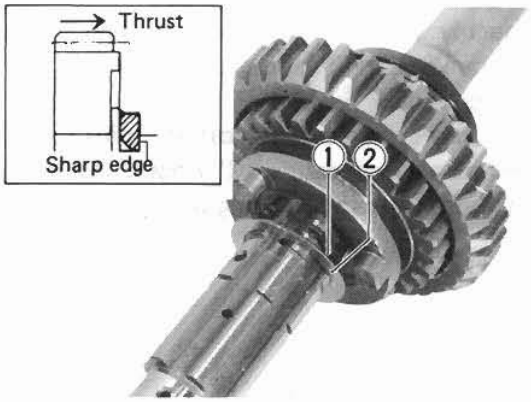
DRIVE SHAFT REASSEMBLY

- Before installing the shaft and gears, wash them in a cleaning solvent.
- Mount the 1st driven gear, washer and circlip on the drive shaft.
  Always use new circlip.
- Apply SUZUKI Moly Paste to the drive shaft spline lightly.

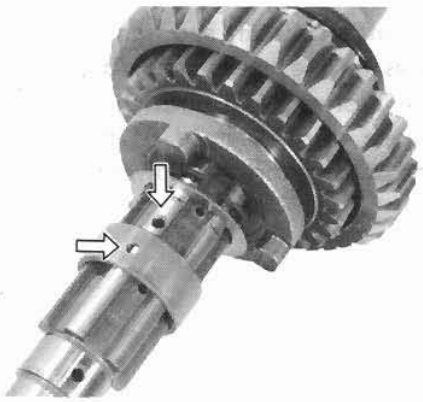
99000 - 25140	SUZUKI Moly Paste



- Mount the 4th driven gear.
- Mount the circlip ⑪ and washer ⑩ on the drive shaft.
  Temporarily position the circlip ⑪ beyond the groove.
  Always use new circlip.



- Align the hole in the spacer with the oil hole in the drive shaft, and install the 3rd driven gear.



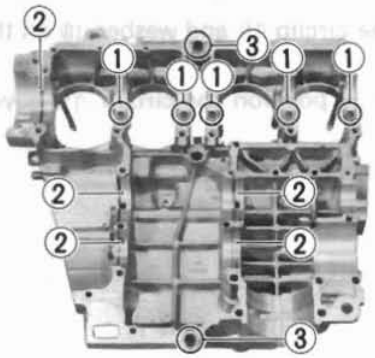
- Mount the lock washer and washer, on the drive shaft, in that order, and by turning the washer in or out, align the lock washer tongue with the cut on the washer.
- Fit the circlip ⑪ in the groove on the drive-shaft.
- Take special care so that the circlip ⑪ is correctly installed.
  Fit it to the side where the thrust is as shown in the figure.
- Mount the 5th driven gear and 2nd driven gear.

ENGINE REASSEMBLY

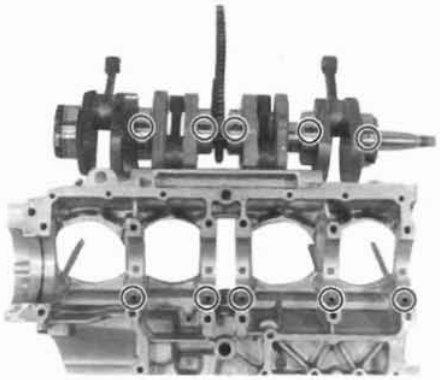
The engine is reassembled by carrying out the steps of disassembly in the reversed order, but there are a number of steps which demand special descriptions or precautionary measures.

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

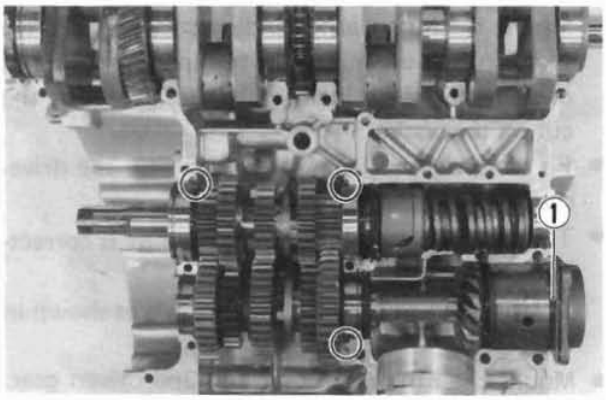
- Thoroughly wash the upper crankcase and the lower crankcase with solvent to remove any sealing compound.
- Firmly insert crankshaft locating "pins" ① , transmission gear locating "C" rings ② for bearings on both sides and locating pin ③ .



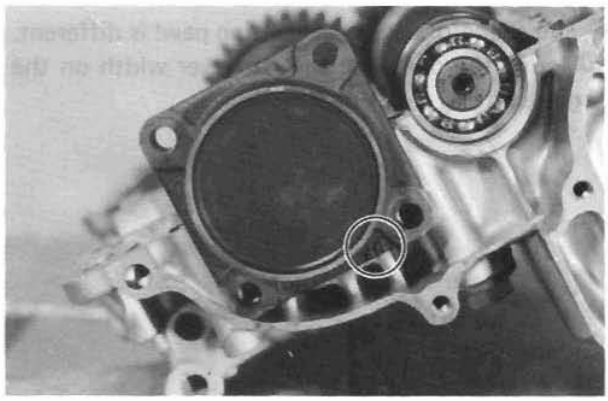
- Mount crankshaft and transmission shaft assemblies on the upper case. At this time firmly fit the bearing races onto the locating pins with punch mark stamped on the circumference of the bearings directed upwards.



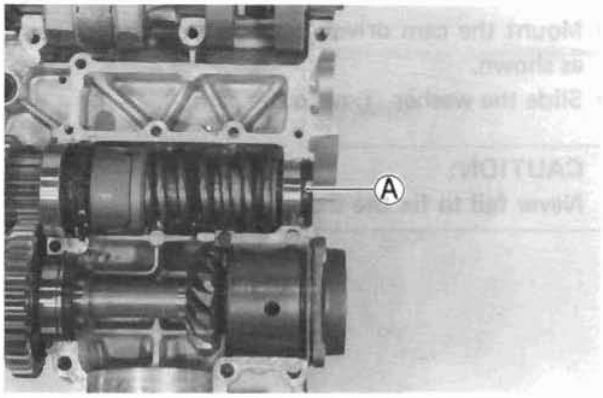
- Use the "C" rings and bearing stopper pins to position the bearings as shown in the photo.
- Install the secondary drive gear assembly with new O-ring ① .



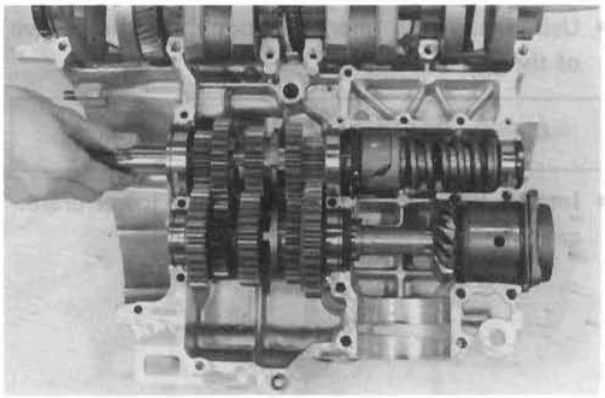
CAUTION:
Drive bevel gear housing must be installed with letter "UP" facing upper crankcase as shown in Fig.



- Install the countershaft end cap to the position Ⓐ .

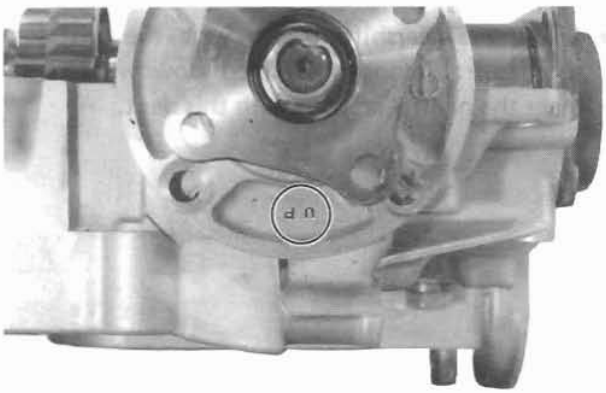


- Before installing secondary driven gear assembly, make sure that the countershaft turns freely. If not, shift the gear which is engaged to the neutral position.

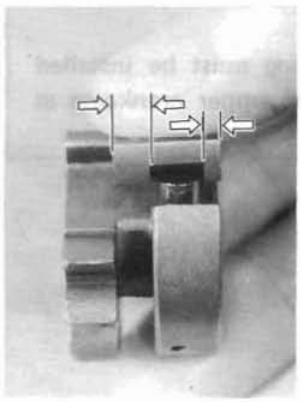


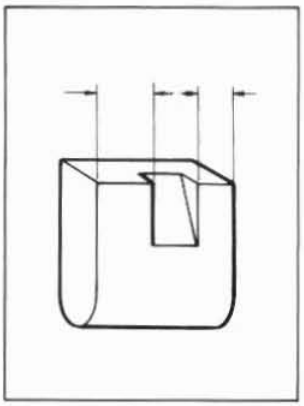
- Install the secondary driven gear assembly with new O-ring.

CAUTION:
Driven bevel gear housing must be installed with letter "UP" facing upper crankcase as shown in Fig.



- The shape of each gear shifting pawl is different. Mount the one with the narrower width on the gear shifting cam side.





- Mount the cam driven gear on the gearshift cam as shown.
- Slide the washer ① onto the cam.

CAUTION:
Never fail to fix the thrust washer.

- Using snap ring pliers, fix circlip in the groove of the gearshifting cam.

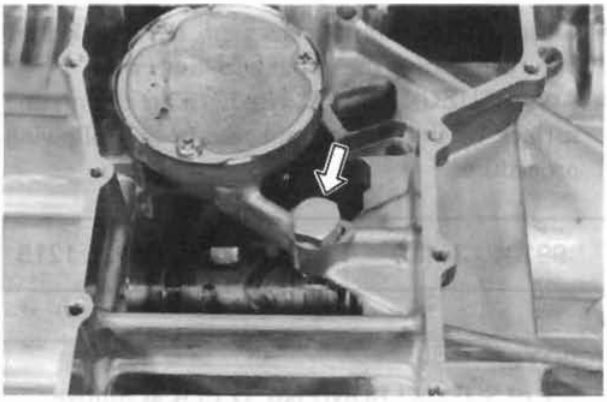
09900 - 06104	Snap ring pliers

- Install the gearshifting cam to the lower crankcase.

- Install the gearshifting cam with the dent for the neutral stopper directed downward, and meet the neutral stopper with this dent.

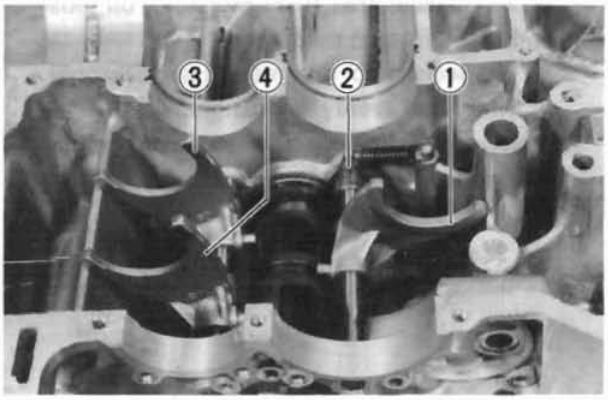
- Tighten the neutral stopper housing to the following torque value.

Tightening torque	1.8 – 2.8 kg-m (13.0 – 20.0 lb-ft)



- Install gearshifting fork ① for the 3rd drive gear and gearshift cam stopper ② .

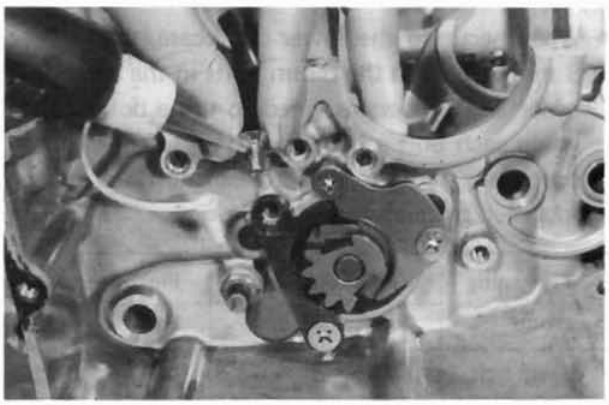
NOTE:
Hitch the cam stopper spring to the other side of the crankcase rib.



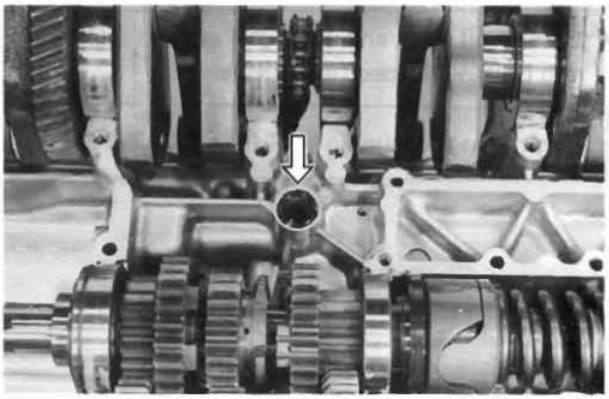
- Install the two gearshifting forks for 4th and 5th driven gears.
  ③ Gearshifting fork for 4th driven gear.
  ④ Gearshifting fork for 5th driven gear.

- Install both gearshifting cam guide and gearshifting pawl lifter screws with thread lock "1363C".

99104 - 32050	Thread Lock "1363C"



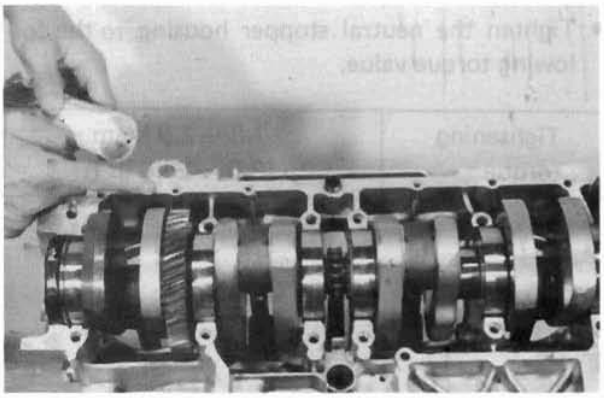
- Install the new O-ring.



- Clean the mating surfaces of the crankcases before matching the upper and lower ones.
- Apply SUZUKI BOND No.1215 to the mating surface of the lower crankcase in the following procedure.

99104 - 31110	SUZUKI Bond No. 1215

NOTE:
Use of SUZUKI BOND No.1215 is as follows:
* **Make surfaces free from moisture, oil, dust and other foreign materials.**
* **Apply sealant to one mating surface only, as thinly and evenly as possible.**
* **Wait approximately 10 minutes before assembling.**

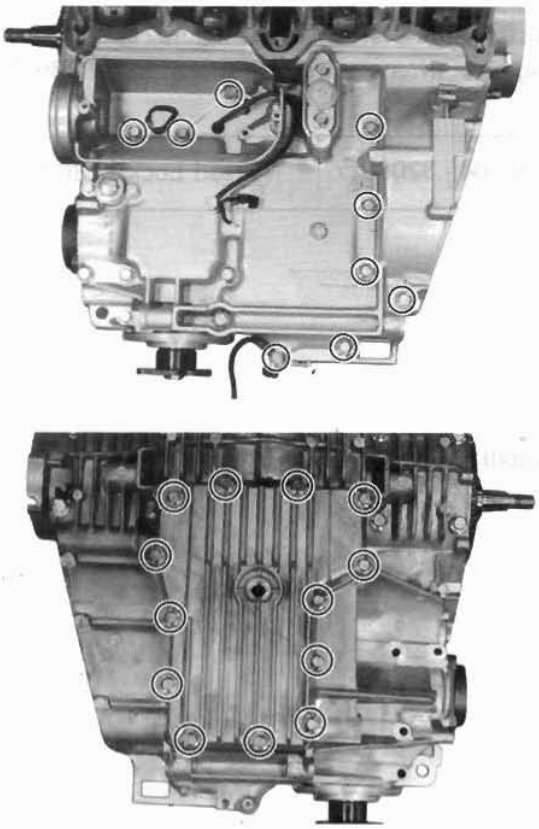


- When securing the lower crankcase, tighten the 8 mm bolts and the 6 mm bolts in the ascending order of numbers assigned to these bolts, tightening each bolt a little at a time to equalize the pressure. Tighten all the securing bolts to the specified torque values.

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

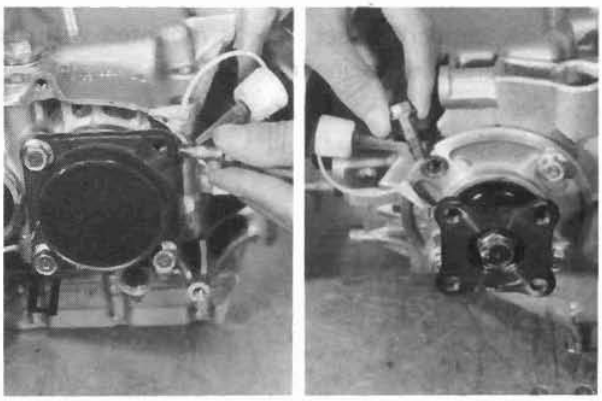
- Locate oil pan and new gasket, and tighten 6 mm bolts with specified torque.

Tightening torque	1.0 kg-m (7.0 lb-ft)



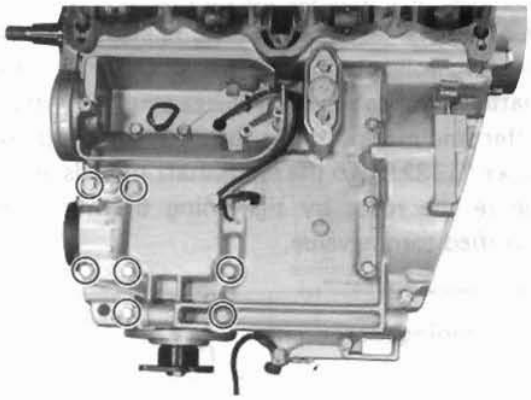
- Apply thread lock "1363C" to the secondary drive and driven gear housing bolts and then fix them lightly to the crank crankcase.

99104 - 32050	Thread Lock "1363C"



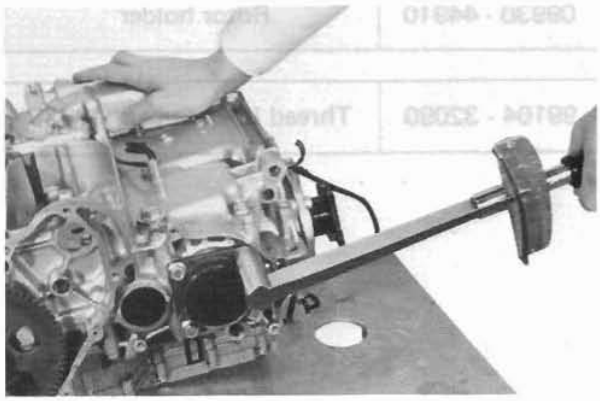
- Tighten the upper crankcase bolts to the specified torque values.

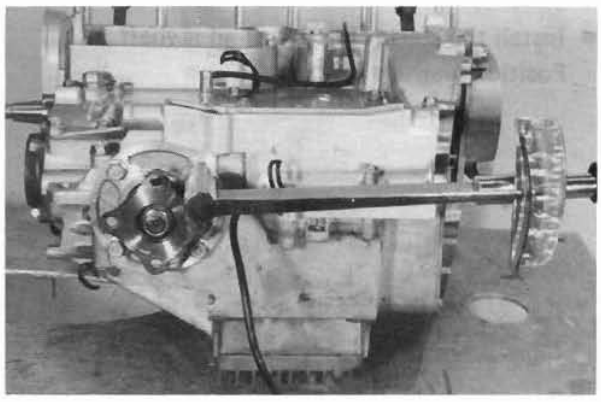
	kg-m	lb-ft
8 mm	2.0 – 2.4	14.5 – 17.5
6 mm	0.9 – 1.3	6.5 – 9.5



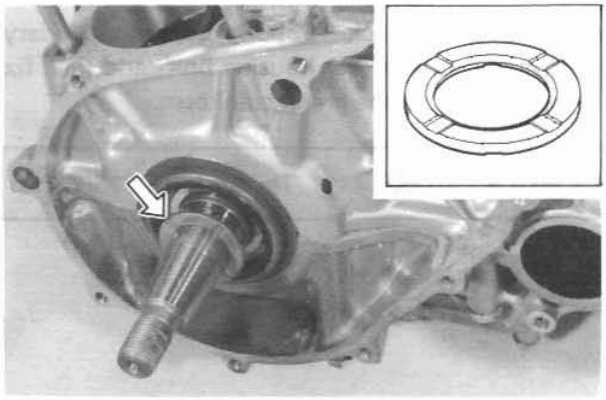
- Tighten the secondary drive and driven gear housing bolts to the specified torque values.

Tightening torque	2.0 – 2.6 kg-m (14.5 – 19.0 lb-ft)

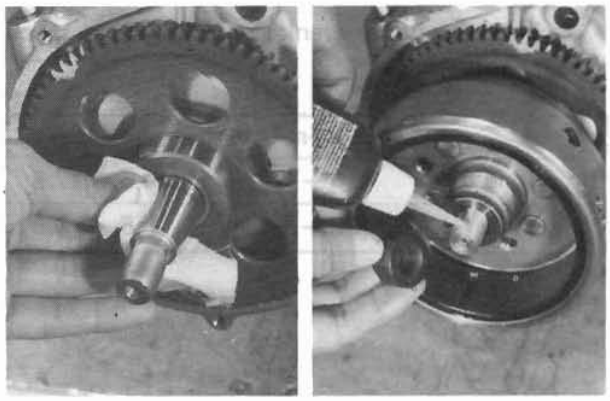




- Thick copper washer ① is mounted with its chamfered side facing in.



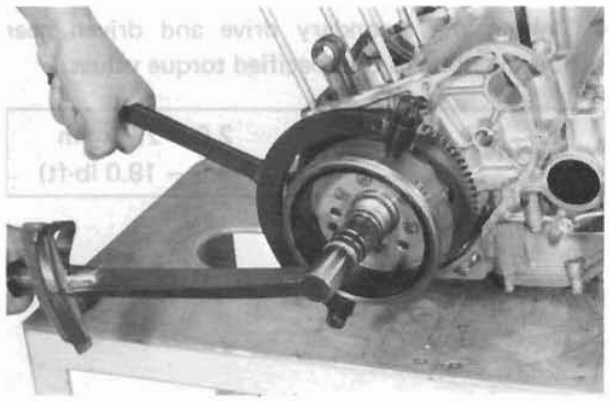
- Degrease the tapered portion of the rotor and also the crankshaft. Use a non-petroleum based cleaning solvent to wipe off the oily or greasy matter to make these surfaces completely dry.
- After mounting the rotor, apply thread lock super "1332B" to the crankshaft threads as then secure the rotor by tightening the nut to the specified torque value.



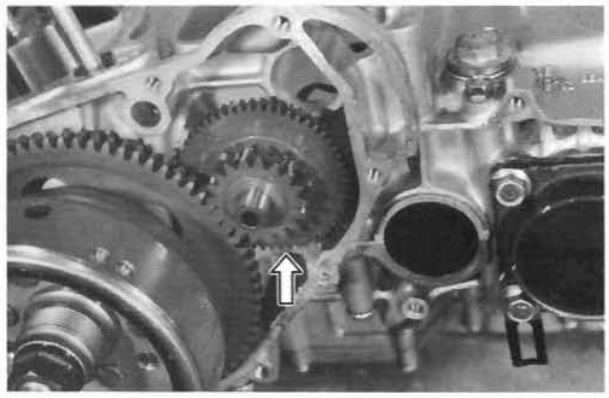
Tightening torque	16 – 17 kg-m (116 – 123 lb-ft)

09930 - 44910	Rotor holder

99104 - 32090	Thread Lock Super "1332B"

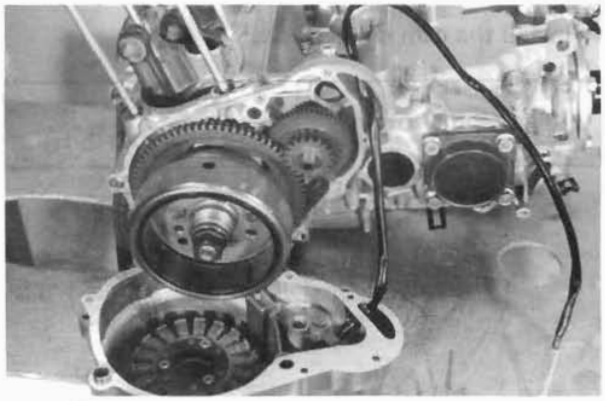


- Install the starter idle gear and it shaft. Position washers properly.



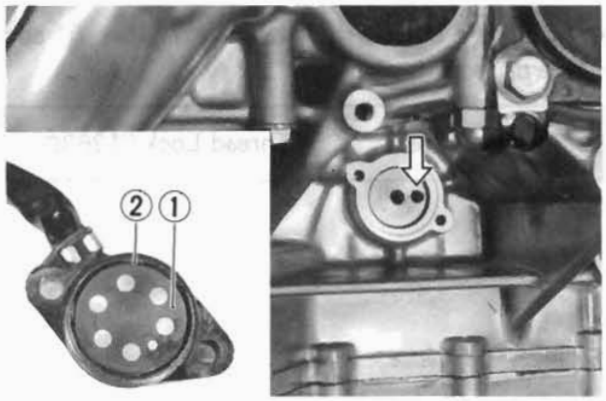
- Pass the generator stator lead wire through gasket and upper crankcase. Route its lead wire properly.
- Mount the left crankcase cover.

NOTE:
Always use new gasket, and install knock pin.

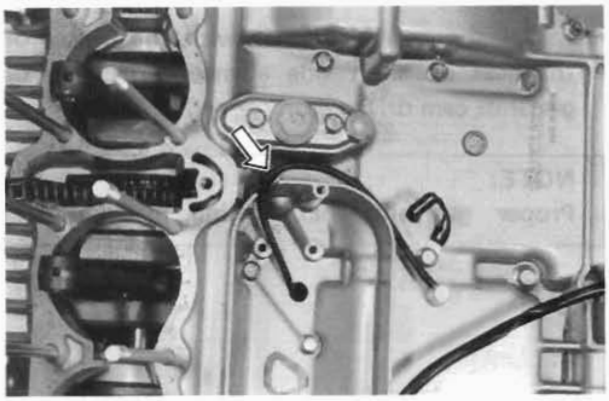


- Install the gear position indicator switch ①.

NOTE:
When installing gear position indicator switch, be sure to locate spring, switch contact, and O-ring ②.



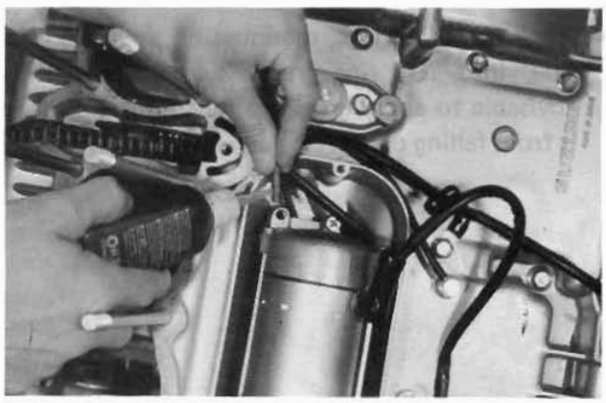
- Route the breather hose properly.



- Mount starter motor, and route the lead wire properly.

99104 - 32050	Thread Lock "1363C"

- Install the starter motor cover.

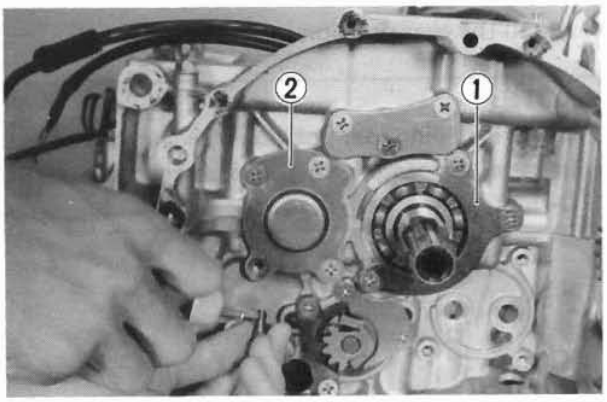


- Install the cam chain guide.

Tightening torque	0.9 – 1.4 kg-m (6.5 – 10.0 lb-ft)

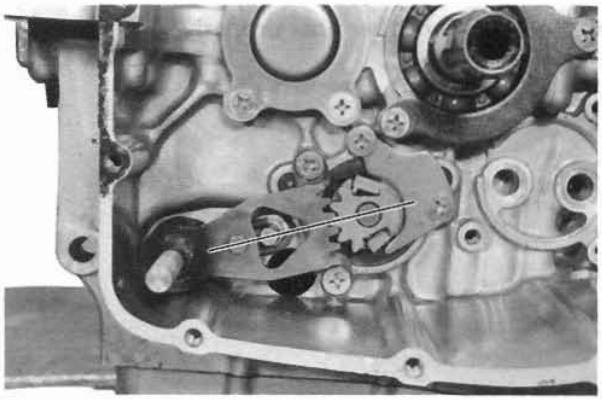
- Install the countershaft bearing retainer ① and the drive shaft plate ② .

99104 - 32050	Thread Lock "1363C"

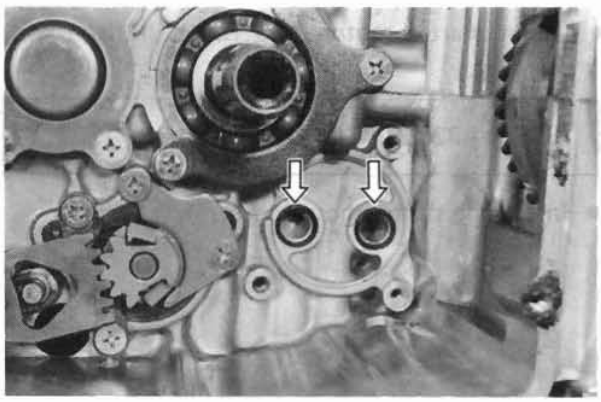


- Install the gearshift shaft with the center of the gear on shaft side aligned the center of gearshift cam driven gear.

NOTE:
Proper gearshift shaft spring installation.



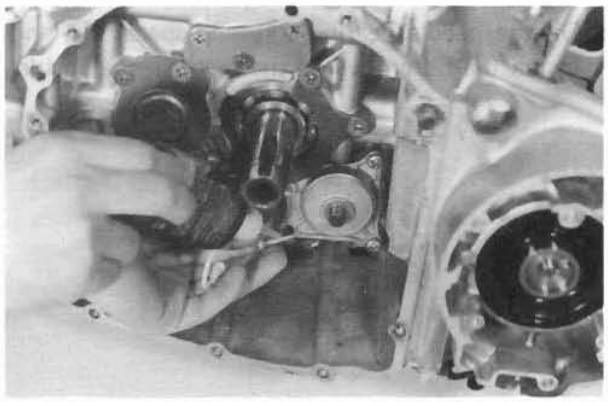
- Place two "O" rings, mounted on the crankcase side, into "O" ring groove without fail. It is advisable to apply grease to "O" ring to prevent it from falling off.



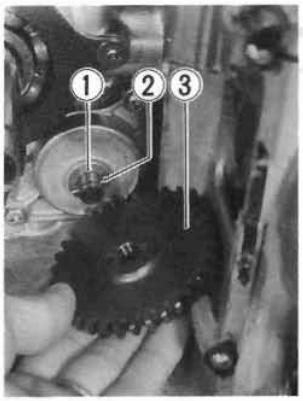
- Install oil pump assembly.

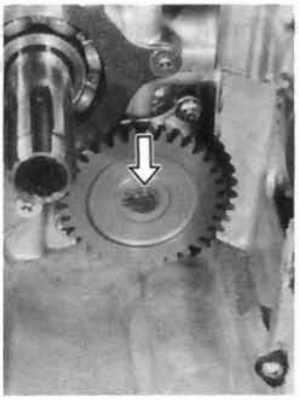
99104 - 32050	Thread Lock "1363C"

Tightening torque	0.7 – 0.9 kg-m (5.0 – 6.5 lb-ft)

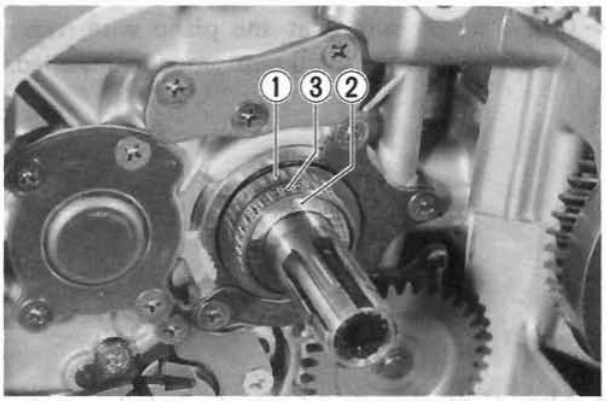


- Install the washer ① , drive pin ② and driven gear ③ by using snap ring pliers.

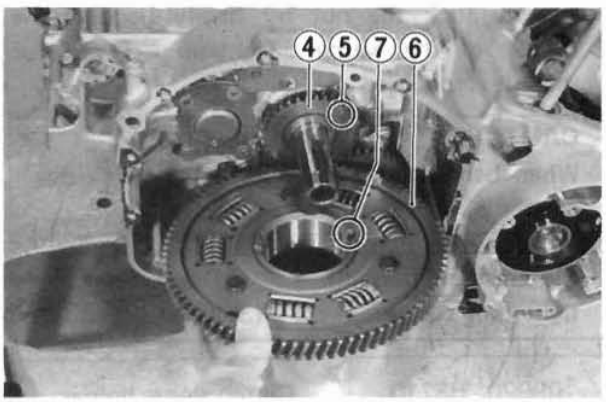




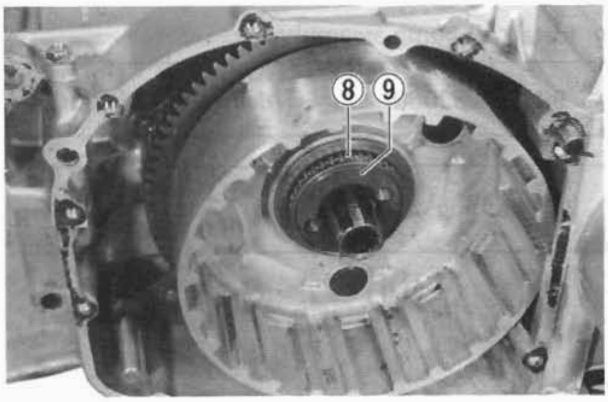
- Install the washer ① , oil pump driven gear spacer ② and bearing ③ .
- Apply engine oil to the oil pump drive gear bearing.



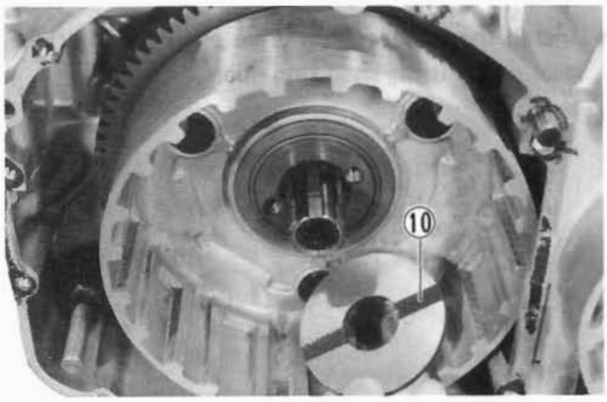
- Fix the drive gear ④ so the tabs ⑤ face the outside.
- Assemble the primary driven gear ⑥ so that the tabs ⑤ align with the notch ⑦ behind the primary driven gear.



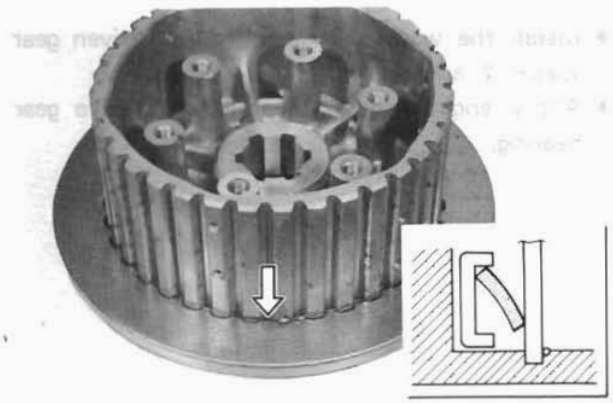
- Oil the needle bearing ⑧ and spacer ⑨ and install the oil groove on the spacer facing inside.



- Thrust washer must be installed with the oil groove side ⑩ facing in.



- Check to be sure that the piano wire, wave washer and driven plate are properly installed.



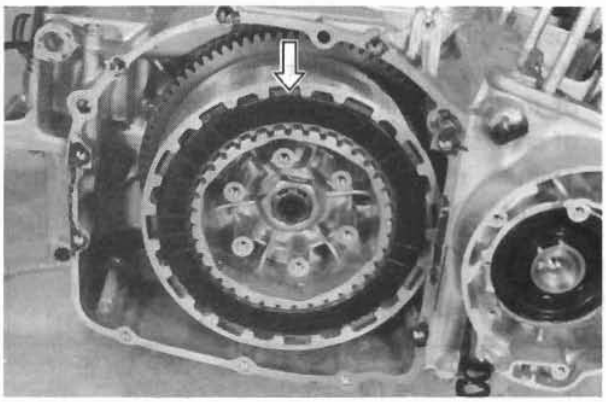
- After tightening the clutch sleeve hub nut, be sure to lock the nut by firmly bending the tongue of the washer. Tightening torque for the nut is specified.

CAUTION:
When bending the lock washer, do not damage the oil seal ① in the countershaft.

Clutch sleeve hub nut tightening torque	5.0 – 7.0 kg-m (36.0 – 50.5 lb-ft)

09920 - 53710	Clutch sleeve holder

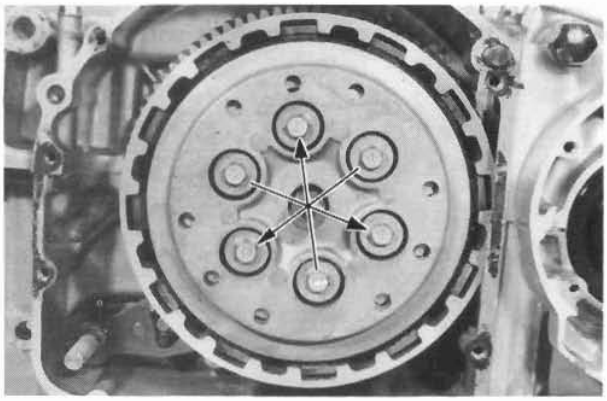
- Insert clutch driven plate and drive plate one by one into sleeve hub in the prescribed order, cork plate first. Insert clutch release rack, bearing and thrust washer to pressure plate, making sure that the thrust washer is between the bearing and pressure plate. Then fit pressure plate into sleeve hub.



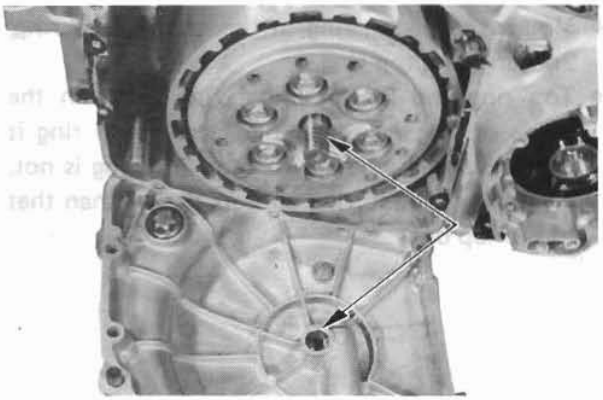
- Tighten clutch spring bolts in the order shown in the photo.

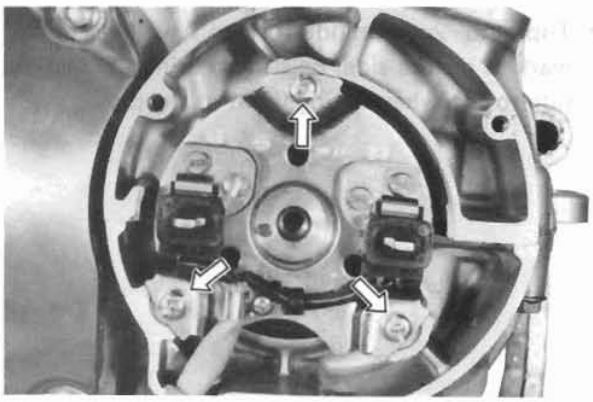
NOTE:
Tighten the clutch spring bolts in the manner indicated, tightening them evenly a little at a time until they attain the specified tightness.

Clutch spring bolt tightening torque	1.1 – 1.3 kg-m (8.0 – 9.5 lb-ft)



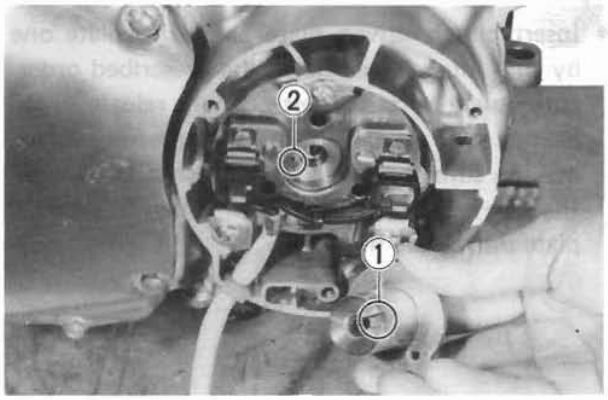
- Apply a small amount of Suzuki Bond #1215 to the clutch cover/crankcase mating surface around the seam area where the upper and lower crankcases meet.
- Replace clutch cover gasket with new one to prevent oil leakage.
- Engage the teeth of clutch release rack with those of pinion gear at the clutch cover side, and replace clutch cover. Make sure that the rack and pinion gear engage positively. To install cover, tap lightly with plastic hammer, and tighten bolts.
- Install the signal generator.



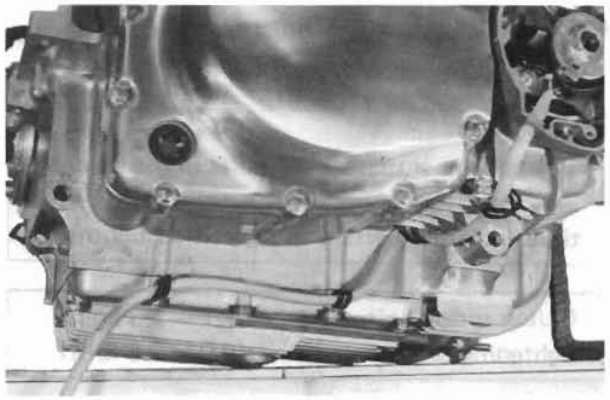


- Install the signal generator rotor.
- Make sure to fit the slot ① on the back surface of the rotor over the locating pin ② at the end of crankshaft.
- Tighten the rotor center bolt with specified torque.

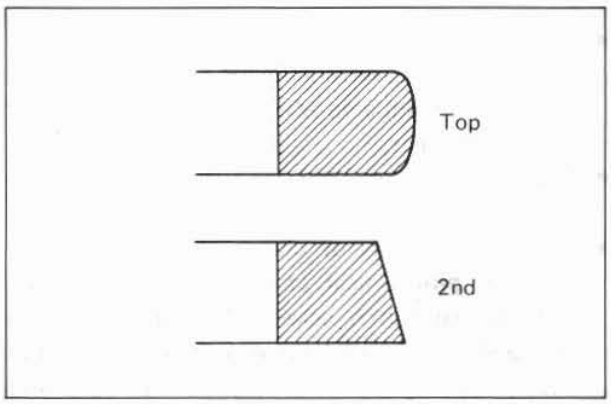
Tightening torque	2.5 – 3.5 kg-m (18.0 – 25.5 lb-ft)



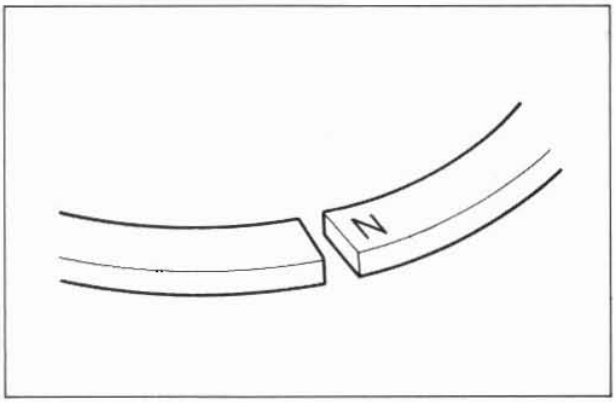
- Route the signal generator lead wire as shown.



- Mount the piston ring in the order of oil ring, 2nd ring, and top ring.
- Top ring and 2nd (middle) ring differ in the shape of ring face, and the face of top ring is chrome-plated whereas that of 2nd ring is not. The color of 2nd ring appears darker than that of the top one.

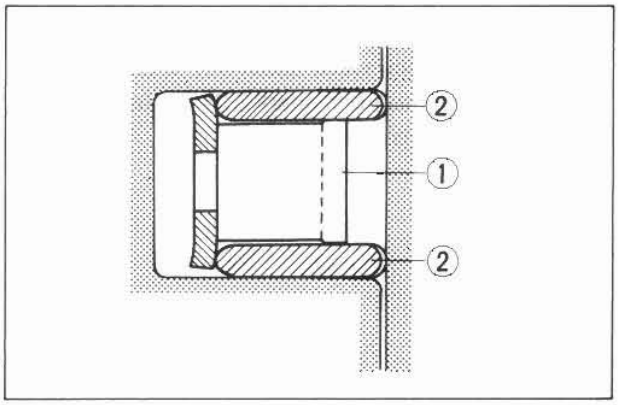


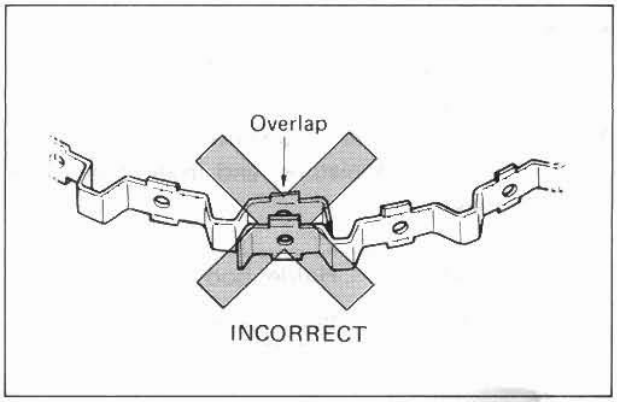
- Top and 2nd (middle) rings have letter "N" marked on the side. Be sure to bring the marked side to top when fitting them to the piston.



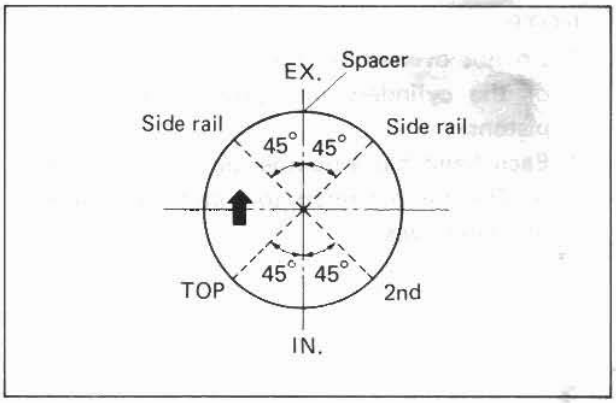
- The first member to go into the ring groove is spacer ① . After placing spacer, fit the two side rails ② . Side designations, top and bottom, are not applied to the spacer and side rails: you can position each either way.

CAUTION:
When mounting the spacer, be careful not to allow its two ends to overlap in the groove.



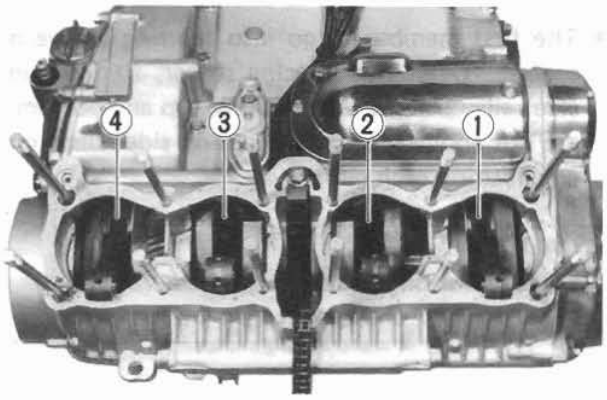


- Position the gaps of the three rings as shown. Before inserting each piston into the cylinder, check that the gaps are so located.

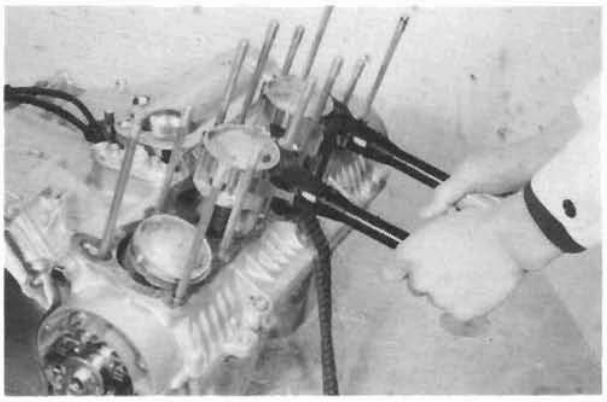


- The piston is in correct position when its arrow (on the crown) points forward.

- Be sure to install the pistons in the cylinder from which they were taken out in disassembly, refer to the number mark, "1" through "4", scribed on the piston.



- 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.



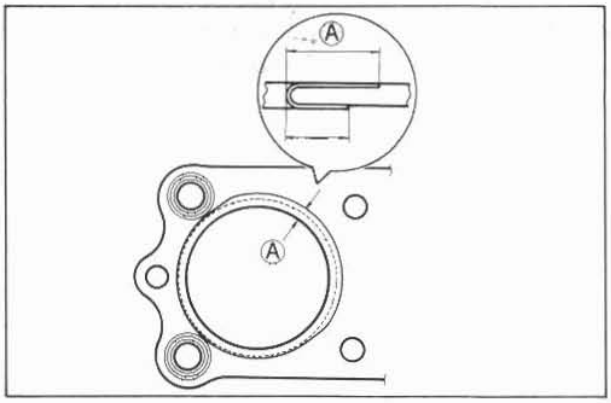
09916 - 74520	Holder body
09916 - 74540	Band (bore 63 – 75 mm)

NOTE:
* **Do not overtighten the special tool bands or the cylinders will resist to admit the pistons.**
* **Each band has a number punchmarked on it. The number refers to a particular range of piston sizes.**

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

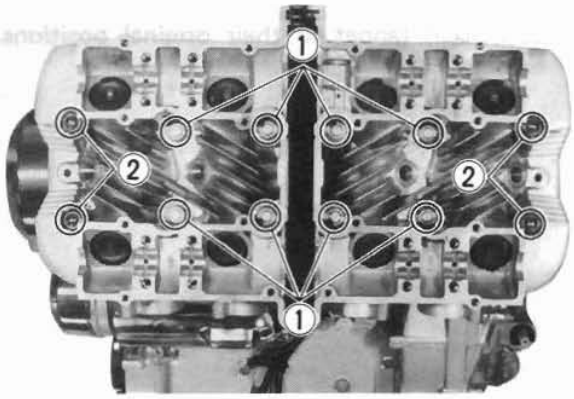
NOTE:
Place the cylinder head gasket with its wider side (the Ⓐ side) positioned toward the cylinder head side as illustrated below.

- Fix two knock pins properly.



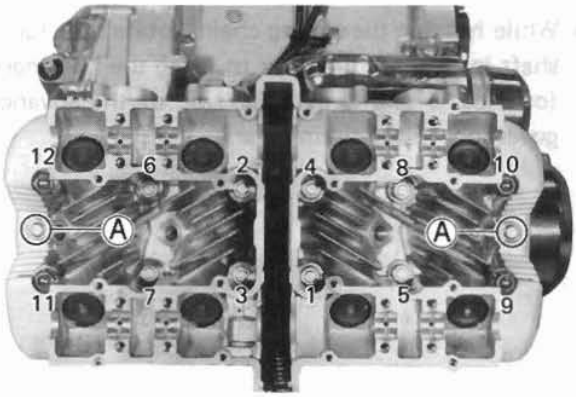
- Mount the cylinder head on the cylinder block.
- Install two kinds of cylinder head nuts in the respective positions indicated.

① Iron washer
② Copper washer



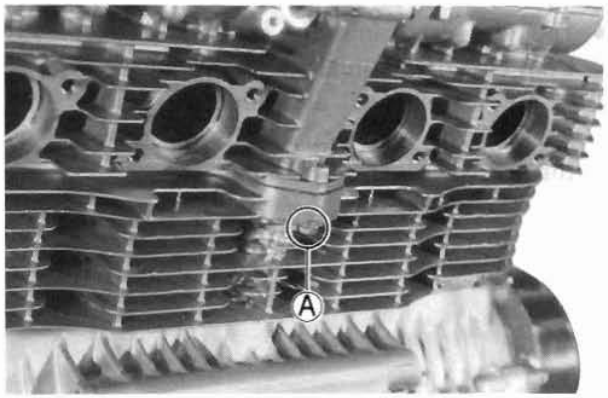
- Tighten the twelve 10 mm nuts to specification with a torque wrench sequentially in the ascending order of numbers.

Cylinder head nut tightening torque	3.5 – 4.0 kg-m (25.5 – 29.0 lb-ft)

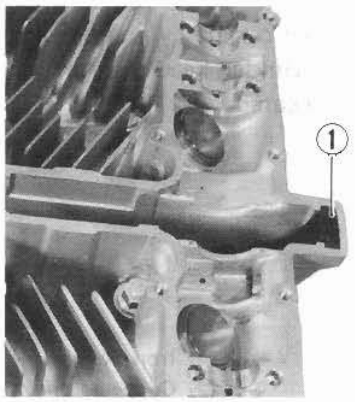


- After firmly tightening the 12-nuts, insert three 6 mm bolts Ⓐ and tighten them with specified torque.

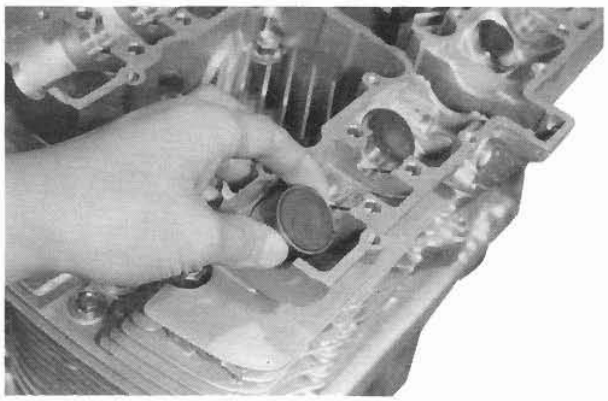
Tightening torque	0.9 – 1.1 kg-m (6.5 – 8.0 lb-ft)



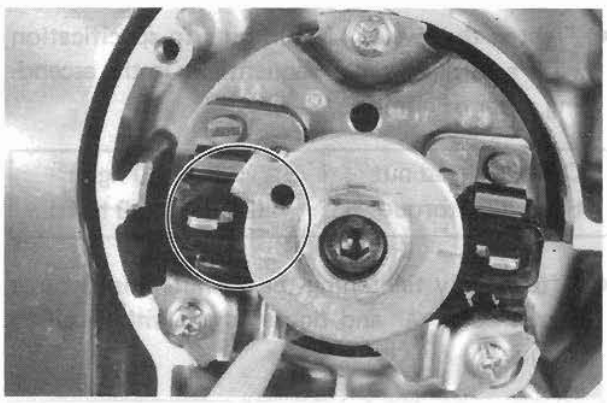
- Place chain guide ① properly.



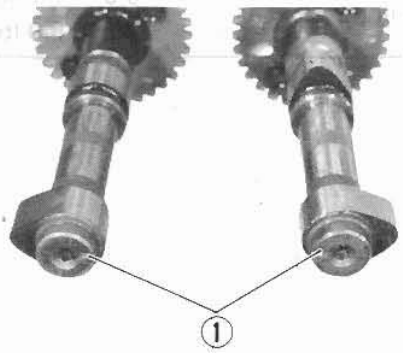
- Install each tappet to their original positions.



- While holding the timing chain, rotate the crankshaft in normal direction to bring the "T" mark (on Nos. 1 and 4 cylinder side of the advance governor) to the timing mark.



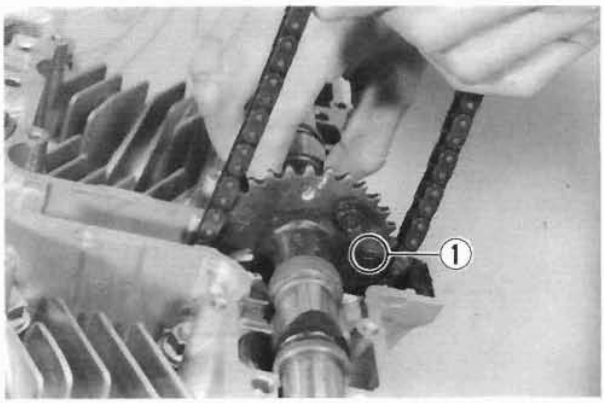
- The exhaust camshaft can be distinguished from that of the intake by the embossed letters "EX" (for exhaust) as against letters "IN" (for intake). The right end can be distinguished by the notch ① at the right end.

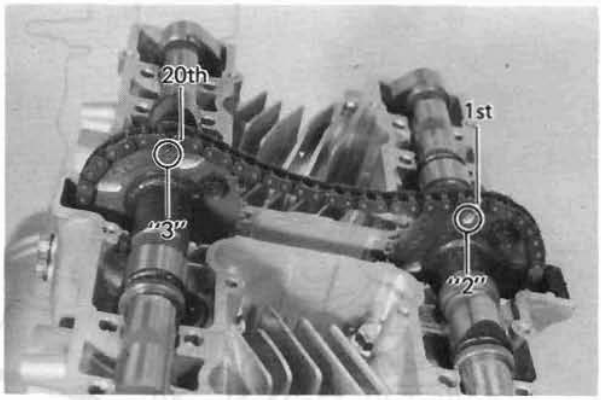


NOTE:
Just before placing the camshaft on the cylinder head, apply SUZUKI Moly Paste to its journals, fully coating each journal ② with the paste taking care not to leave any dry spot. Apply engine oil to the journal bearings.

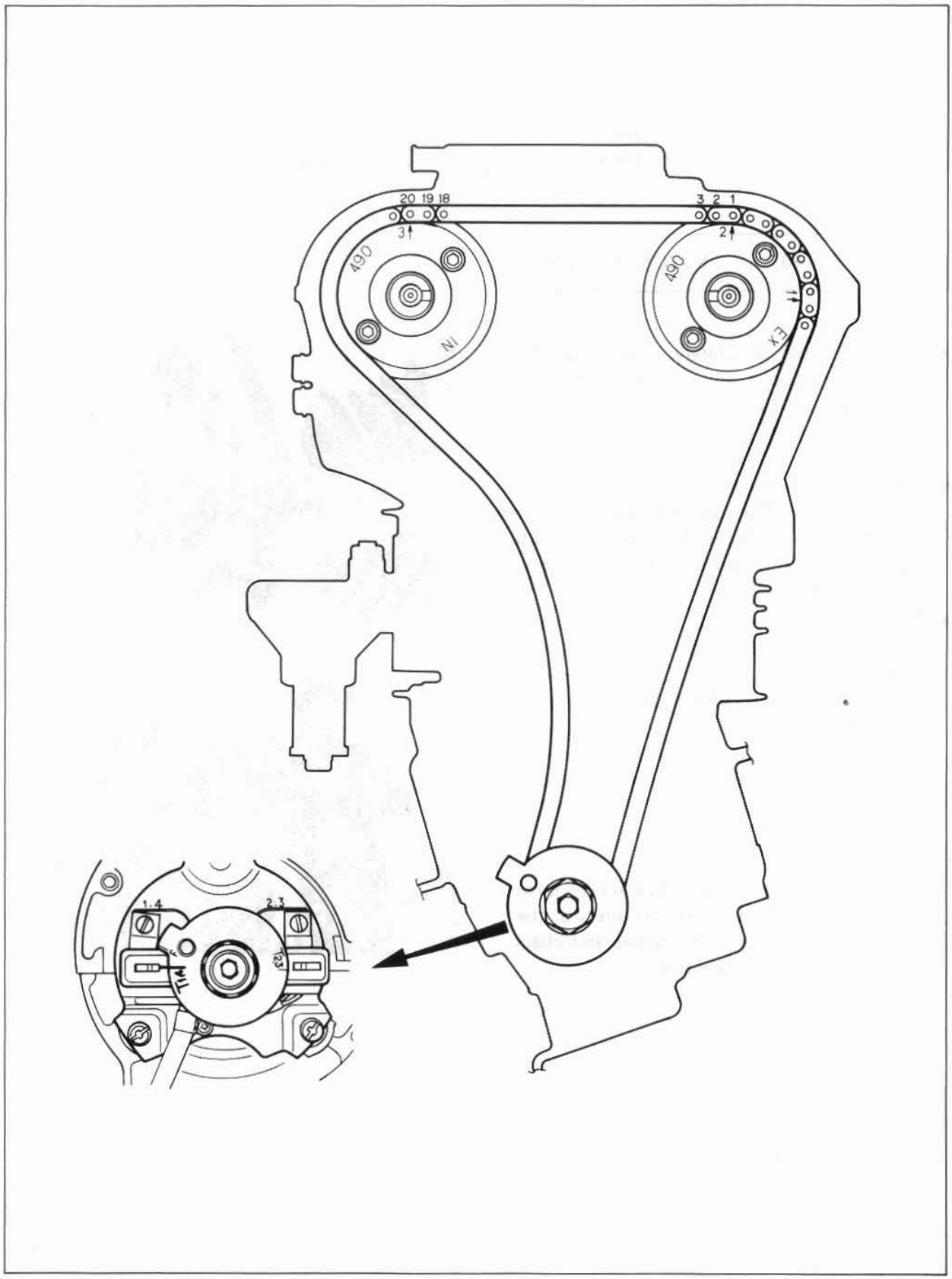
99000 - 25140	SUZUKI Moly Paste

- With "T" mark accurately lined up with the timing mark, hold the crankshaft 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 gasket surface of the cylinder head. Engage the timing 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 20th roller pin. Engage the chain with intake sprocket, locating the 20th pin at and above the arrow marked "3" on the intake sprocket.

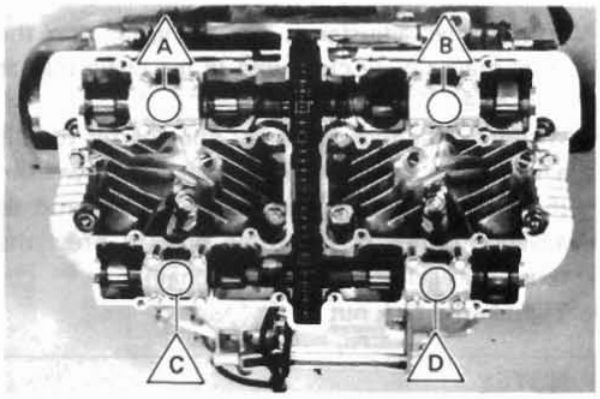




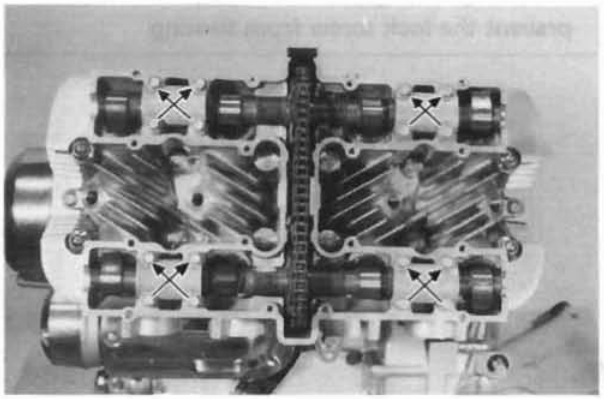
NOTE:
The timing chain is now riding on all three sprockets. Be careful not to disturb the crankshaft until the four holders and chain tensioner adjuster are secured.



- Each camshaft holder is identified with a cast-on letter with a triangle. A matching cast-on symbol appears on the head. Install each holder at it's matching letter, with triangle symbols pointing forward.
- Secure the four 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 cam journal holder thrust surfaces may result in the situation that cam journal holders are not drawn down evenly.



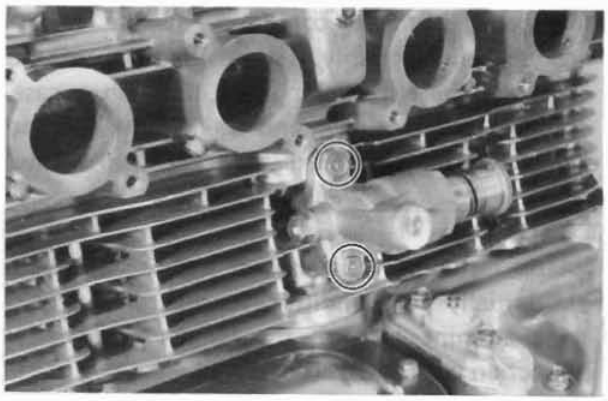
- Tighten the camshaft journal holder bolts to the following torque value:

CAUTION:
The camshaft journal holder bolts are made of a special material and much superior in strength campared 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.

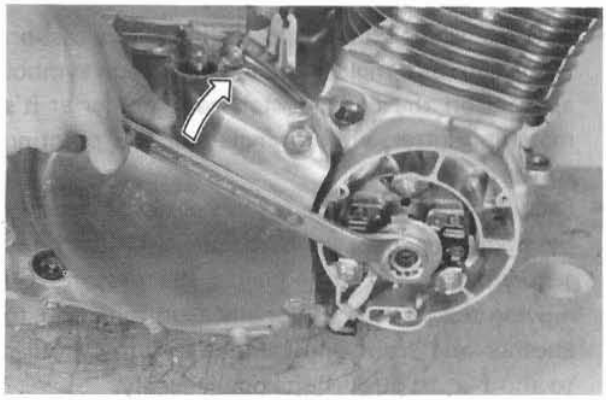
Camshaft holder bolt tightening torque	0.8 – 1.2 kg-m (5.5 – 8.5 lb-ft)

- While turning lock shaft handle counterclockwise, push in the pushrod all the way. Keep on turning the handle until it refuses to turn further.
- Tighten the lock screw to lock the pushrod, so that the pushrod will not plunge out.
- Secure the adjuster to the cylinder block.

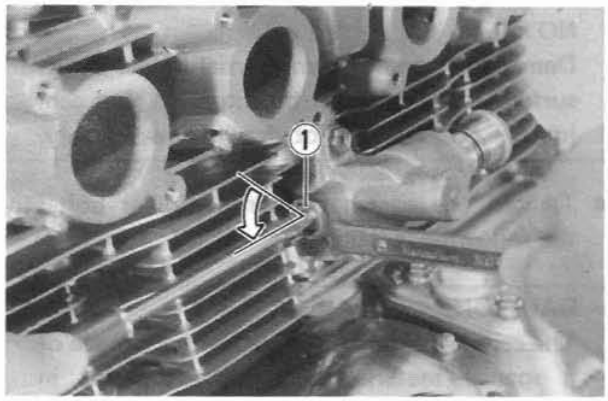
Tightening torque	0.6 – 0.8 kg-m (4.5 – 5.5 lb-ft)



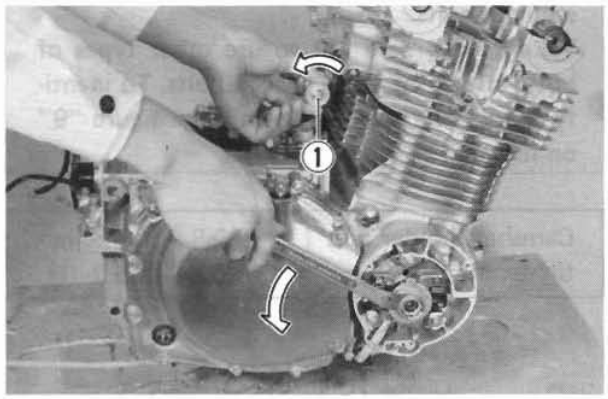
- If tensioner adjuster is not going in, turn the crankshaft slowly clockwise to get chain play at inlet side.
- Withdraw the lock screw by one-quarter to half a turn: this separates the tip of the screw from the pushrod, thereby allowing the pushrod to advance under spring force and to press the tensioner against the camshaft chain.
- Tighten the lock nut ①.



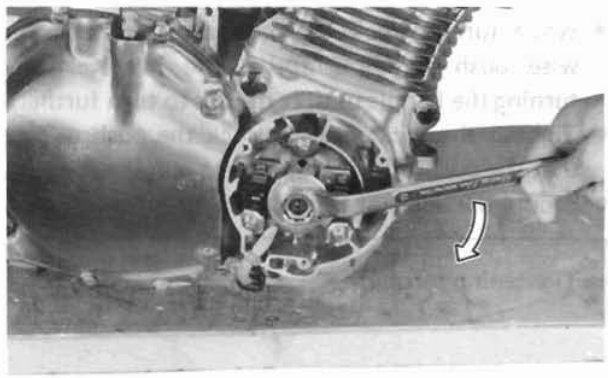
NOTE:
When tightening the lock nut, take care to prevent the lock screw from turning.



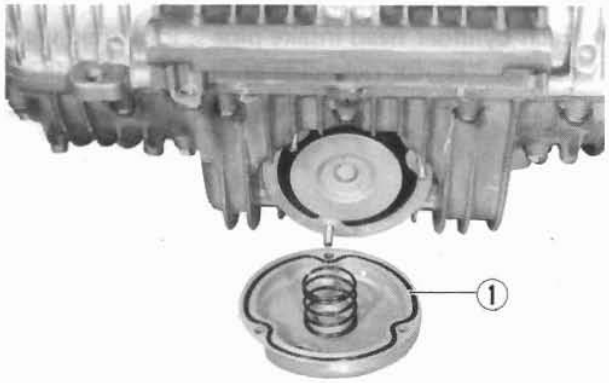
- While turning the handle ① counterclockwise, slowly rotate the crankshaft in reverse direction (thus causing the chain to push back the tensioner).
- Release the handle and slowly turn back the crankshaft in normal running direction (to slacken that portion of the chain extending along the tensioner). See if the handle rotates by itself as the chain becomes progressively slackened; if it does, then the pushrod inside is obviously moving forward under spring force as it should, thus signifying that the tensioner is in good operable condition. If the handle rotates, but sluggishly, it means that the pushrod or lock shaft is sticking and, in such a case, remove the tensioner and service the pushrod and lock shaft to make them move smoothly.



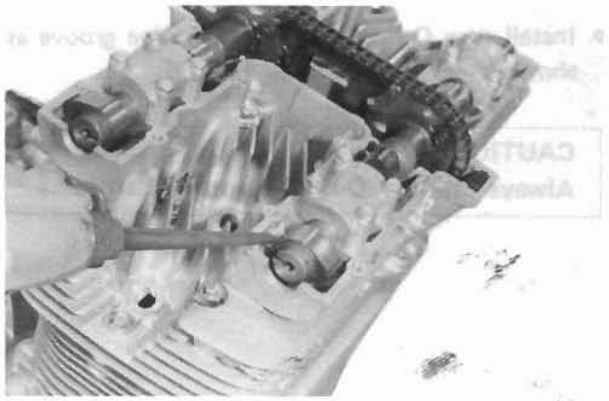
CAUTION:
After installing the tensioner and checking it in initially set condition for operation, do not attempt to turn the handle in either direction until the next overhaul.



- Adjust the tappet clearance. (see page 2-6).
- In fitting the seal ring to the oil filter chamber cap, lightly coat grease on the seal ring groove ① to avoid any chance of dropping or mislocating the ring during the installation work.
- Tighten engine oil drain plug and secondary housing drain plug.



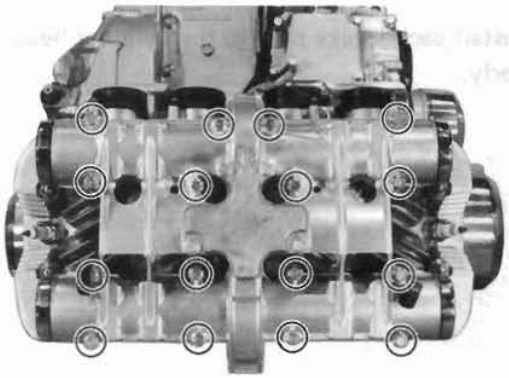
- Pour 50 ml of engine oil in eight oil pockets and tachometer drive gear in the head.



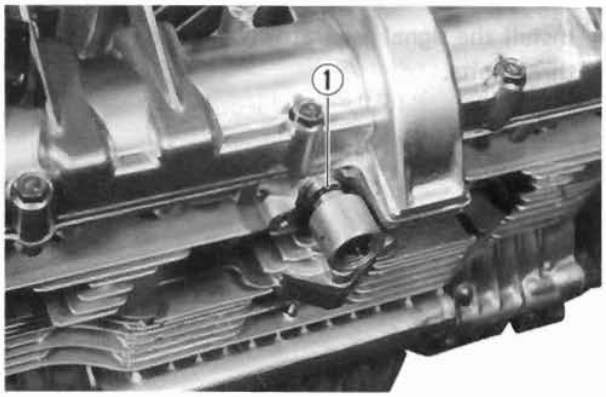
- Install a new gasket and the cylinder head cover.

Tightening torque	1.0 kg-m (7.0 lb-ft)

84-86 in lb.



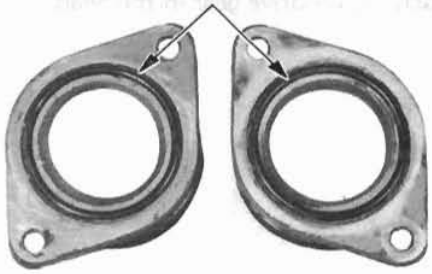
- Install the tachometer drive gear with a new O-ring ①.



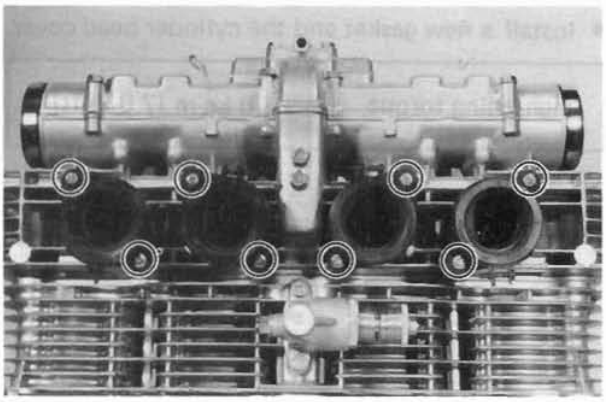
- Each cylinder head intake pipe is identified with a letter "R" for right side or "L" for left side on it. Fit each pipe to cylinder head properly.

- Install new O-ring to the intake pipe groove as shown.

CAUTION:
Always use new O-rings to prevent air leaks.



- Install each intake pipe to the cylinder head properly.



- Install the signal generator cover and gasket with three bolts.

SHAFT DRIVE

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SECONDARY DRIVE GEAR 4- 4
SECONDARY DRIVEN GEAR 4-10
SECONDARY GEAR SET SHIM ADJUSTMENT 4-15
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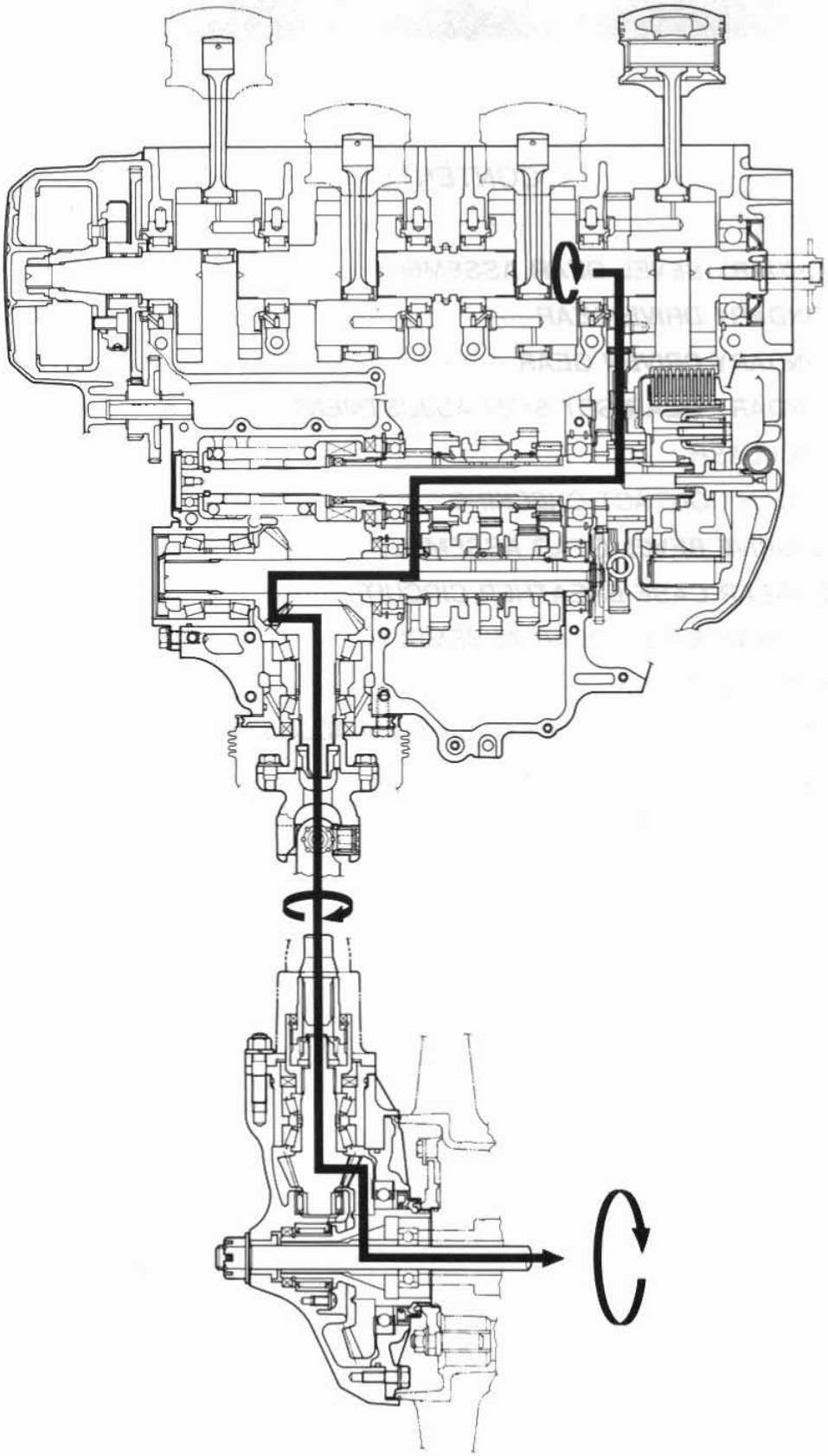
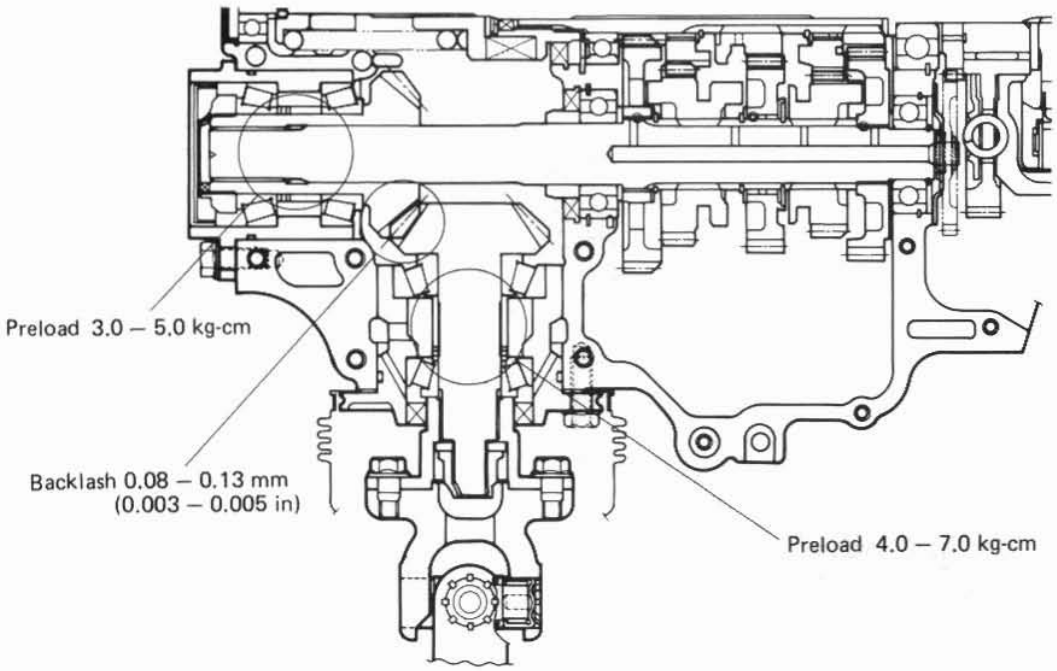
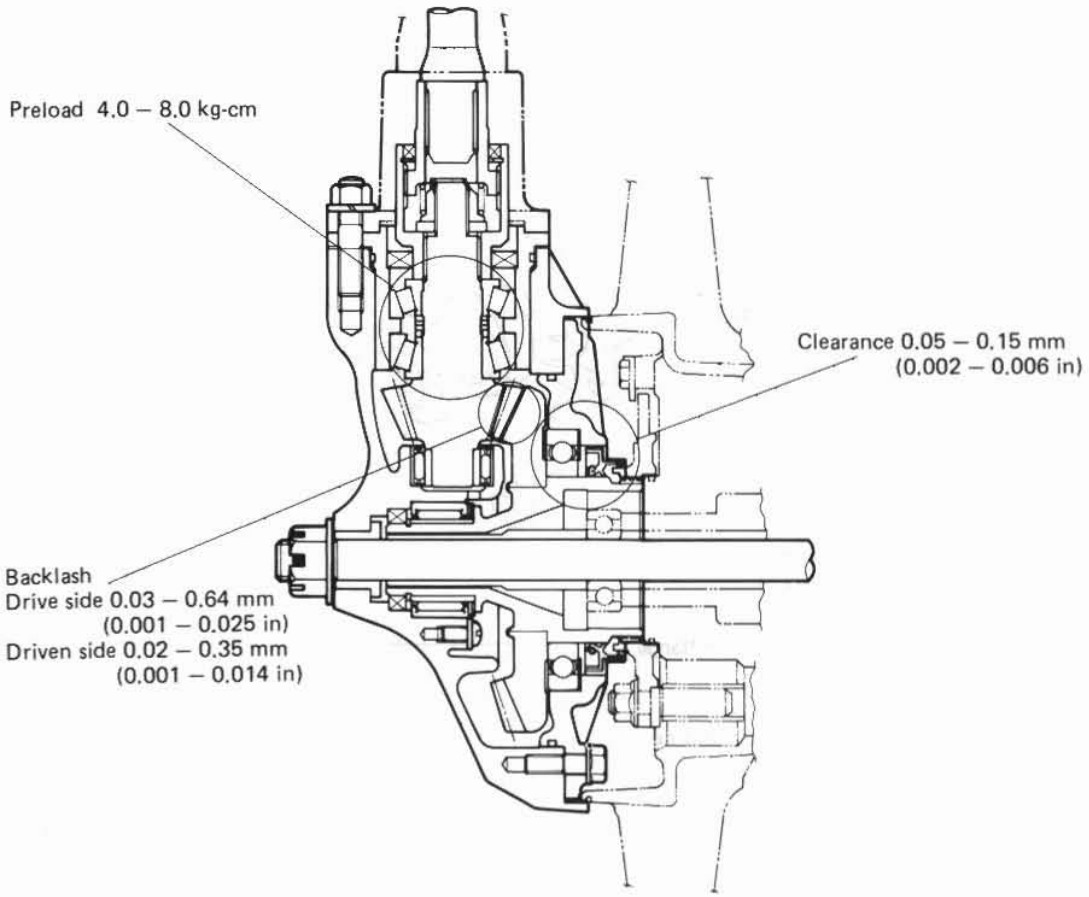
4

SHAFT DRIVE

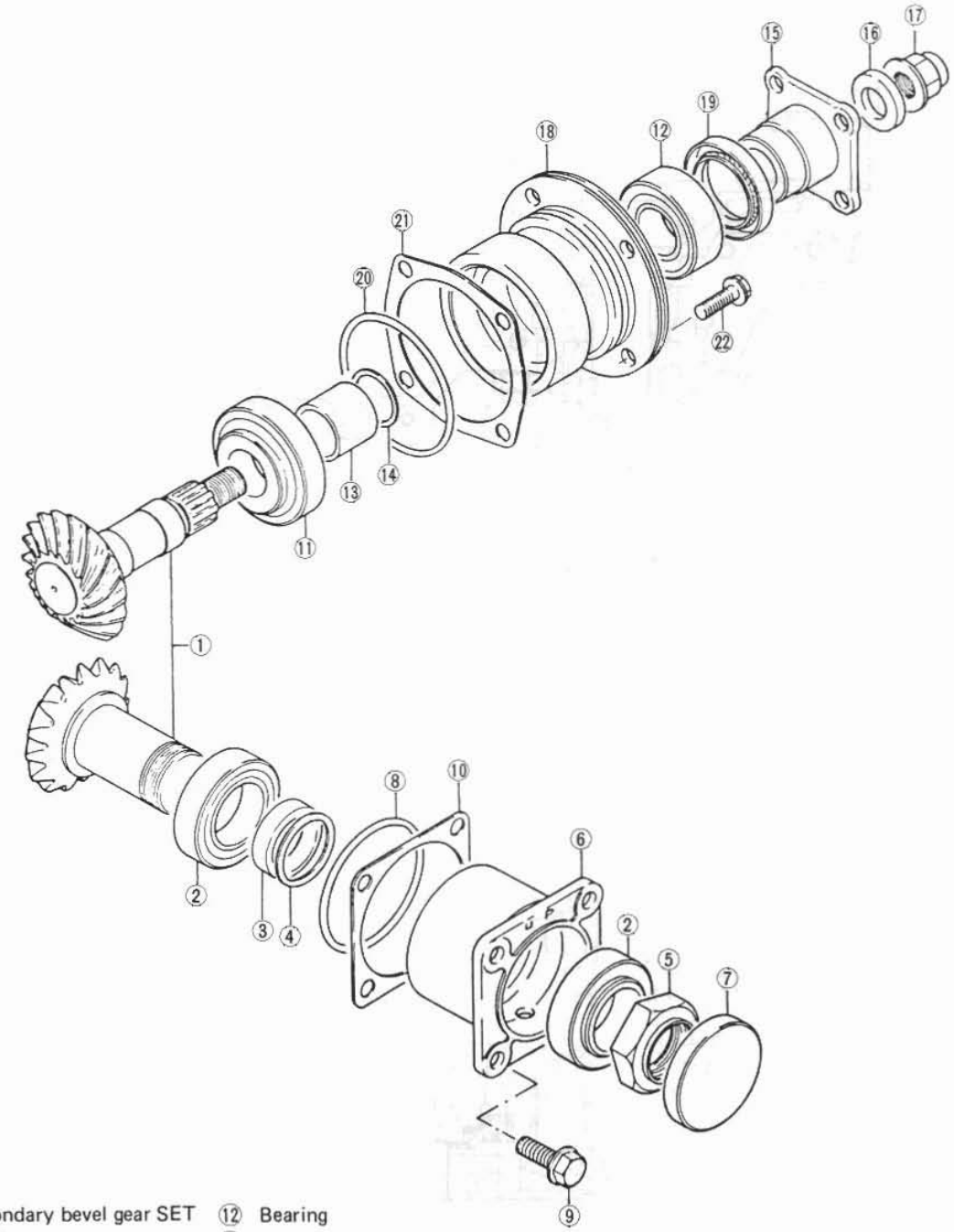


PRELOAD AND BACKLASH





SECONDARY BEVEL GEAR ASSEMBLY



① Secondary bevel gear SET
② Bearing
③ Spacer
④ Shim
⑤ Nut
⑥ Drive gear housing
⑦ Plug
⑧ O-ring
⑨ Bolt
⑩ Shim
⑪ Bearing
⑫ Bearing
⑬ Spacer
⑭ Shim
⑮ Universal joint flange
⑯ Washer
⑰ Nut
⑱ Driven gear housing
⑲ Oil seal
⑳ O-ring
㉑ Shim
㉒ Bolt

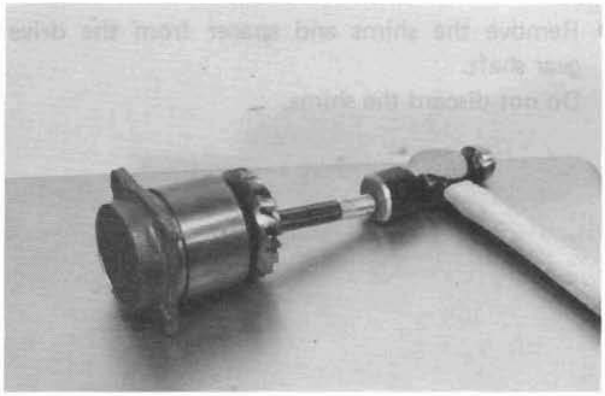
	Tightening torque	
	kg-m	lb-ft
⑤	12.0 – 15.0	87.0 – 108.5
⑨	2.0 – 2.6	14.5 – 19.0
⑰	9.0 – 11.0	65.0 – 79.5
㉒	2.0 – 2.6	14.5 – 19.0

SECONDARY DRIVE GEAR

REMOVAL AND DISASSEMBLY

Remove the secondary drive bevel gear housing. (See page 3-11)

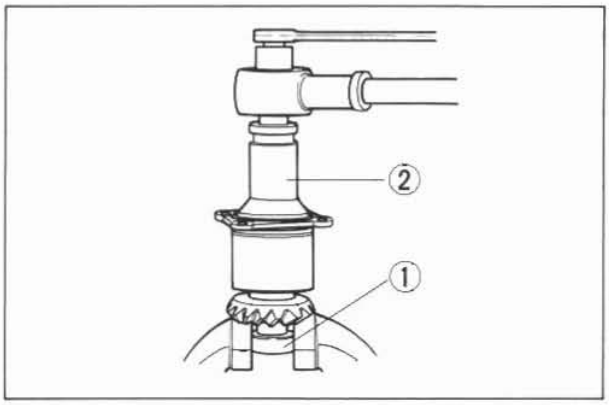
- Using a drift, knock the plug out of the housing.



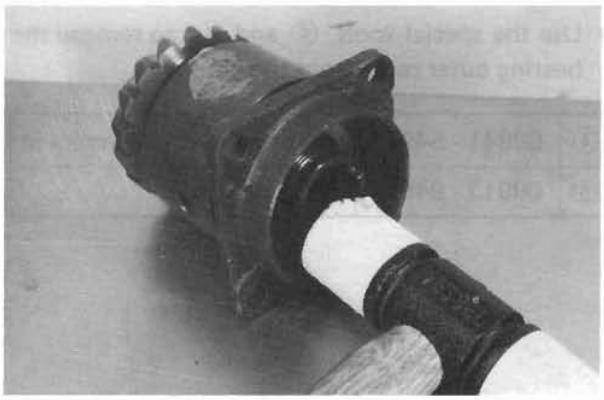
- Straighten the bent area of the nut.

- Use the special tool ① to lock the drive gear and the special tool ② to remove the nut.

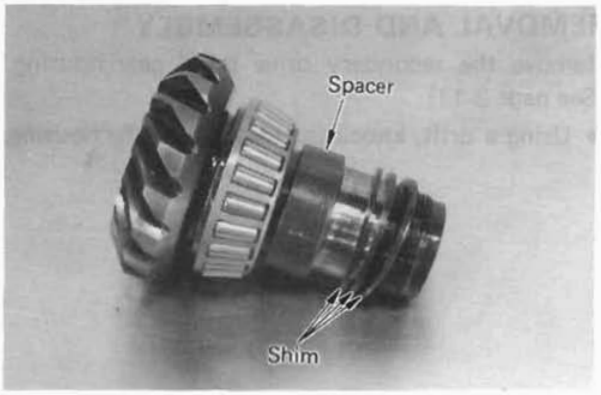
①	09924 - 54511	Secondary drive bevel gear holder
②	09910 - 23710	41 mm socket wrench



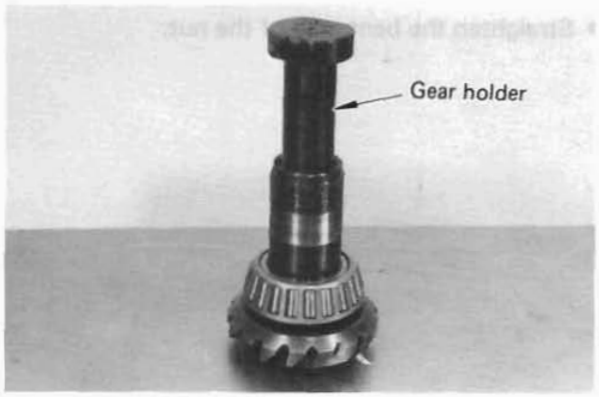
- Tap the drive gear with a plastic hammer to remove it from the housing.



- Remove the shims and spacer from the drive gear shaft.
  Do not discard the shims.

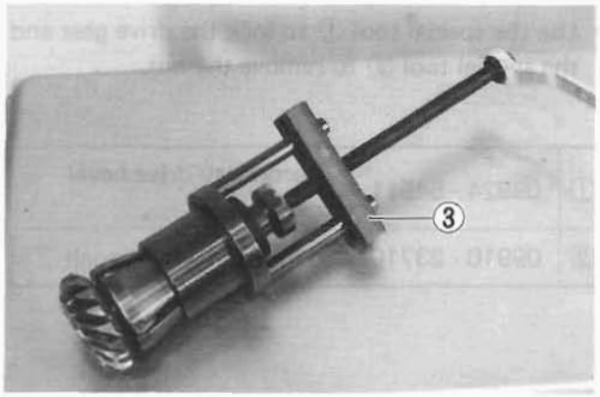


- Insert the secondary bevel gear holder into the drive shaft.



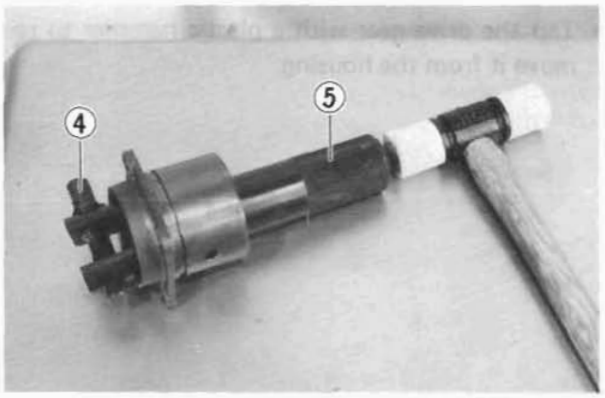
- Use the special tool ③ to remove the inner bearing race from drive gear.

③	09941 - 84510	Bearing inner race remover



- Use the special tools, ④ and ⑤, to remove the bearing outer races from the housing.

④	09941 - 54911	Bearing outer race remover
⑤	09913 - 84510	Bearing installer

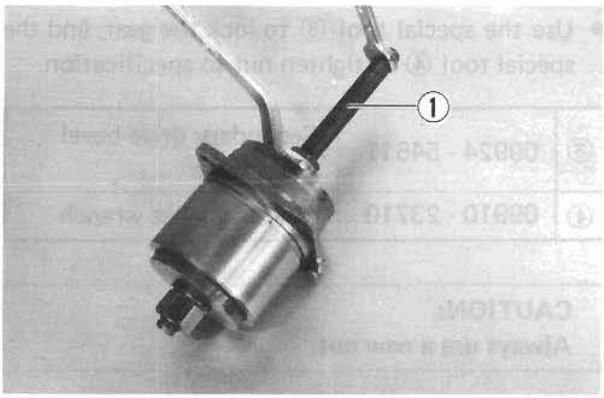


INSPECTION AND REASSEMBLY

NOTE:
Before reassembly, clean all parts in solvent.

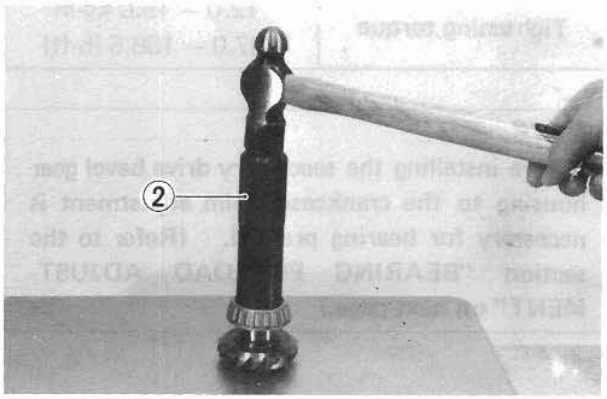
- Use the special tool ① to install the outer bearing races into the drive gear housing.

①	09924 - 84510	Bearing installer set



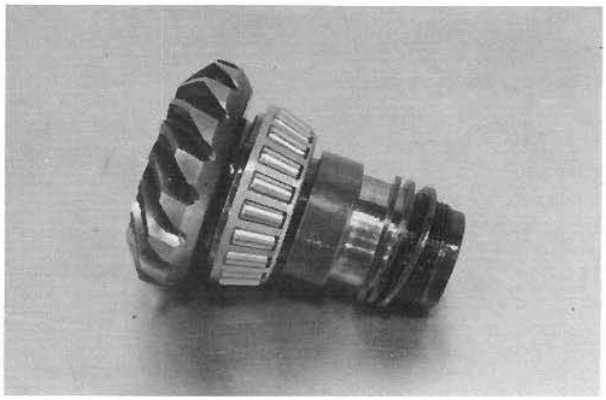
- Use the special tool ② to install the inner bearing race on the drive gear shaft.

②	09913 - 84510	Bearing installer

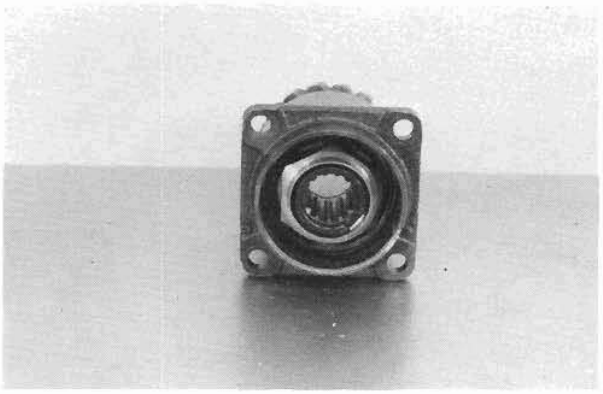


CAUTION:
When replacing the secondary drive gear, be sure to replace secondary driven gear also, as they must be replaced together.

- Install the spacer and the shims which are removed, during disassembly, on the drive gear shaft.

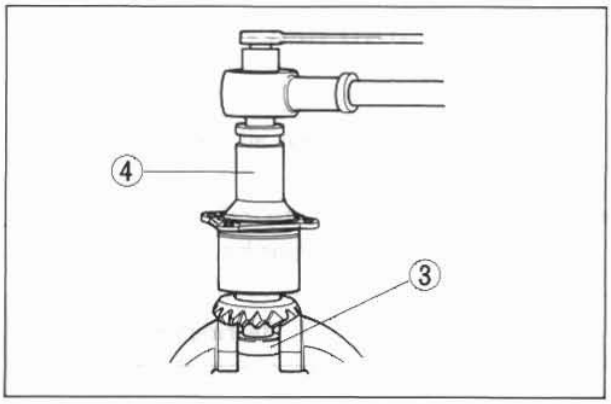


- Install the drive gear into the housing and install the other inner bearing race and nut. Oil the bearings with Hypoid gear oil.



- Use the special tool ③ to lock the gear, and the special tool ④ to tighten nut to specification.

③	09924 - 54511	Secondary drive bevel gear holder
④	09910 - 23710	41 mm socket wrench



CAUTION:
Always use a new nut.

Tightening torque	12.0 – 15.0 kg-m (87.0 – 108.5 lb-ft)

NOTE:
Before installing the secondary drive bevel gear housing to the crankcase, shim adjustment is necessary for bearing preload. (Refer to the section "BEARING PRELOAD ADJUSTMENT" on next page.)

BEARING PRELOAD ADJUSTMENT

- After tightening the nut to specification using the old shims, rotate the drive gear several turns in both directions to seat the bearings.
- Use the special tools, ① through ② , to measure the torque necessary to turn the gear. This is the bearing preload.

①	09900 - 21107	Torque wrench 0 – 15 kg-cm
②	09910 - 23710	41 mm socket wrench

Preload	3 – 5 kg-cm (2.5 – 4.5 lb-in)

- If the bearing preload is not within specification, the shims between the bearings must be changed. Refer to the table below and make appropriate adjustments, repeating the preload checking procedure as necessary.

NOTE:
Whenever the preload is checked after a shim change, and the gear must be rotated in both directions to seat the bearings after the nut is retorqued to specification.

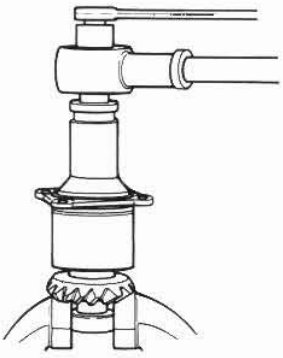
Preload	Adjustment by shim
Under 3 kg-cm (2.5 lb-in)	Decrease shim thickness
3 – 5 kg-cm (2.5 – 4.5 lb-in)	Correct
Over 5 kg-cm (4.5 lb-in)	Increase shim thickness

- After the bearing preload has been adjusted to specification, remove the drive gear nut, clean and degrease the threads on the drive gear shaft, install the nut, and torque to specification.

Tightening torque	12.0 – 15.0 kg-m (87.0 – 108.5 lb-ft)

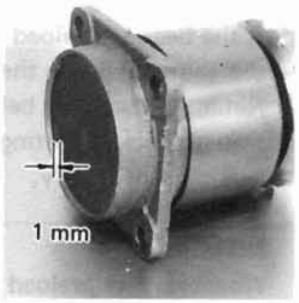
List of shims Ⓐ

Part No.	Shim thickness
09181 - 32001	1.60 mm
09181 - 32002	1.62 mm
09181 - 32003	1.64 mm
09181 - 32004	1.66 mm
09181 - 32005	1.68 mm
09181 - 32006	1.70 mm
09181 - 32007	1.80 mm
09181 - 32008	1.90 mm
09181 - 32009	2.00 mm



- Bend the collar of the nut over into the notch in the drive gear shaft.

- Press a new plug into the secondary drive gear housing so that it is 1.0 mm below the housing shoulder.

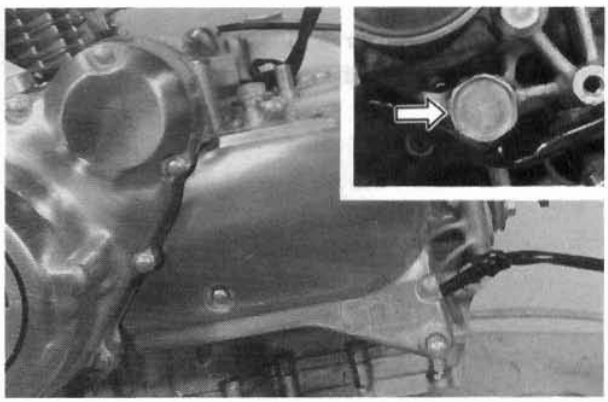


- The secondary drive gear assembly is now ready for installation into the crankcase.
  For backlash and tooth contact adjustments, see pages 4-15 and 4-16.

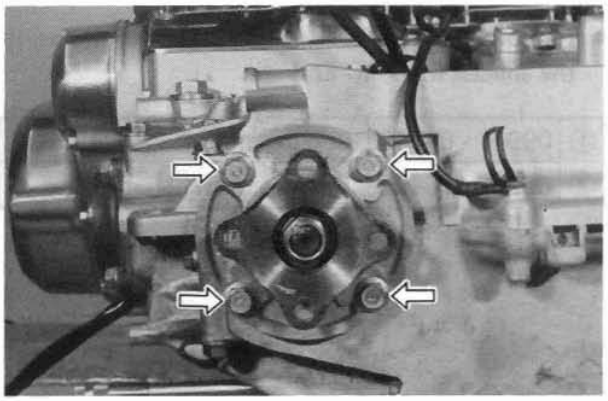
SECONDARY DRIVEN GEAR

REMOVAL AND DISASSEMBLY

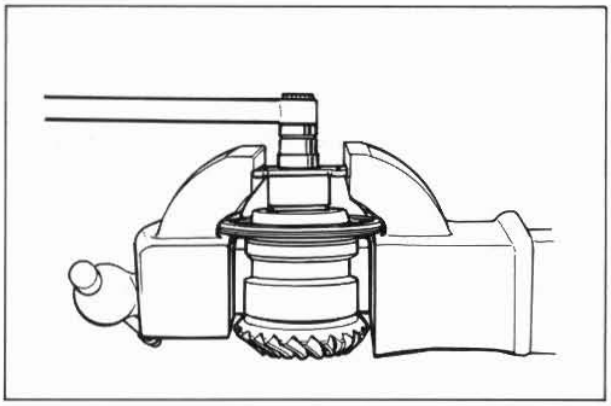
- Remove engine assembly from the frame. (See the page 3-1)
- Remove drive unit cover and drain secondary gear oil into a pan.



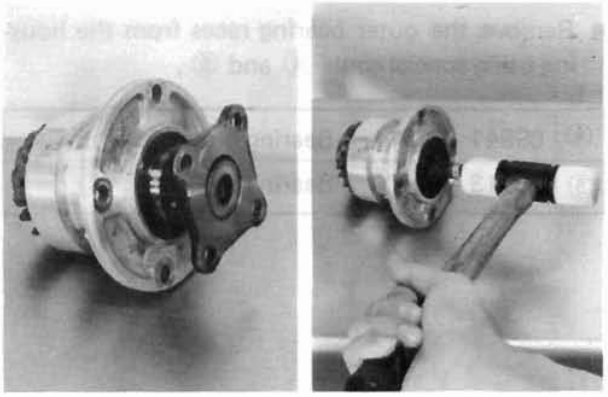
- Remove the four secondary driven gear housing bolts and remove the assembly from the crankcase.



- Remove the shims and O-ring.
- Secure the universal joint flange in a vise and straighten the bent portion of the driven gear nut. Remove the nut.



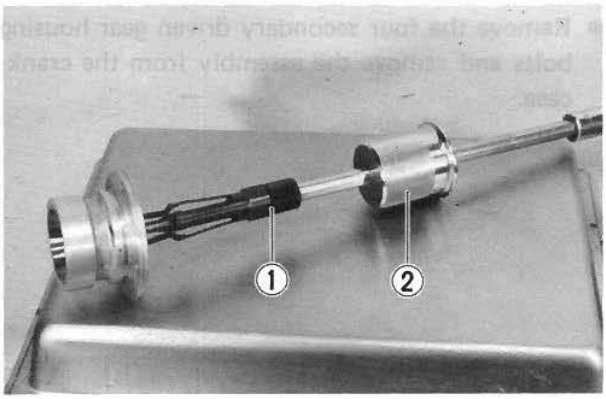
- Remove the flange from the driven gear.
- Tap the driven gear with a plastic hammer to remove it from the housing.



- Remove the spacer and shims from the driven gear shaft. Do not discard them.

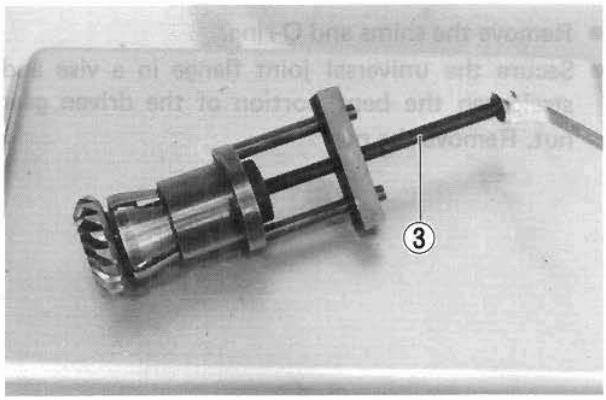
- Remove the oil seal from the housing using the special tools, ① and ② .

①	09941 - 64510	Bearing and oil seal remover
②	09930 - 30102	Rotor remover shaft



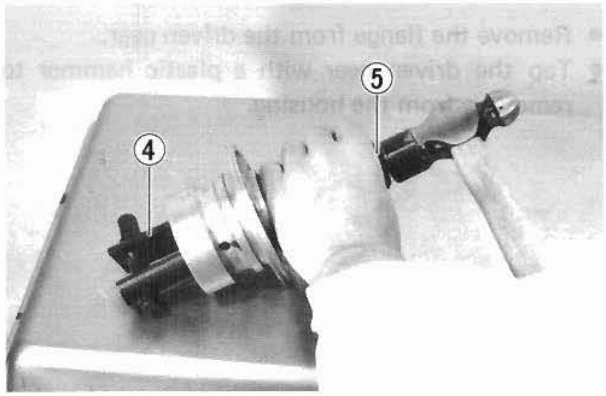
- Remove the inner bearing race from the driven gear using special tool ③ .

③	09941 - 84510	Bearing inner race remover



- Remove the outer bearing races from the housing using special tools ④ and ⑤ .

④	09941 - 54911	Bearing outer race remover
⑤	09913 - 84510	Bearing installer

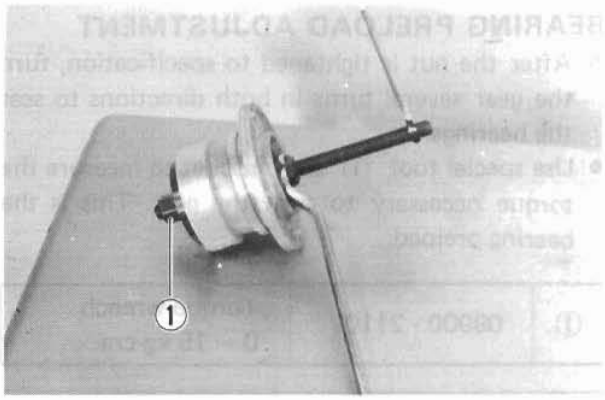


INSPECTION AND REASSEMBLY

NOTE:
Before reassembly, clean all parts in solvent.

- Install the outer bearing races into the secondary driven gear housing using the special tool ①.

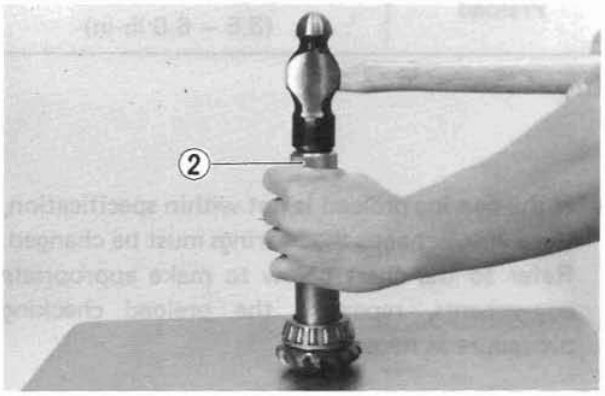
①	09924 - 84510	Bearing installer set



- Install the inner bearing race onto the driven gear using the special tool ②.

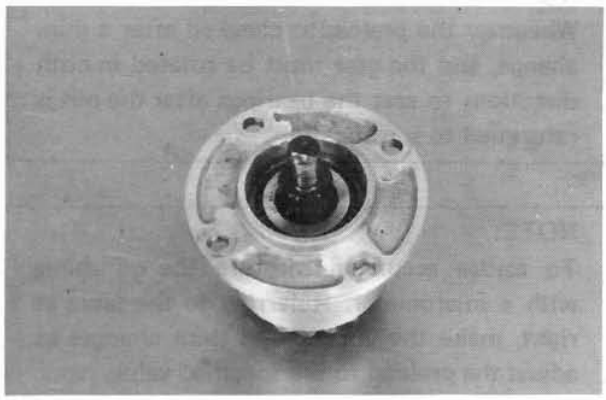
CAUTION:
When replacing the secondary driven gear, be sure also to replace the secondary drive gear, as they must be replaced together.

②	09913 - 80112	Drive pinion race installer



- Install the spacer and shims, removed during disassembly, onto the driven gear shaft.
- Lubricate the bearings with Hypoid gear oil and install the secondary driven gear and bearings into the housing.

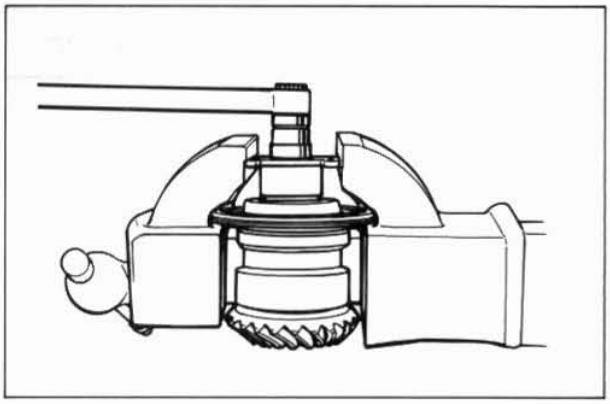
NOTE:
No oil seal is installed at this point. Oil seal is installed after bearing preload is correct.



- Install the propeller shaft flange, washer and nut on the driven gear, and tighten the nut to specification.

CAUTION:
Always use a new nut.

Tightening torque	90–110 N·m (9.0 – 11.0 kg-m)



- Before installing the secondary driven bevel gear housing to the crankcase, shim adjustment is necessary for bearing preload. (Refer to the section "BEARING PRELOAD ADJUSTMENT" on next page).

BEARING PRELOAD ADJUSTMENT

- After the nut is tightened to specification, turn the gear several turns in both directions to seat the bearings.
- Use special tool ① and a socket to measure the torque necessary to turn the gear. This is the bearing preload.

①	09900 - 21107	Torque wrench 0 – 15 kg-cm

Preload	4.0 – 7.0 kg-cm (3.5 – 6.0 lb-in)

- If the bearing preload is not within specification, the shims between the bearings must be changed. Refer to the chart below to make appropriate adjustments, repeating the preload checking procedure as necessary.

NOTE:
Whenever the preload is checked after a shim change, and the gear must be rotated in both directions to seat the bearings after the nut is retorqued to specification.

NOTE:
To assure accuracy, measure the oil shims with a micrometer. Referring to the table at right, make the appropriate shim changes to adjust the preload to the specified value.

09900 - 20205	Micrometer 0 – 25 mm

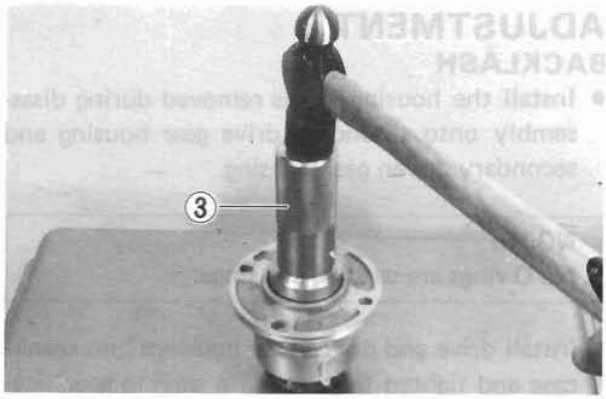
Preload	Shim Adjustment
Under 4.0 kg-cm (3.5 lb-in)	Decrease shim thickness
4.0 – 7.0 kg-cm (3.5 – 6.0 lb-in)	Correct
Over 7.0 kg-cm (6.0 lb-in)	Increase shim thickness

List of shims Ⓓ

Part No.	Shim thickness
09181 - 25006	1.60 mm
09181 - 25007	1.62 mm
09181 - 25008	1.64 mm
09181 - 25009	1.66 mm
09181 - 25010	1.68 mm
09181 - 25011	1.70 mm
09181 - 25012	1.80 mm
09181 - 25013	1.90 mm
09181 - 25014	2.00 mm

- After the bearing preload has been adjusted to specification, remove the driven gear nut, washer and propeller shaft flange.
- Install a new oil seal into the secondary driven gear housing using special tool ③ , making it flush with housing shoulder.

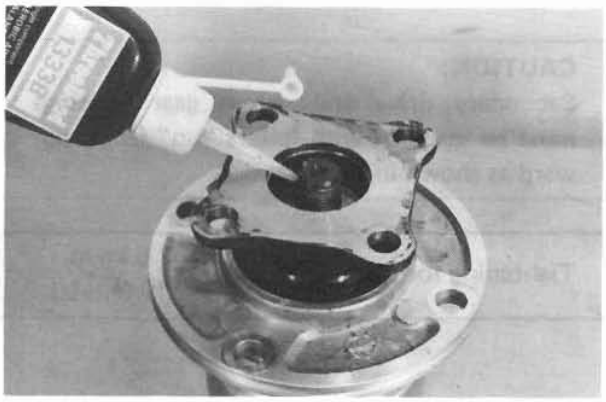
③	09913 - 70122	Bearing installer



- Clean and degrease the driven gear shaft threads, apply a small amount of THREAD LOCK SUPER "1361A" to the threads and install the propeller shaft flange, washer and nut.
  Tighten the nut to specification.

99104 - 32020	Thread Lock Super "1361A"

Tightening torque	9.0 – 11.0 kg-m (65.0 – 79.5 lb-ft)



- Bend the collar of the nut over into the notch in the driven gear shaft.

SECONDARY GEAR SET SHIM ADJUSTMENT

BACKLASH

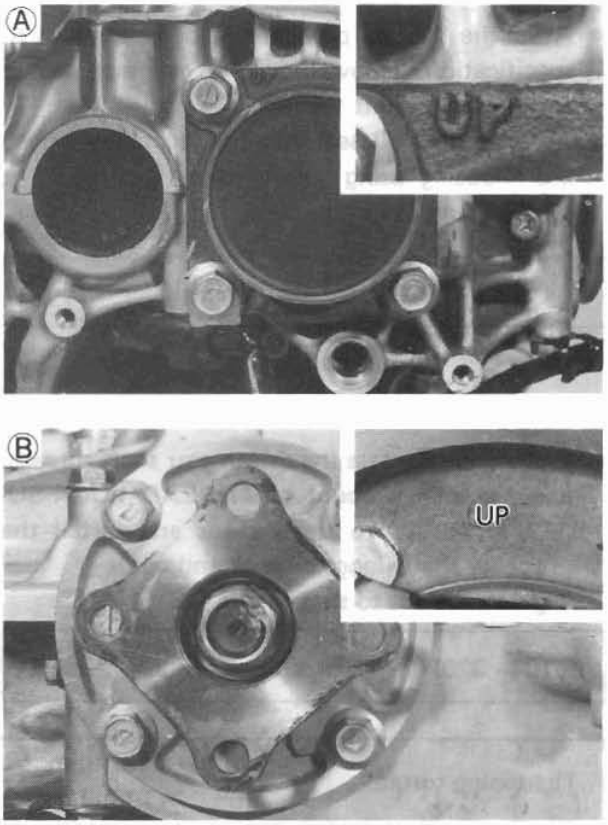
- Install the housing shims removed during disassembly onto secondary drive gear housing and secondary driven gear housing.

NOTE:
No O-rings are used at this stage.

- Install drive and driven gear housings into crankcase and tighten four bolts on each to specification.

CAUTION:
Secondary drive and driven gear housings must be installed with letters "up" facing upward as shown in Fig. Ⓐ and Ⓑ.

Tightening torque	2.0 – 2.6 kg-m (14.5 – 19.0 lb-ft)

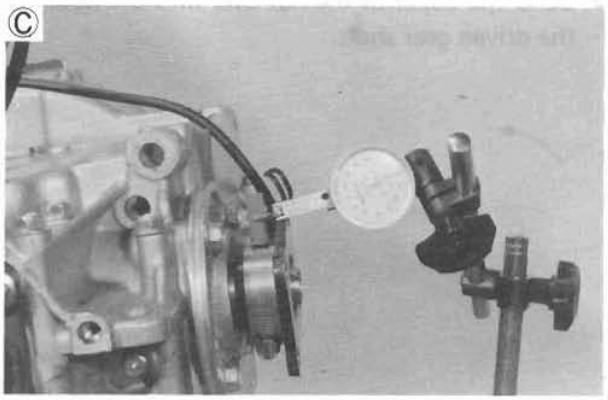


- Place a dial gauge as shown on the secondary driven gear flange and measure the backlash by turning the flange in each direction until it stops.

Secondary Driven Gear Backlash	0.08 – 0.13 mm (0.003 – 0.005 in)

- If the backlash is not within specification, the shim between the secondary driven gear housing and crankcase must be changed and the backlash rechecked until correct.
  Refer to the table below for appropriate changes.

Backlash	Shim adjustment
Under 0.08 mm (0.003 in)	Increase shim thickness
0.08 – 0.13 mm (0.003 – 0.005 in)	Correct
Over 0.13 mm (0.005 in)	Decrease shim thickness



List of Shims Ⓒ

Part No.	Shim thickness
24945 - 45100	0.35 mm
24945 - 45101	0.30 mm
24945 - 45102	0.40 mm
24945 - 45103	0.50 mm
24945 - 45104	0.60 mm

TOOTH CONTACT CHECKING

- After bringing the backlash within specification by changing the shim between the secondary driven gear housing and crankcase, it will be necessary to check tooth contact.
- Remove the four bolts and remove the secondary driven gear housing from the crankcase.
- Clean and degrease the secondary driven gear teeth, and apply a coating of machinist's layout dye or paste to several teeth.
- Reinstall the secondary driven gear housing, with correct shim, into the crankcase, and torque the bolts to specification.

NOTE: No O-ring is used at this stage.

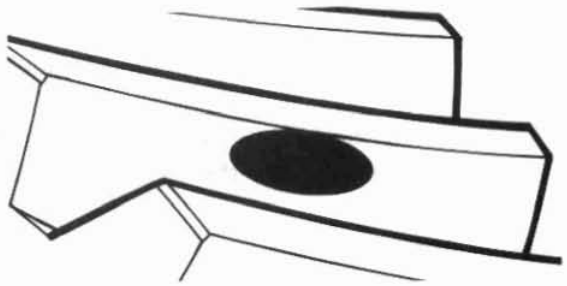
Tightening torque	2.0 – 2.6 kg-m (14.5 – 19.0 lb-ft)

- Turn the secondary driven gear flange several turns in both directions.
- Remove the secondary driven gear housing from the crankcase, and observe the tooth contact pattern made in the dye or paste.
- Compare the tooth contact pattern to the examples as shown in ①, ② and ③.
- If tooth contact is found to be correct, go the Final Assembly sub-section, and complete.
- If tooth contact is found to be incorrect, the shim between the secondary drive gear housing and crankcase must be changed, tooth contact rechecked until correct.

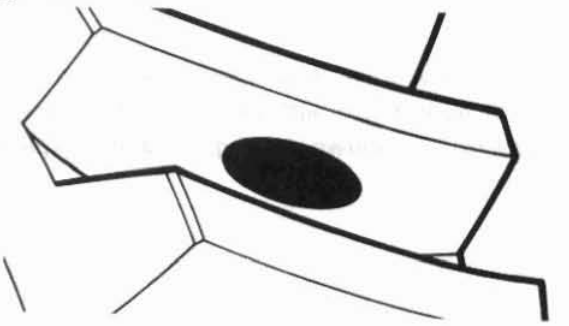
Tooth contact	Shim thickness
Contact at tooth top ①	Decrease shim thickness
Contact at tooth root ③	Increase shim thickness

CAUTION:
After the tooth contact adjustment is made, the backlash must be rechecked, as it may change. Refer to the backlash checking subsection, and readjust until both backlash and tooth contact are correct.

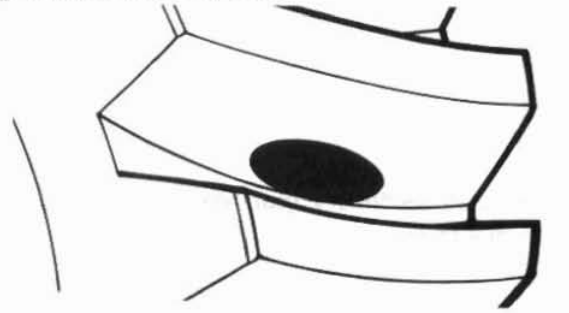
① Contact at tooth top



② CORRECT



③ Contact at tooth root



List of shims Ⓑ

Part No.	Shim thickness
24935 - 45100	0.35 mm
24935 - 45101	0.30 mm
24935 - 45102	0.40 mm
24935 - 45103	0.45 mm
24935 - 45104	0.50 mm

FINAL ASSEMBLY

- After both gear backlash and tooth contact are correct, remove the secondary drive gear housing and secondary driven gear housing from the crankcase.
- Clean off any machinist's dye or paste from the gear teeth, and lubricate the teeth with Hypoid gear oil.
- Install new O-rings on the secondary drive and driven gear housings. Lightly grease the O-rings.
- Install the secondary drive and driven gear housings into the upper crankcase.

NOTE:
Secondary drive and driven gear housings must be installed with the letters "UP" facing upward, as shown in Fig. Ⓐ and Ⓑ (page 4-15).

- Use THREAD LOCK "1363C" on the threads of the housing bolts, and torque to specification.

99104 - 32050	Thread Lock "1363C"

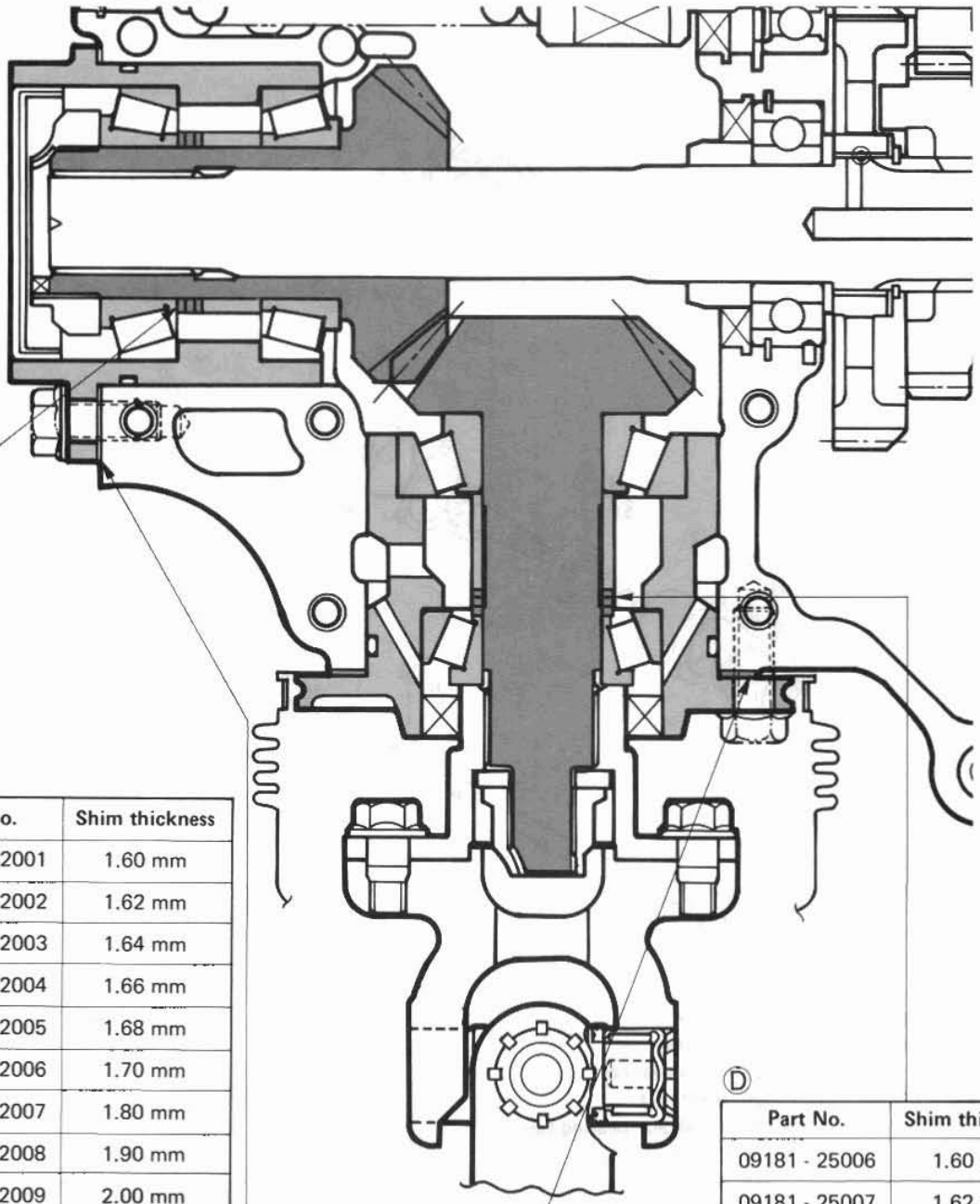
Tightening torque	2.0 – 2.6 kg-m (14.5 – 19.0 lb-ft)

- Reinstall secondary gear box oil drain plug and torque to specification.

Drain plug torque	2.0 – 3.0 kg-m (14.5 – 21.5 lb-ft)

- Fill the gear cavity to specified capacity, 340 – 400 ml with Hypoid gear oil.
- Remount engine assembly, see page 3-7.
- Reinstall secondary drive gear outer cover.

LOCATION OF SHIMS



Ⓐ

Part No.	Shim thickness
09181 - 32001	1.60 mm
09181 - 32002	1.62 mm
09181 - 32003	1.64 mm
09181 - 32004	1.66 mm
09181 - 32005	1.68 mm
09181 - 32006	1.70 mm
09181 - 32007	1.80 mm
09181 - 32008	1.90 mm
09181 - 32009	2.00 mm

Ⓑ

Part No.	Shim thickness
24935 - 45100	0.35 mm
24935 - 45101	0.30 mm
24935 - 45102	0.40 mm
24935 - 45103	0.45 mm
24935 - 45104	0.50 mm

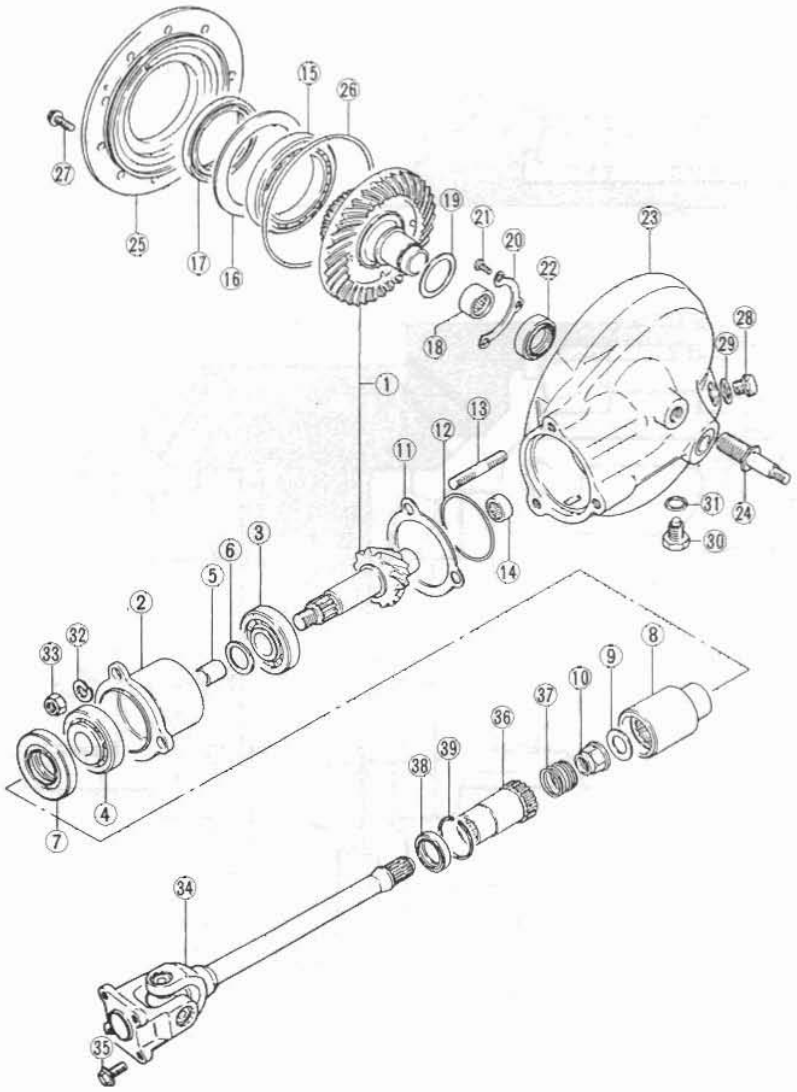
Ⓒ

Part No.	Shim thickness
24945 - 45100	0.35 mm
24945 - 45101	0.30 mm
24945 - 45102	0.40 mm
24945 - 45103	0.50 mm
24945 - 45104	0.60 mm

Ⓓ

Part No.	Shim thickness
09181 - 25006	1.60 mm
09181 - 25007	1.62 mm
09181 - 25008	1.64 mm
09181 - 25009	1.66 mm
09181 - 25010	1.68 mm
09181 - 25011	1.70 mm
09181 - 25012	1.80 mm
09181 - 25013	1.90 mm
09181 - 25014	2.00 mm

FINAL DRIVE BEVEL GEAR ASSEMBLY



① Final bevel gear set
② Final drive gear housing
③ Bearing
④ Bearing
⑤ Spacer
⑥ Shim
⑦ Oil seal
⑧ Drive gear coupling
⑨ Washer
⑩ Nut
⑪ Shim
⑫ O-ring
⑬ Stud bolt
⑭ Bearing
⑮ Final driven gear bearing
⑯ Shim
⑰ Oil seal
⑱ Needle bearing
⑲ Shim
⑳ Bearing holder
㉑ Screw
㉒ Oil seal
㉓ Final gear case
㉔ Stud bolt
㉕ Final gear bearing case
㉖ O-ring
㉗ Bolt
㉘ Oil filler plug
㉙ Gasket
㉚ Oil drain plug
㉛ Gasket
㉜ Lock washer
㉝ Nut
㉞ Propeller shaft
㉟ Bolt
㊱ Propeller shaft coupling
㊲ Spring
㊳ Oil seal
㊴ Circlip

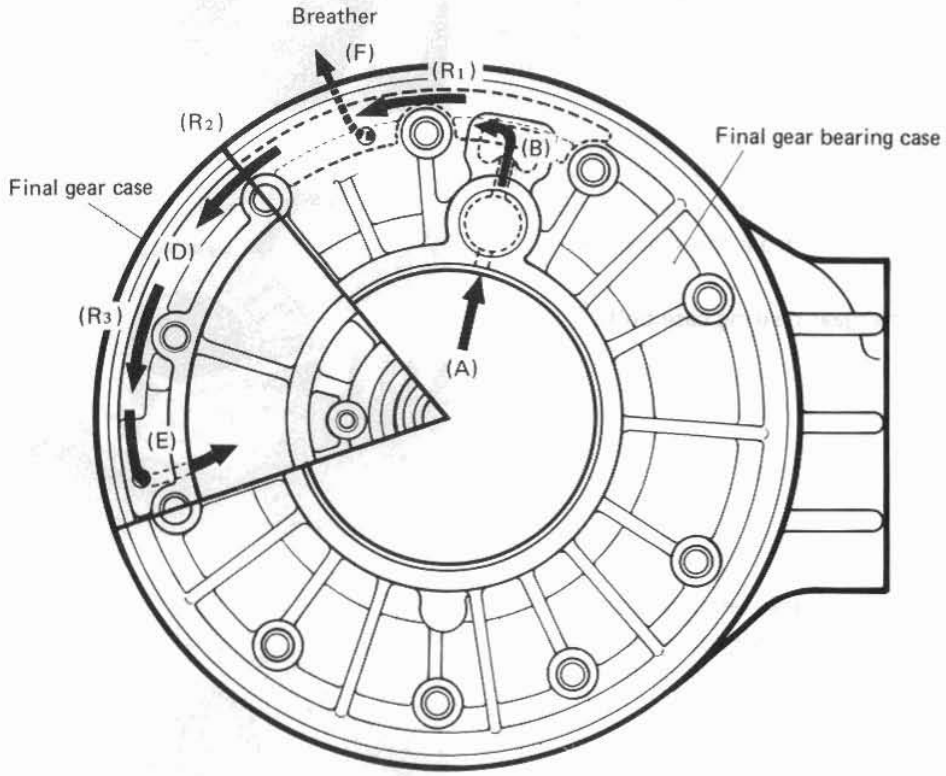
	Tightening torque	
	kg-m	lb-ft
⑩	9.0 – 11.0	65.0 – 79.5
㉑	0.8 – 1.0	6.0 – 7.0
㉔	9.0 – 11.0	65.0 – 79.5
㉗	2.0 – 2.6	14.5 – 19.0
㉘	2.0 – 3.0	14.5 – 21.5
㉚	2.0 – 3.0	14.5 – 21.5
㉝	3.5 – 4.5	25.5 – 32.5
㉟	3.0 – 4.0	21.5 – 29.0

FINAL GEAR CASE BREATHER CIRCUIT

AIR AND GEAR OIL FLOW IN FINAL GEAR CASE BREATHER CIRCUIT

Breather circuit

The GS1100G final gear case breather circuit (passage) consists of the final gear case and final gear bearing case, and air/oil mixed gas flows through the following routes:



Air passage

When the air pressure in the final gear case becomes higher than atmospheric pressure, both air and oil flow in the following passages.

- Air flows from hole (A) to chamber (B) and passes through the gap between rib (R_1) and bearing case to the atmosphere through the breather hole (F).

Oil passage

When the final gear case pressure rises abruptly or when the gear case oil level changes during cornering, the gear oil may sometime flows out into the air passage.

- In this case, the gear oil which has flown into hole (A) goes into chamber (B), where the oil is separated from the air.
- Then, the air flows through the gap between rib (R_1) and bearing case, and goes out through the breather.
- On the other hand, the gear oil when the gear case pressure is higher than atmospheric pressure, flows through the gaps (D) between ribs, (R_1), (R_2) and (R_3) and bearing case and returns to the gear case from gear oil return port (E).

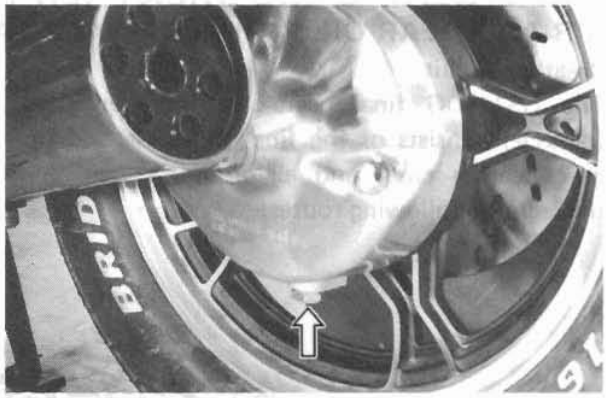
FINAL DRIVE BEVEL GEAR ASSEMBLY

REMOVAL AND DISASSEMBLY

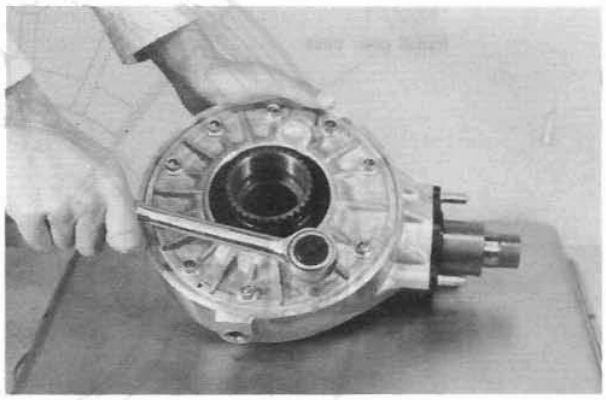
NOTE:
Be sure to retain all adjusting shims for reassembly.

DRIVE GEAR AND BEVEL GEAR HOUSING

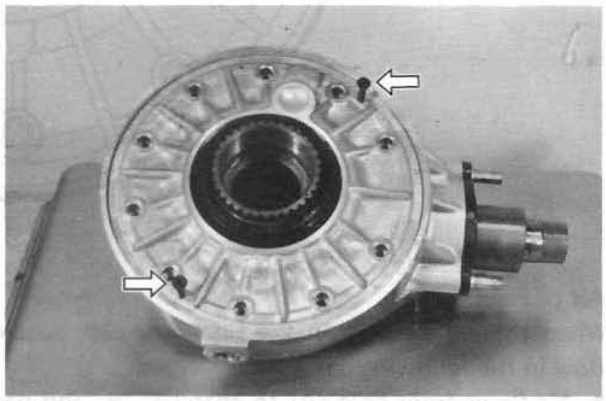
- Place an oil pan under the final drive bevel gear assembly, remove the drain plug and drain the oil.
- Remove the rear wheel assembly. (See page 8-24)
- Remove three nuts attaching the drive gear housing to the swing arm, and move the housing to the rear to detach it from the swing arm.



- Remove ten final gear bearing case bolts.

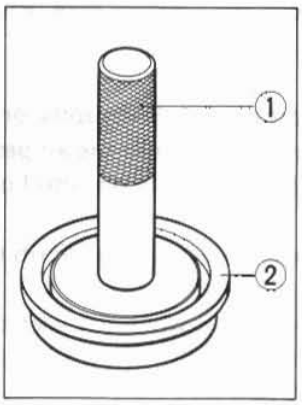


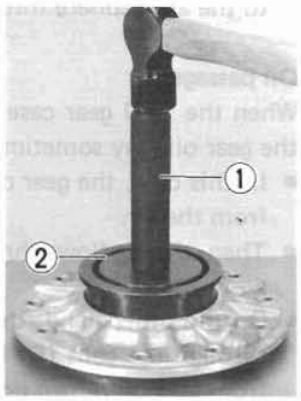
- To remove the final gear bearing case from the housing, use two 6 mm screws; screw them into the holes provided and draw the case off evenly.



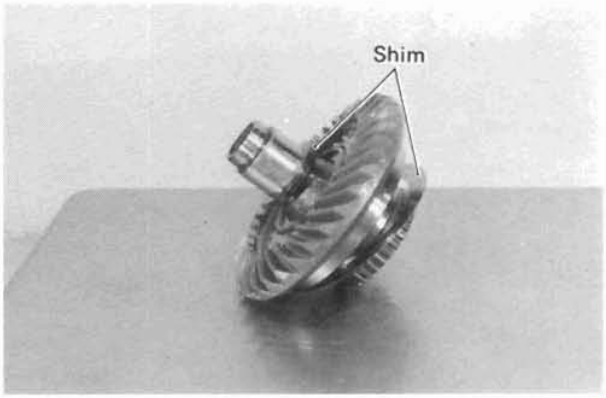
- Using the special tools, ① and ②, remove the oil seal from the final gear bearing case.

①	09924 - 74510	Bearing and oil seal handle
②	09924 - 74520	Oil seal installer and remover



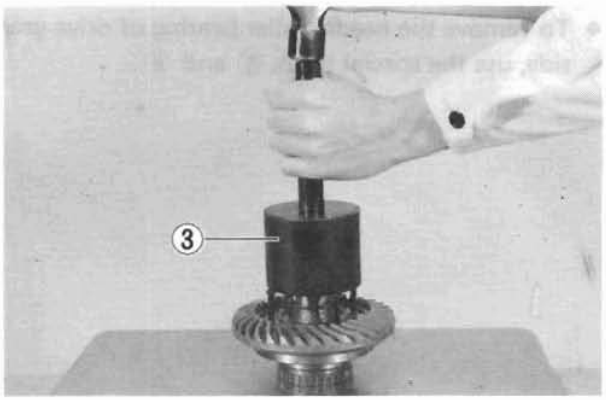


- Remove the shims which are located at the both side of driven gear.

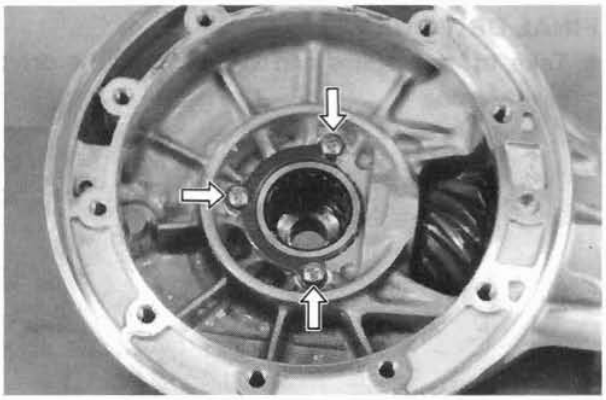


- Using the special tool ③ , remove the ball bearing from the driven gear.

③	09924 - 74570	Final driven gear bearing installer and remover

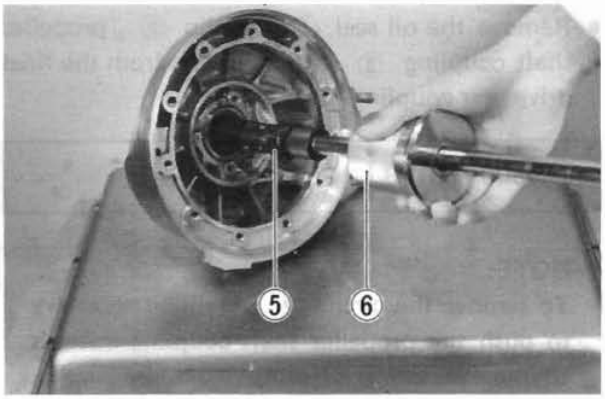


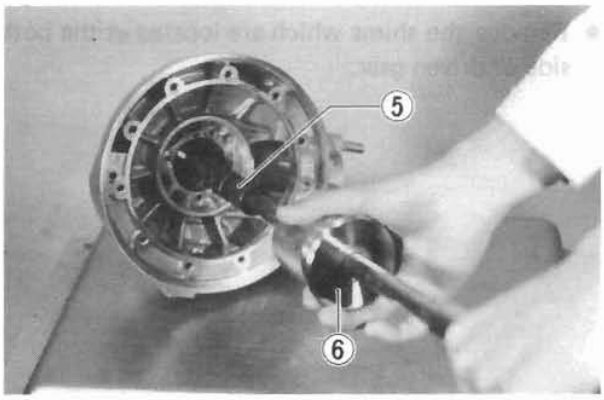
- Remove the three screws and bearing holder, from the final gear case.
- Remove the final drive gear housing from the final gear case.



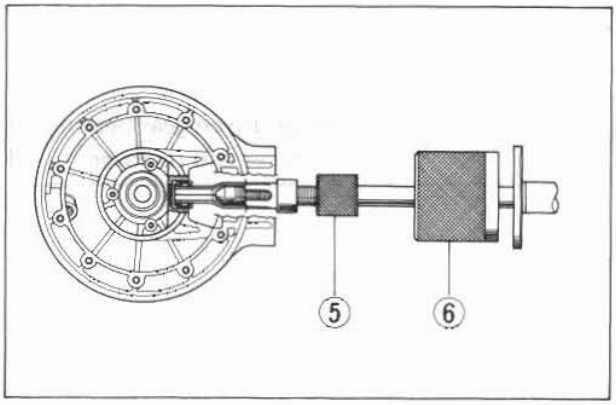
- To remove the needle roller bearing of driven gear side and oil seal from the final gear case, use the special tools, ⑤ and ⑥ .

⑤	09941 - 64510	Bearing and oil seal remover
⑥	09930 - 30102	Rotor remover shaft set





- To remove the needle roller bearing of drive gear side, use the special tools, ⑤ and ⑥ .

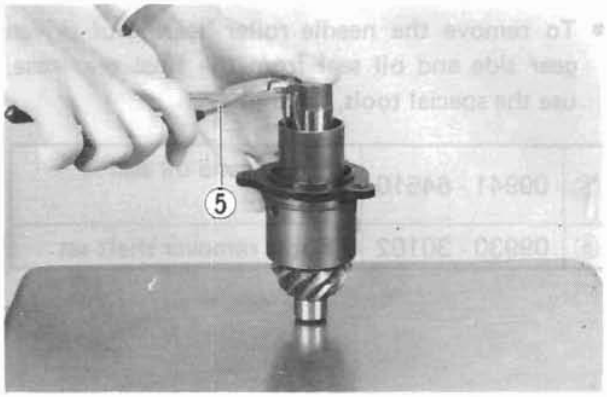


FINAL DRIVE GEAR

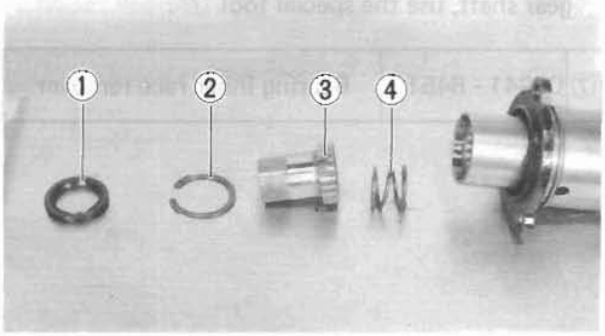
- Take off the shims and O-ring from the drive gear housing.

- Remove the oil seal ① , circlip ② , propeller shaft coupling ③ , and spring ④ from the final drive gear coupling.

⑤	09900 - 06108	Snap ring pliers



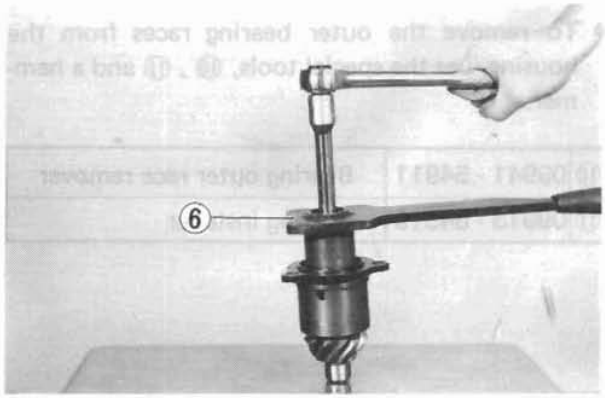
NOTE:
To remove the circlip ② , it will be necessary to push the propeller shaft coupling inwards to remove spring pressure from the circlip.



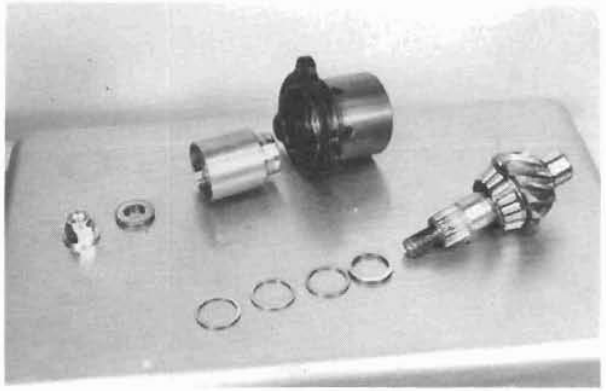
- Straighten the bent portion of the final drive gear nut.

- Use the special tool ⑥ to hold the coupling, and remove the nut.

⑥	09924 - 64510	Final drive gear coupling holder



- Remove the washer and coupling, and tap the drive gear shaft with a plastic hammer to remove it from housing. Do not lose the shims and spacer on the final drive gear shaft.

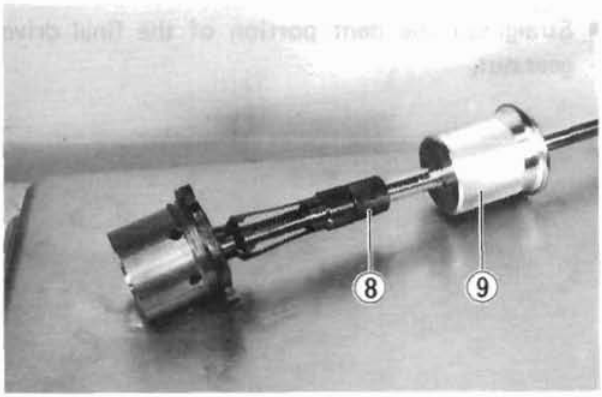


- To remove the inner bearing race from the drive gear shaft, use the special tool ⑦ .

⑦	09941 - 84510	Bearing inner race remover

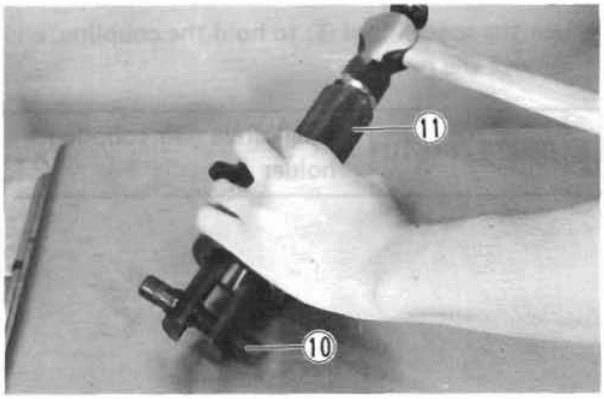
- To remove the oil seal from the housing, use the special tools, ⑧ and ⑨ .

⑧	09941 - 64510	Bearing and oil seal remover
⑨	09930 - 30102	Rotor remover shaft



- To remove the outer bearing races from the housing, use the special tools, ⑩ , ⑪ and a hammer.

⑩	09941 - 54911	Bearing outer race remover
⑪	09913 - 84510	Bearing installer



INSPECTION AND REASSEMBLY

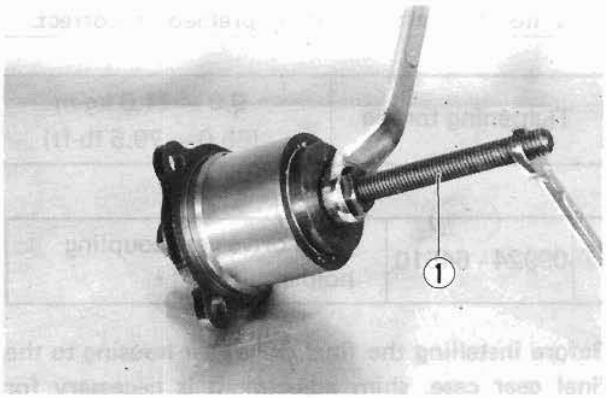
NOTE:
Before reassembly, thoroughly clean all parts in cleaning solvent.

NOTE:
It will be helpful to have a selection of all shims available for clearancing operations.

FINAL DRIVE GEAR

- To install the outer bearing races into the drive gear housing, use the special tool ① .

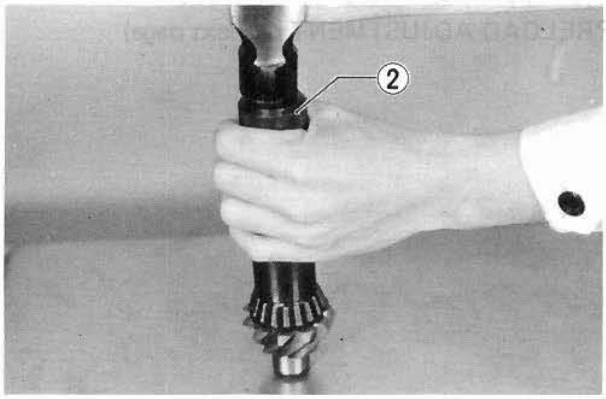
①	09924 - 84510	Bearing installer set



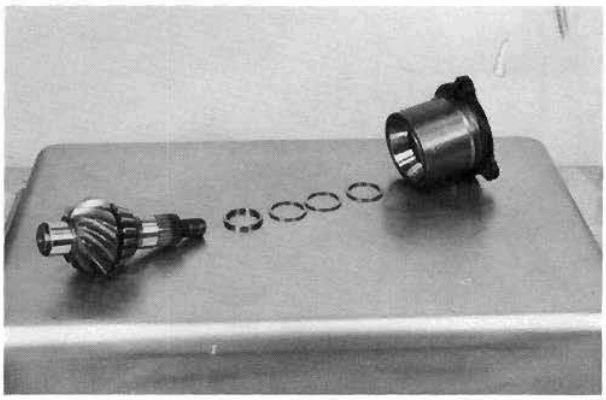
- To install the inner bearing race onto the final drive gear shaft, use the special tool ② .

CAUTION:
When replacing the final drive gear, replace the driven gear also, as they must be replaced together.

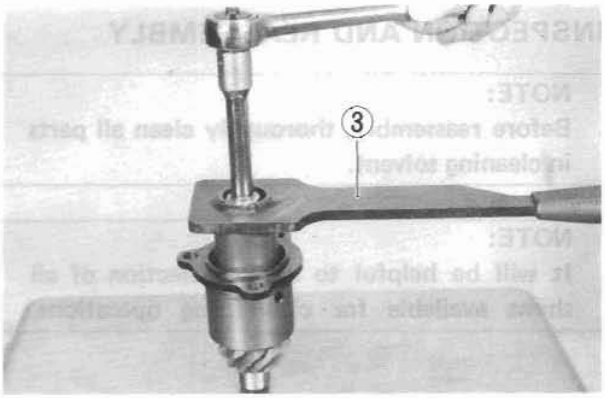
②	09913 - 84510	Bearing installer set



- Install the spacer and shims removed from the old final drive gear on the new gear.
  Install gear into housing.



- Install the other inner bearing race, the washer and final drive gear nut, and tighten to specification, using the special tool ③.



CAUTION:
Always use a new nut.

NOTE:
Coat the bearings with Hypoid gear oil.

NOTE:
No oil seal is installed at this point. Oil seal is installed after bearing preload is correct.

Tightening torque	9.0 – 11.0 kg-m (65.0 – 79.5 lb-ft)

③	09924 - 64510	Final drive gear coupling holder

Before installing the final drive gear housing to the final gear case, shim adjustment is necessary for bearing preload. (Refer to the section "BEARING PRELOAD ADJUSTMENT on next page)

FINAL DRIVE GEAR BEARING PRELOAD ADJUSTMENT

- After tightening the final drive gear nut to specification, measure the bearing preload using the special tool with a 1/2" x 1/4" adapter socket.

NOTE:
Rotate the gear several turns in both directions to seat the bearings.

Preload torque	4.0 – 8.0 kg-cm (3.5 – 7.0 lb-in)

①	09900 - 21107	Torque wrench 0 – 15 kg-cm

- If the preload measured is not correct.
  Remove the final drive gear and change the shims according to the following chart:

Preload	Shim
Under 4.0 kg-cm (3.5 lb-in)	Decrease shim thickness
4.0 – 8.0 kg-cm (3.5 – 7.0 lb-in)	Correct
Over 8.0 kg-cm (7.0 lb-in)	Increase shim thickness

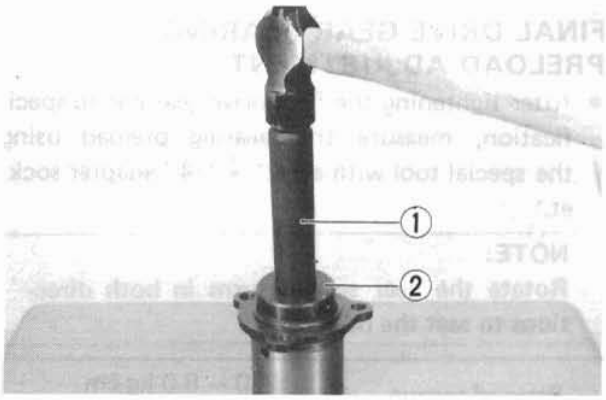
- Re-torque the final drive gear nut to specification, and re-check the preload measurement until it is correct.

List of Shims Ⓐ

Part No.	Shim thickness
09181 - 25006	1.60 mm
09181 - 25007	1.62 mm
09181 - 25008	1.64 mm
09181 - 25009	1.66 mm
09181 - 25010	1.68 mm
09181 - 25011	1.70 mm
09181 - 25012	1.80 mm
09181 - 25013	1.90 mm
09181 - 25014	2.00 mm

- Once the bearing preload is correct, remove the nut, washer, coupling, and the final drive gear from the housing. Using the special tools, ① and ② , install a new oil seal into the housing.

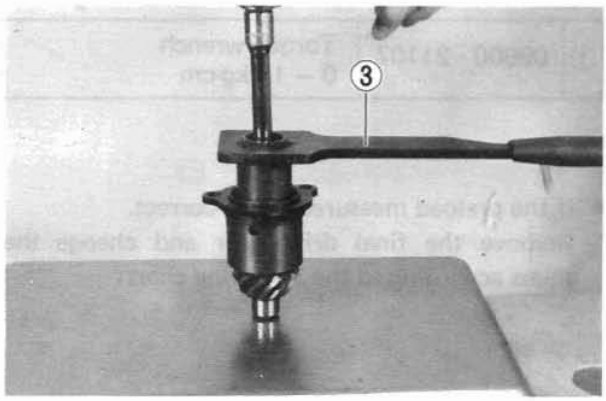
①	09924 - 74510	Bearing and oil seal handle
②	09924 - 74560	Final drive bevel gear housing oil seal installer



- Liberally coat the bearings with Hypoid gear oil and reinstall the final drive gear into the housing.

- Make sure the final drive gear threads are free of oil. Put a small amount of THREAD LOCK SUPER "1361A" on the threads, install the drive gear coupling, washer and nut, and torque to specification.

99104 - 32020	Thread Lock Super "1361A"



③	09924 - 64510	Final drive gear coupling holder

Tightening torque	9.0 – 11.0 kg-m (65.0 – 79.5 lb-ft)

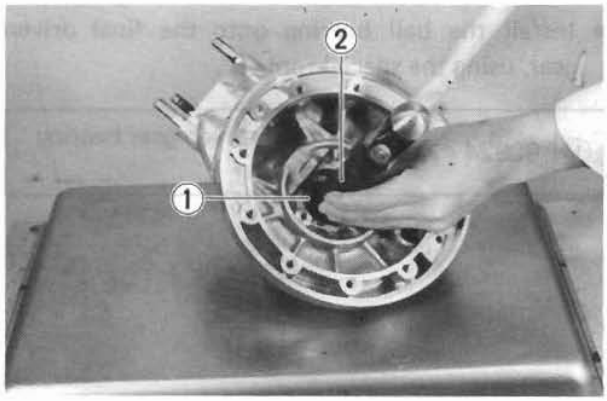
- After tightening the nut to specification, bend the collar of the nut over into the notch in the final drive gear shaft.

FINAL DRIVEN GEAR

- Install the final gear case oil seal, using the special tools, ① and ② .

①	09924 - 74550	Oil seal installer
②	09924 - 74510	Handle

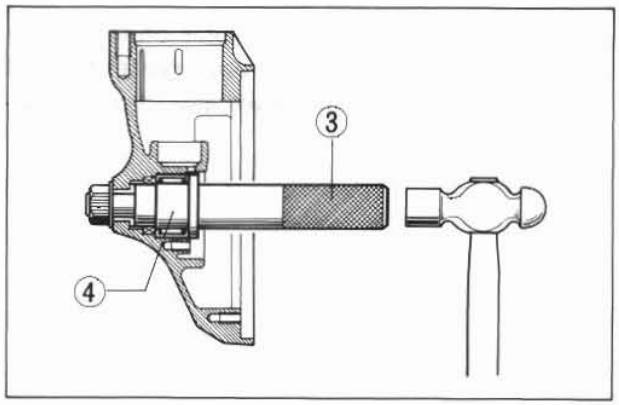
NOTE:
The oil seal is correctly installed when the lip spring is on the driven gear side.



- Use the special tools, ③ and ④ , to install the needle bearing for the driven gear.

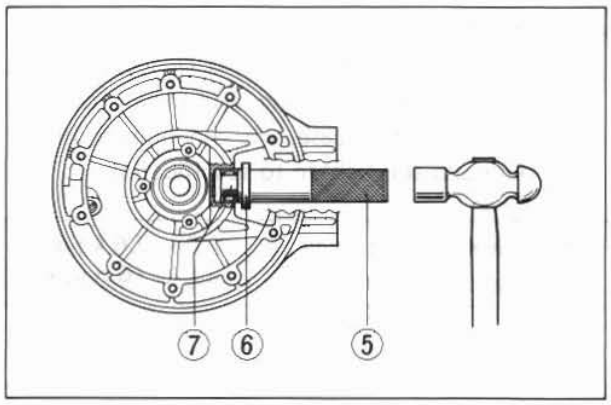
CAUTION:
The bearing case has a stamped mark on one end, which must face inside.

③	09913 - 84510	Bearing installer
④	09924 - 94510	Final gear case bearing installer



- Install the needle bearing for the final drive gear into the final gear case using the special tools, ⑤ , ⑥ and ⑦ .

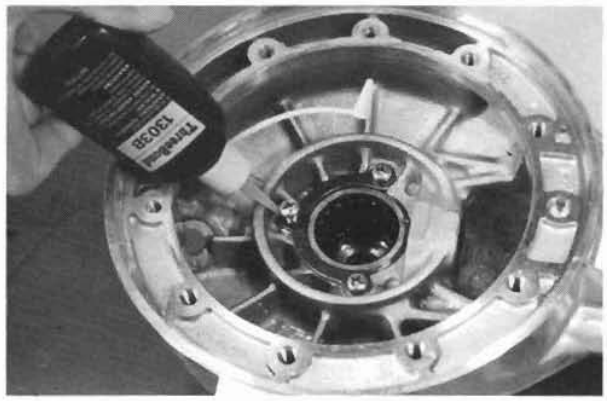
⑤	09924 - 74510	Bearing and oil seal installer handle
⑥	09924 - 74530	Bearing installer
⑦	09924 - 74540	Pilot



- Install the driven gear needle bearing holder. Use THREAD LOCK "1363A" on the screws, and tighten to specification.

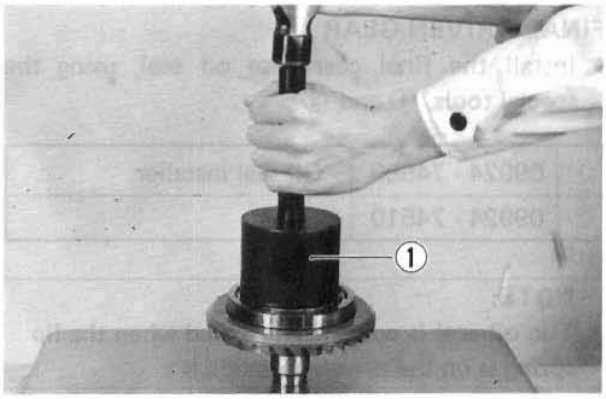
99104 - 32030	Thread Lock "1363A"

Tightening torque	0.8 – 1.0 kg-m (6.0 – 7.0 lb-ft)

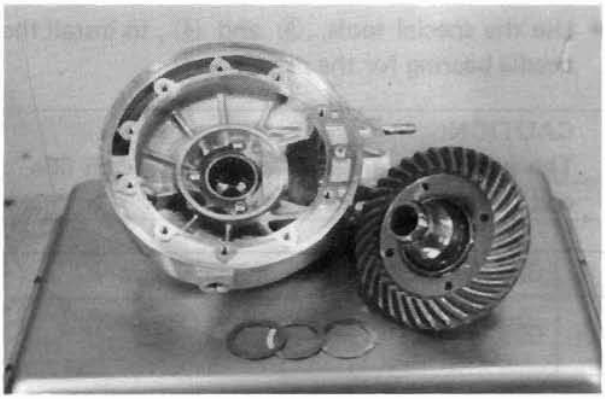


- Install the ball bearing onto the final driven gear, using the special tool ① .

①	09924 - 74570	Final driven gear bearing installer



- Place the final driven gear shims on the driven gear needle bearing, oil the bearing with Hypoid gear oil, and install the driven gear into the final gear case completely.



- Oil the final driven gear ball bearing with Hypoid gear oil, place the shims removed during disassembly on the bearing, and install the final driven gear bearing case, without oil seal. Install the ten bolts and tighten to specification.

Final gear bearing cover bolt tightening torque	2.0 – 2.6 kg-m (14.5 – 19.0 lb-ft)

SHIM ADJUSTMENT

FINAL GEAR BEARING CASE SHIM ADJUSTMENT

- Using a thickness gauge, measure the clearance between the shims and the bearing case. If not within specification, the shims must be changed.

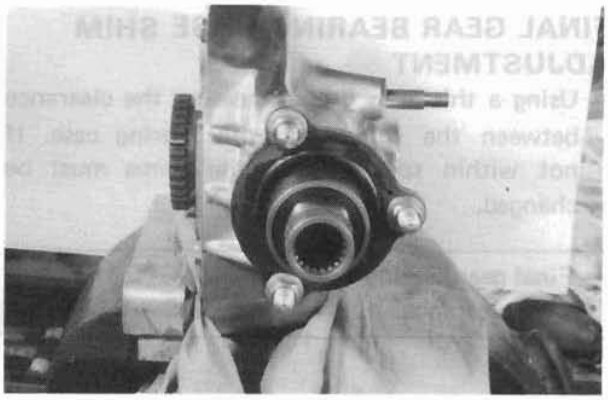
Final gear bearing case shim clearance	0.05 – 0.15 mm (0.002 – 0.006 in)

List of Shims Ⓓ

Part Number	Thickness
27327 - 45100	0.35 mm
27327 - 45102	0.40 mm
27327 - 45103	0.50 mm
27327 - 45104	0.60 mm

BACKLASH MEASUREMENT

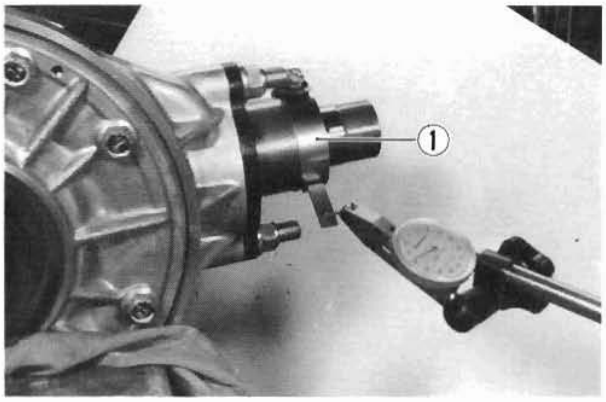
- Using the shims removed during disassembly, install the final drive gear housing, without O-ring, into the final gear case and remove the final gear bearing case oil seal. Tighten the nuts and bolts to specification.



Final drive gear housing nut torque	3.5 – 4.5 kg-m (25.5 – 32.5 lb-ft)
Final gear bearing case bolt	2.0 – 2.6 kg-m (14.5 – 19.0 lb-ft)

To measure the backlash as follow:

A) Install the backlash measuring tool on the drive gear coupling, and set-up a dial gauge as shown.



①	09924 - 34510	Backlash Measuring Tool Ⓐ (27 – 50ϕ)

- Adjust the dial gauge so that it touches the backlash measuring tool arm at the mark; hold the final driven gear securely, and turn the final drive gear coupling slightly in each direction, reading the total backlash on the dial gauge.

Final gear backlash drive side	0.03 – 0.64 mm (0.001 – 0.025 in)

NOTE:
If the backlash is not within specification, adjust the shim thickness as follows.

- Remove shims from final gear bearing case and final gear case, and measure total thickness.
- In order not to change the clearance between the final gear bearing case and final driven gear bearing, the total thickness of the shims installed after a change is made must equal the original total thickness of shims.

List of Shims Ⓑ
(Final Driven Gear to Case)

Part Number	Thickness
27326 - 45100	1.25 mm
27326 - 45101	1.20 mm
27326 - 45102	1.05 mm
27326 - 45103	1.10 mm
27326 - 45104	1.35 mm

List of Shims Ⓓ
(Final Driven Gear Case to Bearing)

Part Number	Thickness
27327 - 45100	0.35 mm
27327 - 45102	0.40 mm
27327 - 45103	0.50 mm
27327 - 45104	0.60 mm

- If backlash is too large:
  a) Install a thinner shim pack between final driven gear and final gear case.
  b) Increase thickness of shims between final gear case and bearing by an amount equal to the decrease above.

- If backlash is too small:
  a) Install a thicker shim pack between final driven gear and final gear case.
  b) Decrease thickness of shims between final gear case and bearing by an amount equal to the increase above.

EXAMPLE:
Final gear to case shims;
1.35 + 1.05 mm = 2.40 mm
Final gear case to bearing shims;
0.50 mm + 0.40 mm = 0.90 mm
Original total measurement = 3.30 mm

Backlash too large:
Final gear to case shims;
1.30 mm + 1.05 mm = 2.35 mm
Final gear case to bearing shims;
0.60 mm + 0.35 mm = 0.95 mm
Total thickness = 3.30 mm

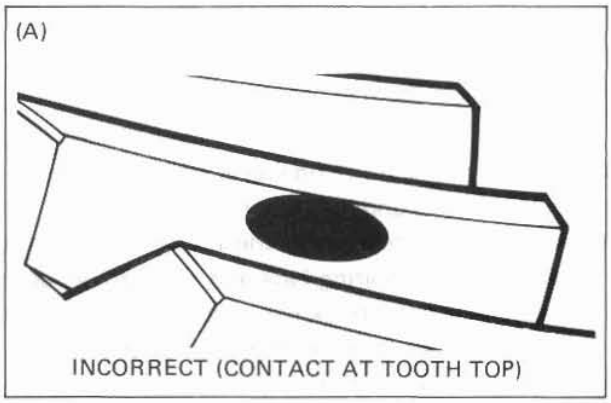
Backlash too small:
Final gear to case shims;
1.40 mm + 1.05 mm = 2.45 mm
Final gear case to bearing shims;
0.50 mm + 0.35 mm = 0.85 mm
Total thickness = 3.30 mm

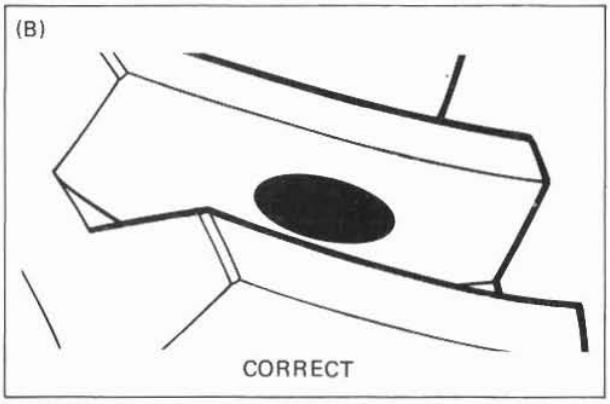
TOOTH CONTACT ADJUSTMENT

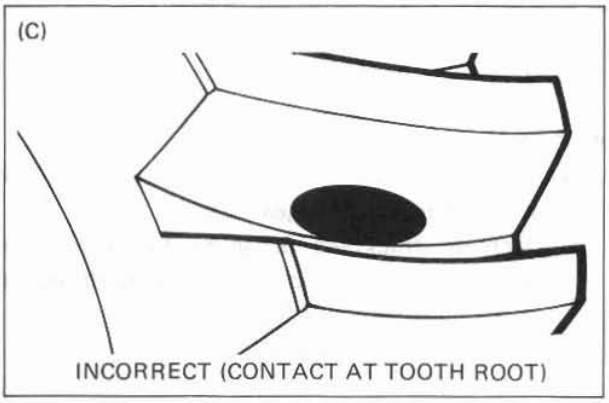
- After backlash adjustment is carried out, the tooth contact must be checked.
- Remove the 10 bolts from the final gear case, and remove the case, using the 6 mm screws (see page 4-21). Do not misplace the shims. Remove the driven gear.
- Clean and de-grease several teeth on the final driven gear. Coat these teeth with machinist's dye (usually available from parts houses) or paste, preferably of a light color.
- Re-install the driven gear with shims in place, positioning the coated teeth so they are centered on the final drive gear.
- Re-install the final gear case and bolts, and tighten to specification.

Final gear case bolt tightening torque	2.0 – 2.6 kg-m (14.5 – 19.0 lb-ft)

- Using a socket and handle on the final drive gear coupling nut, rotate the final drive gear several turns in each direction, while loading the final driven gear. This will provide a contact pattern on the coated teeth of the driven gear.
- Remove the final gear case and final gear, and inspect the coated teeth of the driven gear. The contact patch should be as shown below:
- If the tooth contact pattern is correct, as shown in (B), go to the Final Assembly section.
- If the tooth contact pattern is incorrect, as shown in (C), a thinner shim is needed between the final drive gear housing and final gear case.
- If the tooth contact pattern is incorrect, as shown in (A), a thicker shim is needed between the final drive gear housing and final gear case.
- If the tooth contact pattern is incorrect for either reason, the appropriate shim must be installed, and the tooth contact pattern re-checked by repeating the tooth coating procedure above.







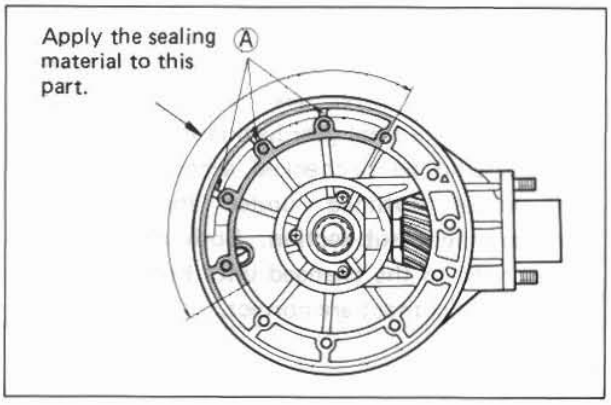
NOTE:
If it is necessary to adjust the shim thickness between final drive gear housing and final gear case, the final gear backlash may change, and should be re-checked according to the procedure outlined under the Backlash Measurement sub-section. Both adjustments may need to the changed until both backlash and tooth contact are correct.

List of Shims ©
(Final Drive Gear Housing to Final Gear Case)

Part No.	Shim thickness
27445 - 45100	0.15 mm
27445 - 45101	0.35 mm
27445 - 45102	0.30 mm
27445 - 45103	0.40 mm

FINAL ASSEMBLY

- After adjusting the backlash tooth contact and clearance between the bearing case and the bearing, remove the final gear case, clean the mating surfaces thoroughly, and apply SUZUKI BOND No. 1215 to the final gear case should be limited to the surface shown at right.

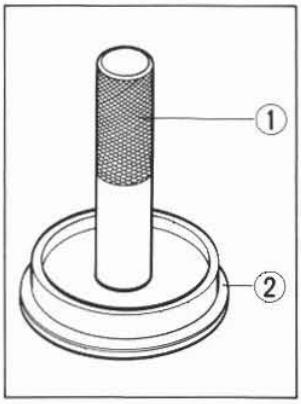


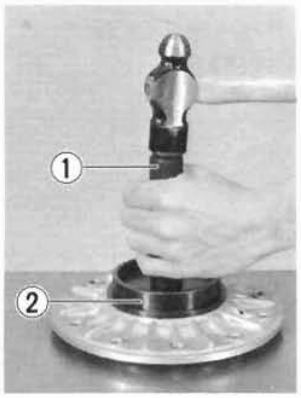
CAUTION:
* **Thoroughly clean mating surfaces of final gear case and final gear bearing case.**
* **Take care not to apply SUZUKI BOND No. 1215 to ribs Ⓐ or not allow it to flow on to ribs.**

- Use the special tools, ① and ② , to install a new oil seal into the final gear bearing case.

NOTE:
Lip of seal with spring goes toward final driven gear.

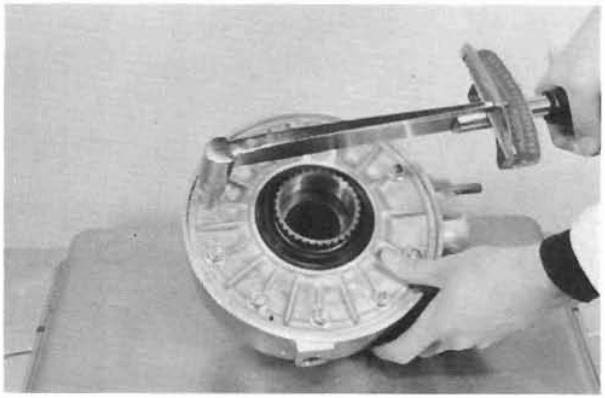
①	09924 - 74510	Bearing and oil seal installer handle
②	09924 - 74520	Oil seal installer and remover





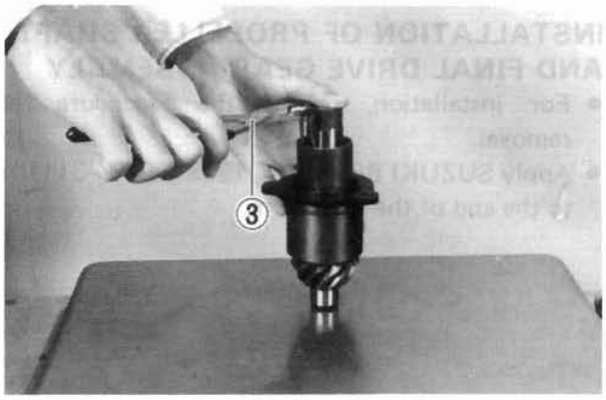
- Install the final gear bearing case and tighten the 10 bolts to specification. Take care not to damage the seal lip.

Tightening torque	2.0 – 2.6 kg-m (14.5 – 19.0 lb-ft)



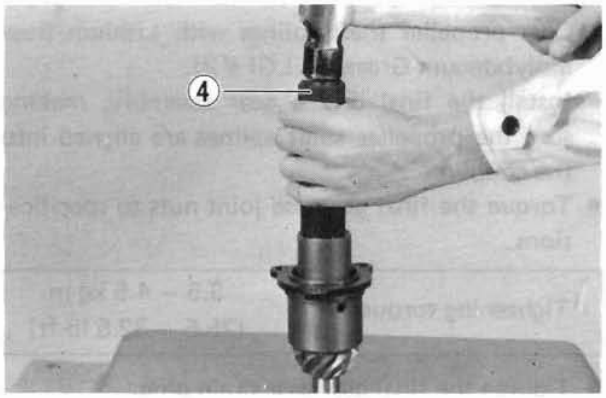
- Remove the final drive gear housing from the final gear case.
- Liberally coat the final drive gear coupling splines with Lithium Base Molybdenum Grease (NLGI #2), and install the propeller shaft coupling spring and propeller shaft coupling.
- Push the coupling in against the spring and install the circlip using the special tool ③ .

③	09900 - 06108	Snap ring pliers



- Using the special tool ④ , install a new oil seal into the propeller shaft coupling.

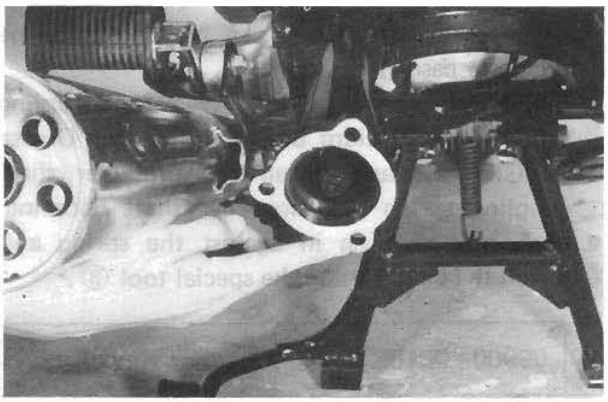
④	09913 - 84510	Bearing installer



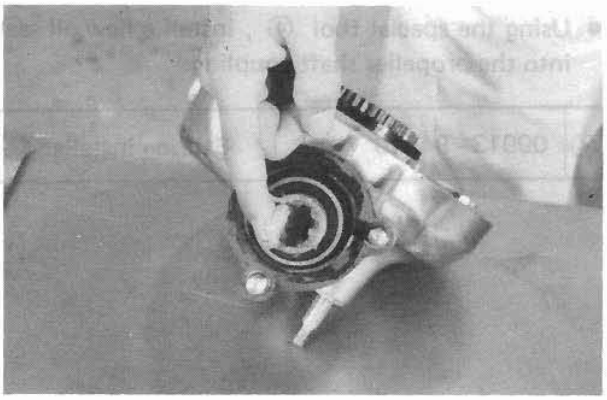
- Install the shims and a new O-ring on final drive gear housing, lubricate it lightly with Hypoid gear oil, and install the housing into the final gear case.

INSTALLATION OF PROPELLER SHAFT AND FINAL DRIVE GEAR ASSEMBLY

- For installation, reverse the procedure for removal.
- Apply SUZUKI BOND No. 1215 (99104-31110) to the end of the swing arm.



- Coat propeller shaft splines with Lithium Base Molybdenum Grease (NLGI #2).
- Install the final driven gear assembly, making sure the propeller shaft splines are aligned into the coupling.
- Torque the final gearcase joint nuts to specifications.



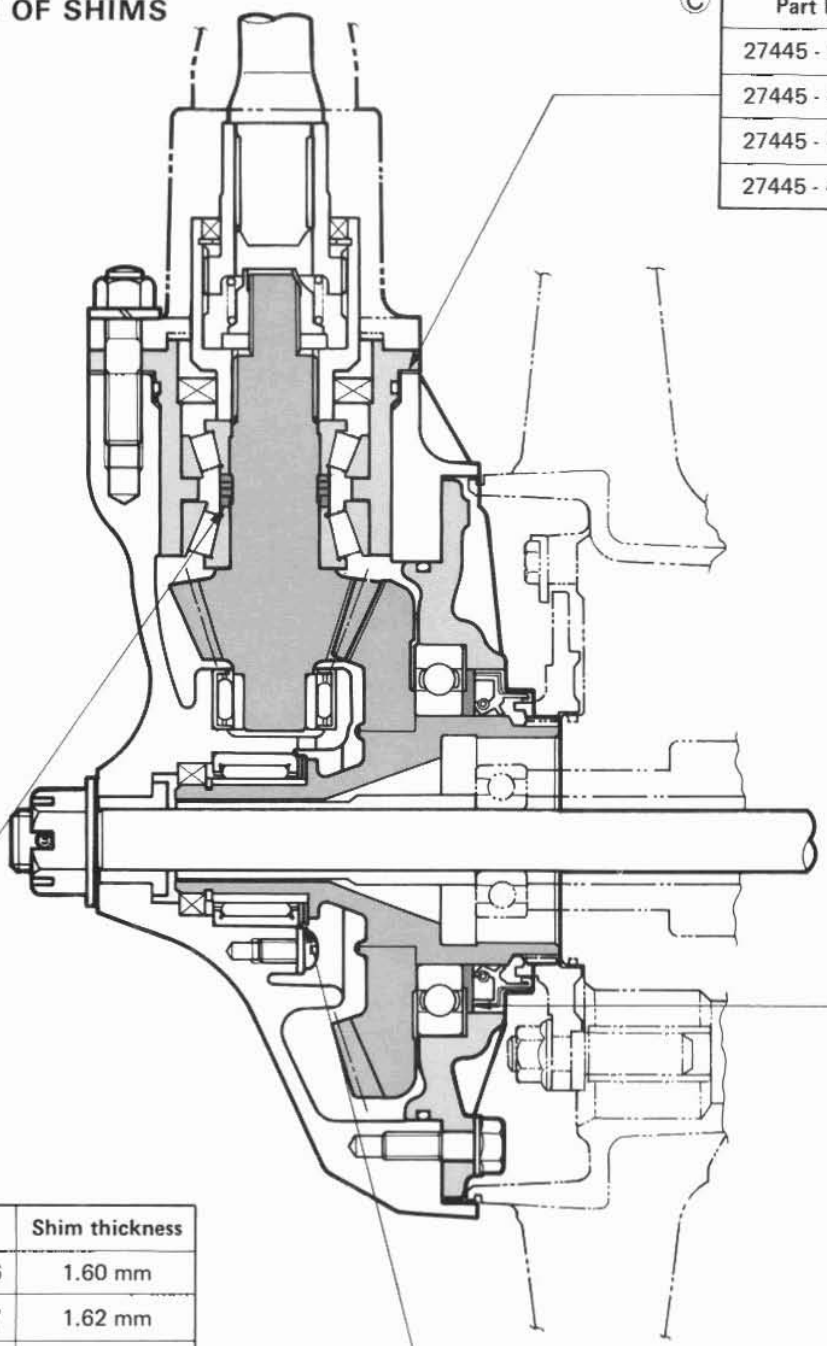
Tightening torque	3.5 – 4.5 kg-m (25.5 – 32.5 lb-ft)

- Tighten the final gear case drain plug.

Tightening torque	2.0 – 3.0 kg-m (14.5 – 21.5 lb-ft)

- Add Hypoid gear oil through filler hole until level is equal to filler hole opening level.

LOCATION OF SHIMS



Ⓒ

Part No.	Shim thickness
27445 - 45100	0.15 mm
27445 - 45101	0.30 mm
27445 - 45102	0.35 mm
27445 - 45103	0.40 mm

Ⓐ

Part No.	Shim thickness
09181 - 25006	1.60 mm
09181 - 25007	1.62 mm
09181 - 25008	1.64 mm
09181 - 25009	1.66 mm
09181 - 25010	1.68 mm
09181 - 25011	1.70 mm
09181 - 25012	1.80 mm
09181 - 25013	1.90 mm
09181 - 25014	2.00 mm

Ⓑ

Part No.	Shim thickness
27326 - 45100	1.25 mm
27326 - 45101	1.20 mm
27326 - 45102	1.05 mm
27326 - 45103	1.10 mm
27326 - 45104	1.35 mm

Ⓓ

Part No.	Shim thickness
27327 - 45100	0.35 mm
27327 - 45102	0.40 mm
27327 - 45103	0.50 mm
27327 - 45104	0.60 mm

FUEL AND LUBRICATION SYSTEM

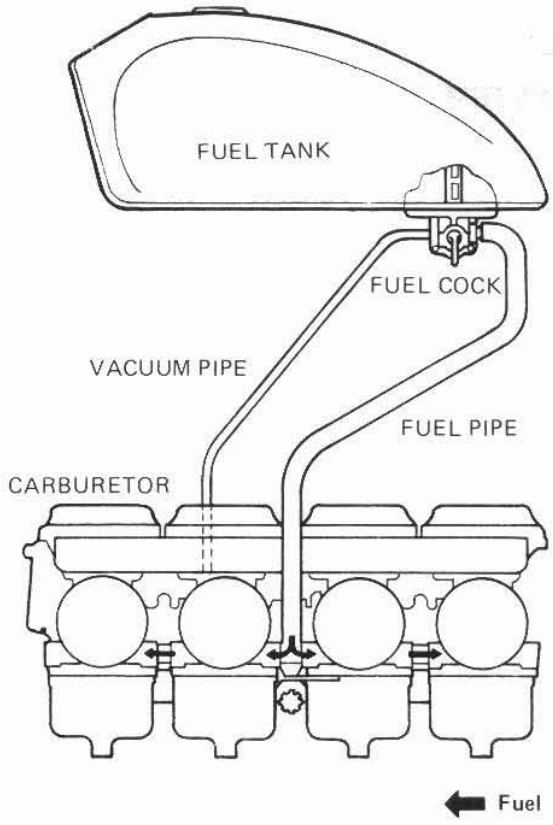
CONTENTS

FUEL SYSTEM 5- 1
FUEL COCK 5- 2
CARBURETOR 5- 3
SPECIFICATIONS 5- 4
DISASSEMBLY 5- 9
REASSEMBLY 5-13
LUBRICATION SYSTEM 5-17

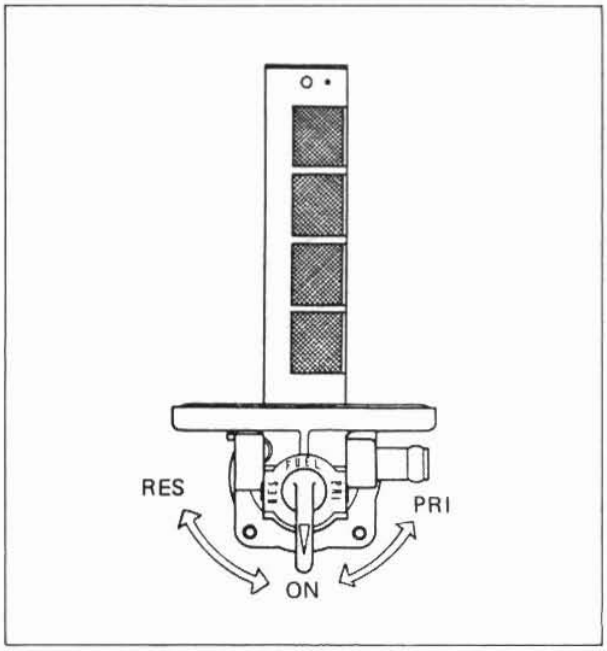
5

FUEL SYSTEM

When turning starter motor, negative pressure is generated in the combustion chamber. This negative pressure works on the diaphragm 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 allow fuel to flow into carburetor float chamber.

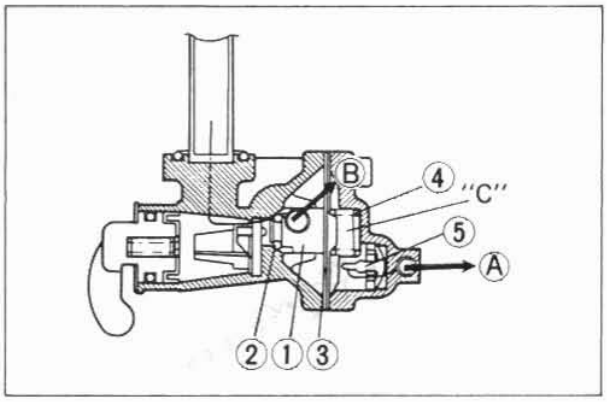


FUEL COCK



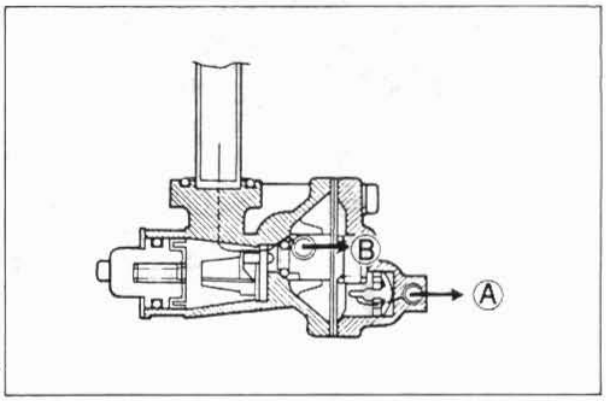
When the engine is not running and the valve is the ON or RES position, the fuel valve is kept in the closed position by applying pressure utilizing a spring so that no fuel will flow to the carburetors. When the engine is started, a negative pressure is generated in the diaphragm chamber "C" through the vacuum (negative pressure) pipe which is connected to the No. 2 carburetor, and builds up a negative pressure which is higher than the spring pressure so that the diaphragm is forced to open the fuel valve and thus allow the fuel to flow to the carburetors.

When the lever is set to PRI position, the protrusion ⑥ located on the lever end pushes back the fuel valve mechanically against the spring force and it allows fuel to flow to the carburetors directly, whether the engine is running or not, through the RES side fuel filter and fuel valve clearance.

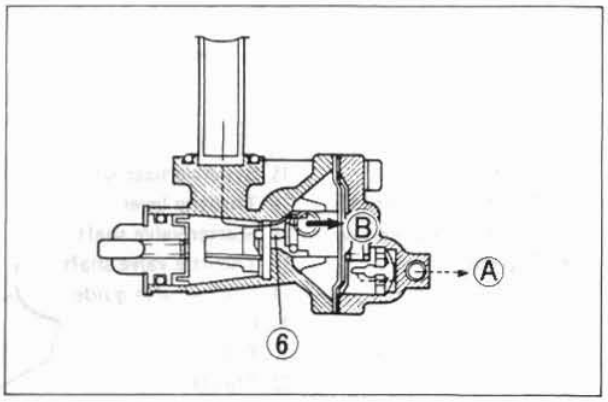


"ON"

① Fuel valve ② O-ring ③ Diaphragm
④ Spring ⑤ One way valve
Ⓐ Vacuum Ⓑ Fuel flow

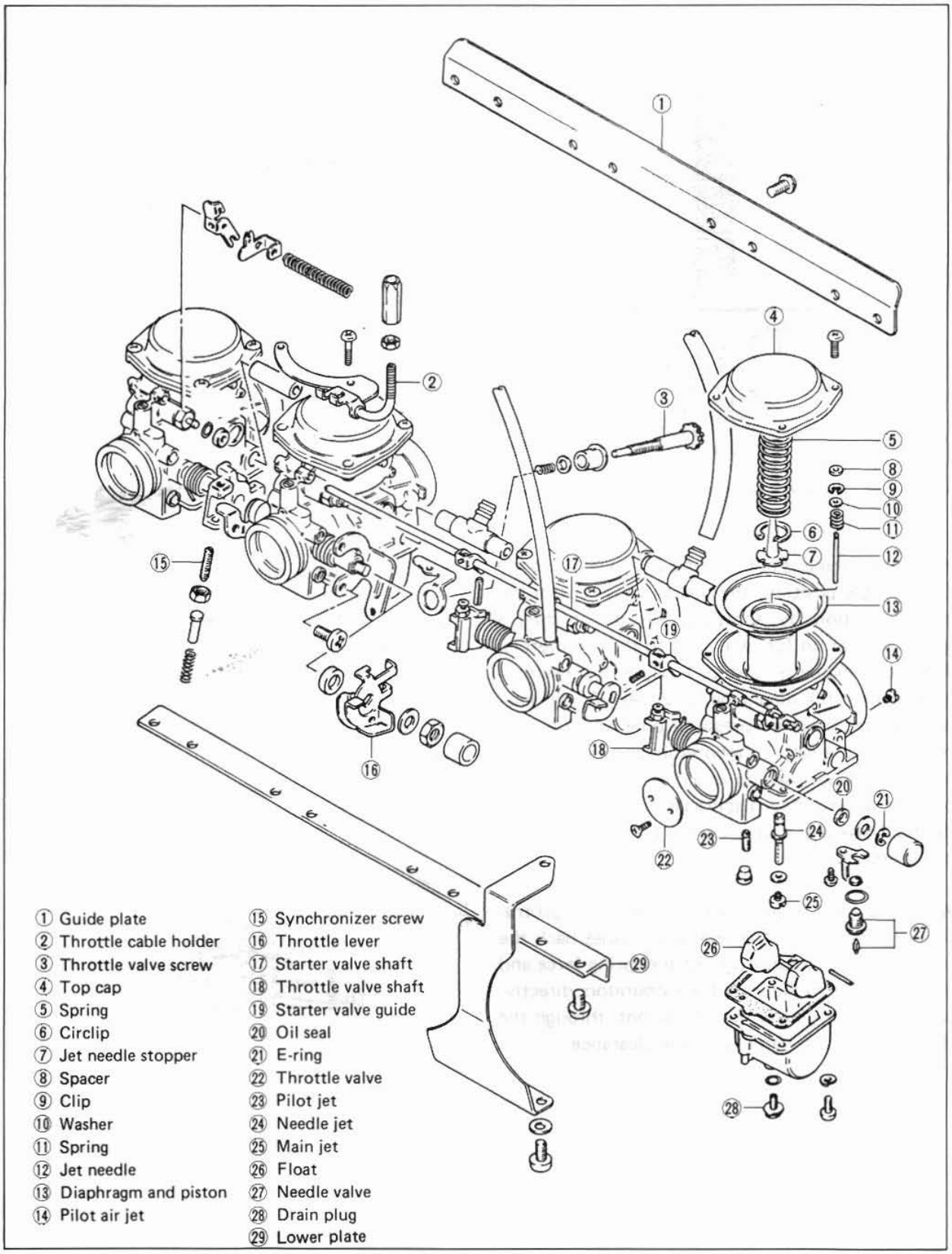


"RES"



"PRI"

CARBURETOR

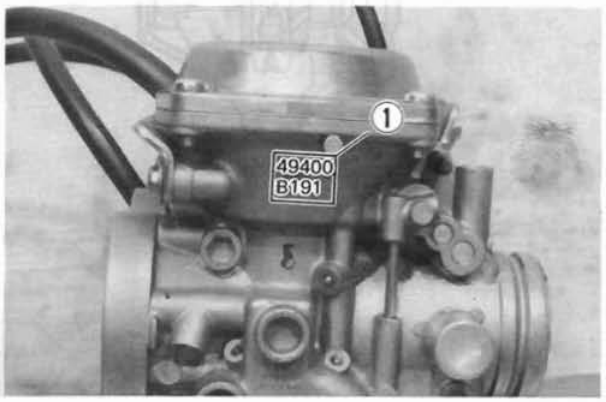


① Guide plate
② Throttle cable holder
③ Throttle valve screw
④ Top cap
⑤ Spring
⑥ Circlip
⑦ Jet needle stopper
⑧ Spacer
⑨ Clip
⑩ Washer
⑪ Spring
⑫ Jet needle
⑬ Diaphragm and piston
⑭ Pilot air jet
⑮ Synchronizer screw
⑯ Throttle lever
⑰ Starter valve shaft
⑱ Throttle valve shaft
⑲ Starter valve guide
⑳ Oil seal
㉑ E-ring
㉒ Throttle valve
㉓ Pilot jet
㉔ Needle jet
㉕ Main jet
㉖ Float
㉗ Needle valve
㉘ Drain plug
㉙ Lower plate

SPECIFICATIONS

ITEM	SPECIFICATIONS
Type	MIKUNI BS34SS
I.D. No.	49400
Bore	34 mm (1.33 in)
Idle r/min	1 050 ± 100 r/min
Fuel level	5.0 ± 0.5 mm (0.20 ± 0.02 in)
Float height	22.4 ± 1.0 mm (0.88 ± 0.04 in)
Main jet	# **115**
Main air jet	1.7 mm (0.07 in)
Jet needle	5D58
Needle jet	**X – 3**
Pilot jet	# **40**
By pass	0.9, 0.8, 0.8 mm (0.04, 0.03, 0.03 in)
Pilot outlet	0.7 mm (0.03 in)
Valve seat	2.0
Starter jet	# 50
Pilot screw	Pre-set
Pilot air jet	# 170
Throttle cable play	0.5 – 1.0 mm (0.02 – 0.04 in)
Starter cable play	0.5 – 1.0 mm (0.02 – 0.04 in)

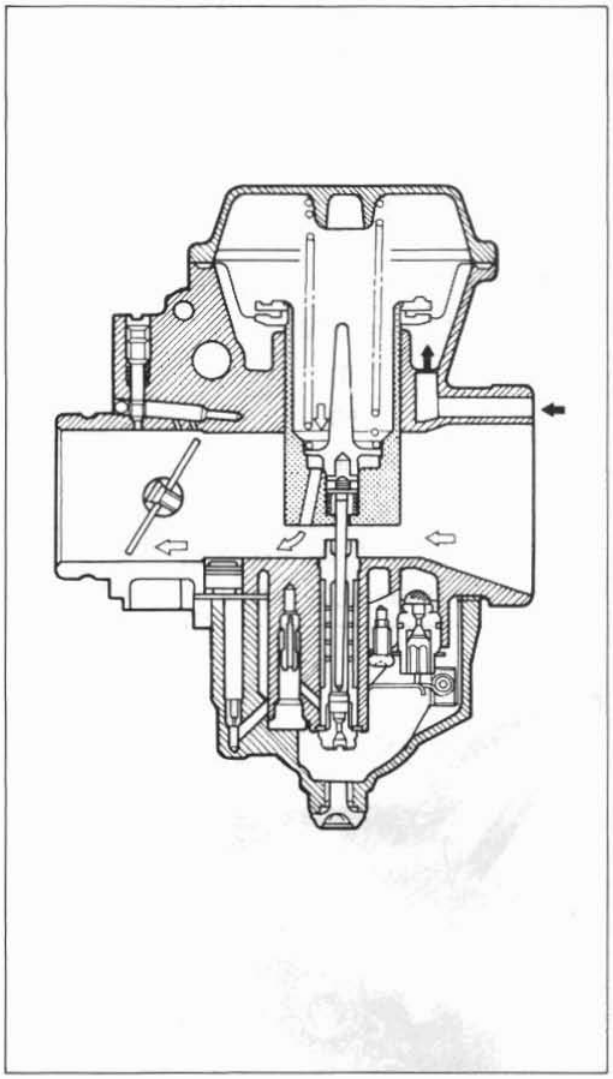
Each carburetor has I.D. Number ① printed on the carburetor body according to its specifications.

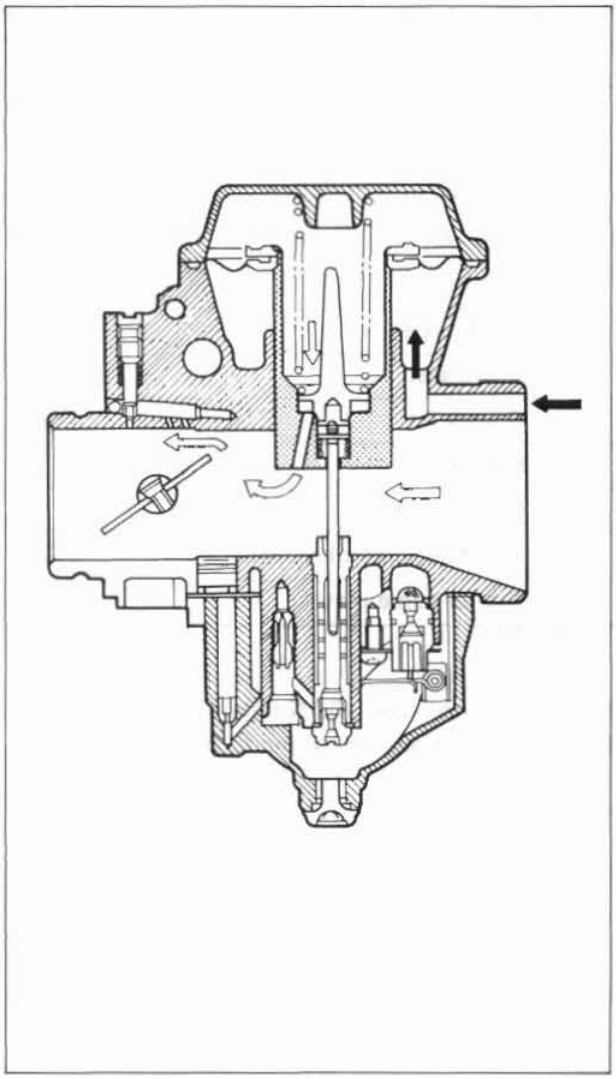


DIAPHRAGM AND PISTON OPERATION

The carburetor is of 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 to prevent the air velocity from increasing. Therefore, air velocity in the venturi passage is kept relatively constant for improved fuel atomization and for securing an optimum ratio of fuel to air in the mixture.



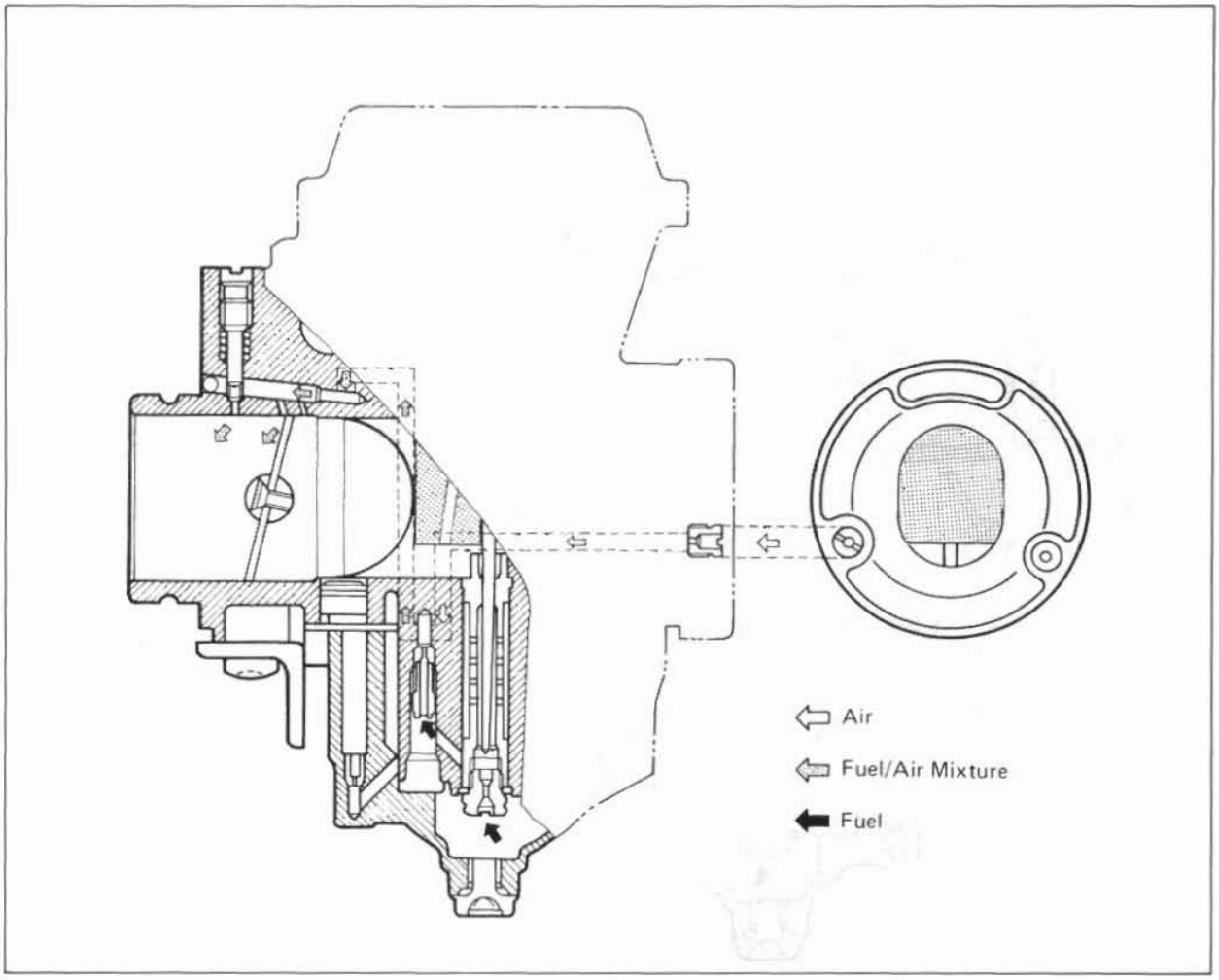


SLOW SYSTEM

This system supplies fuel during engine operation with throttle valve closed or slight opened.

The fuel from float chamber is first passed through main jet and 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.



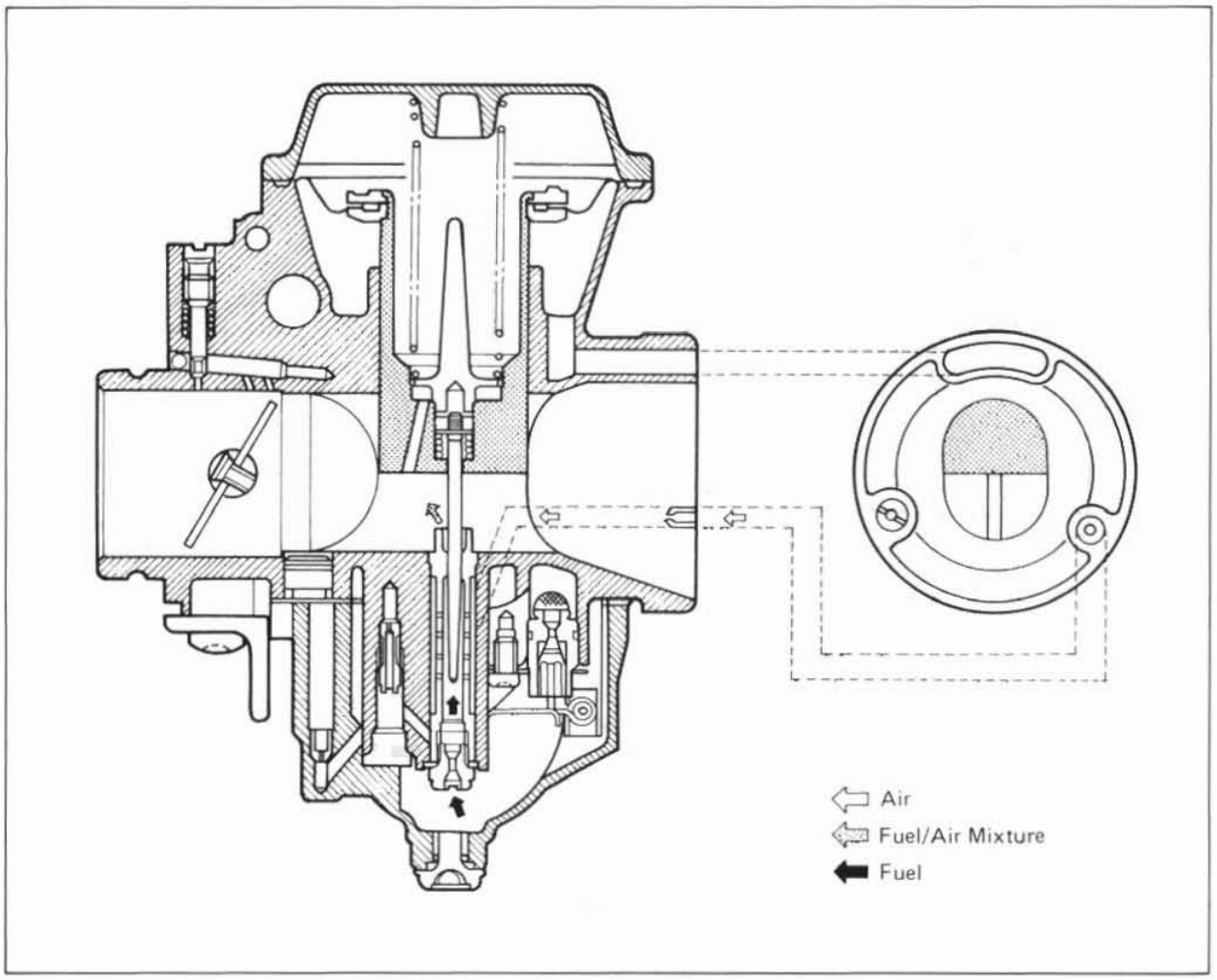
MAIN SYSTEM

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 either large or small, depending ultimately on throttle position.

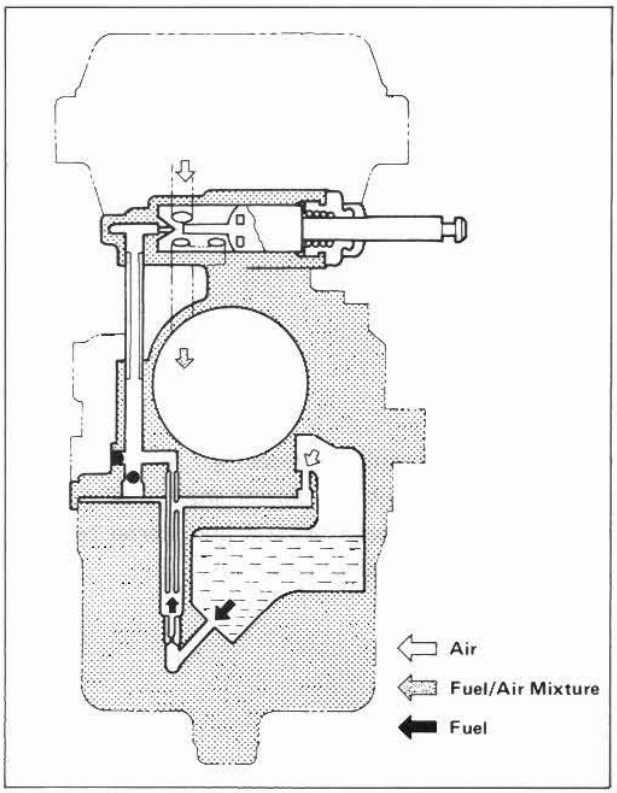


STARTER SYSTEM

Turning the choke knob all the way left, slides starting plunger to draw fuel into the starter circuit from the float chamber through starter jet.

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 extended from behind the diaphragm.

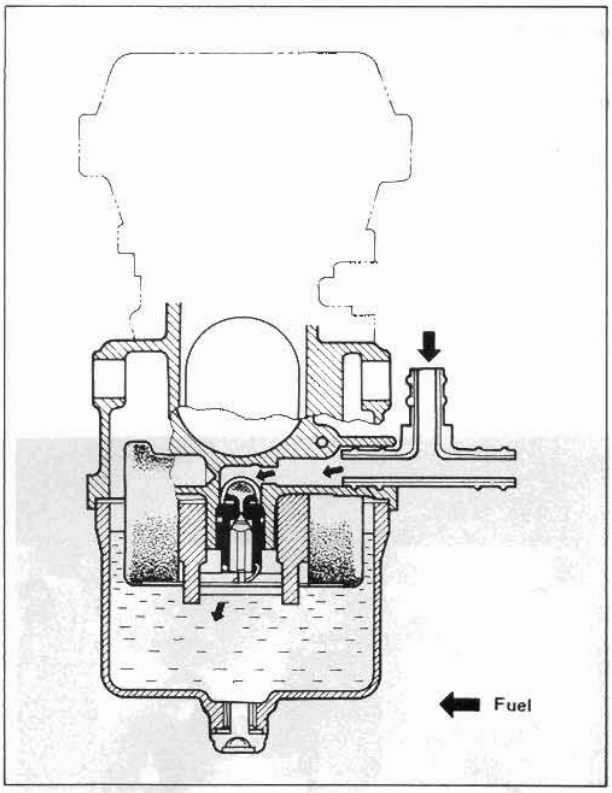
The two successive mixings of fuel with air are such that proper air/fuel mixture for starting is produced when the mixture is sprayed out through starter outlet into the main bore.



FLOAT SYSTEM

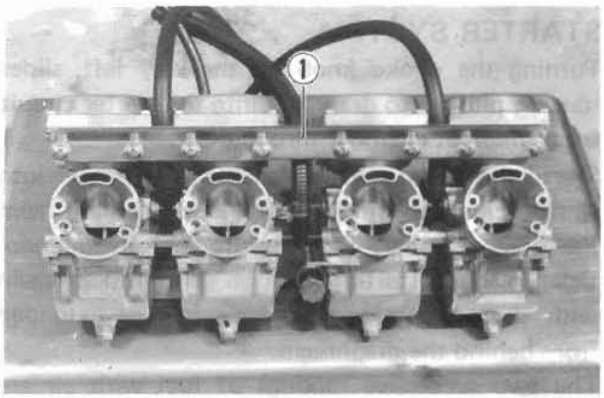
Floats and needle valve are associated with the same mechanism, so that, as the floats move up and down, the needle valve too moves likewise. When fuel level is up in float chamber, floats are up and needle valve remains pushed up against valve seat. Under this condition, no fuel enters the float chamber.

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

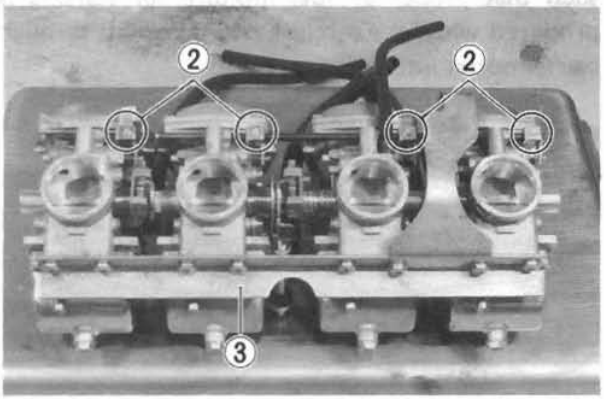


DISASSEMBLY

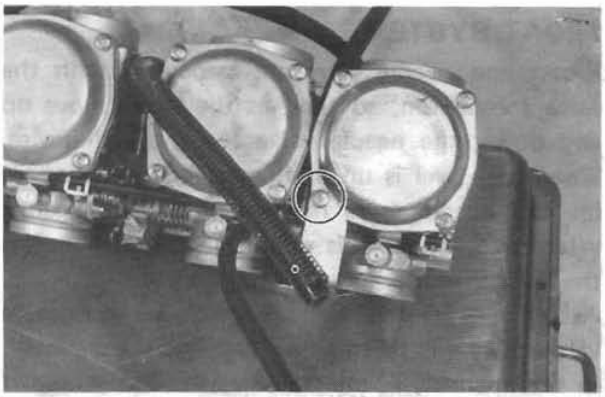
- Remove the carburetor set guide plate ① by unscrewing 8 screws.

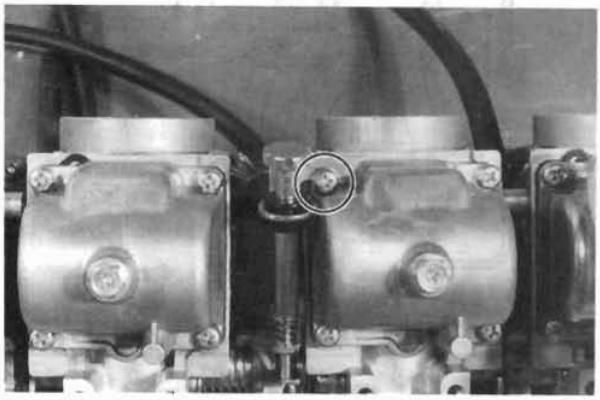


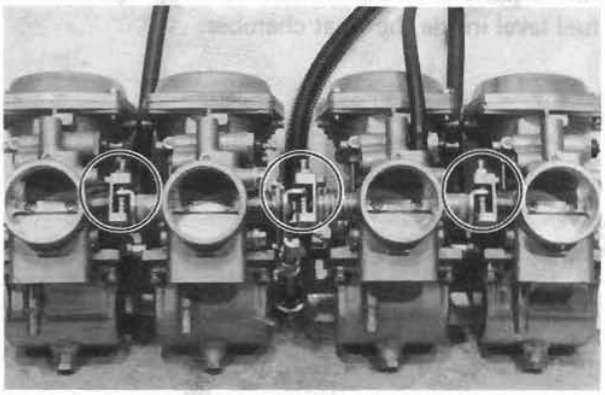
- Loosen 4 tightening screws ② of the starter shaft and pull out the starter shaft to the right.
- Remove the throttle bracket and starter bracket by unscrewing respective screws.



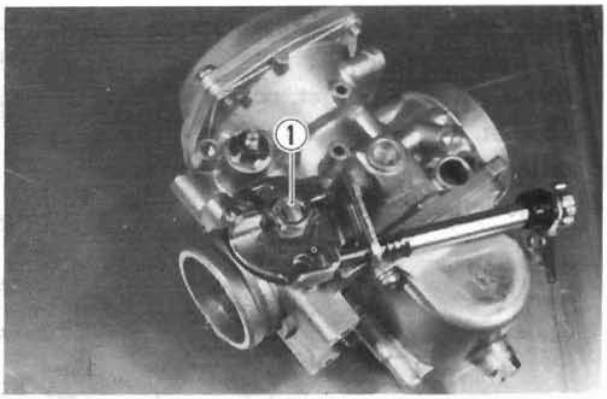
- Remove carburetor set lower plate ③ by unscrewing 8 screws.
- Remove throttle valve stop screw plate and separate 4 carburetors each.



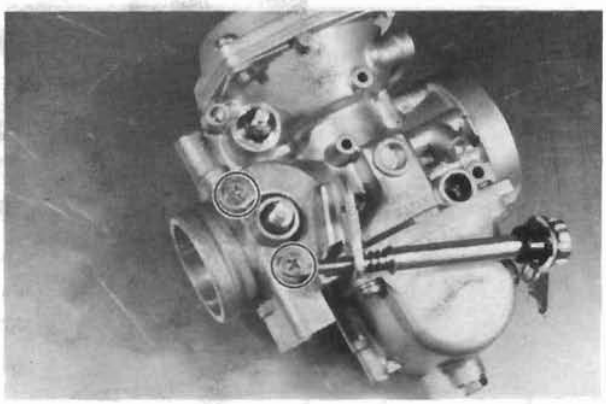




- Flatten the lock washer.
- Take off the adjuster lever by removing nut ① .

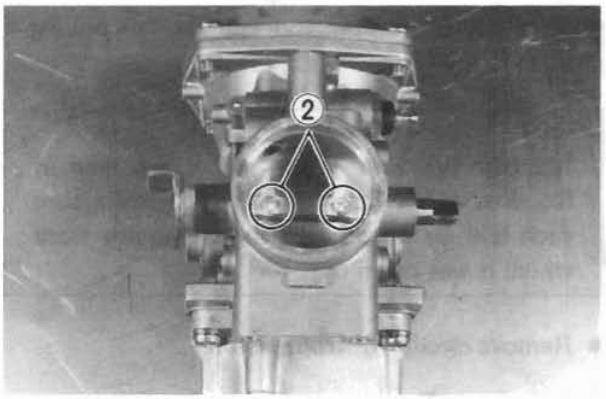


- Take off the throttle valve adjust screw holder by unscrewing two screws.

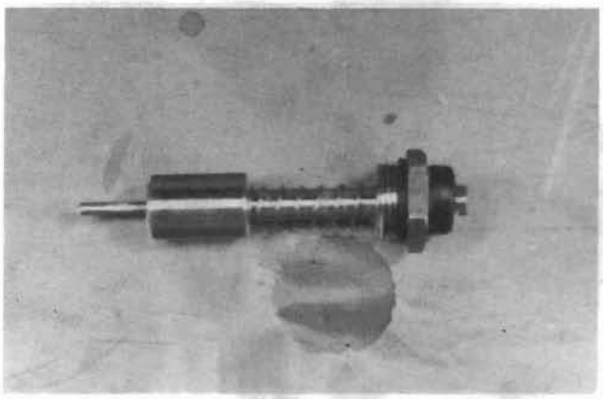


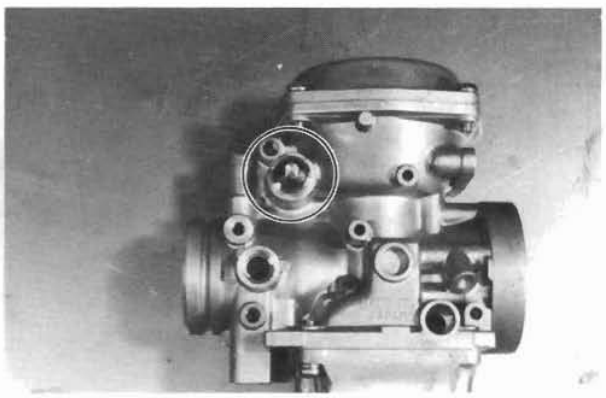
- Remove two throttle valve screws ② , and pull out the valve by turning throttle valve shaft.

CAUTION:
This two screws are locked by punching its end. Once remove the screws, they will be damaged.

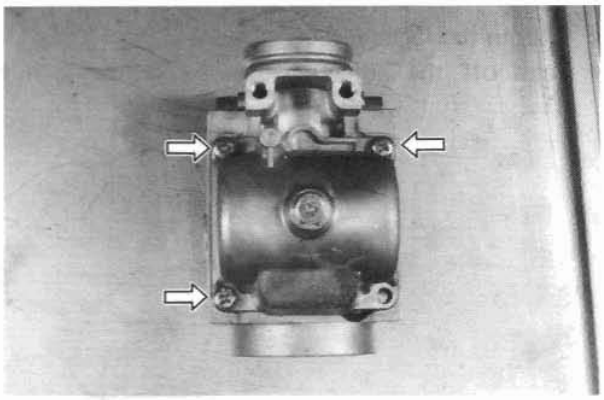


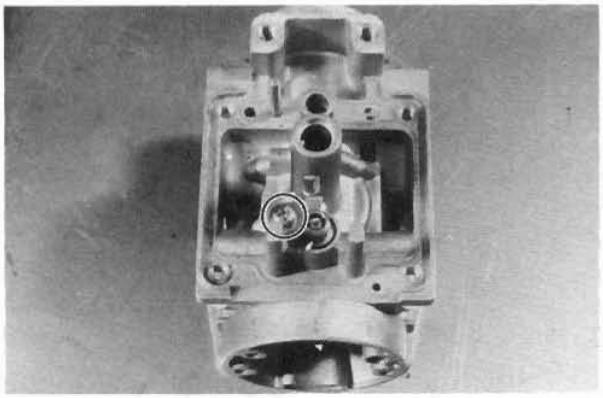
- Remove the throttle valve shaft.
- Remove the starter valve from the carburetor body.

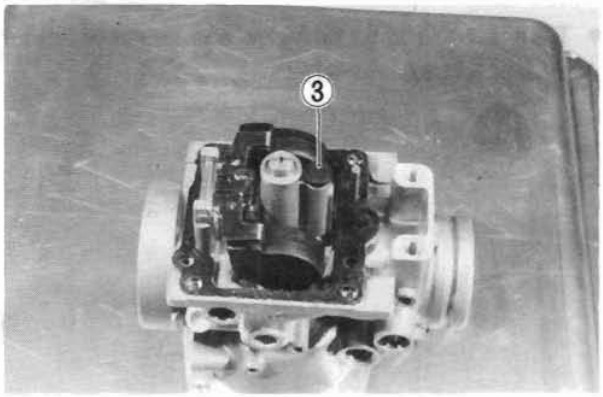




- Remove the 4 float chamber screws and remove the float chamber.
- Remove float, main jet, needle jet, plug ③ and pilot jet.
- Unscrewing the needle valve holder screw.
- Remove the needle valve.

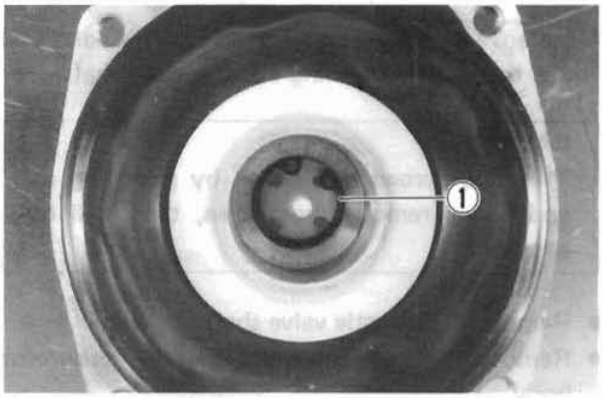




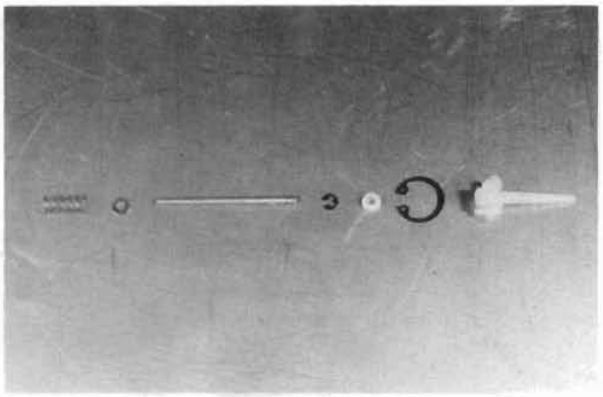


- Take off carburetor top cap by unscrewing 4 screws.

NOTE:
Identify the four piston valves removed as No. 1 through No. 4 in order to make sure each will be restored to the carburetor from which it was taken out.



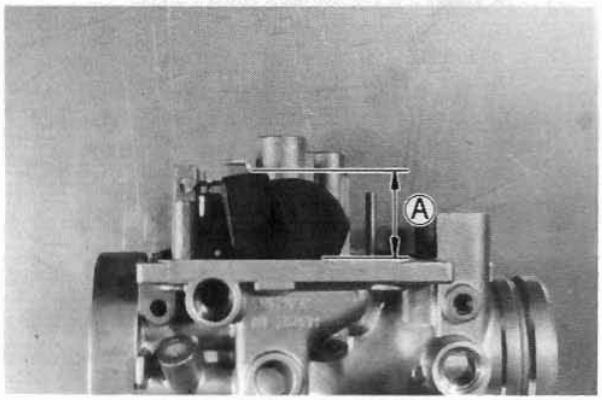
- Remove circlip ① from piston.

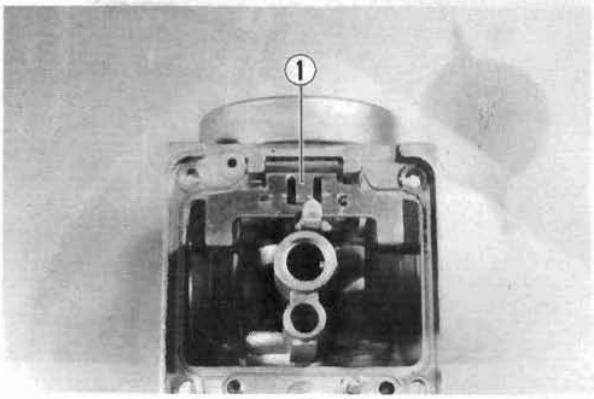


FLOAT HEIGHT ADJUSTMENT

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.

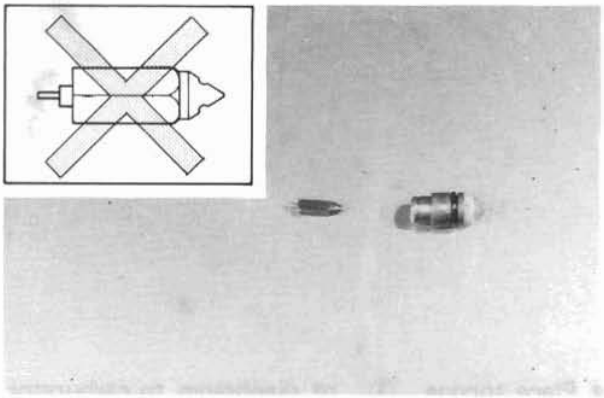
NOTE:
Be sure to remove the gasket before measuring the height.





NEEDLE VALVE

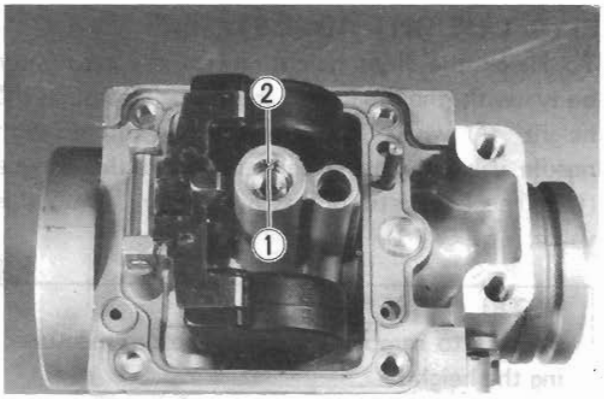
If foreign matter is caught between the valve seat and the needle, the gasoline will continue to flow and result in overflowing. If the seat and needle are worn out beyond the permissible limits, similar trouble will occur. Conversely, if the needle sticks, the gasoline will not flow into the float chamber.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

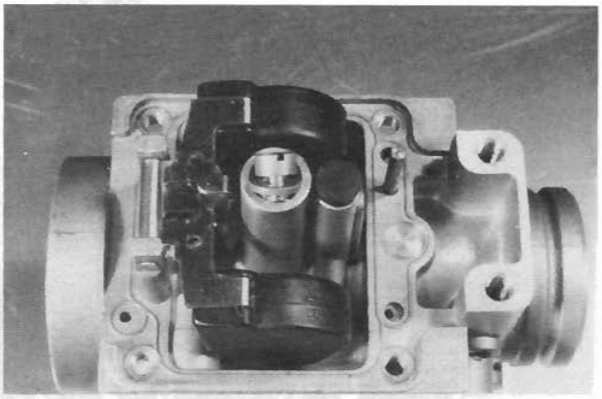


- Check following items for any damage or clogging.
  * Pilot jet
  * Main jet
  * Main air jet
  * Pilot air jet
  * Needle jet air bleeding holes
  * Float
  * Needle valve mesh and O-ring
  * Diaphragm
  * Gasket and O-ring
  * Throttle valve shaft oil seals
  * Drain plug O-ring
  * Pilot screw bleeding hole and rubber cap
  * Pilot outlet and bypass holes
  * Fuel pipe O-rings

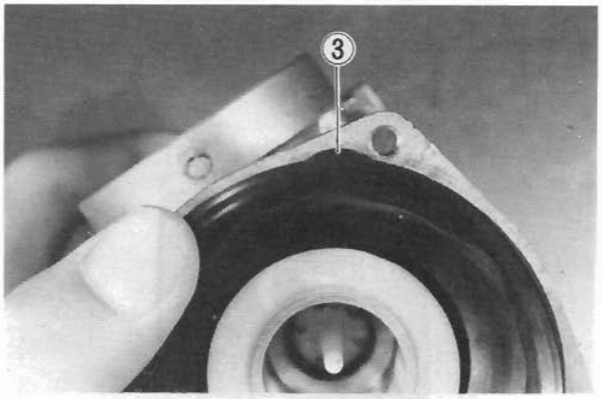
REASSEMBLY

- Align the groove ① of the needle jet with the pin ② and replace it and install the main jet, washer, pilot jet and plug.

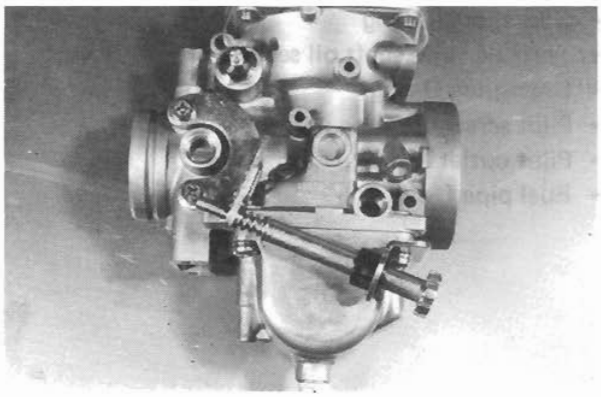


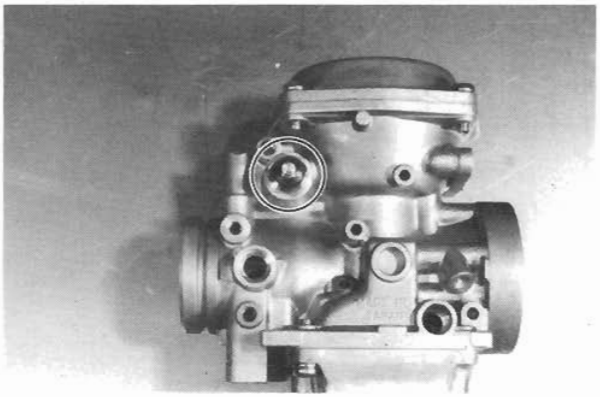


- Place tongue ③ of diaphragm to carburetor body properly.

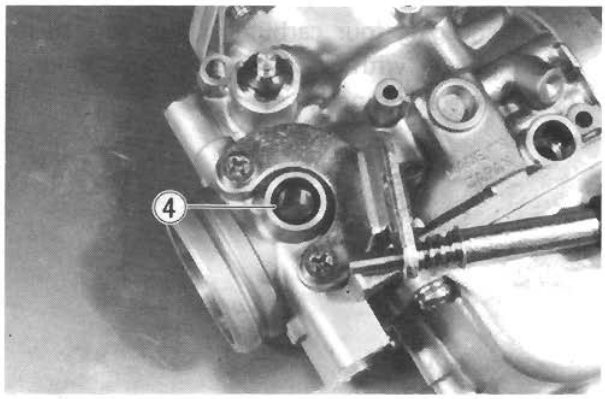


- Install the starter valve.
- Set the throttle valve adjust screw.

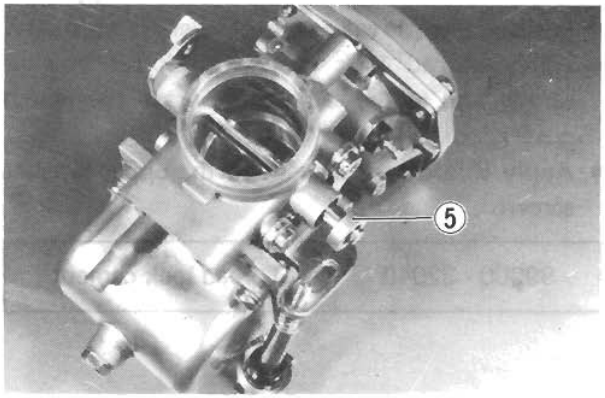




- When fitting throttle valve shaft oil seals, groove should be faced outside ④ .

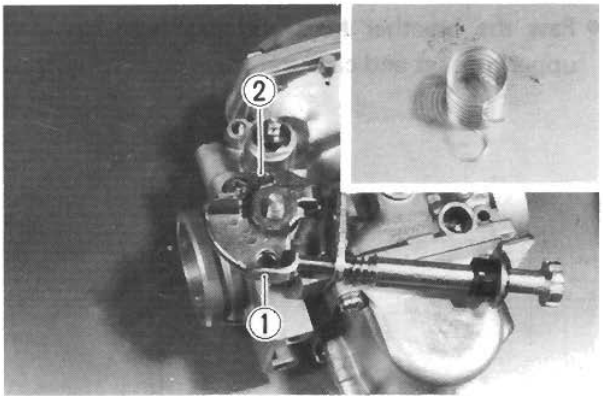


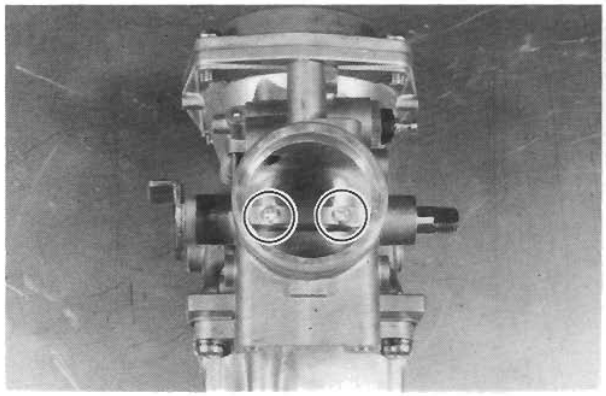
- Set the throttle valve shaft and install the washer ⑤ as shown.

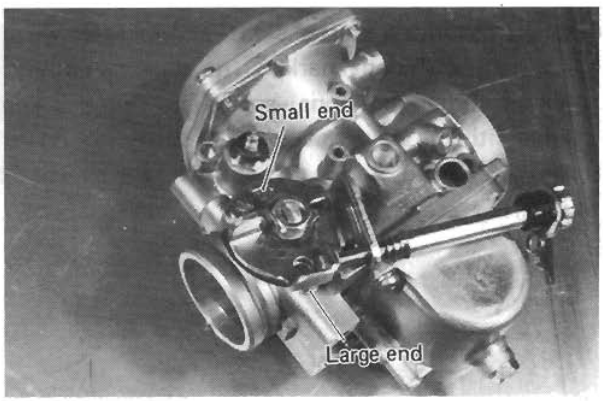


- Hook one end of spring to the boss ① , turn the other end ② clockwise by one turn, and hook it to the cable guide properly.
  Tighten lock nut and bend up lock washer.
- Apply thread lock "1363C" to two screws for securing throttle valve.

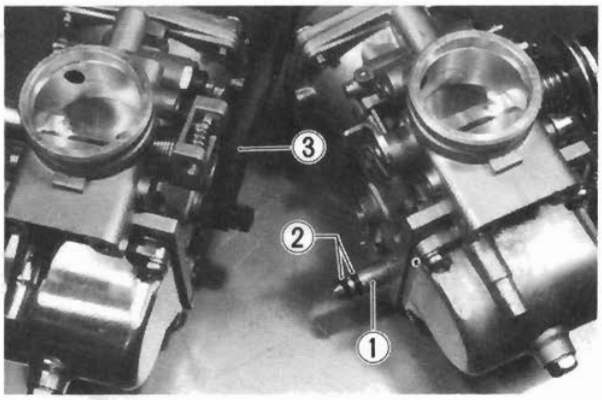
99104 - 32050	Thread Lock 1363C





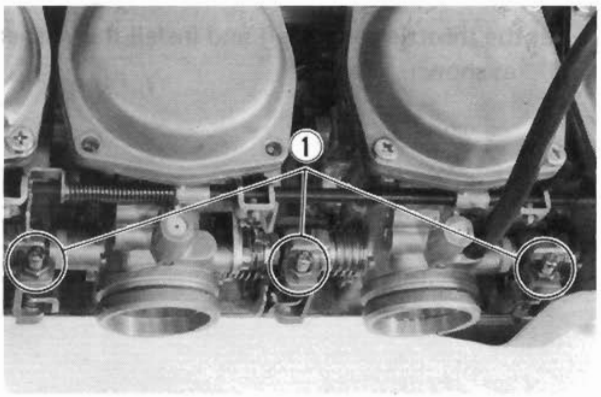


- When engaging four carburetors, be sure to fix fuel pipe ① with four O-rings ② and breather connector ③ properly.

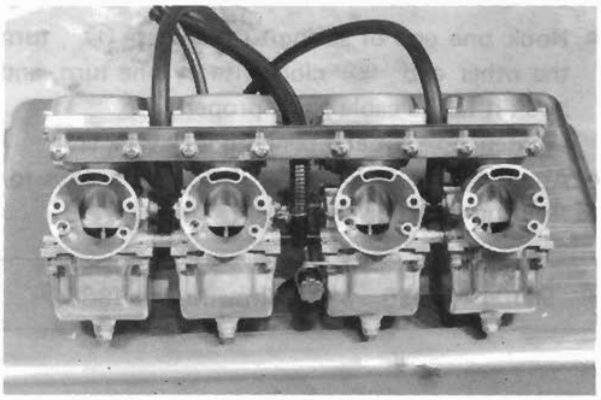


- Position throttle valve control lever ① correctly.
- Apply thread lock cement to lower bracket screws and at the same time install the clutch cover.
- Apply thread lock cement to the upper bracket screws.

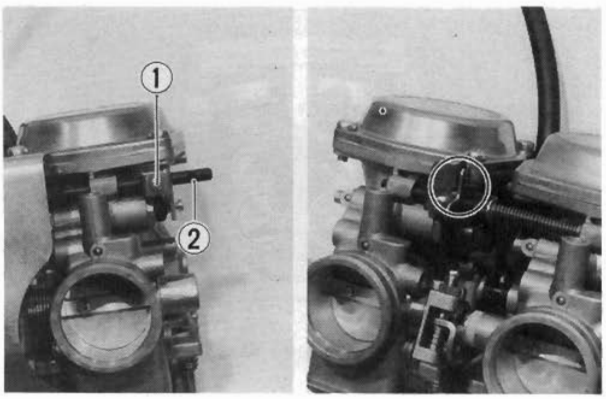
99000 - 32040	Thread lock cement



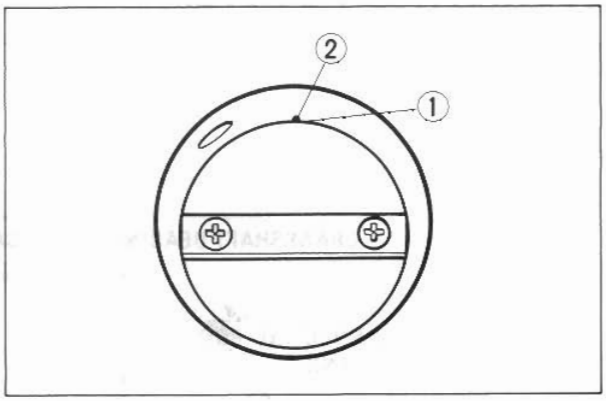
- Pass the breather hose and fuel hose between upper bracket and carburetor.

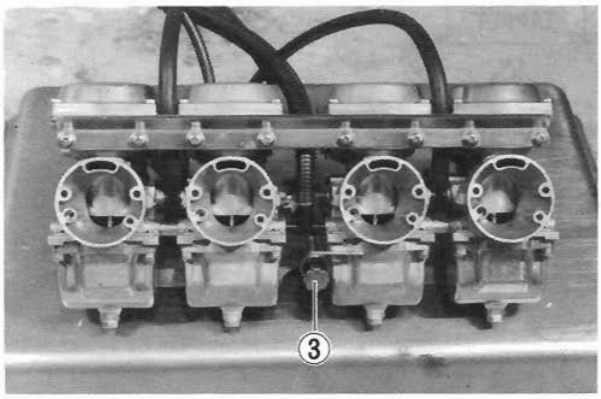


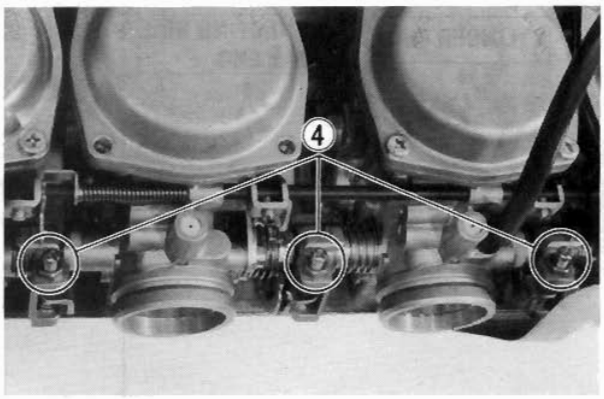
- When mounting starter shaft, align starter valve screw ① with dent mark ② on starter shaft and grease sliding portions, and align starter valve boss with the starter cable guide slit.
- Apply thread lock cement to starter shaft securing screws.



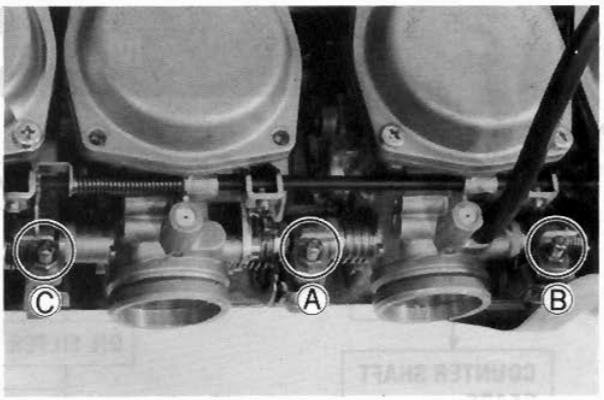
- Set each throttle valve in such a way that its top end ① meets the foremost bypass ② . This is accomplished by turning throttle valve stop screw ③ and balance screw ④ .







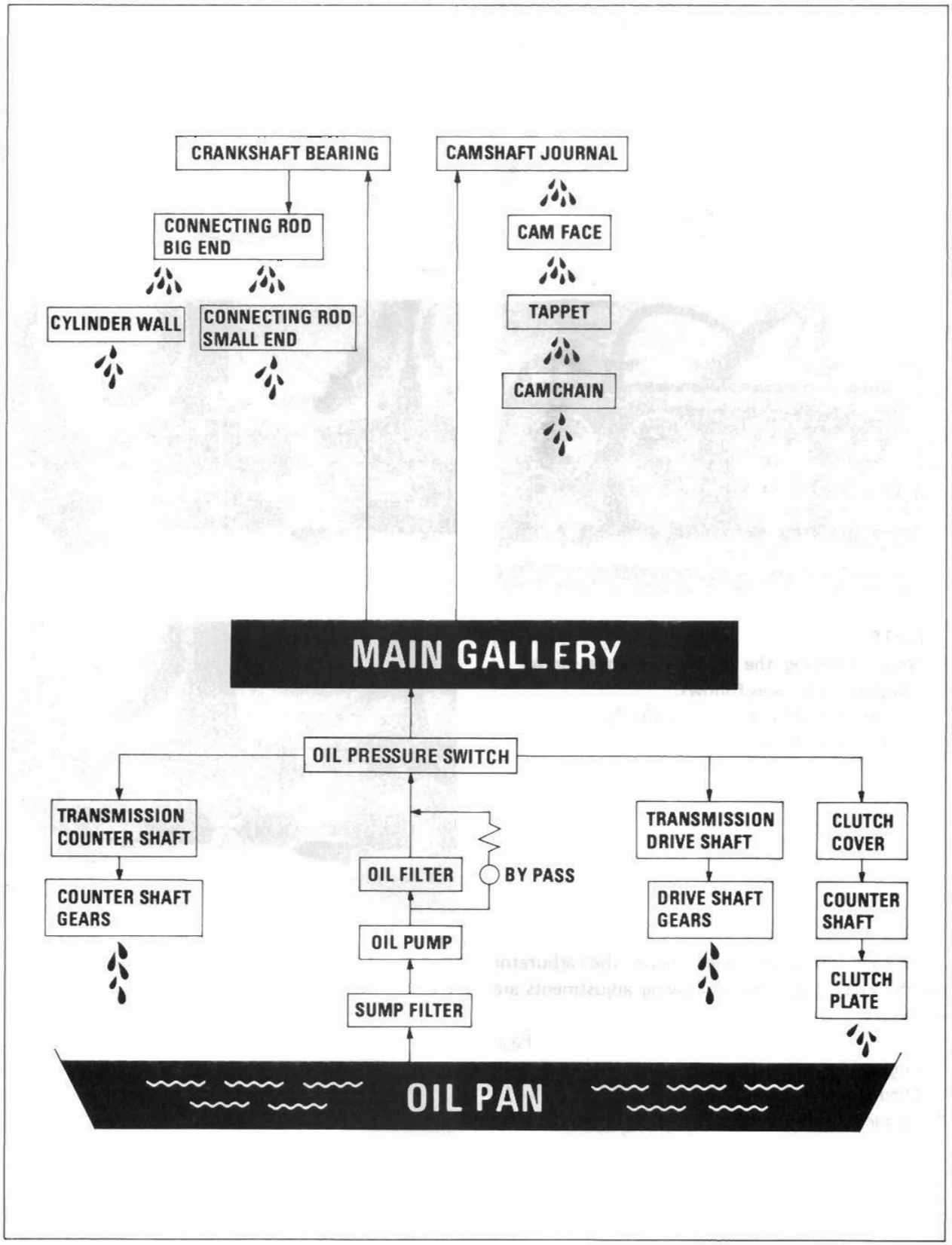
NOTE:
When adjusting the throttle balance screws, adjusting order is as follows:
Ⓐ (for No. 2 Carb.) → Ⓑ (for No. 1) → Ⓒ (for No. 4)

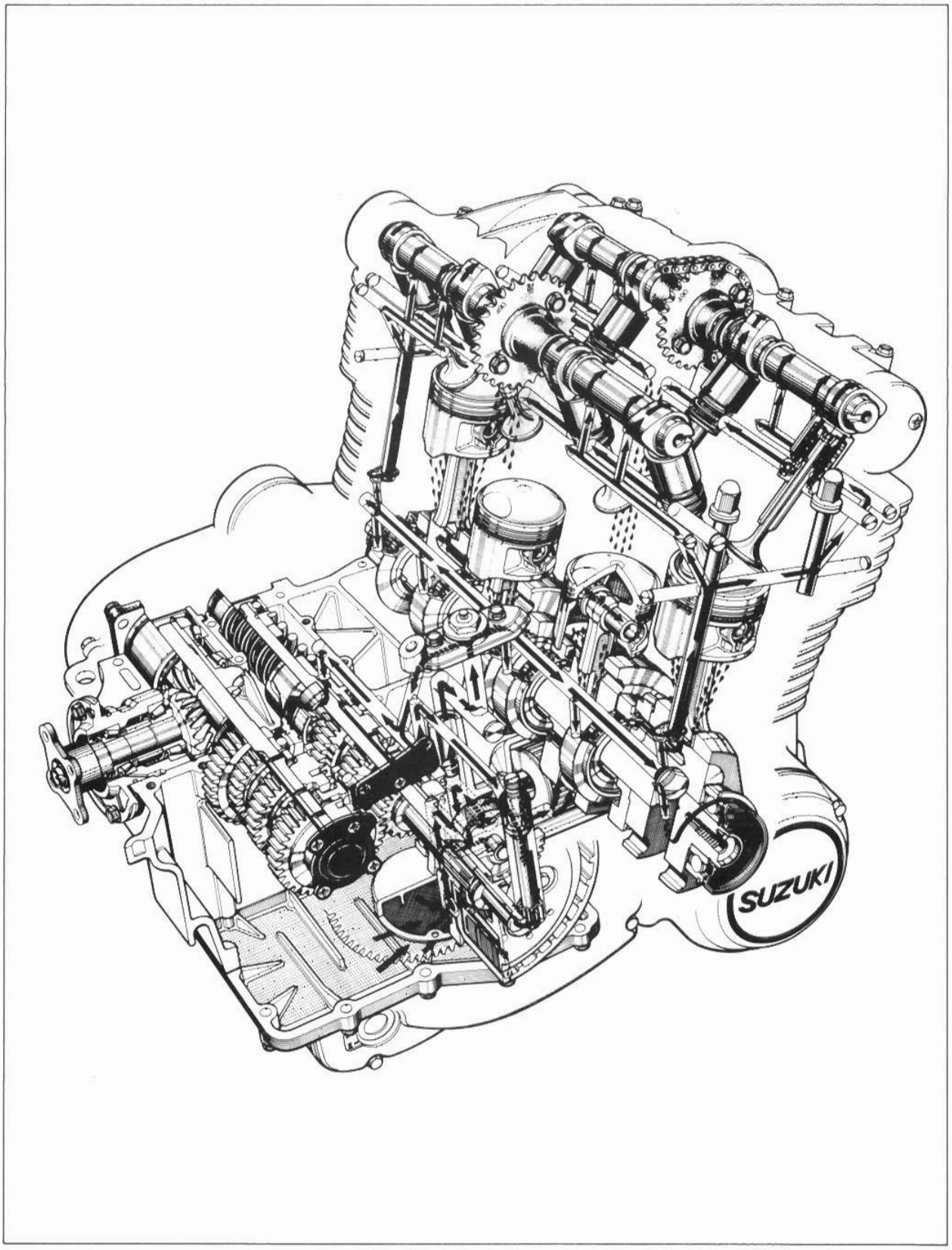


After each job is completed, mount the carburetor on the engine, and the following adjustments are necessary.

	Page
* Engine idle rpm	2 – 11
* Throttle cable play	2 – 11
* Balancing carburetor	2 – 12

LUBRICATION SYSTEM





EMISSION CONTROL & REGULATIONS

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EMISSION REGULATIONS 6-1
EMISSION CONTROL CARBURETOR COMPONENTS 6-2
GENERAL EMISSION INFORMATION 6-3

6

EMISSION REGULATIONS

On February 4, 1977, Federal Emission Regulations for motorcycles that may be licensable took effect. The regulations provided for a gradual, multi-step application of stricter emission limits beginning with all effected motorcycles manufactured after January 1, 1978, culminating with the present 1980 emission level restrictions. For the 1980 and succeeding years one set of emission limits will be in effect. They are as follows:

1980 EMISSION LIMITS

CATEGORIES	HYDROCARBONS (HC)	CARBON MONOXIDE
All motorcycles 50 cc – Larger	5.0 Grams/Kilometer (8.0 Grams/Mile)	12 Grans/Kilometer (19.3 Grams/Mile)

Emission-controlled motorcycles which are subject to the emission regulations are those motorcycles which are equipped with a headlight, taillight, stop light and which have an engine displacement larger than 50 cc.

Suzuki Motor Company performed all the necessary testing and certification of emission-controlled models in strict compliance with the E.P.A. testing regulations. Suzuki motorcycle dealers are not required to either test or certify emission levels on any motorcycles as Suzuki Motor Company is legally responsible for the entire certification procedure.

E.P.A. regulations also provide fines for individuals who alter, render inoperative or improperly service emission-controlled motorcycles ranging up to $10,000.00 per motorcycle. It is essential that the individual servicing this emission-controlled motorcycle review thoroughly all the service procedures presented in this manual. Under no circumstances should the recommended service procedures be deviated from nor adjustments made which are not in accordance with the factory specifications or service procedures.

EMISSION CONTROL CARBURETOR COMPONENTS

GS1100G motorcycles are equipped with precision, manufactured carburetors for emission level control. These carburetors require spacial 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 GS1100G are as follows.

Carburetor I.D. No.	Main Jet	Needle Jet	Jet Needle	Pilot Jet	Pilot Screw
49400	#115	X-3	5D58	#40	PRE-SET DO NOT ADJUST

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.

GENERAL EMISSION INFORMATION

There are three different types of regulated exhaust emissions. They are:

Hydrocarbons (HC)
Carbon Monoxide (CO)
Oxides of Nitrogen (NOx)

Automobiles must meet specific emission standards for all three of these pollutants. Motorcycles must only meet the requirements for the following:

Hydrocarbons (HC)
Carbon Monoxide (CO)

HC exhaust emissions are basically unburned fuel vapors which have passed through the engine and escaped the combustion process.

CO exhaust emissions are formed during an incomplete combustion cycle as a result of a rich air/fuel mixture. The only way that CO can be produced is by the combustion cycle.

Total NOx emissions from all motorcycles is considered negligible. The EPA states that total NOx emission from motorcycles by 1990 will only amount to approximately 0.5%. NOx is formed during the combustion process at high combustion chamber temperatures.

CARBON MONOXIDE

Carbon monoxide is a product of an incomplete combustion cycle. CO is measured in grams per mile or kilometer and also in percentage (%).

The most common cause of CO is rich carburetion. As the mixture is richened excessively, the CO amount increases proportionately. Engine oil is also a hydrocarbon, so engine problems which lead to oil burning increase carbon monoxide.

CARBURETION MALFUNCTION

1. Air Cleaner – Dirty or over oiled.
2. Idle Mixture – Adjusted incorrectly.
3. Idle Speed – Too high or low.
4. Fuel Level – Sticking float, leaking needle, incorrect setting.
5. Choke – Leaking or linkage sticking.
6. Synchronization – Improper balance on multi cylinders.

ENGINE MALFUNCTION

1. Valve Seals – Leaking or torn.
2. Valve Guide – Worn and leaking excess oil.
3. Gaskets – Leaking oil into combustion chamber.

HYDROCARBONS

Hydrocarbons are unburnt gasoline vapors and can be measured in two different ways. The first is to measure the weight of the pollutants over a specific distance such as grams per mile or grams per kilometer. The second method is to measure the concentration of HC in the exhaust gas in parts per million (PPM).

The most common cause of high HC emissions are ignition system problems. If the ignition system fails to ignite the fuel mixture properly, then raw gasoline vapors will pass through the engine into the exhaust system. Listed are the most common ignition problems which occur and which can affect HC emission output.

IGNITION SYSTEM MALFUNCTIONS

1. Spark Plugs – Fouled, dirty, improper type or improperly gapped.
2. Ignition Timing – Advanced or Retarded.
3. Timing Advance – Too fast or too slow an advance rate.
4. Battery – Low charge or faulty.

Carburetion can also lead to high HC emissions if the mixture is either excessively rich or excessively lean.

MIXTURE-RELATED MALFUNCTIONS

1. Air Cleaner – Dirty, over oiled or torn.
2. Jets – Clogged, restricted or incorrect size.
3. Float Level – Level too low (lean) or too high (rich).
4. Choke – Leaking choke plunger or sticking linkage.
5. Air Leaks – Intake manifolds, engine gaskets and other sealing surfaces.
6. Synchronization – Unbalanced on multi-cylinder machines.
7. Exhaust System – Restricted flow or improper exhaust system.

Engine wear or damage can also cause high HC emissions.

1. Rings – Low compression, leakage into crankcase.
2. Valves – Improper adjustment, bent stem or burnt.
3. Gaskets – Leaking, loss of compression.
4. Crank Seals – Leaking.
5. Oil Consumption – Worn valve guides, worn rings, clogged crankcase breather.
6. Oil – Improper engine oil.

ELECTRICAL SYSTEM

CONTENTS

CHARGING SYSTEM 7- 1
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STARTER SYSTEM 7- 6
COMBINATION METERS 7- 9
LAMPS 7-10
FUEL METER 7-12
SWITCHES 7-15
SELF CANCELLING DEVICE 7-18
BATTERY 7-20

7

CHARGING SYSTEM
INSPECTION

CHARGING OUTPUT CHECK

Remove the seat.

Start the engine and keep it running at 5 000 r/min with lighting switch turned ON (HI position).

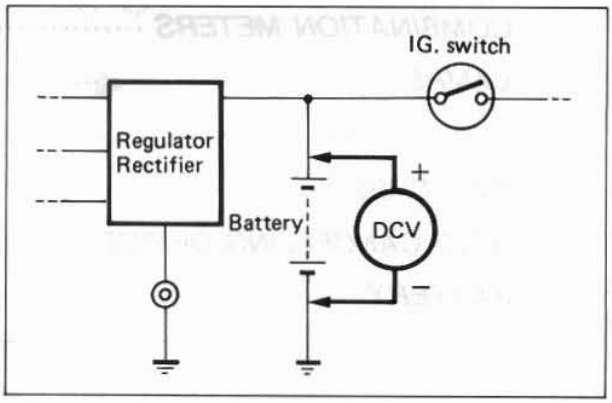
Using the pocket tester, measure the DC voltage between the battery terminal ⊕ and ⊖.

If the tester reads under 14V or over 15.5V, check the AC generator no-load performance and regulator/rectifier.

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

STD charging output
14 – 15.5 V (DC) at 5 000 r/min

09900 - 25002	Pocket tester



AC GENERATOR NO-LOAD PERFORMANCE

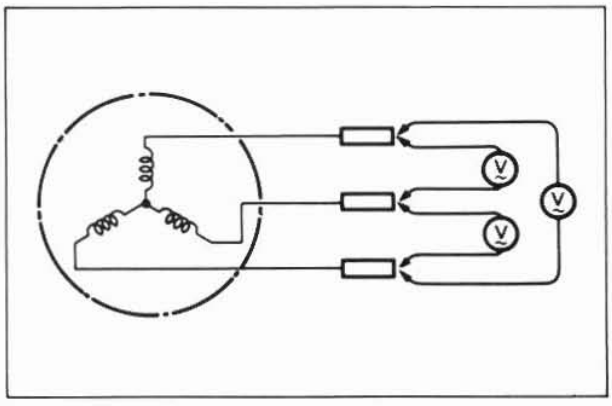
Disconnect the three lead wires from the AC generator terminal.

Start the engine and keep it running at 5 000 r/min.

Using the pocket tester, measure the AC voltage between the three lead wires.

If the tester reads under 80V, the AC generator is faulty.

STD No-load performance
More than 80V (AC) at 5 000 r/min

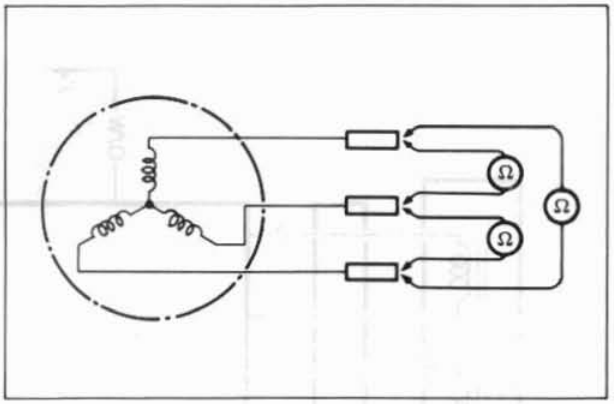


AC GENERATOR CONTINUITY CHECK

Using the pocket tester, check the continuity between the lead wires of the stator.
Also check that the stator core is insulated.

NOTE:
When making this test, it is not necessary to remove the AC generator.

09900 - 25002	Pocket tester

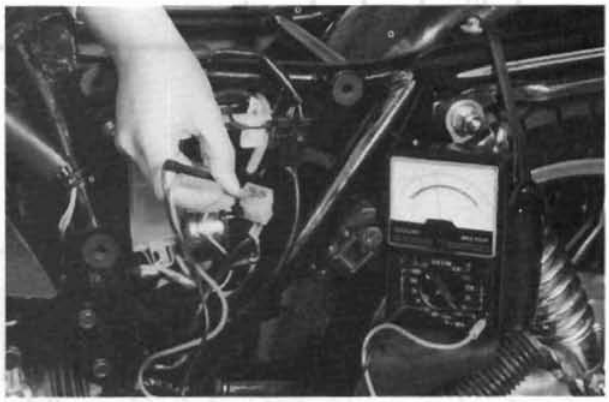


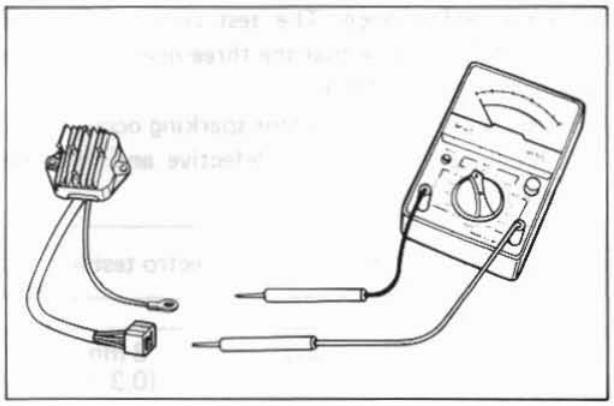
REGULATOR/RECTIFIER

Using the pocket tester (X1Ω range), measure the resistance between the lead wires in the following table.
If the resistance checked is incorrect, replace the regulator/rectifier.

09900 - 25002	Pocket tester

⊖ probe of tester ① \ ⊕ Probe of tester	R	W/Bl	W/R	Y	B/W
R		OFF	OFF	OFF	OFF
W/Bl	7-8Ω		OFF	OFF	OFF
W/R	7-8Ω	OFF		OFF	OFF
Y	7-8Ω	OFF	OFF		OFF
B/W	65-85Ω	7-8Ω	7-8Ω	7-8Ω	



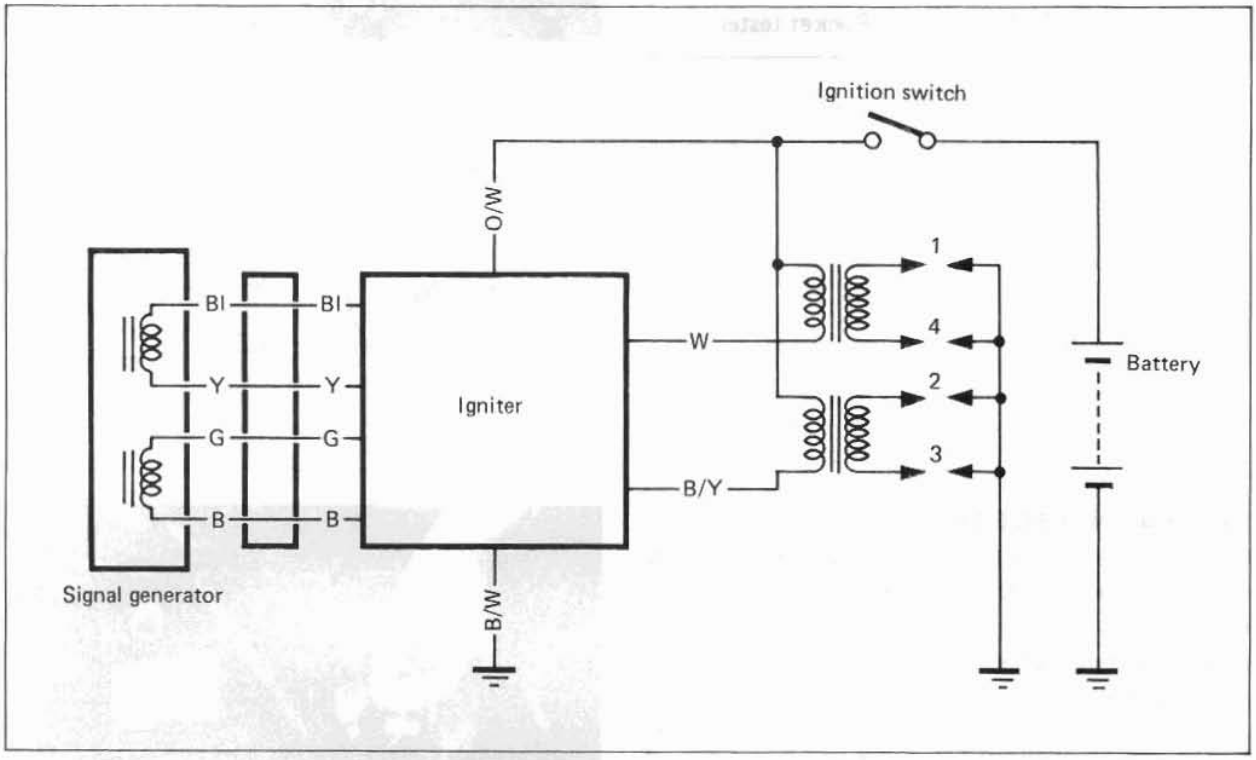


IGNITION SYSTEM

DESCRIPTION

The fully transistorized ignition system consists of a signal generator, Igniter, ignition coils, and spark plugs. The signal generator comprises one rotor and two pickup coils.

The signal generator is mounted at the right end of the crankshaft. The output of the signal generator goes to the Igniter unit, where it turns ON and OFF the transistor alternately. As the transistor is turned ON and OFF, the current passing through the primary winding 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.



INSPECTION

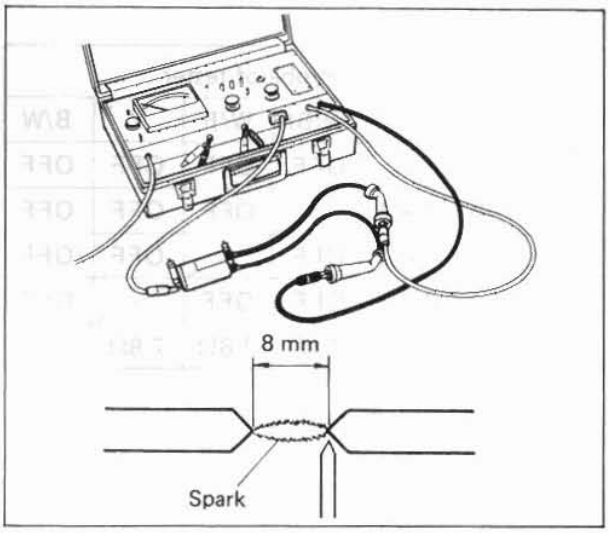
IGNITION COILS (Checking with Electro Tester)

Using the electro tester, test each ignition coil for sparking performance. The test connection is as indicated. Make sure that the three-needle sparking distance is at least 8 mm.

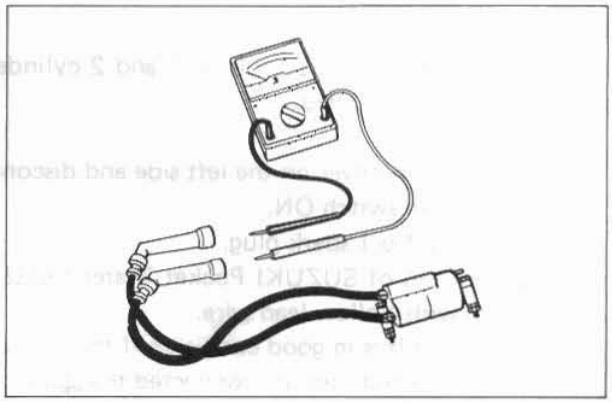
If no sparking or orange color sparking occurs with this much gap, then it is defective and must be replaced.

09900 - 28106	Electro tester

STD Spark performance	8 mm (0.3 in)

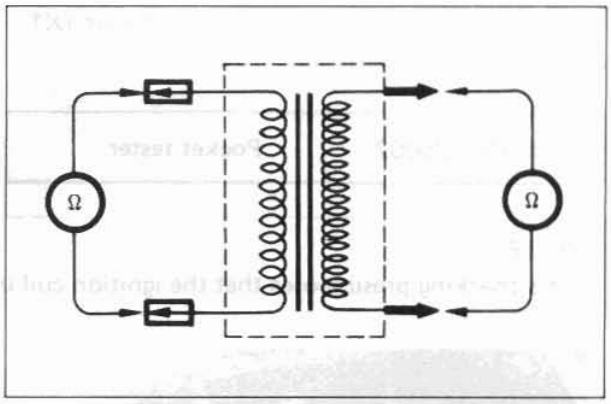


IGNITION COILS (Checking with Pocket Tester)
A SUZUKI pocket tester or an ohm meter may be used, instead of the electro tester. In either case, the ignition coil is to be checked for continuity in both primary and secondary windings. Exact ohmic readings are not necessary, but, if the windings are in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



09900 - 25002	Pocket tester

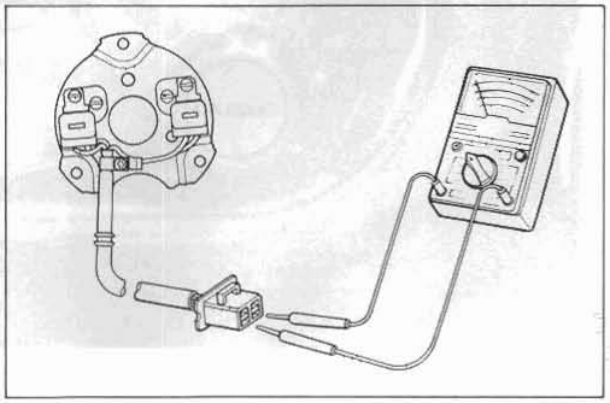
Ignition coil resistance	
Primary	Approx. 3 – 5Ω
Secondary	Approx. 30 – 40kΩ



SIGNAL GENERATOR
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	
Green – Yellow	Approx. 140 – 200Ω
Blue – Black	



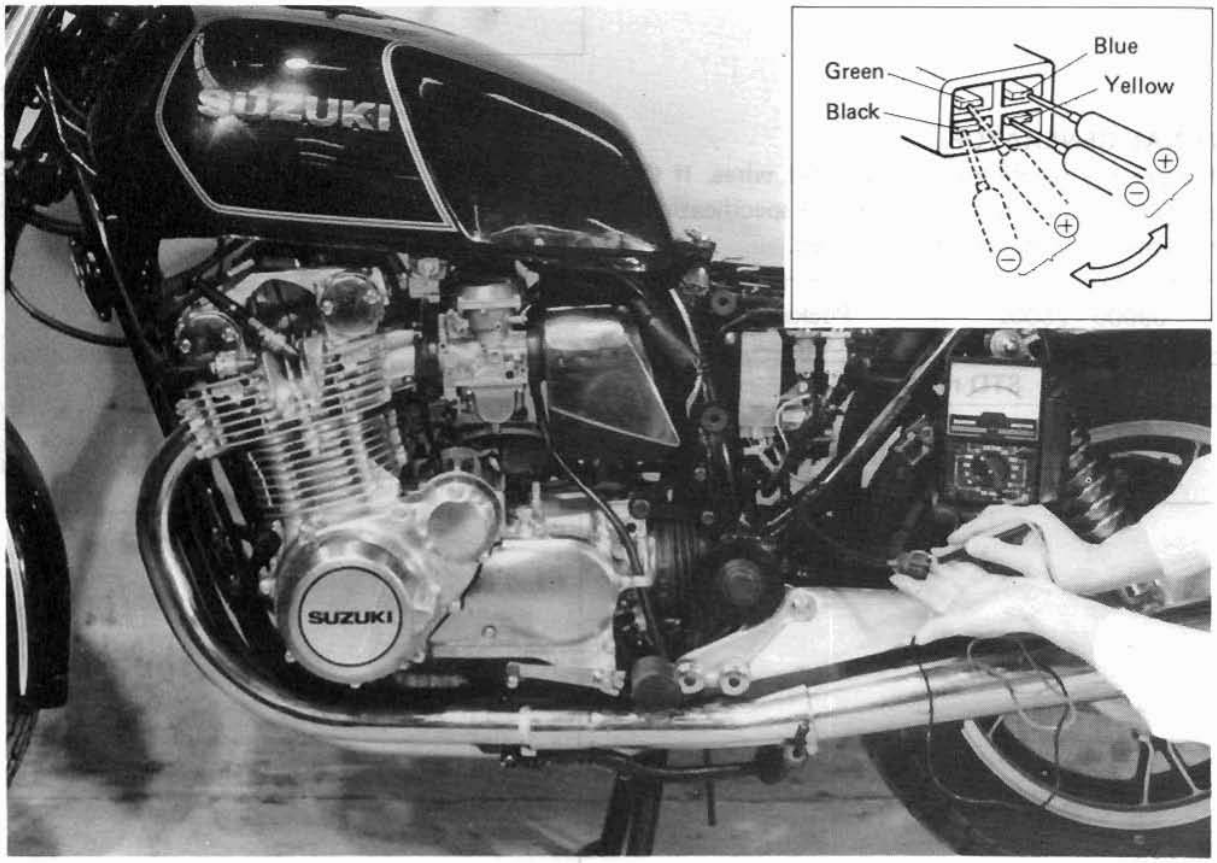
IGNITER UNIT

Remove the spark plugs from Nos. 1 and 2 cylinders. Install the respective plug caps and place the spark plugs on the cylinder head.

Remove the frame cover on the left side and disconnect the lead wire from the signal generator.
Turn the ignition switch ON.
First, check the No.1 spark plug.
Connect ⊕ pin of SUZUKI Pocket Tester (X1Ω range) with Blue lead wire on the transistor unit side and ⊖ pin with Yellow lead wire.
The transistor unit is in good condition if the following is observed:
The moment the test pins are connected the spark plug of No.1 cylinder sparks.
Next, check the No.2 spark plug.
Connect ⊕ pin of SUZUKI Pocket Tester (X1Ω range) with Green lead wire on the transistor unit side and ⊖ pin with Black lead wire.

09900 - 25002	Pocket tester

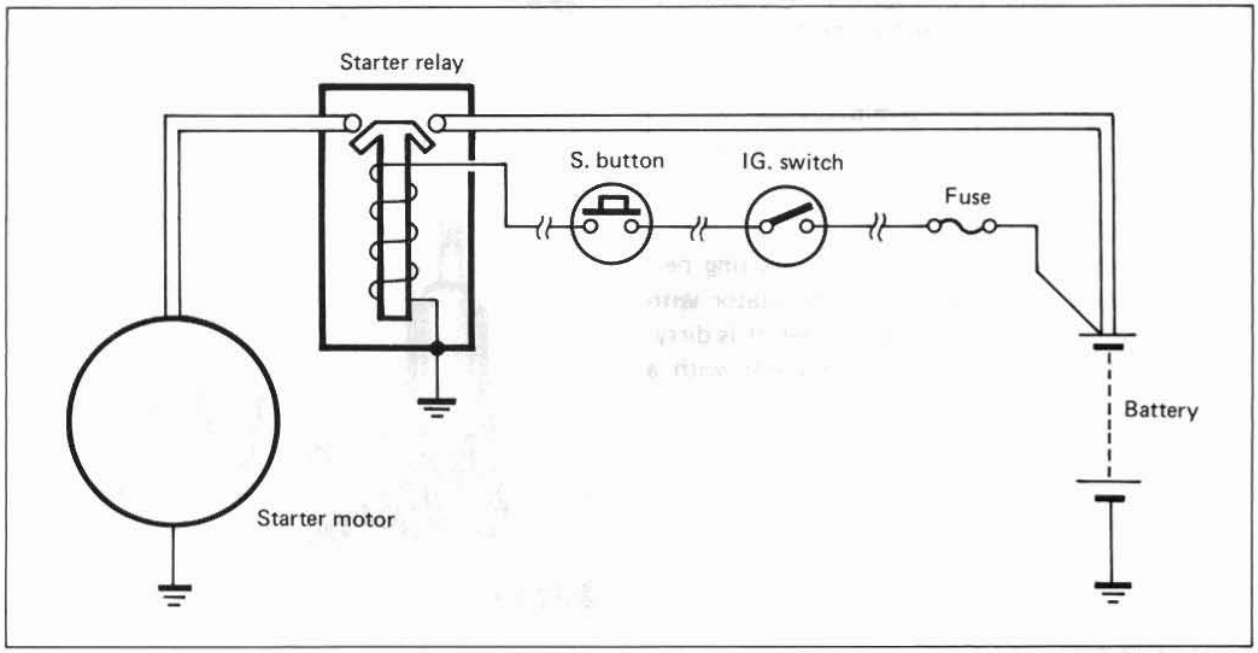
NOTE:
This checking presupposes that the ignition coil used for checking is a good one.



STARTER SYSTEM

DESCRIPTION

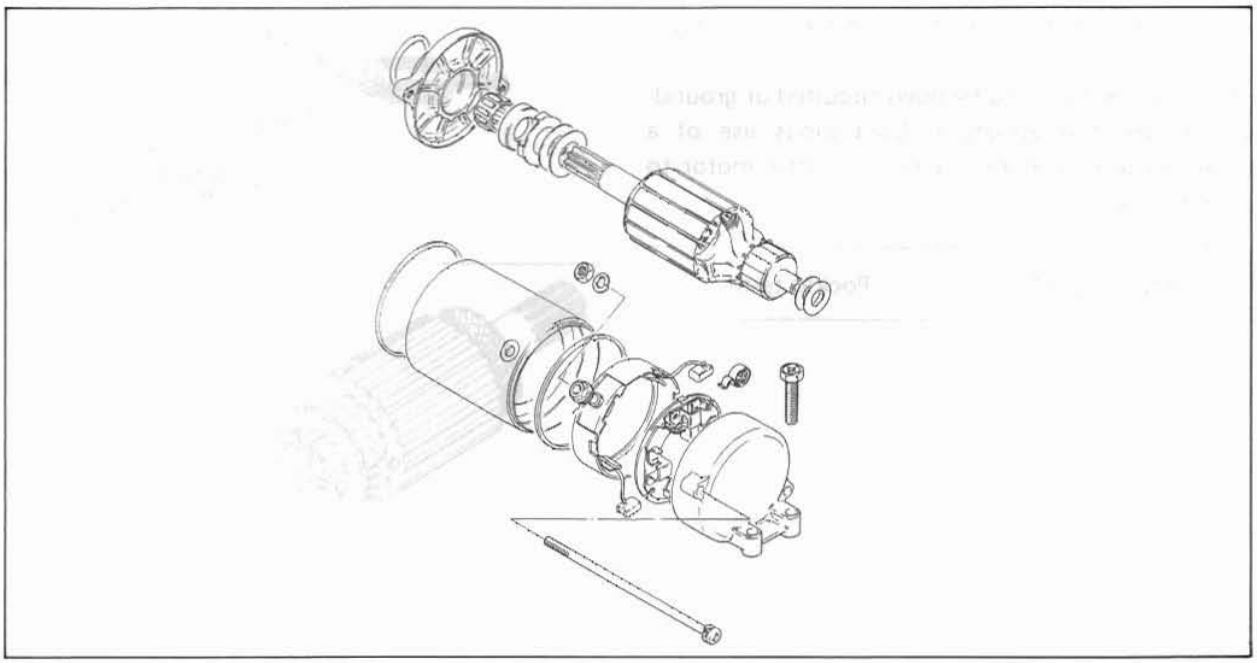
The starter system is shown in the diagram below: namely, the starter motor, relay, IG switch, starter button and battery. Depressing the starter button (on the right handlebar switch box) energizes the relay, causing the contact points to close which connects the starter motor to the battery. The motor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



STARTER MOTOR REMOVAL AND DISASSEMBLY

Remove the starter motor (See page 3-7).

Disassemble the starter motor as follows.

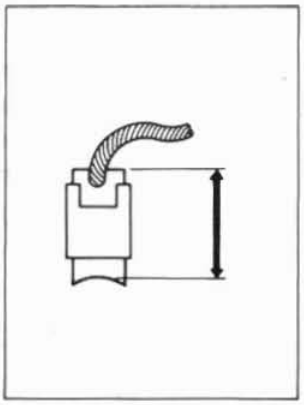


STARTER MOTOR INSPECTION

CARBON BRUSHES

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, inspect the length of the brushes, replacing them when they are too short or chipping.

Service Limit	6 mm (0.2 in)

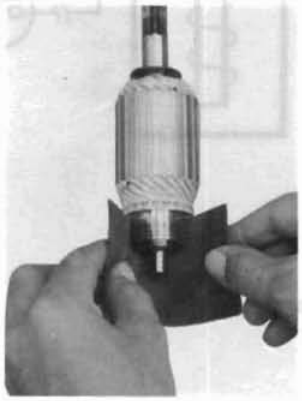


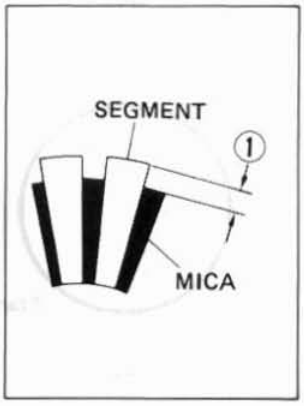
COMMUTATOR

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)



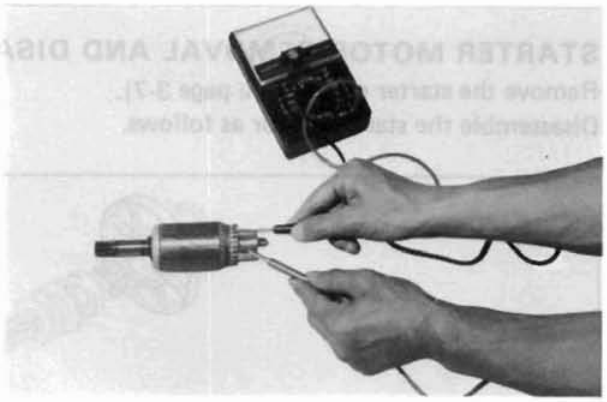


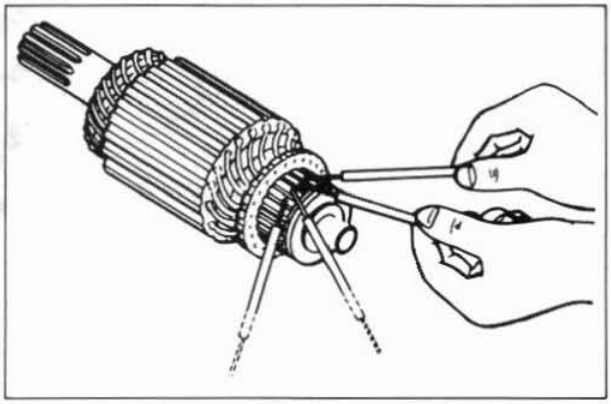
ARMATURE COIL

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

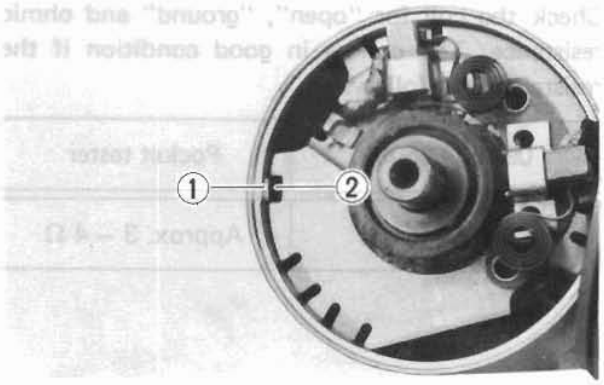




STARTER MOTOR REASSEMBLY

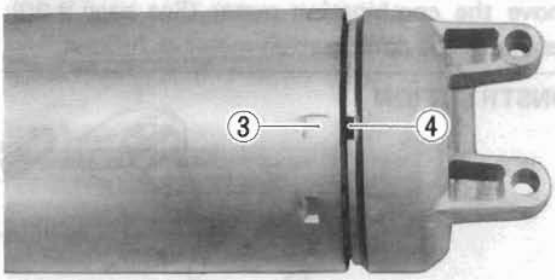
BRUSH HOLDER

When fixing brush holder to starter motor case, align the protrusion ① of the starter motor case with the notch ② of the brush holder.



HOUSING END

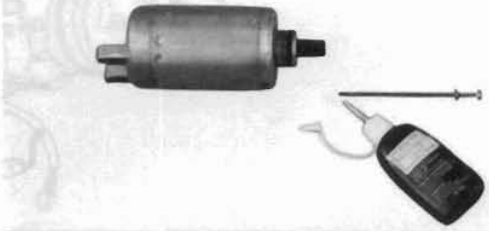
When installing housing end, fix the protrusion ③ of the starter motor case to the notch ④ on the housing end.



SECURING SCREWS

Apply Thread Lock "1363C" to starter motor securing screws.

99104 - 32050	Thread Lock "1363C"



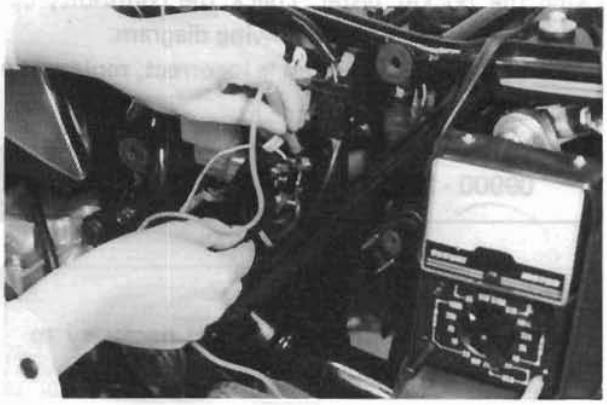
STARTER RELAY INSPECTION

Disconnect lead wire of the starter motor at starter relay.

Turn on the ignition switch, inspect the continuity between the terminals, positive and negative, when pushing the starter button.

If the starter relay is in sound condition, continuity is found.

09900 - 25002	Pocket tester



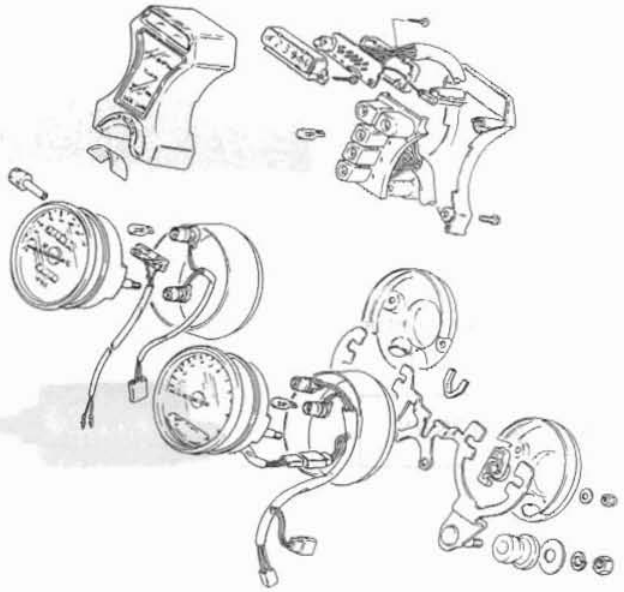
Check the coil for "open", "ground" and ohmic resistance. The coil is in good condition if the resistance is as follows.

09900 - 25002	Pocket tester
STD resistance	Approx. 3 – 4 Ω

COMBINATION METER

Remove the combination meter (See page 8-20).
Disassemble the combination meter as follows.

CONSTRUCTION

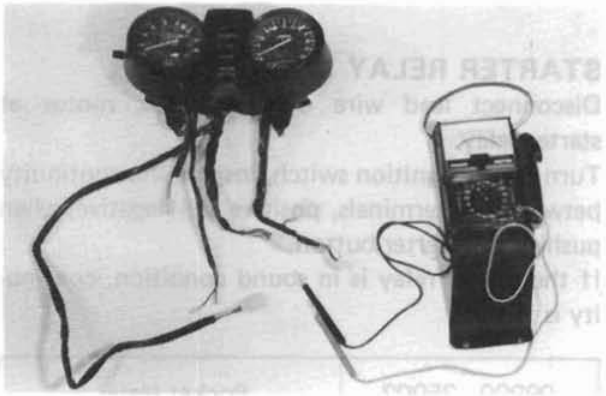


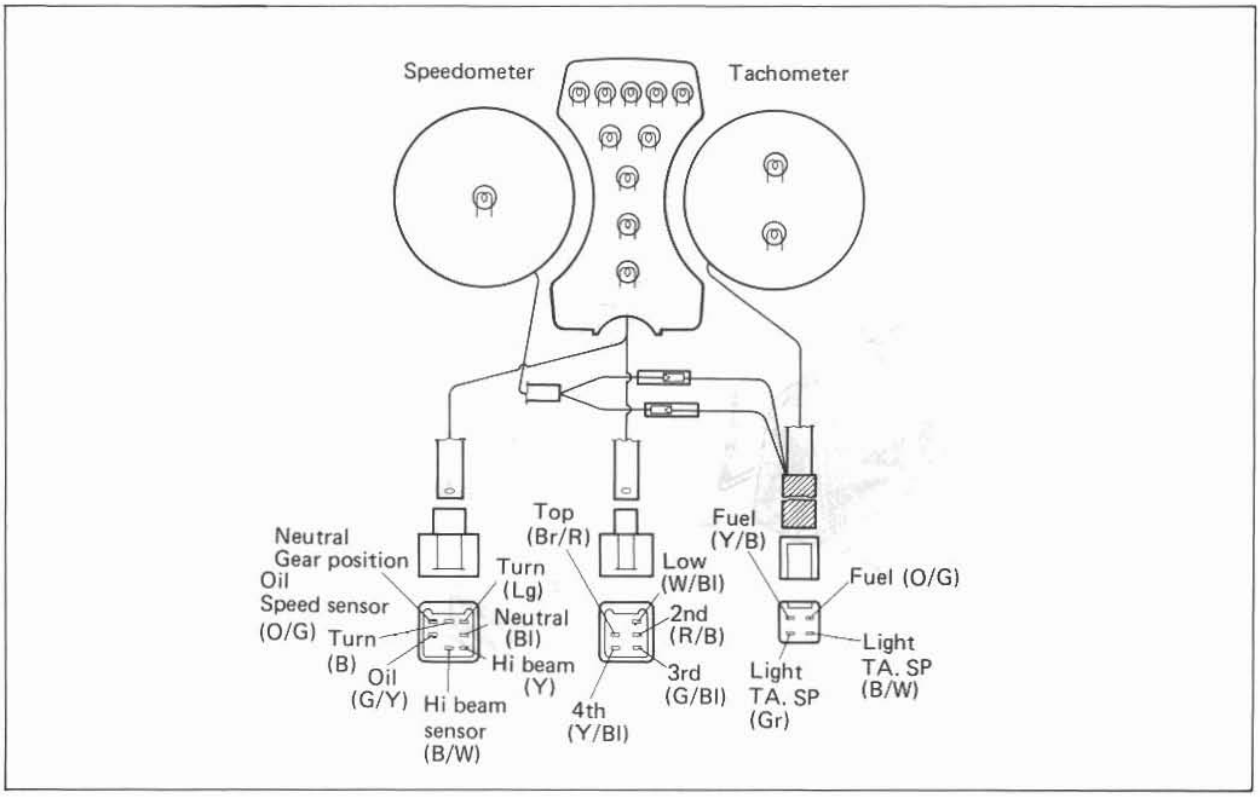
INSPECTION

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

09900 - 25002	Pocket tester

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

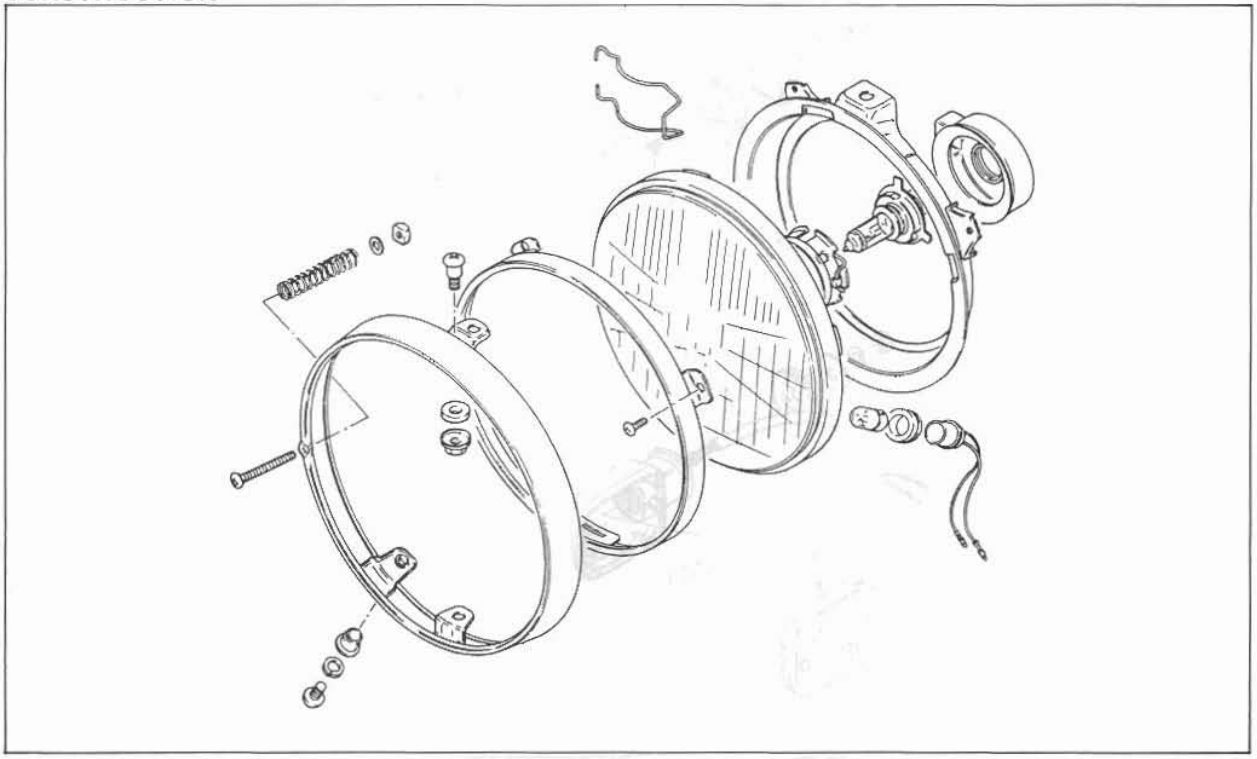




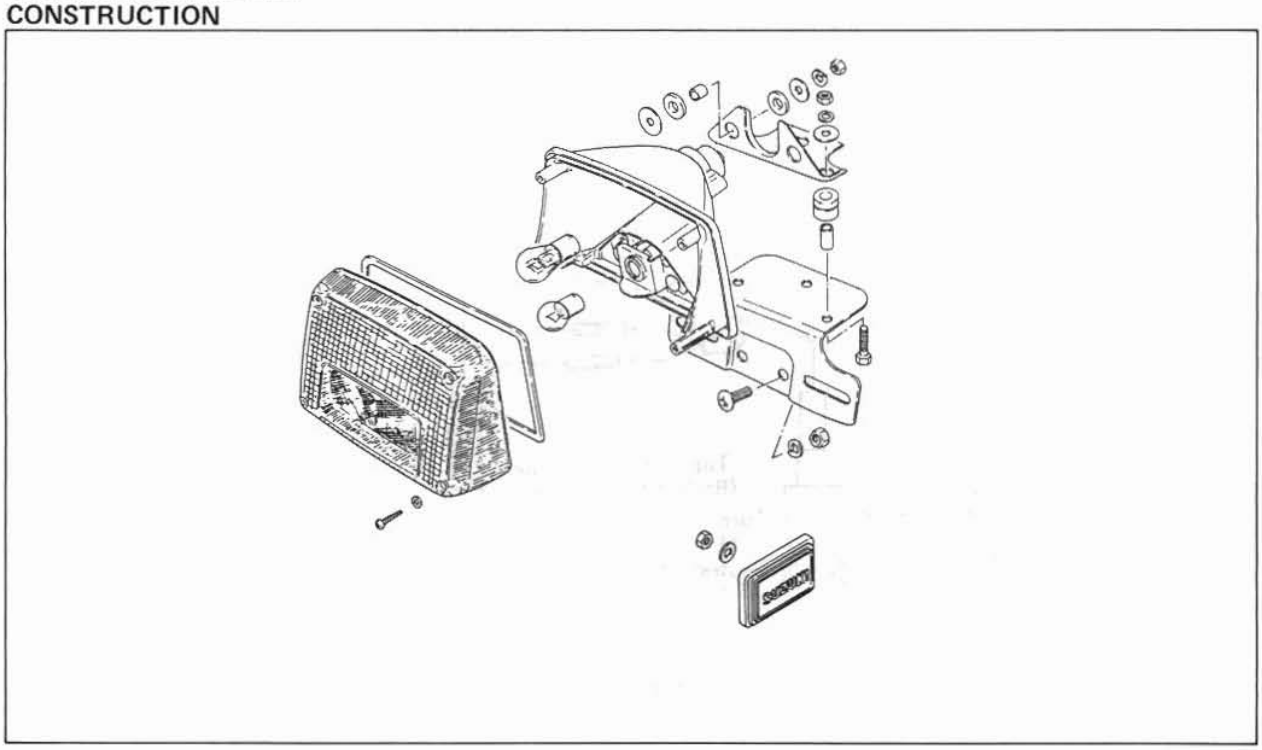
LAMPS

HEADLIGHT

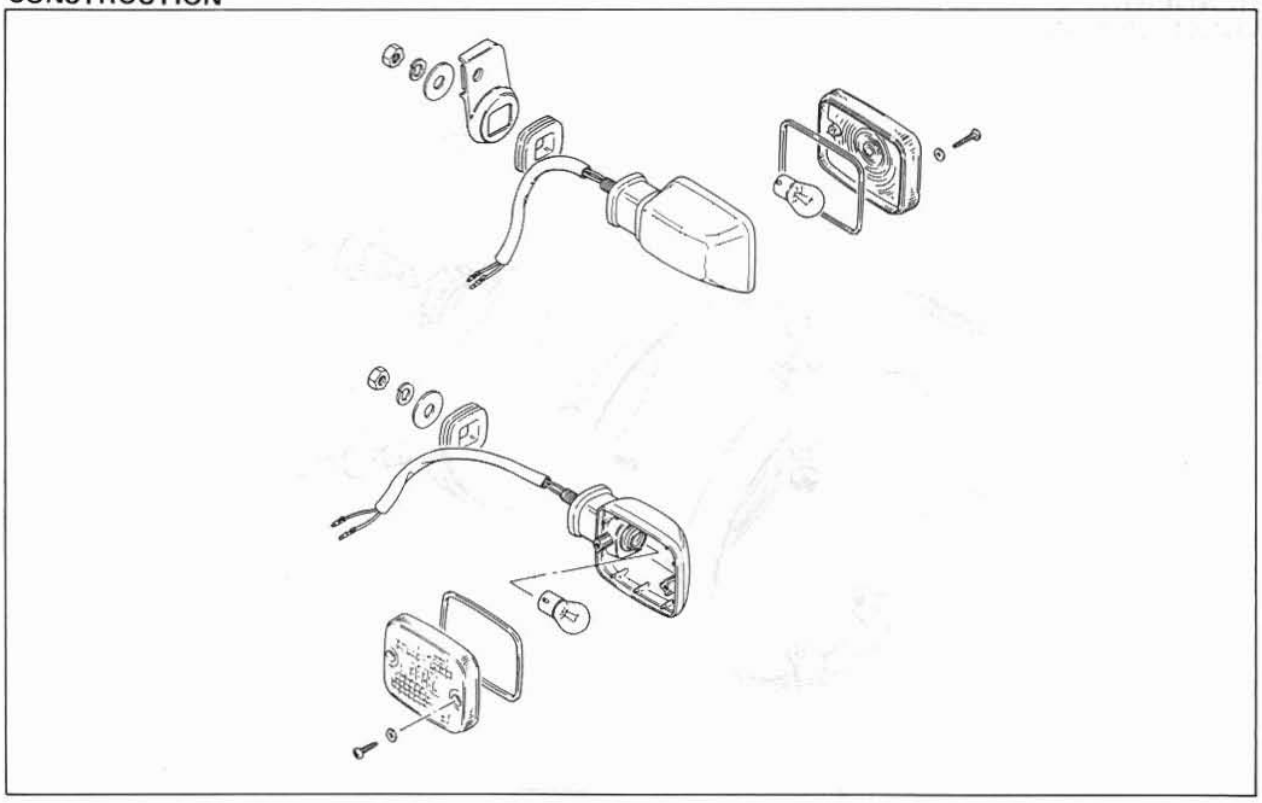
CONSTRUCTION



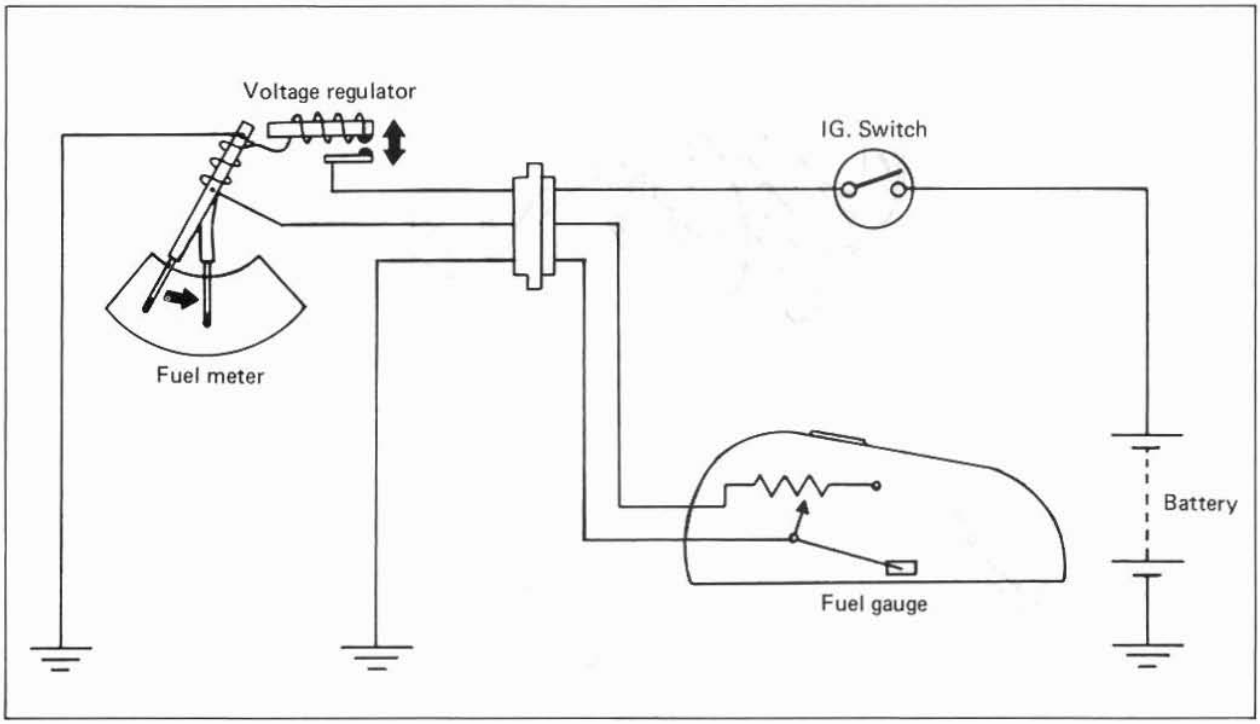
TAIL/BRAKE LIGHT
CONSTRUCTION



TURN SIGNAL LIGHT
CONSTRUCTION

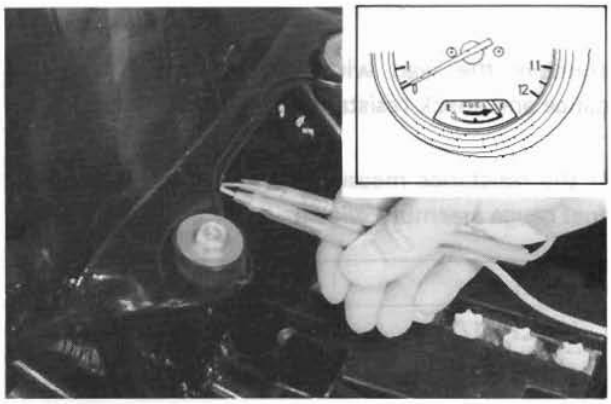


FUEL METER WIRING



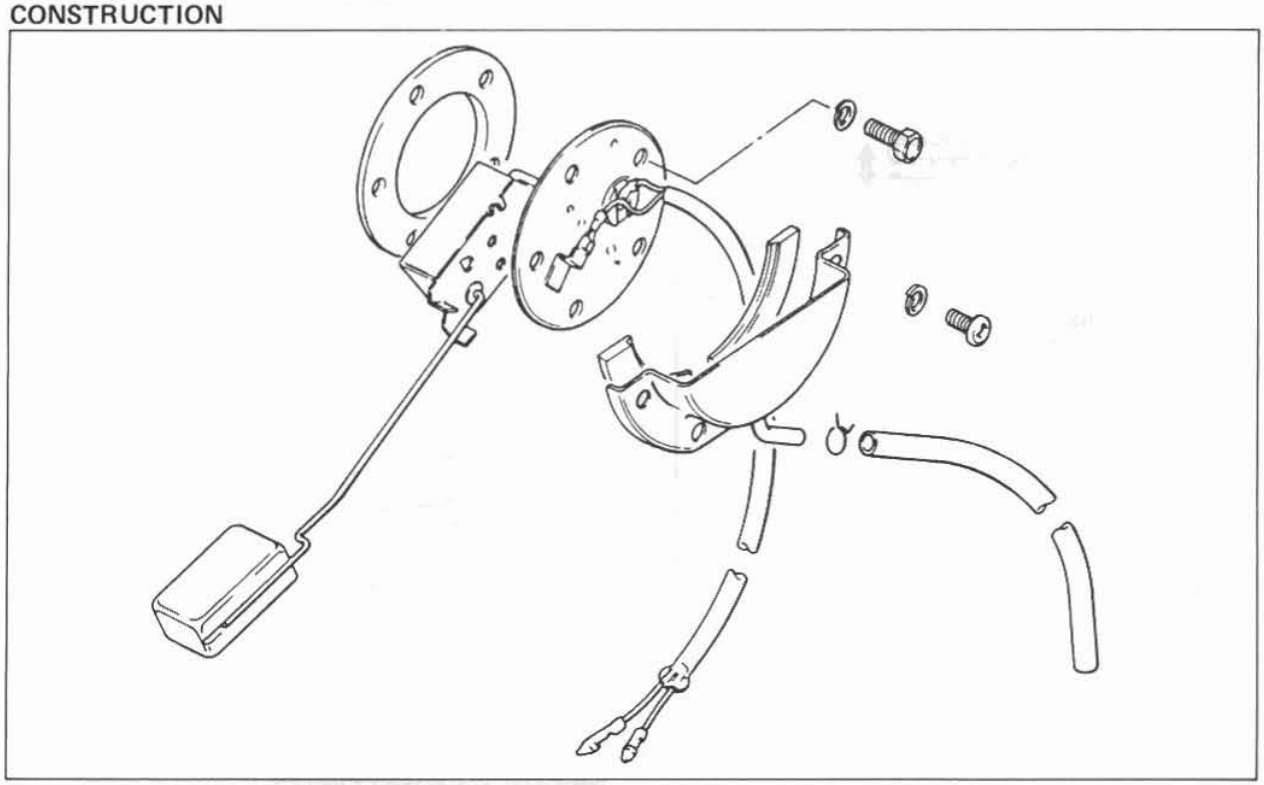
FUEL METER

With the ignition switch turned on, remove two lead wires going into the fuel gauge, connect the lead wires on the main wiring harness side and check the fuel meter. If "F" is indicated, the fuel meter is in good condition.



FUEL GAUGE SENDING UNIT

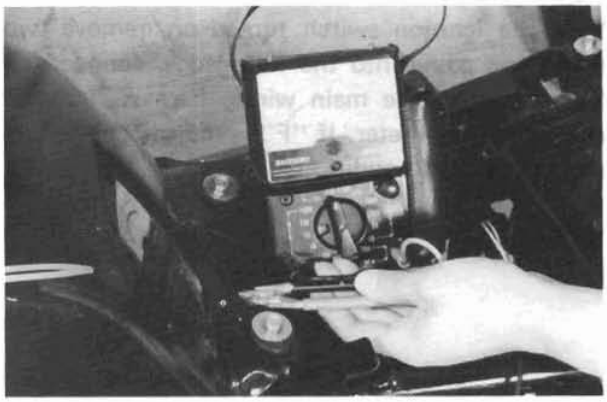
CONSTRUCTION

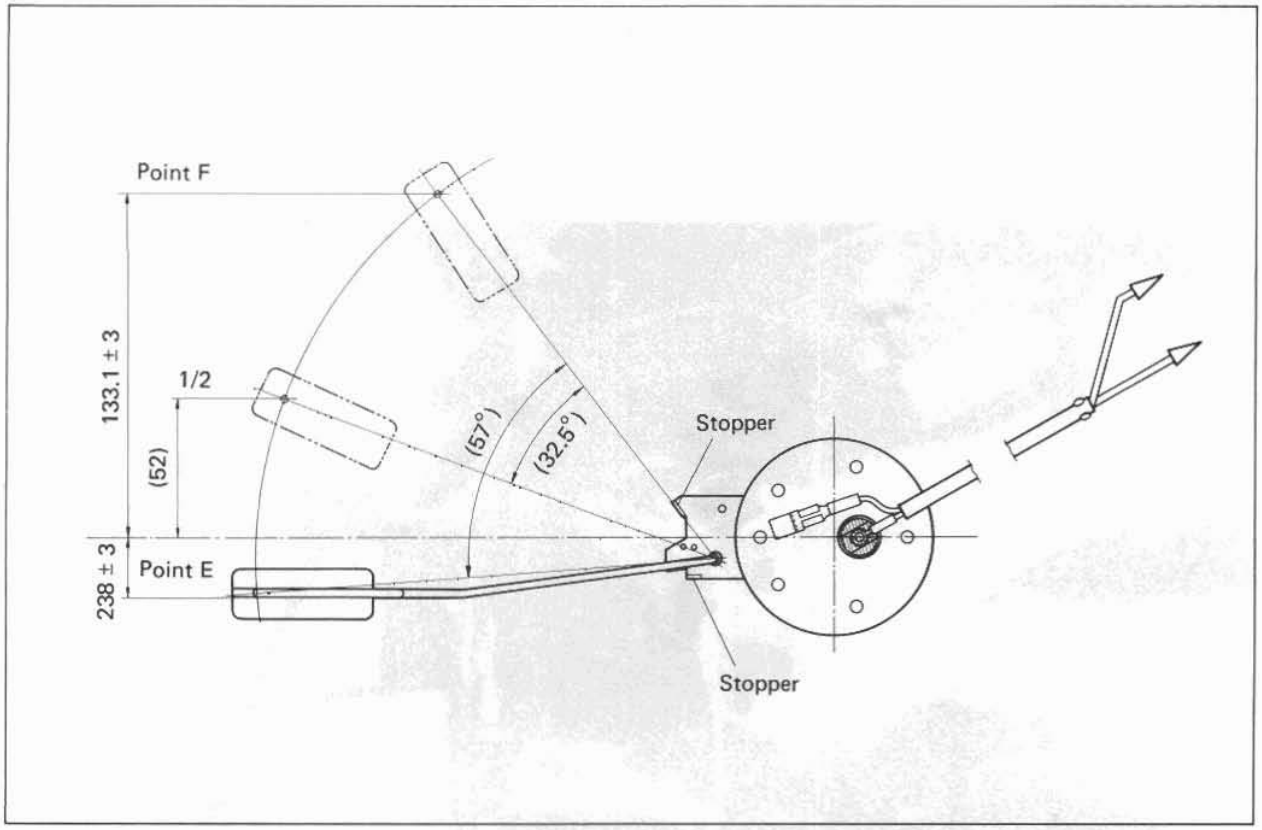


Remove the lead wires coming out of the fuel gauge and check resistance of each of them.

If the resistance measured is incorrect, replace the fuel gauge assembly with new one.

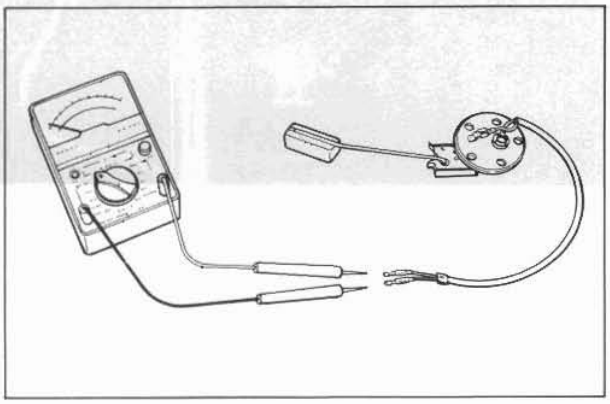
FULL	Approx. 1 – 5 Ω
HALF (1/2)	Approx. 25 – 40 Ω
EMPTY	Approx. 100 – 120 Ω





The relation between the needle of fuel meter and fuel amount is as follows:

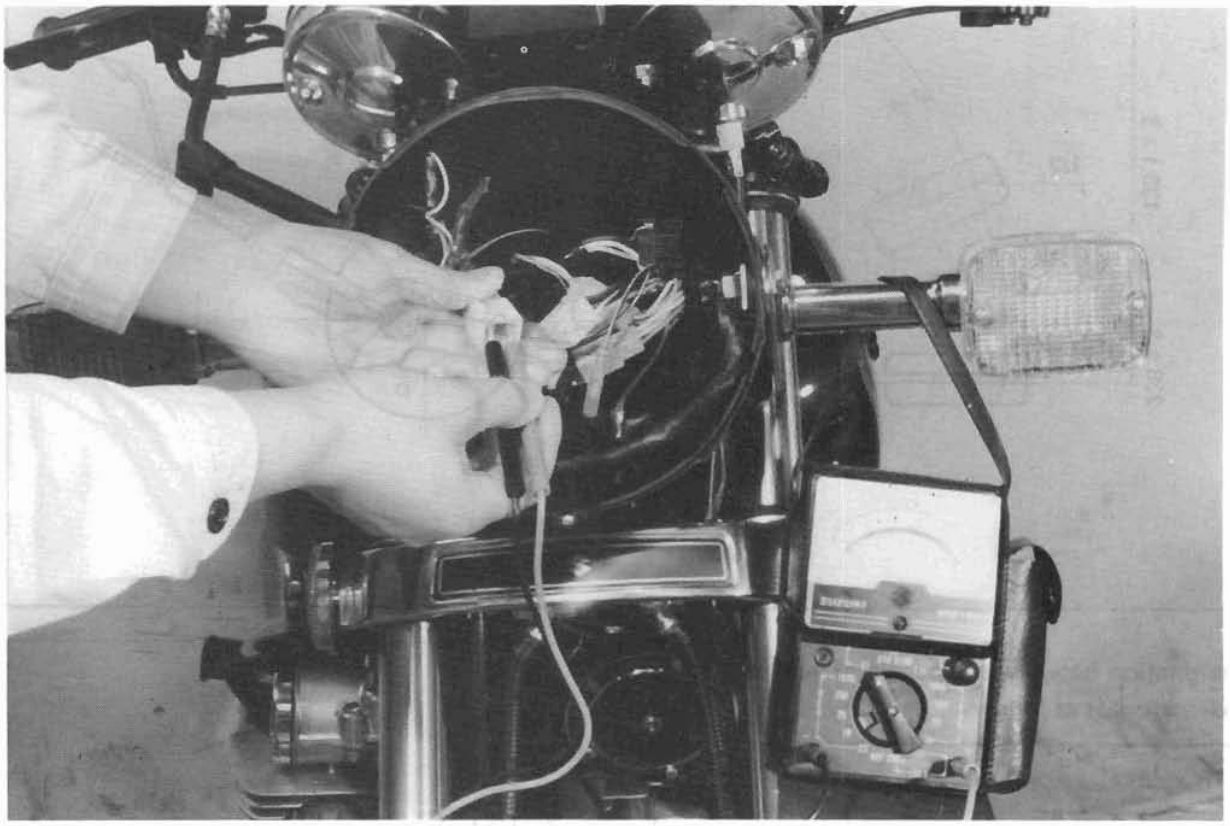
F	Approx. 19L
H	Approx. 10L
E	Approx. 2L



SWITCHES

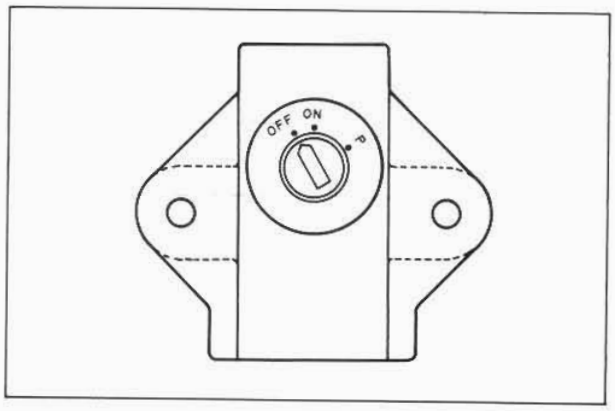
Inspect each switch for continuity with the pocket tester referring to the chart.
If it is found any abnormality, replace the respective switch assembly with new one.

09900 - 25002	Pocket tester



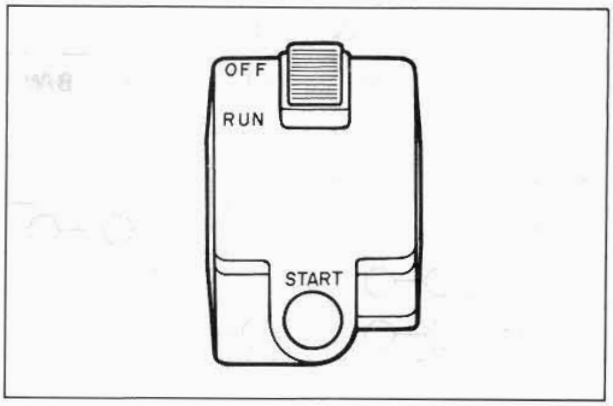
IGNITION SWITCH

	R	O	Gr	Br
OFF				
ON	○	○	○	○
P	○			○



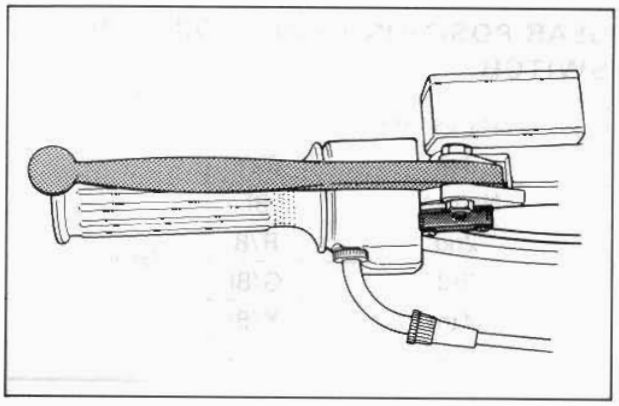
ENGINE STOP AND START SWITCH

	O (Red coupler)	O/W	Y/G
OFF			
RUN	○	○	
START		○	○



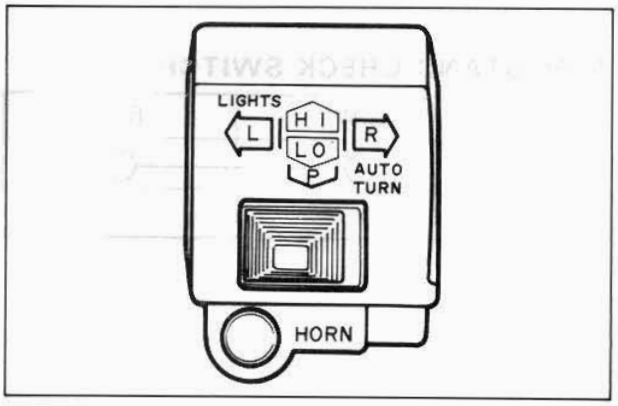
FRONT BRAKE SWITCH

	O	W
ON	○	○
OFF		



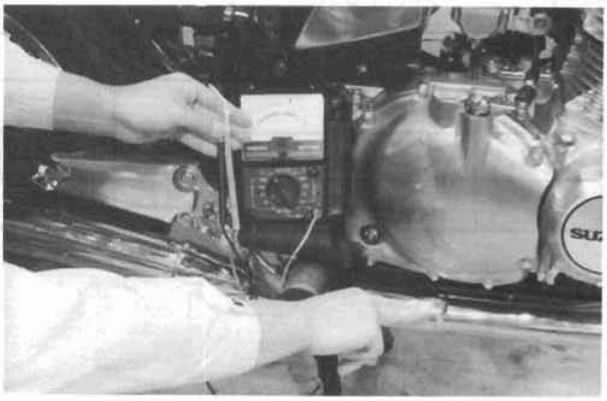
DIMMER AND PASSING SWITCH

	W	Y	Y/W	O/R
HI		○	○	
LO	○		○	
PASS	○	○	○	○



REAR BRAKE LIGHT SWITCH

	O/G	W
ON	○—○	
OFF		

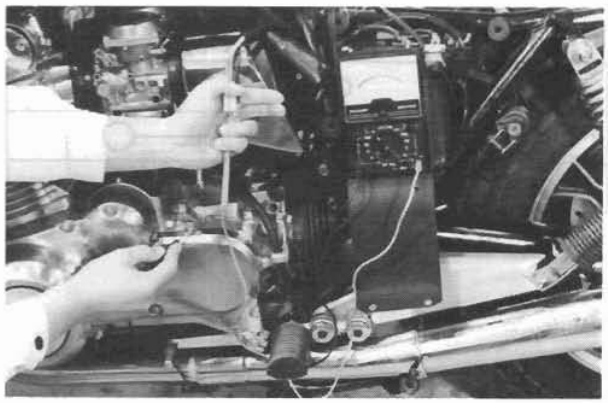


TURN SIGNAL SWITCH

	B	Lbl	Lg	O/R	Lg/B	Br/Y	B/W
R set		○—○		○—○			
R		○—○					
N						○—○	
L	○—○						
L set	○—○			○—○			

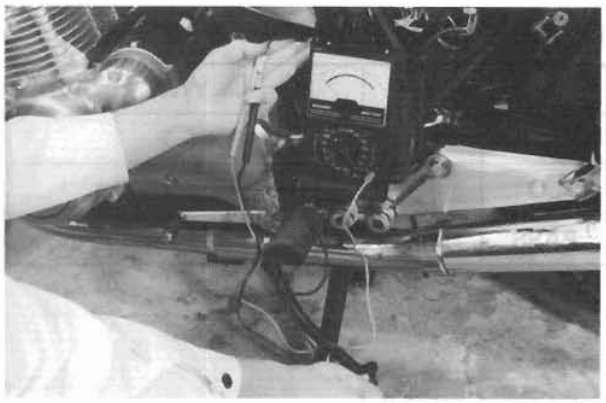
GEAR POSITION INDICATOR LIGHT SWITCH

Gear position	Wire color	
1st	W/Y	Ground
Neutral	Bl	
2nd	R/B	
3rd	G/Bl	
4th	Y/Bl	
Top	Br/R	



SIDE STAND CHECK SWITCH

	G/W	B/W
ON	○—○	
OFF		

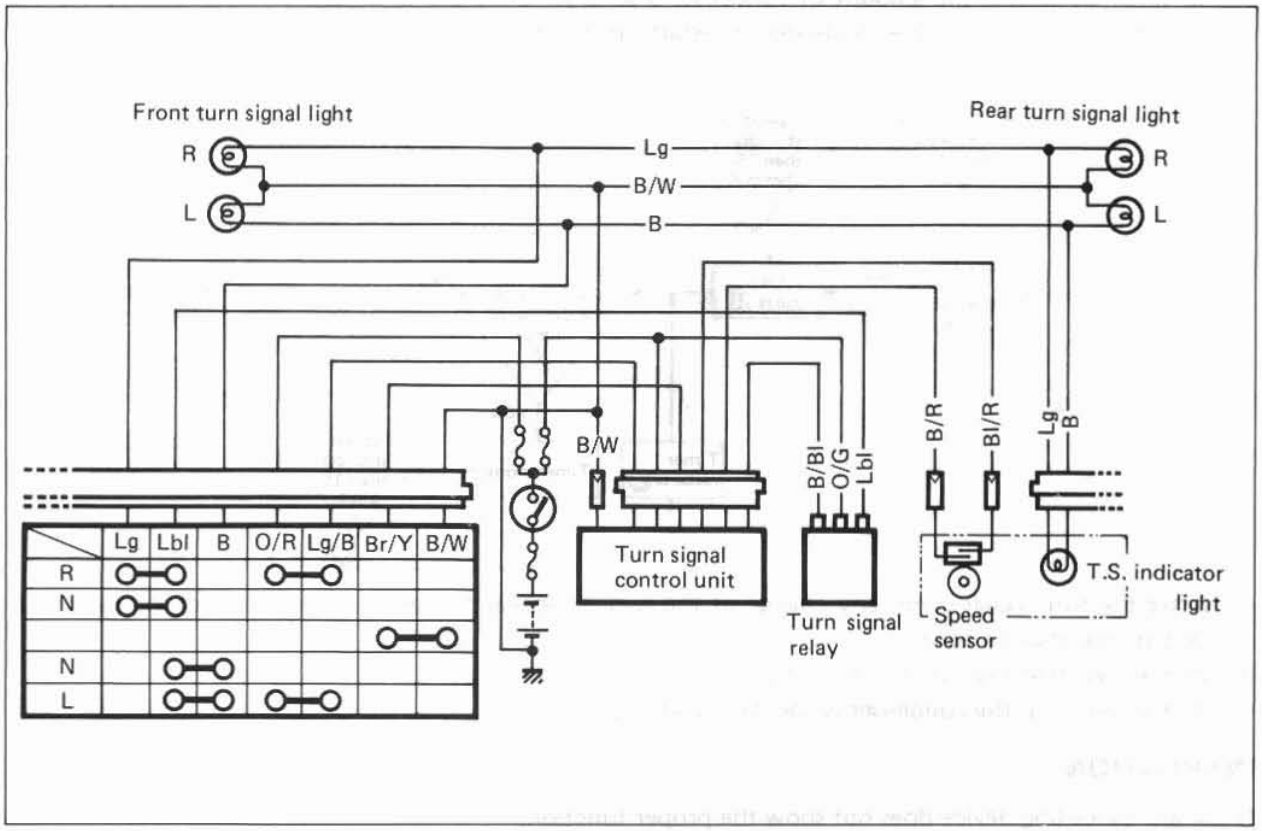


SELF CANCELLING DEVICE

DESCRIPTION

The turn signal light self cancelling device attached to this motorcycle functions as the way the following diagram shows, and it is only an added circuit to the ordinary turn signal.

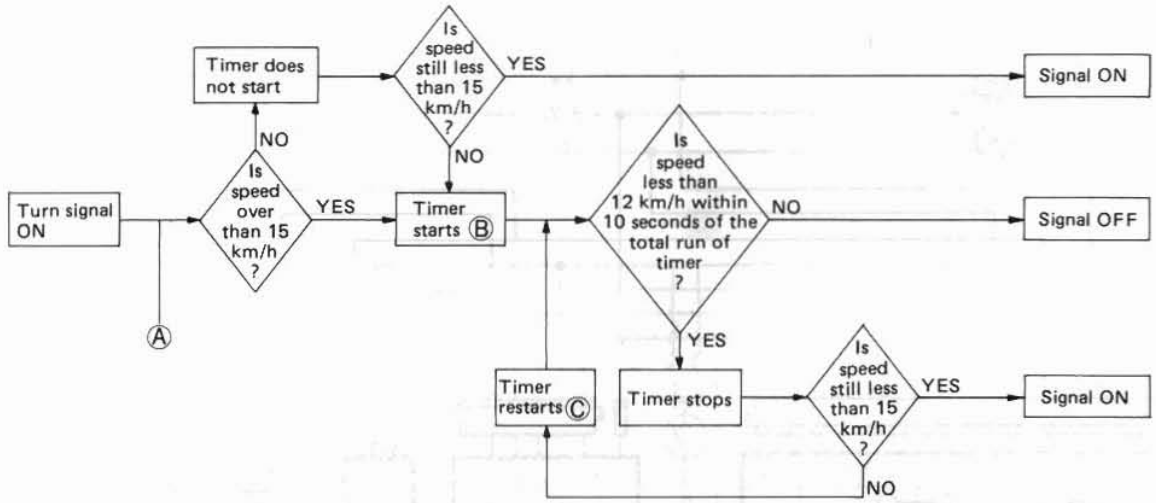
DIAGRAM



SELF CANCELLING DEVICE FUNCTIONS

TIMER SPECIFICATION AND FUNCTION

* The speed at which the timer starts to run: 15 km/h.
* The speed at which the timer stops: Less than 12 km/h.
* The time during which the timer runs: 10 ± 1 seconds (= Time needed for descharge from the condenser.)
* The timer calculates the amount of condenser discharge. Once the timer stops at the level before the complete discharge from the condenser, it restarts at this level; i.e. the condenser is partially discharged.



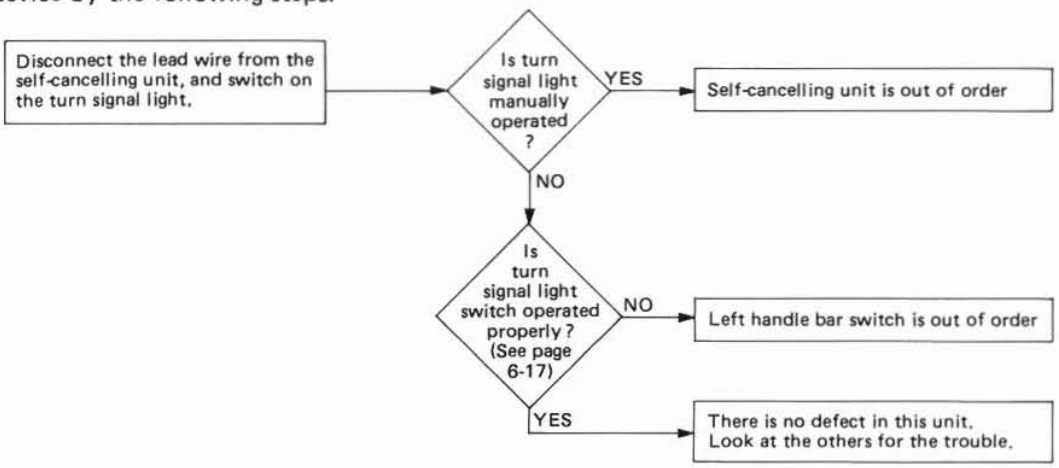
Ⓐ After the turn signal is on, any change of the switch cancels the device and reapply for the switch begins at this position again.

Ⓑ At the level that the condenser is fully charged.

Ⓒ At the level that the condenser is partially discharged.

INSPECTION

If the self cancelling device does not show the proper function.
Check the device by the following steps.



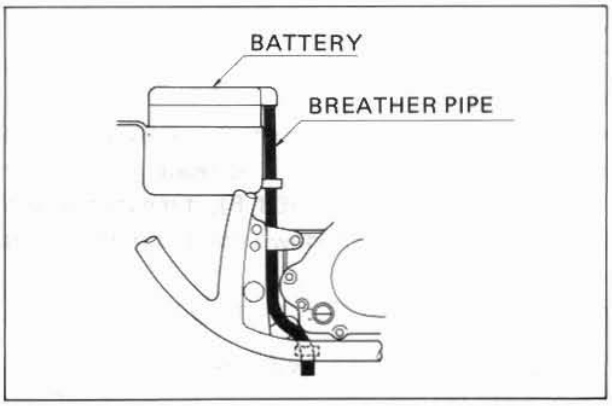
CAUTION:
Be sure to confirm that 1) battery is fully charged, 2) bulbs are standard wattage, and 3) wiring connection is tight before inspecting self-cancelling device.

BATTERY

SPECIFICATIONS

Type designation	YB14L-A2
Capacity	50.4kC (14 Ah)
Standard electrolyte S.G.	1.28 at 20°C (68°F)

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

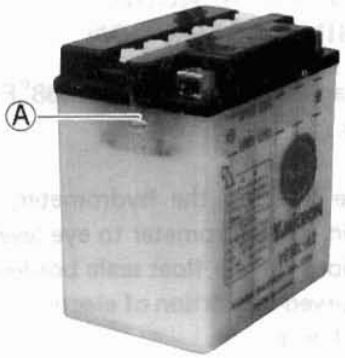


INITIAL CHARGING

Filling electrolyte

Remove short sealed tube before filling electrolyte. Fill 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 UPPER LEVEL. Filling 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.



Ⓐ Sealed tube

Maximum charging current	1.4A

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 follows, each indicating month, date and year.

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

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

SERVICING

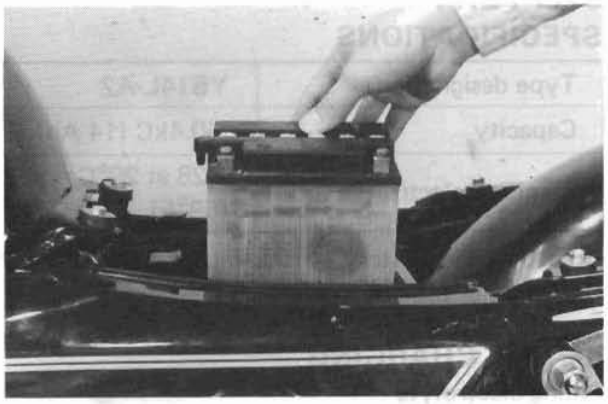
Visually inspect the surface of the battery container. If any signs of cracking or electrolyte leakage from the sides of the battery have occurred, replace the battery with a new one.

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 upper 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.

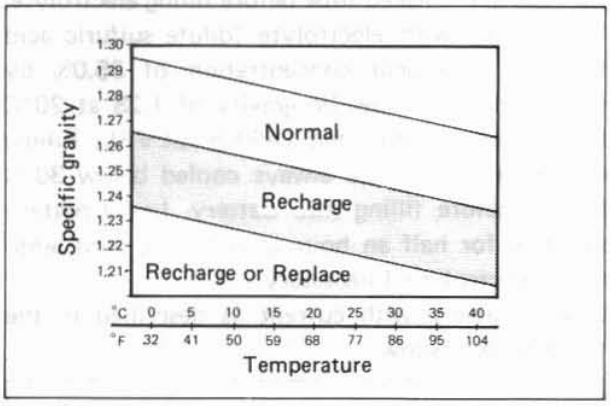
NOTE:
First, remove the ⊖ lead wire.



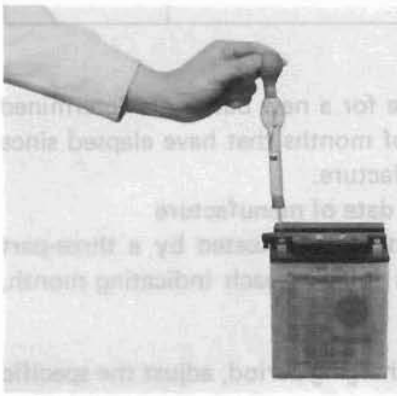
BASED ON S.G. READING RECHARGING OPERATION

To correct an S.G. reading 20°C (68°F), use following table.

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



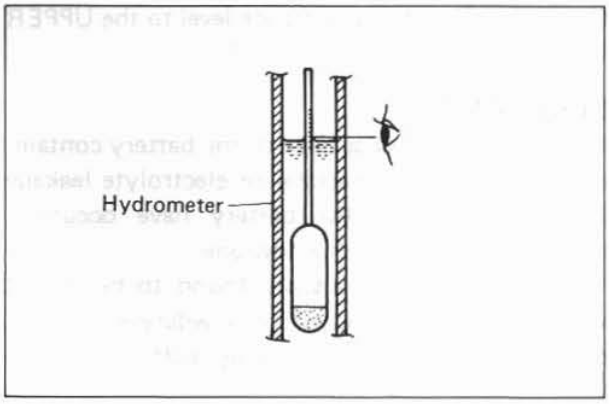
Check the reading (as corrected to 20°C) with chart to determine the recharging time in hours by constant-current charging at a charging rate of 1.4 amperes (which is a tenth of the capacity of the present battery).



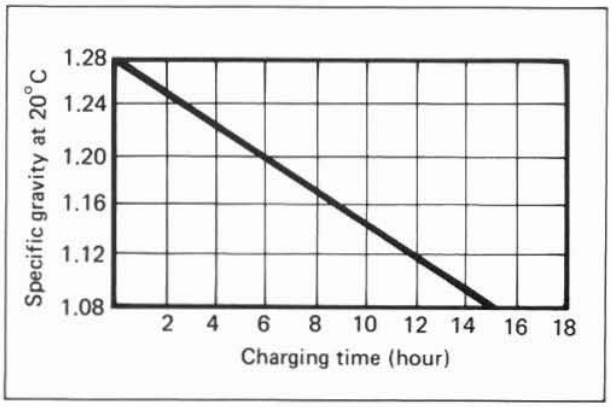
Be careful not to permit the electrolyte temperature to exceed 45°C (113°F), at any time, during the recharging operation. Interrupt the operation, as necessary, to let the electrolyte cool down. Recharge the battery to the specification.

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.



09900 - 28403	Hydrometer



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.**

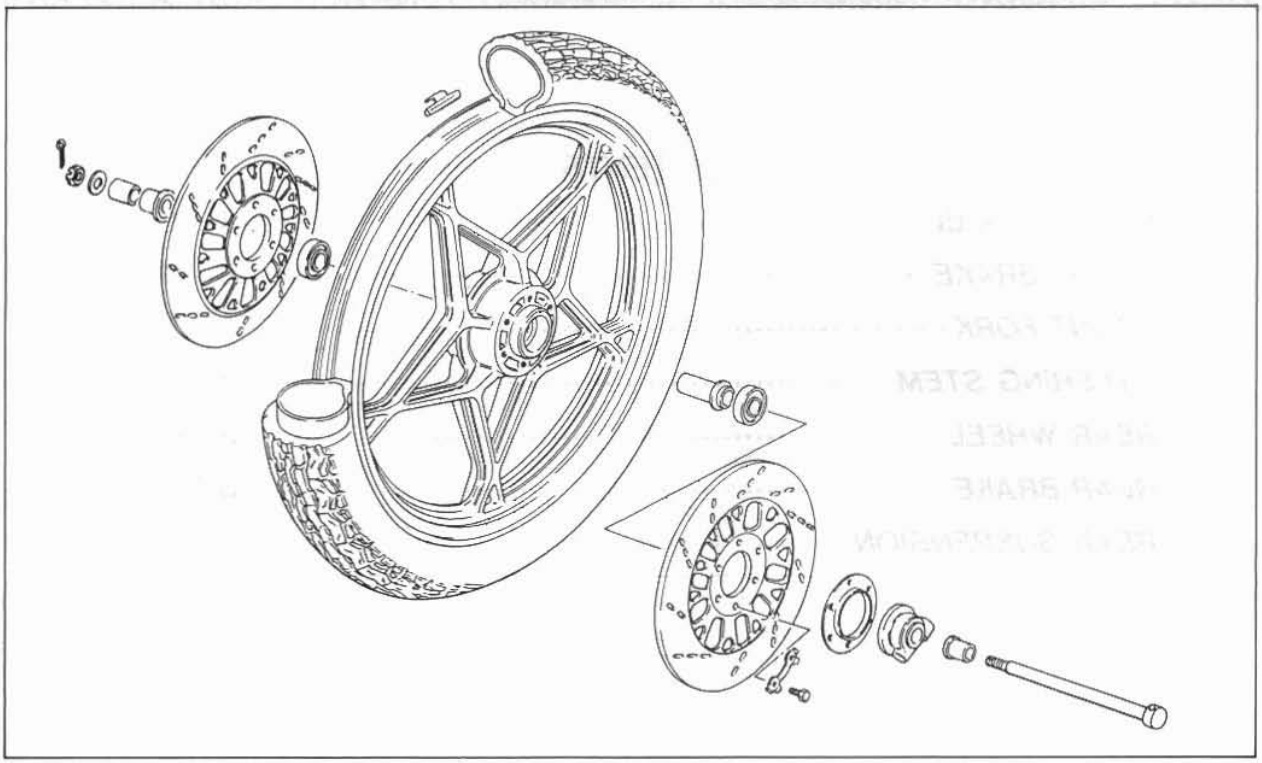
CHASSIS

CONTENTS

FRONT WHEEL 8- 1
FRONT BRAKE 8- 5
FRONT FORK 8-13
STEERING STEM 8-20
REAR WHEEL 8-24
REAR BRAKE 8-29
REAR SUSPENSION 8-36

FRONT WHEEL

CONSTRUCTION

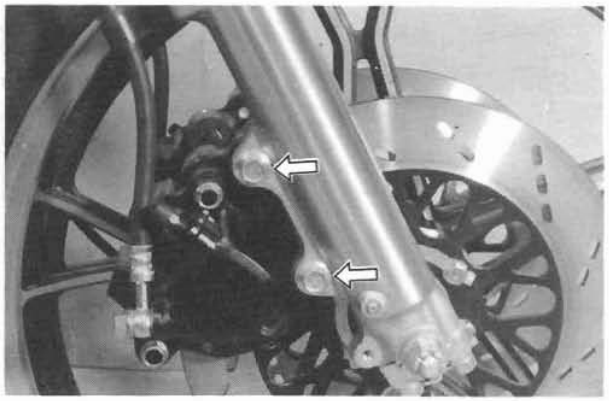


REMOVAL AND DISASSEMBLY

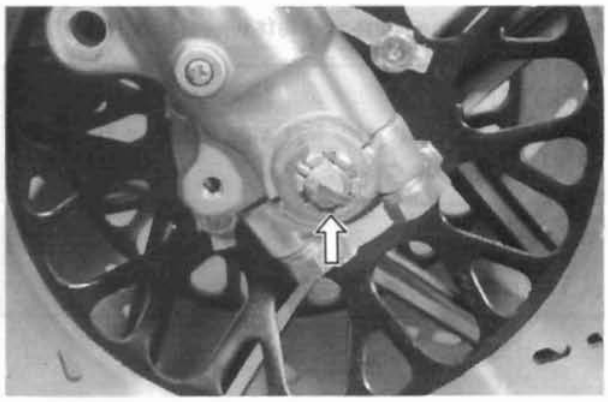
- Support the machine by center stand and jack.

- Remove caliper mounting bolts and dismount the caliper.

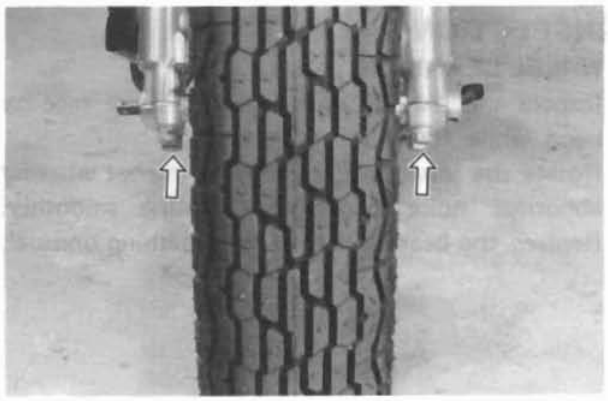
NOTE:
Do not operate the brake lever while dismounting the caliper.



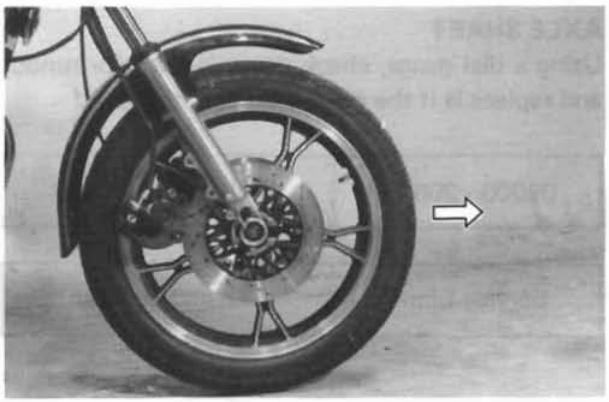
- Pull off cotter pin and remove axle nut and washer.



- Remove axle holder (Right and Left).

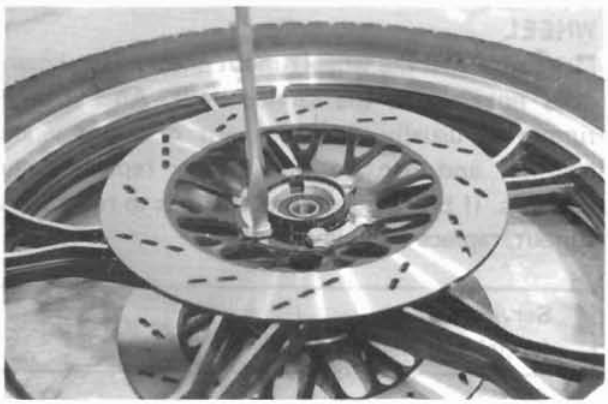


- Draw out axle shaft and take off front wheel.

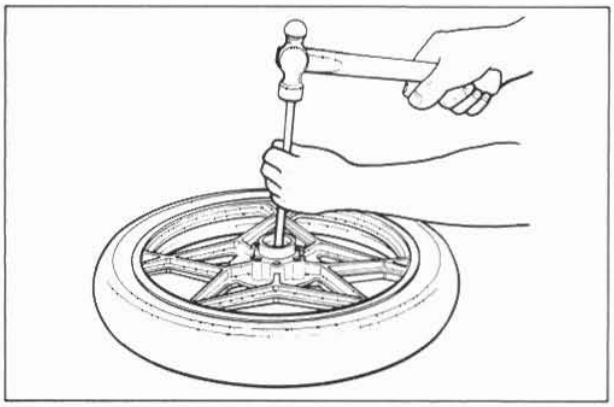


- Unlock the lock washer.
  Remove the securing bolts and separate the disc from wheel (Right and Left).

CAUTION:
Do not reuse the lock washer.



- Draw out the right and left wheel bearings.



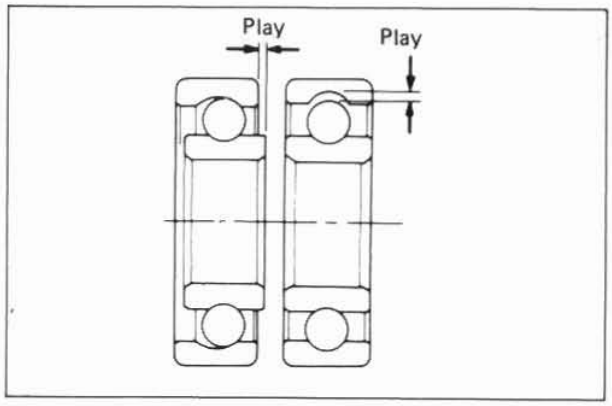
NOTE:
If drawing out the left side bearing first, it makes the job easier.

CAUTION:
The removed bearing should be replaced.

INSPECTION

WHEEL BEARINGS

Inspect the play of wheel bearing inner race by hand while fixing it in the wheel.
Rotate the inner race by hand to inspect whether abnormal noise occurs or rotating smoothly. Replace the bearing if there is something unusual.

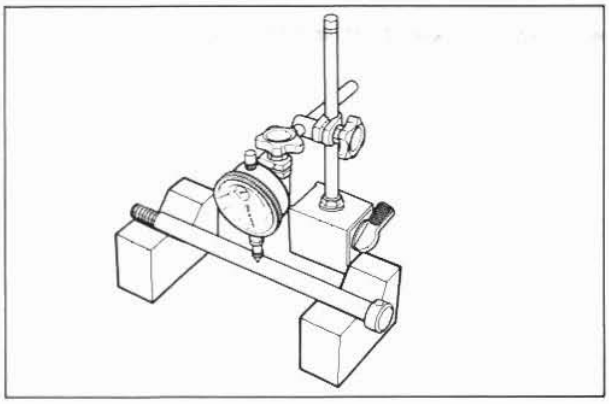


AXLE SHAFT

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)

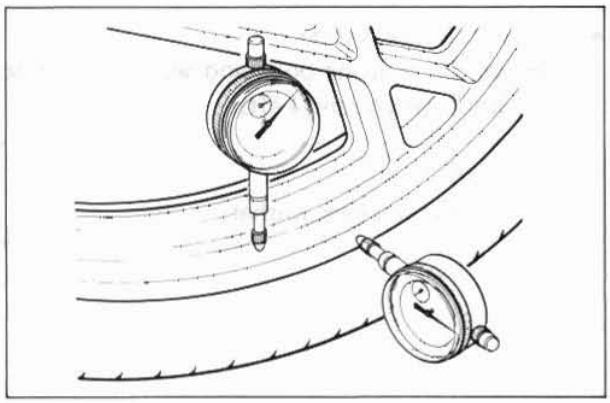
Service Limit	0.25 mm (0.01 in)



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)



REASSEMBLY

Reassemble and remount the front wheel in the reverse order of disassembly and removal, and also carry out the following steps:

WHEEL BEARING

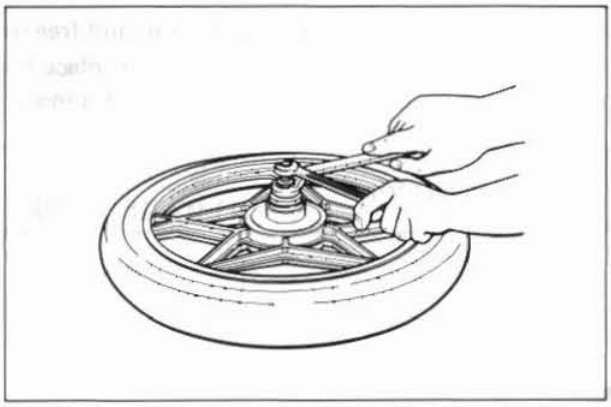
- Apply grease before install the bearings.

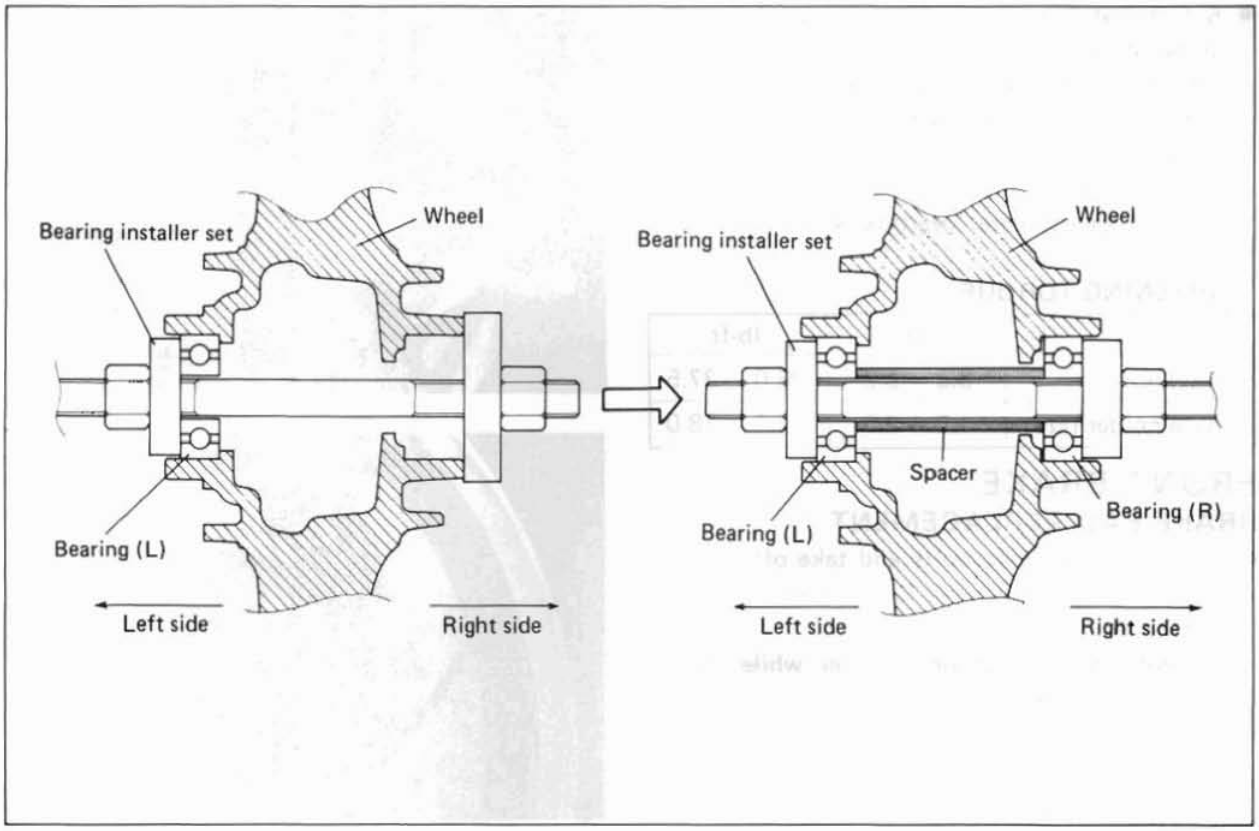
99000 - 25030	Suzuki super grease "A"

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

CAUTION:
First install the wheel bearing for left side.

09924 - 84510	Bearing installer set

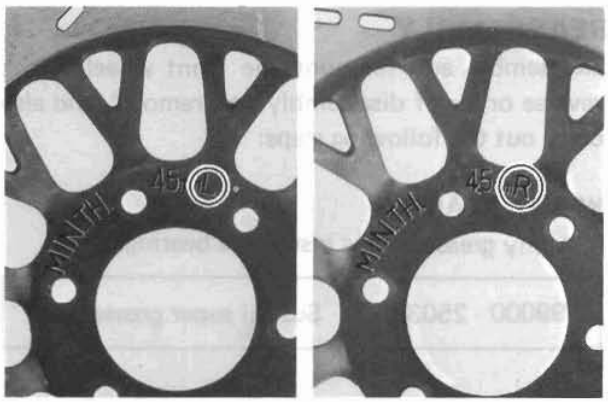




- Mount each brake disc properly according to the stamped marks, "R" or "L", on the respective disc plate.

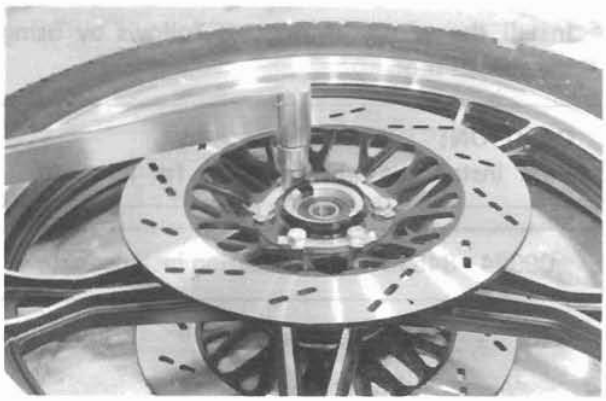
"R"	Right side
"L"	Left side

NOTE:
There is the dust seal on left disc plate.



- Make sure that the brake disc is clean and free of any greasy matter. After securing it in place by tightening its bolts, be sure to lock each tongue.

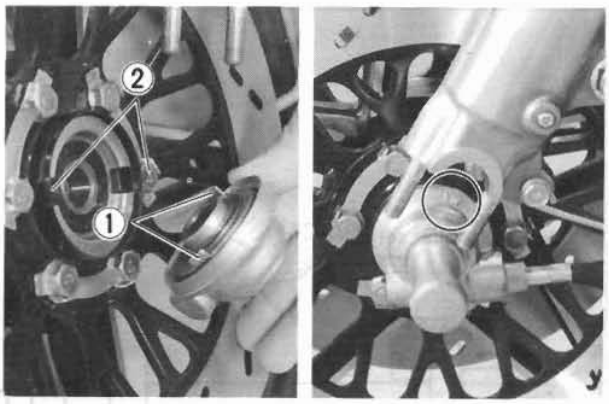
Tightening torque	1.5 – 2.5 kg-m (11.0 – 18.0 lb-ft)



- Before installing the speedometer gearbox ① grease it and align the two drive pawls (for fitting them into the two 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 shown.

TIGHTENING TORQUE

	kg-m	lb-ft
Axle nut	3.6 – 5.2	26.0 – 37.5
Axle holder nut	1.5 – 2.5	11.0 – 18.0

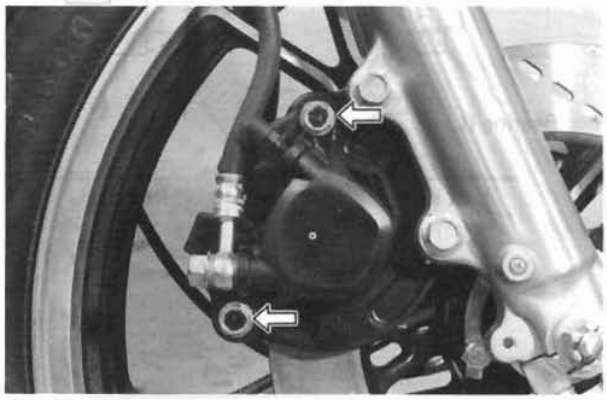


FRONT BRAKE

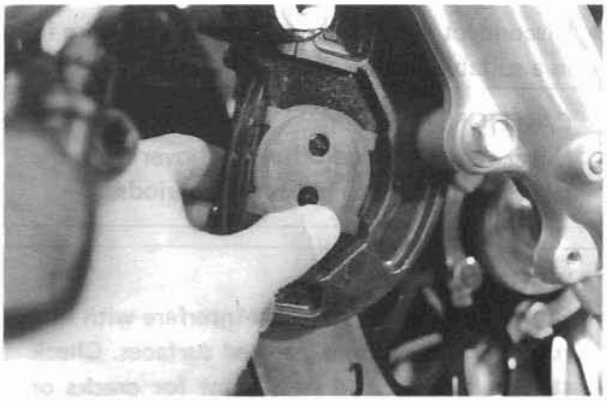
BRAKE PAD REPLACEMENT

- Remove caliper axle bolts and take off caliper.

CAUTION:
Do not operate the brake lever while dismounting the caliper.

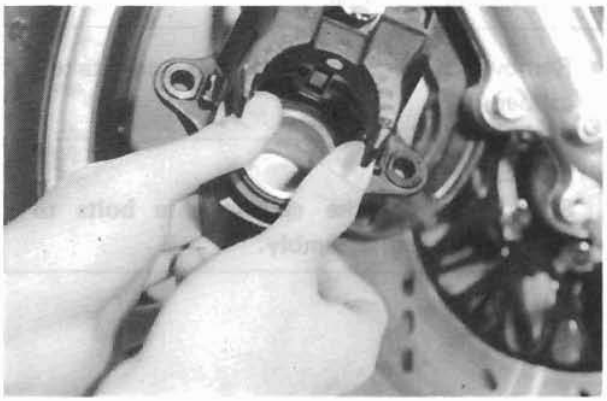


- Pull out brake pads with pad shim.



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

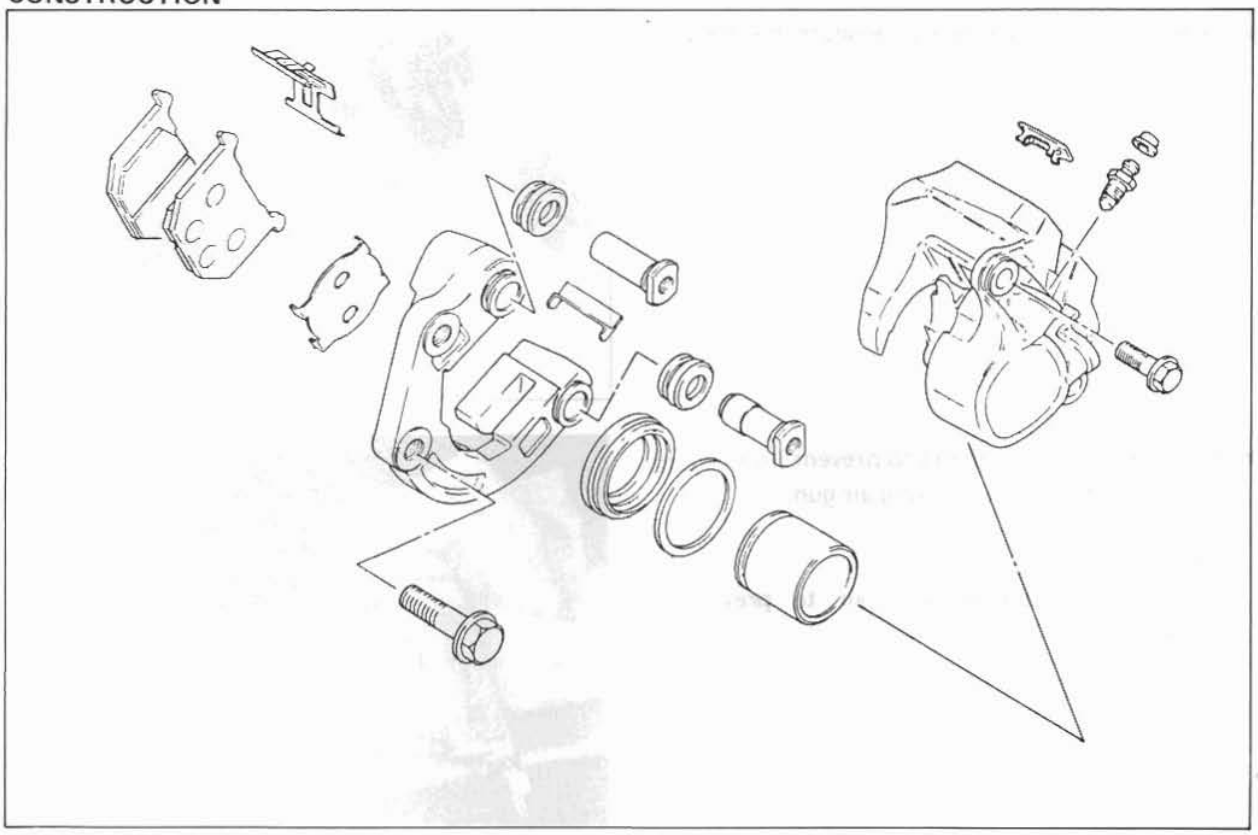
NOTE:
Push in the piston all the way to the caliper when remounting the caliper.



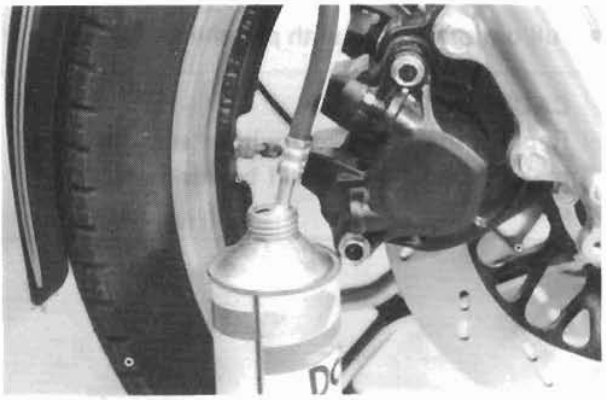
Tightening torque	2.5 – 4.0 kg-m (18.0 – 29.0 lb-ft)

CALIPER REMOVAL AND DISASSEMBLY

CONSTRUCTION



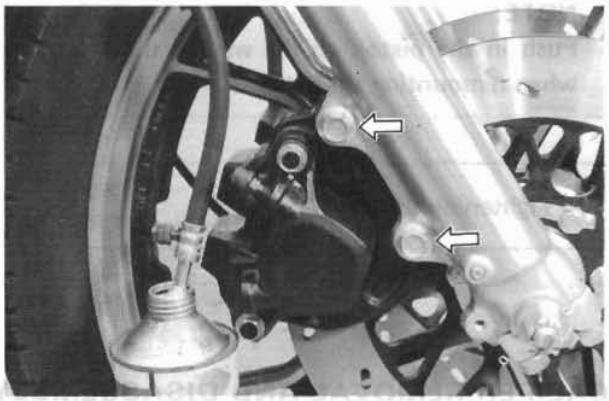
- Disconnect brake hose and catch the brake fluid in a suitable receptacle.



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

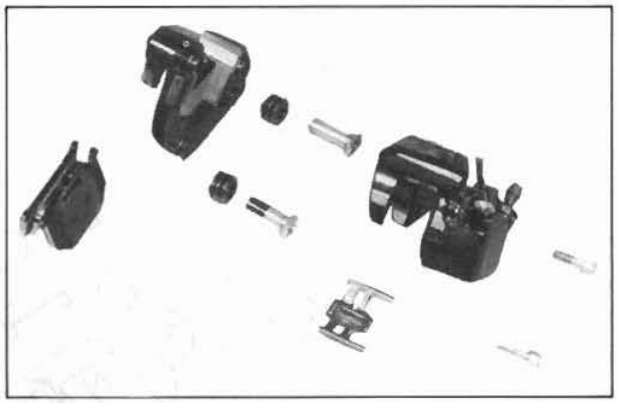
WARNING:
Brake fluid, if it leaks, will interfere with safe running and discolor painted surfaces. Check the brake hose and hose joint for cracks or leakage before riding.

- Remove caliper mounting bolts and take off caliper.



NOTE:
Slightly loosen the caliper axle bolts to facilitate later disassembly.

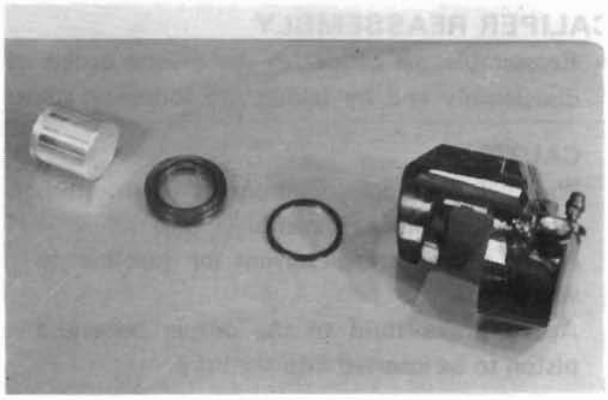
- Remove caliper axle bolts, separate the caliper and caliper holder.



- 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.

- Remove dust boot and piston seal.

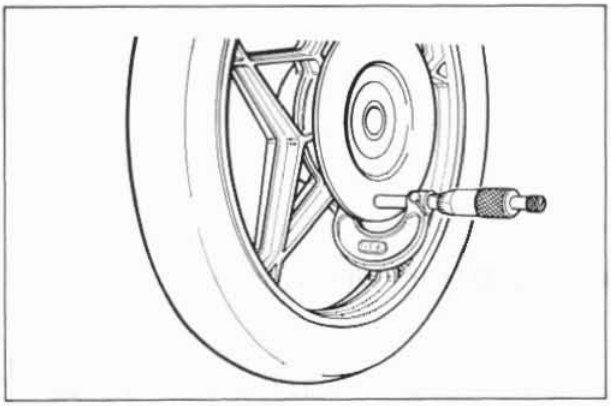


CALIPER AND DISC INSPECTION

- Inspect the caliper bore wall for nicks, scratches or other damage.
- Inspect the each rubber parts for damage and wear.
- Inspect the piston surface for any scratches or other damage.

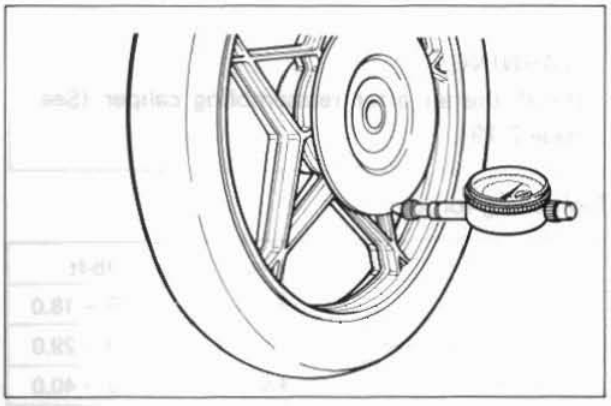
- Using a micrometer check the disc for wear. Its thickness can be checked with disc and wheel in place. The service limit for the thickness of the discs:

09900 - 20205	Micrometer (0 - 25 mm)
Service Limit	4.5 mm (0.18 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)
Service Limit	0.30 mm (0.01 in)

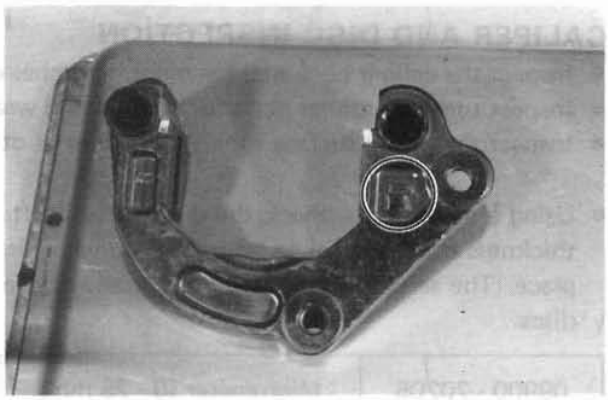


CALIPER REASSEMBLY

- Reassemble the caliper in the reverse orders of disassembly and by taking the following steps:

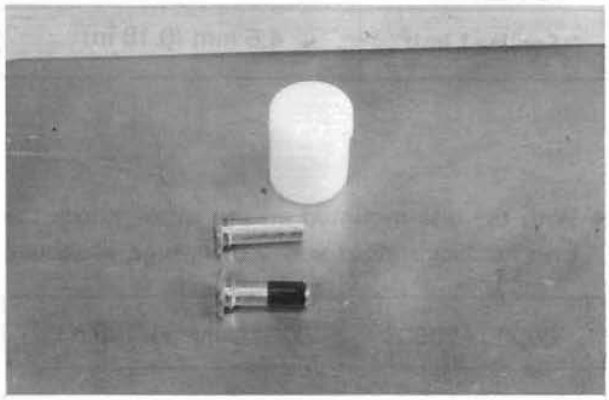
CAUTION:
Wash the caliper components with fresh brake fluid before reassembly.
Never use cleaning solvent or gasoline to wash them.
Apply brake fluid to the caliper bore and piston to be inserted into the bore.

- Mount each caliper holder properly according to the stamped mark, "R" or "L" on the caliper holder.



- Apply SUZUKI silicone grease to the caliper axles.

99000 - 25100	SUZUKI silicone grease

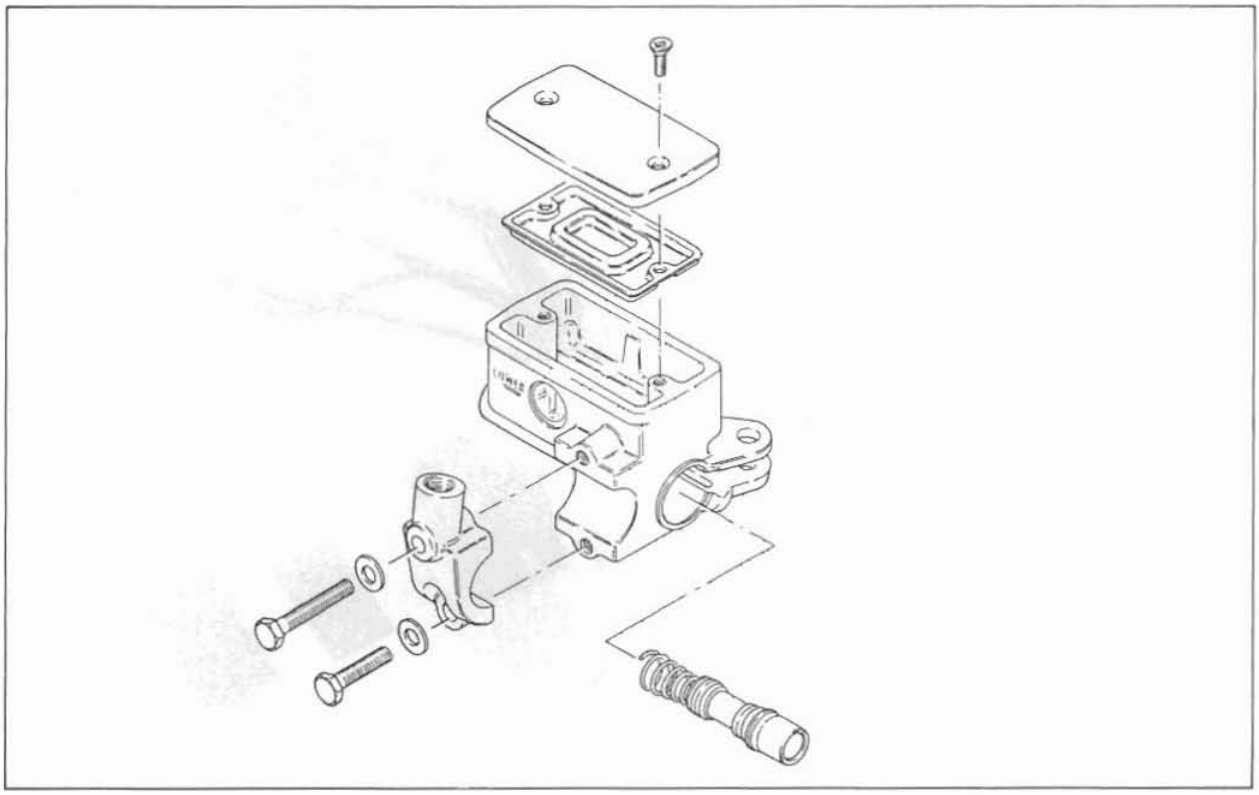


WARNING:
Bleed the air after reassembling caliper (See page 2-19).

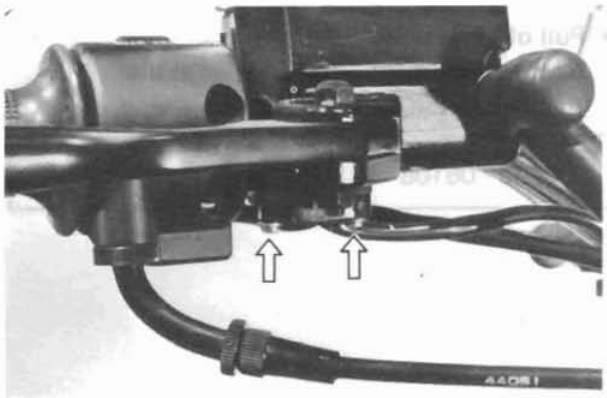
Tightening torque:

	kg-m	lb-ft
Union bolt	2.0 – 2.5	14.5 – 18.0
Caliper mounting bolt	2.5 – 4.0	18.0 – 29.0
Caliper axle bolt	4.0 – 5.5	29.0 – 40.0

MASTER CYLINDER REMOVAL AND



- Take off front brake light switch and remove front brake lever.

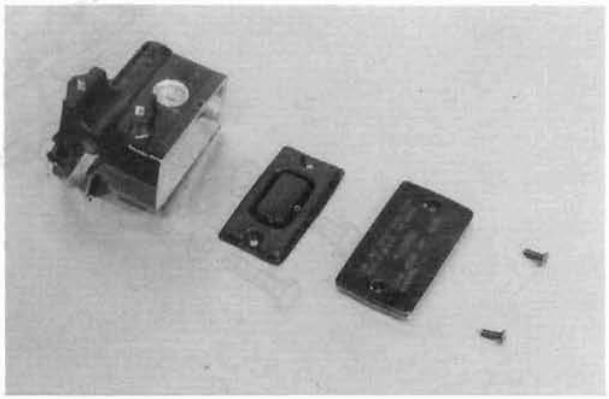


- Place a cloth underneath the union bolt on the master cylinder to catch spilled drops of brake fluid. Unscrew the union bolt and disconnect the brake hose/master cylinder joint.

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

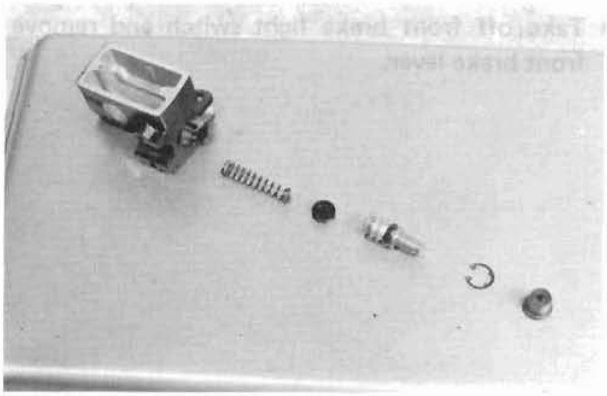
- Remove two clamp bolts and take off master cylinder ass'y.

- Remove reservoir cap and diaphragm.
  Drain brake fluid.



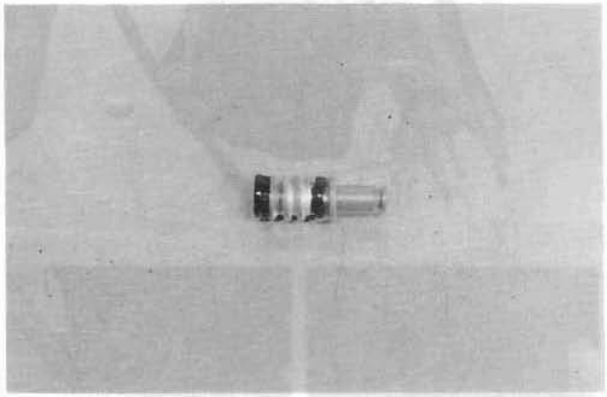
- Pull off dust boot.
  Remove circlip by using the special tool.
  Remove piston, primary cup and spring.

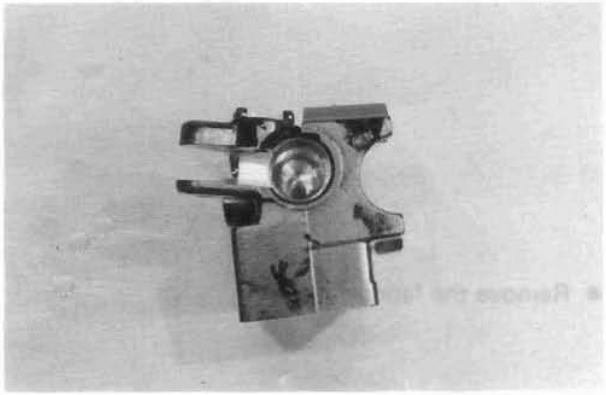
09900 - 06108	Snap ring pliers



MASTER CYLINDER INSPECTION

- Inspect the master cylinder bore for any scratches or other damage.
- Inspect the piston surface for scratches or other damage.
- Inspect the primary cup, secondary cup and dust boot for wear or damage.





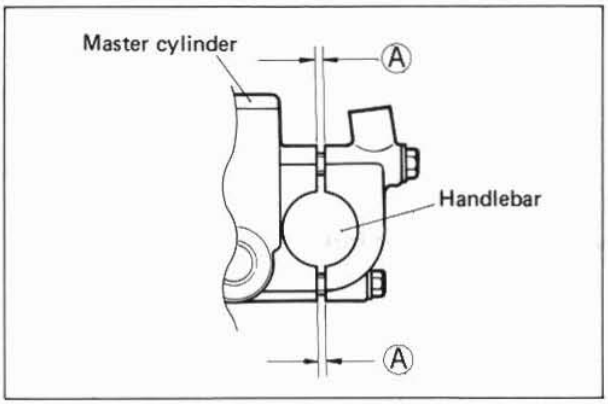
MASTER CYLINDER REASSEMBLY

- Reassemble the master cylinder in the reverse orders of disassembly and by taking the following steps:

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 internals to be inserted into the bore.

- When remounting the master cylinder on the handlebars, secure the clamp so that the clearances Ⓐ of both upside and downside of the handlebars stay equally.

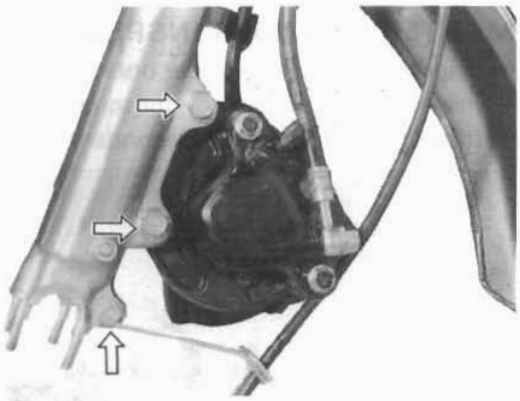
CAUTION:
Bleed the air after reassembling master cylinder. (See page 2-19).
Adjust the front brake light switch after installation.



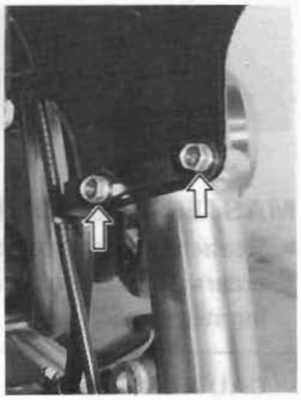
FRONT FORK

REMOVAL

- Remove front wheel (See page 8-1).
- Disconnect speedometer cable guide.
- Remove the caliper.



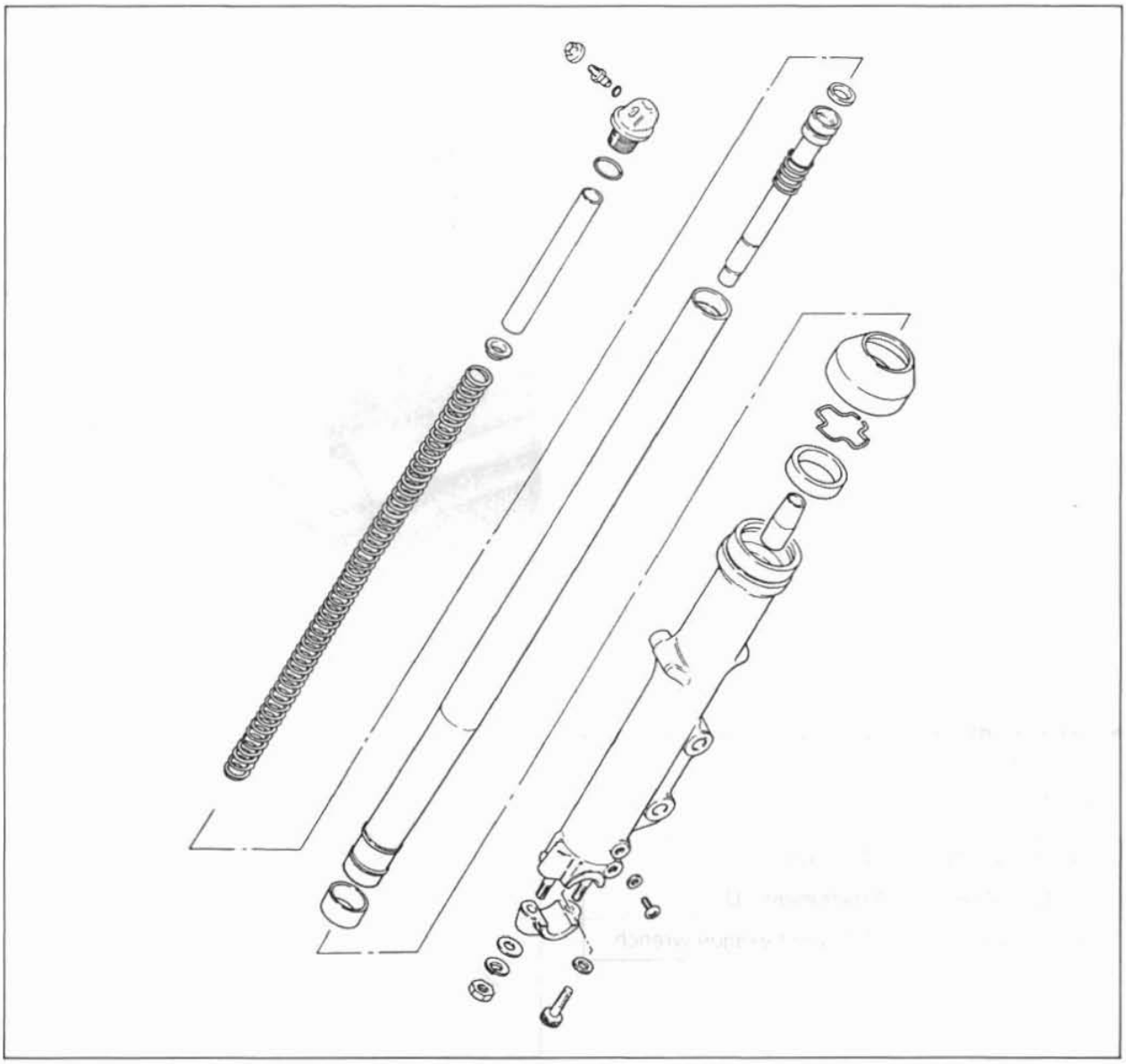
- Remove the fender.



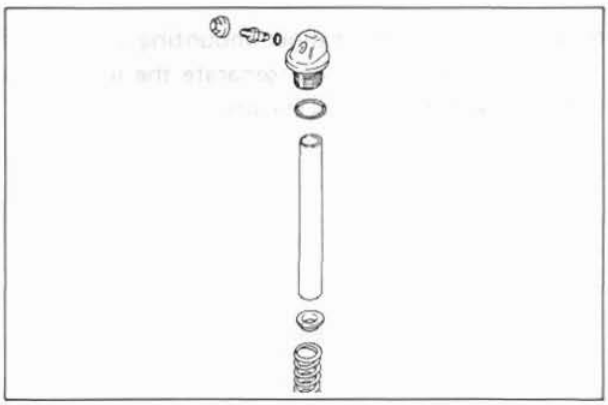
- Loosen the front fork clamp bolts upper and lower.

- Pull off the front fork.

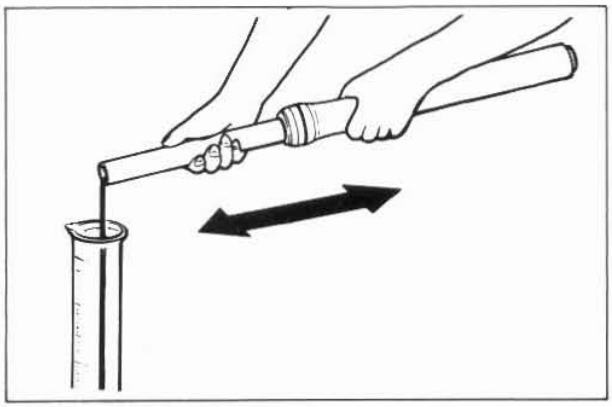
DISASSEMBLY



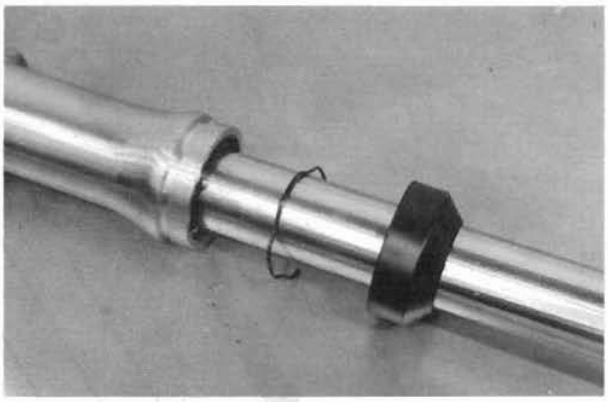
- Bleed the air of the front fork.
  Loosen and remove the cap bolt.
  Draw out the fork spring.



- Invert the fork and stroke it several times to let out the fork oil.
  Under the condition (inverted condition), hold the fork for a few minutes.

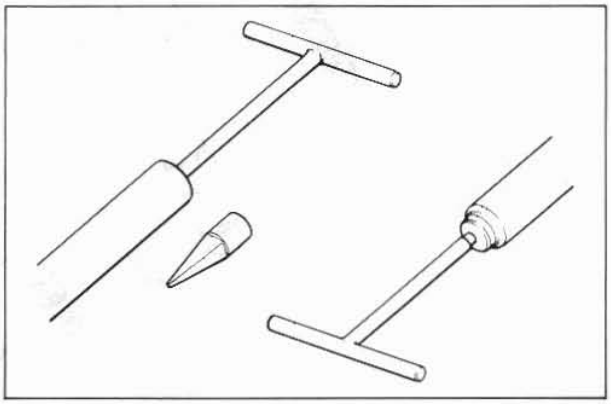


- Draw out dust seal.
  Remove stopper ring.

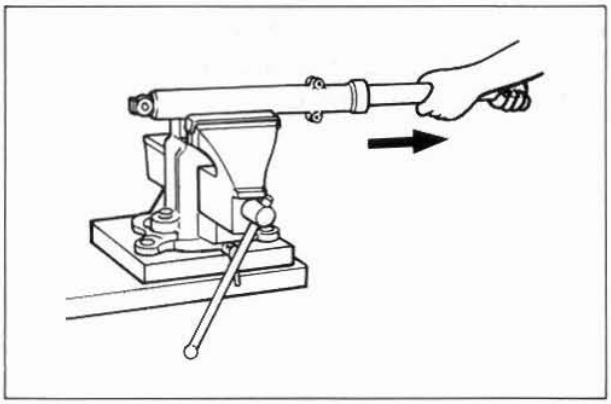


- Remove damper rod securing bolt by using the special tools.
  Draw out damper rod and rebound spring.

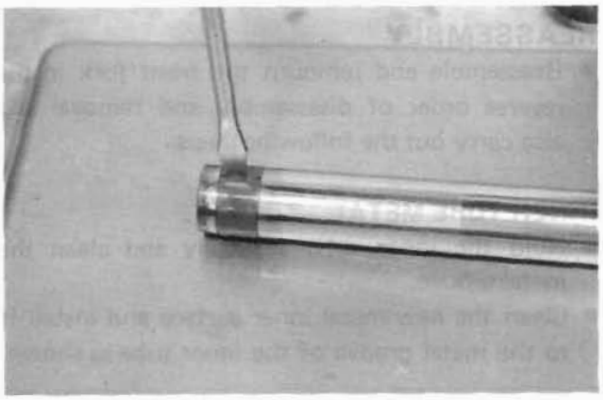
09940 - 34520	"T" handle
09940 - 34561	Attachment "D"
09914 - 25811	"T" type hexagon wrench



- While holding the caliper mounting portion of the outer tube by vise, separate the inner tube from the outer tube as shown.



- Remove inner tube anti-friction metal.



INSPECTION

FORK SPRING

- Measure the fork spring free length. If it is shorter than service limit, replace it.

Service Limit	416 mm (16.4 in)

INNER TUBE AND OUTER TUBE

- Inspect inner tube sliding surface for any scuffing and check the bend. Inspect outer tube sliding surface for any scuffing.

DAMPER ROD RING

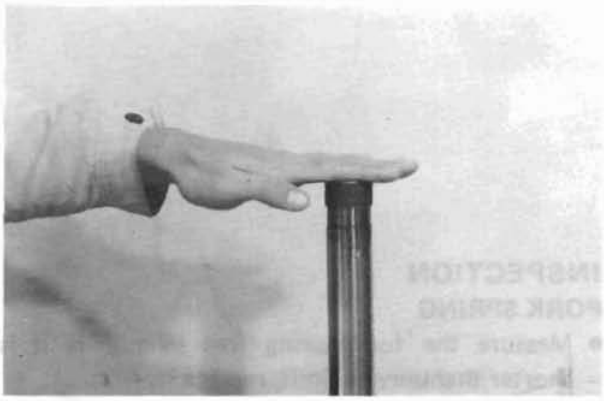
- Inspect damper rod ring for wear and damage.

REASSEMBLY

- Reassemble and remount the front fork in the reverse order of disassembly and removal and also carry out the following steps:

INNER TUBE METAL

- Hold the inner tube vertically and clean the metal groove.
- Clean the new metal inner surface and install it to the metal groove of the inner tube as shown.



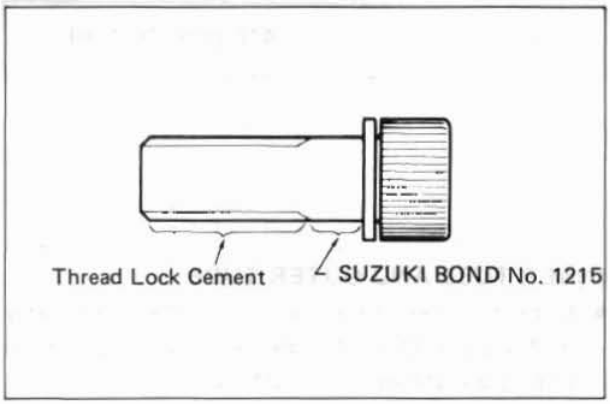
CAUTION.
Use special care to prevent damage to the Teflon coated surface of the Anti-friction metal when mounting it.

DAMPER ROD BOLT

- Apply Thread Lock Cement and SUZUKI BOND NO. 1215 to the damper rod bolt. Tighten the damper rod bolt with specified torque.

99000 - 32040	Thread Lock Cement
99104 - 31110	SUZUKI BOND No. 1215

Tightening torque	2.0 – 2.6 kg-m (14.5 – 19.0 lb-ft)

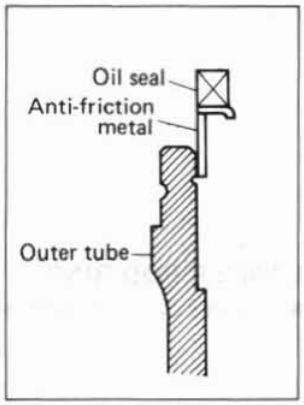


OUTER TUBE METAL, SPACER AND OIL SEAL

- Clean the metal groove of the outer tube. Clean the new metal outer surface and install it to the metal groove of the outer tube as shown.

CAUTION:
Use special care to prevent damage to the Teflon coated surface of the Anti-friction metal when mounting it.

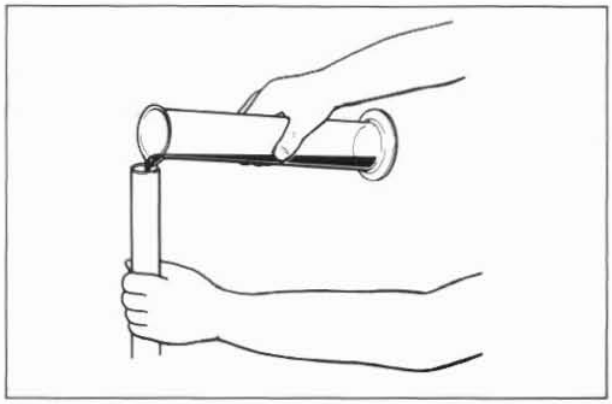
09940 - 50111	Front fork oil seal installer



FORK OIL

- For the fork oil, be sure to use a front fork oil whose viscocity rating meets specifications below.

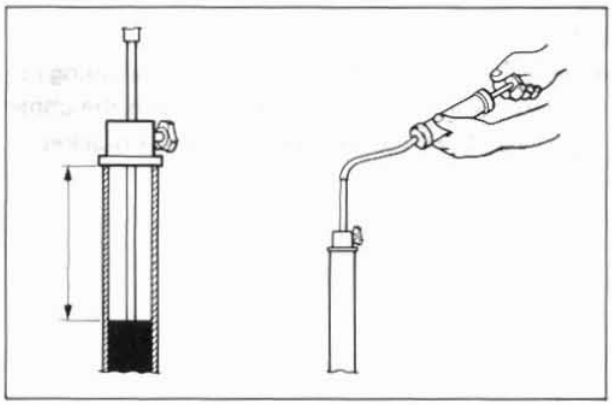
Fork oil	Fork oil # 15
Fork oil capacity	255 ml (8.62 US oz)



- Hold the front fork vertical and adjust the fork oil level with a special tool.

NOTE:
When adjusting oil level, remove the fork spring and compress the inner tube fully.

09943 - 74111	Fork oil level gauge
STD oil level	140 mm (5.5 in)

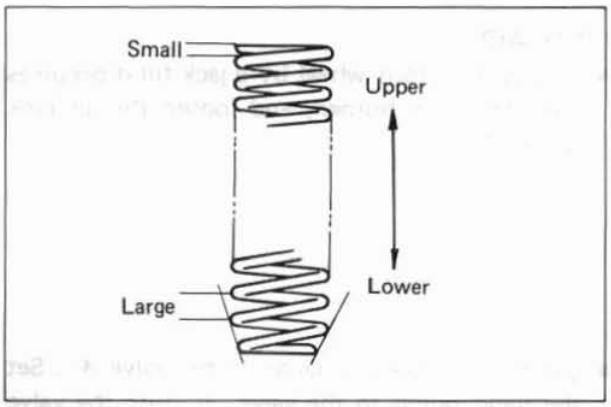


FORK SPRING

- When reinstalling the fork spring large pitch end should position in bottom.

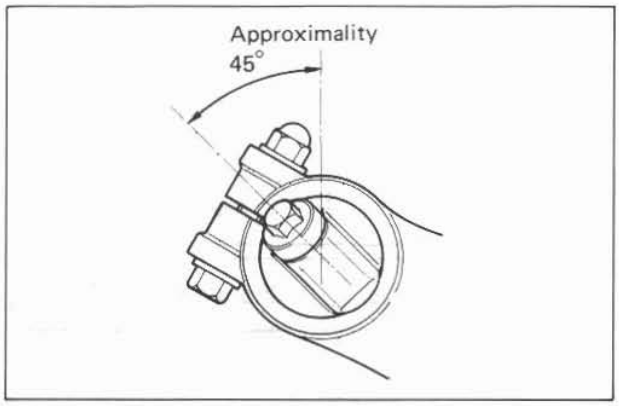
Tightening torque:

	kg-m	lb-ft
Front fork clamp bolt (U)	2.0 – 3.0	14.5 – 21.5
Front fork clamp bolt (L)	1.5 – 2.5	11.0 – 18.0
Damper rod bolt	2.0 – 2.6	14.5 – 19.0
Front fork cap bolt	1.5 – 3.0	11.0 – 21.5



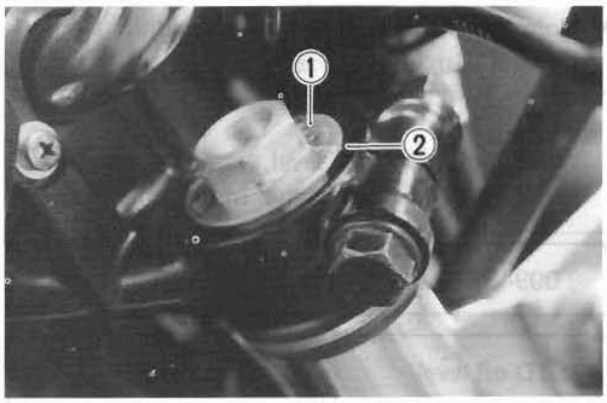
FRONT FORK INSTALLATION

When installing the front fork to the upper bracket, turn the inner tube and position the air valve as shown in Fig.



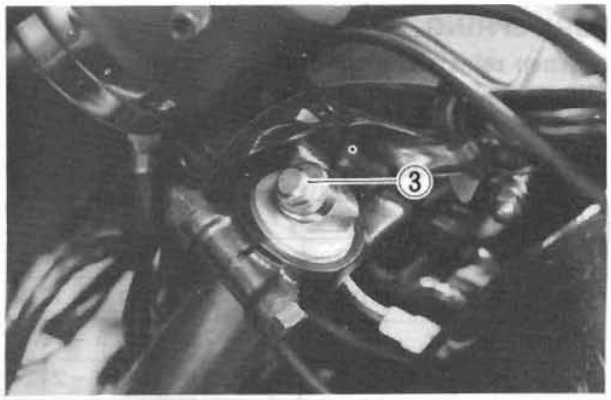
INNER TUBE

- Install the front fork assembly with aligning upper surface ① of the inner tube with the upper surface ② of the steering stem upper bracket.

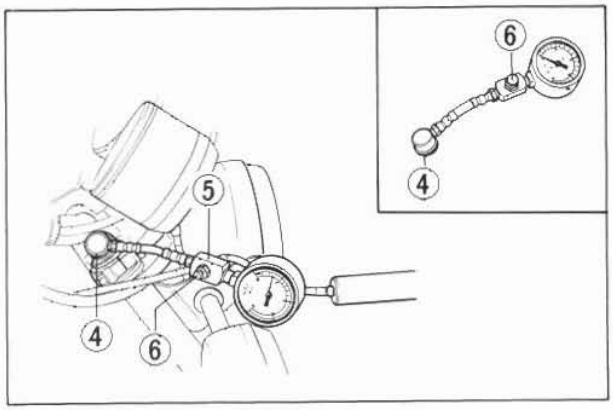


FORK AIR

- Lift up the front wheel by a jack till it becomes free from any burden, and loosen the air lock screw ③.



- Set the air pressure gauge to the valve ④. Set the hand pump to the valve ⑤, turn the valve handle ⑥ clockwise, and charge the air.
  Let the air out by loosening the handle ⑥ till the specified air pressure is left inside, and remove the air lock screw ④.



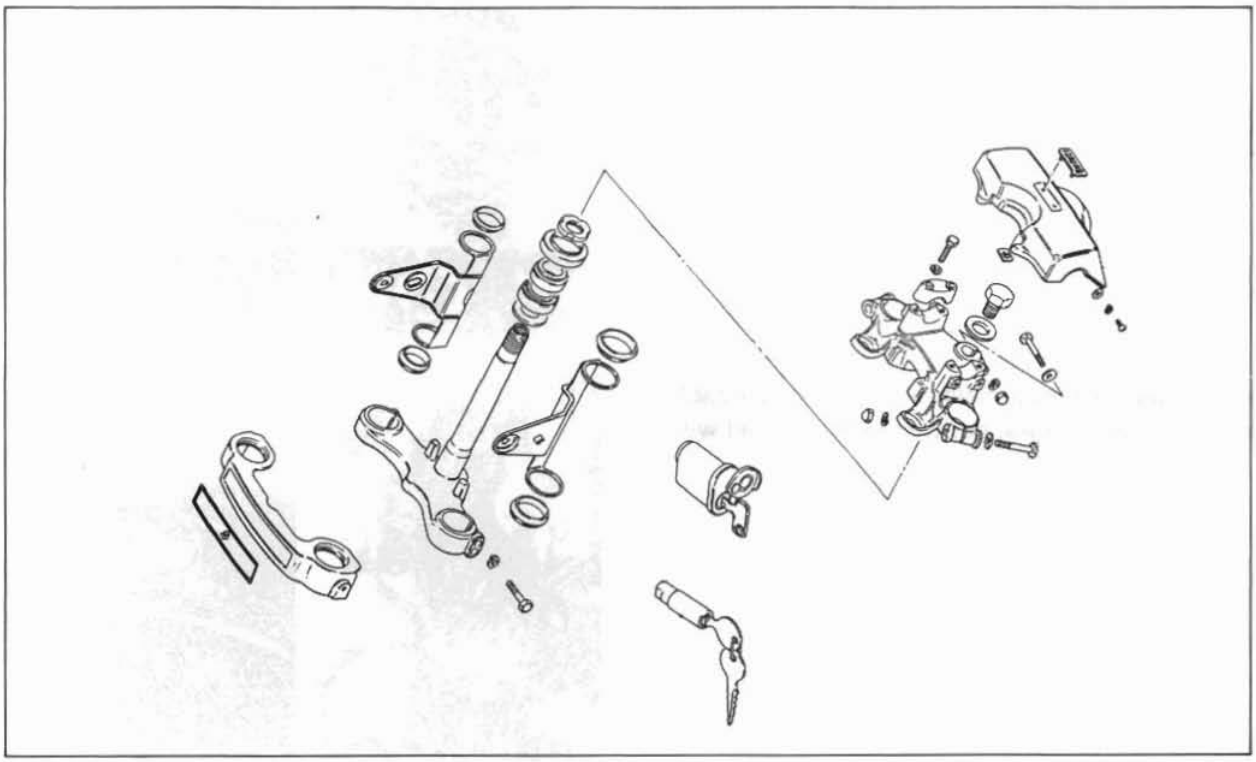
STD Air pressure	60 kPa (0.6 kg/cm², 8.5 psi)

CAUTION:
Do not charge air more than 245 kPa (2.5 kg/cm², 35.5 psi).

09940 - 44120	Air pressure gauge

STEERING STEM

CONSTRUCTION

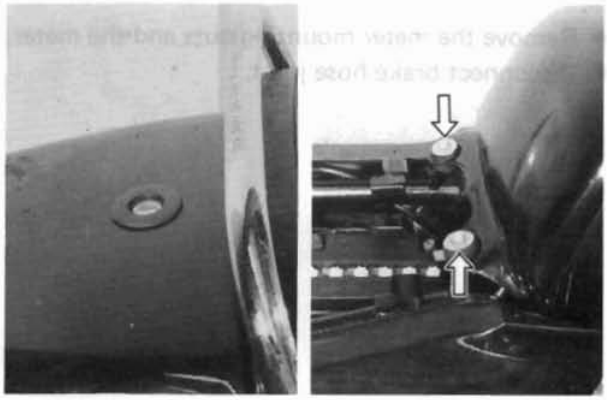


DISASSEMBLY

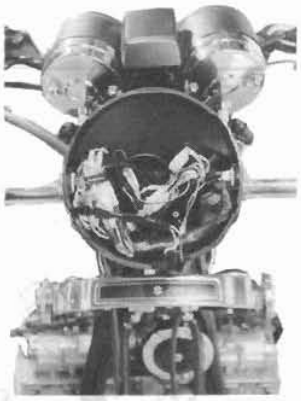
- Remove front wheel (See page 8-1).
- Remove front forks (See page 8-13).
- Remove seat.
- Take off the vacuum hose and fuel hose. Next remove the fuel tank and disconnect fuel level gauge lead wires.

NOTE:
When taking off fuel tank, disconnect fuel hose, vacuum hose and fuel gauge lead wires. Fuel cock must be in ON position.

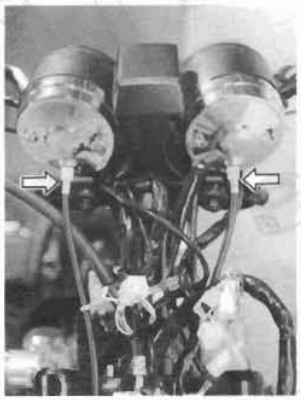
- Remove headlight by removing three fitting screws.



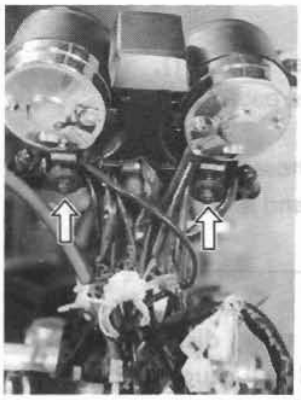
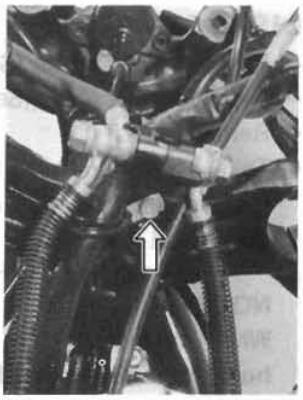
- Disconnect lead wires.
- Dismount the headlight housing, turn signal light and headlight bracket at the same time.




- Disconnect speedometer and tachometer cables.
- Disconnect the gear position indicator lead wires.



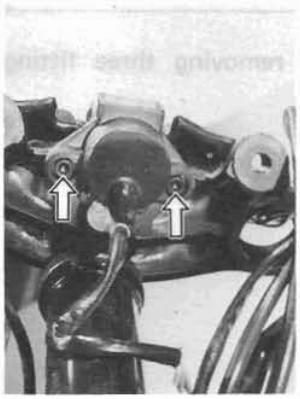

- Remove the meter mounting nuts and the meter.
- Disconnect brake hose joint.

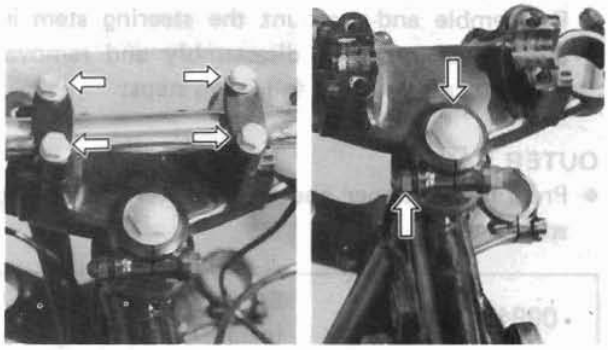
- Remove ignition switch by using special tool.

09911 - 73730	T type hexagon wrench

- Remove the handlebar pad by unscrewing the 4 screws.



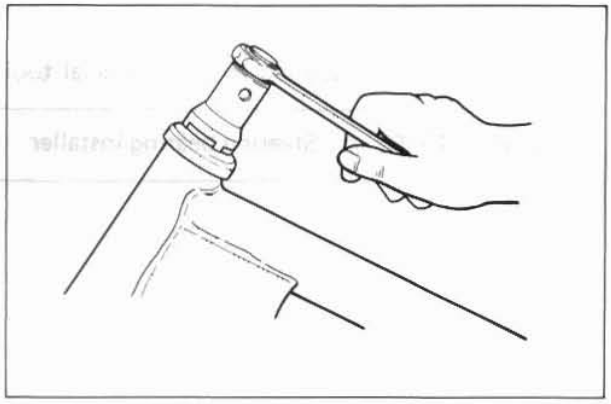

- Remove clamp bolts and take off handlebars.
- Loosen the steering stem clamp bolt.
- Remove steering stem head bolt and take off steering stem upper bracket.



- Remove steering stem nut by using the special tool.

NOTE:
Hold the steering stem lower bracket by hand to prevent dropping.

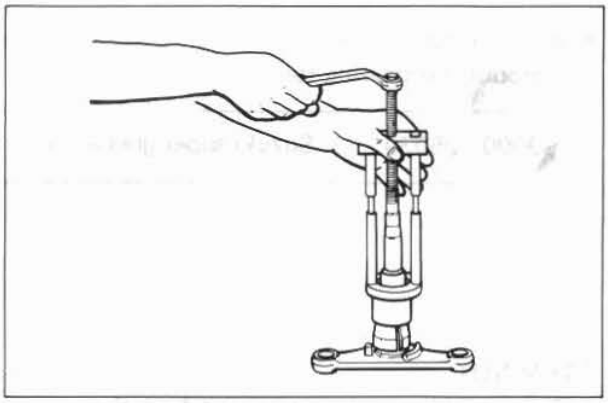
09940 - 14911	Steering nut socket wrench



- Draw out lower steering stem bearing by using the special tool.

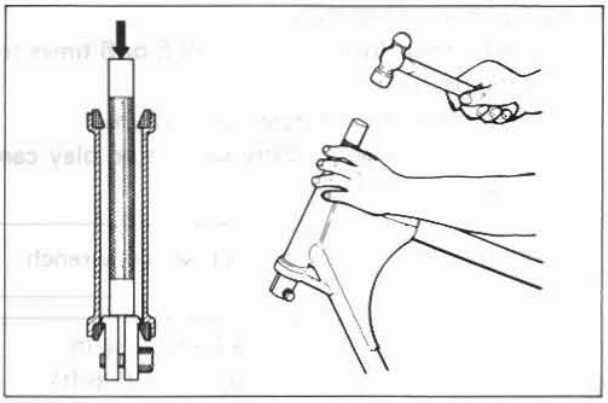
CAUTION.
The removed bearing should be replaced.

09941 - 84510	Bearing inner race remover



- Push out steering stem bearing outer races, upper and lower, by using the special tools.

09941 - 54911	Steering race remover
09941 - 74910	Steering bearing installer



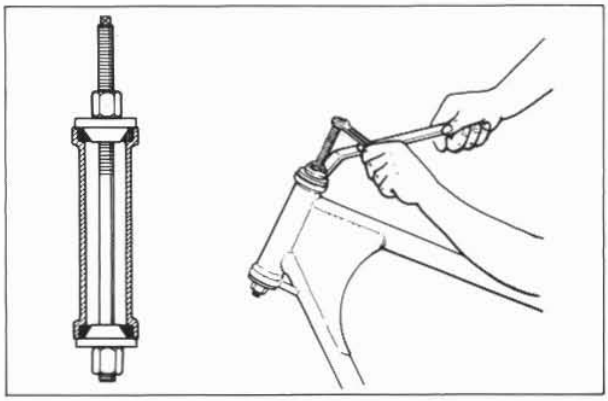
REASSEMBLY

- Reassemble and remount the steering stem in the reverse order of disassembly and removal and also carry out the following steps:

OUTER RACES

- Press in the upper and lower outer races using special tool.

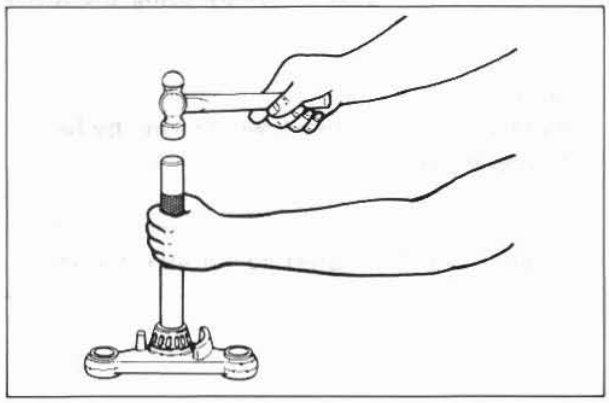
09941 - 34513	Steering outer race installer



BEARING

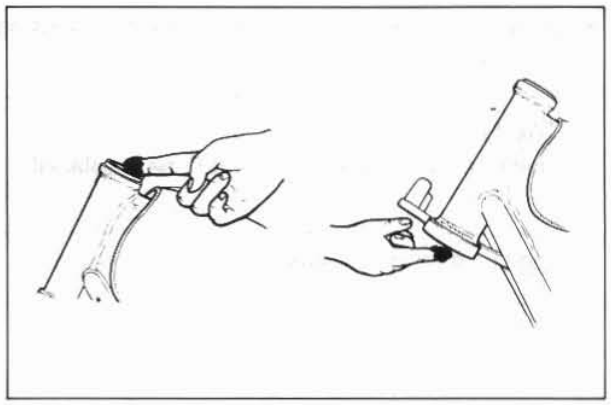
- Press in the lower bearing by using special tool.

09941 - 74910	Steering bearing installer



- Apply grease upper and lower bearing before remount the steering stem.

99000 - 25030	Suzuki super grease "A"

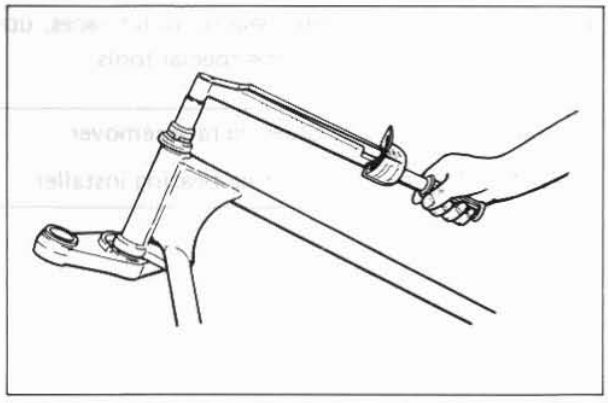


STEM NUT

- Tighten the steering stem nut by using special tool with specified torque.
  Turn the front fork right and left 5 or 6 times to seat the bearings.
  Turn out the steering stem nut 1/4 turn.
  Then retighten very lightly so that no play can be detected in the stem.

09940 - 14911	Stem nut socket wrench

Tightening torque	4.0 – 5.0 kg-m (29.0 – 36.0 lb-ft)

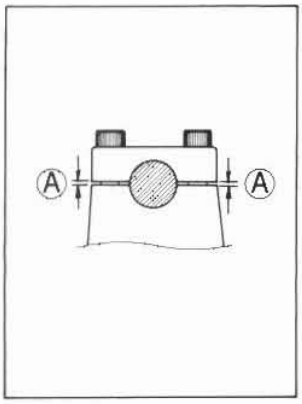


HANDLEBARS

- Set the handlebars to match its punched mark to the mating face of the holder.

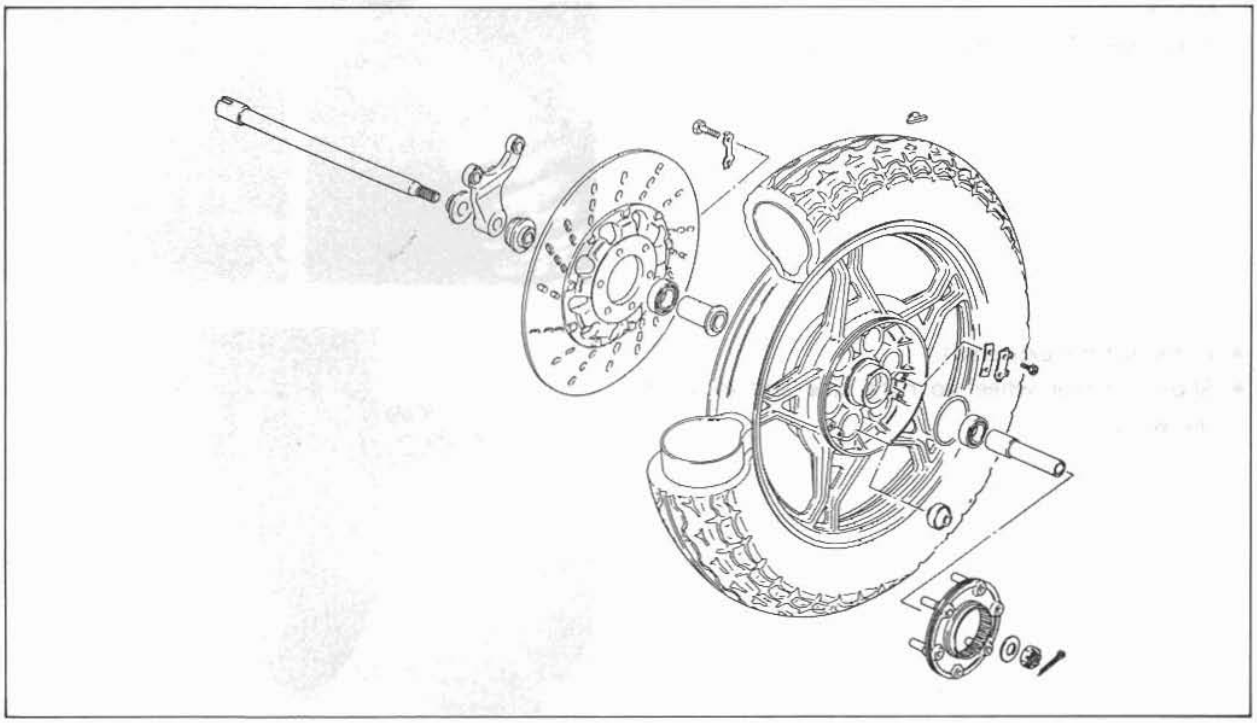
- Secure the each handlebars clamp in such a way that the clearances Ⓐ ahead of and behind the handlebars are equalized.

Tightening torque	1.2 – 2.0 kg-m (8.5 – 14.5 lb-ft)



REAR WHEEL

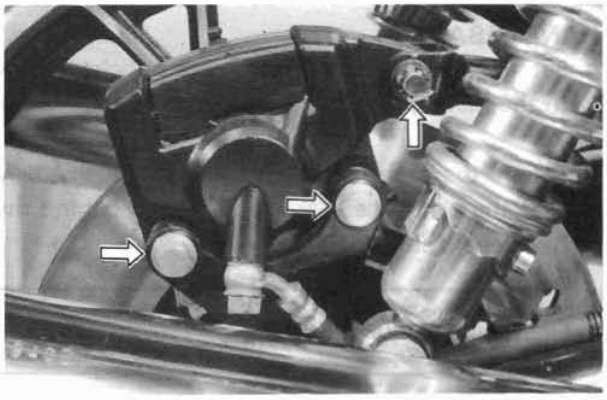
CONSTRUCTION



REMOVAL

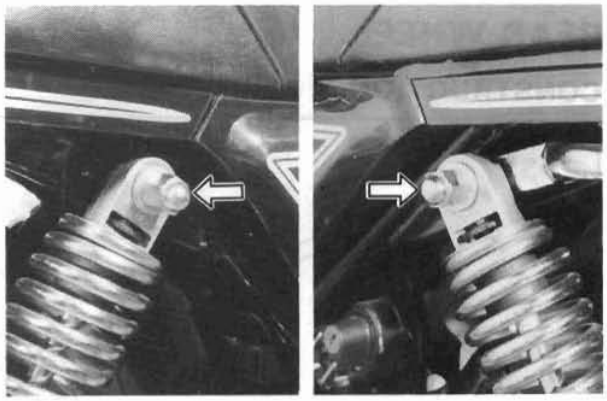
- Support the machine by center stand.
- Pull off cotter pin and remove axle nut.
- Loosen and remove the rear axle clamp bolt.

- Remove rear torque link bolt for rear side.
- Remove rear caliper mounting bolts and take off caliper.



- Remove rear shock absorber fitting nuts for upper side (right and left).

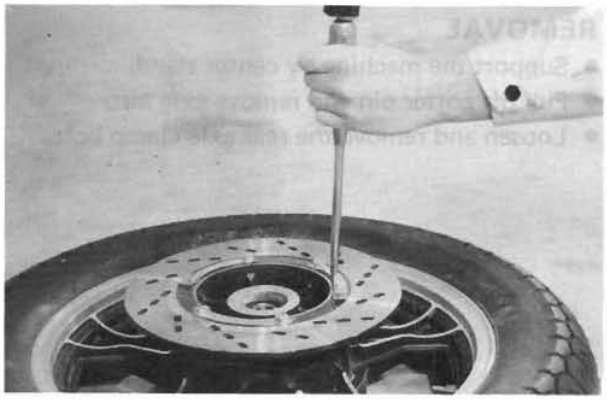
NOTE:
Take care of the dropping of rear wheel.



- Draw out the axle shaft.
- Slide the rear wheel to right side and move it rearward.

- Flatten the lock washers. Remove fitting bolts and separate the disc from wheel.

WARNING:
Do not reuse the lock washers.

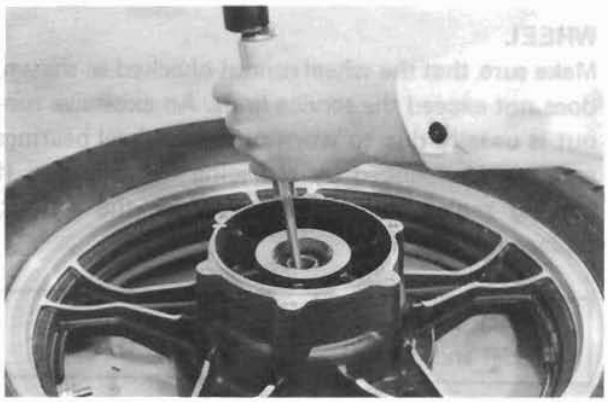


- Flatten the lock washers.
- Remove fitting bolts and pull off driven joint.

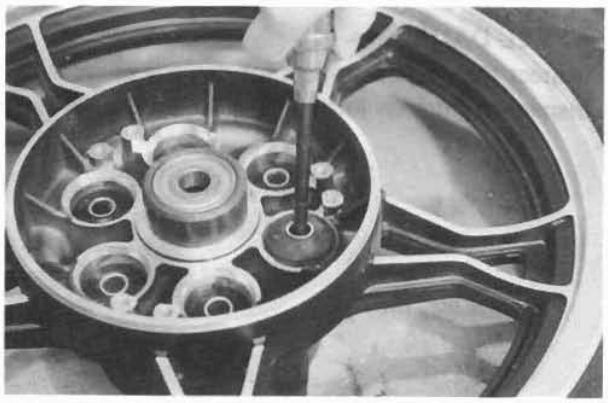
- Drive out wheel bearings, right and left.

NOTE:
If drawing out the left side bearing first, it makes the job easier.

CAUTION:
The removed bearing should be replaced.



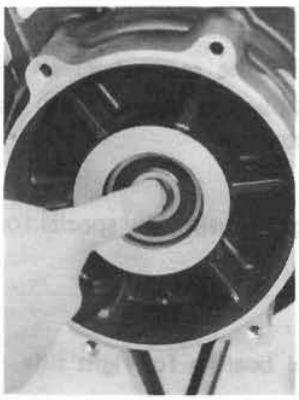
- Take off the dampers.

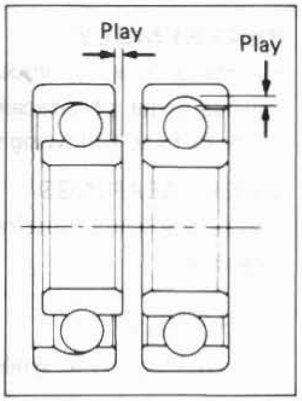


INSPECTION

WHEEL BEARINGS

Inspect the play of wheel bearing inner race by hands while fixing it in the wheel. Rotate the inner race by hands to inspect whether abnormal noise occurs or rotating smoothly. Replace the bearing if there is something unusual.



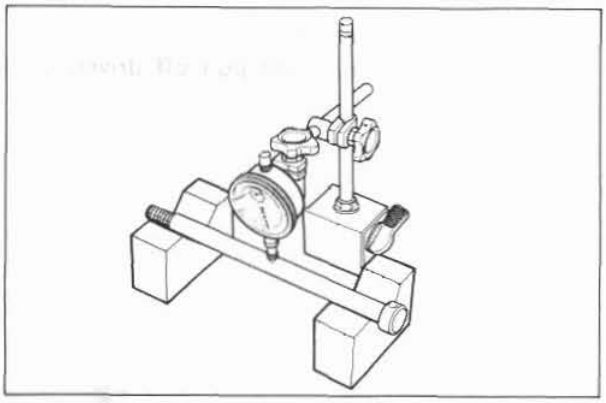


AXLE SHAFT

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)

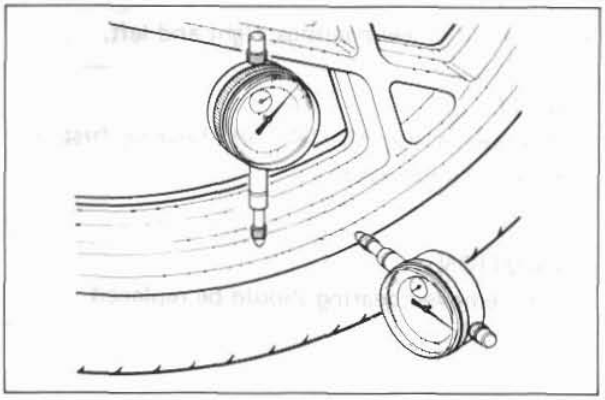
Service Limit	0.25 mm (0.01 in)



WHEEL

Make sure that the wheel runout checked as shown, does not exceed the service limit. An excessive run-out 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)



WHEEL DAMPER

Inspect the wheel dampers for damage or wear.
Inspect the driven joint O-ring for damage or wear.

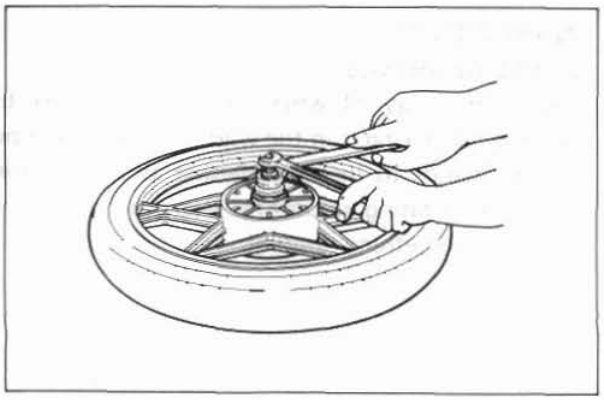
REASSEMBLY

Reassemble and remount the rear wheel in the reverse order of disassembly and removal, and also carry out the following steps:

WHEEL BEARINGS

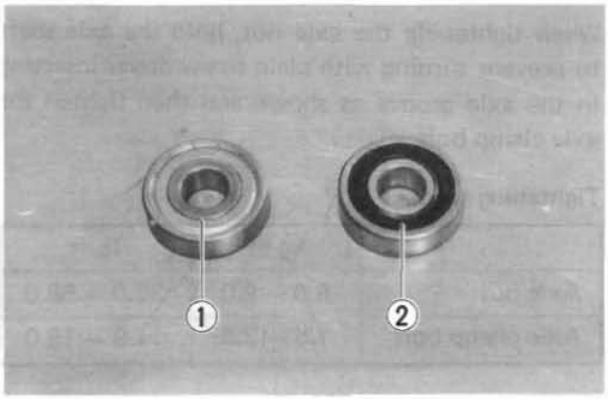
Install the wheel bearings by using the special tool as shown.

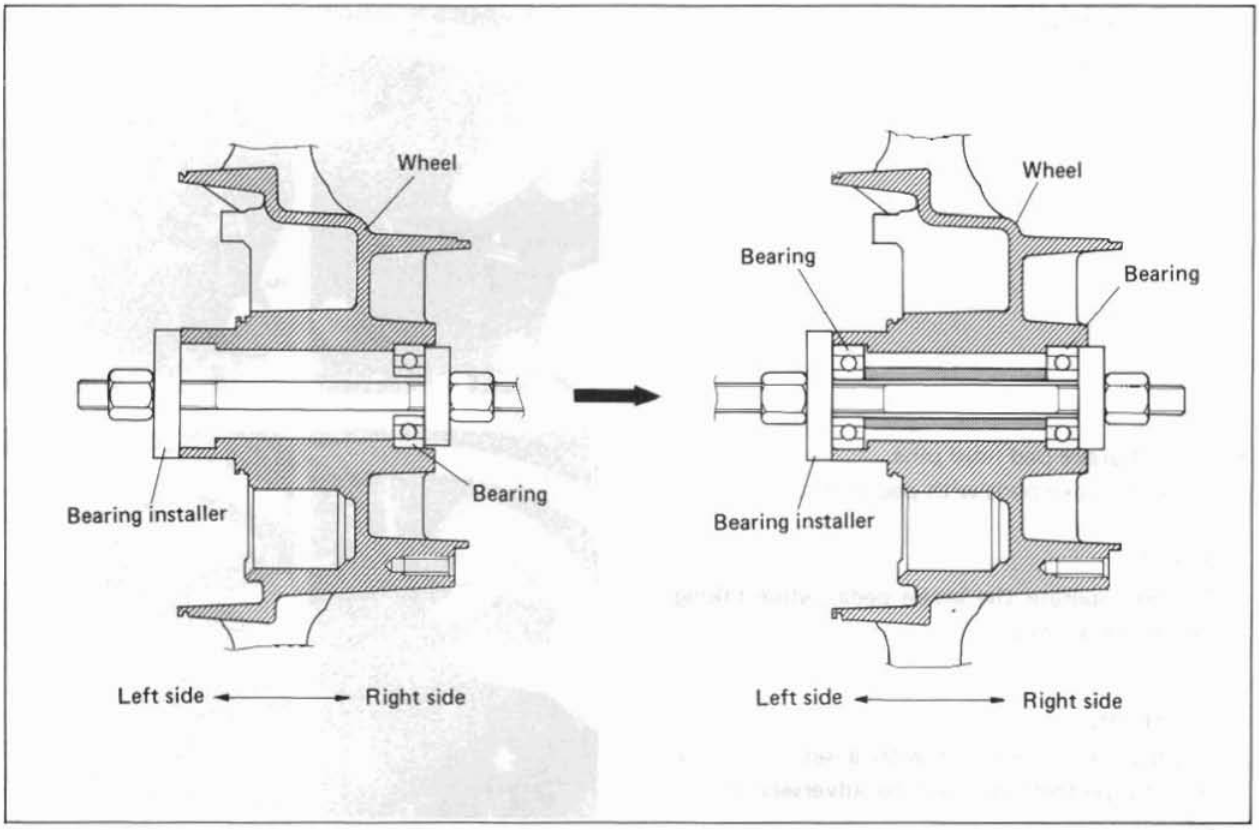
CAUTION:
First install the wheel bearing for right side.



CAUTION:
Make sure to identify each bearing, the left side (iron plate sealed type) ① and right side (rubber sealed type) ② .

09924 - 84510	Bearing installer set





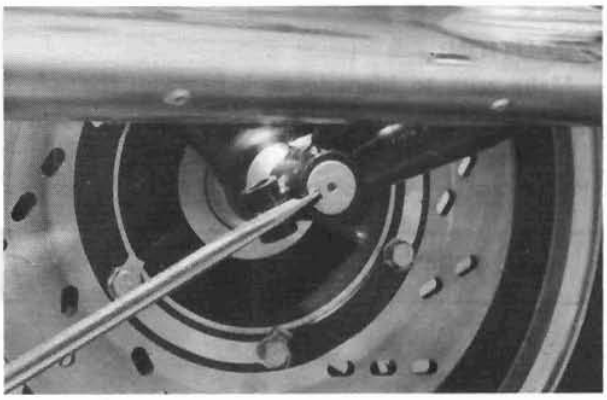
Install the damper.

NOTE:
If soap is around the damper, it makes the job easier.

Apply grease to the O-ring before installing the driven joint.
Apply grease to the final gear spline before installing the rear wheel.

99000 - 25030	Suzuki super grease "A"

When tightening the axle nut, hold the axle shaft to prevent turning with plain screw driver inserting in the axle groove as shown and then tighten the axle clamp bolt.



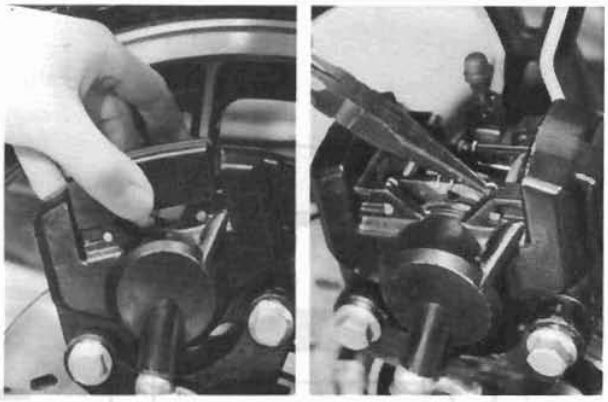
Tightening torque:

	kg-m	lb-ft
Axle nut	5.0 – 8.0	36.0 – 58.0
Axle clamp bolt	1.5 – 2.5	11.0 – 18.0

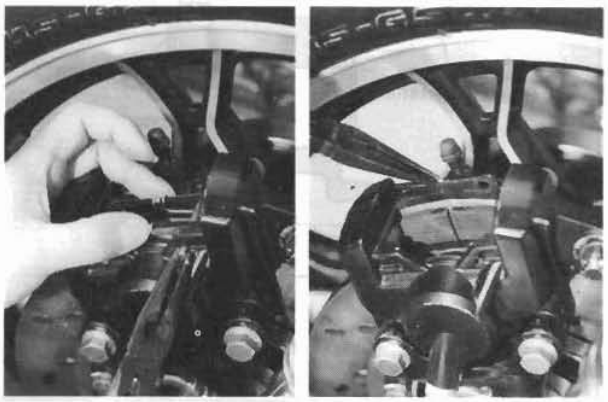
REAR BRAKE

BRAKE PAD REPLACEMENT

- Remove dust cover.
- Pull off clips.



- Pull off brake pad hold pins.
- Take off brake pads with pad shims.



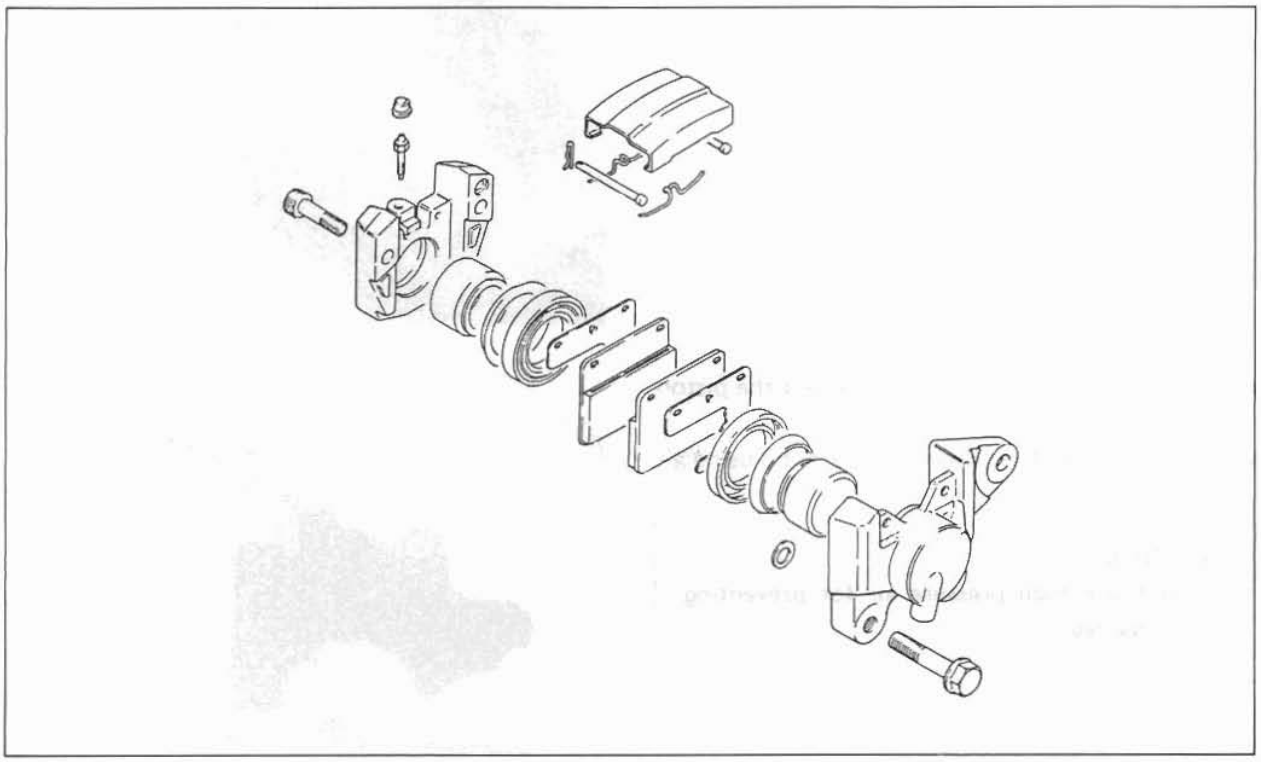
NOTE:
Do not operate the brake pedal while taking off the brake pads.

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

- Fit brake pad shim to the rear of each brake pad so that the "hole" in the shim points to the front.

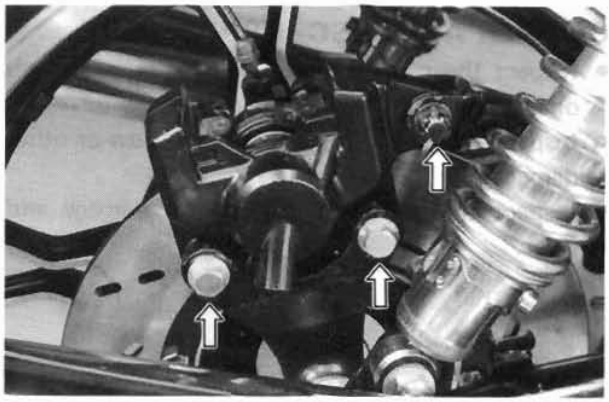
Forward

CALIPER REMOVAL AND DISASSEMBLY



- Remove brake pads (See page 8-29).
- Disconnect brake hose and catch the brake fluid in a suitable receptacle.

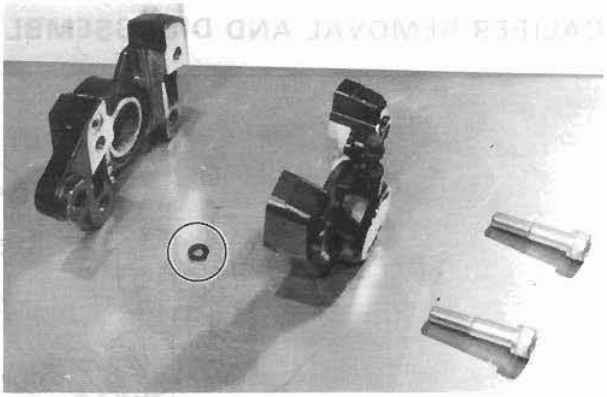
- Pull off cotter pin and remove the rear torque link bolt.
- Remove caliper mounting bolts and take off caliper.



NOTE:
Slightly loosen the caliper axle bolts to facilitate later disassembly.

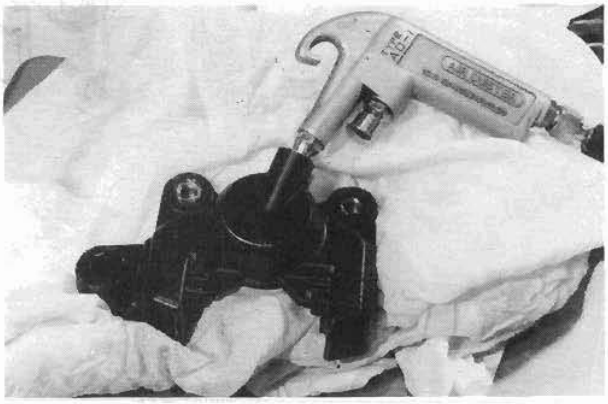
- Separate the caliper after removing caliper bolts.

NOTE:
Do not lose the O-ring.

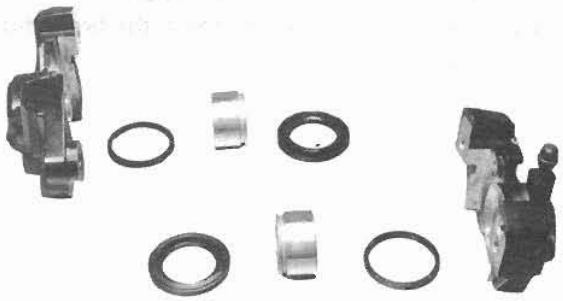


- Place a rag over the piston to prevent the piston popping out.
- Push out the piston (Right and Left) by using air gun.

CAUTION:
Do not use high pressure air for preventing piston damage.



- Remove dust boot and piston seal.



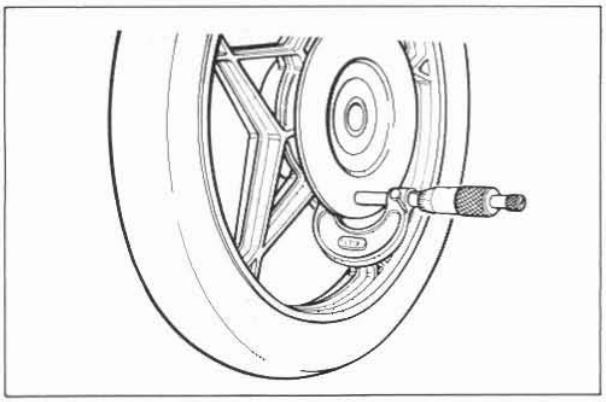
CALIPER AND DISC INSPECTION

- Inspect the cylinder bore wall for nick, scratch or other damage.
- Inspect the piston surface for any flow or other damage.
- Inspect the each rubber parts for damage and wear.

Using a micrometer check the disc for wear. Its thickness can be checked with disc and wheel in place. The service limit is specified for the thickness of the disc:

09900 - 20205	Micrometer (0 – 25 mm)

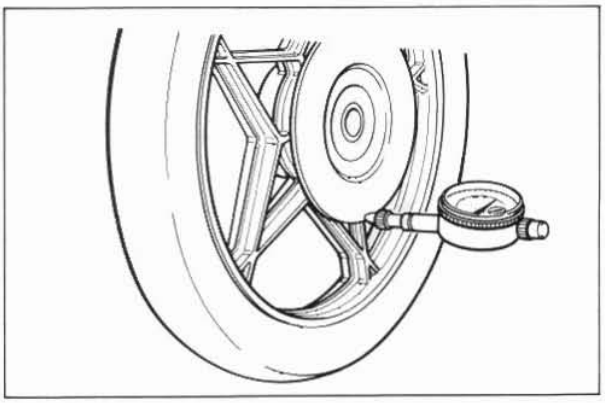
Service Limit	6.0 mm (0.24 in)



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)

Service Limit	0.30 mm (0.012 in)



CALIPER REASSEMBLY

Reassemble and remount the caliper in the reverse orders of disassembly and removal, and also carry out the following steps:

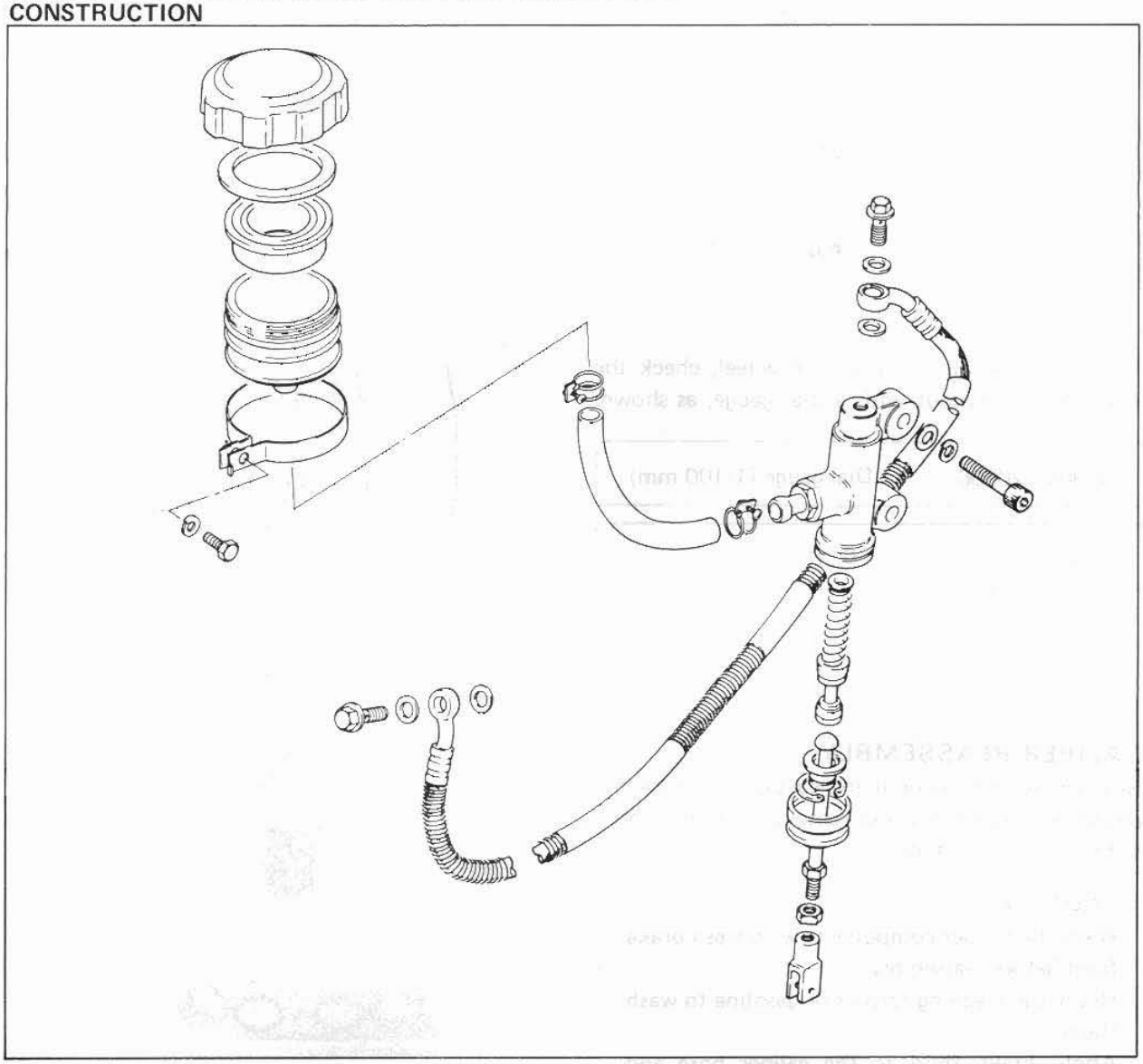
CAUTION:
Wash the caliper components with fresh brake fluid before reassembly.
Never use cleaning solvent or gasoline to wash them.
Apply brake fluid to the caliper bore and piston to be inserted into the bore.
Bleed the air after reassembling master cylinder.

Tightening torque:

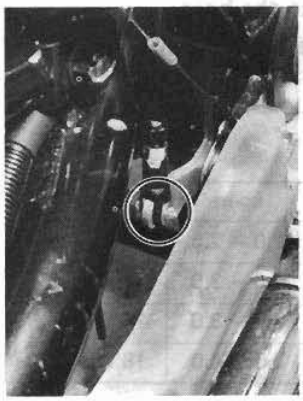
	kg-m	lb-ft
Union bolt	2.0 – 2.5	14.5 – 18.0
Torque link bolt	2.0 – 3.0	14.5 – 21.5
Caliper bolt	2.0 – 3.0	14.5 – 21.5
Caliper mounting bolt	2.5 – 4.0	18.0 – 29.0

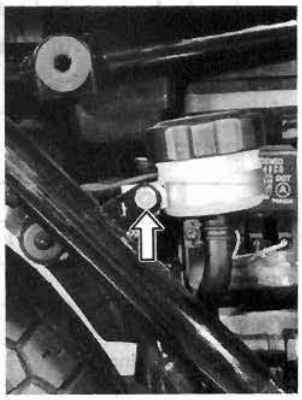
MASTER CYLINDER REMOVAL AND DISASSEMBLY

CONSTRUCTION



- Disconnect master cylinder rod from the brake pedal arm.
- Remove the right frame cover.
- Remove reservoir fitting bolt.



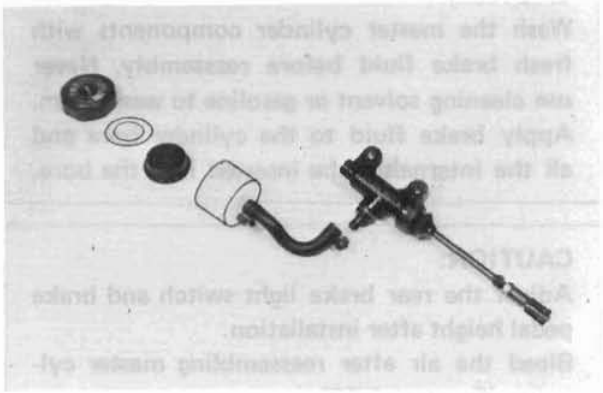


- Loosen and remove the brake hose union bolt.

- Remove master cylinder mounting bolts and take off master cylinder.

09914 - 25811	T type hexagon wrench

- Remove reservoir cap and drain brake fluid.
- Remove reservoir.



- Remove rod, piston, primary cup and spring by using the special tool.

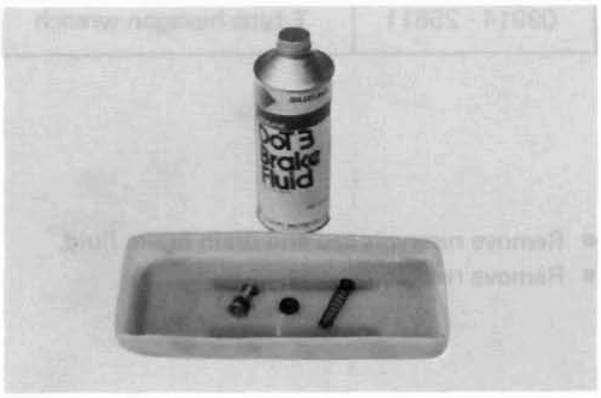
09900 - 06105	Snap ring pliers

MASTER CYLINDER INSPECTION

- Inspect the cylinder bore wall for any scratch or other damage.
- Inspect the primary cup, secondary cup and each rubber parts for damage.
- Inspect the piston surface for scratch or other damage.

MASTER CYLINDER REASSEMBLY

Reassemble and remount the master cylinder in the reverse orders of disassembly and removal, and also carry out the following steps:



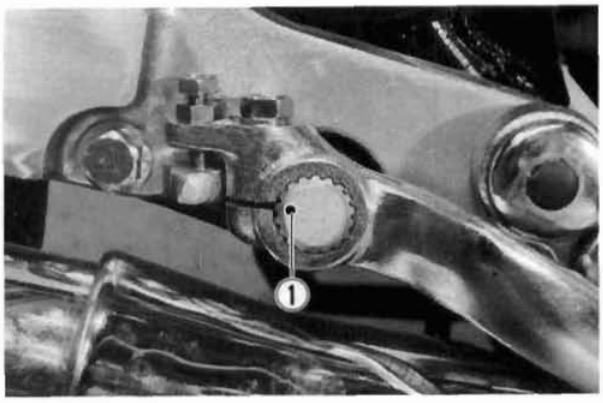
CAUTION:
Wash the master cylinder components with fresh brake fluid before reassembly. Never use cleaning solvent or gasoline to wash them. Apply brake fluid to the cylinder bore and all the internals to be inserted into the bore.

CAUTION:
Adjust the rear brake light switch and brake pedal height after installation.
Bleed the air after reassembling master cylinder. (See page 2-19).

Tightening torque:

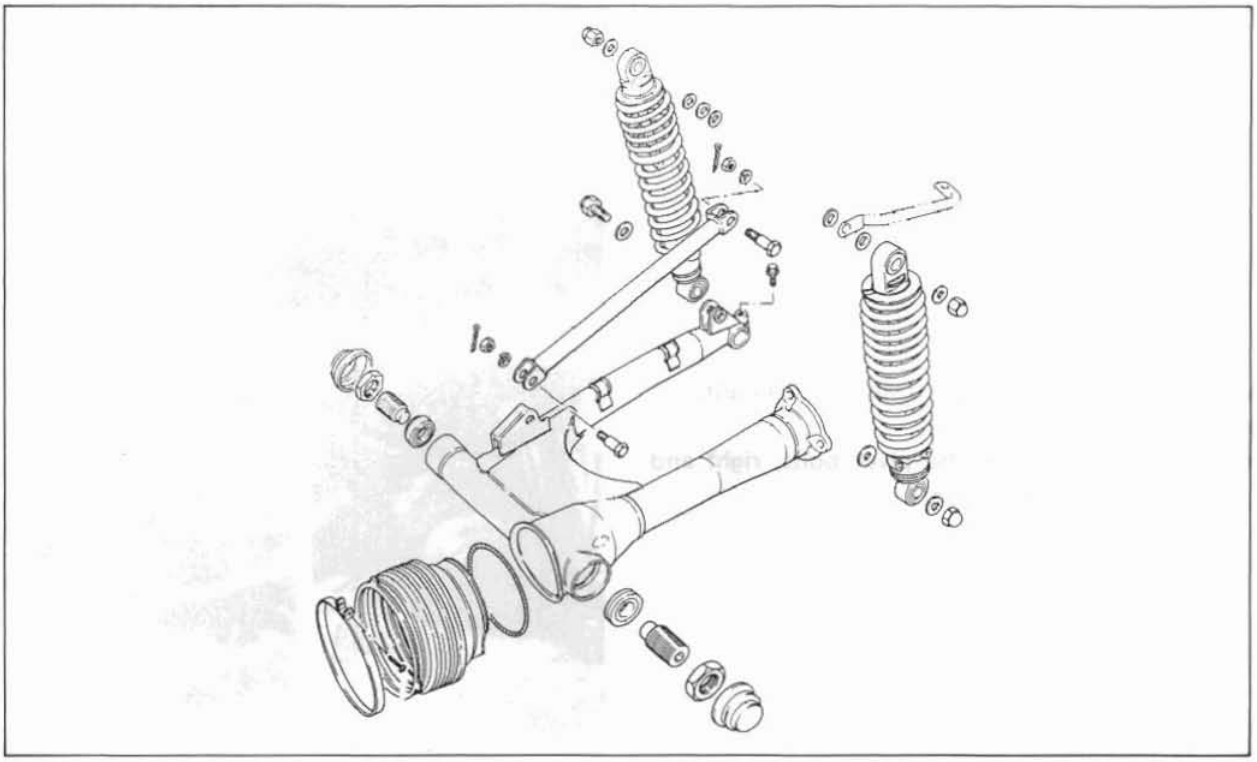
	kg-m	lb-ft
Union bolt	2.0 – 2.5	14.5 – 18.0
Mounting bolt	1.5 – 2.5	11.0 – 18.0

When installing the rear brake pedal, align the brake pedal groove with punched mark ① provided on the end face of brake pedal shaft.



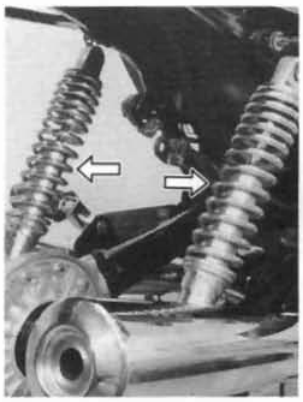
REAR SUSPENSION

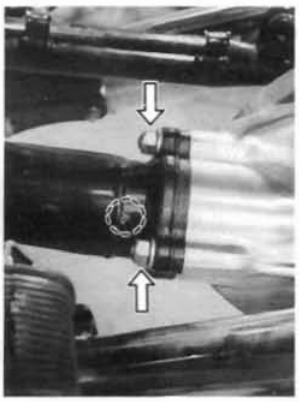
CONSTRUCTION



REMOVAL AND DISASSEMBLY

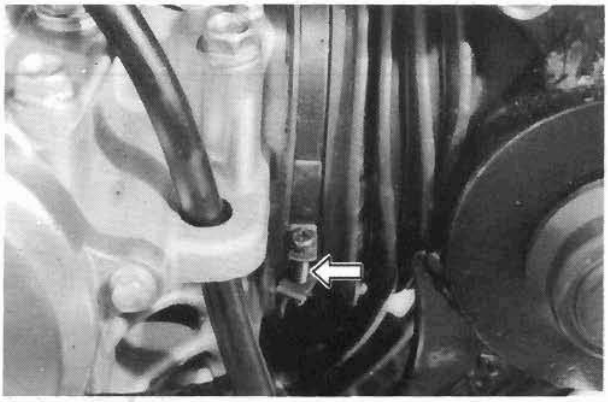
- Remove rear wheel (See page 8-24).
- Remove rear shock absorbers right and left.
- Remove three mounting nuts and take off final gear case.



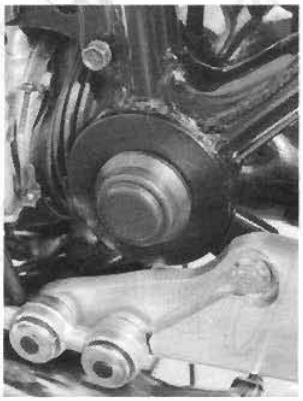


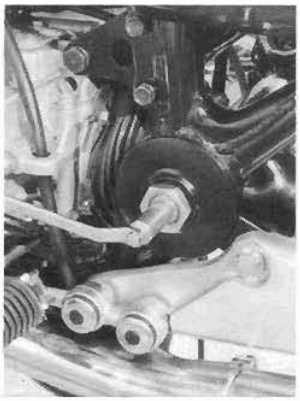
- Remove torque link bolt after pulling off cotter pin and take off torque link.
- Detach the push rod after pulling off cotter pin and pin.
- Remove the right frame cover.
- Remove brake hose union bolt and remove rear brake caliper with brake hose.

- Loosen the drive shaft boot clamp screw.

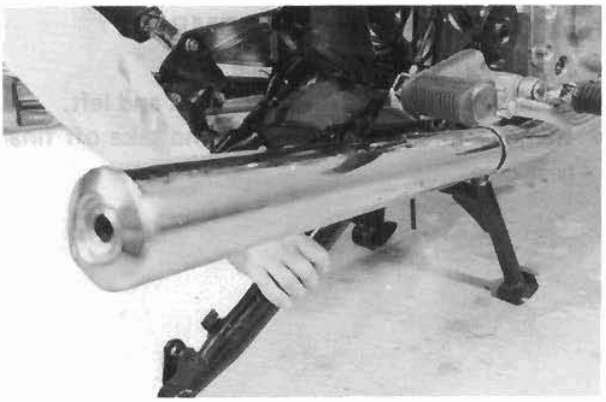


- Remove swing arm pivot cover right and left.
- Loosen the each lock nut.
- Loosen and remove the pivot bolts, right and left, using the special tool.





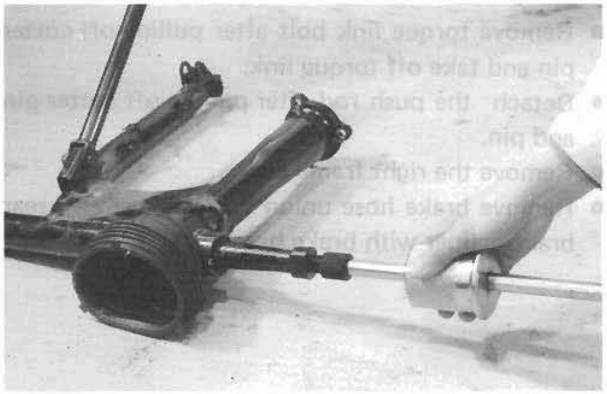
- Take off swing arm.



- Remove the bearing outer race by using the special tools.

CAUTION:
The removed bearing should be replaced.

09941 - 64510	Bearing puller
09930 - 30102	Slide shaft

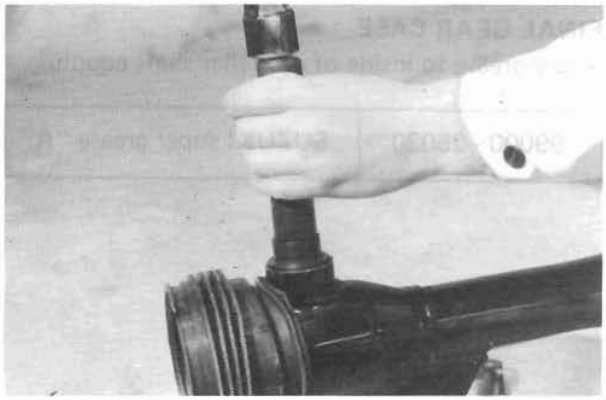


REASSEMBLY

Reassemble and remount the swing arm and rear shock absorbers in the reverse order of disassembly and removal, and also carry out the following steps:

SWING ARM BEARING

Press in the bearing outer race by using the special tool.



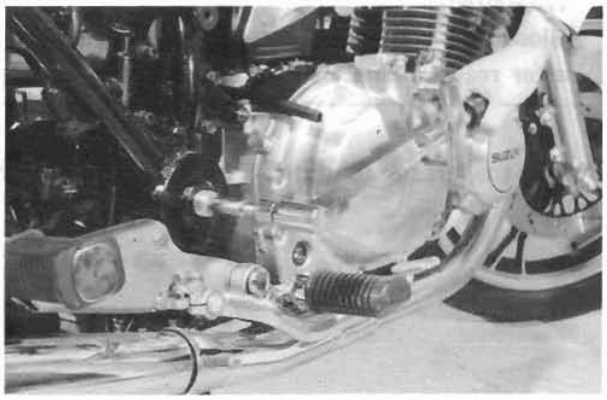
Apply grease to the bearings.

99000 - 25030	Suzuki super grease "A"

BEARING HOLDER BOLT

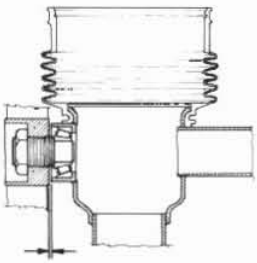
Tighten both bearing holder bolts with specified torque and tighten the lock nuts.

CAUTION:
Both sides of the clearance between the frame and swing arm should be even.



Bearing holder bolt tightening torque	0.35 – 0.45 kg-m (2.5 – 3.5 lb-ft)

Bearing holder lock nut tightening torque	11.0 – 13.0 kg-m (79.5 – 94.0 lb-ft)



Clearance

FINAL GEAR CASE

Apply grease to inside of propeller shaft coupling.

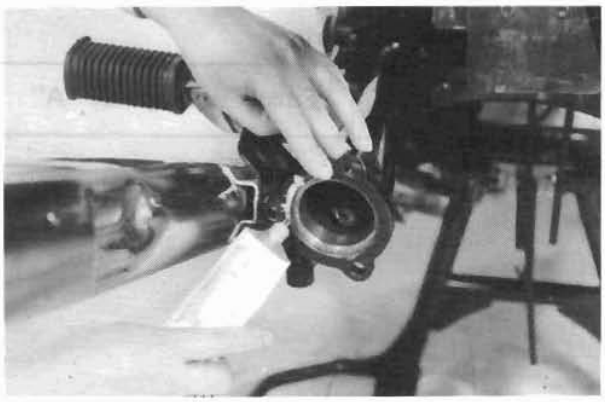
99000 - 25030	SUZUKI super grease "A"

Apply SUZUKI BOND NO.1215 to mating surface of swing arm and final gearcase.
Tighten the final gear case joint nuts with specified torque.

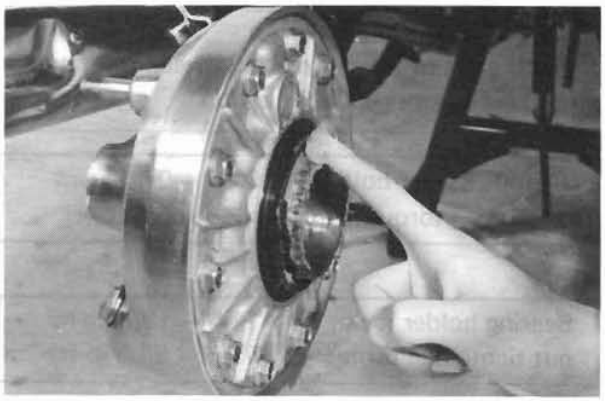
99000 - 31110	SUZUKI BOND No. 1215

Tighetning torque	3.5 – 4.5 kg-m (25.5 – 32.5 lb-ft)

WARNING:
Bleed the air from the rear master cylinder after reassembling swing arm and rear wheel.



Apply the grease to outside of final driven gear spline.



SERVICING INFORMATION

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TROUBLESHOOTING

ENGINE

Complaint	Symptom and possible causes	Remedy
Engine will not start, or is hard to start.	**Compression too low.**	
	1. Tappet clearance out of adjustment.	Adjust.
	2. Worn valve 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".
	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 or igniter unit.	Replace.
	No fuel reaching the carburetors.	
	1. Clogged hole in the fuel tank cap.	Clean.
	2. Clogged or defective fuel cock.	Clean or replace.
	3. Defective carburetor needle valve.	Replace.
	4. Clogged fuel pipe or vacuum pipe.	Clean.
	5. Defective fuel cock diaphragm.	Replace.
Engine stalls easily.	1. Fouled spark plugs.	Clean.
	2. Defective signal generator or igniter unit.	Replace.
	3. Clogged fuel pipe.	Clean.
	4. Clogged jets in carburetors.	Clean.
	5. Tappet clearance out of adjustment.	Adjust.
Noisy engine.	**Excessive valve chatter.**	
	1. Tappet clearance too large.	Adjust.
	2. Weakened or broken valve springs.	Replace.
	3. Camshaft journal worn and burnt.	Replace.
	Noise appears to come from pistons.	
	1. Pistons or cylinders worn down.	Replace.
	2. Combustion chambers fouled with carbon.	Clean.
	3. Piston pins 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.	Repair or replace.
	Noise seems to come from crankshaft.	
	1. Rattling bearings due to wear.	Replace.
	2. Big-end bearings worn and burnt.	Replace.
	3. Journal bearing worn and burnt.	Replace.

Complaint	Symptom and possible causes	Remedy
Noisy engine.	**Noise seems to come from transmission.**	
	1. Gears worn or rubbing.	Replace.
	2. Badly worn splines.	Replace.
	3. Primary gears worn or rubbing.	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 plates.	Replace.
Transmission will not shift.	1. Broken gearshift cam.	Replace.
	2. Distorted gearshift forks.	Replace.
Transmission will not shift back.	1. Broken return spring on shift shaft.	Replace.
	2. Shift shafts are rubbing or sticky.	Repair.
Transmission jumps out of gear.	1. Worn shifting gears on countershaft or drive shaft.	Replace.
	2. Distorted or worn gearshift forks.	Replace.
	3. Weakened stopper spring on gearshift stopper.	Replace.
Engine idles poorly.	1. Tappet clearance out of adjustment.	Adjust.
	2. Poor seating of valves.	Replace.
	3. Defective valve guides.	Replace.
	4. Spark plug gaps too wide.	Adjust or replace.
	5. Defective ignition coil.	Replace.
	6. Defective signal generator or igniter unit.	Replace.
	7. Float-chamber fuel level out of adjustment in carburetors.	Adjust.
	8. Clogged jets or imbalance of carburetors.	Clean or adjust.
Engine runs poorly in high-speed range.	1. Valve springs weakened.	Replace.
	2. Valve timing out of adjustment.	Adjust.
	3. Spark plug gaps too narrow.	Adjust.
	4. Defective ignition coil.	Replace.
	5. Defective signal generator or igniter unit.	Replace.
	6. Float-chamber fuel level too low.	Adjust.
	7. Clogged air cleaner element.	Clean.
	8. Clogged fuel pipe, resulting in inadequate fuel supply to carburetors.	Clean, and prime.
	9. Clogged suction cock pipe.	Clean.
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 valve stems.	Replace.
	6. Defective stem seal.	Replace.

Complaint	Symptom and possible causes	Remedy
Engine lacks power.	1. Loss of tappet 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. Spark plug gaps incorrect.	Adjust or replace.
	7. Clogged jets in carburetors.	Clean.
	8. Float-chamber fuel level out of adjustment.	Adjust.
	9. Clogged air cleaner element.	Clean.
	10. Carburetor balancing screw loose.	Retighten.
	11. Suck air from intake pipe.	Retighten or replace.
	12. Too much engine oil in the engine.	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. Suck air from intake pipes.	Retighten or replace.
	6. Use incorrect engine and oil.	Change.
Noisy shaft drive.	**Noise seems to come from secondary bevel gear and final bevel gear assemblies.**	
	1. Oil level too low. (final bevel gear)	Refill.
	2. Excessive backlash.	Adjust.
	3. Improper tooth contact.	Adjust.
	4. Damage to bearings.	Replace.
	Noise seems to come from propeller shaft area.	
	1. Propeller shaft joint bolts loose.	Retighten.
	2. Propeller shaft splines damaged or worn.	Replace.
	3. Insufficient lubricant.	Refill.
No power transmitted from engine to rear wheel.	1. Broken propeller shaft.	Replace.
	2. Broken gear teeth.	Replace.
Secondary bevel gear and final bevel gear assemblies oil leak.	1. Damage to oil seals.	Replace.
	2. Damage to O rings.	Replace.

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 adjust.
	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. 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 igniter unit.	Replace. Replace. Replace.
Spark plugs soon become fouled with carbon.	1. Mixture too rich. 2. Idling speed set too 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. Pistons 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. Defective signal generator or igniter unit. 4. Spark plugs loose. 5. Mixture too lean.	Replace by cold type plugs. Tune up. Adjust. Retighten. Adjust carburetors.
Generator does not charge.	1. Open or short in lead wires, or loose lead connections. 2. Shorted, grounded or open generator coils. 3. Shorted or panctured regulator/rectifier.	Repair or replace or retighten. Replace. Replace.
Generator 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/rectifier. 4. Not enough electrolyte in the battery. 5. Defective cell plates in the battery.	Repair, or retighten. Replace. Replace. Add distilled water between the level lines. Replace the battery.
Generator overcharges.	1. Internal short-circuit in the battery. 2. Resistor element in the regulator/rectifier damaged or defective. 3. Regulator/rectifier 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/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.	Recharge or replace. Replace. Repair or replace. Replace.

BATTERY

Symptom	Symptom and possible causes	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. Adulterated electrolyte (Foreign matter has enteres 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 over-charging.	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. Adulterated 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 directions.

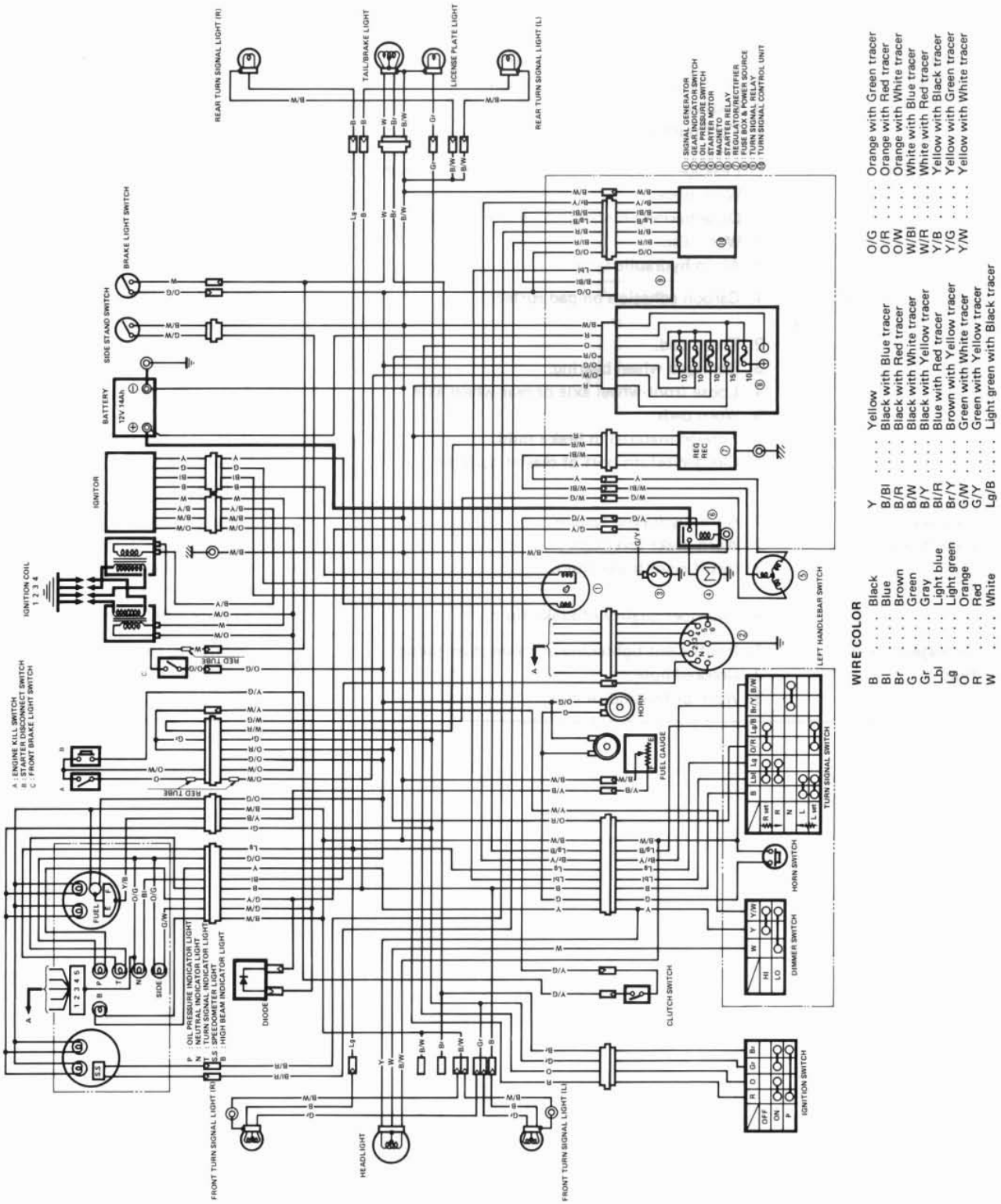
CHASSIS

Complaint	Symptom and possible causes	Remedy
Heavy steering.	1. Steering stem nut overtightened. 2. Broken bearing in steering stem. 3. Distorted steering stem. 4. Not enough pressure in tires.	Adjust. Replace. Replace. Adjust.
Wobbly handle.	1. Loss of balance between right and left suspensions 2. Distorted front fork. 3. Distorted front axle or cocked tire.	Replace. Repair or replace. Replace.
Wobbly front wheel	1. Distorted wheel. 2. Worn-down front wheel bearings. 3. Loose nut on axle.	Replace. Replace. Retighten.
Front suspension too soft.	1. Weakened springs. 2. Not enough fork oil.	Replace. Refill.
Front suspension too stiff.	1. Fork oil too viscous. 2. Too much fork oil.	Replace. Drain excess oil.
Noisy front suspension.	1. Not enough fork oil. 2. Loose nuts on suspension.	Refill. Retighten.
Wobbly rear wheel.	1. Distorted wheel. 2. Worn-down rear wheel bearings. 3. Defective or incorrect tire.	Replace. Replace. Replace.
Rear suspension too soft.	1. Weakened springs. 2. Rear suspension adjusters improperly set. 3. Air pressure is too low.	Replace. Adjust. Adjust.
Rear suspension too stiff.	1. Rear suspension adjusters improperly set. 2. Air pressure is too high.	Adjust. Adjust.
Noisy rear suspension.	Loose nuts on suspension.	Retighten.

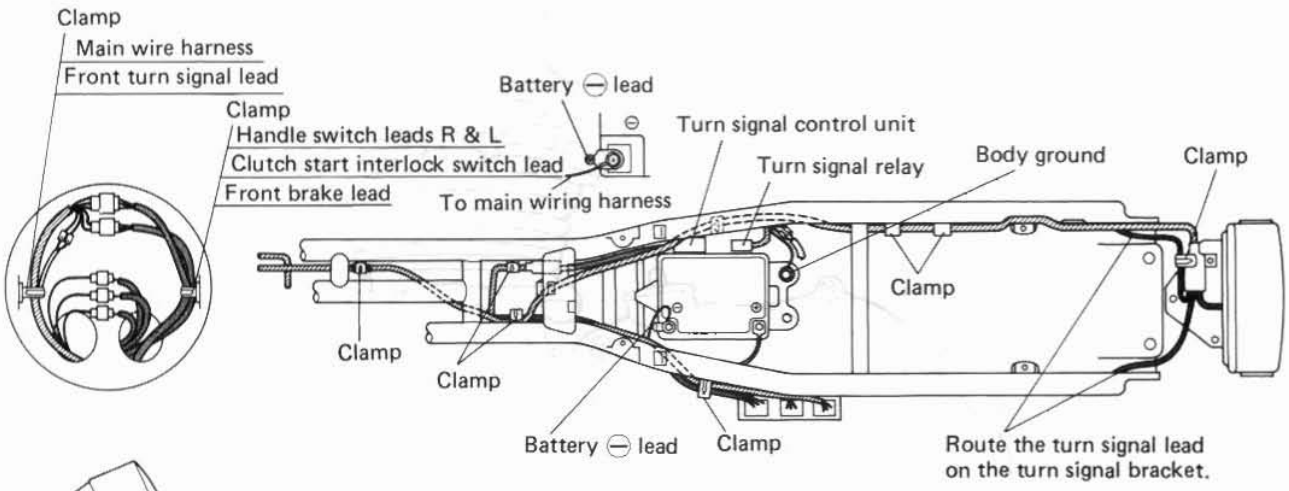
BRAKES

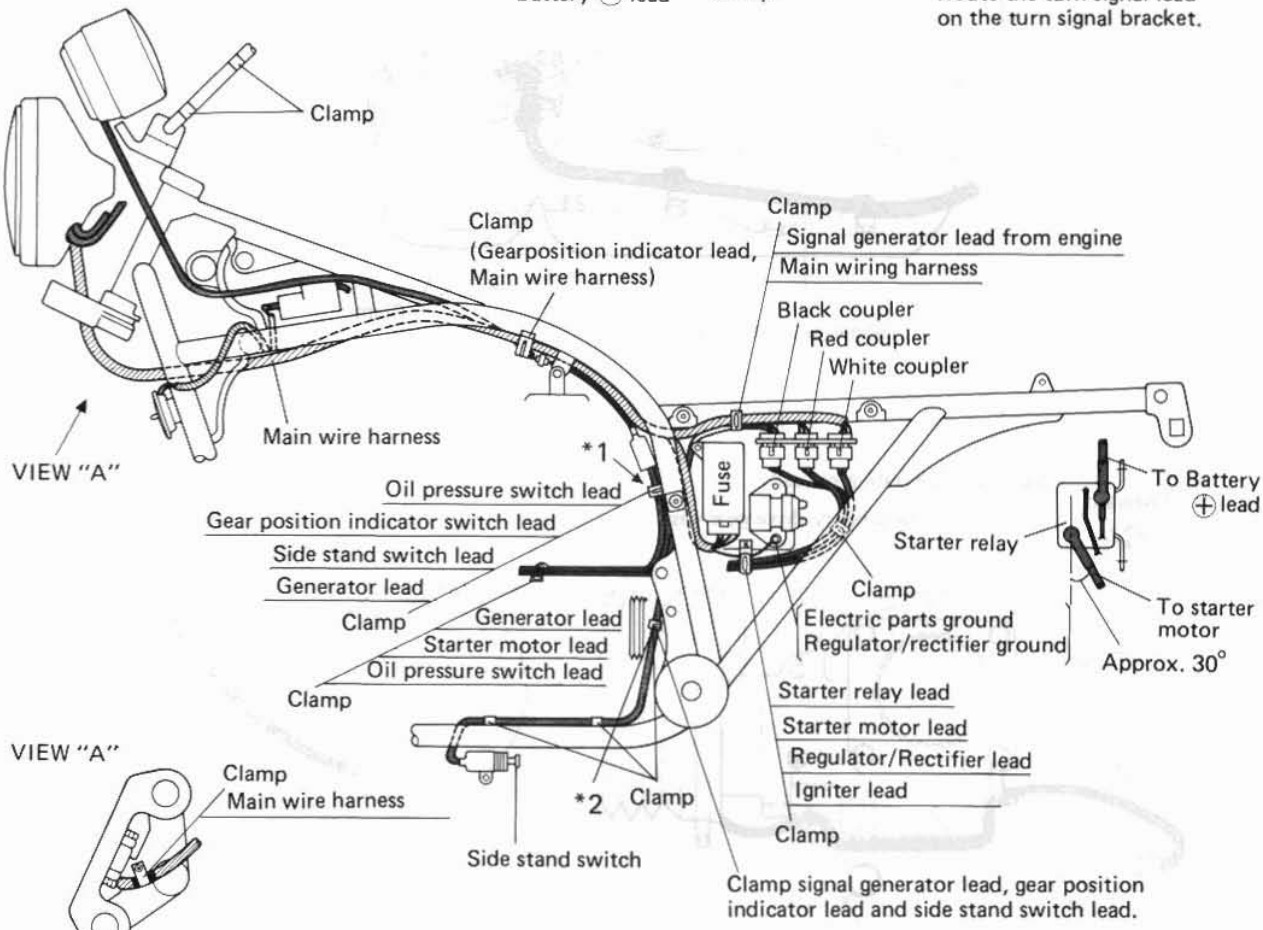
Complaint	Symptom and possible causes	Remedy
Poor braking. (FRONT and REAR)	1. Not enough brake fluid in the reservoir. 2. Air trapped in brake fluid circuit. 3. Pads worn down. 4. Too much play on brake pedal	Refill to level mark. Bleed air out. Replace. Adjust.
Insufficient brake power.	1. Leakage 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 emery paper. 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. Worn brake lever cam. 3. Insufficient brake fluid. 4. Improper quality of brake fluid.	Bleed air. Replace brake lever. 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.

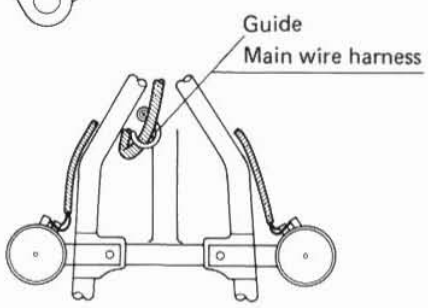
WIRING DIAGRAM



WIRE ROUTING

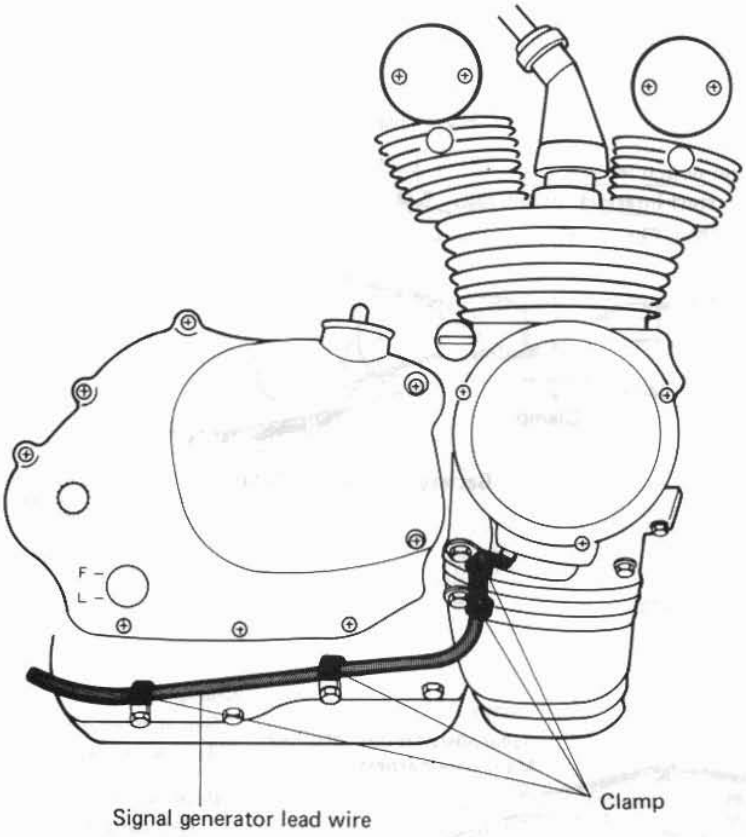


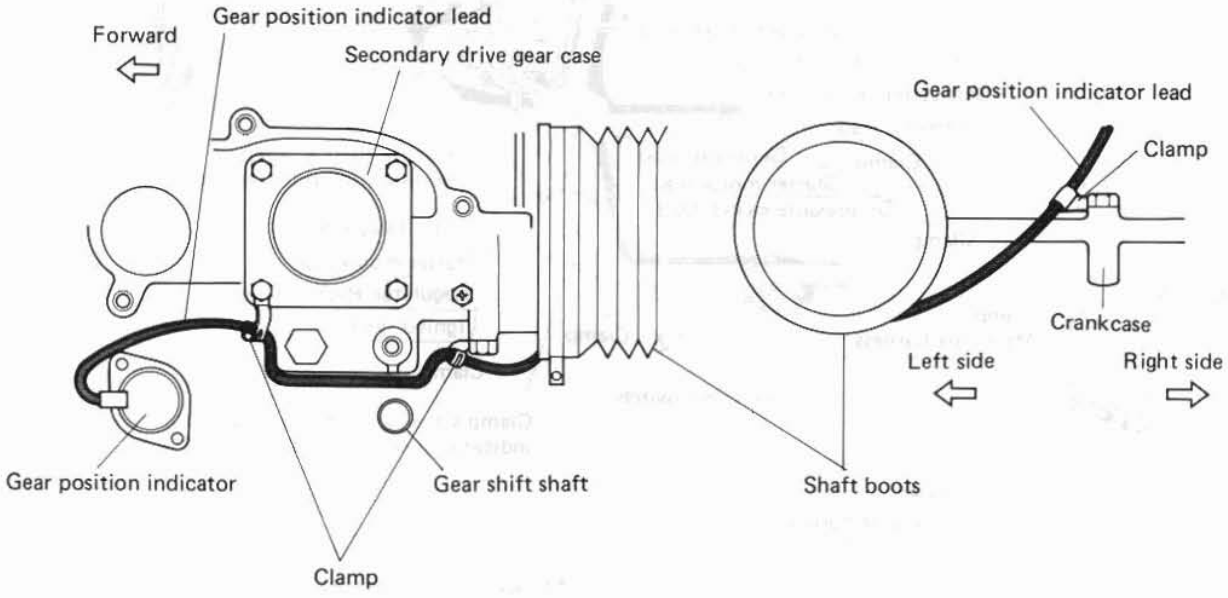




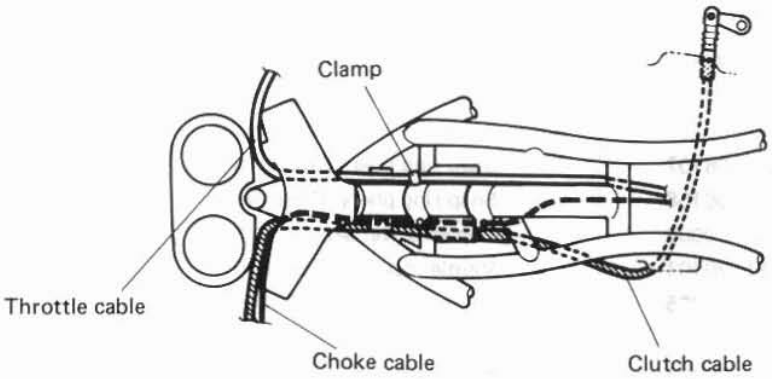
*1 Keep the room between air inlet of cleaner case and wiring harness.

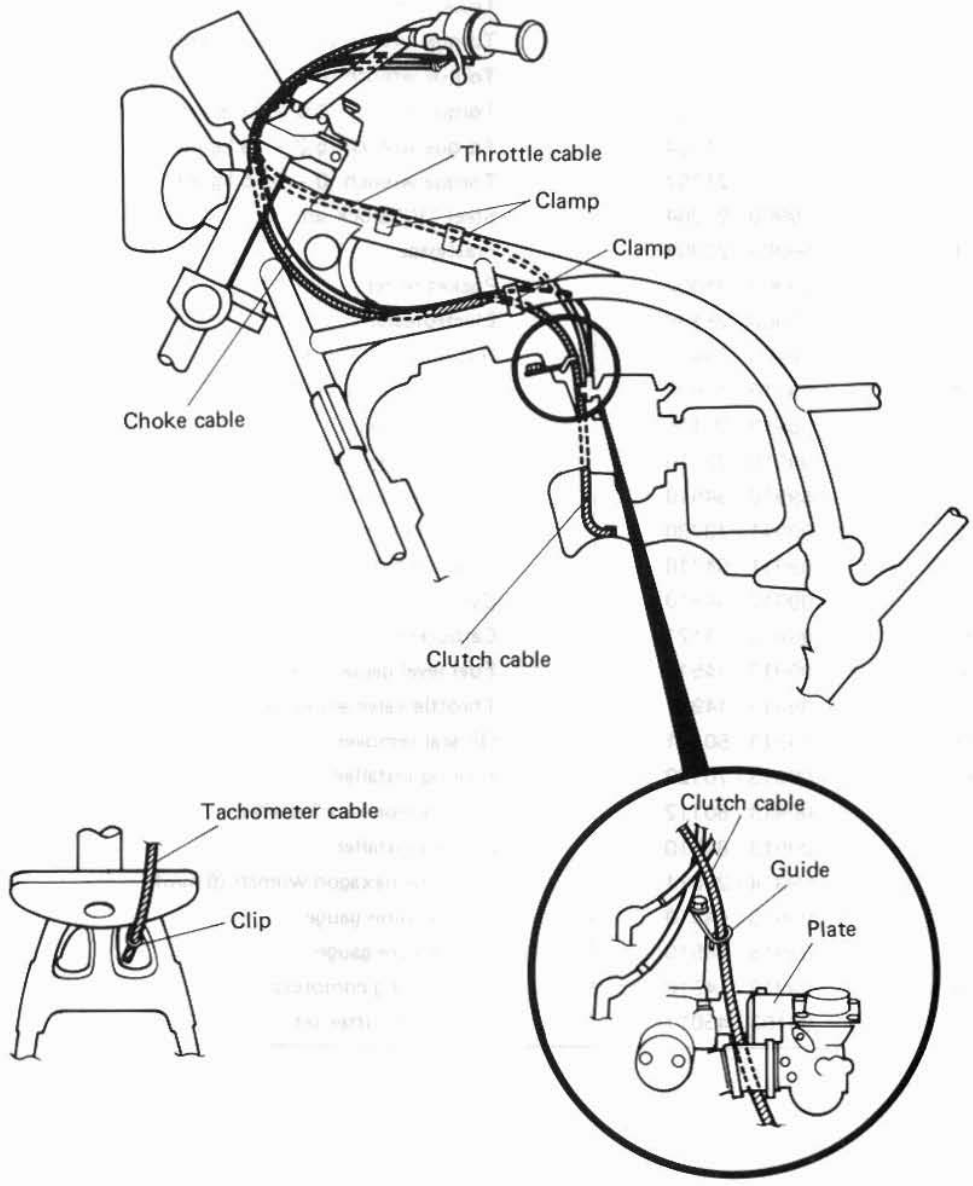
*2 Clamp side stand switch lead along with signal generator lead and gear position indicator lead.





CABLE ROUTING

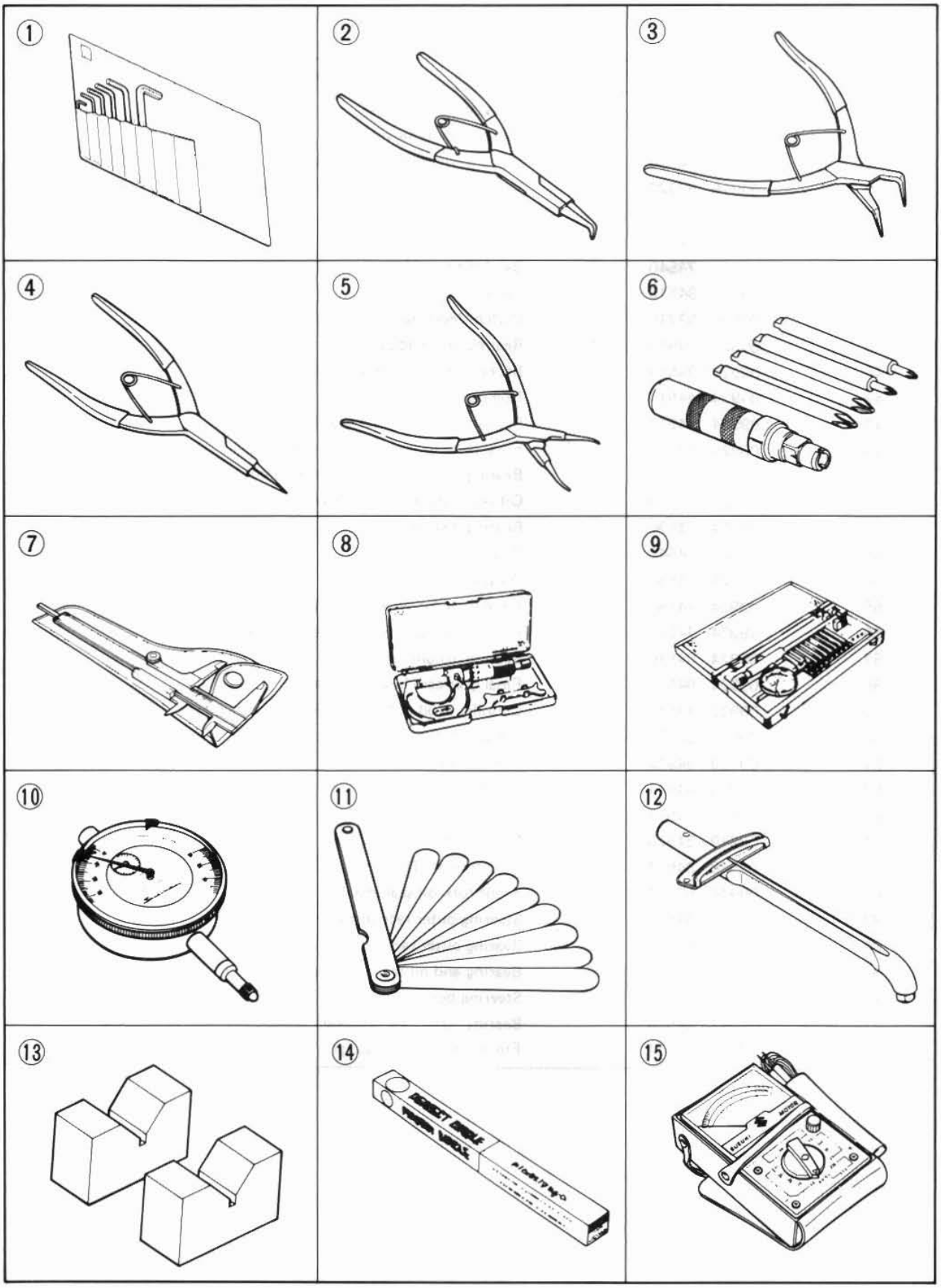


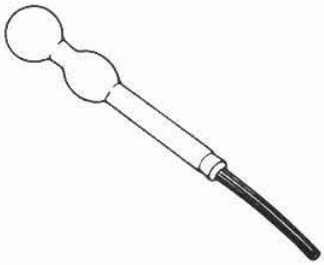
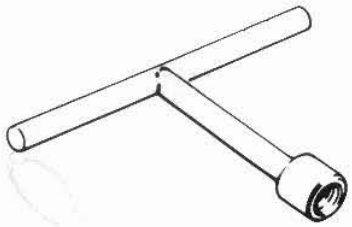
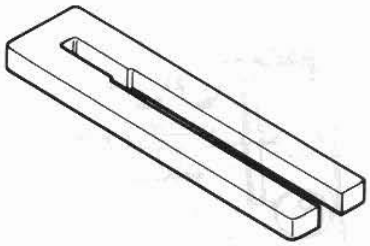
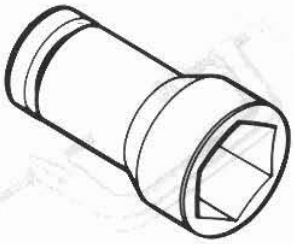
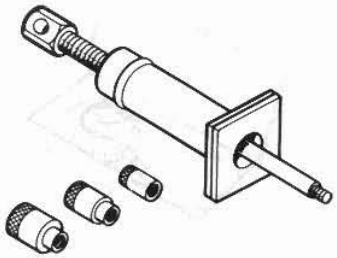
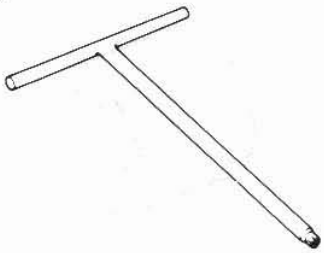
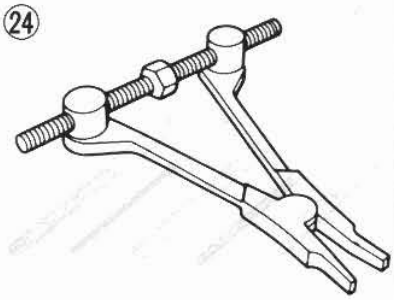
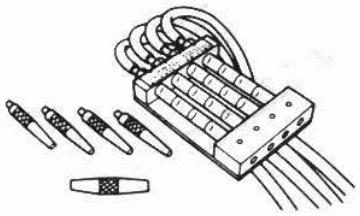
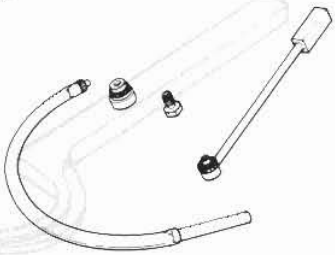
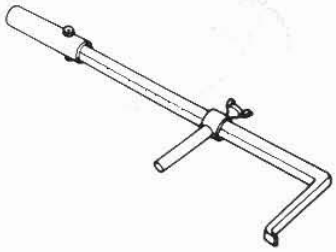
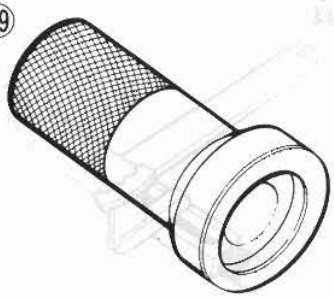
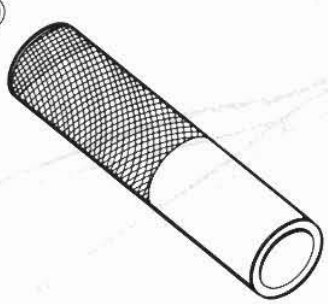


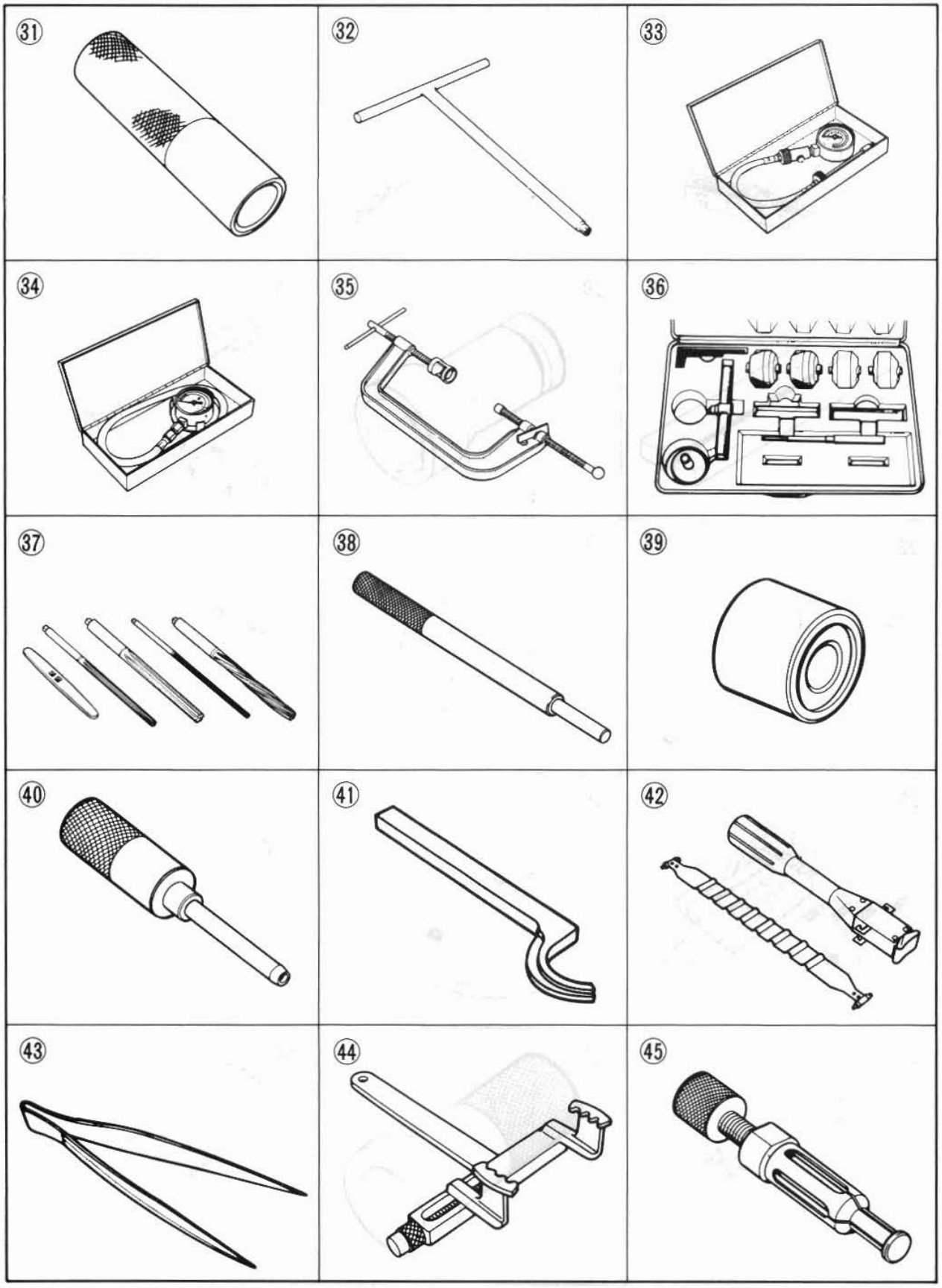
SPECIAL TOOLS

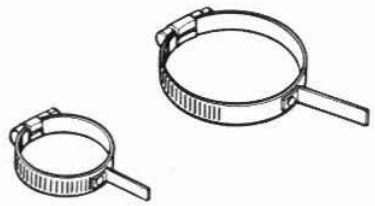
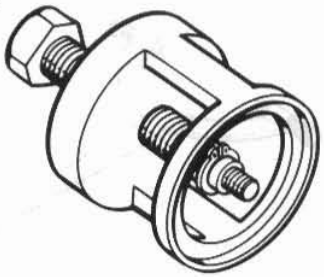
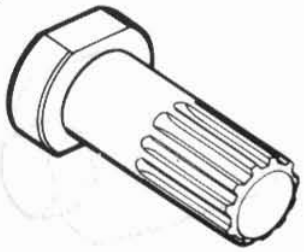
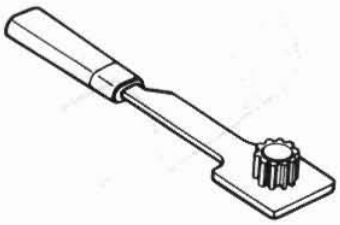
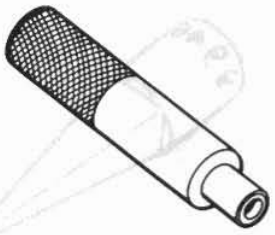
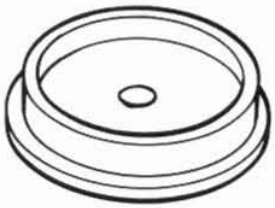
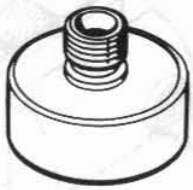
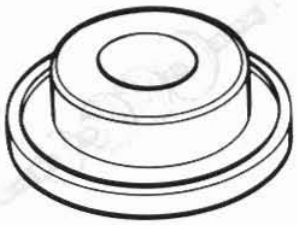
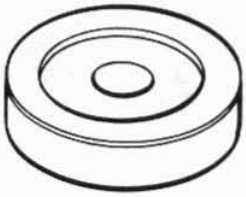
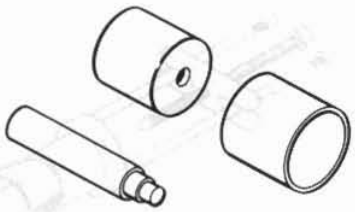
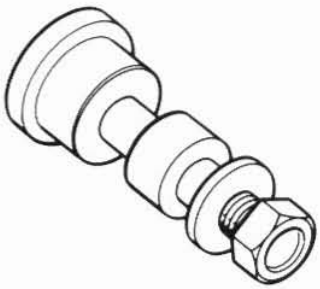
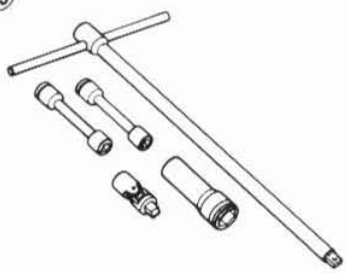
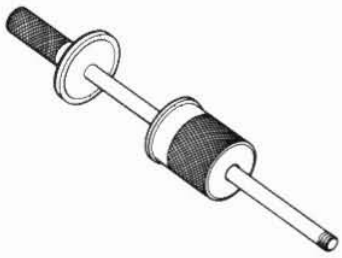
Item	Part No.	Part Name
1	09900 - 00401	"L" type hexagon wrench set
2	09900 - 06104	Snap ring pliers (Open type)
3	09900 - 06105	Snap ring pliers (Close type)
4	09900 - 06107	Snap ring pliers (Open type)
5	09900 - 06108	Snap ring pliers (Close type)
6	09900 - 09003	Impact driver set
7	09900 - 20101	Vernier calipers (150 mm)
8	09900 - 20205	Micrometer (0 – 25 mm)
	- 20202	Micrometer (25 – 50 mm)
	- 20203	Micrometer (50 – 75 mm)
9	09900 - 20508	Cylinder gauge set
10	09900 - 20606	Dial gauge (1/100 mm)
11	09900 - 20803	Thickness gauge
12	09900 - 21101	Torque wrench (0.5 – 4.5 kg-m)
	- 21102	Torque wrench (0 – 1.2 kg-m)
	- 21103	Torque wrench (1.0 – 9.0 kg-m)
	- 21104	Torque wrench (5.0 – 28 kg-m)
	- 21107	Torque wrench (0 – 0.15 kg-m)
13	09900 - 21304	Steel "V" block set
14	09900 - 22301	Prastigage
15	09900 - 25002	Pocket tester
16	09900 - 28106	Electrotester
17	09900 - 28403	Hydrometer
18	09910 - 11510	Stud bolt installer (10 mm)
19	09910 - 20115	Conrod stopper
20	09910 - 23710	41 mm socket wrench
21	09910 - 34510	Piston pin puller
22	09911 - 73730	"T" type hexagon wrench (5 mm)
23	09911 - 94710	Valve stem seal installer attachment
24	09912 - 34510	Cylinder disassembling tool
25	09913 - 13121	Carburetor balancer set
26	09913 - 14511	Fuel level gauge (6 mm x P 0.75)
27	09913 - 14911	Throttle valve adjust wrench
28	09913 - 50121	Oil seal remover
29	09913 - 70122	Bearing installer
30	09913 - 80112	Drive pinion race installer
31	09913 - 84510	Bearing installer
32	09914 - 25811	"T" type hexagon wrench (6 mm)
33	09915 - 64510	Compression gauge
34	09915 - 74510	Oil pressure gauge
35	09916 - 14510	Valve spring compressor
36	99103 - 45011	Valve seat cutter set

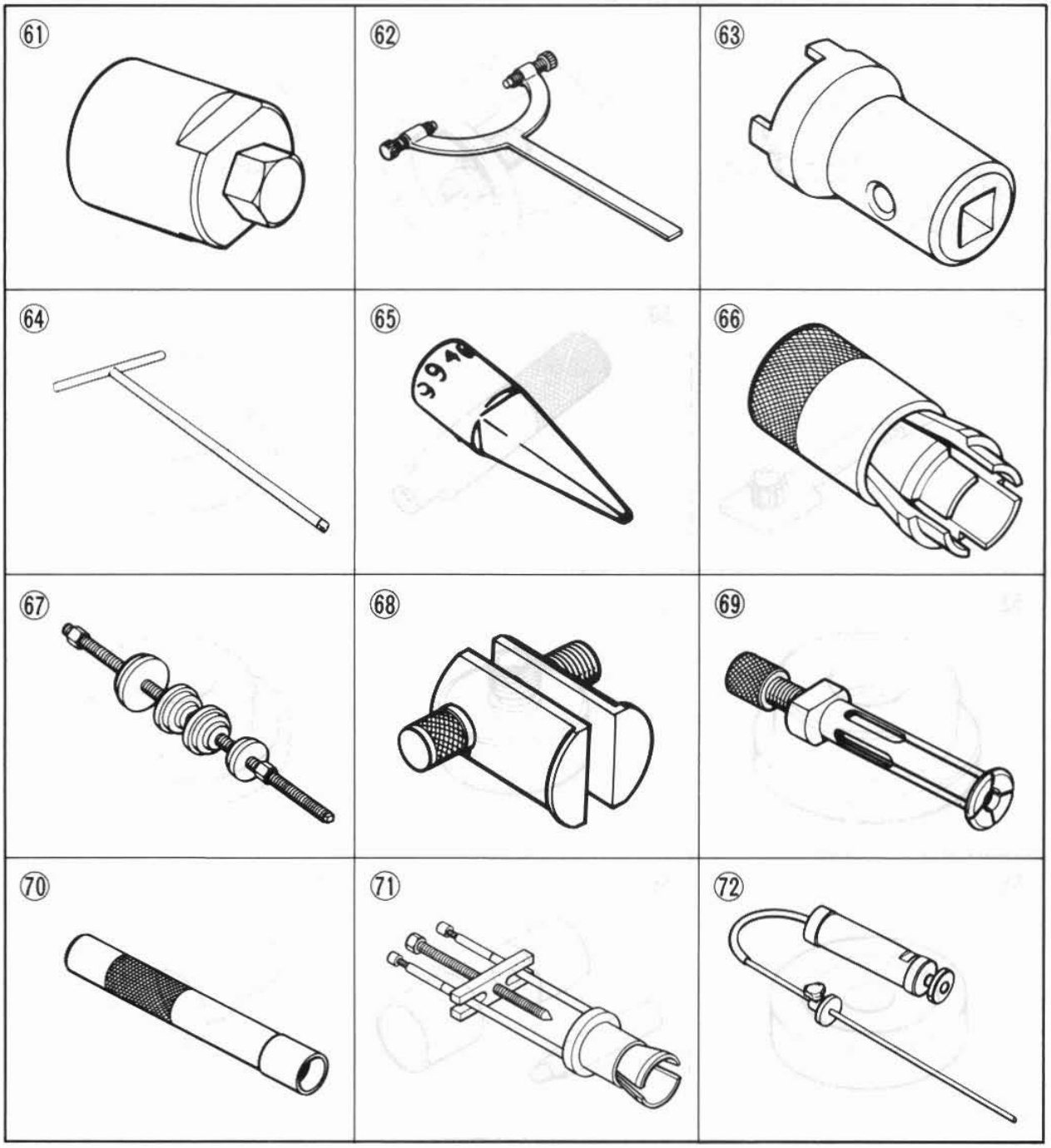
Item	Part No.	Part Name
37	09916 - 34511	Valve guide reamer set
38	09916 - 44511	Valve guide remover
39	09916 - 54530	Valve guide installer attachment
40	09916 - 57320	Valve stem seal/valve guide installer handle
41	09916 - 64510	Tappet depressor
42	09916 - 74521	Piston ring holder body
	- 74540	Band (Bore : 63 – 75 mm)
43	09916 - 84510	Tweezer
44	09920 - 53710	Clutch sleeve hub holder
45	09923 - 74510	Bearing puller (φ20 – 38)
46	09924 - 34510	Backlash measuring tool (φ27 – 50)
47	09924 - 44511	Dog cam stopper tool set
48	09924 - 54511	Secondary drive bevel gear holder
49	09924 - 64510	Final drive gear coupling holder
50	09924 - 74510	Bearing and oil seal installer or remover handle
51	09924 - 74520	Oil seal installer and remover
52	09924 - 74530	Bearing installer
53	09924 - 74540	Pilot
54	09924 - 74550	Oil seal installer
55	09924 - 74560	Final drive bevel gear housing oil seal installer
56	09924 - 74570	Final driven gear bearing installer and remover
57	09924 - 84510	Bearing installer set
58	09924 - 94510	Final gear case bearing installer
59	09930 - 14511	Cylinder head nut and spark plug wrench set
60	09930 - 30102	Rotor remover sliding shaft
61	09930 - 34912	Rotor remover
62	09930 - 44911	Rotor holder
63	09940 - 14911	Steering nut socket wrench
64	09940 - 34520	"T" handle
65	09940 - 34561	Attachment "D"
66	09940 - 50112	Front fork oil seal installer
67	09941 - 34511	Steering outer race installer
68	09941 - 54911	Bearing outer race remover
69	09941 - 64510	Bearing and oil seal remover
70	09941 - 74910	Steering bearing installer
71	09941 - 84510	Bearing inner race remover
72	09943 - 74111	Front fork oil level gauge



⑯ 	⑰ 	⑱ 
⑲ 	⑳ 	㉑ 
㉒ 	㉓ 	㉔ 
㉕ 	㉖ 	㉗ 
㉘ 	㉙ 	㉚ 



(46) 	(47) 	(48) 
(49) 	(50) 	(51) 
(52) 	(53) 	(54) 
(55) 	(56) 	(57) 
(58) 	(59) 	(60) 



TIGHTENING TORQUE

ENGINE

ITEM		kg-m	lb-ft
Exhaust pipe clamp bolt		1.0 – 1.6	7.0 – 11.5
Exhaust pipe connector bolt		0.9 – 1.4	6.5 – 10.0
Cylinder head cover bolt		1.0	7.0
Cylinder head bolt		0.9 – 1.1	6.5 – 8.0
Cylinder head nut		3.5 – 4.0	25.5 – 29.0
Camshaft holder bolt		0.8 – 1.2	6.0 – 8.5
Cam sprocket bolt		2.4 – 2.6	17.5 – 19.0
Cam chain tensioner fitting bolt		0.6 – 0.8	4.5 – 8.5
Cam chain tensioner shaft assembly		3.1 – 3.5	22.5 – 29.0
Cam chain tensioner lock shaft nut		0.9 – 1.4	6.5 – 10.0
Cam chain guide bolt		0.9 – 1.4	6.5 – 10.0
Generator rotor nut		16.0 – 17.0	115.5 – 123.0
Starter clutch allen bolt		1.5 – 2.0	11.0 – 14.5
Signal generator rotor bolt		2.5 – 3.5	18.0 – 25.5
Crankcase bolt	(6 mm)	0.9 – 1.3	6.5 – 9.5
	(8 mm)	2.0 – 2.4	14.5 – 17.5
Starter motor bolt		0.4 – 0.7	3.0 – 5.0
Oil pump screw		1.0	7.0
Oil pressure switch		1.3 – 1.7	9.5 – 12.5
Oil filter cover nut		0.6 – 0.8	4.5 – 8.5
Neutral stopper housing		1.8 – 2.8	13.0 – 20.0
Gearshift arm stopper		1.5 – 2.3	11.0 – 16.5
Clutch sleeve hub nut		5.0 – 7.0	36.0 – 50.5
Clutch spring bolt		1.1 – 1.3	8.0 – 9.5
Engine mounting bolt	(8 mm)	2.0 – 3.0	14.5 – 21.5
	(10 mm)	3.0 – 3.7	21.5 – 27.0
	(12 mm)	4.5 – 5.5	32.5 – 40.0
Gearshift lever bolt		1.3 – 2.3	9.5 – 16.5
Clutch release arm bolt		0.6 – 1.0	4.5 – 7.0

SHAFT DRIVE

ITEM	kg-m	lb-ft
Secondary drive gear nut	12.0 – 15.0	87.0 – 108.5
Secondary drive gear housing bolt	2.0 – 2.6	14.5 – 19.0
Secondary driven gear nut	9.0 – 11.0	65.0 – 79.5
Secondary driven gear housing bolt	2.0 – 2.6	14.5 – 19.0
Secondary gear oil drain plug	2.0 – 3.0	14.5 – 21.5
Final gear oil drain plug	2.0 – 3.0	14.5 – 21.5
Propeller shaft flange nut	3.0 – 4.0	21.5 – 29.0
Final drive gear nut	9.0 – 11.0	65.0 – 79.5
Final gearcase bearing holder screw	0.8 – 1.0	6.0 – 7.0
Final gear bearing case bolt	2.0 – 2.6	14.5 – 19.0
Final gearcase joint nut	3.5 – 4.5	25.5 – 32.5

CHASSIS

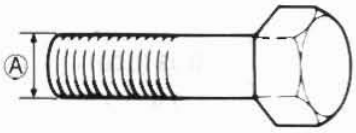
ITEM	kg-m	lb-ft
Disc bolt	1.5 – 2.5	11.0 – 18.0
Front axle nut	3.6 – 5.2	26.0 – 37.5
Front axle holder nut	1.5 – 2.5	11.0 – 18.0
Front caliper mounting bolt	2.5 – 4.0	18.0 – 29.0
Front caliper axle bolt	4.0 – 5.5	29.0 – 40.0
Brake hose union bolt	2.0 – 2.5	14.5 – 18.0
Caliper bleeder	0.7 – 0.9	5.0 – 6.5
Front fork damper rod bolt	2.0 – 2.6	14.5 – 19.0
Front fork lower clamp bolt	1.5 – 2.5	11.0 – 18.0
Front fork upper clamp bolt	2.0 – 3.0	14.5 – 21.5
Front fork cap bolt	1.5 – 3.0	11.0 – 21.5
Steering stem nut	4.0 – 5.0	29.0 – 36.0
Steering stem clamp bolt	1.5 – 2.5	11.0 – 18.0
Steering stem head bolt	2.0 – 3.0	14.5 – 21.5
Handlebar clamp bolt	1.2 – 2.0	6.0 – 14.5
Front master cylinder clamp bolt	0.5 – 0.8	3.5 – 6.0
Front footrest bolt	2.7 – 4.3	19.5 – 31.0
Swing arm bearing holder bolt	0.35 – 0.45	25.5 – 32.5
Swing arm bearing holder lock nut	11.0 – 13.0	79.5 – 94.0
Brake pedal arm bolt	1.0 – 1.5	7.0 – 11.0
Rear master cylinder mounting bolt	1.5 – 2.5	11.0 – 18.0
Rear torque link bolt and nut	2.0 – 3.0	14.5 – 21.5
Rear caliper mounting bolt	2.5 – 4.0	18.0 – 29.0
Rear caliper bolt	2.0 – 3.0	14.5 – 21.5
Muffler bracket nut	1.5 – 2.0	11.0 – 14.5
Rear shock absorber fitting bolt or nut	2.0 – 3.0	14.5 – 21.5
Rear footrest bolt	2.7 – 4.3	19.5 – 31.0
Wheel hub driven joint fitting bolt	0.8 – 1.2	6.0 – 8.5
Rear axle nut	5.0 – 8.0	36.0 – 58.0
Rear axle clamp bolt	1.5 – 2.5	11.0 – 18.0

TIGHTENING TORQUE CHART

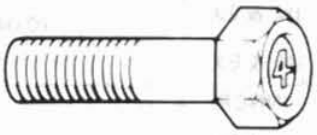
For other bolts and nuts not listed above, refer to this chart:

Tightening torque

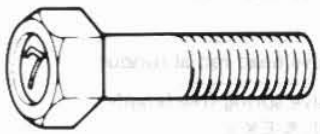
Bolt Diameter Ⓐ (mm)	Conventional or "4" marked bolt		"7" marked bolt	
	kg-m	lb-ft	kg-m	lb-ft
4	0.1 – 0.2	0.7 – 1.5	0.15 – 0.3	1.0 – 2.0
5	0.2 – 0.4	1.5 – 3.0	0.3 – 0.6	2.0 – 4.5
6	0.4 – 0.7	3.0 – 5.0	0.8 – 1.2	6.0 – 8.5
8	1.0 – 1.6	7.0 – 11.5	1.8 – 2.8	13.0 – 20.0
10	2.2 – 3.5	16.0 – 25.5	4.0 – 6.0	29.0 – 43.5
12	3.5 – 5.5	25.5 – 40.0	7.0 – 10.0	50.5 – 72.5
14	5.0 – 8.0	36.0 – 58.0	11.0 – 16.0	79.5 – 115.5
16	8.0 – 13.0	58.0 – 94.0	17.0 – 25.0	123.0 – 181.0
18	13.0 – 19.0	94.0 – 137.5	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.	38 (1.5)	—
	EX.	32 (1.3)	—
Valve lift	IN.	8.0 (0.31)	—
	EX.	7.5 (0.31)	—
Tappet clearance (when cold)	IN. & EX.	0.03 – 0.08 (0.001 – 0.003)	—
Valve guide to valve stem clearance	IN.	0.020 – 0.055 (0.0079 – 0.0217)	0.35 (0.014)
	EX.	0.035 – 0.070 (0.0014 – 0.0028)	0.35 (0.014)
Valve guide I.D.	IN. & EX.	6.995 – 7.015 (0.2754 – 0.2762)	—
Valve stem O.D.	IN.	6.960 – 6.975 (0.2740 – 0.2746)	—
	EX.	6.945 – 6.960 (0.2734 – 0.2740)	—
Valve stem runout	IN. & EX.	—	0.05 (0.002)
Valve head thickness	IN. & EX.	—	0.5 (0.02)
Valve stem end length	IN. & EX.	—	4.0 (0.16)
Valve seat width	IN. & EX.	1.1 – 1.3 (0.04 – 0.05)	—
Valve head radial runout	IN. & EX.	—	0.03 (0.001)
Valve spring free length (IN. & EX.)	INNER	—	33.9 (1.33)
	OUTER	—	41.3 (1.63)
Valve spring tension (IN. & EX.)	INNER	8.9 – 12.5 kg (19.62 – 27.56 lb) at length 31 mm (1.2 in)	—
	OUTER	22.1 – 27.1 kg (48.72 – 59.74 lb) at length 35 mm (1.4 in)	—

CAMSHAFT + CYLINDER HEAD

Unit: mm (in)

ITEM	STANDARD		LIMIT
Cam height	IN.	36.320 – 36.360 (1.4299 – 1.4315)	36.020 (1.4181)
	EX.	35.770 – 35.810 (1.4083 – 1.4098)	35.470 (1.3965)
Camshaft journal oil clerance	IN. & EX.	0.020 – 0.054 (0.0008 – 0.0021)	0.150 (0.0059)
Camshaft journal holder I.D.	IN. & EX.	22.000 – 22.013 (0.8661 – 0.8713)	—
Camshaft journal O.D.	IN. & EX.	21.959 – 21.980 (0.8645 – 0.8654)	—
Camshaft runout	IN. & EX.	—	0.1 (0.004)
Cam chain 20-pitch length		—	157.80 (6.213)
Cam chain pin (at arrow "3")		20th pin	—
Cylinder head distortion		—	0.2 (0.008)

CYLINDER + PISTON + PISTON RING

Unit: mm (in)

ITEM	STANDARD			LIMIT
Compression pressure	8 – 12 kg/cm² (113.76 – 170.64 psi)			7 kg/cm² (99.5 psi)
Compression pressure difference	———			2 kg/cm² (28.4 psi)
Piston to cylinder clearance	0.050 – 0.060 (0.0020 – 0.0024)			0.120 (0.0047)
Cylinder bore	72.000 – 72.015 (2.8346 – 2.8352)			72.080 (2.8378)
Piston diam.	71.945 – 71.960 (2.8325 – 2.8331) Measure at the 17 (0.7) from skirt end.			71.880 (2.8299)
Cylinder distortion	———			0.2 (0.008)
Piston ring free end gap	1st	N	Approx. 9.5 (0.37)	7.6 (0.30)
	2nd	N	Approx. 11.0 (0.43)	8.8 (0.35)
Piston ring end gap	1st		0.10 – 0.30 (0.004 – 0.012)	0.7 (0.03)
	2nd		0.10 – 0.30 (0.004 – 0.012)	0.7 (0.03)
Piston ring to groove clearance	1st		———	0.180 (0.0071)
	2nd		———	0.150 (0.0059)
Piston ring groove width	1st		1.025 – 1.045 (0.0404 – 0.0411)	———
	2nd		1.210 – 1.230 (0.0476 – 0.0484)	———
	Oil		2.510 – 2.530 (0.0988 – 0.0996)	———
Piston ring thickness	1st		0.975 – 0.990 (0.0384 – 0.0390)	———
	2nd		1.170 – 1.190 (0.0461 – 0.0469)	———
Piston pin bore	18.002 – 18.008 (0.7087 – 0.7090)			18.030 (0.7098)
Piston pin O.D.	17.995 – 18.000 (0.7085 – 0.7087)			17.980 (0.7079)

CONROD + CRANKSHAFT

Unit: mm (in)

ITEM	STANDARD	LIMIT
Conrod small end I.D.	18.006 – 18.014 (0.7090 – 0.7092)	18.040 (0.7102)
Conrod deflection	—	3.0 (0.12)
Conrod big end side clearance	0.10 – 0.65	1.00 (0.039)
Crankshaft runout	—	0.10 (0.004)

OIL PUMP

ITEM	STANDARD	LIMIT
Oil pump reduction ratio	1.723 (87/49 x 33/34)	—
Oil pressure (at 60°C, 140°F)	Above 10 kPa (0.1 kg/cm², 1.422 psi) Below 50 kPa (0.5 kg/cm², 7.11 psi) at 3 000 r/min.	—

CLUTCH

Unit: mm (in)

ITEM	STANDARD	LIMIT
Clutch cable play	2 – 3 (0.08 – 0.12)	—
Drive plate thickness	2.9 – 3.1 (0.11 – 0.12)	2.6 (0.10)
Drive plate claw width	15.6 – 15.8 (0.61 – 0.62)	14.8 (0.58)
Driven plate thickness	2.0 ± 0.06 (0.08 ± 0.002)	—
Driven plate distortion	—	0.1 (0.064)
Clutch spring free length	—	38.8 (1.53)

TRANSMISSION + DRIVE SHAFT

Unit: (mm (in)

ITEM	STANDARD		LIMIT
Primary reductin ratio	1.775 (87/49)		———
Secondary reduction ratio	0.941 (16/17)		———
Final reduction ratio	3.090 (34/11)		———
Gear ratios	Low	2.500 (35/14)	———
	2nd	1.777 (32/18)	———
	3rd	1.380 (29/21)	———
	4th	1.125 (27/24)	———
	Top	0.961 (25/26)	———
Shift fork to groove clearance	0.4 – 0.6 (0.016 – 0.024)		0.8 (0.03)
Shift fork groove width	5.45 – 5.55 (0.215 – 0.219)		———
Shift fork thickness	4.95 – 5.05 (0.195 – 0.199)		———

SHAFT DRIVE

Unit: mm (in)

ITEM	STANDARD		LIMIT
Secondary bevel gear backlash	0.08 – 0.13 (0.003 – 0.005)		———
Final bevel gear backlash	Drive side	0.03 – 0.04 (0.001 – 0.002)	———
	Driven side	0.02 – 0.35 (0.001 – 0.014)	———
Secondary drive bevel gear preload	30 – 50 N·m (3 – 5 kg-cm, 0.2 – 0.4 lb-ft)		———
Secondary driven bevel gear preload	40 – 70 N·m (4 – 7 kg-cm, 0.3 – 0.5 lb-ft)		———
Final drive bevel gear preload	40 – 80 N·m (4 – 8 kg-cm, 0.3 – 0.6 lb-ft)		———

CARBURETOR

Unit: mm (in)

ITEM		SPECIFICATION
Carburetor type		MIKUNI BS34SS
Bore size		34 (1.34)
I.D. No.		49400
Idle r/min.		1 050 ± 100 r/min.
Fuel level		5.0 ± 0.5 (0.20 ± 0.02)
Float height		22.4 ± 1.0 (0.88 ± 0.04)
Main jet	(M. J.)	#115
Main air jet	(M.A.J.)	1.7
Jet needle	(J. N.)	5D58
Needle jet	(N. J.)	X – 3
Pilot jet	(P. J.)	#40
By pass	(B. P.)	0.9, 0.8, 0.8 (0.04, 0.03, 0.03)
Pilot Outlet	(P. O.)	0.7
Valve seat	(V. S.)	2.0
Starter jet	(G. S.)	50
Pilot screw	(P. S.)	PRE-SET
Pilot air jet	(P.A.J.)	#170
Throttle cable play		0.5 – 1.0 (0.02 – 0.04)
Choke cable play		0.5 – 1.0 (0.02 – 0.04)

ELECTRICAL

Unit: mm (in)

ITEM	SPECIFICATION			NOTE
Ignition timing	17° B.T.D.C. Below 1 500 ± 150 r/min and 37° B.T.D.C. Above 2 350 ± 150 r/min			—
Firing order	1. 2. 4. 3.			—
Spark plug	Type	NGK: B8ES ND : W24ES-U		—
	Gap	0.6 – 0.8 (0.02 – 0.03)		—
Spark performance	Over 8 at 1 atm			—
Signal coil resistance	Y – G B – Bl Approx. 140 – 200 Ω			—
Ignitoin coil resistance	Primary	O/W – W O/W – B/Y Approx. 3 – 5 Ω		—
	Secondary	Plug cap – Plug cap Approx. 30 – 40 kΩ		—
Generator no-load voltage	More than 80V (AC) at 5 000 r/min.			—
Regulated voltage	14 – 15.5V at 5 000 r/min.			—
Starter motor	Brush length	MITSUBA	Limit: 6 (0.23)	—
	Commutator under cut		Limit: 0.2 (0.008)	—
Starter relay resistance	Approx.	3 – 4 Ω		—
Battery	Type designation	YB14L-A2		—
	Capacity	12V50.4kC(14Ah)/10HR		—
	Standard electrolyte S.G.	1.28 at 20°C (68°F)		—
Fuse size	Headlight	10 A		—
	Turn signal	10 A		—
	Ignition	10 A		—
	Main	15 A		—
	Power source	10 A		—

BRAKE + WHEEL

Unit: mm (in)

ITEM		STANDARD	LIMIT
Rear brake pedal height		20 (0.8)	
Brake disc thickness	Front	5.0 ± 0.2 (0.20 ± 0.008)	4.5 (0.18)
	Rear	6.7 ± 0.2 (0.26 ± 0.008)	6.0 (0.24)
Brake disc runout		—	0.30 (0.012)
Master cylinder bore	Front	15.870 – 15.913 (0.6248 – 0.6265)	—
	Rear	14.000 – 14.043 (0.5512 – 0.5529)	—
Master cylinder piston diam.	Front	15.827 – 15.854 (0.6231 – 0.6242)	—
	Rear	13.957 – 13.984 (0.5495 – 0.5506)	—
Brake caliper cylinder bore	Front	38.180 – 38.256 (1.5031 – 1.5061)	—
	Rear	38.180 – 38.256 (1.5031 – 1.5061)	—
Brake caliper piston diam.	Front	38.098 – 38.148 (1.4999 – 1.5019)	—
	Rear	38.098 – 38.148 (1.4999 – 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	3.50H19 4PR	—
	Rear	4.50H17 4PR	—
Tire tread depth	Front	—	1.6 (0.06)
	Rear	—	2.0 (0.08)

SUSPENSION

Unit: mm (in)

ITEM	STANDARD	LIMIT	NOTE
Front fork stroke	160 (6.3)	———	
Front fork spring free length	———	416 (16.4)	
Front fork oil level	140 (5.5)	———	
Front fork air pressure	60 kPa, 0.6 kg/cm^2, 8.5 psi	———	
Rear wheel travel	109 (4.3)	———	

FUEL + OIL

ITEM	SPECIFICATION		NOTE
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 including reserve	22 L (5.8 US gal)		
reserve	4.2 L (4.4 US qt)		
Engine oil type	SAE 10W/40, API grade SE or SF		
Engine oil capacity	Change	3 000 ml (3.2 US qt)	
	Filter change	3 300 ml (3.5 US qt)	
	Overhaul	3 700 ml (3.9 US qt)	
Front fork oil type	Mixture ratio SAE 10W/30 : ATF = 1 : 1 or fork oil #15		
Front fork oil capacity (each leg)	255 ml (8.6 US oz)		
Bevel gear oil type	Hypoid Gear oil SAE #90, API grade GL-5		
Bevel gear oil capacity	Secondary	340 – 400 ml (11.5 – 13.5 US oz)	
	Final	280 – 330 ml (9.5 – 11.2 US oz)	
Brake fluid type	DOT3, DOT4 or SAE J1703		

TIRE PRESSURE

COLD INFLATION TIRE PRESSURE	NORMAL RIDING						CONTINUOUS HIGH SPEED RIDING					
	SOLO RIDING			DUAL RIDING			SOLO RIDING			DUAL RIDING		
	psi	kPa	kg/cm^2	psi	kPa	kg/cm^2	psi	kPa	kg/cm^2	psi	kPa	kg/cm^2
FRONT	24	175	1.75	24	175	1.75	28	200	2.00	28	200	2.00
REAR	28	200	2.00	31	225	2.25	31	225	2.25	40	280	2.80

WATTAGE

(W)

ITEM		SPECIFICATION
Headlight	HI	60
	LO	55
Tail/Brake light		8/23
Front turn signal/running light		23/8
Rear turn signal light		23
Speedometer light		3.4
Tachometer light		3.4
Turn signal indicator light		3.4
High beam indicator light		3.4
Neutral indicator light		3.4
Oil pressure indicator light		3.4
License light		8
Side stand check light		3.4
Fuel meter light		3.4
Gear position indicator light		1.12

GS1100GL

This section gives only service data and servicing procedures which differ from those of the GS1100G and describes the new features of the GS1100GL.

CONTENS

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LAMPS 10- 7
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FRONT WHEEL 10-11
FRONT FORK 10-14
REAR CALIPER 10-20
WIRE AND CABLE ROUTING 10-22
WIRING DIAGRAM 10-24
SERVICE DATA 10-25

10

VIEW OF SUZUKI GS1100GL

Right side

Left side

SPECIFICATIONS

DIMENSIONS AND DRY MASS

Overall length	2 225 mm (87.6 in)
Overall width	845 mm (33.3 in)
Overall height	1 180 mm (46.5 in)
Wheelbase	1 510 mm (59.4 in)
Ground clearance	155 mm (6.1 in)
Dry mass	244 kg (538 lbs)

ENGINE

Type	Four-stroke, air -cooled, DOHC
Number of cylinders	4
Bore	72.0 mm (2.835 in)
Stroke	66.0 mm (2.598 in)
Piston displacement	1 074 cm^3 (65.5 cu.in)
Compression ratio	8.8 : 1
Carburetor	MIKUNI BS34SS, four
Air cleaner	Polyurethane foam 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		1.775 (87/49)
Gear ratios,	Low	2.500 (35/14)
	2nd	1.722 (31/18)
	3rd	1.380 (29/21)
	4th	1.125 (27/24)
	Top	0.961 (25/26)

SECONDARY DRIVE

Type	Shaft drive
Secondary reduction	0.941 (16/17)
Final reduction	3.090 (34/11)

CHASSIS

Front suspension	Telescopic, pneumatic/coil spring, oil dampened
Rear suspension	Swing arm, oil dampened, damper 4-way/ spring 5-way adjustable
Steering angle	40° (right and left)
Caster	62° 15'
Trail	102 mm (4.02 in)
Turning radius	2.7 m (8.9 ft)
Front brake	Disc brake, twin
Rear brake	Disc brake
Front tire size	100/90-19 57H
Rear tire size	130/90-16 67H
Front tire pressure	1.75 kg/cm^2, (24 psi) (Normal solo riding)
Rear tire pressure	2.00 kg/cm^2, (28 psi) (Normal solo riding)

ELECTRICAL

Ignition type	Transistorized
Ignition timing	17° B.T.D.C. below 1 500 r/min and 37° B.T.D.C. above 2 350 r/min
Spark plug	NGK B8ES or NIPPON DENSO W24ES-U
Spark plug gap	0.6 – 0.8 mm (0.02 – 0.03 in) both NGK and NIPPON DENSO
Battery	12V 50.4 kC (14 Ah)/10 HR
Generator	Three-phase A.C. generator
Fuse	10/10/10/10/15A

CAPACITIES

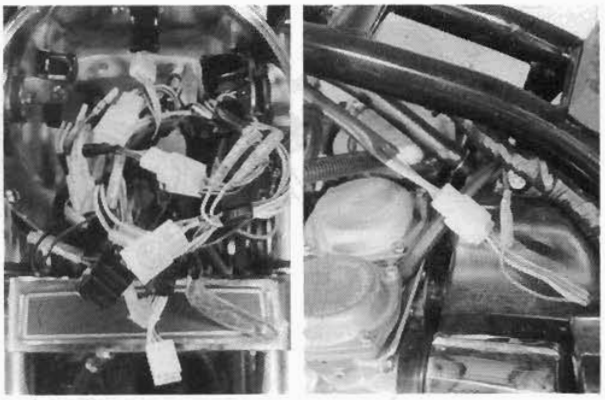
Fuel tank including reserve	17 L (4.5 US gal)
reserve	4.5 L (4.76 US qt)
Engine oil change	3.0 L (3.17 US qt)
filter change	3.3 L (3.49 US qt)
overhaul	3.7 L (3.91 US qt)
Secondary bevel gear oil	340 – 400 ml (11.5 – 13.5 US oz)
Final bevel gear oil	280 – 330 ml (9.5 – 11.2 US oz)
Front fork air pressure	80 kPa (0.8 kg/cm^2, 11.4 psi)
Front fork oil (each leg)	245 ml (8.28 US oz)

Specifications subject to change without notice.

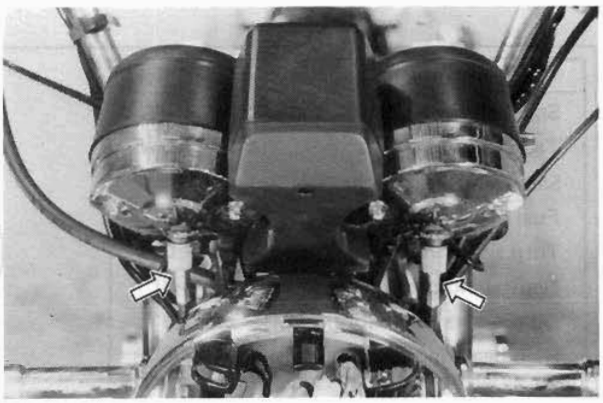
COMBINATION METER

- Remove headlight by removing two fitting screws.

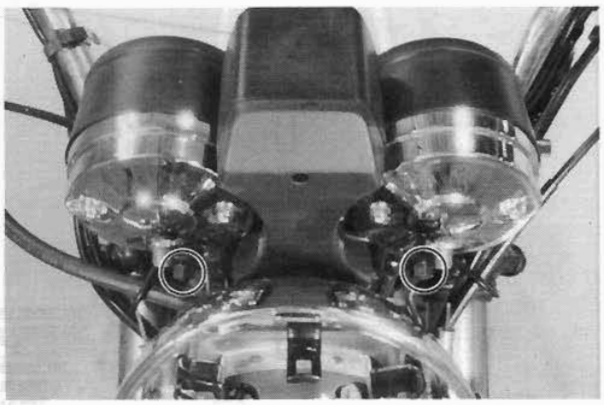
- Disconnect combination meter couplers and lead wires.
- Remove fuel tank and disconnect the gear position indicator lead wire coupler.



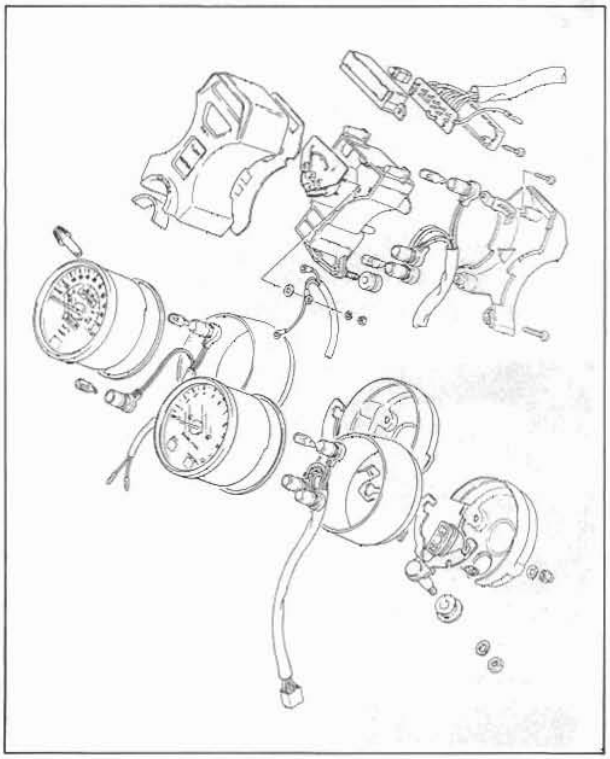
- Disconnect speedometer and tachometer cables.



- Remove combination meter by removing the nuts.



DISASSEMBLY



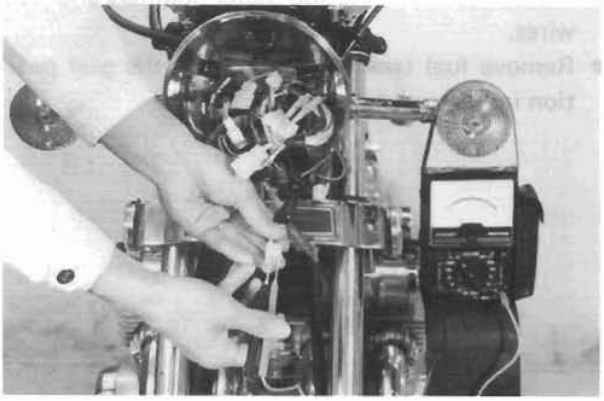
INSPECTION

Using pocket tester, check the continuity between lead wires in the below diagram.

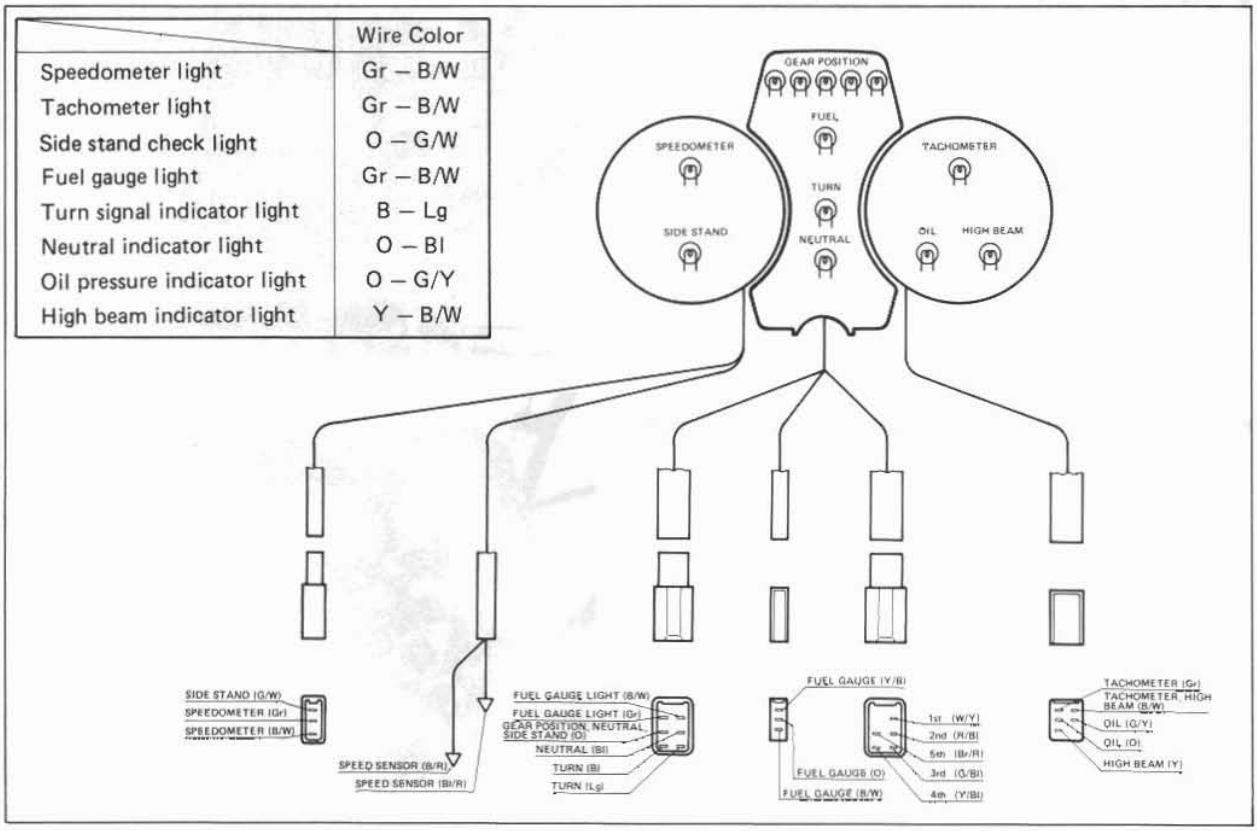
If the continuity measured is incorrect, replace the respective part.

09900 - 25002	Pocket tester

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



	Wire Color
Speedometer light	Gr – B/W
Tachometer light	Gr – B/W
Side stand check light	O – G/W
Fuel gauge light	Gr – B/W
Turn signal indicator light	B – Lg
Neutral indicator light	O – Bl
Oil pressure indicator light	O – G/Y
High beam indicator light	Y – B/W



COIL TYPE FUEL GAUGE

The GS1100GL is equipped with an electro-magnetic oil damped fuel gauge. This type of instrument differs from the type previously used and does not return to the "E" position when the ignition switch is turned off.

OPERATION

SENDING UNIT

When the ignition switch is turned on, the resistance from the fuel tank float assembly will vary with the amount of fuel in the tank.

FUEL GAUGE

As shown in Fig.1, four coils are located in the fuel gauge (N1, N2, N3 and N4). As the resistance from the sending unit varies along with the fuel level, the current at points L1 and L2 will also vary, This in turn will cause the strength of the magnetic field generated in the four coils to increase or decrease (causing a related increase or decrease in the force vector H in Fig.2) which will force the needle to move to the proper position (Fig.3).

When the ignition is turned off, the pointer remains in the position where it was when the switch was ON. This function is displayed by using high-viscosity oil and a balanced magnet (Fig.4).

FUEL LEVEL SYSTEM

The Fuel Level System can be divided into two sections:

(1) The Fuel Meter: Located in the instrument cluster

(2) The Fuel Tank Float Assembly (Fuel gauge sending unit)

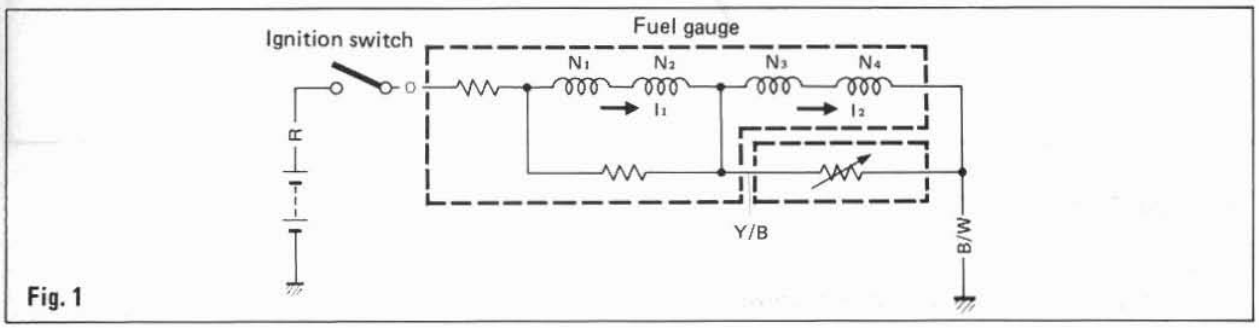


Fig. 1

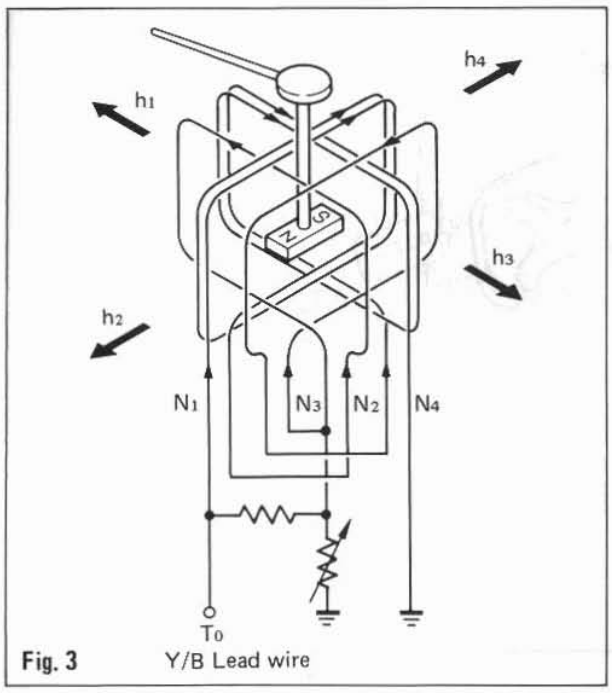


Fig. 3

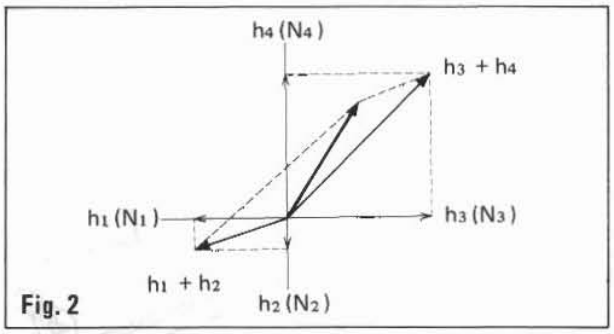


Fig. 2

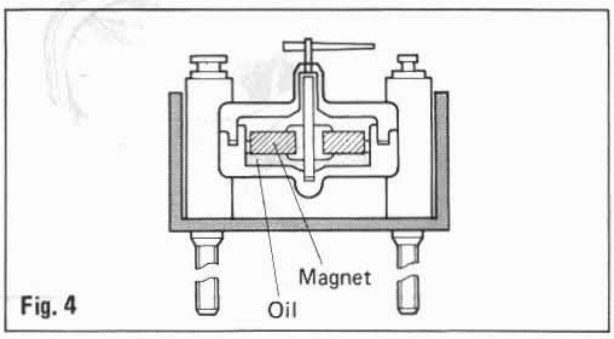
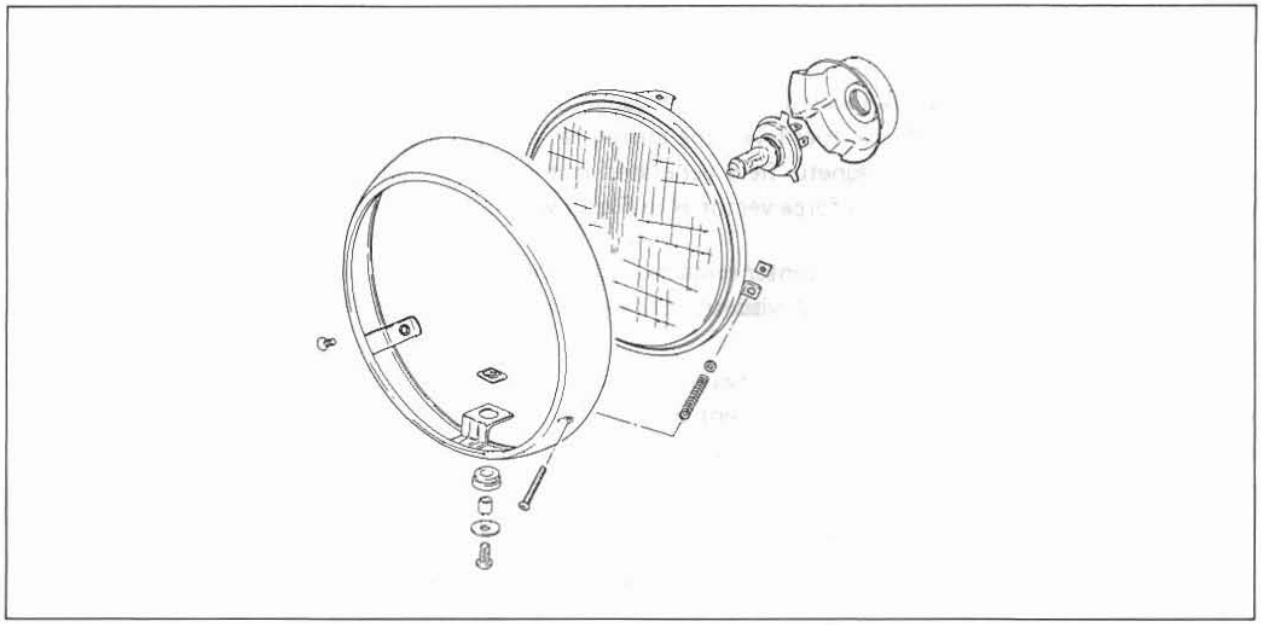


Fig. 4

LAMPS

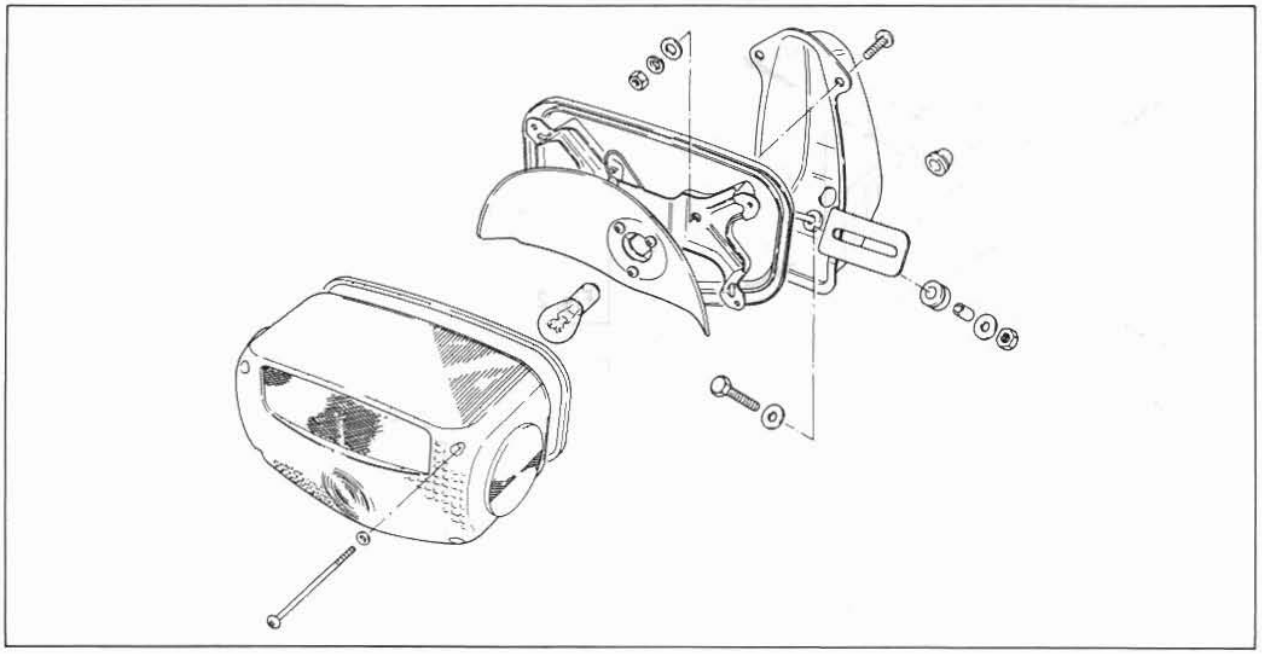
HEADLIGHT

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



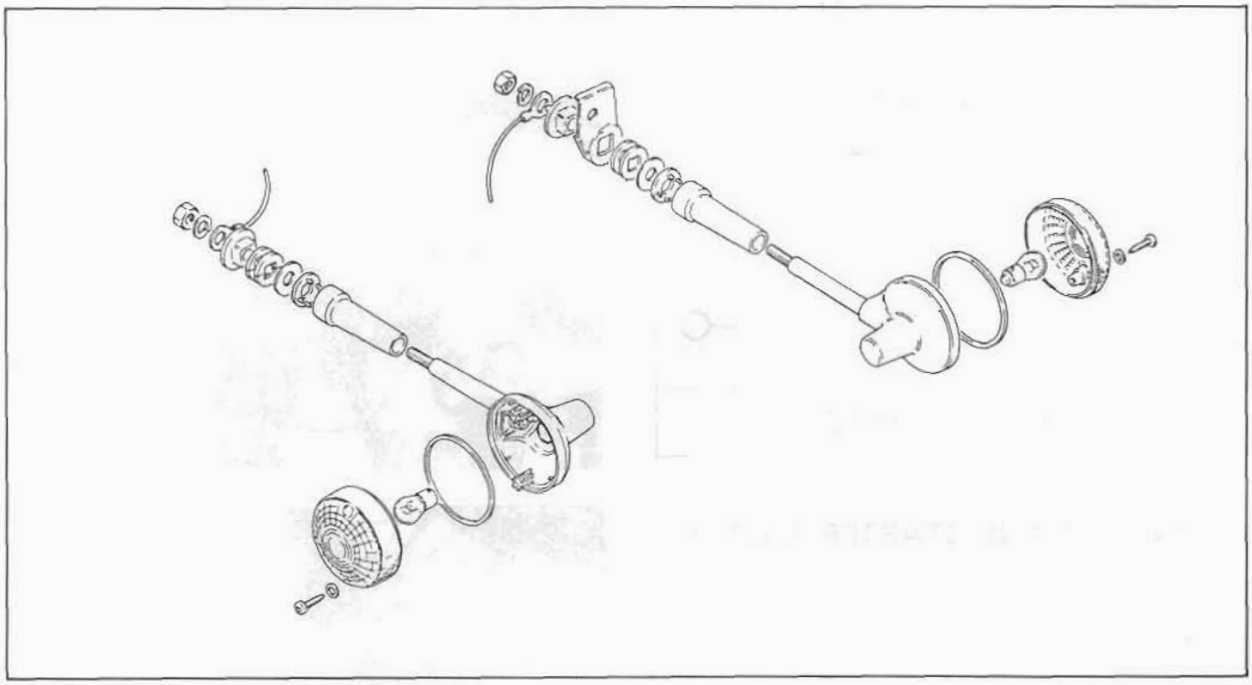
TAIL/BRAKE LIGHT

CAUTION:
Do not overtighten the lens fitting screws.



TURN SIGNAL LIGHT

CAUTION:
Do not overtighten the lens fitting screws.



SWITCHES

Inspect each switches for continuity with the pocket tester referring to the chart. If it is found any abnormality, replace the respective switch assembly with new one.

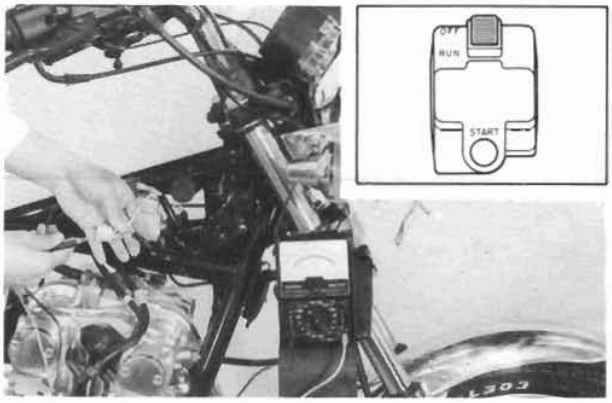
09900 - 25002	Pocket tester

TURN SIGNAL LIGHT SWITCH

	B	Lbl	Lg	O/R	Lg/B	Br/Y	B/W
R SET		○—○		○—○			
R		○—○					
N						○—○	
L	○—○						
L SET	○—○			○—○			

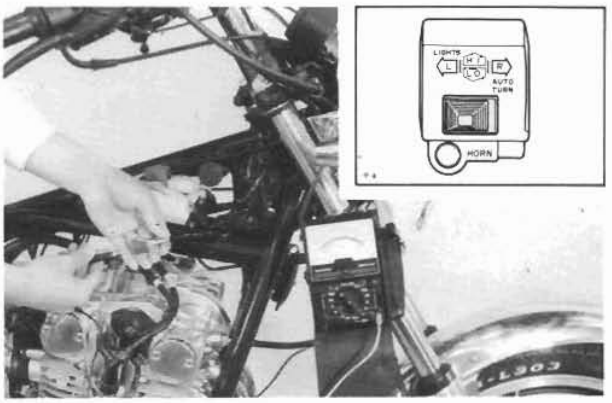
ENGINE KILL AND STARTER SWITCH

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



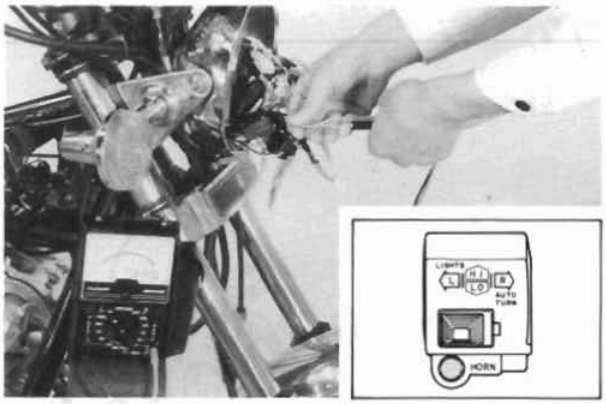
DIMMER SWITCH

	W	Y/W	Y
HI		○—○	
LO	○—○		



HORN SWITCH

	G	B/W
HORN	○	○
OFF		

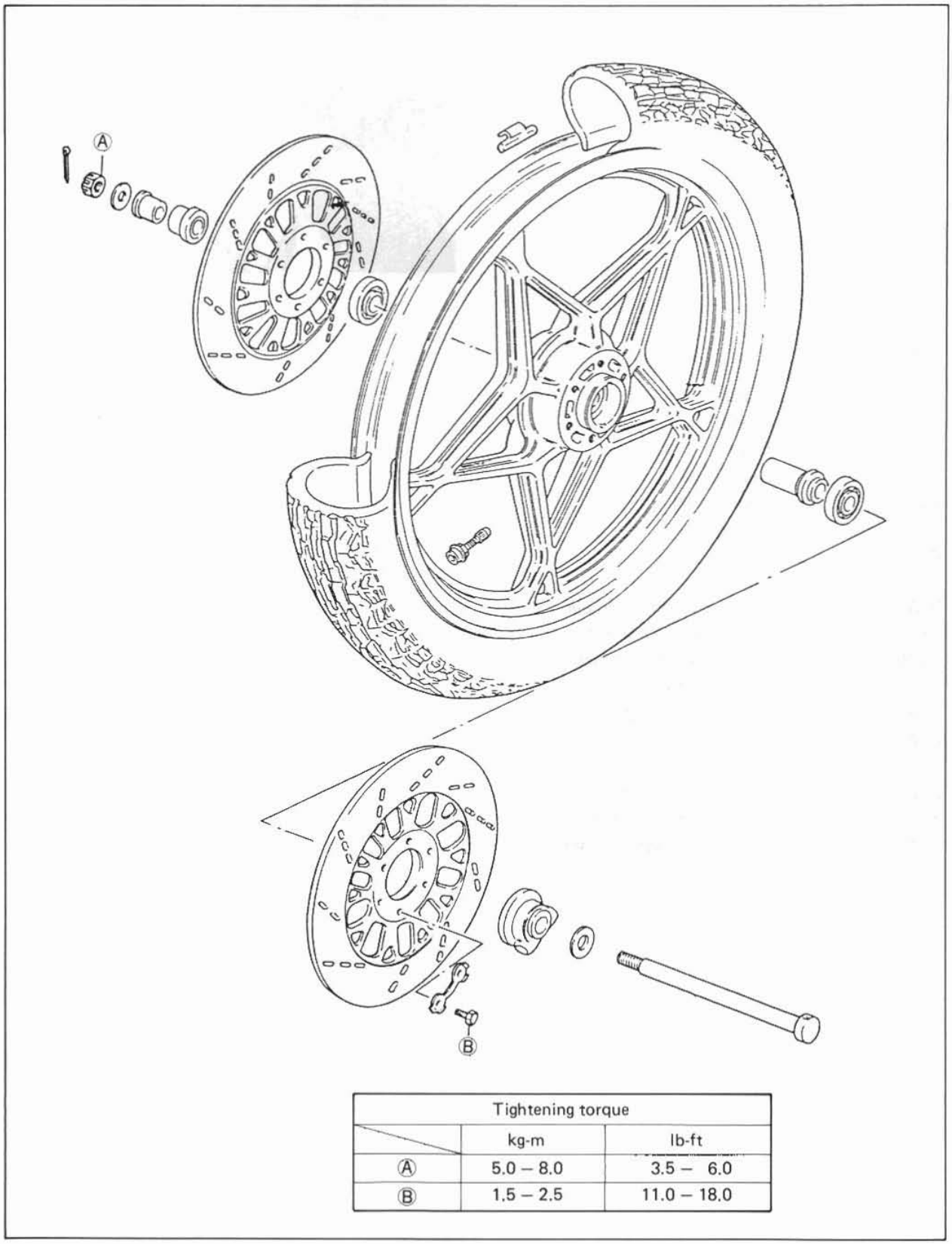


NOTE:

WIRE COLOR

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

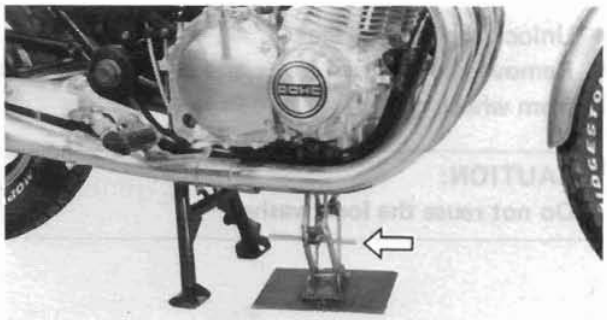
FRONT WHEEL



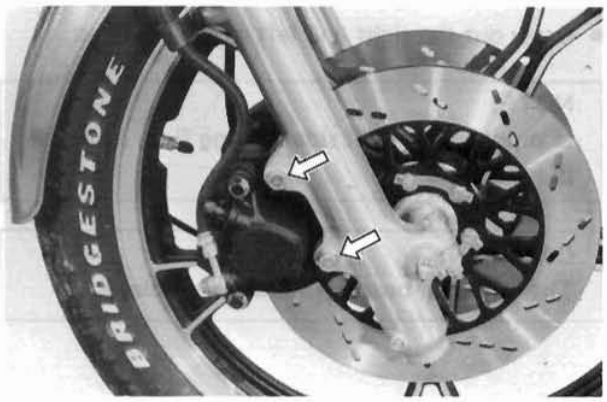
Tightening torque		
	kg-m	lb-ft
Ⓐ	5.0 – 8.0	3.5 – 6.0
Ⓑ	1.5 – 2.5	11.0 – 18.0

REMOVAL

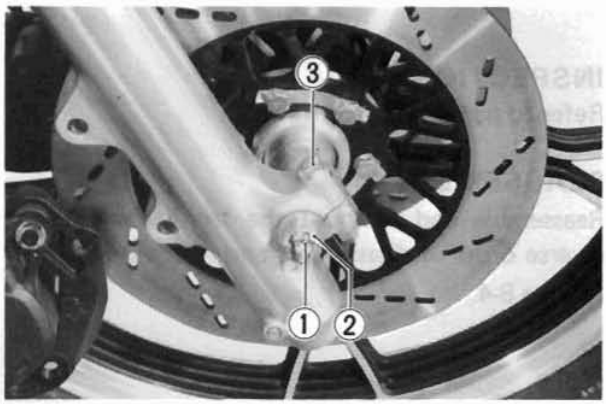
- Support the machine by center stand and jack.



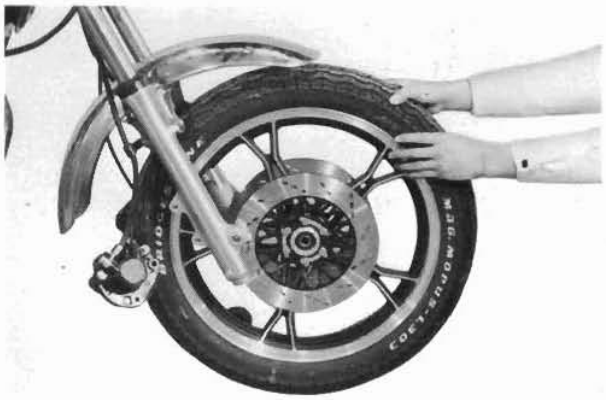
- Remove caliper axle bolts and take off caliper.



- Pull off cotter pin ① and remove axle nut ②.
- Loosen axle pinch bolt ③.

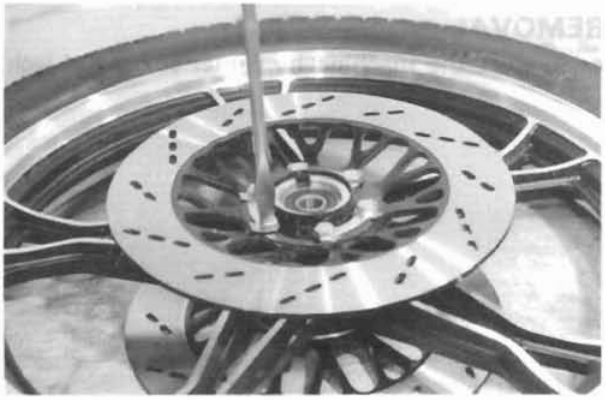


- Draw out axle shaft and take off front wheel.



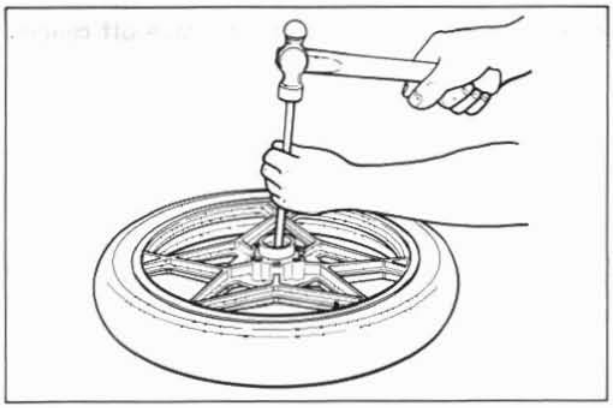
NOTE:
Do not operate the brake lever when removing the front wheel.

- Unlock the lock washer.
- Remove the securing bolts and separate the disc from wheel.



CAUTION:
Do not reuse the lock washer.

- Draw out the right and left wheel bearings.



NOTE:
If draw out the left side bearing first, it makes the job easier.

CAUTION:
The removed bearings should be replaced.

INSPECTION

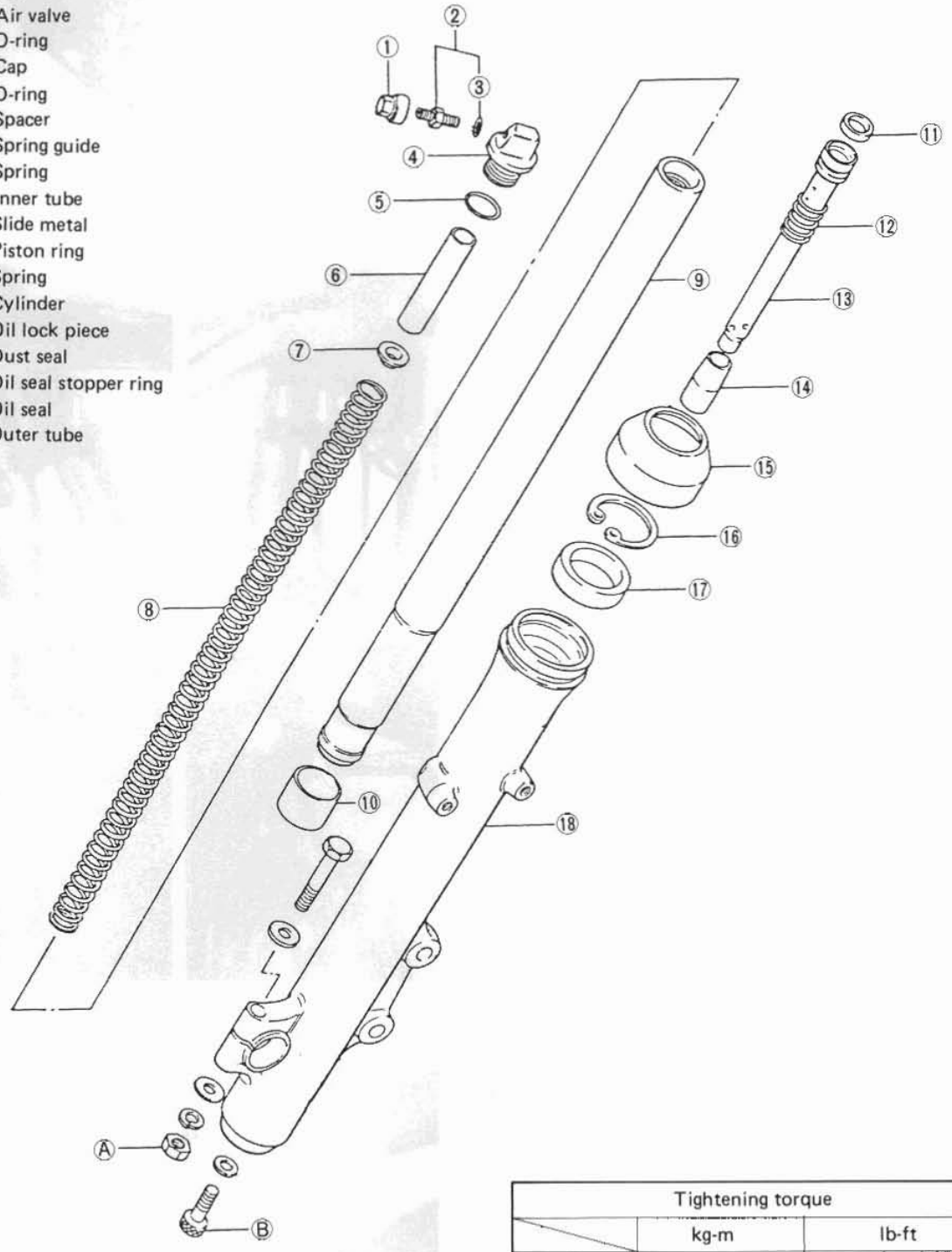
Refer to page 8-3.

REASSEMBLY

Reassemble and remount the front wheel in the reverse order of disassembly and removal, and refer to page 8-4.

FRONT FORK

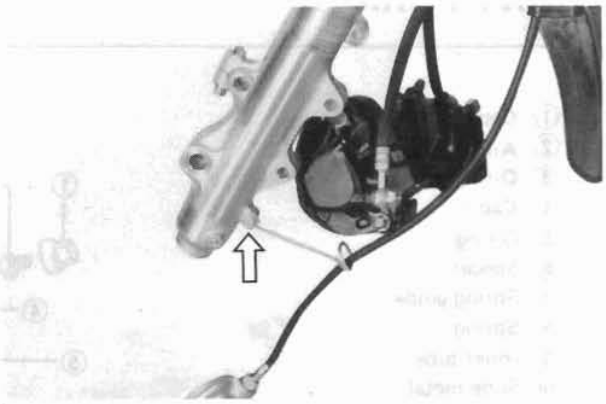
① Cap
② Air valve
③ O-ring
④ Cap
⑤ O-ring
⑥ Spacer
⑦ Spring guide
⑧ Spring
⑨ Inner tube
⑩ Slide metal
⑪ Piston ring
⑫ Spring
⑬ Cylinder
⑭ Oil lock piece
⑮ Dust seal
⑯ Oil seal stopper ring
⑰ Oil seal
⑱ Outer tube



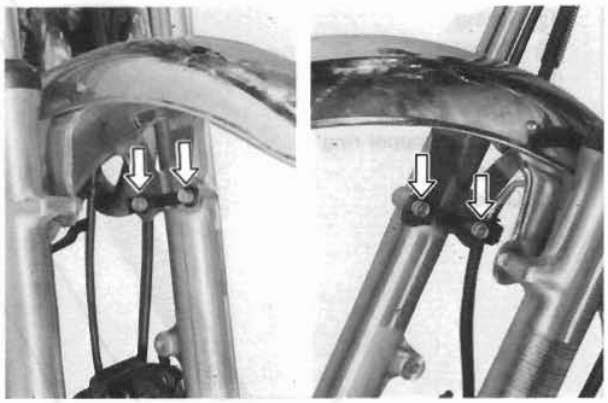
Tightening torque		
	kg-m	lb-ft
Ⓐ	1.5 – 2.5	11.0 – 18.0
Ⓑ	2.0 – 2.6	14.5 – 19.0

REMOVAL

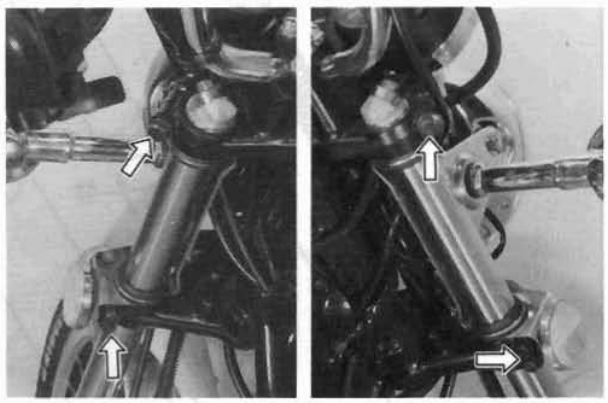
- Remove front wheel (See page 10-11).
- Disconnect speedometer cable guide.



- Remove fender.



- Loosen the front fork clamp bolts upper and lower.



- Pull off front fork.

DISASSEMBLY

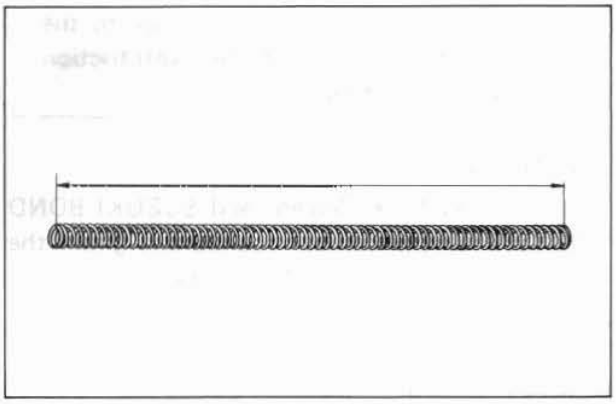
Refer to page 8-15.

INSPECTION

FORK SPRING

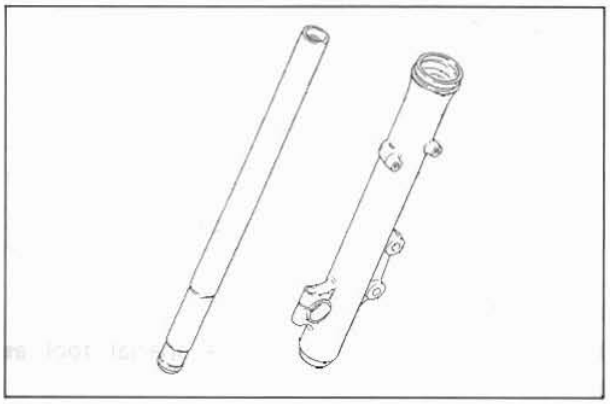
Measure the fork spring free length. If it is shorter than service limit, replace it.

Service Limit	516 mm (20.3 in)



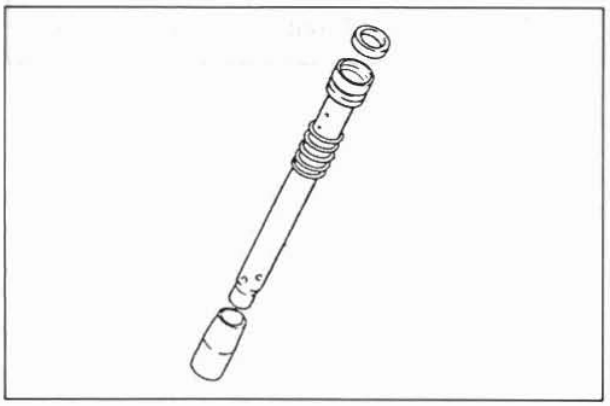
INNER TUBE AND OUTER TUBE

Inspect inner tube sliding surface for any scuffing and check the bent. Inspect outer tube sliding surface for any scuffing.



DAMPER ROD RING

Inspect damper rod ring for wear and damage.



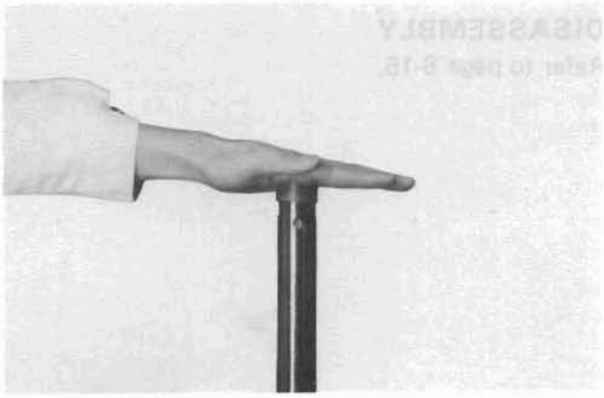
REASSEMBLY

Reassemble and remount the front fork in the reverse order of disassembly and removal, and also carry out the following steps:

INNER TUBE METAL

Hold the inner tube vertically and clean the metal groove.

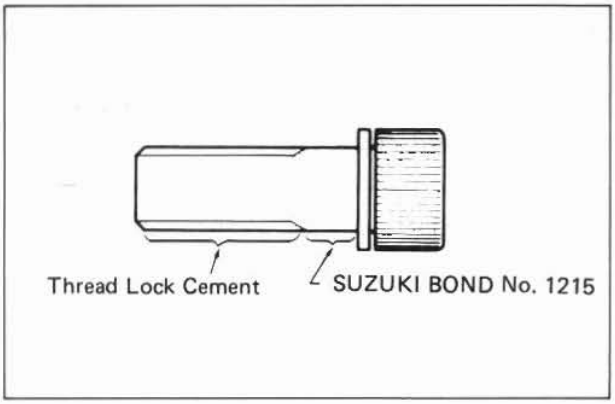
Clean the new metal inner surface and install it to the metal groove of the inner tube as shown.



CAUTION:
Take special care to prevent damage to the Teflon coated surface of the Anti-friction metal when mounting it.

DAMPER ROD BOLT

Apply Thread Lock Cement and SUZUKI BOND NO. 1215 to the damper rod bolt. Tighten the damper rod bolt with specified torque.



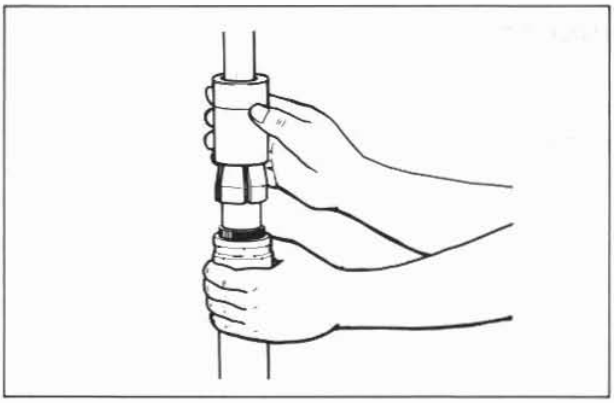
99000 - 32040	Thread Lock Cement
99104 - 31110	SUZUKI BOND NO. 1215

09940 - 34520	"T" handle
09940 - 34561	Attachment "D"
09914 - 25811	"T" type hexagon wrench

Tightening torque	2.0 – 2.6 kg-m (14.5 – 19.0 lb-ft)

OIL SEAL

Mounting oil seal by using the special tool as shown.



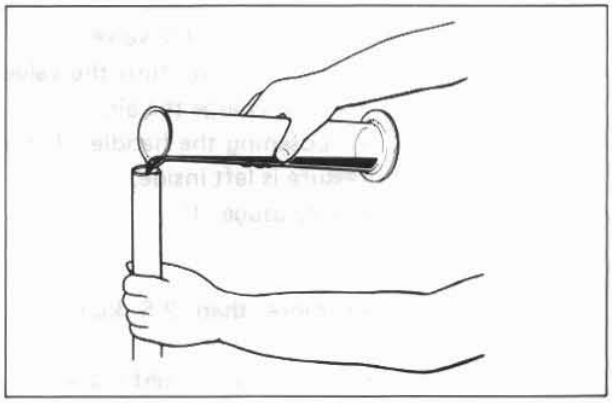
09940 - 50111	Front fork oil seal installer

FORK OIL

For the fork oil, be sure to use a motor oil whose viscocity rating meets specifications below.

Fork oil	Fork oil # 15

Fork oil capacity	245 ml (8.28 US oz)

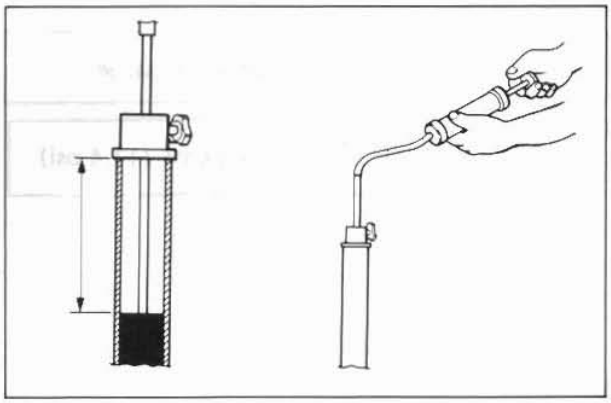


Hold the front fork vertival and adjust the fork oil level with the special tool.

NOTE:
When adjusting oil level, remove the fork spring and compress the inner tube fully.

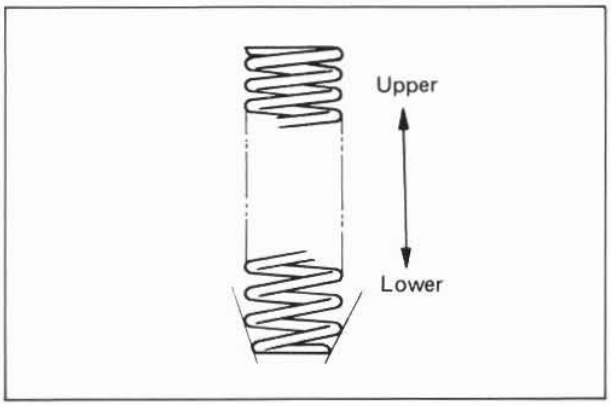
09943 - 74111	Fork oil level gauge

STD oil level	260 mm (10.2 in)



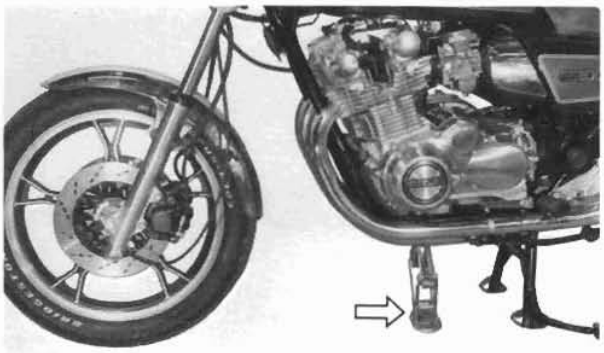
FORK SPRING

When installing the fork small pitch or large pitch end should position in bottom.

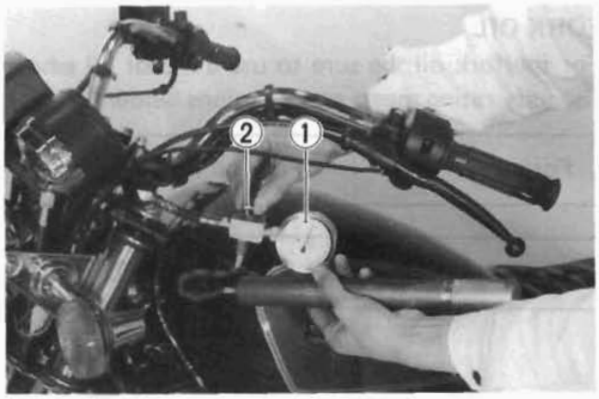


FORK AIR

- Lift up the front wheel by jack.



- Set the air pressure gauge ① to the valve.
- Set the hand pump to the valve, turn the valve handle ② clockwise, and charge the air.
- Let the air out by loosening the handle ② till the specified air pressure is left inside.
- Remove the air pressure gauge ①.

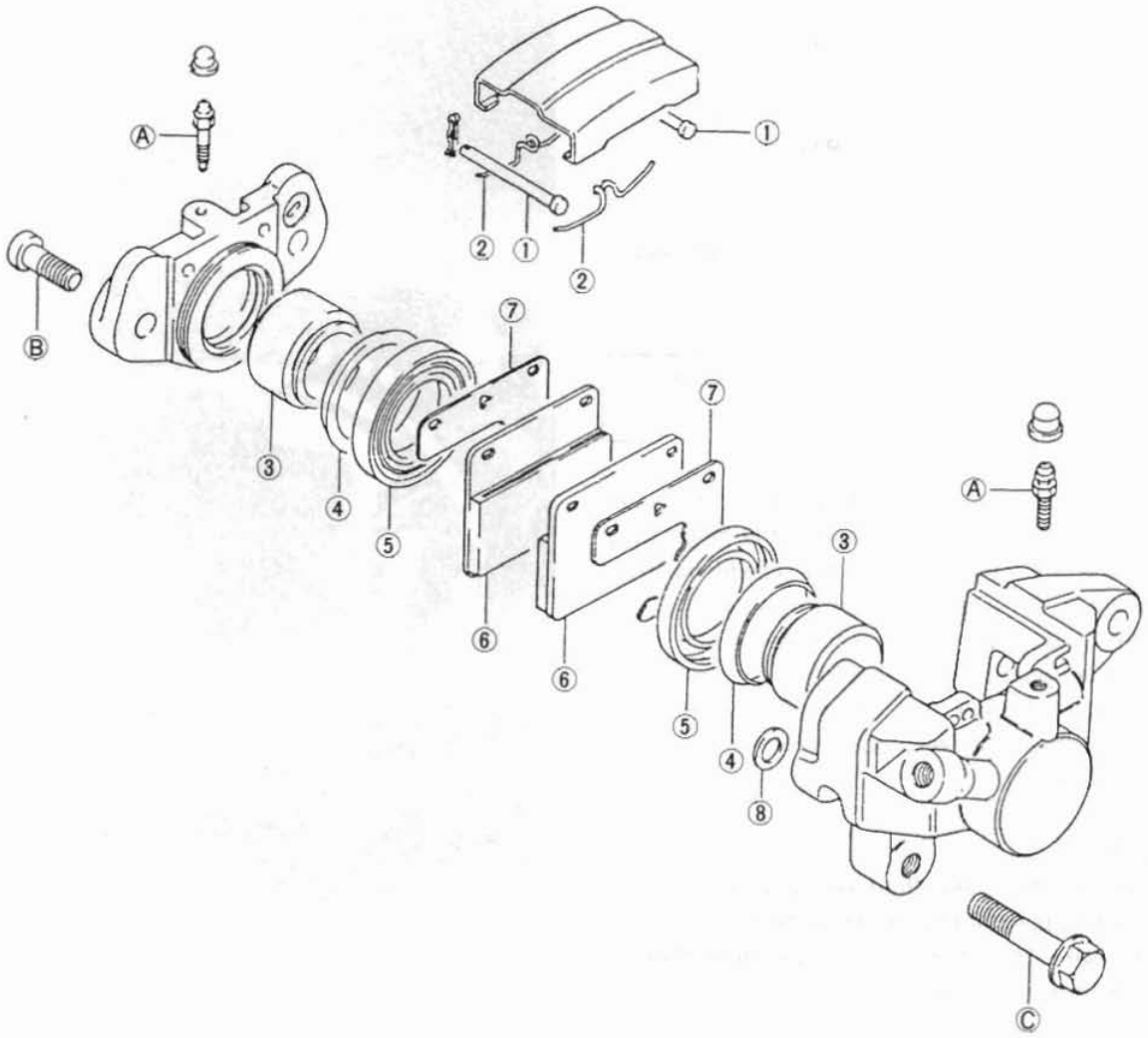


CAUTION:
Do not charge air more than 2.5 kg/cm² (35.6 psi).
Balance the air pressure of both right and left forks.

09940 - 44110	Air pressure gauge

STD Air pressure	0.8 kg/cm² (11.4 psi)

REAR CALIPER



① Pin
② Spring
③ Piston
④ Piston seal
⑤ Piston boot
⑥ Pad
⑦ Shim
⑧ Piston seal

	Tightening torque	
	kg-m	lb-ft
Ⓐ	0.7 – 0.9	5.0 – 6.5
Ⓑ	2.0 – 3.0	14.5 – 21.5
Ⓒ	2.5 – 4.0	14.5 – 29.0

NOTE:
Please refer to the rear brake section of GS1100G when disassembling and reassembling the rear caliper (See page 8-30).

AIR BLEEDING THE BRAKE FLUID CIRCUIT

Brake fluid circuit be purged of air in the following manner:

- Fill up the master cylinder reservoir to the "HIGH" level line. 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.

NOTE:
Bleed air from the inboard valve first, and then from the outboard valve.

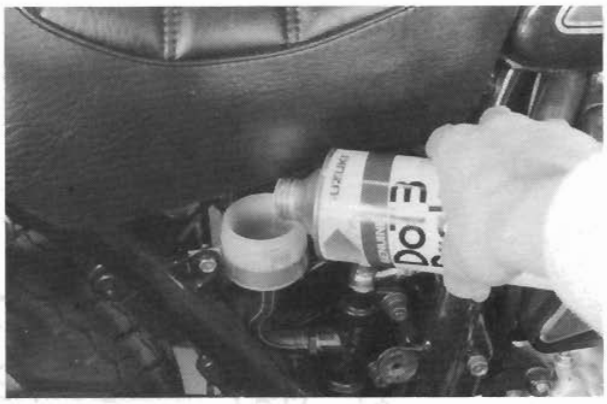
Bleeder valve tightening torque	0.7 – 0.9 kg-m (5.0 – 6.5 lb-ft)

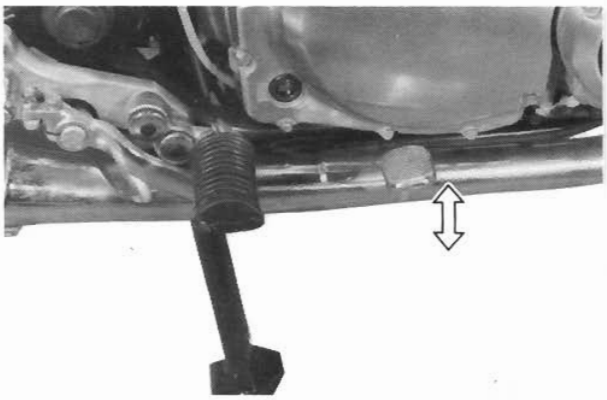
- Depress and release the brake pedal several times in rapid succession, and depress the pedal fully without releasing it. Loosen the bleeder valve by turning it a quarter of a turn or so so that the brake fluid runs into the receptacle. Then, close the valve, pump and depress the pedal, and open the 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.

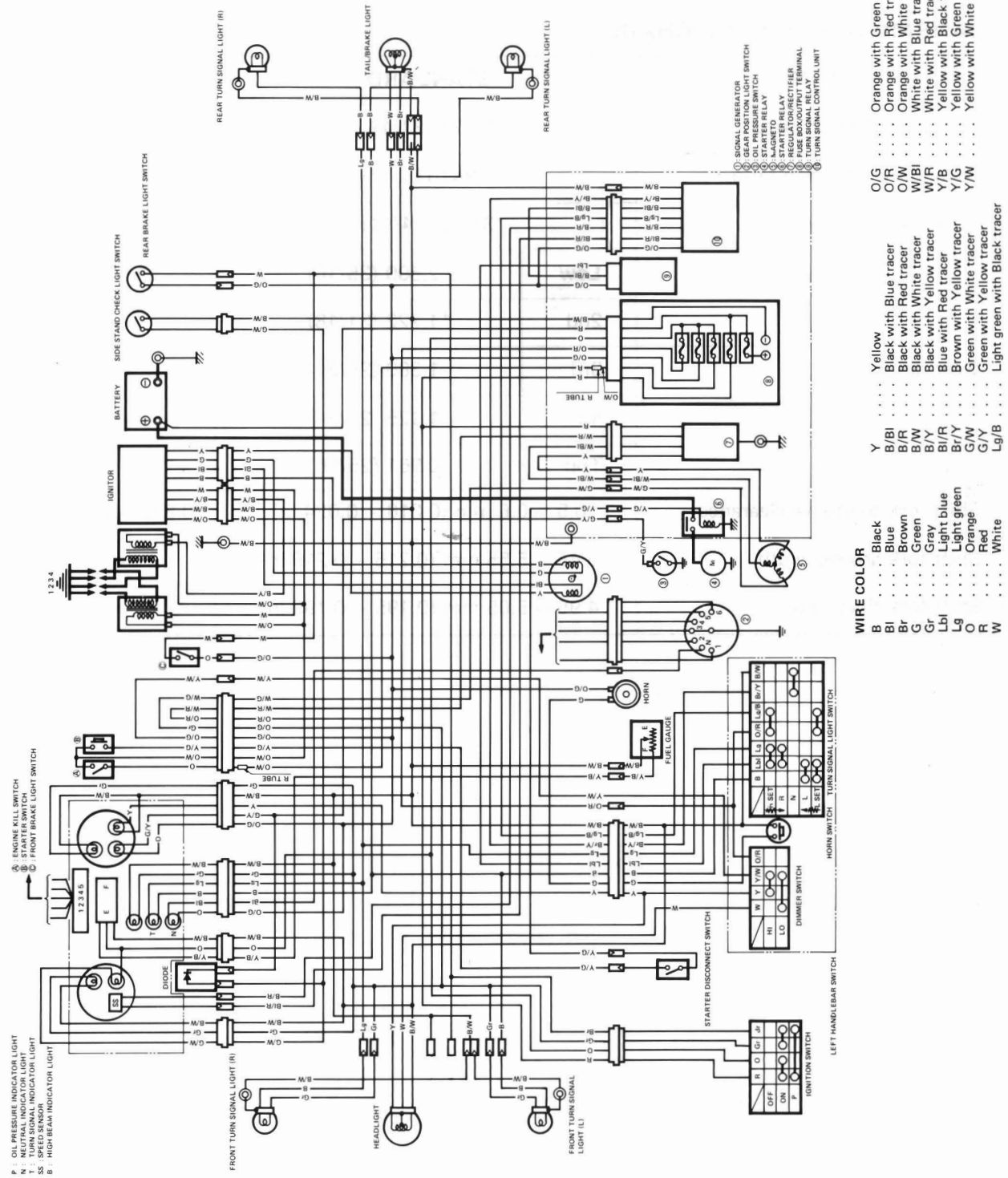
- Close the bleeder valve, and disconnect the pipe. Fill the reservoir to the "HIGH" level line.

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





WIRING DIAGRAM



WIRE COLOR

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

SERVICE DATA

Please refer to the service data of GS1100G except for the service data shown below.

* The asterisk mark indicates GS1100GL specifications.

TRANSMISSION+DRIVE CHAIN

ITEM	STANDARD		LIMIT
Primary reduction ratio	1.775 (87/49)		—
Secondary reduction ratio	0.941 (16/17)		—
Final reduction ratio	3.090 (34/11)		—
	Low	2.500 (35/14)	—
	2nd	*1.722 (31/18)	—
Gear ratios	3rd	1.380 (29/21)	—
	4th	1.125 (27/24)	—
	Top	0.961 (25/26)	—
Shift fork to groove clearance	0.5 – 0.6 mm (0.016 – 0.024 in)		0.8 mm (0.031 in)
Shift fork groove width	5.45 – 5.55 mm (0.215 – 0.219 in)		—
Shift fork thickness	4.95 – 5.05 mm (0.195 – 0.199 in)		—

BRAKE+WHEEL

Unit: mm (in)

ITEM		STANDARD	LIMIT
Rear brake pedal height		20 (0.8)	—
Brake disc thickness	Front	5.0 ± 0.2 (0.20 ± 0.008)	4.5 (0.18)
	Rear	6.7 ± 0.2 (0.26 ± 0.008)	6.0 (0.24)
Brake disc runout		—	0.30 (0.012)
Master cylinder bore	Front	15.870 – 15.913 (0.6248 – 0.6265)	—
	Rear	14.000 – 14.043 (0.5512 – 0.5529)	—
Master cylinder piston diam.	Front	15.827 – 15.854 (0.6231 – 0.6242)	—
	Rear	13.957 – 13.984 (0.5495 – 0.5506)	—
Brake caliper cylinder bore	Front	38.180 – 38.256 (1.5031 – 1.5061)	—
	Rear	38.180 – 38.256 (1.5031 – 1.5061)	—
Brake caliper piston diam.	Front	38.098 – 38.148 (1.4998 – 1.5019)	—
	Rear	38.098 – 38.148 (1.4998 – 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	* 100/90-19 57H	—
	Rear	* 130/90-16 67H	—
Tire tread depth	Front	—	1.6 (0.06)
	Rear	—	2.0 (0.08)

SUSPENSION

Unit: mm (in)

ITEM	STANDARD	LIMIT
Front fork stroke	160 (6.3)	—
Front fork spring free length	—	* 516 (20.3)
Front fork oil level	* 260 (10.2)	—
Front fork air pressure	* 0.8 kg/cm^2 (11.4 psi)	—
Rear wheel travel	109 (4.3)	—

FUEL+OIL

ITEM	SPECIFICATION	
Fuel type	Use only unleaded or low-lead type gasoline of at least 85 – 95 pump octane ($\frac{R+M}{2}$ mehtod) or 89 octane or higher rated by the Research Method.	
Fuel tank including reserve	* 17 L (4.5 US gal)	
reserve	* 4.5 L (4.76 US qt)	
Engine oil type	SAE 10W/40 of SE or SF	
Engine oil capacity	Change	3 000 ml (3.17 US qt)
	Filter change	3 300 ml (3.49 US qt)
	Overhaul	3 700 ml (3.91 US qt)
Front fork oil type	Fork oil #15	
Front fork oil capacity (each leg)	* 245 ml (8.28 US oz)	
Bevel gear oil type	Hypoid gear oil SAE #90, API grade GL-5	
Bevel gear oil capacity	Secondary	340 – 400 ml (11.5 – 13.5 US oz)
	Final	280 – 330 ml (9.5 – 11.2 US oz)
Brake fluid type	DOT3, DOT4	

TIRE PRESSURE

COLD INFLATION TIRE PRESSURE	NORMAL RIDING				CONTINUOUS HIGH-SPEED RIDING			
	SOLO RIDING		DUAL RIDING		SOLO RIDING		DUAL RIDING	
	kg/cm^2	psi	kg/cm^2	psi	kg/cm^2	psi	kg/cm^2	psi
FRONT	1.75	24	1.75	24	2.00	28	*2.25	*32
REAR	2.00	28	*2.50	*36	2.25	32	2.80	40

WATTAGE

Unit: W (cp)

ITEM		SPECIFICATION
Headlight	HI	60
	LO	55
Tail/Brake light		8/23 (3/32)
Front turn signal/running light		23/8
Rear turn signal light		23 (32)
Speedometer light		3.4
Tachometer light		3.4
Turn signal indicator light		3.4
High beam indicator light		3.4
Neutral indicator light		3.4
Oil pressure indicator light		3.4
Gear position indicator light		1.12 x 5 pcs
Side stand check light		3.4
Fuel meter light		1.7

Prepared by

SUZUKI MOTOR CO.,LTD.

Administration Department
Overseas Service Division

April, 1982

Manual No. 99500–39020–03E(英)
Printed in Japan

SUZUKI

GS1100GK

SUPPLEMENTARY SERVICE MANUAL

USE THIS MANUAL WITH:
* GS1100G SERVICE MANUAL (99500-39020-03E)

99501-39030-03E
(英)

GS1100GK SUZUKI MOTOR CO., LTD. MAY, '82 PRINTED IN JAPAN 99501-39030-03E

GS1100GK

FOREWORD

This supplementary service manual describes service data and servicing procedures which differ from those of the GS1100G.

This manual has been written primarily for the experienced Suzuki mechanic but will also be very useful even for the apprentice mechanic and do-it-yourself mechanics. The entire manual should be thoroughly reviewed before any servicing is performed.

Please also refer to the GS1100G (1982 MODEL) Service Manual (99500-39020-03E).

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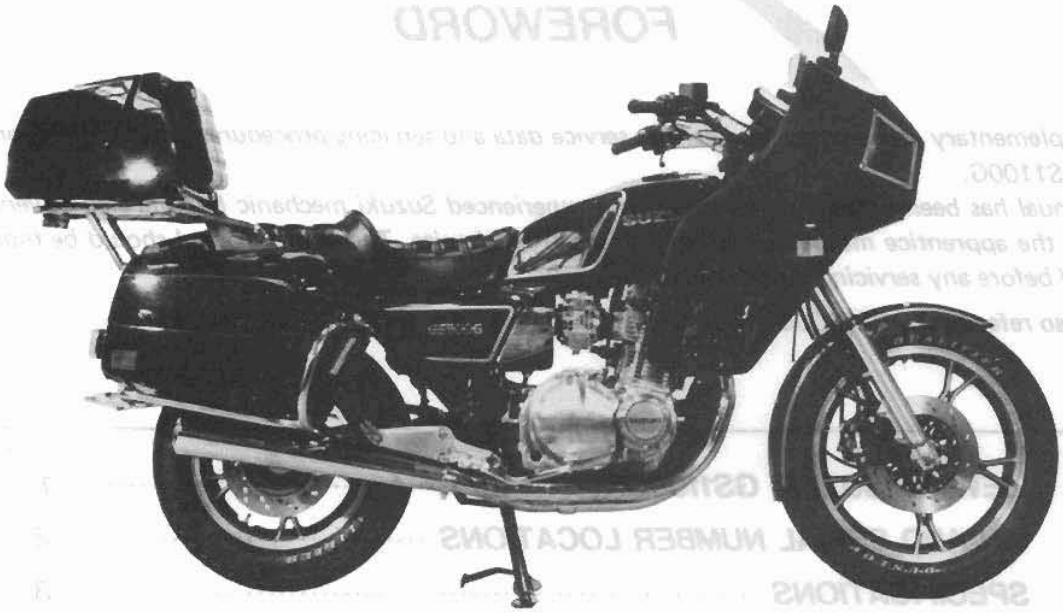
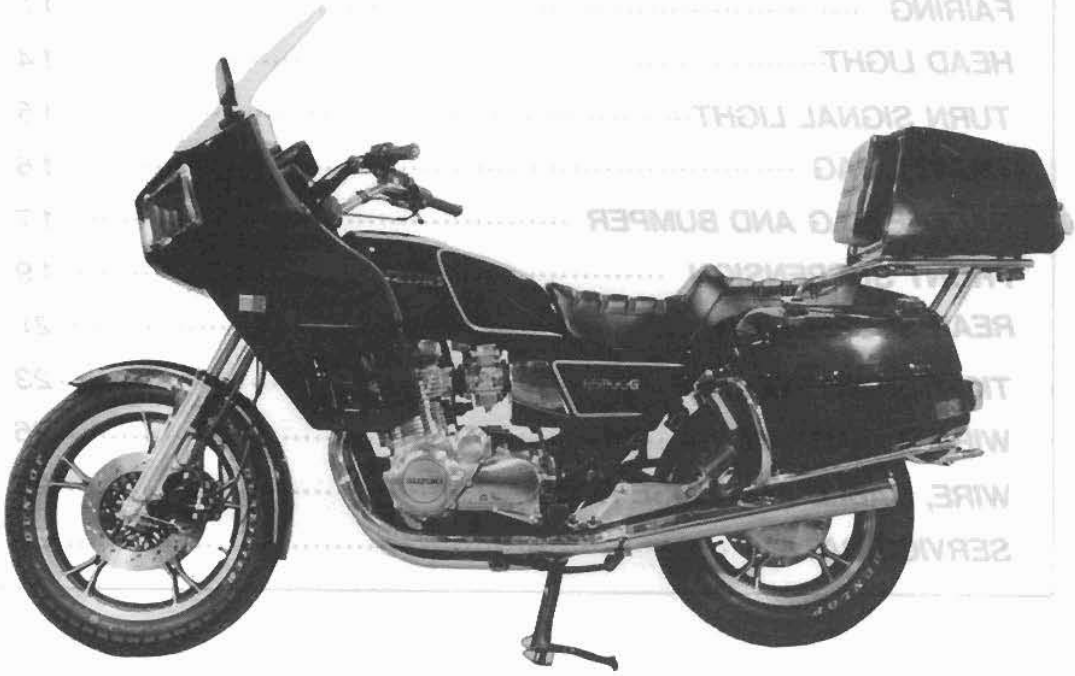
VIEW OF SUZUKI GS1100GK



RIGHT SIDE

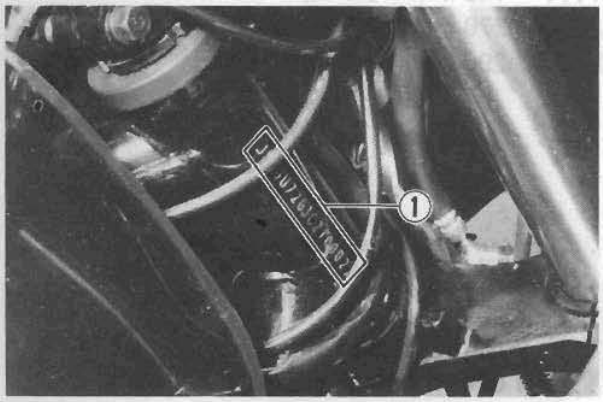


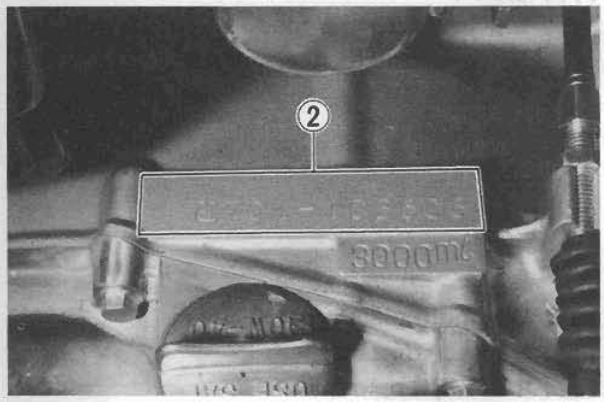
LEFT SIDE

VIN AND SERIAL NUMBER LOCATIONS

The VIN number ① is stamped on the steering head pipe. The engine serial number ② is located on the crankcase.

These numbers are required especially for registering the machine and ordering spare parts.





SPECIFICATIONS

DIMENSIONS AND DRY MASS

Overall length	2 490 mm (98.0 in)
Overall width	930 mm (36.6 in)
Overall height	1 545 mm (60.8 in)
Wheelbase	1 495 mm (58.9 in)
Ground clearance	145 mm (5.7 in)
Seat height	770 mm (30.3 in)
Dry mass	290 kg (439 lbs)

ENGINE

Type	Four-stroke, air-cooled, DOHC
Number of cylinders	4
Bore	72.0 mm (2.835 in)
Stroke	66.0 mm (2.598 in)
Piston displacement	1 074 cm^3 (65.5 cu. in)
Compression ratio	8.8 : 1
Carburetor	MIKUNI BS34SS, four
Air cleaner	Polyurethane foam 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	1.775 (87/49)
Secondary reduction	0.941 (16/17)
Final reduction	3.090 (34/11)
Gear ratios, Low	2.500 (35/14)
2nd	1.722 (31/18)
3rd	1.380 (29/21)
4th	1.125 (27/24)
Top	0.961 (25/26)
Drive system	Shaft drive

ELECTRICAL

Ignition type	Transistorized
Ignition timing	17° B.T.D.C. below 1 500 r/min and 37° B.T.D.C. above 2 350 r/min
Spark plug	NGK B8ES or NIPPON DENSO W24ES-U
Battery	12V 50.4 kC (14 Ah)/10 HR
Generator	Three phase A.C. generator
Fuse	10/10/10/15/10A
Headlight	12V 60/55W
Tail/Brake light	12V 8/23W
Turn signal light	12V 8/23W (FRONT) 12V 23W (REAR)
License plate light	12V 8W
Speedometer light	12V 3.4W x 2 pcs
Tachometer/Fuel meter light	12V 3.4W
Neutral indicator light	12V 3.4W
High beam indicator light	12V 3.4W
Turn signal indicator light	12V 3.4W
Oil pressure indicator light	12V 3.4W
Side stand check light	12V 3.4W
Gear position indicator light	12V 1.12W x 5 pcs

CHASSIS

Front suspension	Telescopic, pneumatic/coil spring, oil dampened
Rear suspension	Swinging arm, pneumatic/coil spring, oil damper 4-way adjustable
Steering angle	40° (Right & Left)
Caster	61° 95′
Trail	118 mm (4.65 in)
Turning radius	2.6 m (8.5 ft)
Front brake	Disc brake
Rear brake	Disc brake
Front tire size	110/90-19 62H
Rear tire size	130/90-16 67H

CAPACTIES

Fuel tank including reserve	22 L (5.8 US gal)
reserve	4.2 L (4.4 US qt)
Engine oil	3.0 L (3.2 US qt)
Front fork oil	363 ml (12.67 US oz)
Secondary bevel gear oil	340 – 400 ml (11.5 – 13.5 US oz)
Final bevel gear oil	280 – 330 ml (9.5 – 11.2 US oz)

Specifications subject to change without notice.

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 kilometers, miles and time for your convenience.

PERIODIC MAINTENANCE CHART

INTERVAL: THIS INTERVAL SHOULD BE JUDGED BY ODO-METER READING OR MONTHS, WHICHEVER COMES FIRST.						
	miles	600	4,000	7,500	11,000	15,000
	km	1,000	6,000	12,000	18,000	24,000
	months	2	12	24	36	48
Battery (Specific gravity of electrolyte)		–	I	I	I	I
Cylinder head nuts & exhaust pipe bolts		T	T	T	T	T
Air cleaner element		–	C	C	C	C
Tappet clearances		I	I	I	I	I
Spark plugs		–	C	R	C	R
Fuel line		I	I	I	I	I
		Replace every four years.				
*Engine oil and oil filter		R	R	R	R	R
*Carburetor idle rpm		I	I	I	I	I
Clutch		I	I	I	I	I
Secondary and Final Gear oil		Change oil at initial 600 miles (1,000 km) and thereafter every 7,500 miles (12,000 km)				
Brake hoses		I	I	I	I	I
		Replace every four years.				
Brake fluid		Change every two years.				
Brakes		I	I	I	I	I
Tires		I	I	I	I	I
Steering stem		I	I	I	I	I
Chassis bolts and nuts		T	T	T	T	T
Front fork and rear suspension		–	–	I	–	I
		Check air pressure every 6 months.				

NOTE: T = Tighten, I = Inspect, R = Replace, C = Clean
** = Appears on the vehicle emission control information label.*

EMISSION CONTROL & REGULATIONS

EMISSION REGULATIONS

On February 4, 1977, Federal Emission Regulations for motorcycles that may be licensable took effect. The regulations provided for a gradual, multi-step application of stricter emission limits beginning with all effected motorcycles manufactured after January 1, 1978, culminating with the present 1980 emission level restrictions. For the 1980 and succeeding years one set of emission limits will be in effect. They are as follows:

1980 EMISSION LIMITS

CATEGORIES	HYDROCARBONS (HC)	CARBON MONOXIDE
All motorcycles 50 cc – Larger	5.0 Grams/Kilometer (8.0 Grams/Mile)	12 Grams/Kilometer (19.3 Grams/Mile)

Emission-controlled motorcycles which are subject to the emission regulations are those motorcycles which are equipped with a headlight, taillight, stop light and which have an engine displacement larger than 50 cc.

Suzuki Motor Company performed all the necessary testing and certification of emission-controlled models in strict compliance with the E.P.A. testing regulations. Suzuki motorcycle dealers are not required to either test or certify emission levels on any motorcycles as Suzuki Motor Company is legally responsible for the entire certification procedure.

E.P.A. regulations also provide fines for individuals who alter, render inoperative or improperly service emission-controlled motorcycles ranging up to $10,000.00 per motorcycle. It is essential that the individual servicing this emission-controlled motorcycle review thoroughly all the service procedures presented in this manual. Under no circumstances should the recommended service procedures be deviated from nor adjustments made which are not in accordance with the factory specifications or service procedures.

EMISSION CONTROL CARBURETOR COMPONENTS

GS1100GK motorcycles are equipped with precision, manufactured carburetors for emission level control. These carburetors require spacial 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 GS1100GK are as follows.

Carburetor I.D. No.	Main Jet	Needle Jet	Jet Needle	Pilot Jet	Pilot Screw
49400	#115	X-3	5D58	#40	PRE-SET DO NOT ADJUST

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, interfering 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.

GENERAL EMISSION INFORMATION

There are three different types of regulated exhaust emissions. They are:

Hydrocarbons (HC)
Carbon Monoxide (CO)
Oxides of Nitrogen (NOx)

Automobiles must meet specific emission standards for all three of these pollutants. Motorcycles must only meet the requirements for the following:

Hydrocarbons (HC)
Carbon Monoxide (CO)

HC exhaust emissions are basically unburned fuel vapors which have passed through the engine and escaped the combustion process.

CO exhaust emissions are formed during an incomplete combustion cycle as a result of a rich air/fuel mixture. The only way that CO can be produced is by the combustion cycle.

Total NOx emissions from all motorcycles is considered negligible. The EPA states that total NOx emission from motorcycles by 1990 will only amount to approximately 0.5%. NOx is formed during the combustion process at high combustion chamber temperatures.

CARBON MONOXIDE

Carbon monoxide is a product of an incomplete combustion cycle. CO is measured in grams per mile or kilometer and also in percentage (%).

The most common cause of CO is rich carburetion. As the mixture is richened excessively, the CO amount increases proportionately. Engine oil is also a hydrocarbon, so engine problems which lead to oil burning increase carbon monoxide.

CARBURETION MALFUNCTION

1. Air Cleaner – Dirty or over oiled.
2. Idle Mixture – Adjusted incorrectly.
3. Idle Speed – Too high or low.
4. Fuel Level – Sticking float, leaking needle, incorrect setting.
5. Choke – Leaking or linkage sticking.
6. Synchronization – Improper balance on multi cylinders.

ENGINE MALFUNCTION

1. Valve Seals – Leaking or torn.
2. Valve Guide – Worn and leaking excess oil.
3. Gaskets – Leaking oil into combustion chamber.

HYDROCARBONS

Hydrocarbons are unburnt gasoline vapors and can be measured in two different ways. The first is to measure the weight of the pollutants over a specific distance such as grams per mile or grams per kilometer. The second method is to measure the concentration of HC in the exhaust gas in parts per million (PPM).

The most common cause of high HC emissions are ignition system problems. If the ignition system fails to ignite the fuel mixture properly, then raw gasoline vapors will pass through the engine into the exhaust system. Listed are the most common ignition problems which occur and which can affect HC emission output.

IGNITION SYSTEM MALFUNCTIONS

1. Spark Plugs – Fouled, dirty, improper type or improperly gapped.
2. Ignition Timing – Advanced or Retarded.
3. Timing Advance – Too fast or too slow an advance rate.
4. Battery – Low charge or faulty.

Carburetion can also lead to high HC emissions if the mixture is either excessively rich or excessively lean.

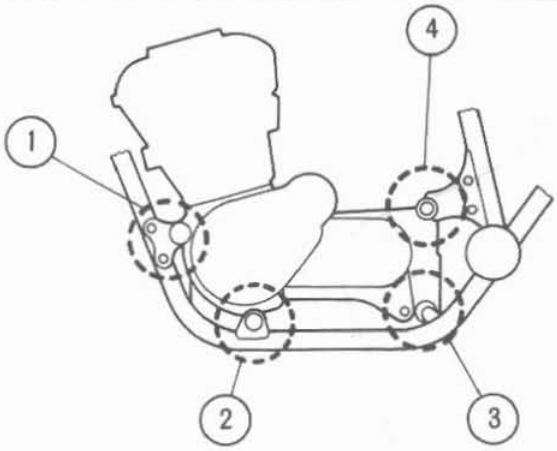
MIXTURE-RELATED MALFUNCTIONS

1. Air Cleaner – Dirty, over oiled or torn.
2. Jets – Clogged, restricted or incorrect size.
3. Float Level – Level too low (lean) or too high (rich).
4. Choke – Leaking choke plunger or sticking linkage.
5. Air Leaks – Intake manifolds, engine gaskets and other sealing surfaces.
6. Synchronization – Unbalanced on multi-cylinder machines.
7. Exhaust System – Restricted flow or improper exhaust system.

Engine wear or damage can also cause high HC emissions.

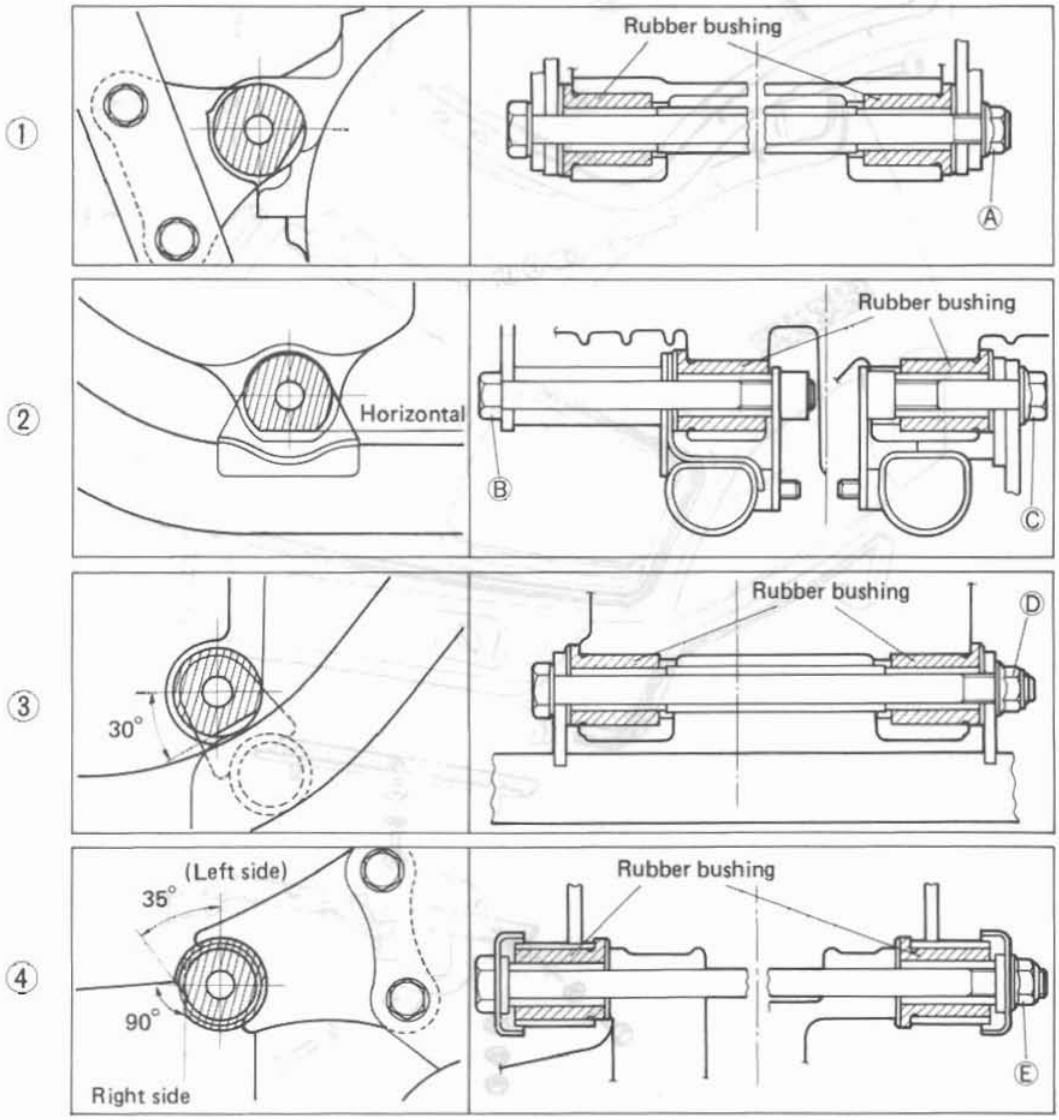
1. Rings – Low compression, leakage into crankcase.
2. Valves – Improper adjustment, bent stem or burnt.
3. Gaskets – Leaking, loss of compression.
4. Crank Seals – Leaking.
5. Oil Consumption – Worn valve guides, worn rings, clogged crankcase breather.
6. Oil – Improper engine oil.

ENGINE MOUNTING



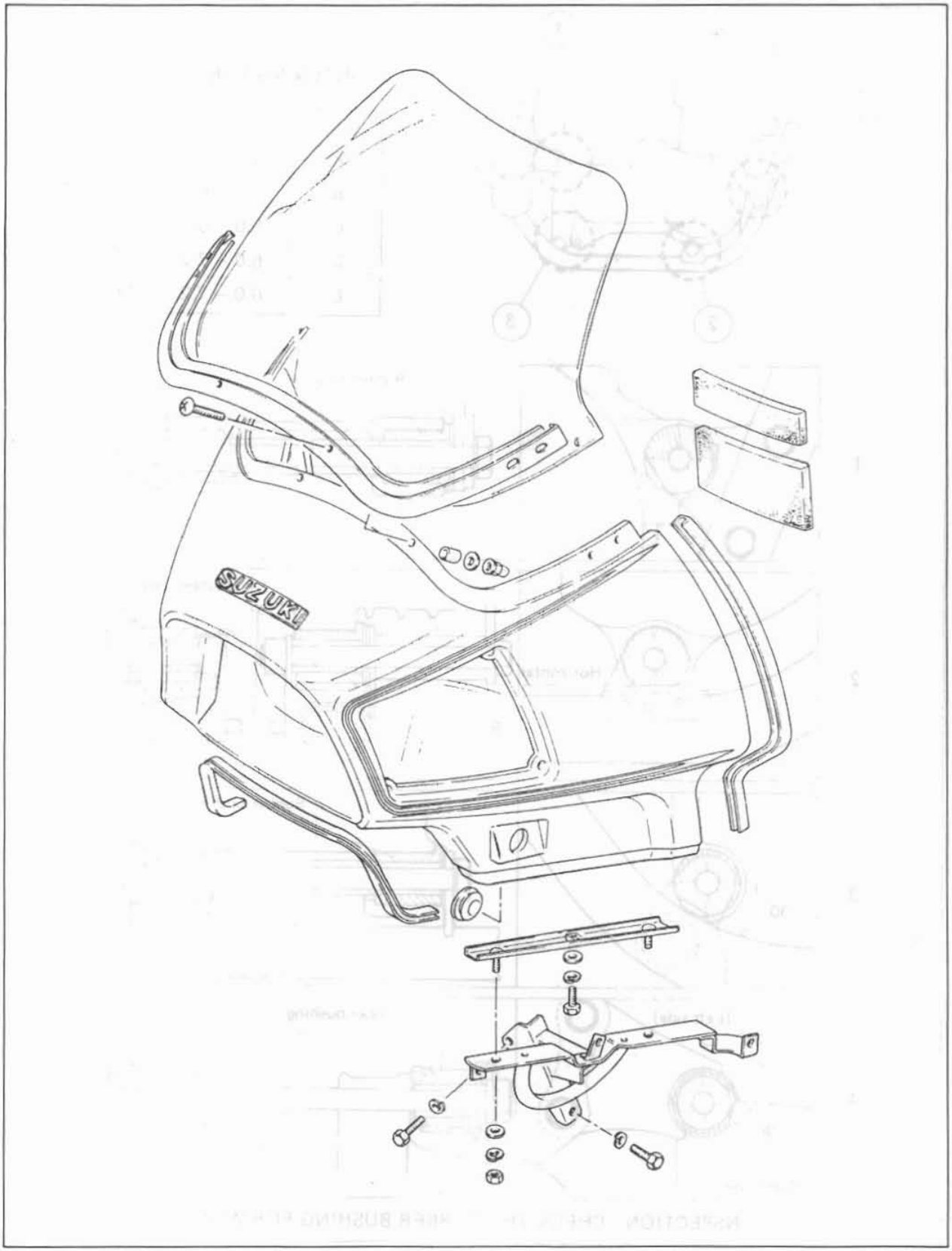
TIGHTENING TORQUE

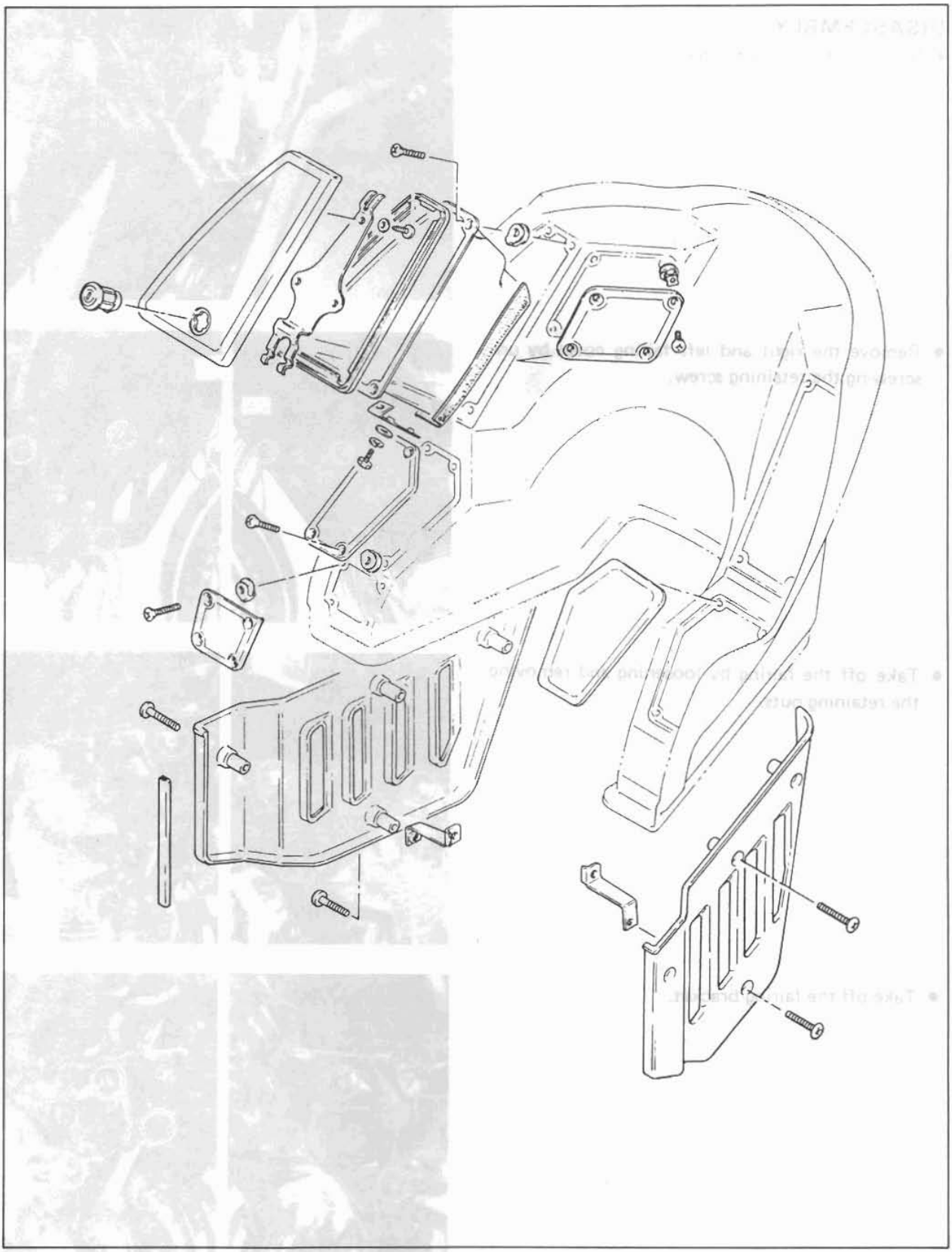
	kg-m	lb-ft
Ⓐ	6.0 – 7.2	43.5 – 52.0
Ⓑ	5.0 – 6.0	36.0 – 43.5
Ⓒ	5.0 – 6.0	36.0 – 43.5
Ⓓ	6.0 – 7.2	43.5 – 52.0
Ⓔ	6.0 – 7.2	43.5 – 52.0



INSPECTION : CHECK THE RUBBER BUSHING FOR WEAR

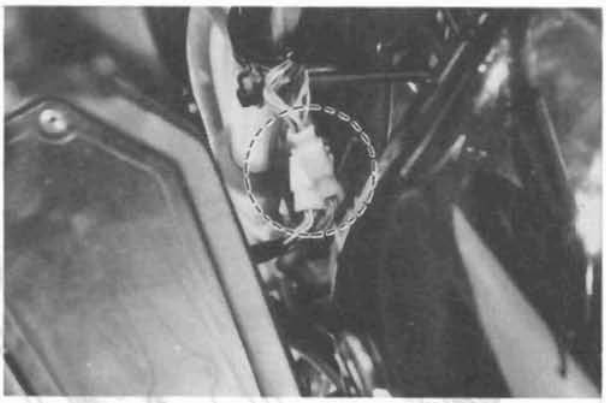
FAIRING



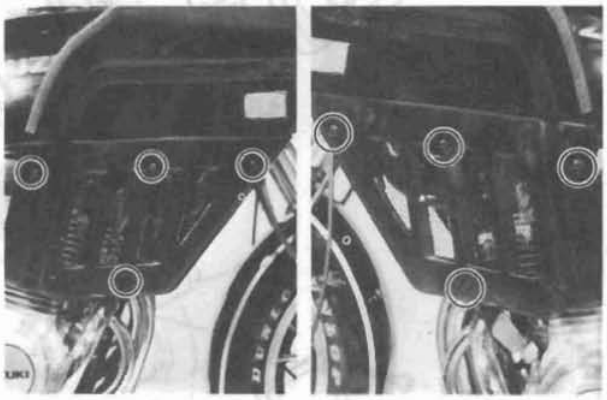


DISASSEMBLY

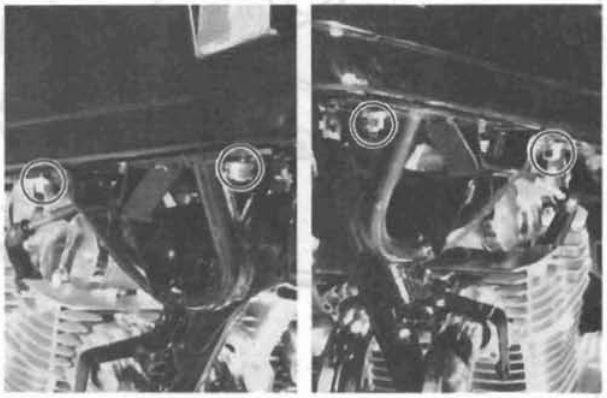
- Disconnect the wire harness.



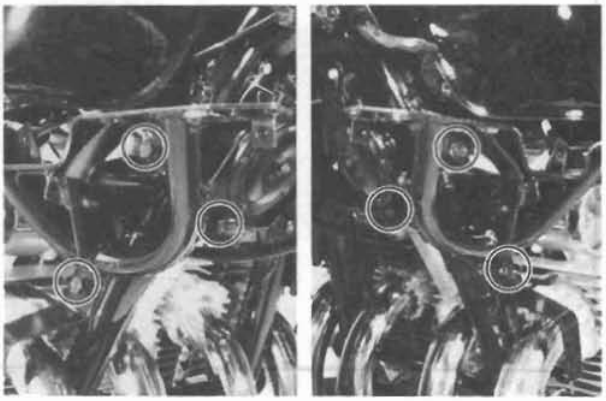
- Remove the right and left fairing cover by unscrewing the retaining screw.



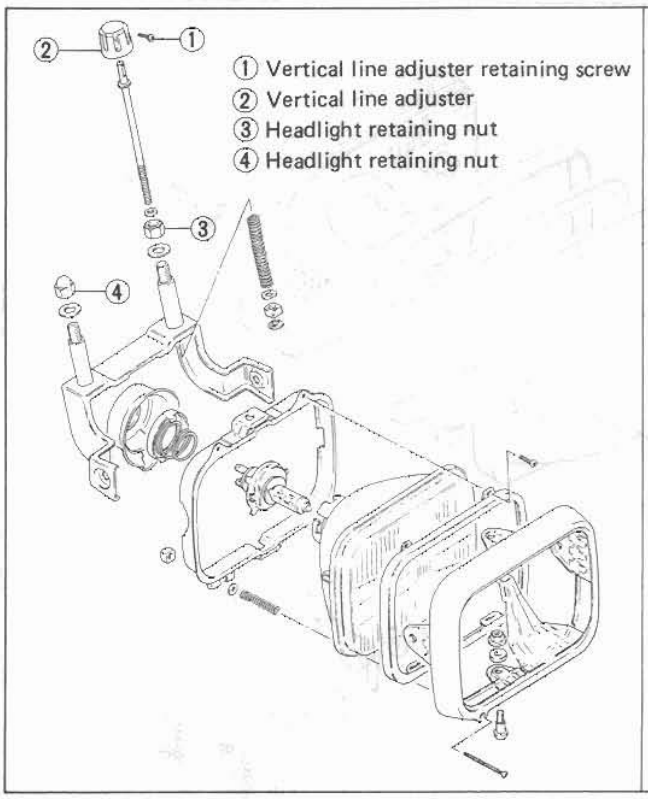
- Take off the fairing by loosening and removing the retaining nuts.

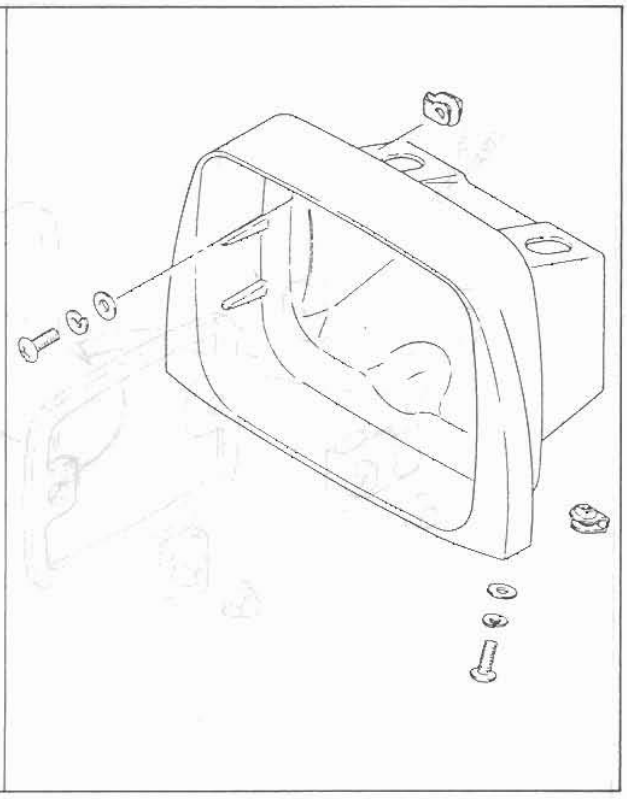


- Take off the fairing bracket.



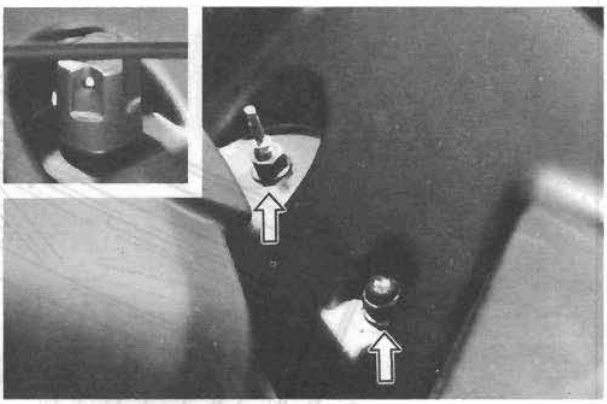
HEADLIGHT



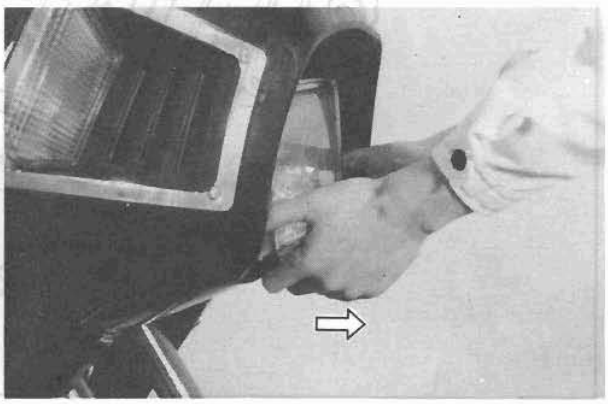


DISASSEMBLY

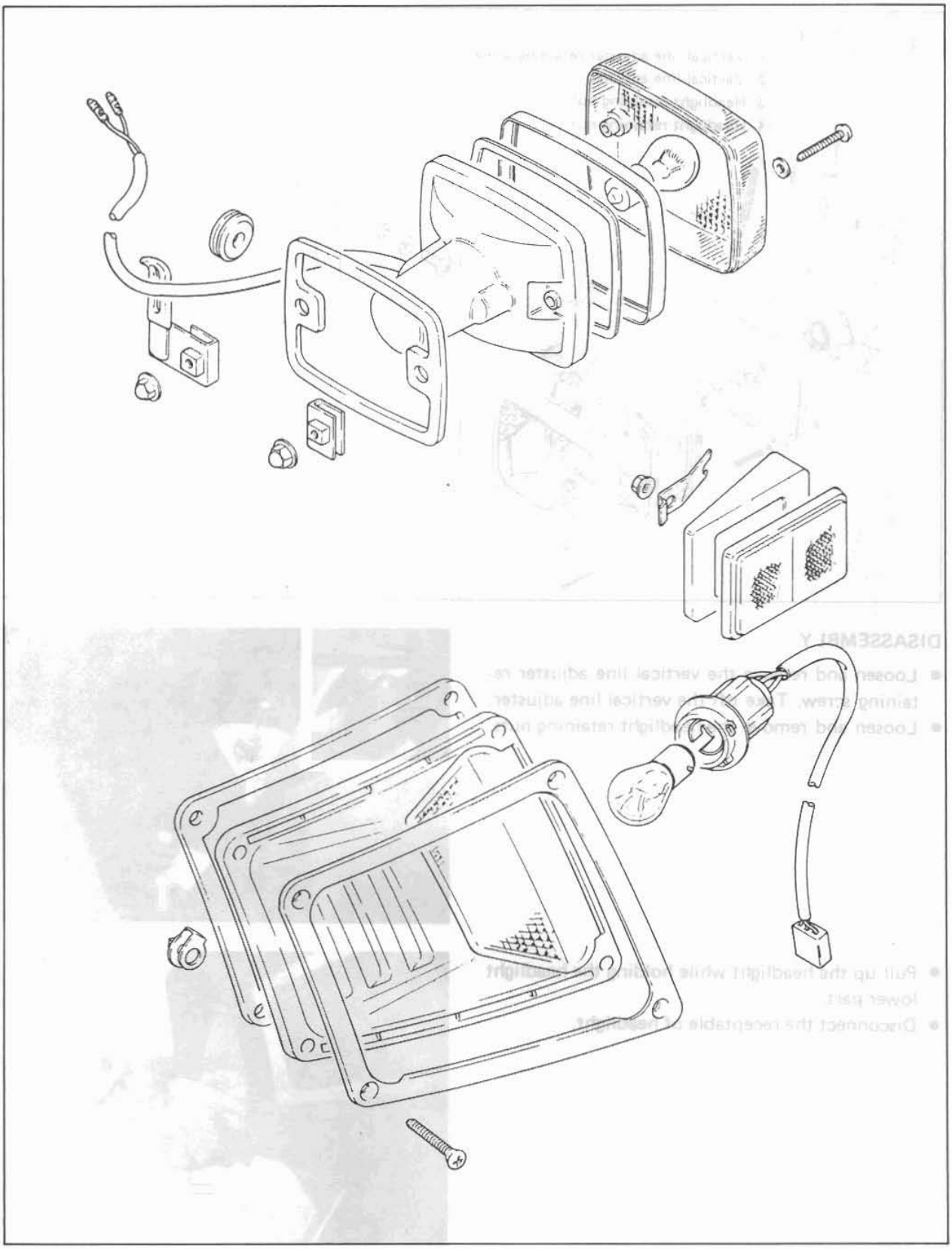
- Loosen and remove the vertical line adjuster retaining screw. Take off the vertical line adjuster.
- Loosen and remove the headlight retaining nuts.



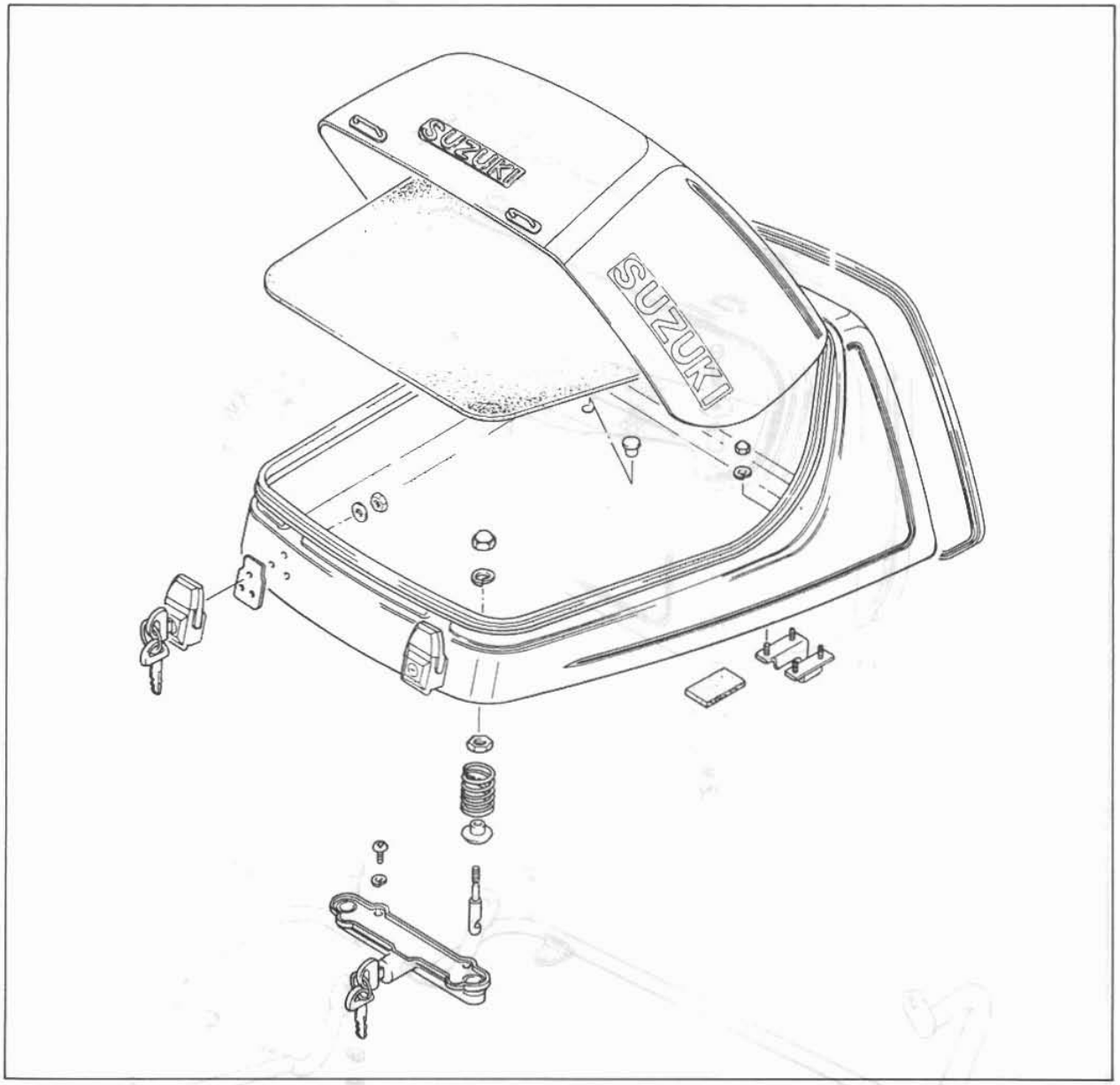
- Pull up the headlight while holding the headlight lower part.
- Disconnect the receptable of headlight.



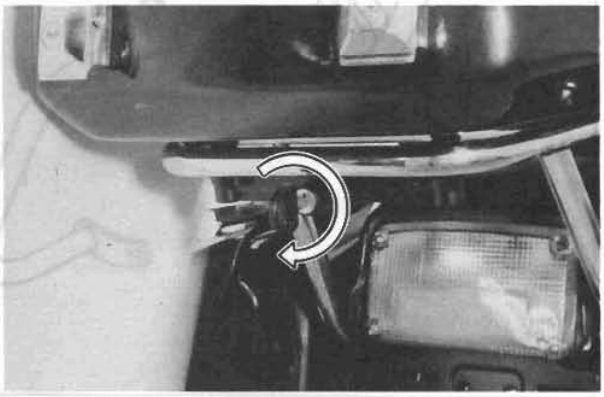
TURN SIGNAL LIGHT



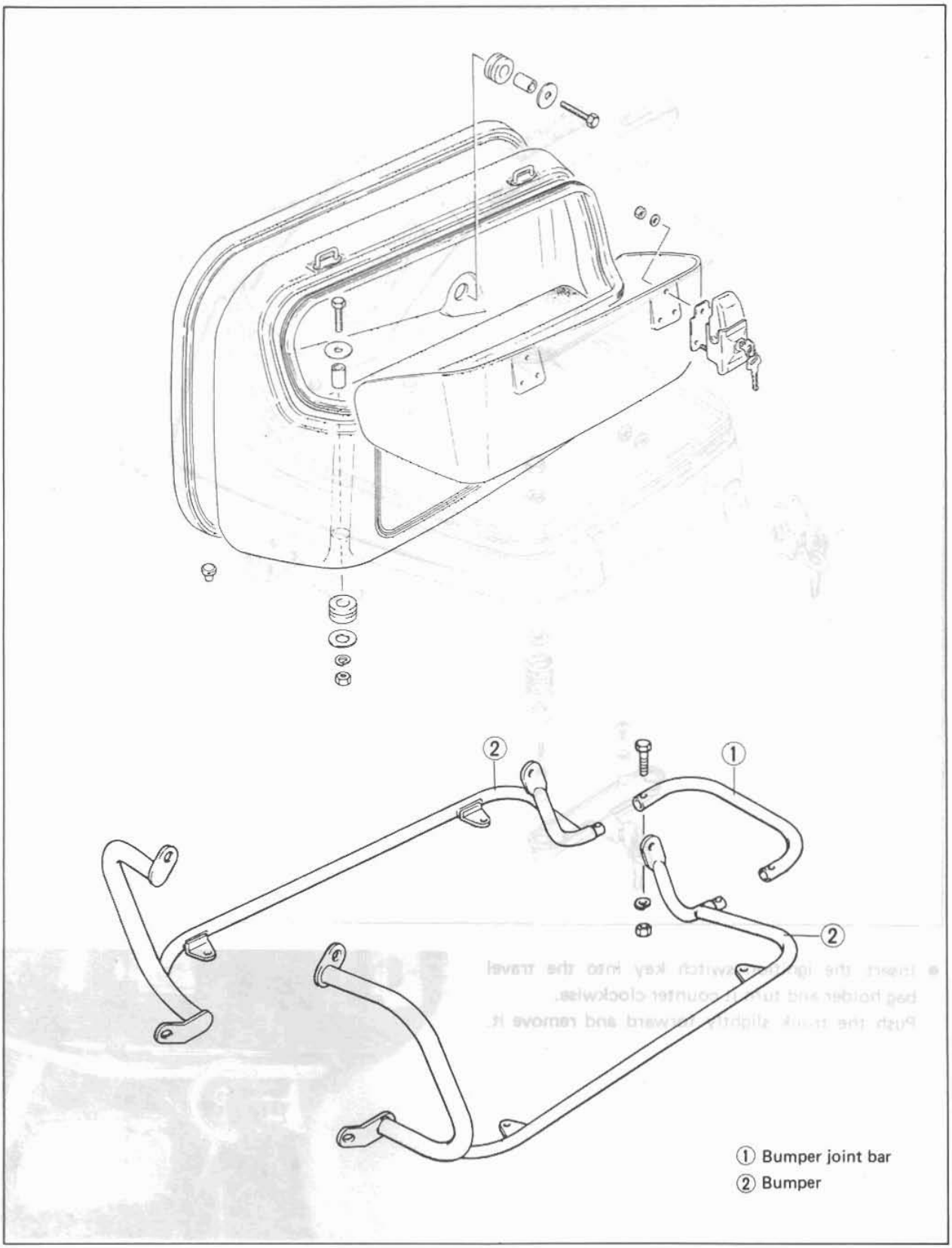
TRAVEL BAG



- Insert the ignition switch key into the travel bag holder and turn it counter-clockwise. Push the trunk slightly forward and remove it.

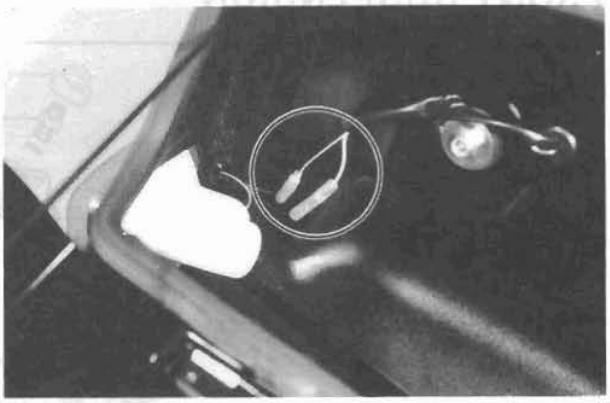


SADDLE BAG AND BUMPER

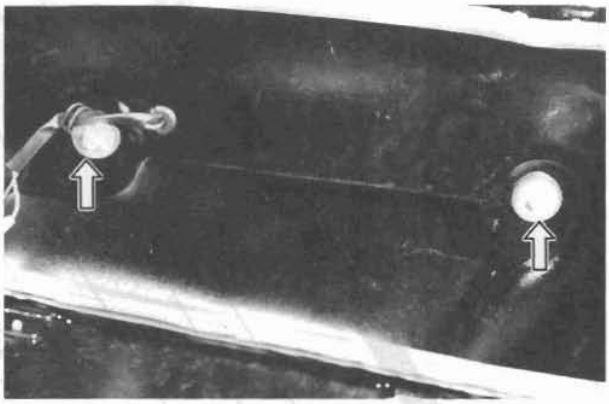


DISASSEMBLY

- Disconnect the wire harness of rear turn signals.

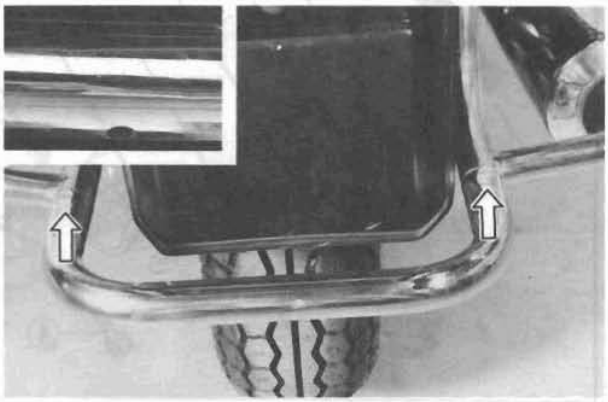


- Loosen and remove the four retaining bolt. Take off the left and right saddle bag.

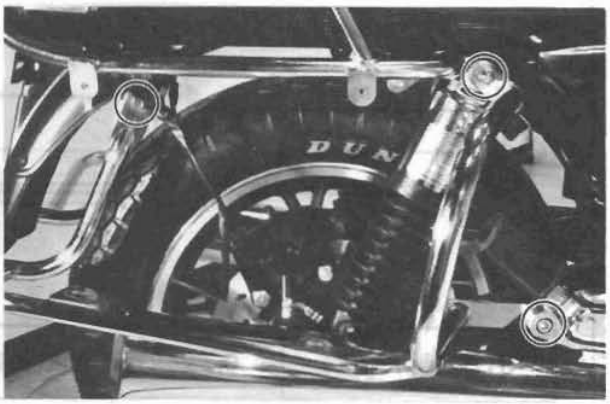


- Loosen and remove the bumper joint bar retaining bolts.
- Take off the joint bar.

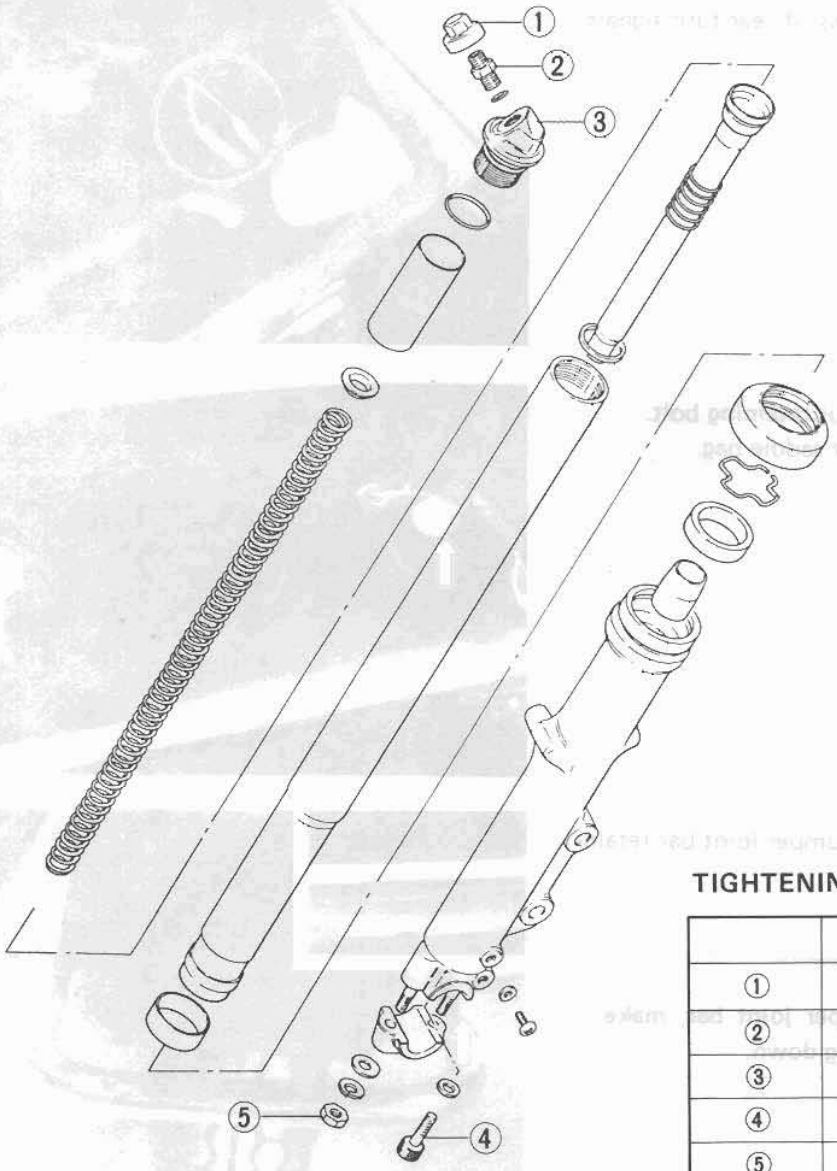
NOTE:
When installing the bumper joint bar, make sure the drain hole is facing down.



- Loosen and remove the bumper fitting bolts.
- Take off the bumper.

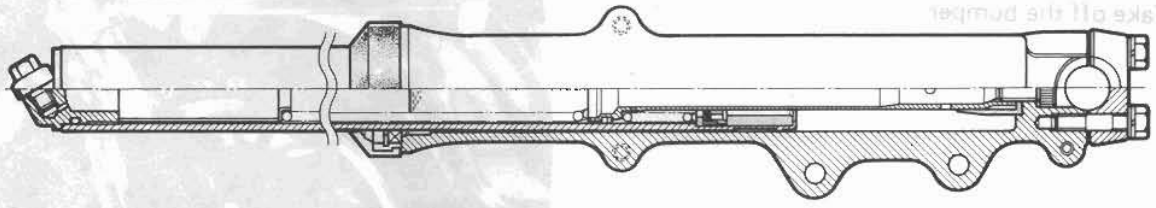


FRONT SUSPENSION



TIGHTENING TORQUE

	kg-m	lb-ft
①	0.1 – 0.2	0.7 – 1.5
②	1.0 – 1.3	7.0 – 9.5
③	1.5 – 3.0	11.0 – 21.5
④	3.2 – 4.2	23.0 – 30.5
⑤	1.5 – 2.5	11.0 – 18.0

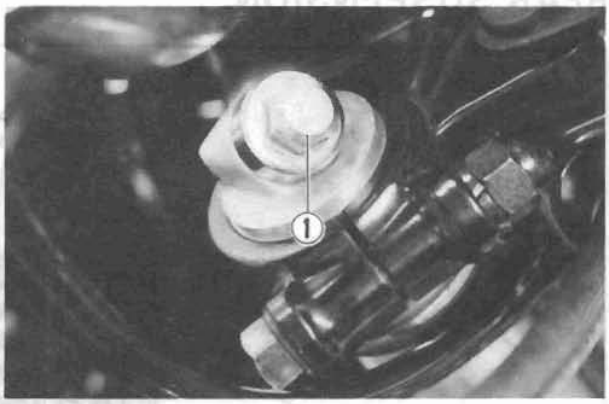


STD air pressure	0.7 kg/cm², 9.95 psi

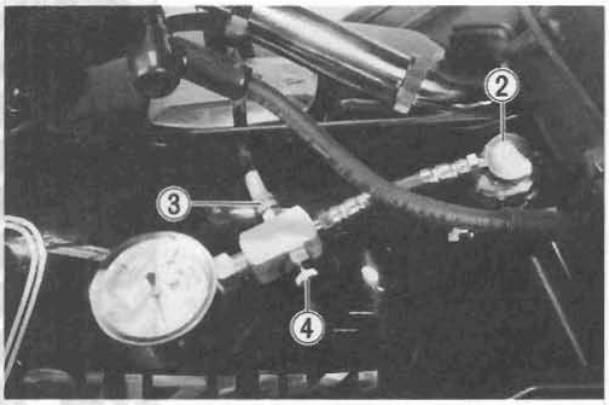
INSPECTION

FRONT FORK AIR PRESSURE ADJUSTMENT

Lift up the front wheel by a jack till it becomes free from any burden, and loosen the air valve cap ①.



Set the air pressure gauge to the valve ②. Set the hand pump to the valve ③, turn the valve handle ④ clockwise, and charge the air.
Let the air out by loosening the handle ④ till the specified air pressure is left inside, and remove the air lock screw ②.

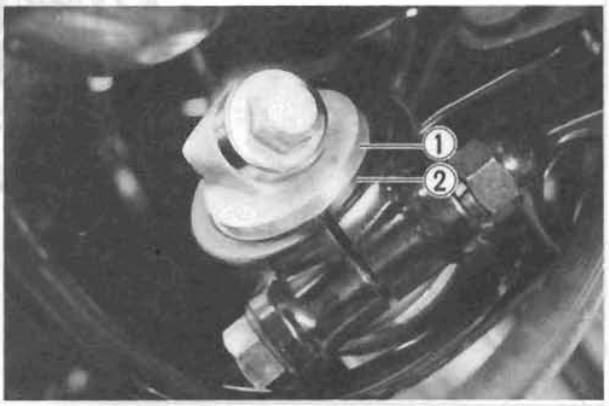


STD air pressure	0.7 kg/cm², 9.95 psi

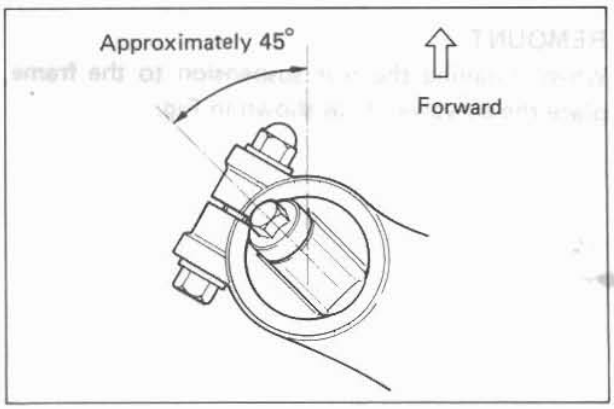
CAUTION:
Do not charge air more than 2.5 kg/cm² (35.55 psi). It may cause damage of oil seal.

FRONT FORK INSTALLATION

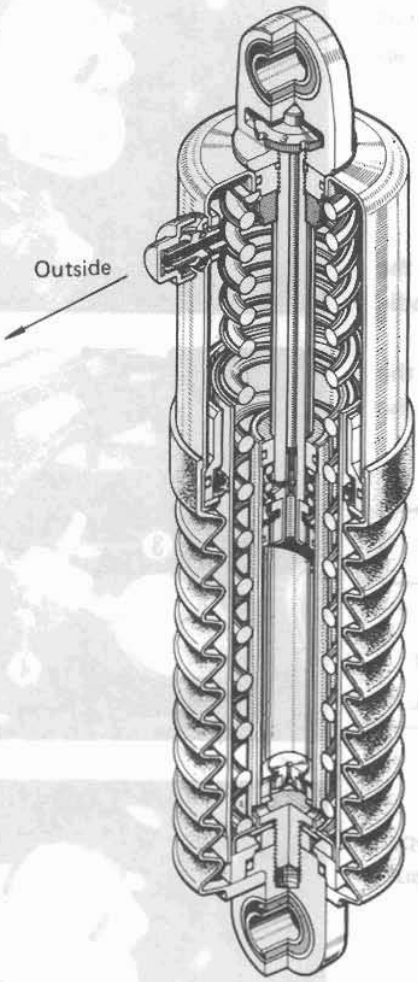
Install the front fork assembly with aligning upper surface ① of the inner tube with the upper surface ② of the steering stem upper bracket.



When installing the front fork to the upper bracket, turn the inner tube and position the air valve as shown in Fig.



REAR SUSPENSION

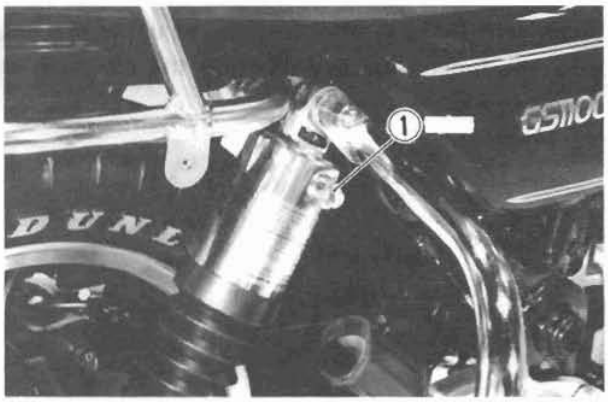


STD SETTING

Air pressure	1.0 kg/cm², 14.22 psi
Damper position	3

REMOUNT

When installing the rear suspension to the frame, place the air valve ① as shown in Fig.

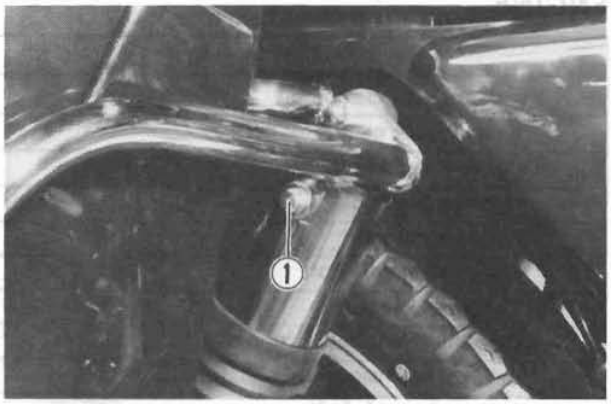


INSPECTION

REAR SUSPENSION AIR PRESSURE ADJUSTMENT

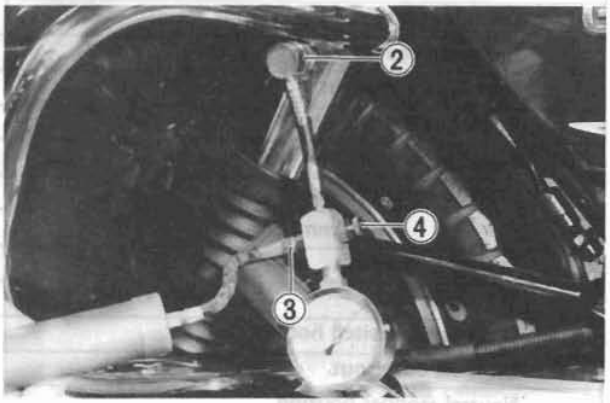
Place the motorcycle on the center stand.

Loosen the air valve cap ① .



Set the air pressure gauge to the valve ② . Set the hand pump to the valve ③ , turn the valve handle ④ clockwise, and charge the air.

Let the air out by loosening the handle ④ till the specified air pressure is left inside, and remove the air lock screw ② .



STD air pressure	1.0 kg/cm², 14.22 psi

CAUTION:
Do not charge air more than 2.5 kg/cm², 35.55 psi). It may cause damage of oil seal.

TIGHTENING TORQUE

ENGINE

ITEM	kg-m	lb-ft
Exhaust pipe clamp bolt	1.3 – 2.3	9.5 – 16.5
Exhaust pipe connector bolt	0.4 – 0.7	3.0 – 5.0
Cylinder head cover bolt	1.0	7.0
Cylinder head bolt	0.7 – 1.1	5.0 – 8.0
Cylinder head nut	3.5 – 4.0	25.5 – 29.0
Cam shaft holder bolt	0.8 – 1.2	6.0 – 8.5
Cam sprocket bolt	2.4 – 2.6	17.5 – 19.0
Cam chain tensioner fitting bolt	0.6 – 0.8	4.5 – 6.0
Cam chain tensioner lock shaft nut	0.9 – 1.4	6.5 – 10.0
Cam chain guide bolt	0.9 – 1.4	6.5 – 10.0
Cylinder head cam chain guide screw	0.2 – 0.4	1.5 – 3.0
Cam chain guide screw	0.6 – 0.8	4.5 – 10.0
Generator rotor nut	16.0 – 17.0	115.5 – 123.0
Starter clutch allen bolt	1.5 – 2.0	11.0 – 14.5
Signal generator rotor bolt	2.5 – 3.5	18.0 – 25.5
Crankcase bolt (6 mm)	0.9 – 1.3	6.5 – 9.5
(8 mm)	2.0 – 2.4	14.5 – 17.5
Starter motor bolt	0.4 – 0.7	3.0 – 5.0
Oil pump screw	1.0	7.0
Oil pressure switch housing bolt	1.3 – 1.7	9.5 – 12.5
Oil filter cover nut	0.6 – 0.8	4.5 – 6.0
Neutral stopper housing	1.8 – 2.8	13.0 – 20.0
Gear shift arm stopper	1.5 – 2.3	11.0 – 16.5
Clutch sleeve hub nut	5.0 – 7.0	36.0 – 50.5
Clutch spring bolt	1.1 – 1.3	8.0 – 9.5
Engine mounting bolt L : 110 mm	5.0 – 6.0	36.0 – 43.5
The others	6.0 – 7.2	43.5 – 50.0
Gear shift lever bolt	1.3 – 2.3	9.5 – 16.5
Clutch release arm bolt	0.6 – 1.0	4.5 – 7.0

SHAFT DRIVE

ITEM	kg-m	lb-ft
Secondary drive gear nut	12.0 – 15.0	87.0 – 108.5
Secondary drive gear housing bolt	2.0 – 2.6	14.5 – 19.0
Secondary driven gear nut	9.0 – 11.0	65.0 – 79.5
Secondary driven gear housing bolt	2.0 – 2.6	14.5 – 19.0
Secondary gear oil drain plug	2.0 – 3.0	14.5 – 21.5
Final gear oil drain plug	2.0 – 3.0	14.5 – 21.5
Propeller shaft flange nut	3.0 – 4.0	21.5 – 29.0
Final drive gear nut	9.0 – 11.0	65.0 – 79.5
Final gearcase bearing retainer plate screw	0.8 – 1.0	6.0 – 7.0
Final gear bearing case bolt	2.0 – 2.6	14.5 – 19.0
Final gearcase joint nut	3.5 – 4.5	25.5 – 32.5

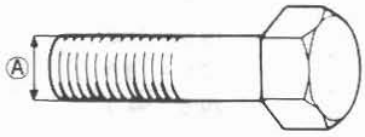
CHASSIS

ITEM	kg-m	lb-ft
Disc bolt	1.5 – 2.5	11.0 – 18.0
Front axle nut	3.6 – 5.2	26.0 – 37.5
Front axle holder nut	1.5 – 2.5	11.0 – 18.0
Front caliper mounting bolt	2.5 – 4.0	18.0 – 29.0
Front caliper axle bolt	1.5 – 2.0	11.0 – 14.5
Brake hose union bolt	2.5 – 3.5	18.0 – 25.5
Caliper bleeder	0.7 – 0.9	5.0 – 6.5
Front fork damper rod bolt	3.2 – 4.2	23.0 – 30.5
Front fork lower clamp bolt	1.5 – 2.5	11.0 – 18.0
Front fork upper clamp bolt	2.0 – 3.0	14.5 – 21.5
Front fork cap bolt	1.5 – 3.0	11.0 – 21.5
Front fork air valve	1.0 – 1.3	7.0 – 9.5
Front fork air valve cap	0.2	1.5
Steering stem nut	4.0 – 5.0	29.0 – 36.0
Steering stem clamp bolt	1.5 – 2.5	11.0 – 18.0
Steering stem head bolt	2.0 – 3.0	14.5 – 21.5
Handlebar clamp bolt	1.2 – 2.0	8.5 – 14.5
Front master cylinder clamp bolt	0.5 – 0.8	3.5 – 6.0
Front brake lever mounting bolt	0.2 – 0.4	1.5 – 3.0
Front footrest bolt	2.7 – 4.3	19.5 – 31.0
Swing arm bearing holder bolt	0.35 – 0.45	2.5 – 3.0
Swing arm bearing adjustment lock nut	11.0 – 13.0	79.5 – 94.0
Brake pedal arm bolt	1.0 – 1.5	7.0 – 11.0
Rear master cylinder mounting bolt	1.5 – 2.5	11.0 – 18.0
Rear torque link bolt and nut	2.0 – 3.0	14.5 – 21.5
Rear caliper mounting bolt	2.5 – 4.0	18.0 – 29.0
Rear caliper bolt	2.8 – 3.2	20.0 – 23.0
Muffler bracket nut	1.5 – 2.0	11.0 – 14.5
Rear shock absorber fitting bolt and nut	2.0 – 3.0	14.5 – 21.5
Rear footrest bolt	1.8 – 2.8	13.0 – 20.0
Wheel hub driven joint fitting bolt	0.8 – 1.2	6.0 – 8.5
Rear axle nut	5.0 – 8.0	36.0 – 58.0
Rear axle clamp nut	1.5 – 2.5	11.0 – 18.0
Cowling mounting bolt	1.0 – 1.6	7.0 – 11.5
Travel trank bolt	1.0 – 1.6	7.0 – 11.5
Rear bumper joint bar bolt	0.4 – 0.7	3.0 – 5.0

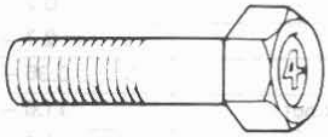
TIGHTENING TORQUE CHART

For other bolts and nuts not listed in the previous page, refer to this chart:
Tightening torque

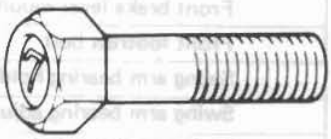
Bolt Diameter Ⓐ (mm)	Conventional or "4" marked bolt		"7" marked bolt	
	kg-m	lb-ft	kg-m	lb-ft
4	0.1 – 0.2	0.7 – 1.5	0.15 – 0.3	1.0 – 2.0
5	0.2 – 0.4	1.5 – 3.0	0.3 – 0.6	2.0 – 4.5
6	0.4 – 0.7	3.0 – 5.0	0.8 – 1.2	6.0 – 8.5
8	1.0 – 1.6	7.0 – 11.5	1.8 – 2.8	13.0 – 20.0
10	2.2 – 3.5	16.0 – 25.5	4.0 – 6.0	29.0 – 43.5
12	3.5 – 5.5	25.5 – 40.0	7.0 – 10.0	50.5 – 72.5
14	5.0 – 8.0	36.0 – 58.0	11.0 – 16.0	79.5 – 115.5
16	8.0 – 13.0	58.0 – 94.0	11.0 – 25.0	123.0 – 181.0
18	13.0 – 19.0	94.0 – 137.5	20.0 – 28.0	144.5 – 202.5



Conventional bolt

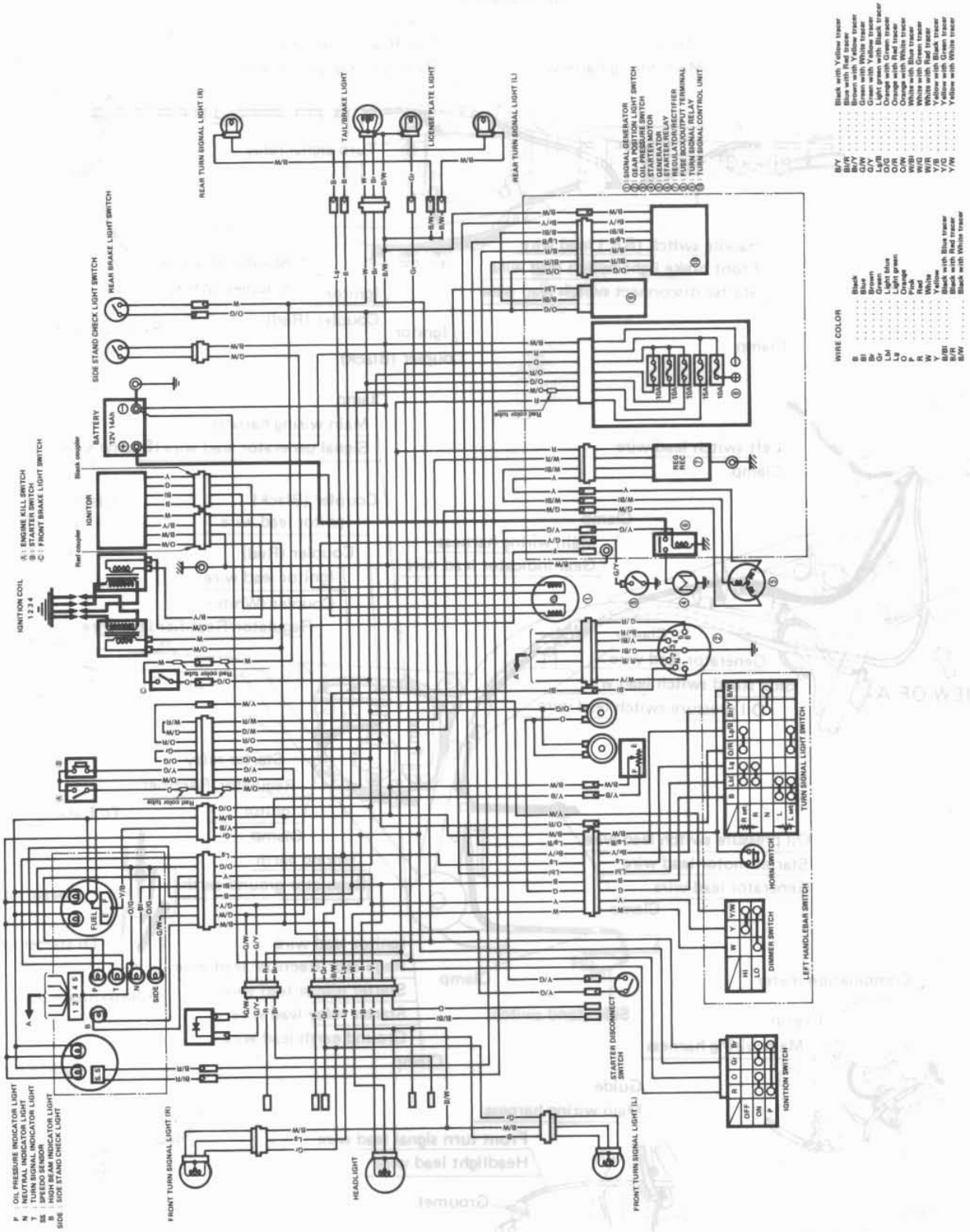


"4" marked bolt

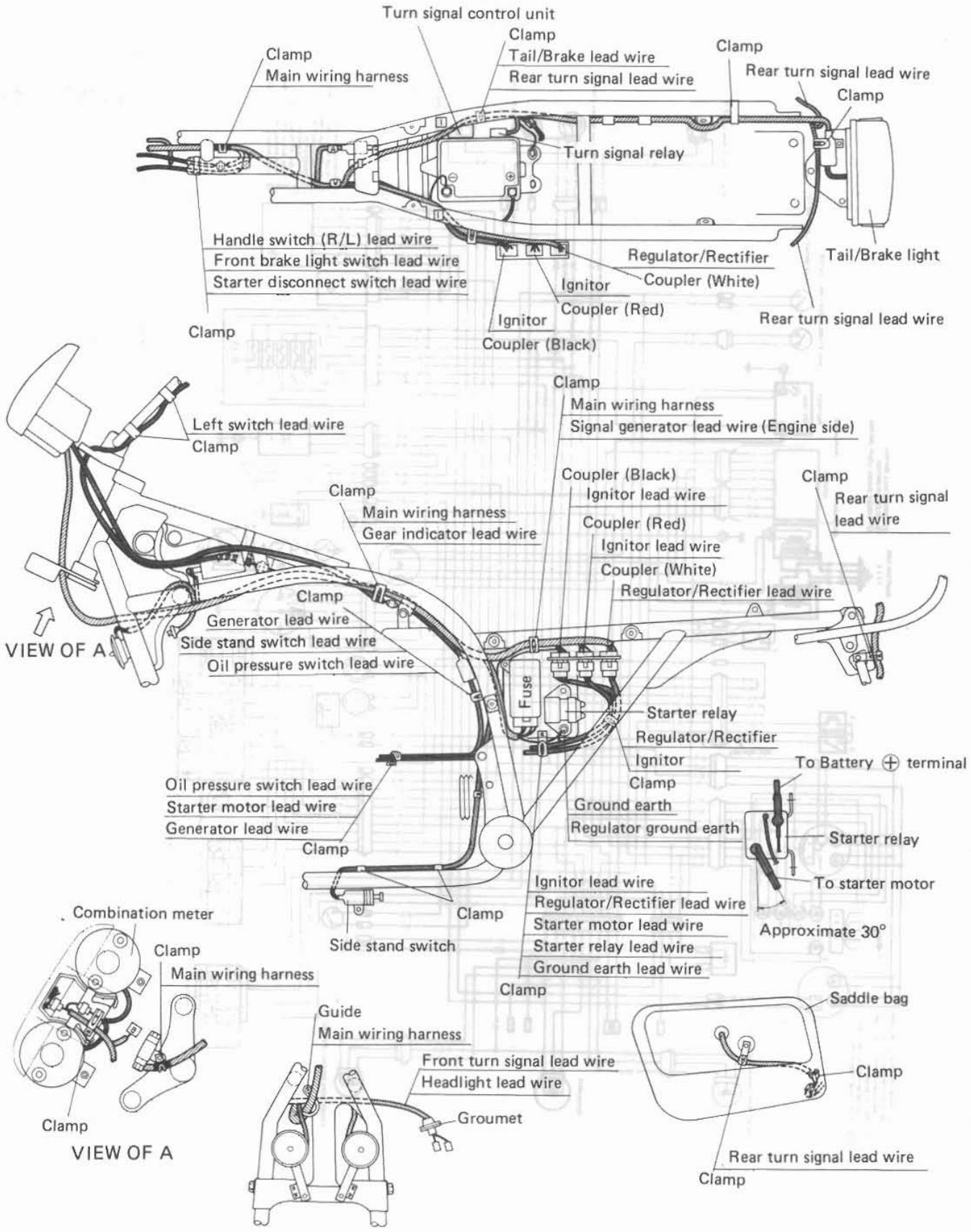


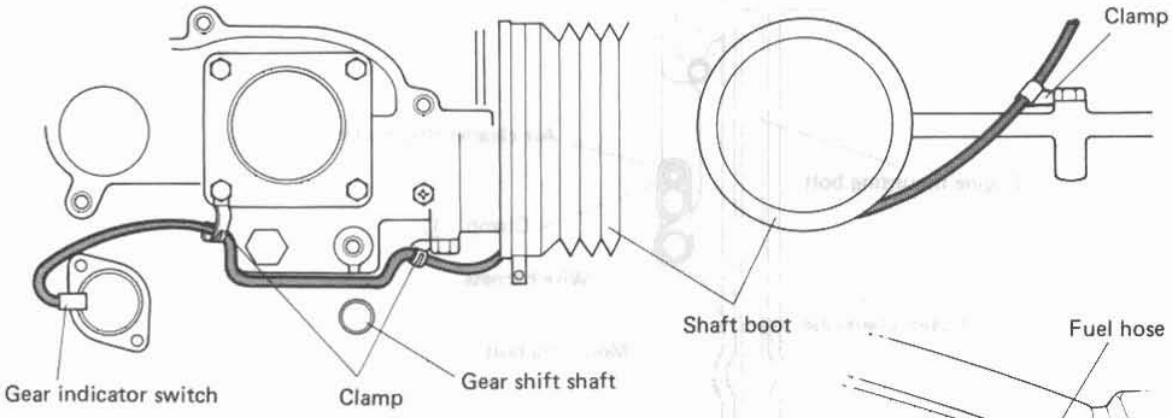
"7" marked bolt

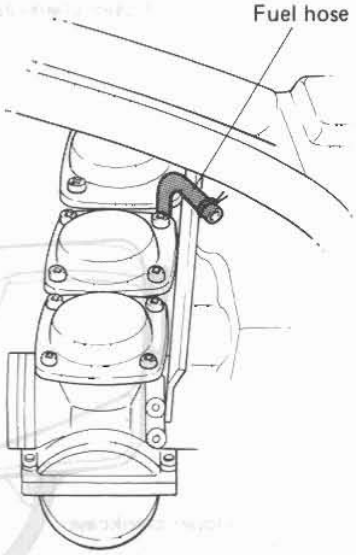
WIRING DIAGRAM

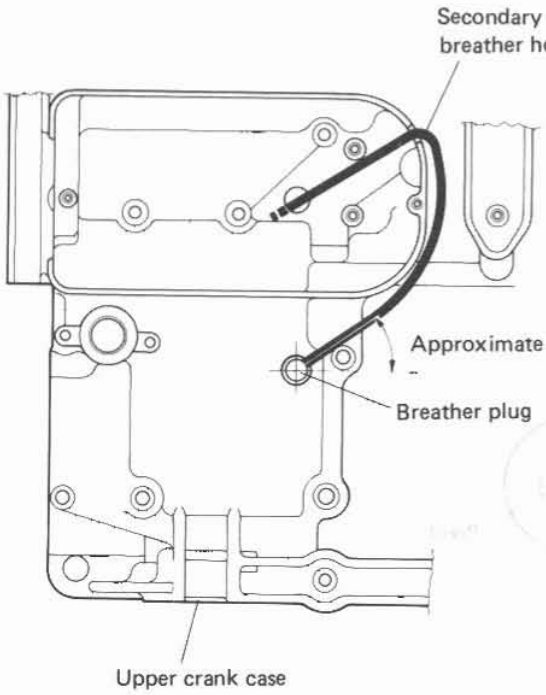


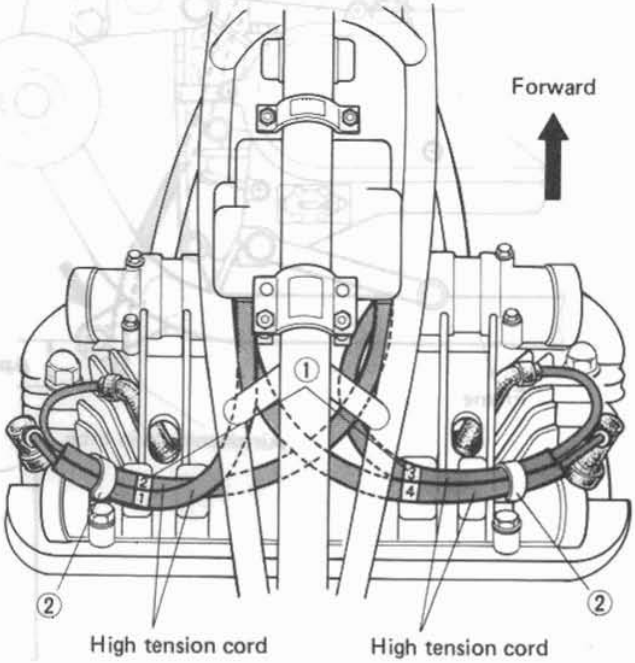
WIRE, CABLE AND HOSE ROUTING





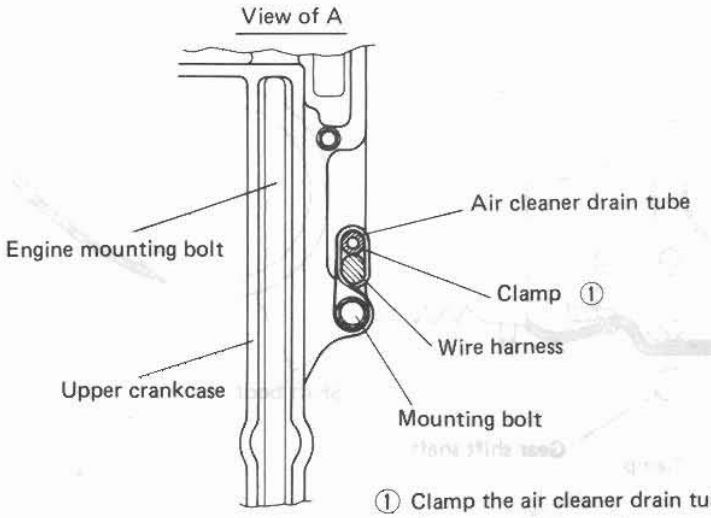




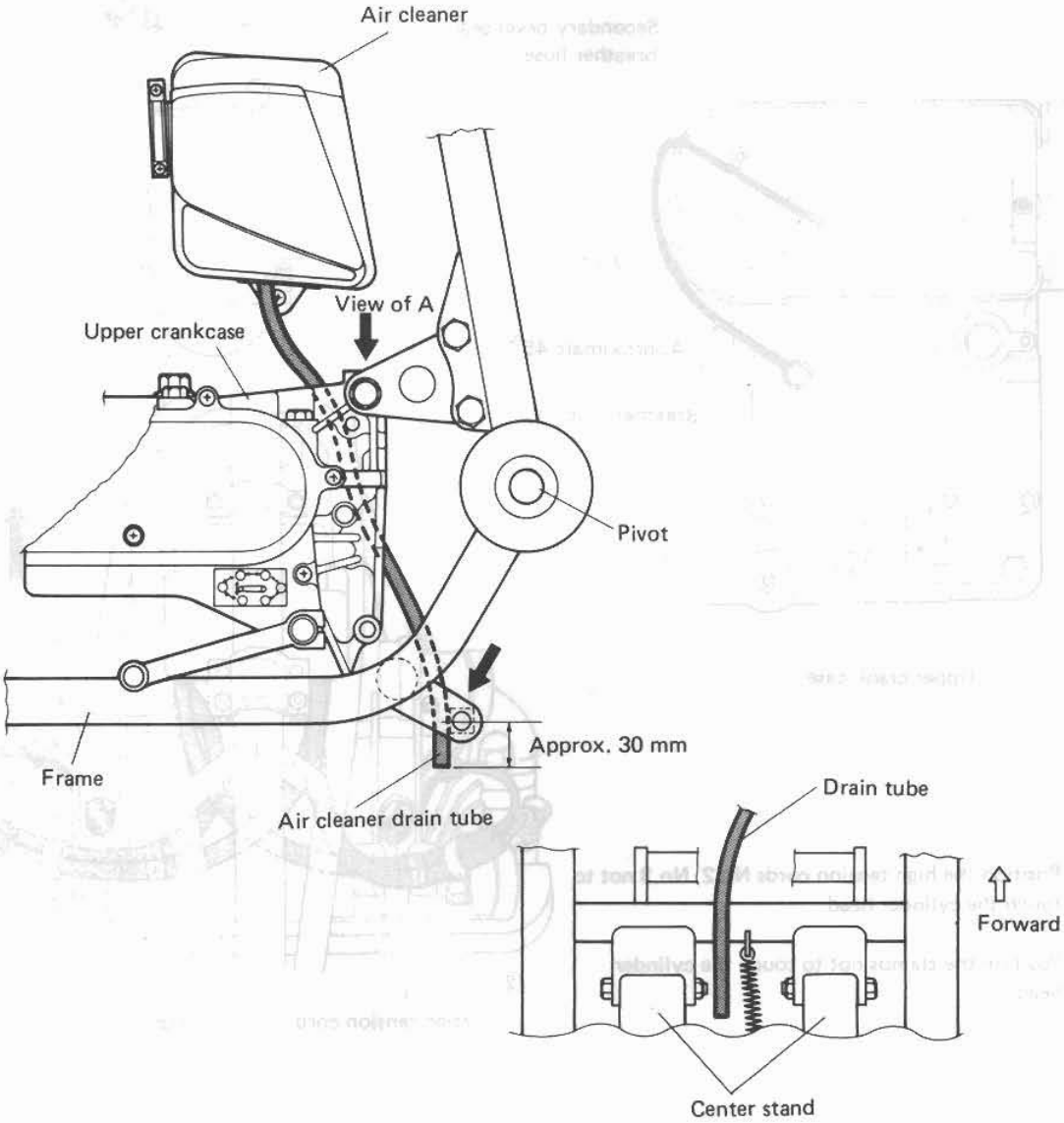


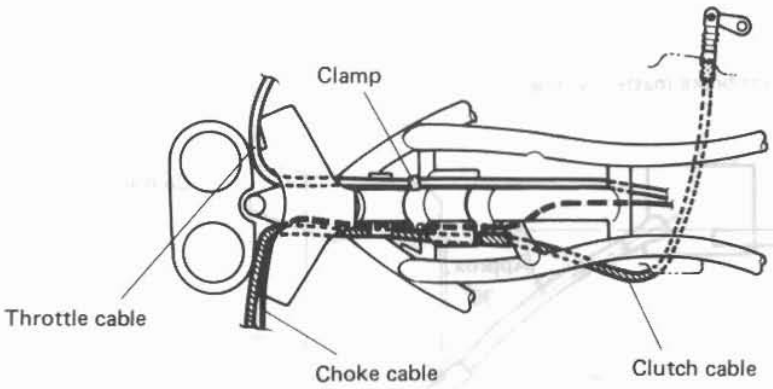
① Position the high tension cords No.2, No.3 not to touch the cylinder head.

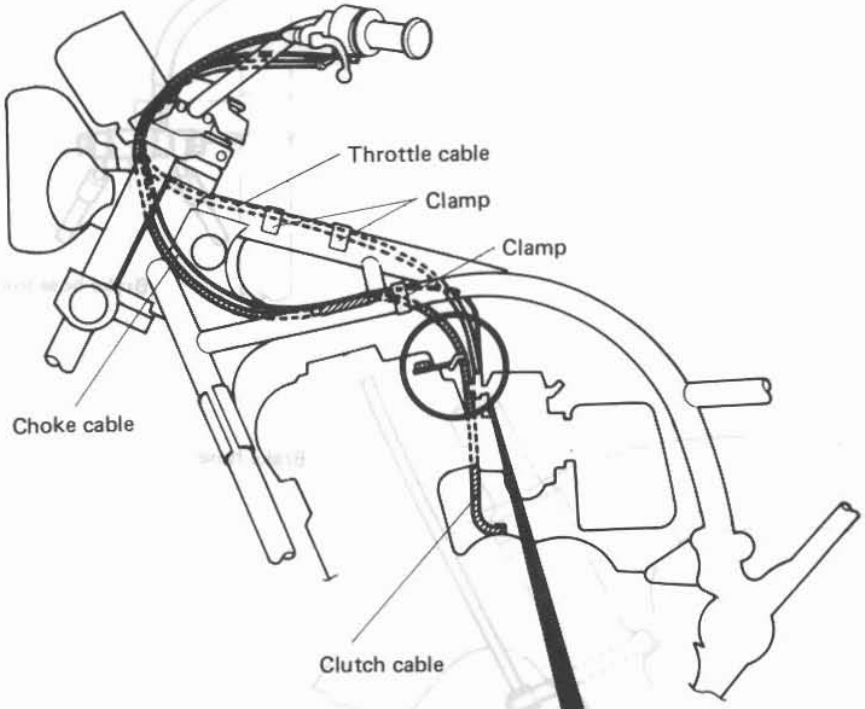
② Position the clamps not to touch the cylinder head.

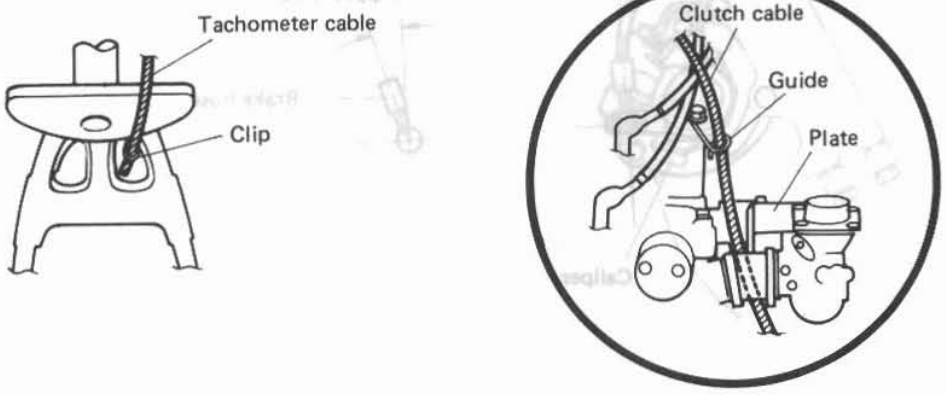


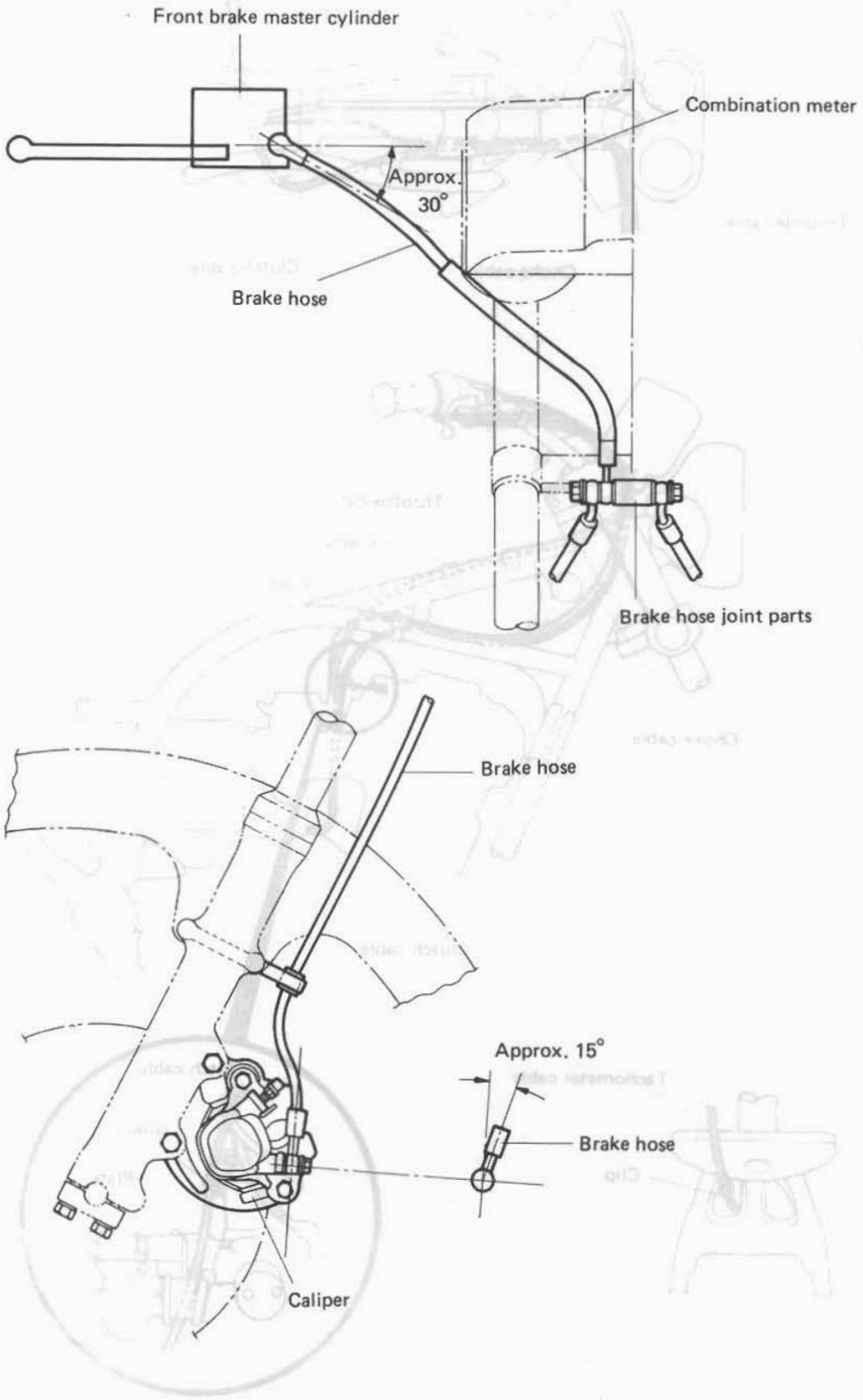
① Clamp the air cleaner drain tube with wire harness by clamp on upper crankcase.

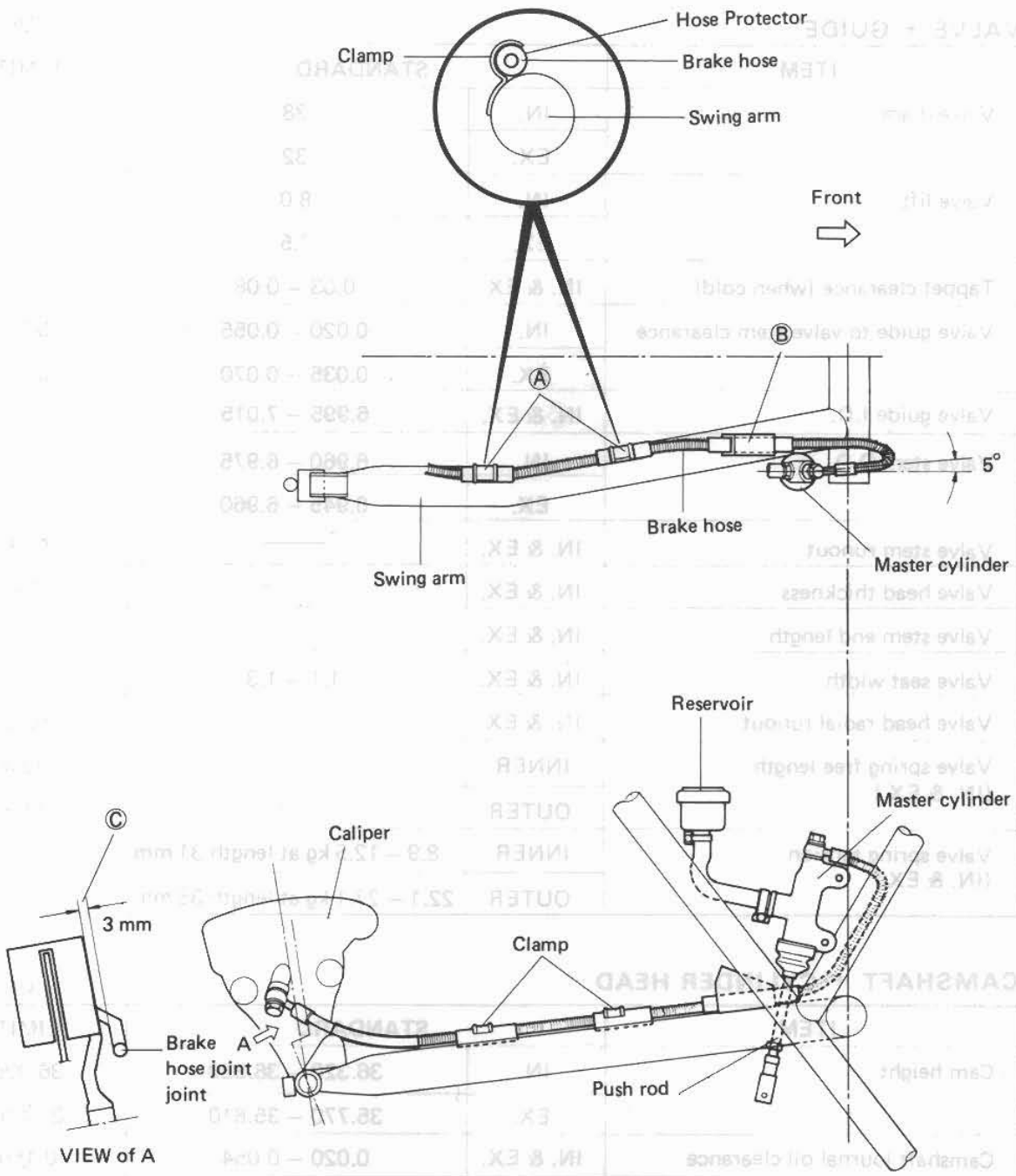












Ⓑ Bend the clamp after routing the hose.
Ⓒ Pass the brake hose through the rear torque link mounting bracket.
Ⓓ Keep the clearance 3 mm from the caliper bracket.

SERVICE DATA

VALVE + GUIDE

Unit: mm

ITEM		STANDARD	LIMIT
Valve diam.	IN.	38	—
	EX.	32	—
Valve lift	IN.	8.0	—
	EX.	7.5	—
Tappet clearance (when cold)	IN. & EX.	0.03 – 0.08	—
Valve guide to valve stem clearance	IN.	0.020 – 0.055	0.35
	EX.	0.035 – 0.070	0.35
Valve guide I.D.	IN. & EX.	6.995 – 7.015	—
Valve stem O.D.	IN.	6.960 – 6.975	—
	EX.	6.945 – 6.960	—
Valve stem runout	IN. & EX.	—	0.05
Valve head thickness	IN. & EX.	—	0.5
Valve stem end length	IN. & EX.	—	4.0
Valve seat width	IN. & EX.	1.1 – 1.3	—
Valve head radial runout	IN. & EX.	—	0.03
Valve spring free length (IN. & EX.)	INNER	—	33.9
	OUTER	—	41.3
Valve spring tension (IN. & EX.)	INNER	8.9 – 12.5 kg at length 31 mm	—
	OUTER	22.1 – 27.1 kg at length 35 mm	—

CAMSHAFT + CYLINDER HEAD

Unit: mm

ITEM		STANDARD	LIMIT
Cam height	IN.	36.320 – 36.360	36.020
	EX.	35.770 – 35.810	35.470
Camshaft journal oil clearance	IN. & EX.	0.020 – 0.054	0.150
Camshaft journal holder I.D.	IN. & EX.	22.000 – 22.013	—
Camshaft journal O.D.	IN. & EX.	21.959 – 21.980	—
Camshaft runout	IN. & EX.	—	0.1
Cam chain 20-pitch length		—	157.80
Cam chain pin (at arrow "3")		20th pin	—
Cylinder head distortion		—	0.2

CYLINDER + PISTON + PISTON RING

Unit: mm

ITEM			STANDARD	LIMIT
Compression pressure			8 – 12 kg/cm²	7 kg/cm²
Compression pressure difference			—	2 kg/cm²
Piston to cylinder clearance			0.050 – 0.060	0.120
Cylinder bore			72.000 – 72.015	72.080
Piston diam.			71.945 – 71.960 Measure at the 17 from skirt end.	71.880
Cylinder distortion			—	0.2
Piston ring free end gap	1st	N	Approx. 9.5	7.6
	2nd	N	Approx. 11.0	8.8
Piston ring end gap	1st		0.10 – 0.30	0.7
	2nd		0.10 – 0.30	0.7
Piston ring to groove clearance	1st		—	0.180
	2nd		—	0.150
Piston ring groove width	1st		1.025 – 1.045	—
	2nd		1.210 – 1.230	—
	Oil		2.510 – 2.530	—
Piston ring thickness	1st		0.975 – 0.990	—
	2nd		1.170 – 1.190	—
Piston pin bore			18.002 – 18.008	18.030
Piston pin O.D.			17.995 – 18.000	17.980

CONROD + CRANKSHAFT + BALANCER

Unit: mm

ITEM	STANDARD	LIMIT
Conrod small end I.D.	18.006 – 18.014	18.040
Conrod deflection	———	3.0
Conrod big end side clearance	0.10 – 0.65	1.00
Crankshaft runout	———	0.10

OIL PUMP

ITEM	STANDARD	LIMIT
Oil pump reduction ratio	1.723 (87/49 x 33/34)	———
Oil pressure (at 60°C, 140°F)	Above 0.1 kg/cm² (1.5 psi) Below 0.5 kg/cm² (7.0 psi) at 3 000 rpm	———

CLUTCH

Unit: mm

ITEM	STANDARD	LIMIT
Clutch cable play	2 – 3	———
Drive plate thickness	2.9 – 3.1	2.6
Drive plate claw width	15.6 – 15.8	14.8
Driven plate thickness	2.0 ± 0.06	———
Driven plate distortion	———	0.1
Clutch spring free length	———	38.8

TRANSMISSION + DRIVE CHAIN

Unit: mm

ITEM	STANDARD		LIMIT
Primary reduction ratio	1.775 (87/49)		—
Secondary reduction ratio	0.941 (16/17)		—
Final reduction ratio	3.090 (34/11)		—
Gear ratios	Low	2.500 (35/14)	—
	2nd	1.722 (31/18)	—
	3rd	1.380 (29/21)	—
	4th	1.125 (27/24)	—
	Top	0.961 (25/26)	—
Shift fork to groove clearance	0.4 – 0.6		0.8
Shift fork groove width	5.45 – 5.55		—
Shift fork thickness	4.95 – 5.05		—

SHAFT DRIVE

Unit: mm

ITEM	STANDARD		LIMIT
Secondary bevel gear backlash	0.08 – 0.13		—
Final bevel gear backlash	Drive side	0.03 – 0.64	—
	Driven side	0.02 – 0.35	
Secondary drive bevel gear preload	30 – 50 N·m (3 – 5 kg-cm)		—
Secondary driven bevel gear preload	40 – 70 N·m (4 – 7 kg-cm)		—
Final drive gear preload	40 – 80 N·m (4 – 8 kg-cm)		—

CARBURETOR

Unit: mm

ITEM		SPECIFICATION
Carburetor type		MIKUNI BS34SS
Bore size		34
I.D. No.		49400
Idle r/min.		1 050 ± 100 r/min.
Fuel level		5.0 ± 0.5
Float height		22.4 ± 1.0
Main jet	(M.J.)	#115
Main air jet	(M.A.J.)	1.7
Jet needle	(J.N.)	5D58
Needle jet	(N.J.)	X-3
Pilot jet	(P.J.)	#40
By pass	(B.P.)	0.9, 0.8, 0.8
Pilot outlet	(P.O.)	0.7
Valve seat	(V.S.)	2.0
Starter jet	(G.S.)	50
Pilot screw	(P.S.)	PRE-SET
Pilot air jet	(P.A.J.)	# 170
Throttle cable play		0.5 – 1.0
Choke cable play		0.5 – 1.0

ELECTRICAL

Unit: mm

ITEM	SPECIFICATION			NOTE
Ignition timing	17° B.T.D.C. below 1 500 ± 150 r/min and 37° B.T.D.C. above 2 350 ± 150 r/min.			
Firing order	1. 2. 4. 3.			
Spark plug	Type	NGK : B8ES N D : W24ES-U		
	Gap	0.6 – 0.8		
Spark performance	Over 8 at 1 atm			
Signal coil resistance	Y – Bl B – G Approx. 140 – 200Ω			
Ignition coil resistance	Primary	O/W – W O/W – B/Y Approx. 3 – 5Ω		
	Secondary	Plug cap – Plug cap Approx. 30 – 40 kΩ		
Generator no-load voltage	More than 80V (AC) at 5 000 r/min.			
Regulated voltage	14 – 15.5V at 5 000 r/min.			
Starter motor	Brush length	MITSUBA	Limit: 6	
	Commutator under cut		Limit: 0.2	
Starter relay resistance	Approx.	3 – 4 Ω		
Battery	Type designation	YB14L-A2		
	Capacity	12V50.4kC (14Ah)/10HR		
	Standard electrolyte S.G.	1.28 at 20°C (68°F)		
Fuse size	Headlight	10 A		
	Turn signal	10 A		
	Ignition	10 A		
	Main	15 A		
	Power source	10 A		

BRAKE + WHEEL

Unit: mm

ITEM	STANDARD		LIMIT
Rear brake pedal height	20		———
Brake disc thickness	Front	6.7 ± 0.2	6.0
	Rear	6.7 ± 0.2	6.0
Brake disc runout	———		0.30
Master cylinder bore	Front	15.870 – 15.913	———
	Rear	14.000 – 14.043	———
Master cylinder piston diam.	Front	15.827 – 15.854	———
	Rear	13.957 – 13.984	———
Brake caliper cylinder bore	Front	42.85	———
	Rear	42.85	———
Brake caliper piston diam.	Front	42.82	———
	Rear	42.82	———
Wheel rim runout	Axial	———	2.0
	Radial	———	2.0
Wheel axle runout	Front	———	0.25
	Rear	———	0.25
Tire size	Front	110/90-19 62H	———
	Rear	130/90-16 67H	———
Tire tread depth	Front	———	1.6
	Rear	———	2.0

SUSPENSION

Unit: mm

ITEM	STANDARD	LIMIT	NOTE
Front fork stroke	160	——	
Front fork spring free length	——	416	
Front fork oil level	138.5	——	
Front fork air pressure	0.7 kg/cm², 10 psi	——	
Rear suspension air pressure	1.0 kg/cm², 14 psi		
Rear wheel travel	109	——	

FUEL + OIL

ITEM	SPECIFICATION	NOTE
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 including reserve	22 L (5.8 gal)	
reserve	4.2 L (1.1 gal)	
Engine oil type	SAE 10W/40 of API grade SE or SF	
Engine oil capacity	Change 3 000 ml	
	Filter change 3 300 ml	
	Overhaul 3 700 ml	
Front fork oil type	Fork oil #15	
Front fork oil capacity (each leg)	363 ml	
Bevel gear oil type	Hypoid gear oil SAE #90, API grade GL-5	
Bevel gear oil capacity	Secondary 340 – 400 ml	
	Final 280 – 330 ml	
Brake fluid type	DOT3, DOT4 or SAE J1703	

TIRE PRESSURE (COLD)

TIRE INFLATION PRESSURE		kg/cm²	kPa	psi
FRONT		2.0	200	28
REAR	Up to 80 kg (175 lbs) load	2.25	225	32
	80 – 132 kg (175 – 300 lbs) load	2.8	280	40

WATTAGE

(W)

ITEM		SPECIFICATION
Headlight	HI	60
	LO	55
Tail/Brake light		8/23
Front turn signal/running light		23/8
Rear turn signal light		23
Speedometer light		3.4
Tachometer light		3.4
Turn signal indicator light		3.4
High beam indicator light		3.4
Neutral indicator light		3.4
Oil pressure indicator light		3.4
Gear position indicator light		1.12
Side stand check light		3.4
Fuel meter light		3.4

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