SUZUKI

FRONT BG.
RMCT. 36. 38.

GSX-R1100

SERVICE MANUAL

99500-39061-01E
(英)

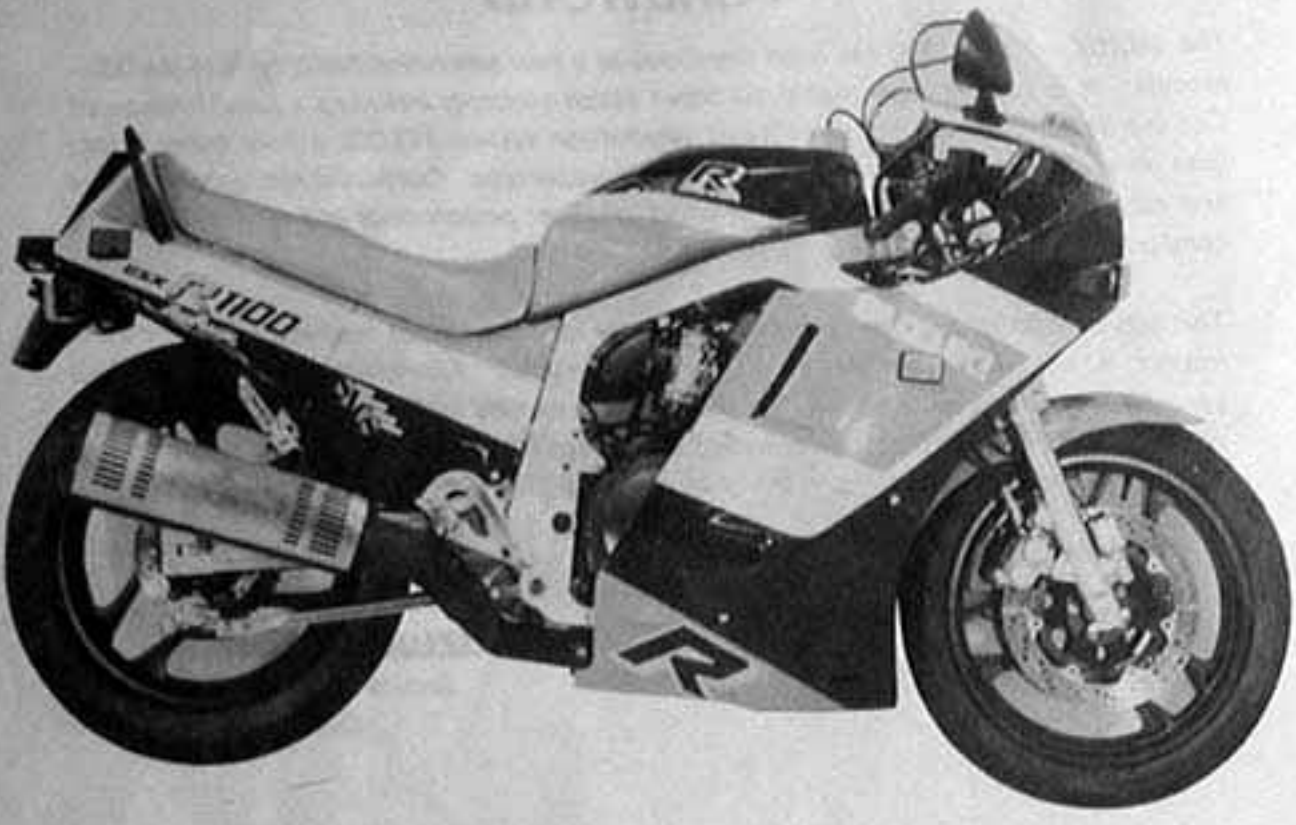
FOREWORD

The SUZUKI GSXR-1100 has been developed as a new generation motorcycle to the GSX-models. It is packed with highly advanced design concepts including a Suzuki Advanced Cooling System, a new highly efficient combustion system (TSCC), a fully transistorized ignition system and a improved full-floater rear suspension. Combined with precise control and easy handling the GSX-R1100 provides excellent performance and outstanding riding comfort.

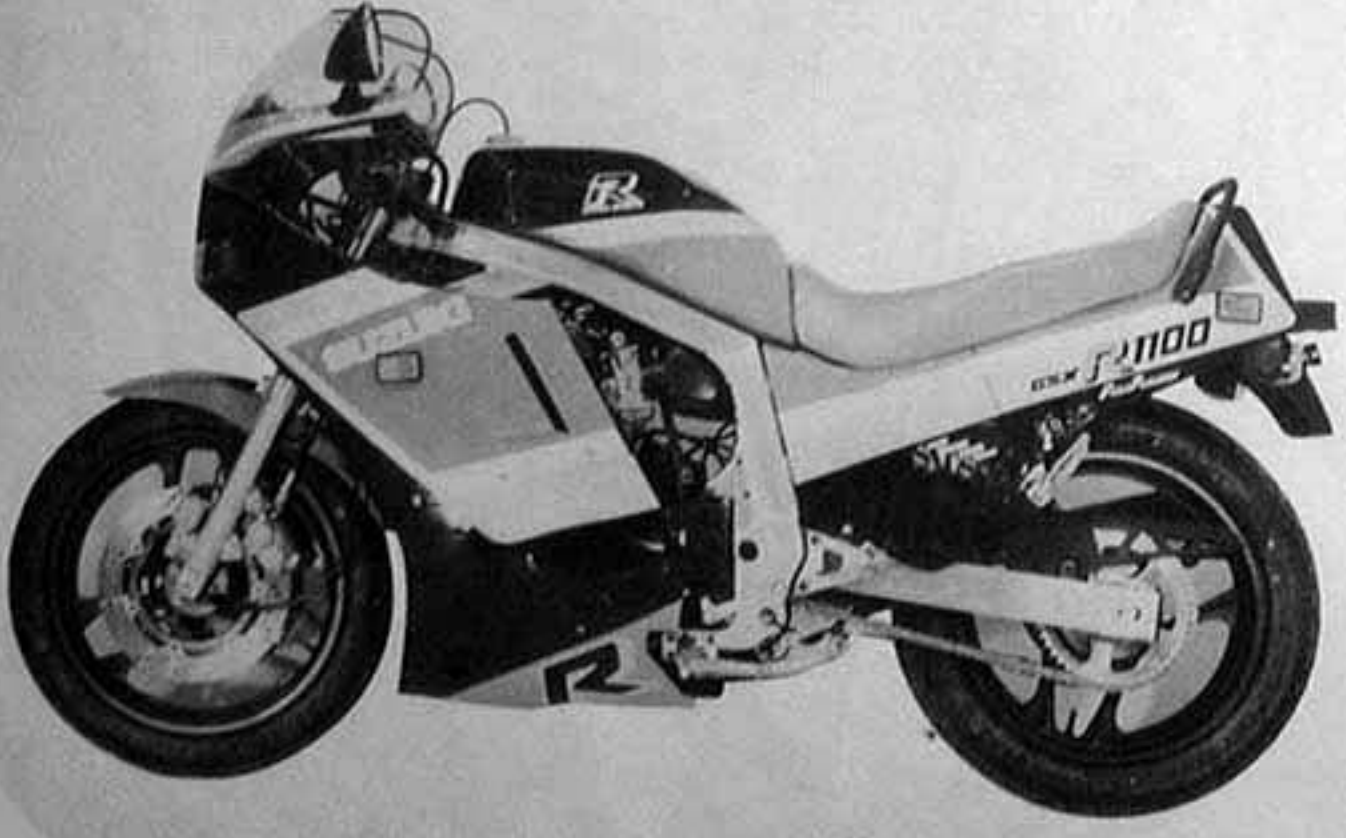
This service manual has been produced primarily for experienced mechanics whose job is to inspect, adjust, repair and service SUZUKI motorcycles. Apprentice mechanics and do-it-yourself mechanics, will also find this manual an extremely useful repair guide. This manual contains the most up-to-date information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

SUZUKI MOTOR CO., LTD.
Service Publications Department
Overseas Service Division

VIEW OF GSX-R1100

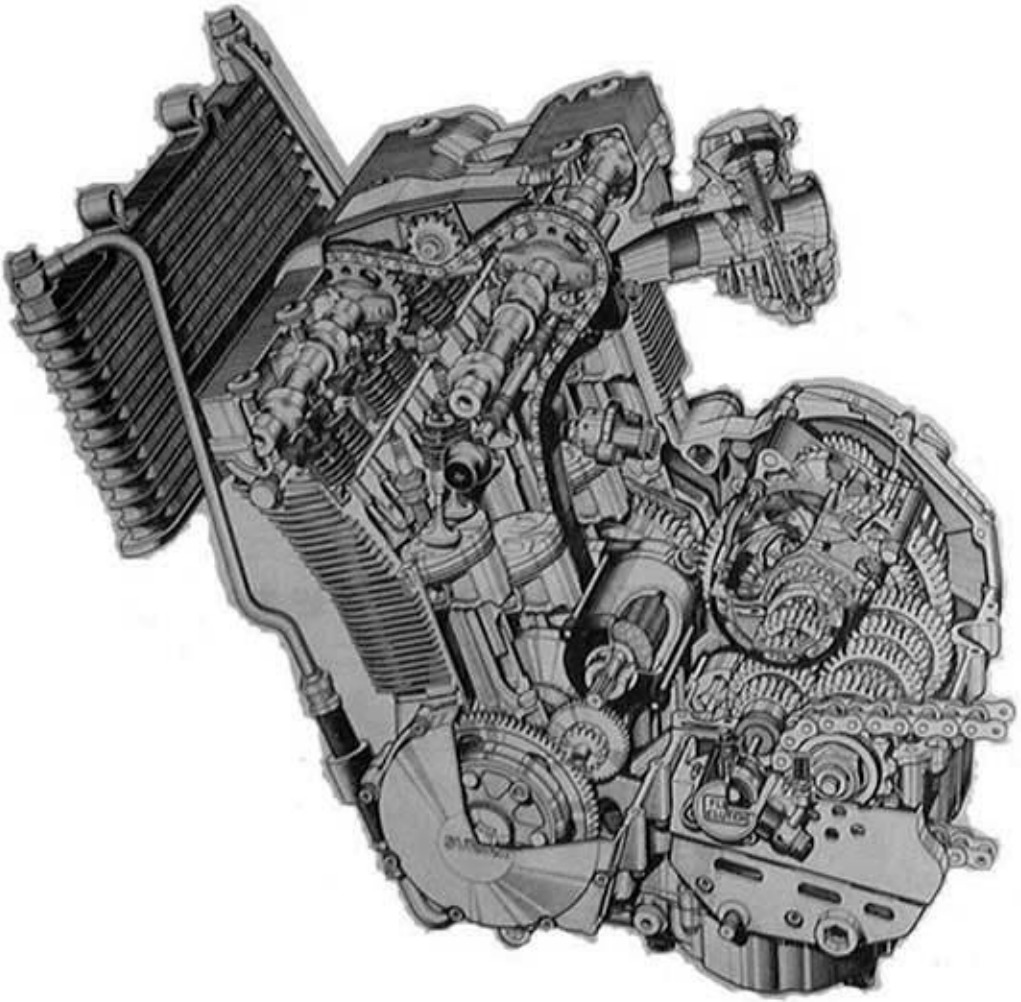


RIGHT SIDE



LEFT SIDE

GROUP INDEX



GENERAL INFORMATION

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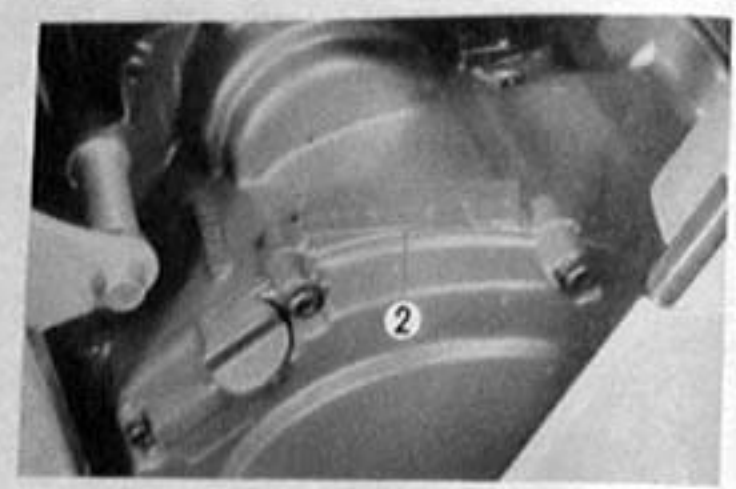
SERIAL NUMBER LOCATION

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



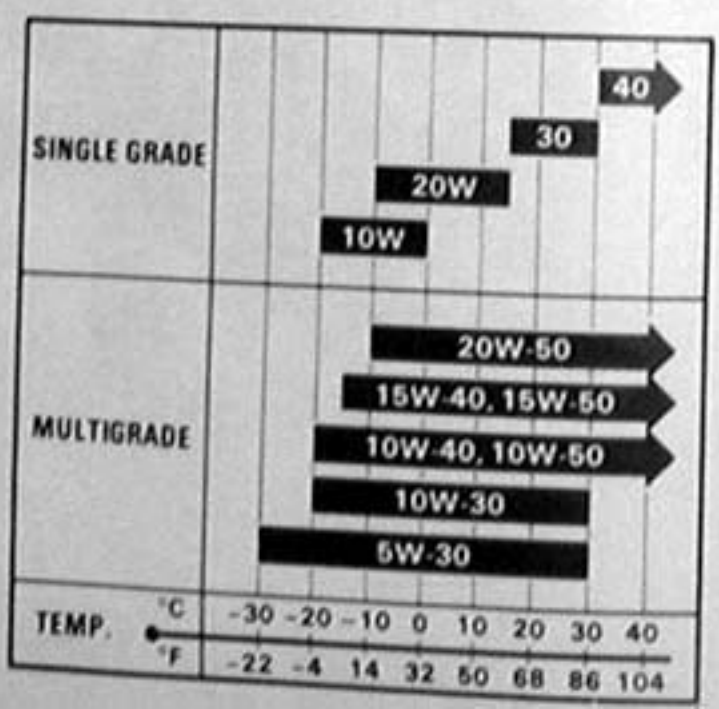
FUEL AND OIL RECOMMENDATION

FUEL

Gasoline used should be graded 85 – 95 octane or higher. An unleaded or low-lead gasoline type is recommended.

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 an SAE 10W/40 motor oil is not available, select an alternate according to the following chart.



BRAKE AND CLUTCH FLUID

Specification and classification:	SAE J1703, DOT3 or DOT4

WARNING:

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

FRONT FORK OIL

Use fork oil #15 . . . . . Only for E-28
Use fork oil #10 . . . . . For the others

BREAK-IN PROCEDURES

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

- Keep to these break-in engine speed limits:

Initial 800 km (500 miles)	Below 4 000 r/min
Up to 1 600 km (1 000 miles)	Below 6 000 r/min
Over 1 600 km (1 000 miles)	Below 10 500 r/min Below 9 000 r/min . . . . . Only for E-18

- 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 10 500 r/min (9 000 r/min . . . Only for E-18) at any time.

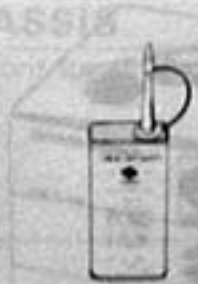
CYLINDER IDENTIFICATION

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

SPECIAL MATERIALS

The materials listed below are needed for maintenance work on the GSX-R1100, and should be kept on hand for ready use. They supplement such standard materials as cleaning fluids, lubricants, emery cloth and the like. How to use them and where to use them are described in the text of this manual.

MATERIAL	PART	PAGE	PART	PAGE
 SUZUKI SUPER GREASE "A" 99000-25010	• Driveshaft oil seal • Starter motor O-ring • Engine oil pipe O-ring • Generator oil seal • Starter motor oil seal • Wheel bearing • Steering stem bearing • Steering damper bearing • Sprocket mounting drum bearing	3-54 3-67 3-71 5-7 5-14 6-6 6-41 6-27 6-28 6-41	• Swingarm spacer and dust seal • Cushion lever bearing, spacer and dust seal • Shock absorber bearing and dust seal	6-57 6-57 6-57
 SUZUKI MOLY PASTE 99000-25140	• Valve stem • Conrod big end bearing • Countershaft and driveshaft • Crankshaft journal • Camshaft journal • Generator damper • Starter motor armature end • Clutch lever push rod	3-31 3-43 3-53 3-59 3-72 5-6 5-15 6-63		
 SUZUKI BOND NO. 1207B 99000-31140	• Crankcase mating surface • Clutch cover mating surface • Oil pressure switch • Signal generator lead wire grommet • Starter clutch cover mating surface • Cylinder stud bolt • Cylinder head cover	3-60 3-64 3-65 3-65 3-67 3-69 3-76	• Cam end cap	3-76
 THREAD LOCK SUPER "1303" 99000-32030	• Engine sproket nut • Cam sproket bolt • Cam chain guide bolt	3-9 3-35 3-36		
 THREAD LOCK SUPER "1305" 99000-32100	• Starter clutch mounting bolt	3-66		

MATERIAL	PART	PAGE	PART	PAGE
 THREAD LOCK "1360" 99000-32130	• Disc plate mounting bolt	6-7 6-42		
 THREAD LOCK "1342" 99000-32050	• Gearshift cam stopper bolt • Oil pump mounting bolt • Countershaft bearing retainer screw • Gearshift cam guide/pawl lifter screw • Starter motor mounting bolt • Generator bearing retainer screw	3-22 3-58 3-61 3-62 3-67 5-7	• Starter motor housing screw • Front fork damper rod bolt • NEAS unit mounting bolt	5-15 6-21 6-21
 SUZUKI BRAKE FLUID 99000-23021	• Clutch • Brakes			
 SUZUKI FORK OIL #15 99000-99044-15G (Only for E-28) SUZUKI FORK OIL #10 99000-99044-10G(For the others)				
 Thread lock cement 99000-32040	• Carburetor set screw • Starter shaft securing screw	4-17 4-18		

PRECAUTIONS AND GENERAL INSTRUCTIONS

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

- Do not run engine indoors with little or no ventilation.
- Be sure to replace packings, gaskets, circlips, O-rings and cotter pins with new ones.

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

- Tighten cylinder head and case bolts and nuts beginning with larger diameter and ending with smaller diameter, and from inside to out-side diagonally, to the specified tightening torque.
- Use special tools where specified.
- Use genuine parts and recommended oils.
- When 2 or more persons work together, pay attention to the safety of each other.
- After the reassembly, check parts for tightness and operation.
- Treat gasoline, which is extremely flammable and highly explosive, with greatest care. Never use gasoline as cleaning solvent.

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

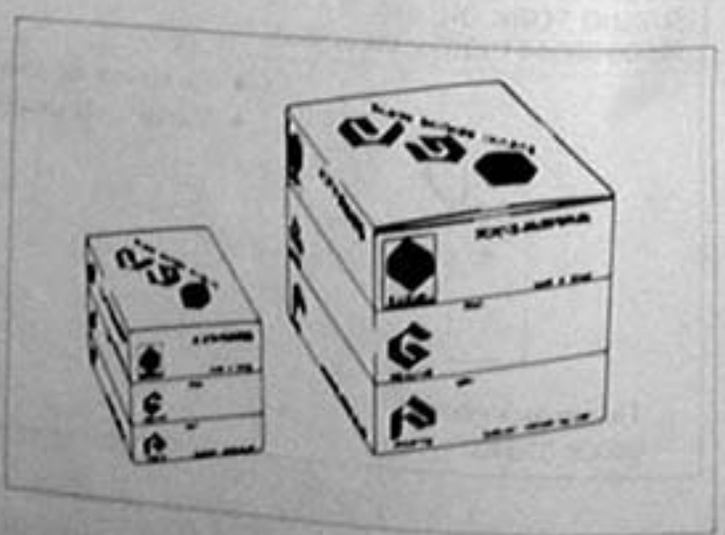
WARNING ..... When personal safety of the rider is involved, disregard of the information could result in injury.

CAUTION ..... For the protection of the motorcycle, the instruction or rule must be strictly adhered to.

NOTE ..... Advice calculated to facilitate the use of the motorcycle is given under this heading.

USE OF GENUINE SUZUKI PARTS

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



SPECIFICATIONS

DIMENSIONS AND DRY MASS

Overall length	2 115 mm (83.3 in)
Overall width	745 mm (29.3 in)
Overall height	1 215 mm (47.8 in)
Wheelbase	1 460 mm (57.5 in)
Ground clearance	125 mm (4.9 in)
Dry mass	197 kg (434 lbs)

ENGINE

Type	Four-stroke, Air-Cooled with SACS, DOHC, TSCC
Number of cylinders	4
Bore	76.0 mm (2.9 in)
Stroke	58.0 mm (2.3 in)
Piston displacement	1 052 cm^3 (64.2 cu.in)
Carburetor	MIKUNI BST34SS four
Air cleaner	Polyester fiber element
Starter system	Electric
Lubrication system	Wet sump

TRANSMISSION

Clutch	Wet multi-plate type
Transmission	5-speed constant mesh
Gearshift pattern	1-down, 4-up
Primary reduction	1.622 (73/45)
Final reduction	3.285 (46/14) . . . For E-02, 18, 21, 22, 25, 34 3.357 (47/14) . . . . . For the others
Gear ratios, Low 2nd 3rd 4th Top	2.385 (31/13) 1.632 (31/19) 1.250 (25/20) 1.045 (23/22) 0.913 (21/23)
Drive chain	DAIDO: D.I.D. 532ZL TAKASAGO: RK532GSV, 114 links

CHASSIS

Front suspension	Telescopic, coil spring, oil damped, spring preload 4-way adjustabl, damping force 3-way adjustable
Rear suspension	Full-floating suspension system, gas/oil damped, spring preload fully adjustable, damping force 4-way adjustable
Steering angle	30° (right & left)
Caster	63° 30′
Trail	116 mm (4.6 in)
Turning radius	3.2 m (10.5 ft)
Front brake	Disc brake, twin
Rear brake	Disc brake
Front tire size	110/80VR 18V 260
Rear tire size	150/70VR 18V 260
Front fork stroke	130 mm (5.1 in)
Rear wheel travel	135 mm (5.3 in)

ELECTRICAL

Ignition type	Transistorized
Ignition timing	13° B.T.D.C. below 1 500 r/min and 35° B.T.D.C. above 2 350 r/min
Spark plug	N.G.K.: J9A . . . . . For E-01, 24, 25, 34 N.G.K.: JR9A . . . . . For the others
Battery	12V 50.4 kC (14Ah) / 10HR
Generator	Three-phase A.C. Generator
Fuse	10/10/10/10/10A
Circuit breaker	30A

CAPACITIES

Fuel tank including reserve	21.0 L (5.5 US gal) . . . . . Only for E-24 19,0 L (5.0 US gal) . . . . . For the others
reserve	4.5 L (4.8 US qt)
Engine oil with filter change	3.7 L (3.9 US qt)
Front fork oil	417 ml (14.1 US oz)

These specifications are subject to change without notice.

COUNTRY OR AREAS

The series of symbols on the left stand for the countries and areas on the right.

SYMBOL	COUNTRY OR AREA	SYMBOL	COUNTRY OR AREA
E-01	General	E-21	Belgium
E-02	England	E-22	W. Germany
E-04	France	E-24	Australia
E-06	S. Africa	E-25	Netherlands
E-15	Finland	E-28	Canada
E-16	Norway	E-34	Italy
E-17	Sweden	E-39	Austria
E-18	Switzerland		

PERIODIC MAINTENANCE AND TUNE-UP PROCEDURES

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CONTENTS

PERIODIC MAINTENANCE SCHEDULE

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

NOTE:
More frequent servicing may be performed on motorcycles that are used under severe conditions.

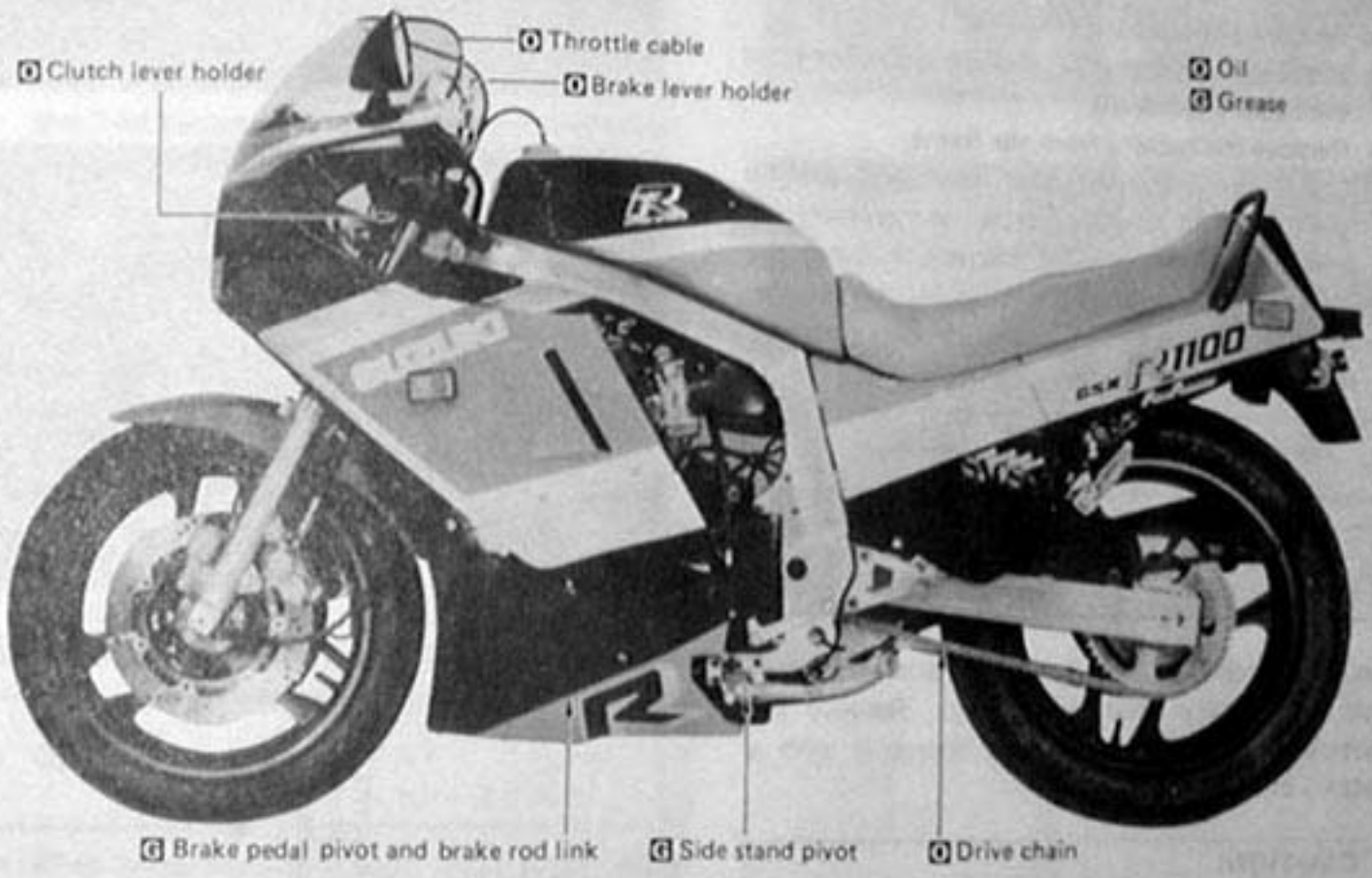
PERIODIC MAINTENANCE CHART

Item \ Interval	km	1 000	6 000	12 000	18 000	24 000
	miles	600	4 000	7 500	11 000	15 000
	months	2	12	24	36	48
Battery		–	I	I	I	I
Cylinder head nuts & exhaust pipe bolts		T	T	T	T	T
Air cleaner		Clean every 3 000 km (2 000 miles) and replace every 12 000 km (7 500 miles)				
Valve clearance		I	I	I	I	I
Spark plugs		–	I	R	I	R
Fuel line		I	I	I	I	I
		Replace every four years				
Engine oil and filter		R	R	R	R	R
Carburetors (Idle rpm)		I	I	I	I	I
Clutch hose		I	I	I	I	I
		Replace every four years				
Clutch fluid		I	I	I	I	I
		Replace every two years				
Drive chain		I	I	I	I	I
		Clean and lubricate every 1 000 km (600 miles)				
Brake hoses		I	I	I	I	I
		Replace every four years				
Brake fluid		I	I	I	I	I
		Replace every two years				
Brakes		I	I	I	I	I
Tires		I	I	I	I	I
Steering		I	I	I	I	I
Front fork		I	–	I	–	I
Rear suspension		I	–	I	–	I
Chassis bolts and nuts		T	T	T	T	T

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

LUBRICATION POINTS

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



NOTE:

- **Before lubricating each part, clean off any rusty spots and wipe off any grease, oil, dirt or grime.**
- **Lubricate exposed parts which are subject to rust, with oil or grease.**

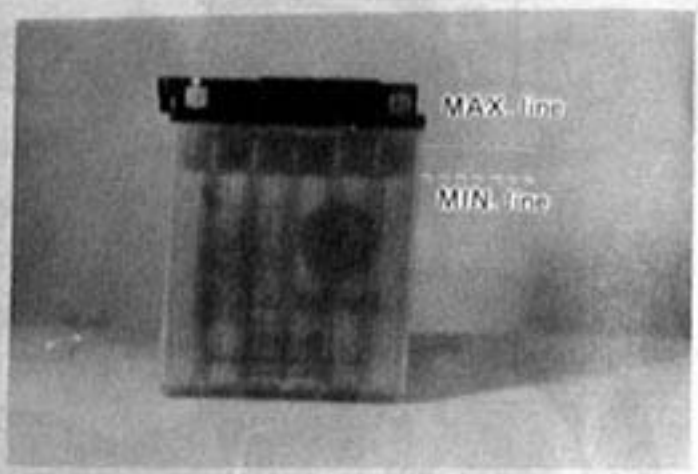
MAINTENANCE AND TUNE-UP PROCEDURES

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

BATTERY

Inspect Every 6 000 km. (4 000 miles, 12 months)

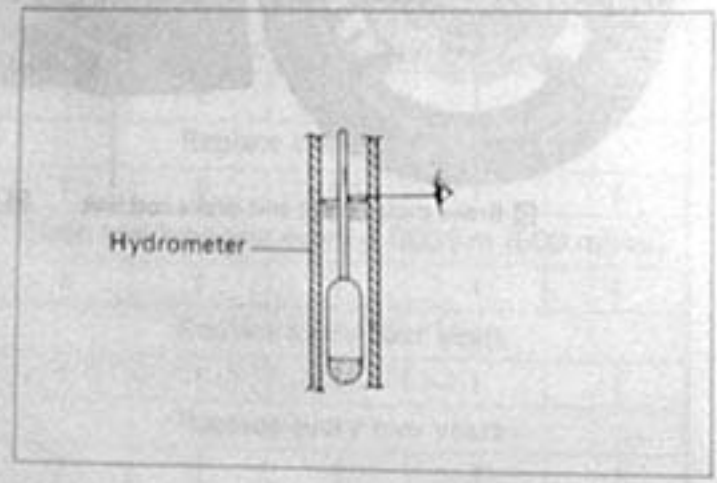
- Remove the seat.
- Remove the battery ⊖ and ⊕ lead wires from the battery terminals.
- Remove the battery from the frame.
- Check the electrolyte for level and specific gravity. Add distilled water, as necessary, to keep the surface of the electrolyte above the MIN. level line but not above the MAX.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



09900-28403	Hydrometer

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

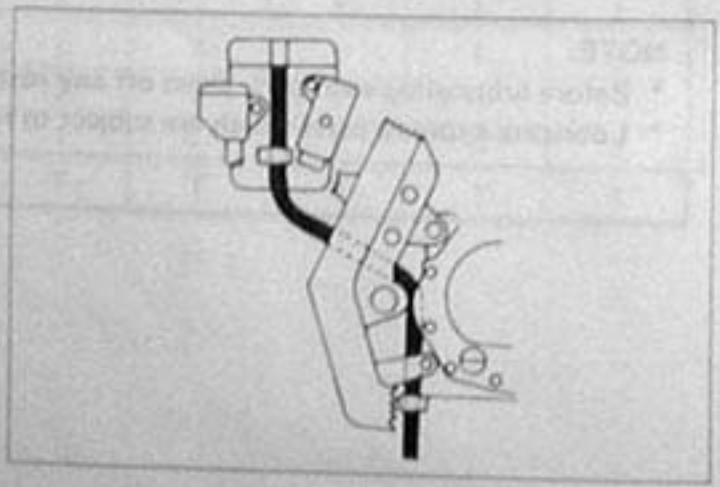
An S.G. reading of 1.22 (at 20°C) or under means that the battery needs recharging. Remove the battery from the machine and charge it with a battery charger.



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

- Charge at a maximum of 1.2 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.

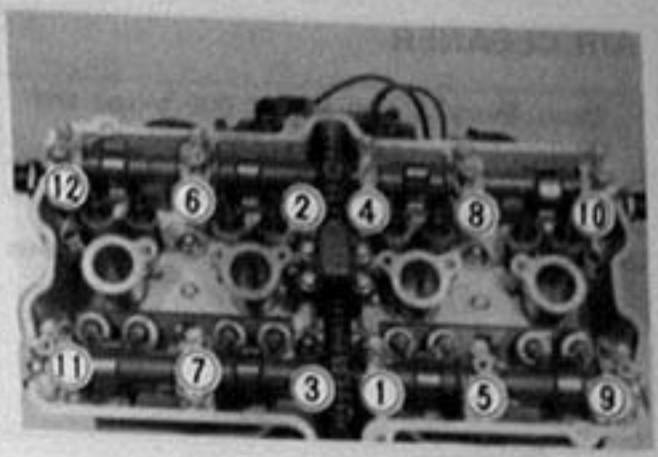
CYLINDER HEAD NUTS AND EXHAUST PIPE BOLTS

Tighten Initially at 1 000 km (600 miles, 2 months) and Every 6 000 km. (4 000 miles, 12 months) thereafter.

CYLINDER HEAD

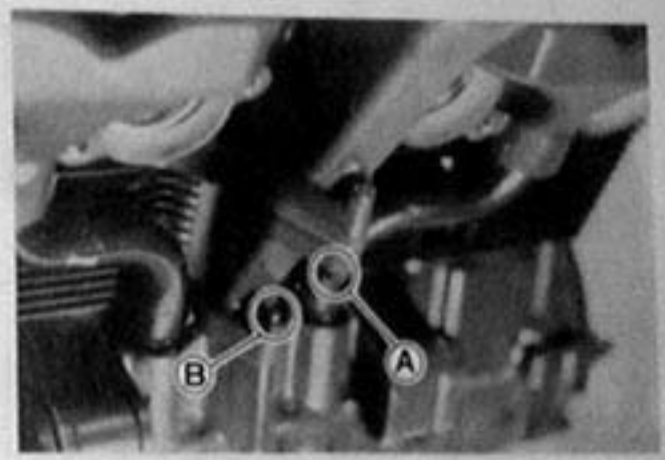
- Remove the seat, fairing and fuel tank. **(Refer to page 3-3 and 6-1)**
- Remove the cylinder head cover.
- First loosen and retighten the nuts to the specified torque with a torque wrench sequentially in ascending numerical order with the engine cold.

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



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

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



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

- When installing the cylinder head cover, apply SUZUKI Bond No. 1207B to the head cover groove and cam end caps. (Refer to page 3-76)
- Tighten the head cover bolts to the specified torque.

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

EXHAUST PIPE

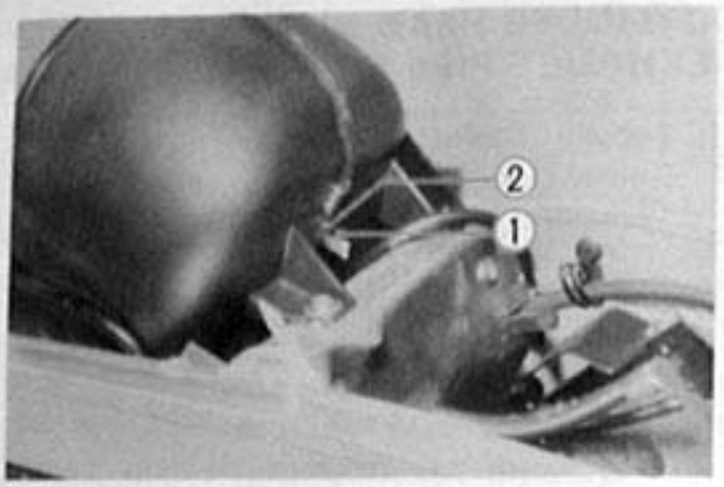
- Tighten the exhaust pipe clamp bolts to the specified torque with a torque wrench.

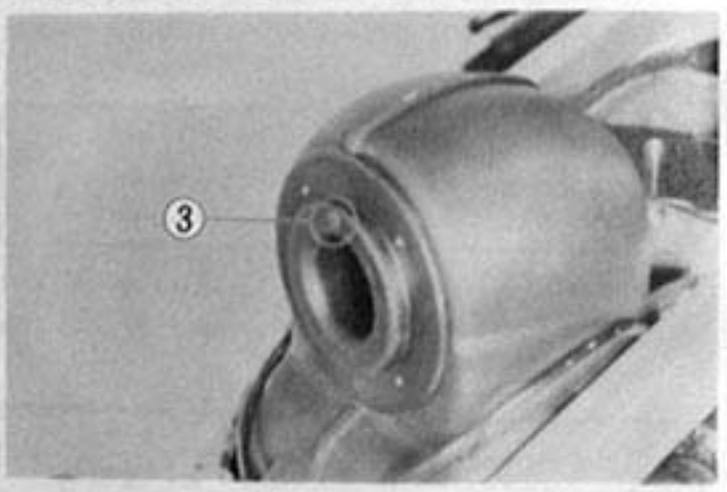
Exhaust pipe clamp bolt	9 – 12 N·m (0.9 – 1.2 kg-m / 6.5 – 8.5 lb-ft)

AIR CLEANER

Clean Every 3 000 km (2 000 miles) and Replace Every 12 000 km (7 500 miles).

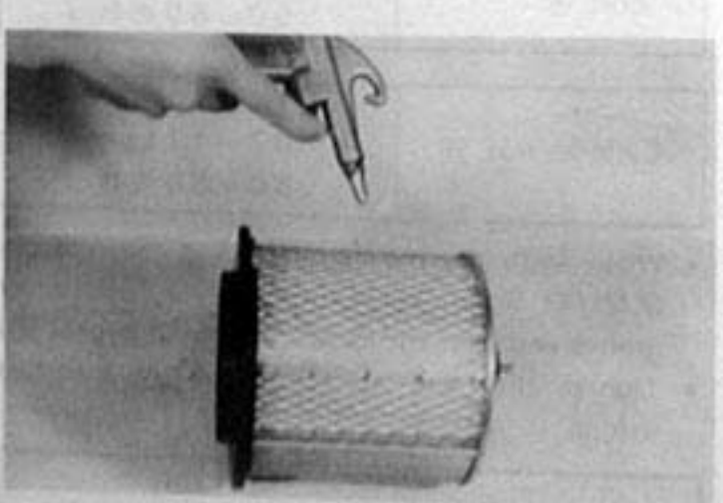
- Remove the seat and fuel tank.
- Remove the wing nut ① and washer ②, then take out the air cleaner element.





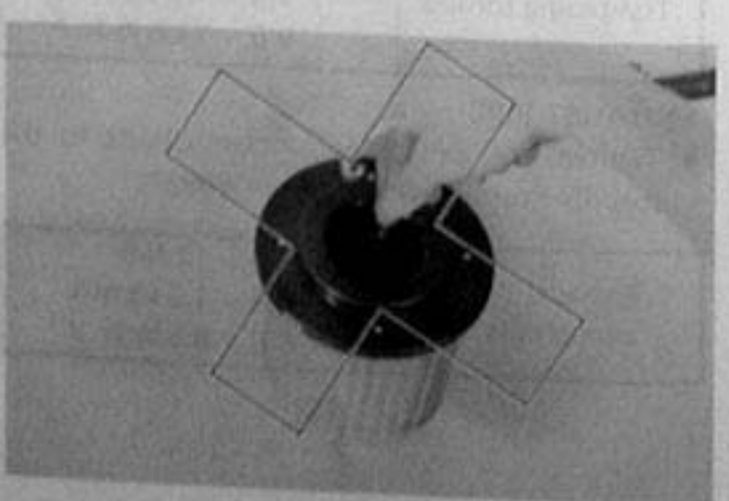
- Carefully use air hose to blow the dust from the cleaner element outside.

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



- Reinstall the cleaned or new cleaner element in the reverse order of removal.
- When installing the air cleaner element in the cleaner case, make sure that the arrow mark ③ comes upward.

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



VALVE CLEARANCE

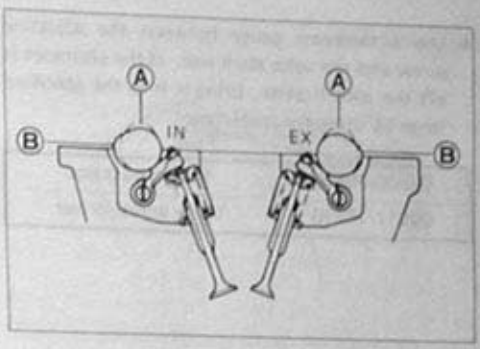
Inspect Initially at 1 000 km (600 miles, 2 months) and Every 6 000 km (4 000 miles, 12 months) thereafter.

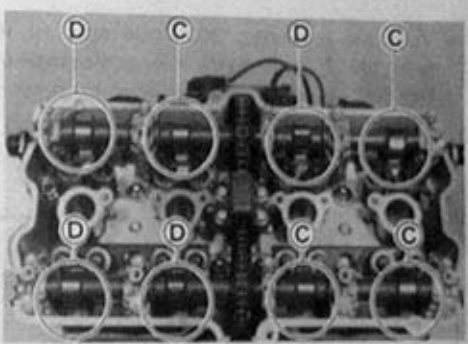
The valve clearance specification is the same for both intake and exhaust valves.
Valve clearance adjustment must be checked and adjusted 1) at the time of periodic inspection, 2) when the valve mechanism is serviced, and 3) when the camshafts are disturbed by removing them for servicing.

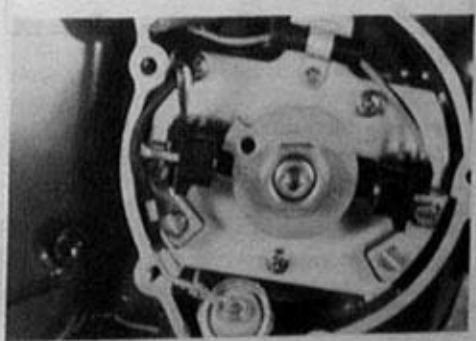
Valve clearance (when cold)	0.10 – 0.15 mm (0.004 – 0.006 in)

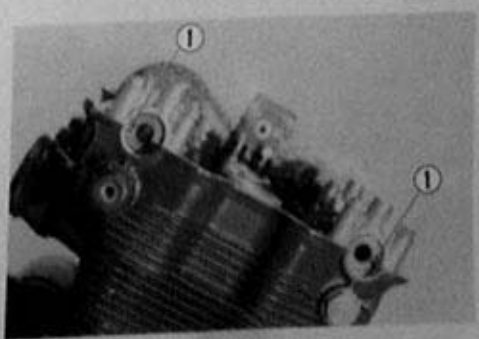
NOTE:
* The cam must be at positions, Ⓐ or Ⓑ, in order to check the valve clearance or to adjust valve clearance. Clearance readings should not be taken with the cam in any other position than these two positions.
* The clearance specification is for COLD state.
* To turn the crankshaft for clearance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

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



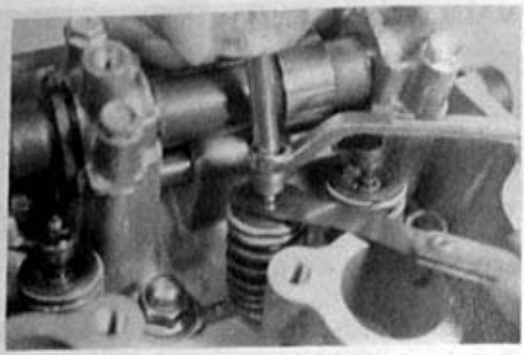




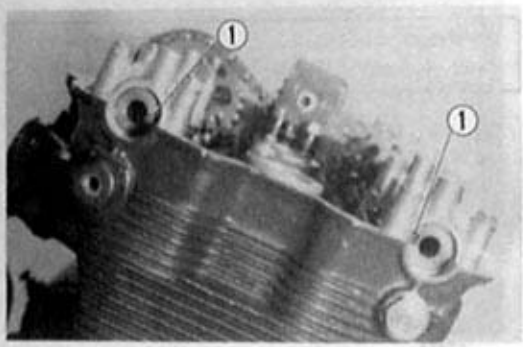


- Use a thickness gauge between the adjusting screw and the valve stem end. If the clearance is off the specification, bring it into the specified range by using the special tool.

09900-20803	Thickness guage
09917-14910	Valve adjust driver



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



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

- When installing the cylinder head cover, apply SUZUKI Bond No. 12078 to the head cover groove and cam end caps. (Refer to page 3-76)
- Tighten the head cover bolts to the specified torque.

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

CAUTION:
An each rocker arm ensure that both the right and left valve clearances are as close as possible.

SPARK PLUGS

Inspect at 6 000 km (4 000 miles, 12 months), 18 000 km (11 000 miles, 36 months) and Replace Every 12 000 km (7 500 miles, 24 months).

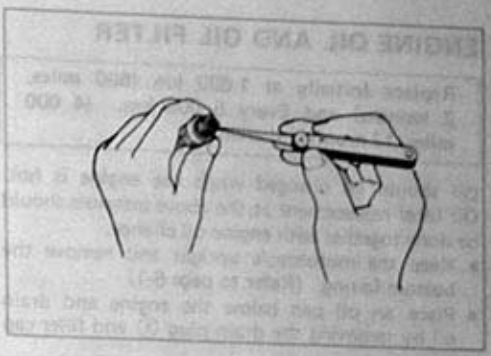
- Remove the fairing.

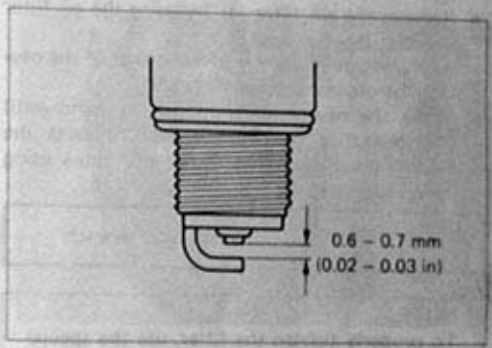
The plug gap is adjusted to 0.6 – 0.7 mm (0.02 – 0.03 in) The gap is correctly adjusted by using a thickness gauge. When carbon is deposited on the spark plug, remove the carbon with a spark plug cleaning machine or by carefully using a tool with a pointed end. If the electrodes are extremely worn or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

NGK J9A as listed in the table should be used as the standard plug. However, the heat range of the plug should be selected to meet the requirements of speed, actual load, fuel, etc. If the plugs need be replaced, it is recommended that ones having a heat range closest to the standard plug in the table be selected. Remove the plugs and inspect the insulators. Proper heat range would be indicated if all insulators were light brown in color. If they are baked white, they should be replaced by a cold type NGK J10A.

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

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





Recommended spark plug

	Standard	Cold type
NGK	J9A (JR9A)	J10A (JR10A)

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

ENGINE OIL AND OIL FILTER

Replace Initially at 1 000 km (600 miles, 2 months) and Every 6 000 km. (4 000 miles, 12 months) thereafter.

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

- Keep the motorcycle upright and remove the bottom fairing. (Refer to page 6-1)
- Place an oil pan below the engine and drain oil by removing the drain plug ① and filler cap ②.
- Remove the oil filter ③ by using the oil filter wrench. (Special tool Ⓐ)
- Apply engine oil lightly to the gasket of the new filter before installation.
- Install the new filter turning it by hand until you feel that the filter gasket contacts the mounting surface. Then tighten 2 turns using the oil filter wrench. (Special tool Ⓐ)

09915-40610	Oil filter wrench

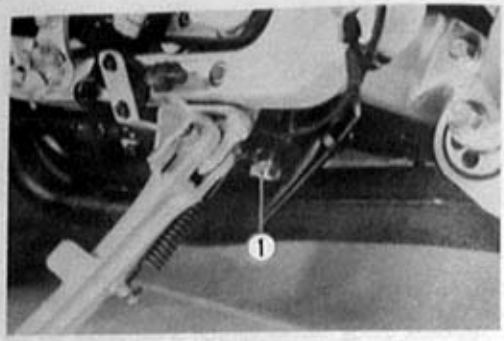
NOTE:
To properly tighten the filter, use the special tool. Never tighten the filter by hand.

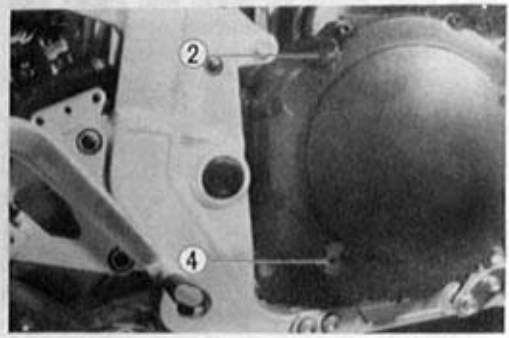
- Fit the drain plug ① securely, and add fresh oil through the oil filler. The engine will hold about 3.7 L (3.9 US qt) of oil.
  Use an API classification of SE or SF oil with SAE 10W/40 viscosity.
- Start up the engine and allow it to run for several seconds at idling speed.
- Turn off the engine and wait about one minute, then check the oil level through the inspection window ④. If the level is below mark "F", add oil to that level.

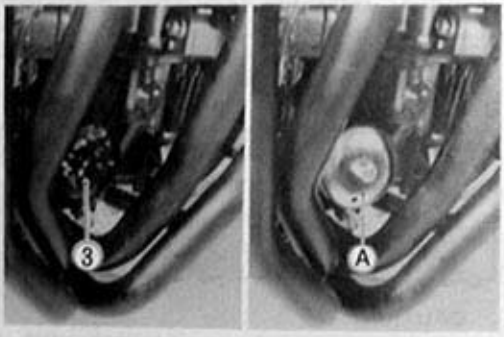
NECESSARY AMOUNT OF ENGINE OIL

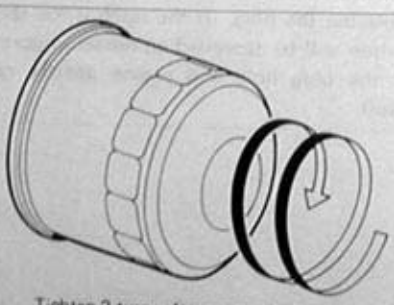
Oil change	3.4 L (3.6 US qt)
Filter change	3.7 L (3.9 US qt)
Overhaul engine	4.7 L (5.0 US qt)

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









Tighten 2 turns after contacting gasket.

FUEL LINE

Inspect Initially at 1 000 km (600 miles, 2 months) and Every 6 000 km (4 000 miles, 12 months) thereafter. Replace Every four years.

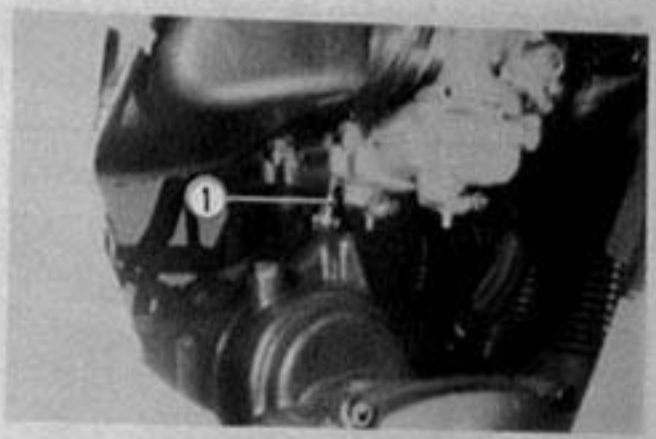
CARBURETOR

IDLE R.P.M. (Idling adjustment)

Inspect Initially at 1 000 km (600 miles, 2 months) and Every 6 000 km (4 000 miles, 12 months) thereafter.

NOTE: Make this adjustment when the engine is hot.

- Connect a tachometer.
- Start up the engine and set its speed at anywhere between 1 000 and 1 200 r/min by turning throttle stop screw (1).

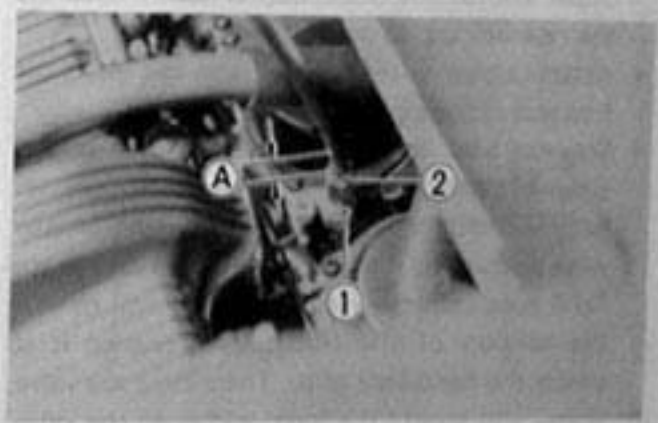


Engine idle speed	1 100 ± 100 r/min

THROTTLE CABLE PLAY

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

- Remove the fuel tank.
- Loosen the lock nut (1) and slide the adjuster (2) up or down until the specified play is obtained.
- Tighten the lock nut (1) while holding the adjuster.



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

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

CLUTCH

Inspect Initially at 1 000 km (600 miles, 2 months) and Every 6 000 km (4 000 miles, 12 months) thereafter.
Replace hose every four years.
Replace fluid every two years.

CLUTCH FLUID LEVEL

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

Specification and classification	SAE J1703, DOT3 or DOT4

BLEEDING AIR FROM THE CLUTCH FLUID CIRCUIT

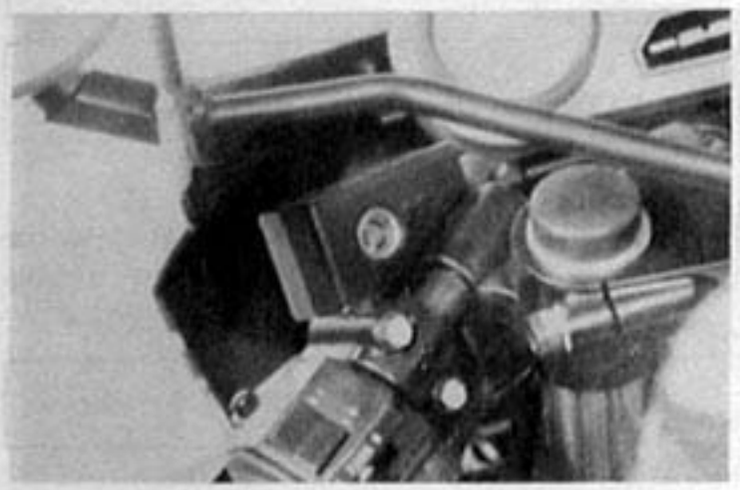
The clutch fluid circuit may be purged of air in the following manner.

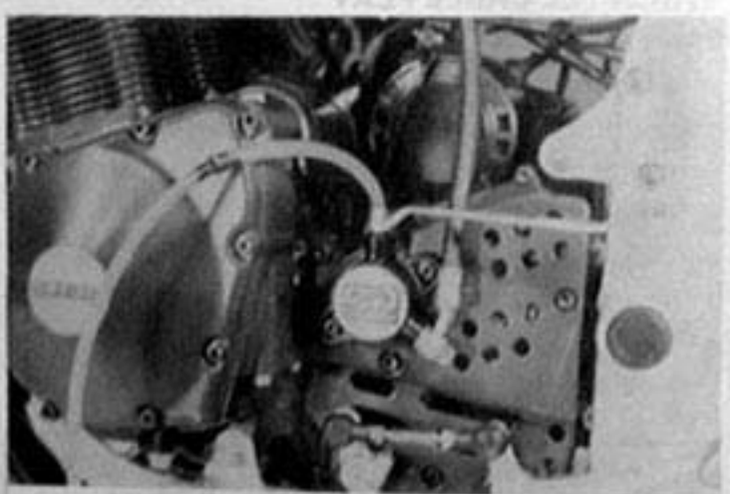
- Fill up the master cylinder reservoir to the upper end of the inspection window. Replace the reservoir cap to prevent entry of dirt.
- Attach a pipe to the bleeder valve and insert the free end of the pipe into a receptacle.
- Squeeze and release the clutch lever several times in rapid succession,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

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

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

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



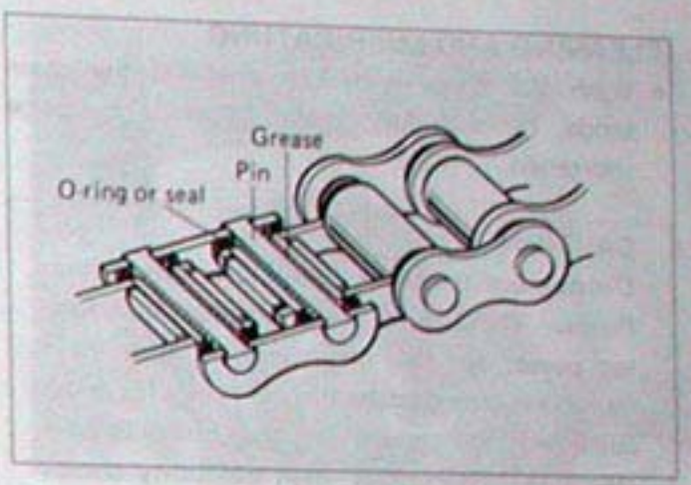


Bleeder valve tightening torque	6 – 9 N·m (0.6 – 0.9 kg·m, 4.5 – 6.5 lb·ft)

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

DRIVE CHAIN

Inspect Initially at 1 000 km (600 miles, 2 months) and Every 6 000 km (4 000 miles, 12 months) thereafter.
Clean and Lubricate Every 1 000 km (600 miles).



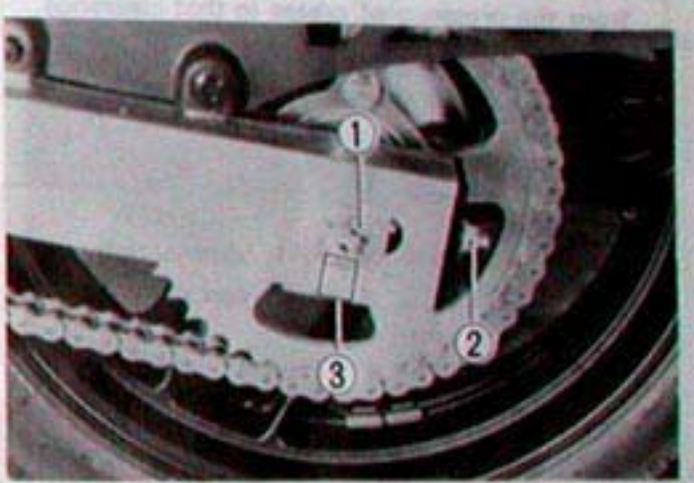
Visually check the drive chain for the possible defects, listed below. (Support, the motorcycle by a jack with a wooden block, and turn the rear wheel slowly by hand with the transmission shifted to Neutral.)

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

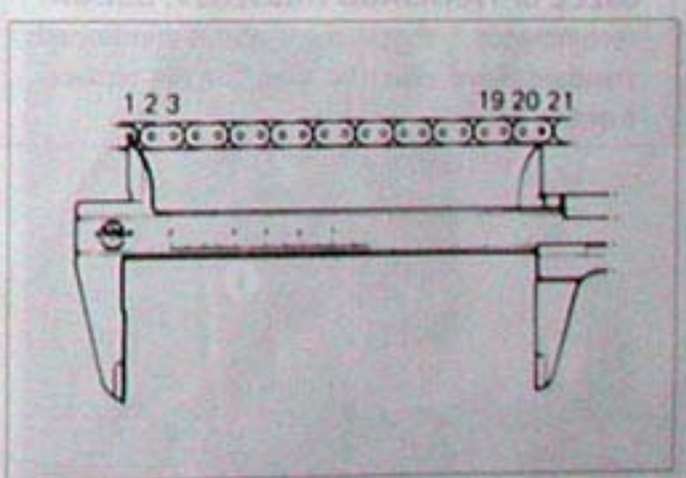
If any defects are found, the drive chain must be replaced.

CHECKING

- Remove the cotter pin. (Only for E-28)
- Loosen axle nut ①.
- Tension the drive chain fully by tightening the chain adjuster lock nuts ②.



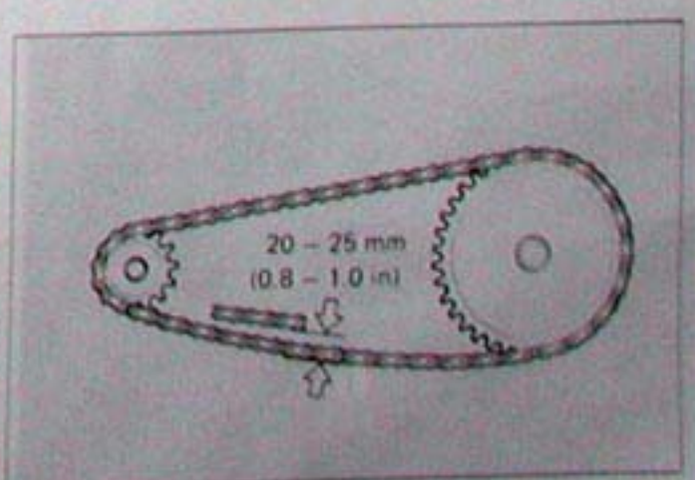
- Count out 21 pins (20 pitches) on the chain and measure the distance between the two points. If the distance exceeds following limit, the chain must be replaced.



Service Limit	319.4 mm (12.6 in)

ADJUSTING

- Loosen the chain adjuster lock nuts ② until the chain has 20 – 25 mm (0.8 – 1.0 in) of slack at the middle between engine and rear sprockets. The mark ③ on both chain adjusters must be at the same position on the scale to ensure that the front and rear wheels are correctly aligned. Place on side stand for accurate adjustment.
- After adjusting the drive chain, tighten the axle nut ① securely.
- Tighten the chain adjuster lock nuts securely.

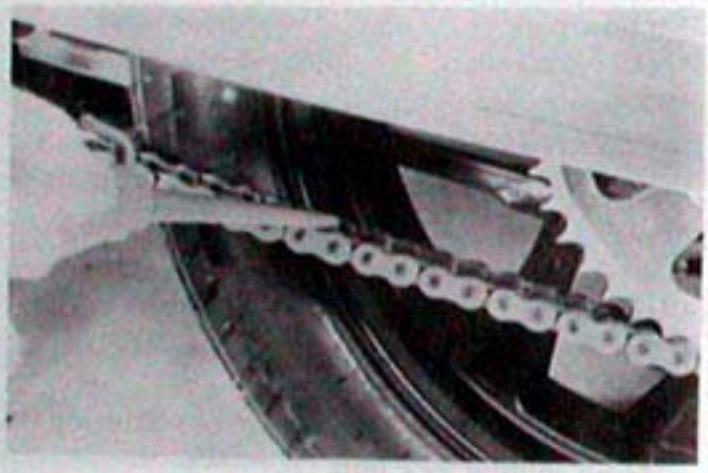


Rear axle nut Tightening torque	85 – 115 N·m (8.5 – 11.5 kg·m / 61.5 – 83.0 lb·ft)

CLEANING AND LUBRICATIING

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

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



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

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

CAUTION:
The standard drive chain is DAIDO D.I.D 532ZL or TAKASAGO RK532GSV. SUZUKI recommends that the above-mentioned standard drive chain be used for the replacement.

BRAKES

Inspect Initially at 1 000 km (600 miles, 2 months) and Every 6 000 km. (4 000 miles, 12 months) thereafter.
Replace hoses Every four years.
Change fluid Every two years.

BRAKE FLUID LEVEL

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

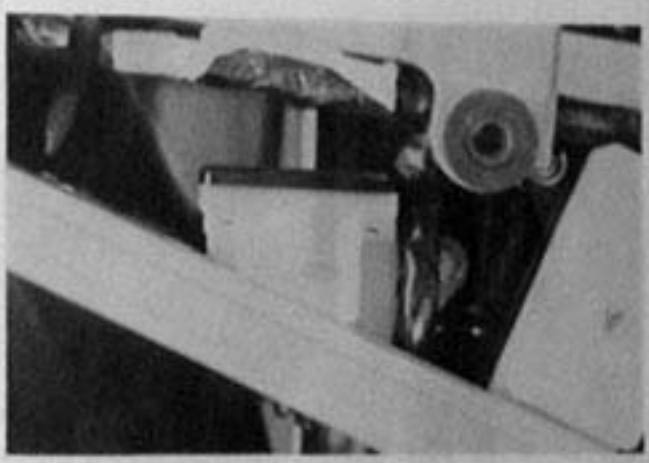
Specification and Classification	SAE J1703, DOT3 or DOT4

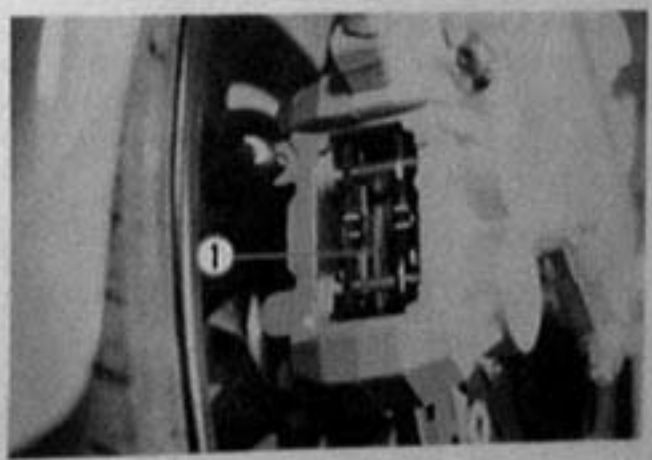
WARNING:
The brake system of this motorcycle is filled with a glycol-based brake fluid. Do not use or mix different types of fluid such as silicone-based and petroleum-based. Do not use any brake fluid taken from old, used or unsealed containers. Never re-use brake fluid left over from the last servicing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

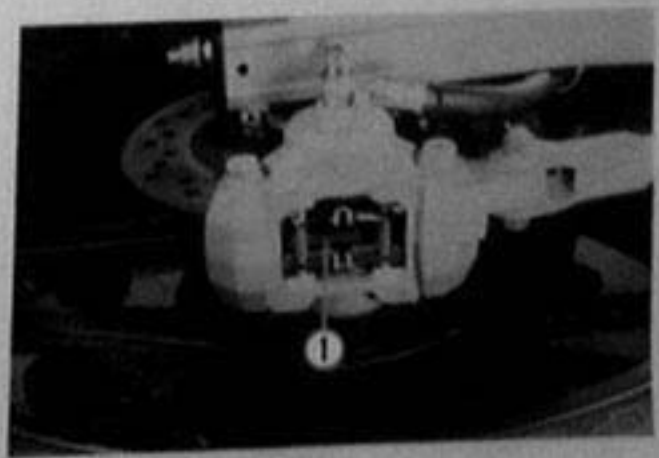
WARNING:
Brake fluid, if it leaks, will interfere with safe running and immediately discolor painted surfaces.
Check the brake hoses and hose joints for cracks and oil leakage before riding.

BRAKE PADS

The extent of brake pad wear can be checked by observing the limit line ① marked on the pad. When the wear exceeds the limit line, replace the pads with new ones. **(Refer to pages 6-9 and 6-31)**



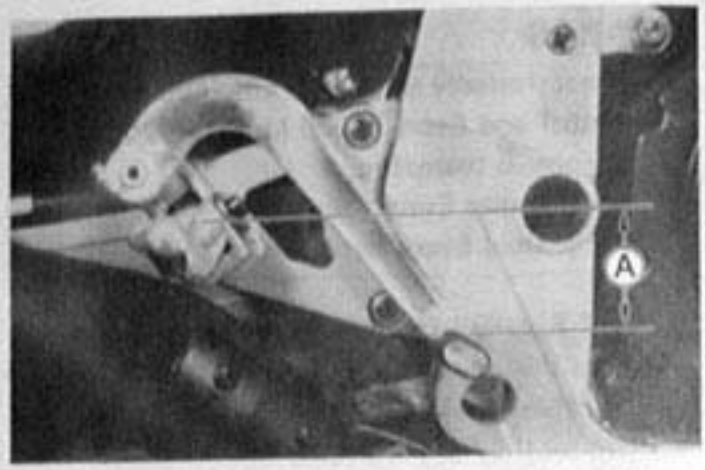


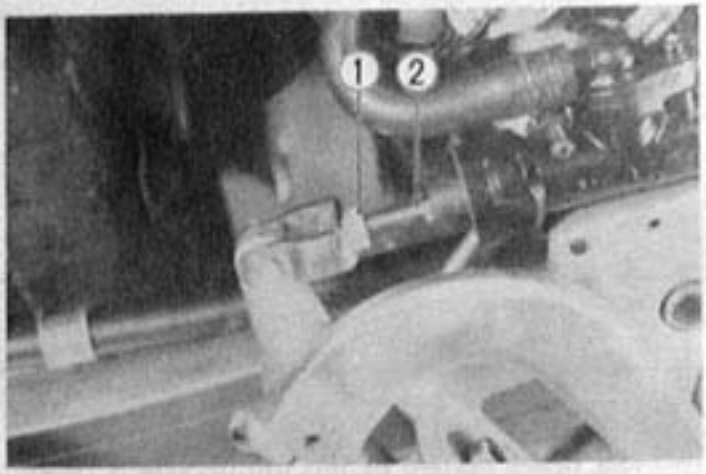


BRAKE PEDAL HEIGHT

- Remove the right frame cover.
- Loosen the lock nut ①, and rotate the push rod ② to locate brake pedal 55 mm (2.2 in) Ⓐ below the top face of the footrest.
- Retighten the lock nut ① to secure the push rod ② in the proper position.

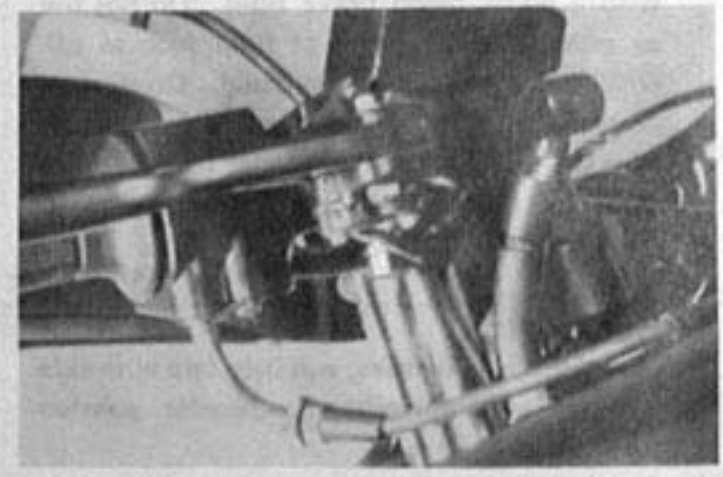
Brake pedal height Ⓐ	55 mm (2.2 in)

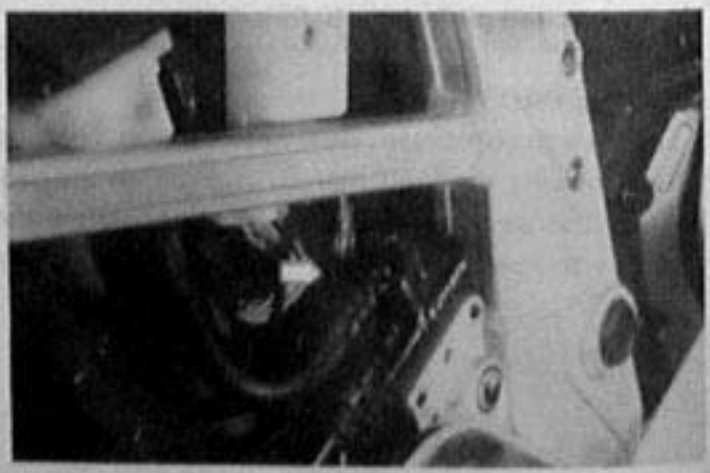




BRAKE LIGHT SWITCHES

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





AIR BLEEDING THE BRAKE FLUID CIRCUIT

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

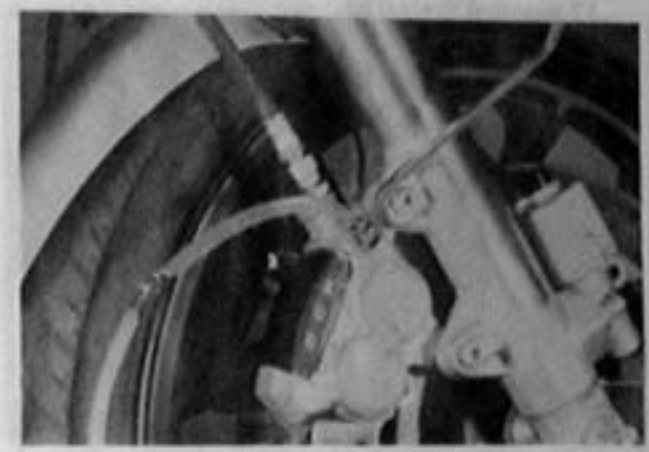
- Fill up the master cylinder reservoir to the upper end of the inspection window, (for front brake) and "UPPER" line. (for rear brake) Replace the reservoir cap to prevent entry of dirt.
- Attach a pipe to the caliper bleeder valve, and insert the free end of the pipe into a receptacle.

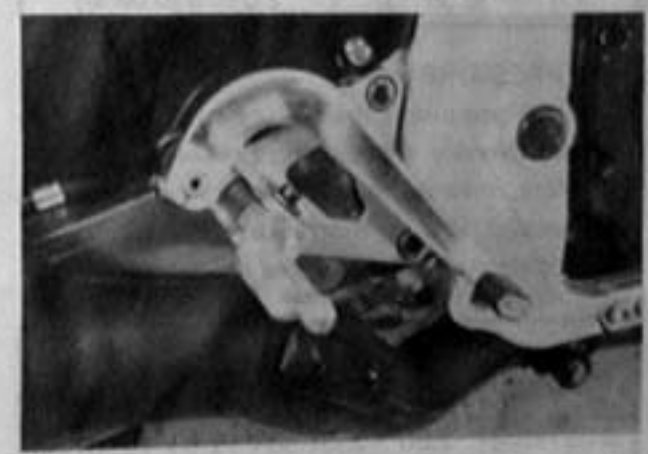
Bleeder valve tightening torque	6 – 9 N·m (0.6 – 0.9 kg-m / 4.5 – 6.5 lb-ft)

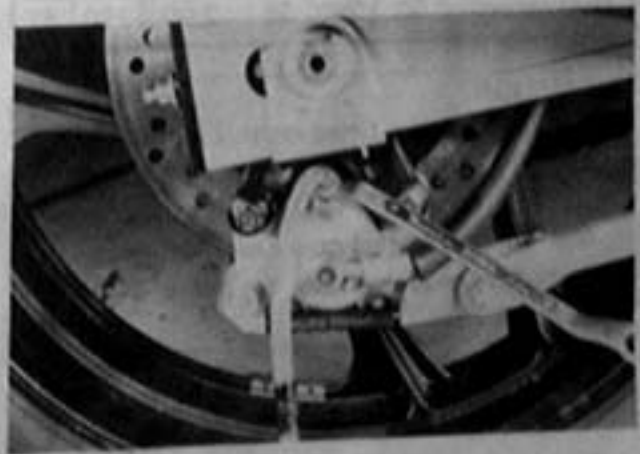
- Front brake: Bleed the air from the inboard valve first, and then outboard valve.
- Squeeze and release the brake lever several times in rapid succession and squeeze the lever fully without releasing it. Loosen the bleeder valve by turning it a quarter of a turn so that the brake fluid runs into the receptacle; this will 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 upper end of the inspection window (for front brake) and "UPPER" line. (for rear brake)







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

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

TIRES

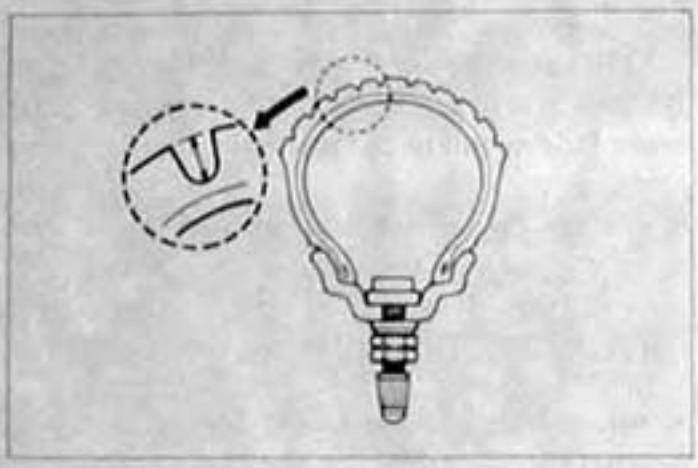
Inspect Initially at 1 000 km (600 miles, 2 months) and Every 6 000 km (4 000 miles, 12 months) thereafter.

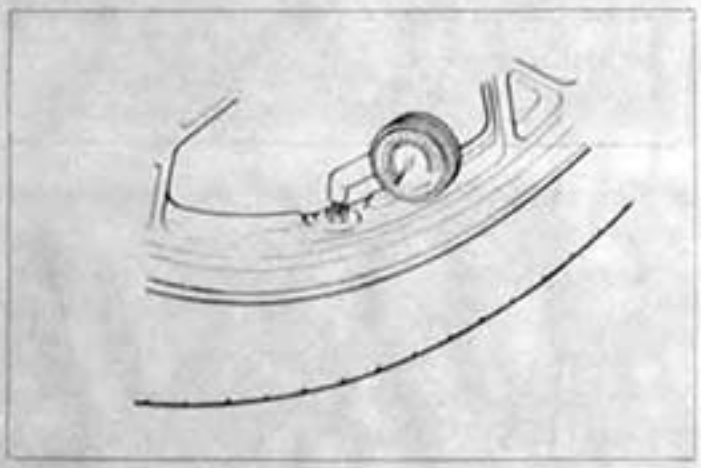
TIRE TREAD CONDITION

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

Tire tread depth limit

FRONT	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.

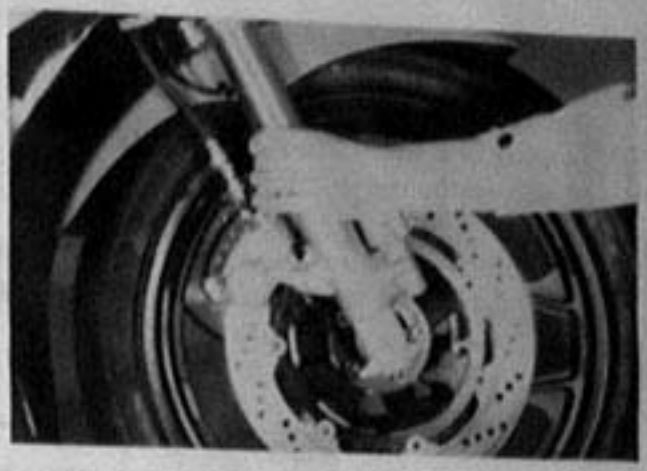
	FRONT			REAR		
	kg/cm²	kPa	Psi	kg/cm²	kPa	Psi
Solo riding	2.50	250	36	2.50	250	36
Dual riding	2.50	250	36	2.90	290	42

CAUTION:
The standard tire fitted on this motorcycle is 110/80VR18V260 for front and 150/70VR 18V260 for rear. The use of tires other than those specified may cause instability. It is highly recommended to use a SUZUKI Genuine Tire.

STEERING

Inspect Initially at 1 000 km (600 miles, 2 months) and Every 6 000 km (4 000 miles, 12 months) thereafter.

Taper roller type bearings are used on the steering system for better handling.
Steering should be adjusted properly for smooth turning of handlebars and safe running. Overtight steering prevents smooth turning of the handlebar and too loose steering will cause poor stability.
Check that there is no play in the front fork assembly by supporting the machine so that the front wheel is off the ground, with the wheel straight ahead, grasp the lower fork tubes near the axle and pull forward. If play is found, perform steering bearing adjustment as described in page 6-27 of this manual.



FRONT FORKS

Inspect Initially at 1 000 km (600 miles, 2 months) and Every 12 000 km (7 500 miles, 24 months) thereafter.

Inspect the front forks for oil leakage, scoring or scratches on the outer surface of the inner tubes. Replace any defective parts, if necessary.
(Refer to page 6-16)

REAR SUSPENSION

Inspect Initially at 1 000 km (600 miles, 2 months) and Every 12 000 km (7 500 miles, 24 months) thereafter.

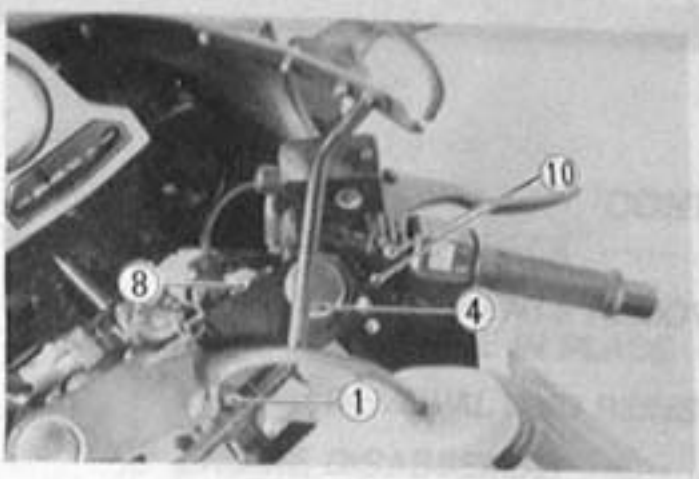
Inspect the rear shock absorber for oil leakage and check that there is no play in the swingarm assembly.

CHASSIS BOLTS AND NUTS

Tighten Initially at 1 000 km (600 miles, 2 months) and Every 6 000 km (4 000 miles, 12 months) thereafter.

The nuts and bolts listed below are important safety parts. They must be retightened when necessary to the specified torque with a torque wrench. (Refer to page 2-20 for the locations of the following nuts and bolts on the motorcycle.)

	Item	N·m	kg·m	lb-ft
①	Steering stem head nut	30 – 40	3.0 – 4.0	21.5 – 29.0
②	Front fork upper clamp bolt	20 – 30	2.0 – 3.0	14.5 – 21.5
③	Front fork lower clamp bolt	15 – 25	1.5 – 2.5	11.0 – 18.0
④	Front fork cap bolt	15 – 30	1.5 – 3.0	11.0 – 21.5
⑤	Front axle nut (Only for E-28)	36 – 52	3.6 – 5.2	26.0 – 37.5
⑤	Front axle nut (For the others)	40 – 58	4.0 – 5.8	21.5 – 42.0
⑥	Front axle pinch nut	20 – 40	2.0 – 4.0	14.5 – 29.0
⑦	Handlebar holder set bolt	6 – 10	0.6 – 1.0	4.5 – 7.0
⑧	Handlebar holder mounting bolt	15 – 25	1.5 – 2.5	11.0 – 18.0
⑨	Clutch master cylinder mounting bolt	5 – 8	0.5 – 0.8	3.5 – 6.0
⑩	Front brake master cylinder mounting bolt	5 – 8	0.5 – 0.8	3.5 – 6.0
⑪	Front caliper mounting bolt	15 – 25	1.5 – 2.5	11.0 – 18.0
⑫	Front caliper housing bolt	30 – 36	3.0 – 3.6	21.5 – 26.0
⑬	Brake/clutch hose union bolt	20 – 25	2.0 – 2.5	14.5 – 18.0
⑭	Air bleeder valve	6 – 9	0.6 – 0.9	4.5 – 6.5
⑮	NEAS unit bolt	6 – 8	0.6 – 0.8	4.5 – 6.0
⑯	Front and rear disc bolt	15 – 25	1.5 – 2.5	11.0 – 18.0
⑰	Swingarm pivot nut	50 – 80	5.0 – 8.0	36.0 – 58.0
⑱	Rear shock absorber upper/lower mounting nut	40 – 60	4.0 – 6.0	29.0 – 43.5
⑲	Rear cushion lever mounting nut	70 – 100	7.0 – 10.0	50.5 – 72.5
⑳	Rear cushion lever nut	70 – 100	7.0 – 10.0	50.5 – 72.5
㉑	Rear caliper mounting bolt	15 – 25	1.5 – 2.5	11.0 – 18.0
㉒	Rear caliper housing bolt	30 – 36	3.0 – 3.6	21.5 – 26.0
㉓	Rear torque link nut	18 – 28	1.8 – 2.8	13.0 – 20.0
㉔	Rear brake master cylinder mounting bolt	6 – 10	0.6 – 1.0	4.5 – 7.0
㉕	Rear axle nut (Only for E-28)	85 – 115	8.5 – 11.5	61.5 – 83.0
㉕	Rear axle nut (For the others)	94 – 127	9.4 – 12.7	68.0 – 92.0
㉖	Rear sprocket nut	48 – 72	4.8 – 7.2	35.0 – 52.0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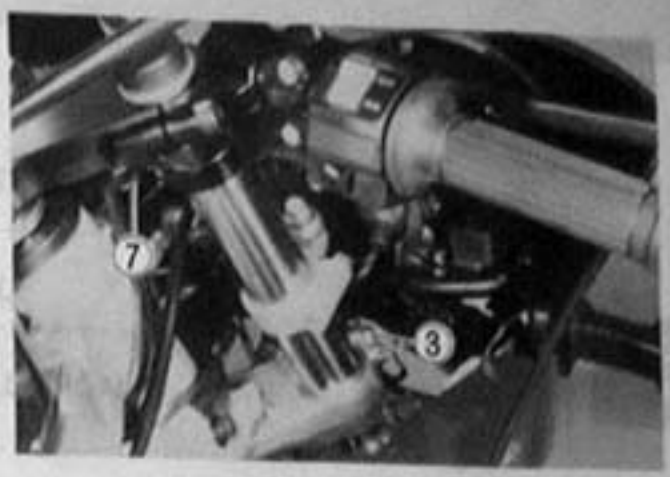
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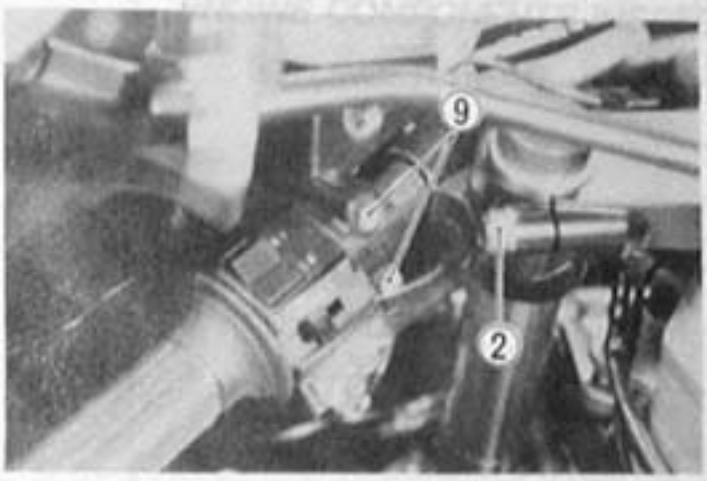
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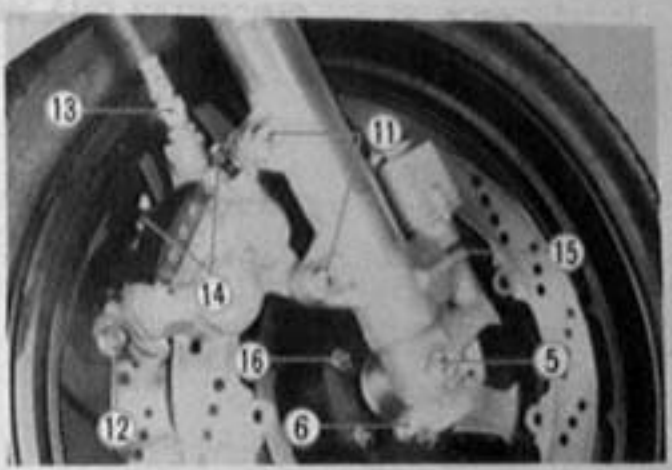
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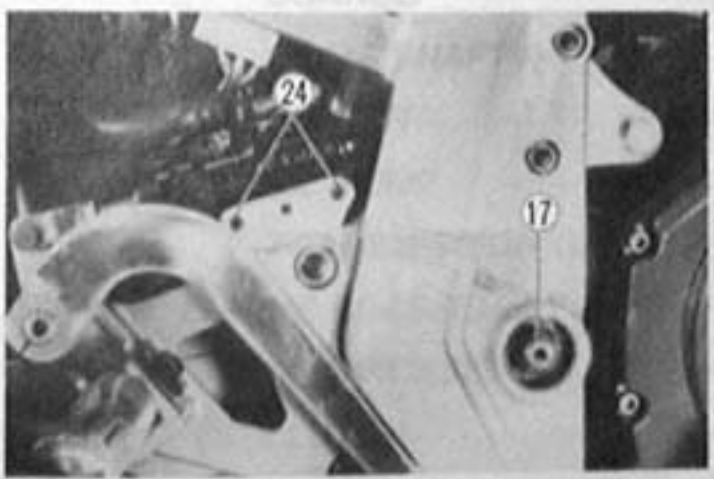
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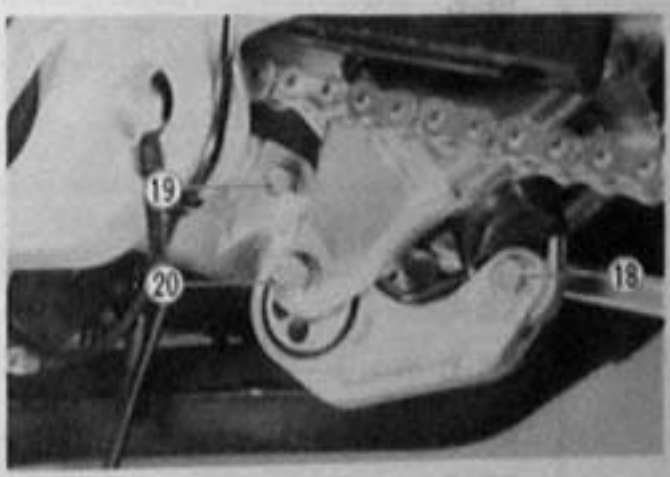
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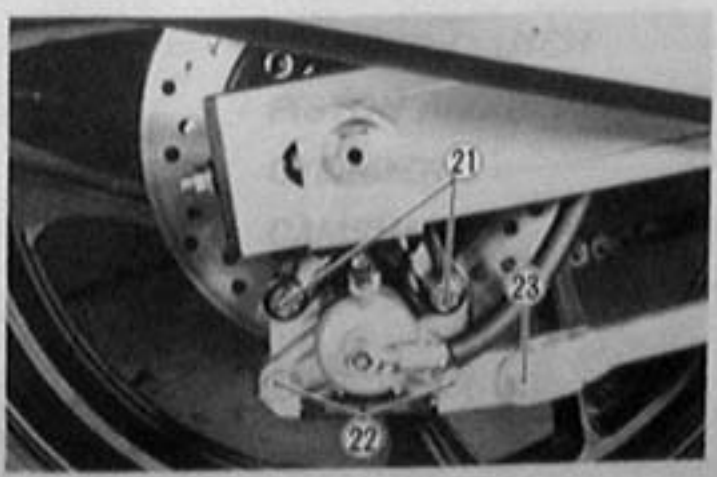
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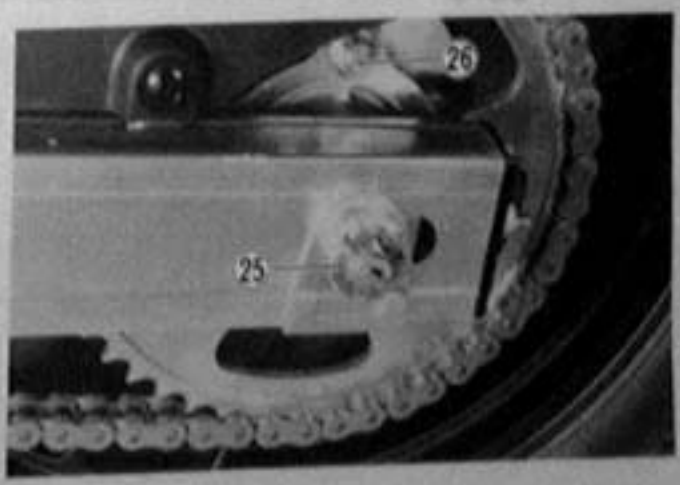
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ENGINE

CONTENTS

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
1 000 – 14000 kPa (10 – 14 kg/cm² 142 – 199 psi)	800 kPa (8 kg/cm² 114 psi)	200 kPa (2 kg/cm² 28 psi)

Low compression pressure can indicate any of the following conditions:

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

Overhaul the engine in the following cases:

- Compression pressure in one of the cylinders is less than 800 kPa (8 kg/cm², 114 psi).
- Difference in compression pressure between any two cylinders is more than 200 kPa (2 kg/cm², 28 psi).
- All compression pressure are below 1000 kPa (10 kg/cm², 142 psi) (standard) even when they measure than 800 kPa (8 kg/cm², 114 psi).

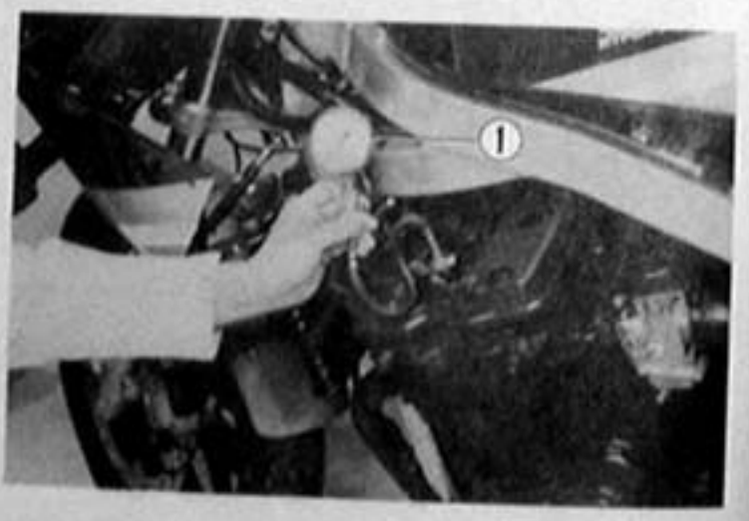
COMPRESSION TEST PROCEDURE

NOTE:

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

- Remove the left and right middle fairings.
- Remove the left and right fuel tank mounting bolts, and lift up the fuel tank with an appropriate bar.
- Remove the all spark plugs.
- Fit the compression gauge ① in one of the plug holes, while taking care that the connection is tight.
- Twist the throttle grip full open.
- Crank the engine a few seconds with the starter, and record the maximum gauge reading as the compression of that cylinder.
- Repeat this procedure with the other cylinders.

09915-64510	Compression gauge
09915-63210	Adaptor



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

ENGINE LEFT SIDE

ENGINE CENTER

ENGINE RIGHT SIDE

ENGINE REMOVAL AND REINSTALLATION

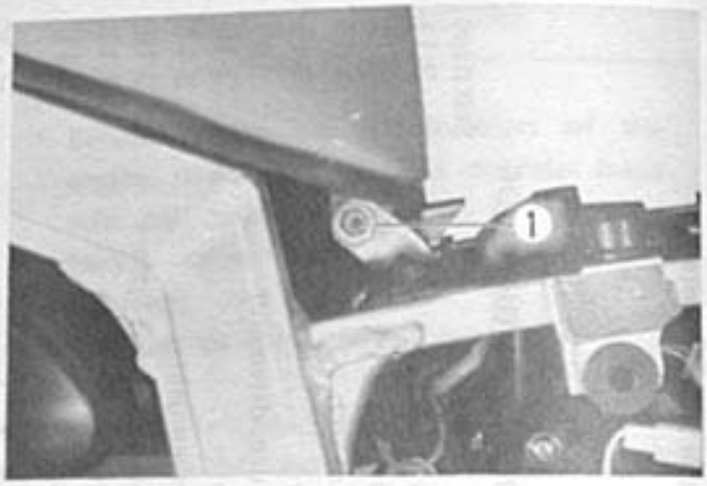
ENGINE REMOVAL

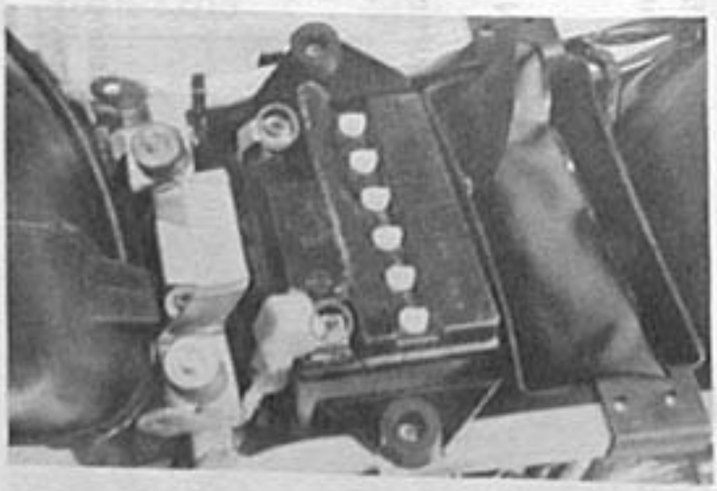
Before taking the engine out of the frame, wash the engine with a steam cleaner and drain engine oil, etc. The procedure of engine removal is sequentially explained in the following steps, and engine installation is effected by reversing the removal procedure.

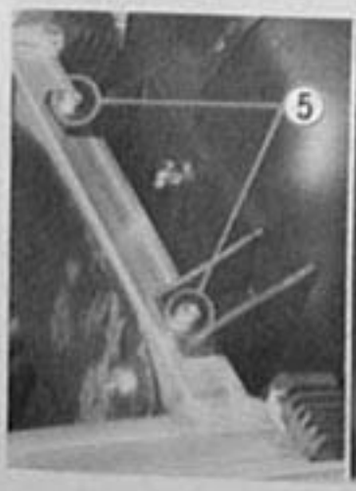
- Remove the bottom fairing.
  (Refer to page 6-1)
- Remove the left and right middle fairings.
  (Refer to page 6-1)
- Remove the seat.
- Remove the left and right frame covers.
- Remove the left and right fuel tank mounting bolts ①.
- Remove the fuel cock lever ② by removing the screw.
- Shift the fuel hose clip sideways and disconnect the two hoses (fuel hose ③ and vacuum hose ④) from the fuel cock.
- Remove the fuel tank.
- Disconnect the battery ⊖ and ⊕ lead wires from the battery terminals.

CAUTION:
Be sure to disconnect the ⊖ lead wire first.

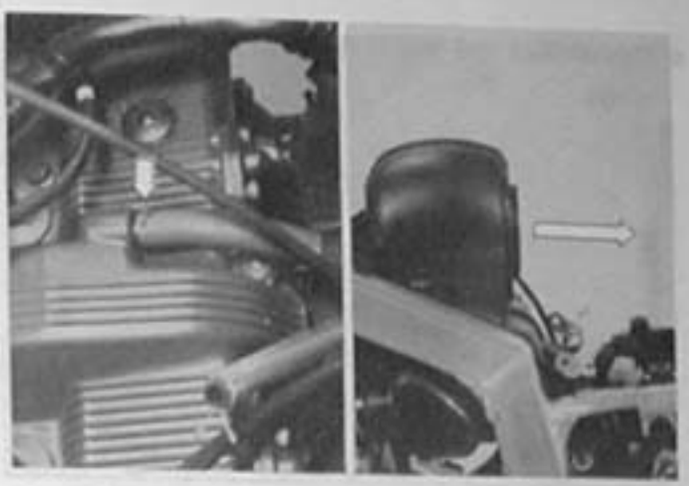
- Remove the battery.
- Remove the air cleaner case mounting screws ⑤.
- Loosen the respective carburetor clamp screws.





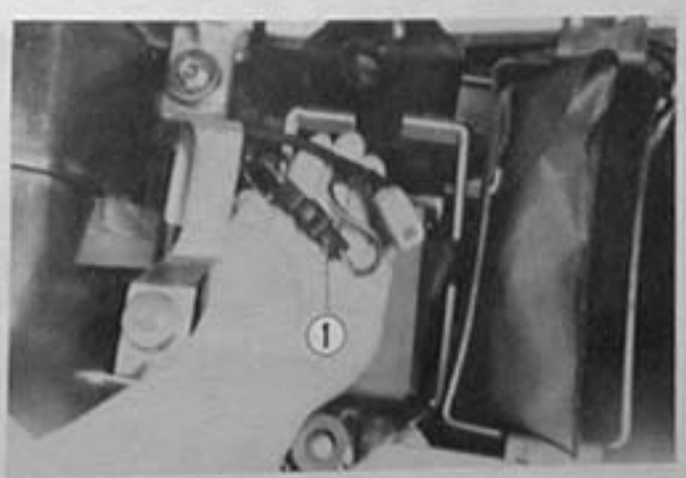


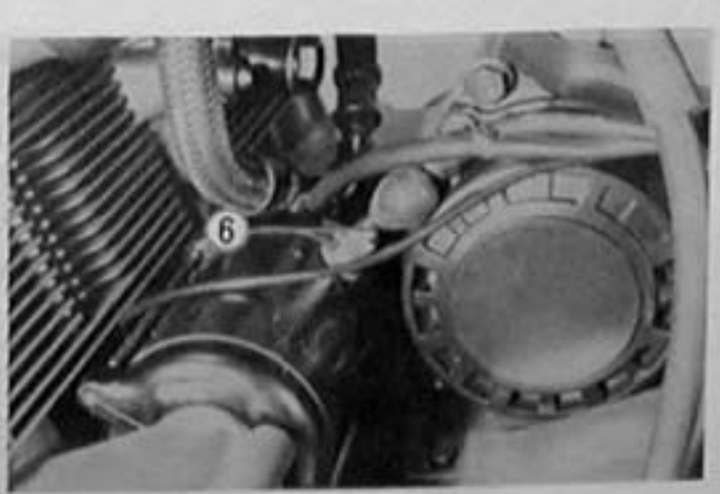
- Shift the breather hose clip sideways and disconnect the hose from the cylinder head cover.
- Shift the air cleaner case backward.

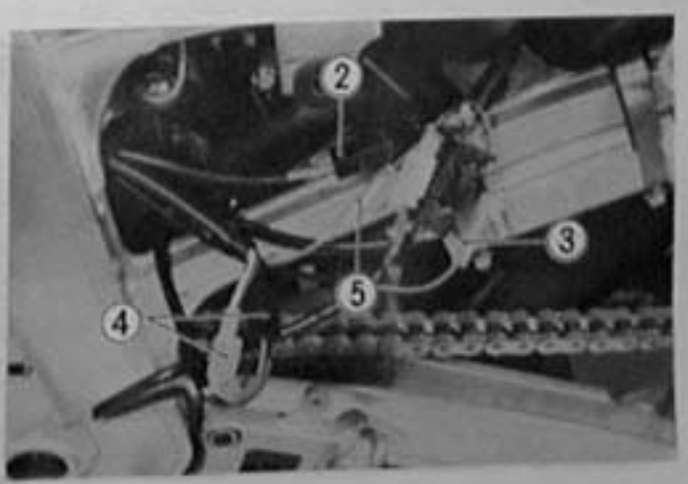


- Remove the carburetor assembly from right side, and then disconnect the throttle cable.

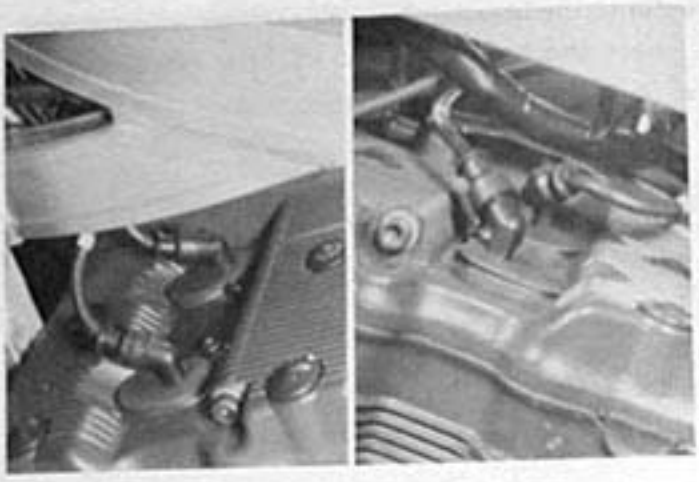
- Disconnect the various lead wires.
  - Battery ⊖ lead wire (coupler ①)
  - Generator lead wires (coupler ②)
  - Neutral indicator switch lead wire ③
  - Signal generator lead wires (coupler ④)
  - Oil pressure indicator switch lead wire ⑤
  - Starter motor lead wire ⑥



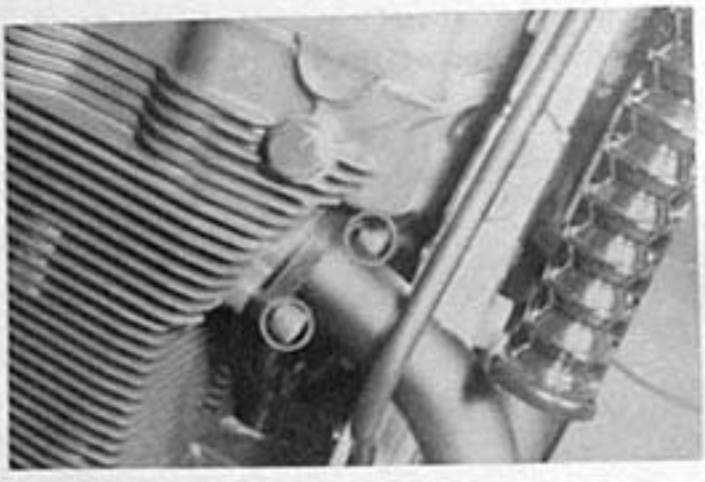




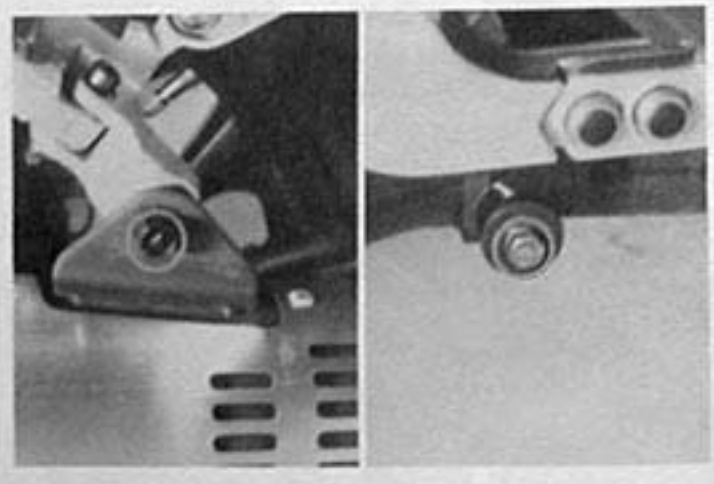
- Disconnect the spark plug caps from the spark plugs.



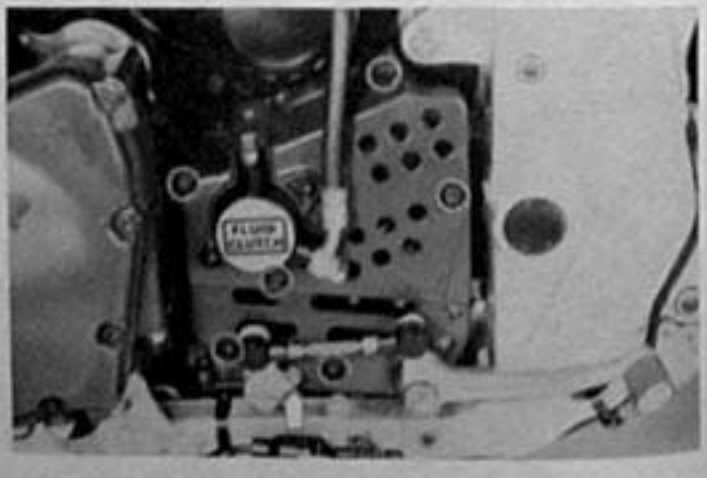
- Remove the eight exhaust pipe clamp bolts with a 6-mm hexagon wrench.



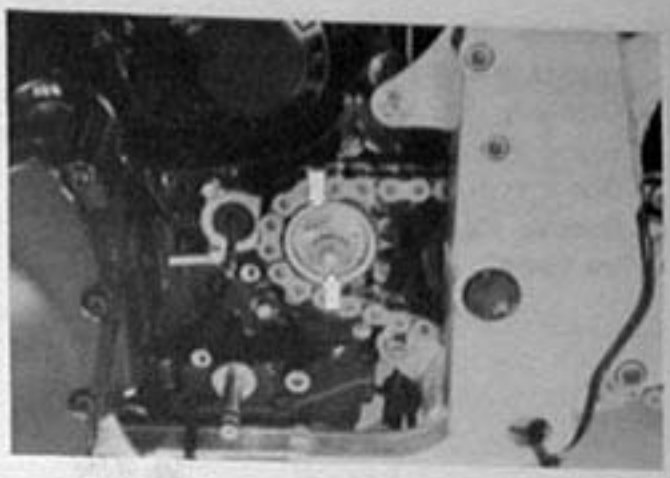
- Remove the muffler mounting bolts and take off the exhaust pipe/muffler.



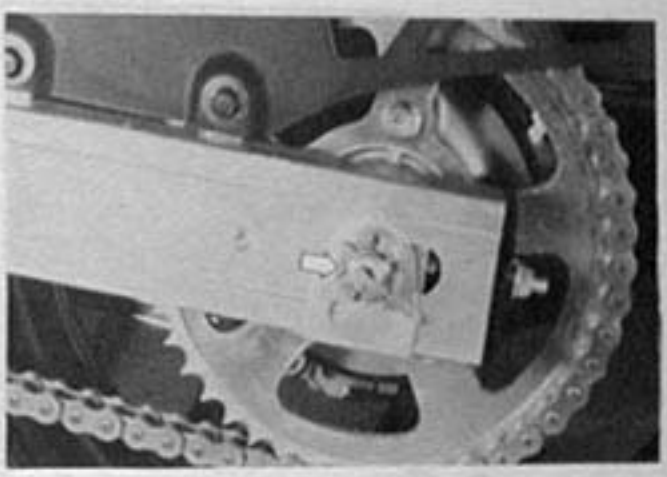
- Remove the gearshift lever securing bolt.
- Remove the engine sprocket cover with the gearshift lever by removing the bolts.



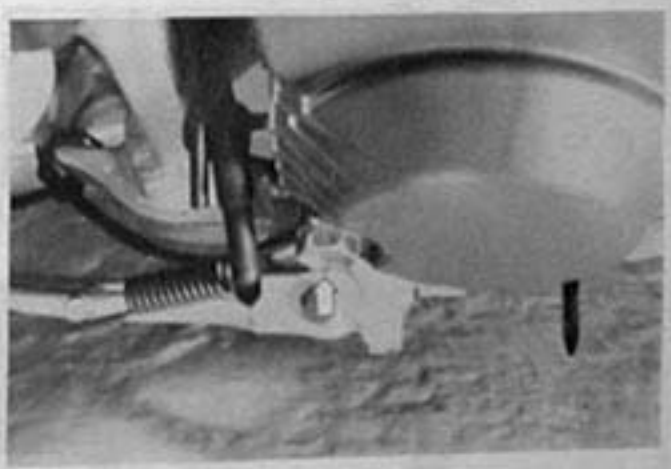
- Remove the engine sprocket bolt and nut while depressing the rear brake pedal.



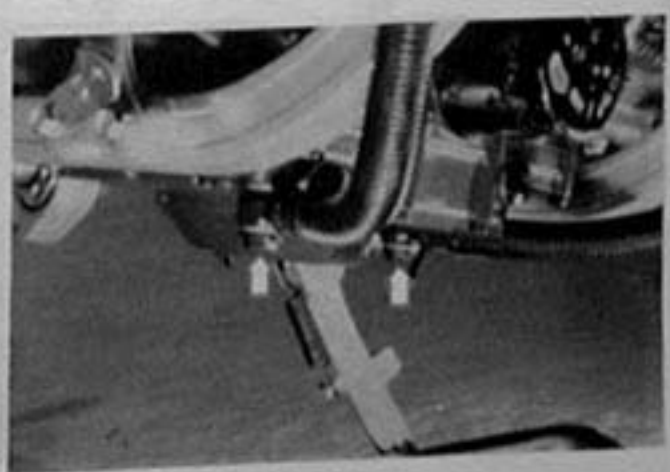
- Pull out the *cotter pin, and loosen the axle nut and chain adjuster nuts. (*Canada model only)
- Push the rear wheel forward, and disengage the drive chain and engine sprocket from the drive-shaft.



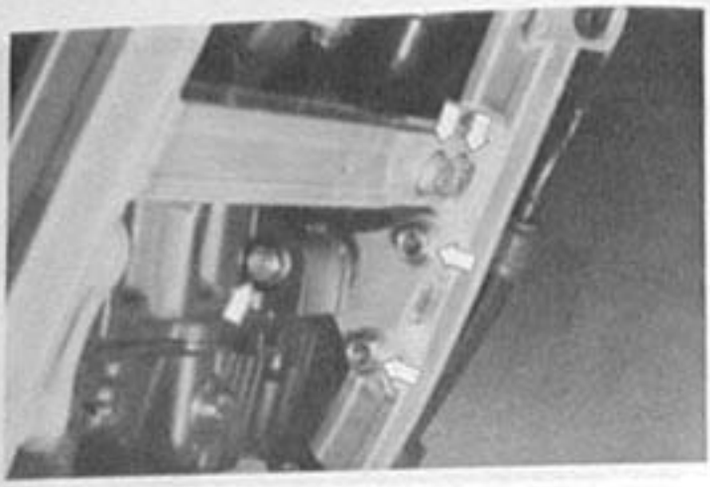
- Place an oil pan under the engine and remove the oil drain plug to drain out engine oil.

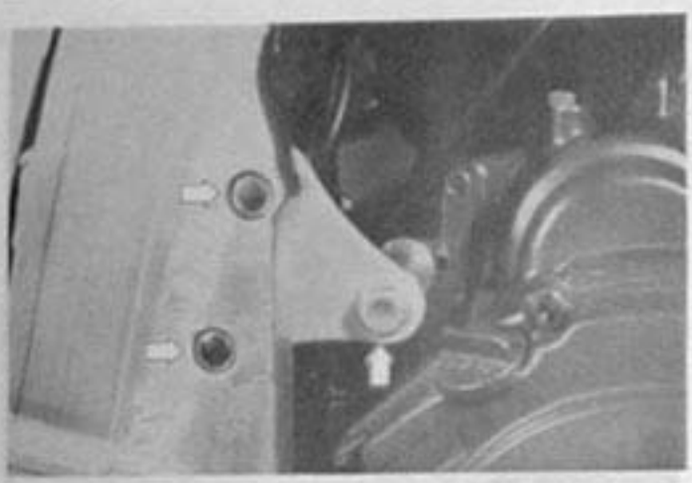


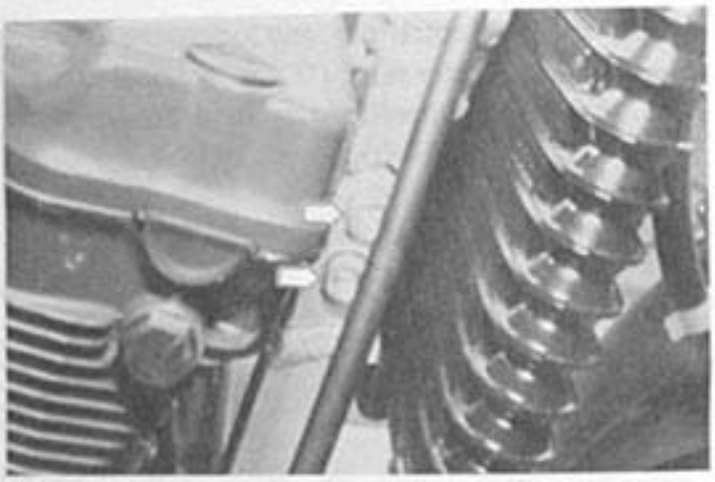
- Place an oil pan under the engine and remove the two oil cooler hoses by removing union bolts.

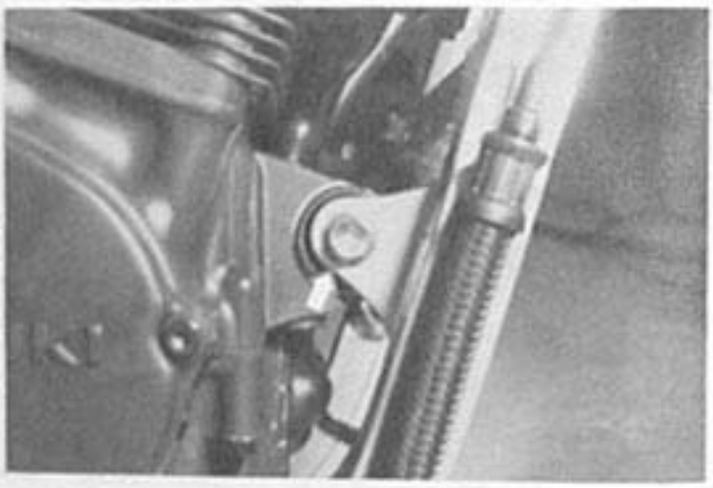


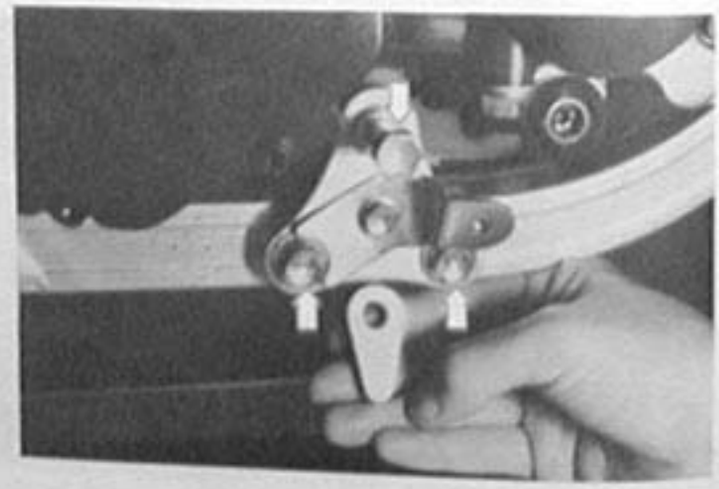
- Remove the engine mounting bolts, nuts, spacers, brackets and right frame down tube.
- Gradually lift up the engine and lower the engine assembly on the right side making sure that it does not make contact with the frame. Remove the engine through the right side of the frame.











ENGINE REINSTALLATION

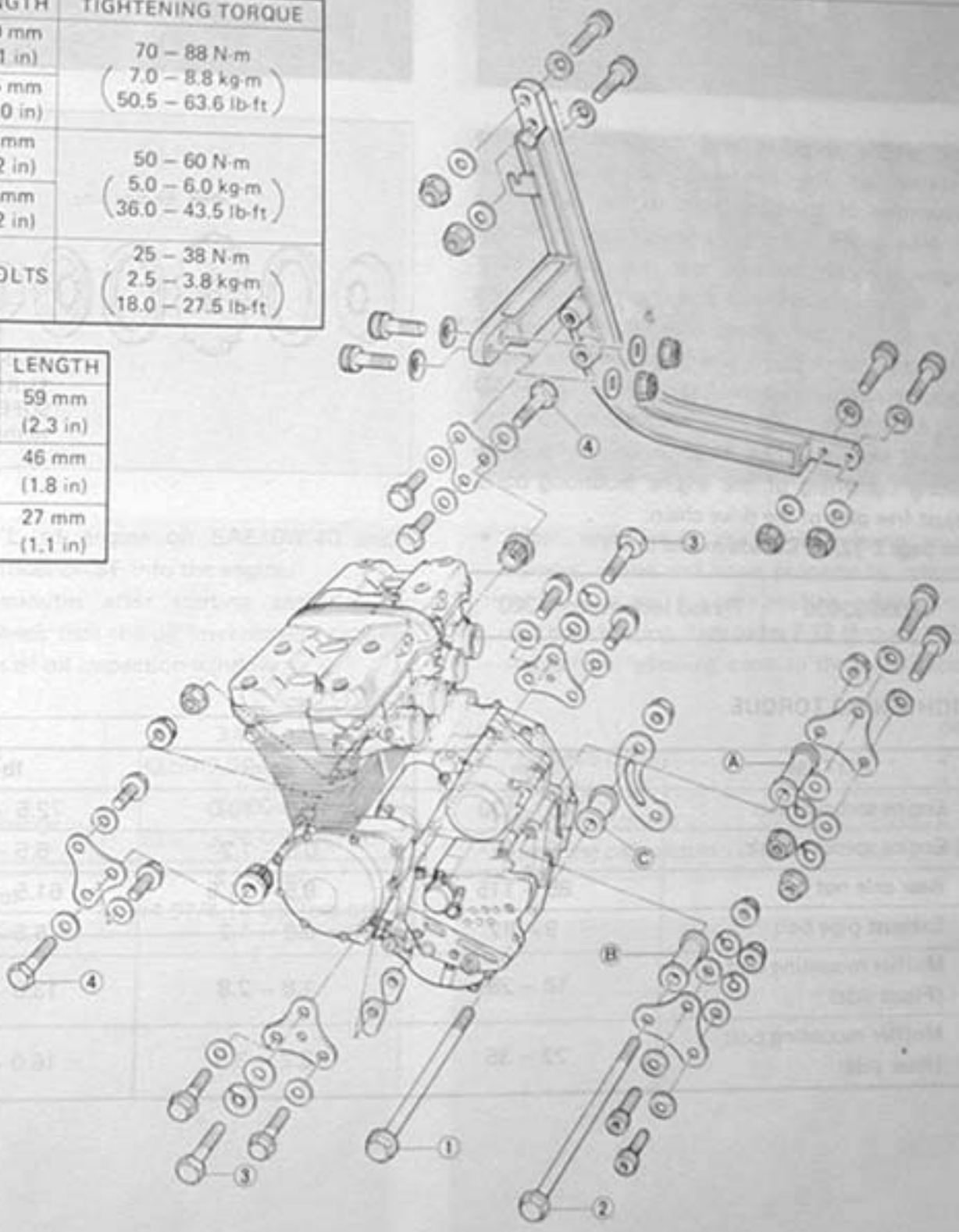
Reinstall the engine in the reverse order of engine removal.

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

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

	LENGTH	TIGHTENING TORQUE
①	180 mm (7.1 in)	70 – 88 N·m (7.0 – 8.8 kg·m, 50.5 – 63.6 lb-ft)
②	255 mm (10.0 in)	
③	55 mm (2.2 in)	50 – 60 N·m (5.0 – 6.0 kg·m, 36.0 – 43.5 lb-ft)
④	55 mm (2.2 in)	
OTHER BOLTS		25 – 38 N·m (2.5 – 3.8 kg·m, 18.0 – 27.5 lb-ft)

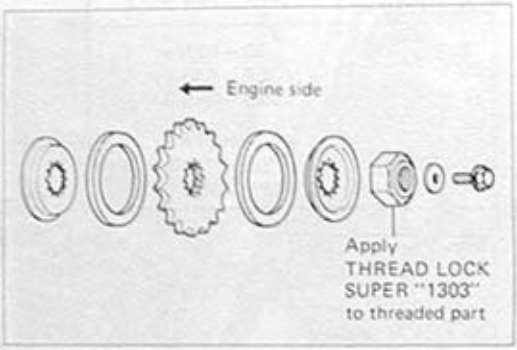
SPACER	LENGTH
Ⓐ	59 mm (2.3 in)
Ⓑ	46 mm (1.8 in)
Ⓒ	27 mm (1.1 in)



- Locate the gaskets on the both sides of union and tighten the union bolt to the specified torque.

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

The engine sprocket and dampers should be installed on the driveshaft as shown in the illustration at the same time of the installation of drive chain. If it is difficult to assemble the engine sprocket, remove the rear axle *cotter pin, loosen the axle nut and chain adjuster nuts to push the rear wheel forward and give the drive chain some play. When installing the engine sprocket nut, apply a small quantity of THREAD LOCK SUPER "1303" to its threaded part and stepped side should be faced inside. After completing tightening of the engine mounting bolts, adjust free play of the drive chain.
(see page 2-12). (*Canada model only)

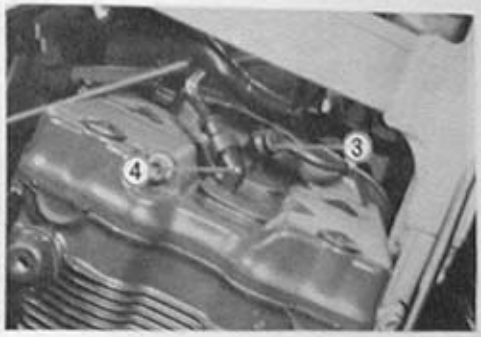


99000-32030	Thread lock super "1303"

TIGHTENING TORQUE

ITEM	N·m	kg·m	lb·ft
Engine sprocket nut	100 – 130	10.0 – 13.0	72.5 – 94.0
Engine sprocket bolt	9 – 12	0.9 – 1.2	6.5 – 8.5
Rear axle nut	85 – 115	8.5 – 11.5	61.5 – 83.0
Exhaust pipe bolt	9 – 12	0.9 – 1.2	6.5 – 8.5
Muffler mounting bolt (Front side)	18 – 28	1.8 – 2.8	13.0 – 20.0
Muffler mounting bolt (Rear side)	22 – 35	2.2 – 3.5	16.0 – 25.5

- 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.



- Pour 4.7L of engine oil SAE10W/40 under API classification SF into the engine.
  Several minutes after starting and stopping engine, check that the oil level remains between the marks of oil inspection window.

Change	3 400 ml (3.59/2.99 US/Imp qt)
Filter change	3 700 ml (3.91/3.26 US/Imp qt)
Overhaul	4 700 ml (4.97/4.14 US/Imp qt)

- After remounting the engine, route wiring harness, cables and hoses properly by referring to the sections, for wire routing, cable routing and hose routing. (see pages 7-12 through 16)
  Adjust the following items to the specification.

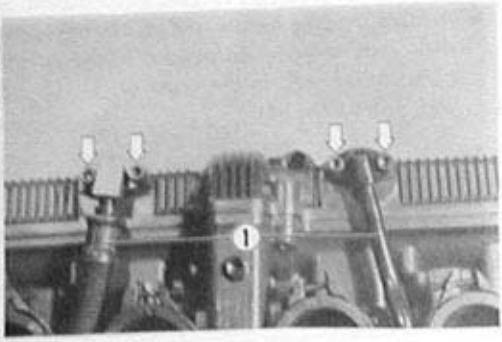
page

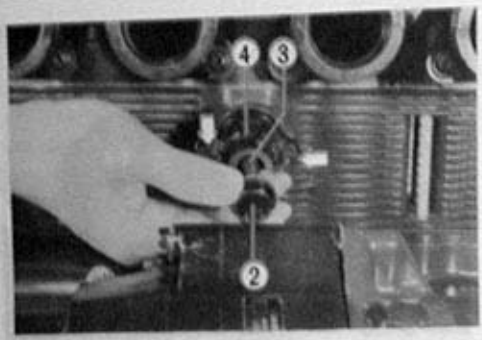
- Throuttle cable 2-10
- Drive chain 2-12
- Idling adjustment 2-10
- Balancing carburetors 4-20

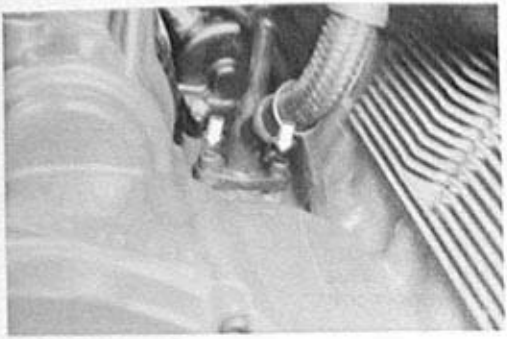
ENGINE DISASSEMBLY

- Remove the right and left oil hoses ① by removing the bolts.
- Remove the spring holder bolt ② and spring ③, and then remove the cam chain tensioner ④ by removing the bolts.

09911-73730	5 mm "T" type hexagon wrench

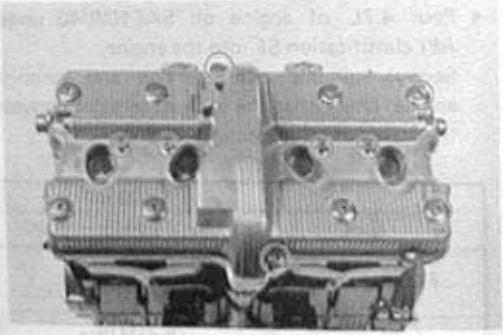






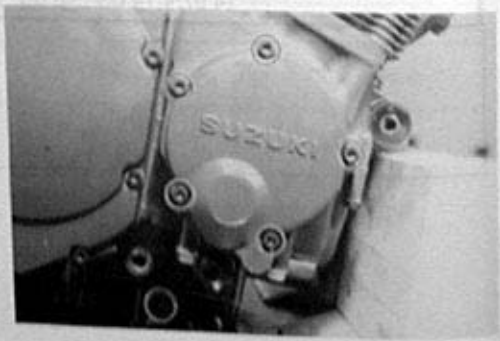
- Remove the cylinder head cover by removing the bolts.

09914-25811	6 mm "T" type hexagon wrench

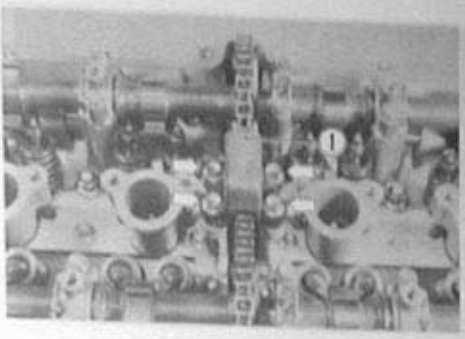


- Remove the signal generator cover by removing the bolts.

09911-73730	5 mm "T" type hexagon wrench

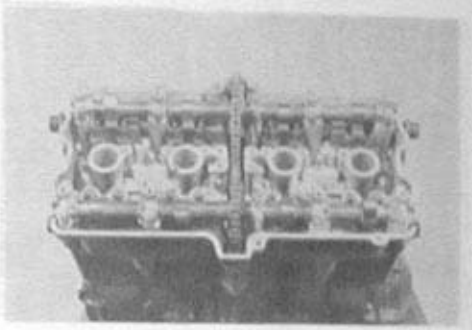


- Remove the cam chain idler ① by removing the bolts.



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

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

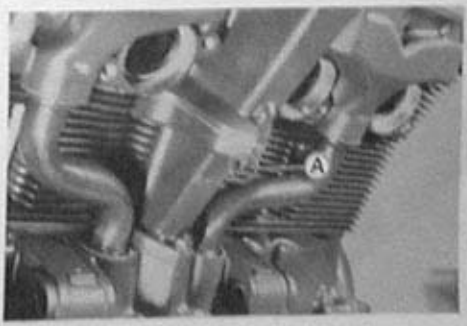


- Remove the two camshafts, intake and exhaust.

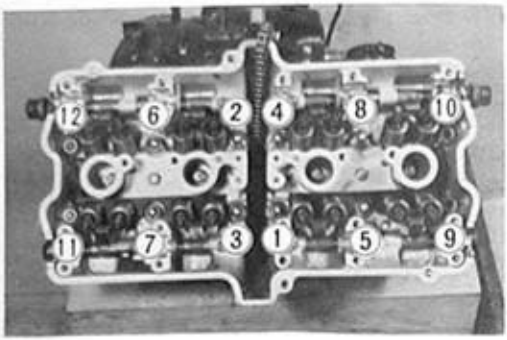
- Pull out the cam chain guide.

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

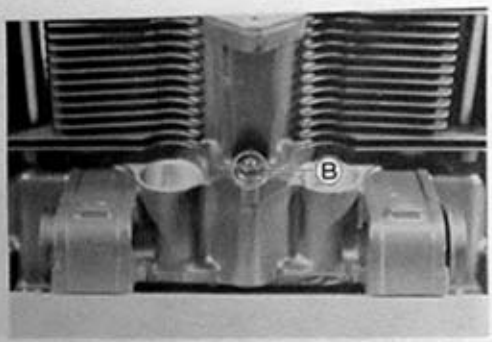
09911-74510	Long socket 14 mm
09914-24510	T handle

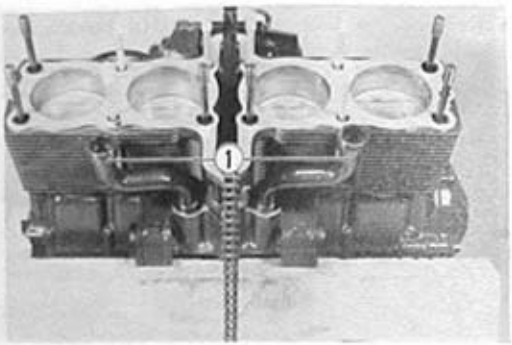


NOTE:
When loosening the cylinder head nuts, break each nut loosen a little at a time in a descending order according to the numbers cast on a cylinder head.



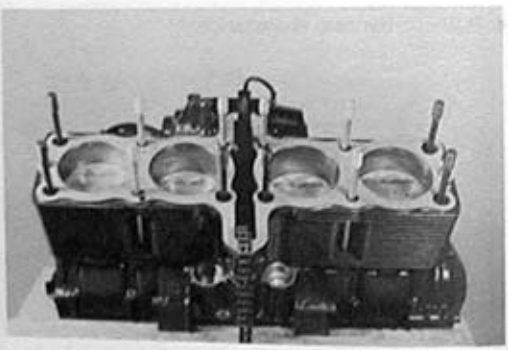
- Remove the right and left oil pipes ①.
- Remove the cylinder nut Ⓑ.



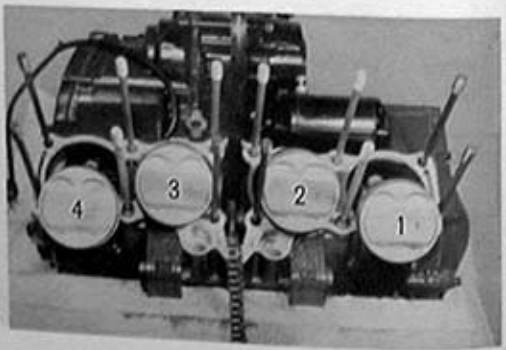


- Firmly grip the cylinder block at both ends, and lift it straight up. If the block does not come off, lightly tap on the finless portions of the block with a plastic mallet to shake the gasketed joint loose.

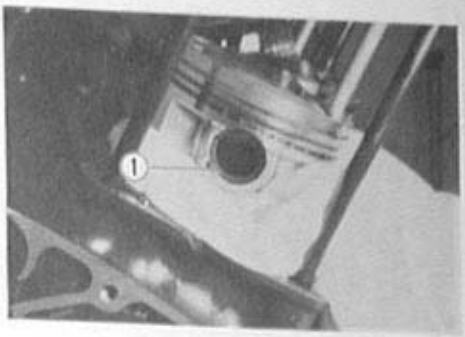
CAUTION:
Be careful not to damage the fins when removing or handling the cylinder block. This precaution applies to the cylinder head also.



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

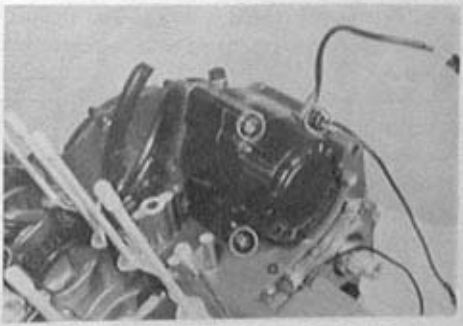


- Place a cloth beneath the piston so as not to drop the parts in the crankcase, and remove the circlip ① with long-nose pliers.
- Draw out the piston pin. Place each piston pin in the same piston as that it was removed from.



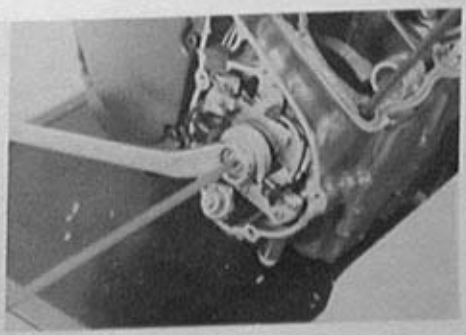
- Remove the starter motor by removing the bolts.

- Remove the generator by removing the bolts.

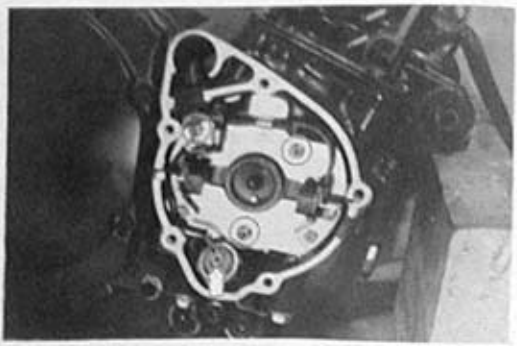


- Remove the signal generator rotor by removing the bolt.

09914-25811	6 mm "T" type hexagon wrench

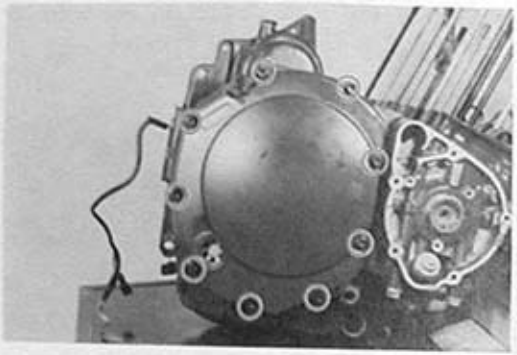


- Disconnect the oil pressure switch lead wire.
- Remove the signal generator stator by removing the three screws.



- Remove the clutch cover by removing the bolts.

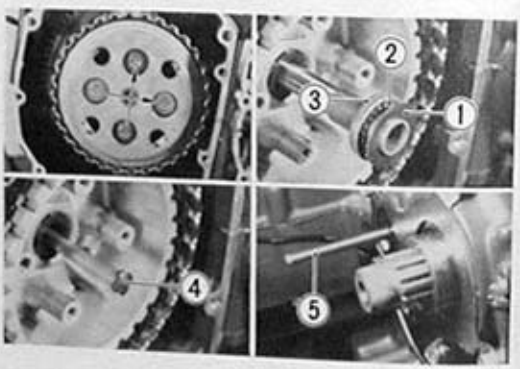
09911-73730	5 mm "T" type hexagon wrench



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

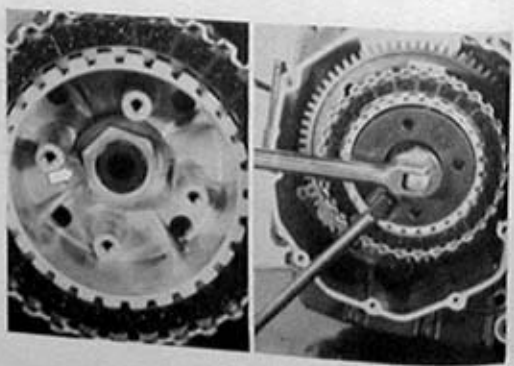
09910-20116	Conrod stopper

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

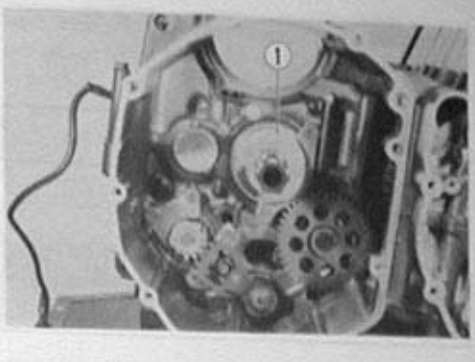


- Flatten the clutch sleeve hub nut lock washer by using chisel.
- Firmly secure clutch sleeve hub to remove mounting nut with a clutch sleeve hub holder, and then remove the several clutch drive and driven plates along with the clutch sleeve hub.

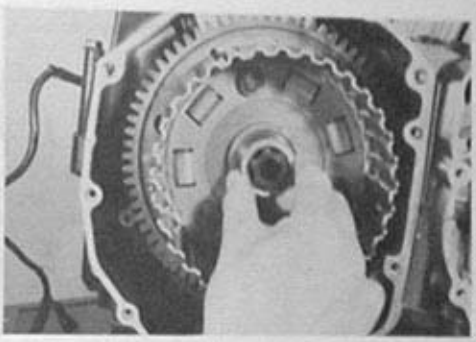
09920-53722	Clutch sleeve hub holder



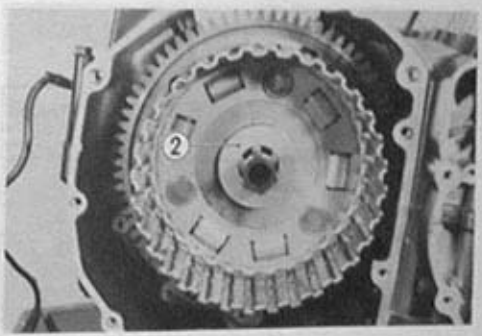
- Remove the thrust washer ①.



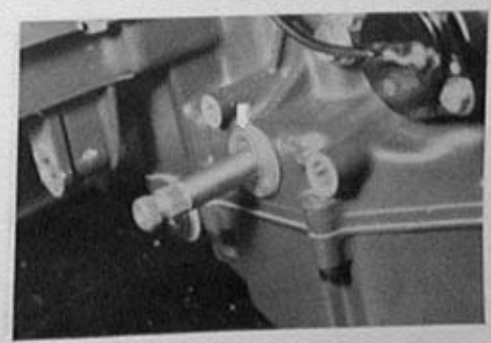
- With the spacer removed, the primary driven gear (integral with the clutch housing) is free to disengage from the primary drive gear.
- Remove the primary driven gear assembly with the generator/oil pump drive gears.



- Remove the thrust washer ②.



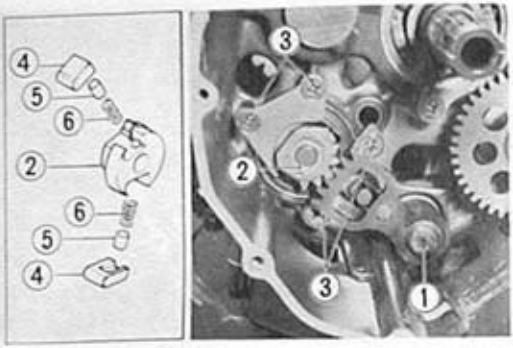
- Remove the clip and washer from the gearshift shaft.



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

09900-09003	Impact driver set

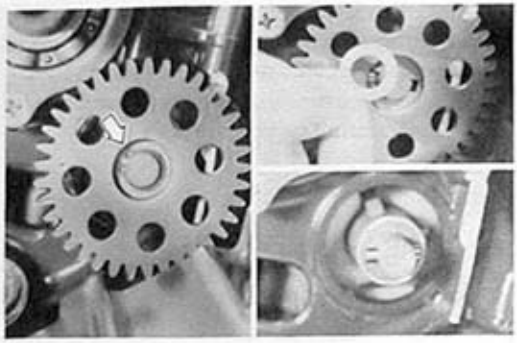
NOTE:
When removing the cam driven gear, do not lose gear shifting pawl ④, pin ⑤ and spring ⑥.



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

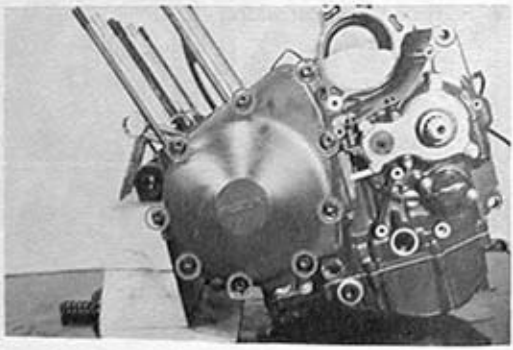
09900-06107	Snap ring pliers

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

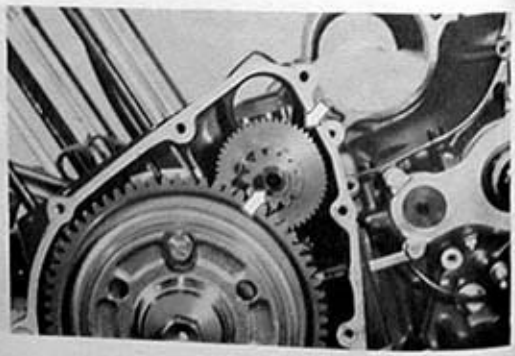


- Remove the starter clutch cover by removing the bolts.

09911-73730	5 mm "T" type hexagon wrench



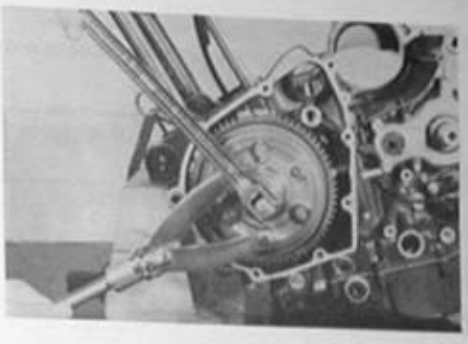
- Remove the starter idle gear and its shaft.



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

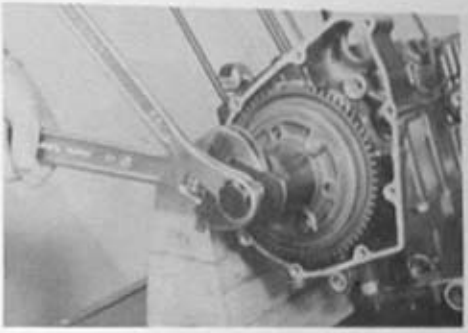
09930-40113	Rotor holder

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



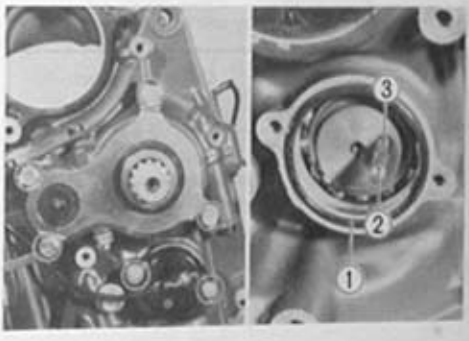
- Remove the starter clutch assembly from the crankshaft by using the special tool.

09930-33720	Rotor remover

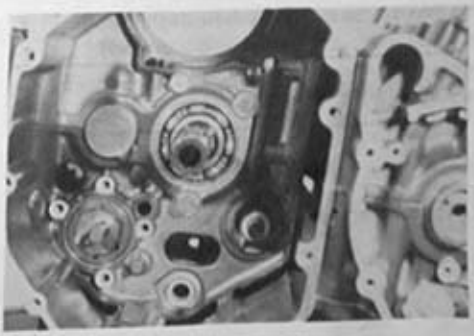


- Flatten the lock portion of the oil seal retainer and remove it by removing the four bolts.
- Remove the neutral position indicator switch by removing the screws.

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

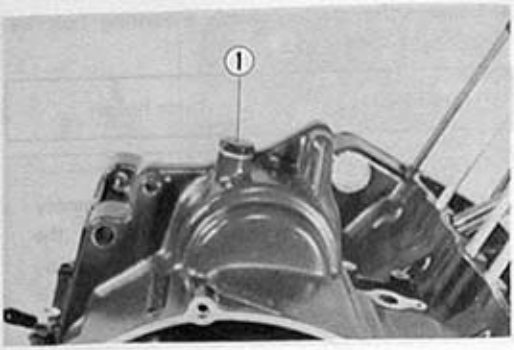


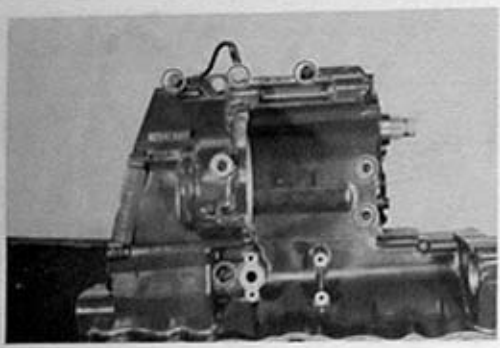
- Remove the countershaft bearing retainer by removing the two screws.

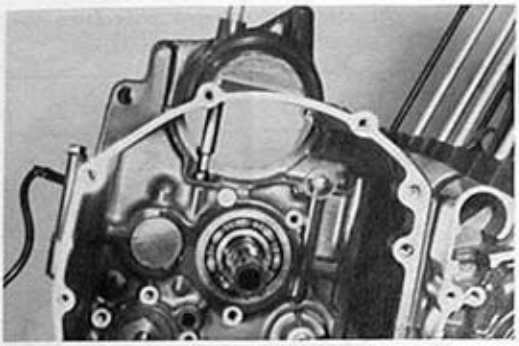


- Remove the plug ① on the upper crankcase.
- Remove the upper crankcase securing bolts and nut.

09911-73730	5 mm "T" type hexagon wrench



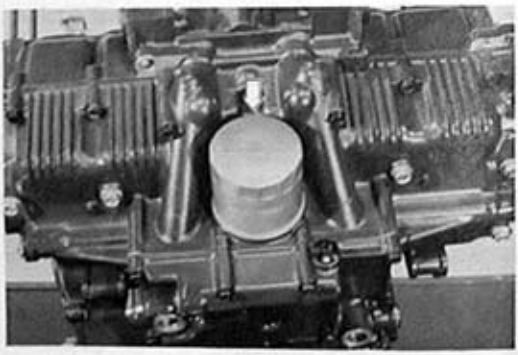




- Remove the oil filter by using the special tool.

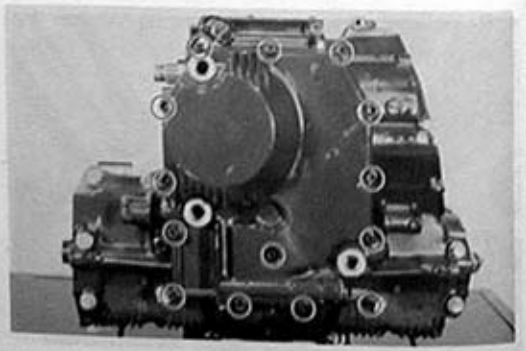
09915-40610	Oil filter wrench

NOTE:
Refer to page 2-9 for installation procedures.

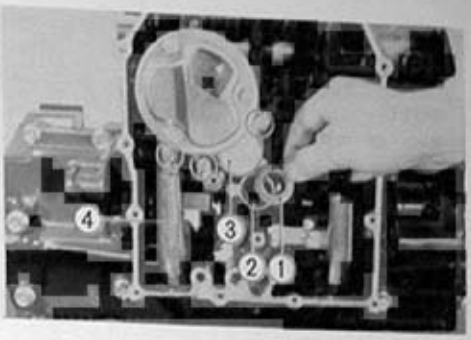


- Remove the oil pan by removing the bolts.

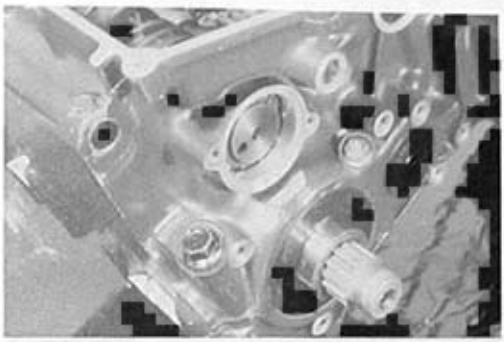
09911-73730	5 mm "T" type hexagon wrench

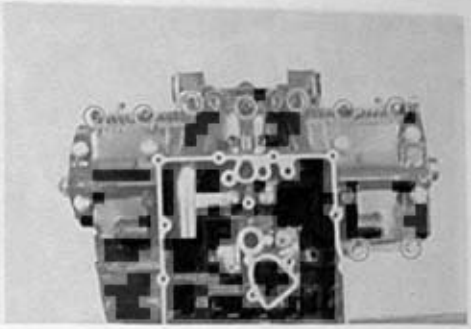


- Remove the shim ① and O-ring ②.
- Remove the oil sump filter ③ by removing the two bolts.
- Remove the left oil pipe ④ by removing the bolt.

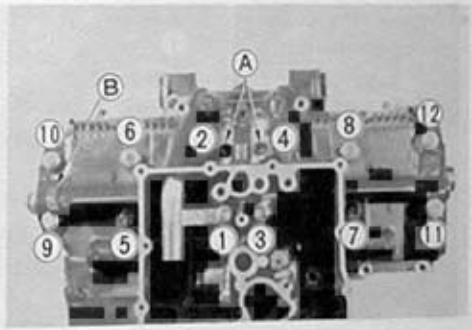


- Remove the lower crankcase securing bolts and nut.





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



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

09914-25811	6 mm "T" type hexagon wrench

09900-00401	"L" type hexagon wrench set

Tightening torque

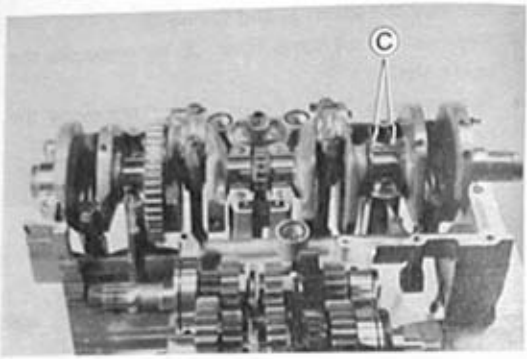
Main oil gallery plug Ⓑ	35 – 45 N·m (3.5 – 4.5 kg·m / 25.5 – 32.5 lb-ft)

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

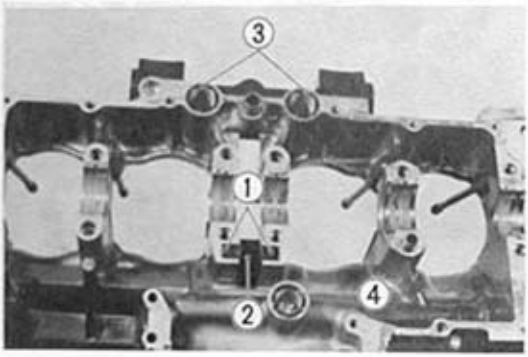
CAUTION:
Do not drop the crankshaft journal bearings from the lower crankcase.

- Remove the crankshaft assembly from the upper crankcase.

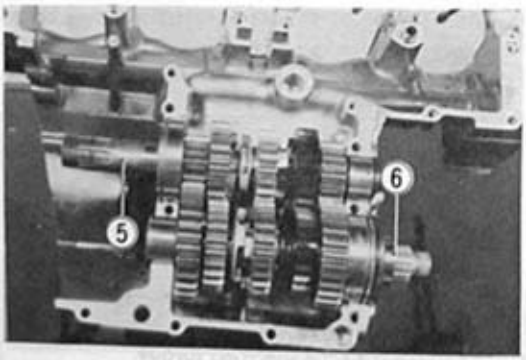
NOTE:
Bear in mind that the crankshaft thrust bearings (C) are located between shaft and case.



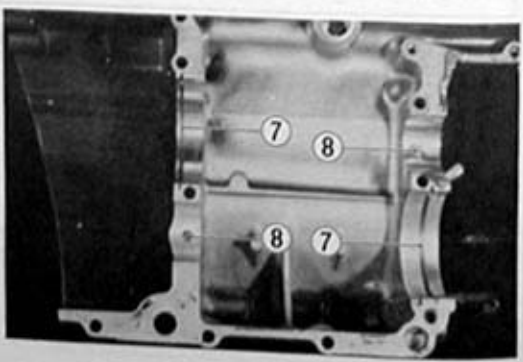
- Pull out the two dampers (1) and cam chain guide (2).
- Remove the O-rings, (3) and (4).



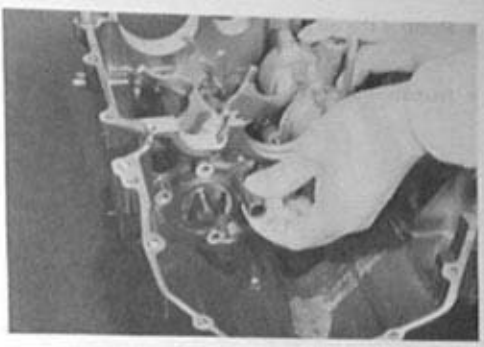
- Remove the countershaft assembly (5) and driveshaft assembly (6).



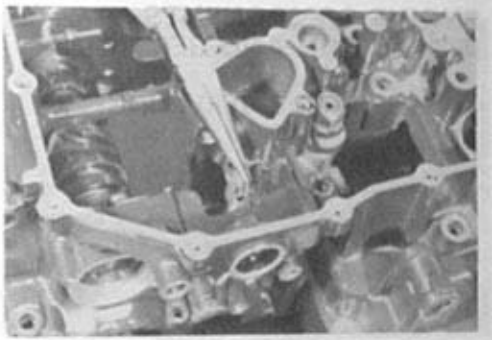
NOTE:
Do not lose the C-rings (7) and bearing pins (8).



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

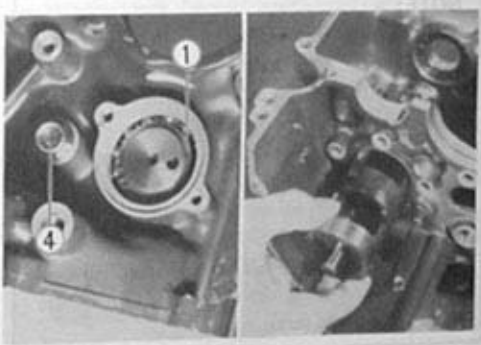


- Unhook the gearshift cam stopper spring from the lower crankcase.

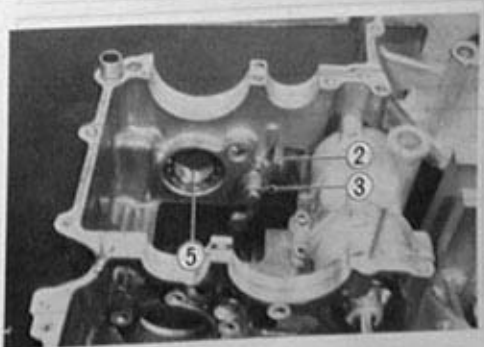


- Remove the circlip ① from the gearshift cam, and then draw out the gearshift cam from the other side.
- Remove the gearshift cam stopper ② by removing the circlip ③.

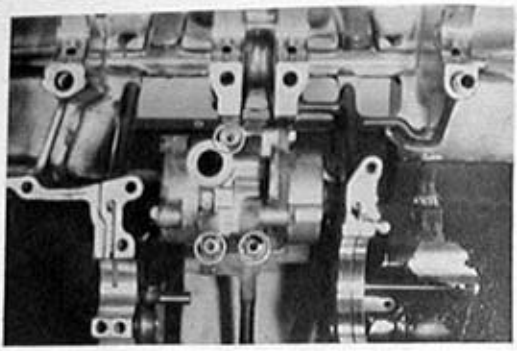
09900-06107	Snap ring pliers



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



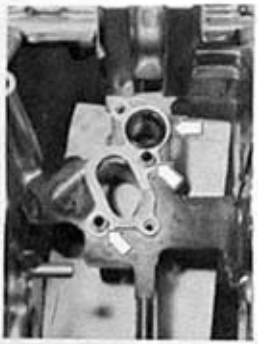
- Remove the oil pump by removing the mounting bolts.
- Remove the O-rings and dowel pins.



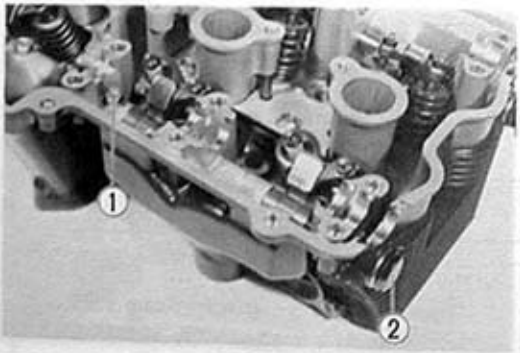
ENGINE COMPONENTS INSPECTION AND SERVICING

CYLINDER HEAD SERVICING

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



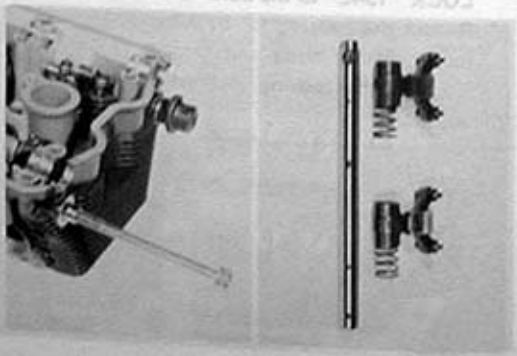
NOTE:
- When removing rocker arm shaft, remove the rocker arm shaft set bolt ① and plug ②, and screw 8 mm bolt into the rocker arm shaft end and pull it out.
- Tighten the set bolt ① and plug ② to the specified torque.
- Removal of valves completes ordinary disassembling work. If valve guides have to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



09900-00401	"L" type hexagon wrench set

Tightening torque

Set bolt ①	8 – 12 N·m (0.8 – 1.2 kg-m, 6.0 – 8.5 lb-ft)
Plug ②	25 – 30 N·m (2.5 – 3.0 kg-m, 18.0 – 21.5 lb-ft)

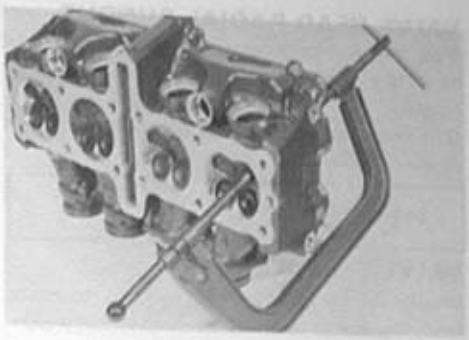


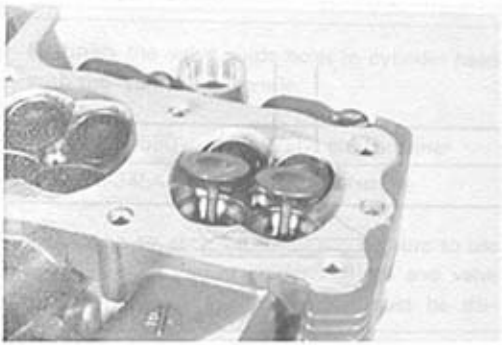
- Using special tools, compress the valve springs and take off the two cotter halves ① from valve stem.

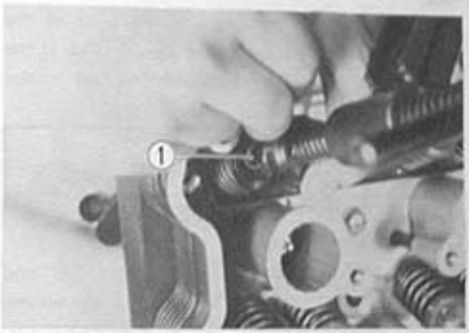
09916-14510	Valve lifter
09916-14910	Valve lifter attachment
09916-84510	Tweezers

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

- Pull out the valve from the other side.







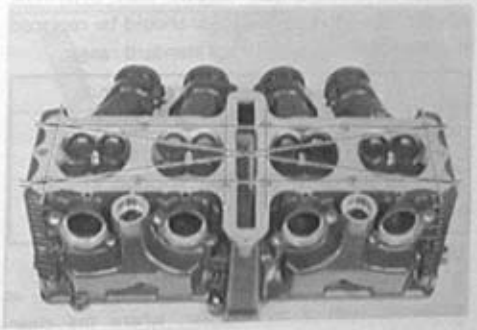
CYLINDER HEAD DISTORTION

Decarbonize the combustion chambers.

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

09900-20803	Thickness gauge

Service Limit	0.2 mm (0.008 in)

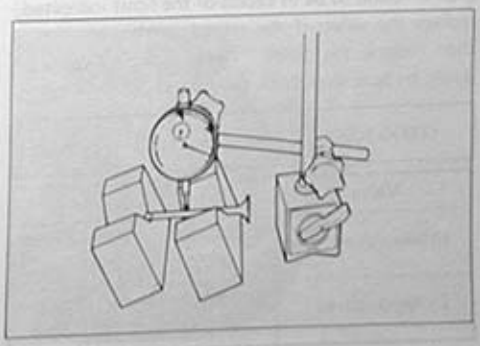


VALVE STEM RUNOUT

Support the valve with "V" blocks, as shown, and check 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)

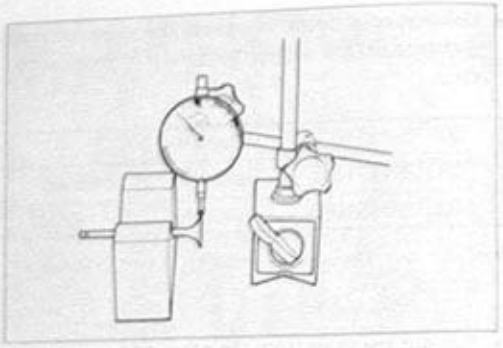


VALVE HEAD RADIAL RUNOUT

Place the dial gauge at right angles to the valve head face, and measure the valve head radial runout.

If it measures more than the limit, replace the valve.

Service Limit	0.03 mm (0.001 in)

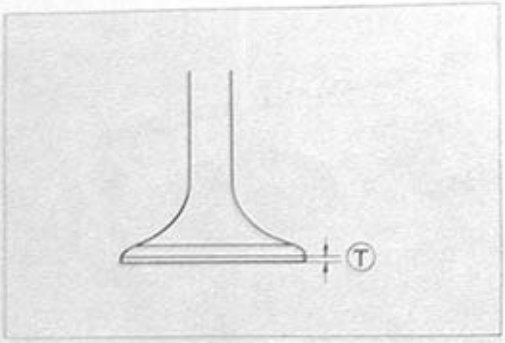


VALVE FACE WEAR

Visually inspect each valve for wear of its seating face. Replace any valve with an abnormally worn face.

The thickness Ⓣ decreases as the wear of the face advances. Measure the thickness and, if the thickness is found to have been reduced to the limit, replace it.

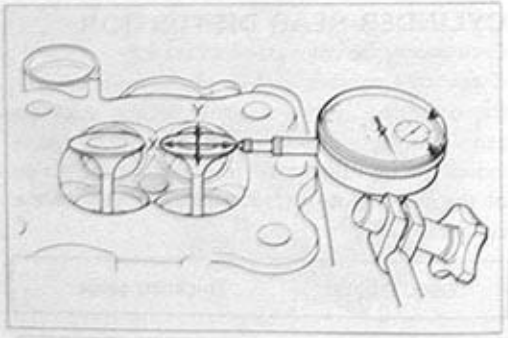
Service Limit Ⓣ	0.5 mm (0.02 in)



VALVE GUIDE-VALVE STEM CLEARANCE

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

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

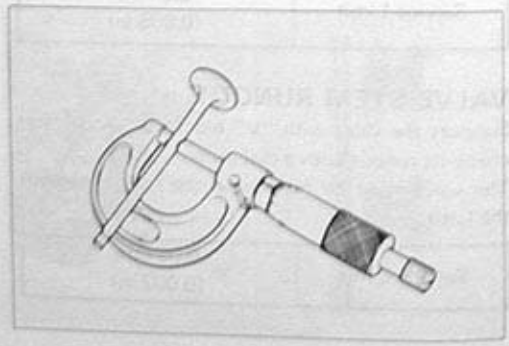


VALVE STEM WEAR

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	4.965 – 4.980 mm (0.1955 – 0.1961 in)
Exhaust valves	4.945 – 4.960 mm (0.1947 – 0.1953 in)



VALVE GUIDE SERVICING

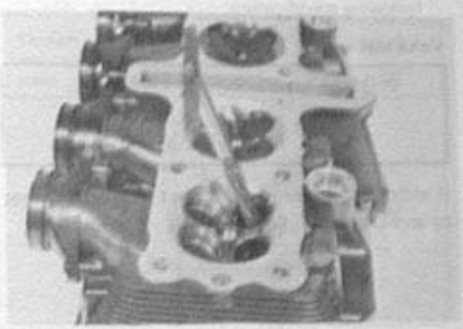
- Using the valve guide remover ①, drive the valve guide out toward intake or exhaust camshaft side.

09916-44310	Valve guide remover/installer

NOTE:
* Discard the removed valve guide sub-assemblies.
* Only oversized valve guides are available as replacement parts.

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

09916-34580	Valve guide reamer
09916-34541	Reamer handle

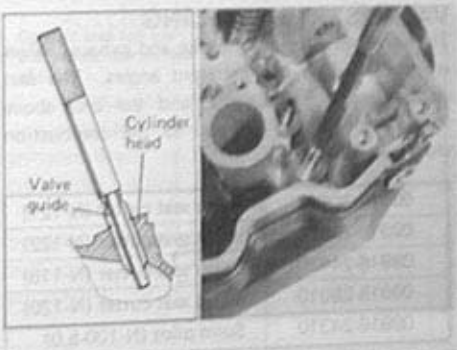


- Fit a ring to each valve guide. Be sure to use new rings and valve guides. Rings and valve guides removed in disassembly must be discarded.

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

09916-44310	Valve guide remover/installer

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



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

09916-34570	Valve guide reamer
09916-34541	Reamer handle

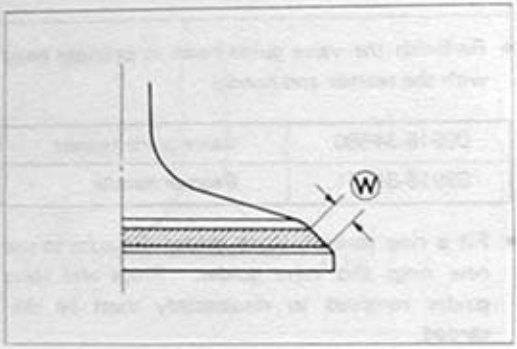
VALVE AND SEAT CONDITION
VALVE SEAT WIDTH

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

Valve seat width

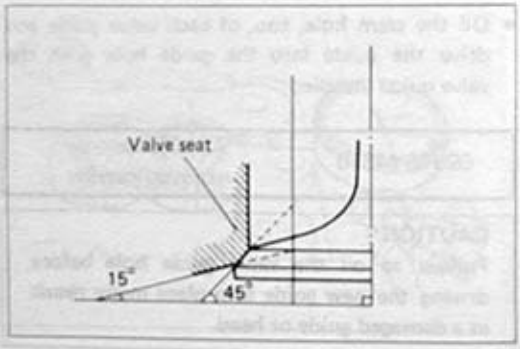
Seat width	Standard
Ⓦ	0.9 – 1.1 mm (0.035 – 0.043 in)

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



VALVE SEAT SERVICING

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



09916-20610	Valve seat cutter (N-121)
09916-20620	Valve seat cutter (N-122)
09916-24420	Valve seat cutter (N-116)
09916-29010	Valve seat cutter (N-120)
09916-24310	Solid pilot (N-100-5.0)

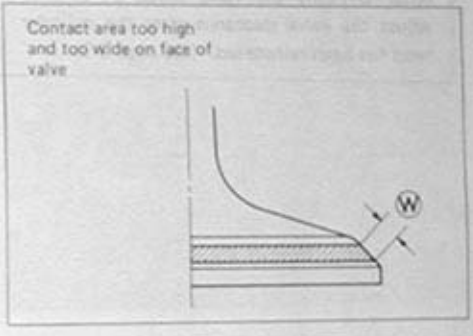
	Intake side	Exhaust side
45°	N-116 or 122	N-116 or 122
15°	N-116 or 121	N-120 or 121

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

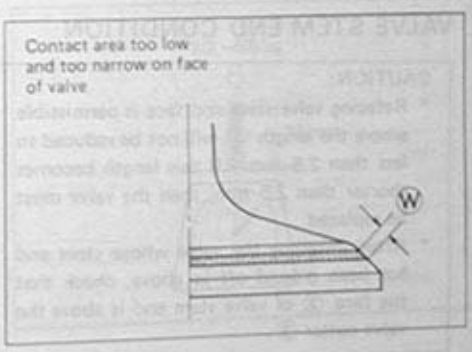
- Insert the solid pilot ① with a slight rotation. Seat the pilot snugly. Install the 45° cutter, attachment and T handle.
- Using the 45° cutter, descale and clean up the seat with one or two turns.
- Inspect the seat by the previously described seat width measurement procedure. If the seat is pitted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

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

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

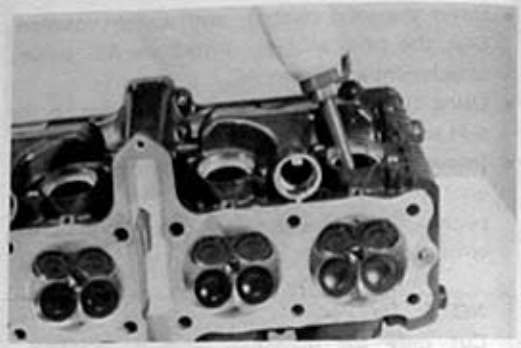


If the contact area is too low or too narrow, use the 45° cutter to raise and widen the contact area.



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

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



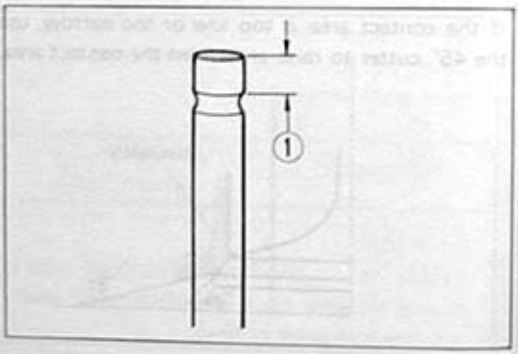
WARNING:
Always use extreme caution when handling gasoline.

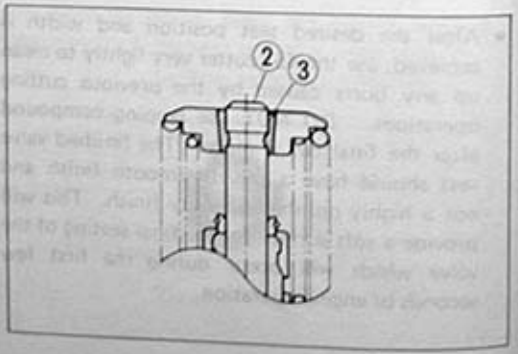
NOTE:
After servicing the valve seats, be sure to adjust the valve clearance after the cylinder head has been reinstalled. (see page 2-6)

VALVE STEM END CONDITION

CAUTION:

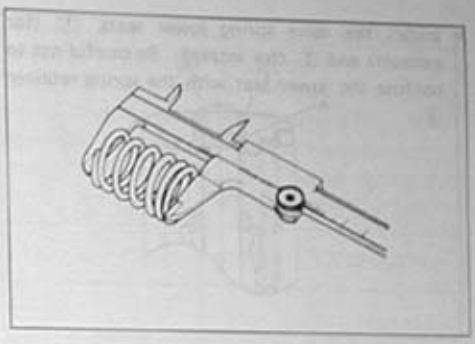
- **Refacing valve stem end face is permissible where the length ① will not be reduced to less than 2.5 mm. If this length becomes shorter than 2.5 mm, then the valve must be replaced.**
- **After installing the valve whose stem end has been ground off as above, check that the face ② of valve stem end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





VALVE SPRINGS

The force of the two coil springs keeps the valve seat tight. Weakened springs result in reduced engine power output, and often account for the chattering noise coming from the valve mechanism. Check the valve springs for proper strength by measuring their free lengths and also by the force required to compress them. If the spring length is less than the service limit, or if the force required to compress the spring dose not fall within the range specified, replace both the inner and outer springs as a set.



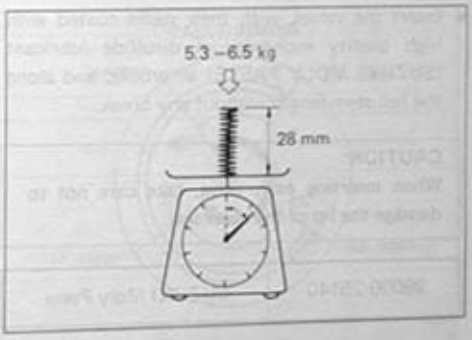
CAUTION:
Replace both the valve springs, inner and outer, at a time, if any one of these is found to be beyond the limit.

Valve spring free length

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

Valve spring tension

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

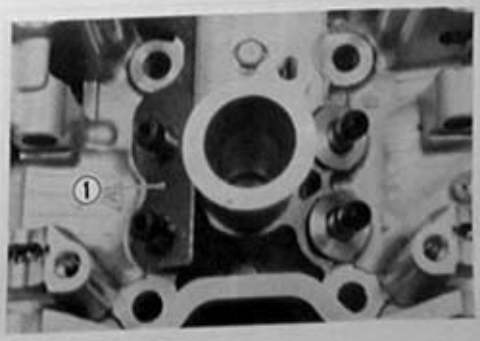


REASSEMBLY

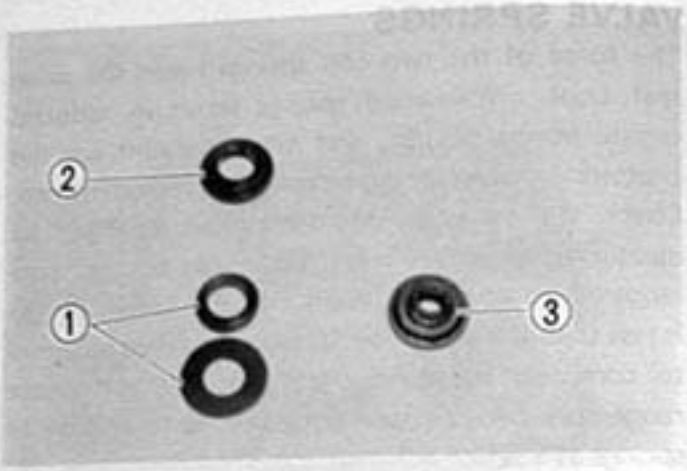
- Oil each oil seal, and press-fit them into position with the finger tip.

CAUTION:
Do not reuse the oil seals.

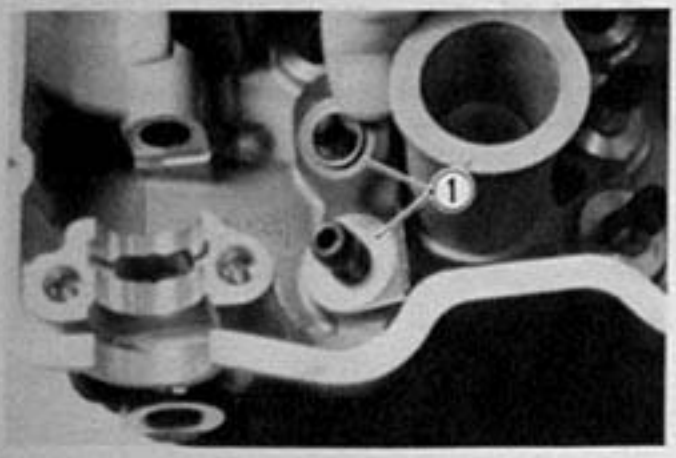
NOTE:
Be sure to restore the plate ① on the cylinder head of exhaust side.



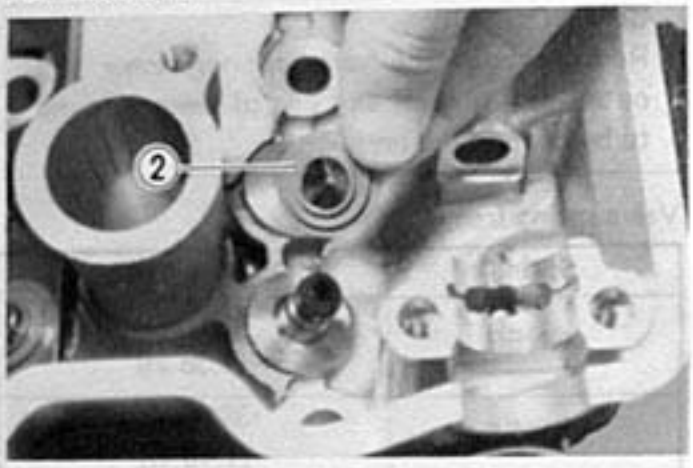
- Install the valve spring lower seats, ① (for exhaust) and ② (for intake). Be careful not to confuse the lower seat with the spring retainer ③.



For Exhaust side



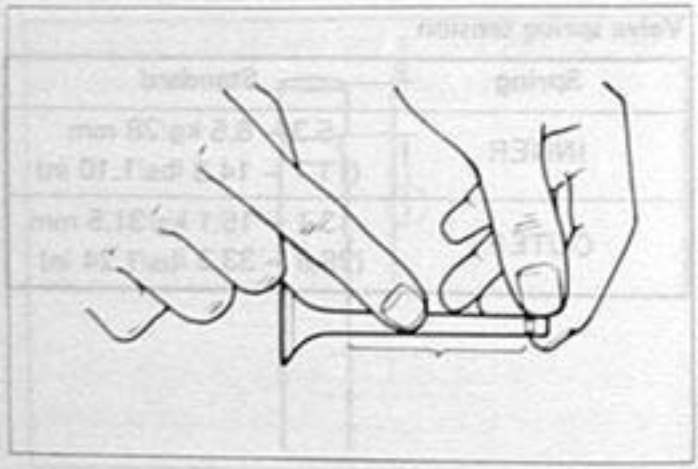
For Intake side



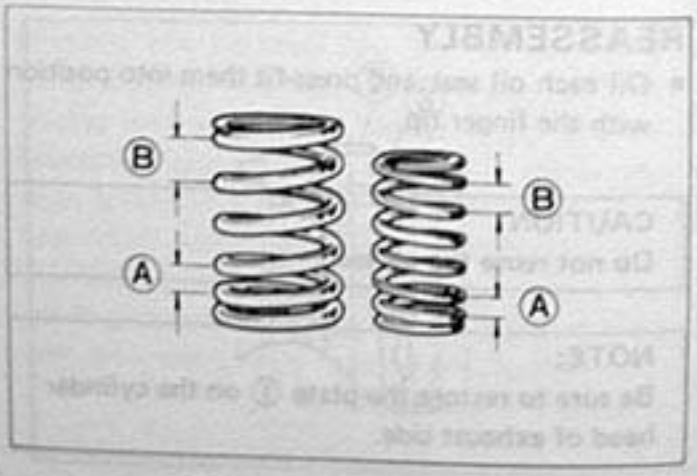
- Insert the valves, with their stems coated with high quality molybdenum disulfide lubricant (SUZUKI MOLY PASTE) all around and along the full stem length without any break.

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

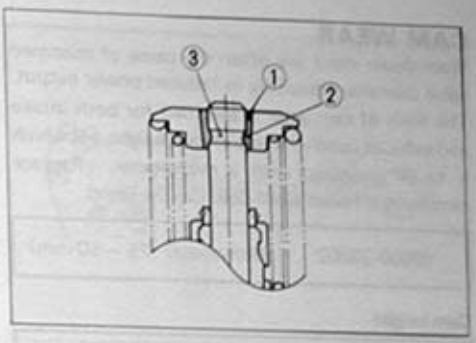
99000-25140	SUZUKI Moly Paste



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



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

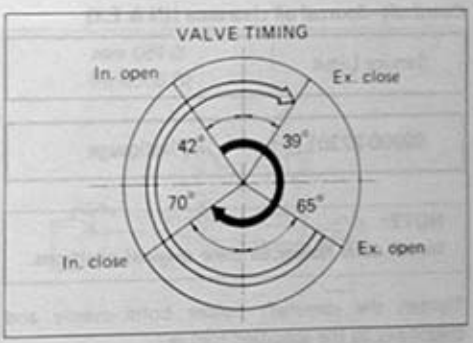


09916-14510	Valve lifter
09916-14910	Valve lifter attachment
09916-84510	Tweezers

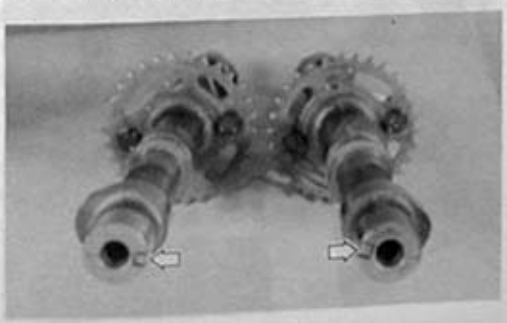
CAUTION:
Be sure to restore each spring and valve to their original positions.

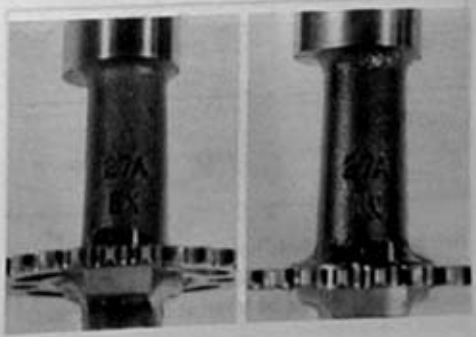
CAMSHAFT

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



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





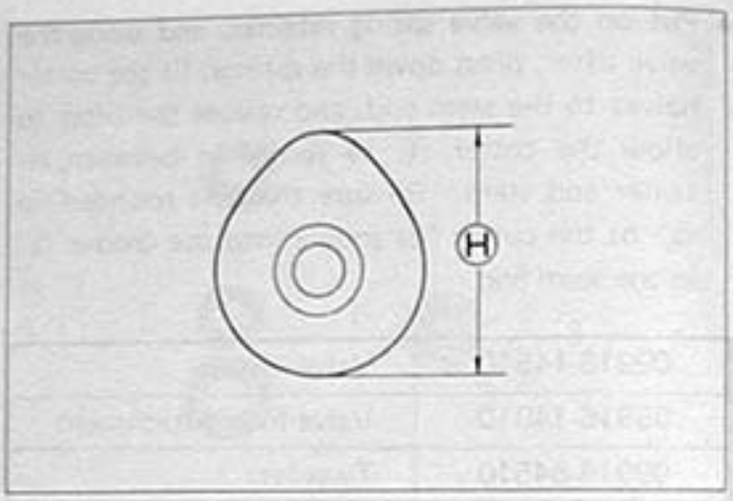
CAM WEAR

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

09900-20202	Micrometer (25 – 50 mm)

Cam height

Height Ⓗ	Service Limit
Intake cams	33.580 mm (1.3220 in)
Exhaust cams	33.240 mm (1.3087 in)



CAMSHAFT JOURNAL WEAR

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

Camshaft–Journal oil clearance (IN & EX)

Service Limit	0.150 mm (0.0059 in)

09900-22301	Plastigauge

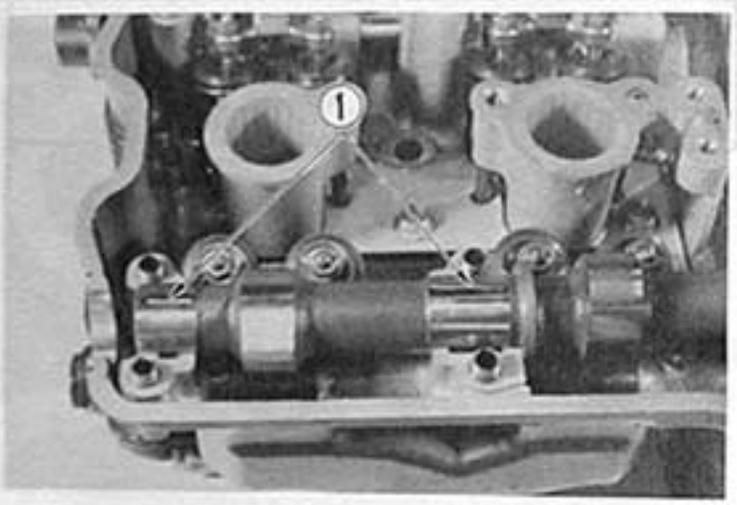
NOTE:
Install each holder to their original positions.

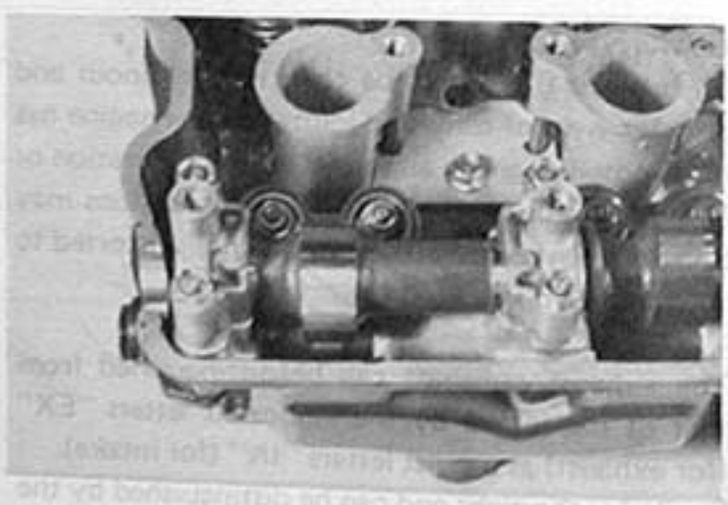
Tighten the camshaft holder bolts evenly and diagonally to the specified torque.

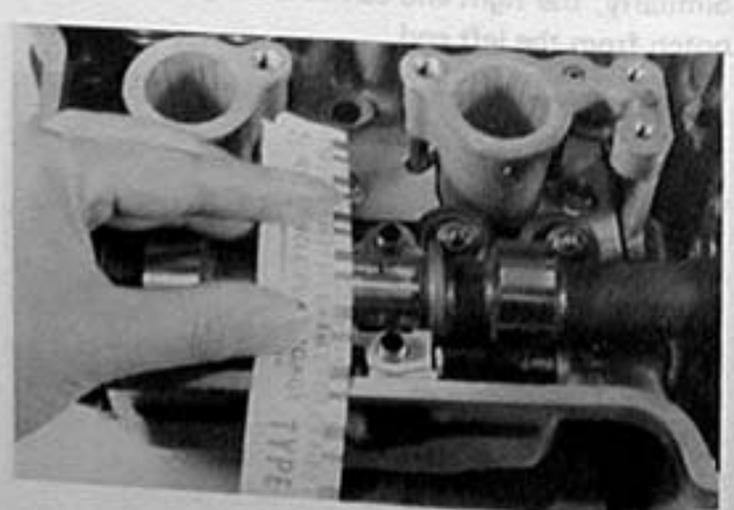
Tightening torque	8 – 12 N·m (0.8 – 1.2 kg-m / 6.0 – 8.5 lb-ft)

NOTE:
Do not rotate the camshafts with plastigauge inplace.

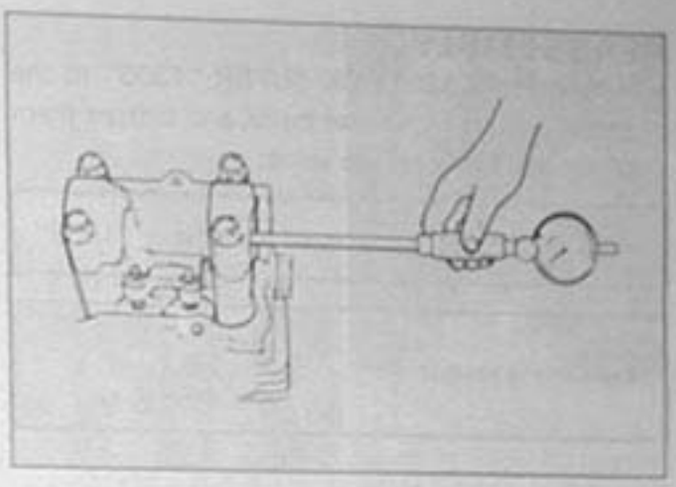
Remove the camshaft holders, and read the width of compressed plastigauge with envelope scale. This measurement should be taken at the widest part.





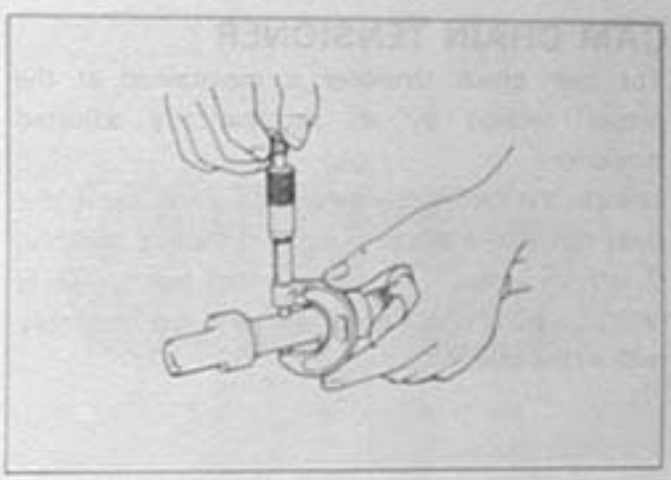


If the camshaft journal oil clearance measured exceed the limit, measure the inside diameter of camshaft journal holder and outside diameter of the camshaft journal. Replace the camshaft or cylinder head depending on which one exceeds the specification.



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)	21.959 – 21.980 mm (0.8645 – 0.8654 in)

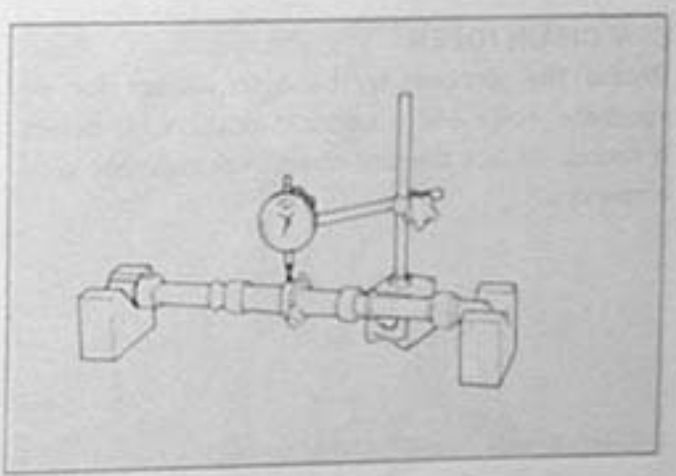


CAMSHAFT RUNOUT

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

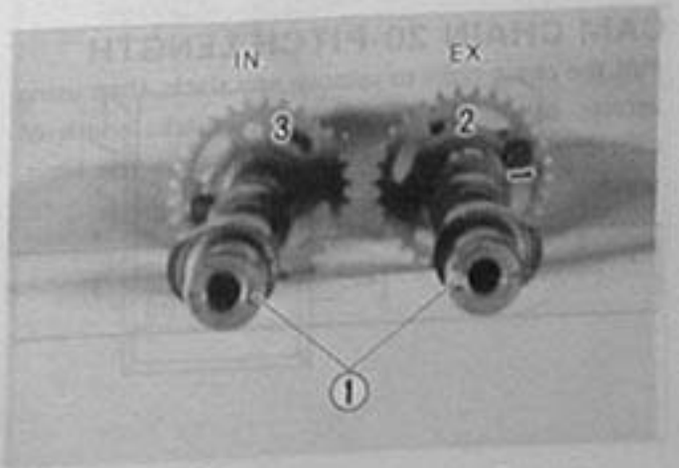
Camshaft runout (IN & EX)

Service Limit	0.1 mm (0.004 in)



CAM SPROCKET

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

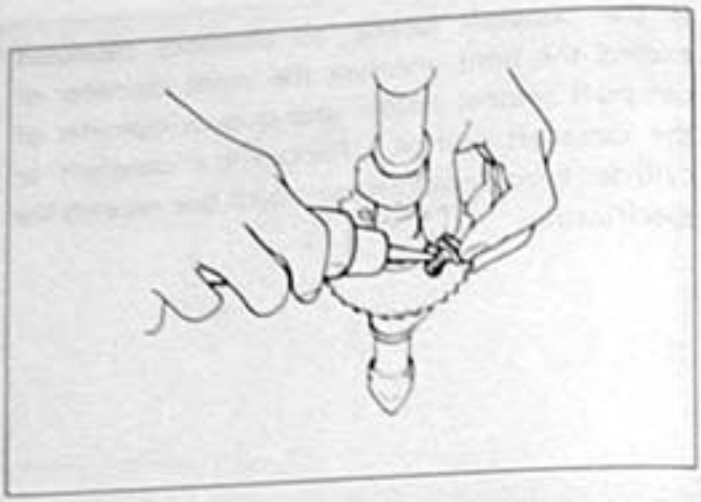


REASSEMBLY

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

99000-32030	Thread lock super "1303"

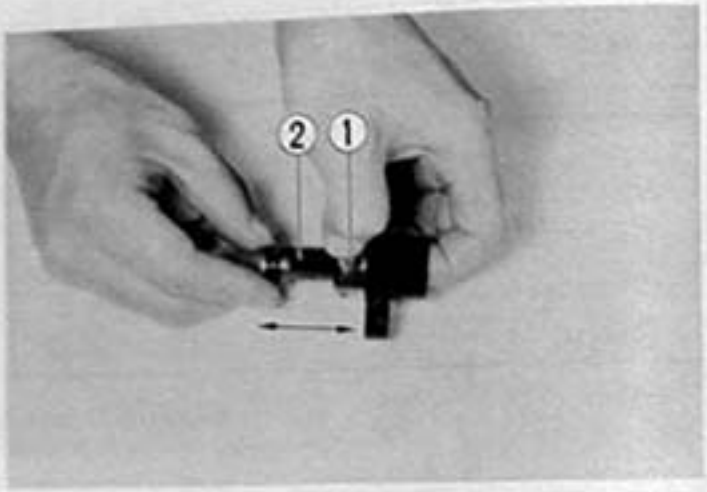
Tightening torque	24 – 26 N·m (2.4 – 2.6 kg-m 17.5 – 19.0 lb-ft)



CAM CHAIN TENSIONER

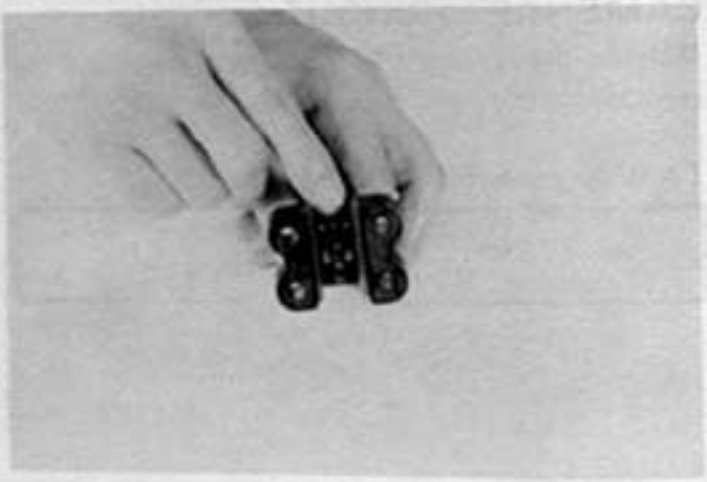
The cam chain tensioner is maintained at the proper tension by an automatically adjusted tensioner.

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



CAM CHAIN IDLER

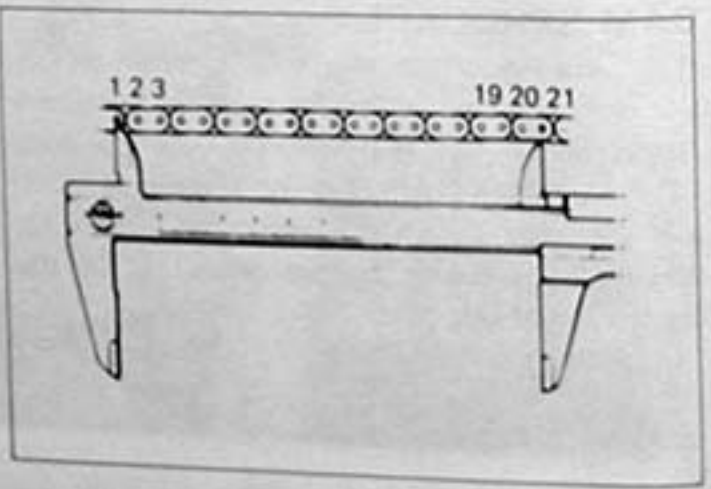
Rotate the sprocket by hand to inspect for an abnormal noise and a smooth rotation. If defect is found, replace the cam chain idler assembly with a new one.



CAM CHAIN 20-PITCH LENGTH

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

Service Limit	158.0 mm (6.22 in)

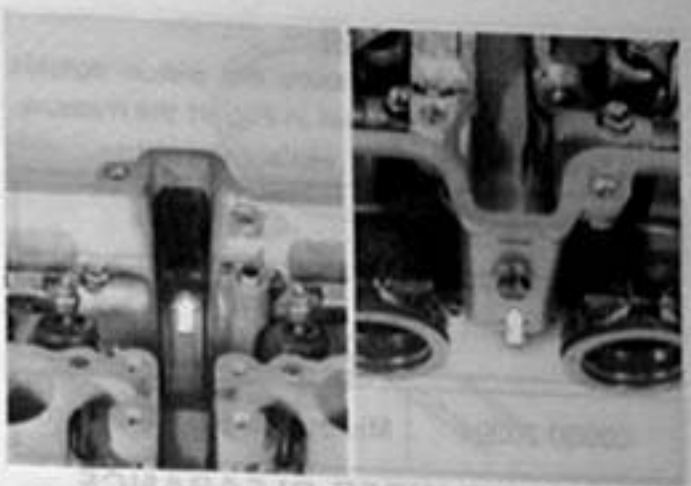


CAM CHAIN GUIDE

NOTE:
When replacing the cam chain guide, apply SUZUKI Thread lock "1303" to threads of bolt and tighten it to the specified torque.

99000-32030	Thread lock super "1303"

Tightening torque	4 – 7 N·m (0.4 – 0.7 kg-m) 3.0 – 5.0 lb-ft



CYLINDER DISTORTION

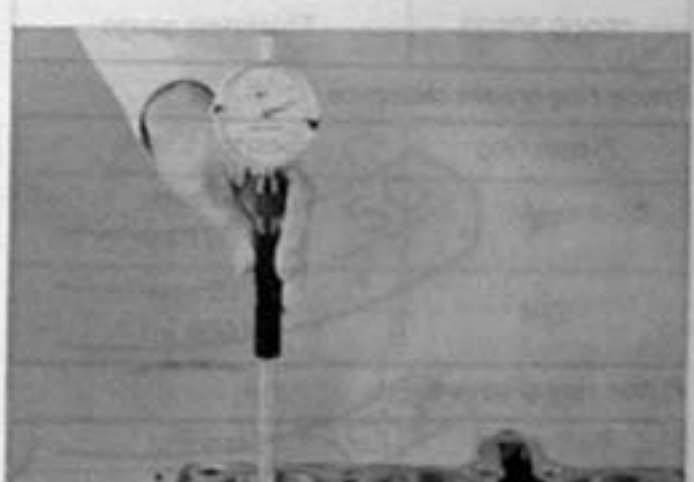
Check the gasketed surface of the cylinder for distortion with a straightedge and thickness gauge, taking a clearance reading at several places as indicated. If the largest reading at any position of the straightedge exceeds the limit, replace the cylinder.

Cylinder distortion specification

Service Limit	0.2 mm (0.008 in)

CYLINDER BORE

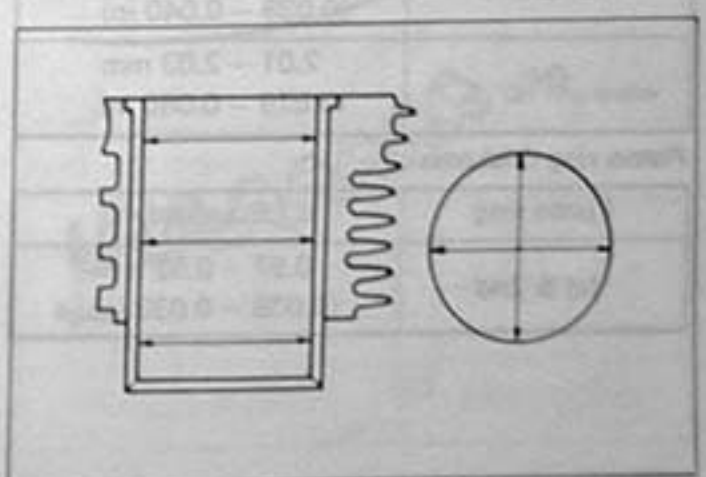
Measure the cylinder bore diameter at six places. If any one of the measurements exceeds the limit, overhaul the cylinder and replace the piston with an oversize, or replace the cylinder. Once the remaining cylinders must be also rebored accordingly. Otherwise, the imbalance might cause excess vibration.



Cylinder bore

Service Limit	76.065 mm (2.9947 in)

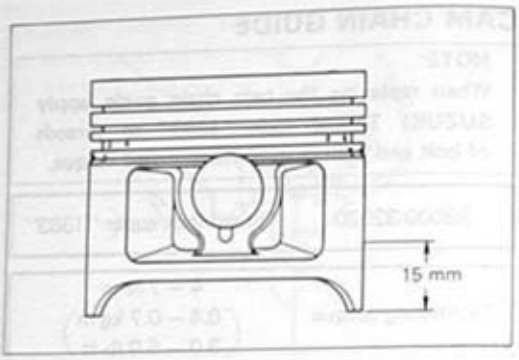
09900-20508	Cylinder gauge set (40 – 80 mm)



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.

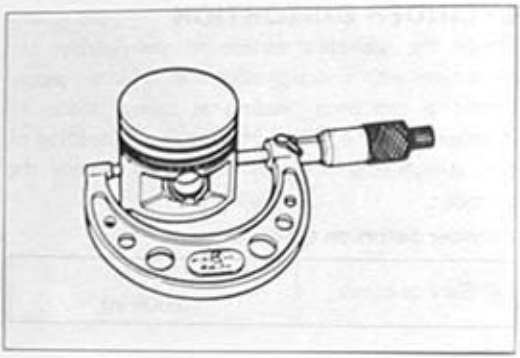
Piston oversize	0.5, 1.0 mm
Service Limit	75.880 mm (2.9874 in)
09900-20204	Micrometer (75 – 100 mm)



PISTON-CYLINDER CLEARANCE

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

Service Limit	0.120 mm (0.0047 in)



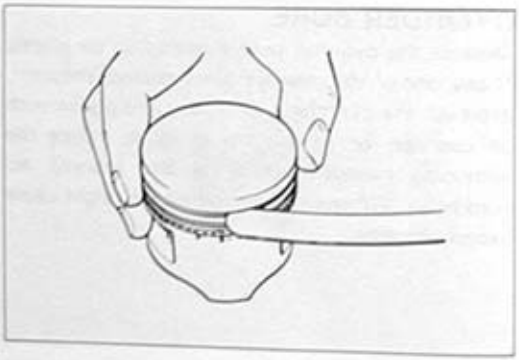
PISTON RING-GROOVE CLEARANCE

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

09900-20803	Thickness gauge

Piston ring-groove clearance

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

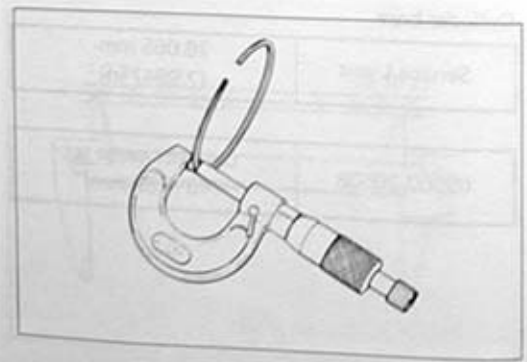


Piston ring groove width

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

Piston ring thickness

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



PISTON RING FREE END GAP AND PISTON RING END GAP

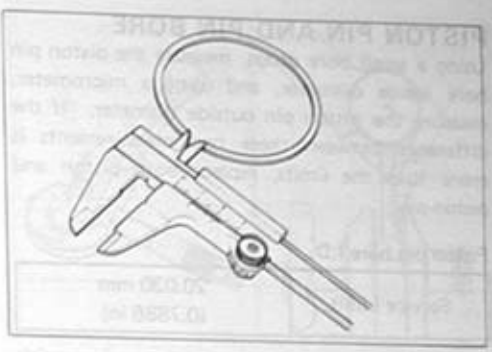
Before installing piston rings, measure the free end gap of each ring using vernier calipers. Next, fit the ring in the cylinder, and measure each ring end gap using a thickness gauge.

If any ring has an excess end gap, replace the ring.

Piston ring free end gap

Piston ring	Service Limit
1st	7.8 mm (0.31 in)
2nd	6.6 mm (0.26 in)

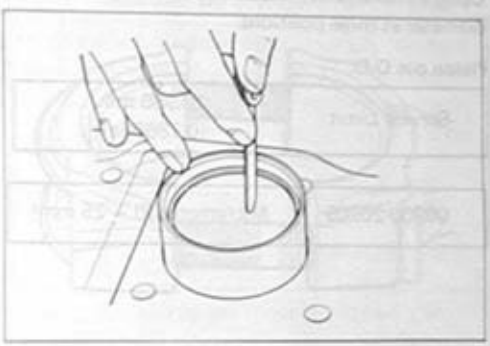
09900-20102	Vernier calipers



Piston ring end gap

Piston ring	Service Limit
1st & 2nd	0.7 mm (0.03 in)

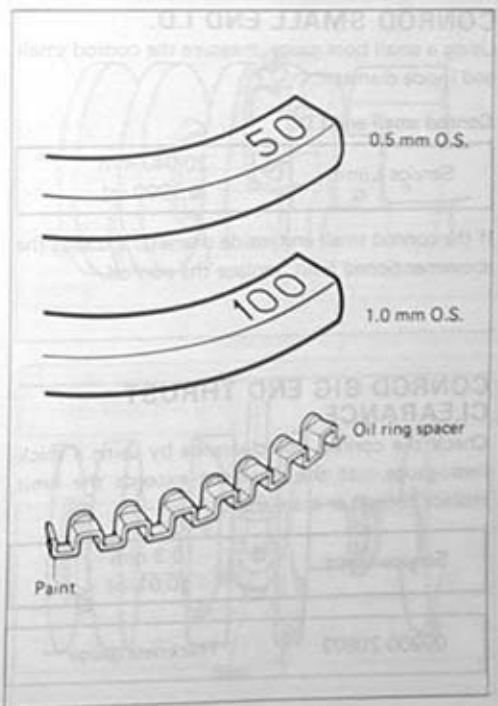
09900-20803	Thickness gauge



Oversize piston ring

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

	1st	2nd
0.5 mm	Painted red	50
1.0 mm	Painted yellow	100



Oversize oil ring

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

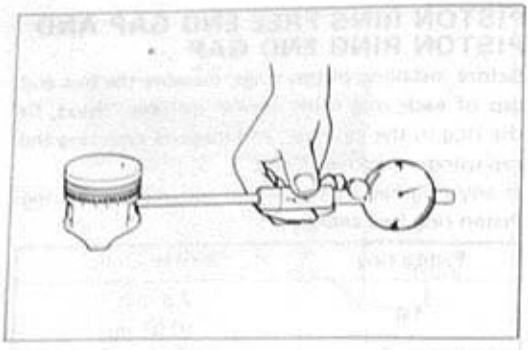
SIZE	COLOR
STD	
0.5 mm O.S.	Painted red
1.0 mm O.S.	Painted yellow

Oversize side rail

Just measure out side diameter to identify the size.

PISTON PIN AND PIN BORE

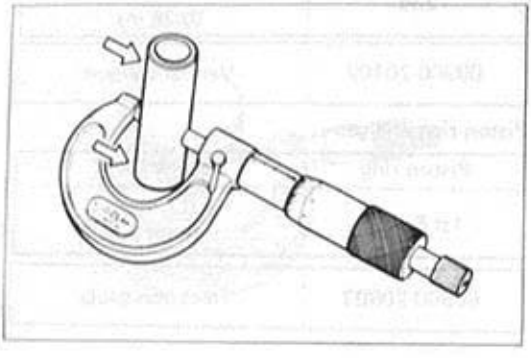
Using a small bore gauge, measure the piston pin bore inside diameter, and using a micrometer, measure the piston pin outside diameter. If the difference between these two measurements is more than the limits, replace both piston and piston pin.



Piston pin bore I.D.

Service Limit	20.030 mm (0.7886 in)

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



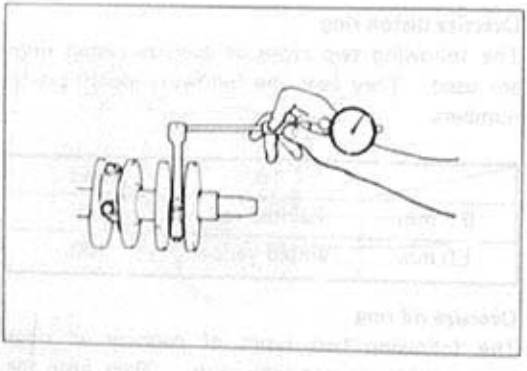
Piston pin O.D.

Service Limit	19.980 mm (0.7866 in)

09900-20205	Micrometer (0 – 25 mm)

CONROD SMALL END I.D.

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



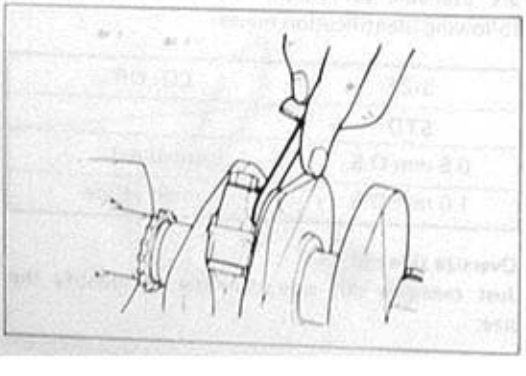
Conrod small end I.D.

Service Limit	20.040 mm (0.7890 in)

If the conrod small end inside diameter exceeds the abovementioned limit, replace the conrod.

CONROD BIG END THRUST CLEARANCE

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

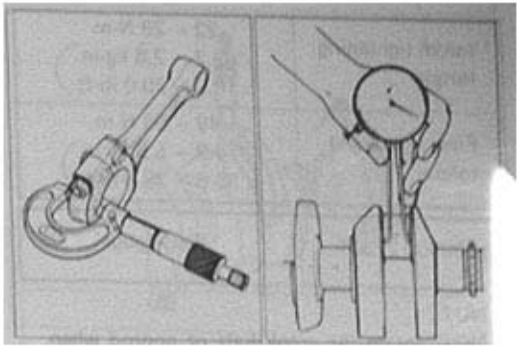


Service Limit	0.3 mm (0.01 in)

09900-20803	Thickness gauge

	Standard
Big end width	20.95 – 21.00 mm (0.825 – 0.827 in)
Crank pin width	21.10 – 21.15 mm (0.831 – 0.833 in)

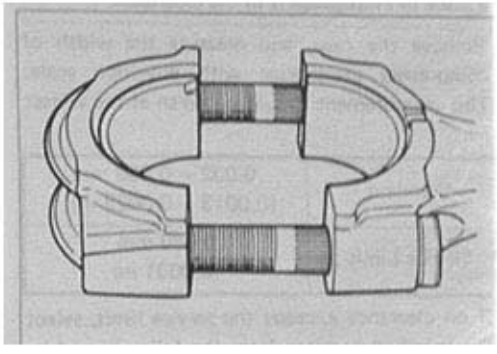
09900-20205	Micrometer (0 – 25 mm)
09900-20605	Dial calipers



CONROD-CRANK PIN BEARING SELECTION

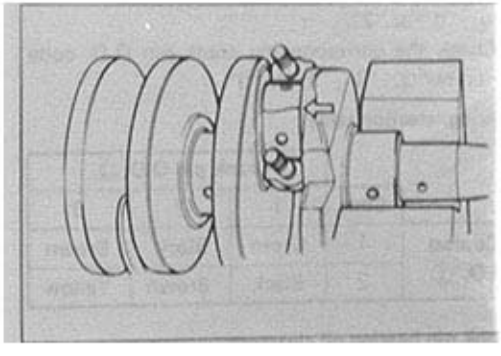
- Loosen the bearing cap nuts, and tap the bolt end lightly with plastic hammer to remove bearing cap.
- Remove the rods, and mark them to identify the cylinder position.
- Inspect the bearing surfaces for any sign of fusion, pitting, burn, or flaws. If any, replace them with a specified set of bearings.

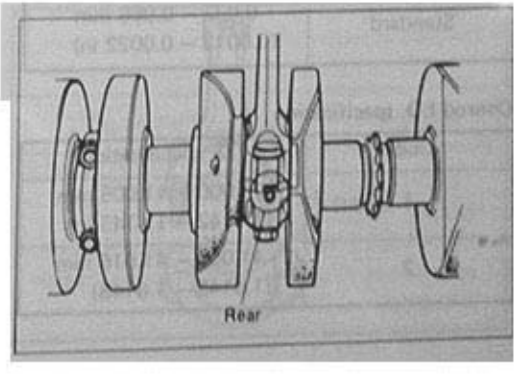
NOTE:
Never try to remove or loosen the conrod cap bolts due to their possible loosening in the rod. Once displaced, the bearing cap will not be fitted properly.



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

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





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

09900-22301	Plastigauge

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

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

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

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

Bearing selection table

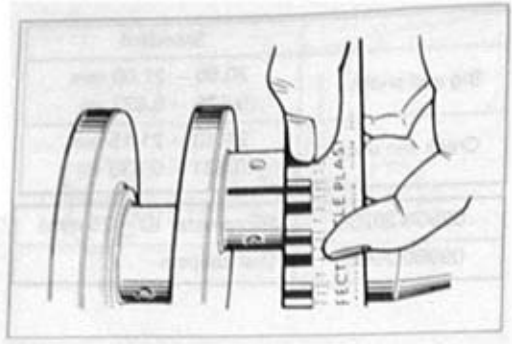
		Crank pin O.D. ②		
	Code	1	2	3
Conrod I.D. ①	1	Green	Black	Brown
	2	Black	Brown	Yellow

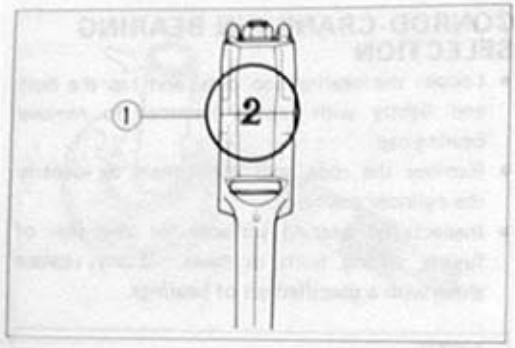
Crank pin bearing oil clearance

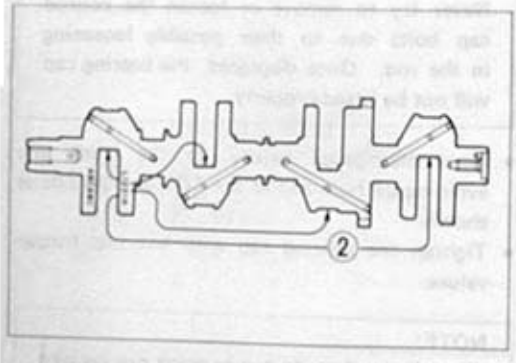
Standard	0.032 – 0.056 mm (0.0013 – 0.0022 in)

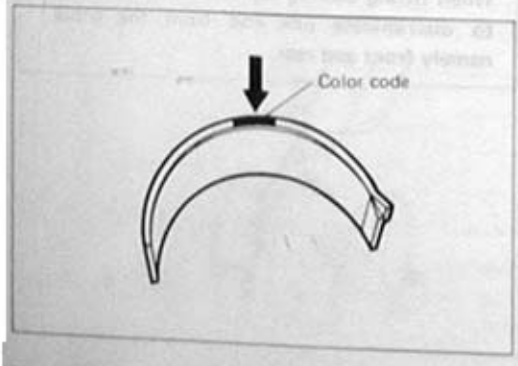
Conrod I.D. specification

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





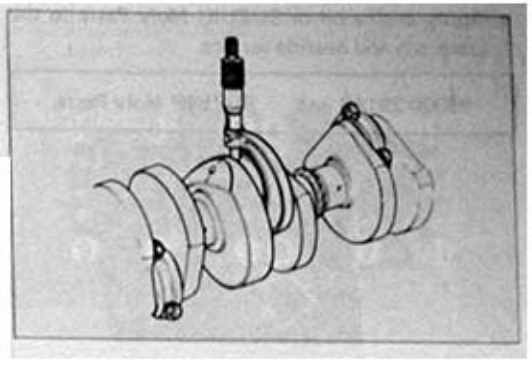




Crank pin O.D. specification

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

09900-20202	Micrometer (25 – 50 mm)



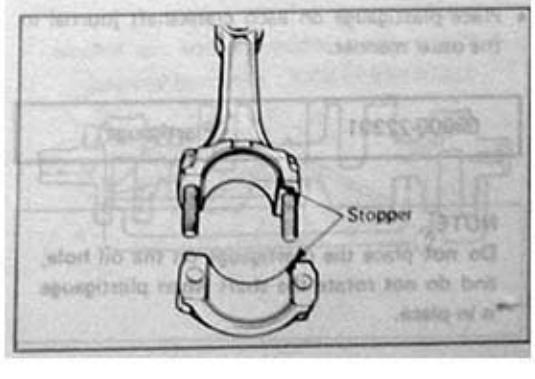
Bearing thickness

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

CAUTION:
Bearing should be replace as a set.

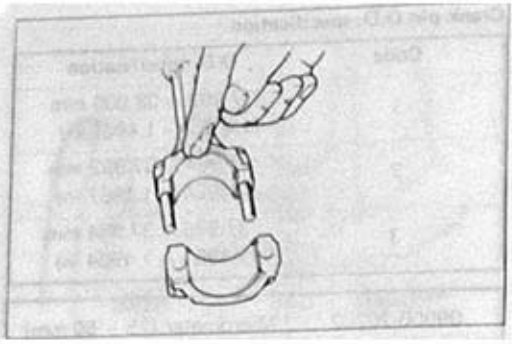
BEARING ASSEMBLY

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



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

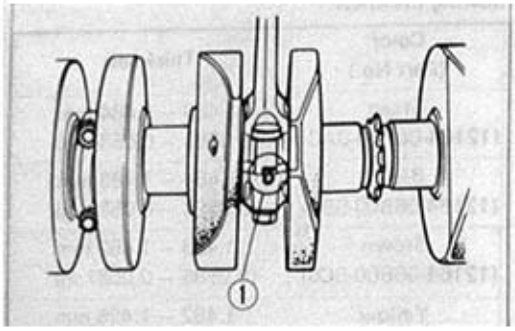
99000-25140	SUZUKI Moly Paste



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

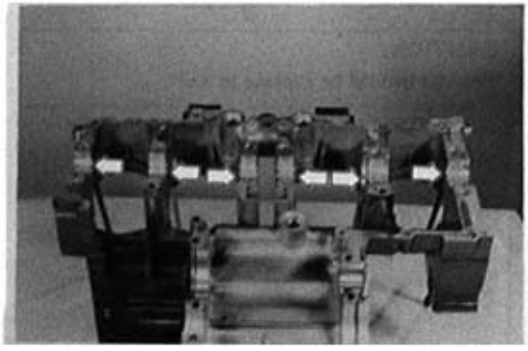
Tightening torque	49 – 53 N·m (4.9 – 5.3 kg·m 35.5 – 38.5 lb·ft)

- Check the conrod for smooth turning.



CRANKCASE-CRANKSHAFT BEARING SELECTION

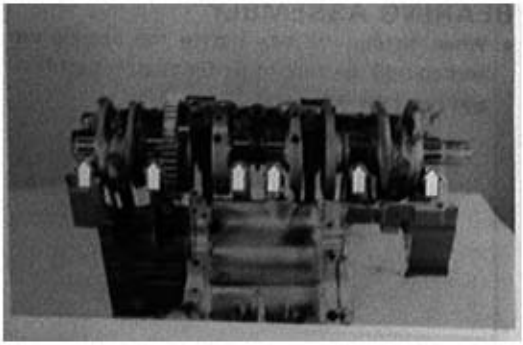
- Inspect each bearing of upper and lower crank cases for any damage.



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

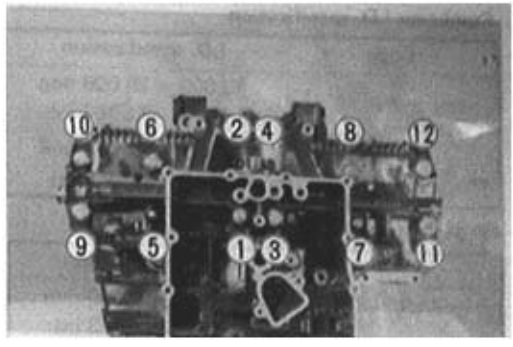
09900-22301	Plastigauge

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



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

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



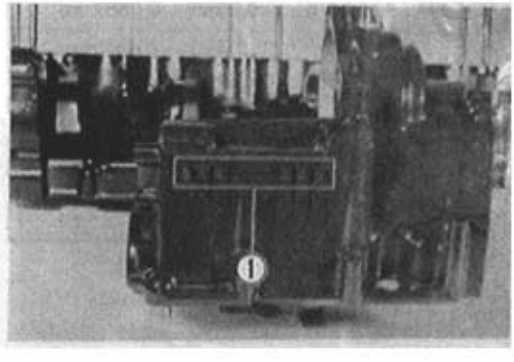
- Remove the lower crankcase, and measure the width of compressed plastigauge in the usual manner.

Standard	0.020 – 0.044 mm (0.0008 – 0.0017 in)
Service Limit	0.80 mm (0.0031 in)

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

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

- Check the corresponding crankshaft journal O.D. code number ② "A", "B" or "C".

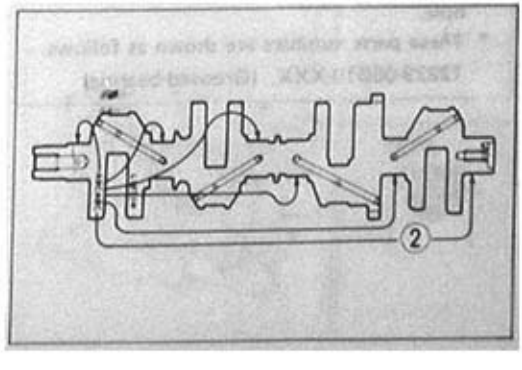


Bearing selection table

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

Crank journal bearing oil clearance

Standard	0.020 – 0.044 mm (0.0008 – 0.0017 in)



Crankcase I.D. specification

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

Crankshaft journal O.D. specification

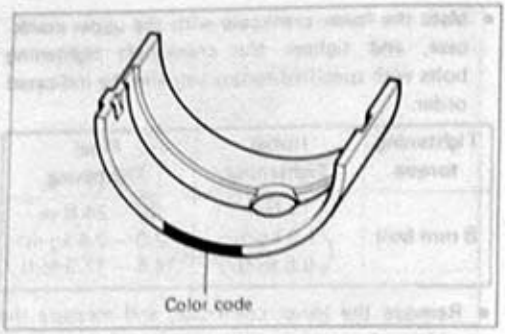
Code	O.D. specification
A	35.992 – 36.000 mm (1.4170 – 1.4173 in)
B	35.984 – 35.992 mm (1.4167 – 1.4170 in)
C	35.976 – 35.984 mm (1.4164 – 1.4167 in)

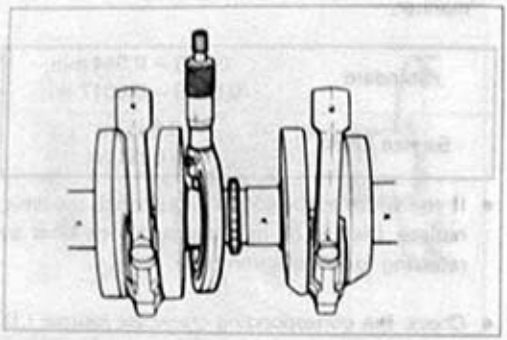
09900-20202	Micrometer (25 – 50 mm)

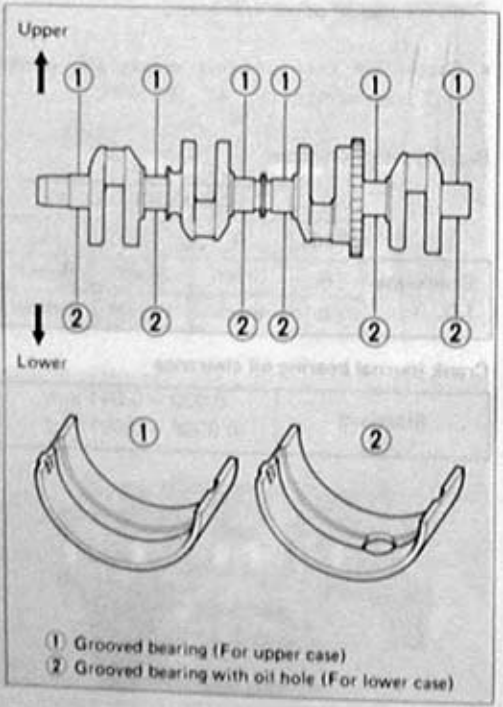
Bearing thickness specification
(Grooved bearing with oil hole . . . For lower case)

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

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



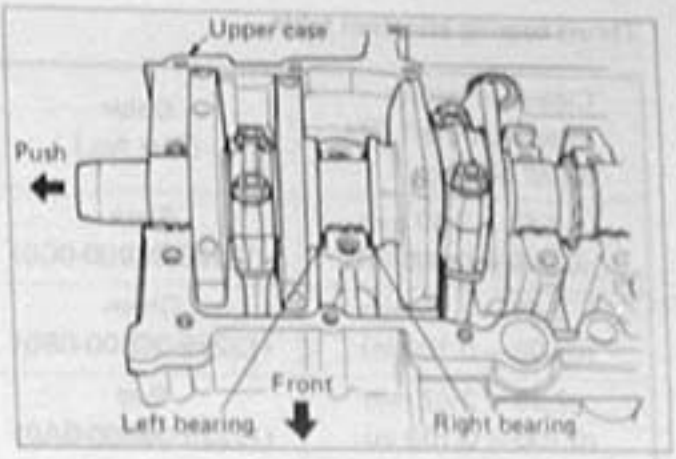




CRANKSHAFT THRUST CLEARANCE

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

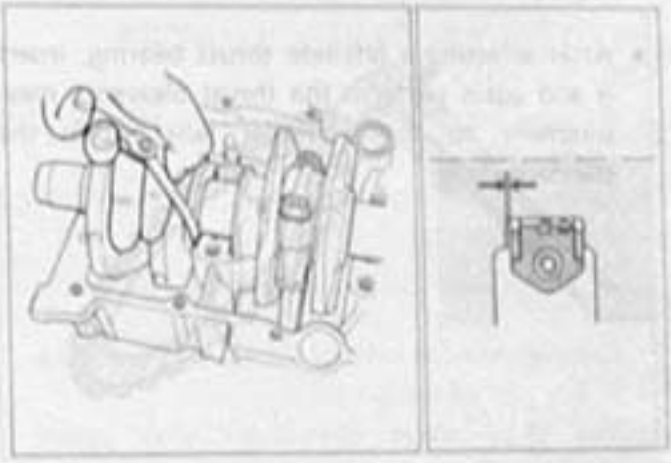
NOTE:
Push the crankshaft to the starter clutch side, so that there is no clearance on the right-side thrust bearing.



Thrust clearance

Standard	0.04 – 0.16 mm (0.002 – 0.006 in)

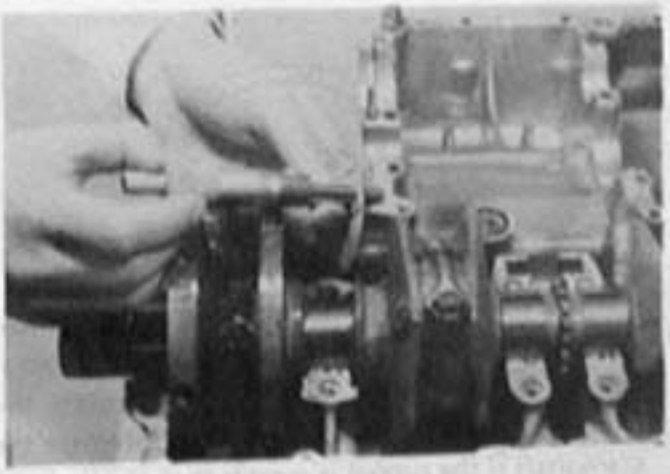
If the thrust clearance exceeds the standard range, adjust the thrust clearance by the following procedures:



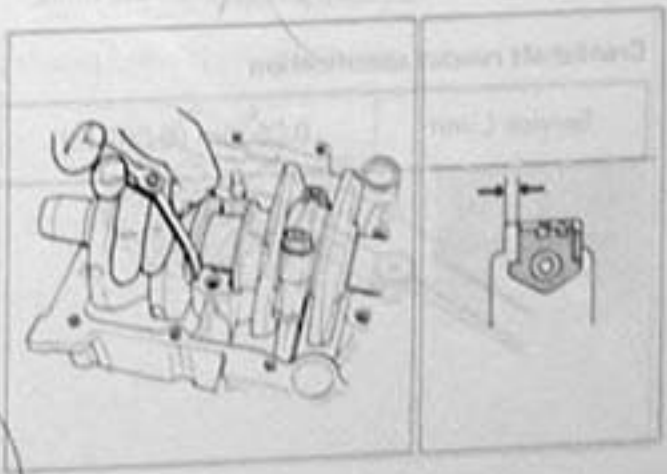
- Remove the right-side thrust bearing, and measure its thickness with a micrometer. If the thickness of the right-side thrust bearing is below standard, replace with a new bearing and once again perform the thrust clearance measurement listed above, checking to make sure it is within standard.

Right-side thrust bearing thickness

Standard	2.39 – 2.45 mm (0.094 – 0.097 in)

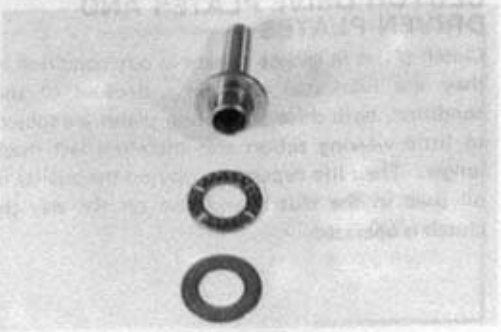


- If the right-side thrust bearing is within the standard range, reinsert the right-side thrust bearing, and remove the left-side thrust bearing.
- As shown in the illustration, use a thickness gauge to measure the clearance before inserting of the left-side thrust bearing, and select a left-side thrust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



CLUTCH BEARING

Inspect the clutch release bearing for any abnormality, particularly cracks, to decide whether it can be reused or should be replaced.
Smooth engagement and disengagement of the clutch depends much on the condition of this bearing.

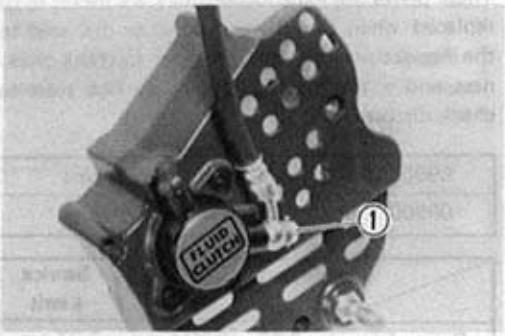


CLUTCH RELEASE CYLINDER

DISASSEMBLY

- Remove the gearshift lever and engine sprocket cover. (Refer to page 3-5)
- Remove the clutch hydraulic line by removing the union bolt ①.

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



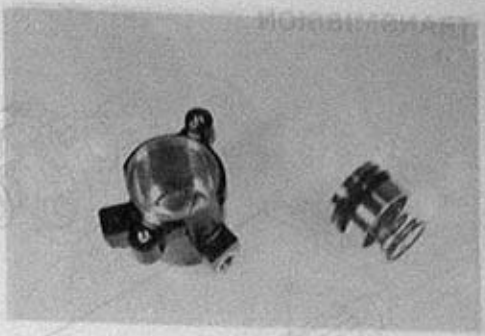
- Remove the air bleeder valve ②.
- Remove the clutch release cylinder by removing the mounting bolts ③ and piston retainer screws ④.

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

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

INSPECTION

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



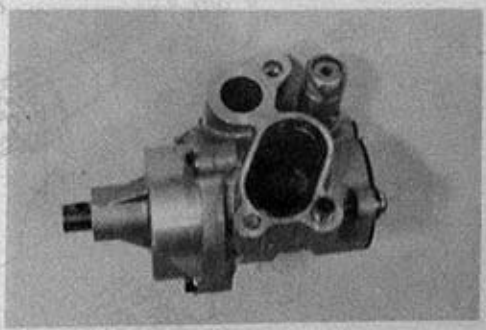
REASSEMBLY

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

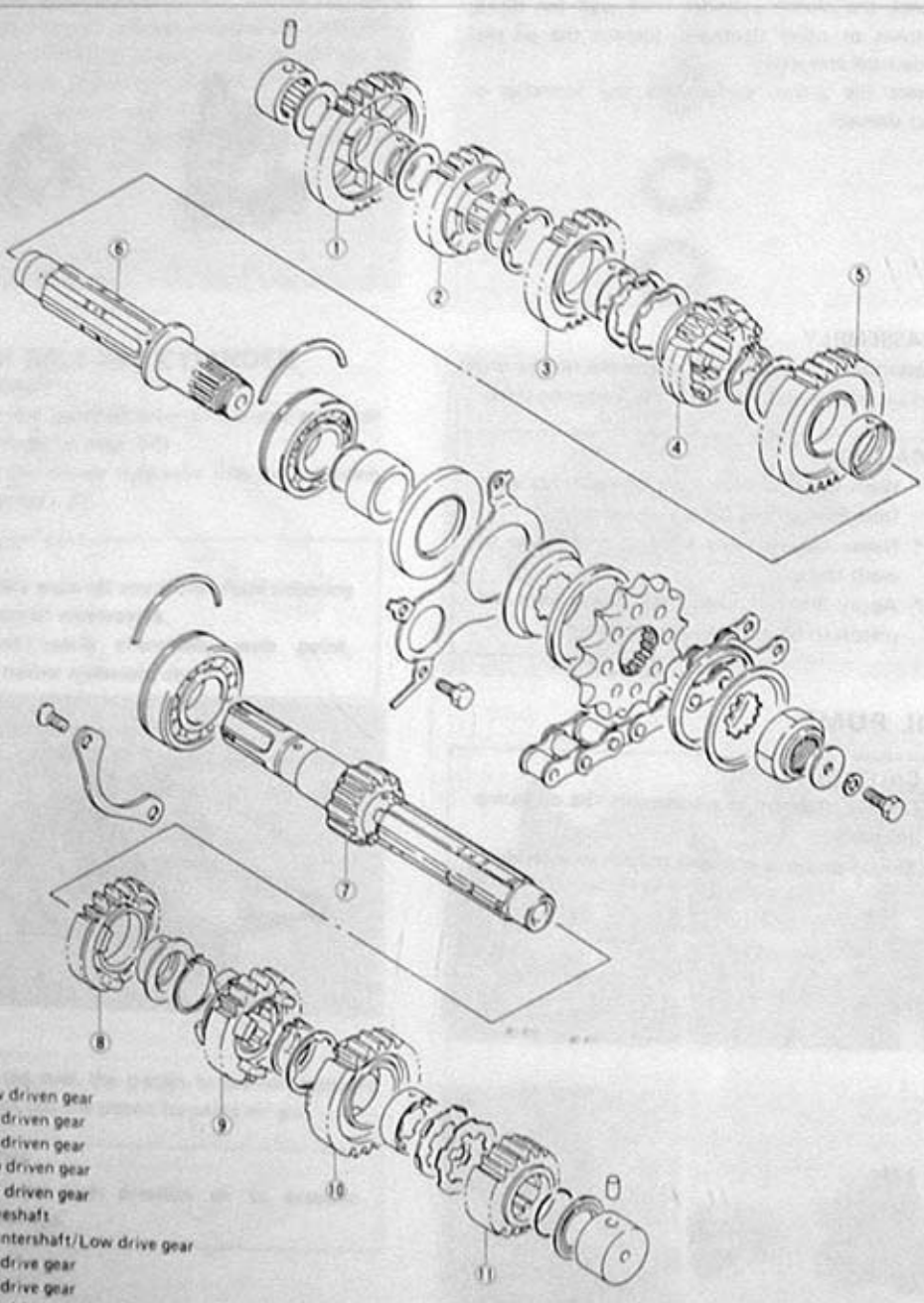
CAUTION:
- Wash the clutch cylinder components with fresh brake fluid before reassembly.
- Never use cleaning solvent or gasoline to wash them.
- Apply brake fluid to the cylinder bore and piston to be inserted into the bore.

OIL PUMP

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



TRANSMISSION

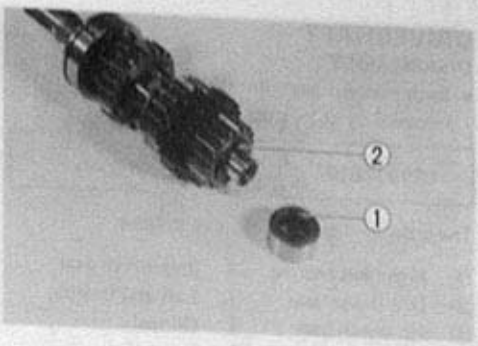


① Low driven gear
② 4th driven gear
③ 3rd driven gear
④ Top driven gear
⑤ 2nd driven gear
⑥ Driveshaft
⑦ Countershaft/Low drive gear
⑧ 4th drive gear
⑨ 3rd drive gear
⑩ Top drive gear
⑪ 2nd drive gear

COUNTERSHAFT

DISASSEMBLY

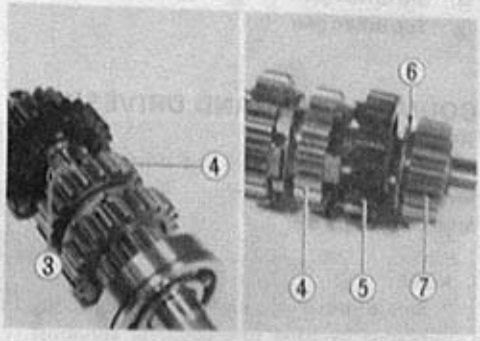
- Remove the left end bearing ① and oil seal ②.



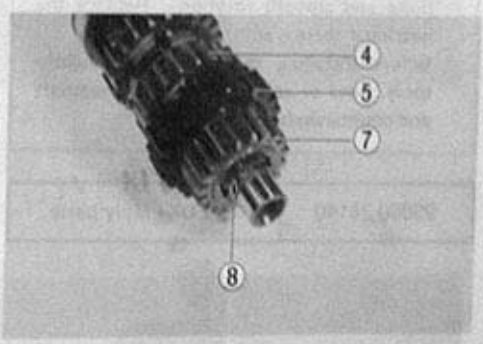
- Remove the Top drive gear circlip ③ from the groove and slide the circlip ③ toward the 3rd drive gear ④.

09900-06104	Snap ring pliers

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

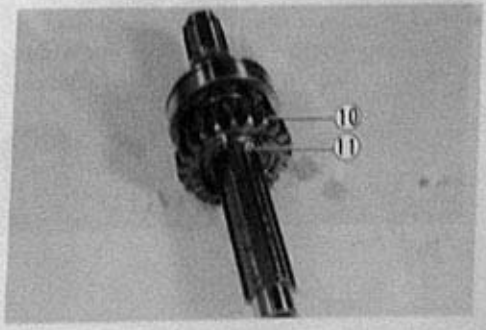


- Remove the 2nd drive gear circlip ⑧, and then remove the 2nd drive gear ⑦, Top drive gear ⑤ and 3rd drive gear ④.



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

09900-06107	Snap ring pliers



DRIVESHAFT

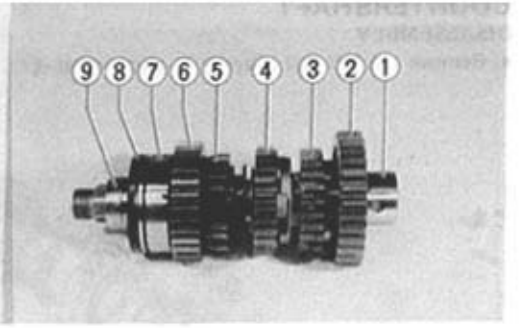
DISASSEMBLY

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

09900-06107	Snap ring pliers

The order of disassembling is as follows:

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



COUNTERSHAFT AND DRIVESHAFT

REASSEMBLY

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

NOTE:

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

99000-25140	SUZUKI Moly paste

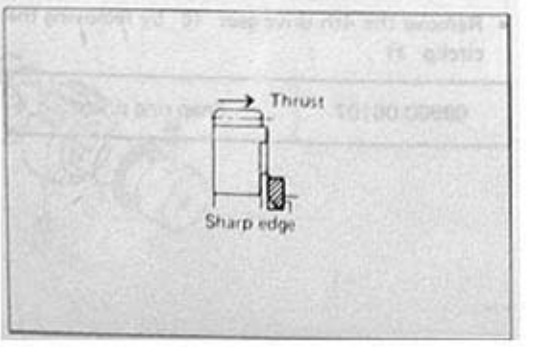
CAUTION:

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

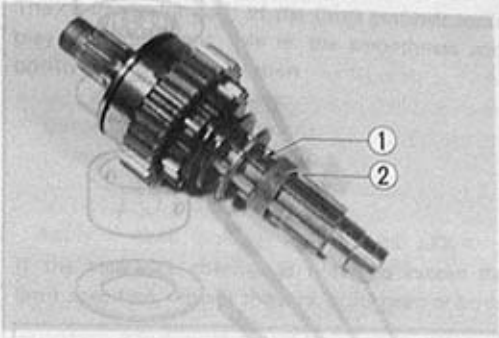
NOTE:

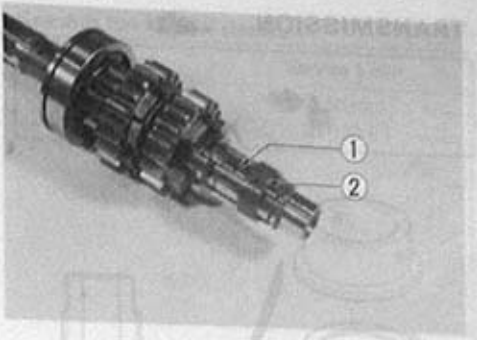
In reassembling the transmission, attention must be given to the locations and positions of washers and circlips. The cross sectional view given here will serve as a reference for correctly mounting the gears, washers and circlips. (Refer to page 3-55)

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

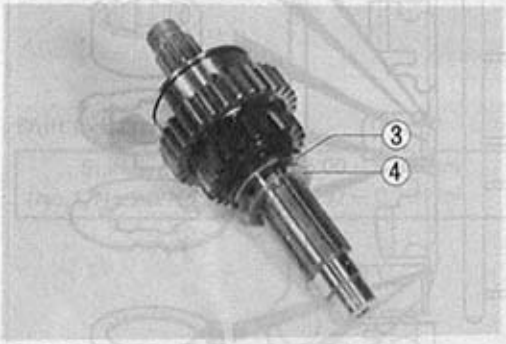


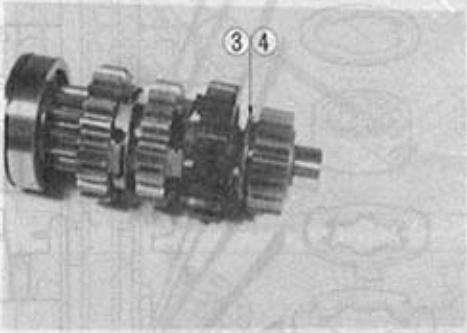
- When installing the gear bushing onto the shaft, align the oil hole ① of the shaft with the bushing oil hole ②.





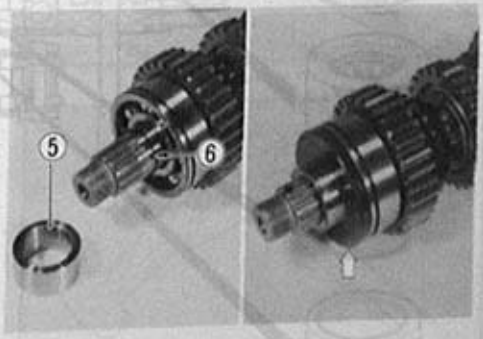
- When installing the pair of the lock washers, ③ and ④, be sure to align the three grooves of the lock washer ③ with the three tabs of the lock washer ④.



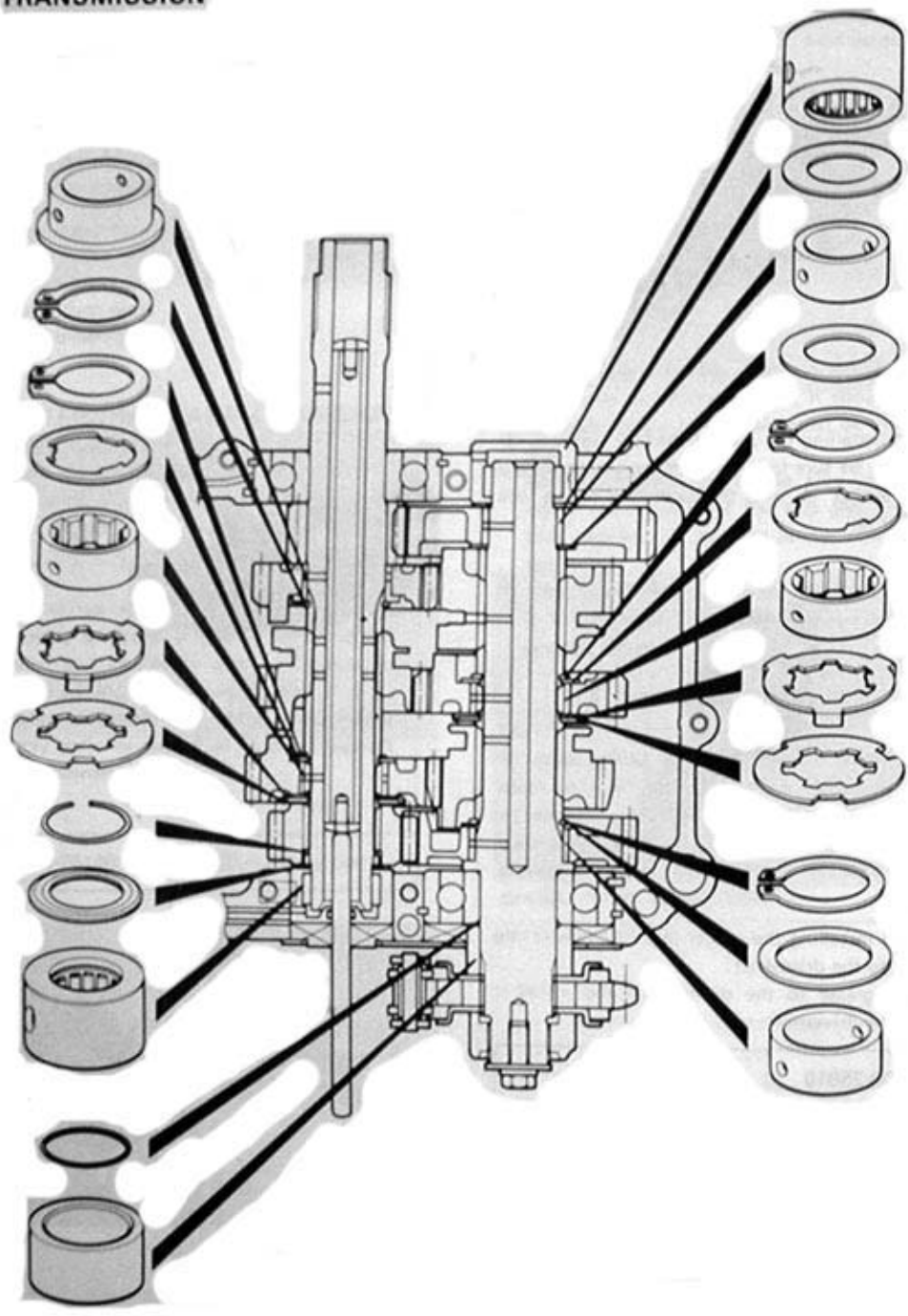


- Before installing the spacer ⑤, fit a new O-ring ⑥ onto the driveshaft.
- Apply grease to the oil seal lip and install it onto the driveshaft.

99000-25010	SUZUKI super grease "A"



TRANSMISSION



GEARSHIFT FORK-GROOVE CLEARANCE

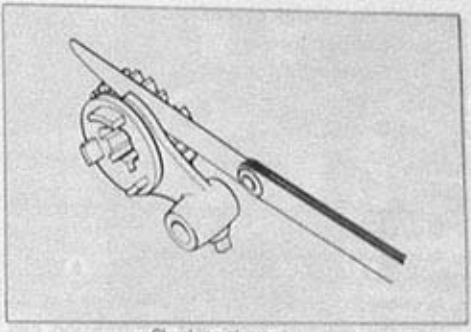
Using a thickness gauge, check the gearshift fork clearance in the groove of its gear.
The clearance for each of the three gearshift forks plays an important role in the smoothness and positiveness of shifting action.

Gearshift fork-Groove clearance

Standard	Service Limit
0.10 – 0.30 mm (0.004 – 0.012 in)	0.50 mm (0.020 in)

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

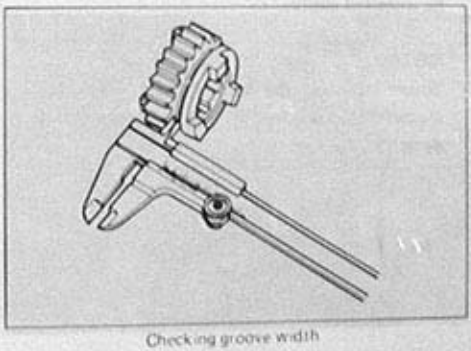
09900-20803	Thickness gauge
09900-20102	Vernier calipers



Checking clearance

Shift fork groove width

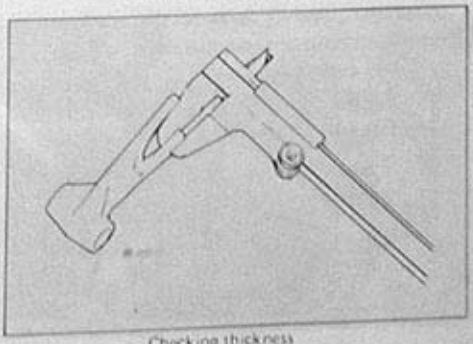
Standard (No.1, No.2 & No.3)	5.00 – 5.10 mm (0.197 – 0.201 in)



Checking groove width

Shift fork thickness

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



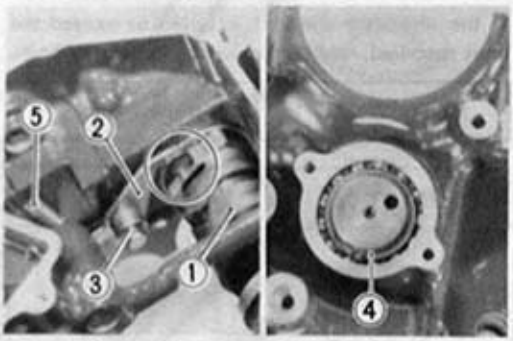
Checking thickness

ENGINE REASSEMBLY

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

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

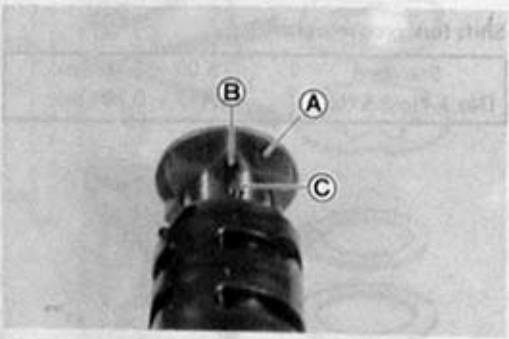
- Install the gearshift cam related parts.
  1. Gearshift cam
  2. Gearshift cam stopper
  3. Circlip
  4. Circlip
  5. Spring



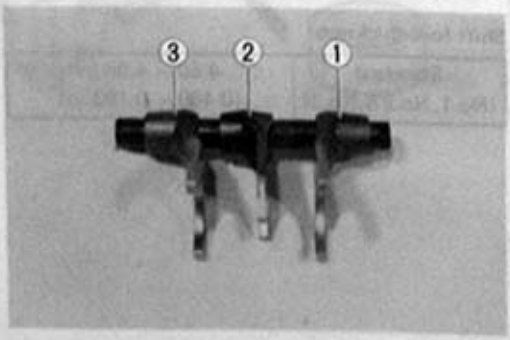
CAUTION:
Always use new circlips, 3 and 4.

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

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



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



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

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

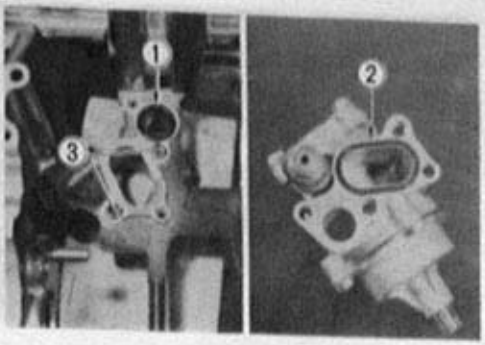
- Install the oil pump to the lower crankcase with three bolts and tighten them to the specified torque.

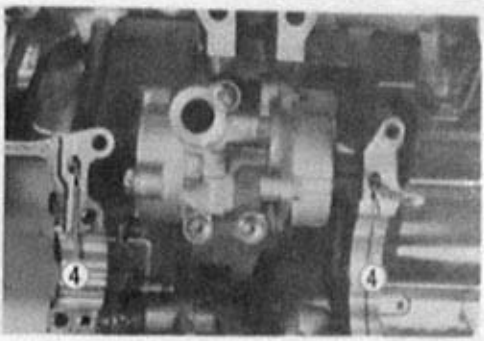
NOTE:
Apply a small quantity of THREAD LOCK "1342" to the bolts.

99000-32050	Thread lock "1342"

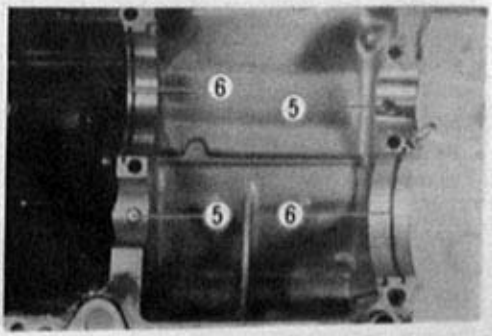
Tightening torque	8 – 12 N·m (0.8 – 1.2 kg·m 6.0 – 8.5 lb·ft)

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



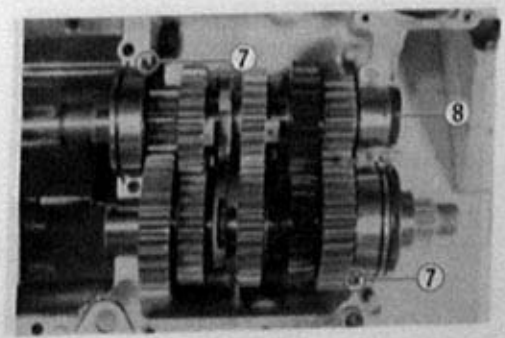


- Fit the bearing pins ⑤ and C-rings ⑥ on the upper crankcase.



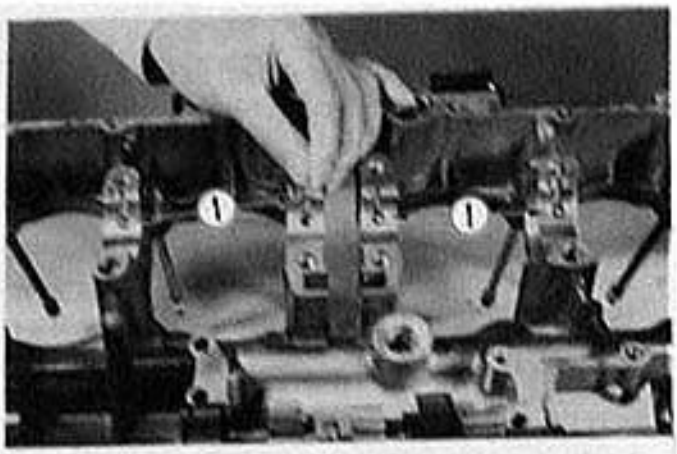
- Install the countershaft assembly and driveshaft assembly on the upper crankcase.

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



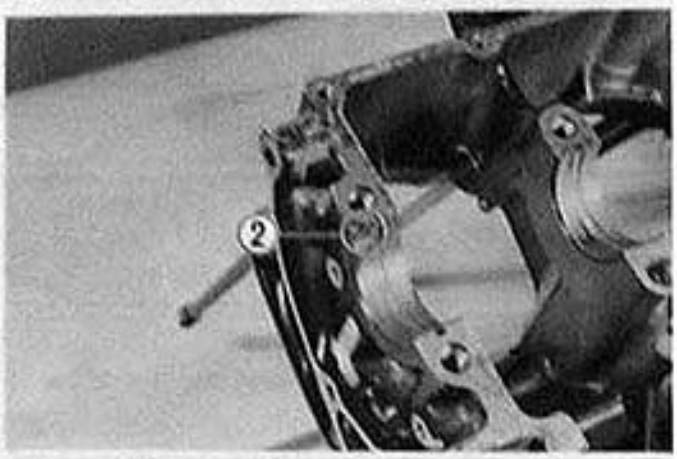
NOTE:
Before fitting the crankshaft journal bearings, check the nozzles ① fitted on the upper crankcase for clogging.

① Nozzle (4 pcs) ..... For upper case



- When fitting the crankshaft journal bearings to the upper and lower crankcases, be sure to fix the stopper part ② first and press the other end.
(Refer to page 3-45)

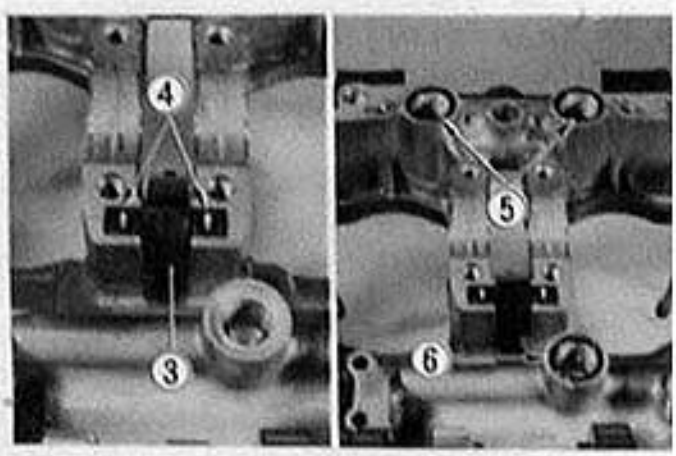
CAUTION:
Do not touch the bearing surfaces with your hands. Grasp by the edge of the bearing shell.



- Install the cam chain guide ③ and two dampers ④ properly.
- Fit the O-rings, ⑤ and ⑥.

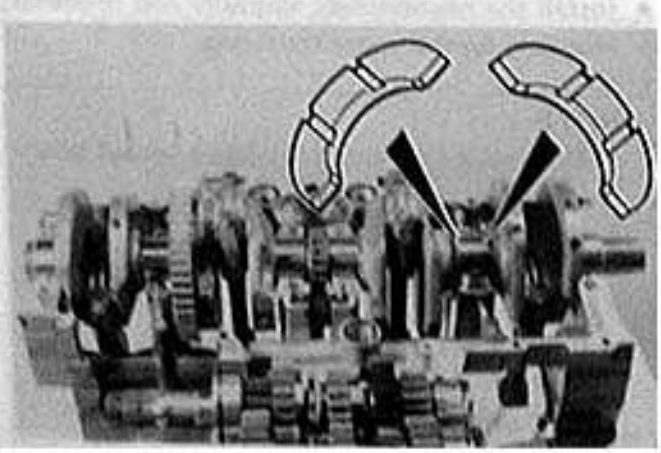
NOTE:
Be sure to face the arrow mark on the damper to the front.

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



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

99000-25140	SUZUKI Moly Paste

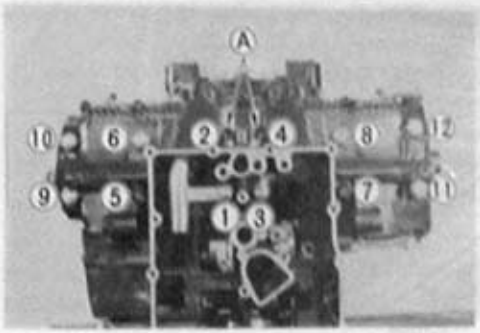


- Clean the mating surfaces of the crankcases before matching the upper and lower ones.
- Install the dowel pins to the upper crankcase.
- Apply SUZUKI BOND NO. 12078 to the mating surface of the lower crankcase in the following procedure.

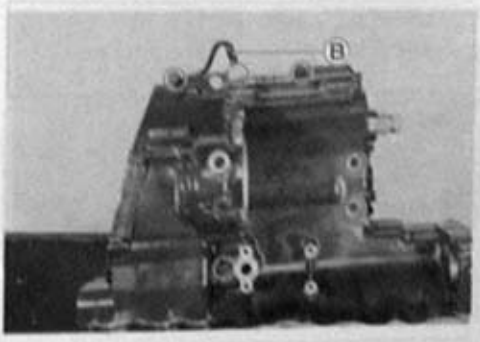
99000-31140	SUZUKI Bond No. 1207B

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

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

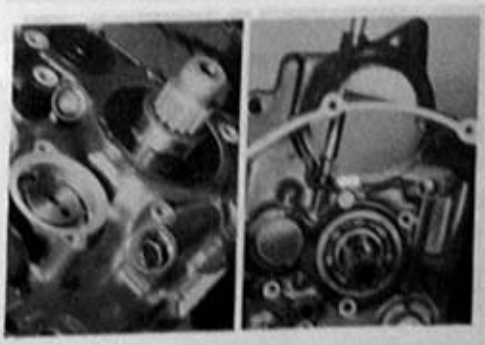


Tightening torque	Initial tightening			Final tightening		
	kg-m	N-m	lb-ft	kg-m	N-m	lb-ft
6 mm bolt	0.6	6	4.5	1.3	13	9.5
8 mm bolt	1.3	13	9.5	2.4	24	17.5



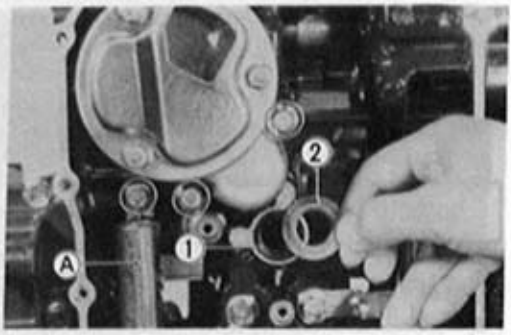
NOTE:
- **Install the main oil gallery plug. (Refer to page 3-20)**
- **Fit up the engine ground wire Ⓑ to the correct position as shown in Fig.**

09914-25811	6-mm T-type hexagon wrench



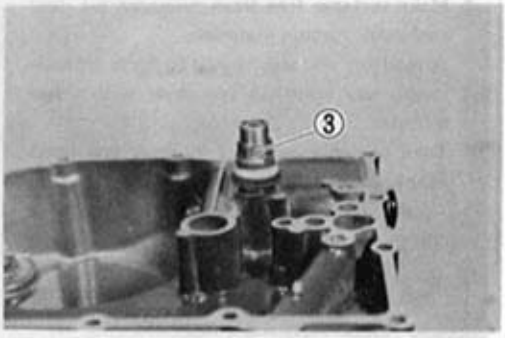
- Install the left oil pipe Ⓐ with bolt.
- Fit a new O-ring ① and shim ②.
- Fit a new gasket and install the oil sump filter to the lower crankcase with two bolts to face the oil inlet to the rear.

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



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

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

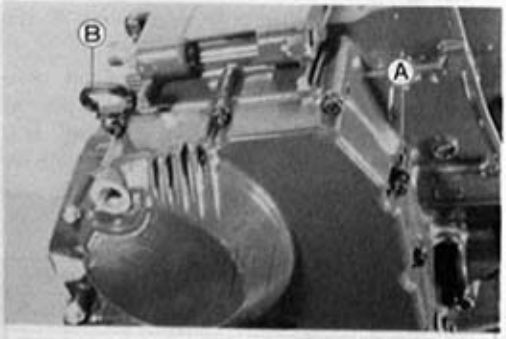


- Fit a new gasket and install the oil pan with bolts. Tighten the oil pan bolts to the specified torque.

Tightening tortue	12 – 16 N·m (1.2 – 1.6 kg-m / 8.5 – 11.5 lb-ft)

NOTE:
- **Fit a new gasket Ⓐ to the correct position as shown.**
- **Fit the air cleaner drain hose guide Ⓑ to the correct position as shown.**

CAUTION:
Use a new gasket to prevent oil leakage.

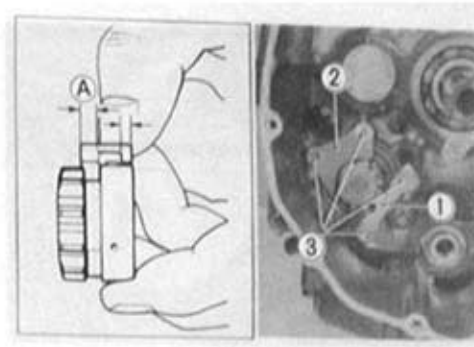


- Tighten the engine oil drain plug to the specified torque. (Refer to page 7-21)
- Install the countershaft bearing retainer with two screws.

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

99000-32050	Thread lock "1342"

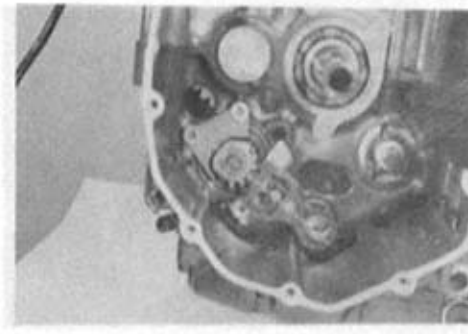
- Install each gear shifting pawl into the cam driven gear. The large shoulder Ⓐ must face to the outside as shown.
- When installing the cam guide ① and pawl lifter ②, apply a small quantity of THREAD LOCK "1342" to the screws ③.



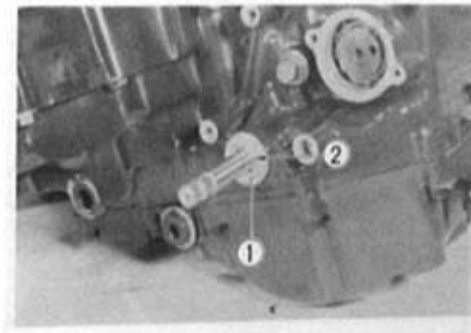
99000-32050	Thread lock "1342"

09900-09003	Impact driver set

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

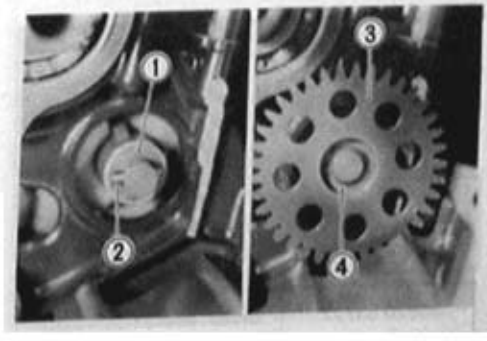


- Install the washer ① and fix the gearshift shaft with the clip ②.



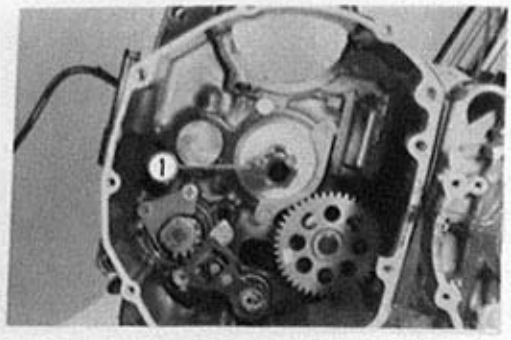
- Install the washer ①, pin ②, oil pump driven gear ③ and washer ④.
- Fix the oil pump driven gear with the circlip.

09900-06107	Snap ring pliers

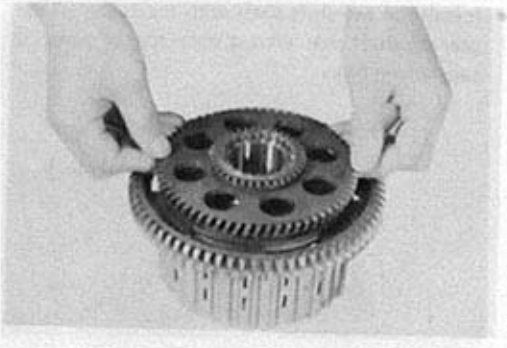


- Install the thrust washer (1) onto the countershaft.

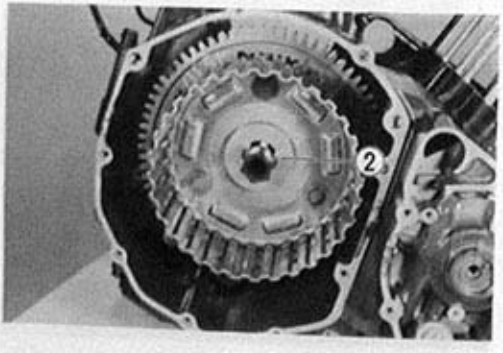
NOTE:
Flat surface of washer is positioned outside.



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



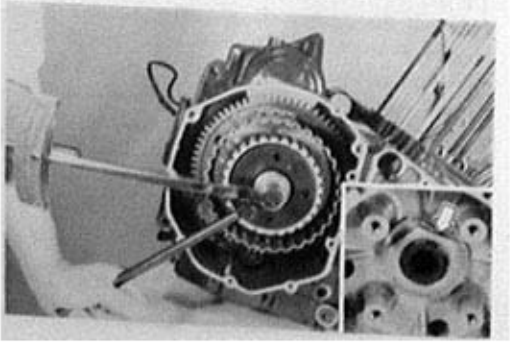
- Install the primary driven gear assembly onto the countershaft, and apply engine oil to the needle bearing and spacer.
- Install the thrust washer (2) onto the countershaft.



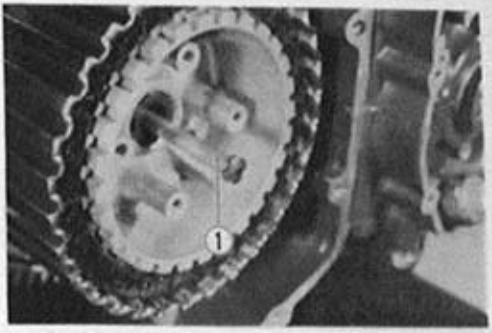
- Install the clutch sleeve hub onto the countershaft.
- After tightening the clutch sleeve hub nut, be sure to lock the nut by firmly bending the tongue of the washer. Tightening torque for the nut is specified.

Tightening torque	50 – 70 N·m (5.0 – 7.0 kg·m 36.0 – 50.5 lb·ft)

09920-53722	Clutch sleeve hub holder



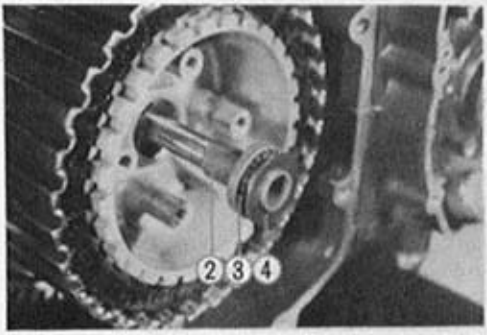
- Insert the clutch drive plate and driven plate one by one into the sleeve hub in the prescribed order, cork plate first. Insert the clutch push rod ①, clutch push piece ②, bearing ③ and thrust washer ④ into the countershaft. Then, fit the pressure plate into the sleeve hub.



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

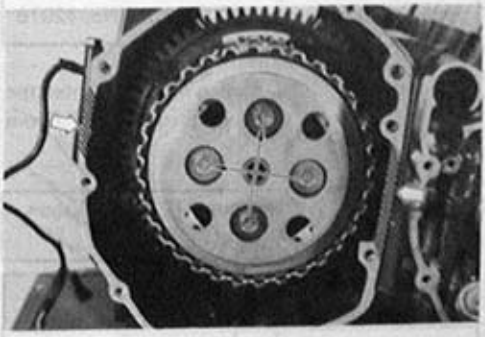
NOTE:
Tighten the clutch spring set bolts in the manner indicated, tightening them by degrees until they attain a uniform tightness.

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



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

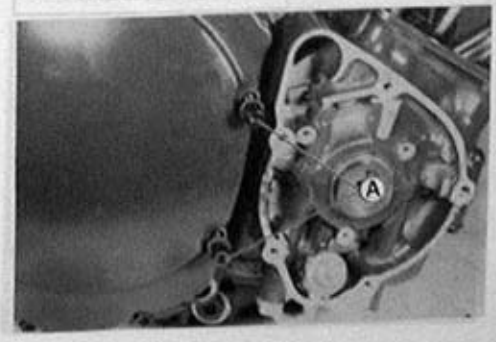
99000-31140	SUZUKI Bond No. 1207B



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

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

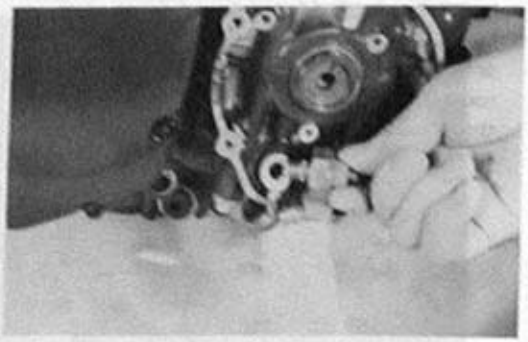
CAUTION:
Use only new gasket to prevent oil leakage.



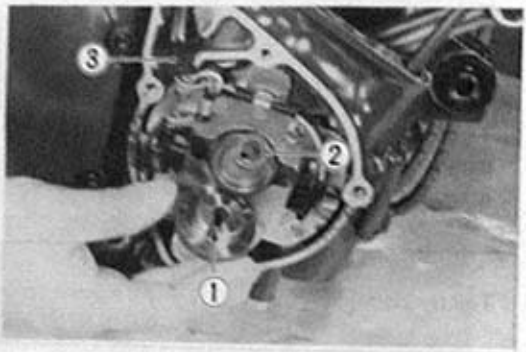
NOTE:
When replacing the oil pressure switch, apply SUZUKI Bond No. 1207B to its thread lightly.

99000-31140	SUZUKI Bond No. 1207B

Tightening torque	12 – 15 N·m (1.2 – 1.5 kg-m 6.0 – 11.0 lb-ft)



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



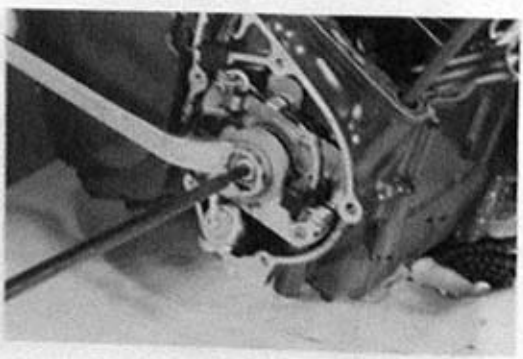
NOTE:
Bond No. 1207B should be applied to the groove of the signal generator lead wire grommet ③.

99000-31140	SUZUKI Bond No. 1207B

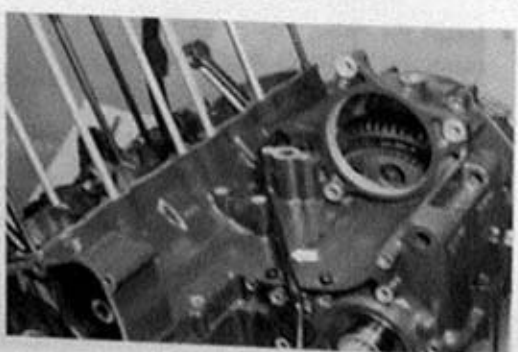
- Hold the crankshaft turning nut and tighten the rotor bolt with specified torque using 6-mm hexagon wrench.

09914-25811	6 mm "T" type hexagon wrench

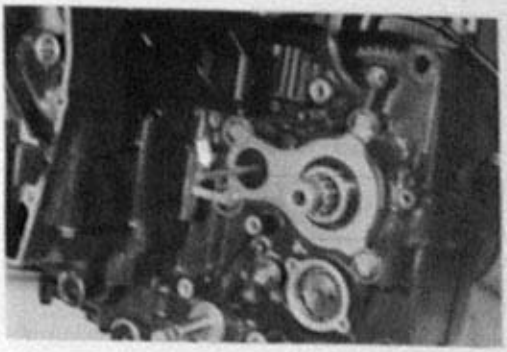
Tightening torque	25 – 35 N·m (2.5 – 3.5 kg-m 18.0 – 25.5 lb-ft)



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

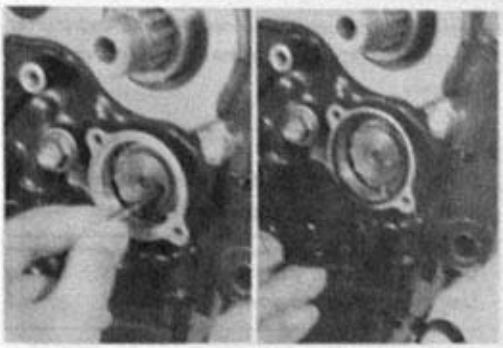


- Install the oil seal retainer with four bolts and positively bend the lock portion of the retainer.
- Insert the clutch push rod into the countershaft.



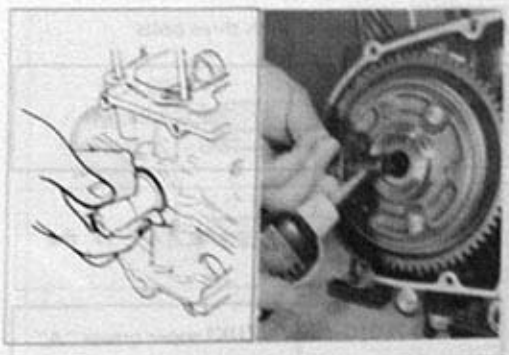
- Install the neutral position indicator switch with two screws.

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



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

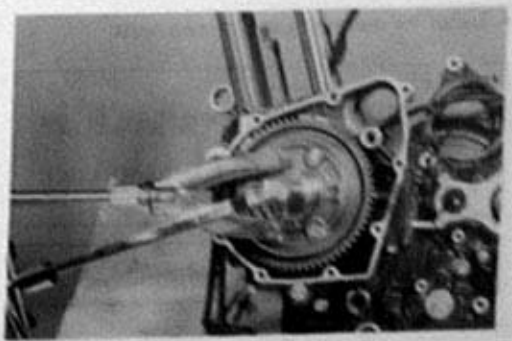
NOTE:
Apply a small quantity of THREAD LOCK SUPER "1305" to the starter clutch mounting bolt.



99000-32100	Thread lock super "1305"

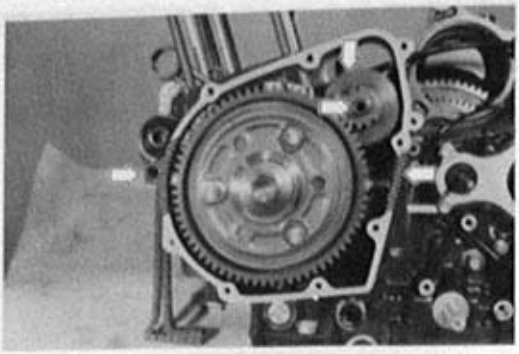
- Tighten the starter clutch mounting bolt to the specified torque by using the special tool and torque wrench.

Tightening torque	143 – 157 N·m (14.3 – 15.7 kg-m) 103.5 – 113.5 lb-ft
09930-40113	Rotor holder



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

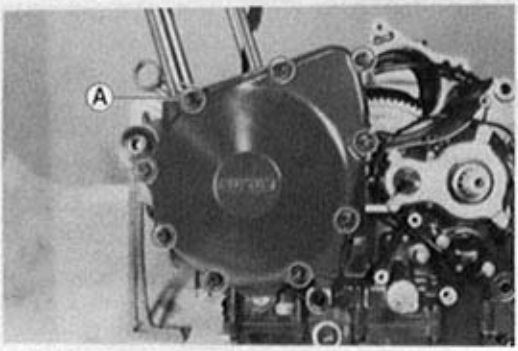
99000-31140	SUZUKI Bond No. 1207B



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

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

CAUTION:
Use a new gasket to prevent oil leakage.

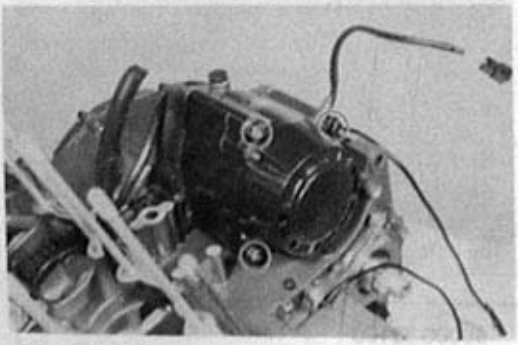


- Install the generator with three bolts.

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

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

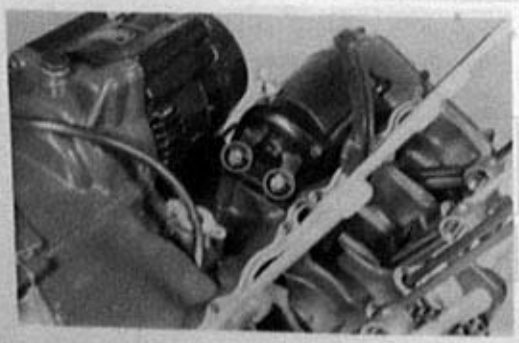
99000-25010	SUZUKI super grease "A"



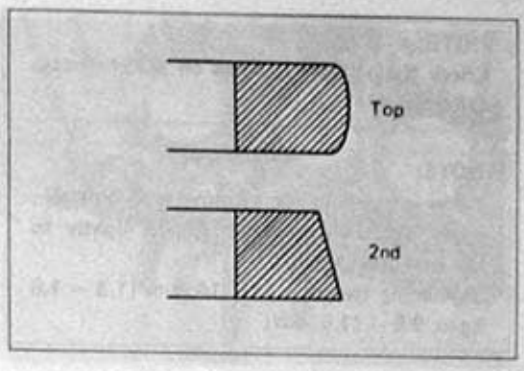
- Install the starter motor with two bolts.

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

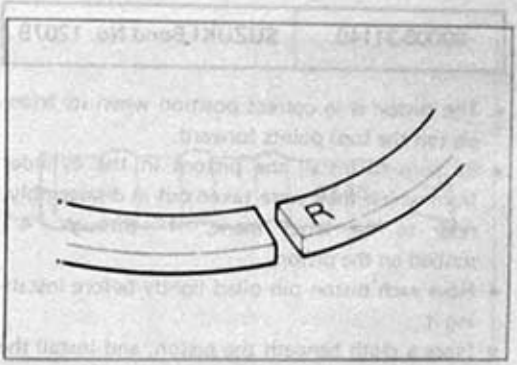
99000-32050	Thread lock "1342"



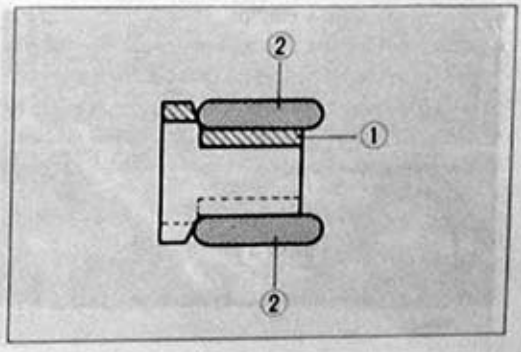
- Install the piston rings in the order of oil ring, 2nd ring and top ring.
- Top ring and 2nd (middle) ring differ in the shape of ring face, and the face of top ring is chrome-plated whereas that of 2nd ring is not.



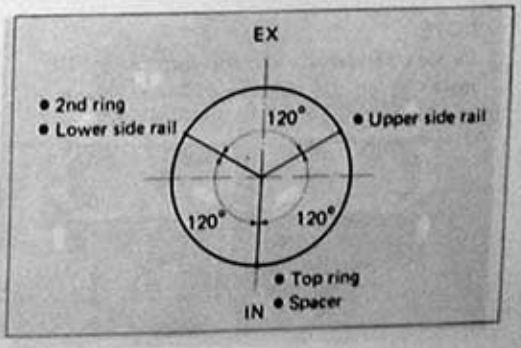
- The 2nd ring has the letter "R" (Top marked) on it. Be sure to bring the marked side to top when fitting it to the piston. But, top ring and oil ring do not have any designations, and may be fit in either way.



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



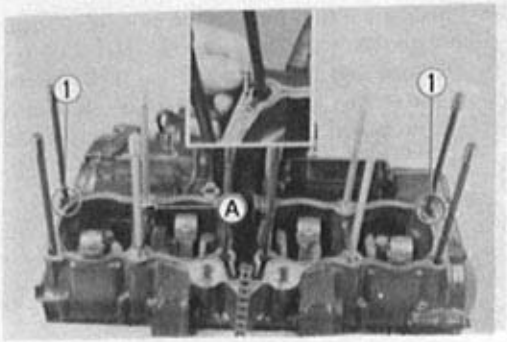
- Position the gaps of the three rings as shown. Before inserting each piston into the cylinder, check that the gaps are so located.



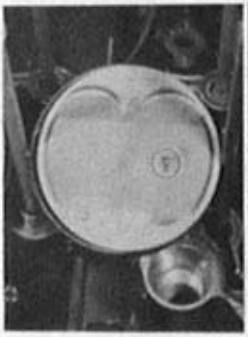
NOTE:
Check the oil jets ① fitted on the crankcase for clogging.

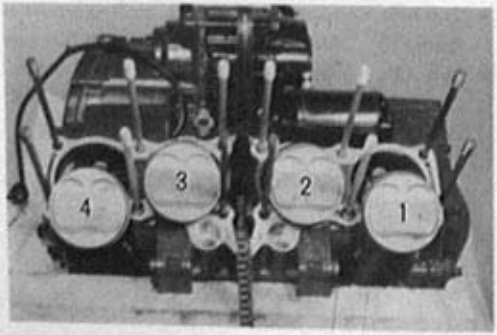
NOTE:
When reinstalling the cylinder stud bolt Ⓐ, apply SUZUKI Bond No. 1207B lightly to the stud bolt thread.
Tightening torque: 13 – 16 N·m (1.3 – 1.6 kg-m, 9.5 – 11.5 lb-ft)

99000-31140	SUZUKI Bond No. 1207B

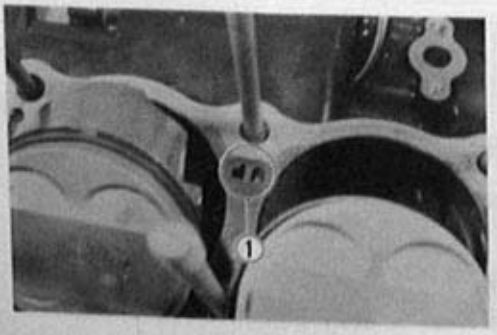


- The piston is in correct position when its triangle (on the top) points forward.
- Be sure to install the pistons in the cylinder from which they were taken out in disassembly, refer to the letter mark, "1" through "4", scribed on the piston.
- Have each piston pin oiled lightly before installing it.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

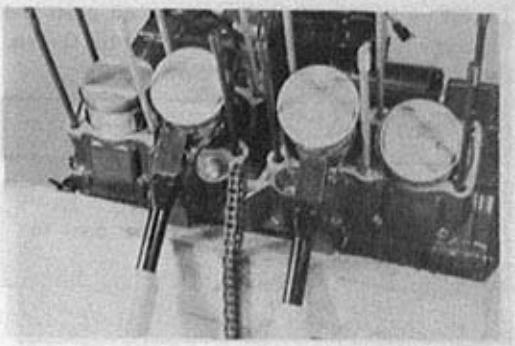




NOTE:
Be sure to identify the top surface by "UP" mark ① on the cylinder gasket as shown in the Fig.

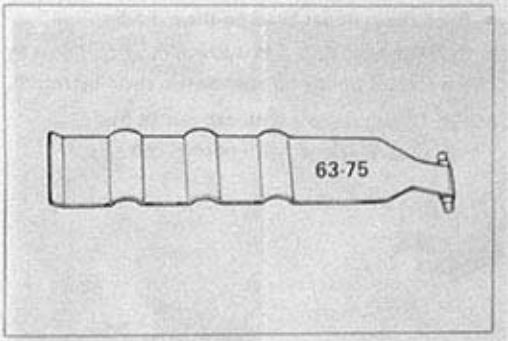


- Install piston ring holders in the indicated manner. Some light resistance must be overcome to lower the cylinder block.
- With No. 2 and No. 3 pistons in place, install No. 1 and No. 4 pistons, and insert them into the cylinder.



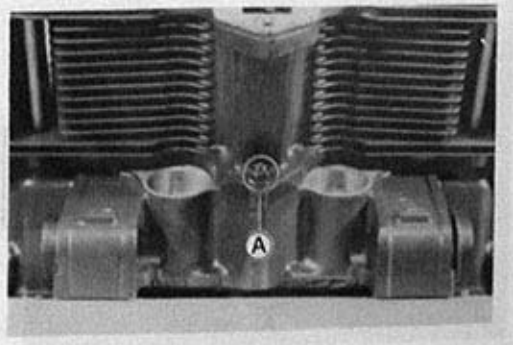
09916-74521	Holder body
09916-74540	Band (bore 63 – 75 mm)

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.**



- Tighten the cylinder nut (A) to the specified torque.

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

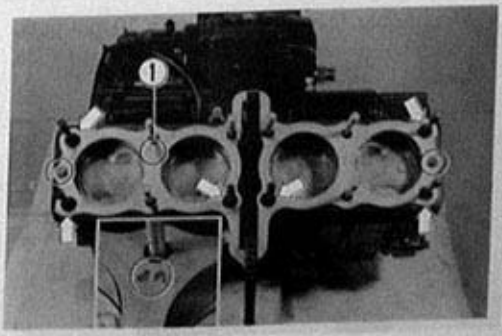


- Place the six O-rings and two dowel pins on the cylinder.

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

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

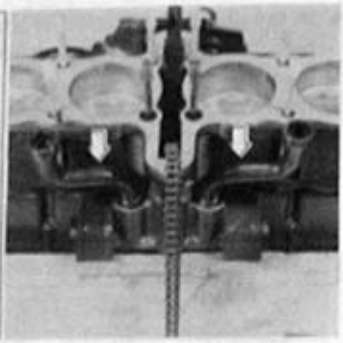
NOTE:
Be sure to identify the top surface by "UP" mark (1) on the cylinder head gasket as shown in the Fig.



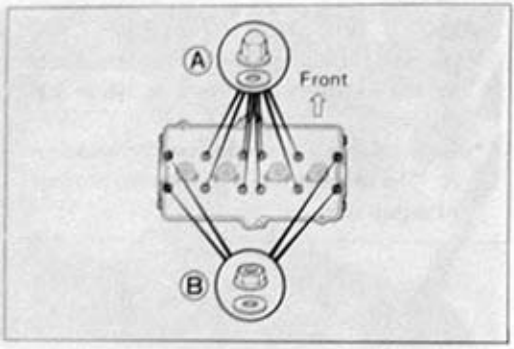
- Fit up the new O-rings onto the oil pipes and apply SUZUKI super grease "A" to the O-rings.
- Install the right and left oil pipes.

99000-25010	SUZUKI super grease "A"

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

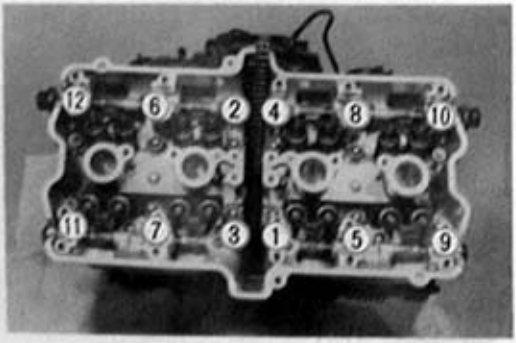


- Place the cylinder head on the cylinder.
- Cylinder head nuts and washers must be fitted in the correct positions, as shown in the illustration.
  - A Copper washer with cap nut (8 pcs)
  - B Copper washer with normal nut (4 pcs)



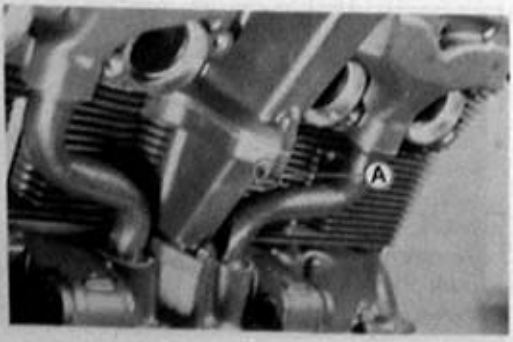
- Tighten the twelve 10-mm nuts to the specification with a torque wrench sequentially in the ascending order of numbers.

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

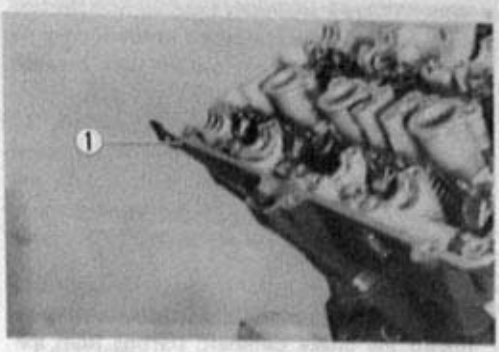


- After firmly tightening the twelve 10-mm nuts, install one 6-mm bolt A and tighten it to the specified torque.

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

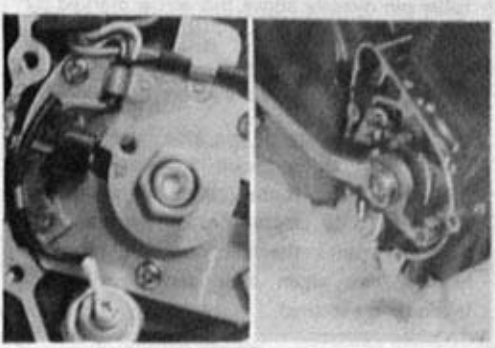


- Place the cam chain guide ① properly.



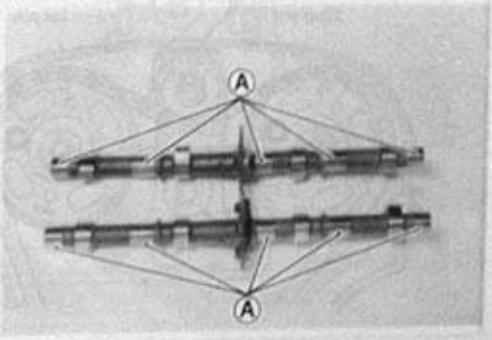
- While holding down the cam chain, rotate the crankshaft in normal direction to bring the "T" mark on the rotor to the center of left pick up coil.

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

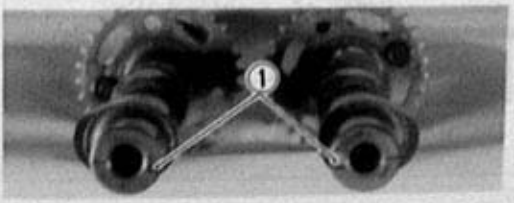


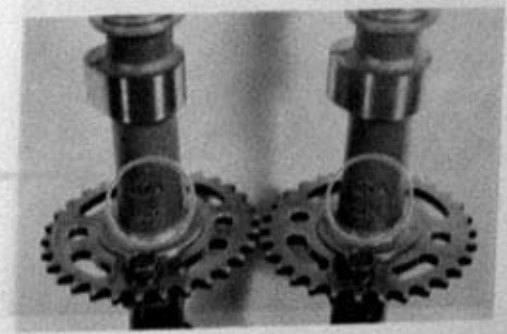
NOTE:
Just before placing the camshaft on the cylinder head, apply SUZUKI Moly paste to its journals, fully coating each journal Ⓐ with the paste taking care not to leave any dry spot. Apply engine oil to the camshaft journal holders.

99000-25140	SUZUKI Moly Paste



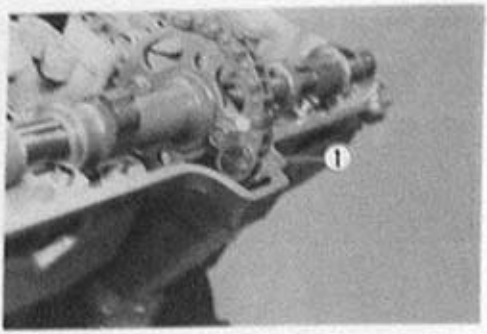
- The exhaust camshaft can be distinguished from that of the intake by the embossed letters "EX" (for exhaust) as against letters "IN" (for intake). Similarly, the right end can be distinguished by the notch ① at the right end.

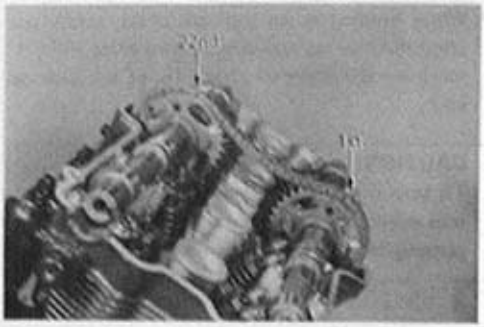


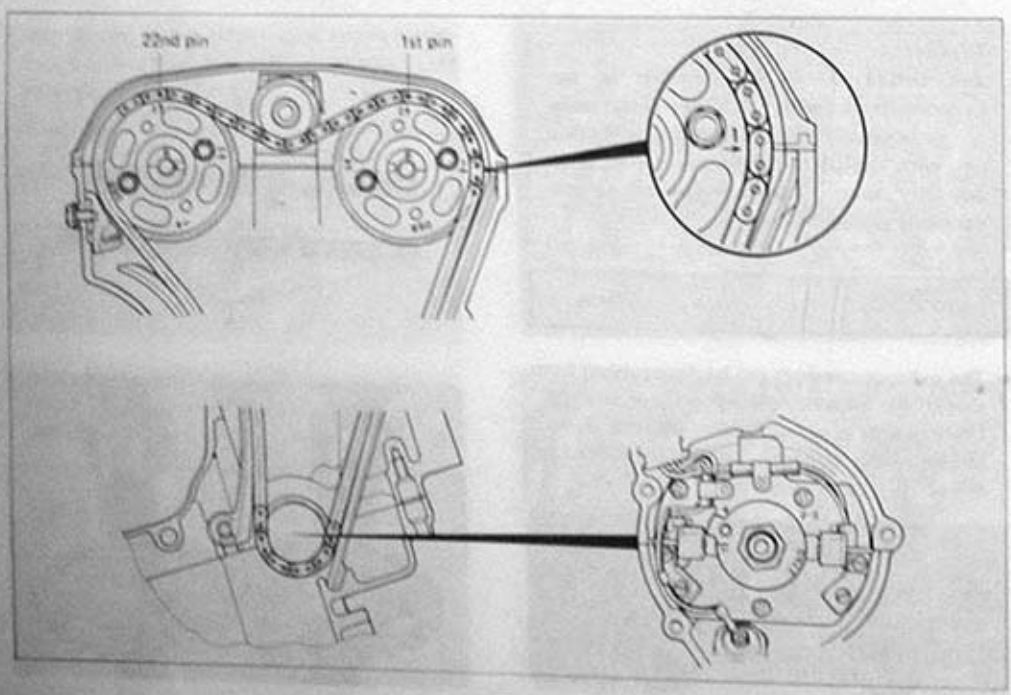


- With "T" mark accurately lined up with the timing mark, hold the crankshaft steady and lightly pull up the chain to remove the slack between the crank sprocket and exhaust sprocket.
- Exhaust sprocket bears an arrow marked "1" indicated as ①. Turn over the exhaust camshaft so that the arrow points flush with the gasketed surface of the cylinder head. Engage the cam chain with this sprocket.
- The other arrow marked "2" is now pointing straight upward. Count the chain roller pins toward the intake camshaft, starting from the roller pin directly above this arrow marked "2" and ending with the 22nd roller pin. Engage the cam chain with intake sprocket, locating the 22nd pin at the above the arrow marked "3" on the intake sprocket.

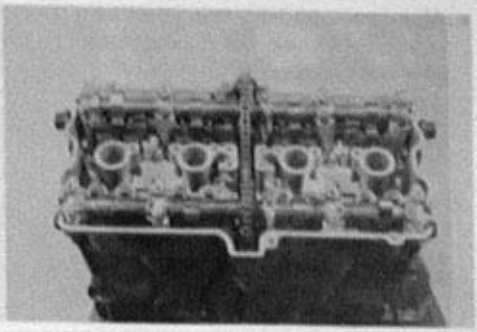
NOTE:
The cam chain is now riding on all three sprockets. Be careful not to disturb the crankshaft until the ten camshaft journal holders, cam chain idler and cam chain tensioner are secured.







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

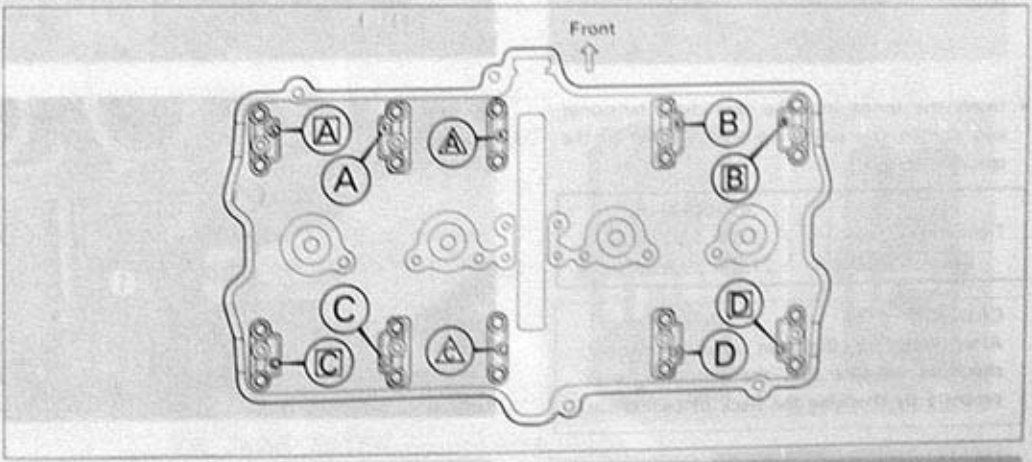


NOTE:
Damage to head or camshaft journal holder thrust surfaces may result if the camshaft journal holders are not drawn down evenly.

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

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

CAUTION:
The camshaft journal holder bolts are made of 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.

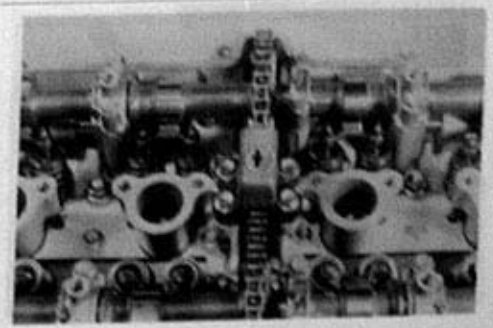


NOTE:
Be sure to face the arrow mark on the cam chain idler to the front.

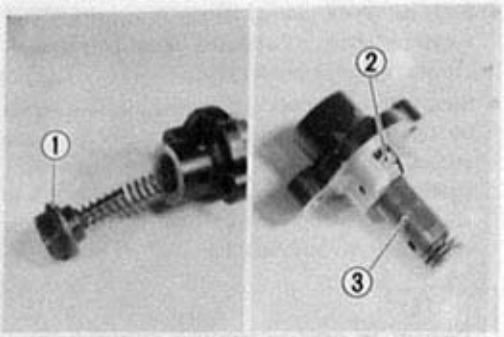
- Tighten the four bolts to the specified torque.

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

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

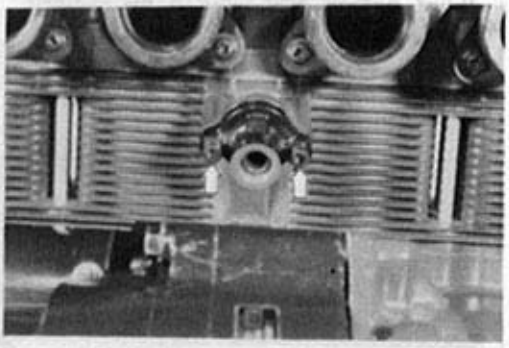


- After removing the spring holder bolt ① and spring, unlock the rachet mechanism ② and push in the push rod ③ all the way.



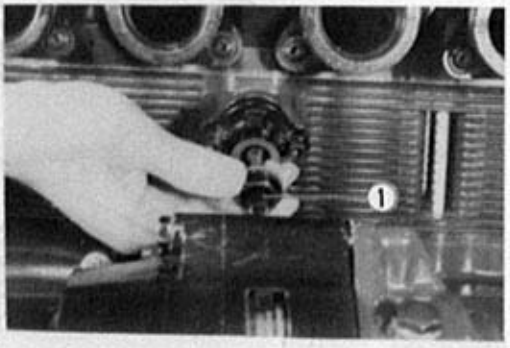
- Install a new gasket and the cam chain tensioner to the cylinder block with two bolts and tighten them to the specified torque.

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



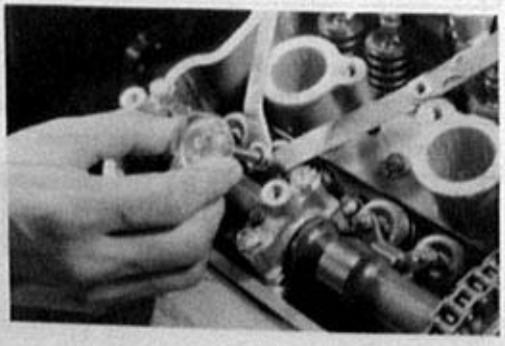
- Insert the spring into the cam chain tensioner and tighten the spring holder bolt ① to the specified torque.

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



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

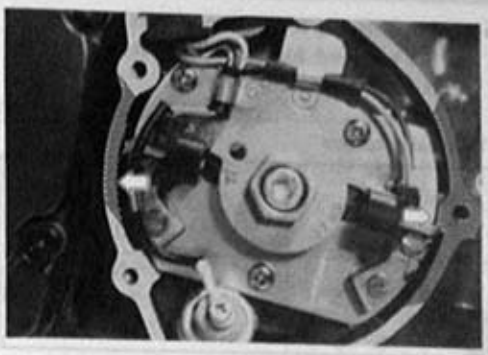
NOTE:
Turn the crankshaft and check that all the moving parts such as cam follower, camshaft, work properly.



CAUTION:
Be sure to check and adjust the valve clearance.
(Refer to page 2-6)

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

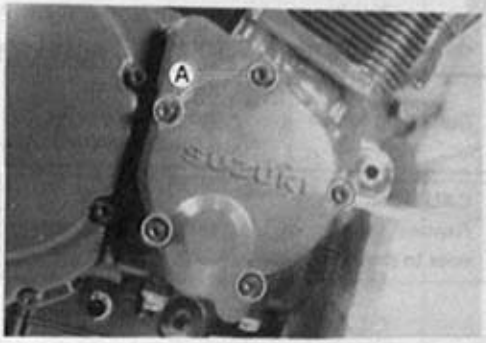
99000-31140	SUZUKI Bond No. 1207B



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

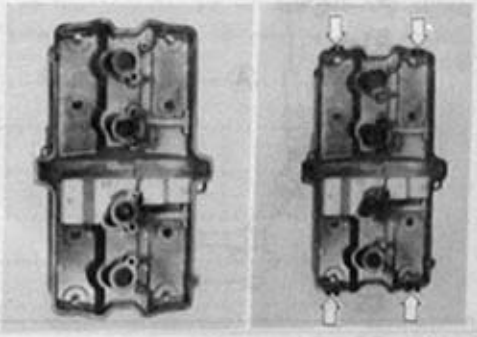
NOTE:
Fit up the gasket to the signal generator cover bolt Ⓐ correctly as shown in the Fig.

CAUTION:
Use a new gasket to prevent oil leakage.



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

99000-31140	SUZUKI Bond No. 1207B



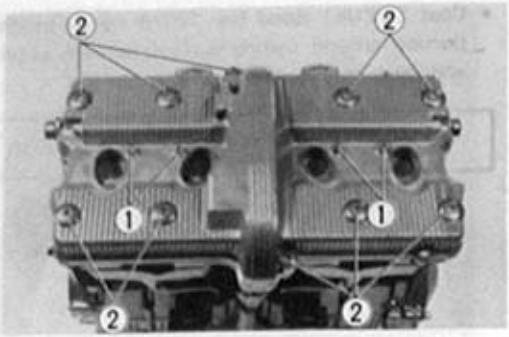
- Place the cylinder head cover on the cylinder head.
- Fit up the four gaskets to each head cover union bolt.
- Seat the eight gaskets to each exact position.

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

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

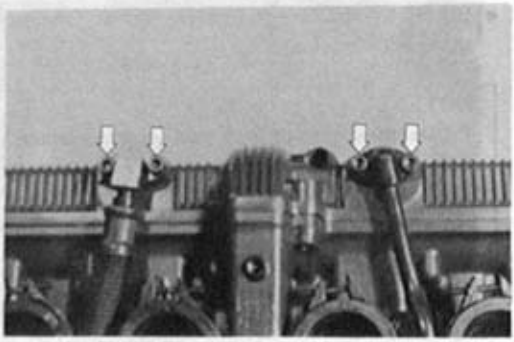
Tightening torque

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

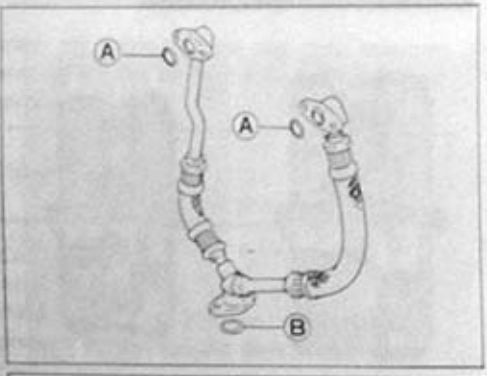


- Place the right and left oil hoses and tighten the bolts to the specified torque.

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



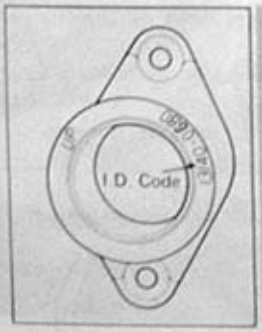
CAUTION:
Replace the O-rings (A and B) with new ones to prevent oil leakage.



NOTE:
When replacing the intake pipes, identify the four different intake pipes according to each I.D. code.

	Only for E-18
(13110-06B0 for No. 1)	(13110-06B1 for No. 1)
(13120-06B0 for No. 2)	(13120-06B1 for No. 2)
(13130-06B0 for No. 3)	(13130-06B1 for No. 3)
(13140-06B0 for No. 4)	(13140-06B1 for No. 4)

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



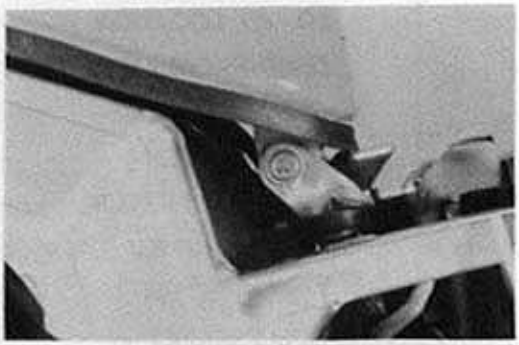
FUEL AND LUBRICATION SYSTEM

CONTENTS

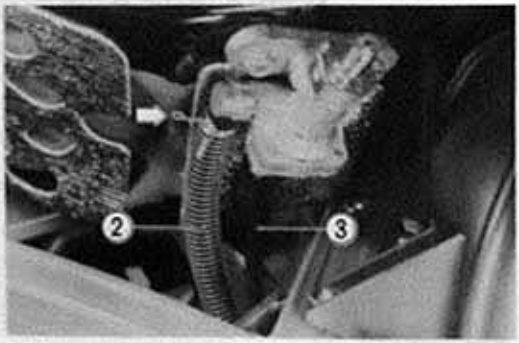
FUEL TANK AND FUEL COCK REMOVAL

- Turn the fuel cock to "ON" or "RES" position.
- Remove the screw ① and take out the fuel cock lever.

- Remove the seat and frame covers. (Refer to Page 3-3)
- Remove the two fuel tank mounting bolts.



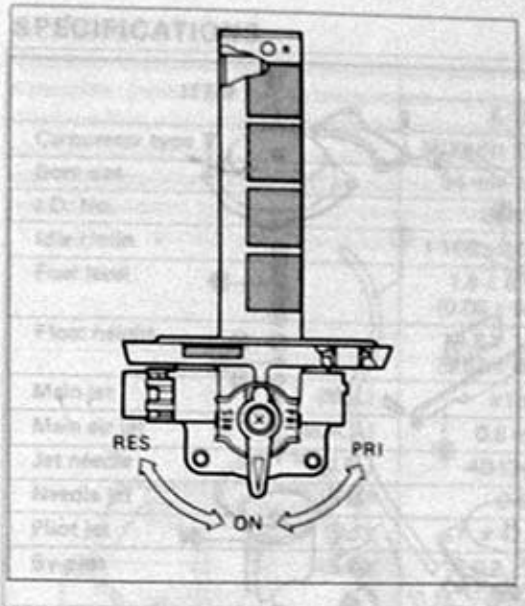
- Lift up the fuel tank by the rear side, and disconnect the fuel hose ② by sliding the clip and vacuum hose ③.

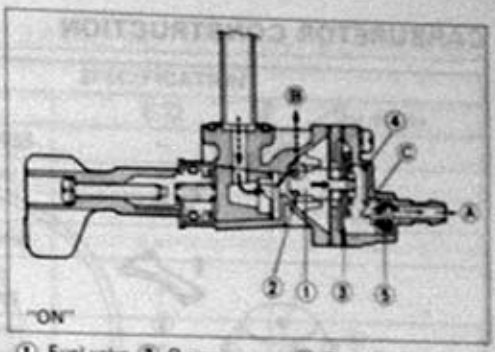


- Remove the fuel cock assembly by removing the two bolts.

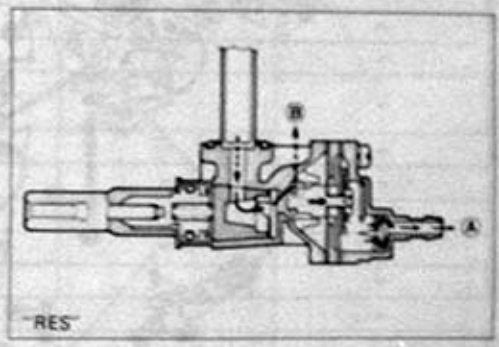
WARNING:
Gasoline is very explosive. Extreme care must be taken.
Gasket must be replaced with a new one to prevent fuel leakage.

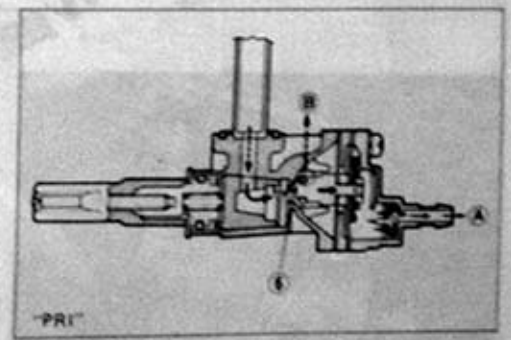
FUEL COCK





① Fuel valve ② O-ring ③ Diaphragm
④ Spring ⑤ One way valve ⑥ Protrusion
Ⓐ Vacuum Ⓑ Fuel flow Ⓒ Diaphragm chamber





When the engine is not running and the valve in the ON 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 engaged, a negative pressure is generated in the diaphragm chamber Ⓒ through the vacuum (negative pressure) pipe which is connected to the carburetors, 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.

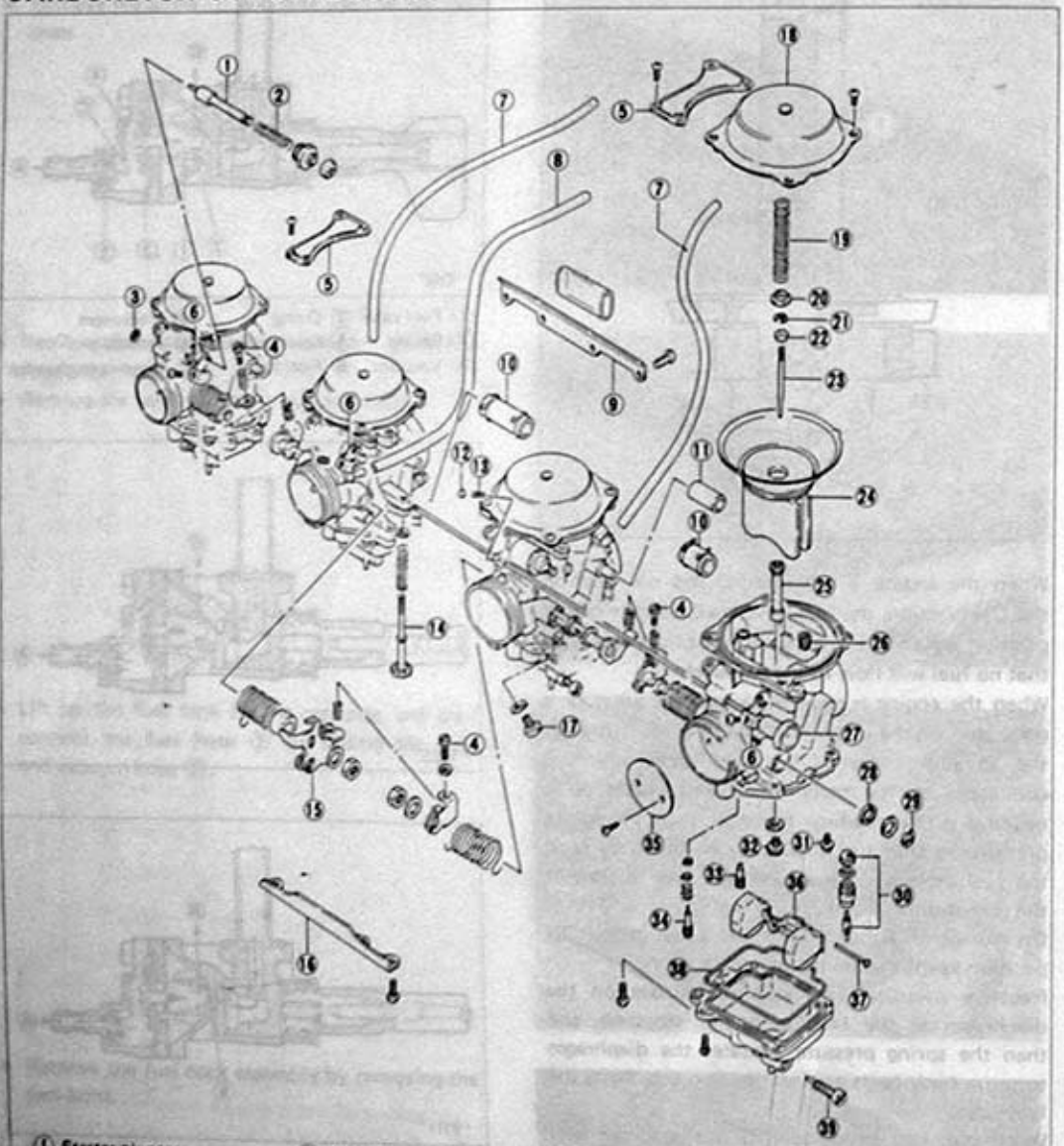
On the other hand, setting the valve in the ON position keeps the air return orifice open.

Negative pressure does not accumulate on the diaphragm at the time of engine stopping, and then the spring pressure actuates the diaphragm to move back to its original position and closes the fuel valve.

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.

CARBURETOR

CARBURETOR CONSTRUCTION



1. Starter plunger
2. Spring
3. E-ring
4. Balance screw
5. Connection plate
6. Starter holder
7. Air vent pipe
8. Fuel cock vacuum pipe
9. Carburetor set upper plate
10. Fuel hose connector
11. Air vent connector
12. Steel ball
13. Spring
14. Throttle stop screw
15. Throttle lever
16. Caburetor set lower plate
17. Vacuum inspection screw
18. Carburetor top cap
19. Spring
20. Spring seat
21. E-ring
22. Washer
23. Jet needle
24. Piston valve
25. Needle jet
26. Pilot air jet
27. Starter shaft
28. Oil seal
29. E-ring
30. Needle valve
31. Retainer screw
32. Main jet
33. Pilot jet
34. Pilot screw
35. Throttle valve
36. Float
37. Float arm pin
38. O-ring
39. Drain screw

SPECIFICATIONS

ITEM		SPECIFICATION		
		E-18	E-22	The others
Carburetor type		MIKUNI BST34SS	←	←
Bore size		34 mm (1.3 in)	←	←
I.D. No.		06B30	06B40	06B00
Idle r/min.		1 100 ± 100 r/min.	←	←
Fuel level		1.5 ± 0.5 mm (0.06 ± 0.02 in)	←	←
Float height		14.6 ± 1.0 mm (0.58 ± 0.04 in)	←	←
Main jet	(M.J.)	#130	#127.5	#130
Main air jet	(M.A.J.)	0.6 mm	←	←
Jet needle	(J.N.)	4D13-3rd	←	←
Needle jet	(N.J.)	O-9	←	←
Pilot jet	(P.J.)	#42.5	←	←
By-pass	(B.P.)	#1 0.8, #2 0.8, #3 0.8 mm	←	←
Pilot outlet	(P.O.)	0.7 mm	←	←
Valve seat	(V.S.)	2.0 mm	←	←
Starter jet	(G.S.)	#42.5	←	←
Pilot screw	(P.S.)	2.0 turns out	←	←
Throttle valve	(Th.V.)	#130	←	←
Pilot air jet	(P.A.J.)	#150	←	←
Throttle cable play		0.5 – 1.0 mm (0.02 – 0.04 in)	←	←

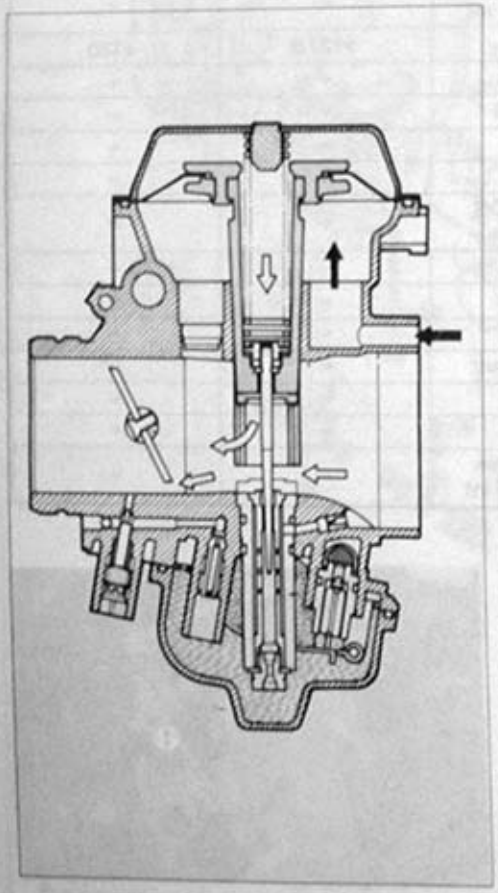
I.D. NO. LOCATION

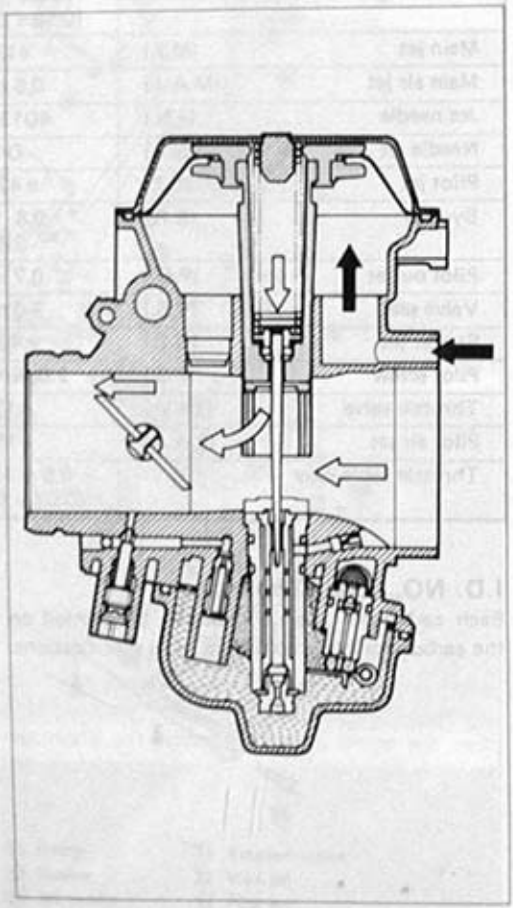
Each carburetor has I.D. Number ① printed on the carburetor body according to its specifications.

DIAPHRAGM AND PISTON OPERATION

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

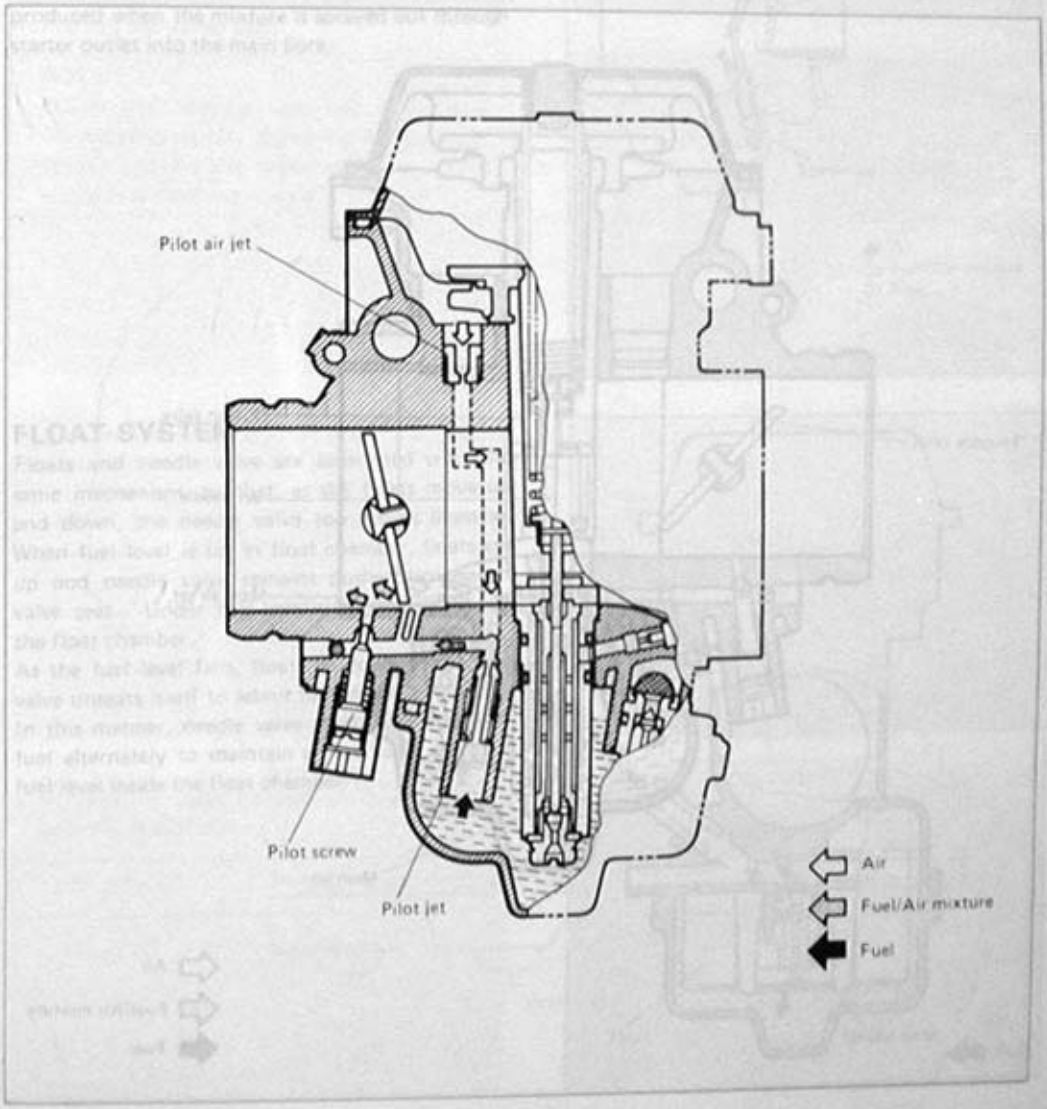
Rising vacuum overcomes the spring force, causing the piston to rise to increase the said area and thus prevent the air velocity from increasing. Thus, air velocity in the venturi passage is kept relatively constant for improved fuel atomization and for securing and optimum ratio of fuel to air in the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





SLOW SYSTEM

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



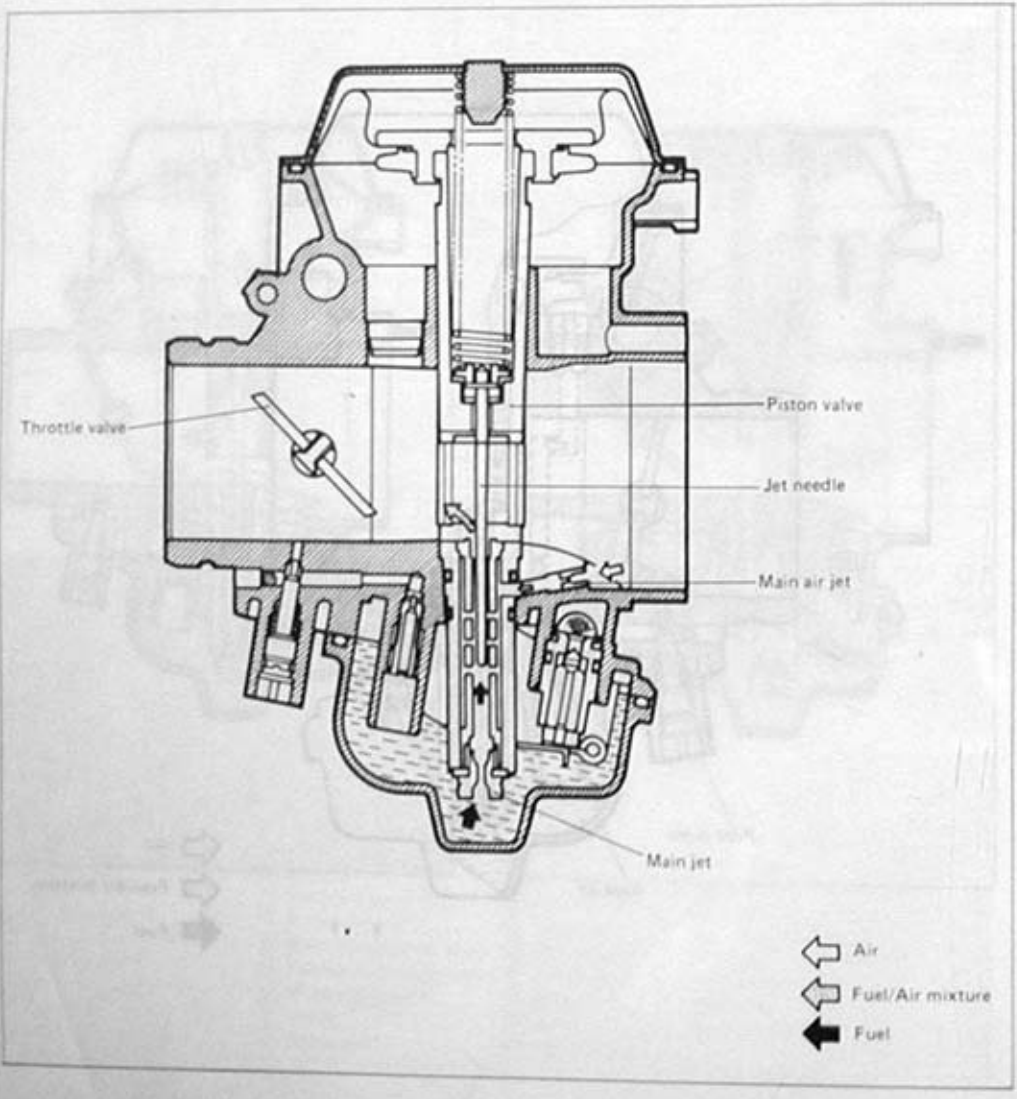
MAIN SYSTEM

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

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

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

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

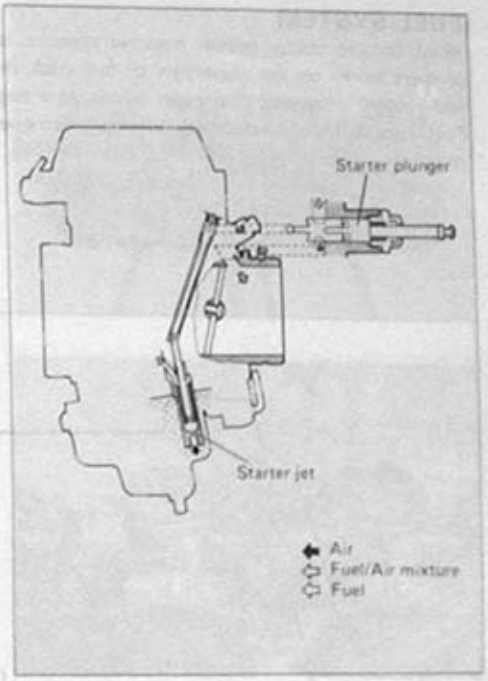


STARTER SYSTEM

Pulling up the starter knob draws fuel into the starter circuit from the float chamber.

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

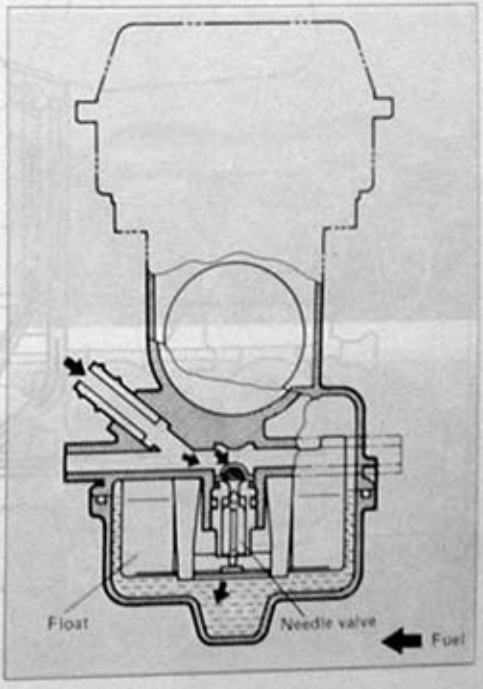
The two successive mixings of fuel with air are such that proper fuel/air mixture for starting is produced when the mixture is sprayed out through starter outlet into the main bore.



FLOAT SYSTEM

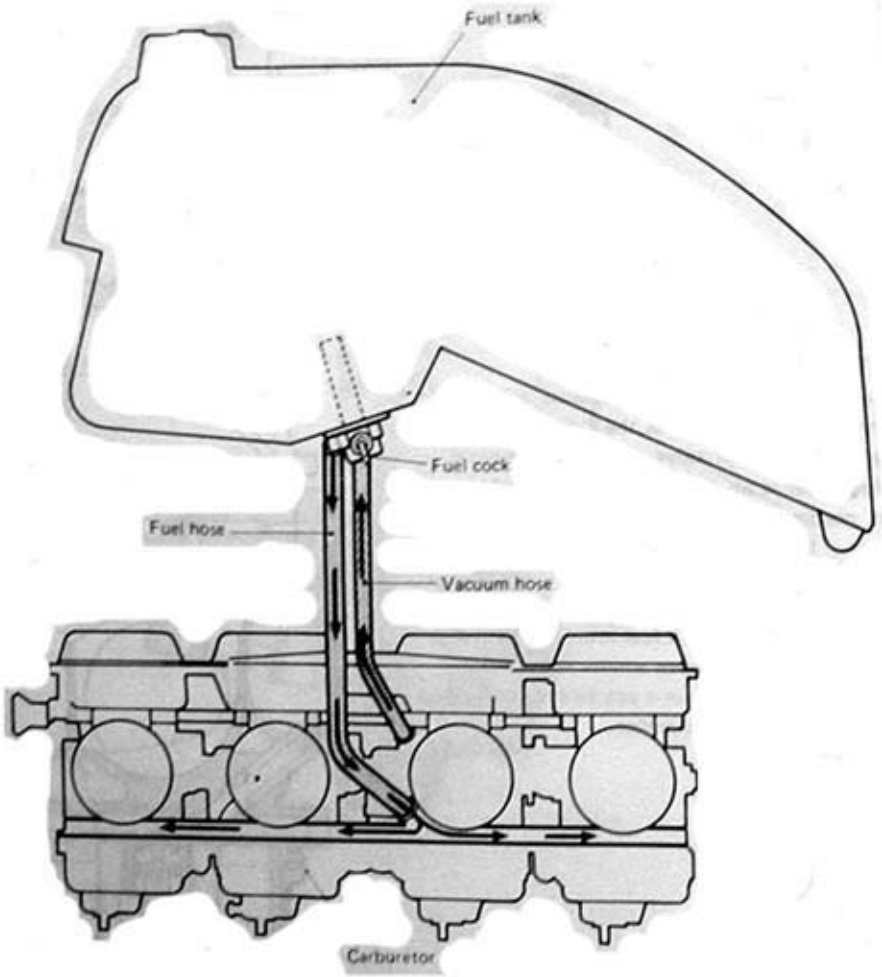
Floats and needle valve are associated with the same mechanism, so that, as the floats move up and down, the needle valve too moves likewise. When fuel level is up in float chamber, floats are up and needle valve remains pushed up against valve seat. Under this condition, no fuel enters the float chamber.

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



FUEL SYSTEM

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

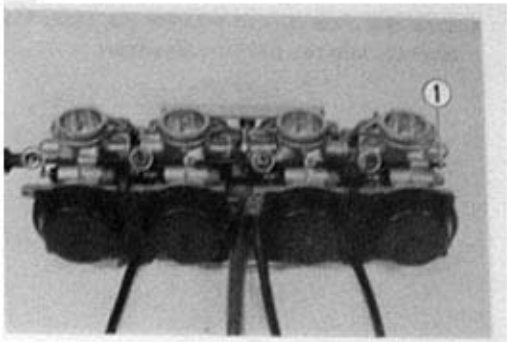


DISASSEMBLY

- Remove the E-ring ① and loosen four screws which are holding the starter shaft.

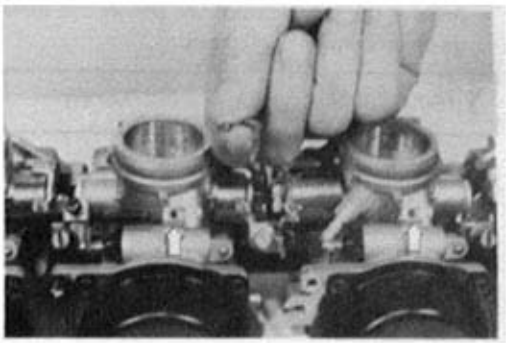
CAUTION:
These four screws are locked with thread lock. Once removing screws, they will be damaged.

09900-09003	Impact driver set



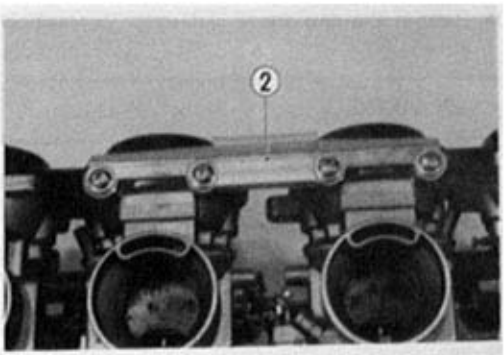
- Pull out the starter shaft.

NOTE:
Starter shaft stopper steel balls and springs are installed on No. 2 and No. 3 carburetor. When removing the starter shaft, be careful not to lose these samll parts.



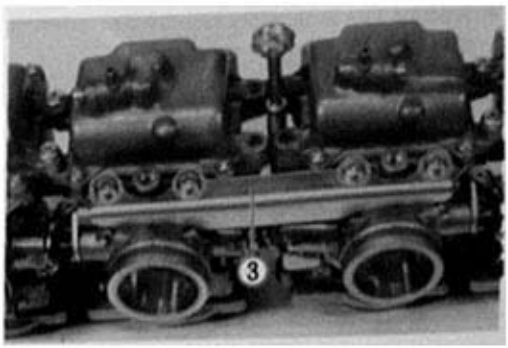
- Remove the carburetor set upper plate ② by unscrewing four screws.

09900-09003	Impact driver set

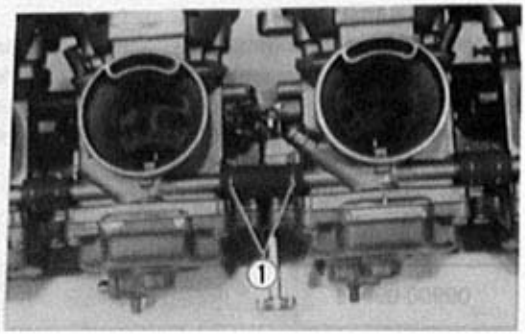


- Remove the carburetor set lower plate ③ by unscrewing four screws.

09900-09003	Impact driver set

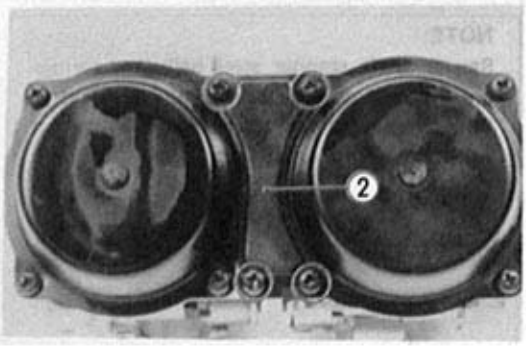


- Slide the clips ① and separate the carburetor assembly into two pairs of carburetors.



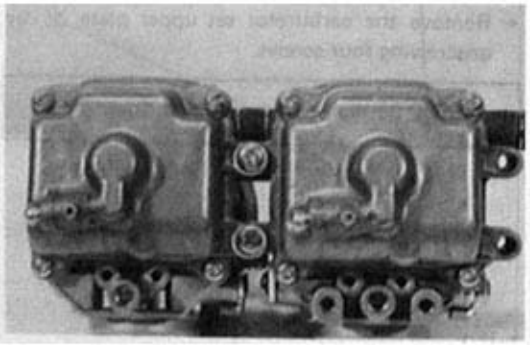
- Remove the upper carburetor connection plate ② by unscrewing four screws.

09900-09003	Impact driver set

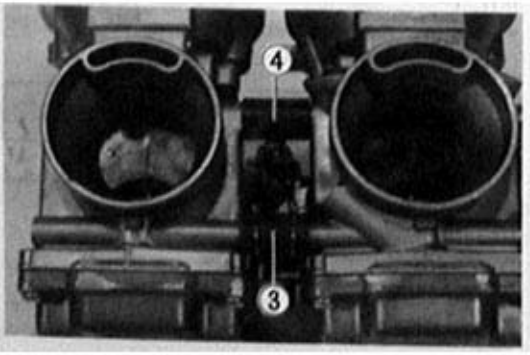


- Remove the two lower carburetor connection screws.

09900-09003	Impact driver set

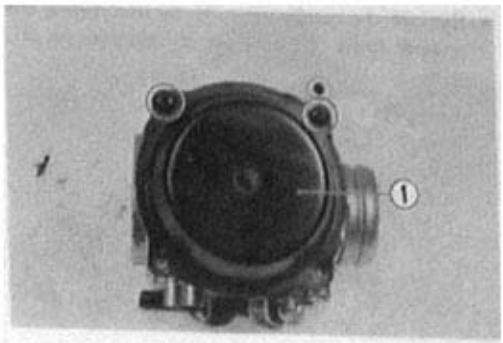


- Separate two carburetors each by disconnecting the fuel hose ③ and air vent pipe ④.

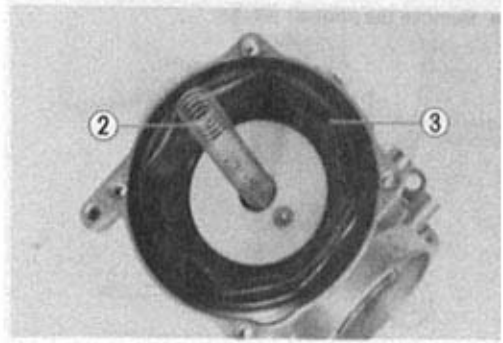


- Remove the carburetor top cap ① by unscrewing screws.

09900-09003	Impact driver set

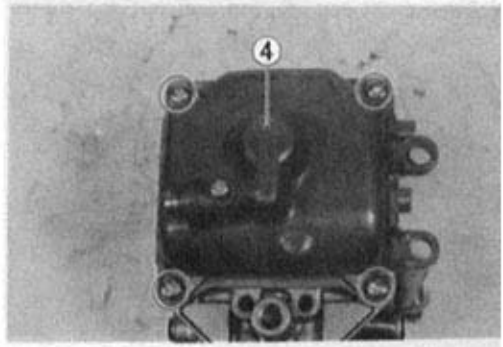


- Remove the piston valve return spring ② and piston valve ③.



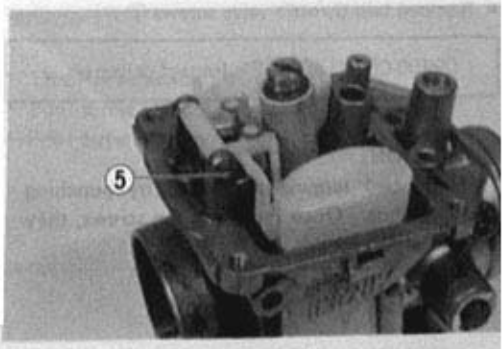
- Remove the float chamber body ④ by unscrewing four screws.

09900-09003	Impact driver set

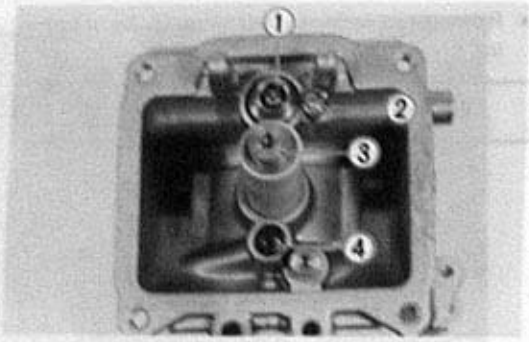


- Pull out the float arm pin ⑤ and remove the float.

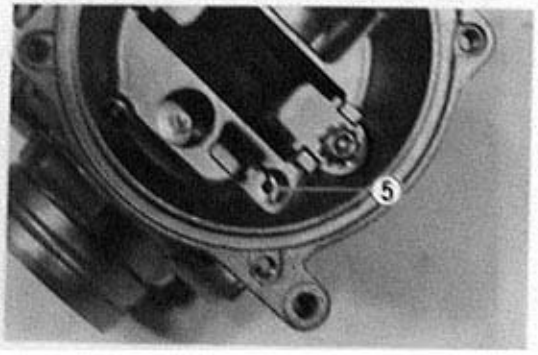
CAUTION:
When removing the float arm pin, be careful not to damage the carburetor body.



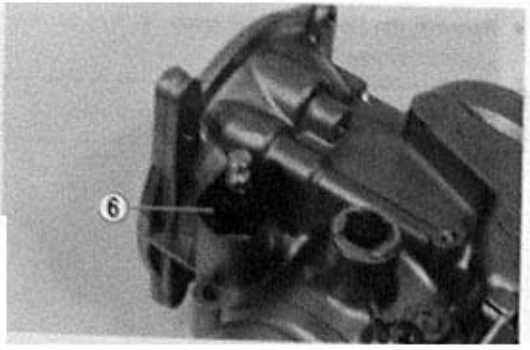
- Remove the needle valve ① by unscrewing the retainer screw ②, main jet ③ and pilot jet ④.



- Remove the pilot air jet ⑤.



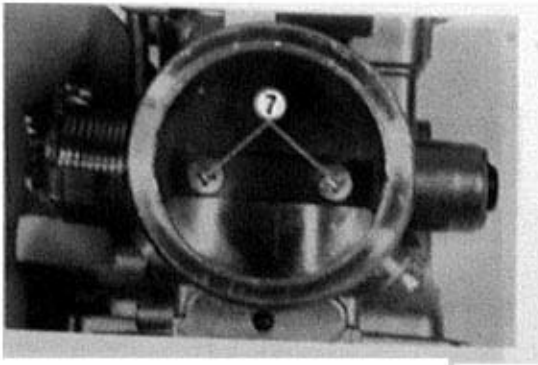
- Remove the nut ⑥ and pull out the starter plunger.



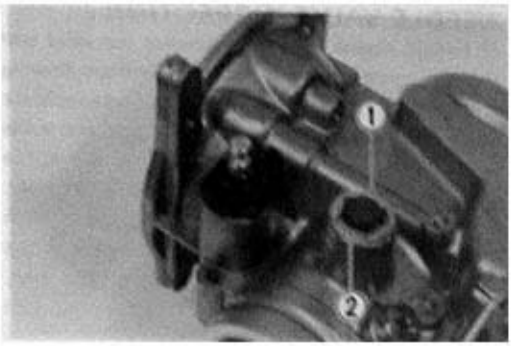
- Remove two throttle valve screws ⑦.

09900-09003	Impact driver set

CAUTION:
These two screws are locked by punching these ends. Once removing the screws, they will be damaged.

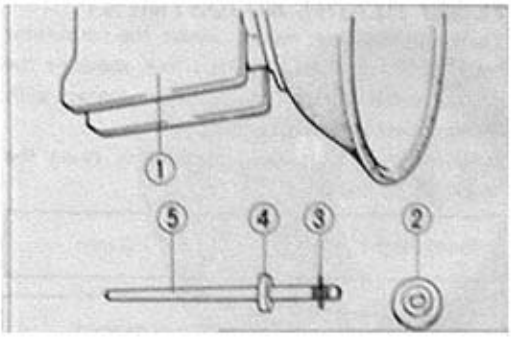


- After removing E-ring ① and washer ② pull out the throttle valve by turning the throttle valve shaft.



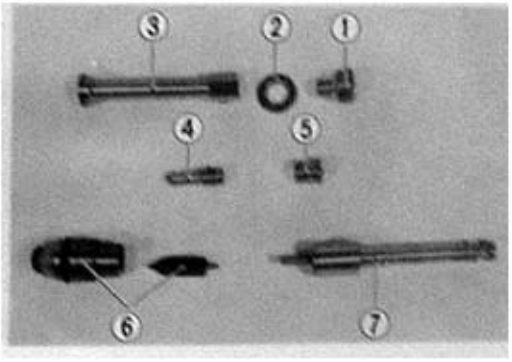
- Remove the jet needle from the piston valve.

① Piston valve
② Spring seat
③ E-ring
④ Washer
⑤ Jet needle



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.

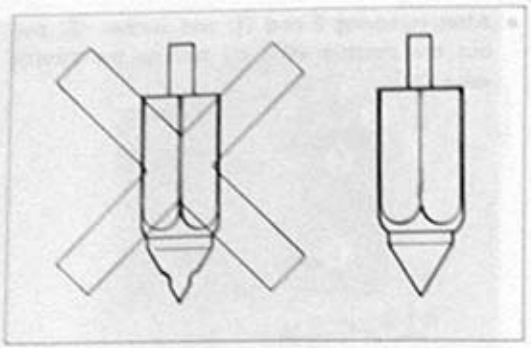
① Main jet
② Washer
③ Needle jet
④ Pilot jet
⑤ Pilot air jet
⑥ Needle valve
⑦ Starter plunger



- Check following items for any damage or clogging.
  - Pilot jet
  - Main jet
  - Pilot air jet
  - Main air jet
  - Needle jet air bleeding holes
  - Float
  - Needle valve mesh and O-ring
  - Diaphragm
  - Gasket and O-ring
  - Throttle valve shaft oil seals
  - Pilot screw bleeding holes
  - Pilot outlet and bypass holes

NEEDLE VALVE INSPECTION

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



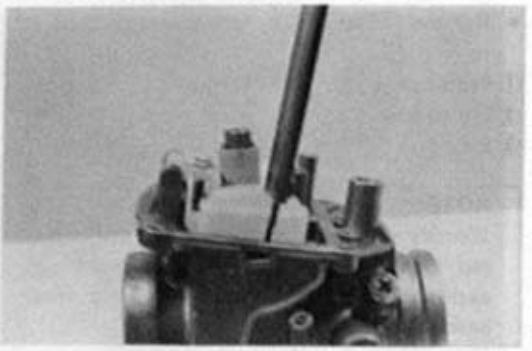
FLOAT HEIGHT ADJUSTMENT

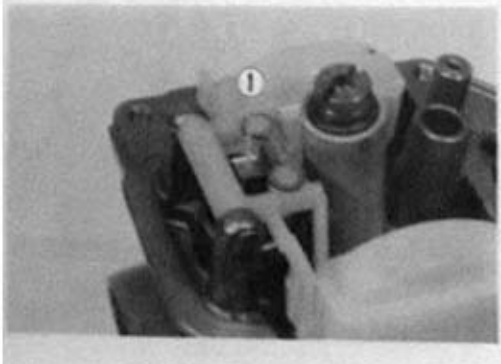
To check the float height, invert the carburetor body, with the float arm kept free, measure the height (A) while float arm is just in contact with needle valve by using calipers.

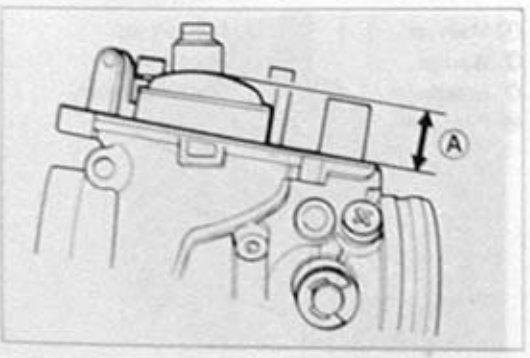
Bend the tongue (1) as necessary to bring the height (A) to this value.

Float height (A)	14.6 ± 1.0 mm

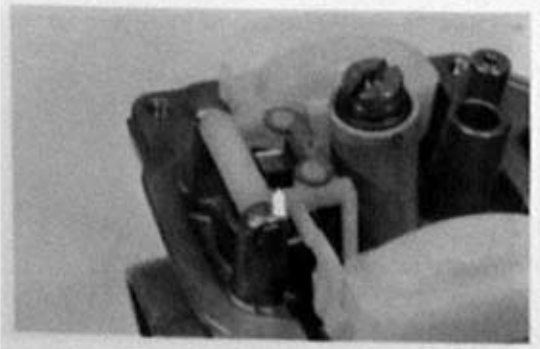
09900-20102	Vernier calipers





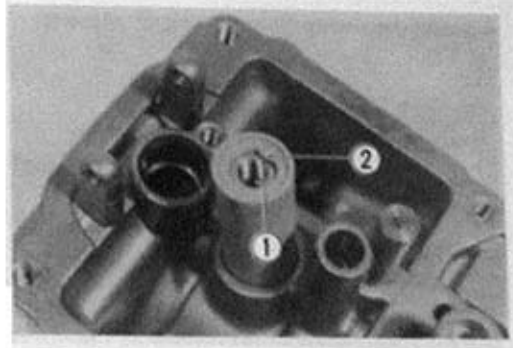


NOTE:
Be sure not to compress the spring in the needle valve.

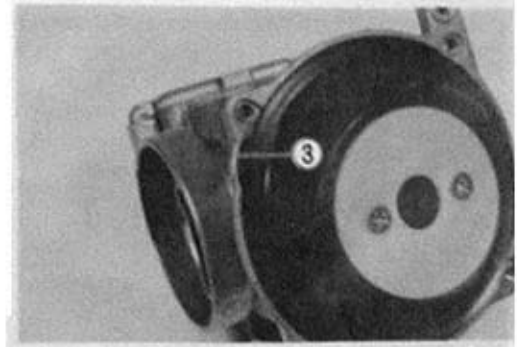


REASSEMBLY

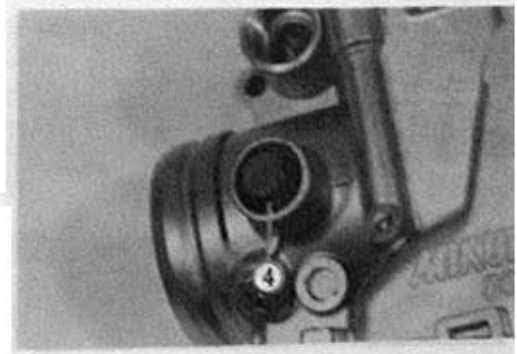
- Align the groove ① of the needle jet with the protrusion ②.



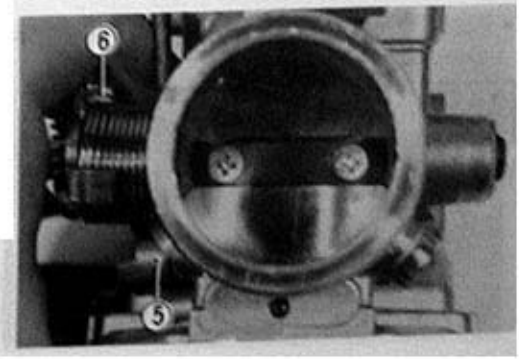
- Place the tongue ③ of diaphragm to carburetor body properly.



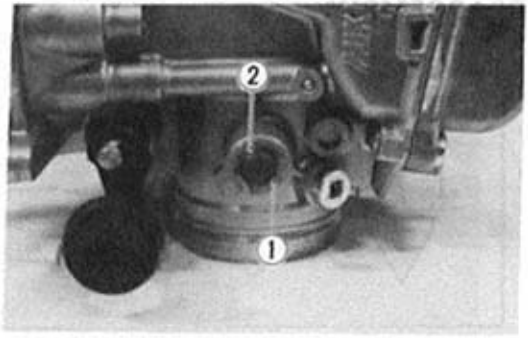
- When fitting the throttle valve shaft oil seals, groove should be faced outside ④. Apply grease to the lip of oil seal.



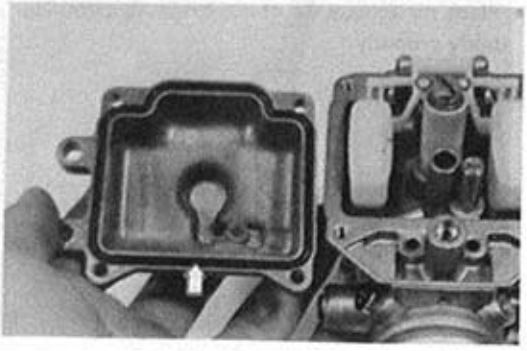
- Hitch one end of spring to the boss ⑤ and turn the other end ⑥ clockwise by one turn and hitch it to the throttle valve shaft lever properly.



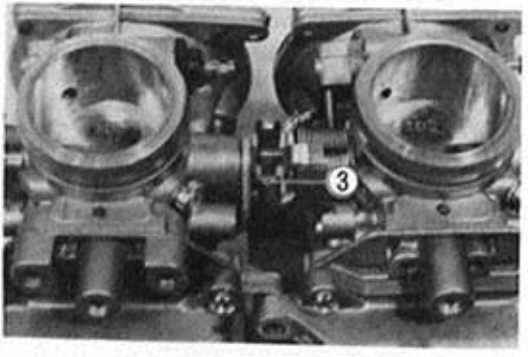
- Install the washer ① and E-ring ② properly.



- When installing the float chamber body, correctly position the O-ring.

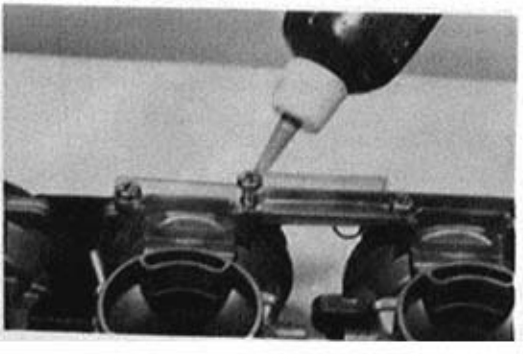


- When engaging two carburetors or two pairs of carburetors, position the throttle valve control lever ③ correctly.

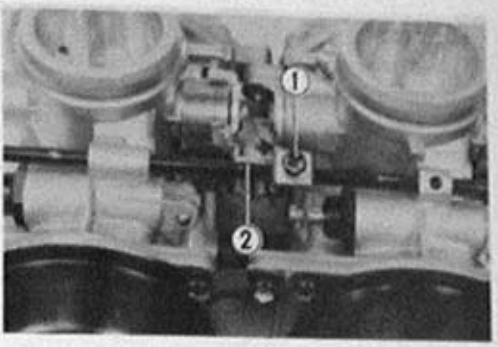


- Apply thread lock cement to the upper and lower plates' screws.

99000-32040	Thread lock cement

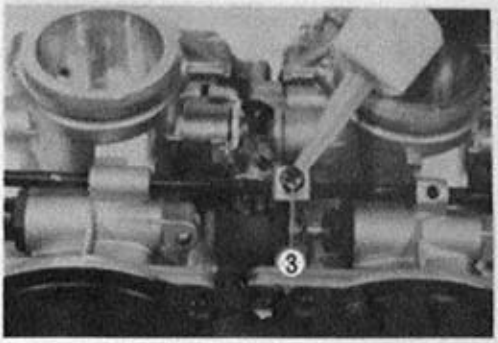


- When mounting the starter shaft, align the starter shaft holder screw ① with dent mark ② on starter shaft and grease sliding portions.

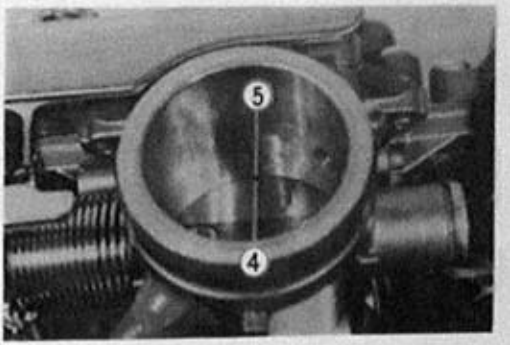


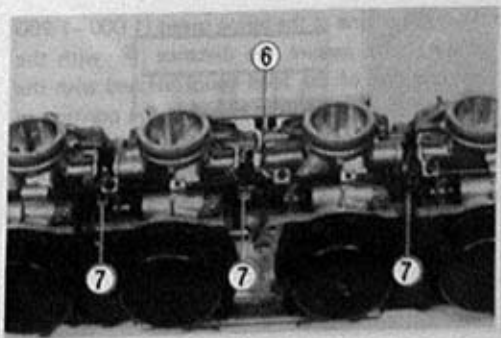
- Apply thread lock cement to the starter shaft securing screws ③.

99000-32040	Thread lock cement

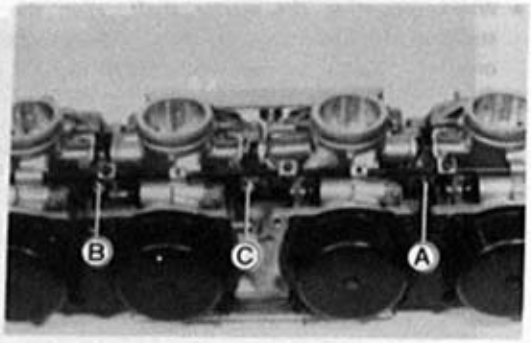


- Set each throttle valve in such a way that its top end ④ meets the foremost bypass ⑤. This is accomplished by turning the throttle stop screw ⑥ and balance screws ⑦.





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

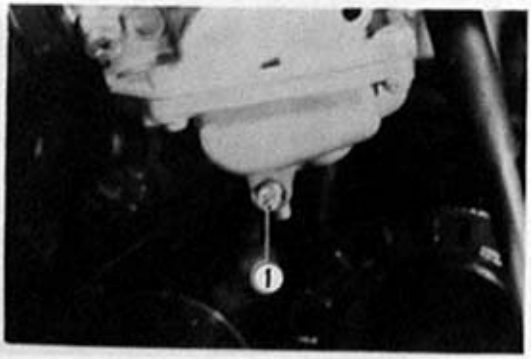


- After all work is completed, mount the carburetors on the engine and the following adjustments are necessary.
  - * Engine idle r/min ..... Page 2-10
  - * Throttle cable play ..... Page 2-10
  - * Balancing carburetors ..... Page 4-20

FUEL LEVEL INSPECTION

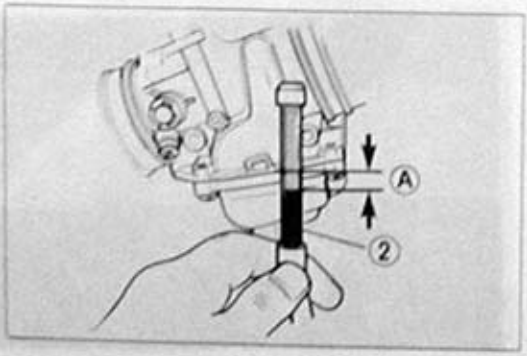
- Place the machine upright.
- Remove carburetor drain plug ① and install the fuel level gauge ②.

09913-14511	Fuel level gauge



- Run the engine at the idling speed (1 000–1 200 r/min), and mesure the distance Ⓐ with the middle line of the level gauge aligned with the mating surface of float blowl at the position in the middle of carburetor body as shown in figure. Ⓐ should be within the specified range.

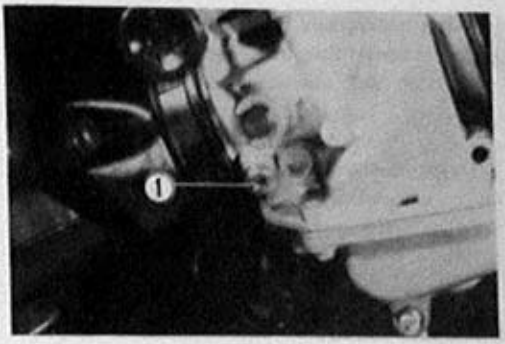
Distance Ⓐ	1.5 ± 0.5 mm



BALANCING CARBURETORS

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

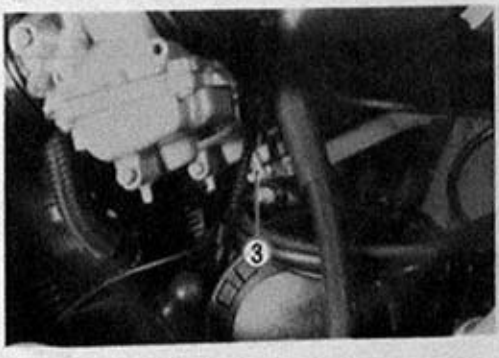
09913-13121	Carburetor balancer
09913-13140	Adaptor



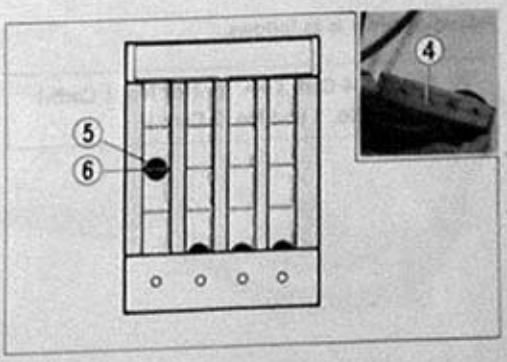
- Start up the engine and run it in idling condition for warming up.
- Stop the warmed-up engine. Remove the vacume inlet screw ① for No. 1 or No. 4 cylinder and install adaptor ② with O-ring.

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

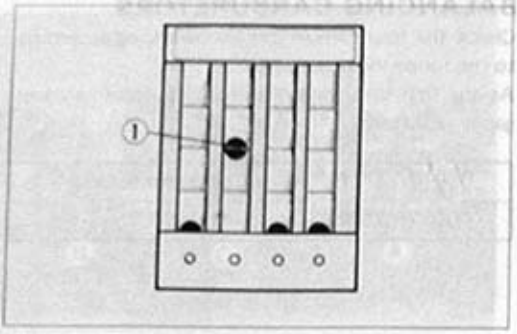
- Connect one of the four rubber hoses of the balancer gauge to this adaptor, and start up the engine, and keep it running at 1750 r/min by turning throttle stop screw ③.



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

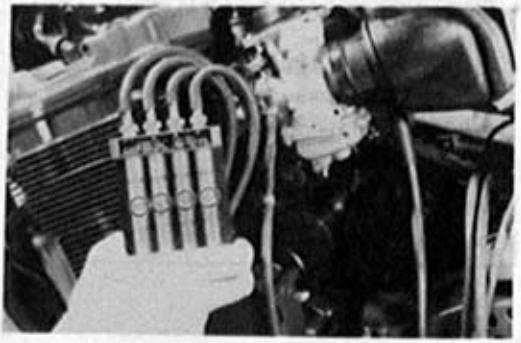


- After making sure that the steel ball stays steady at the center line, disconnect the hose from the adaptor and connect the next hose to the adaptor. Turn air screw to bring the other steel ball ① to the center line.
- Repeat the process on the third and forth tubes. The balancer gauge is now ready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



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

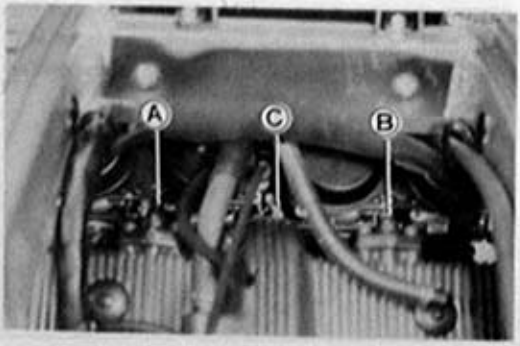
- Start up the engine, and keep it running at 1750 r/min.
- A correctly adjusted carburetor has the steel balls in the Nos. 1 through 4 tubes at the same level, as shown.
- If the steel balls are not in correct positions, loosen the lock nut and adjust the throttle valve adjusting screw correctly. After adjusting, tighten the lock nut securely.



09913-14911	Throttle valve adjust wrench

Adjusting order is as follows.

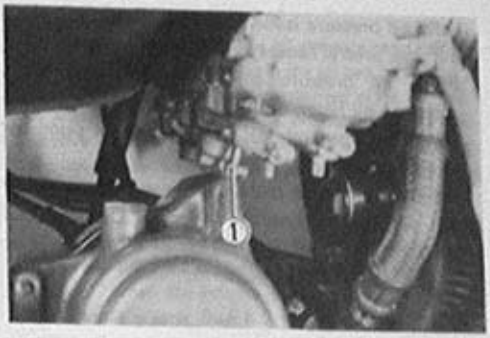
Ⓐ (for No. 4 Carb.) → Ⓑ (for No. 1 Carb.) → Ⓒ (for No. 1 and No. 2 Carb.)

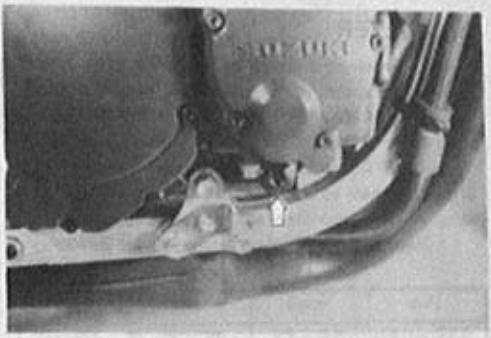


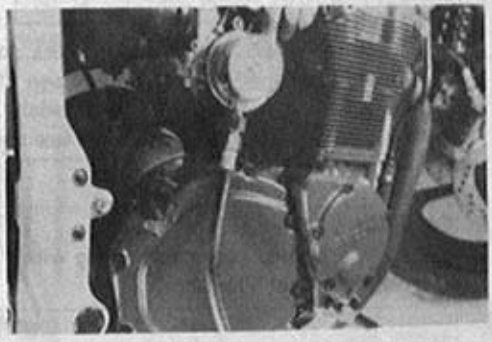
- After balancing the carburetors, set its speed between 1 000 and 1 200 r/min by turning the throttle stop screw ①.

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

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.**







LUBRICATION SYSTEM

OIL PRESSURE

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

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

Oil pressure specification

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

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

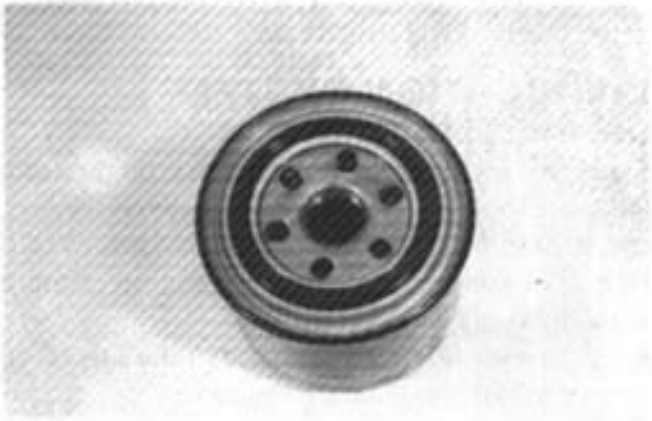
NOTE:
Engine oil must be warmed up to 60°C (140°F) when checking the oil pressure.

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

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

OIL FILTER

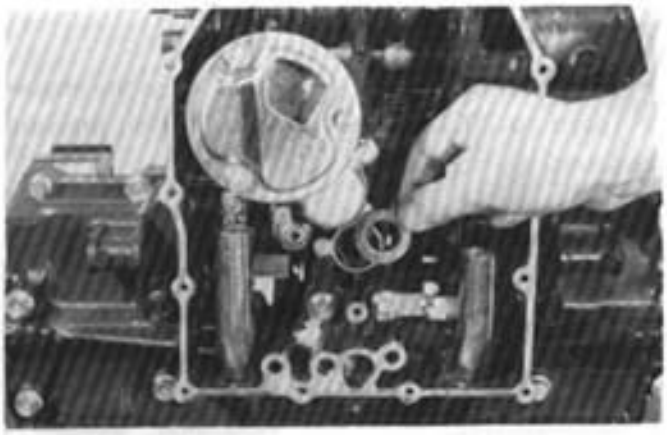
NOTE:
Coat the O-ring of oil filter with grease.



OIL SUMP FILTER

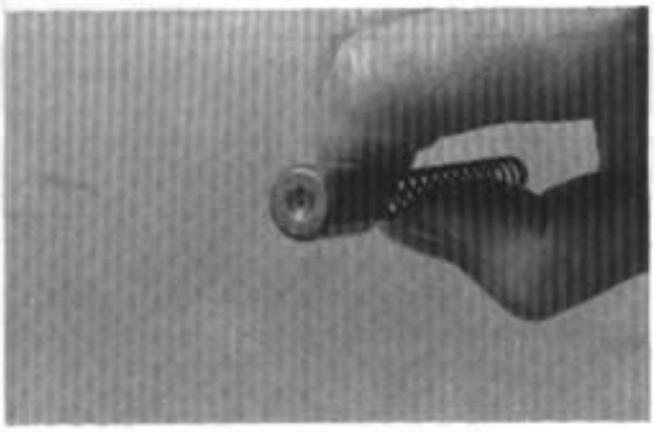
At the same time wash the oil pan. Check to be sure that the strainer is free from any sign of rupture and wash the strainer clean periodically. When installing oil sump filter, be sure to face the oil inlet to the rear.

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



RELIEF VALVE

Check the hole of the relief valve for clogging.



OIL COOLER

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

  Low Engine Oil Temperature

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

  High Engine Oil Temperature

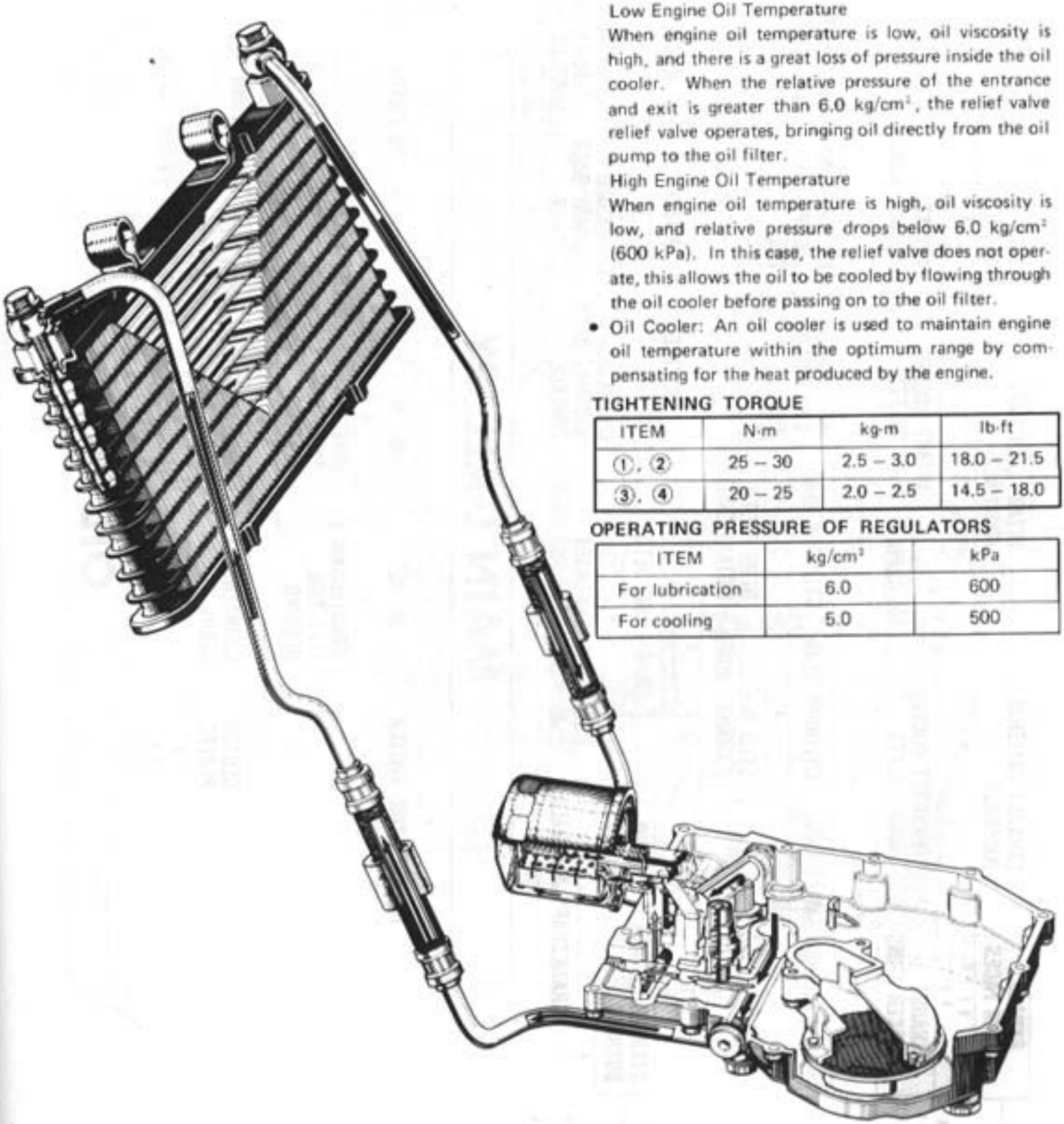
  When engine oil temperature is high, oil viscosity is low, and relative pressure drops below 6.0 kg/cm² (600 kPa). In this case, the relief valve does not operate, this allows the oil to be cooled by flowing through the oil cooler before passing on to the oil filter.
- Oil Cooler: An oil cooler is used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

TIGHTENING TORQUE

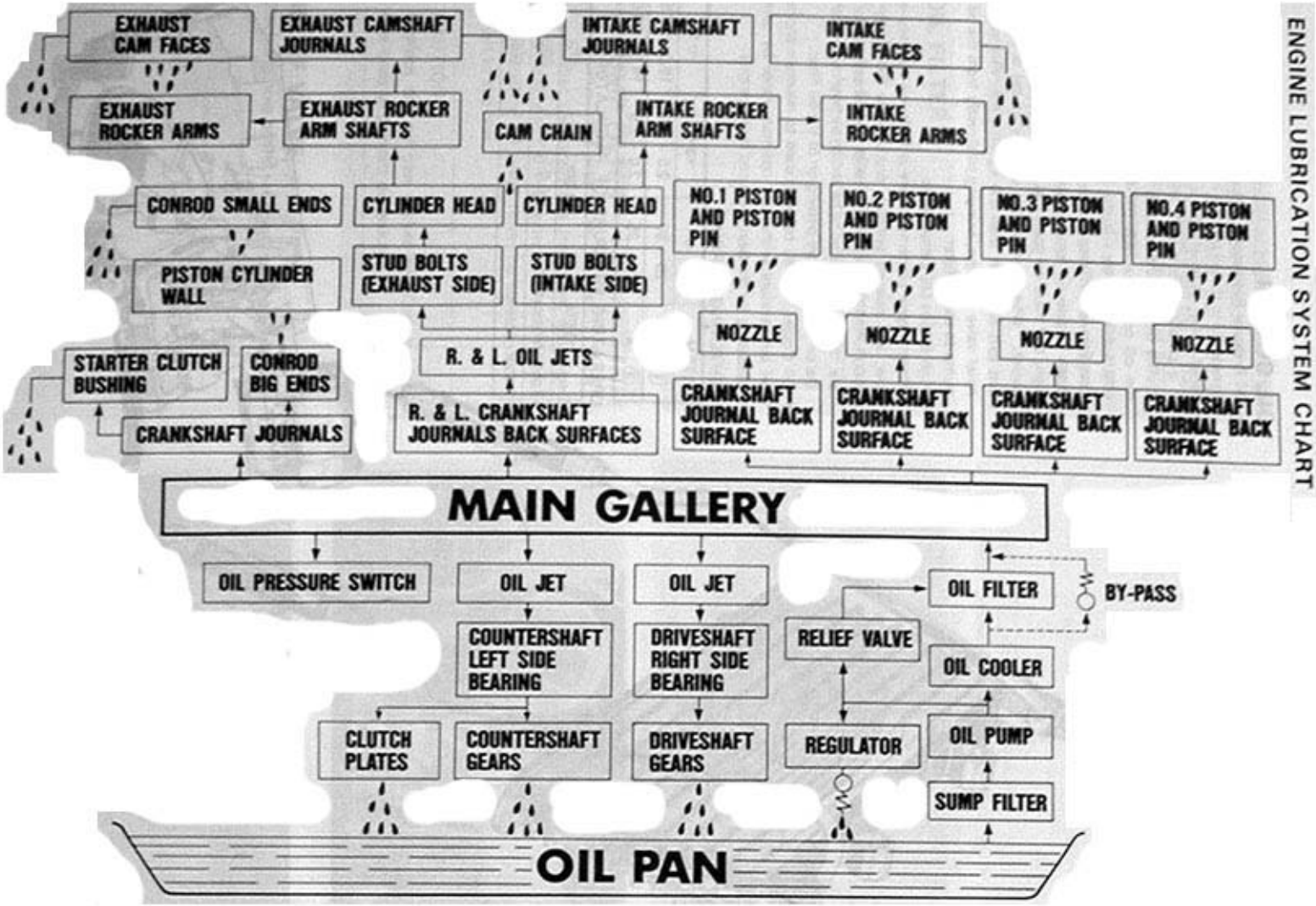
ITEM	N·m	kg·m	lb·ft
①, ②	25 – 30	2.5 – 3.0	18.0 – 21.5
③, ④	20 – 25	2.0 – 2.5	14.5 – 18.0

OPERATING PRESSURE OF REGULATORS

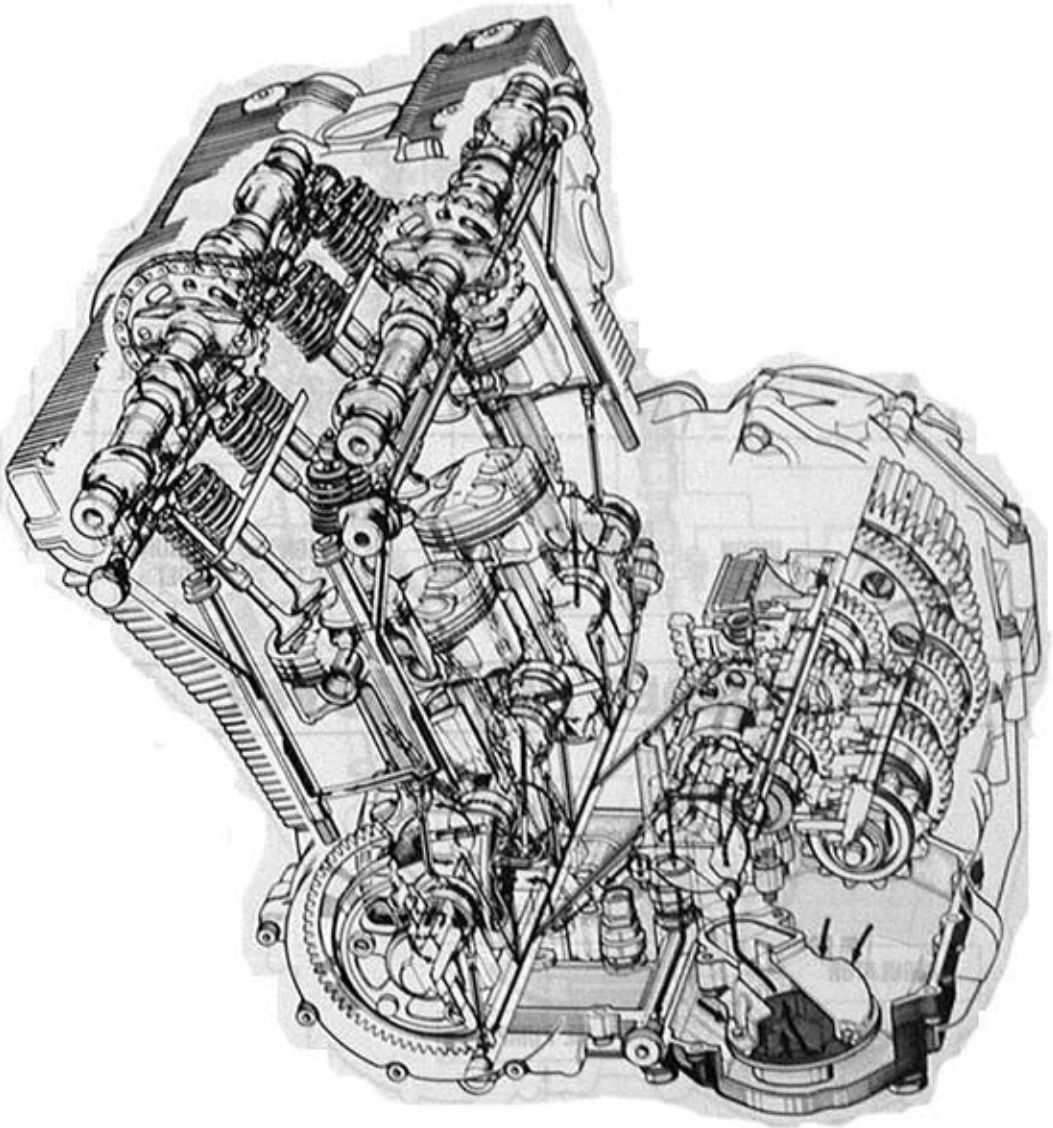
ITEM	kg/cm²	kPa
For lubrication	6.0	600
For cooling	5.0	500



ENGINE LUBRICATION SYSTEM CHART



ENGINE LUBRICATION SYSTEM



ELECTRICAL SYSTEM

CONTENTS

CHARGING SYSTEM

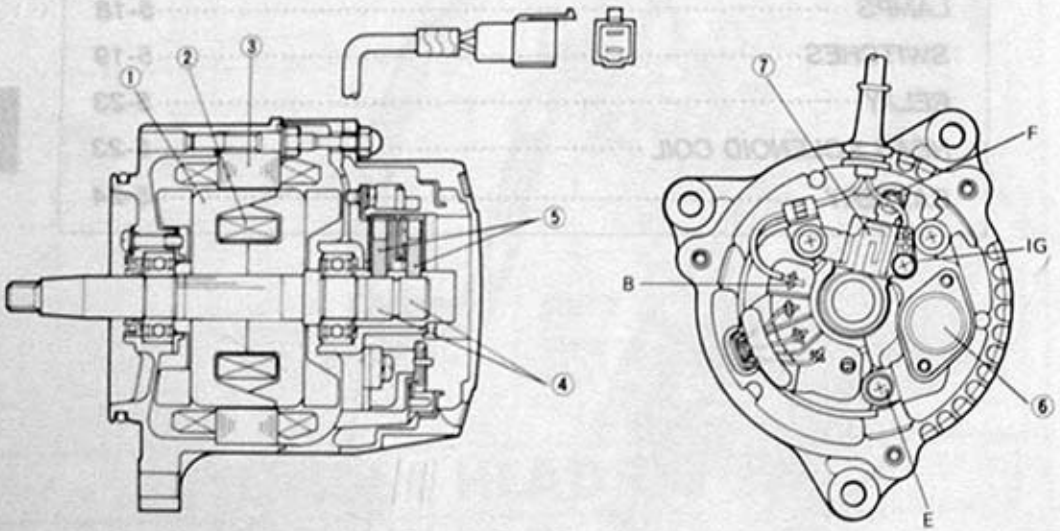
DESCRIPTION (GENERATOR WITH IC REGULATOR)

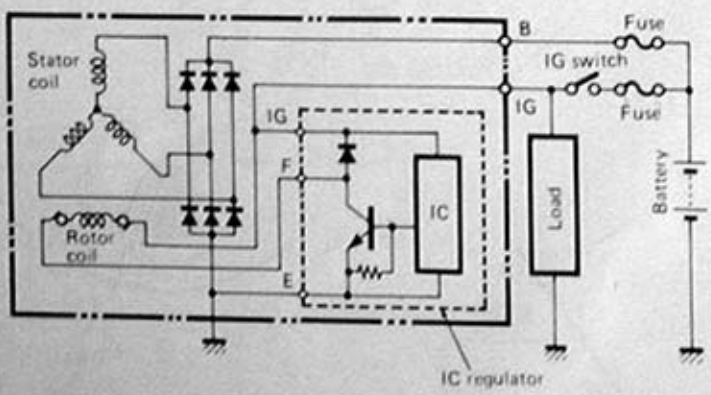
The generator features a solid state regulator that is mounted inside the generator. All regulator components are enclosed into a solid mold, and this unit is attached to the brush holder frame. The regulator voltage setting cannot be adjusted.

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

The stator windings are assembled on the inside of a laminated core that forms part of the generator housing.

A rectifier bridge connected to the stator windings contains six diodes, and electrically changes the stator A.C. voltages to a D.C. voltage which appears at the generator output terminal.



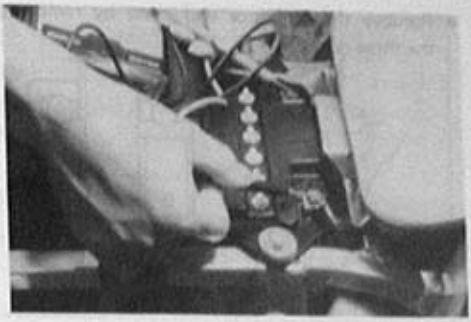


1. Rotor
2. Rotor coil
3. Stator coil
4. Slip ring
5. Brush
6. IC regulator
7. Brush holder

B: Battery terminal
IG: Ignition terminal
F: Rotor coil terminal
E: Ground

CHARGING OUTPUT CHECK

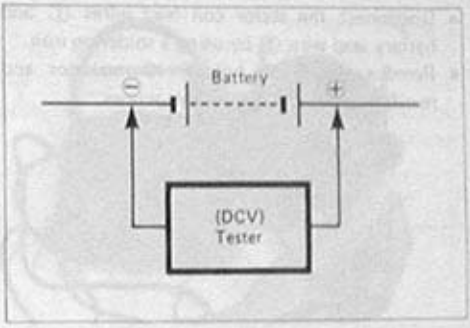
- Remove the seat.
- Start the engine and keep it running at 5 000 r/min.
- Using the pocket tester, measure the DC voltage between the battery terminals, ⊕ and ⊖.
  If the tester reads under 13.5 V, check the generator, regulator and rectifier.



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

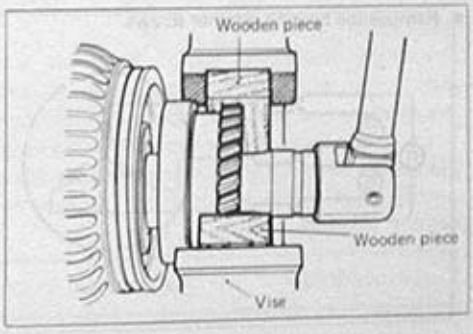
STD charging output	Above 13.5 V (DC) at 5 000 r/min

09900-25002	Pocket tester



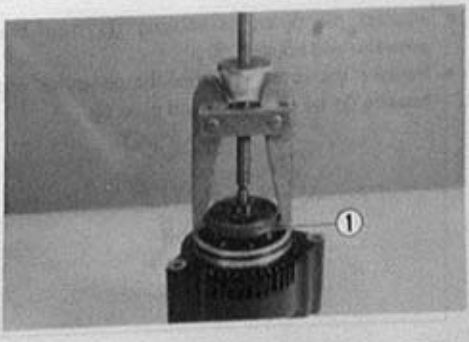
GENERATOR REMOVAL AND DISASSEMBLY

- Disconnect the generator lead wires. (Refer to page 3-4)
- Remove the engine sprocket cover. (Refer to page 3-5)
- Remove the generator. (Refer to page 3-14)
- Use a vise and appropriate pieces of woods to hold the generator driven gear as shown in the illustration, and remove the generator driven gear nut.



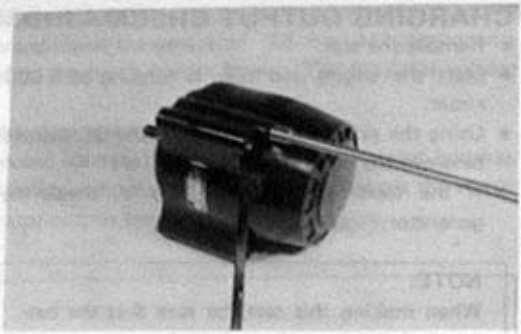
CAUTION:
Do not hold the damper housing with a vise, or damage or breakage of damper housing will result.

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

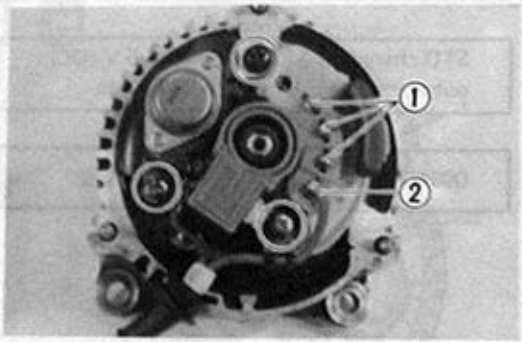


09913-61510	Bearing puller

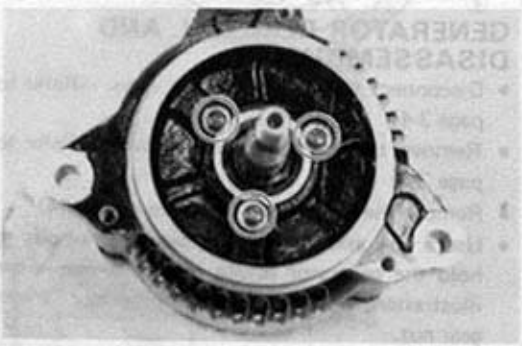
- Remove the generator end cover by removing the three nuts.



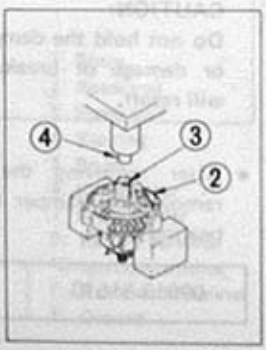
- Disconnect the stator coil lead wires ① and battery lead wire ② by using a soldering iron.
- Remove the brush holder, IC regulator and rectifier by removing the three screws.



- Remove the bearing retainer screws.



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

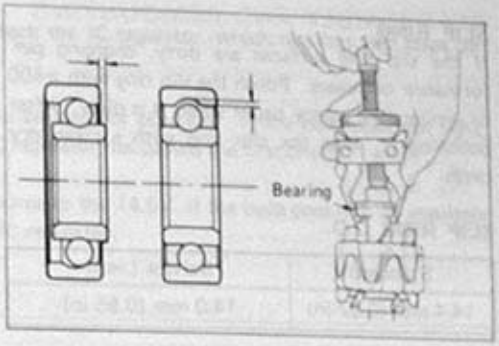


INSPECTION

ROTOR BEARING

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

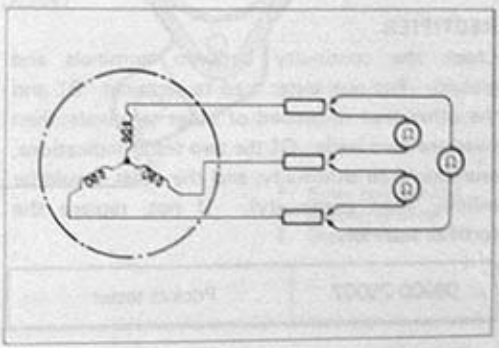
CAUTION:
The removed bearing should be replaced.



STATOR COIL CONTINUITY CHECK

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

09900-25002	Pocket tester



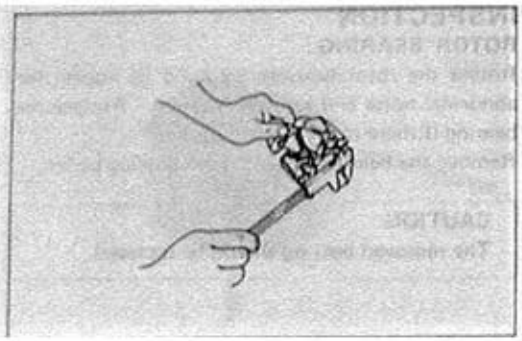
ROTOR COIL CONTINUITY CHECK

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

09900-25002	Pocket tester

SLIP RING

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



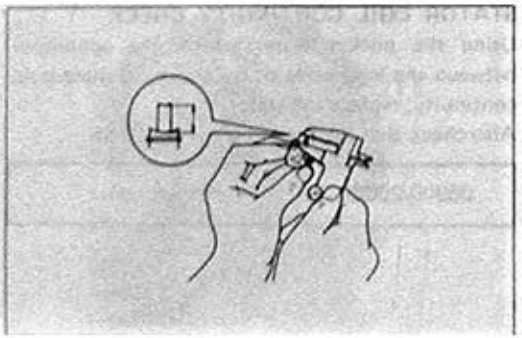
SLIP RING O.D.

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

CARBON BRUSH

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

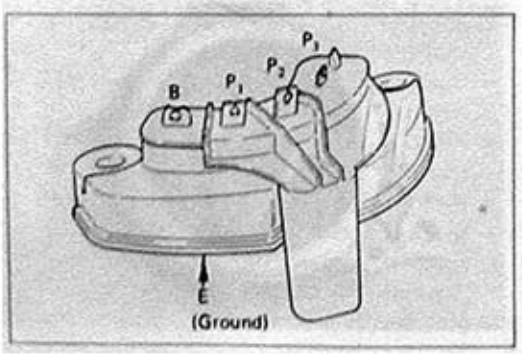
Service Limit	4.5 mm (0.18 in)

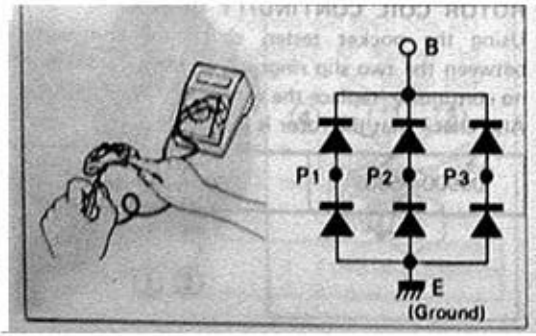


RECTIFIER

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

09900-25002	Pocket tester





IC REGULATOR

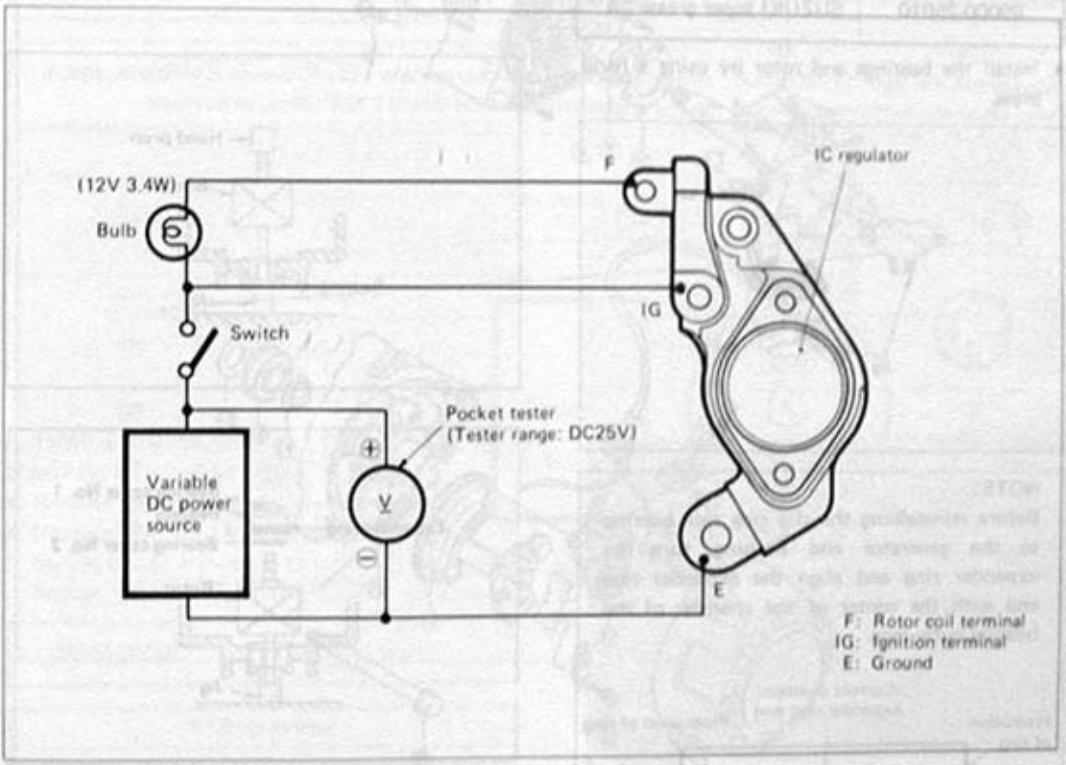
Use a variable DC power source, switch and bulb to check the IC regulator, which requires two steps described below:

First check:

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

Second check:

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

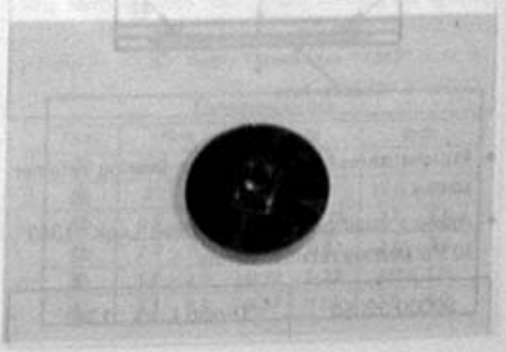


GENERATOR DRIVEN GEAR DAMPER

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

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

99000-25140	SUZUKI Moly Paste



REASSEMBLY AND REMOUNTING

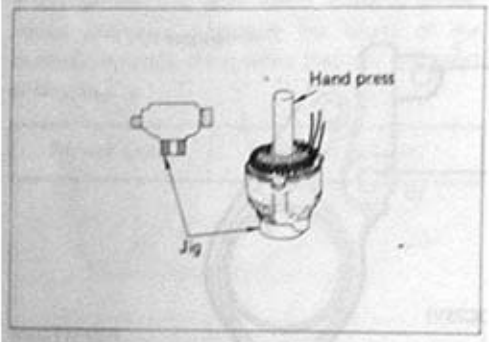
Reassemble and remount the generator in the reverse order of disassembly and removal. Pay attention to the following points:

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

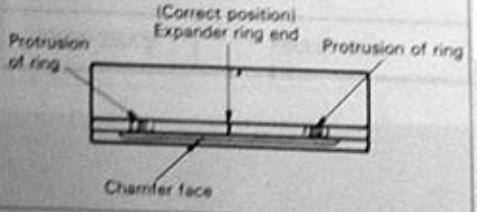
- Apply grease to the lip of the oil seal.

99000-25010	SUZUKI super grease "A"

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

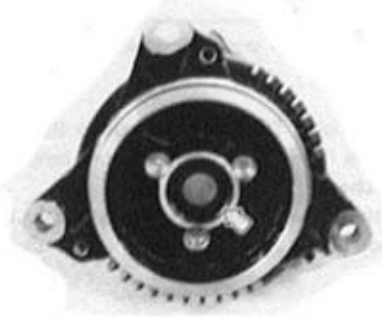


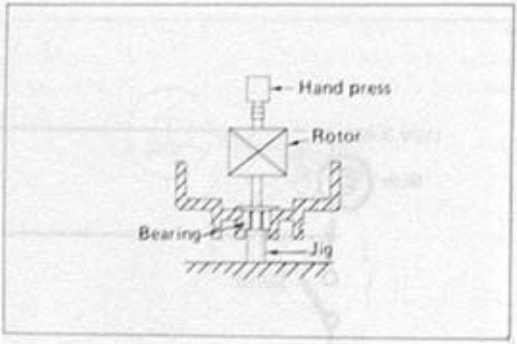
NOTE:
Before reinstalliing the slip ring side bearing to the generator end housing, turn the expander ring and align the expander ring end with the center of the chamfer of the bearing outer race.

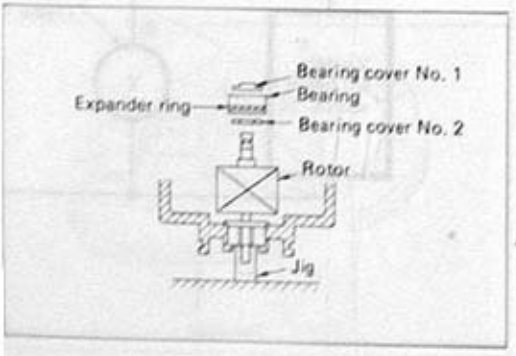


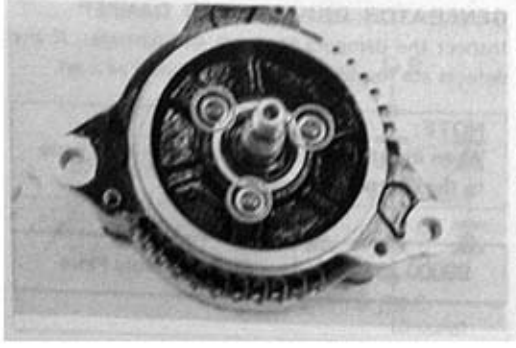
- Fit the three O-rings to the bearing retainer screws.
- Apply a small quantity of Thread Lock "1342" to the bearing retainer screws.

99000-32050	Thread Lock "1342"

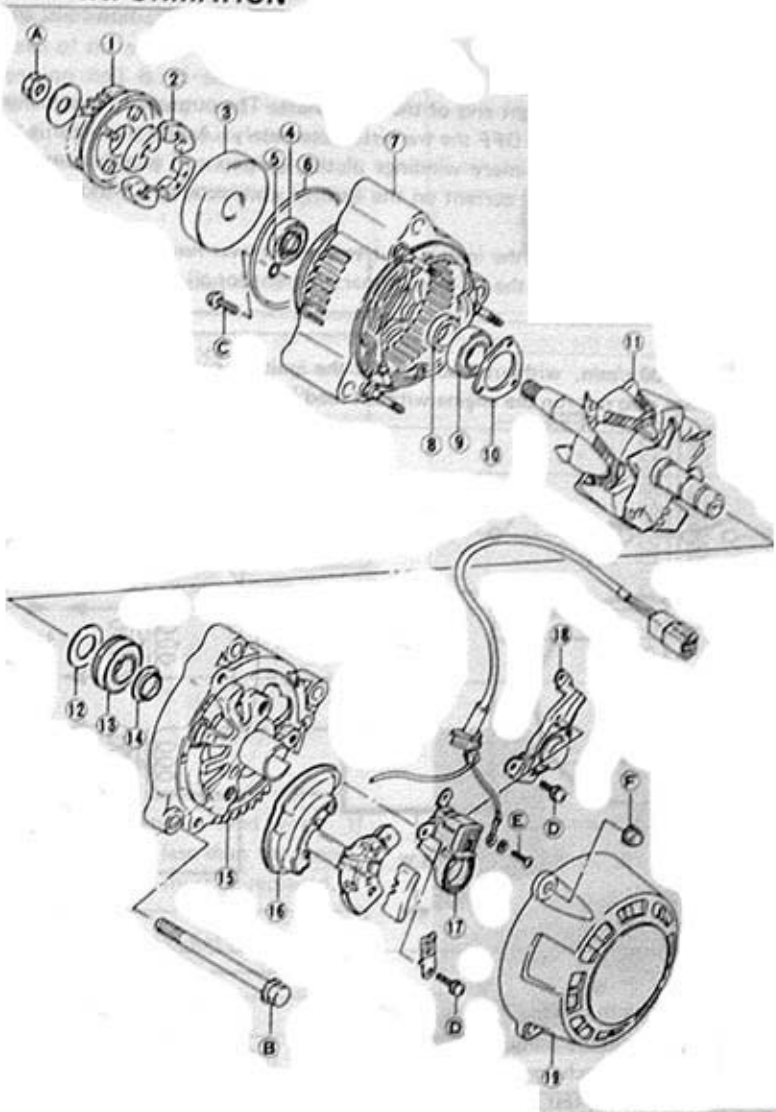








REASSEMBLY INFORMATION



Ⓒ : Apply Thread Lock "1342"

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

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

IGNITION SYSTEM

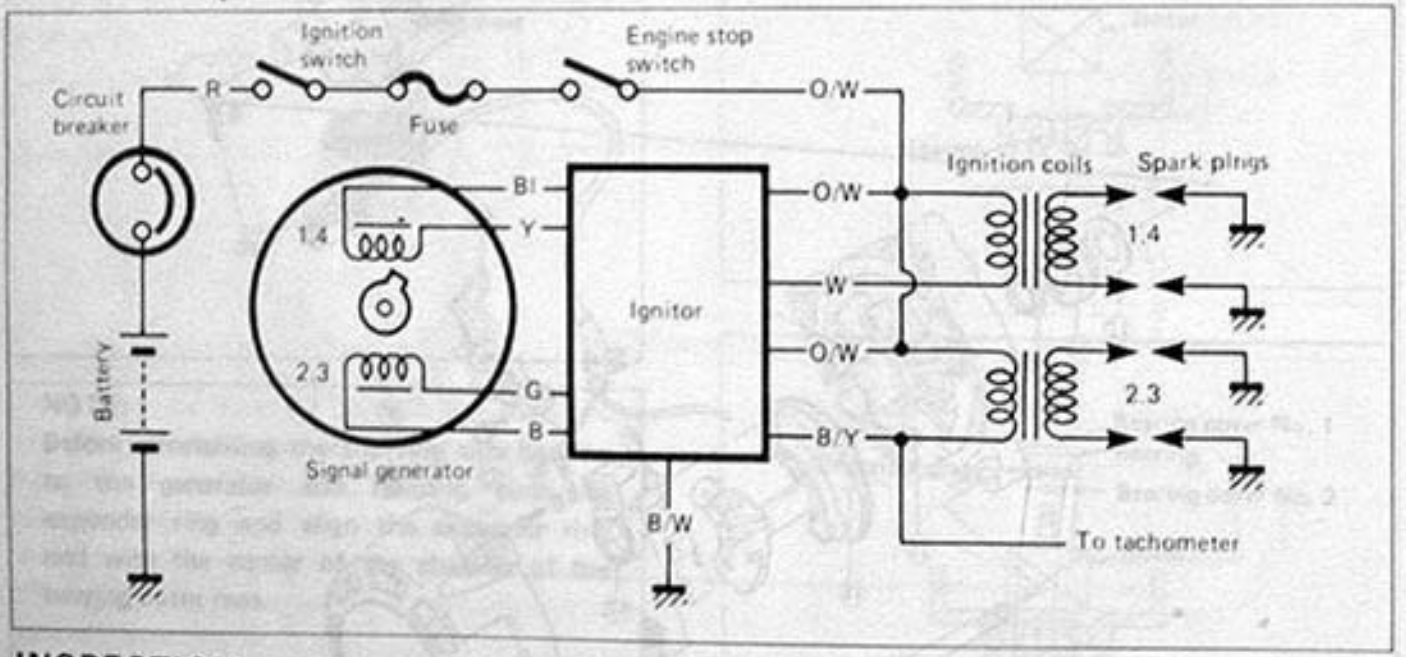
DESCRIPTION

The fully transistorized ignition system consists of a signal generator, ignitor, ignition coils, and spark plugs. The signal generator comprises one rotor tip 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 ignitor unit, where it turns ON and OFF the transistor alternately. As the transistor is turned ON and OFF, the current passing through the primary windings of the ignition coil is also turned OFF and ON accordingly, thus it induces the secondary current on the ignition coil secondary windings and produce the spark between spark plug gaps.

Ignition cut-off circuit is incorporated in the ignitor unit to prevent over-running engine. If engine r/min. reaches 11,100 r/min., this circuit cuts off the ignition primary current for all spark plugs.

CAUTION:
Engine can run over 11,100 r/min. without load, even if the ignition cut-off circuit is effective, and it may cause engine damage. Do not run the engine without load over 11,100 r/min. at anytime.



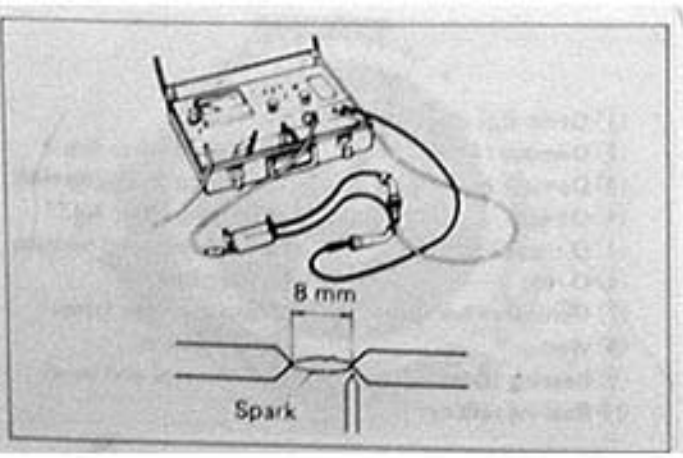
INSPECTION

IGNITION COIL (Checking with Electro Tester)

- Remove the ignition coils from the frame.
- 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 occures with this much gap, then it is defective and must be replaced.

09900-28106	Electro tester

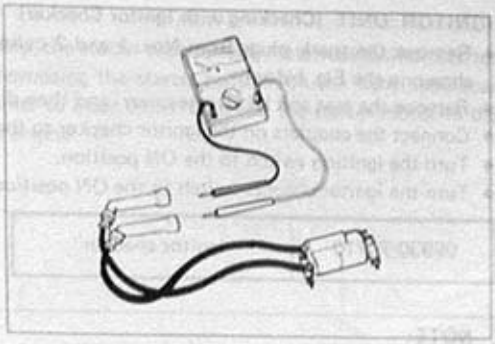
STD Spark performance	8 mm (0.3 in)



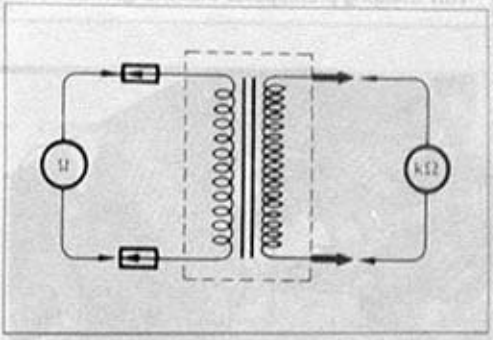
IGNITION COIL (Checking with Pocket Tester)

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

09900-25002	Pocket tester



Ignition coil resistance	
Primary	⊕ tap – ⊖ tap 3 – 5 Ω Tester range: (X1Ω)
Secondary	Plug cap – Plug cap 25 – 45 kΩ Tester range: (X1kΩ)

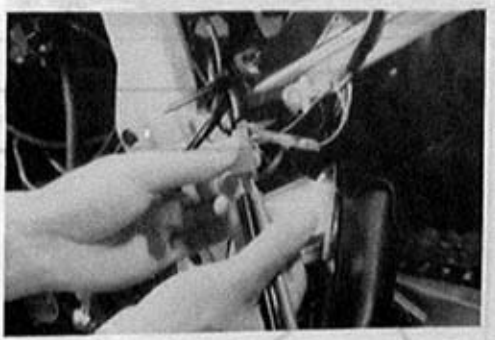


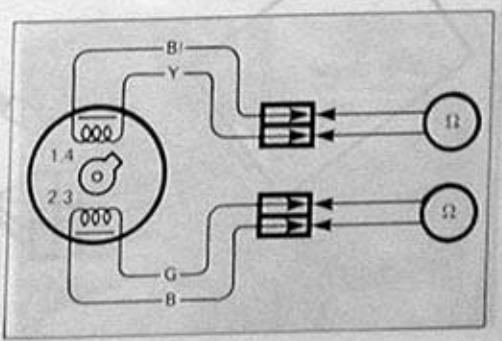
SIGNAL GENERATOR (Checking with Pocket Tester)

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

09900-25002	Pocket tester

STD resistance	
Green – Black	130 – 180 Ω Tester range: (X100Ω)
Blue – Yellow	





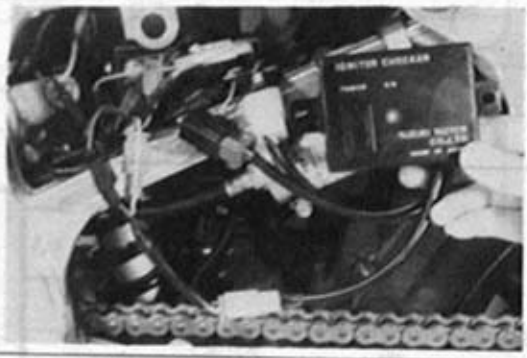
IGNITOR UNIT (Checking with Ignitor Checker)

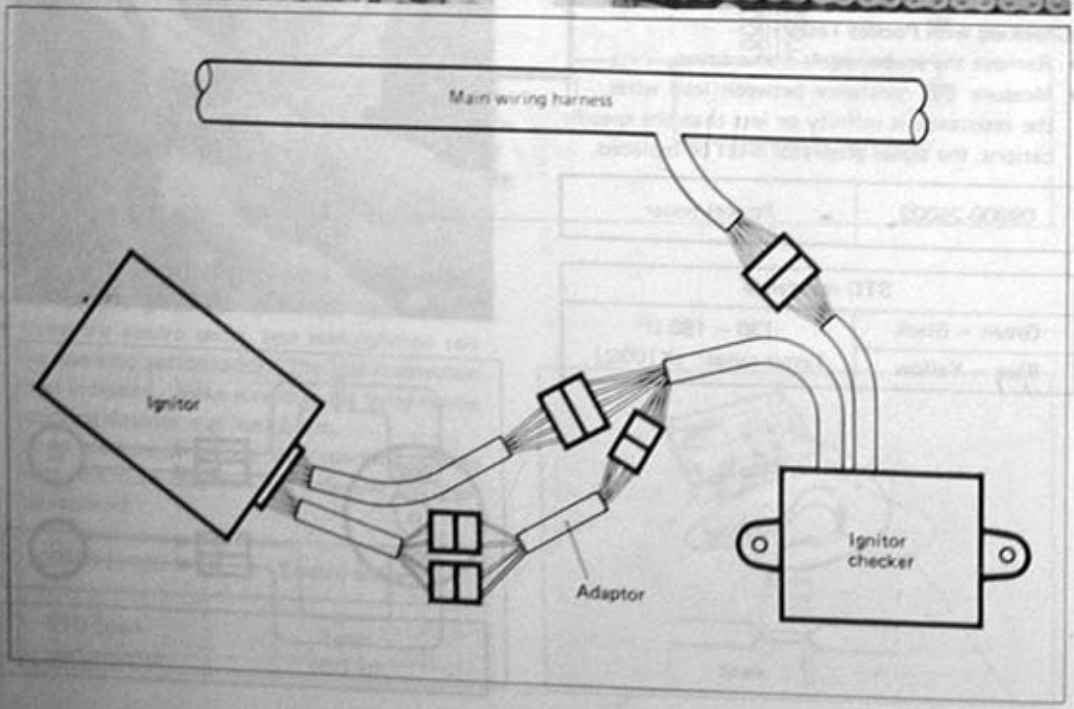
- Remove the spark plugs from Nos. 1 and 2 cylinders and place the spark plugs on the cylinder head, as shown in the Fig. below.
- Remove the seat and left frame cover, and then disconnect the ignitor lead wire couplers.
- Connect the couplers on the ignitor checker to the ignitor lead wire couplers, as shown in the illustration.
- Turn the ignition switch to the ON position.
- Turn the ignitor checker switch to the ON position and check the sparks of respective spark plugs.

09930-70710	Ignitor checker

09930-72710	Adaptor

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

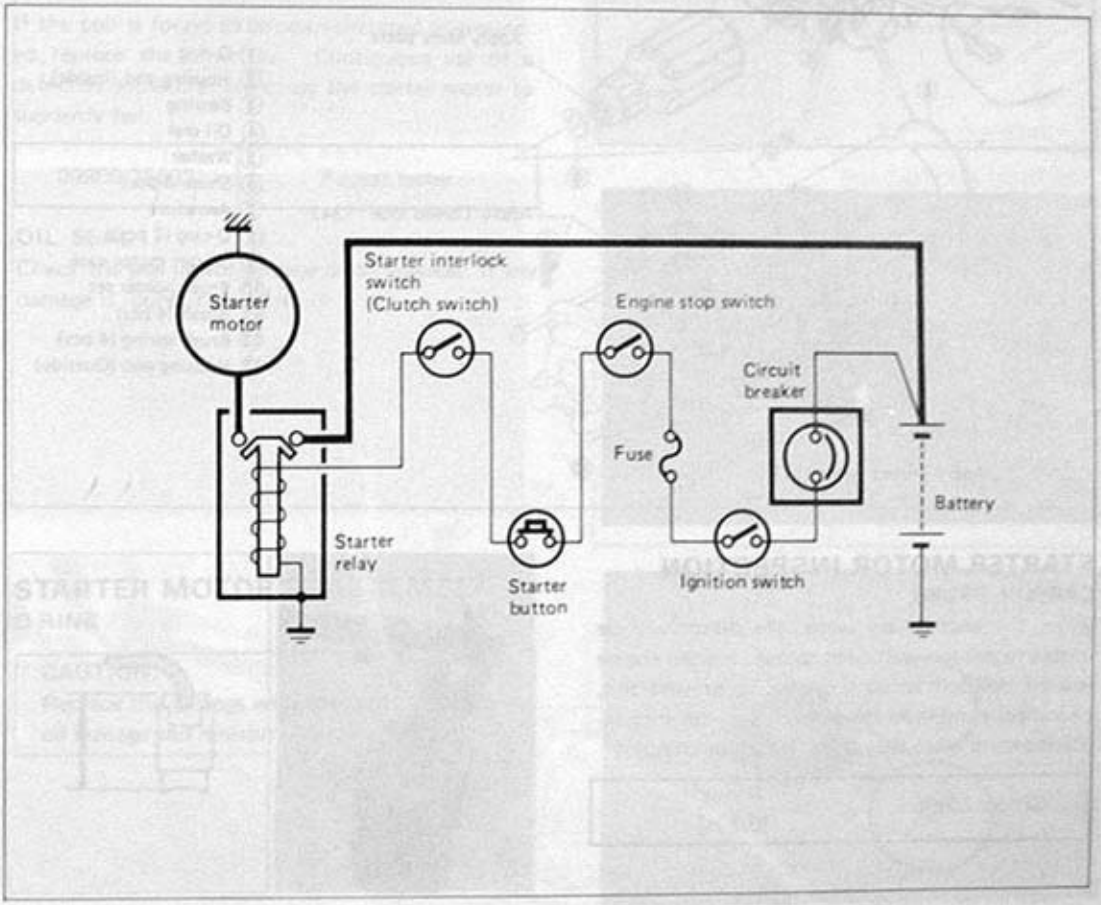




STARTER SYSTEM

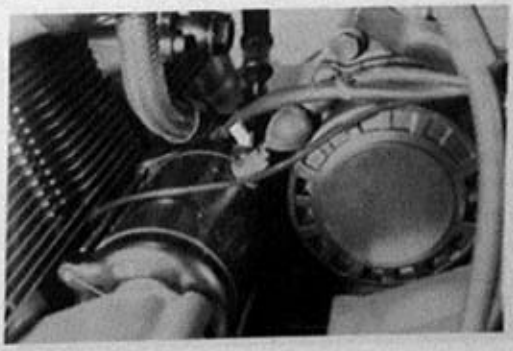
DESCRIPTION

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

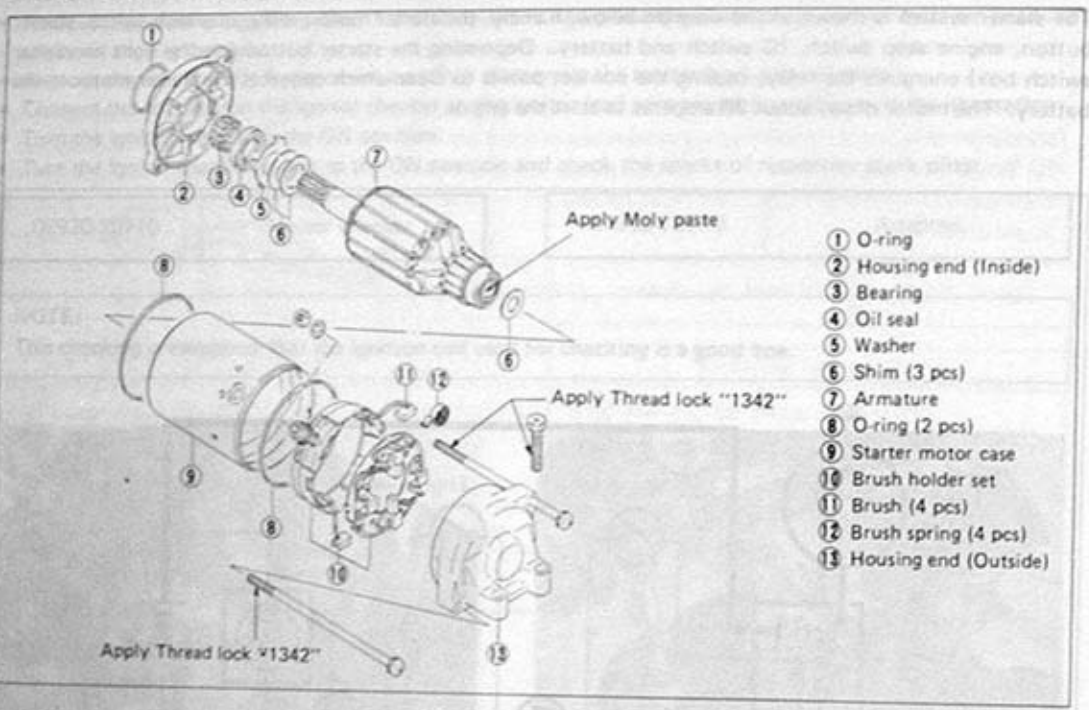


STARTER MOTOR REMOVAL AND DISASSEMBLY

- Remove the engine sprocket cover and generator. **(Refer to pages 3-5 and 14)**
- Disconnect the starter motor lead wire by removing the nut, then remove the starter motor by removing the mounting bolts.



- Disassemble the starter motor as shown in the illustration.

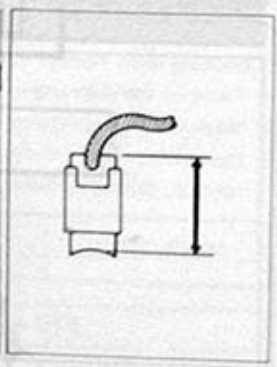


STARTER MOTOR INSPECTION

CARBON BRUSH

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

Service Limit	6 mm (0.2 in)

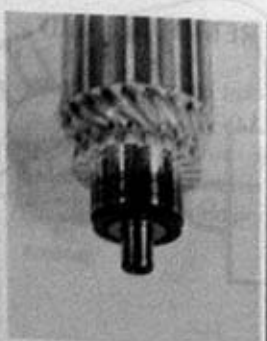


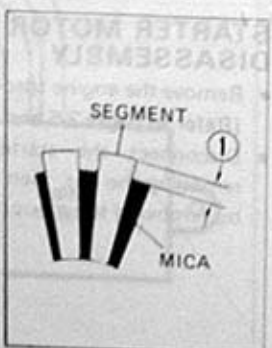
COMMUTATOR

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

Measure the commutator under cut ①.

Service Limit	0.2 mm (0.008 in)



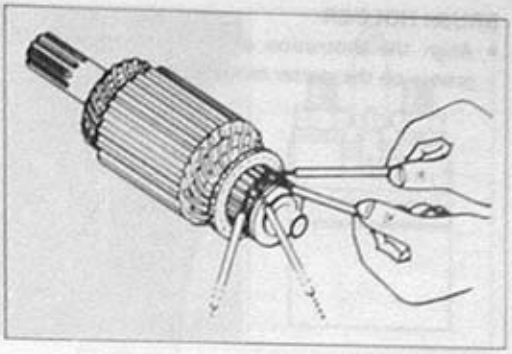


ARMATURE COIL

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

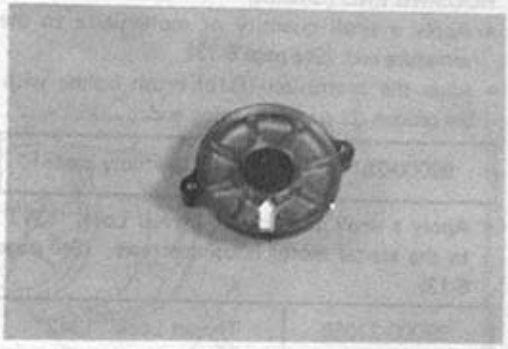
If the coil is found to be open-circuited or grounded, replace the armature. Continuous use of a defective armature will cause the starter motor to suddenly fail.

09900-25002	Pocket tester



OIL SEAL

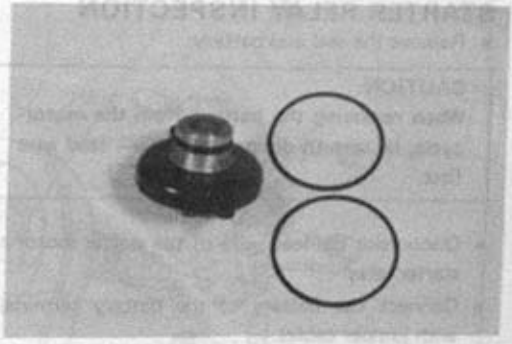
Check the seal lip for damage or oil leakage. If any damage is found, replace it.



STARTER MOTOR REASSEMBLY

O-RING

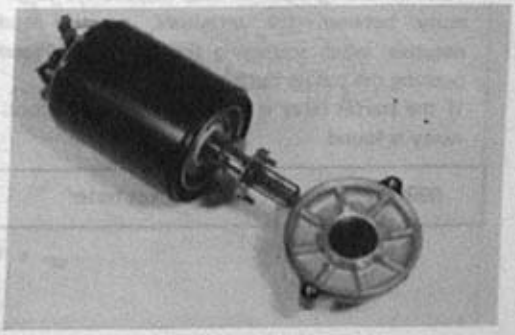
CAUTION:
Replace the O-rings with new ones to prevent oil leakage and moisture.



HOUSING END (Inside)

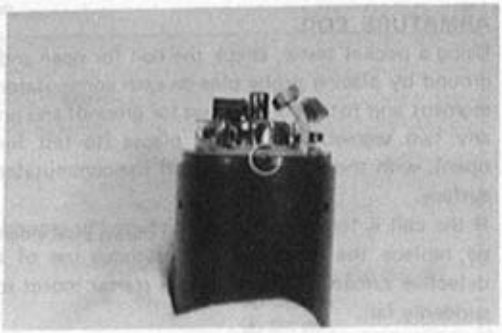
- Apply grease to the lip of the oil seal.
- Align the grooves on the housing end with the tabs of washer.

99000-25010	SUZUKI super grease "A"



BRUSH HOLDER

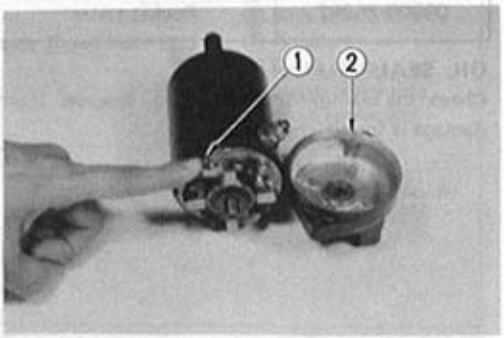
- Align the protrusion of brush holder with the groove on the starter motor case.



HOUSING END (Outside)

- Apply a small quantity of moly paste to the armature end. (See page 6-13)
- Align the protrusion ① of brush holder with the groove ② on the housing end.

99000-25140	SUZUKI moly paste



- Apply a small quantity of Thread Lock "1342" to the starter motor housing screws. (See page 6-13)

99000-32050	Thread Lock "1342"

STARTER RELAY INSPECTION

- Remove the seat and battery.

CAUTION:
When removing the battery from the motorcycle, be sure to disconnect the ⊖ lead wire first.

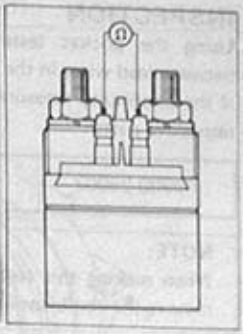
- Disconnect the lead wire of the starter motor at starter relay.
- Connect the battery to the battery terminals with jumper cables.
- Turn on the ignition switch, inspect the continuity* between the terminals, positive and negative, when squeezing the clutch lever and pushing the starter button.
  If the starter relay is in sound condition, continuity is found.

09900-25002	Pocket tester

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

09900-25002	Pocket tester

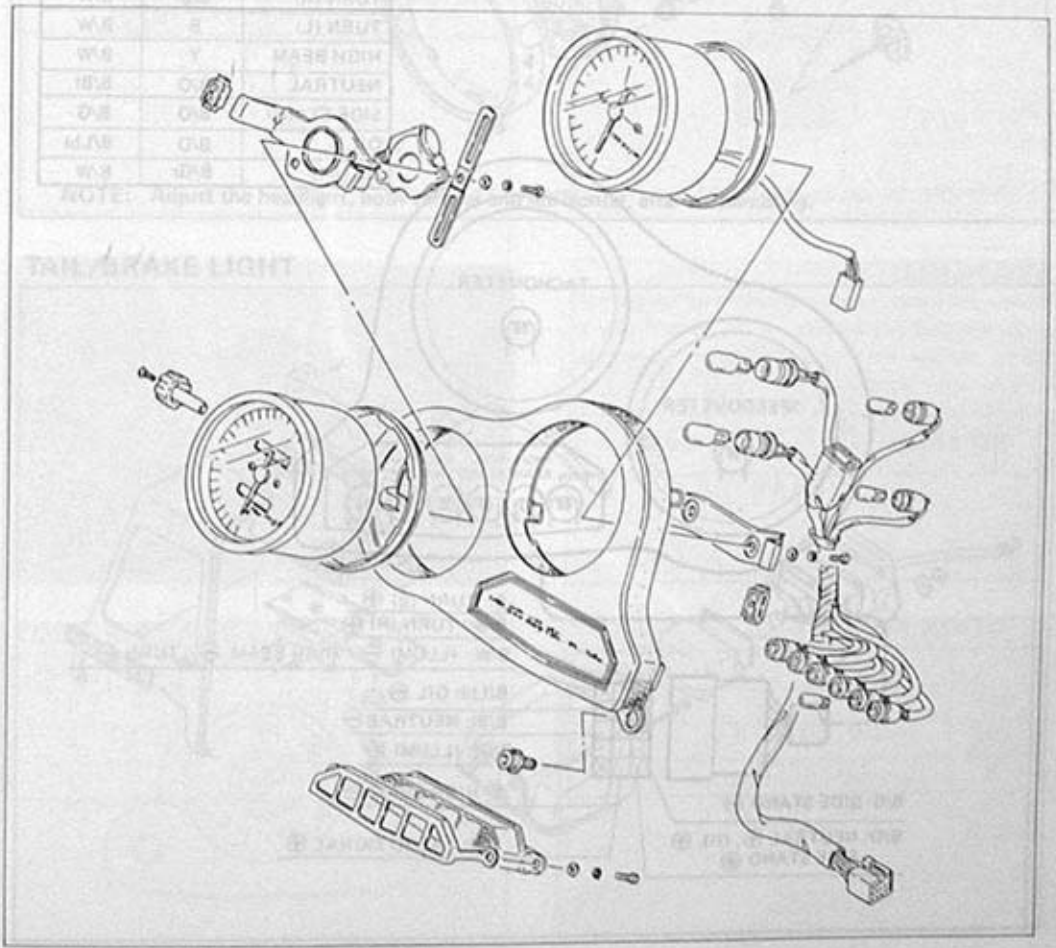
STD resistance	3 – 5 Ω



COMBINATION METER

REMOVAL AND DISASSEMBLY

- Remove the combination meter.
- Disassemble the combination meter as follows.



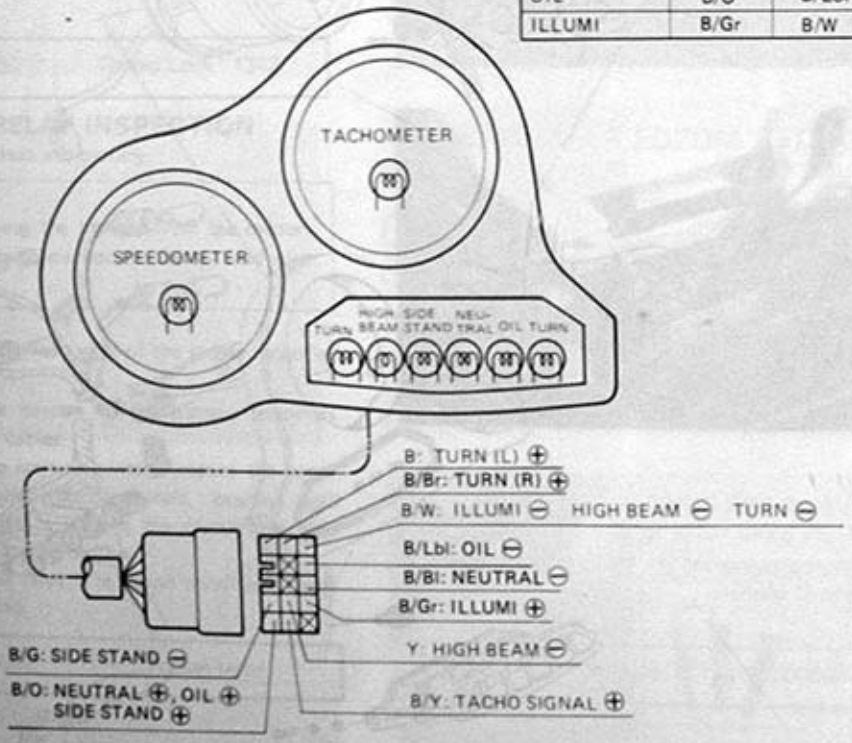
INSPECTION

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

09900-25002	Pocket tester

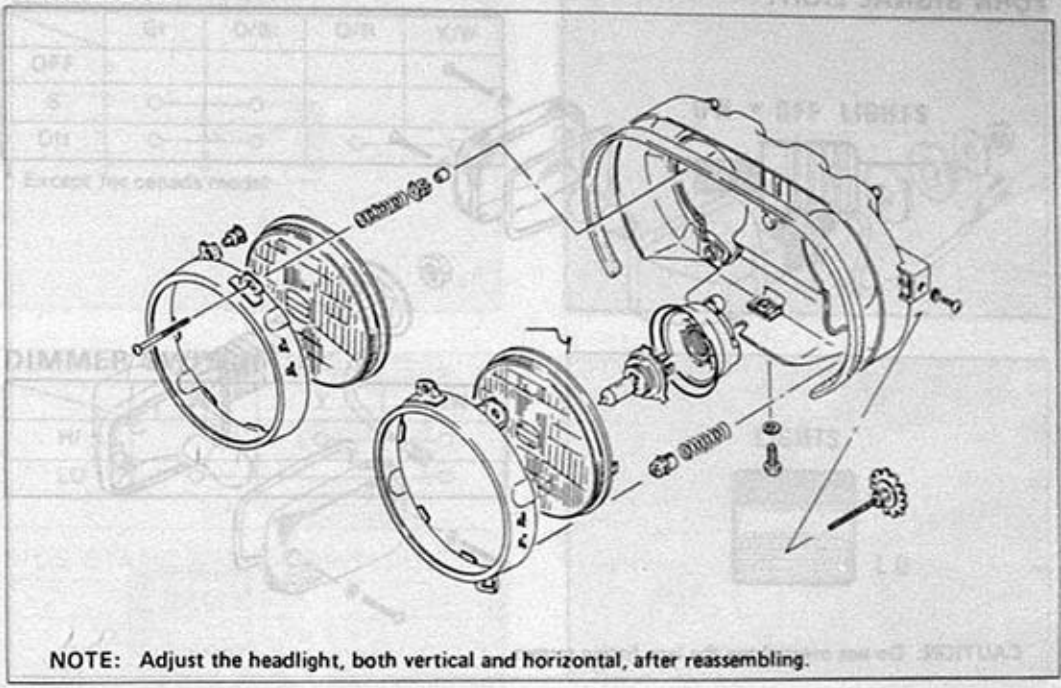
NOTE:
When making this test, it is not necessary to remove the combination meter.

ITEM	⊕ Probe of tester to:	⊖ Probe of tester to:
TURN (R)	B/Br	B/W
TURN (L)	B	B/W
HIGH BEAM	Y	B/W
NEUTRAL	B/O	B/Bl
SIDE STAND	B/O	B/G
OIL	B/O	B/Lbl
ILLUMI	B/Gr	B/W



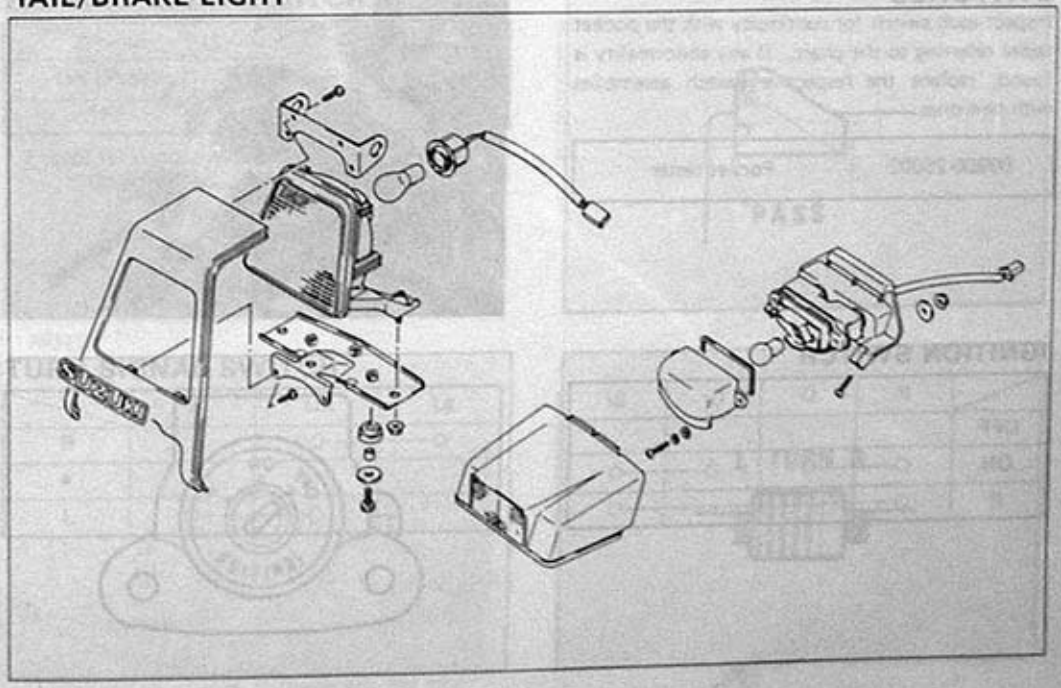
LAMPS

HEADLIGHT

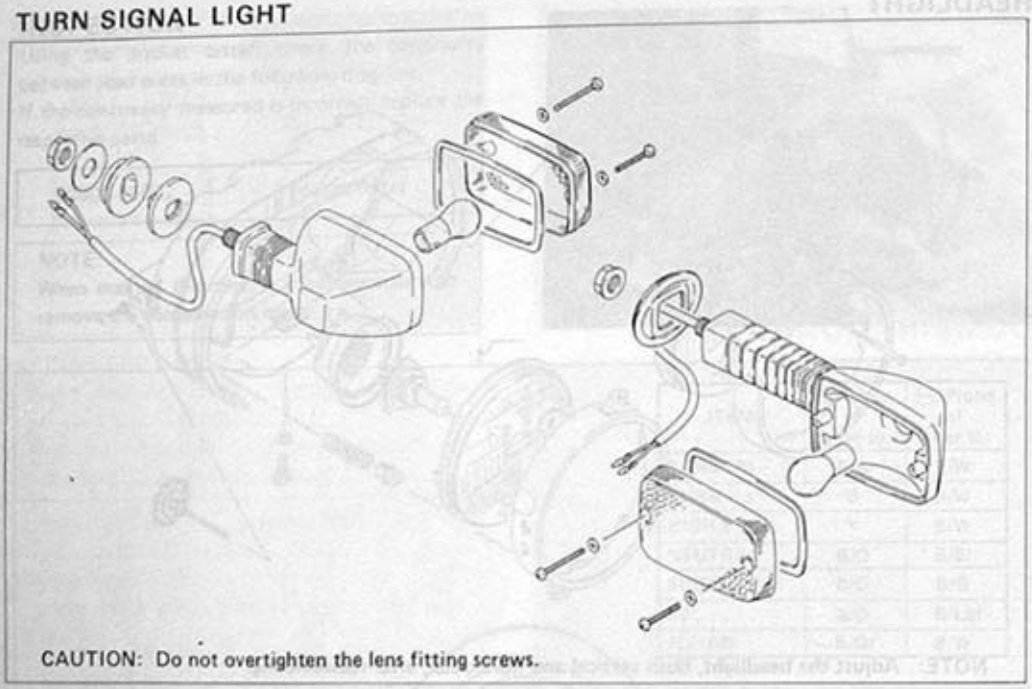


NOTE: Adjust the headlight, both vertical and horizontal, after reassembling.

TAIL/BRAKE LIGHT



TURN SIGNAL LIGHT

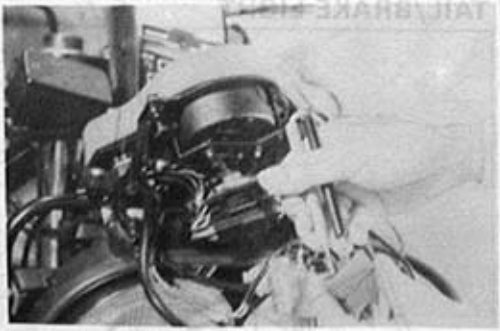


CAUTION: Do not overtighten the lens fitting screws.

SWITCHES

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

09900-25002	Pocket tester



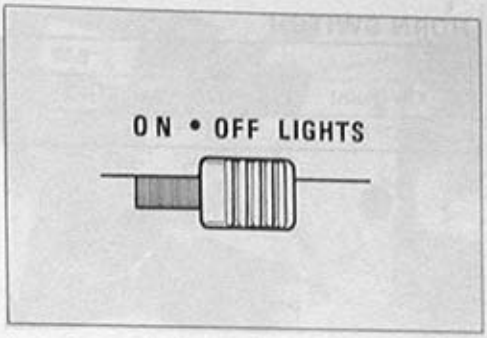
IGNITION SWITCH

	R	O	Gr	Br
OFF				
ON	○	○	○	○
P	○			○

LIGHTING SWITCH

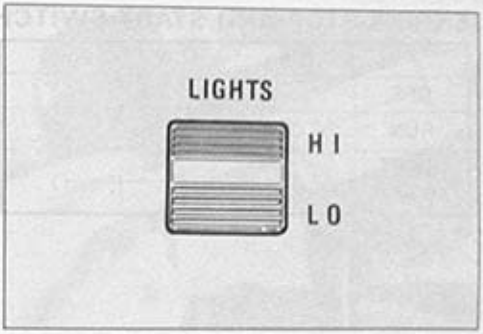
	Gr	O/Bl	O/R	Y/W
OFF				
S	○	○		
ON	○	○	○	○

* Except for canada model



DIMMER SWITCH

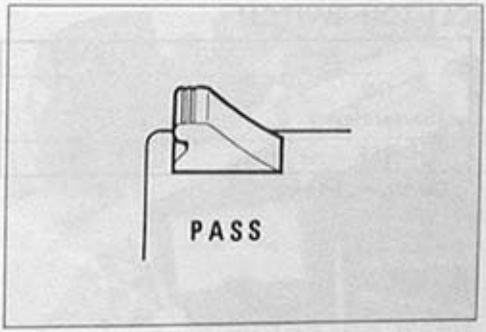
	W	Y	Y/W
HI		○	○
LO	○		○



PASSING LIGHT SWITCH

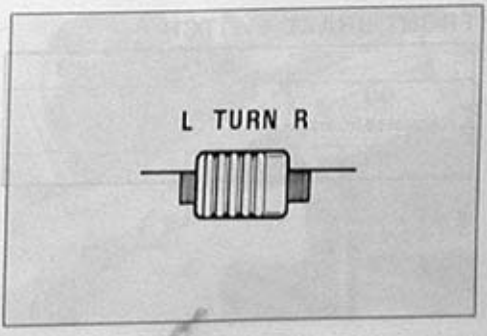
	Y	O/R
ON (Push)	○	○
OFF		

* Except for canada model



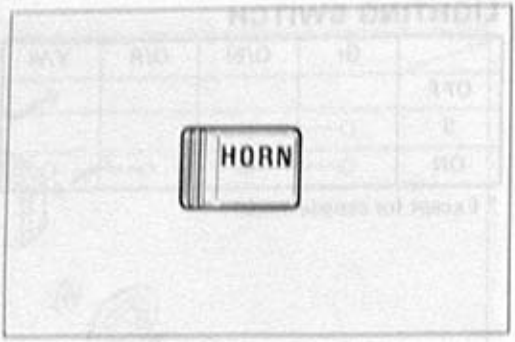
TURN SIGNAL SWITCH

	B	Lbl	Lg
R		○	○
•			
L	○	○	



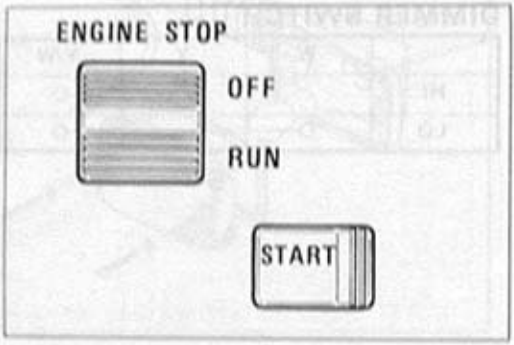
HORN SWITCH

	G	B/W
ON (Push)	○	○
OFF		



ENGINE STOP AND START SWITCH

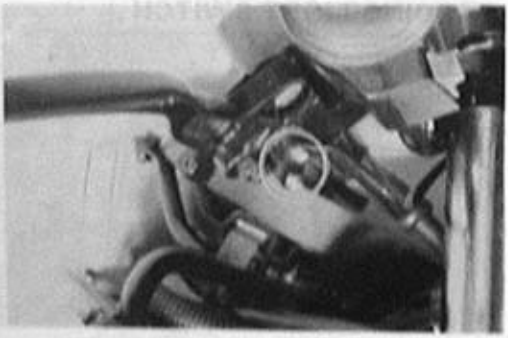
	O/B	O/W	Y/G
OFF			
RUN	○	○	
START (Push)		○	○



CLUTCH SWITCH

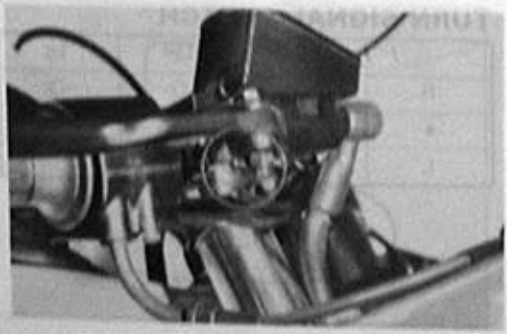
	Y/G	Y/G
ON (Squeeze lever)	○	○
OFF		

* Canada model only



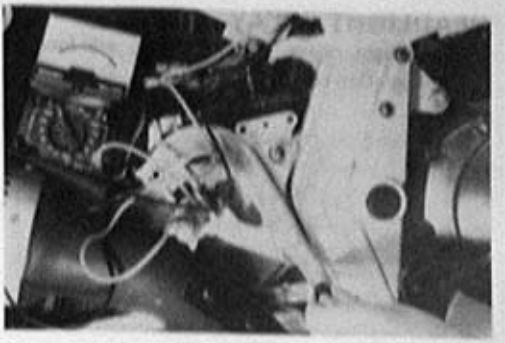
FRONT BRAKE SWITCH

	O/G	W/B
ON (Squeeze lever)	○	○
OFF		



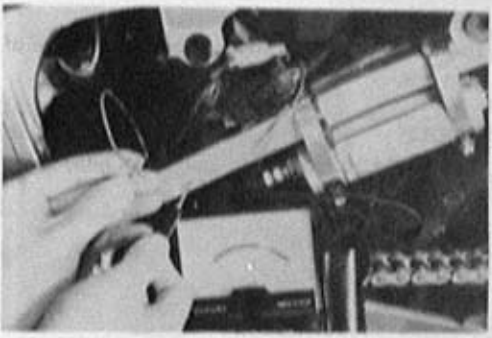
REAR BRAKE SWITCH

	O/G	W/B
ON (Depress pedal)	○	○
OFF		



NEUTRAL INDICATOR SWITCH

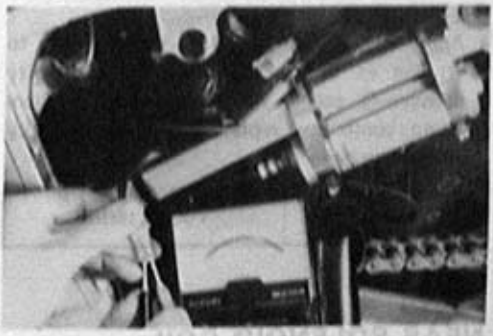
	Bl	Ground
ON (Neutral position)	○	○
OFF		



SIDE STAND CHECK SWITCH

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

* Except for Finland, Norway, Switzerland and W. Germany



OIL PRESSURE SWITCH

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

	G/Y	Ground
ON	○	○
OFF		

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

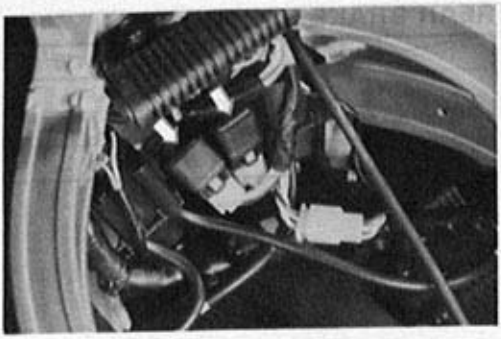
WORE COLOR

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

RELAY

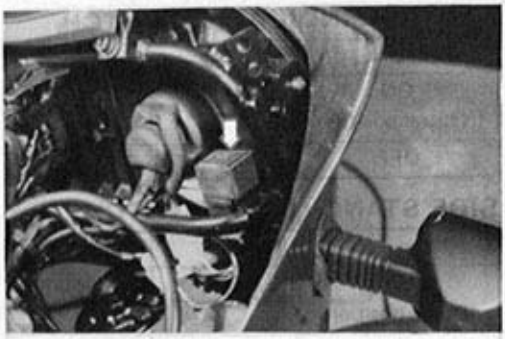
HEADLIGHT RELAY

The headlight relays, right and left, are located near the ignition coils.



NEAS RELAY

The NEAS relay is located on the fairing brace of right side.

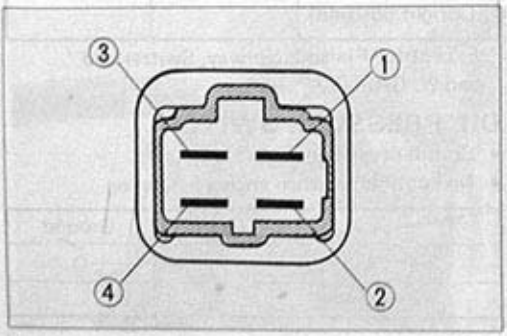


NOTE:
The HEADLIGHT relay and NEAS relay are the same part.

INSPECTION

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

09900-25002	Pocket tester



NEAS SOLENOID COIL

INSPECTION

- Disconnect the NEAS lead wire couplers, right and left, from the NEAS units.
- Check the solenoid coil for "open", "ground" and ohmic resistance. The solenoid coil is in good condition if the resistance is as follows.

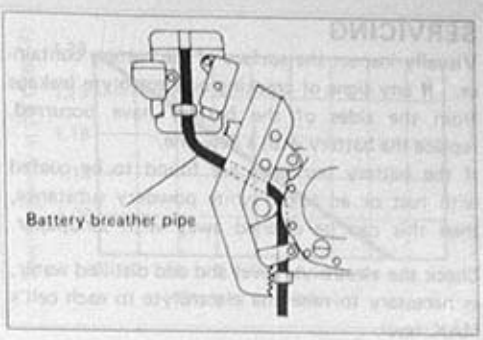
09900-25002	Pocket tester
STD resistance	5.4 – 8 Ω

BATTERY

SPECIFICATIONS

Type designation	YB14L-A2
Capacity	12V, 50.4 kC (14 Ah)/ 10HR
Standard electrolyte S.G.	1.28 at 20°C (68°F)

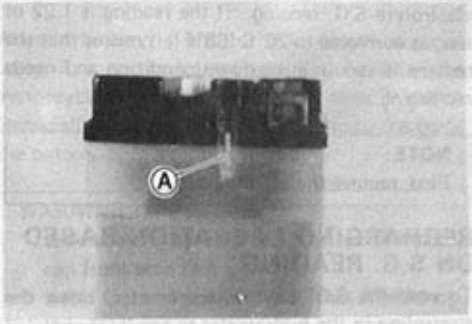
In fitting the battery to the motorcycle, connect the breather pipe to the battery vent.



INITIAL CHARGING

Filling electrolyte

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



Ⓐ Sealed tube

Maximum charging current	1.4A

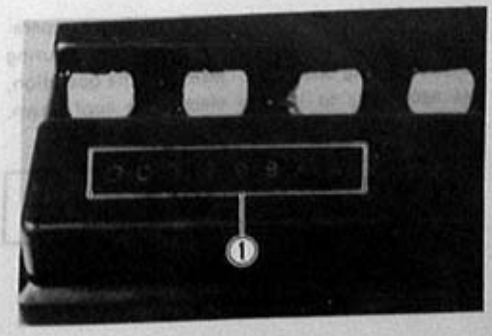
Charging time

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 shown in the photograph, each indicating month, date and year.

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



SERVICING

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

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

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

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

> **NOTE:**
> **First, remove the ⊖ lead wire.**

RECHARGING OPERATION BASED ON S.G. READING

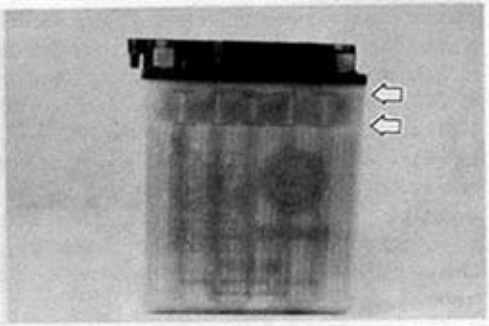
To read the S.G. on the hydrometer, bring the electrolyte in the hydrometer to eye level and read the graduation on the float scale bordering on the meniscus (curved-up portion of electrolyte surface), as shown in figure.

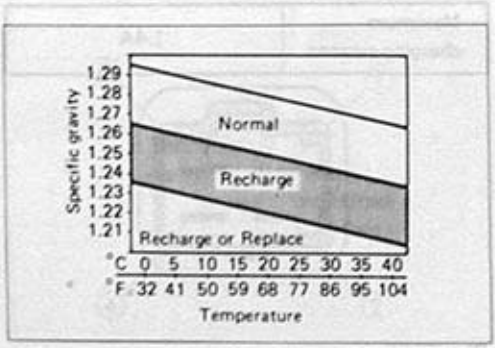
Check the reading (as corrected to 20°C) with chart to determine the recharging time in hour by constant-current charging at a charging rate of 1.4 amperes (which is tenth of the capacity of the present battery).

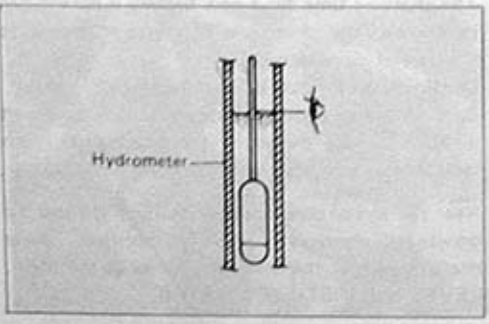
Be careful not to permit the electrolyte temperature to exceed 45°C (113°F), at any time, during the recharging operation. Interrupt the operation, as necessary, to let the electrolyte cool down. Recharge the battery to the specification.

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

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

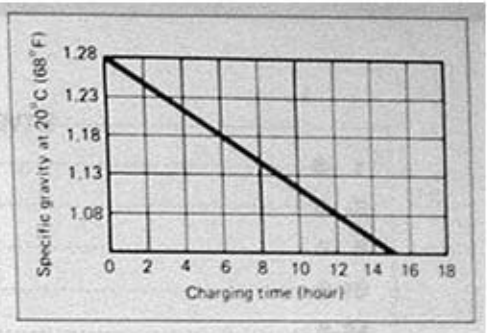






CAUTION:
Constant-voltage charging, otherwise called "quick" charging, is not recommendable for it could shorten the life of the battery.

09900-28403	Hydrometer



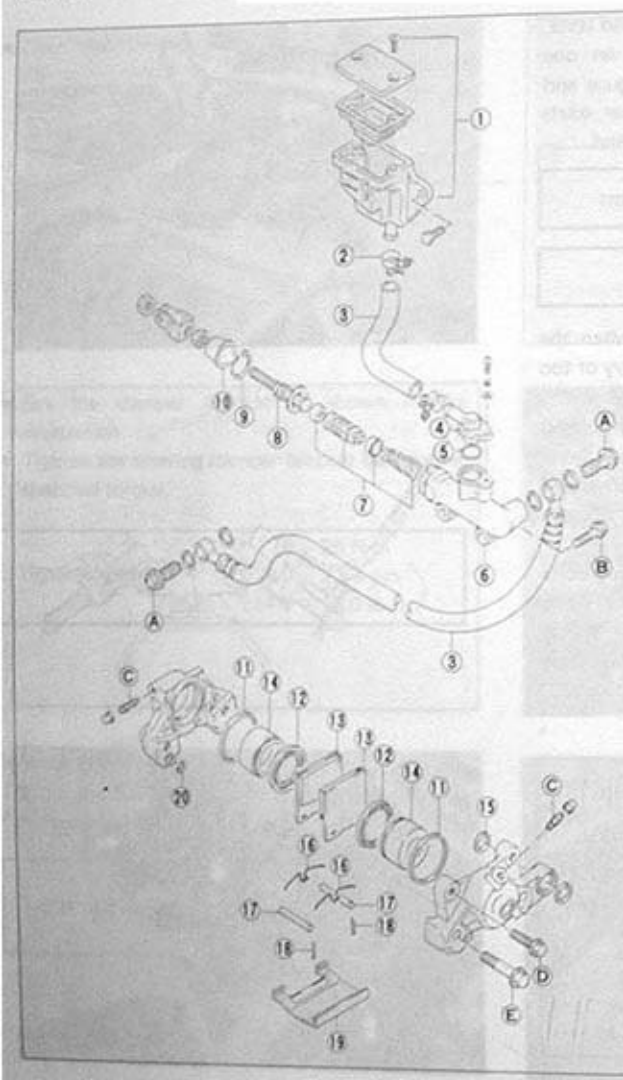
SERVICE LIFE

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.**

REAR BRAKE



① Reservoir tank
② Clamp
③ Hose
④ Connector
⑤ O-ring
⑥ Master cylinder
⑦ Cup set
⑧ Rod
⑨ Circlip
⑩ Dust cover
⑪ Piston seal
⑫ Dust boot
⑬ Pad
⑭ Piston
⑮ Oil seal
⑯ Spring
⑰ Pin
⑱ Clip
⑲ Cover
⑳ O-ring
Ⓐ Union bolt
Ⓑ Master cylinder mounting bolt
Ⓒ Air bleeder valve
Ⓓ Caliper mounting bolt
Ⓔ Caliper housing bolt

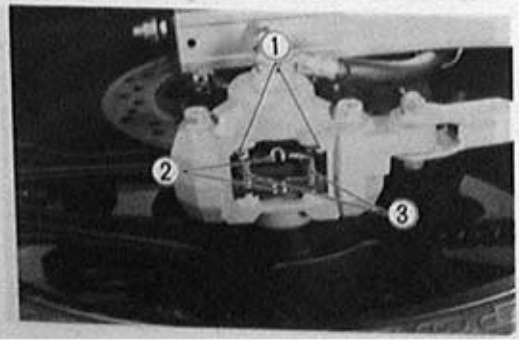
Item	Tightening torque		
	N·m	kg·m	lb-ft
Ⓐ	20 – 25	2.0 – 2.5	14.5 – 18.0
Ⓑ	6 – 10	0.6 – 1.0	4.5 – 7.0
Ⓒ	6 – 9	0.6 – 0.9	4.5 – 6.5
Ⓓ	15 – 25	1.5 – 2.5	11.0 – 18.0
Ⓔ	30 – 36	3.0 – 3.6	21.5 – 26.0

BRAKE PAD REPLACEMENT

- Remove the dust cover.
- Remove the clips ① and springs ②, and draw out the pins ③.
- Take off the pads.

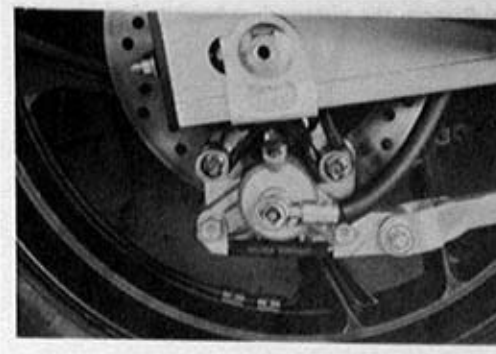
CAUTION:

- Do not operate the brake pedal while dismounting the pads.
- Replace the brake pad as a set, otherwise braking performance will be adversely affected.



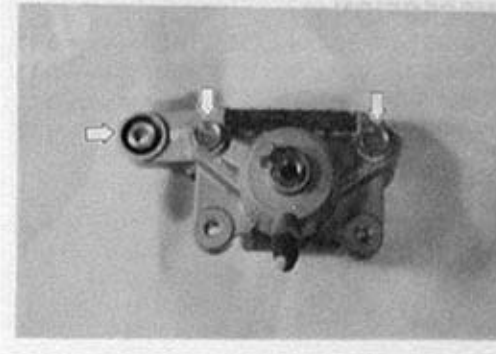
CALIPER REMOVAL AND DISASSEMBLY

- Remove the union bolt and catch the brake fluid in a suitable receptacle.
- Remove the caliper mounting bolts.
- Remove the torque link bolt and nut, and take off the caliper.



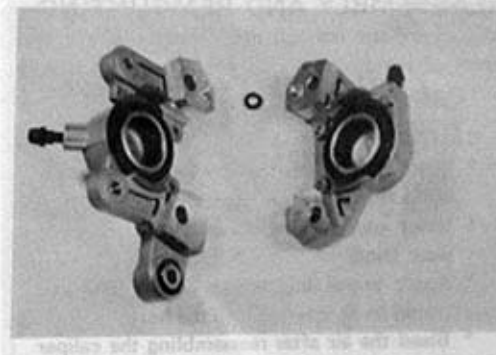
NOTE:
Slightly loosen the caliper housing bolts to facilitate later disassembly before removing the caliper mounting bolts.

- Remove the pads. (Refer to page 6-31)
- Remove the torque link bushing.
- Remove the caliper housing bolts and separate the caliper halves.



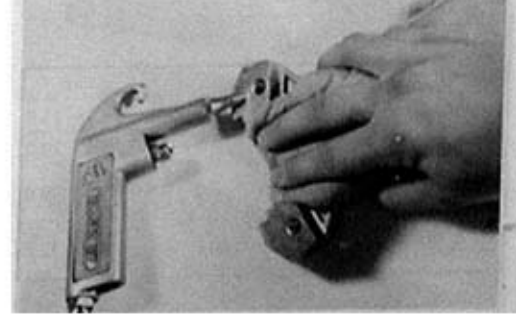
- Remove the O-ring.

NOTE:
Whenever separating the caliper halves, replace the O-ring with a new one.



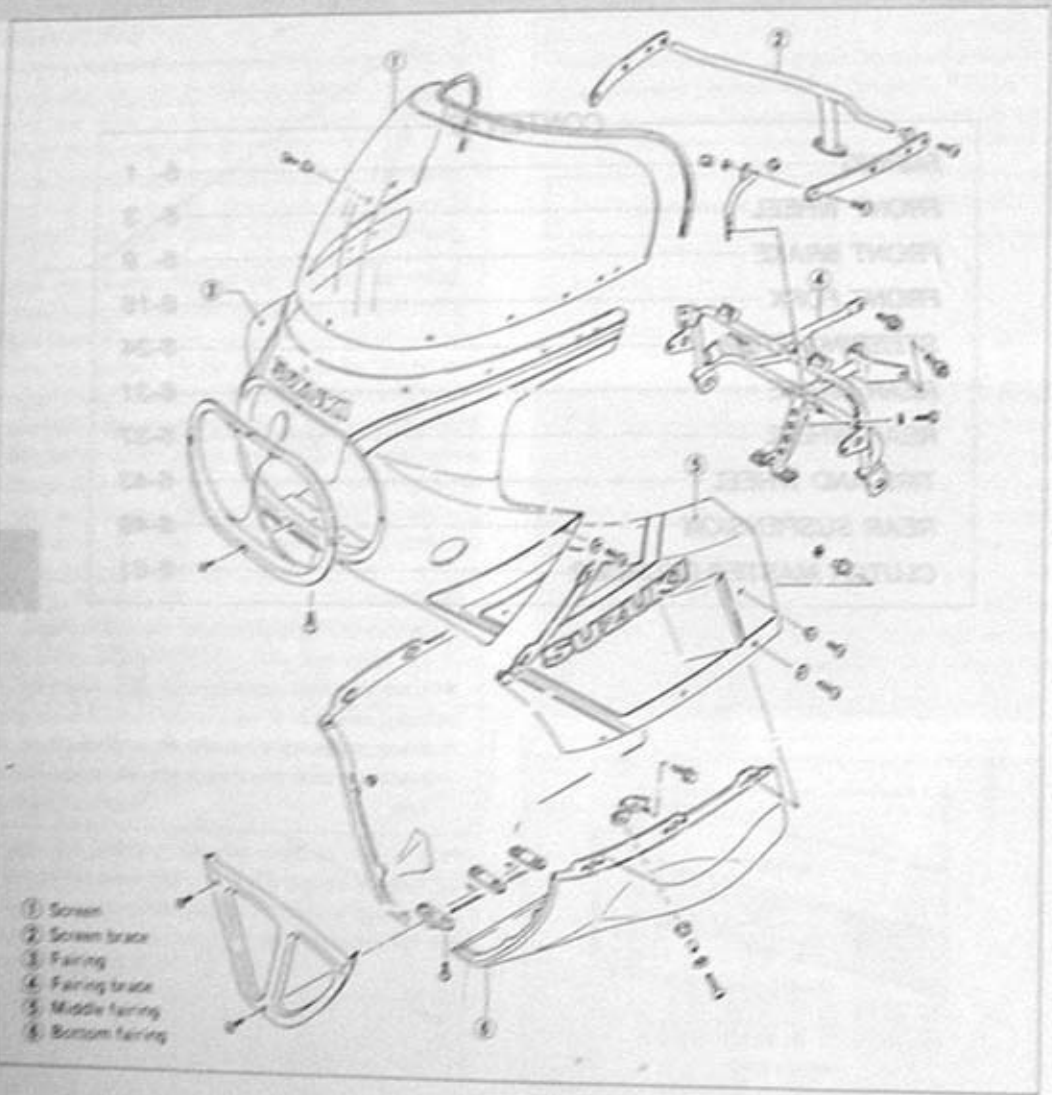
- Place a rag over the piston to prevent it from popping out and push out the piston by using air gun.

CAUTION:
To prevent piston damage, do not use high pressure air.



CONTENTS

FAIRING



REMOVAL

- Remove the bottom fairing by removing the screws, right and left.

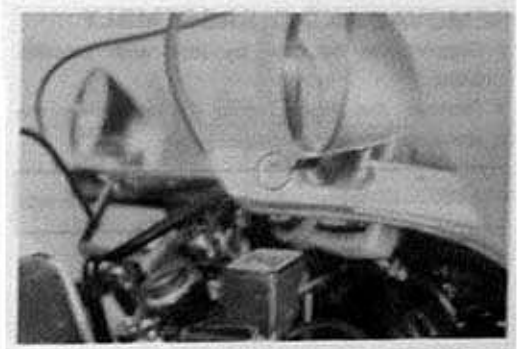
09900-09401	L-type hexagon wrench set

Tightening torque	2 – 4 N·m (0.2 – 0.4 kg-m / 1.5 – 3.0 lb-ft)

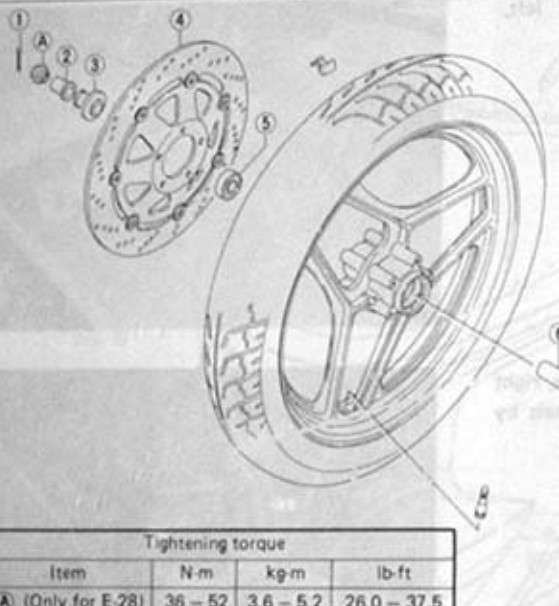
- Remove the middle fairings, right and left, by removing the screws.

- Disconnect the turn signal light lead wires, right and left, and remove the both turn signals by removing the mounting nuts.

- Remove the fairing by removing the screws, right and left.



FRONT WHEEL



① Cotter pin (Only for E-28)
② Spacer
③ Spacer
④ Disc plate
⑤ Bearing
⑥ Spacer
⑦ Bearing
⑧ Disc plate
⑨ Speedometer gearbox
⑩ Front axle shaft
Ⓐ Axle nut
Ⓑ Disc plate mounting bolt

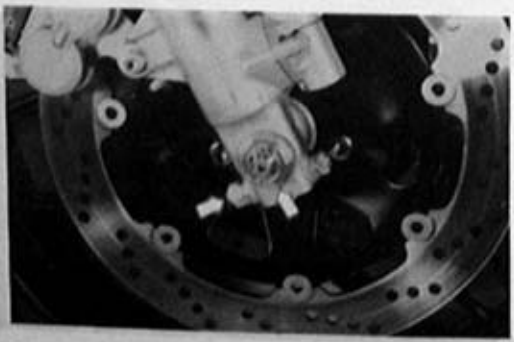
Tightening torque			
Item	N·m	kg·m	lb·ft
Ⓐ (Only for E-28)	36 – 52	3.6 – 5.2	26.0 – 37.5
Ⓐ (For the others)	40 – 58	4.0 – 5.8	21.5 – 42.0
Ⓑ	15 – 25	1.5 – 2.5	11.0 – 18.0

REMOVAL AND DISASSEMBLY

- Support the machine by jack with wooden block.
- Remove the front fender by removing the stabilizer mounting screws.

09900-00401	L-type hexagon wrench set

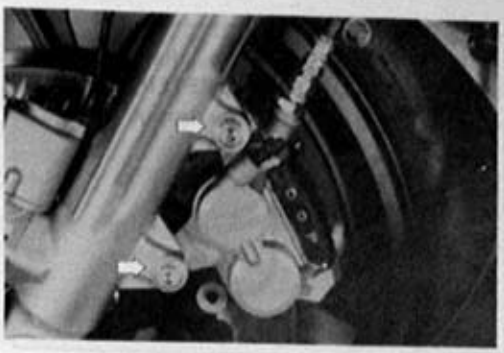
- Pull out the cotter pin. (Only for E-28)
- Loosen the pinch nut and remove the axle nut.



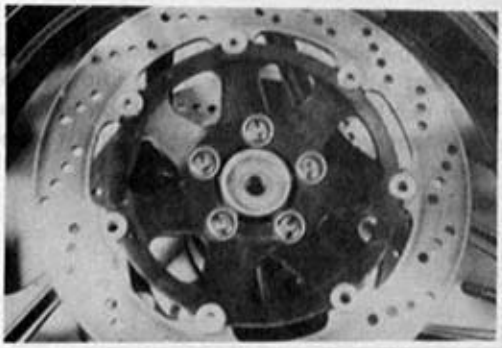
- Remove the caliper mounting bolts, right and left, and dismount the both calipers.

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

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

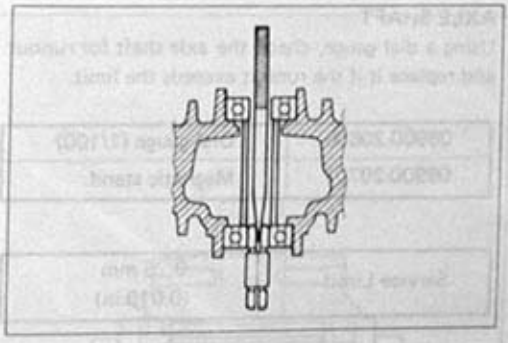


- Draw out the axle shaft and take off the front wheel.
- Remove the securing bolts, right and left, and separate the both discs from the wheel.



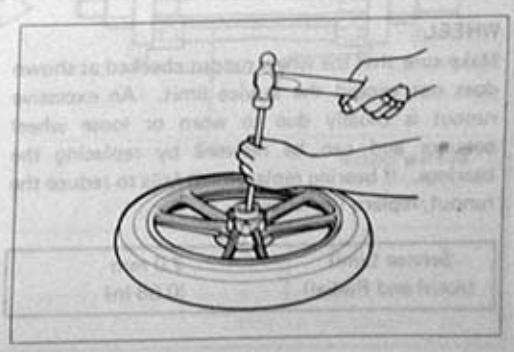
- Drive out the both wheel bearings by using the special tool in the following procedures.

09941-50110	Bearing remover



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

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

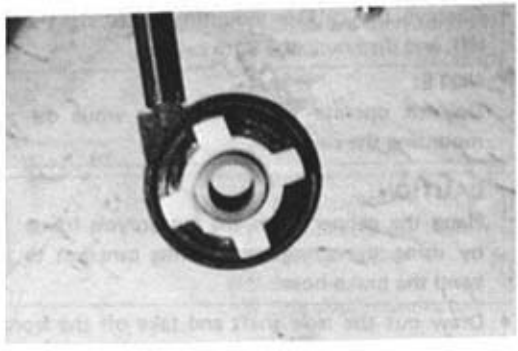


INSPECTION

TIRE ..... Refer to page 6-41

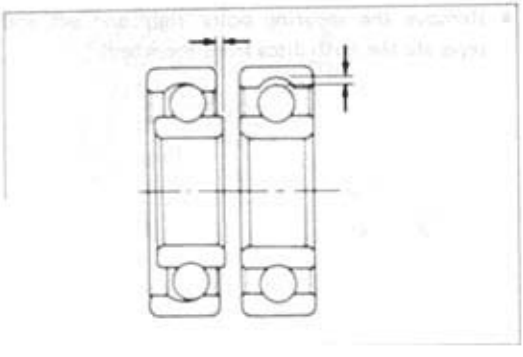
DUST SEAL OF SPEEDOMETER GEAR BOX

Inspect the lip of dust seal for damage.



WHEEL BEARINGS

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

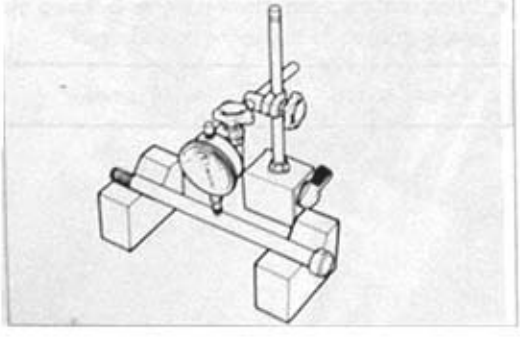


AXLE SHAFT

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

09900-20606	Dial gauge (1/100)
09900-20701	Magnetic stand

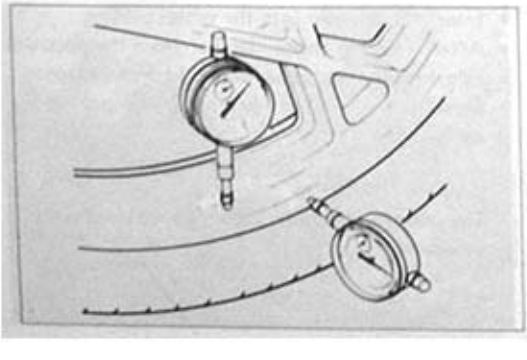
Service Limit	0.25 mm (0.010 in)



WHEEL

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

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



REASSEMBLY AND REMOUNTING

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

WHEEL BEARING

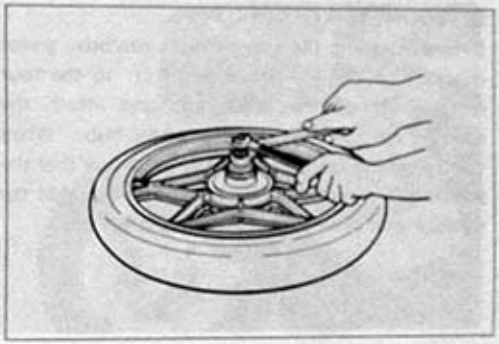
- Apply grease to the bearing before installing the bearings.

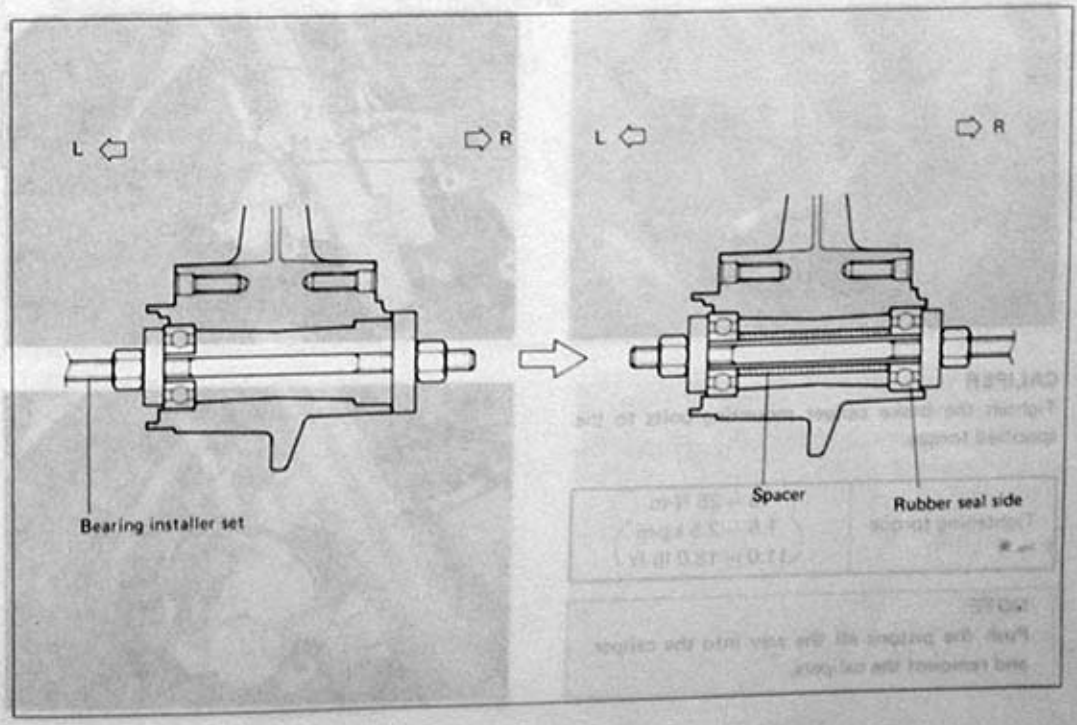
99000-25010	SUZUKI super grease "A"

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

CAUTION:
First install the left wheel bearing, then install the rubber sealed bearing for right side. The sealed face of the bearing faces outwards.

09924-84510	Bearing installer set

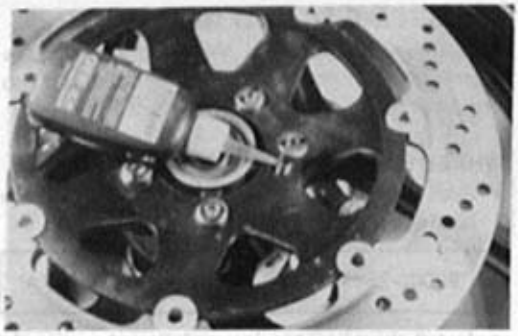




DISC

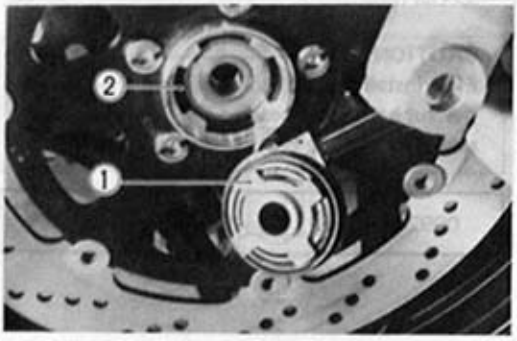
Make sure that the brake disc is clean and free of any greasy matter. Apply Thread Lock "1360" and tighten to the specified torque.

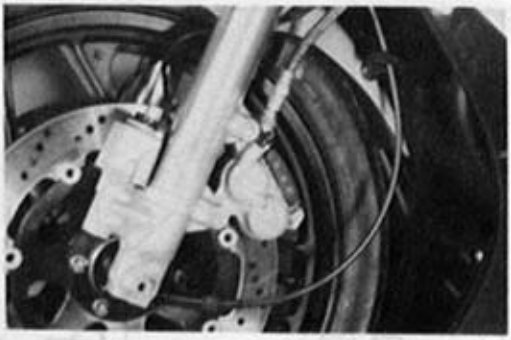
Tightening torque	15 – 25 N·m (1.5 – 2.5 kg-m 11.0 – 18.0 lb-ft)
99000-32130	Thread Lock "1360"



SPEEDOMETER GEARBOX

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



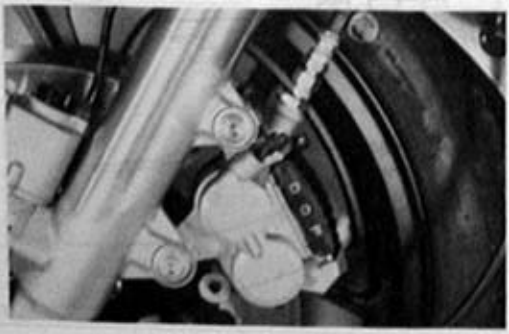


CALIPER

Tighten the brake caliper mounting bolts to the specified torque.

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

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

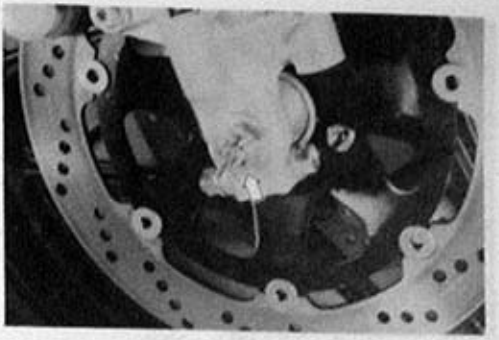


AXLE SHAFT

- Tighten the axle nut to the specified torque.

Tightening torque (Only for E-28)	36 – 52 N·m (3.6 – 5.2 kg·m, 26.0 – 37.5 lb·ft)

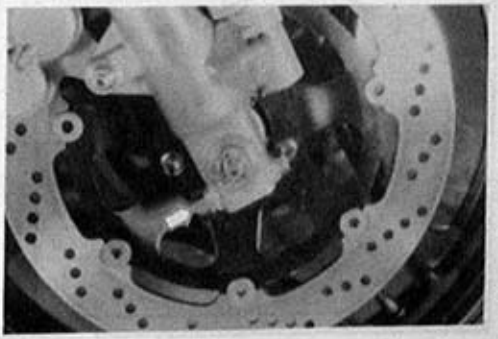
Tightening torque (For the others)	40 – 58 N·m (4.0 – 5.8 kg·m, 21.5 – 42.0 lb·ft)



- Move the front fork up and down 4 or 5 times as shown in the photograph.

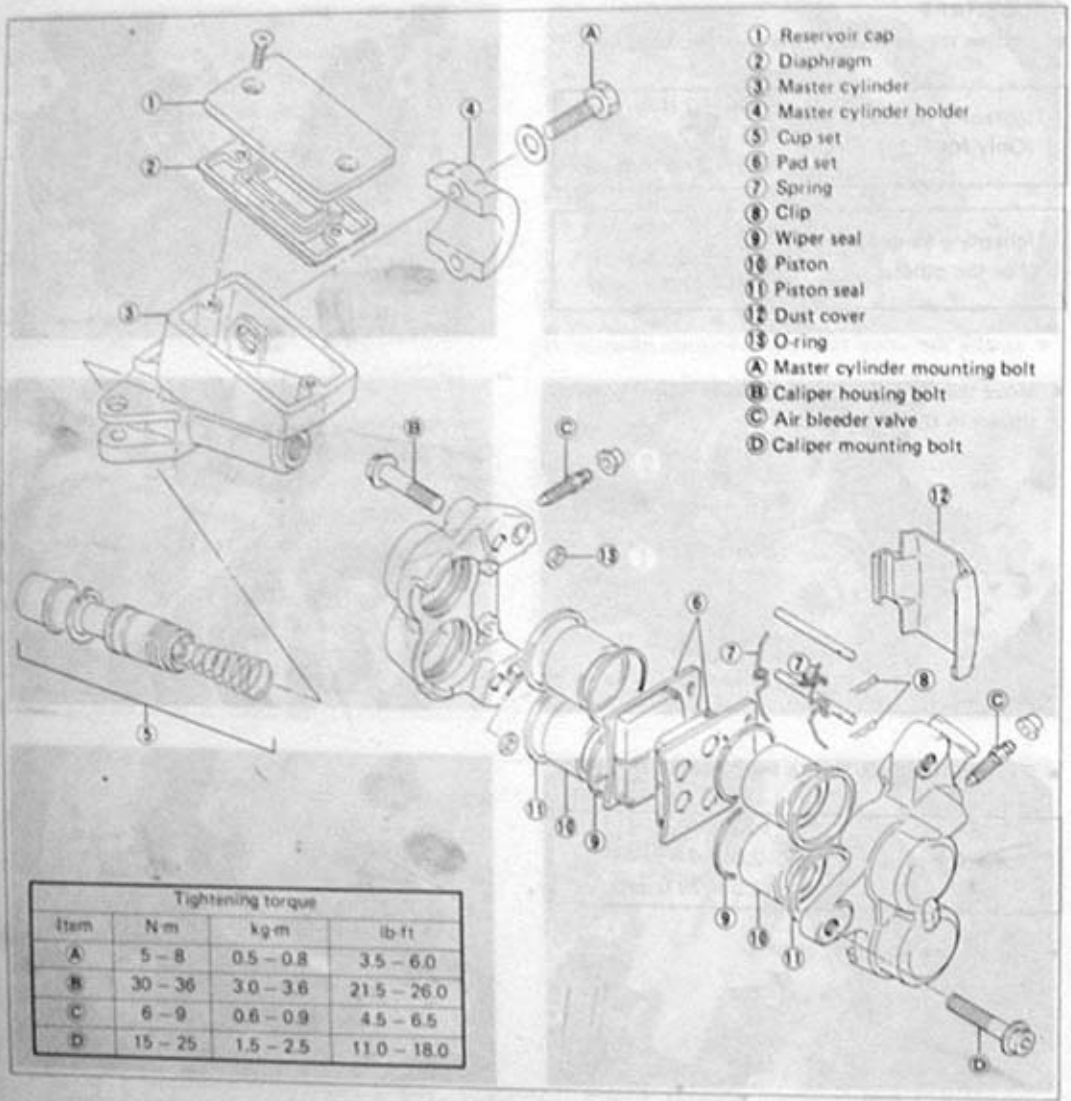
- Tighten the pinch nut to the specified torque.

Tightening torque	20 – 40 N·m (2.0 – 4.0 kg·m, 14.5 – 29.0 lb·ft)



- Tighten the stabilizer screws.

FRONT BRAKE



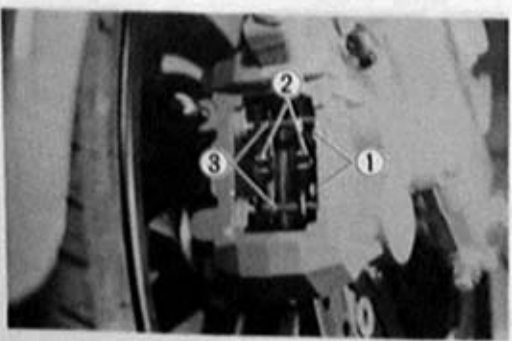
Item	Tightening torque		
	N·m	kg-m	lb-ft
Ⓐ	5 – 8	0.5 – 0.8	3.5 – 6.0
Ⓑ	30 – 36	3.0 – 3.6	21.5 – 26.0
Ⓒ	6 – 9	0.6 – 0.9	4.5 – 6.5
Ⓓ	15 – 25	1.5 – 2.5	11.0 – 18.0

BRAKE PAD REPLACEMENT

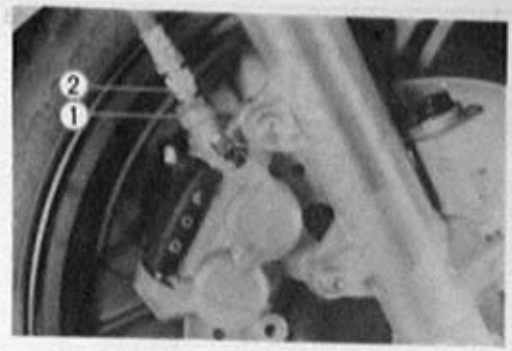
- Remove the dust cover.
- Remove the clips ① and springs ②, and draw out the pins ③.
- Take off the pads.

CAUTION:

- **Do not operate the brake lever while dismounting the pads.**
- **Replace the brake pad as a set, otherwise braking performance will be adversely affected.**



CALIPER REMOVAL AND DISASSEMBLY



- Loosen the nut ② while holding the lock nut ①.
- Disconnect the brake hose and catch the brake fluid in a suitable receptacle.

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

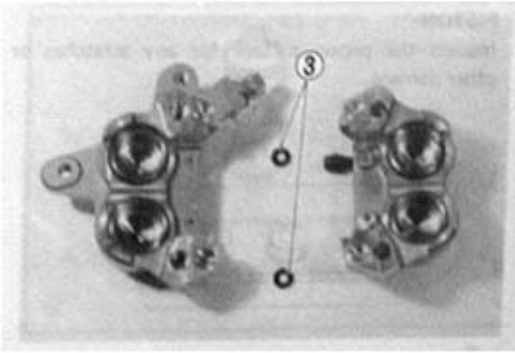
WARNING:
Brake fluid, if it leaks, will interfere with safe running and discolor painted surfaces. Check the brake hose and hose joint for cracks and oil leakage.

- Remove the caliper mounting bolts and take off the caliper.

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

09900-00401	L-type hexagon wrench set

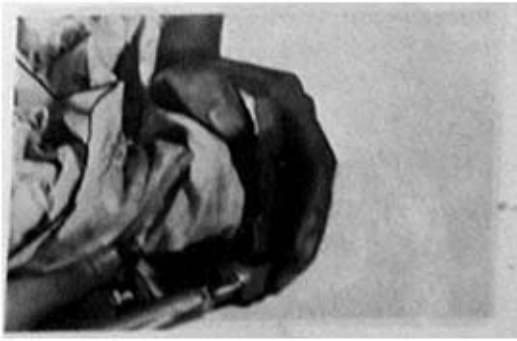
- Remove the pads. (Refer to page 6-9)
- Separate the caliper by removing the caliper housing bolts.
- Remove the O-rings ③.



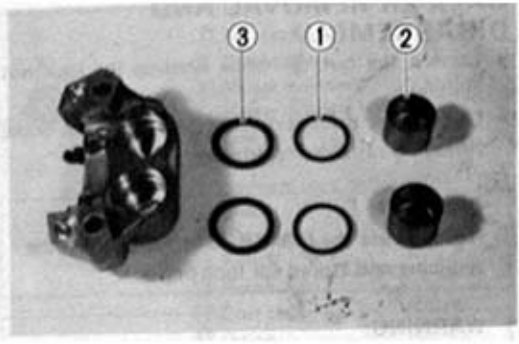
NOTE:
Once separate the caliper halves, replace the O-ring ③ with a new one.

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

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



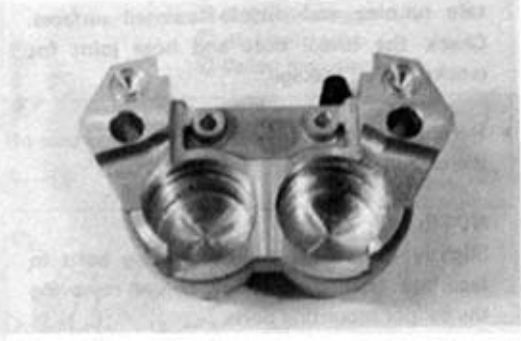
- Remove the wiper seals ①, pistons ② and piston seals ③ from the caliper.



CALIPER AND DISC INSPECTION

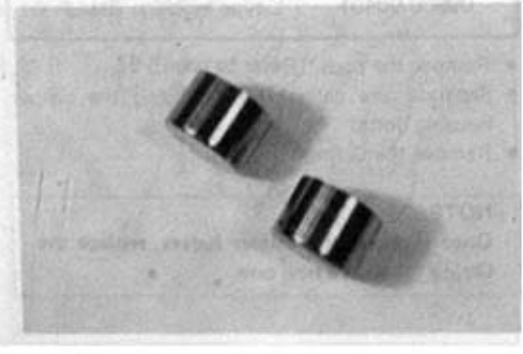
CYLINDER

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



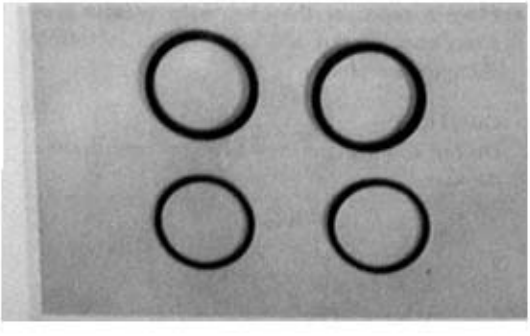
PISTON

Inspect the piston surface for any scratches or other damage.



RUBBER PART

Inspect the each rubber part for damage and wear.



DISC

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

09900-20205	Micrometer (0 – 25 mm)

Service Limit (Front disc)	4.0 mm (0.15 in)

Service Limit (Rear disc)	5.5 mm (0.22 in)

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

09900-20606	Dial gauge (1/100 mm)
09900-20701	Magnetic stand

Service Limit	0.30 mm (0.01 in)

CALIPER REASSEMBLY AND REMOUNTING

Reassemble and remount the caliper in the reverse order of removal and disassembly and taking the following steps.

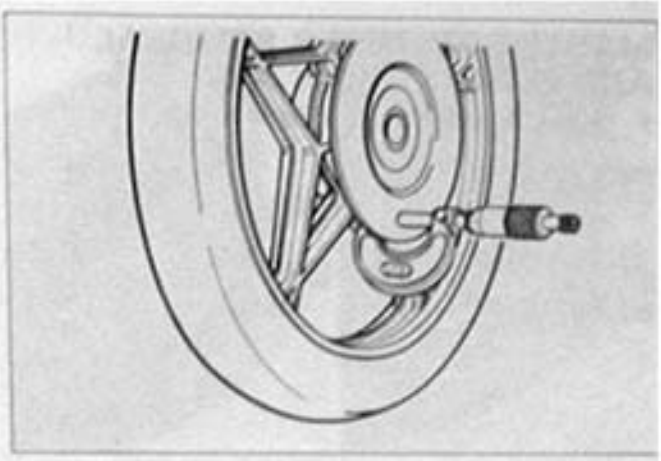
CAUTION:
- **Wash the caliper components with fresh brake fluid before reassembly.**
- **Never use cleaning solvent or gasoline to wash them.**
- **Apply brake fluid to the caliper bore and piston to be inserted into the bore.**

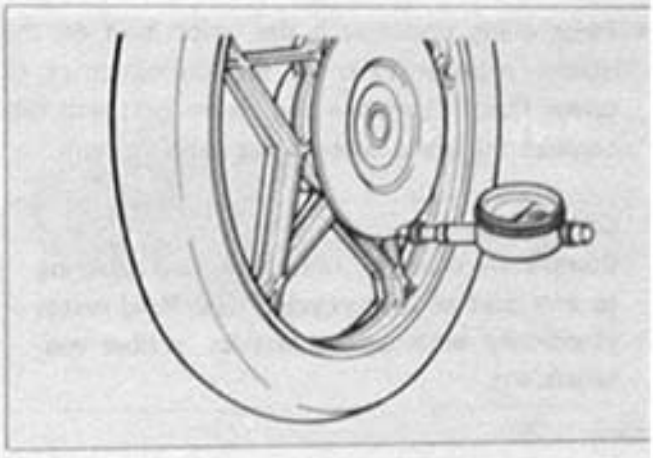
CALIPER BOLTS

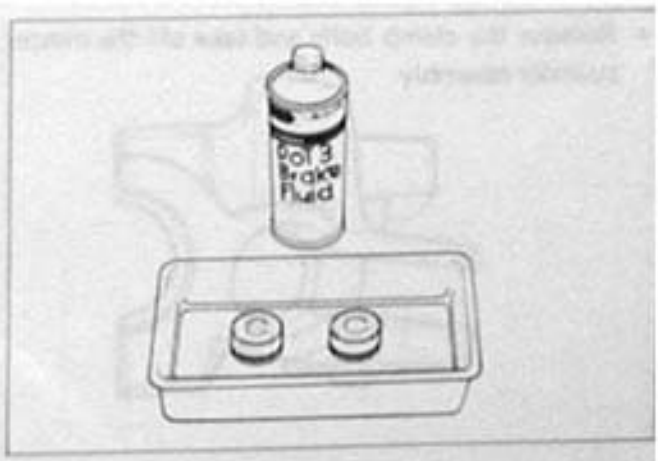
Tighten the bolts to the specified torque.

Item	N·m	kg-m	lb-ft
Union bolt	20 – 25	2.0 – 2.5	14.5 – 18.0
Caliper mounting bolt	15 – 25	1.5 – 2.5	11.0 – 18.0
Caliper housing bolt	30 – 36	3.0 – 3.6	21.5 – 26.0

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

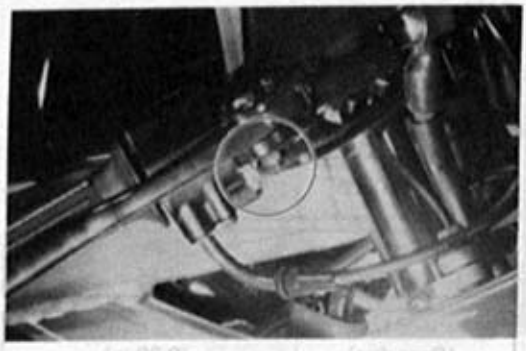






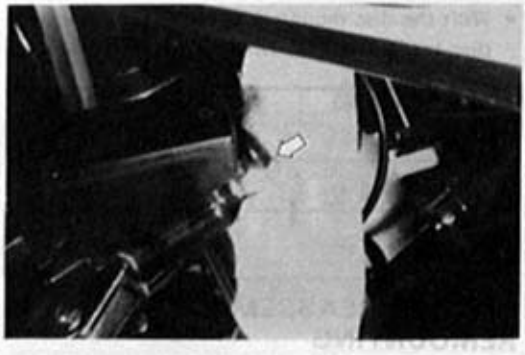
MASTER CYLINDER REMOVAL AND DISASSEMBLY

- Take off the front brake light switch.



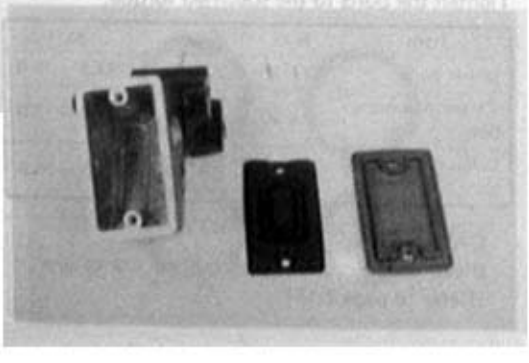
- Place a rag underneath the union bolt on the master cylinder to catch the spilled drops of brake fluid. Unscrew the union bolt and disconnect the brake hose/master cylinder joint.

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



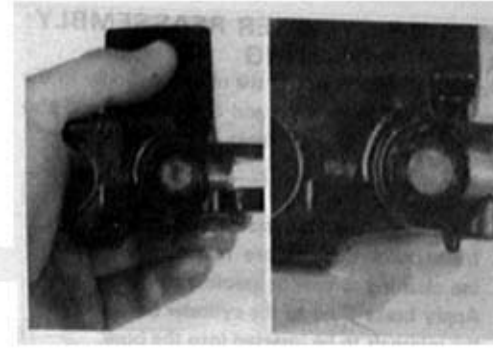
- Remove the clamp bolts and take off the master cylinder assembly.

- Remove the front brake lever, reservoir cap and diaphragm.
- Drain brake fluid.



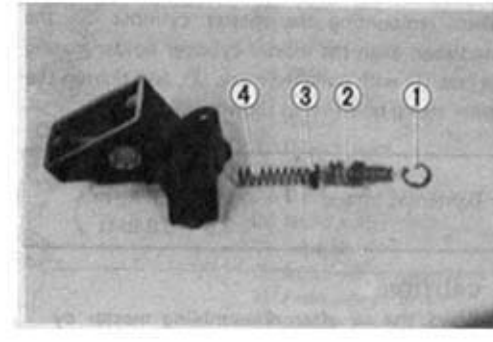
- Pull off the dust boot, then remove the circlip by using the special tool.

09900-06108	Snap ring pliers



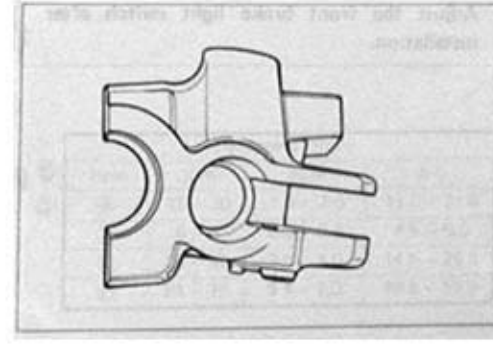
- Remove the piston, primary cup and spring.

① Circlip ③ Primary cup
② Piston ④ Return spring



MASTER CYLINDER INSPECTION

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



MASTER CYLINDER REASSEMBLY AND REMOUNTING

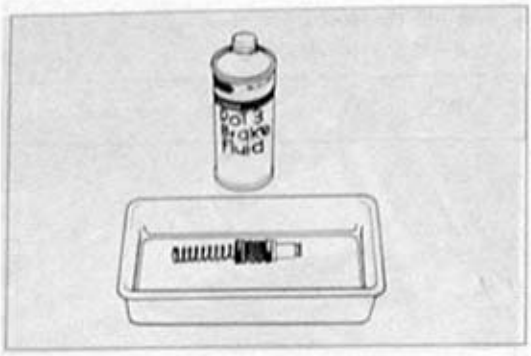
Reassemble and remount the master cylinder in the reverse order of removal and disassembly, and also carry out the following steps:

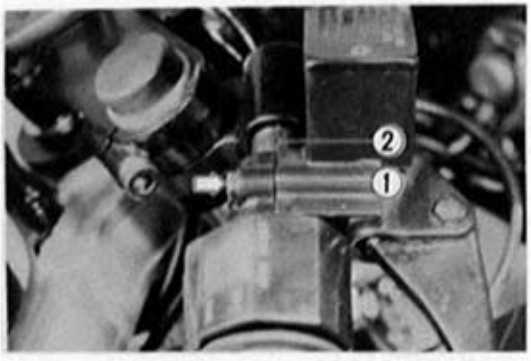
CAUTION:
Wash the master cylinder components with fresh brake fluid before reassembly. Never use cleaning solvent or gasoline to wash them. Apply brake fluid to the cylinder bore and all the internals to be inserted into the bore.

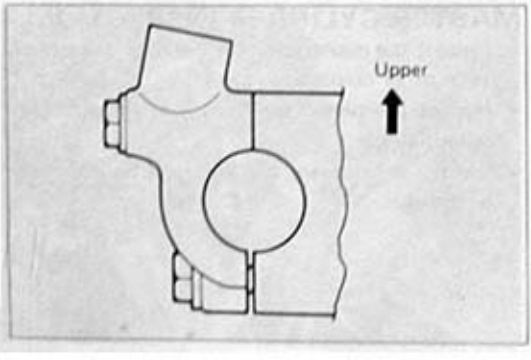
When remounting the master cylinder on the handlebar, align the master cylinder holder mating surface ① with punched mark ②, and tighten the upper clamp bolt first as shown.

Tightening torque	5.0 – 8.0 N·m (0.5 – 0.8 kg-m 3.5 – 6.0 lb-ft)

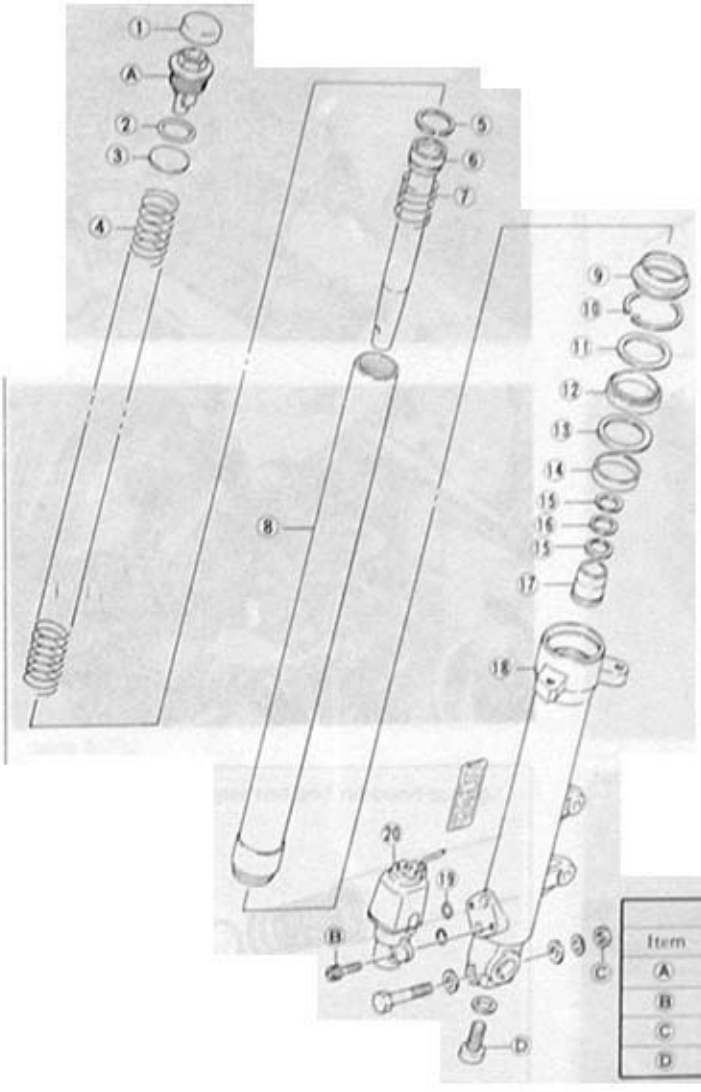
CAUTION:
Bleed the air after reassembling master cylinder. (Refer to page 2-15)
Adjust the front brake light switch after installation.







FRONT FORK



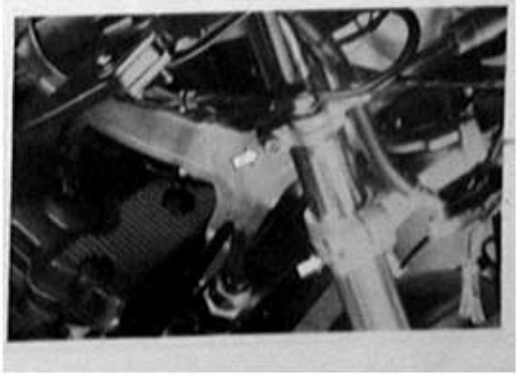
1. Cap
2. O-ring
3. Seat
4. Spring
5. Ring
6. Damper rod
7. Rebound spring
8. Inner tube
9. Dust seal
10. Snap ring
11. Washer
12. Oil seal
13. Washer
14. Metal
15. Wave washer
16. Washer
17. Oil lock piece
18. Outer tube
19. O-ring
20. NEAS unit
- A. Cap bolt
- B. NEAS unit mounting bolt
- C. Front axle pinch nut
- D. Damper rod bolt

Tightening torque			
Item	N·m	kg·m	lb-ft
A	15 – 30	1.5 – 3.0	11.0 – 21.5
B	6 – 8	0.6 – 0.8	4.5 – 6.0
C	20 – 40	2.0 – 4.0	14.5 – 29.0
D	54 – 70	5.4 – 7.0	49.5 – 50.5

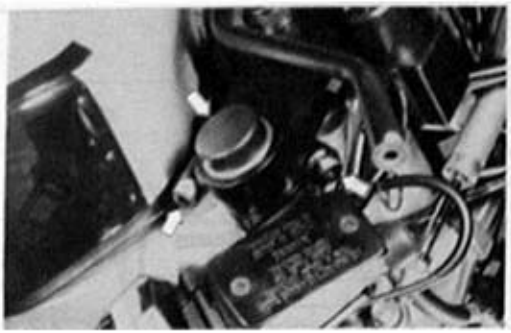
REMOVAL AND DISASSEMBLY

- Remove the fairing. (Refer to page 6-1)
- Remove the front wheel. (Refer to page 6-3)
- Loosen the front fork lower mounting bolts and steering damper bracket bolt.

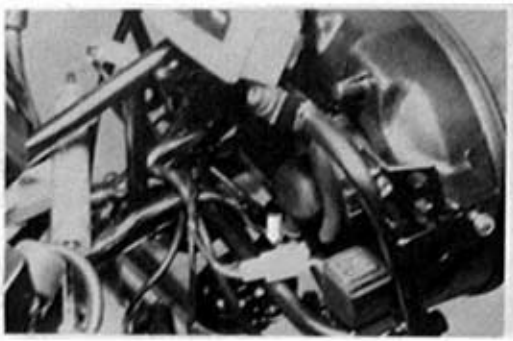
09900-00401	L-type hexagon wrench set



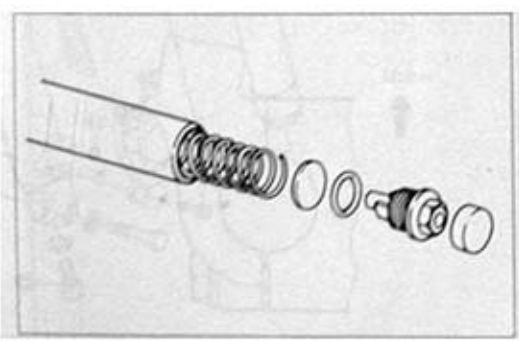
- Slightly loosen the front fork cap bolts to facilitate later disassembly.
- Loosen the handlebar holder mounting bolts and front fork upper mounting bolts.



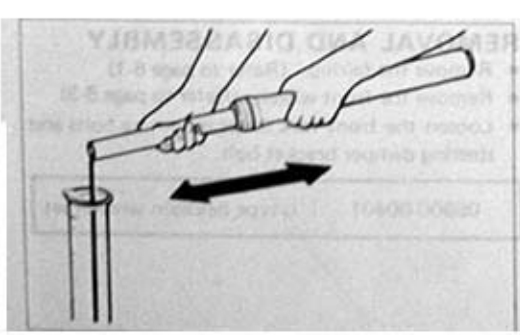
- Disconnect the right and left NEAS lead wire couplers and pull down the front fork.



- Remove the front fork cap bolt and draw out the seat, O-ring and spring.

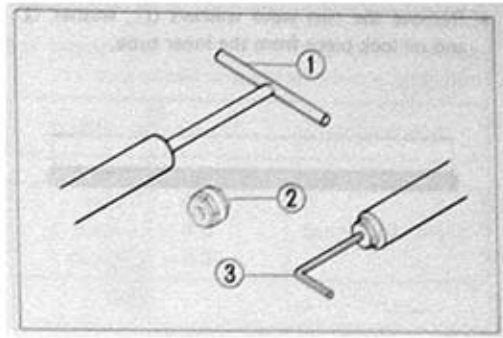


- Invert the fork and stroke it several times to let out fork oil.
- Hold the fork inverted for a few minutes to drain oil.

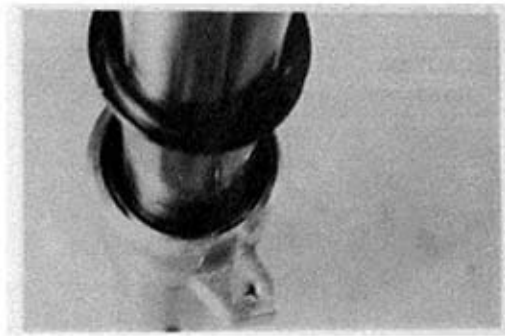


- Remove the damper rod bolt by using the special tools.

① 09940-34520	"T" handle
② 09940-34592	Attachment "G"
③ 09900-00401	L-type hexagon wrench set



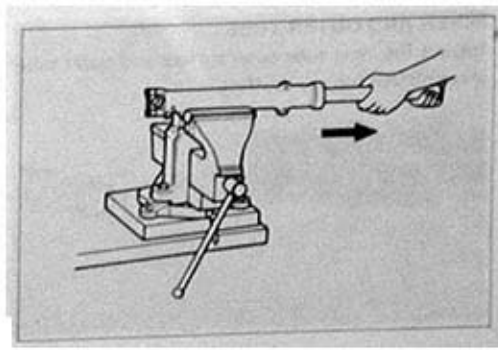
- Remove the dust seal and snap ring.



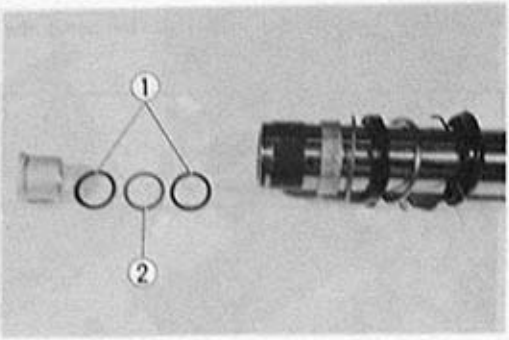
- Draw out the damper rod and rebound spring.

- While holding the caliper mounting portion by vise, separate the inner tube from the outer tube.

CAUTION:
The outer tube and inner tube "anti-friction" metals must be replaced along with the oil seal any time the fork is disassembled.

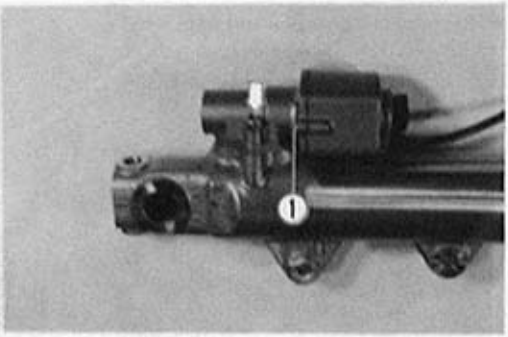


- Remove the two wave washers ①, washer ② and oil lock piece from the inner tube.



- Remove the NEAS unit.

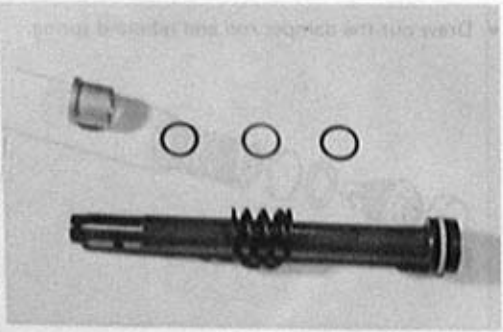
CAUTION:
Do not remove the screw ①.



INSPECTION

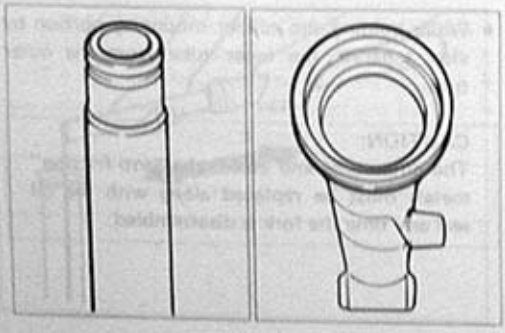
DAMPER ROD, OIL LOCK PIECE AND WASHERS

Inspect the damper rod ring, oil lock piece, wave washers and washer for wear or damage.



INNER AND OUTER TUBE

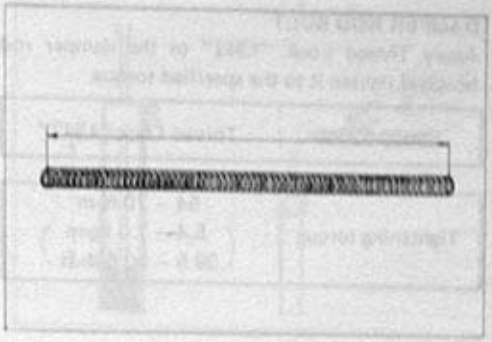
Inspect the inner tube outer surface and outer tube inner surface for any scuffing.



FORK SPRING

Measure the fork spring free length. If it is shorter than the service limit, replace it with a new one.

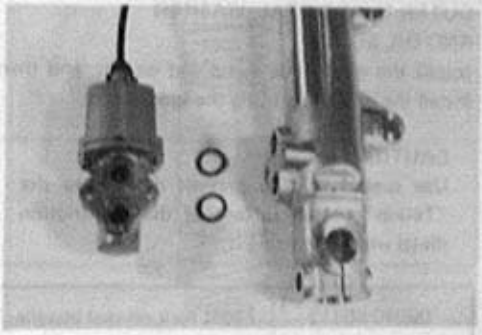
Service Limit	459 mm (18.1 in)



NEAS UNIT

- Inspect the NEAS unit for leakage of fork oil. If any defect is found, replace affected unit with a new one.

NOTE:
This part is only available as a replacement unit.



- Inspect the O-rings located between unit and front fork for wear or damage.
- Inspect the NEAS electrical system. (Refer to page 5-23)

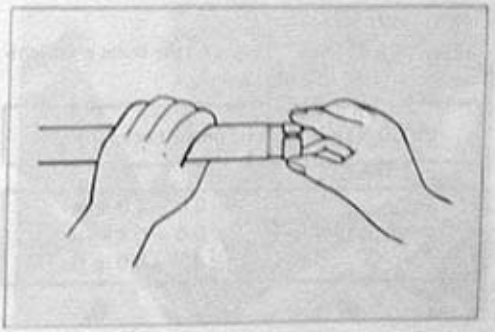
REASSEMBLY AND REMOUNTING

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

INNER TUBE METAL

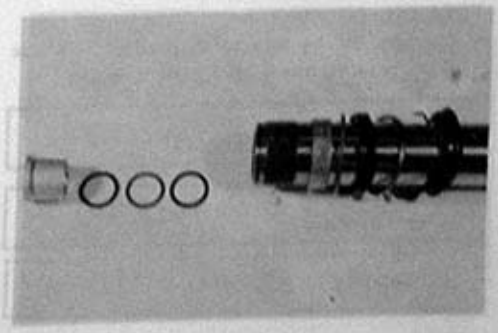
Install the metal by hand as shown.

CAUTION:
Use special care to prevent damage to the "Teflon" coated surface of the Anti-friction metal when mounting it.



OIL LOCK PIECE AND WASHERS

Install the oil lock piece, washer and wave washers as shown in the photograph.

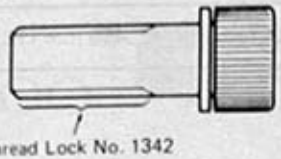


DAMPER ROD BOLT

Apply Thread Lock "1342" to the damper rod bolt and tighten it to the specified torque.

99000-32050	Thread Lock "1342"

Tightening torque	54 – 70 N·m (5.4 – 7.0 kg·m) (39.5 – 50.5 lb·ft)



Thread Lock No. 1342

OUTER TUBE METAL, WASHER AND OIL SEAL

Install the outer tube metal and washer, and then install the oil seal by using the special tool.

CAUTION:
Use special care to prevent damage to the "Teflon" coated surface of the anti-friction metal when mounting it.

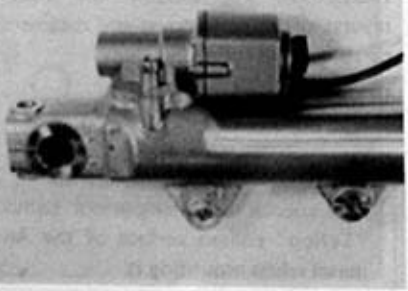
09940-50112	Front fork oil seal installer

NEAS UNIT

Apply Thread Lock "1342" to the bolts and tighten them to the specified torque.

99000-32050	Thread Lock "1342"

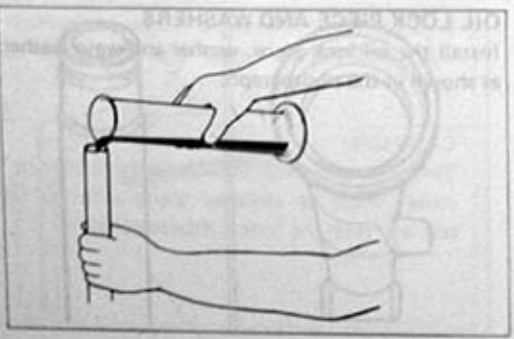
Tightening torque	6.0 – 8.0 N·m (0.6 – 0.8 kg·m) (4.5 – 6.0 lb·ft)



FORK OIL

- For fork oil, be sure to use motor oil whose viscosity rating meets specifications below.

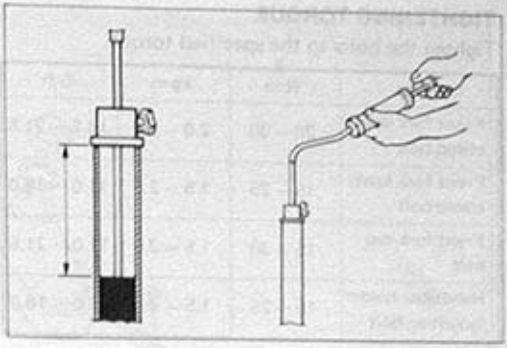
Fork oil (Only for E-28)	Fork oil #15
Fork oil (For the others)	Fork oil #10
Capacity	417 ml (14.1 US oz)



- Hold the front fork vertical and adjust the fork oil level with the special tool.

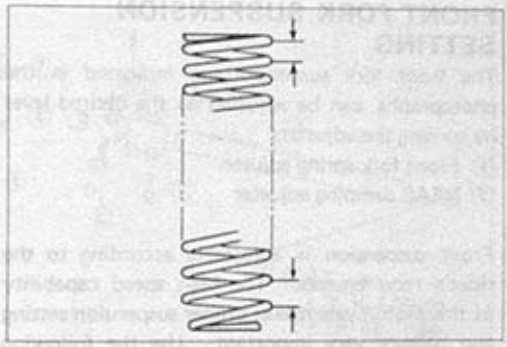
NOTE:
When adjusting oil level, remove the fork springs and compress the inner tube fully.

09943-74111	Fork oil level gauge
Oil level	159 mm (6.26 in)



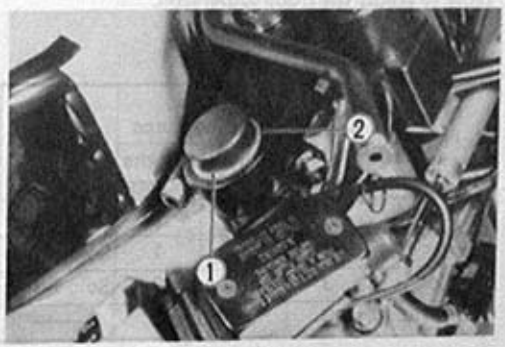
FORK SPRING

When installing the fork spring, insert it with the smaller pitch to the top.



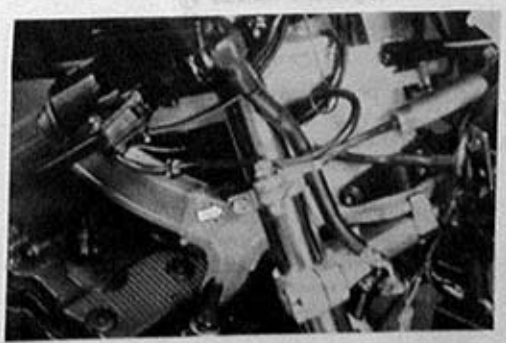
INNER TUBE

When installing the front fork assembly, align the upper surface ① of inner tube with the upper surface ② of the upper bracket.



STEERING DAMPER

When installing the steering damper, refer to page 6-28.



TIGHTENING TORQUE

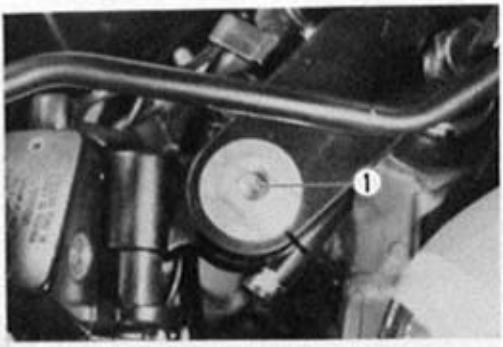
Tighten the bolts to the specified torque.

Item	N·m	kg-m	lb-ft
Front fork upper clamp bolt	20 – 30	2.0 – 3.0	14.5 – 21.5
Front fork lower clamp bolt	15 – 25	1.5 – 2.5	11.0 – 18.0
Front fork cap bolt	15 – 30	1.5 – 3.0	11.0 – 21.5
Handlebar holder mounting bolt	15 – 25	1.5 – 2.5	11.0 – 18.0

FRONT FORK SUSPENSION SETTING

The front fork suspension, as indicated in the photopraphs, can be adjusted to the desired level by turning the adjusters.

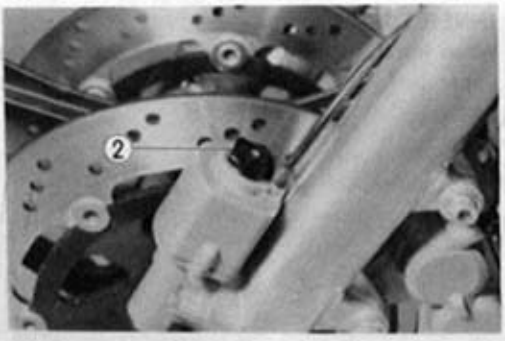
① Front fork spring adjuster
② NEAS damping adjuster



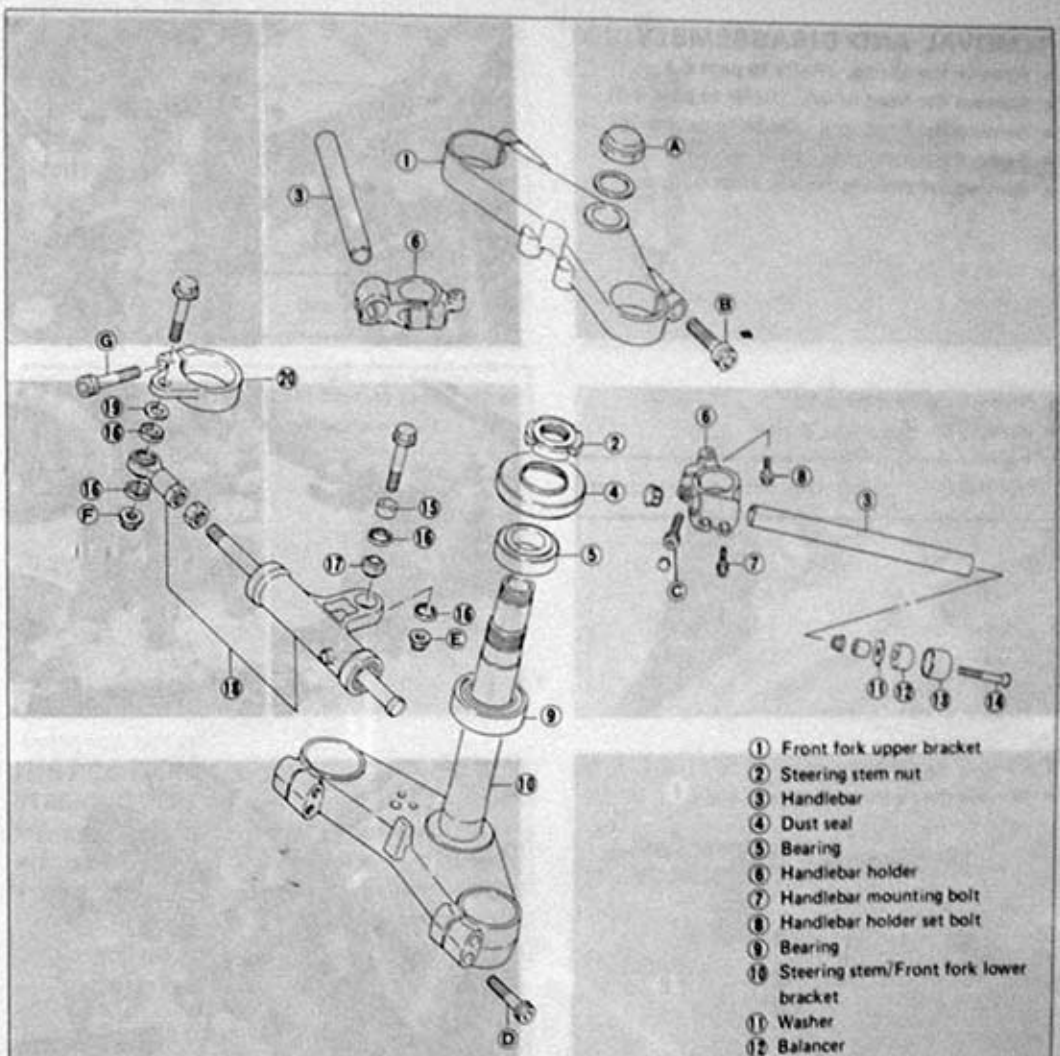
Front suspension is adjustable according to the rider's requirements. The high speed capability of this motorcycle makes proper suspension setting and balance very important. Use the following table to adjust the front suspension.

SUSPENSION SETTING TABLE

ITEM	Spring Pre-load	NEAS Damping Force		Remarks
		Only for E-28	For the others	
Standard	2	2	1	Solo riding
Softer	1	1	1	Solo riding
Stiffer	3	3	2	Solo riding
Dual riding	3	3	2	——



STEERING SYSTEM



Tightening torque			
Item	N·m	kg·m	lb·ft
Ⓐ	30 – 40	3.0 – 4.0	21.5 – 29.0
Ⓑ	20 – 30	2.0 – 3.0	14.5 – 21.5
Ⓒ	15 – 25	1.5 – 2.5	11.0 – 18.0
Ⓓ	15 – 25	1.5 – 2.5	11.0 – 18.0
Ⓔ	15 – 20	1.5 – 2.0	11.0 – 14.5
Ⓕ	15 – 20	1.5 – 2.0	11.0 – 14.5
Ⓖ	20 – 25	2.0 – 2.5	14.5 – 18.0

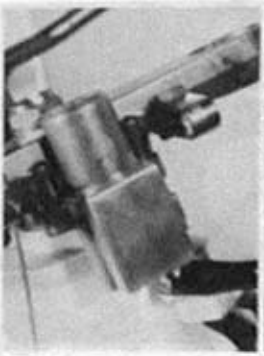
① Front fork upper bracket
② Steering stem nut
③ Handlebar
④ Dust seal
⑤ Bearing
⑥ Handlebar holder
⑦ Handlebar mounting bolt
⑧ Handlebar holder set bolt
⑨ Bearing
⑩ Steering stem/Front fork lower bracket
⑪ Washer
⑫ Balancer
⑬ Cap
⑭ Balancer mounting screw
⑮ Spacer
⑯ Dust seal
⑰ Bearing
⑱ Steering damper unit
⑲ Washer
⑳ Steering damper bracket
Ⓐ Steering stem head nut
Ⓑ Front fork upper clamp bolt
Ⓒ Handlebar holder mounting bolt
Ⓓ Front fork lower clamp bolt
Ⓔ Steering damper mounting nut
Ⓕ Steering damper mounting nut
Ⓖ Steering damper bracket bolt

REMOVAL AND DISASSEMBLY

- Remove the fairing. (Refer to page 6-1)
- Remove the front wheel. (Refer to page 6-3)
- Remove the front fork. (Refer to page 6-16)
- Remove the handlebar holder set bolts.
- Remove the steering damper inner bolt.

- Remove the ignition switch.
- Remove the brake hose joint.

09900-00401	L-type hexagon wrench set

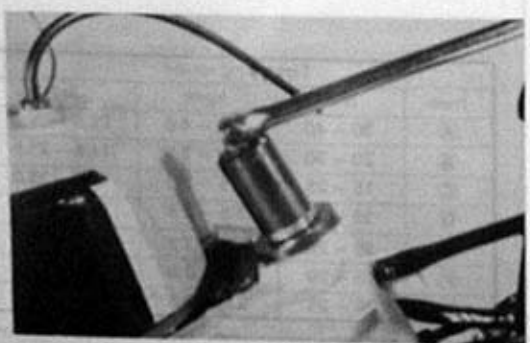


- Remove the screen brace.
- Remove the steering stem head nut.

- Remove the steering stem nut by using the special tool, then draw out the steering stem/ front fork lower bracket.

09940-14920	Steering stem nut wrench

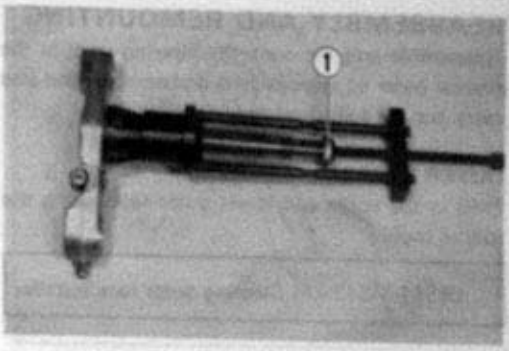
NOTE:
Hold the steering stem/front fork lower bracket by hand to prevent it from falling.



- Insert the appropriate bolt ① into the steering stem head.
- Draw out lower steering stem bearing by using the special tool.

CAUTION:
The removed bearing should be replaced with a new one.

09941-84510	Bearing remover



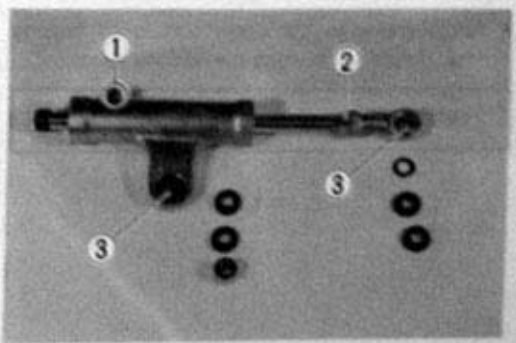
- Push out the steering stem bearing races, upper and lower, by using the appropriate drift.

INSPECTION

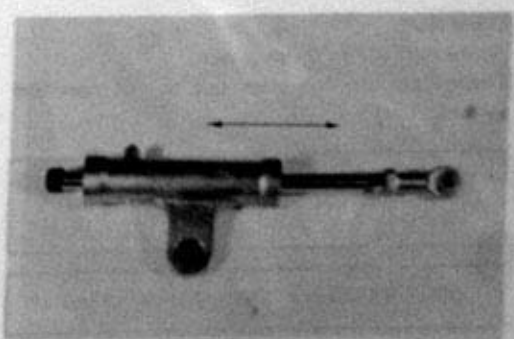
STEERING DAMPER

- Inspect the steering damper for leakage of oil.
- Inspect the each rubber part for wear or damage.
- Insert the bolt into the spherical ball bearings ③ and check the abnormal noise and smooth movement by moving the bolt.

CAUTION:
Do not touch the screw ① and nut ② .



- Inspect the steering damper operation by stroking the damper as shown in the photograph.



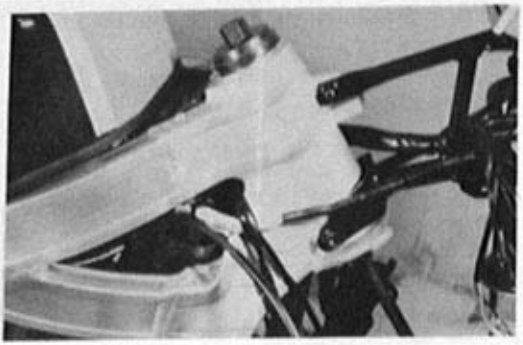
REASSEMBLY AND REMOUNTING

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

OUTER RACES

Press in the upper and lower outer races using the special tool.

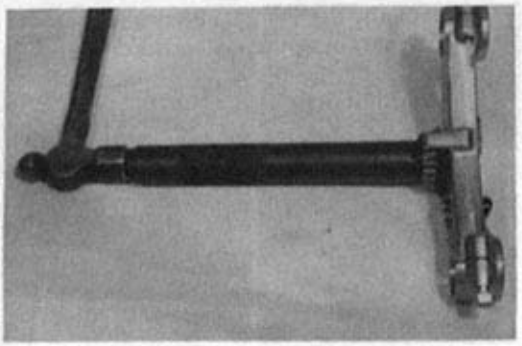
09941-34513	Steering outer race installer



BEARING

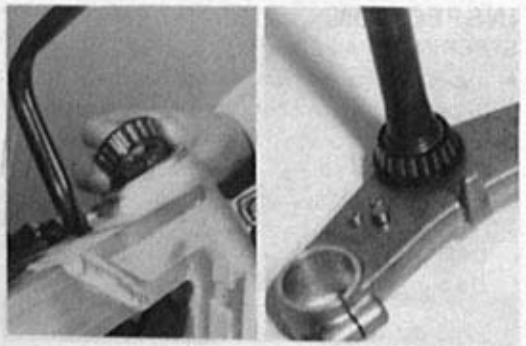
- Place a washer on the bearing and press in the lower bearing by using the special tool.

09941-74910	Steering bearing installer



- Apply grease to the upper and lower bearing races before remounting the steering stem.

99000-25010	SUZUKI super grease "A"

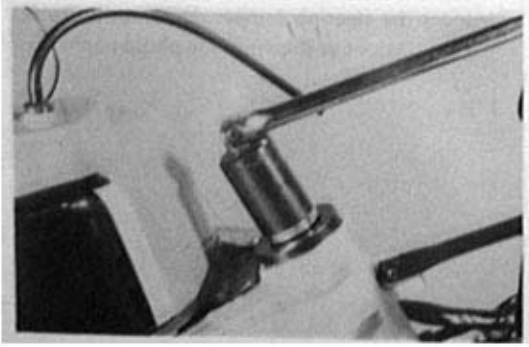


STEM NUT

Fit the dust seal to the stem nut.

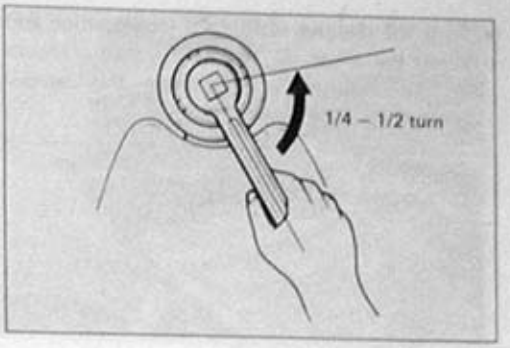
Tighten the steering stem nut to the specified torque.

Tightening torque	40 – 50 N·m (4.0 – 5.0 kg-m 29.0 – 36.0 lb-ft)
09940-14920	Steering stem nut wrench



Turn the steering stem bracket about five or six times to the left and right so that the taper roller bearing will be seated properly.

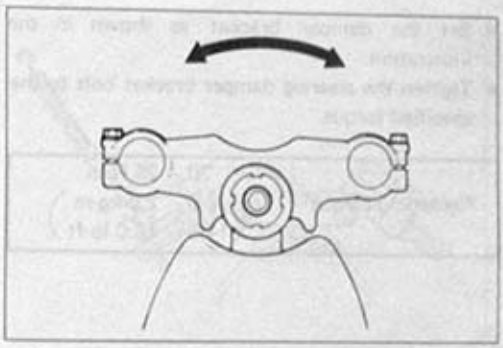
Turn back the stem nut by ¼ – ½ turn.



NOTE:
This adjustment will vary from motorcycle to motorcycle.

Steering stem head nut should be tightened to the specified torque.

Tightening torque	30 – 40 N·m (3.0 – 4.0 kg·m 21.5 – 29.0 lb·ft)

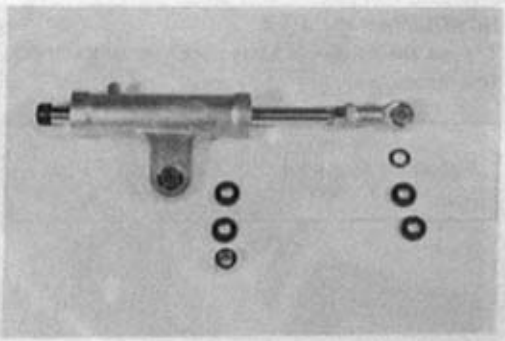


CAUTION:
After performing the adjustment and installing all the parts, check the steering tension (Refer to page 6-29)

STEERING DAMPER

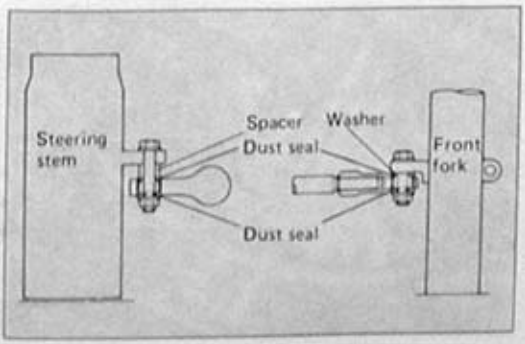
- Apply a grease to the bearing and dust seal.

99000-25010	SUZUKI super grease "A"



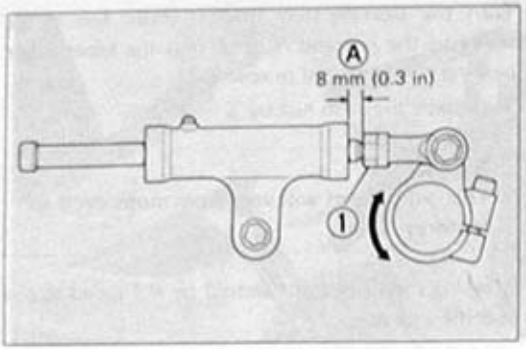
- Tighten the steering damper mounting bolts to the specified torque as shown in the illustration and photograph.

Tightening torque	15 – 20 N·m (1.5 – 2.0 kg·m 11.0 – 14.5 lb·ft)



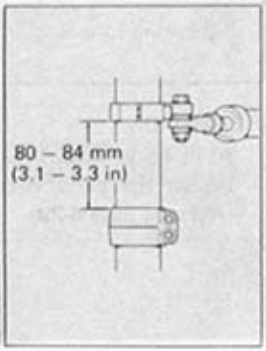
- Turn the steering to full left lock position and adjust the length Ⓐ to 8 mm (0.3 in) as shown in the illustration by turning the damper bracket.

CAUTION:
Do not turn the nut ①.



- Set the damper bracket as shown in the illustration.
- Tighten the steering damper bracket bolt to the specified torque.

Tightening torque	20 – 25 N·m (2.0 – 2.5 kg-m) (14.5 – 18.0 lb-ft)



HANDLEBAR HOLDER

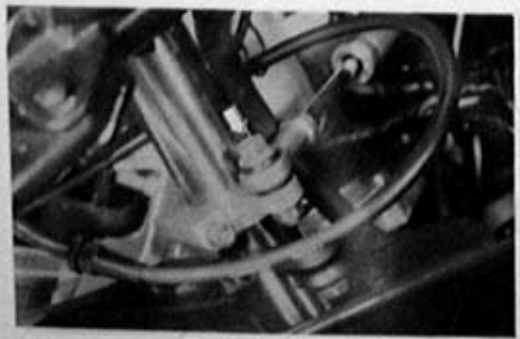
Tighten the handlebar holder set bolt to the specified torque.

Tightening torque	6.0 – 10 N·m (0.6 – 1.0 kg-m) (4.5 – 7.0 lb-ft)

STEERING TENSION ADJUSTMENT

Check the steering tension with the following procedures.

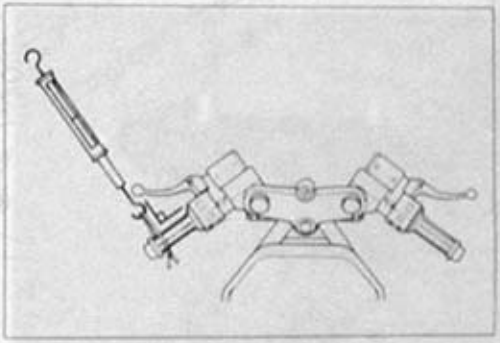
- Remove the steering damper right-side mounting bolt.
- Remove the bottom fairing.
- By using jacks at two (right and left) positions on the frame down tubes (lower straight portions), left the front wheel until it is off the floor by 20 to 30 mm.
- Check to make sure that the cables and wire harness are properly routed.



- With the front wheel in the straight ahead state, hitch the spring scale (special tool) on one handlebar grip end as shown in the figure and read the graduation when the handlebar starts moving. Do the same on the other grip end.

Initial force	200 – 500 grams

09940-92710	Spring scale



- If the initial force read on the scale when the handlebar starts turning is either too heavy or too light, adjust it till it satisfies the specification.
  1) First, loosen the front fork upper clamp bolts, handlebar holder mounting bolts and steering stem head nut, and then adjust the steering stem nut by loosening or tightening it.
  2) Tighten the head nut, holder mounting bolts and clamp bolts to the specified torque and re-check the initial force with the spring scale according to the previously described procedure.

Tightening torque

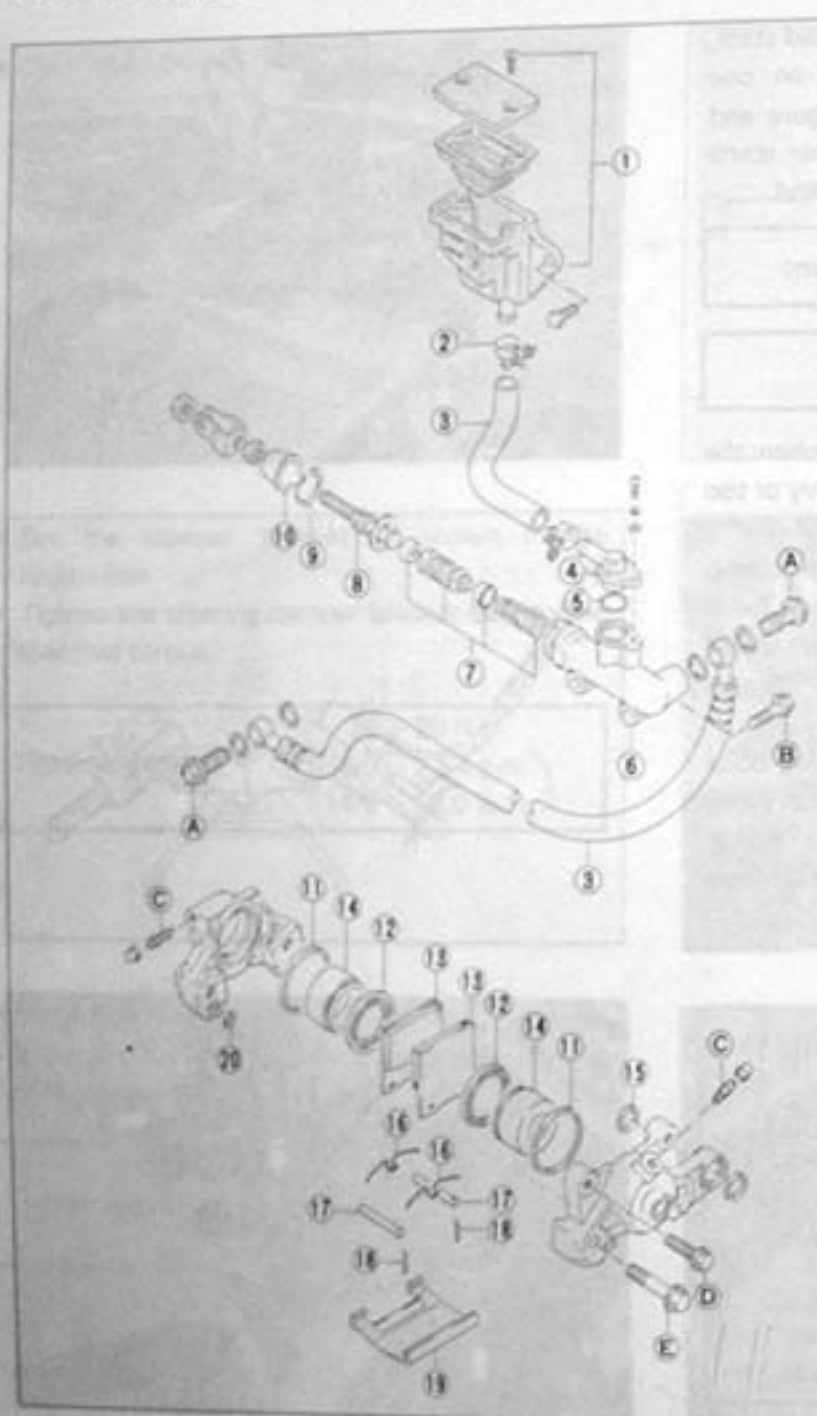
Stem head nut tightening torque	30 – 40 N·m (3.0 – 4.0 kg-m / 21.5 – 29.0 lb-ft)
Front fork upper clamp bolt tightening torque	20 – 30 N·m (2.0 – 3.0 kg-m / 14.5 – 21.5 lb-ft)
Handlebar holder mounting bolt tightening torque	15 – 25 N·m (1.5 – 2.5 kg-m / 11.0 – 18.0 lb-ft)

  3) If the initial force is found within the specified range, adjustment has been completed.

NOTE:
Hold the front fork leg, move it back and forth and make sure that the steering is not loose.

- Lower the jacks and install the bottom fairing.
- Install the steering damper. (Refer to page 6-28)

REAR BRAKE



① Reservoir tank
② Clamp
③ Hose
④ Connector
⑤ O-ring
⑥ Master cylinder
⑦ Cup set
⑧ Rod
⑨ Circlip
⑩ Dust cover
⑪ Piston seal
⑫ Dust boot
⑬ Pad
⑭ Piston
⑮ Oil seal
⑯ Spring
⑰ Pin
⑱ Clip
⑲ Cover
⑳ O-ring
Ⓐ Union bolt
Ⓑ Master cylinder mounting bolt
Ⓒ Air bleeder valve
Ⓓ Caliper mounting bolt
Ⓔ Caliper housing bolt

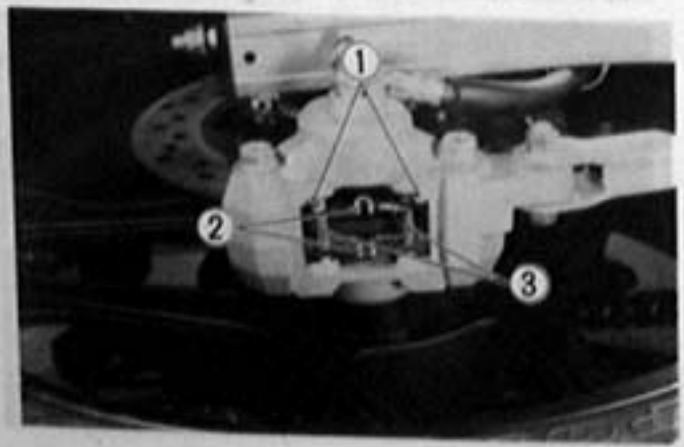
Tightening torque			
Item	N·m	kg-m	lb-ft
Ⓐ	20 – 25	2.0 – 2.5	14.5 – 18.0
Ⓑ	6 – 10	0.6 – 1.0	4.5 – 7.0
Ⓒ	6 – 9	0.6 – 0.9	4.5 – 6.5
Ⓓ	15 – 25	1.5 – 2.5	11.0 – 18.0
Ⓔ	30 – 36	3.0 – 3.6	21.5 – 26.0

BRAKE PAD REPLACEMENT

- Remove the dust cover.
- Remove the clips ① and springs ②, and draw out the pins ③.
- Take off the pads.

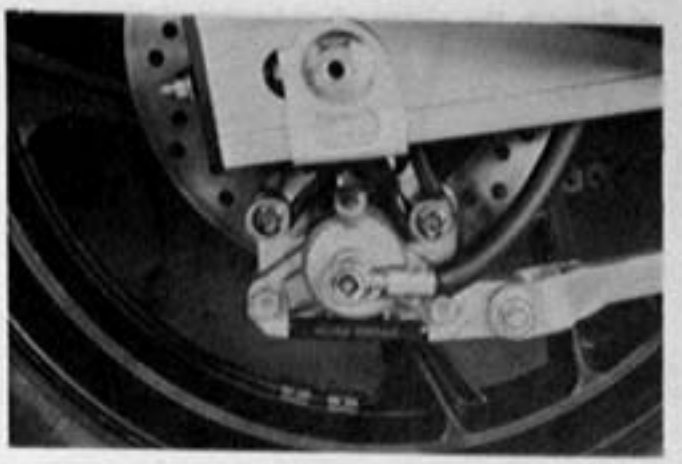
CAUTION:

- **Do not operate the brake pedal while dismounting the pads.**
- **Replace the brake pad as a set, otherwise braking performance will be adversely affected.**



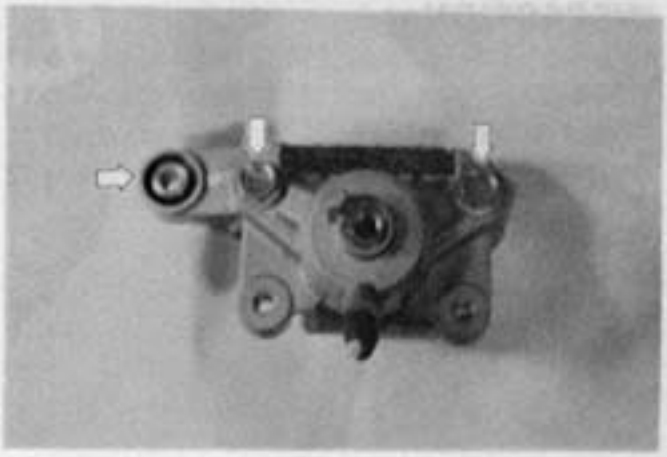
CALIPER REMOVAL AND DISASSEMBLY

- Remove the union bolt and catch the brake fluid in a suitable receptacle.
- Remove the caliper mounting bolts.
- Remove the torque link bolt and nut, and take off the caliper.



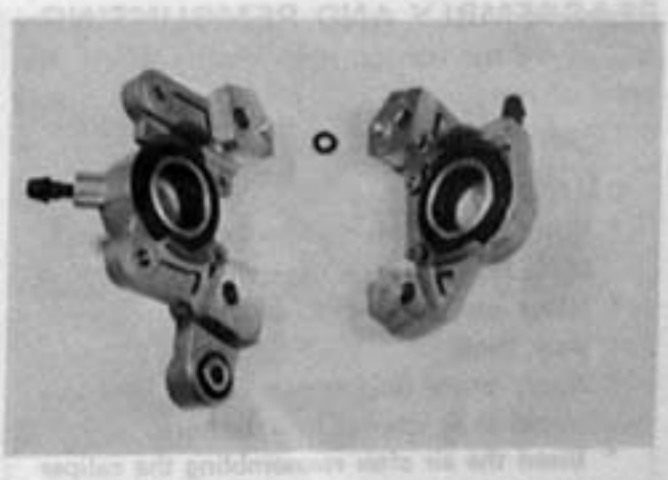
NOTE:
Slightly loosen the caliper housing bolts to facilitate later disassembly before removing the caliper mounting bolts.

- Remove the pads. (Refer to page 6-31)
- Remove the torque link bushing.
- Remove the caliper housing bolts and separate the caliper halves.



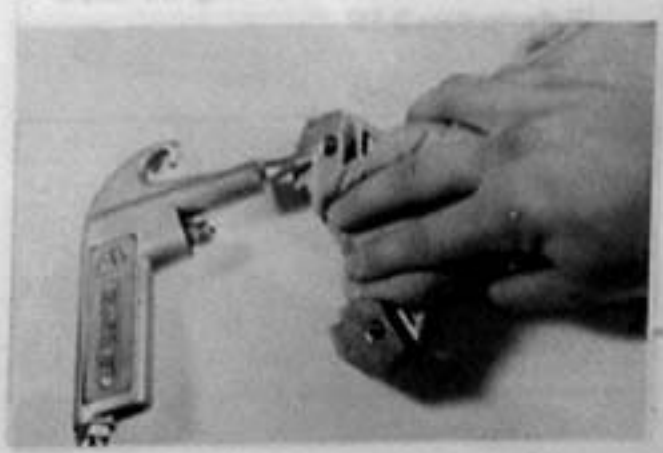
- Remove the O-ring.

NOTE:
Whenever separating the caliper halves, replace the O-ring with a new one.



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

CAUTION:
To prevent piston damage, do not use high pressure air.



- Remove the piston, dust boot and piston seal.

INSPECTION

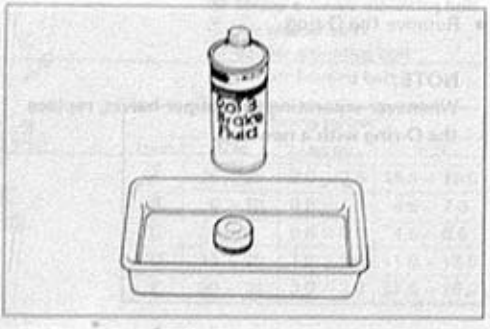
CYLINDER ..... Refer to page 6-11
PISTON ..... Refer to page 6-11
RUBBER PARTS ..... Refer to page 6-11
DISC ..... Refer to page 6-12

REASSEMBLY AND REMOUNTING

Reassemble and remount the caliper in the reverse order of removal and disassembly, 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 the caliper (Refer to page 2-15)**



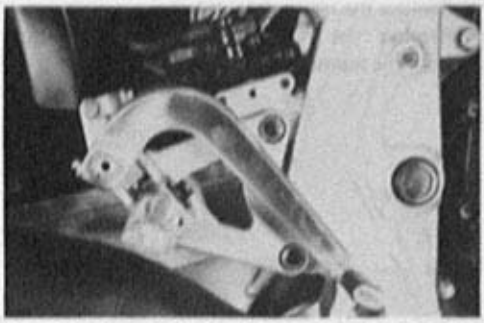
TIGHTENING TORQUE

Item	N·m	kg-m	lb-ft
Union bolt	20 – 25	2.0 – 2.5	14.5 – 18.0
Torque link nut	18 – 28	1.8 – 2.8	13.0 – 20.0
Caliper housing bolt	30 – 36	3.0 – 3.6	21.5 – 26.0
Caliper mounting bolt	15 – 25	1.5 – 2.5	11.0 – 18.0

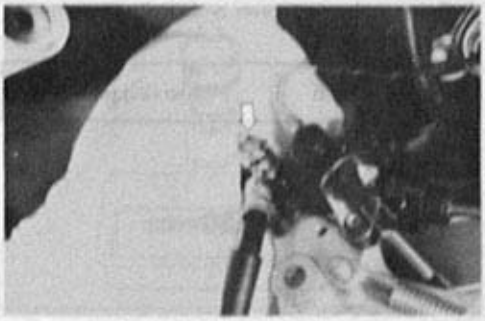
MASTER CYLINDER REMOVAL AND DISASSEMBLY

- Remove the right frame cover.
- Remove the brake pedal.
- Remove the right footrest mounting bracket.

09900-00401	L-type hexagon wrench set

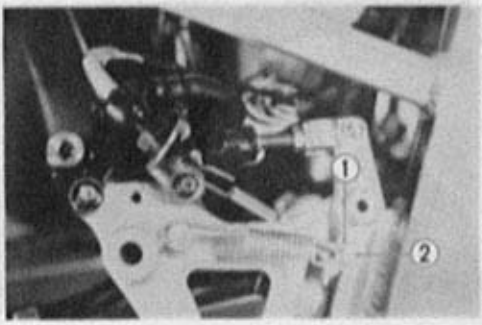


- Disconnect the rear brake light switch lead wires.
- Place a cloth underneath the union bolt on the master cylinder to catch spilled drops of brake fluid. Unscrew the union bolt and disconnect the brake hose from the master cylinder joint.

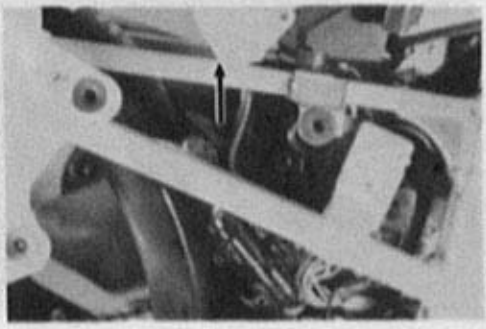


CAUTION:
Immediately and completely wipe off any brake fluid contacting any part of the motorcycle. The fluid reacts chemically with paint, plastics and rubber materials, etc. and will damage them severely.

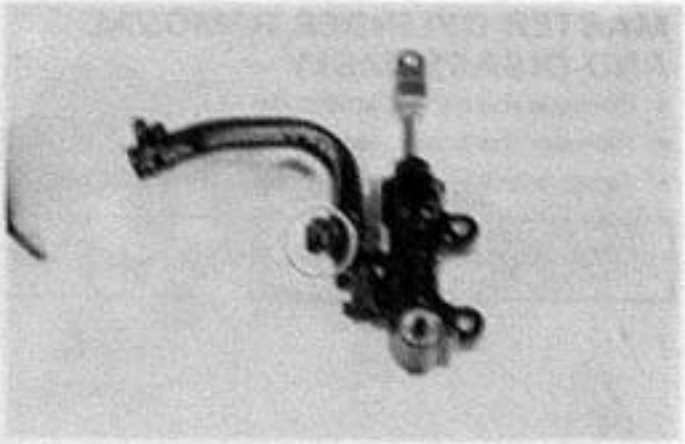
- Pull out cotter pin ① and take off the pin ②.
- Remove the master cylinder from the footrest bracket.



- Remove the reservoir tank mounting bolt.
- Take out the master cylinder with reservoir tank upward, as shown in the photograph.



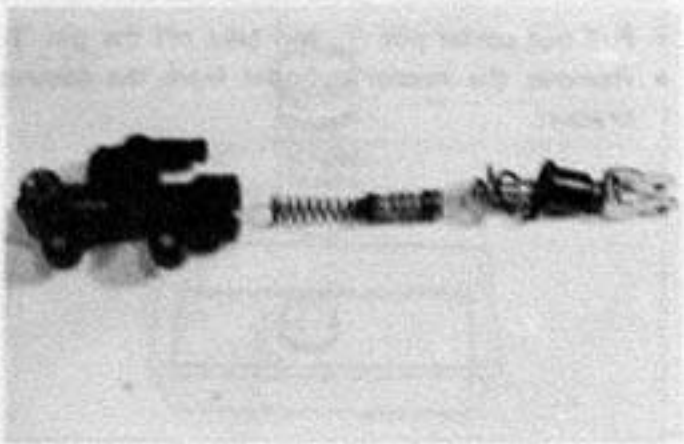
- Remove the reservoir tank hose.
- Remove the reservoir tank and drain fluid from the reservoir tank.



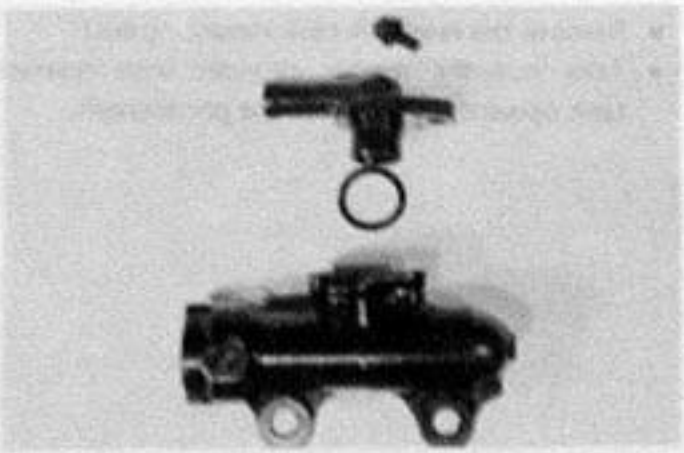
- Remove the dust cover and circlip by using the special tool.

09900-06105	Snap ring pliers

- Draw out the rod, piston, primary cup and spring.



- Remove the connector and O-ring.



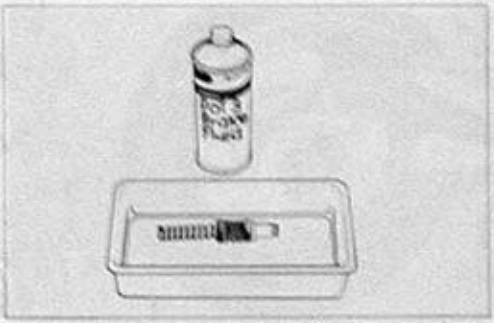
INSPECTION

CYLINDER, PISTON AND CUPSET

- Inspect the cylinder bore wall for any scratches or other damage.
- Inspect the piston surface for any scratches or other damage.
- Inspect the cup set and each rubber part for damage.

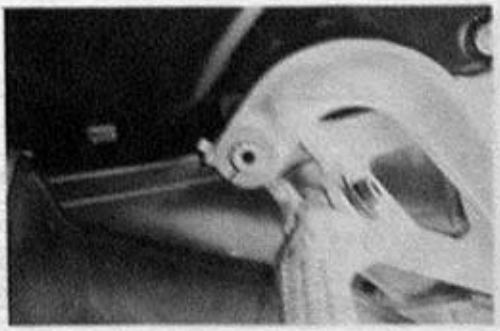
REASSEMBLY AND REMOUNTING

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



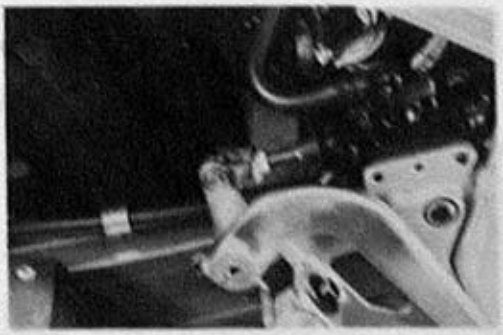
CAUTION:
Wash the master cylinder components with fresh brake fluid before reassembly. Never use cleaning solvent or gasoline to wash them. Apply brake fluid to the cylinder bore and all the internal parts to be inserted into the bore.

CAUTION:
Bleed the air after reassembling master cylinder. (Refer to page 2-15)
Adjust the rear brake light switch and brake pedal height after installation. (Refer to page 2-14)



REAR BRAKE PEDAL

When reinstalling the brake pedal, align both the punched marks on the brake pedal and on the end face of the brake pedal rod arm.

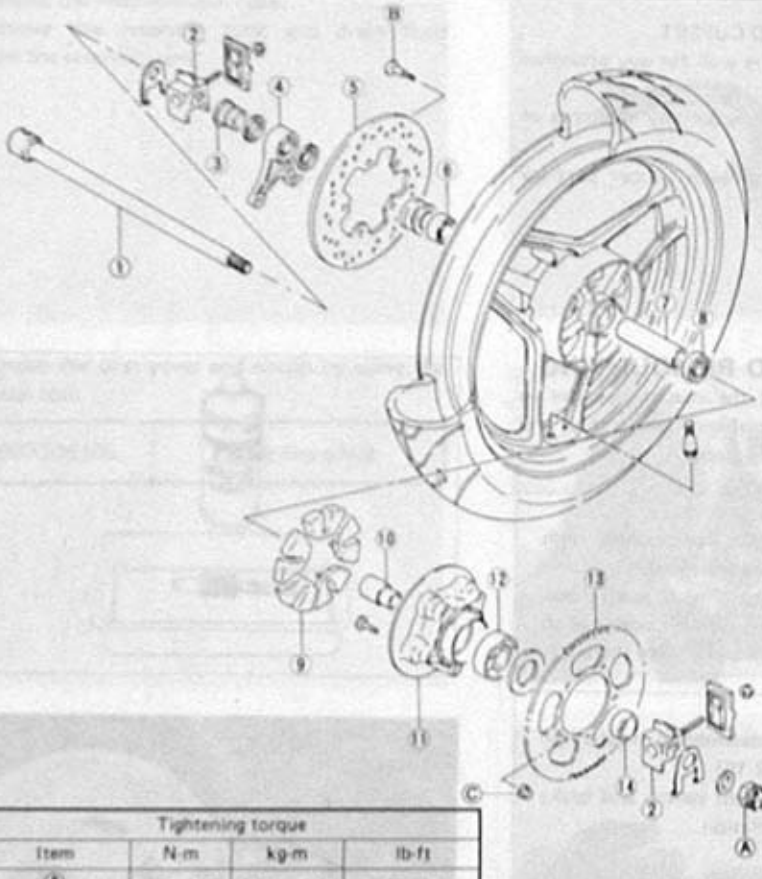


TIGHTENING TORQUE

Tighten the bolts to the specified torque.

	N·m	kg·m	lb·ft
Master cylinder mounting bolt	6 – 10	0.6 – 1.0	4.5 – 7.0
Union bolt	20 – 25	2.0 – 2.5	14.5 – 18.0
Brake pedal bolt	6 – 10	0.6 – 1.0	4.5 – 7.0

REAR WHEEL

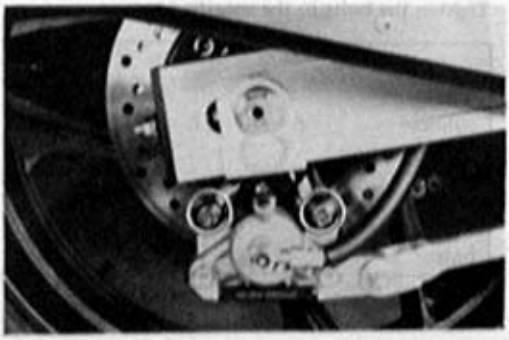


① Axle shaft
② Chain adjuster
③ Spacer
④ Caliper bracket
⑤ Disc plate
⑥ Bearing
⑦ Spacer
⑧ Bearing
⑨ Cushion
⑩ Spacer
⑪ Sprocket drum
⑫ Bearing
⑬ Sprocket
⑭ Spacer
⑮ Cotter pin (Only for E-28)
Ⓐ Axle nut
Ⓑ Disc plate mounting bolt
Ⓒ Sprocket mounting nut

Tightening torque			
Item	N·m	kg-m	lb-ft
Ⓐ (Only for E-28)	85 – 115	8.5 – 11.5	61.5 – 83.0
Ⓐ (For the others)	94 – 127	9.4 – 12.7	68.0 – 92.0
Ⓑ	15 – 25	1.5 – 2.5	11.0 – 18.0
Ⓒ	48 – 72	4.8 – 7.2	35.0 – 52.0

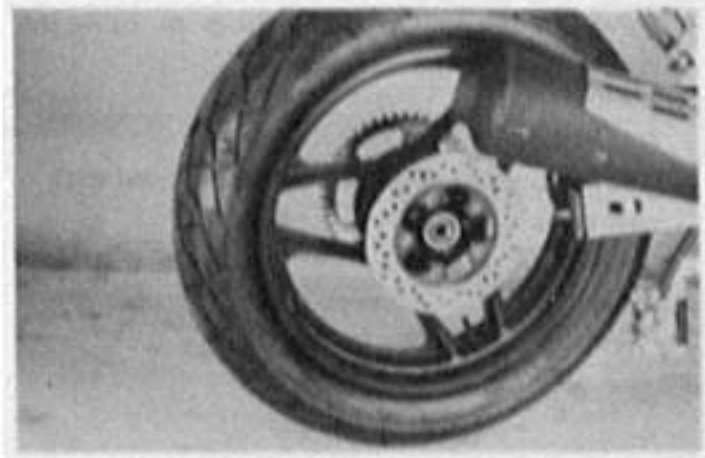
REMOVAL AND DISASSEMBLY

- Support the motorcycle by using jack with wooden block.
- Remove the rear brake caliper mounting bolts and take off the caliper with torque link.

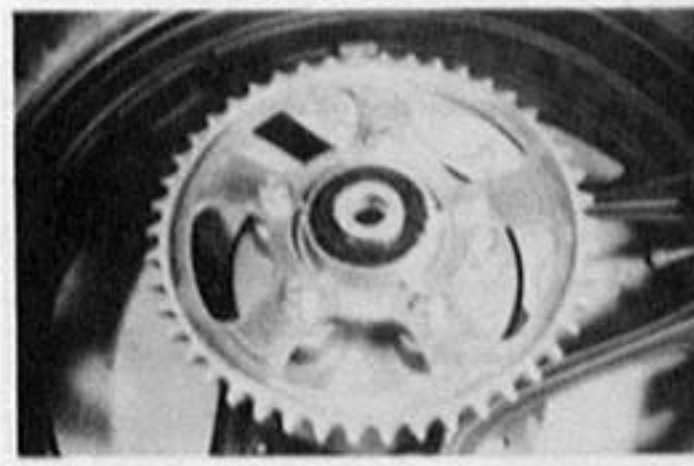


- Pull out the cotter pin. (Only for E-28)
- Remove the rear axle nut.
- Draw out the axle shaft.

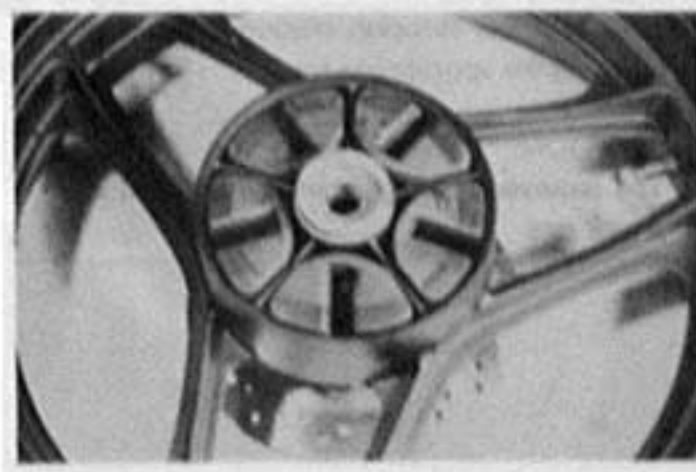
- Take off the drive chain from the rear sprocket.
- Remove the rear wheel.



- Draw out the rear sprocket mounting drum from the wheel.



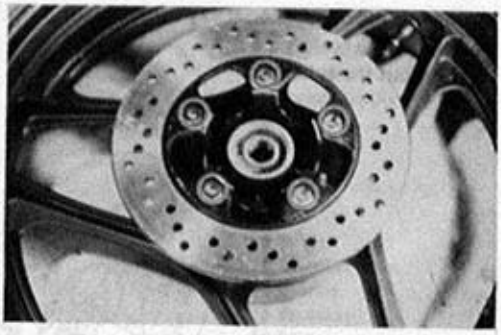
- Remove the five cushions.



REAR WHEEL

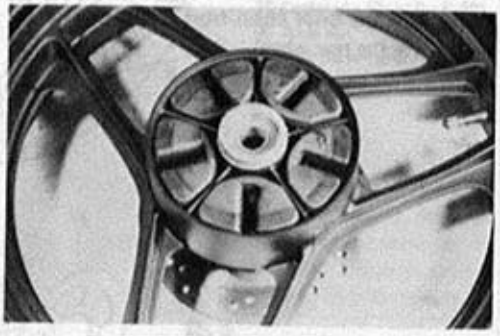
- Separate the disc from wheel.

09900-00401	L-type hexagon wrench set

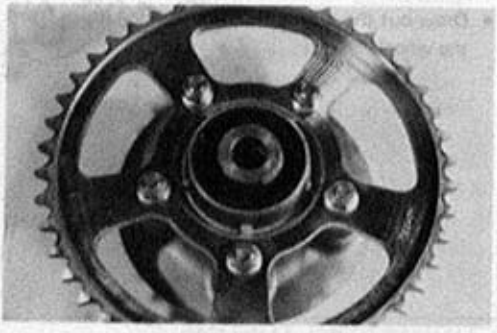


- Drive out the four wheel bearings by using the appropriate tool.

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

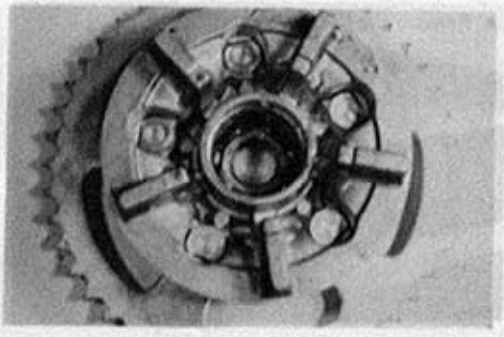


- Separate the rear sprocket from sprocket mounting drum.
- Remove the spacer and oil seal.



- Drive out the sprocket mounting drum bearing by using the appropriate tool.

CAUTION:
The removed bearing should be replaced with a new one.



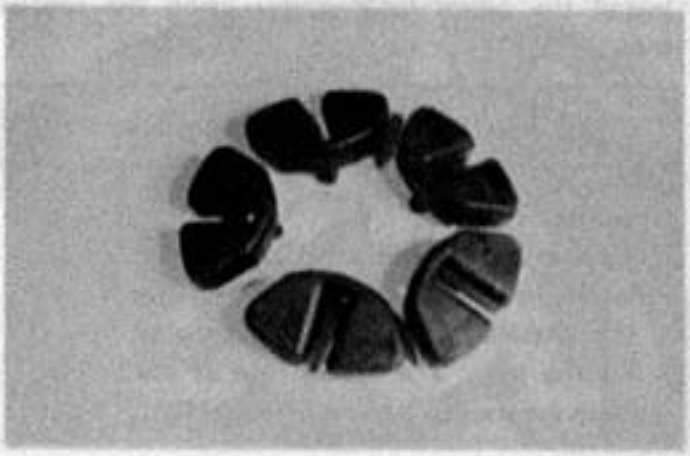
INSPECTION

WHEEL AND MOUNTING

DRUM BEARINGS ..... Refer to page 6-5
AXLE SHAFT ..... Refer to page 6-5
WHEEL ..... Refer to page 6-5
TIRE ..... Refer to page 6-45

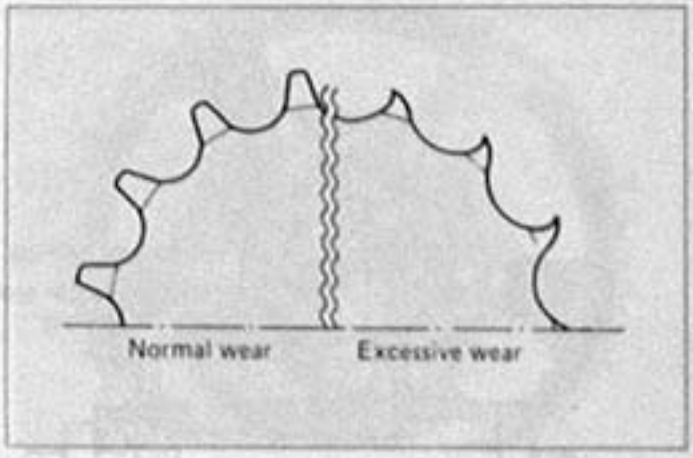
CUSHION

Inspect the cushions for wear and damage.



SPROCKET

Inspect the sprocket teeth for wear. If they are worn as illustrated, replace the sprocket and drive chain.



REASSEMBLY AND REMOUNTING

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

WHEEL AND SPROCKET MOUNTING DRUM BEARINGS

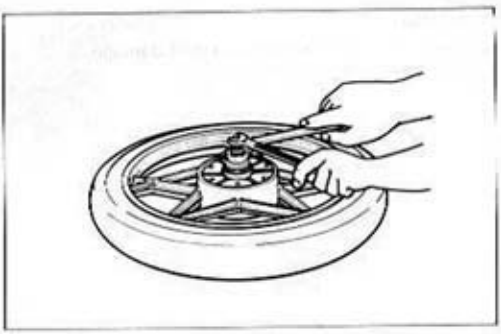
Apply grease before installing the bearings.

99000-25010	SUZUKI super grease "A"

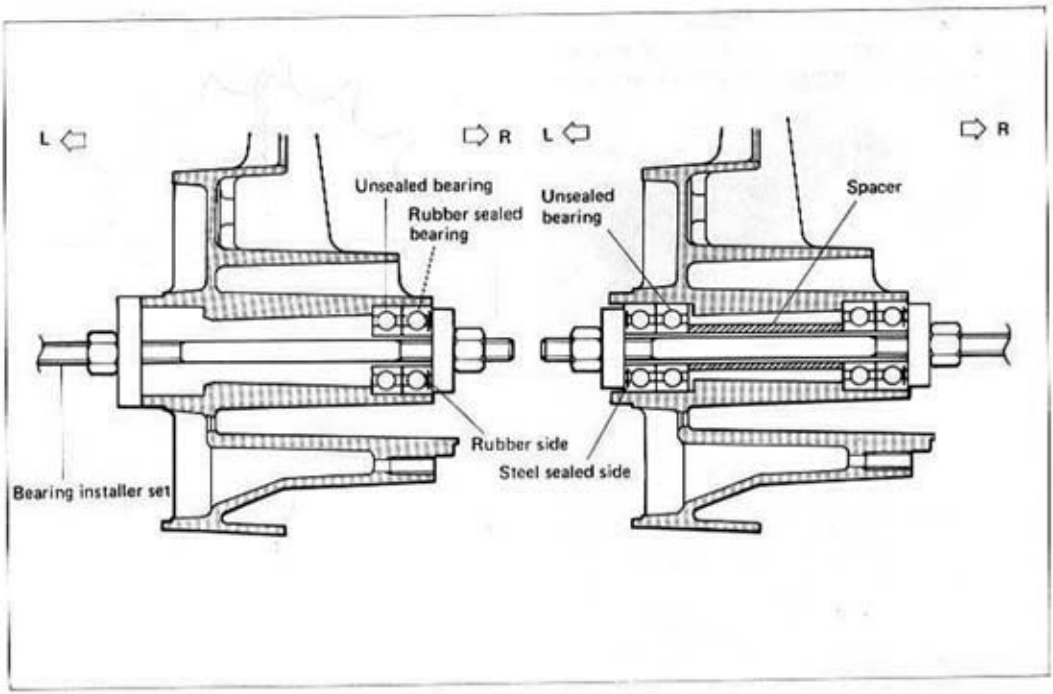
WHEEL BEARINGS

Install the wheel bearings by using the special tools.

09941-34511	Bearing installer set



NOTE:
First install the unsealed bearing and rubber sealed bearing for the right side, then install the unsealed bearing and steel sealed bearing for the left. The sealed face of the bearing faces outwards.



MOUNTING DRUM BEARING

Install the bearing by using the special tool.

09913-75520	Bearing installer

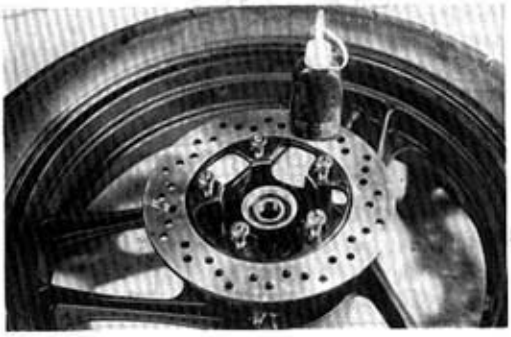
NOTE:
Apply grease to the bearing and oil seal lip before assembling rear wheel.

BRAKE DISC

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

99000-32130	Thread Lock "1360"

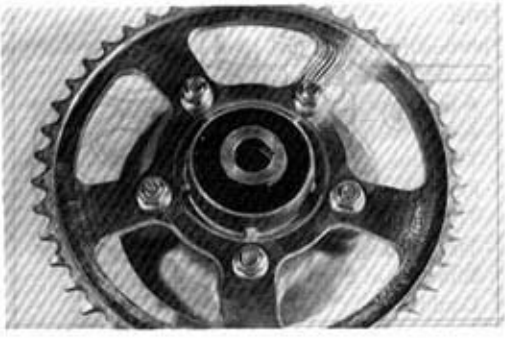
Tightening torque	15 – 25 N·m (1.5 – 2.5 kg-m) (11.0 – 18.0 lb-ft)



REAR SPROCKET

Tighten the mounting nuts to the specified torque.

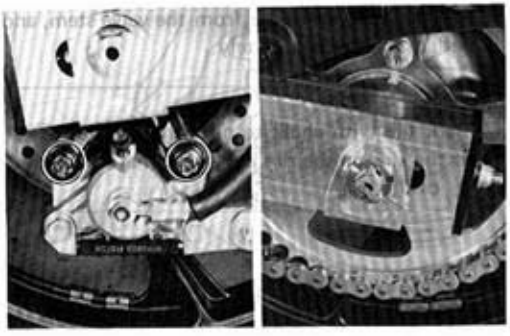
Tightening torque	48 – 72 N·m (4.8 – 7.2 kg-m) (35.0 – 52.0 lb-ft)



REMOUNTING

- Adjust the chain slack after rear wheel installation. (Refer to page 2-11)
- Tighten the rear axle nut and caliper mounting bolts to the specified torque.

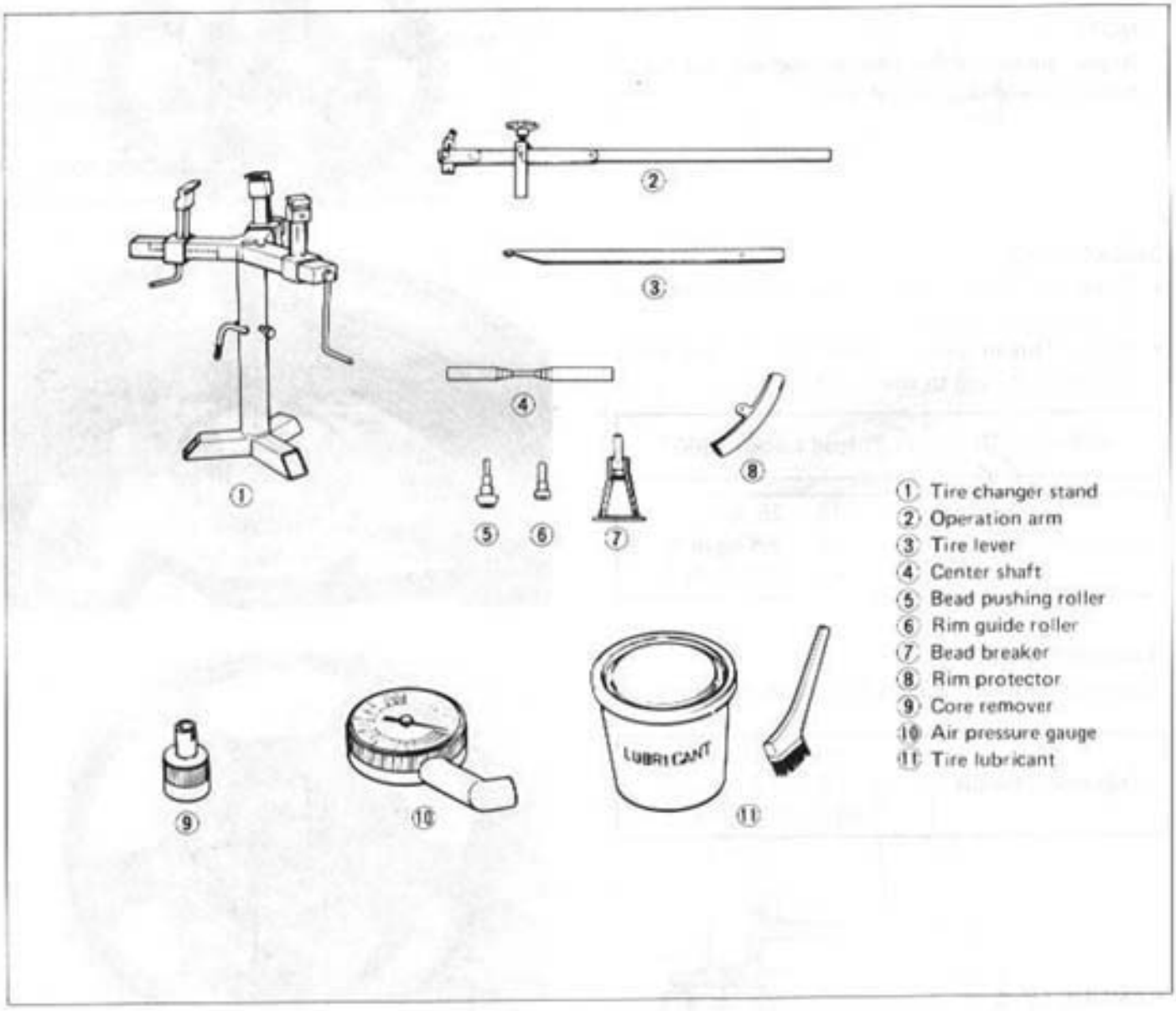
	N·m	kg-m	lb-ft
Rear axle nut (Only for E-28)	85 – 115	8.5 – 11.5	61.5 – 83.0
Rear axle nut (For the others)	94 – 127	9.4 – 12.7	68.0 – 92.0
Caliper mounting bolt	15 – 25	1.5 – 2.5	14.5 – 18.0



TIRE AND WHEEL

REMOVAL

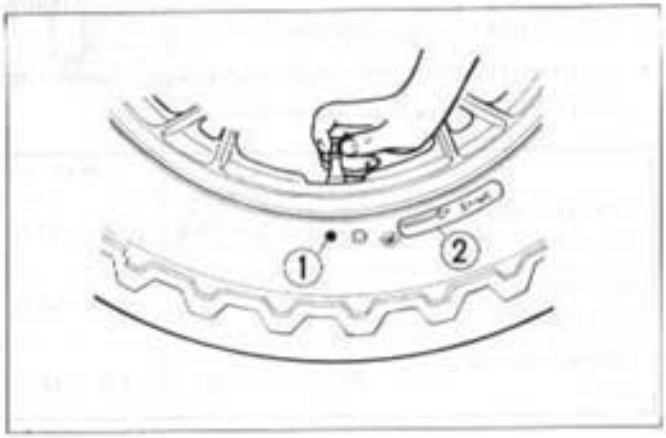
The most critical factor of a tubeless tire is the seal between the wheel rim and the tire bead. Because of this, we recommend using a tire changer which is also more efficient than tire levers.
For tire removal the following tools are required.



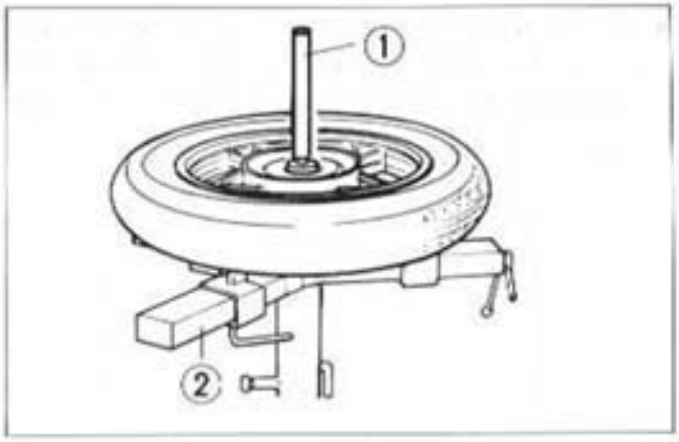
① Tire changer stand
② Operation arm
③ Tire lever
④ Center shaft
⑤ Bead pushing roller
⑥ Rim guide roller
⑦ Bead breaker
⑧ Rim protector
⑨ Core remover
⑩ Air pressure gauge
⑪ Tire lubricant

- Remove the valve core from the valve stem, and deflate the tire completely.

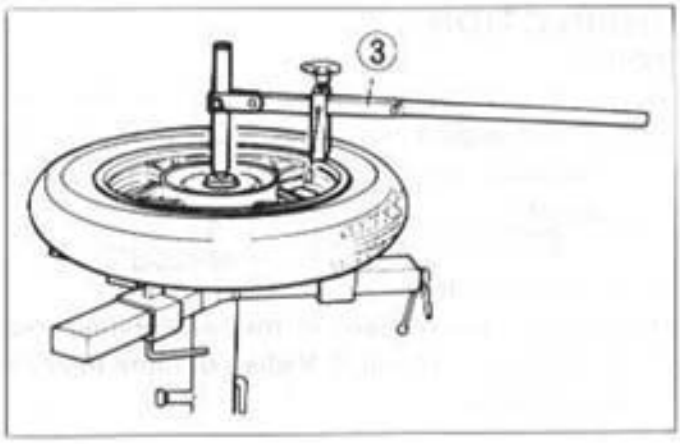
NOTE:
Mark tire with chalk to note the position ① of the tire on the rim and rotational direction ② of the tire.



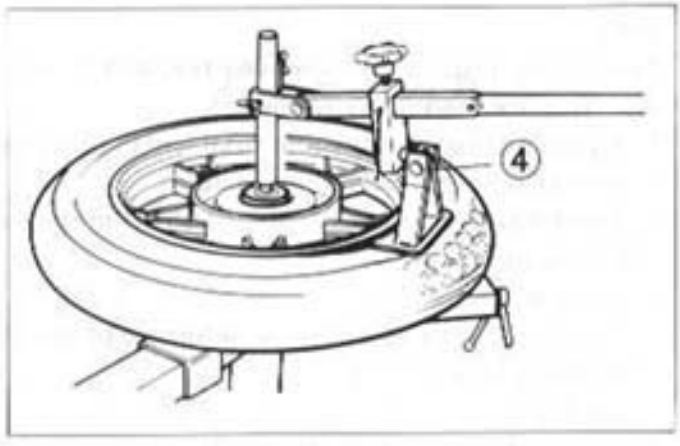
- Place the center shaft ① to the wheel, and fix the wheel firm by the rim holder ②.



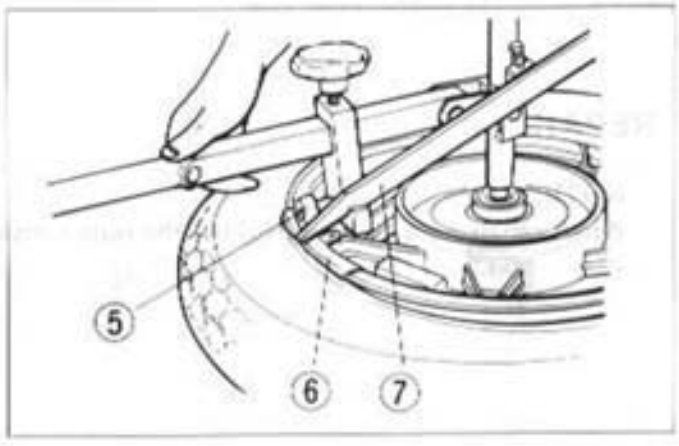
- Attach the operation arm ③ to the center shaft.



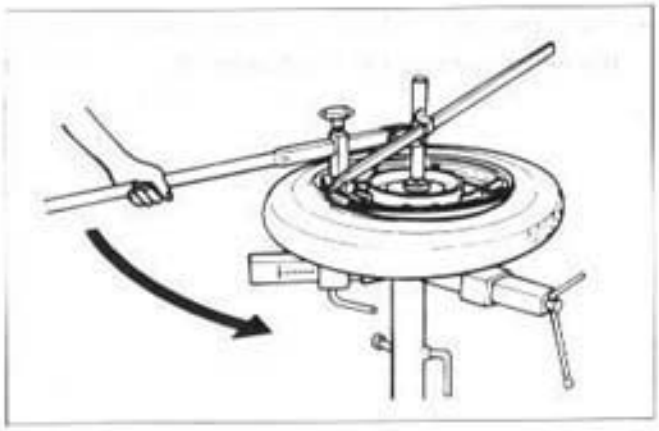
- Attach the bead breaker ④ to the operation arm, and dismount the bead from the rim. Turn the wheel over and dismount the other bead from the rim.



- Install the rim guide roller ⑤.
- Install the rim protecter ⑥, and raise the tire bead with the tire lever ⑦.



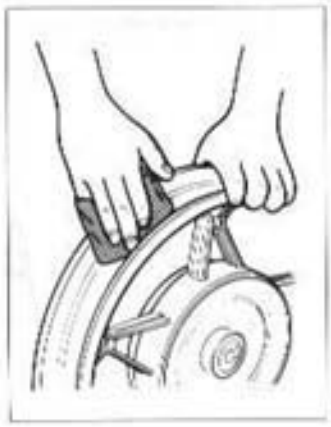
- Set the tire lever against the operation arm, and rotate the lever around the rim. Repeat this procedure to remove the other bead from the rim.



INSPECTION

WHEEL

Wipe off any rubber substance or rust from the wheel, and inspect the wheel rim. If any one of the following items is observed, replace it with a new wheel.



- A distortion or crack.
- Any scratches or flaws in the bead seating area.
- Wheel runout (Axial & Radial) of more than 2.0 mm. (0.08 in)

TIRE

Thoroughly inspect the removed tire, and if any one of the following items is observed, do not repair the tire. Replace with the new one.

- A puncture or a split whose total length or diameter exceeds 6 mm. (0.24 in)
- A scratch or split at the side wall.
- Tread depth less than 1.6 mm (0.06 in) in the front tire and less than 2.0 mm (0.08 in) in the rear tire.
- Ply separation.
- Tread separation.
- Tread wear is extraordinarily deformed or distributed around the tire.
- Scratches at the bead.
- Cord is cut.
- Damage from skidding (flat spots).
- Abnormality in the inner liner.

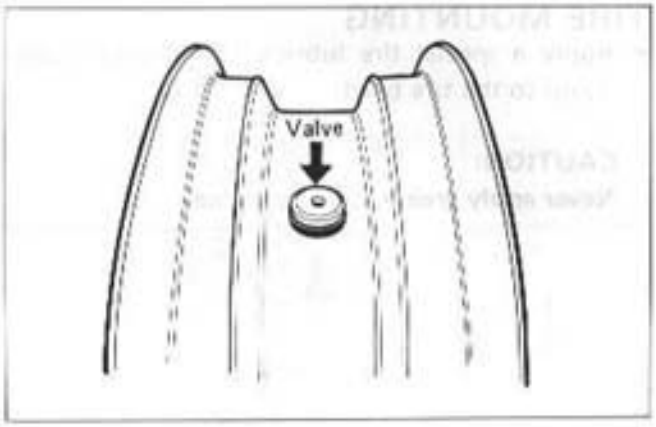
REPAIR

NOTE:
When repairing a flat tire, follow the repair instructions and use only recommended repairing materials.

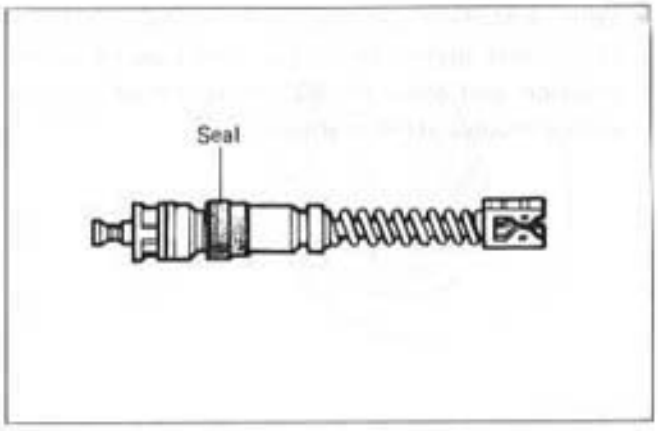
VALVE

INSPECTION

Inspect the valve after the tire is removed from the rim, and replace with a new valve if the seal rubber has any splits or scratches.



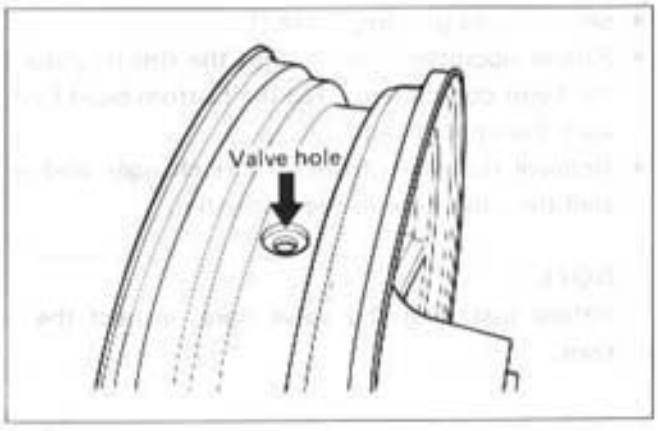
Inspect the removed valve core and replace with the new one if the seal rubber is abnormally deformed or worn.

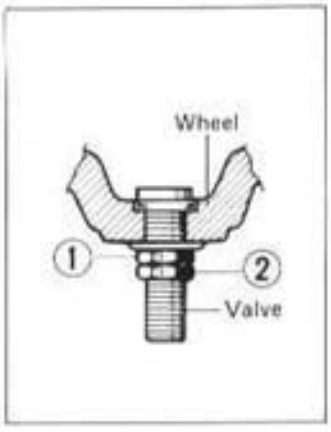


INSTALLATION

Any dust or rust around the valve hole must be cleaned off. Then install the valve in the rim.

CAUTION:
When installing the valve, tighten the nut ① by hand as much as possible. Holding the nut under this condition, tighten the lock nut ②. Do not overtighten nut ① as this may distort the rubber packing and cause an air leak.



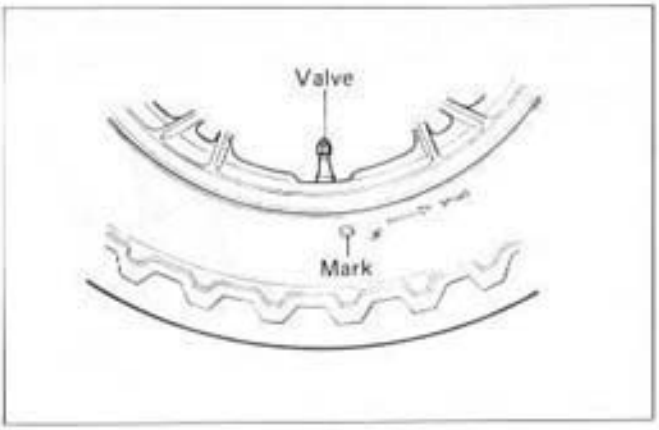


TIRE MOUNTING

- Apply a special tire lubricant or neutral soapy liquid to the tire bead.

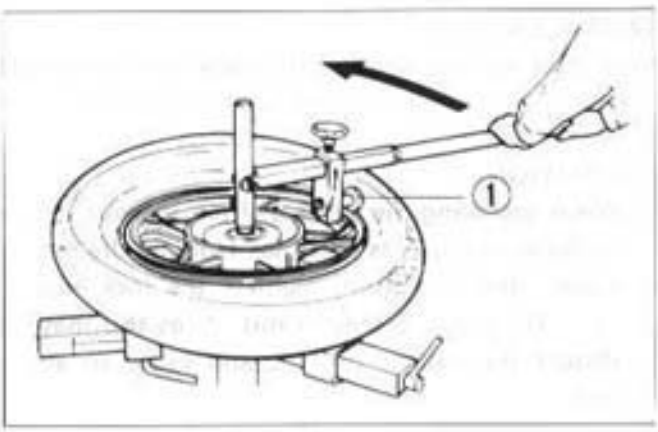
CAUTION:
Never apply grease, oil or gasoline.

- When installing the tire, make certain that the directional arrow faces the direction of wheel rotation and align the balancing dot of the tire with the valve stem as shown.

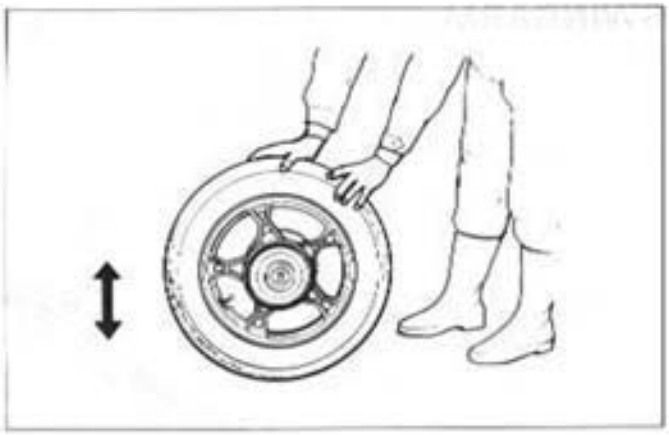


- Set the bead pushing roller ①.
- Rotate operation arm around the rim to mount the bead completely. Do the bottom bead first, then the upper bead.
- Remove the wheel from the tire changer, and install the valve core in the valve stem.

NOTE:
Before installing the valve core, inspect the core.

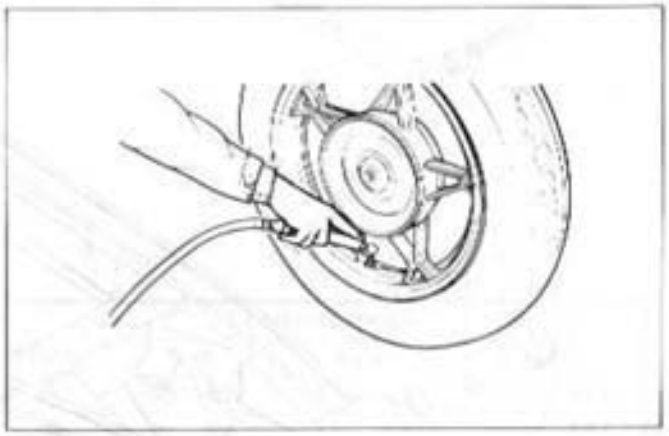


- Bounce the tire several times while rotating. This makes the tire bead expand outwards, and thus makes inflation easier.



NOTE:
Before inflating, confirm that the balance mark lines up with the valve stem.

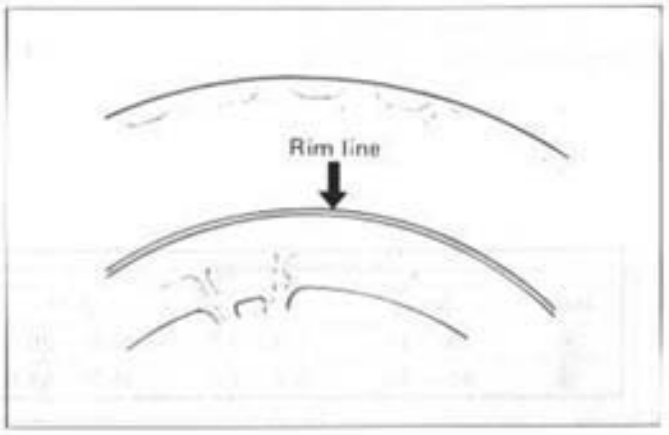
- Pump up the tire with air.



WARNING:
Do not inflate the tire to more than 4.0 kg/cm² (56 psi). The tire could burst with sufficient force to cause severe injury. Never stand directly over the tire while inflating it.

NOTE:
Check the "rim line" cast on the tire side walls. It must be equidistant from the wheel rim all the way around. If the distance between the rim line and the wheel rim varies, this indicates that the bead is not properly seated. If this is so, deflate the tire completely, and unseat the bead for the both sides. Coat the bead with lubricant, any try again.

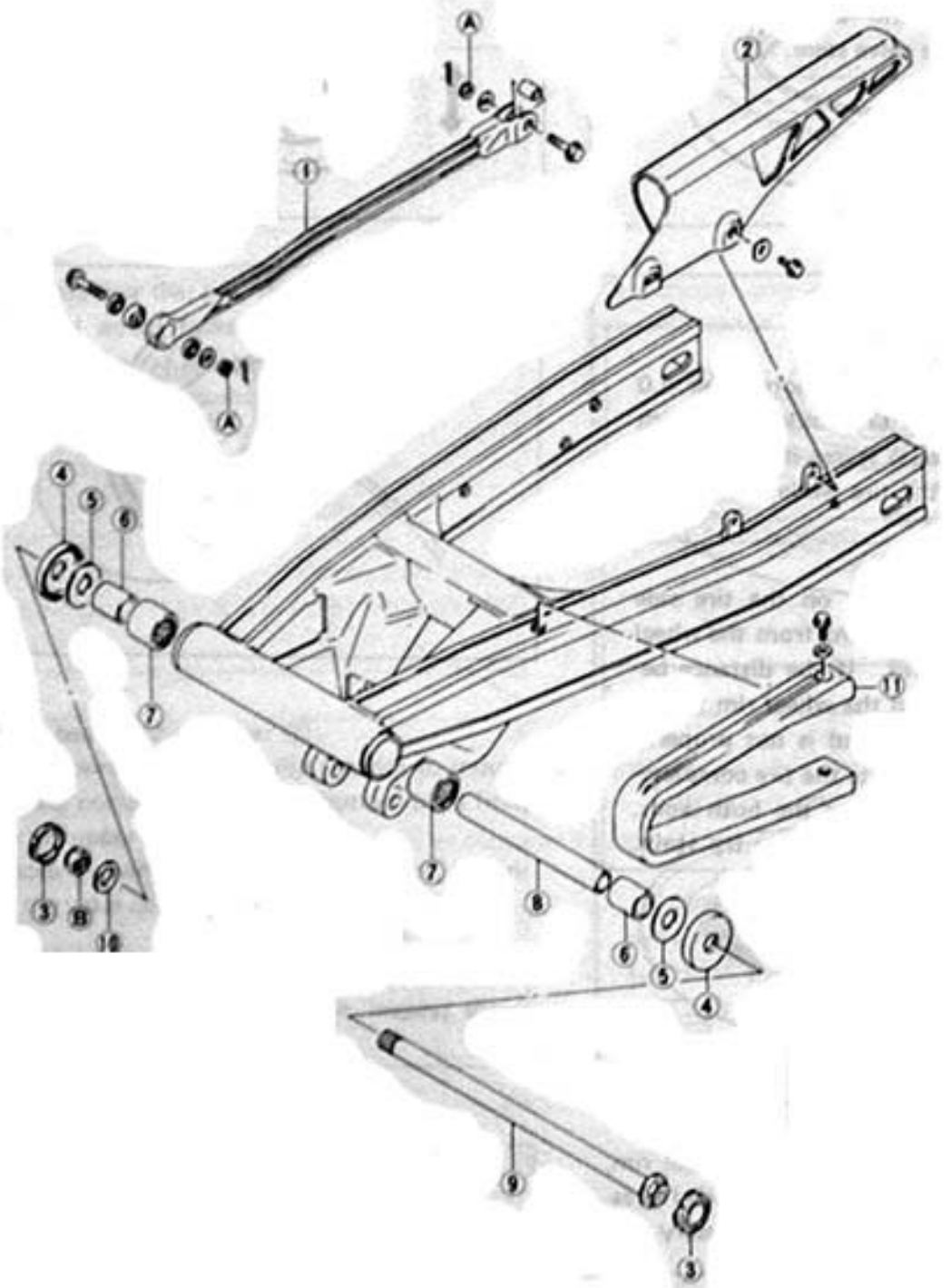
- After tire is properly seated to the wheel rim, adjust the pressure to the recommended pressure. Correct the wheel balance if necessary.



WARNING:
Do not run a repaired tire more than 50 km/h (30 mph) within 24 hours after tire repairing, since the patch may not be completely cured. Do not exceed 130 km/h (80 mph) with a repaired tire.

REAR SUSPENSION

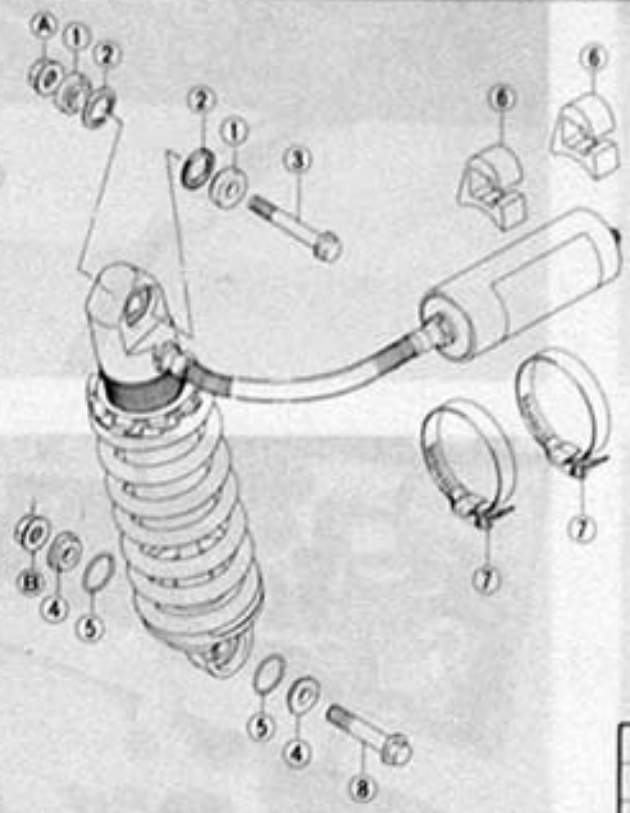
SWINGARM



① Torque link
② Chain cover
③ Cap
④ Dust cover
⑤ Washer
⑥ Spacer
⑦ Bearing
⑧ Spacer
⑨ Pivot shaft
⑩ Washer
⑪ Chain buffer
Ⓐ Torque link nut
Ⓑ Pivot nut

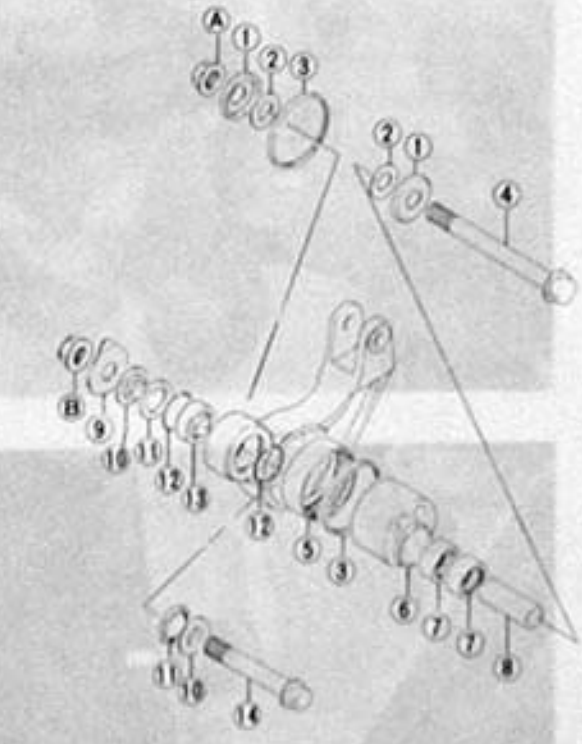
Tightening torque			
Item	N·m	kg·m	lb·ft
Ⓐ	18 – 28	1.8 – 2.8	13.0 – 20.0
Ⓑ	50 – 80	5.0 – 8.0	36.0 – 58.0

SHOCK ABSORBER AND CUSHION LEVER



① Spacer
② Dust seal
③ Shock absorber upper mounting bolt
④ Spacer
⑤ Dust seal
⑥ Damper
⑦ Clamp
⑧ Shock absorber lower mounting bolt
Ⓐ Shock absorber upper mounting nut
Ⓑ Shock absorber lower mounting nut

Tightening torque			
Item	N·m	kg·m	lb·ft
Ⓐ	40 – 60	4.0 – 6.0	29.0 – 43.5
Ⓑ	40 – 60	4.0 – 6.0	29.0 – 43.5

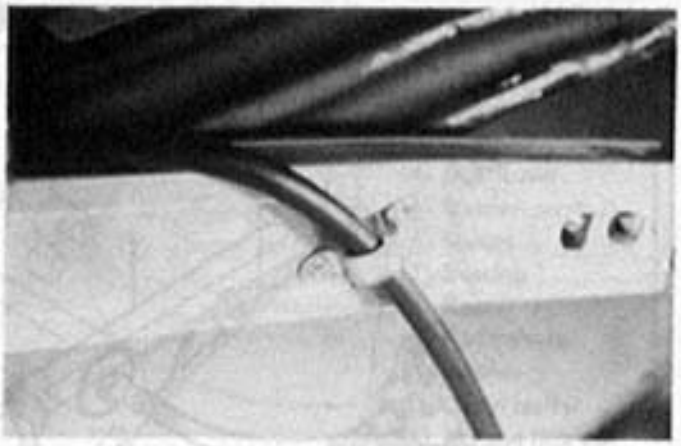


① Dust seal
② Washer
③ Dust seal
④ Cushion lever center bolt
⑤ Bearing
⑥ Spacer
⑦ Bearing
⑧ Spacer
⑨ Shim
⑩ Spacer
⑪ Dust seal
⑫ Stopper ring
⑬ Bearing
⑭ Cushion lever mounting bolt
Ⓐ Cushion lever center nut
Ⓑ Cushion lever mounting nut

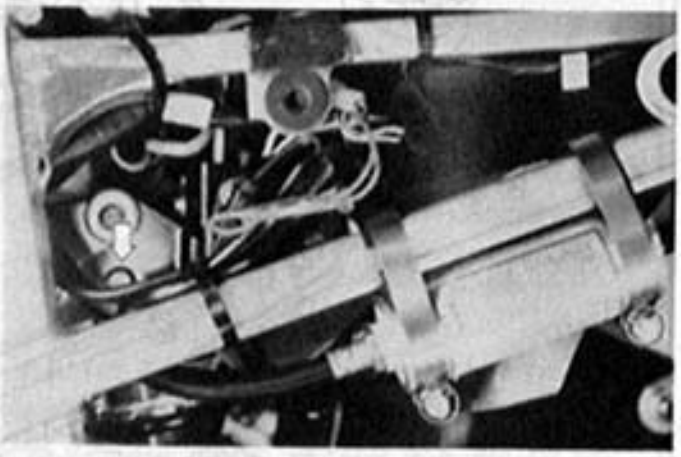
Tightening torque			
Item	N·m	kg·m	lb·ft
Ⓐ	70 – 100	7.0 – 10.0	50.5 – 72.5
Ⓑ	70 – 100	7.0 – 10.0	50.5 – 72.5

REMOVAL AND DISASSEMBLY

- Remove the rear wheel. (Refer to page 6-35)
- Remove the right and left frame covers.
- Remove the brake hose clamp.

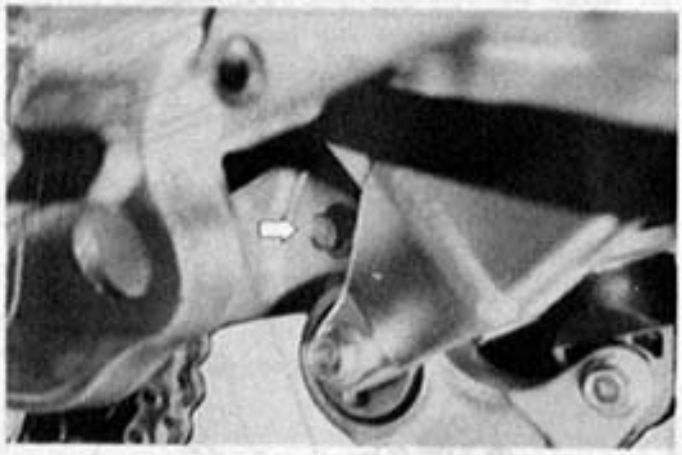


- Remove the reservoir tank mounting clamps.
- Remove the shock absorber upper mounting bolt.

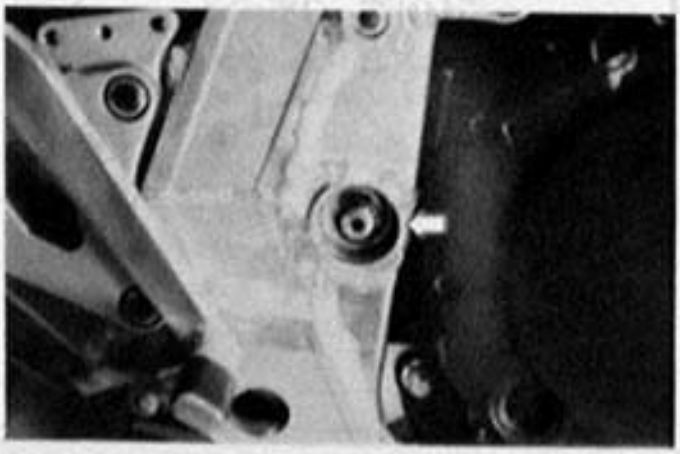


- Remove the cushion lever mounting bolt.

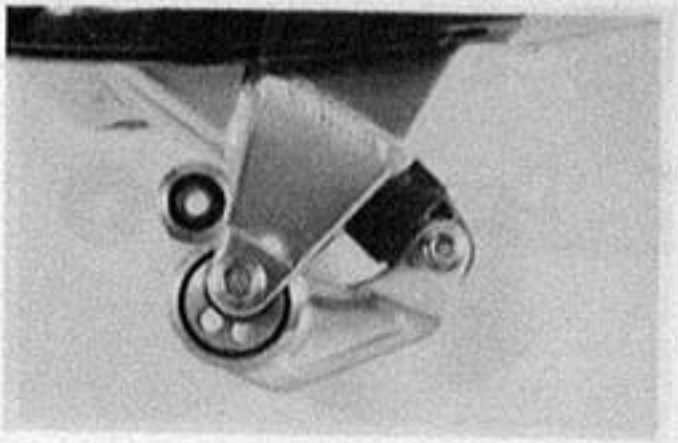
NOTE:
Some units may be assembled with a shim on the cushion lever pivot.



- Remove the swingarm pivot shaft.
- Take off the rear suspension assembly.

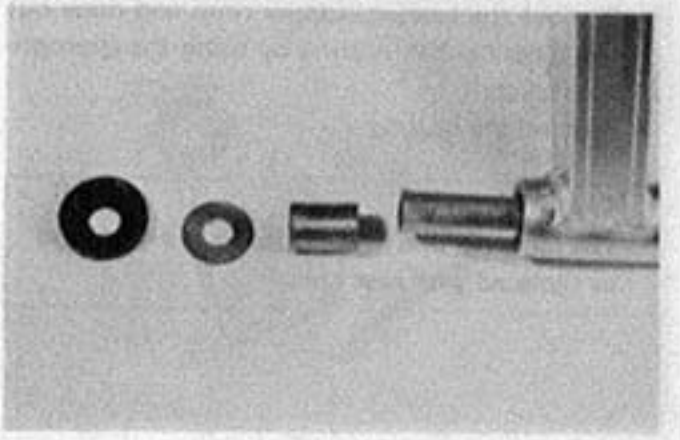


- Remove the rear cushion lever bolt and nut.
- Remove the shock absorber lower mounting bolt and nut.



SWINGARM

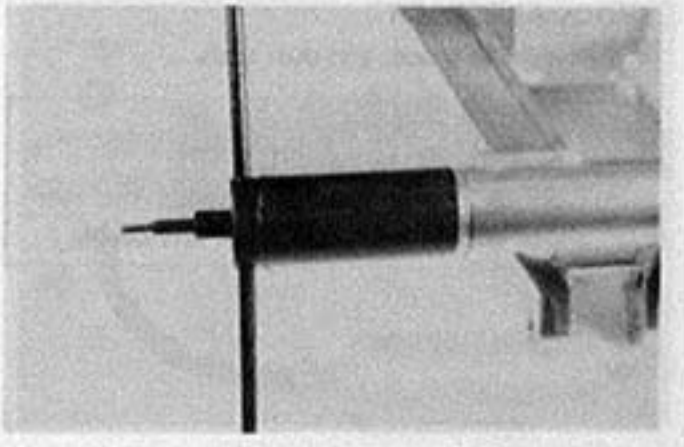
- Remove the dust seal, washer and spacers from the swingarm pivot.



- Draw out the swingarm bearings by using the special tool.

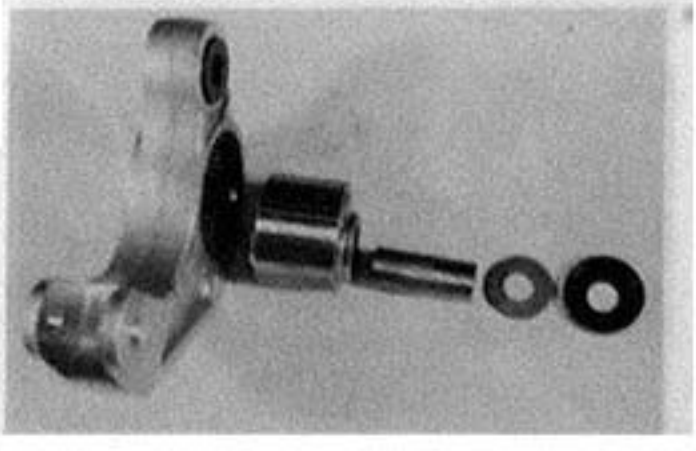
09941-44910	Swingarm bearing remover

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

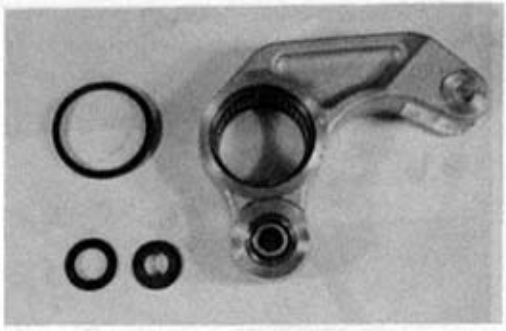


CUSHION LEVER

- Remove the spacers, washer and dust seals.

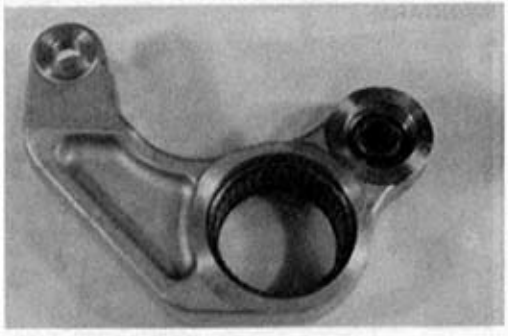


- Remove the dust seals and spacer.



- Remove the bearing stopper rings and draw out the spherical ball bearing by using the appropriate socket.
- Remove the bearing.

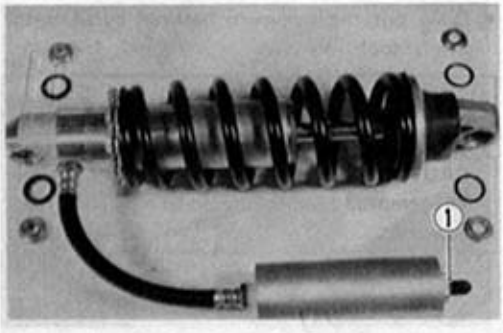
CAUTION:
The removed bearings and stopper rings should be replaced with new ones.



SHOCK ABSORBER

- Remove the spacer and dust seals.

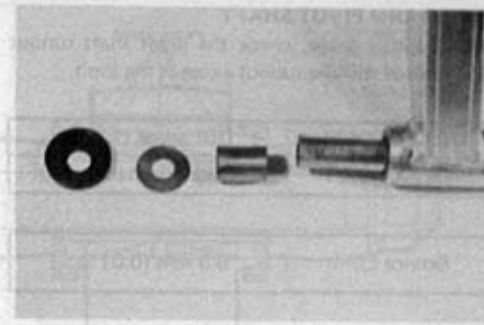
CAUTION:
- Do not touch the valve ①.
- Do not attempt to disassemble the rear shock absorber unit. It is not serviceable.



INSPECTION

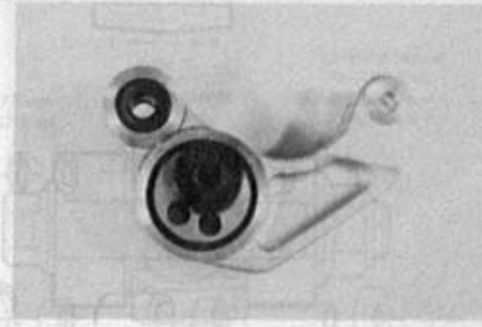
SWINGARM

- Insert the spacer in the bearing and check the play by moving the spacer up and down. If excessive play is noted, replace the bearing with a new one.
- Inspect the spacer for any flaws or other damage.
- Inspect the each rubber part for wear or damage.



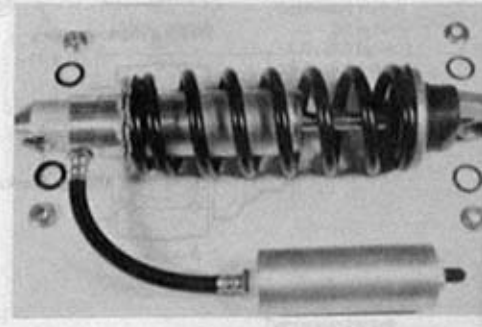
CUSHION LEVER

- Inspect the spacer for any flaws or other damage.
- Insert the mounting bolt to the spherical ball bearing and check the play by moving the bolt. If an excessive play is noted, replace the bearing with a new one.
- Insert the spacer in the bearing and check the play by moving the spacer up and down. If an excessive play is noted, replace the bearing with a new one.
- Inspect the each rubber part for wear and damage.



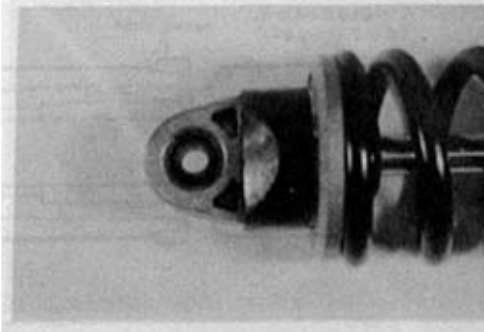
SHOCK ABSORBER

- Insert the mounting bolt into the spherical ball bearing and check the play by moving the bolt. If an excessive play is noted, replace the bearing with a new one.
- Inspect the each rubber part for wear or other damage.



- Inspect the rear shock absorber for any oil leakage by turning the adjuster knob to the arrow direction. When turning the adjuster knob, check the rear shock absorber for smooth operation.

CAUTION:
Do not turn the adjuster knob to the opposite direction.

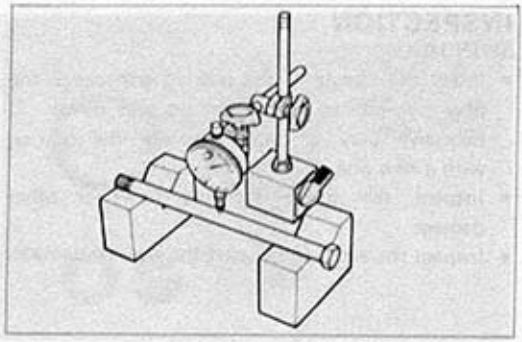


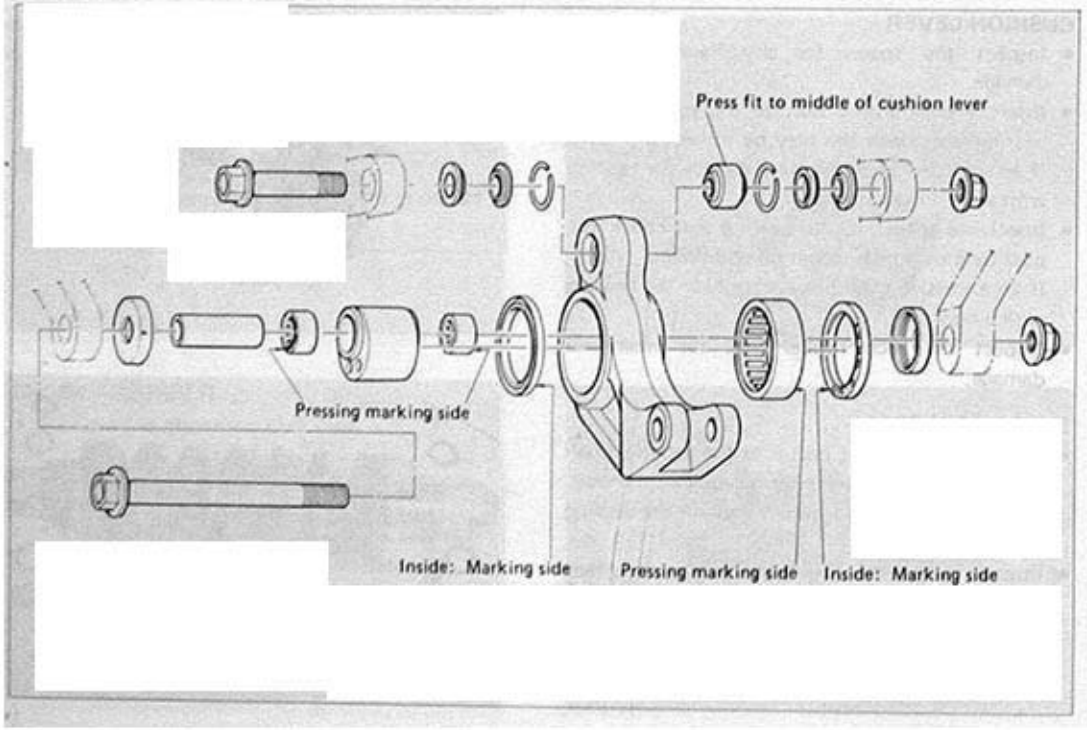
SWINGARM PIVOT SHAFT

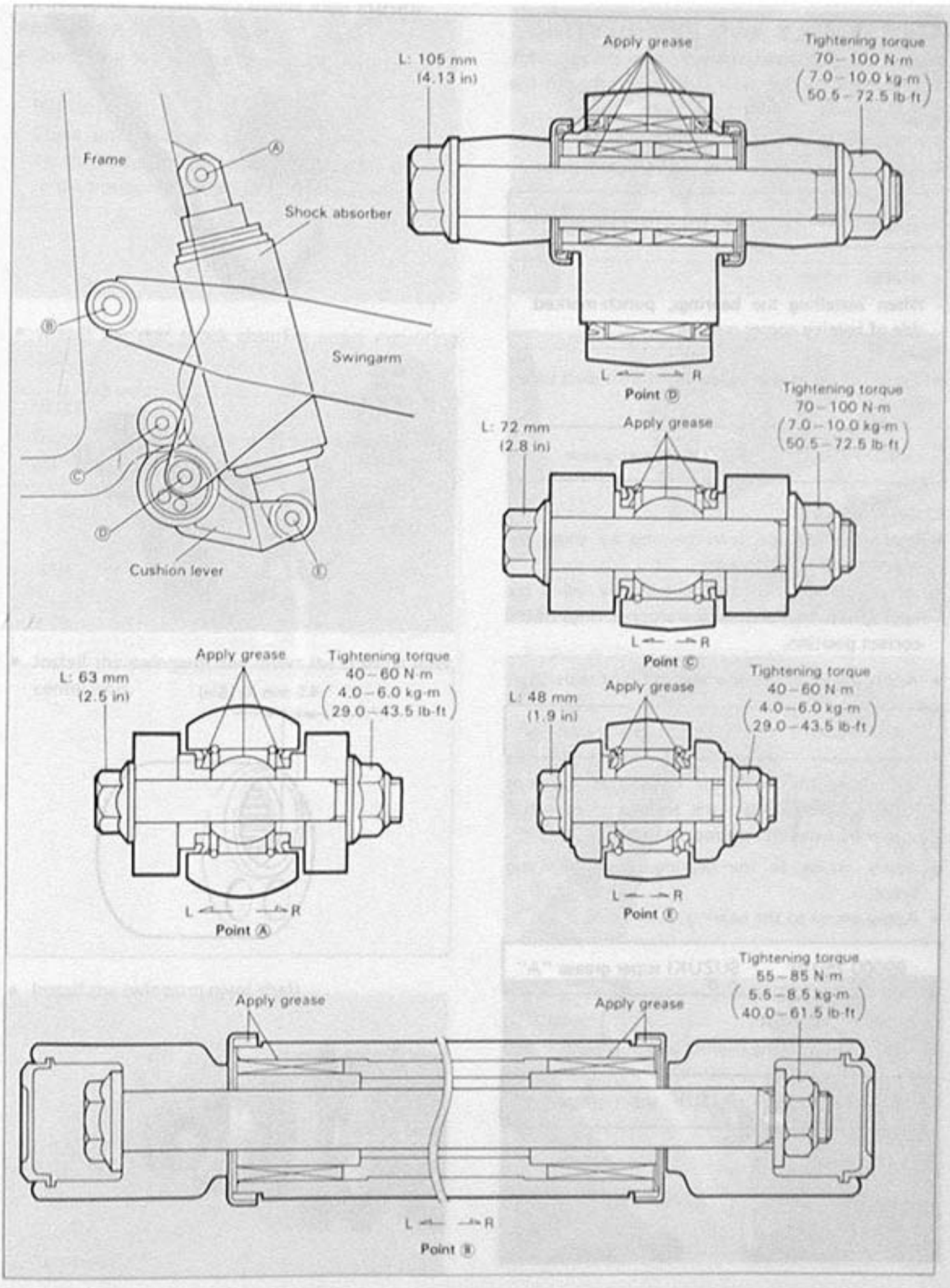
Using a dial gauge, check the pivot shaft runout and replace it if the runout exceeds the limit.

09900-20606	Dial gauge (1/100)
09900-20701	Magnetic stand

Service Limit	0.3 mm (0.01 in)






Frame
Shock absorber
Swingarm
Cushion lever
Ⓐ
Ⓑ
Ⓒ
Ⓓ
Ⓔ
L: 105 mm (4.13 in)
Apply grease
Tightening torque
70 – 100 N·m
(7.0 – 10.0 kg·m
50.5 – 72.5 lb·ft)
L
R
Point Ⓓ
L: 72 mm (2.8 in)
Apply grease
Tightening torque
70 – 100 N·m
(7.0 – 10.0 kg·m
50.5 – 72.5 lb·ft)
L
R
Point Ⓒ
L: 63 mm (2.5 in)
Apply grease
Tightening torque
40 – 60 N·m
(4.0 – 6.0 kg·m
29.0 – 43.5 lb·ft)
L
R
Point Ⓐ
L: 48 mm (1.9 in)
Apply grease
Tightening torque
40 – 60 N·m
(4.0 – 6.0 kg·m
29.0 – 43.5 lb·ft)
L
R
Point Ⓔ
Apply grease
Apply grease
Tightening torque
55 – 85 N·m
(5.5 – 8.5 kg·m
40.0 – 61.5 lb·ft)
L
R
Point Ⓑ

REASSEMBLY AND REMOUNTING

Reassemble and remount the swingarm, rear shock absorber and cushion lever, and also carry out the following steps:

SWINGARM

- Force-fit the bearings into the swingarm pivot.

09941-34513	Steering outer race installer

NOTE:
When installing the bearings, punch-marked side of bearing comes outside.

- Apply grease to the spacers and dust seals when installing them.

99000-25010	SUZUKI super grease "A"

CUSHION LEVER

- Install the cushion lever bearing by using the appropriate drift.
- Install the spherical ball bearing by using the appropriate tool and fit the stopper rings to the correct position.
- Apply grease to the bearings and dust seals.

99000-25010	SUZUKI super grease "A"

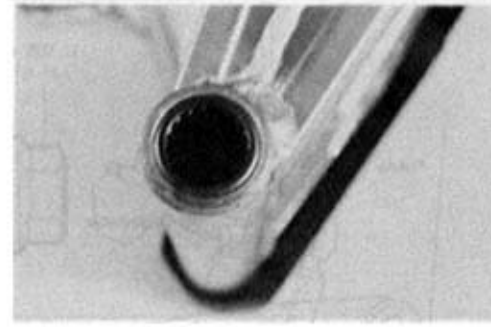
- Make sure to install the bearing at 4.5 mm (0.18 in) depth from the surface of eccentric spacer by using the appropriate tool.
- Apply grease to the bearing, dust seals and spacer.
- Apply grease to the bearing.

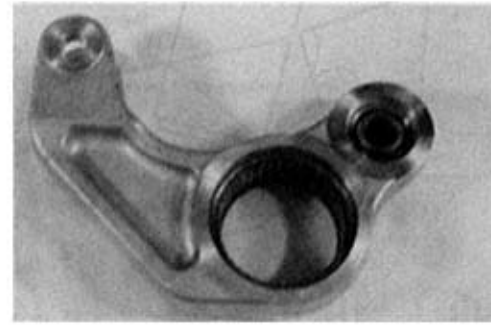
99000-25010	SUZUKI super grease "A"

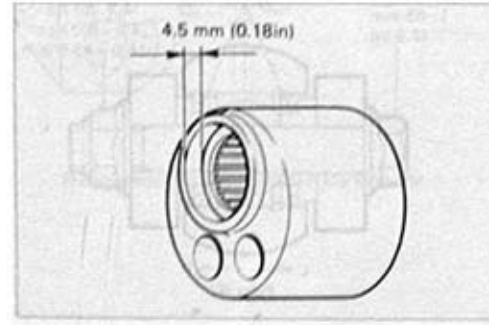
SHOCK ABSORBER

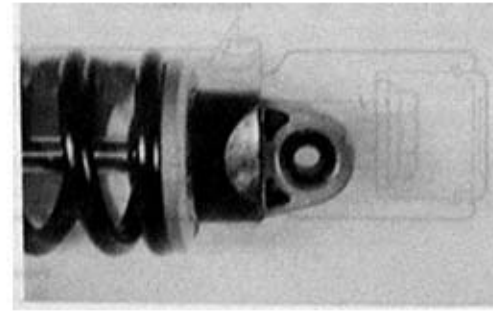
- Apply grease to the bearing and dust seals.

99000-25010	SUZUKI super grease "A"





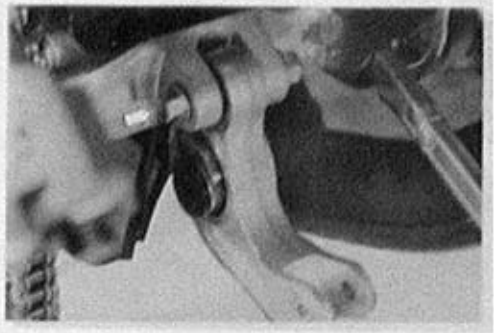




SWINGARM, CUSHION LEVER AND SHOCK ABSORBER REMOUNTING

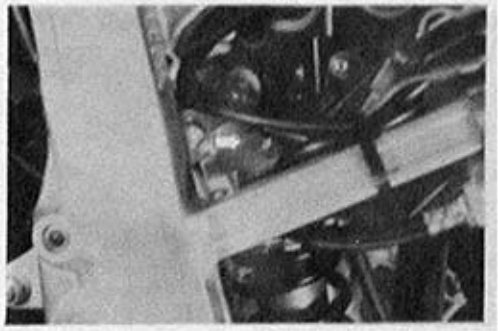
- Install the cushion lever mounting bolt.

NOTE:
Some units may be assembled with a shim on the cushion lever pivot. Reinstall the shim in the position from which it was removed.

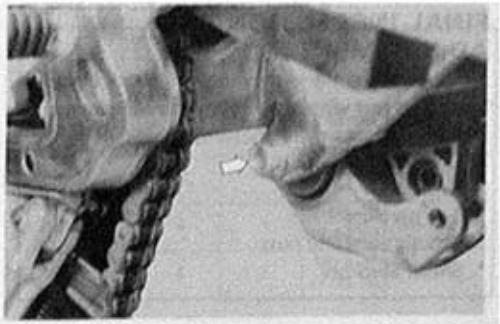


- Install the rear shock absorber upper mounting bolt.

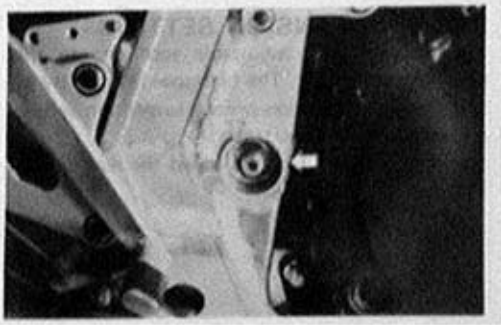
NOTE:
When installing the shock absorber, install it with the adjusting mark facing left.



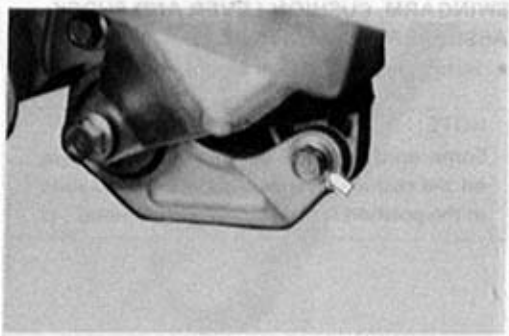
- Install the swingarm and insert the cushion lever center bolt.



- Install the swingarm pivot shaft.



- Install the rear shock absorber lower mounting bolt.



- Tighten the nuts to the specified torque.

	N·m	kg-m	lb-ft
Swingarm pivot shaft nut	55 – 85	5.5 – 8.5	40.0 – 61.5
Shock absorber mounting nut (upper)	40 – 60	4.0 – 6.0	29.0 – 43.5
Shock absorber mounting nut (lower)	40 – 60	4.0 – 6.0	29.0 – 43.5
Cushion lever mounting nut	70 – 100	7.0 – 10.0	50.0 – 72.5
Cushion lever center nut	70 – 100	7.0 – 10.0	50.5 – 72.5

FINAL INSPECTION AND ADJUSTMENT

After installing the rear swingarm, shock absorber, brake and rear wheel, the following adjustments are required before driving motorcycle.

* Drive chain
* Rear brake
* Tire pressure
* Chassis bolts and nuts
* Shock absorber

REAR SUSPENSION SETTING

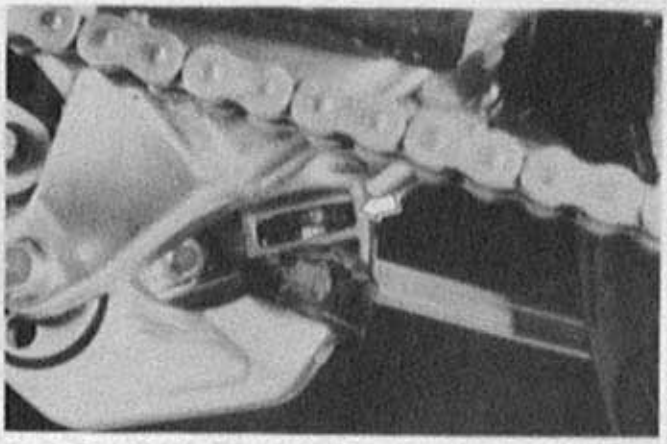
Rear suspension is adjustable according to the rider's requirements. The high speed capability of this motorcycle makes proper suspension setting and balance very important.

Use the following table to adjust the rear suspension.

DAMPING FORCE

Damping force can be adjusted to the desired level by turning the adjuster.

CAUTION:
Turn the adjuster knob in the direction of the arrow.

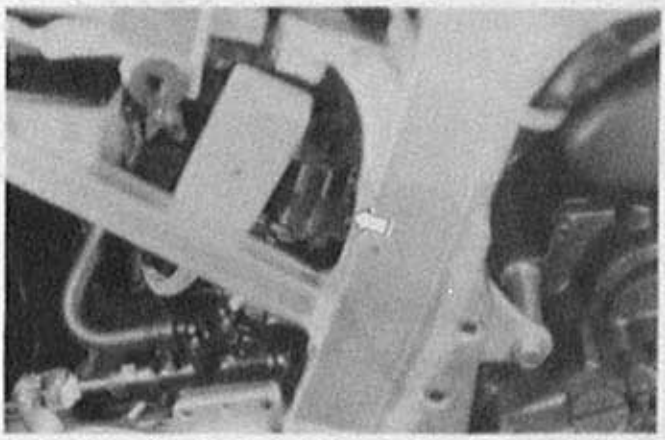


SPRING PRE-LOAD

Spring pre-load is adjustable by changing the spring adjuster ring position by using the special tool. Turning the spring adjuster ring counter-clockwise or clockwise to increase or decrease the spring pre-load. The standard setting set length is 190 mm. (7.48 in) After adjusting the pre-load, tighten the spring adjuster lock ring securely.

09910-60611	Universal clamp wrench

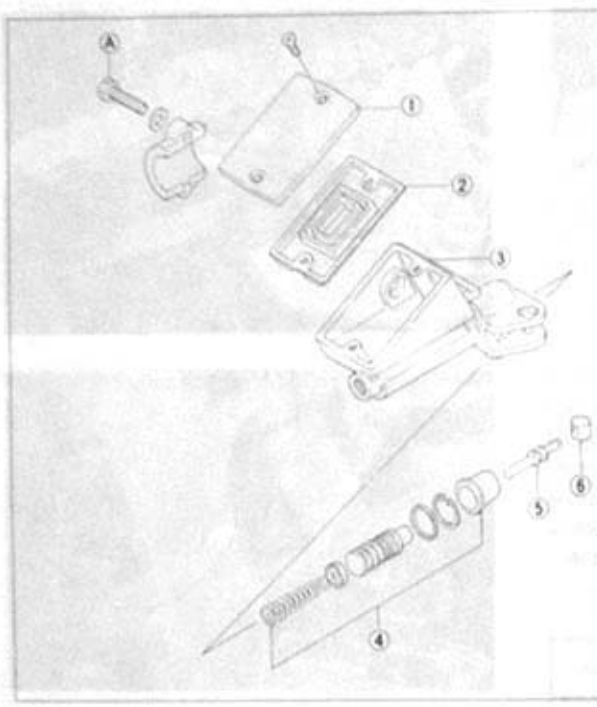
CAUTION:
Do not set the spring to a length less than 185 mm (7.28 in) or more than 195mm (7.68 in).



SUSPENSION SETTING TABLE

ITEM	Damping force		Spring pre-load	Remarks
	Only for E-28	For the others		
Standard	4	2	190mm (7.48 in)	Solo riding
Softer	3	1	191.5mm (7.54 in)	Solo riding
Stiffer	4	3	188.5mm (7.42 in)	Solo riding
Dual riding	4	3	187mm (7.36 in)	——

CLUTCH MASTER CYLINDER

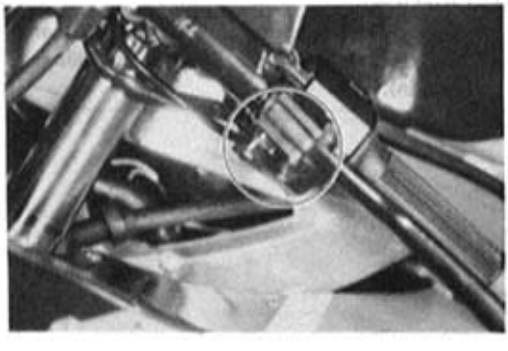


① Reservoir cap
② Diaphragm
③ Master cylinder
④ Cup set
⑤ Push rod
⑥ Lever piece
Ⓐ Clutch master cylinder mounting bolt

Tightening torque			
Item	N·m	kg-m	lb-ft
Ⓐ	5 – 8	0.5 – 0.8	3.5 – 6.0

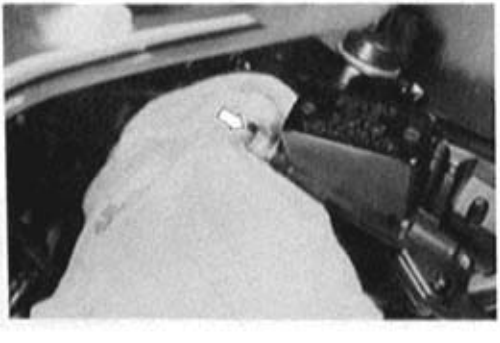
REMOVAL AND DISASSEMBLY

- Take off the starter interlock switch. (Only for E-28)

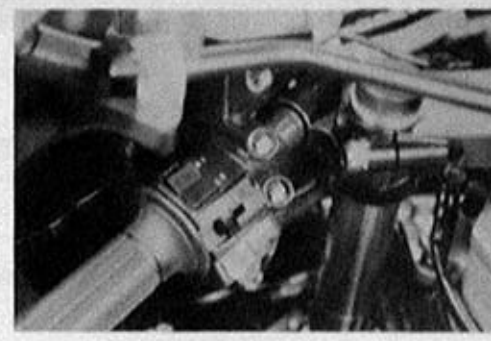


- Place a cloth underneath the union bolt on the master cylinder to catch spilled drops of brake fluid. Unscrew the union bolt and disconnect the clutch hose/master cylinder joint.

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



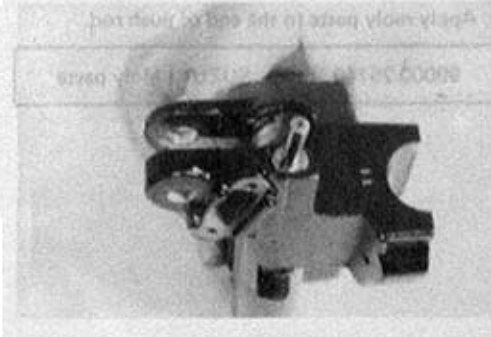
- Remove the mounting bolts and take off the master cylinder.

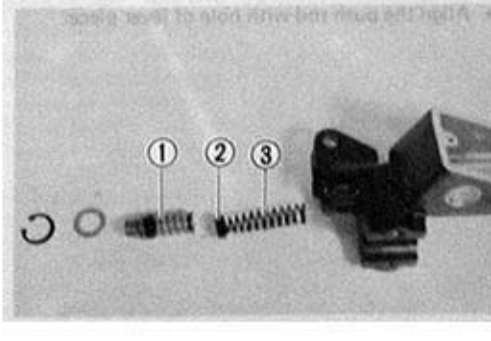


- Remove the clutch lever, reservoir cap and diaphragm.
- Drain brake fluid.

- Remove the push rod and boot.
- Remove the circlip by using the special tool, then take out the piston ①, primary cup ② and spring ③.

09900-06108	Snap ring pliers





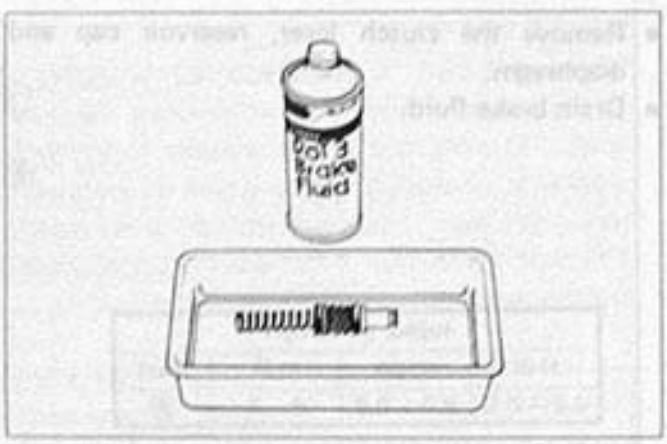
INSPECTION

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

REASSEMBLY AND REMOUNTING

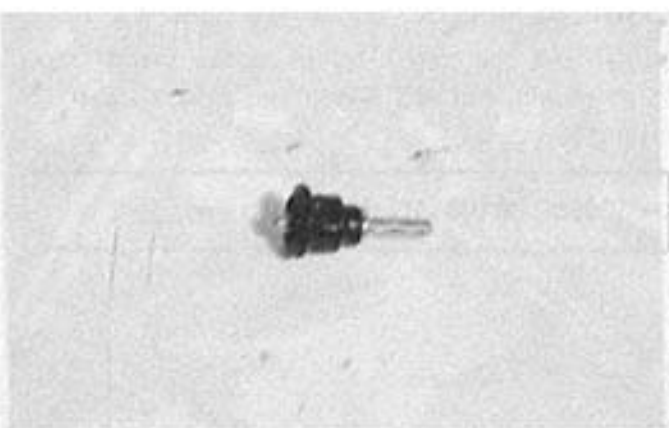
Reassemble and remount the master cylinder in the reverse order of disassembly and removal, and also carry out the following steps:

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 internal parts to be inserted into the bore.

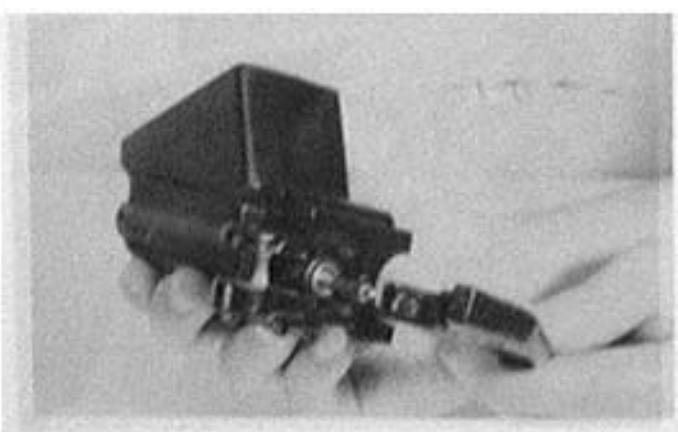


- Apply moly paste to the end of push rod.

99000-25140	SUZUKI Moly paste



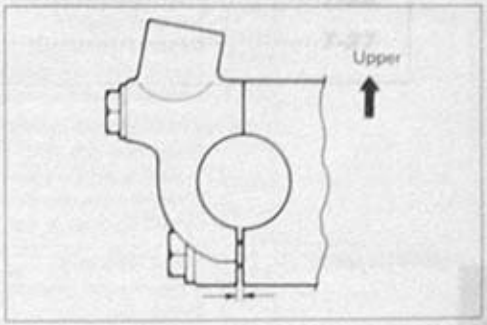
- Align the push rod with hole of lever piece.



- When remounting the master cylinder on the handlebar, align the master cylinder holder mating surface ① with punched mark ② on handlebar and first tighten the clamp bolt for upside as shown.

Tightening torque	5 – 8 N·m (0.5 – 0.8 kg·m / 3.5 – 6.0 lb·ft)

CAUTION:
Bleed the air after reassembling master cylinder. (Refer to page 2-11)
Adjust the starter interlock switch. (Only for E-28)



SERVICING INFORMATION

CONTENTS

TROUBLESHOOTING

ENGINE

Complaint	Symptom and possible causes	Remedy
Engine will not start, or is hard to start.	**Compression too low**	
	1. Valve clearance out of adjustment.	Adjust.
	2. Worn 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".
	7. Poor seating of spark plugs.	Retighten.
	Plugs not sparking	
	1. Fouled spark plugs.	Clean.
	2. Wet spark plugs.	Clean and dry.
	3. Defective ignition coil.	Replace.
	4. Open or short in high-tension cords.	Replace.
	5. Defective signal generator of ignition unit.	Replace.
	No fuel reaching the carburetors	
	1. Clogged fuel tank vent hose.	Clean or replace.
	2. Clogged or defective fuel/cock.	Clean or replace.
	3. Defective carburetor float valve.	Replace.
	4. Clogged fuel hose or fuel filter.	Clean or replace.
Engine stalls easily.	1. Fouled spark plugs.	Clean
	2. Defective signal generator or ignitor unit.	Replace.
	3. Clogged fuel hose.	Clean.
	4. Clogged jets in carburetors.	Clean.
	5. Valve clearance out of adjustment.	Adjust.
Noisy engine.	**Excessive valve chatter**	
	1. Valve clearance too large.	Adjust.
	2. Weakened or broken valve springs.	Replace.
	3. Worn down rocker arm or rocker arm shaft.	Replace.
	Noise appears to come from pistons.	
	1. Pistons or cylinders worn down.	Replace.
	2. Combustion chambers fouled with carbon.	Clean.
	3. Piston pins or piston pin bore worn.	Replace.
	4. Piston rings or ring groove worn.	Replace.
	Noise seems to come from timing chain	
	1. Stretched chain.	Replace.
	2. Worn sprockets.	Replace.
	3. Tension adjuster not working.	Repair or replace.
	Noise seems to come from clutch	
	1. Worn splines of countershaft or hub.	Replace
	2. Worn teeth of clutch plates.	Replace
	3. Distorted clutch plates, driven and drive.	Replace
	4. Worn clutch release bearing.	Replace.
	5. Clutch dampers weakened.	Replace the primary driven gear.

Complaint	Symptom and possible causes	Remedy
Noisy engine.	**Noise seems to come from crankshaft**	
	1. Rattling bearings due to wear.	Replace.
	2. Big-end bearings worn and burnt.	Replace.
	3. Journal bearings worn burnt.	Replace.
	4. Thrust clearance too large	Replace the thrust bearing.
	Noise seems to come from transmission	
	1. Gears worn or rubbing.	Replace.
	2. Badly worn splines.	Replace.
	3. Primary gears worn or rubbing.	Replace.
	4. Badly worn bearings.	Replace.
Slipping clutch.	1. Clutch control out of adjustment or loss of play.	Adjust.
	2. Weakened clutch springs.	Replace.
	3. Worn or distorted pressure plate.	Replace.
	4. Distorted clutch plates, driven and drive.	Replace.
Dragging clutch.	1. Clutch control out of adjustment or too much play.	Adjust.
	2. Some clutch springs weakended while others are not.	Replace.
	3. Distorted pressure plate or clutch plate.	Replace.
Transmission will not shift.	1. Broken gearshift cam.	Replace.
	2. Distorted gearshift forks.	Replace.
	3. Worn gearshift pawl.	Replace.
Transmission will not shift back.	1. Broken return spring on shift shaft.	Replace.
	2. Shift shaft is rubbing or sticky.	Repair.
	3. Distorted or worn gearshift forks.	Replace.
Transmission jumps out of gear.	1. Worn shifting gears on driveshaft or countershaft.	Replace.
	2. Distorted or worn gearshift forks.	Replace.
	3. Weakened stopper spring on gearshift stopper.	Replace.
	4. Worn gearshift pawl.	Replace.
Engine idles poorly.	1. Valve clearance out of adjustment.	Adjust.
	2. Poor seating of valves.	Replace.
	3. Defective valve guides.	Replace.
	4. Worn rocker arms or arm shafts.	Replace.
	5. Spark plug gaps too wide.	Adjust or replace.
	6. Defective ignition coil.	Replace.
	7. Defective signal generator or ignitor unit.	Replace.
	8. Float-chamber fuel level out of adjustment in carburetors.	Adjust.
	9. Clogged jets or imbalance of carburetors.	Clean or adjust.
Engine runs poorly in high speed range.	1. Valve springs weakened.	Replace.
	2. Worn cams or rocker arms.	Replace.
	3. Valve timing out of adjustment.	Adjust.
	4. Spark plug gaps too narrow.	Adjust.
	5. Ignition not advanced sufficiently due to poorly working timing advance circuit.	Replace.
	6. Defective ignition coil.	Replace.
	7. Defective signal generator or ignitor unit.	Replace.
	8. Float-chamber fuel level too low.	Adjust.
	9. Clogged air cleaner element.	Clean.
	10. Clogged fuel hose, resulting in inadequate fuel supply to carburetors.	Clean, and prime.

Complaint	Symptom and possible causes	Remedy
Dirty or heavy exhaust smoke.	1. Too much engine oil in the engine.	Check with level window, drain out excess oil.
	2. Worn piston rings or cylinders.	Replace.
	3. Worn valve guides.	Replace.
	4. Cylinder walls scored or scuffed.	Rebore or replace.
	5. Worn valves stems.	Replace.
	6. Defective stem seal.	Replace.
	7. Worn oil ring side rails.	Replace.
Engine lacks power.	1. Loss of valve clearance.	Adjust.
	2. Weakened valve springs.	Replace.
	3. Valve timing out of adjustment.	Adjust.
	4. Worn piston rings or cylinders.	Replace.
	5. Poor seating of valves.	Repair.
	6. Fouled spark plug.	Clean or replace.
	7. Spark plug gaps incorrect.	Adjust or replace.
	8. Clogged jets in carburetors.	Clean.
	9. Float-chamber fuel level out of adjustment.	Adjust.
	10. Clogged air cleaner element.	Clean.
	11. Carburetor balancing screw loose.	Retighten.
	12. Sucking air from intake pipe.	Retighten or replace.
	13. Too much engine oil.	Drain out excess oil.
Engine overheats.	1. Heavy carbon deposit on piston crowns.	Clean.
	2. Not enough oil in the engine.	Add oil.
	3. Defective oil pump or clogged oil circuit.	Replace or clean.
	4. Fuel level too low in float chambers.	Adjust.
	5. Sucking air from intake pipes.	Retighten or replace.
	6. Use incorrect engine oil.	Change.

CARBURETOR

Complaint	Symptom and possible causes	Remedy
Trouble with starting.	1. Starter jet is clogged.	Clean.
	2. Starter pipe is clogged.	Clean.
	3. Air leaking from a joint between starter body and carburetor.	Check starter body and carburetor for tightness, adjust and replace gasket.
	4. Air leaking from carburetor's joint or vacuum gauge joint.	Check and adjust.
	5. Starter plunger is not operating properly.	Check and adjust.
Idling or low-speed trouble.	1. Pilot jet, pilot air jet are clogged or loose.	Check and clean.
	2. Air leaking from carburetor's joint, vacuum gauge joint, or starter.	Check and 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. Fuel filter is clogged.	Check and clean.

Complaint	Symptom and possible causes	Remedy
Overflow and fuel level fluctuations.	1. Needle valve is worn or damaged. 2. Spring in needle valve is broken. 3. Float is not working properly. 4. Foreign matter has adhered to needle valve. 5. Fuel level is too high or low.	Replace. Replace. Check and adjust. Clean. Adjust float height.

ELECTRICAL

Complaint	Symptom and possible causes	Remedy
No sparking or poor sparking.	1. Defective ignition coil. 2. Defective spark plugs. 3. Defective signal generator or ignitor unit.	Replace. Replace. Replace.
Spark plugs soon become fouled with carbon.	1. Mixture too rich. 2. Idling speed set to high. 3. Incorrect gasoline. 4. Dirty element in air cleaner. 5. Spark plugs too cold.	Adjust carburetors. Adjust carburetors. Change. Clean. Replace by hot type plugs.
Spark plugs become fouled too soon.	1. Worn piston rings. 2. Piston or cylinders worn. 3. Excessive clearance of valve stems in valve guides. 4. Worn stem oil seal.	Replace. Replace. Replace. Replace.
Spark plug electrodes overheat or burn.	1. Spark plugs too hot. 2. The engine overheats. 3. Spark plugs loose. 4. Mixture too lean.	Replace by cold type plugs. Tune up. Retighten. Adjust carburetors.
Generator does not charge.	1. Open or short in lead wires, or loose lead connections. 2. Shorted, grounded or open generator coils. 3. Shorted or punctured regulator and rectifier. 4. Brushes not seating properly on slip ring in rotor.	Repair or replace or retighten. Replace. Replace. Repair or replace.
Generator does charge, but charging rate is below the specification.	1. Lead wires tend to get shorted or open-circuited or loosely connected at terminals. 2. Grounded or open-circuited stator coils of generator. 3. Defective regulator and rectifier. 4. Not enough electrolyte in the battery. 5. Defective cell plates in the battery.	Repair, or retighten. Replace. Replace. Add distilled water to the upper level. Replace the battery.
Generator overchanges.	1. Internal short-circuit in the battery. 2. Resistor element in the regulator damaged or defective. 3. Regulator poorly grounded.	Replace the battery. Replace. Clean and tighten ground connection.
Unstable charging.	1. Lead wire insulation frayed due to vibration, resulting in intermittent shorting. 2. Generator internally shorted. 3. Defective regulator and rectifier.	Repair or replace. Replace. Replace.

Complaint	Symptom and possible causes	Remedy
Starter button is not effective.	1. Battery run down. 2. Defective switch contacts. 3. Brushes not seating properly on commutator in starter motor. 4. Defective starter relay.	Repair or replace. Replace. Repair or replace. Replace.

BATTERY

Symptom	Probable cause	Remedy
"Sulfation", acidic white powdery substance or spots on surfaces of cell plates.	1. Not enough electrolyte. 2. Battery case is cracked. 3. Battery has been left in a run-down condition for a long time. 4. Contaminated electrolyte (Foreign matter has entered the battery and become mixed with the electrolyte).	Add distilled water, if the battery has not been damaged and "sulfation" has not advanced too far, and recharge. Replace the battery. Replace the battery. 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. 2. Cell plates have lost much of their active material as a result of over-charging. 3. A short-circuit condition exists within the battery due to excessive accumulation of sediments caused by the high electrolyte S.G. 4. Electrolyte S.G. is too low. 5. Contaminated electrolyte. 6. Battery is too old.	Check the generator, regulator/rectifier and circuit connections, and make necessary adjustments to obtain specified charging operation. Replace the battery, and correct the charging system. Replace the battery. Recharge the battery fully and adjust electrolyte S.G. Replace the electrolyte, recharge the battery and then adjust S.G. 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.) 2. Battery electrolyte excessive or insufficient, or its specific gravity too high or too low. 3. The battery left unused for too long in cold climate.	Replace the battery. Keep the electolyte up to the prescribed level, or adjust the S.G. by consulting the battery maker's directions. Replace the battery, if badly sulfated.
Battery discharges too rapidly.	1. Dirty container top and sides. 2. Impurities in the electrolyte or electrolyte S.G. is too high.	Clean. Change the electrolyte by consulting the battery maker's direction.

CHASSIS

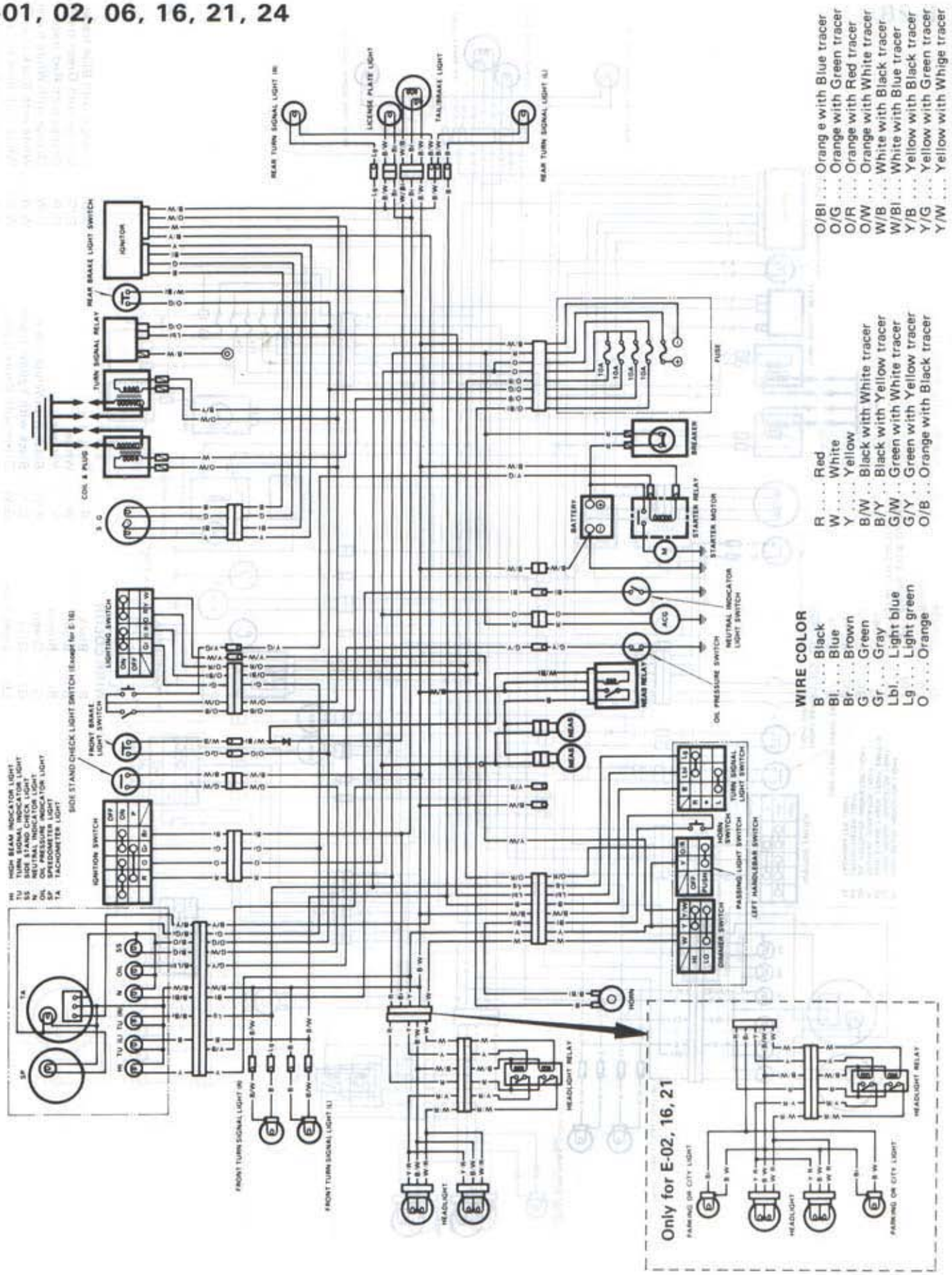
Complaint	Symptom and possible causes	Remedy
Heavy steering.	1. Steering stem nut overtightened. 2. Broken bearing in steering stem. 3. Distorted steering stem. 4. Not enough pressure in tires. 5. Incorrect mounting of steering damper.	Adjust. Replace. Replace. Adjust. Adjust.
Wobbly handle.	1. Loss of balance between right and left front forks. 2. Distorted front fork. 3. Distorted front axle or crooked tire. 4. Incorrect front fork air pressure. 5. Oil leakage of steering damper.	Replace. Repair or replace. Replace. Adjust. Replace.
Wobbly front wheel.	1. Distorted wheel rim. 2. Worn-down front wheel bearings. 3. Defective or incorrect tire. 4. Loose nut on axle. 5. Incorrect front fork oil or air pressure.	Replace. Replace. Replace. Retighten. Adjust.
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. 3. Incorrect air pressure in front fork.	Replace. Drain excess oil. Adjust.
Noisy front suspension.	1. Not enough fork oil. 2. Loose nuts on suspension.	Refill. Retighten.
Wobbly rear wheel.	1. Distorted wheel rim. 2. Worn-down rear wheel bearings or swingarm bearings. 3. Defective or incorrect tire. 4. Worn swingarm and rear cushion related bearings. 5. Loose nuts or bolts on rear suspension.	Replace. Replace. Replace. Replace. Retighten.
Rear suspension too soft.	1. Weakened shock absorber spring. 2. Rear suspension adjuster improperly set. 3. Oil leakage of shock absorber. 4. Gas leakage of shock absorber.	Replace. Adjust. Replace. Replace.
Rear suspension too stiff.	1. Rear suspension adjuster improperly set. 2. Shock absorber shaft bent. 3. Swingarm bent. 4. Worn swingarm and rear cushion related bearings.	Adjust. Replace. Replace. Replace.
Noisy rear suspension.	1. Loose nuts or bolts on rear suspension. 2. Worn swingarm and rear cushion related bearings.	Retighten. Replace.

BRAKES

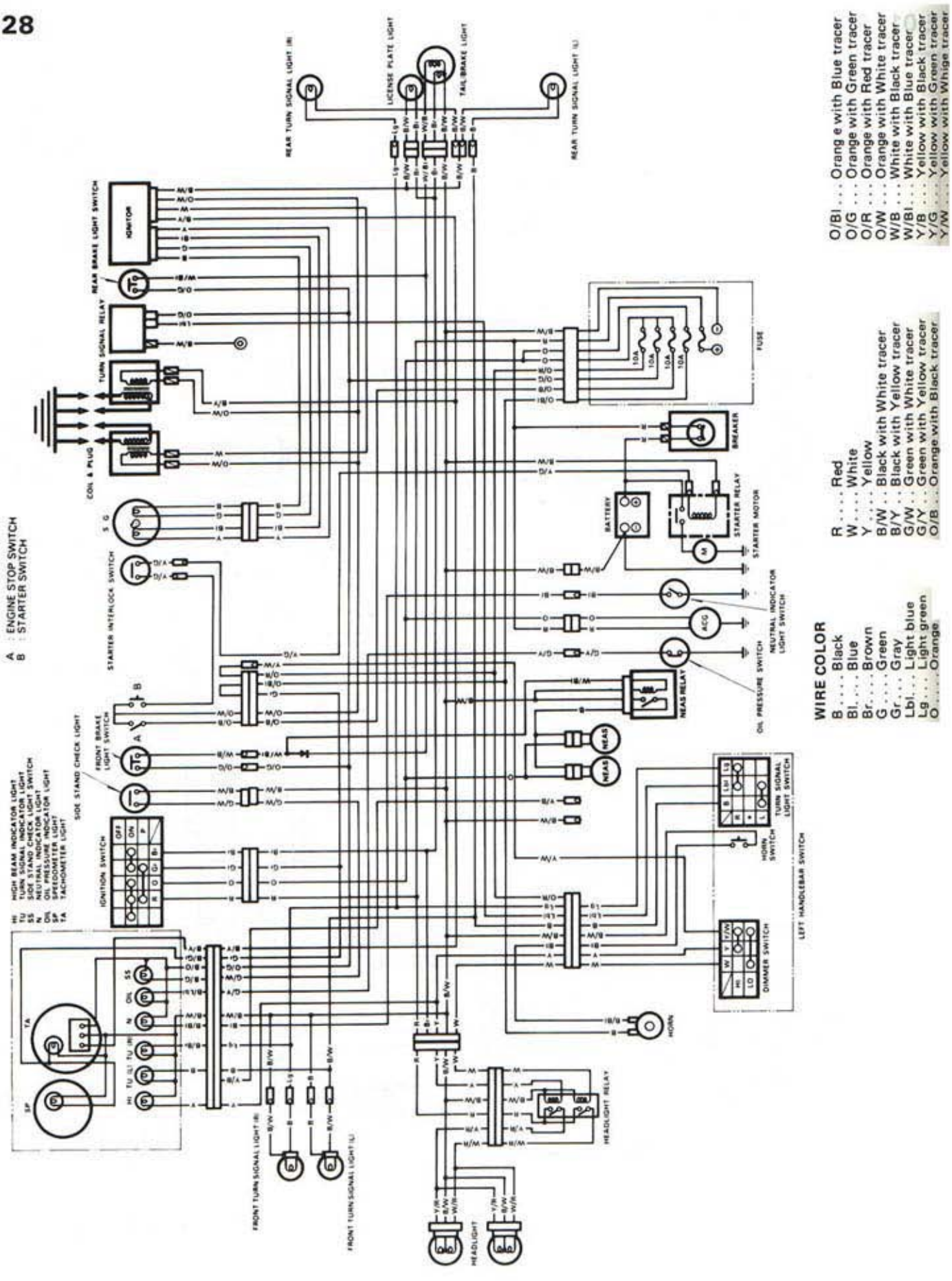
Complaint	Symptom and possible causes	Remedy
Insufficient brake power.	1. Leakage of brake fluid from hydraulic system. 2. Worn pads. 3. Oil adhesion on engaging surface of pads. 4. Worn disc. 5. Air in hydraulic system.	Repair or replace. Replace. Clean disc and pads. Replace. Bleed air.
Brake squeaking.	1. Carbon adhesion on pad surface. 2. Tilted pad. 3. Damaged wheel bearing. 4. Loose front wheel axle or rear wheel axle. 5. Worn pads. 6. Foreign material in brake fluid. 7. Clogged return port of master cylinder.	Repair surface with sandpaper. Modify pad fitting. Replace. Tighten to specified torque. Replace. Replace brake fluid. Disassemble and clean master cylinder.
Excessive brake lever stroke.	1. Air in hydraulic system. 2. Insufficient brake fluid. 3. Improper quality of brake fluid.	Bleed air. Replenish fluid to specified level; bleed air. Replace with correct fluid.
Leakage of brake fluid.	1. Insufficient tightening of connection joints. 2. Cracked hose. 3. Worn piston and/or cup.	Tighten to specified torque. Replace. Replace piston and/or cup.

WIRING DIAGRAM

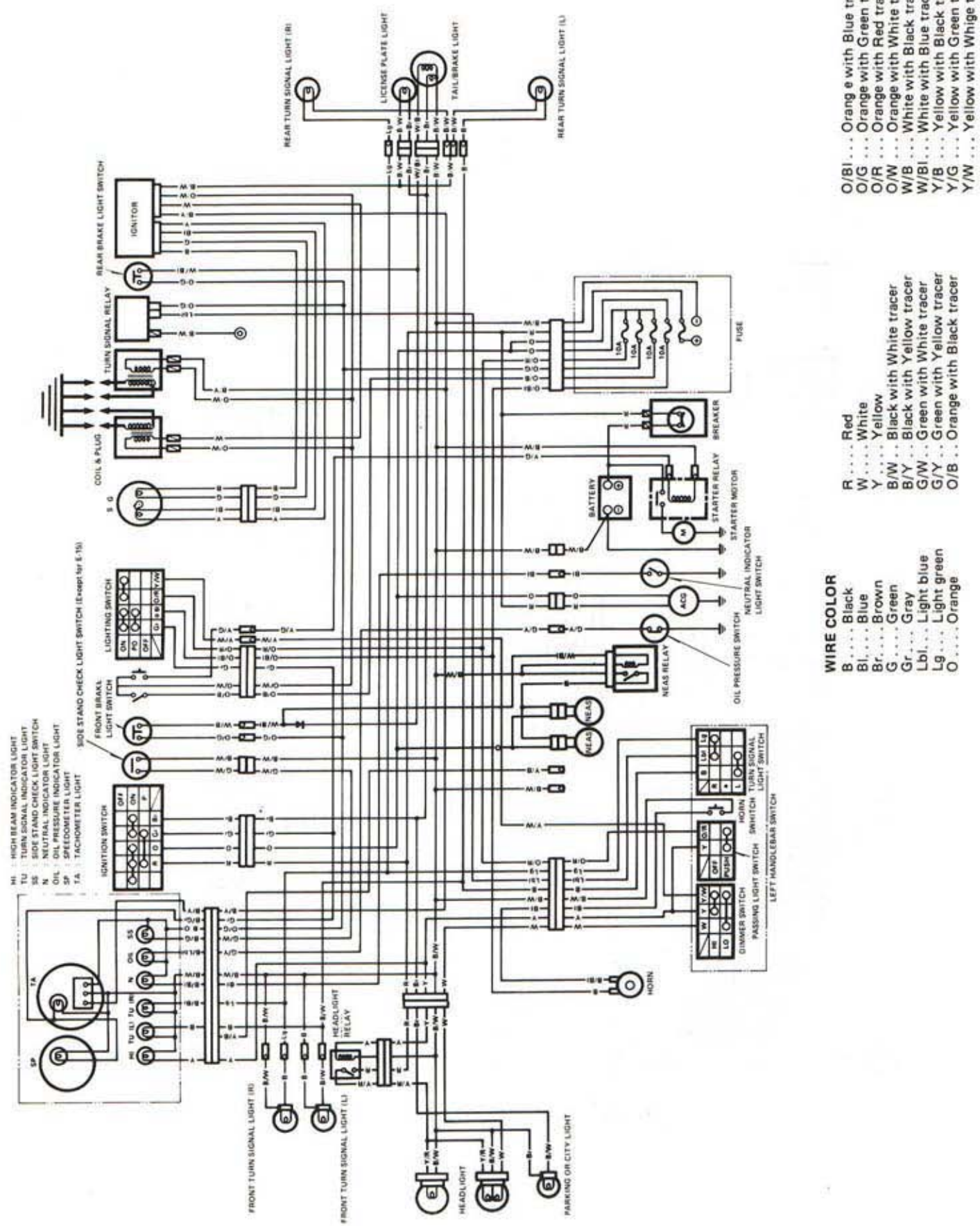
E-01, 02, 06, 16, 21, 24



E-28


A : ENGINE STOP SWITCH
B : STARTER SWITCH
HI : HIGH BEAM INDICATOR LIGHT
TU : TURN SIGNAL INDICATOR LIGHT
SS : SIDE STAND CHECK LIGHT SWITCH
N : NEUTRAL INDICATOR LIGHT
OIL : OIL PRESSURE INDICATOR LIGHT
SP : SPEEDOMETER LIGHT
TA : TACHOMETER LIGHT
REAR TURN SIGNAL LIGHT (R)
LICENSE PLATE LIGHT
TAIL/BRAKE LIGHT
REAR TURN SIGNAL LIGHT (L)
IGNITOR
REAR BRAKE LIGHT SWITCH
TURN SIGNAL RELAY
COIL & PLUG
S.G.
STARTER INTERLOCK SWITCH
FRONT BRAKE LIGHT SWITCH
SIDE STAND CHECK LIGHT
IGNITION SWITCH
FUSE
BREAKER
BATTERY
STARTER RELAY
STARTER MOTOR
ACG
NEUTRAL INDICATOR LIGHT SWITCH
OIL PRESSURE SWITCH
NEAS RELAY
NEAS
TURN SIGNAL LIGHT SWITCH
HORN SWITCH
DIMMER SWITCH
LEFT HANDLEBAR SWITCH
HORN
HEADLIGHT RELAY
FRONT TURN SIGNAL LIGHT (R)
FRONT TURN SIGNAL LIGHT (L)
HEADLIGHT
WIRE COLOR
B . . . . Black
Bl . . . . Blue
Br . . . . Brown
G . . . . Green
Gr . . . . Gray
Lbl . . . Light blue
Lg . . . . Light green
O . . . . Orange
R . . . . Red
W . . . . White
Y . . . . Yellow
B/W . . Black with White tracer
B/Y . . . Black with Yellow tracer
G/W . . Green with White tracer
G/Y . . . Green with Yellow tracer
O/B . . . Orange with Black tracer
O/Bl . . . Orang e with Blue tracer
O/G . . . Orange with Green tracer
O/R . . . Orange with Red tracer
O/W . . . Orange with White tracer
W/B . . . White with Black tracer
W/Bl . . . White with Blue tracer
Y/B . . . Yellow with Black tracer
Y/G . . . Yellow with Green tracer
Y/W . . . Yellow with White tracer

E-04, 15, 17, 22, 25, 39

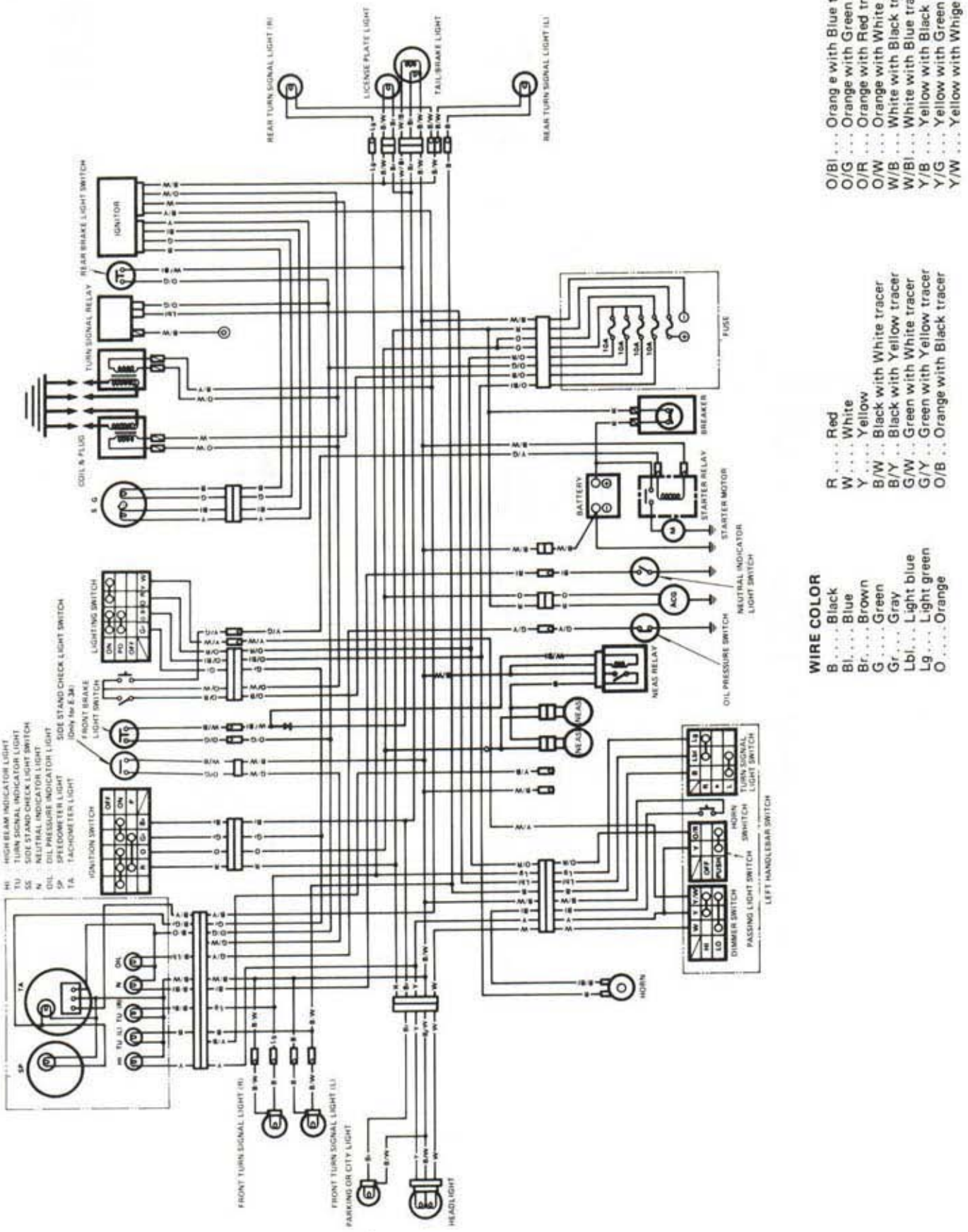


WIRE COLOR

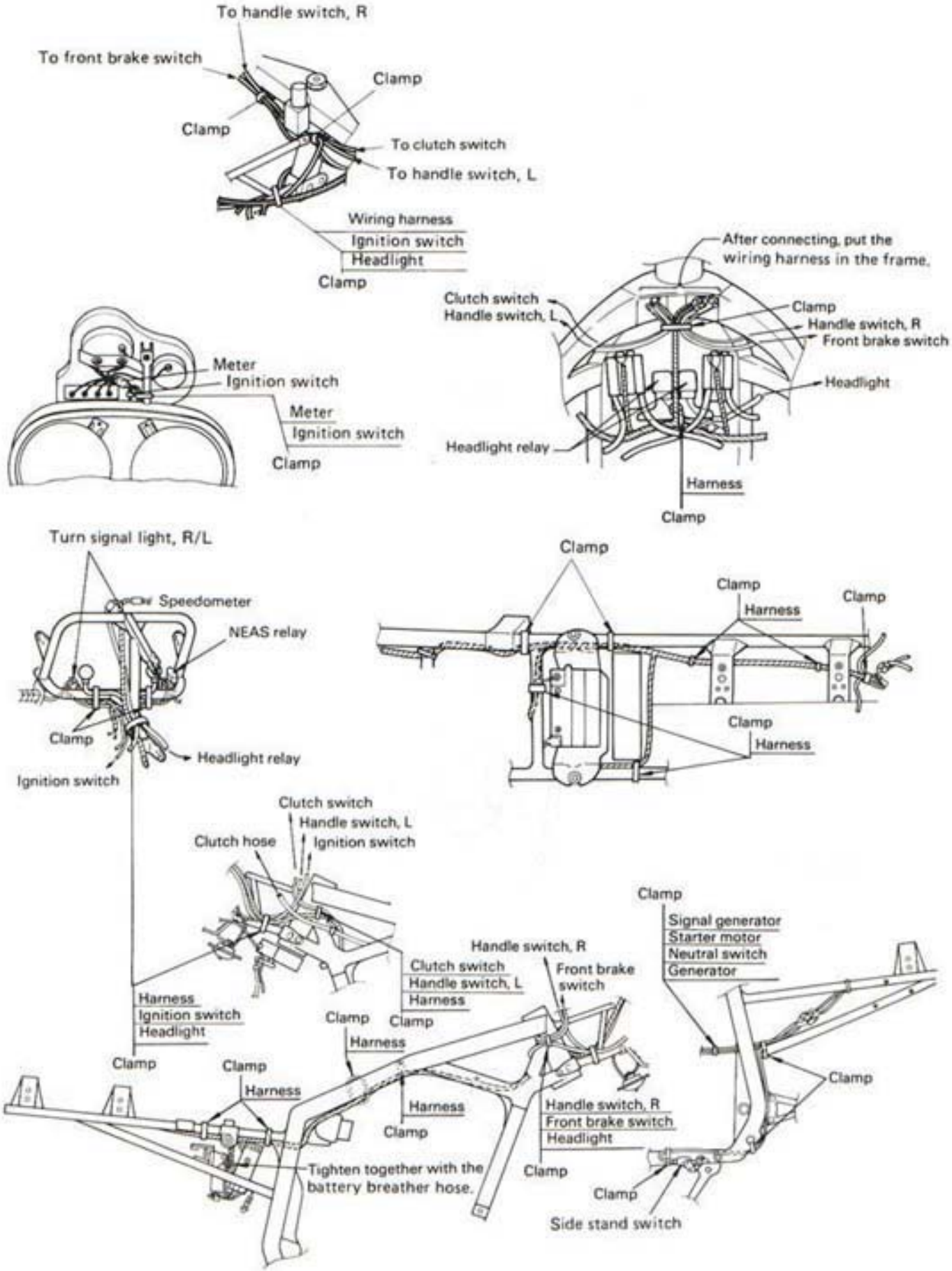
B . . . . Black	R . . . . Red
Bl . . . . Blue	W . . . . White
Br . . . . Brown	Y . . . . Yellow
G . . . . Green	B/W . . Black with White tracer
Gr . . . . Gray	B/Y . . Black with Yellow tracer
Lbl . . . Light blue	G/W . . Green with White tracer
Lg . . . Light green	G/Y . . Green with Yellow tracer
O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

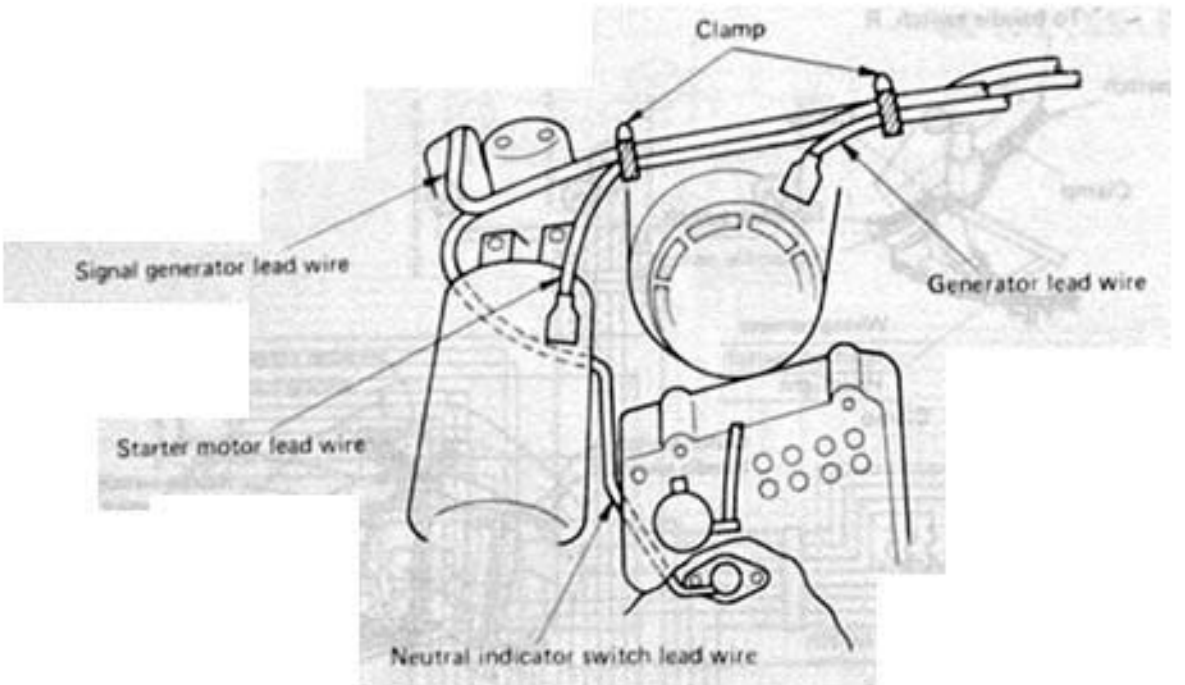
O/Bl . . . Orang e with Blue tracer	
O/G . . . Orange with Green tracer	
O/R . . . Orange with Red tracer	
O/W . . . Orange with White tracer	
W/B . . . White with Black tracer	
W/Bl . . . White with Blue tracer	
Y/B . . . Yellow with Black tracer	
Y/G . . . Yellow with Green tracer	
Y/W . . . Yellow with Whige tracer	

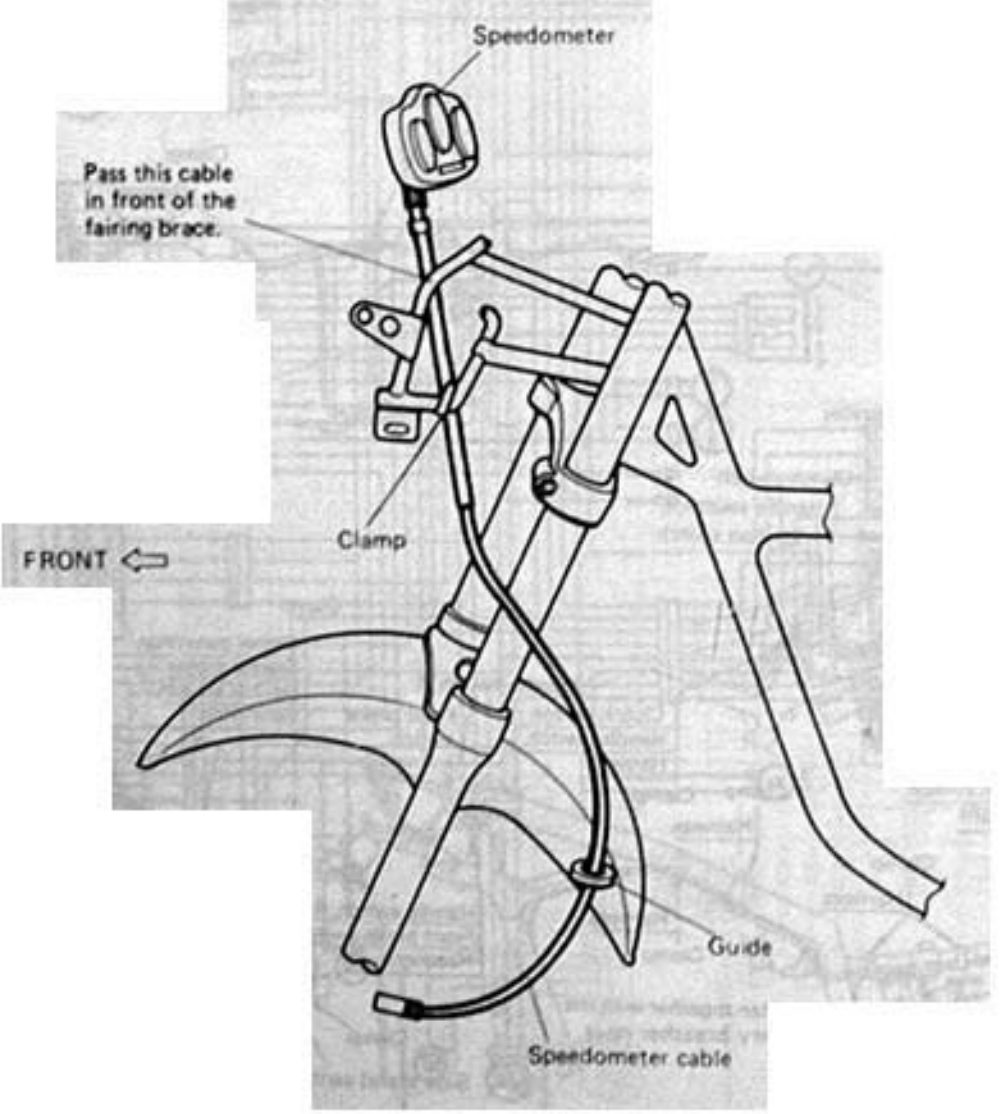
E-18, 34

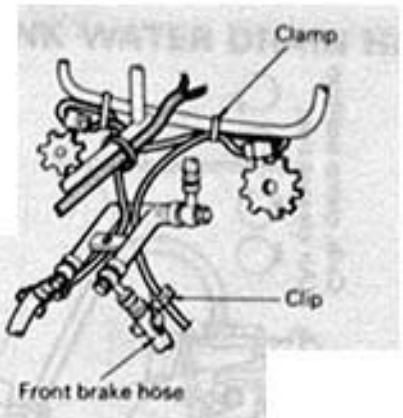

WIRE COLOR
B . . . . Black
Bl . . . . Blue
Br . . . . Brown
G . . . . Green
Gr . . . Gray
Lbl . . . Light blue
Lg . . . Light green
O . . . . Orange
R . . . . Red
W . . . . White
Y . . . . Yellow
B/W . . Black with White tracer
B/Y . . Black with Yellow tracer
G/W . . Green with White tracer
G/Y . . Green with Yellow tracer
O/B . . Orange with Black tracer
O/Bl . . . Orang e with Blue tracer
O/G . . . Orange with Green tracer
O/R . . . Orange with Red tracer
O/W . . . Orange with White tracer
W/B . . . White with Black tracer
W/Bl . . . White with Blue tracer
Y/B . . . Yellow with Black tracer
Y/G . . . Yellow with Green tracer
Y/W . . . Yellow with Whige tracer
REAR TURN SIGNAL LIGHT (R)
LICENSE PLATE LIGHT
TAIL/BRAKE LIGHT
REAR TURN SIGNAL LIGHT (L)
REAR BRAKE LIGHT SWITCH
IGNITOR
TURN SIGNAL RELAY
COIL & PLUG
S G
FUSE
BREAKER
BATTERY
STARTER RELAY
STARTER MOTOR
NEUTRAL INDICATOR LIGHT SWITCH
OIL PRESSURE SWITCH
NEAS RELAY
LIGHTING SWITCH
FRONT BRAKE LIGHT SWITCH
SIDE STAND CHECK LIGHT SWITCH (Only for E-34)
IGNITION SWITCH
HI HIGH BEAM INDICATOR LIGHT
TU TURN SIGNAL INDICATOR LIGHT
SS SIDE STAND CHECK LIGHT SWITCH
N NEUTRAL INDICATOR LIGHT
OIL OIL PRESSURE INDICATOR LIGHT
SP SPEEDOMETER LIGHT
TA TACHOMETER LIGHT
TURN SIGNAL LIGHT SWITCH
HORN SWITCH
PASSING LIGHT SWITCH
DIMMER SWITCH
LEFT HANDLEBAR SWITCH
HORN
FRONT TURN SIGNAL LIGHT (R)
FRONT TURN SIGNAL LIGHT (L)
PARKING OR CITY LIGHT
HEADLIGHT

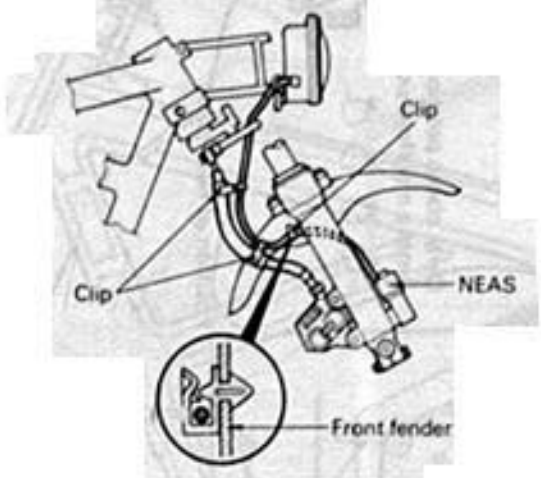
WIRE, CABLE AND HOSE ROUTING

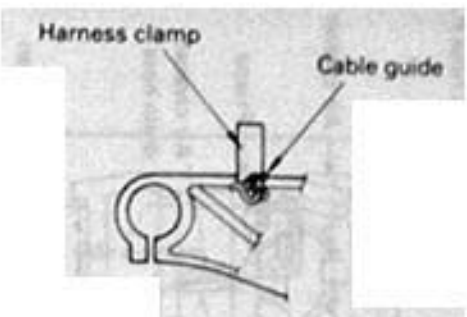


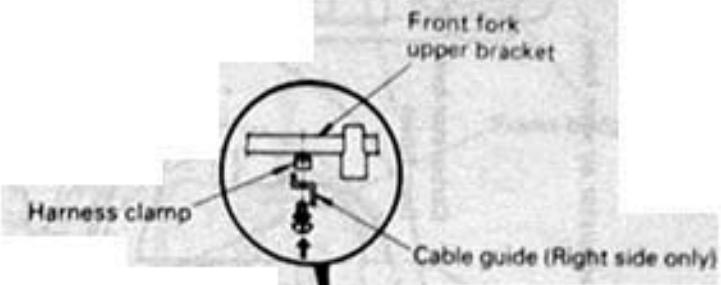

Clamp
Signal generator lead wire
Generator lead wire
Starter motor lead wire
Neutral indicator switch lead wire

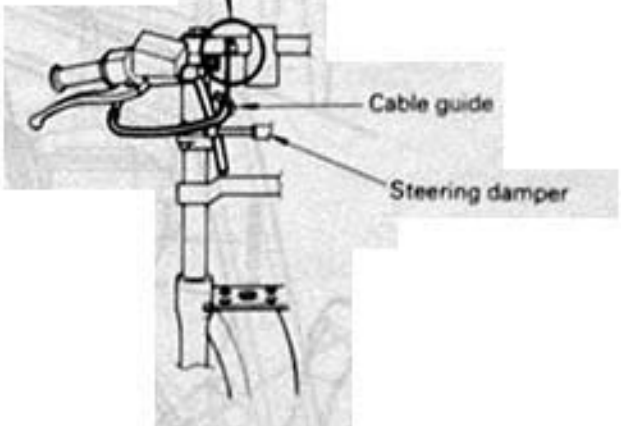

Speedometer
Pass this cable in front of the fairing brace.
Clamp
FRONT
Guide
Speedometer cable

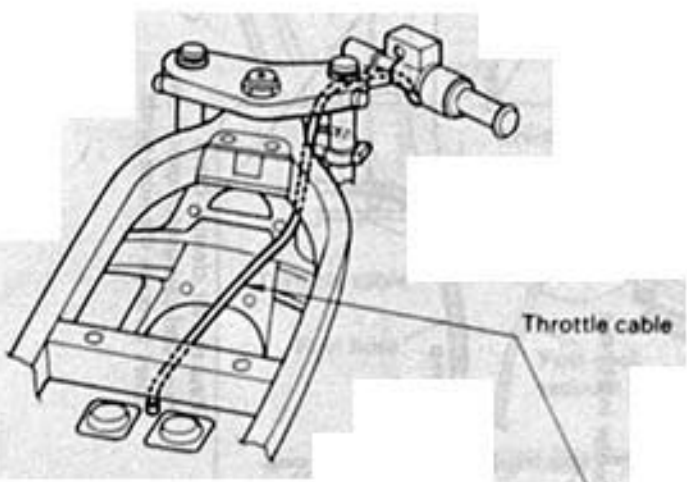

Clamp
Clip
Front brake hose

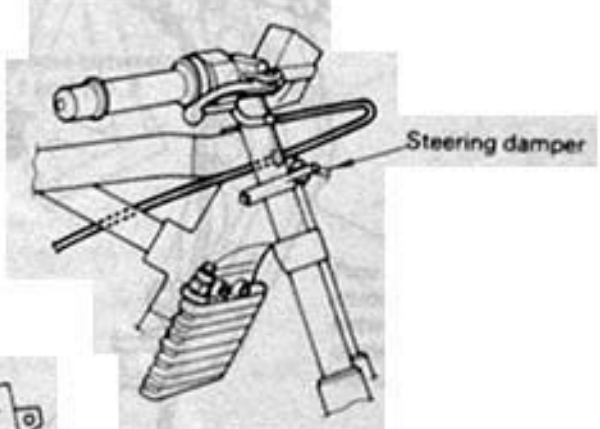

Clip
Clip
NEAS
Front fender

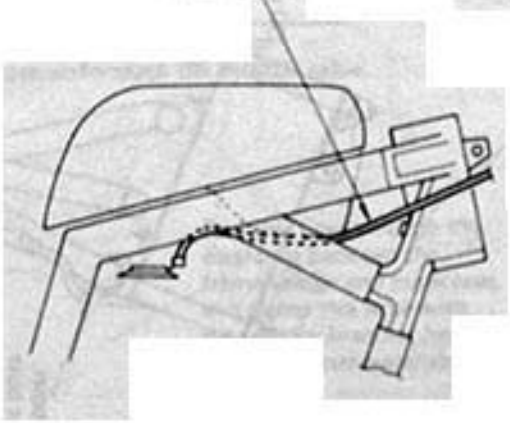

Harness clamp
Cable guide


Front fork
upper bracket
Harness clamp
Cable guide (Right side only)

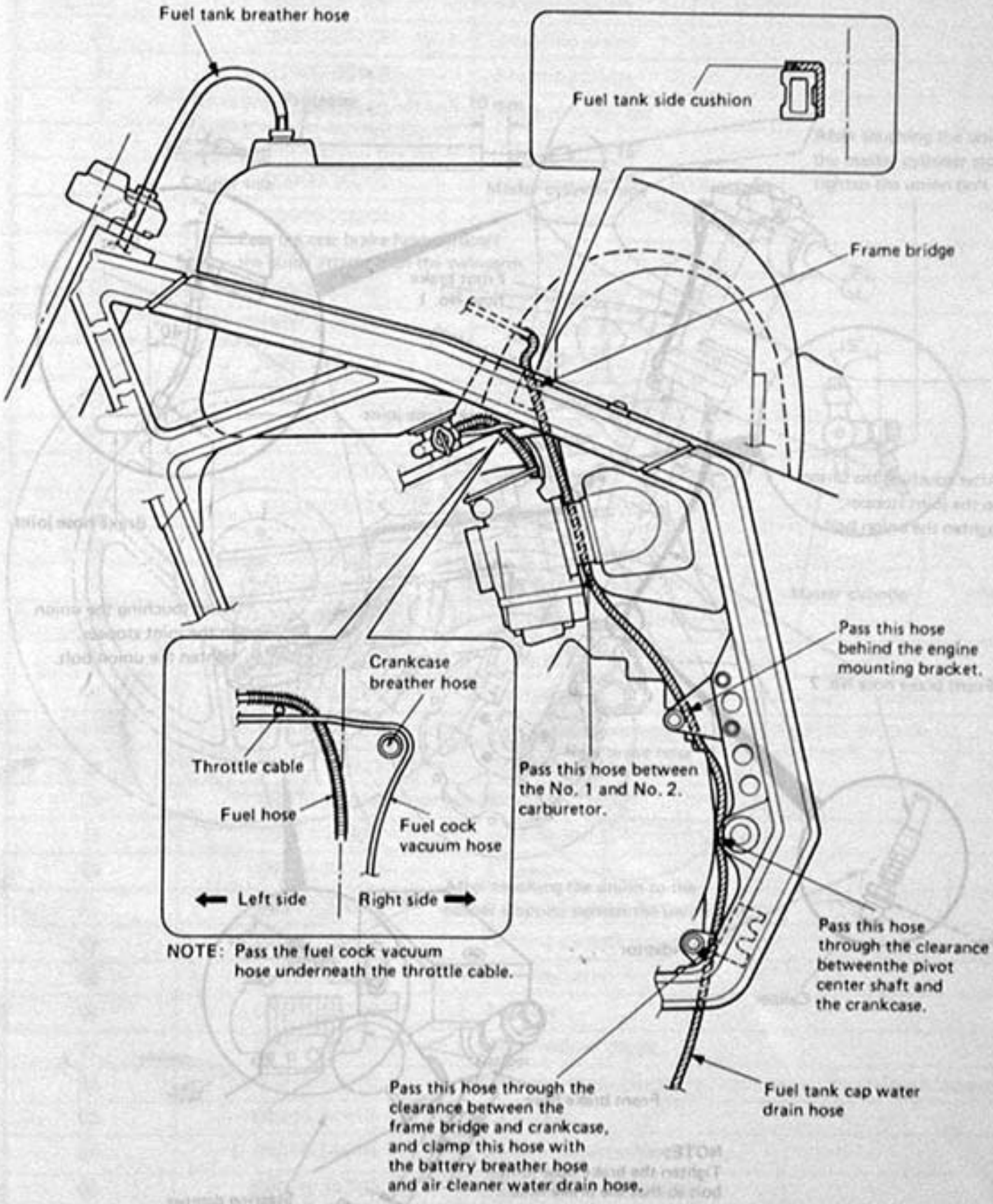

Cable guide
Steering damper


Throttle cable


Steering damper

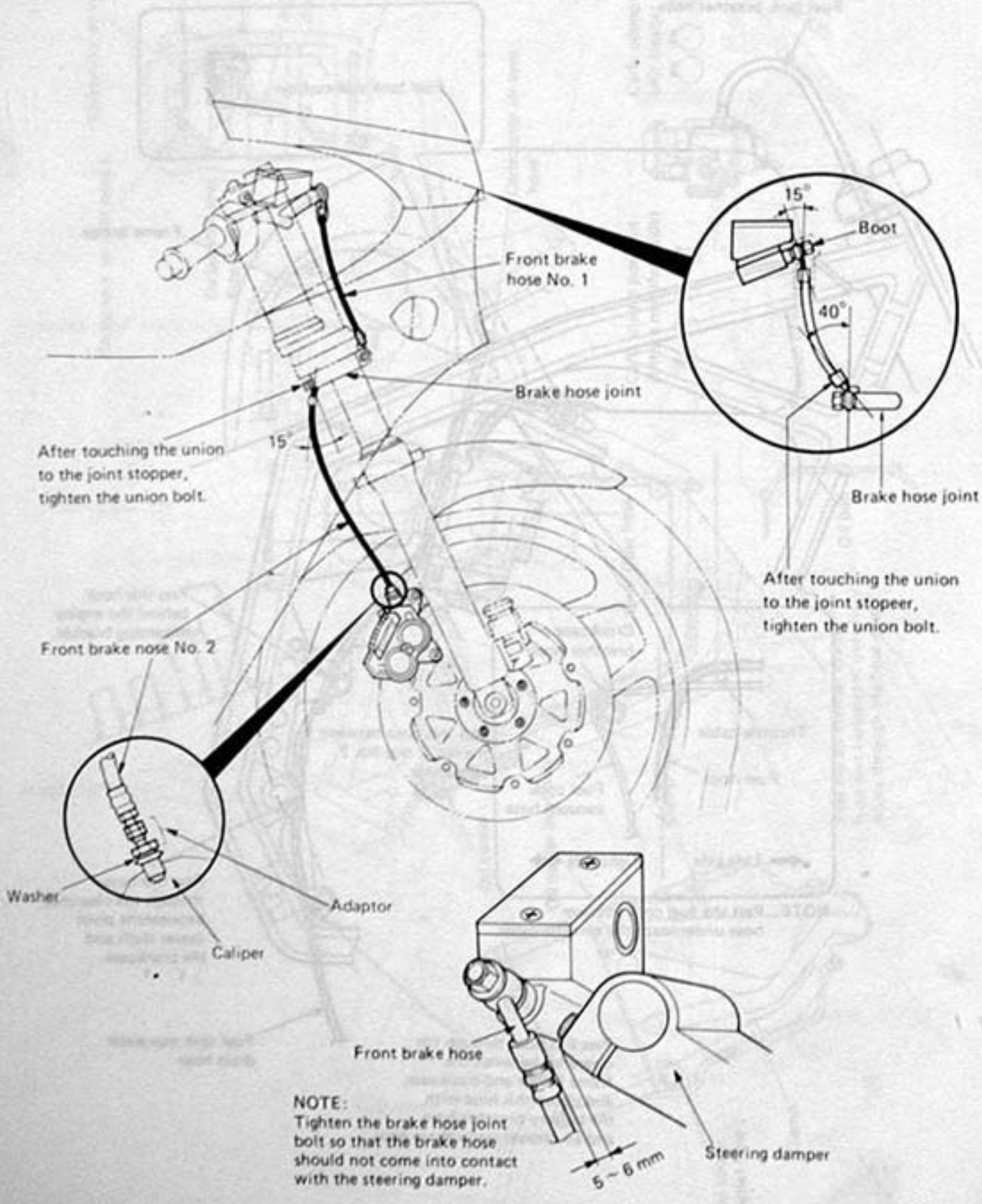


FUEL TANK WATER DRAIN HOSE ROUTING

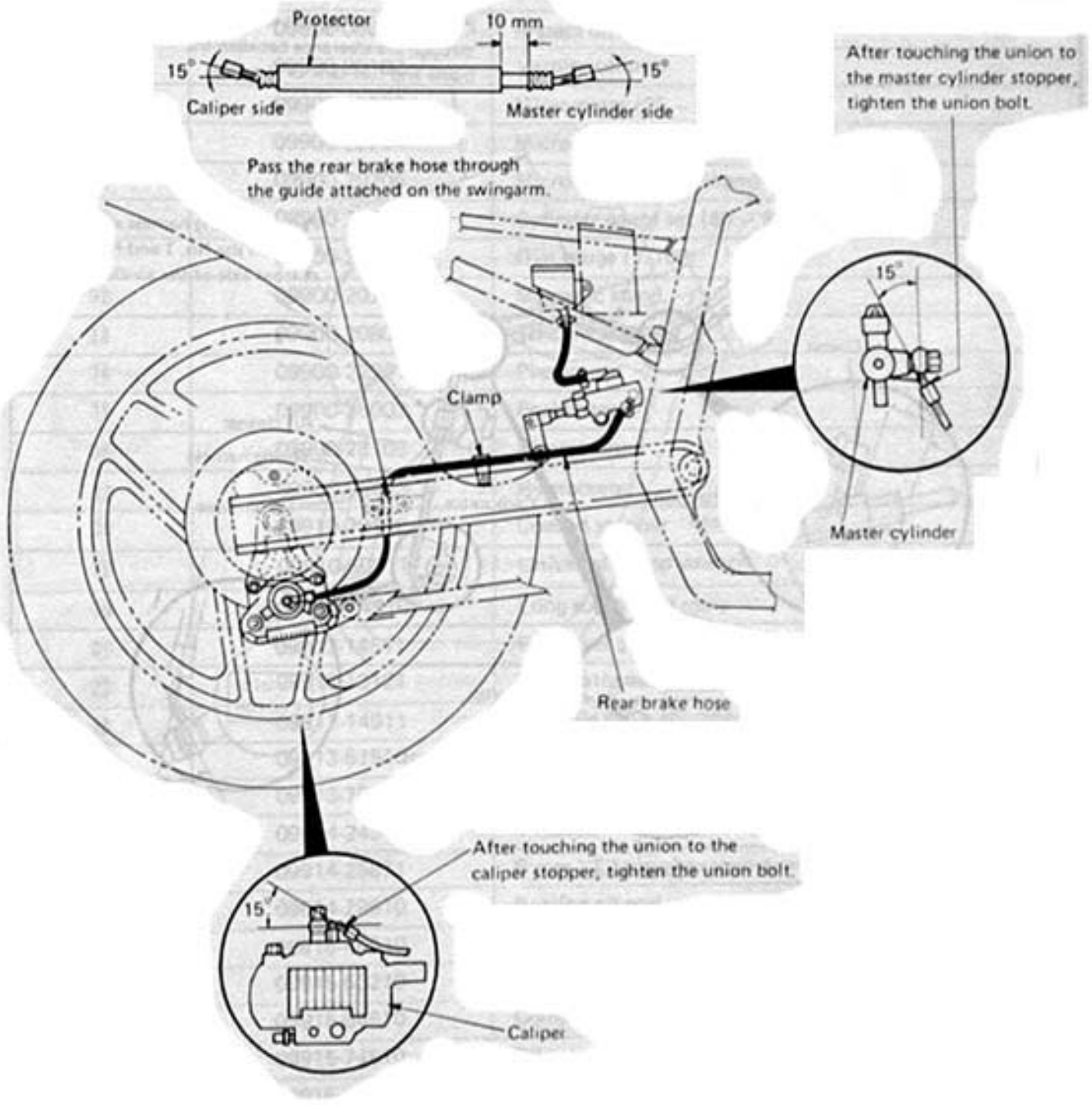


NOTE: Pass the fuel cock vacuum hose underneath the throttle cable.

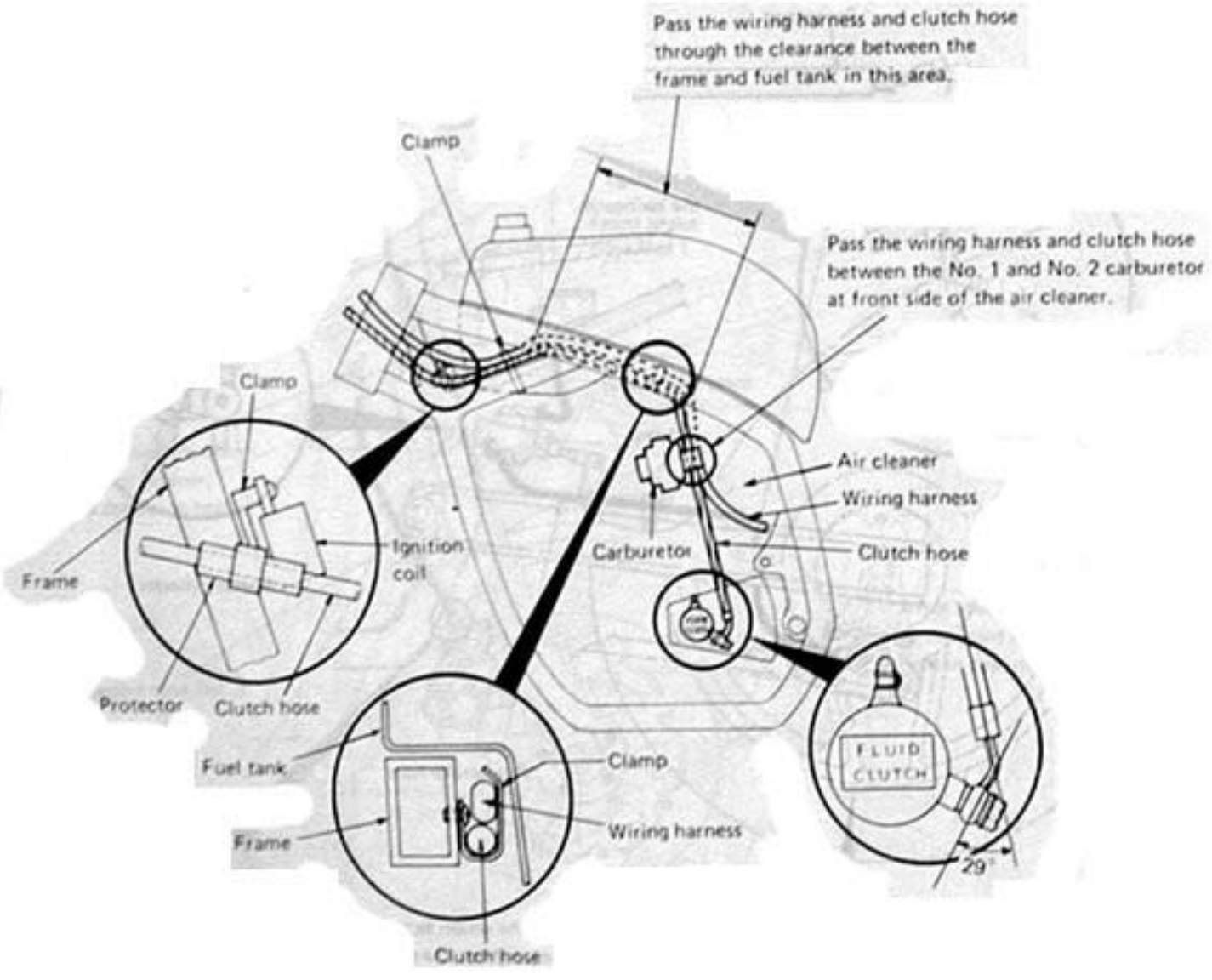
FRONT BRAKE HOSE ROUTING



REAR BRAKE HOSE ROUTING



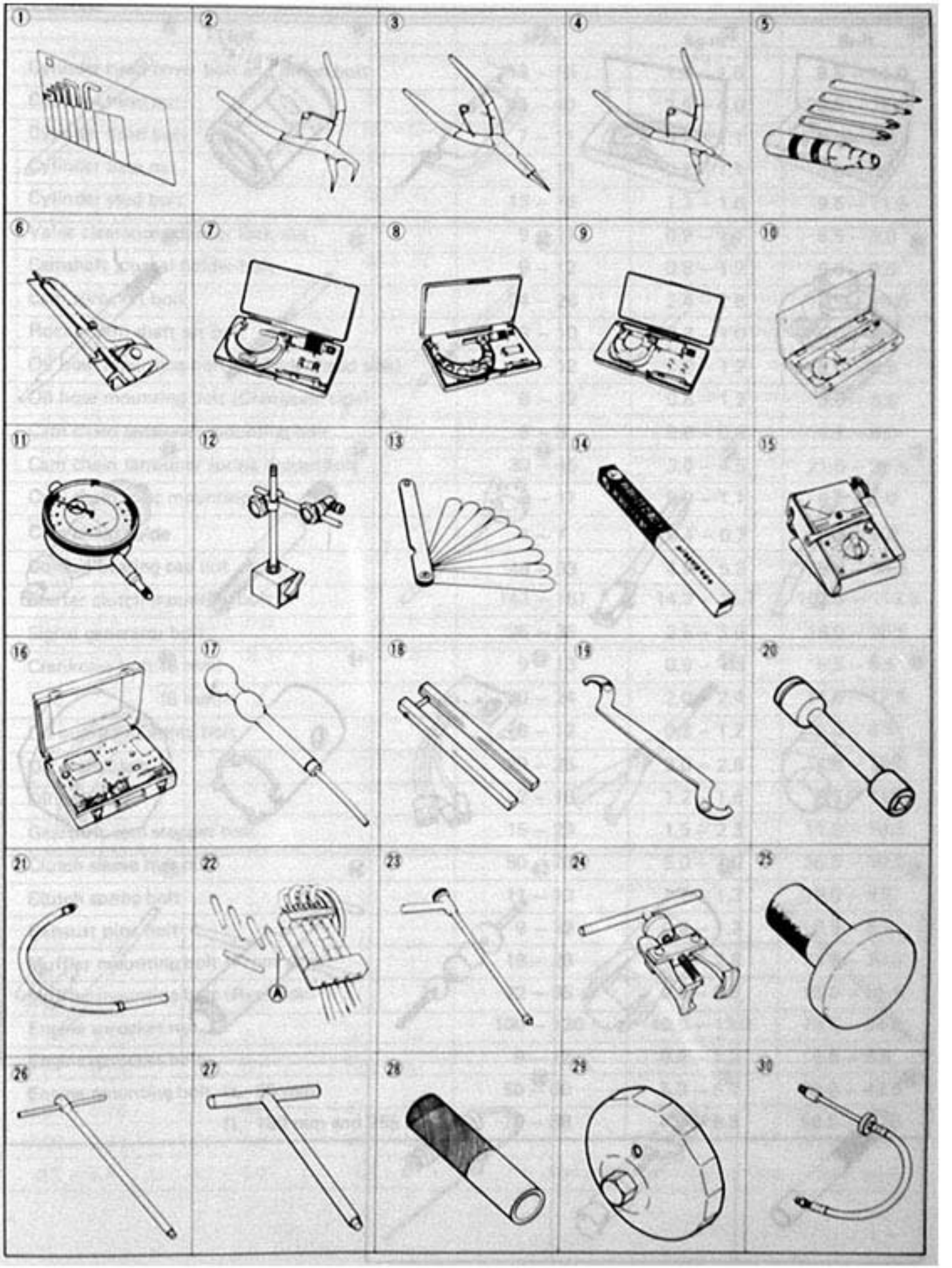
CLUTCH HOSE ROUTING



SPECIAL TOOLS

ITEM	PART NO.	PART NAME
①	09900-00401	"L" type hexagon wrench set
②	09900-06105	Snapring pliers
③	09900-06107	Snapring pliers
④	09900-06108	Snapring pliers
⑤	09900-09003	Impact driver set
⑥	09900-20102	Vernier calipers
⑦	09900-20202	Micrometer (25 – 50 mm)
⑧	09900-20204	Micrometer (75 – 100 mm)
⑨	09900-20205	Micrometer (0 – 25 mm)
⑩	09900-20508	Cylinder gauge set (40 – 80 mm)
⑪	09900-20606	Dial gauge (1/100)
⑫	09900-20701	Magnetic stand
⑬	09900-20803	Thickness gauge
⑭	09900-22301	Plastigauge
⑮	09900-25002	Pocket tester
⑯	09900-28106	Electro tester
⑰	09900-28403	Hydrometer
⑱	09910-20116	Conrod stopper
⑲	09910-60611	Universal clamp wrench
⑳	09911-74510	Long socket (14 mm)
㉑	09913-14511	Fuel level gauge
㉒	09913-13121	Carburetor balancer Ⓐ 09913-13140 Adaptor
㉓	09913-14911	Throttle valve adjust wrench
㉔	09913-61510	Bearing puller
㉕	09913-75520	Bearing installer
㉖	09914-24510	T-handle
㉗	09914-25811	6 mm "T" type hexagon wrench
㉘	09914-79610	Bearing oil seal installer
㉙	09915-40610	Oil filter wrench
㉚	09915-63210	Adaptor
㉛	09915-64510	Compression gauge
㉜	09915-74510	Oil pressure gauge (09915-77330: Meter, 09915-74540: Adaptor)
㉝	09916-14510	Valve lifter
㉞	09916-14910	Valve lifter attachment
㉟	09916-24310	Solid pilot (N-100-5.0)

ITEM	PART NO.	PART NAME
㊱	09916-20610	Valve seat cutter (N-121)
	09916-20620	Valve seat cutter (N-122)
	09916-24420	Valve seat cutter (N-116)
	09916-29010	Valve seat cutter (N-120)
㊲	09916-34541	Reamer handle
㊳	09916-34570	Valve guide reamer
㊴	09916-34580	Valve guide reamer
㊵	09916-44310	Valve guide remover/installer
㊶	09916-74540	Band (63 – 75 mm)
㊷	09916-74521	Holder body
㊸	09920-53722	Clutch sleeve hub holder
㊹	09923-73210	Bearing puller
㊺	09924-84510	Bearing installer set
㊻	09930-33720	Rotor remover
㊼	09930-40113	Rotor holder
㊽	09930-70710	Ignitor checker (09930-72710 Adaptor)
㊾	09940-14920	Steering stem nut wrench
㊿	09940-34592	Attachment "G"
(51)	09940-34520	"T" handle
(52)	09940-50112	Front fork oil seal installer
(53)	09941-34513	Steering outer race installer
(54)	09941-44510	Swingarm bearing remover
(55)	09941-50110	Bearing remover
(56)	09941-74910	Steering bearing installer
(57)	09941-84510	Bearing remover
(58)	09943-74111	Fork oil level gauge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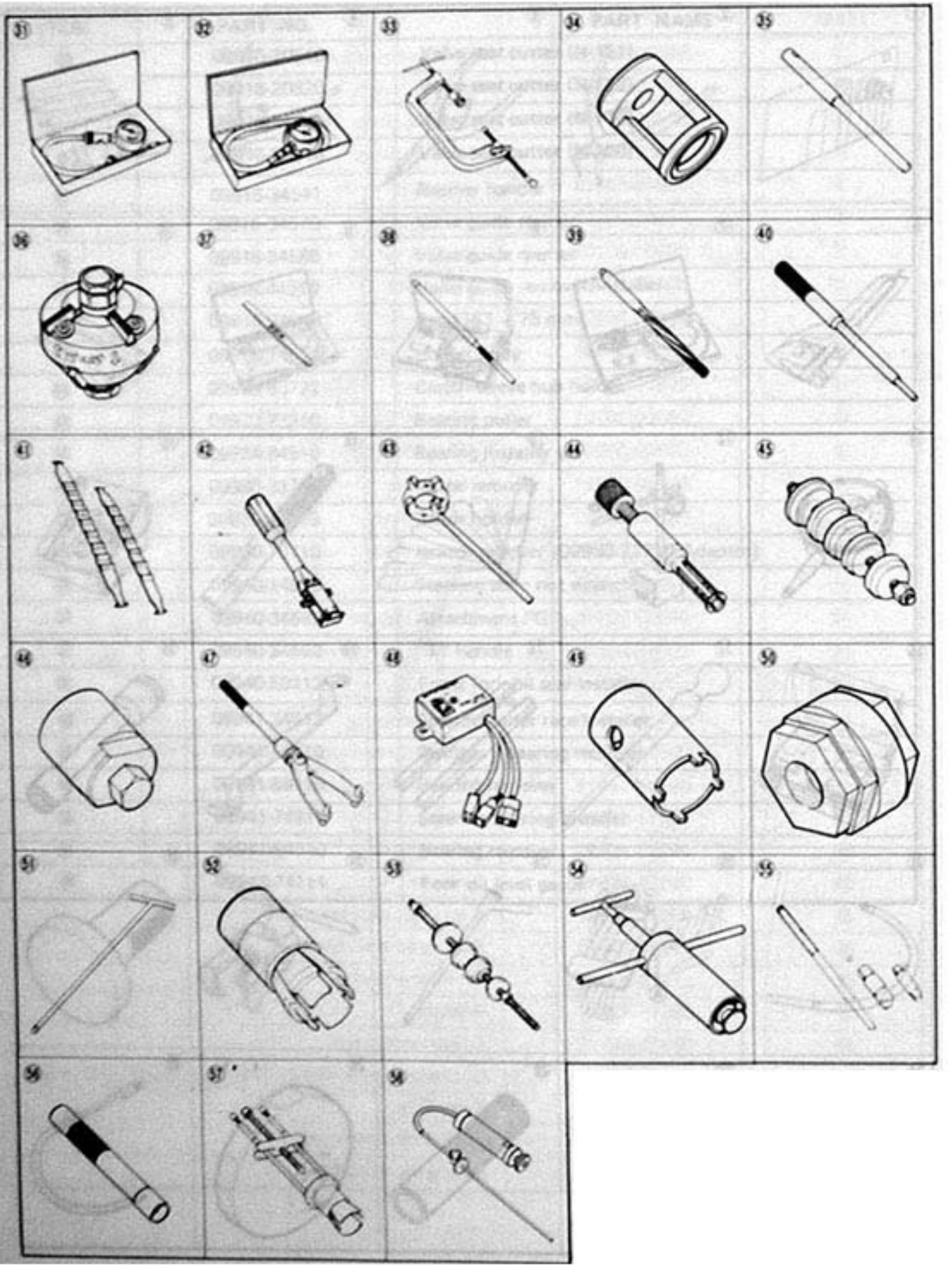
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TIGHTENING TORQUE

ENGINE

ITEM	N·m	kg-m	lb-ft
Cylinder head cover bolt and union bolt	13 – 15	1.3 – 1.5	9.5 – 11.0
Cylinder head nut	35 – 40	3.5 – 4.0	25.5 – 29.0
Cylinder head bolt	7 – 11	0.7 – 1.1	5.0 – 8.0
Cylinder base nut	7 – 11	0.7 – 1.1	5.0 – 8.0
Cylinder stud bolt	13 – 16	1.3 – 1.6	9.5 – 11.5
Valve clearance adjuster lock nut	9 – 11	0.9 – 1.1	6.5 – 8.0
Camshaft journal holder bolt	8 – 12	0.8 – 1.2	6.0 – 8.5
Cam sprocket bolt	24 – 26	2.4 – 2.6	17.5 – 19.0
Rocker arm shaft set bolt	8 – 10	0.8 – 1.0	6.0 – 7.0
Oil hose mounting bolt (Cylinder head side)	8 – 12	0.8 – 1.2	6.0 – 8.5
Oil hose mounting bolt (Crankcase side)	8 – 12	0.8 – 1.2	6.0 – 8.5
Cam chain tensioner mounting bolt	6 – 8	0.6 – 0.8	4.5 – 6.0
Cam chain tensioner spring holder bolt	30 – 45	3.0 – 4.5	21.5 – 32.5
Cam chain idler mounting bolt	9 – 11	0.9 – 1.1	6.5 – 8.0
Cam chain guide	4 – 7	0.4 – 0.7	3.0 – 5.0
Conrod bearing cap nut	49 – 53	4.9 – 5.3	35.5 – 38.5
Starter clutch mounting bolt	143 – 157	14.3 – 15.7	103.5 – 113.5
Signal generator bolt	25 – 35	2.5 – 3.5	18.0 – 25.5
Crankcase bolt (6 mm)	9 – 13	0.9 – 1.3	6.5 – 9.5
(8 mm)	20 – 24	2.0 – 2.4	14.5 – 17.5
Oil pump mounting bolt	8 – 12	0.8 – 1.2	6.0 – 8.5
Oil drain plug	20 – 25	2.0 – 2.5	14.5 – 18.0
Oil pan bolt	12 – 16	1.2 – 1.6	8.5 – 11.5
Gearshift cam stopper bolt	15 – 23	1.5 – 2.3	11.0 – 16.5
Clutch sleeve hub nut	50 – 70	5.0 – 7.0	36.0 – 50.5
Clutch spring bolt	11 – 13	1.1 – 1.3	8.0 – 9.5
Exhaust pipe bolt	9 – 12	0.9 – 1.2	6.5 – 8.5
Muffler mounting bolt (Front side)	18 – 28	1.8 – 2.8	13.0 – 20.0
Muffler mounting bolt (Rear side)	22 – 35	2.2 – 3.5	16.0 – 25.5
Engine sprocket nut	100 – 130	10.0 – 13.0	72.5 – 94.0
Engine sprocket bolt	9 – 12	0.9 – 1.2	6.5 – 8.5
Engine mounting bolt (L: 55 mm)	50 – 60	5.0 – 6.0	36.0 – 43.5
(L: 180 mm and 255 mm)	70 – 88	7.0 – 8.8	50.5 – 63.5

CHASSIS

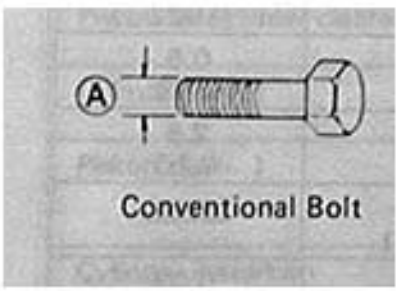
ITEM	N·m	kg·m	lb·ft
Front axle nut (Only for E-28)	36 – 52	3.6 – 5.2	26.0 – 37.5
Front axle nut (For the others)	40 – 58	4.0 – 5.8	21.5 – 42.0
Front axle pinch nut	20 – 40	2.0 – 4.0	14.0 – 29.0
Front fork cap bolt	15 – 30	1.5 – 3.0	11.0 – 21.5
Front fork upper clamp bolt	20 – 30	2.0 – 3.0	14.5 – 21.5
Front fork lower clamp bolt	15 – 25	1.5 – 2.5	11.0 – 18.0
Front fork damper rod bolt	54 – 70	5.4 – 7.0	39.5 – 50.5
Steering stem head nut	30 – 40	3.0 – 4.0	21.5 – 29.0
Handlebar holder mounting bolt	15 – 25	1.5 – 2.5	11.0 – 18.0
Handlebar holder set bolt	6 – 10	0.6 – 1.0	4.5 – 7.0
Clutch cylinder mounting bolt	5 – 8	0.5 – 0.8	3.5 – 6.0
Front brake master cylinder bolt	5 – 8	0.5 – 0.8	3.5 – 6.0
Caliper air bleeder (Front & Rear)	6 – 9	0.6 – 0.9	4.5 – 6.5
Brake hose union bolt (cylinder, caliper side)	20 – 25	2.0 – 2.5	14.5 – 18.0
Front brake caliper mounting bolt	15 – 25	1.5 – 2.5	11.0 – 18.0
Front brake caliper housing bolt	30 – 36	3.0 – 3.6	21.5 – 26.0
NEAS unit mounting bolt	6 – 8	0.6 – 0.8	4.5 – 6.0
Front brake lever nut	8 – 12	0.8 – 1.2	6.0 – 8.5
Steering damper outer and inner nut	15 – 20	1.5 – 2.0	11.0 – 14.0
Steering damper bracket bolt	20 – 25	2.0 – 2.5	14.0 – 18.0
Brake pedal bolt	6 – 10	0.6 – 1.0	4.5 – 7.0
Rear torque link nut (Front and Rear)	18 – 28	1.8 – 2.8	13.0 – 20.0
Rear swingarm pivot nut	55 – 85	5.5 – 8.5	40.0 – 61.5
Rear brake caliper mounting bolt	15 – 25	1.5 – 2.5	11.0 – 18.0
Rear shock absorber mounting nut (Upper & Lower)	40 – 60	4.0 – 6.0	29.0 – 43.5
Rear sprocket mounting nut	48 – 72	4.8 – 7.2	35.0 – 52.0
Disc plate bolt (Front and Rear)	15 – 25	1.5 – 2.5	11.0 – 18.0
Rear brake caliper housing bolt	30 – 36	3.0 – 3.6	21.5 – 26.0
Rear cushion lever center nut	70 – 100	7.0 – 10.0	50.5 – 72.5
Rear cushion lever mounting nut	70 – 100	7.0 – 10.0	50.5 – 72.5
Rear axle nut (Only for E-28)	85 – 115	8.5 – 11.5	61.5 – 83.0
Rear axle nut (For the others)	94 – 127	9.4 – 12.7	68.0 – 92.0
Rear brake master cylinder mounting bolt	6 – 10	0.6 – 1.0	4.5 – 7.0

TIGHTENING TORQUE CHART

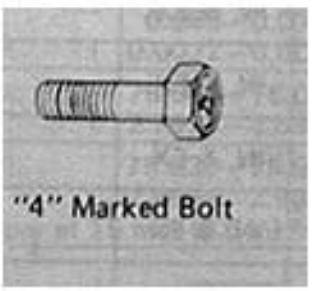
For other bolts and nuts not listed above, refer to this chart:

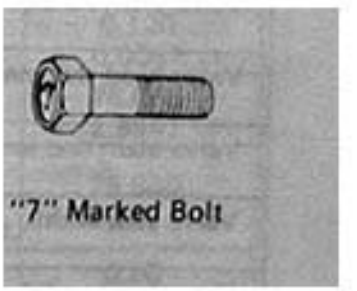
Tightening torque

Bolt Diameter (mm)	Conventional or "4" marked bolt			"7" marked bolt		
	N·m	kg·m	lb·ft	N·m	kg·m	lb·ft
4	1 – 2	0.1 – 0.2	0.7 – 1.5	1.5 – 3	0.15 – 0.3	1.0 – 2.0
5	2 – 4	0.2 – 0.4	1.5 – 3.0	3 – 6	0.3 – 0.6	2.0 – 4.5
6	4 – 7	0.4 – 0.7	3.0 – 5.0	8 – 12	0.8 – 1.2	6.0 – 8.5
8	10 – 16	1.0 – 1.6	7.0 – 11.5	18 – 28	1.8 – 2.8	13.0 – 20.0
10	22 – 35	2.2 – 3.5	16.0 – 25.5	40 – 60	4.0 – 6.0	29.0 – 43.5
12	35 – 55	3.5 – 5.5	25.5 – 40.0	70 – 100	7.0 – 10.0	50.5 – 72.5
14	50 – 80	5.0 – 8.0	36.0 – 58.0	110 – 160	11.0 – 16.0	79.5 – 115.5
16	80 – 130	8.0 – 13.0	58.0 – 94.0	170 – 250	17.0 – 25.0	123.0 – 181.0
18	130 – 190	13.0 – 19.0	94.0 – 137.5	200 – 280	20.0 – 28.0	144.5 – 202.5



Conventional Bolt


"4" Marked Bolt


"7" Marked Bolt

SERVICE DATA

VALVE + GUIDE

Unit: mm (in)

ITEM		STANDARD	LIMIT
Valve diam.	IN.	28.5 (1.12)	———
	EX.	25 (1.0)	———
Valve lift	IN.	8.8 (0.35)	———
	EX.	8.2 (0.32)	———
Valve clearance (when cold)	IN. & EX.	0.10–0.15 (0.004–0.006)	———
Valve guide to valve stem clearance	IN.	0.020–0.047 (0.0008–0.0019)	0.35 (0.014)
	EX.	0.040–0.067 (0.0016–0.0026)	0.35 (0.014)
Valve guide I.D.	IN. & EX.	5.000–5.012 (0.1969–0.1973)	———
Valve stem O.D.	IN.	4.965–4.980 (0.1955–0.1961)	———
	EX.	4.945–4.960 (0.1947–0.1953)	———
Valve stem runout	IN. & EX.	———	0.05 (0.002)
Valve head thickness	IN. & EX.	———	0.5 (0.02)
Valve stem end length	IN. & EX.	———	2.5 (0.10)
Valve seat width	IN. & EX.	0.9–1.1 (0.035–0.043)	———
Valve head radial runout	IN. & EX.	———	0.03 (0.001)
Valve spring free length (IN. & EX.)	INNER	———	35.0 (1.38)
	OUTER	———	37.8 (1.49)
Valve spring tension (IN. & EX.)	INNER	5.3–6.5 kg (11.7–14.3 lbs) at length 28 mm (1.1 in)	———
	OUTER	13.1–15.1 kg (28.9–33.3 lbs) at length 31.5 mm (1.2 in)	———

CAMSHAFT + CYLINDER HEAD

Unit: mm (in)

ITEM		STANDARD	LIMIT
Cam height	IN.	33.878–33.918 (1.3338–1.3354)	33.580 (1.3220)
	EX.	33.533–33.573 (1.3202–1.3218)	33.240 (1.3087)
Camshaft journal oil clearance	IN. & EX.	0.032–0.066 (0.0013–0.0026)	0.150 (0.0059)
Camshaft journal holder I.D.	IN. & EX.	22.012–22.025 (0.8666–0.8671)	———

ITEM	STANDARD		LIMIT
Camshaft journal O.D.	IN. & EX.	21.959–21.980 (0.8645–0.8654)	———
Camshaft runout	IN. & EX.	———	0.10 (0.004)
Cam chain 20-pitch length	———		158.0 (6.22)
Cam chain pin (at arrow "3")	22nd pin		———
Rocker arm I.D.	IN. & EX.	12.000–12.018 (0.4724–0.4731)	———
Rocker arm shaft O.D.	IN. & EX.	11.973–11.984 (0.4714–0.4718)	———
Cylinder head distortion	———		0.20 (0.008)

CYLINDER + PISTON + PISTON RING

Unit: mm (in)

ITEM			STANDARD	LIMIT
Compression pressure			1 000–1 400 kPa 10–14 kg/cm² 142–199 psi	800 kPa 8 kg/cm² 114 psi
Compression pressure difference			———	200 kPa 2 kg/cm² 28 psi
Piston to cylinder clearance			0.065–0.075 (0.0022–0.0026)	0.120 (0.0047)
Cylinder bore			76.000–76.015 (2.7921–2.9927)	76.065 (2.9947)
Piston diam.			75.930–75.945 (2.9894–2.9899) Measure at 15 mm (0.6 in) from the skirt end.	75.880 (2.9874)
Cylinder distortion			———	0.20 (0.008)
Piston ring free end gap	1st	R	Approx. 9.7 (0.38)	7.8 (0.31)
	2nd	R	Approx. 8.2 (0.32)	6.6 (0.26)
Piston ring end gap	1st		0.2–0.35 (0.008–0.014)	0.7 (0.03)
	2nd		0.2–0.35 (0.008–0.014)	0.7 (0.03)
Piston ring to groove clearance	1st		———	0.180 (0.007)
	2nd		———	0.150 (0.006)
Piston ring groove width	1st		1.01–1.03 (0.039–0.040)	———
	2nd		1.01–1.03 (0.039–0.040)	———
	Oil		2.01–2.03 (0.079–0.080)	———
Piston ring thickness	1st		0.97–0.99 (0.038–0.039)	———
	2nd		0.97–0.99 (0.038–0.039)	———

ITEM	STANDARD	LIMIT
Piston pin bore	20.002–20.008 (0.7875–0.7877)	20.030 (0.7886)
Piston pin O.D.	19.996–20.000 (0.7872–0.7874)	19.980 (0.7866)

CONROD + CRANKSHAFT

Unit: mm (in)

ITEM		STANDARD	LIMIT
Conrod small end I.D.		20.010–20.018 (0.7878–0.7881)	20.040 (0.7890)
Conrod big end side clearance		0.10–0.20 (0.004–0.008)	0.30 (0.01)
Conrod big end width		20.95–21.00 (0.825–0.827)	—
Crank pin width		21.10–21.15 (0.831–0.833)	—
Conrod big end oil clearance		0.032–0.056 (0.0013–0.0022)	0.080 (0.0031)
Crank pin O.D.		37.976–38.000 (1.4951–1.4961)	—
Crankshaft journal oil clearance		0.020–0.044 (0.0008–0.0017)	0.080 (0.0031)
Crankshaft journal O.D.		35.976–36.000 (1.4164–1.4173)	—
Crankshaft thrust clearance		0.04–0.16 (0.002–0.006)	—
Crankshaft thrust bearing thickness	Left side	2.33–2.51 (0.092–0.099)	—
	Right side	2.39–2.45 (0.094–0.096)	—
Crankshaft runout		—	0.05 (0.002)

OIL PUMP

ITEM	STANDARD	LIMIT
Oil pump reduction ratio	1.885 (73/45 × 43/37)	—
Oil pressure (at 60°C, 140°F)	Above 300 kPa (3.0 kg/cm², 43 psi) Below 600 kPa (6.0 kg/cm², 85 psi) at 3 000 r/min.	—

CLUTCH

Unit: mm (in)

ITEM	STANDARD	LIMIT
Drive plate thickness	2.52–2.68 (0.100–0.106)	2.22 (0.087)
Driven plate distortion	—	0.10 (0.004)
Clutch spring free length	—	34.0 (1.34)
Clutch master cylinder bore	14.000–14.043 (0.5511–0.5529)	—

ITEM	STANDARD	LIMIT
Clutch master cylinder piston diam.	13.957–13.984 (0.5495–0.5506)	———
Clutch release cylinder bore	35.700–35.762 (1.4055–1.4079)	———
Clutch release cylinder piston diam.	35.650–35.675 (1.4035–1.4045)	———

TRANSMISSION + DRIVE CHAIN

Unit: mm (in) Except ratio

ITEM		STANDARD	LIMIT
Primary reduction ratio		1.622 (73/45)	———
Final reduction ratio	E-02, 18, 21, 22, 25, 34	3.285 (46/14)	———
	The others	3.357 (47/14)	———
Gear ratios	Low	2.385 (31/13)	———
	2nd	1.632 (31/19)	———
	3rd	1.250 (25/20)	———
	4th	1.045 (23/22)	———
	Top	0.913 (21/23)	———
Shift fork to groove clearance	No.1, No.2 & No.3	0.1–0.3 (0.004–0.012)	0.50 (0.020)
Shift fork groove width	No.1, No.2 & No.3	5.0–5.1 (0.197–0.201)	———
Shift fork thickness	No.1, No.2 & No.3	4.8–4.9 (0.189–0.193)	———
Drive chain	Type	DAIDO: DID532ZL TAKASAGO: RK532GSV	———
	Links	114 links	———
	20-pitch length	———	319.4 (1.26)
Drive chain slack		20–25 (0.8–1.0)	———

CARBURETOR

ITEM	SPECIFICATION		
	E-18	E-22	The others
Carburetor type	MIKUNI BST34SS	←	←
Bore size	34 mm (1.3 in)	←	←
I.D. No.	06B30	06B40	06B00
Idle r/min.	1 100 ± 100 r/min.	←	←
Fuel level	1.5 ± 0.5 mm (0.06 ± 0.02 in)	←	←
Float height	14.6 ± 1.0 mm (0.58 ± 0.04 in)	←	←
Main jet (M.J.)	#130	#127.5	#130
Main air jet (M.A.J.)	0.6 mm	←	←
Jet needle (J.N.)	4D13-3rd	←	←
Needle jet (N.J.)	O-9	←	←
Pilot jet (P.J.)	#42.5	←	←

ITEM		SPECIFICATION		
		E-18	E-22	The others
By-pass	(B.P.)	#1 0.8, #2 0.8, #3 0.8 mm	←	←
Pilot outlet	(P.O.)	0.7 mm	←	←
Valve seat	(V.S.)	2.0 mm	←	←
Starter jet	(G.S.)	#42.5	←	←
Pilot screw	(P.S.)	2.0 turns out	←	←
Throttle valve	(Th.V.)	#130	←	←
Pilot air jet	(P.A.J.)	#150	←	←
Throttle cable play		0.5–1.0 mm (0.02–0.04 in)	←	←

ELECTRICAL

Unit: mm (in)

ITEM		SPECIFICATION		NOTE
Ignition timing		13° B.T.D.C. Below 1 500 r/min. and 35° B.T.D.C. Above 2 350 r/min.		
Firing order		1 - 2 - 4 - 3		
Spark plug		Type	NGK: J9A	E-01,24,25,34
		Type	NGK: JR9A	E-02,04,06,15, 16,17,18,21, 22,28,39
		Gap	0.6–0.7 (0.024–0.028)	
Spark performance		Over 8 (0.3) at 1 atm.		
Signal coil resistance		Approx. 130–180 Ω		Tester range (× 100 Ω)
Ignition coil resistance		Primary	⊕ tap – ⊖ tap Approx. 3–5 Ω	Tester range: (× 1 Ω)
		Secondary	Plug cap – Plug cap Approx. 25–45 kΩ	Tester range: (× 1 kΩ)
Generator		Slip ring O.D.	Limit: 14.0 (0.55)	N.D.
		Brush length	Limit: 4.5 (0.18)	
Regulated voltage		Above 13.5 V at 5 000 r/min.		
Starter motor		Brush length	Limit: 6 (0.2)	MITSUBA
		Commutator under-cut	Limit: 0.2 (0.008)	
Starter relay resistance		3–5 Ω		
Battery	Type designation	YB14L-A2		
	Capacity	12V 50.4 kC (14 Ah)/10 HR		
	Standard electrolyte S.G.	1.28 at 20°C (68°F)		
Fuse size	Headlight	10 A		
	Turn signal	10 A		
	Ignition	10 A		
	Taillight	10 A		
	Power source	10 A		

WATTAGE

Unit: W

ITEM		SPECIFICATION				
		E-01,06, 24,28	E-02	E-04,17, 21,25,39	E-15,16, 18,22	E-34
Headlight	HI	60	←	←	←	←
	LO	55	←	←	←	←
Parking or position light			4	←	←	←
Tail/Brake light		8/23	5/21	←	←	←
Turn signal light		23	21	←	←	←
Speedometer light		3	←	←	←	←
Tachometer light		3	←	←	←	←
Turn signal indicator light		1.7	←	←	←	←
High beam indicator light		1.7	←	←	←	←
Neutral indicator light		3	←	←	←	←
Oil pressure indicator light		1.7	←	←	←	←
Side stand check light		3	←	←		3
License light		8	5	←	←	←

BRAKE + WHEEL

Unit: mm (in)

ITEM		STANDARD	LIMIT
Rear brake pedal height		55 (2.2)	—
Brake disc thickness	Front	4.5 ± 0.2 (0.177 ± 0.008)	4.0 (0.15)
	Rear	6.0 ± 0.2 (0.236 ± 0.008)	5.5 (0.22)
Brake disc runout		—	0.30 (0.012)
Master cylinder bore	Front	15.870–15.913 (0.6248–0.6265)	—
	Rear	12.700–12.743 (0.5000–0.5017)	—
Master cylinder piston diam.	Front	15.827–15.854 (0.6231–0.6242)	—
	Rear	12.657–12.684 (0.4983–0.4994)	—
Brake caliper cylinder bore	Front	32.030–32.106 (1.2610–1.2640)	—
	Rear	38.180–38.256 (1.5031–1.5061)	—
Brake caliper piston diam.	Front	31.995–32.000 (1.2596–1.2598)	—
	Rear	38.098–38.148 (1.5000–1.5019)	—
Wheel rim runout	Axial	—	2.0 (0.08)
	Radial	—	2.0 (0.08)

ITEM	STANDARD		LIMIT
Wheel axle runout	Front	—	0.25 (0.010)
	Rear	—	0.25 (0.010)
Tire size	Front	110/80VR18 V260	—
	Rear	150/70VR18 V260	—
Tire tread depth	Front	—	1.6 (0.06)
	Rear	—	2.0 (0.08)

SUSPENSION

Unit: mm (in)

ITEM	STANDARD	LIMIT	NOTE
Front fork stroke	130 (5.12)	—	
Front fork spring free length	—	459 (18.1)	
Front fork oil level	159 (6.26)	—	
Rear wheel travel	135 (5.31)	—	
Swingarm pivot shaft runout	—	0.3 (0.01)	

TIRE PRESSURE

COLD INFLATION TIRE PRESSURE	SOLO RIDING			DUAL RIDING		
	kPa	kg/cm²	psi	kPa	kg/cm²	psi
FRONT	250	2.50	36	250	2.50	36
REAR	250	2.50	36	290	2.90	42

FUEL + OIL

ITEM	SPECIFICATION		NOTE
Fuel type	Gasoline used should be graded 85-95 octane or higher. An unleaded or low-lead type gasoline is recommended.		
Fuel tank including reserve	21.0 L (5.5 US gal)		Only for E-02,24
	19.0 L (5.0 US gal)		The others
reserve	4.5 L (4.8 US gal)		
Engine oil type	SAE 10W/40, API SE or SF		
Engine oil capacity	Change	3 400 ml (3.6 US qt)	
	Filter change	3 700 ml (3.9 US qt)	
	Overhaul	4 700 ml (5.0 US qt)	

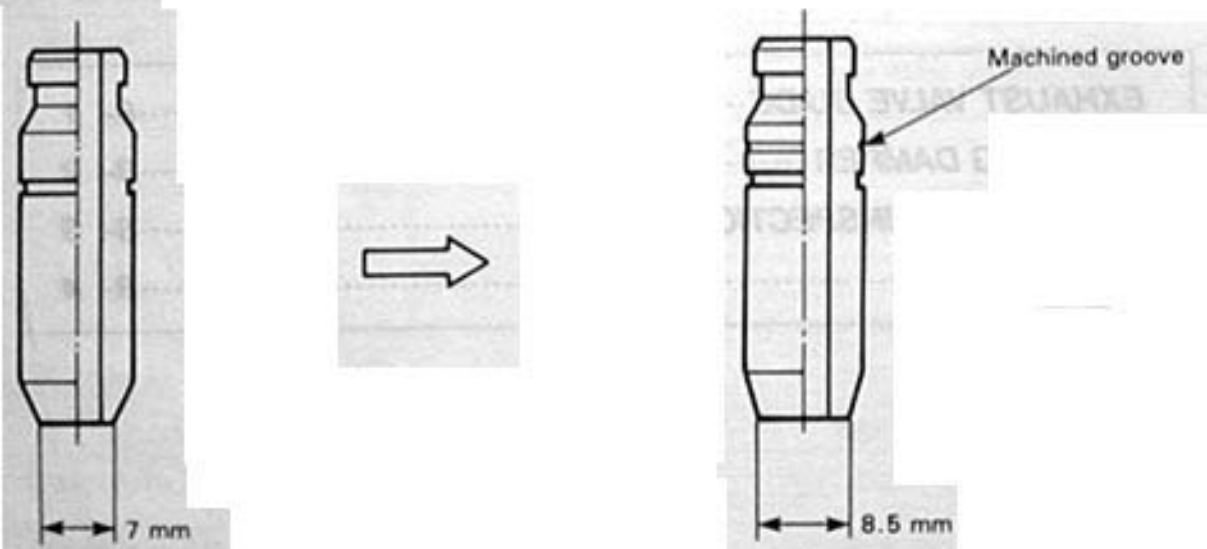
ITEM	SPECIFICATION	NOTE
Front fork oil type	Fork oil #15	Only for E-28
	Fork oil #10	The others
Front fork oil capacity (each leg)	417 ml (14.1 US oz)	
Brake fluid type	DOT3, DOT4 or SAE J1703	

APPENDIX (INFORMATION OF THE '86-MODEL)

CONTENTS

EXHAUST VALVE GUIDE

The dimension of the spare exhaust valve guide has been changed, as shown in the following illustration.



EARLY LATE

NOTE:
- Intake valve guides remain unchanged.
- Exhaust valve guides can be distinguished from that of intake by machined groove.

PARTS SUPPLY DATA

PART NAME	EARLY	LATE
INTAKE VALVE GUIDE	11115-27A70 →	Unchanged
EXHAUST VALVE GUIDE	11115-27A70	11116-06B70

INTERCHANGEABILITY: EARLY ← No / Yes → LATE

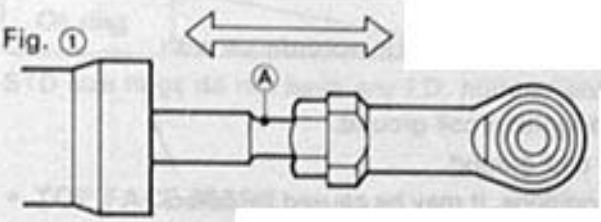
PARTS AVAILABILITY: Only the late type parts are available.

STEERING DAMPER

ADDITIONAL INFORMATION TO STEERING DAMPER INSPECTION

Fig. ① and ② show the side views of the steering damper to be checked their operations by stroking the rod back and forth. The steering damper operates differently depending on the position of the punch mark Ⓐ in the illustrations as described below. If a constant damping force are noticeable in the Fig. ② inspection, the damper unit is in good condition

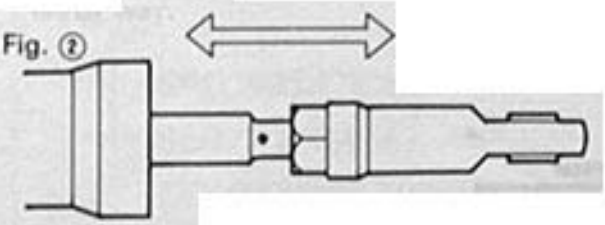
Fig. ①



SIDE VIEW

When the punch mark faces up (Fig. ①), there may be a loose damping force in the initial stroke. But this does not indicate a poor operation of the damper unit.

Fig. ②



SIDE VIEW

When the punch mark faces any other position than upward position (Fig. ②), there should be a constant damping force while stroking the rod. This is the proper way to inspect the damping force of the steering damper unit.

IGNITION COIL INSPECTION

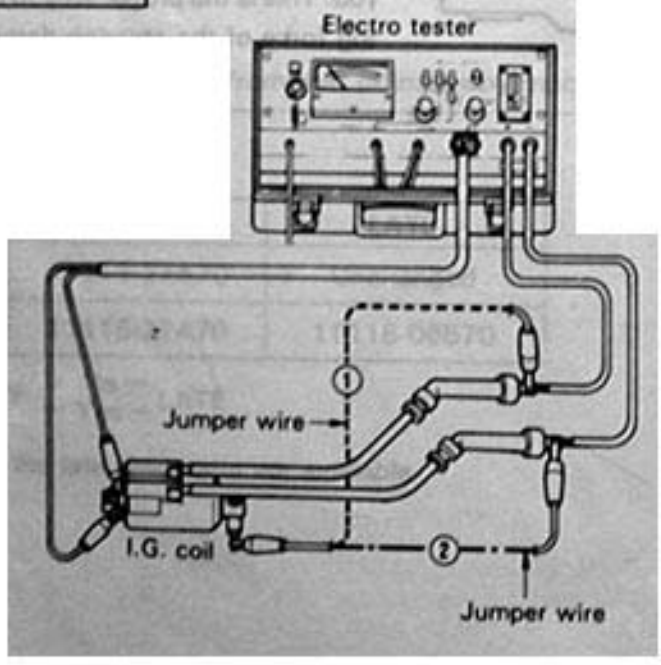
The sparking performance of the ignition coil can be more clearly inspected with the new method than old one.

INSPECTION

NOTE:
Make sure that the three-needle sparking distance of electro tester is set at 8 mm.

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

09900-28106	Electro tester
STD spark performance	8 mm



PISTON RING

Each ring can be distinguished by the following identification numbers or colors.

- **SIZE MARK**

	STD size	Oversize (0.5 mm)	Oversize (1.0 mm)
Top ring		Painted Red	Painted Yellow
2nd ring		50	100
Oil ring		Painted Red	Painted Yellow

STD size rings do not have any I.D. number and color.

- **TOP FACE MARK**

The 2nd ring has the letter "R" (Top marked) on it. Be sure to bring the marked side to top when fitting it to the piston. But, top ring and oil ring do not have any designations, and may be fit in either way.

This section describes service data and servicing procedures which differ from those of the GSX-R1100G ('86-model).

NOTE:
Any differences between "G" ('86-model) and "H" ('87-model) in specifications and service data are clearly indicated with the asterik marks (*). Refer to the service manual for details which are not given in this supplementary service manual.

CONTENTS

SPECIFICATIONS

DIMENSIONS AND DRY MASS

Overall length	2 115 mm (83.3 in.)
Overall width	745 mm (29.3 in.)
Overall height	1 215 mm (47.8 in.)
Wheelbase	1 460 mm (57.5 in.)
Ground clearance	125 mm (4.9 in.)
Seat height	795 mm (31.3 in.)
Dry mass	197 kg (434 lb.)

ENGIN

Type	Four-stroke, air-cooled with SACS, DOHC, TSCC
Number of cylinders	4
Bore	76.0 mm (2.992 in.)
Stroke	58.0 mm (2.283 in.)
Piston displacement	1 052 cm^3 (64.2 cu.in.)
Compression ratio	9.7 : 1
Carburetor	MIKUNI BST34SS, four
Air cleaner	Polyester fiber element
Starter system	Electric starter motor
Lubrication system	Wet sump

TRANSMISSION

Clutch	Wet multi-plate type, hydraulically operated
Transmission	5-speed constant mesh
Gearshift pattern	1-down, 4-up
Primary reduction ratio	1.622 (73/45)
Gear ratios, Low	2.384 (31/13)
2nd	1.631 (31/19)
3rd	1.250 (25/20)
4th	1.045 (23/22)
Top	0.913 (21/23)
Final reduction ratio	3.285 (46/14) ... E02, 18, 21, 22, 25, 34 3.357 (47/14) ....Others
Drive chain	DAIDO D.I.D.532ZL or TAKASAGO RK532GSV, 114 links

CHASSIS

Front suspension	Telescopic, coil spring, oil damped, spring pre-load 4-way adjustable, damping force 3-way adjustable
Rear suspension	Full floating suspension system, gas/oil damped, spring preload fully adjustable, damping force 4-way adjustable
Front suspension stroke	130 mm (5.1 in.)
Rear wheel travel	*126 mm (5.0 in.)
Caster	63°30'
Trail	116 mm (4.6 in.)
Steering angle	30° (right & left)
Turning radius	3.2 m (10.5 ft.)
Front brake	Disc, twin
Rear brake	Disc
Front tire	110/80VR18 V260
Rear tire	150/70VR18 V260

ELECTRICAL

Ignition type	Transistorized
Ignition timing	13° B.T.D.C. below 1 500 rpm and 35° B.T.D.C. above 2 350 rpm
Spark plug	NGK J9A ... E01, 24, 34 NGK JR9A ... Others
Battery	12V 50.4 kC (14Ah)/ 10HR
Generator	Three phase A.C. generator
Circuit breaker	30A
Fuse	10/10/10/10/10A

CAPACITIES

Fuel tank, including reserve	21.0 L (5.5 US gal.) ... ... E02, 24 19.0 L (5.0 US gal.) ... ... Others
reserve	4.5 L (4.8 US qt.)
Engine oil, oil change	3 400 ml (3.6 US qt.)
with filter change	3 700 ml (3.9 US qt.)

- These specifications are subjected to change without notice.
- Asterisk mark (*) indicates the new H model specifications.

SERVICE DATA

VALVE + GUIDE

Unit: mm (in)

ITEM		STANDARD	LIMIT
Valve diam.	IN.	28.5 (1.12)	—
	EX.	25 (1.0)	—
Valve lift	IN.	8.8 (0.35)	—
	EX.	8.2 (0.32)	—
Valve clearance (when cold)	IN. & EX.	0.10–0.15 (0.004–0.006)	—
Valve guide to valve stem clearance	IN.	0.020–0.047 (0.0008–0.0019)	0.35 (0.014)
	EX.	0.040–0.067 (0.0016–0.0026)	0.35 (0.014)
Valve guide I.D.	IN. & EX.	5.000–5.012 (0.1969–0.1973)	—
Valve stem O.D.	IN.	4.965–4.980 (0.1955–0.1961)	—
	EX.	4.945–4.960 (0.1947–0.1953)	—
Valve stem runout	IN. & EX.	—	0.05 (0.002)
Valve head thickness	IN. & EX.	—	0.5 (0.02)
Valve stem end length	IN. & EX.	—	2.5 (0.10)
Valve seat width	IN. & EX.	0.9–1.1 (0.035–0.043)	—
Valve head radial runout	IN. & EX.	—	0.03 (0.001)
Valve spring free length (IN. & EX.)	INNER	—	35.0 (1.38)
	OUTER	—	37.8 (1.49)
Valve spring tension (IN. & EX.)	INNER	5.3–6.5 kg (11.7–14.3 lbs) at length 28 mm (1.1 in)	—
	OUTER	13.1–15.1 kg (28.9–33.3 lbs) at length 31.5 mm (1.2 in)	—

CAMSHAFT + CYLINDER HEAD

Unit: mm (in)

ITEM		STANDARD	LIMIT
Cam height	IN.	33.878–33.918 (1.3338–1.3354)	33.580 (1.3220)
	EX.	33.533–33.573 (1.3202–1.3218)	33.240 (1.3087)
Camshaft journal oil clearance	IN. & EX.	0.032–0.066 (0.0013–0.0026)	0.150 (0.0059)
Camshaft journal holder I.D.	IN. & EX.	22.012–22.025 (0.8666–0.8671)	—

ITEM	STANDARD		LIMIT
Camshaft journal O.D.	IN. & EX.	21.959–21.980 (0.8645–0.8654)	———
Camshaft runout	IN. & EX.	———	0.10 (0.004)
Cam chain 20-pitch length	———		158.0 (6.22)
Cam chain pin (at arrow "3")	22nd pin		———
Rocker arm I.D.	IN. & EX.	12.000–12.018 (0.4724–0.4731)	———
Rocker arm shaft O.D.	IN. & EX.	11.973–11.984 (0.4714–0.4718)	———
Cylinder head distortion	———		0.20 (0.008)

CYLINDER + PISTON + PISTON RING

Unit: mm (in)

ITEM	STANDARD		LIMIT
Compression pressure	1 000–1 400 kPa 10–14 kg/cm² 142–199 psi		800 kPa 8 kg/cm² 114 psi
Compression pressure difference	———		200 kPa 2 kg/cm² 28 psi
Piston to cylinder clearance	0.065–0.075 (0.0022–0.0026)		0.120 (0.0047)
Cylinder bore	76.000–76.015 (2.7921–2.9927)		76.065 (2.9947)
Piston diam.	75.930–75.945 (2.9894–2.9899) Measure at 15 mm (0.6 in) from the skirt end.		75.880 (2.9874)
Cylinder distortion	———		0.20 (0.008)
Piston ring free end gap	1st R	Approx. 9.7 (0.38)	7.8 (0.31)
	2nd R	Approx. 8.2 (0.32)	6.6 (0.26)
Piston ring end gap	1st	0.2–0.35 (0.008–0.014)	0.7 (0.03)
	2nd	0.2–0.35 (0.008–0.014)	0.7 (0.03)
Piston ring to groove clearance	1st	———	0.180 (0.007)
	2nd	———	0.150 (0.006)
Piston ring groove width	1st	1.01–1.03 (0.039–0.040)	———
	2nd	1.01–1.03 (0.039–0.040)	———
	Oil	2.01–2.03 (0.079–0.080)	———
Piston ring thickness	1st	0.97–0.99 (0.038–0.039)	———
	2nd	0.97–0.99 (0.038–0.039)	———

ITEM	STANDARD	LIMIT
Piston pin bore	20.002–20.008 (0.7875–0.7877)	20.030 (0.7886)
Piston pin O.D.	19.996–20.000 (0.7872–0.7874)	19.980 (0.7866)

CONROD + CRANKSHAFT

Unit: mm (in)

ITEM		STANDARD	LIMIT
Conrod small end I.D.		20.010–20.018 (0.7878–0.7881)	20.040 (0.7890)
Conrod big end side clearance		0.10–0.20 (0.004–0.008)	0.30 (0.01)
Conrod big end width		20.95–21.00 (0.825–0.827)	—
Crank pin width		21.10–21.15 (0.831–0.833)	—
Conrod big end oil clearance		0.032–0.056 (0.0013–0.0022)	0.080 (0.0031)
Crank pin O.D.		37.976–38.000 (1.4951–1.4961)	—
Crankshaft journal oil clearance		0.020–0.044 (0.0008–0.0017)	0.080 (0.0031)
Crankshaft journal O.D.		35.976–36.000 (1.4164–1.4173)	—
Crankshaft thrust clearance		0.04–0.16 (0.002–0.006)	—
Crankshaft thrust bearing thickness	Left side	2.33–2.51 (0.092–0.099)	—
	Right side	2.39–2.45 (0.094–0.096)	—
Crankshaft runout		—	0.05 (0.002)

OIL PUMP

ITEM	STANDARD	LIMIT
Oil pump reduction ratio	1.885 (73/45 × 43/37)	—
Oil pressure (at 60°C, 140°F)	Above 300 kPa (3.0 kg/cm², 43 psi) Below 600 kPa (6.0 kg/cm², 85 psi) at 3 000 r/min.	—

CLUTCH

Unit: mm (in)

ITEM	STANDARD	LIMIT
Drive plate thickness	2.52–2.68 (0.100–0.106)	2.22 (0.087)
Driven plate distortion	—	0.10 (0.004)
Clutch spring free length	—	34.0 (1.34)
Clutch master cylinder bore	14.000–14.043 (0.5511–0.5529)	—

ITEM	STANDARD	LIMIT
Clutch master cylinder piston diam.	13.957–13.984 (0.5495–0.5506)	———
Clutch release cylinder bore	35.700–35.762 (1.4055–1.4079)	———
Clutch release cylinder piston diam.	35.650–35.675 (1.4035–1.4045)	———

TRANSMISSION + DRIVE CHAIN

Unit: mm (in) Except ratio

ITEM		STANDARD	LIMIT
Primary reduction ratio		1.622 (73/45)	———
Final reduction ratio	E-02, 18, 21, 22, 25, 34	3.285 (46/14)	———
	The others	3.357 (47/14)	———
Gear ratios	Low	2.385 (31/13)	———
	2nd	1.632 (31/19)	———
	3rd	1.250 (25/20)	———
	4th	1.045 (23/22)	———
	Top	0.913 (21/23)	———
Shift fork to groove clearance	No.1, No.2 & No.3	0.1–0.3 (0.004–0.012)	0.50 (0.020)
Shift fork groove width	No.1, No.2 & No.3	5.0–5.1 (0.197–0.201)	———
Shift fork thickness	No.1, No.2 & No.3	4.8–4.9 (0.189–0.193)	———
Drive chain	Type	DAIDO: DID532ZL TAKASAGO: RK532GSV	———
	Links	114 links	———
	20-pitch length	———	319.4 (1.26)
Drive chain slack		20–25 (0.8–1.0)	———

CARBURETOR

ITEM		SPECIFICATION		
		E-18	E-22	The others
Carburetor type		MIKUNI BST34SS	←	←
Bore size		34 mm (1.3 in)	←	←
I.D. No.		06B30	06B40	06B00
Idle r/min.		1 100 ± 100 r/min.	←	←
Fuel level		1.5 ± 0.5 mm (0.06 ± 0.02 in)	←	←
Float height		14.6 ± 1.0 mm (0.58 ± 0.04 in)	←	←
Main jet	(M.J.)	#130	#127.5	#130
Main air jet	(M.A.J.)	0.6 mm	←	←
Jet needle	(J.N.)	4D13-3rd	←	←
Needle jet	(N.J.)	O-9	←	←
Pilot jet	(P.J.)	#42.5	←	←

ITEM	SPECIFICATION		
	E-18	E-22	The others
By-pass (B.P.)	#1 0.8, #2 0.8, #3 0.8 mm	←	←
Pilot outlet (P.O.)	0.7 mm	←	←
Valve seat (V.S.)	2.0 mm	←	←
Starter jet (G.S.)	#42.5	←	←
Pilot screw (P.S.)	2.0 turns out	←	←
Throttle valve (Th.V.)	#130	←	←
Pilot air jet (P.A.J.)	#150	←	←
Throttle cable play	0.5–1.0 mm (0.02–0.04 in)	←	←

ELECTRICAL

Unit: mm (in)

ITEM		SPECIFICATION		NOTE
Ignition timing		13° B.T.D.C. Below 1 500 r/min. and 35° B.T.D.C. Above 2 350 r/min.		
Firing order		1 · 2 · 4 · 3		
Spark plug		Type	NGK: J9A	E-01,24,34
		Type	NGK: JR9A	E-02,04,06,15, 16,17,18,21,22, 25,28,39,53
		Gap	0.6–0.7 (0.024–0.028)	
Spark performance		Over 8 (0.3) at 1 atm.		
Signal coil resistance		Approx. 130–180 Ω		Tester range (× 100 Ω)
Ignition coil resistance		Primary	⊕ tap – ⊖ tap Approx. 3–5 Ω	Tester range: (× 1 Ω)
		Secondary	Plug cap – Plug cap Approx. 25–45 kΩ	Tester range: (× 1 kΩ)
Generator		Slip ring O.D.	Limit: 14.0 (0.55)	N.D.
		Brush length	Limit: 4.5 (0.18)	
Regulated voltage		Above 13.5 V at 5.000 r/min.		
Starter motor		Brush length	Limit: 6 (0.2)	MITSUBA
		Commutator under-cut	Limit: 0.2 (0.008)	
Starter relay resistance		3–5 Ω		
Battery	Type designation	YB14L-A2		
	Capacity	12V 50.4 kC (14 Ah)/10 HR		
	Standard electrolyte S.G.	1.28 at 20°C (68°F)		
Fuse size	Headlight	10 A		
	Turn signal	10 A		
	Ignition	10 A		
	Taillight	10 A		
	Power source	10 A		

WATTAGE

Unit: W

ITEM		SPECIFICATION				
		E-01,06	E-28	E-24	E-02,15,16, 18,22	E-04,17,21, 25,34,39,53
Headlight	HI	60	←	←	←	←
	LO	55	←	←	←	←
Parking or position light					4	←
Tail/Brake light		8/23	←	5/21	←	←
Turn signal light		23	←	←	21	←
Speedometer light		3	←	←	←	←
Tachometer light		3	←	←	←	←
Turn signal indicator light		1.7	←	←	←	←
High beam indicator light		1.7	←	←	←	←
Neutral indicator light		3	←	←	←	←
Oil pressure indicator light		1.7	←	←	←	←
Side stand check light		3		3		3
License light		8	←	←	5	←

BRAKE + WHEEL

Unit: mm (in)

ITEM		STANDARD	LIMIT
Rear brake pedal height		55 (2.2)	—
Brake disc thickness	Front	4.5 ± 0.2 (0.177 ± 0.008)	4.0 (0.15)
	Rear	6.0 ± 0.2 (0.236 ± 0.008)	5.5 (0.22)
Brake disc runout		—	0.30 (0.012)
Master cylinder bore	Front	15.870–15.913 (0.6248–0.6265)	—
	Rear	12.700–12.743 (0.5000–0.5017)	—
Master cylinder piston diam.	Front	15.827–15.854 (0.6231–0.6242)	—
	Rear	12.657–12.684 (0.4983–0.4994)	—
Brake caliper cylinder bore	Front	32.030–32.106 (1.2610–1.2640)	—
	Rear	38.180–38.256 (1.5031–1.5061)	—
Brake caliper piston diam.	Front	31.995–32.000 (1.2596–1.2598)	—
	Rear	38.098–38.148 (1.5000–1.5019)	—
Wheel rim runout	Axial	—	2.0 (0.08)
	Radial	—	2.0 (0.08)

ITEM	STANDARD		LIMIT
Wheel axle runout	Front	——	0.25 (0.010)
	Rear	——	0.25 (0.010)
Tire size	Front	110/80VR18 V260	——
	Rear	150/70VR18 V260	——
Tire tread depth	Front	——	1.6 (0.06)
	Rear	——	2.0 (0.08)

SUSPENSION

Unit: mm (in)

ITEM	STANDARD	LIMIT	NOTE
Front fork stroke	130 (5.12)	——	
Front fork spring free length	——	* 463 (18.2)	
Front fork oil level	159 (6.26)	——	
Rear wheel travel	* 126 (4.96)	——	
Swingarm pivot shaft runout	——	0.3 (0.01)	

TIRE PRESSURE

COLD INFLATION TIRE PRESSURE	SOLO RIDING			DUAL RIDING		
	kPa	kg/cm²	psi	kPa	kg/cm²	psi
FRONT	250	2.50	36	250	2.50	36
REAR	250	2.50	36	290	2.90	42

FUEL + OIL

ITEM	SPECIFICATION		NOTE
Fuel type	Gasoline used should be graded 85-95 octane or higher. An unleaded or low-lead type gasoline is recommended.		
Fuel tank including reserve	21.0 L (5.5 US gal)		E-02, 24
	19.0 L (5.0 US gal)		The others
reserve	4.5 L (4.8 US gal)		
Engine oil type	SAE 10W/40, API SE or SF		
Engine oil capacity	Change	3 400 ml (3.6 US qt)	
	Filter change	3 700 ml (3.9 US qt)	
	Overhaul	4 700 ml (5.0 US qt)	

Asterisk mark (*) indicates the new H model specifications.

ITEM	STANDARD	LIMIT
Front fork oil type	Fork oil #15	E-28
	Fork oil #10	The others
Front fork oil capacity (each leg)	417 ml (14.1 US oz)	
Brake fluid type	DOT3, DOT4 or SAE J1703	

TIGHTENING TORQUE

ENGINE

ITEM	N·m	kg-m	lb-ft
Cylinder head cover bolt and union bolt	13 – 15	1.3 – 1.5	9.5 – 11.0
Cylinder head nut	35 – 40	3.5 – 4.0	25.5 – 29.0
Cylinder head bolt	7 – 11	0.7 – 1.1	5.0 – 8.0
Cylinder base nut	7 – 11	0.7 – 1.1	5.0 – 8.0
Cylinder stud bolt	13 – 16	1.3 – 1.6	9.5 – 11.5
Valve clearance adjuster lock nut	9 – 11	0.9 – 1.1	6.5 – 8.0
Camshaft journal holder bolt	8 – 12	0.8 – 1.2	6.0 – 8.5
Cam sprocket bolt	24 – 26	2.4 – 2.6	17.5 – 19.0
Rocker arm shaft set bolt	8 – 10	0.8 – 1.0	6.0 – 7.0
Oil hose mounting bolt (Cylinder head side)	8 – 12	0.8 – 1.2	6.0 – 8.5
Oil hose mounting bolt (Crankcase side)	8 – 12	0.8 – 1.2	6.0 – 8.5
Cam chain tensioner mounting bolt	6 – 8	0.6 – 0.8	4.5 – 6.0
Cam chain tensioner spring holder bolt	30 – 45	3.0 – 4.5	21.5 – 32.5
Cam chain idler mounting bolt	9 – 11	0.9 – 1.1	6.5 – 8.0
Conrod bearing cap nut	49 – 53	4.9 – 5.3	35.5 – 38.5
Starter clutch mounting bolt	143 – 157	14.3 – 15.7	103.5 – 113.5
Signal generator bolt	25 – 35	2.5 – 3.5	18.0 – 25.5
Crankcase bolt (6mm)	9 – 13	0.9 – 1.3	6.5 – 9.5
(8 mm)	20 – 24	2.0 – 2.4	14.5 – 17.5
Oil pump mounting bolt	8 – 12	0.8 – 1.2	6.0 – 8.5
Oil drain plug	20 – 25	2.0 – 2.5	14.5 – 18.0
Oil pan bolt	12 – 16	1.2 – 1.6	8.5 – 11.5
Gearshift cam stopper bolt	15 – 23	1.5 – 2.3	11.0 – 16.5
Clutch sleeve hub nut	50 – 70	5.0 – 7.0	36.0 – 50.5
Clutch spring bolt	11 – 13	1.1 – 1.3	8.0 – 9.5
Exhaust pipe bolt	9 – 12	0.9 – 1.2	6.5 – 8.5
Muffler mounting bolt (Front side)	18 – 28	1.8 – 2.8	13.0 – 20.0
Muffler mounting bolt (Rear side)	22 – 35	2.2 – 3.5	16.0 – 25.5
Engine sprocket nut	100 – 130	10.0 – 13.0	72.5 – 94.0
Engine sprocket bolt	9 – 12	0.9 – 1.2	6.5 – 8.5
Engine mounting bolt (L: 55 mm)	50 – 60	5.0 – 6.0	36.0 – 43.5
(L: 180 mm and 255 mm)	70 – 88	7.0 – 8.8	50.5 – 63.5

CHASSIS

ITEM	N·m	kg·m	lb-ft
Front axle nut (E28)	*50 – 80	*5.0 – 8.0	*36.0 – 58.0
Front axle nut (Others)	*55 – 88	*5.5 – 8.8	*40.0 – 63.7
Front axle pinch nut	20 – 40	2.0 – 4.0	14.0 – 29.0
Front fork cap bolt	15 – 30	1.5 – 3.0	11.0 – 21.5
Front fork upper clamp bolt	20 – 30	2.0 – 3.0	14.5 – 21.5
Front fork lower clamp bolt	*20 – 25	*2.0 – 2.5	*14.5 – 18.0
Front fork damper rod bolt	54 – 70	5.4 – 7.0	39.5 – 50.5
Steering stem head nut	30 – 40	3.0 – 4.0	21.5 – 29.0
Handlebar holder mounting bolt	15 – 25	1.5 – 2.5	11.0 – 18.0
Handlebar holder seg bolt	6 – 10	0.6 – 1.0	4.5 – 7.0
Clutch cylinder mounting bolt	5 – 8	0.5 – 0.8	3.5 – 6.0
Front brake master cylinder bolt	5 – 8	0.5 – 0.8	3.5 – 6.0
Caliper air bleeder (Front & Rear)	6 – 9	0.6 – 0.9	4.5 – 6.5
Brake hose union bolt (cylinder, caliper side)	20 – 25	2.0 – 2.5	14.5 – 18.0
Front brake caliper mounting bolt	15 – 25	1.5 – 2.5	11.0 – 18.0
Front brake caliper housing bolt	30 – 36	3.0 – 3.6	21.5 – 26.0
NEAS unit mounting bolt	6 – 8	0.6 – 0.8	4.5 – 6.0
Front brake lever nut	8 – 12	0.8 – 1.2	6.0 – 8.5
Steering damper outer and inner nut	15 – 20	1.5 – 2.0	11.0 – 14.0
Steering damper bracket bolt	20 – 25	2.0 – 2.5	14.0 – 18.0
Brake pedal bolt	*8 – 12	*0.8 – 1.2	*6.0 – 8.5
Rear torque link nut (Front and Rear)	18 – 28	1.8 – 2.8	13.0 – 20.0
Rear swingarm pivot nut	55 – 85	5.5 – 8.5	40.0 – 61.5
Rear brake caliper mounting bolt	15 – 25	1.5 – 2.5	11.0 – 18.0
Rear shock absorber mounting nut (Upper & Lower)	40 – 60	4.0 – 6.0	29.0 – 43.5
Rear sprocket mounting nut	48 – 72	4.8 – 7.2	35.0 – 52.0
Disc plate bolt (Front and Rear)	15 – 25	1,5 – 2.5	11.0 – 18.0
Rear brake caliper housing bolt	30 – 36	3.0 – 3.6	21.5 – 26.0
Rear cushion lever center nut	70 – 100	7.0 – 10.0	50.5 – 72.5
Rear cushion lever mounting nut	70 – 100	7.0 – 10.0	50.5 – 72.5
Rear axle nut	85 – 115	8.5 – 11.5	61.5 – 83.0
Rear brake master cylinder mounting bolt	6 – 10	0.6 – 1.0	4.5 – 7.0

Asterisk mark (*) indicates the new H model specifications.

ELECTRICAL SYSTEM

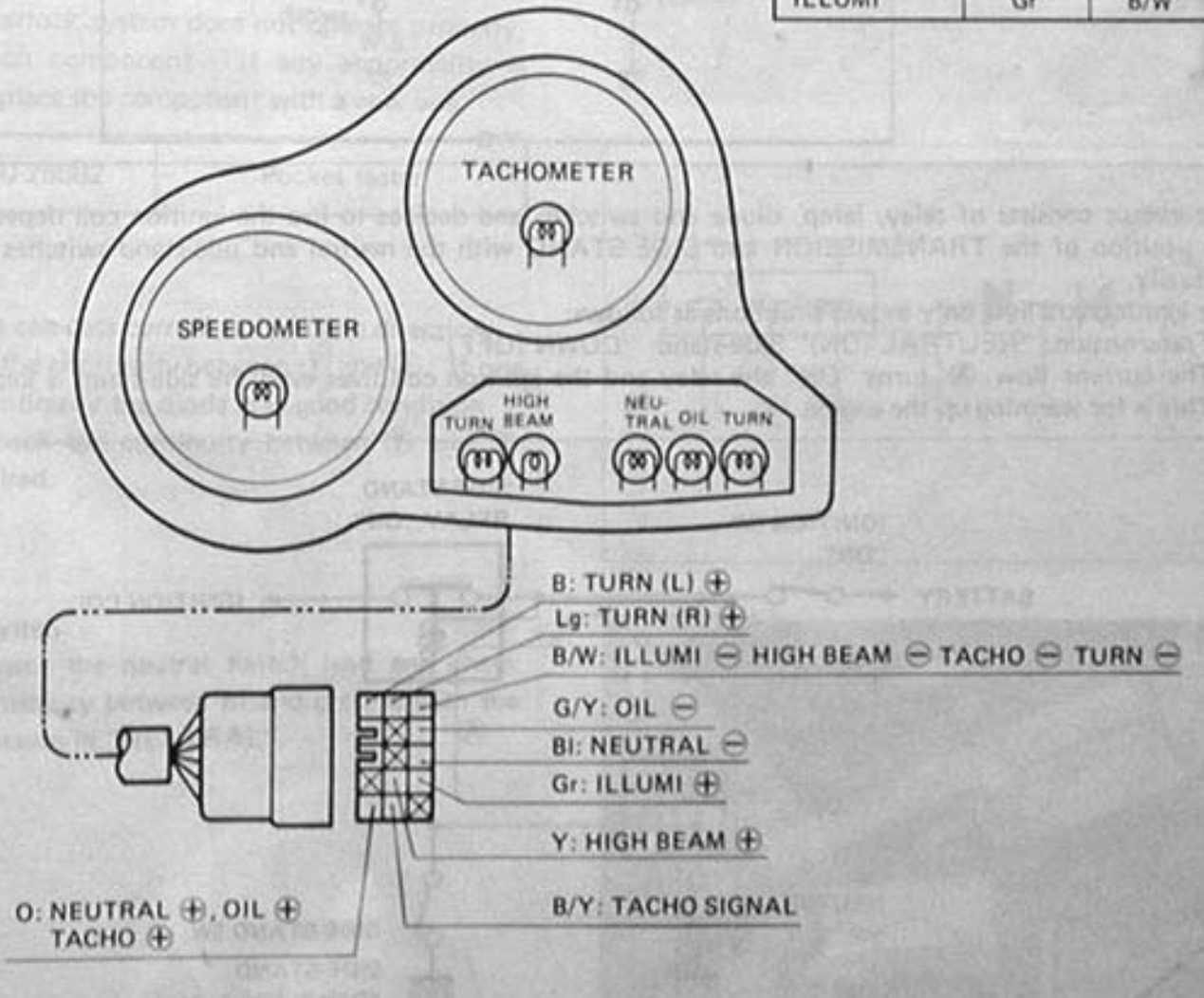
COMBINATION METER (Only for E28)

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

09900-25002	Pocket tester

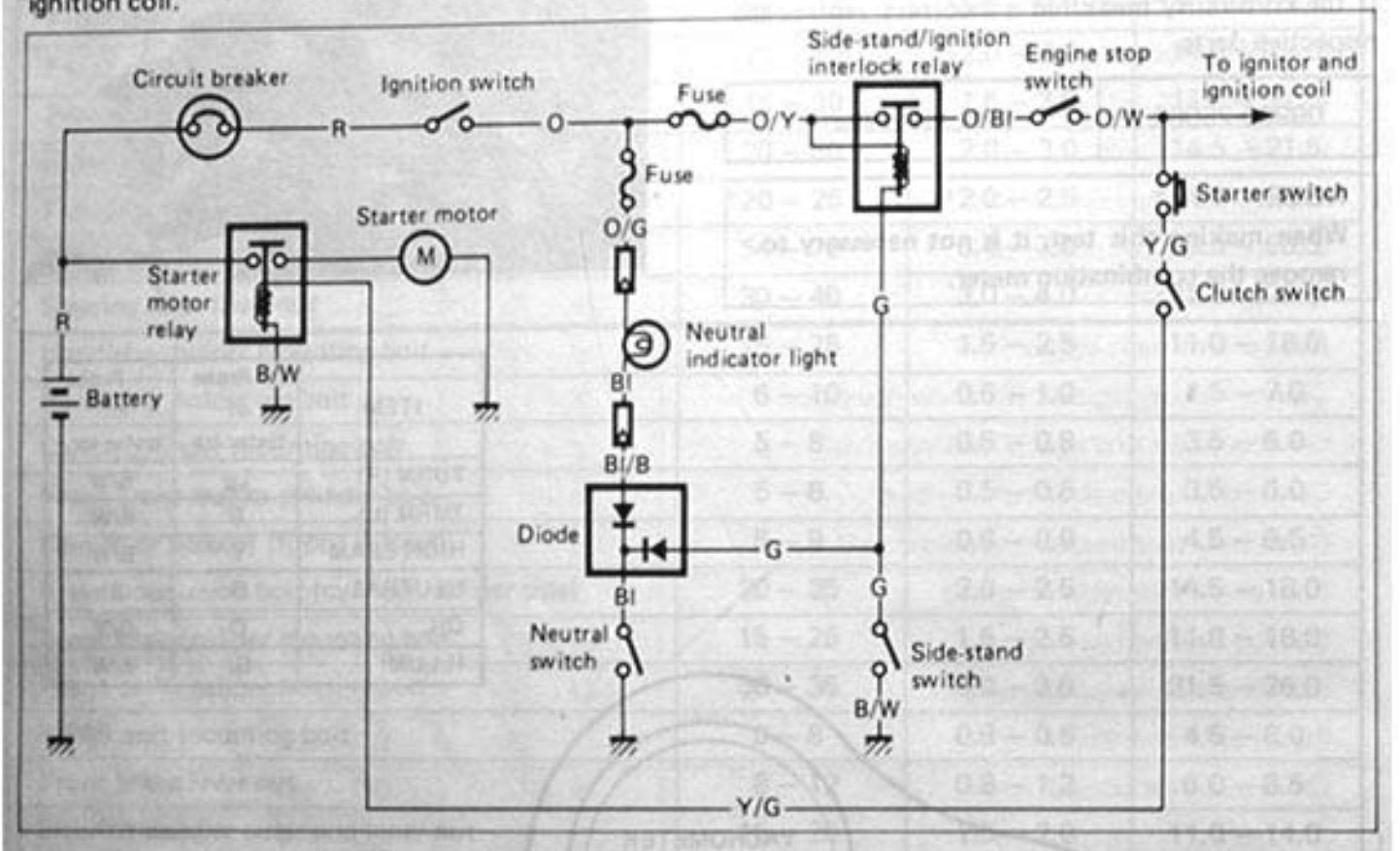
NOTE:
When making this test, it is not necessary to remove the combination meter.

ITEM	⊕ Probe of tester to:	⊖ Probe of tester to:
TURN (R)	Lg	B/W
TURN (L)	B	B/W
HIGH BEAM	Y	B/W
NEUTRAL	O	Bl
OIL	O	G/Y
ILLUMI	Gr	B/W



SIDE-STAND/IGNITION INTERLOCK SYSTEM (Only for E-28)

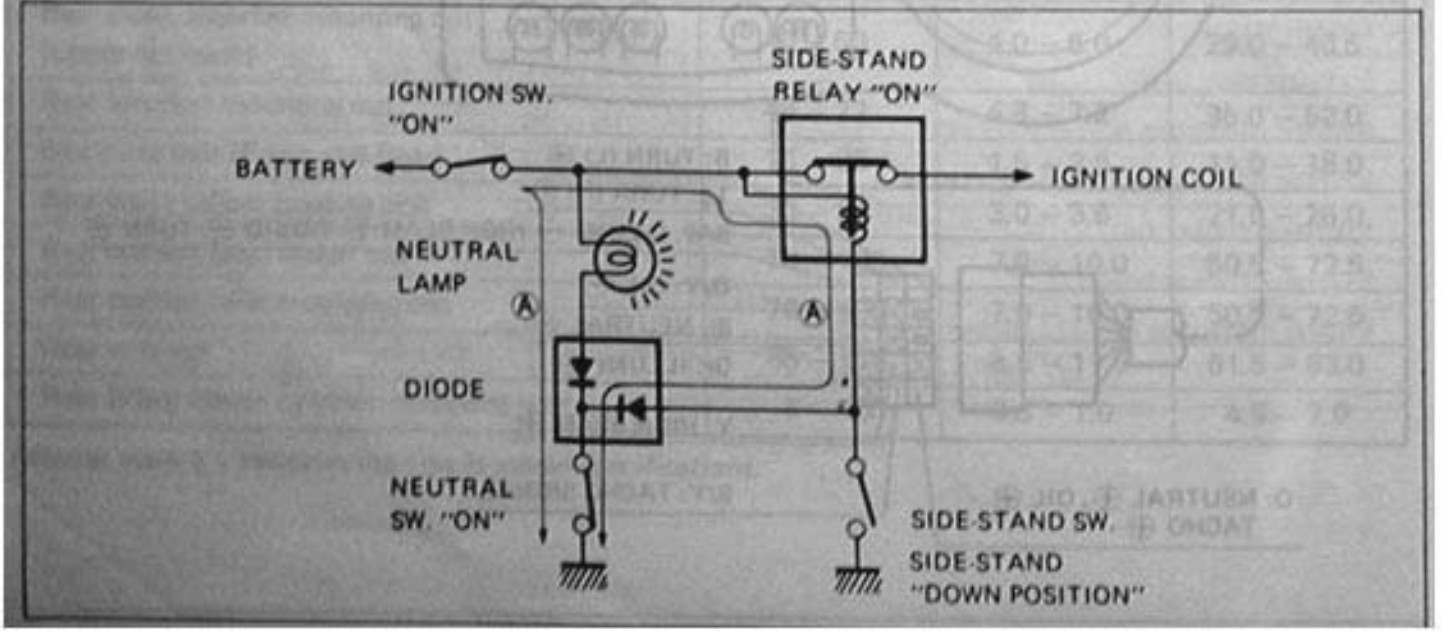
This side-stand/ignition interlock system has been newly attached to prevent starting the motorcycle with the side-stand left down. The system is operated by an electric circuit provided between the battery and ignition coil.



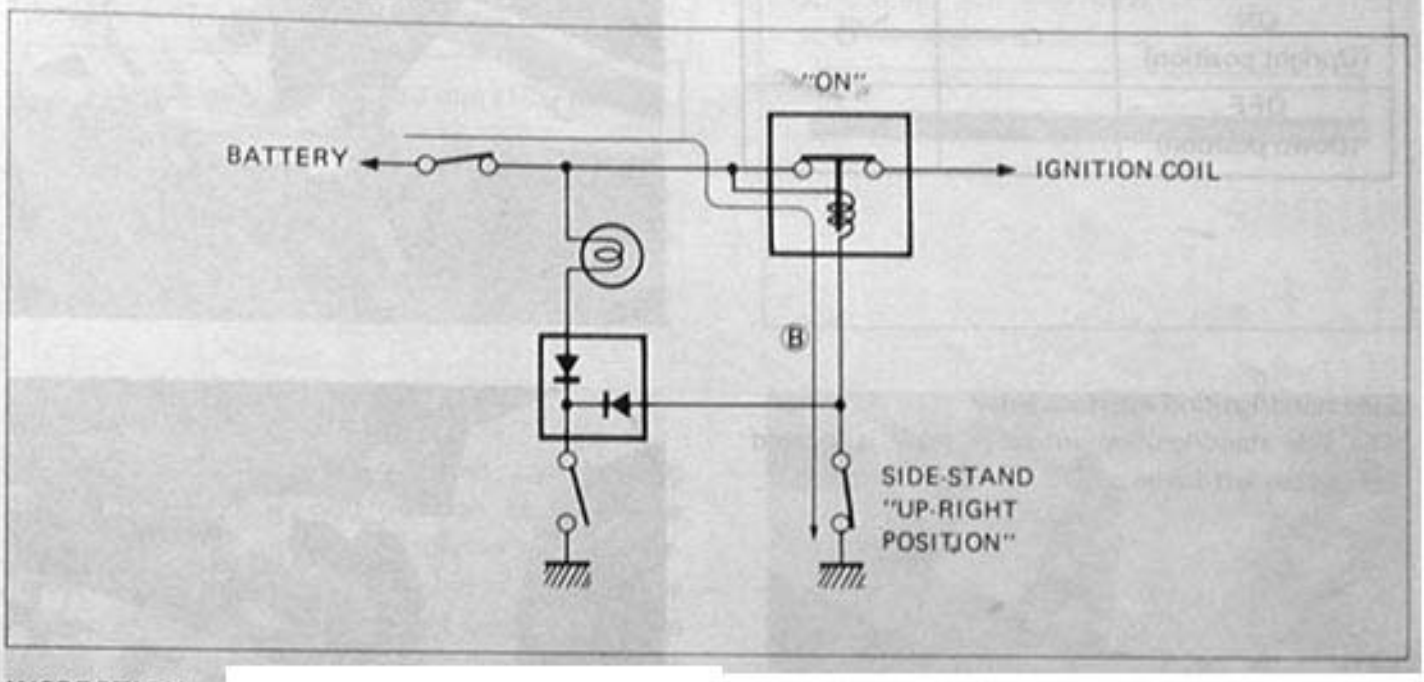
The circuit consists of relay, lamp, diode and switches and decides to live the ignition coil depending on the position of the TRANSMISSION and SIDE-STAND with the neutral and side-stand switches working mutually.

The ignition coil lives only in two situations as follows:

1. Transmission: "NEUTRAL (ON)" Side-stand: "DOWN (OFF)"
   The current flow Ⓐ turns "ON" the relay and the ignition coil lives even the side-stand is kept down. This is for warming up the engine.



2. Side-stand: "UP-RIGHT (ON)"
The current flow Ⓑ turns "ON" the relay and the ignition coil lives. The engine can be easily started at any transmission position.



INSPECTION

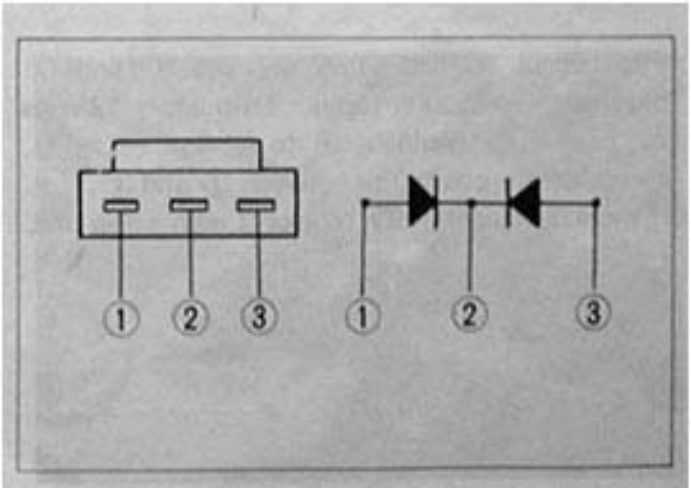
If the interlock system does not operate properly, check each component. If any abnormality is found, replace the component with a new one.

09900-25002	Pocket tester

Diode

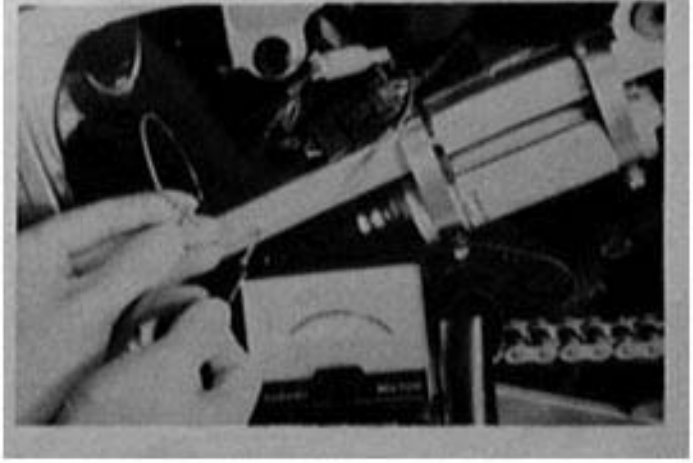
The diode can pass current only in one direction.

- Check the continuity between ① and ②. If one way continuity the diode is in good condition.
- Also check the continuity between ② and ③ as required.



Neutral switch

- Disconnect the neutral switch lead and check the continuity between BI and ground with the transmission in "NEUTRAL".



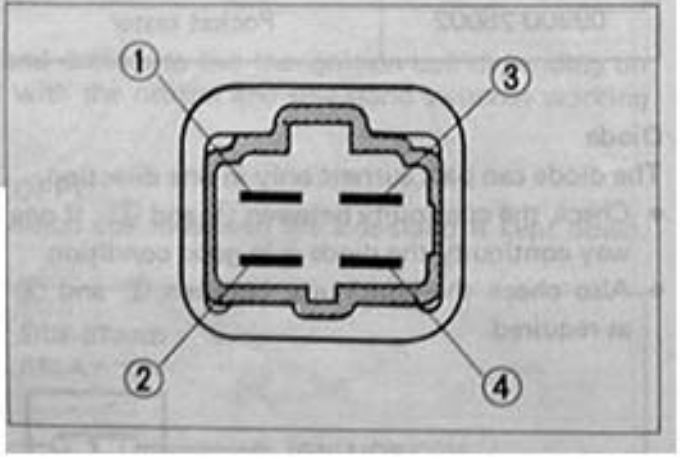
Side stand switch

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

Side stand/ignition interlock relay

The side stand/ignition interlock relay is located behind the left frame cover.

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



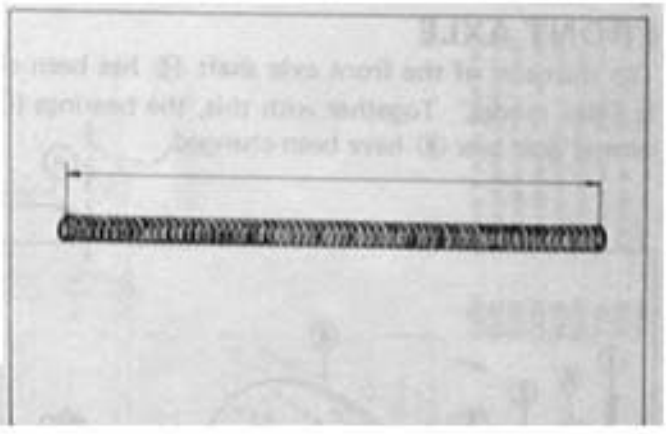
CHASSIS

FRONT FORK

FRONT FORK SPRING

Messure the fork spring free length. If it is shorter than the service limit, replace it with a new one.

Service Limit	463 mm (18.2 in)



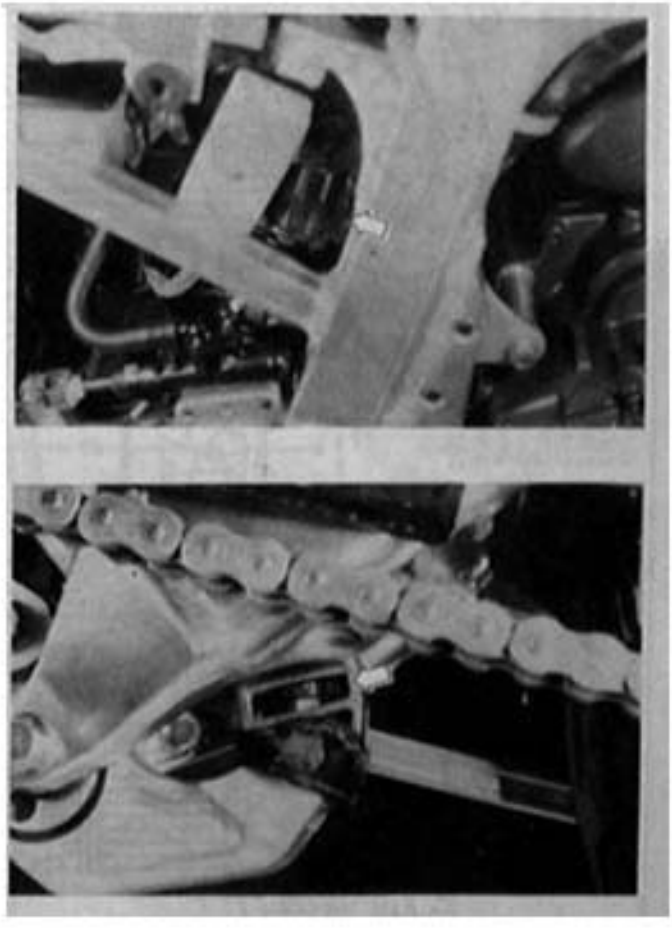
REAR SUSPENSION

SPRING PRE-LOAD

Spring pre-load can be adjusted by changing the spring adjuster ring position by using the special tool. Turn the spring adjuster ring counter-clockwise or clockwise to increase or decrease the spring pre-load. The standard set length is 179 mm (7.05 in). After adjusting the pre-load, tighten the spring adjuster lock ring securely.

09910-60611	Universal clamp wrench

CAUTION:
Do not set the spring to a length less than 167 mm (6.58 in) or more than 185 mm (7.28) in).

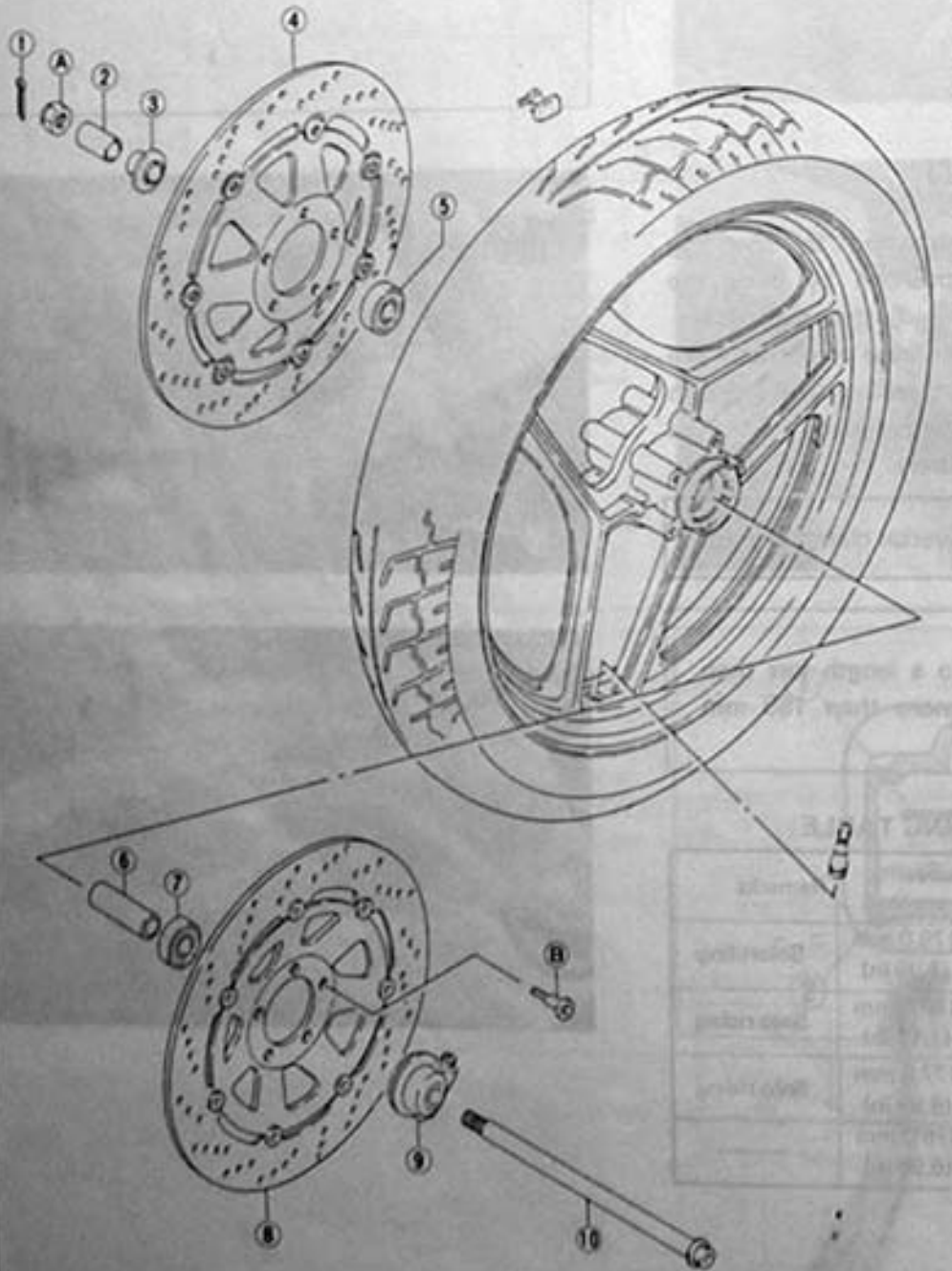


REAR SUSPENSION SETTING TABLE

ITEM	Damping force		Spring pre-load	Remarks
	E28	Others		
Standard	4	2	179.0 mm (7.05 in)	Soloriding
Softer	3	1	180.5 mm (7.11 in)	Solo riding
Stiffer	4	3	177.5 mm (6.99 in)	Solo riding
Dual riding	4	3	176.0 mm (6.93 in)	——

FRONT AXLE

The diameter of the front axle shaft ⑩ has been changed from 15 mm (0.59 in) to 17 mm (0.67in) since H ('89) model. Together with this, the bearings (⑤, ⑦), spacers (②, ③, ⑥), axle nut Ⓐ and speedometer gear box ⑨ have been changed.



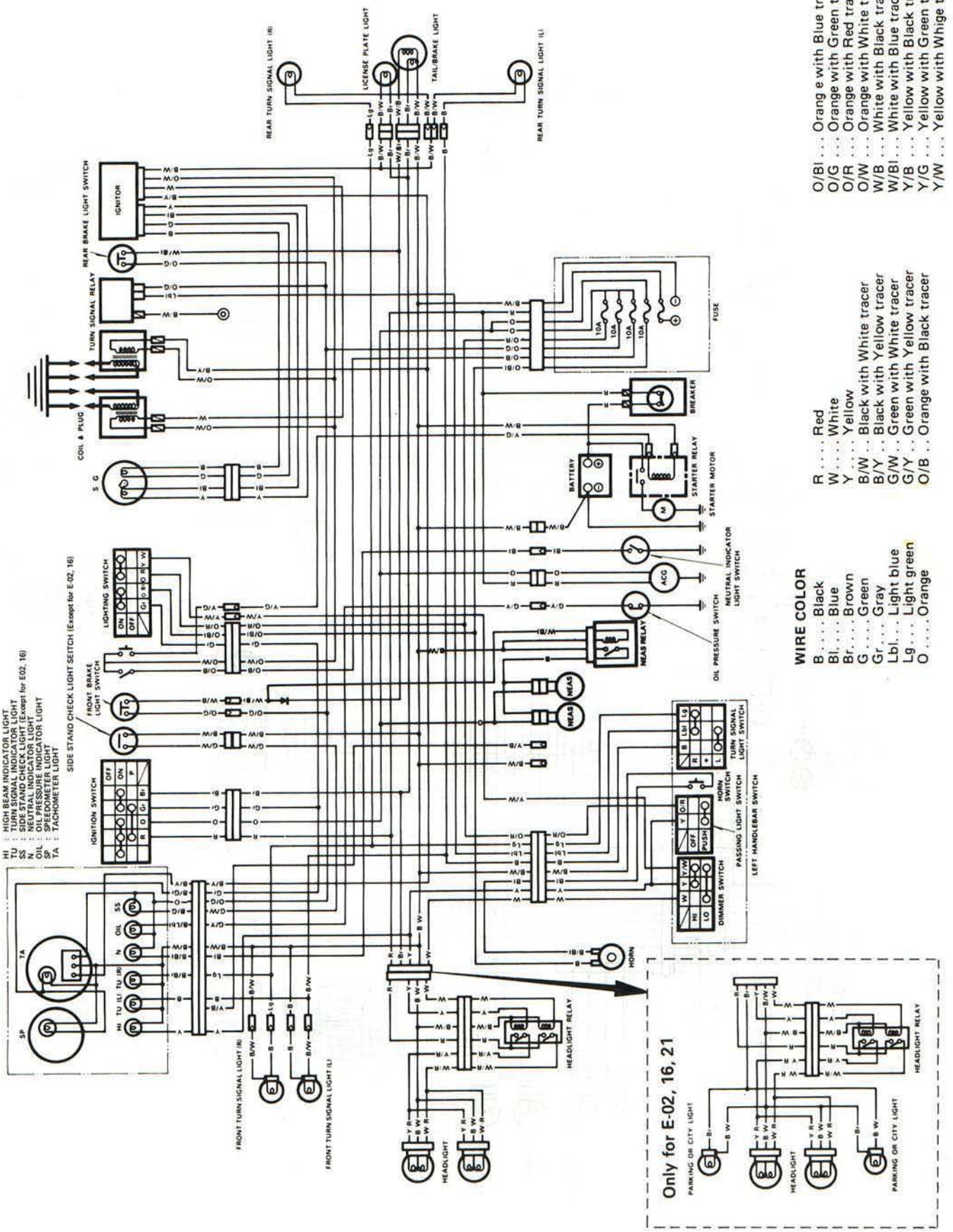
① Cotter pin (For E28)
② Spacer
③ Spacer
④ Disc plate
⑤ Bearing
⑥ Spacer
⑦ Bearing
⑧ Disc plate
⑨ Speedometer gear box
⑩ Front axle shaft
Ⓐ Axle nut
Ⓑ Disc plate mounting bolt

Tightening torque			
Item	N·m	kg-m	lb-ft
Ⓐ (E28)	*50 – 80	*5.0 – 8.0	*36.0 – 58.0
Ⓐ (Others)	*55 – 88	*5.5 – 8.8	*40.0 – 63.7
Ⓑ	15 – 25	1.5 – 2.5	11.0 – 18.0

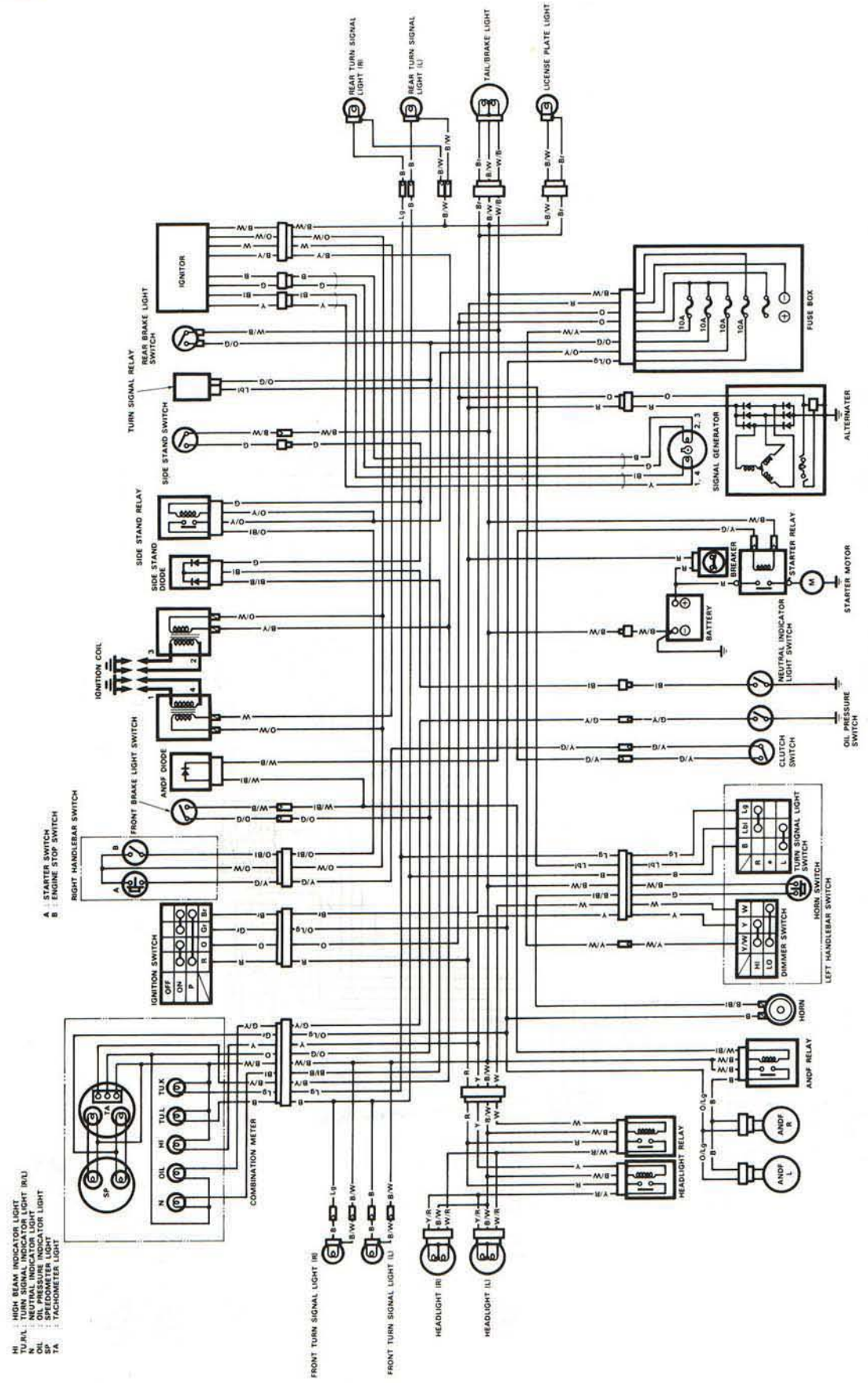
Asterisk mark (*) indicates the new H model specifications.

WIRING DIAGRAM

E-01, 02, 06, 16, 21, 24



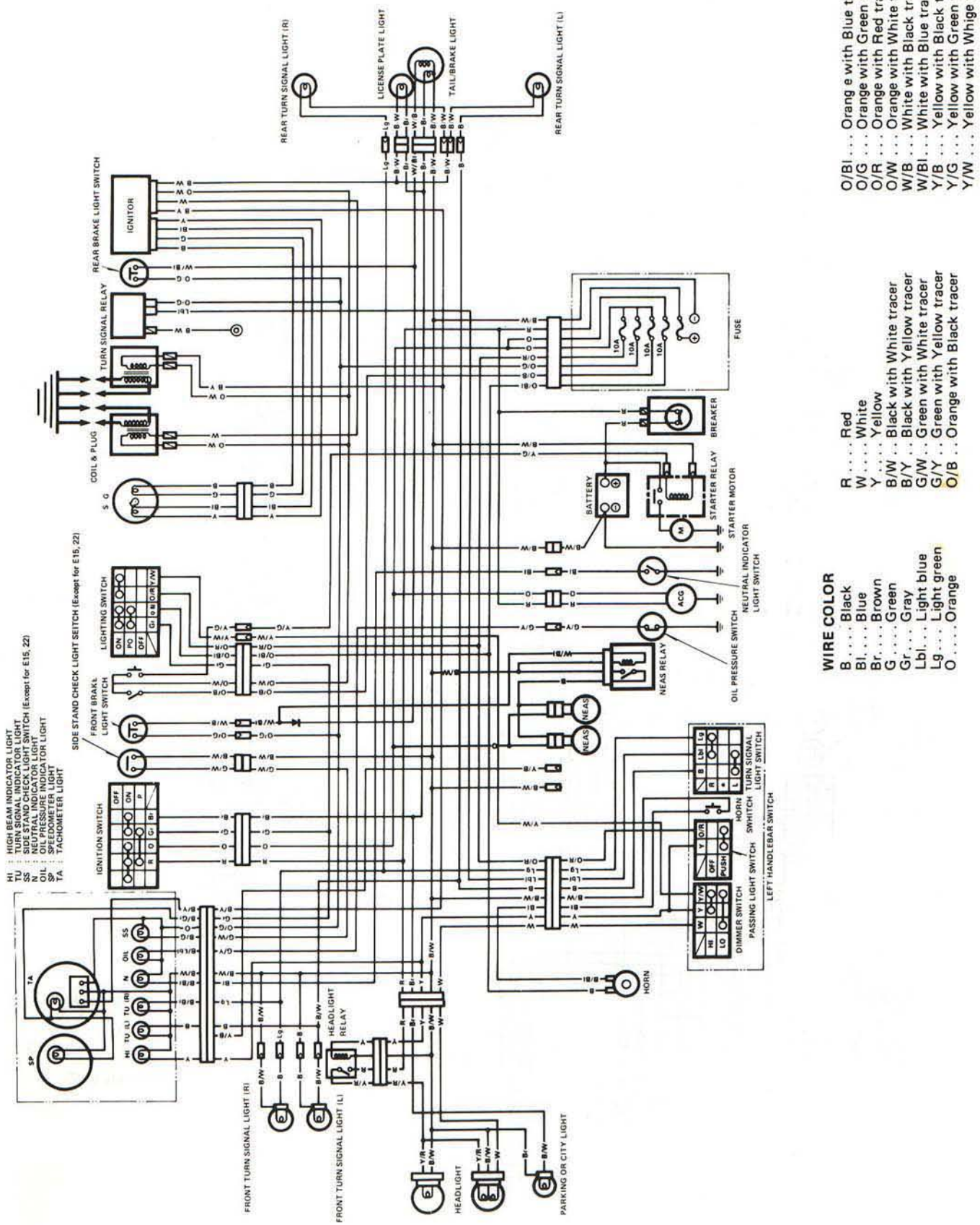
E-28



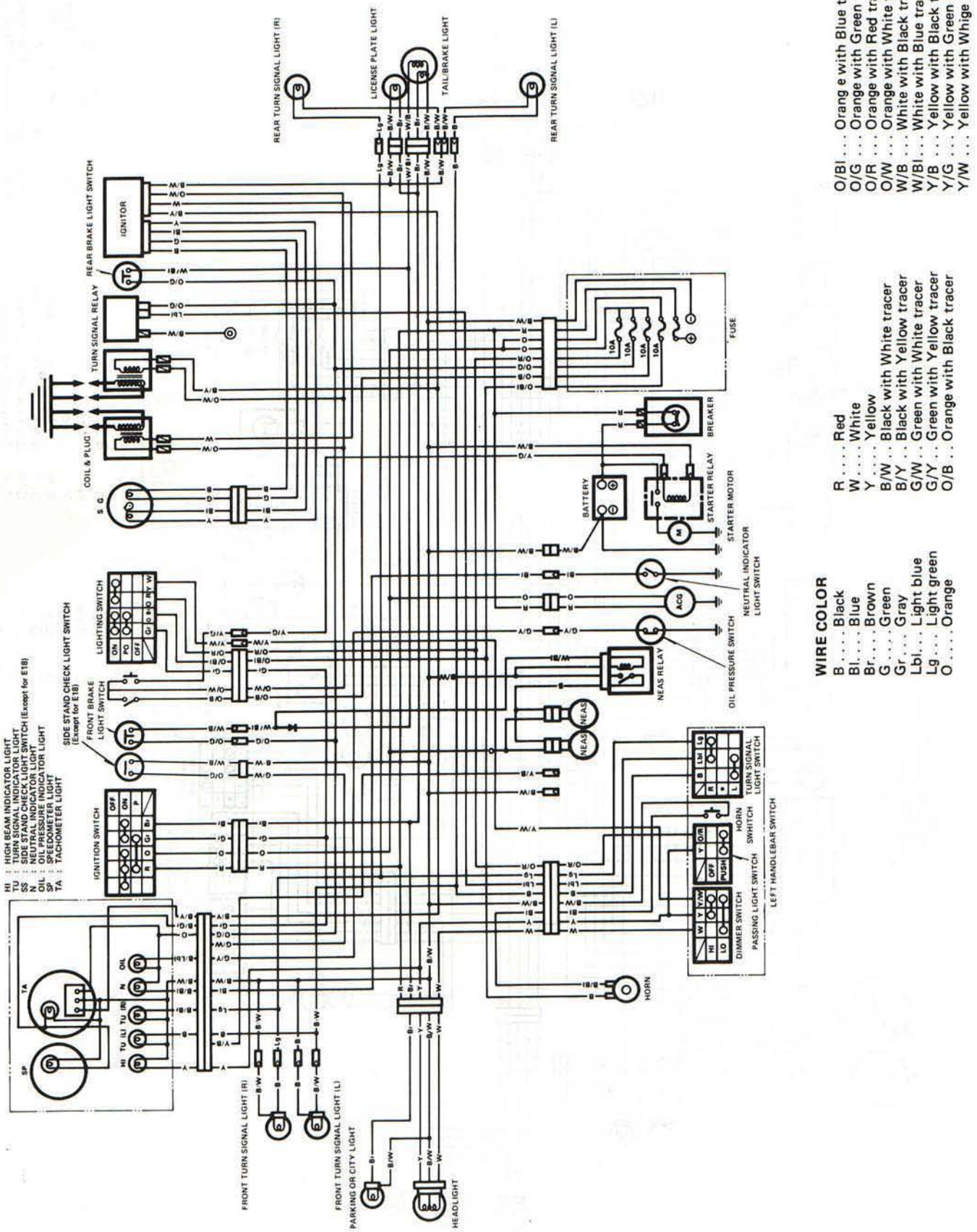
WIRE COLOR

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

E-04, 15, 17, 22, 25, 39

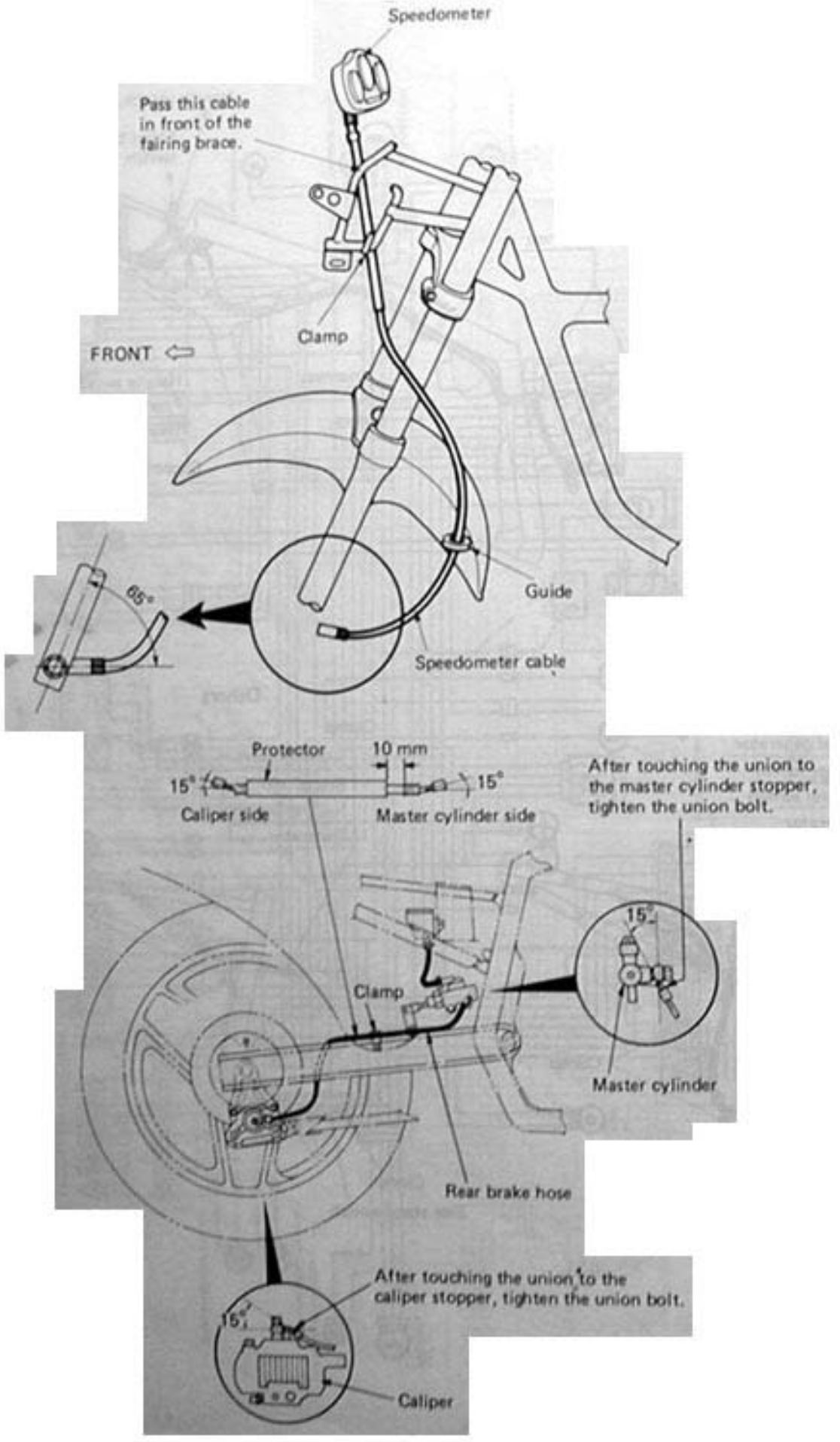


E-18, 34, 53



WIRE COLOR

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


Speedometer
Pass this cable in front of the fairing brace.
Clamp
FRONT
65°
Guide
Speedometer cable
Protector
10 mm
15°
15°
Caliper side
Master cylinder side
After touching the union to the master cylinder stopper, tighten the union bolt.
15°
Clamp
Master cylinder
Rear brake hose
After touching the union to the caliper stopper, tighten the union bolt.
15°
Caliper

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