

SUZUKI

GSXR1100W

SERVICE MANUAL

99500-39113-03E
(英)



FOREWORD

This manual contains an introductory description on SUZUKI GSX-R1100W and procedures for its inspection/service and overhaul of its main components.

Other information considered as generally known is not included.

Read GENERAL INFORMATION section to familiarize yourself with outline of the vehicle and MAINTENANCE and other sections to use as a guide for proper inspection and service.

This manual will help you know the vehicle better so that you can assure your customers of your optimum and quick service.

* This manual has been prepared on the basis of the latest specification at the time of publication.

If modification has been made since then, difference may exist between the content of this manual and the actual vehicle.

* Illustrations in this manual are used to show the basic principles of operation and work procedures.

They may not represent the actual vehicle exactly in detail.

* This manual is intended for those who have enough knowledge and skills for servicing SUZUKI vehicles. Without such knowledge and skills, you should not attempt servicing by relying on this manual only.

Instead, please contact your nearby authorized SUZUKI motorcycle dealer.

IMPORTANT

All street-legal Suzuki motorcycles with engine displacement of 50cc or greater are subject to Environmental Protection agency emission regulations. These regulations set specific standards for exhaust emission output levels as well as particular servicing requirements. This manual includes specific information required to properly inspect and service GSX-R1100W in accordance with all EPA regulations. It is strongly recommended that the chapter on Emission Control, Periodic Servicing and Carburetion be thoroughly reviewed before any type of service work is performed.

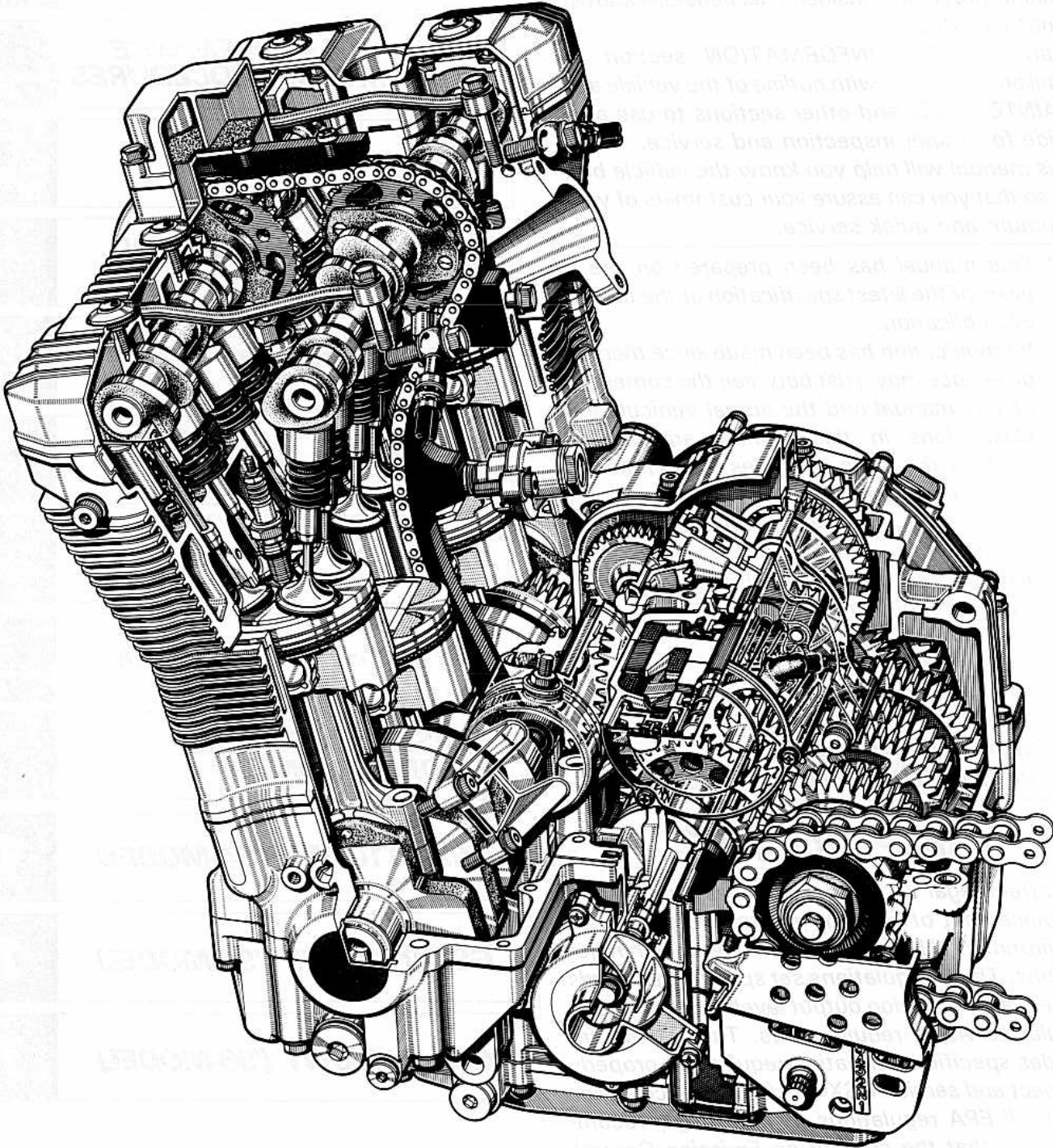
Further information concerning the EPA emission regulations and U.S. Suzuki's emission control program can be found in the U.S. SUZUKI EMISSION CONTROL PROGRAM MANUAL/SERVICE BULLETIN.

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SUZUKI MOTOR CORPORATION

Overseas Service Department



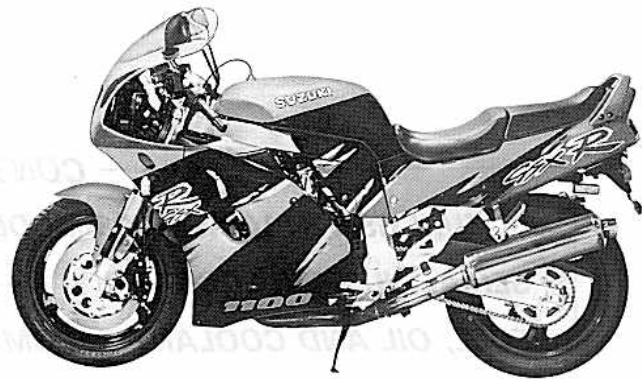
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SUZUKI GSX-R1100WP ('93-MODEL)



RIGHT SIDE

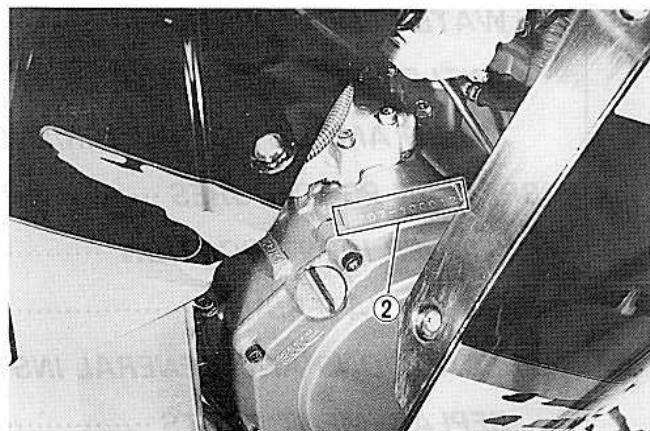
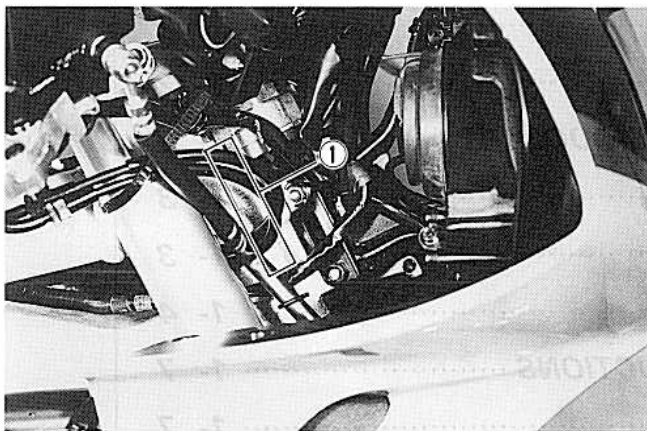


LEFT SIDE

*Difference between photographs and actual motorcycles depends on the markets.

SERIAL NUMBER LOCATION

The frame serial number or V.I.N. (Vehicle Identification Number) ① is stamped on the right side of 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.



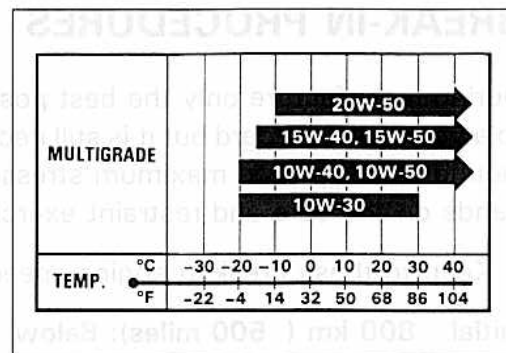
FUEL, OIL AND COOLANT RECOMMENDATION

FUEL

1. Use only unleaded gasoline of at least 87 pump octane ($\frac{R+M}{2}$) method or 91 octane or higher rated by the research method.
2. Suzuki recommends that customers use alcohol free, unleaded gasoline whenever possible.
3. Use of blended gasoline containing MTBE (Methyl Tertiary Butyl Ether) is permitted.
4. Use of blended gasoline/alcohol fuel is permitted provided that it contains not more than 10% ethanol. Gasoline/alcohol fuel may contain up to 5% methanol if appropriate cosolvents and corrosion inhibitors are present.
5. If the performance of the vehicle is unsatisfactory while using blended gasoline/alcohol fuel, you should switch to alcohol free unleaded gasoline.
6. Failure to follow these guideline could possibly void applicable warranty coverage. Check with you fuel supplier to be sure that the fuel you intend to use meets the requirements listed above.

ENGINE OIL

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



BRAKE FLUID

Specification and classification: DOT4

WARNING:

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

FRONT FORK OIL

Use fork oil L01.

ENGINE COOLANT

Use an anti-freeze/coolant compatible with an aluminum radiator, mixed with distilled water only.

WATER FOR MIXING

Use distilled water only. Water other than distilled water can corrode and clog the aluminum radiator.

ANTI-FREEZE/ENGINE COOLANT

The engine coolant perform as a corrosion and rust inhabit as well as anti-freeze. Therefore, the engine coolant should be used at all times even though the atmospheric temperature in your area does not go down to freezing point.

LIQUID AMOUNT OF WATER/ENGINE COOLANT

Solution capacity (total): 2450 ml (2.6/2.2 US/Imp qt)

For engine coolant mixture information, refer to cooling system section, page 5-4.

CAUTION:

Mixing of anti-freeze/engine coolant should be limited to 60%. Mixing beyond it would reduce its efficiency. If the anti-freeze/engine coolant mixing ratio is below 50%, rust inhabiting performance is greatly reduced. Be sure to mix it above 50% even though the atmospheric temperature does not go down to the freezing point.

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

- Keep to these break-in engine speed limits:

Initial 800 km (500 miles): Below 6000 r/min

Up to 1600 km (1000 miles): Below 9000 r/min

Over 1600 km (1000 miles): Below 11500 r/min



- Upon reaching an odometer reading of 1600 km (1000 miles) you can subject the motorcycle to full throttle operation. However, do not exceed 11500 r/min at any time.

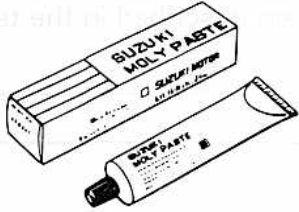



CYLINDER IDENTIFICATION



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

SPECIAL MATERIALS

The materials listed below are needed for maintenance work on the GSX-R1100W, 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
 <p data-bbox="203 730 636 787">SUZUKI BRAKE FLUID DOT3 & DOT4 99000-23110</p>	<ul style="list-style-type: none"> • Clutch • Brakes 	2-11 2-14 7-18 7-21 7-39 7-41
 <p data-bbox="207 1480 544 1537">SUZUKI SUPER GREASE "A" 99000-25030</p>	<ul style="list-style-type: none"> • Brake pedal pivot • Footrest pivot • Side-stand pivot and spring hook • Driveshaft oil seal • Generator O-ring • Starter motor O-ring • Water pump O-ring • Generator oil seal • Starter motor oil seal • Wheel bearing • Speedometer gear box dust seal • Steering stem bearing and dust seat • Swingarm spacer, washer, bearing and dust seal • Cushion lever/rod bearing • Water pump oil seal • Sprocket mounting drum bearing and oil seal 	2- 2 2- 2 2- 2 3-45 3-60 3-60 3-59 6- 7 6-17 7-8,45 7- 9 7-33 7-54 7-54 5-13 7-45

MATERIAL	PART	PAGE
 <p>SUZUKI MOLY PASTE 99000-25140</p>	<ul style="list-style-type: none"> • Valve stem 3-28 • Conrod big end bearing 3-38 • Countershaft and driveshaft 3-45 • Piston pin 3-61 • Crankshaft journal bearing 3-52 • Camshaft journal and cam face 3-63 • Starter motor armature end 6-17 	
 <p>SUZUKI BOND NO.1207B 99104-31140</p>	<ul style="list-style-type: none"> • Oil pressure switch 3-54 • Mating surface of upper and lower crankcases 3-52 • Mating surface of clutch cover 3-57 • Signal generator lead wire grommet 3-58 • Mating surface of starter clutch cover 3-59 • Mating surface of signal generator cover 3-67 • Camshaft end cap and head cover groove 3-67 • Temperature gauge 5-10 • Water pump mechanical seal 5-13 	
 <p>THREAD LOCK SUPER "1303" 99000-32030</p>	<ul style="list-style-type: none"> • Cam sprocket bolt 3-31 • Cam chain guide screw and bolt 3-32 • Starter clutch bolt 3-49 • Gearshift arm stopper bolt 3-54 	
 <p>THREAD LOCK "1342" 99000-32050</p>	<ul style="list-style-type: none"> • Starter motor housing bolt 6-17 • Countershaft bearing retainer screw 3-54 • Gearshift cam guide screw and pawl lifter screw and nut 3-54 • Carburetor set plate screw 4-15 • Generator bearing retainer screw 6- 7 • Oil pump mounting bolt 3-50 • Gearshift cam stopper bolt 3-21 • Gearshift cam stopper plate bolt 3-50 	

MATERIAL	PART	PAGE
 <p>THREAD LOCK SUPER "1360" 99000-32130</p>	<ul style="list-style-type: none"> • Brake disc mounting bolt 	<p>7-8, 46</p>
 <p>SUZUKI FORK OIL L01 99000-99044-L01</p>	<ul style="list-style-type: none"> • Front fork 	<p>7-26</p>



REPLACEMENT PARTS

When you replace any parts, use only genuine SUZUKI replacement parts or their equivalent. Genuine SUZUKI parts are the high quality parts which are designed and built specifically for SUZUKI vehicles.

CAUTION

Use of replacement parts which are not equivalent in quality to genuine SUZUKI parts can lead to performance problems and damage.

PRECAUTIONS AND GENERAL INSTRUCTIONS

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

- Do not run engine indoors with little or no ventilation.
- Be sure to replace packing, 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 engine 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 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 The personal safety of the rider may be involved. Disregarding this information could result in injury to the rider.

CAUTION These instructions point out special service procedures or precautions that must be followed to avoid damaging the machine.

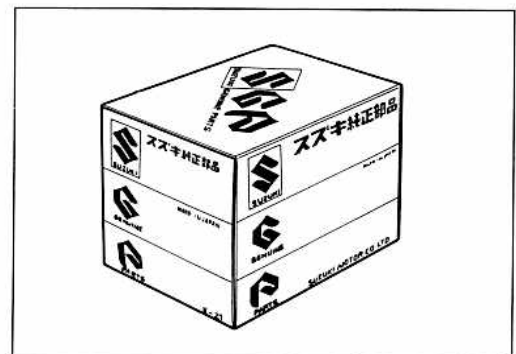
NOTE This provides special information to make maintenance easier or important instructions clearer.

REPLACEMENT PARTS

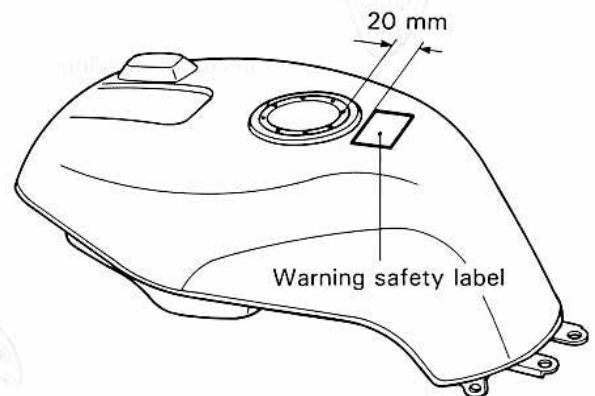
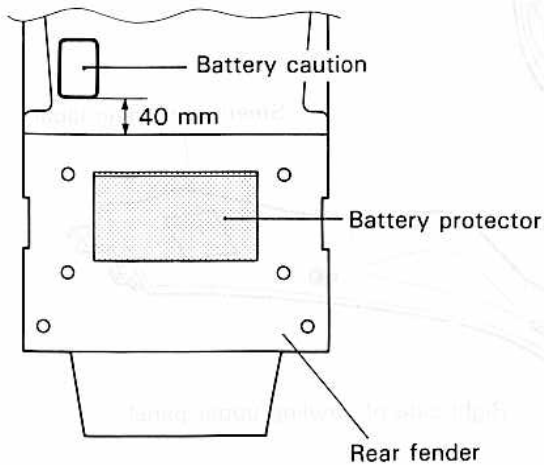
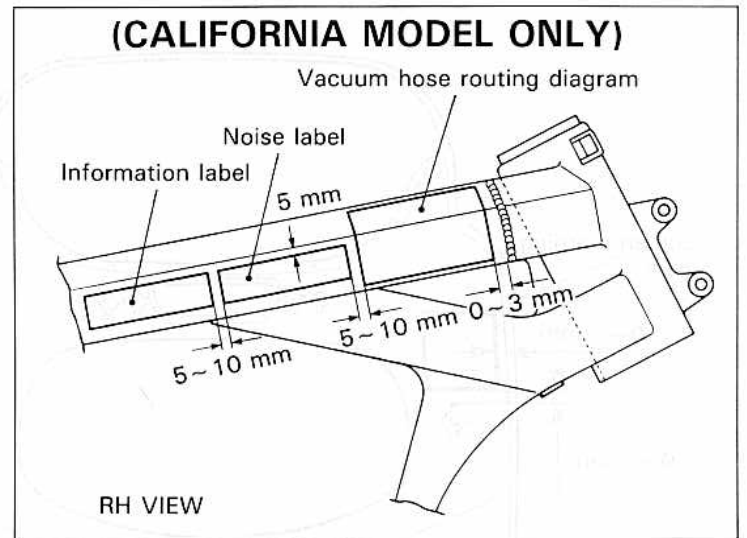
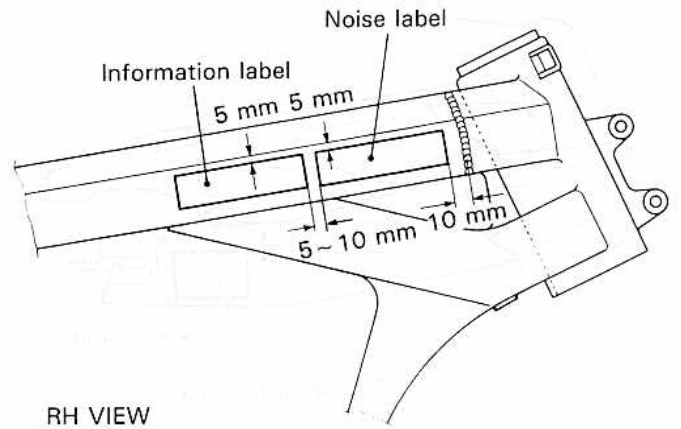
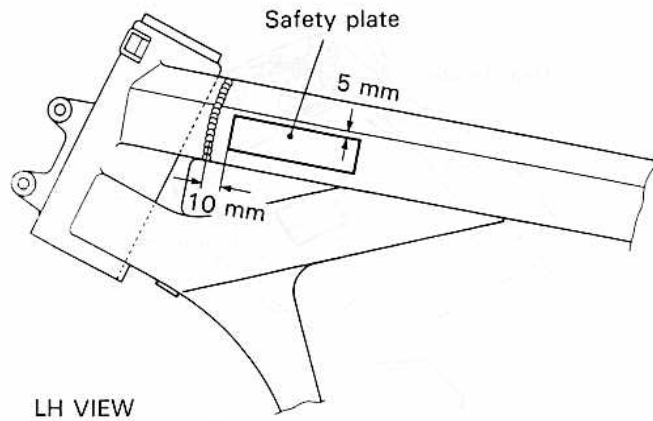
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CAUTION:

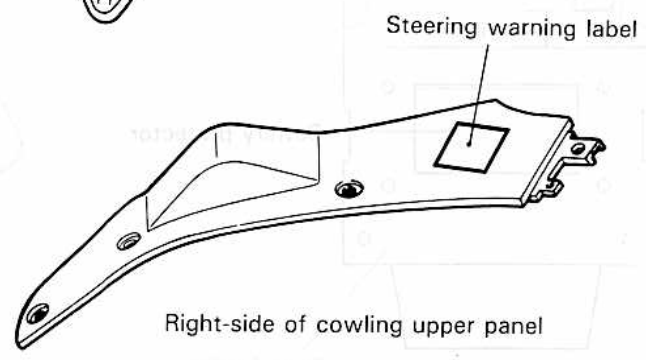
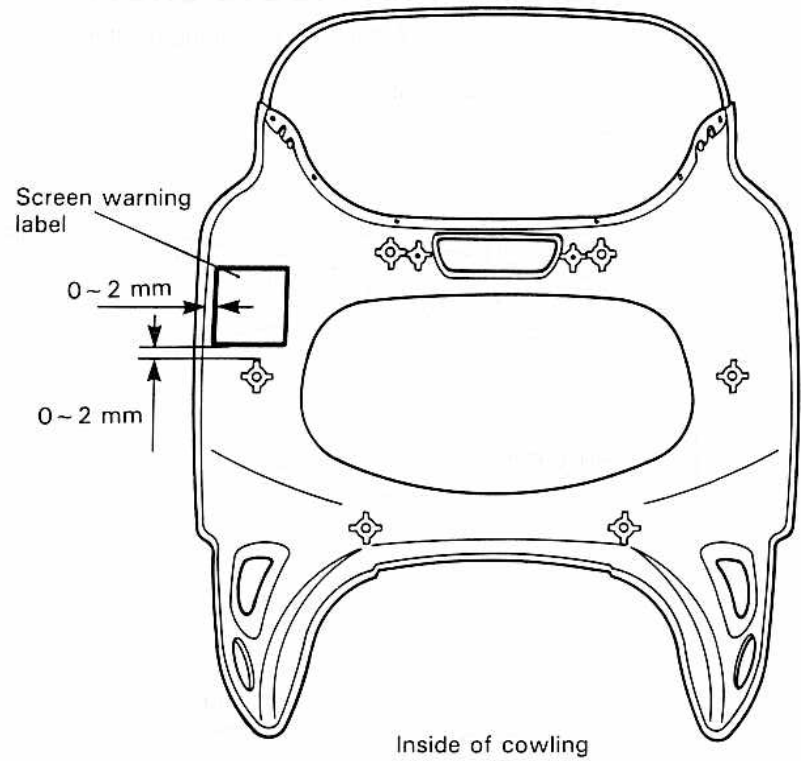
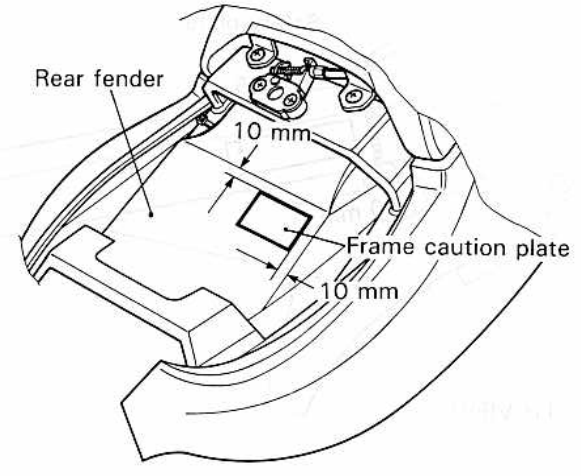
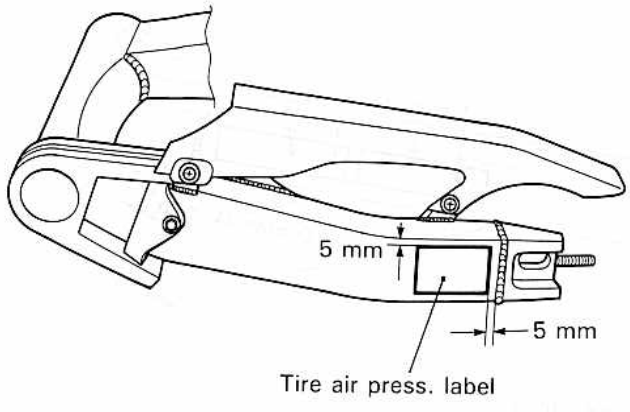
Use of replacement parts which are not equivalent in quality to genuine SUZUKI parts can lead to performance problems and damage.



INFORMATION LABELS



INFORMATION LABELS



SPECIFICATIONS

DIMENSIONS AND DRY MASS

Overall length	2 130 mm (83.9 in)
Overall width	755 mm (29.7 in)
Overall height	1 190 mm (46.9 in)
Wheelbase	1 485 mm (58.5 in)
Ground clearance	130 mm (5.1 in)
Dry mass	233 kg (514 lbs) For E-33 model
	231 kg (509 lbs) For E-03 model

ENGINE

Type	Four-stroke, Water-cooled, DOHC, TSCC
Number of cylinders	4
Bore	75.5 mm (2.972 in)
Stroke	60.0 mm (2.362 in)
Piston displacement	1074 cm ³ (65.5 cu. in)
Carburetor	MIKUNI BST36
Air cleaner	Non-woven fabric element
Starter system	Electric starter
Lubrication system	Wet sump

TRANSMISSION

Clutch	Wet multi-plate type
Transmission	5-speed constant mesh
Gearshift pattern	1-down, 4-up
Primary reduction ratio	1.565 (72/46)
Final reduction ratio	2.800 (42/15)
Gear ratios, Low	2.714 (38/14)
2nd	1.809 (38/21)
3rd	1.409 (31/22)
4th	1.181 (26/22)
5th	1.038 (27/26)
Drive chain	TAKASAGO RK532GSV ₂ , 114 links

CHASSIS

Front suspension	Inverted telescopic, coil spring, oil damped, spring pre-load adjustable, rebound and compression damping force adjustable.
Rear suspension	Link type system, gas/oil damped, coil spring, spring pre-load adjustable, rebound and compression force adjustable.
Steering angle	30° (right & left)
Caster	65° 10'
Trail	100 mm (3.9 in)
Turning radius	3.2 m (10.5 ft)
Front brake	Disc brake, twin
Rear brake	Disc brake
Front tire size	120/70 ZR17, tubeless
Rear tire size	180/55 ZR17, tubeless
Front fork stroke	120 mm (4.7 in)
Rear wheel travel	160 mm (6.3 in)

ELECTRICAL

Ignition type	Electronic Ignition (Fully Transistorized)
Ignition timing	13° B.T.D.C. at 1500 r/min For E-03 model 7° B.T.D.C. at 1500 r/min For E-33 model
Spark plug	N.G.K.: CR9E NIPPONDENSO U27ESR-N
Battery	12V 36.0 kC (10 Ah)/10 HR
Generator	Three-phase A.C. Generator
Main fuse	30A
Fuse	15/15/10/15/10A
Headlight	12V 60/55W x 2
Turn signal light	12V 21W
Front position light	12V 5W
Tail/Brake light	12V 5/21W x 2
Speedometer light	12V 1.7W
Tachometer light	12V 1.7W x 2
Neutral indicator light	14V 3W
High beam indicator light	14V 3W
Turn signal indicator light	14V 3W
Oil pressure indicator light	14V 3W
Fuel level indicator light	14V 3W

CAPACITIES

Fuel tank, including reserve	21.0 L (5.5/4.6 US/Imp gal) For E-03 model 18.5 L (4.9/4.1 US/Imp gal) For E-33 model
Engine oil, oil change	3 000 ml (3.2/2.6 US/Imp qt)
with filter change	3 300 ml (3.5/2.9 US/Imp qt)
overhaul	3 900 ml (4.1/3.4 US/Imp qt)
Front fork oil	425 ml (14.4/15.0 US/Imp oz)
Coolant	2 450 ml (2.6/2.2 US/Imp qt)

These specifications are subject to change without notice.

COUNTRY OR AREA

The series of symbols on the left stand for the countries or area on the right.

SYMBOL	COUNTRY or AREA
E-03	U.S.A.
E-33	California (U.S.A.)

PERIODIC MAINTENANCE AND TUNE-UP PROCEDURES

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PERIODIC MAINTENANCE SCHEDULE

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

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, miles and time for your convenience.

NOTE:

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

PERIODIC MAINTENANCE CHART

Item	Interval	km	1000	6000	12000	18000	24000
		miles	600	4000	7500	11000	15000
		months	2	12	24	36	48
Exhaust pipe bolts		—	T	T	T	T	T
Air cleaner		—	I	I	R	I	I
Tappet clearance		—	—	I	—	I	I
Spark plug		—	I	R	I	R	R
Engine oil		R	R	R	R	R	R
Engine oil filter		R	—	R	—	R	R
Fuel line (EVAP hose California model only)		—	I	I	I	I	I
Replace every 4 years							
Fuel cock filter		—	—	C	—	C	C
Engine idle rpm (Carburetor)		I	I	I	I	I	I
Throttle cable play (Carburetor)		I	I	I	I	I	I
Clutch hose		—	I	I	I	I	I
Replace every 4 years							
Clutch fluid		—	—	I	—	I	I
Replace every 2 years							
Drive chain		I	I	I	I	I	I
Lubricate every 1000 km (600 miles)							
Radiator hose		—	I	I	I	I	I
Replace every 4 years							
Engine coolant		Replace every 2 years					
Brake		I	I	I	I	I	I
Brake hose		—	I	I	I	I	I
Replace every 4 years							
Brake fluid		—	I	I	I	I	I
Replace every 2 years							
Tire		—	I	I	I	I	I
Steering		I	—	I	—	I	I
Front fork		—	—	I	—	I	I
Rear suspension		—	—	I	—	I	I
Chassis bolts and nuts		T	T	T	T	T	T

I = Inspection and adjust, clean, lubricate or replace as necessary

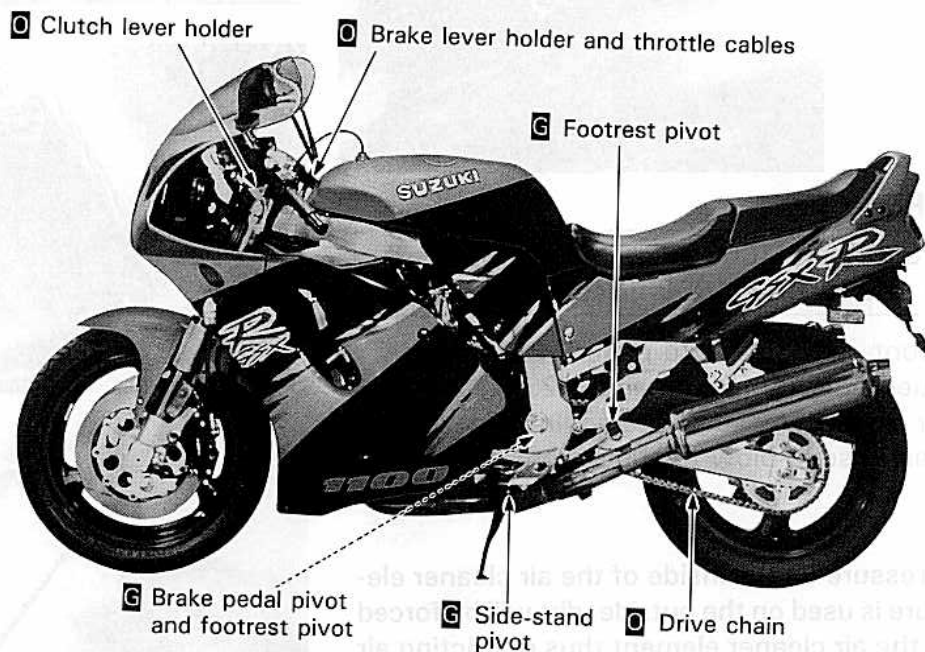
C = Clean R = Replace T = Tighten

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.

- O** Oil
- G** Grease



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.

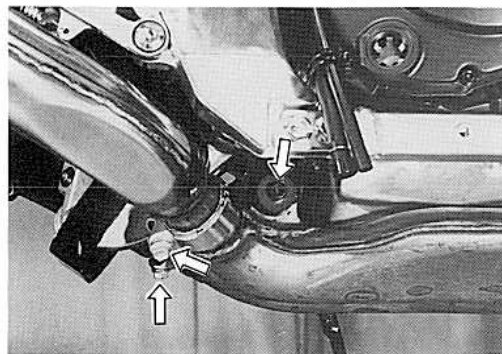
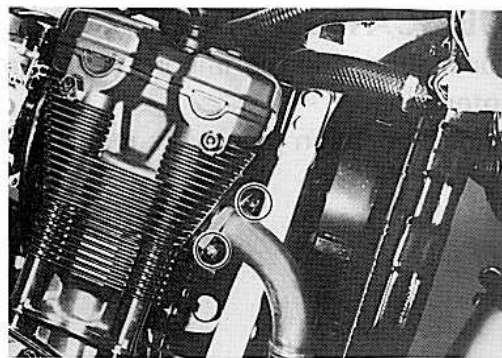
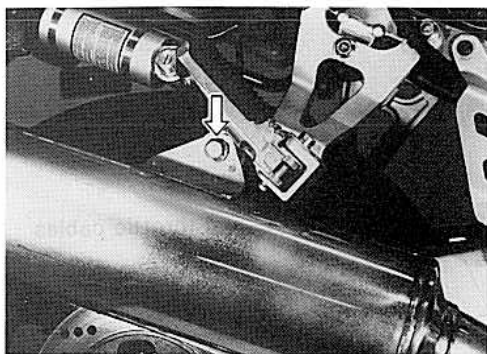
EXHAUST PIPE BOLTS

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

- Remove the lower cowling assembly. (Refer to page 7-4.)
- Remove the oil cooler and radiator mounting bolts. (Refer to page 3-4.)
- Tighten the exhaust pipe clamp bolts and muffler mounting bolts to the specified torque with a torque wrench.

Exhaust pipe clamp bolt 18–28 N·m

& Muffler mounting bolt : (1.8–2.8 kg·m, 13.0–20.0 lb-ft)





AIR CLEANER

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

- Remove the front seat. (Refer to page 7-2.)
- Remove the fuel tank. (Refer to page 4-2.)
- Remove the air cleaner element by removing the screws.
- Carefully use air hose to blow the dust from the cleaner element.

CAUTION:

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

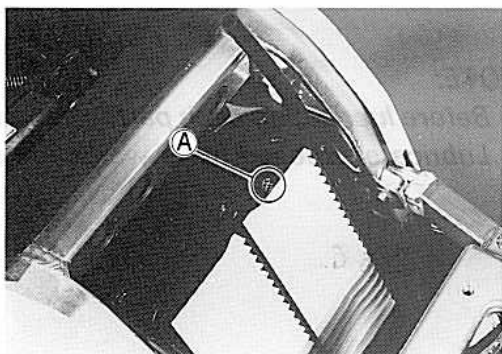
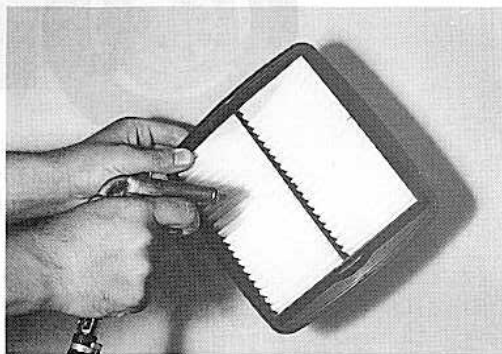
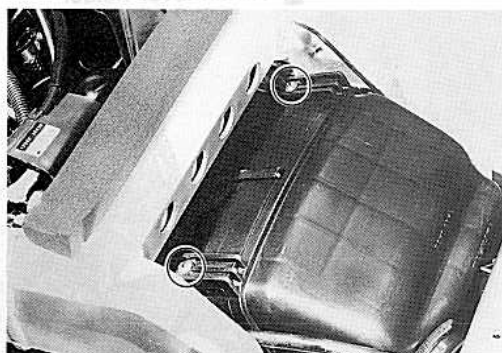
- Reinstall the cleaned or new air cleaner element in the reverse order of removal.
- When installing the air cleaner element in the cleaner case, make sure that the  mark  comes upward.

CAUTION:

If driving under dusty condition, 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!

NOTE:

When you clean the air cleaner element, drain water from the air cleaner drain hose by removing the drain plug.



TAPPET CLEARANCE

Inspect Every 12000 km (7500 miles, 24 months).

- Remove the front seat, lower cowling assembly and fuel tank. (Refer to pages 7-2,3 and 4.)
- Remove the carb. diaphragm chamber air cleaner. (Refer to page 3-2.) [Except for E-03,18,33 and 39 models]
- Drain engine coolant. (Refer to page 2-13.)
- Disconnect the water hoses and remove the thermostat case. (Refer to page 3-4.)
- Remove all the spark plugs.
- Remove the cylinder head cover. (Refer to page 3-11.)

The tappet clearance specification is different for intake and exhaust valves.

Tappet clearance adjustment must be checked and adjusted, 1) at the time of periodic inspection, 2) when the valve mechanism is serviced, and 3) when the camshafts are disturbed by removing them for servicing.

Tappet clearance (when cold):

IN. : 0.10–0.20 mm (0.004–0.008 in)

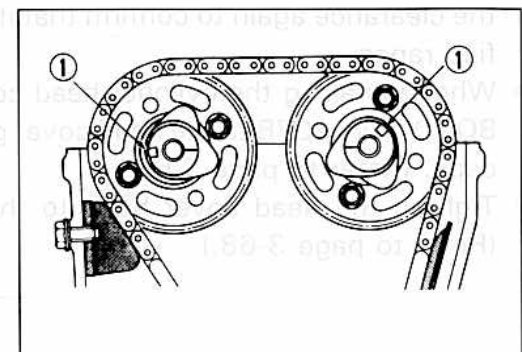
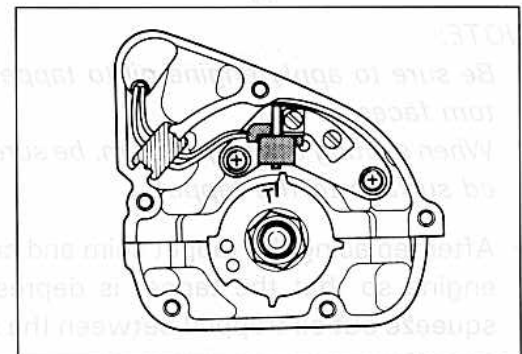
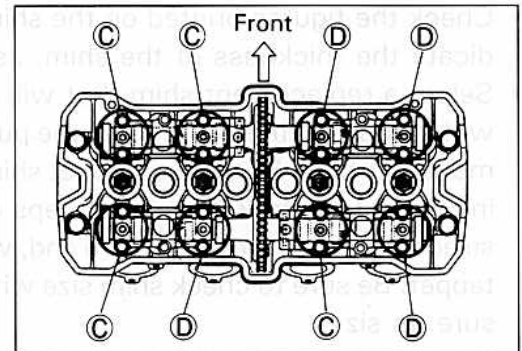
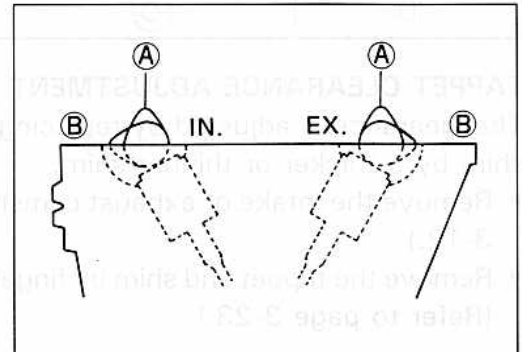
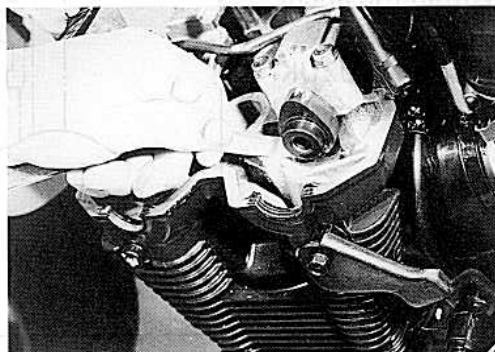
EX.: 0.20–0.30 mm (0.008–0.012 in)

NOTE:

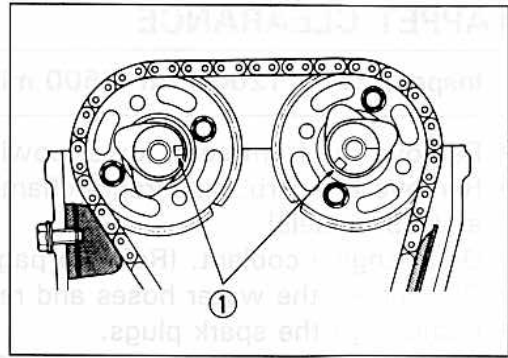
- * The cam must be at positions, **A** or **B**, in order to check the tappet clearance, or to adjust tappet clearance. Clearance readings should not be taken with the cam in any other position than these two positions.
- * The clearance specification is for **COLD** state.
- * To turn the crankshaft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

- Turn crankshaft to bring the "T" mark on the rotor to the center of pick-up coil and also to bring the notches ① in the right ends of both camshafts (Ex and In) to the positions shown. In this condition, read the tappet clearance at the valves **C** (In and Ex of No.1 cylinder, Ex of No.2 and In of No.3).
- Use a thickness gauge between the tappet and the cam. If the clearance is out of specification, bring it into the specified range.

09900-20803: Thickness gauge



- Turn the crankshaft 360° (one rotation) to bring the "T" mark on the rotor to the center of pick-up coil and also to bring the notches ① to the positions shown.
- Read the clearance at the remaining valves ② and adjust the clearance if necessary.



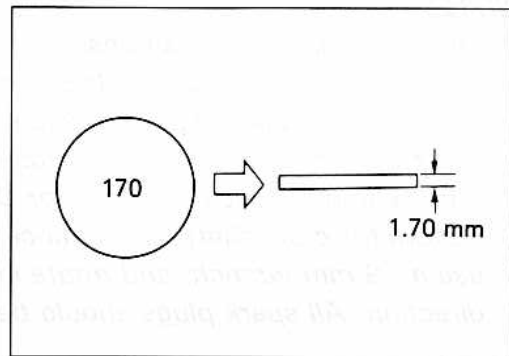
Cam Position	Notch ① position	
	Intake Camshaft	Exhaust Camshaft
Ⓒ		
Ⓓ		

TAPPET CLEARANCE ADJUSTMENT

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

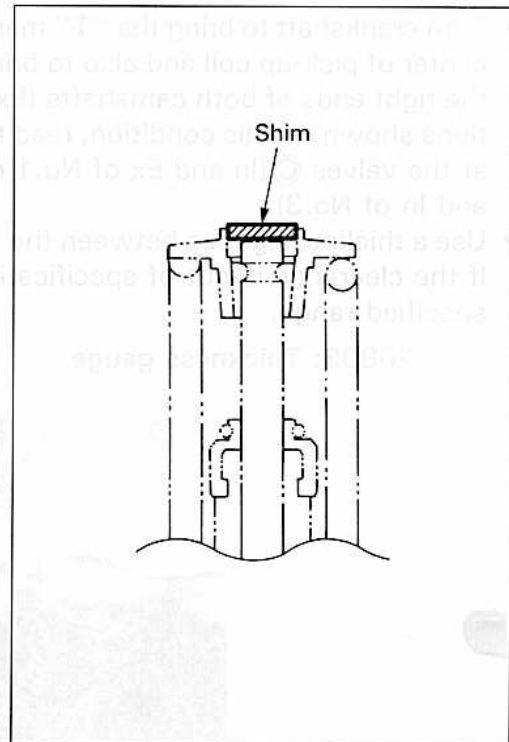
- Remove the intake or exhaust camshafts. (Refer to page 3-12.)
- Remove the tappet and shim by fingers or magnetic hand. (Refer to page 3-23.)
- Check the figures printed on the shim. These figures indicate the thickness of the shim, as illustrated.
- Select a replacement shim that will provide a clearance within the specified range. For the purpose of this adjustment, a total of 21 sizes of tappet shim are available ranging from 1.20 to 2.20 mm in steps of 0.05 mm. Fit the selected shim to the valve stem end, with numbers toward tappet. Be sure to check shim size with micrometer to ensure its size.

Refer to the tappet shim selection table for details.



NOTE:

- * Be sure to apply engine oil to tappet shim top and bottom faces.
- * When seating the tappet shim, be sure to face figure printed surface to the tappet.
- After replacing the tappet shim and camshafts, rotate the engine so that the tappet is depressed fully. This will squeeze out oil trapped between the shim and the tappet that could cause an incorrect measurement, then check the clearance again to confirm that it is within the specified range.
- When installing the cylinder head cover, apply SUZUKI BOND NO.1207B to the head cover groove and cam end caps. (Refer to page 3-67.)
- Tighten the head cover bolts to the specified torque. (Refer to page 3-68.)



(INTAKE SIDE)

TAPPET SHIM SELECTION TABLE (INTAKE)
TAPPET SHIM NO.(12892-05C00-x x x)

TAPPET SHIM SET NO. (12800-05820)

MEASURED TAPPET CLEARANCE (mm)	SUFFIX NO.	SPECIFIED CLEARANCE/NO ADJUSTMENT REQUIRED																			
		120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215
1.20	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20
0.00-0.04	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20
0.05-0.09	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20
0.10-0.20	1.30	1.35	1.40	1.45	1.50	1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20		
0.21-0.25	1.35	1.40	1.45	1.50	1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20			
0.26-0.30	1.40	1.45	1.50	1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20				
0.31-0.35	1.45	1.50	1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20					
0.36-0.40	1.50	1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20						
0.41-0.45	1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20							
0.46-0.50	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20								
0.51-0.55	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20									
0.56-0.60	1.70	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20										
0.61-0.65	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20											
0.66-0.70	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20												
0.71-0.75	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20													
0.76-0.80	1.90	1.95	2.00	2.05	2.10	2.15	2.20														
0.81-0.85	1.95	2.00	2.05	2.10	2.15	2.20															
0.86-0.90	2.00	2.05	2.10	2.15	2.20																
0.91-0.95	2.05	2.10	2.15	2.20																	
0.96-1.00	2.10	2.15	2.20																		
1.01-1.05	2.15	2.20																			
1.06-1.10	2.20																				
1.11-1.15																					

HOW TO USE THIS CHART:

- I. Measure tappet clearance. "ENGINE IS COLD"
- II. Measure present shim size.
- III. Match clearance in vertical column with present shim size in horizontal column.

EXAMPLE

Tappet clearance is 0.23 mm
Present shim size 1.70 mm
Shim size to be used 1.80 mm

(EXHAUST SIDE)

TAPPET SHIM SELECTION TABLE [EXHAUST]
TAPPET SHIM NO.(12892-05C00-x x x)

TAPPET SHIM SET NO. (12800-05820)

MEA-SURED TAPPET CLEARANCE (mm)	SUFFIX NO.	SPECIFIED CLEARANCE/NO ADJUSTMENT REQUIRED																			
		120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215
0.05-0.09	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20
0.10-0.14	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20
0.15-0.19	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20
0.20-0.30	1.30	1.35	1.40	1.45	1.50	1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20	2.20	2.20
0.31-0.35	1.35	1.40	1.45	1.50	1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20	2.20	2.20	2.20
0.36-0.40	1.40	1.45	1.50	1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20	2.20	2.20	2.20	2.20
0.41-0.45	1.45	1.50	1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20	2.20	2.20	2.20	2.20	2.20
0.46-0.50	1.50	1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20	2.20	2.20	2.20	2.20	2.20	2.20
0.51-0.55	1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20
0.56-0.60	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20
0.61-0.65	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20
0.66-0.70	1.70	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20
0.71-0.75	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20
0.76-0.80	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20
0.81-0.85	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20
0.86-0.90	1.90	1.95	2.00	2.05	2.10	2.15	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20
0.91-0.95	1.95	2.00	2.05	2.10	2.15	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20
0.96-1.00	2.00	2.05	2.10	2.15	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20
1.01-1.05	2.05	2.10	2.15	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20
1.06-1.10	2.10	2.15	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20
1.11-1.15	2.15	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20
1.16-1.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20
1.21-1.25	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20

HOW TO USE THIS CHART:

- I. Measure tappet clearance. "ENGINE IS COLD"
- II. Measure present shim size.
- III. Match clearance in vertical column with present shim size in horizontal column.

EXAMPLE

Tappet clearance is 0.33 mm
Present shim size 1.70 mm
Shim size to be used 1.80 mm

SPARK PLUG

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

- Remove the front seat and fuel tank. (Refer to pages 7-2 and 3.)
- Remove the carb. diaphragm chamber air cleaner. (Refer to page 3-2.) [Except for E-03,18,33 and 39 models]
- Remove all the spark plugs.

NOTE: If it is difficult to remove the spark plug cap, pry up it with a screwdriver.

- 09930-10121: Spark plug socket wrench set
- 09930-14530: Universal joint
- 09914-24510: T handle
- 09900-20803: Thickness gauge

	Standard	Cold type	Hot type
NGK	CR9E	CR10E	CR8E
ND	U27ESR-N	U31ESR-N	U24ESR-N

CARBON DEPOSIT

Check to see the carbon deposit on the plug. If the carbon is deposited, remove it with a spark plug cleaner machine or carefully using a tool with a pointed end.

SPARK PLUG GAP

Measure the plug gap with a thickness gauge if it is correct. If not, adjust it to the following gap.

Spark plug gap	Standard
	0.7–0.8 mm (0.028–0.032 in)

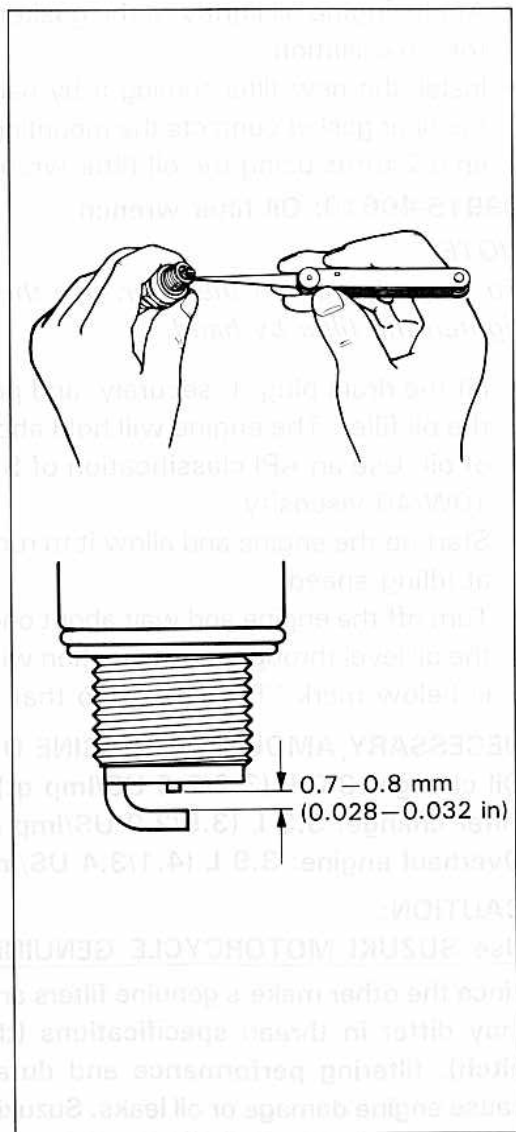
09900-20803: Thickness gauge

ELECTRODE'S CONDITION

Check to see the worn or burnt condition of the electrodes. If it is extremely worn or burnt, replace the plug. And also replace the plug if it has a broken insulator, damaged thread, etc.

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.



ENGINE OIL AND OIL FILTER

(ENGINE OIL)

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

OIL FILTER

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

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

- Remove the lower cowling assembly. (Refer to page 7-4.)
- Keep the motorcycle upright.
- Place an oil pan below the engine, and drain the oil by removing the drain plug ① and filler cap ② .
- Remove the oil cooler ③ and its bracket ④ by removing the bolts.
- Remove the oil filter ⑤ by using the oil filter wrench. (Special tool A)
- 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 it 2 turns using the oil filter wrench. (Special tool A)

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 pour fresh oil through the oil filler. The engine will hold about 3.3 L (3.5 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 ⑥ . If the level is below mark "F", add oil to that level.

NECESSARY AMOUNT OF ENGINE OIL

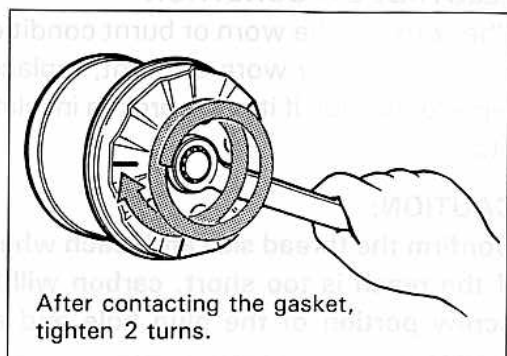
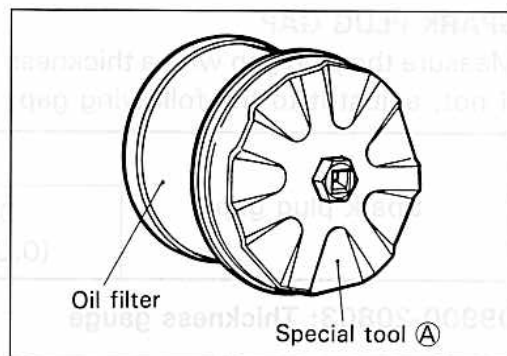
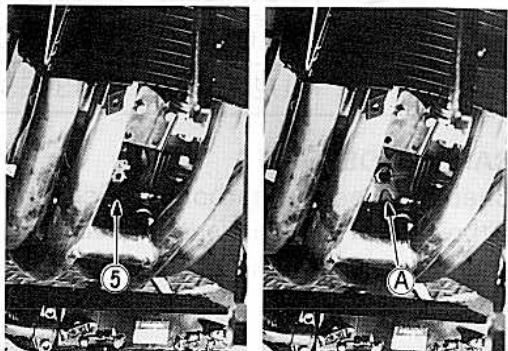
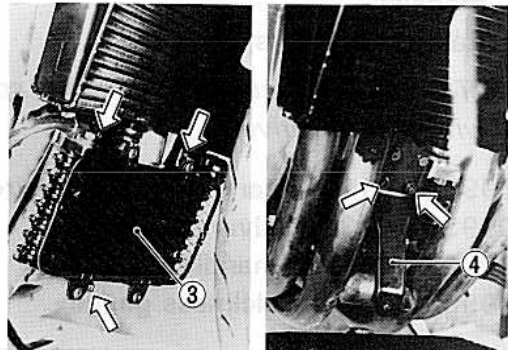
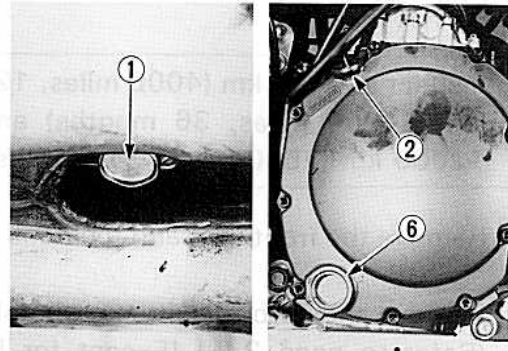
Oil change: 3.0 L (3.2/2.6 US/Imp qt)

Filter change: 3.3 L (3.5/2.9 US/Imp qt)

Overhaul engine: 3.9 L (4.1/3.4 US/Imp qt)

CAUTION:

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



FUEL LINE (EVAP HOSE ... California model only)

Inspect Every 6000 km (4000 miles, 12 months).
Replace Every 4 years.

FUEL COCK FILTER

Clean Every 12000 km (7500 miles, 24 months).

(Refer to page 4-2.)

CARBURETOR

IDLE RPM (Idling adjustment)

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

NOTE:

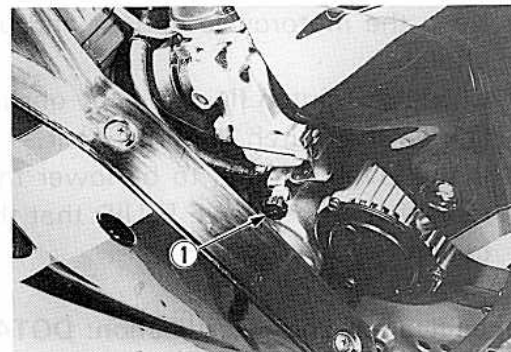
Make this adjustment when the engine is hot.

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

Engine idle speed:

1100 ± 100 r/min

1200 ± 50 r/min Only for Calif. model



THROTTLE CABLE PLAY

Pulling cable play ①

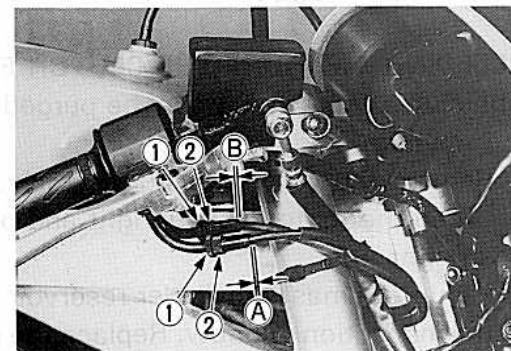
There should be 0.5—1.0 mm (0.02—0.04 in) play ① in the throttle cable. Adjust the throttle cable play with the following procedures.

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

Returning cable play ②

- Adjust the returning cable to the specified play in the same manner as the pulling cable play adjustment.

Throttle cable play (① and ②): 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

(CLUTCH FLUID)

Inspect Every 12000 km (7500 miles, 24 months).
Replace fluid Every 2 years.

(CLUTCH HOSE)

Inspect Every 6000 km (4000 miles, 12 months).
Replace hose Every 4 years.

CLUTCH FLUID LEVEL

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

Specification and classification: DOT4

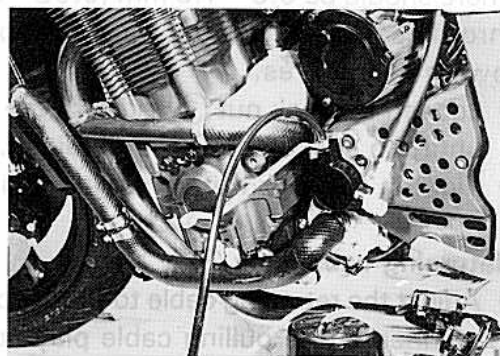
WARNING:

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 or 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 a long periods.

BLEEDING AIR FROM THE CLUTCH FLUID CIRCUIT

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

- Remove the lower cowling assembly. (Refer to page 7-4.)
- Keep the motorcycle upright and place the handlebars straight.
- 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 squeeze the lever, and open the valve. Repeat this process until the fluid flowing into the receptacle no longer contains air bubbles.



DRIVE CHAIN

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

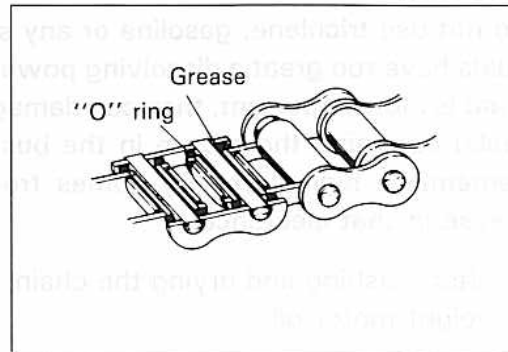
Visually check the drive chain for the possible defects listed below. (Support the motorcycle by a jack and a wooden block, turn the rear wheel slowly by hand with the transmission shifted to Neutral.)

- * 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.

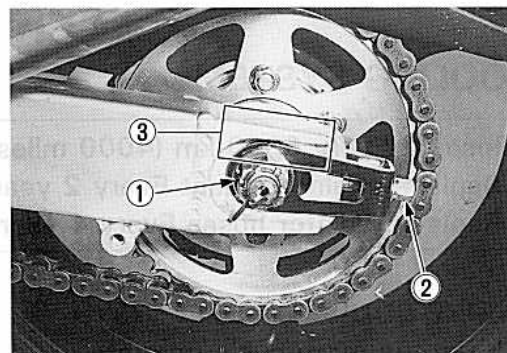
NOTE:

When replacing the drive chain, replace the drive chain and sprockets as a set.

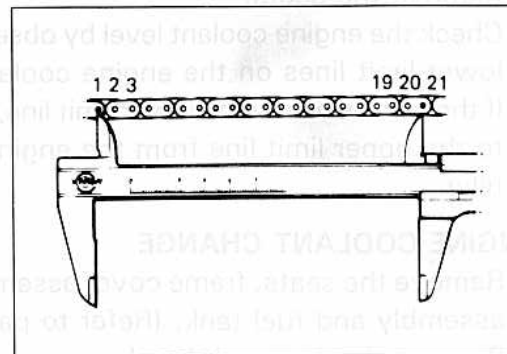


CHECKING

- Remove the axle cotter pin. (For E-03,28 and 33 models)
- Loosen the axle nut ① .
- Tense the drive chain fully by turning both chain adjusters ② .
- Count out 21 pins (20 pitches) on the chain and measure the distance between the two points. If the distance exceeds the service limit, the chain must be replaced.



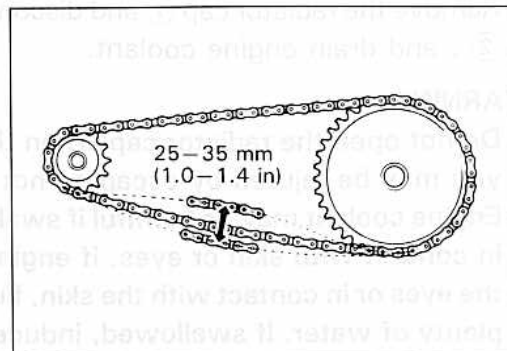
Drive chain 20-pitch length	Service Limit
	319.4 mm (12.6 in)



ADJUSTING

- Loosen or tighten both chain adjusters ② until the chain has 25–35 mm (1.0–1.4 in) of slack in 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 the motorcycle on its side-stand for accurate adjustment.
- After adjusting the drive chain, tighten the axle nut ① securely.
- Tighten both chain adjusters ② securely.

Rear axle nut: 87–117 N·m
(8.7–11.7 kg·m, 63.0–84.5 lb·ft)



CLEANING AND LUBRICATING

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

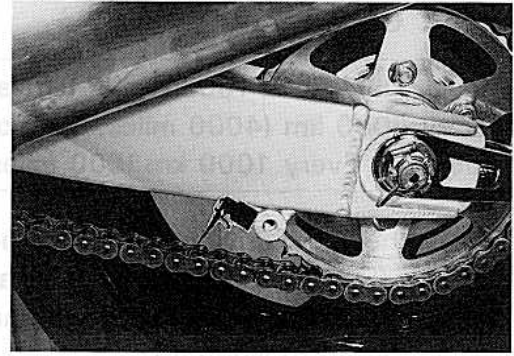
CAUTION:

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, they 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).
- * The standard drive chain TAKASAGO RK532GSV2. SUZUKI recommends that this standard drive chain should be used for the replacement.

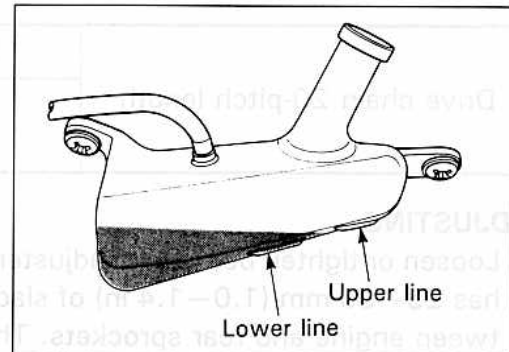
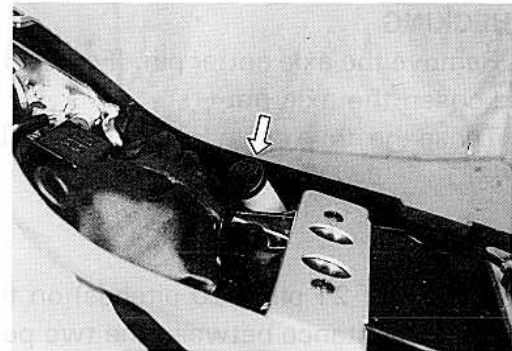


COOLING SYSTEM

Inspect Every 6000 km (4000 miles, 12 months).
 Replace engine coolant Every 2 years.
 Replace radiator hoses Every 4 years.

ENGINE COOLANT LEVEL

- Keep the motorcycle upright.
- Remove the seats.
- Check the engine coolant level by observing the upper and lower limit lines on the engine coolant reservoir.
- If the level is below the lower limit line, add engine coolant to the upper limit line from the engine coolant reservoir filler.

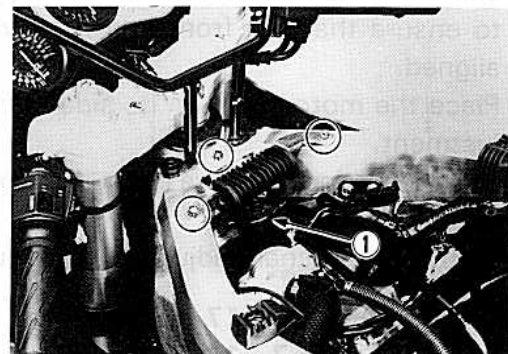


ENGINE COOLANT CHANGE

- Remove the seats, frame cover assembly, lower cowl assembly and fuel tank. (Refer to pages 7-2, 3 and 4.)
- Remove the fuel tank bracket.
- Remove the radiator cap ① and disconnect the water hose ②, and drain engine coolant.

WARNING:

- * Do not open the radiator cap when the engine is hot, as you may be injured by escaping hot liquid or vapor.
- * Engine coolant may be harmful if swallowed or if it comes in contact with skin or eyes. If engine coolant gets into the eyes or in contact with the skin, flush thoroughly with plenty of water. If swallowed, induce vomiting and call physician immediately!



- Flush the radiator with fresh water if necessary.
- Connect the water hose ② securely.
- Pour the specified engine coolant up to the radiator inlet.

NOTE:

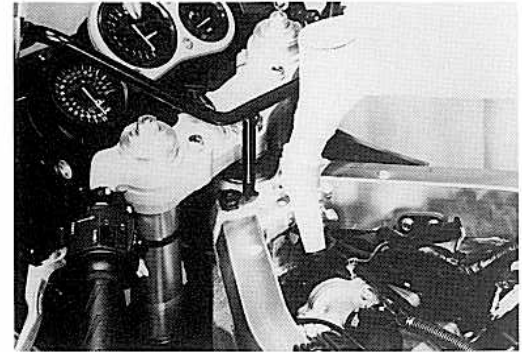
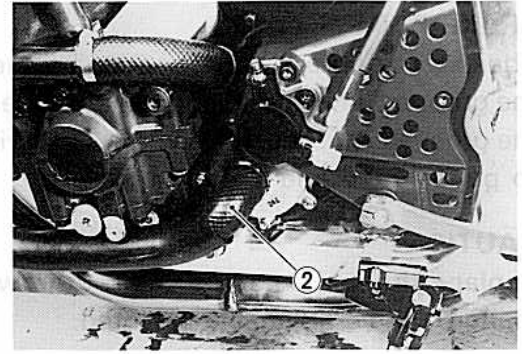
For engine coolant information, refer to page 5-4.

- Close the radiator cap ① securely.
- After warming up and cooling down the engine, add the specified engine coolant up to the engine coolant reservoir.

CAUTION:

Repeat above procedure several times and make sure that the radiator is filled with engine coolant up to the engine coolant reservoir.

Engine coolant capacity: 2450 ml (2.6/2.2 US/Imp qt)

**BRAKE****(BRAKE)**

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

(BRAKE HOSE AND BRAKE FLUID)

Inspect Every 6000 km (4000 miles, 12 months). Replace hoses Every 4 years. Replace fluid Every 2 years.

BRAKE FLUID LEVEL

- Keep the motorcycle upright and place the handlebars straight.
- Check the brake fluid level by observing the lower limit lines on the front and rear brake fluid reservoirs.
- When the level is below the lower limit line, replenish with brake fluid that meets the following specification.

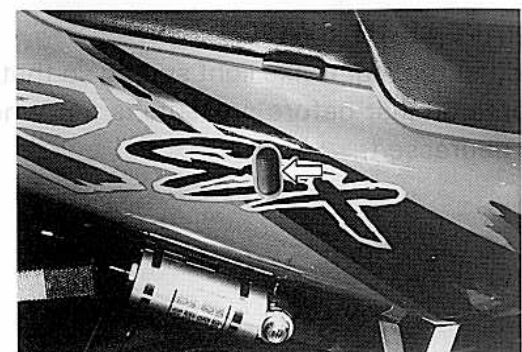
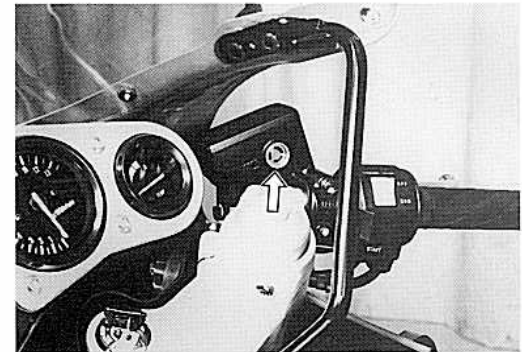
Specification and Classification: DOT4

WARNING:

The brake system of this motorcycle is filled with a glycol-based brake fluid. Do not use or mix different types of fluid such as silicone-based or 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 a long period.

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.

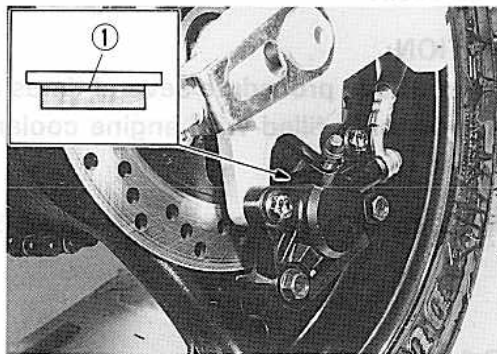
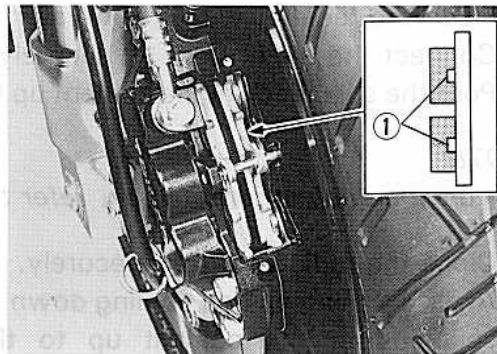


BRAKE PADS

The extent of brake pad wear can be checked by observing the grooved limit line ① on the pad. When the wear exceeds the grooved limit line, replace the pads with new ones. (Refer to pages 7-16 and 7-36.)

CAUTION:

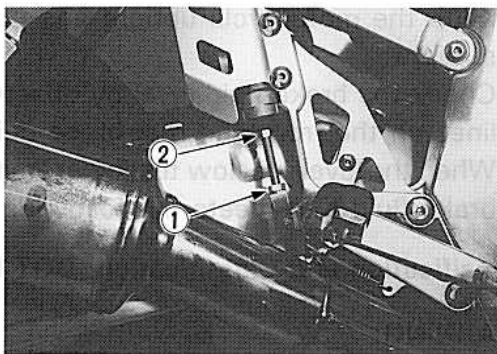
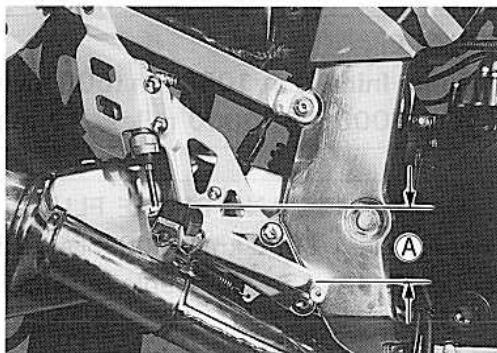
Replace the brake pad as a set, otherwise braking performance will be adversely affected.



BRAKE PEDAL HEIGHT

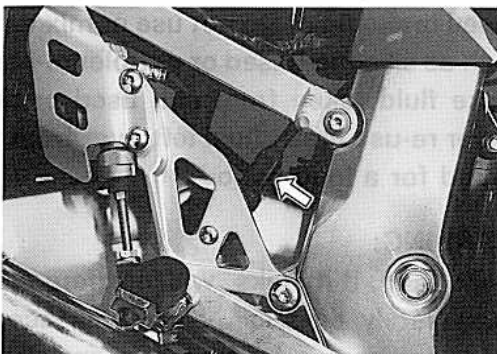
- Loosen the lock nut ① and rotate the push rod ② to locate brake pedal 65–75 mm (2.6–3.0 in) Ⓐ below the top face of the footrest.
- Retighten the lock nut ① to secure the push rod ② in the proper position.

Brake pedal height Ⓐ : 65–75 mm (2.6–3.0 in)



BRAKE LIGHT SWITCH

Adjust the rear brake light switch so that the brake light will come on just before pressure is felt when 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 re-mounting 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" line. Replace the reservoir cap to prevent entry of dirt.
- Attach a pipe to the caliper bleeder valve, and insert the free end of the pipe into a receptacle.

Bleeder valve

tightening torque: 6–9 N·m

(0.6–0.9 kg-m, 4.5–6.5 lb-ft)

- Front brake: Bleed the air from the air bleeder 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:

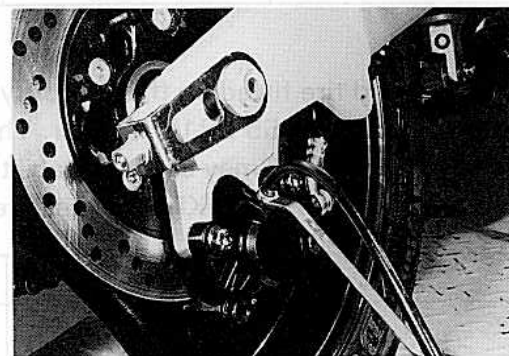
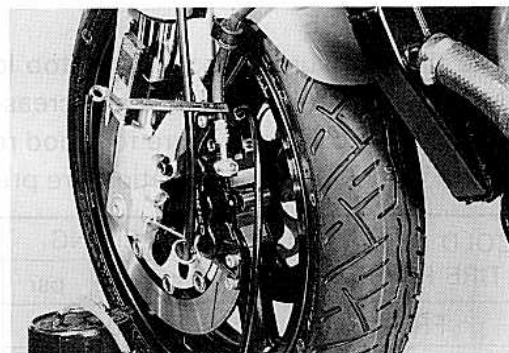
Replenish the brake fluid in the reservoir as necessary while bleeding the brake system. Make sure that there is always some fluid visible in the reservoir.

- Close the bleeder valve, and disconnect the pipe. Fill the reservoir to the "UPPER" line.

CAUTION:

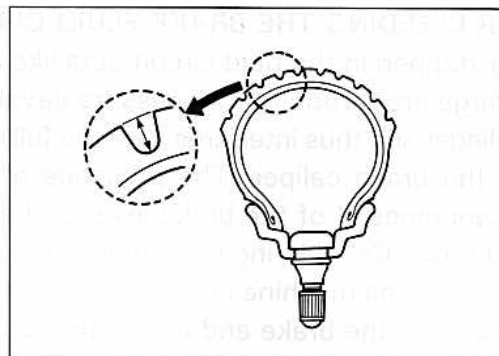
Handle brake fluid with care: the fluid reacts chemically with paint, plastics, rubber materials etc.

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



TIRE

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



TIRE TREAD CONDITION

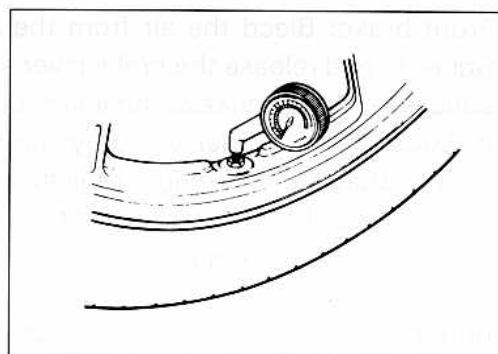
Operating the motorcycle with excessively worn tires will decrease riding stability and consequently invite a dangerous situation. It is highly recommended to replace a tire when the remaining depth of tire tread reaches the following specification.

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

TIRE PRESSURE

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

COLD INFLATION TIRE PRESSURE	SOLO RIDING			DUAL RIDING		
	kPa	kg/cm ²	psi	kPa	kg/cm ²	psi
FRONT	230	2.30	33	230	2.30	33
REAR	250	2.50	36	250	2.50	36



CAUTION:

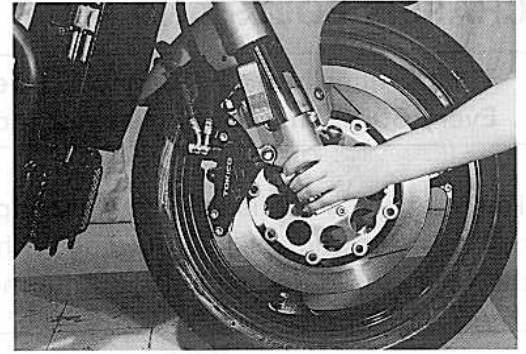
The standard tire fitted on this motorcycle is 120/70 ZR17 for front and 180/55 ZR17 for rear. The use of tires other than those specified may cause instability. It is highly recommended to use a SUZUKI Genuine Tire.

	GENERAL	U.S.A.
FRONT	120/70 ZR17 (MICHELIN A89X)	120/70 ZR17 (DONLOP D202FJ)
REAR	180/55 ZR17 (MICHELIN M89X)	180/55 ZR17 (DUNLOP D202G)

STEERING

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

Taper roller type bearings are used on the steering system for better handling. Steering should be adjusted properly for smooth turning of handlebars and safe running. Overtight steering prevents smooth turning of the handlebars and too loose steering will cause poor stability. Check that there is no play in the front fork assembly by supporting the machine so that the front wheel is off the ground, with the wheel straight ahead, grasp the lower fork tubes near the axle and pull forward. If play is found, perform steering bearing adjustment as described in page 7-34 of this manual.



FRONT FORK

Inspect Every 12000 km (7500 miles, 24 months).

Inspect the front forks for oil leakage, scoring or scratches on the outer surface of the inner tubes. Replace any defective parts, if necessary. (Refer to page 7-22.)

REAR SUSPENSION

Inspect Every 12000 km (7500 miles, 24 months).

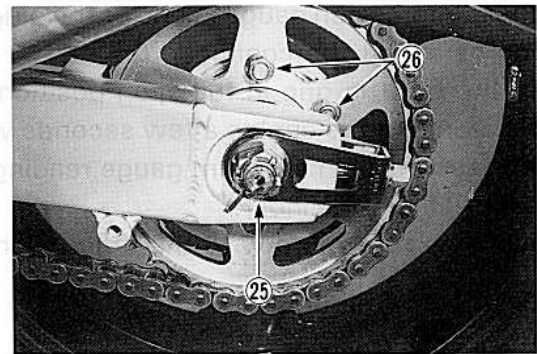
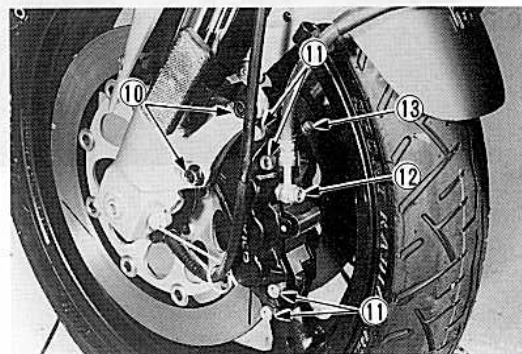
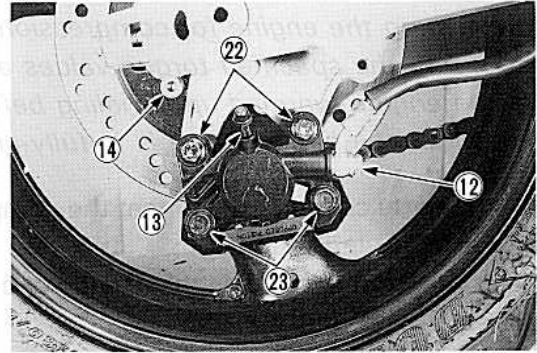
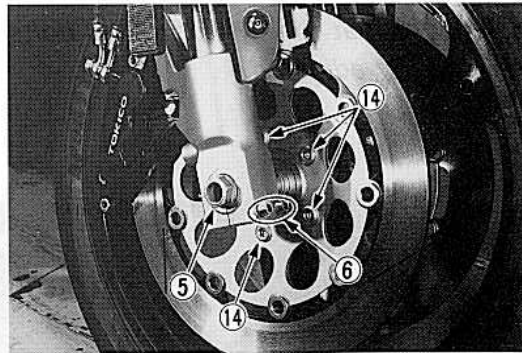
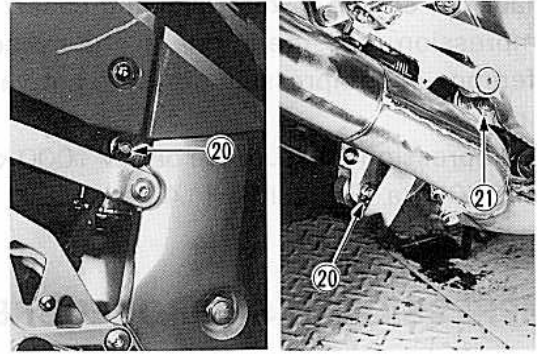
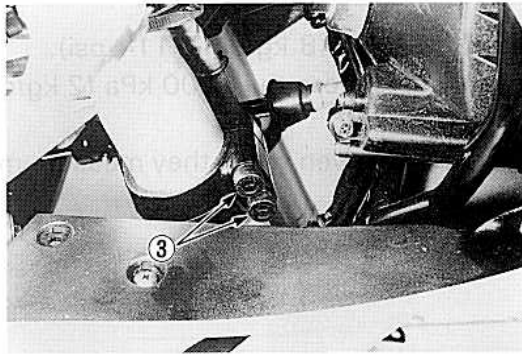
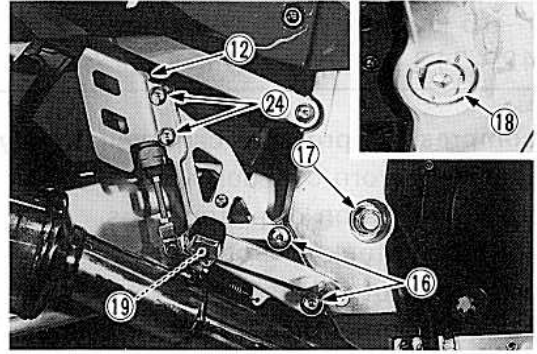
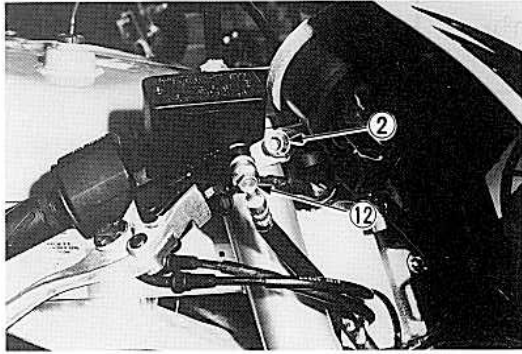
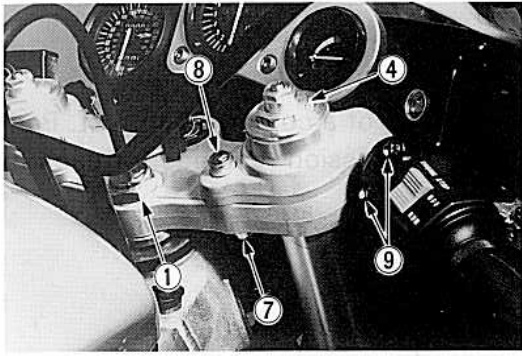
Inspect the rear shock absorber for oil leakage and check that there is no play in the swingarm assembly.

CHASSIS BOLTS AND NUTS

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

The nuts and bolts listed below are important safety related 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	51–81	5.1–8.1	37.0–58.5
② Front fork upper clamp bolt	21–30	2.1–3.0	15.0–21.5
③ Front fork lower clamp bolt	21–30	2.1–3.0	15.0–21.5
④ Front fork cap bolt	15–30	1.5–3.0	11.0–21.5
⑤ Front axle	87–117	8.7–11.7	63.0–84.5
⑥ Front axle pinch bolt	19–28	1.9–2.8	13.5–20.0
⑦ Handlebar mounting nut	23–35	2.3–3.5	16.5–25.5
⑧ Handlebar mounting bolt	41–61	4.1–6.1	29.5–44.0
⑨ Front brake master cylinder mounting bolt	8–12	0.8–1.2	6.0–8.5
⑩ Front brake caliper mounting bolt	31–48	3.1–4.8	22.5–34.5
⑪ Front brake caliper housing bolt	20–25	2.0–2.5	14.5–18.0
⑫ Brake hose union bolt (Cylinder & Caliper)	16–20	1.6–2.0	11.5–14.5
⑬ Air bleeder valve (Front & Rear)	6–9	0.6–0.9	4.5–6.5
⑭ Front and rear disc bolt	18–28	1.8–2.8	13.0–20.0
⑮ Clutch master cylinder mounting bolt	8–12	0.8–1.2	6.0–8.5
⑯ Front footrest bracket mounting bolt	19–28	1.9–2.8	13.5–20.0
⑰ Swingarm pivot nut	87–117	8.7–11.7	63.0–84.5
⑱ Swingarm pivot adjuster lock nut	60–70	6.0–7.0	43.5–50.5
⑲ Front footrest nut	35–55	3.5–5.5	25.5–40.0
⑳ Rear shock absorber mounting nut (Upper & Lower)	41–61	4.1–6.1	29.5–44.0
㉑ Rear cushion lever mounting nut	110–160	11.0–16.0	79.5–115.5
㉒ Rear brake caliper mounting bolt	21–31	2.1–3.1	15.0–22.5
㉓ Rear brake caliper housing bolt	30–36	3.0–3.6	21.5–26.0
㉔ Rear brake master cylinder mounting bolt	19–28	1.9–2.8	13.5–20.0
㉕ Rear axle nut	87–117	8.7–11.7	63.0–84.5
㉖ Rear sprocket nut	48–72	4.8–7.2	35.0–52.0



COMPRESSION PRESSURE CHECK

The compression of a cylinder is a good indicator of its internal condition.

The decision to overhaul the cylinder 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 PRESSURE SPECIFICATION

Standard	Limit	Difference
1000–1500 kPa (10–15 kg/cm ²) (142–213 psi)	800 kPa (8 kg/cm ²) (114 psi)	200 kPa (2 kg/cm ²) (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 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) even when they measure more than 800 kPa (8 kg/cm², 114 psi)

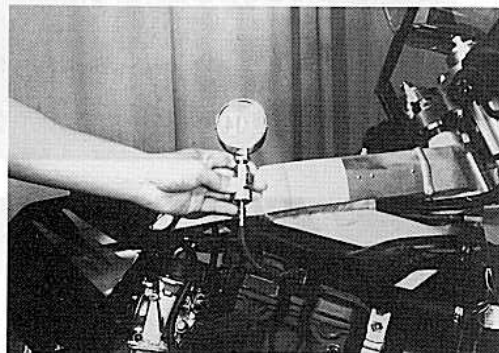
COMPRESSION TEST PROCEDURE

NOTE:

- * *Before testing the engine for compression pressure, make sure that the cylinder head bolts are tightened to the specified torque values and valves are properly adjusted.*
- * *Have the engine warmed up by idling before testing.*
- * *Be sure that the battery used is in fully-charged condition.*

Remove the parts concerned and test the compression pressure in the following manner.

- Remove the front seat, fuel tank and lower cowling. (Refer to pages 7-2, 3 and 4.)
- Remove all the spark plugs.
- Fit the compression gauge in one of the plug holes, while taking care that the connection tight.
- Keep the throttle grip in full-open position.
- While cranking 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

09915-63310: Adaptor

OIL PRESSURE CHECK

Check periodically the oil pressure in the engine to judge roughly the condition of the moving parts.

OIL PRESSURE SPECIFICATION

<p>Above 300 kPa (3.0 kg/cm², 43 psi) Below 600 kPa (6.0 kg/cm², 85 psi)</p>	<p>at 3000 r/min., Oil temp. at 60°C (140°F)</p>
---	--

If the oil pressure is lower or higher than the specification, the following causes may be considered.

LOW OIL PRESSURE

- * Clogged oil filter
- * Oil leakage from the oil passage way
- * Damaged O-ring
- * Defective oil pump
- * Combination of above items

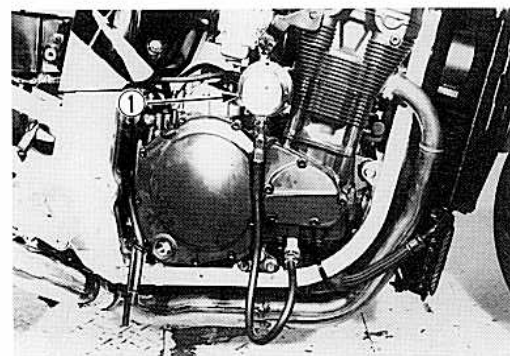
HIGH OIL PRESSURE

- * Used a engine oil which is too heavy a weight
- * Clogged oil passage way
- * Combination of above items

OIL PRESSURE TEST PROCEDURE

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.

- Remove the lower cowling.
- Remove the main oil gallery plug.
- Install the oil pressure gauge ① with adaptor in the position shown in the figure.
- Warm up the engine as follows:
 Summer 10 min. at 2000 r/min.
 Winter 20 min. at 2000 r/min.
- After warming up, increase the engine speed to 3000 r/min. (with the engine tachometer), and read the oil pressure gauge.



09915-74510: Oil pressure gauge

09915-74540: Adaptor

09915-77330: Meter (for high pressure)

OIL PRESSURE CHECK

Check periodically the oil pressure in the engine to avoid damage to the engine parts.

OIL PRESSURE SPECIFICATION

- Above 300 kPa (3.0 kg/cm², 43 psi)
- Below 600 kPa (6.0 kg/cm², 85 psi)

If the oil pressure is lower or higher than the specified value, the following causes may be caused.

LOW OIL PRESSURE

- Clogged oil filter
- Oil leakage from the oil passage way
- Damaged O-ring
- Defective oil pump
- Combination of above items

HIGH OIL PRESSURE

- Used engine oil which is too heavy or thick
- Clogged oil passage way
- Excessive oil level above the normal



- Remove the main oil gallery plug.
- Remove the lower rowling.
- Install the oil pressure gauge with adaptor in the main oil gallery in the following manner.
- Warm up the engine as follows:
 - Warm 20 min. at 2000 rpm.
 - Warm 10 min. at 3000 rpm.
- After warming up, increase the engine speed to 2000 rpm. (with the engine tachometer), and read the pressure gauge.

0091E-24810: Oil pressure gauge

0091E-24810: Adapter

0091E-24810: Oil pressure gauge

ENGINE

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

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TRANSMISSION	3-44
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ENGINE REASSEMBLY	3-50

ENGINE RIGHT SIDE
 Clutch cover 3-12 and 57
 Signal generator 3-15 and 58
 Clutch pressure drive and driven plates 3-16 and 58
 Clutch sleeve hub 3-16 and 58
 Oil pump driven gear 3-17 and 58
 Generator/pump drive gears 3-17 and 58
 Primary driven gear 3-17 and 58
 Gearshift shaft 3-18 and 58
 Gearshift cam shifter 3-18 and 58

ENGINE LEFT SIDE
 Crankst level 3- 8
 Engine sprocket cover 3- 8
 Water pump 3-19
 Engine sprocket and drive chain 3- 8
 Neutral indicator switch body 3-18

ENGINE COMPONENTS REMOVABLE WITH ENGINE IN PLACE

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

ENGINE CENTER

	See page
Radiator	3- 5
Exhaust pipe/muffler	3- 5
Oil pressure switch	3-54
Oil hose	3-12
Oil filter	3-11
Oil cooler	3-5
Oil pan	3-18 and 54
Engine oil pressure regulator	3-53
Oil sump filter	3-19
Carburetors	3- 3
Cam chain tensioner	3-12 and 66
Cylinder head cover	3-11 and 68
Cylinder head breather cover	3-11
Camshafts	3-12 and 63
Cylinder head	3-13 and 62
Cylinder	3-13 and 62
Water pipe (Front side)	3-11 and 68
Water pipe (Rear side)	3-11 and 68
Pistons	3-14 and 61
Starter motor	3-14 and 60
Generator	3-14 and 60
Starter clutch cover	3-14 and 59
Starter idle gear	3-15 and 59
Starter clutch	3-15, 48 and 59

ENGINE LEFT SIDE

	See page
Gearshift lever	3- 6
Engine sprocket cover	3- 6
Water pump	3-18
Engine sprocket and drive chain	3- 6
Neutral indicator switch body	3-18

ENGINE RIGHT SIDE

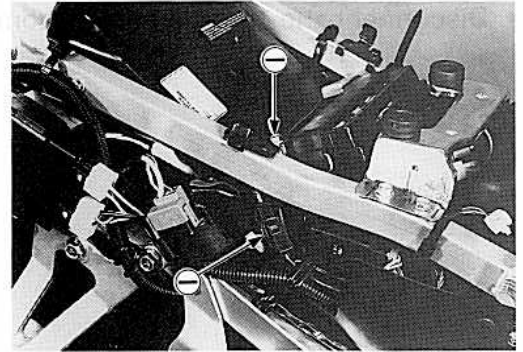
	See page
Clutch cover	3-15 and 57
Signal generator	3-15 and 58
Clutch pressure, drive and driven plates	3-16 and 56
Clutch sleeve hub	3-16 and 56
Oil pump driven gear	3-17 and 55
Generator/oil pump drive gears	3-17 and 56
Primary driven gear	3-17 and 56
Gearshift shaft	3-18 and 55
Gearshift cam shifter	3-18 and 54

ENGINE REMOVAL AND REINSTALLATION

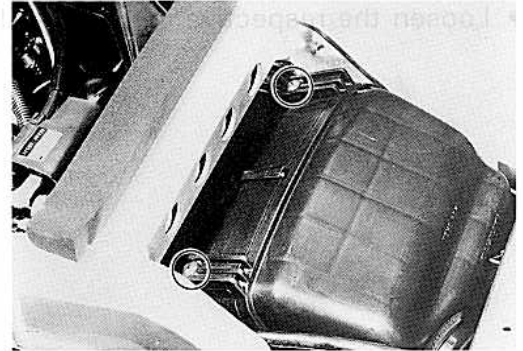
ENGINE REMOVAL

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

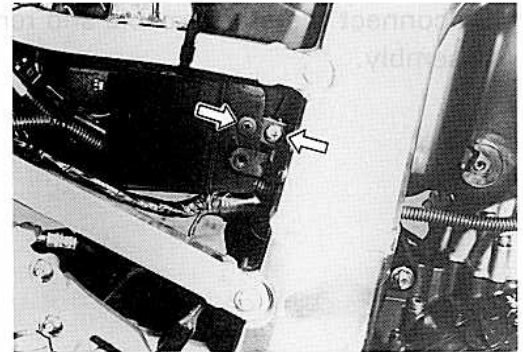
- Remove the oil drain plug to drain out engine oil.
- Remove the front and rear seats.
- Remove the frame cover assembly. (See page 7-2.)
- Remove the fuel tank. (See page 7-3.)
- Remove the center frame covers, left and right.
- Remove the lower cowling assembly. (See page 7-4.)
- Disconnect the battery ⊖ lead wire and battery ⊖ (Black/White) lead wire.



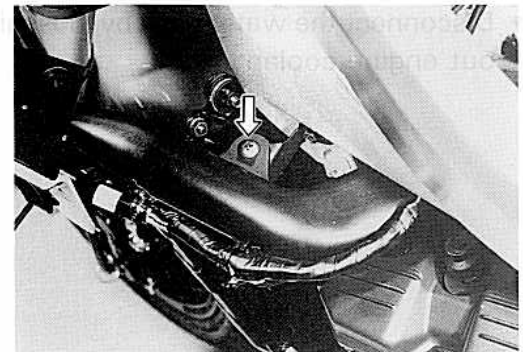
- Remove the air cleaner cover by removing the screws.



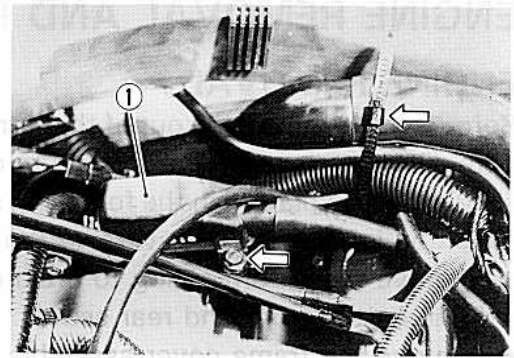
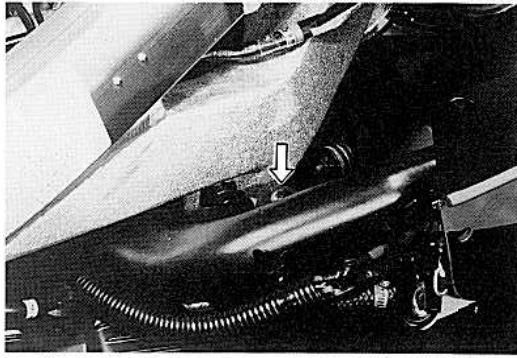
- Remove the air cleaner case mounting screws, left and right.



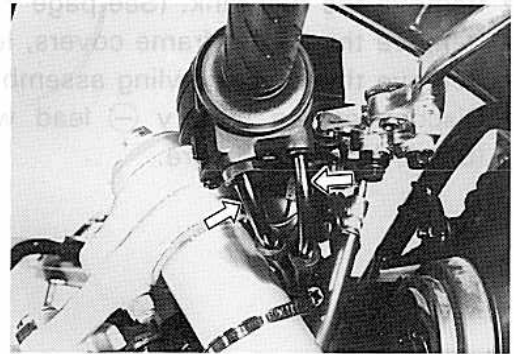
- Remove the left and right air duct hoses by removing the mounting screws and clamp.
- Remove the carb. diaphragm chamber air cleaner ① by removing the mounting bolt. (Not applicable in U.S.A., SWITZERLAND and AUSTRIA models.)



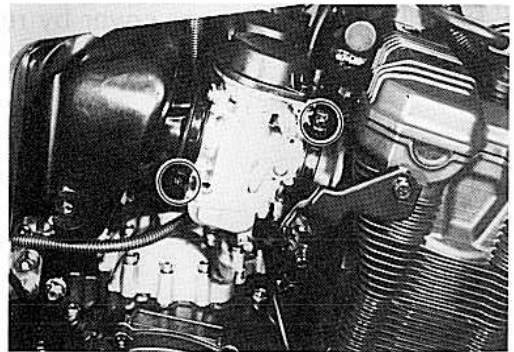
-continued-



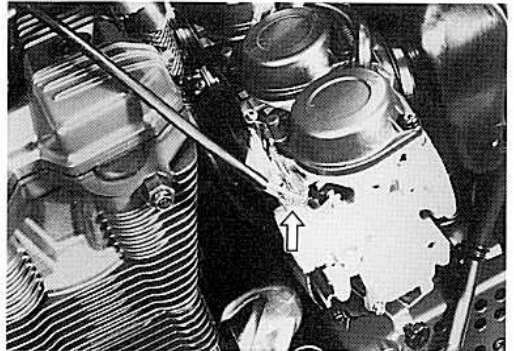
- Disconnect the throttle cables from the throttle grip.



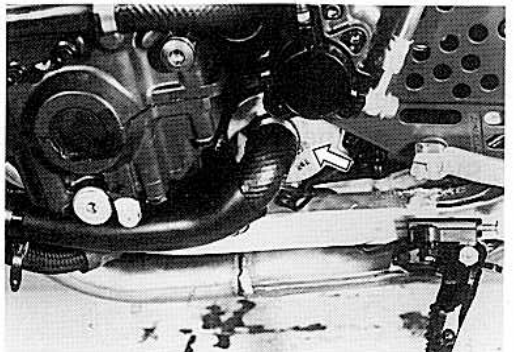
- Loosen the respective carburetor clamp screws.



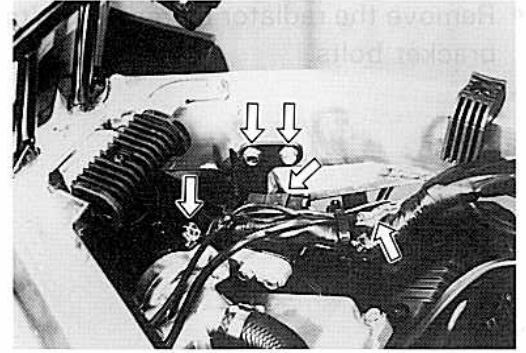
- Disconnect the starter cable and remove the carburetor assembly.



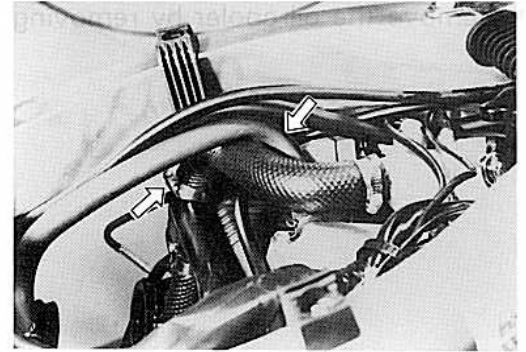
- Disconnect the water hose by loosening its clamp to drain out engine coolant.



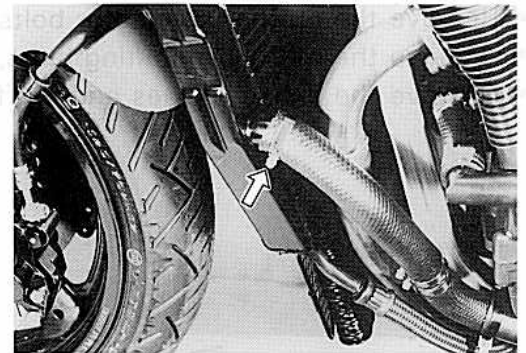
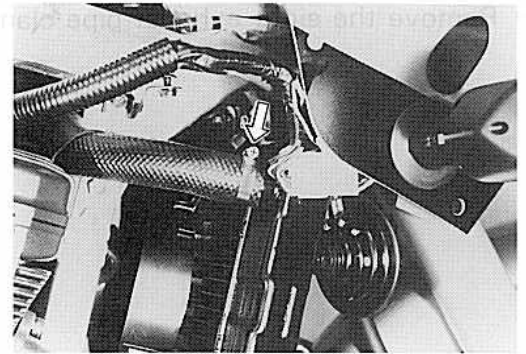
- Remove the thermostat case bracket mounting bolts.
- Disconnect the engine coolant temperature gauge lead wire, cooling fan switch lead wire coupler and ground wire.



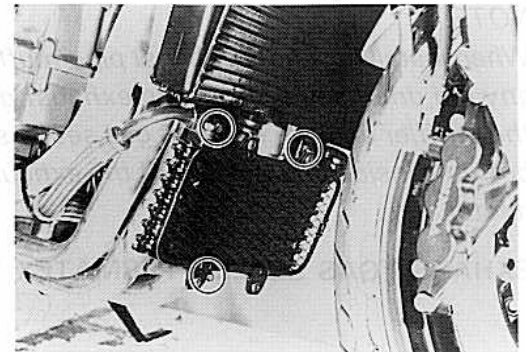
- Disconnect the breather hose.
- Disconnect the water hose by loosening its clamp.



- Disconnect the water hoses by loosening their clamps.
- Remove the thermostat case along with the water hoses.

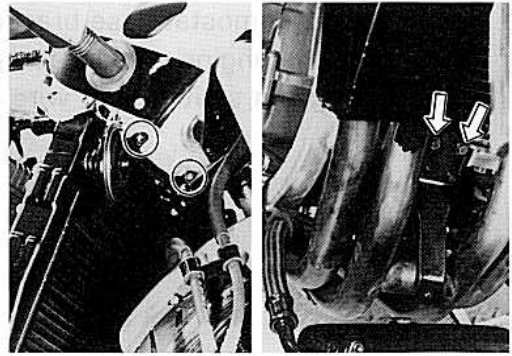


- Remove the oil cooler by removing its mounting bolts.

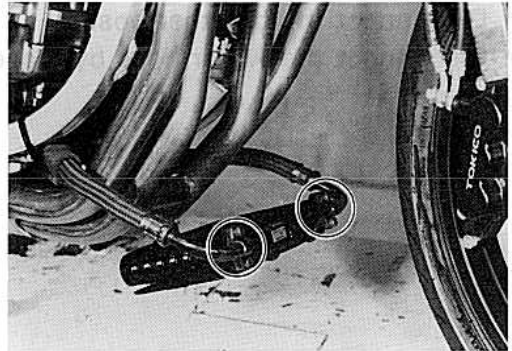


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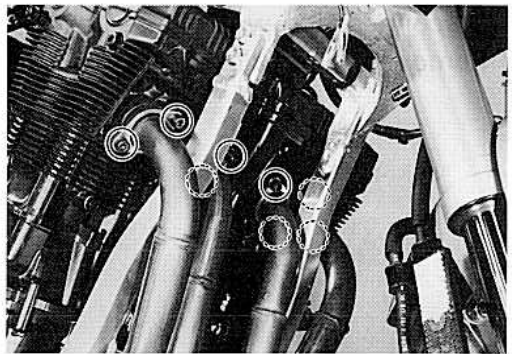
- Remove the radiator by removing its mounting bolts and bracket bolts.



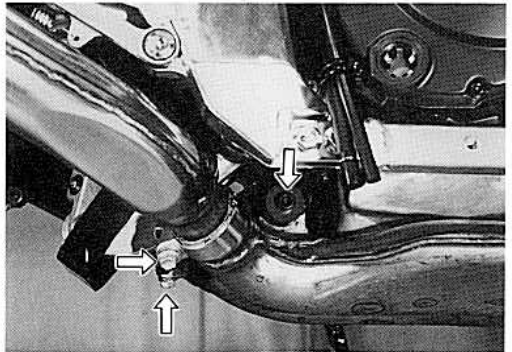
- Remove the oil cooler by removing its hose bolts.



- Remove the eight exhaust pipe clamp bolts.



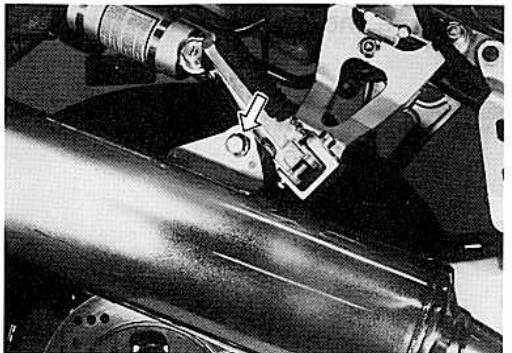
- Remove the muffler connector bolts, left and right.
- Remove the muffler mounting bolts, left and right.
- Remove the exhaust pipes and mufflers.



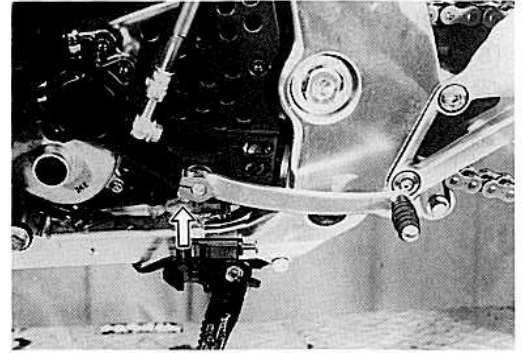
NOTE:

When installing a new exhaust pipe/muffler connector, clean any old dried sealer from the exhaust pipe and from inside the muffler and the exhaust gas sealer should be applied to both the inside and outside of the exhaust pipe/muffler connector.

EXHAUST GAS SEALER: PERMATEX 1372



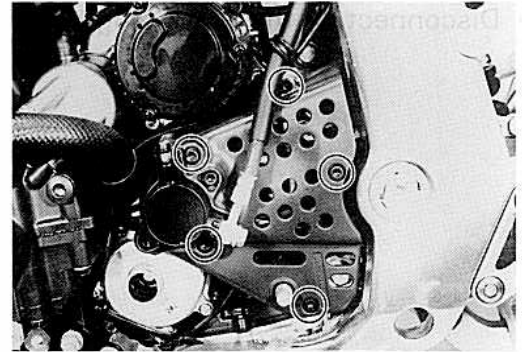
- Remove the gearshift lever by removing its mounting bolt.



- Remove the engine sprocket cover by removing the bolts.

CAUTION:

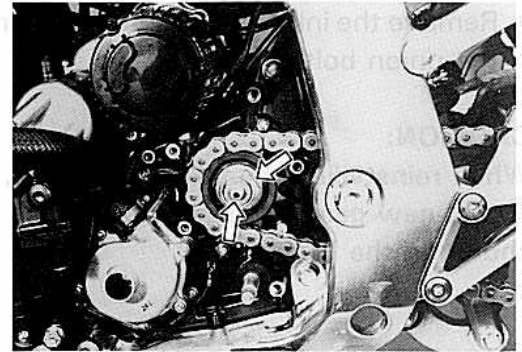
Do not operate the clutch lever to prevent clutch piston re-tainer damage.



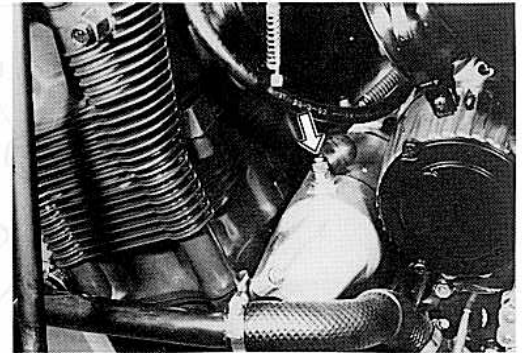
- Remove the engine sprocket bolt and nut while depressing the rear brake pedal.

NOTE:

If it is difficult to remove the engine sprocket, loosen the axle nut and chain adjusting nuts to provide additional chain slack.

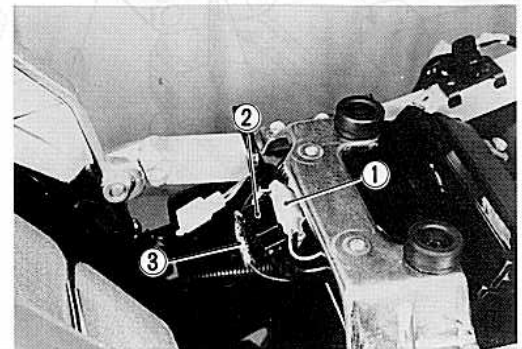


- Disconnect the starter motor lead wire.

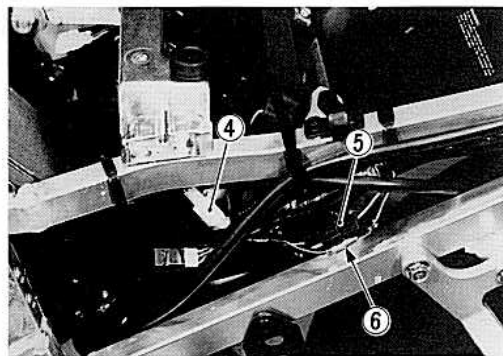


- Disconnect the various lead wires.

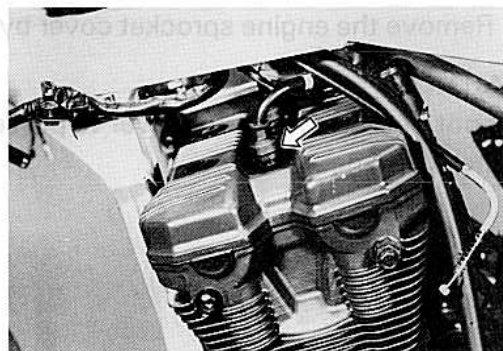
- ① Signal generator
- ② Generator
- ③ Oil pressure switch (Located oil pan)



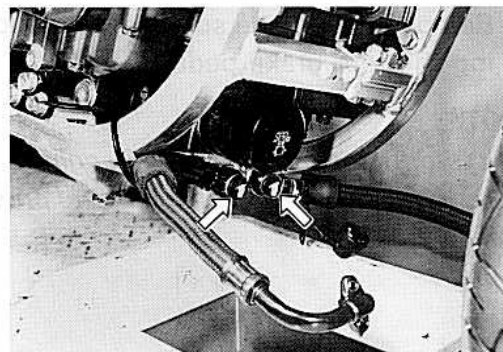
- ④ Neutral switch
- ⑤ Side-stand switch
- ⑥ Side-stand switch ground



- Disconnect all the spark plug caps.

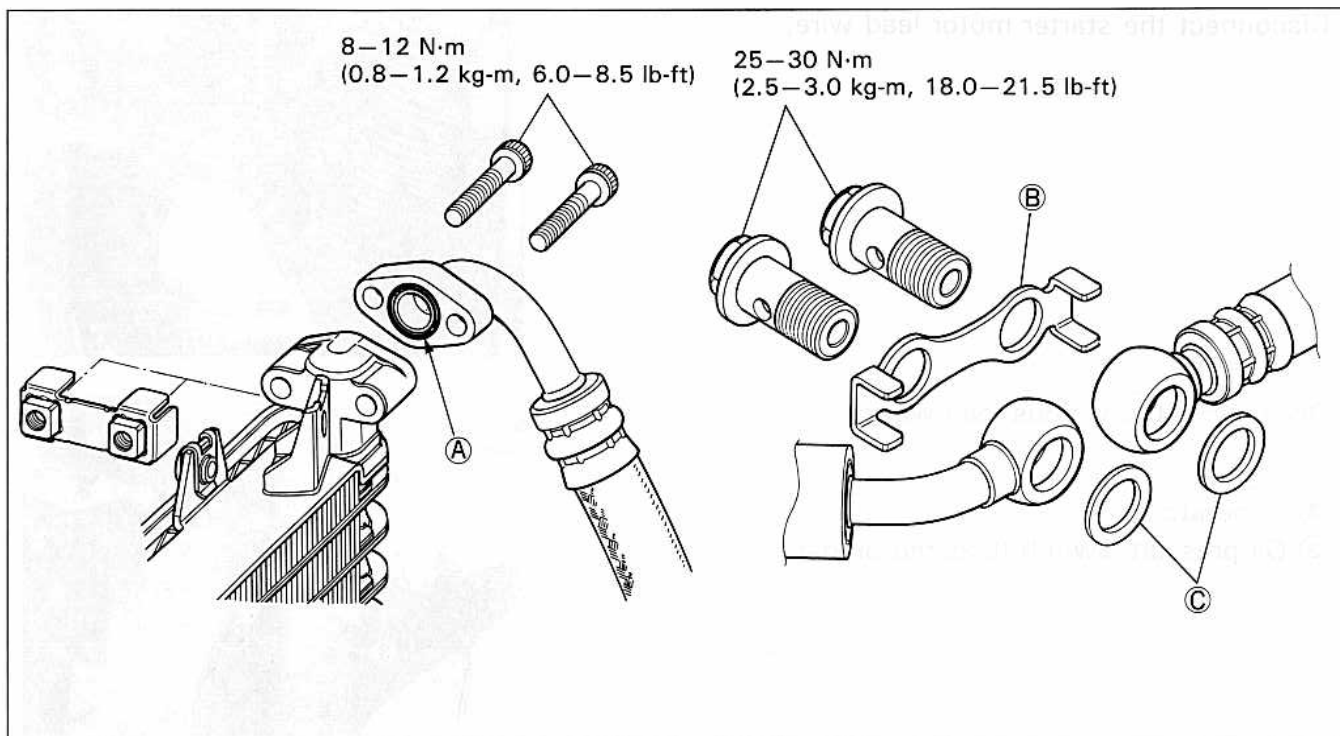


- Remove the inlet and outlet oil cooler hoses by removing the union bolts.



CAUTION:

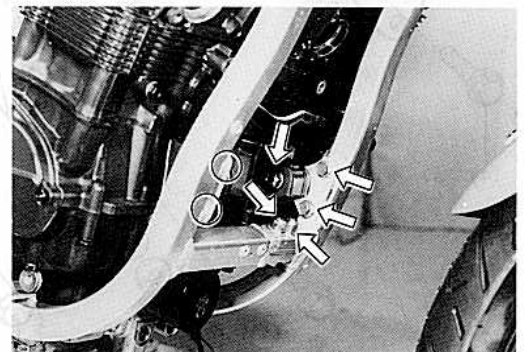
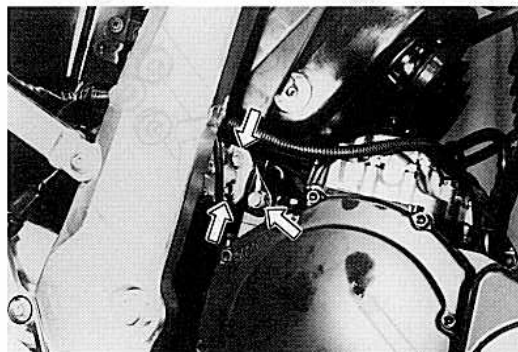
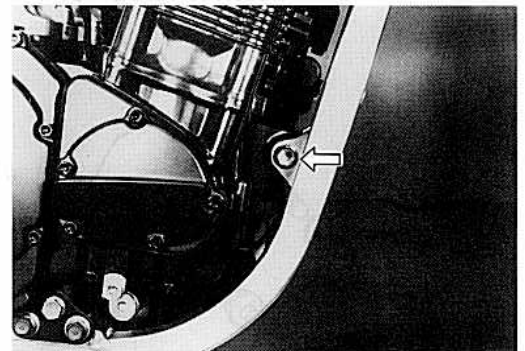
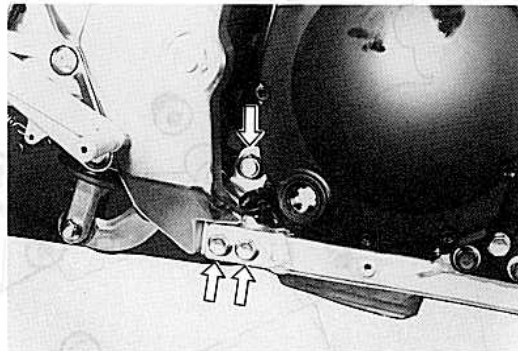
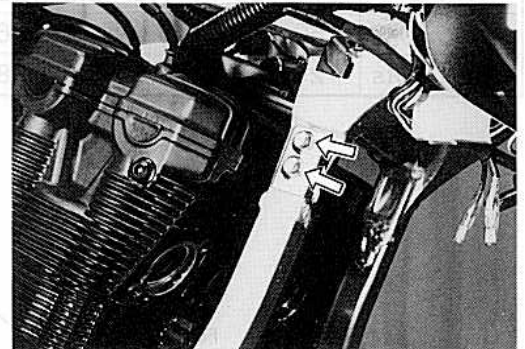
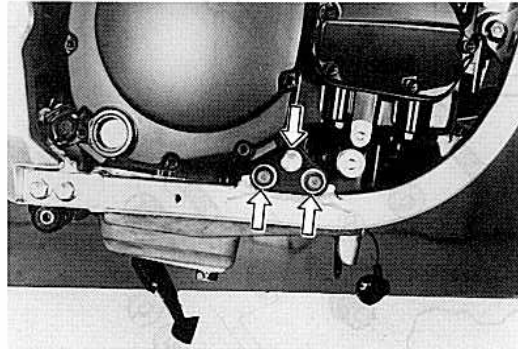
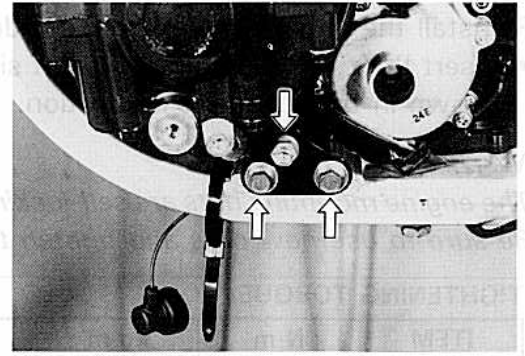
When reinstalling the oil cooler hoses, fit the new o-rings **A** and new gaskets, **B** and **C**, to the unions correctly as shown in the Figs.



- Support the engine with a proper engine jack.
- Remove the engine mounting bolts, nuts, spacer and brackets.
- Remove the frame down tube mounting bolts and nuts.
- Gradually lower the engine assembly on the right side making sure that it does not make contact with the frame.

NOTE:

If it is difficult to remove the engine, remove the cylinder head breather cover to provide additional clearance.



LENGTH	
155 mm (6.1 in)	Bolt (1)
150 mm (5.9 in)	Bolt (2)
85 mm (3.3 in)	Bolt (3)
55 mm (2.2 in)	Bolt (4)
13 mm (0.5 in)	Spacer RH (A)
39 mm (1.5 in)	Push (R & L) (B)

ENGINE REINSTALLATION

Reinstall the engine in the reverse order of engine removal.

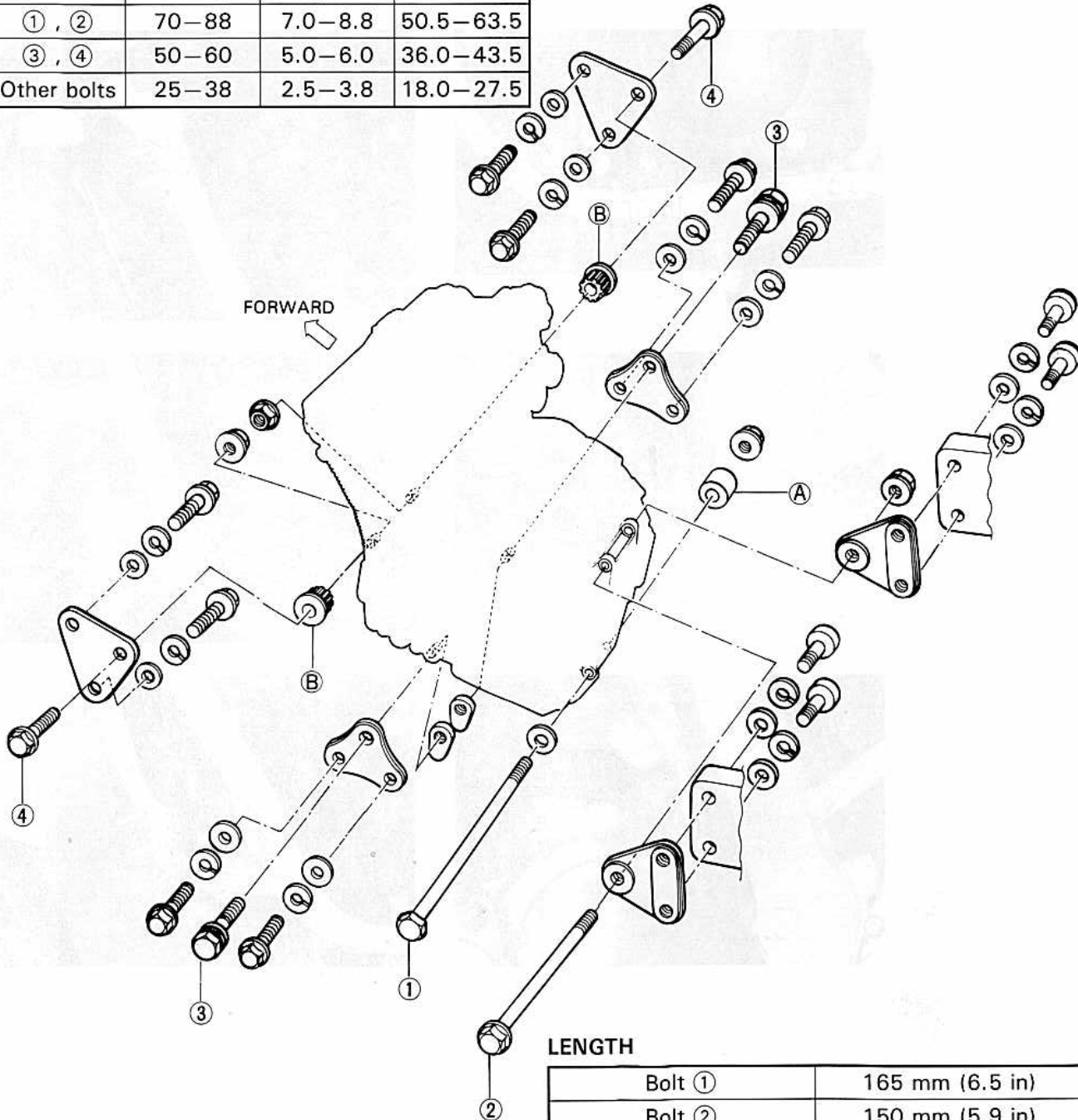
- Insert the two long bolts from left side. Install the brackets, spacer, bolts and nuts properly, as shown in the following illustration.

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.

TIGHTENING TORQUE

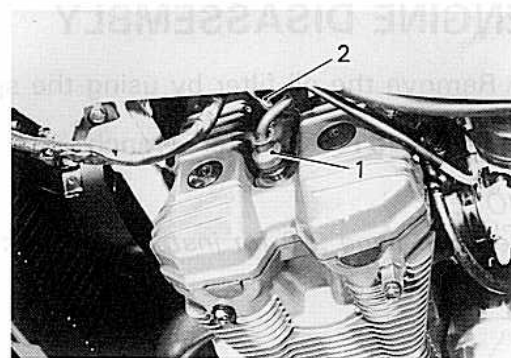
ITEM	N·m	kg-m	lb-ft
① , ②	70–88	7.0–8.8	50.5–63.5
③ , ④	50–60	5.0–6.0	36.0–43.5
Other bolts	25–38	2.5–3.8	18.0–27.5



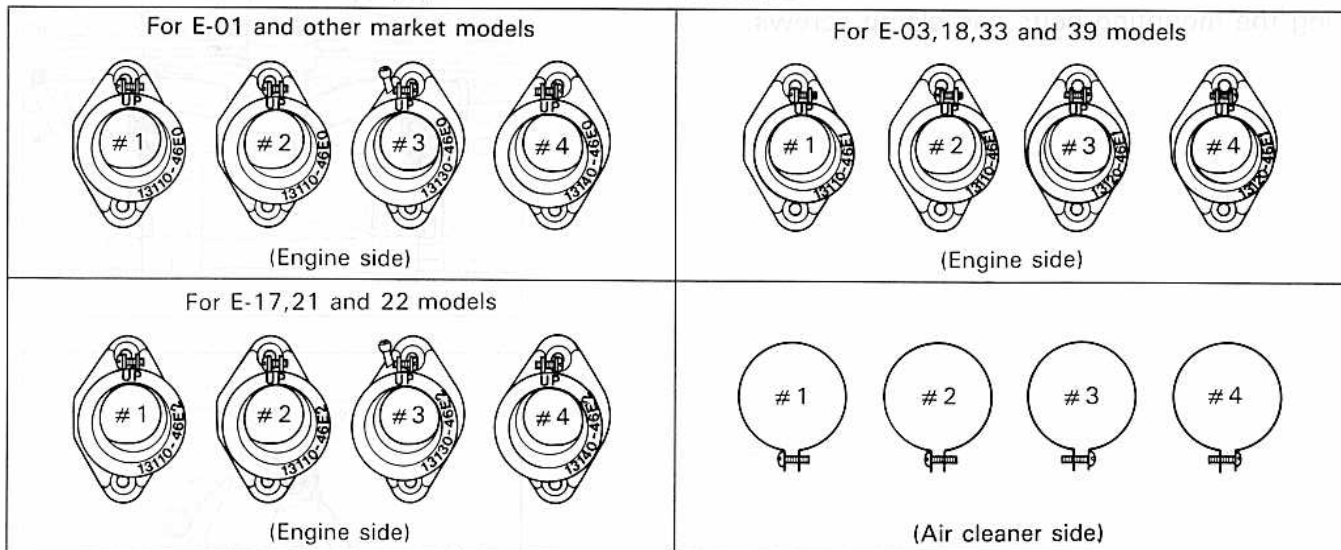
LENGTH

Bolt ①	165 mm (6.5 in)
Bolt ②	150 mm (5.9 in)
Bolt ③	55 mm (2.2 in)
Bolt ④	55 mm (2.2 in)
Spacer RH ①	13 mm (0.5 in)
Bush (R & L) ②	39 mm (1.5 in)

- 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 hand.



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

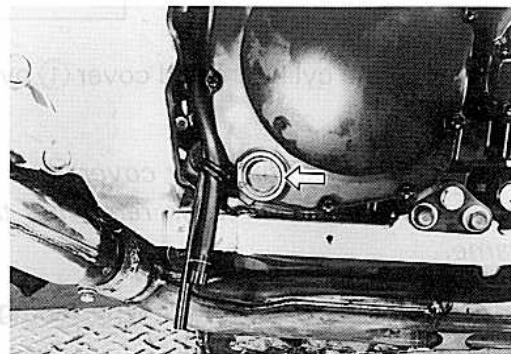


- After remounting the engine, route wiring harnesses, cables and hoses properly by referring to the sections, for wire routing, cable routing and hose routing. (See pages 8-15 through 38.)
- Adjust the following items to the specification.

	Page
* Filling engine coolant	2-13
* Throttle cable play	2-10
* Idling adjustment	4-17
* Balancing carburetors	4-16
* Drive chain	2-12

- Pour 3.9 L (4.1/3.4 US/Imp qt) of engine oil SAE 10W/40 graded SE or SF into the engine after overhauling engine.
- Start up the engine and allow it run for several minutes at idle speed. About several minutes after stopping engine, check that the oil level remains between the marks of oil level inspection window.

Change	3000 ml (3.2/2.6 US/Imp qt)
Filter change	3300 ml (3.5/2.9 US/Imp qt)
Overhaul	3900 ml (4.1/3.4 US/Imp qt)



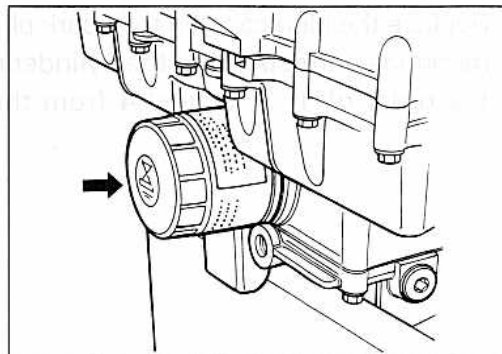
ENGINE DISASSEMBLY

- Remove the oil filter by using the special tool.

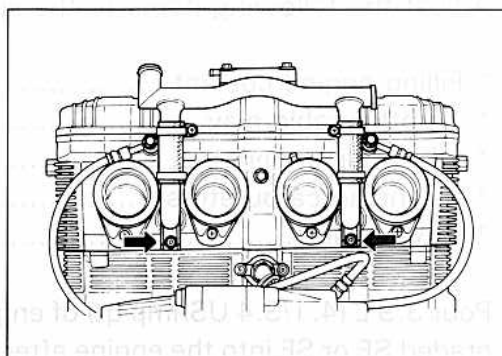
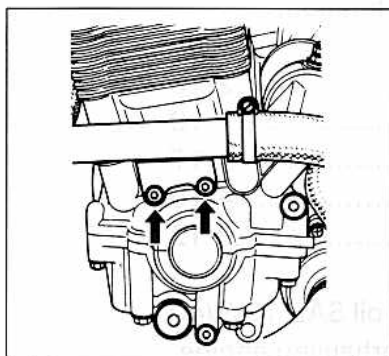
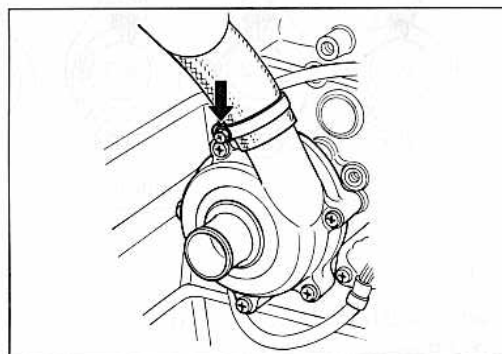
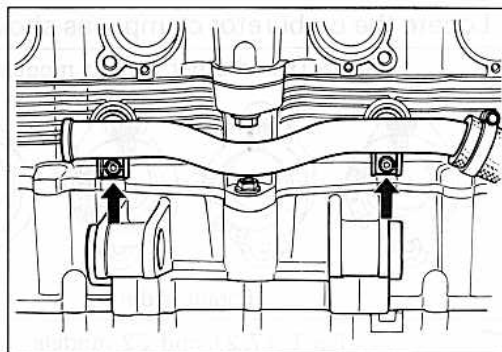
09915-40610: Oil filter wrench

NOTE:

Refer to page 2-9 for installation procedures.



- Remove the inlet and outlet water pipes/hoses by removing the mounting bolts and clamp screws.

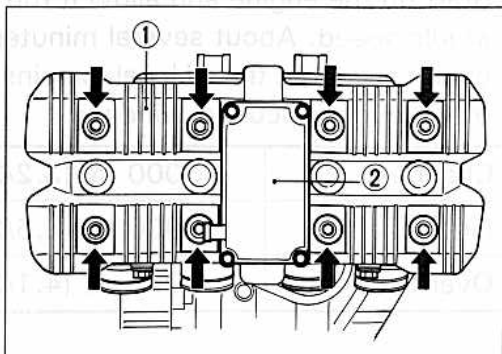


- Remove the cylinder head cover ① by removing the bolts.

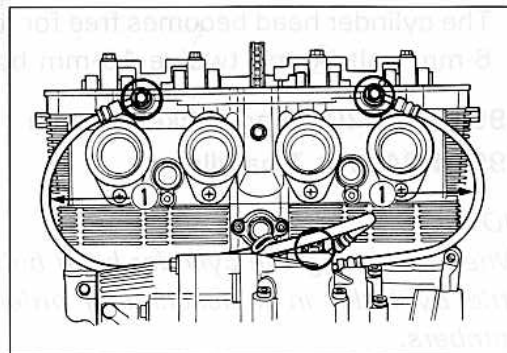
NOTE:

The cylinder head breather cover ② is to be removed only when replacing it or when removing the engine from the frame.

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

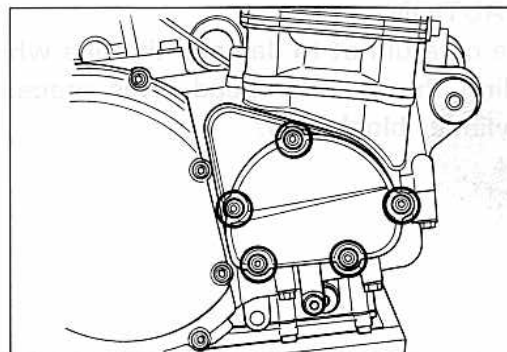


- Remove the left and right oil hoses ① by removing the union bolts.

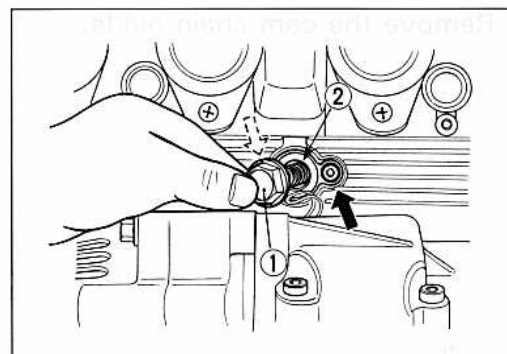


- Remove the signal generator cover by removing the bolts.

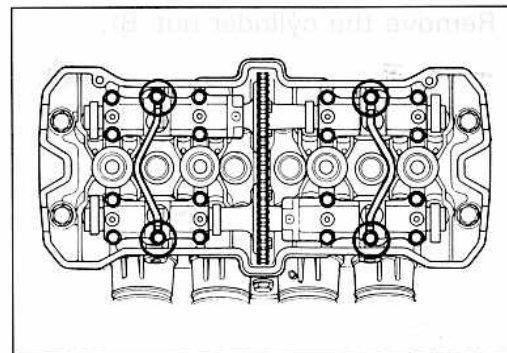
09911-73730: 5 mm "T" type hexagon wrench



- After removing the spring holder bolt ① and spring ②, remove the cam chain tensioner by removing the mounting bolts.



- Remove the left and right oil pipes by removing the bolts.

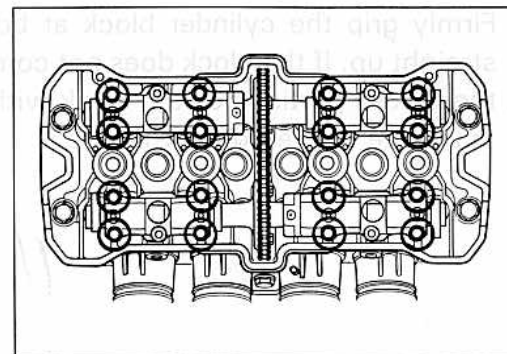


- Remove the four camshaft journal holders by removing the bolts.

NOTE:

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

- Remove the two camshafts, intake and exhaust.



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

09911-74520: Long socket 12 mm

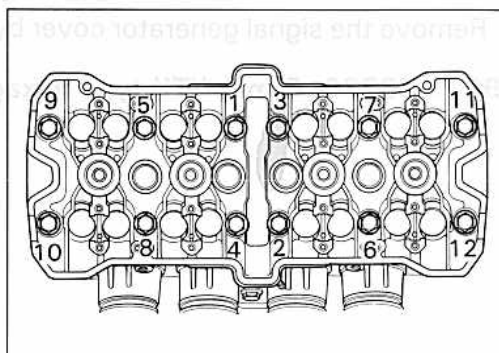
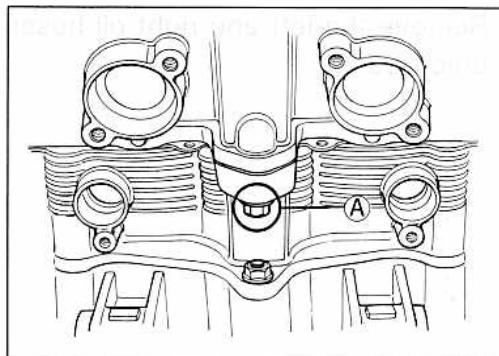
09914-24510: T-handle

NOTE:

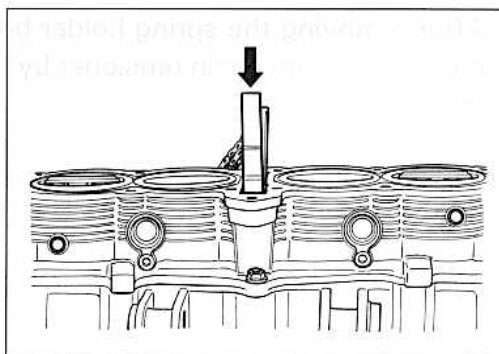
When loosening the cylinder head bolts, loosen each bolt little by little, in a descending order, according to the numbers.

CAUTION:

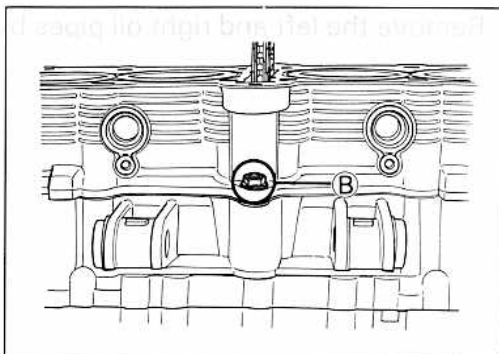
Be careful not to damage the fins when removing or handling the cylinder head. This precaution applies to the cylinder block also.



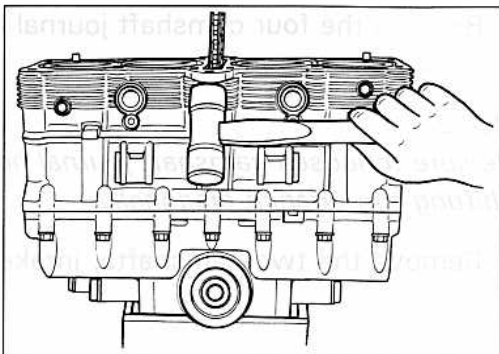
- Remove the cam chain guide.



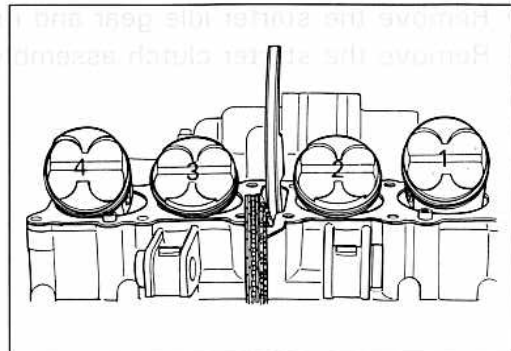
- Remove the cylinder nut **(B)**.



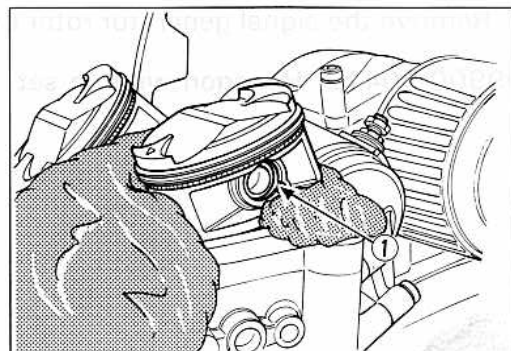
- Firmly grip the cylinder block at both ends, and lift it straight up. If the block does not come off, lightly tap on the finless portions of the block with a plastic mallet to make the gasketed joint loose.



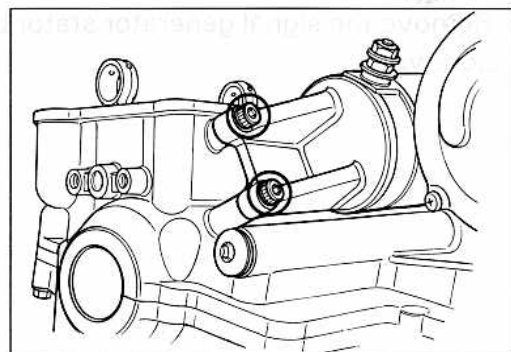
- Scribe the cylinder number on the head of the respective pistons.



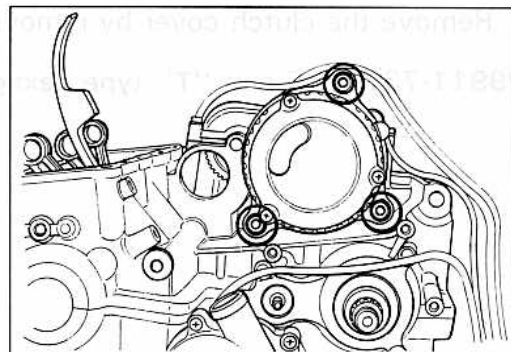
- Place a cloth beneath the piston so as not to drop any parts in the crankcase, and remove the circlip ① with long-nose pliers.
- Draw out the piston pin. Place each piston pin in the same piston as that it was removed from.



- Remove the starter motor by removing the bolts.

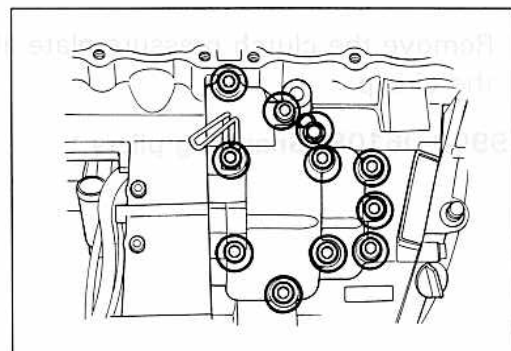


- Remove the generator by removing the bolts.

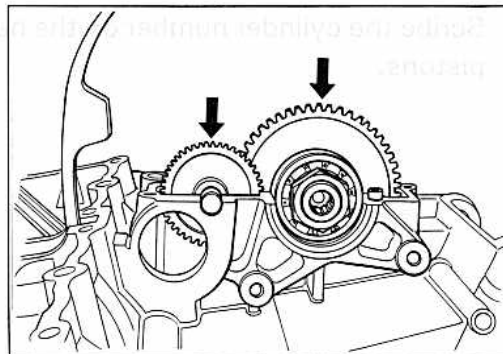


- Remove the starter clutch cover by removing the bolts.

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

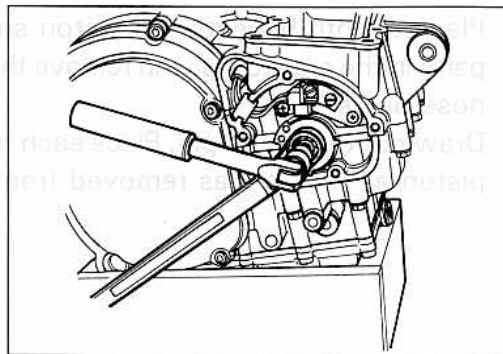


- Remove the starter idle gear and its shaft.
- Remove the starter clutch assembly.

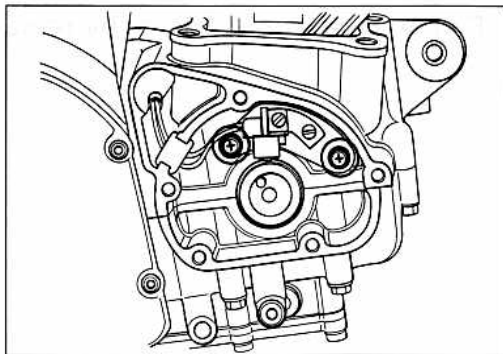


- Remove the signal generator rotor by removing the bolt.

09900-00410: Hexagon wrench set

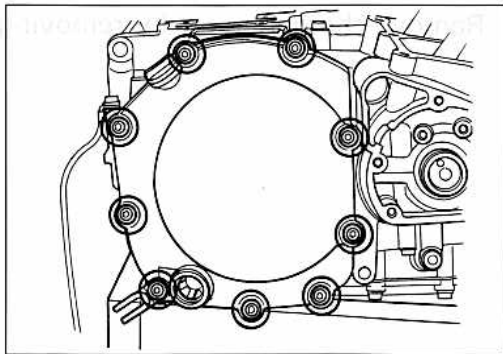


- Remove the signal generator stator by removing the two screws.



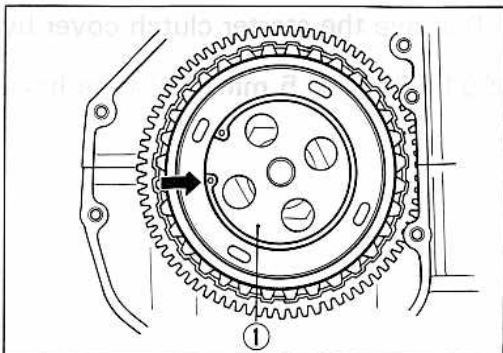
- Remove the clutch cover by removing the bolts.

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



- Remove the clutch pressure plate lifter ① by removing the circlip.

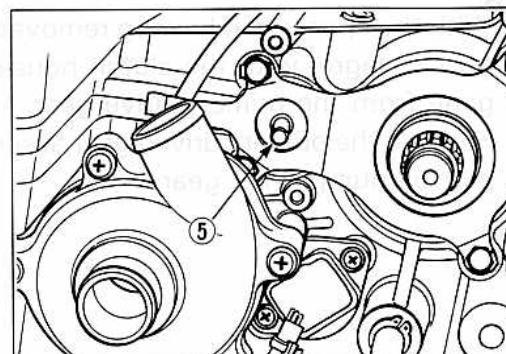
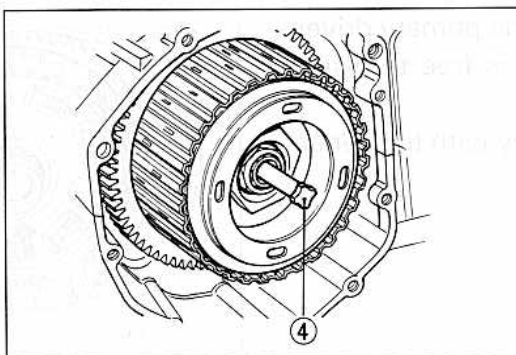
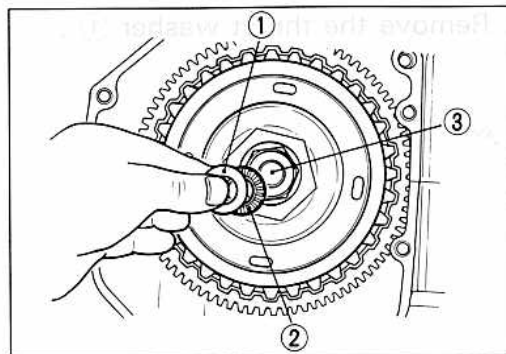
09900-06108: Snap ring pliers



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

NOTE:

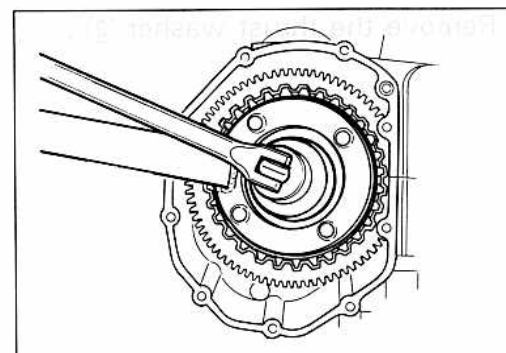
If it is difficult to draw out the push rod ④, use a magnetic hand or wire.



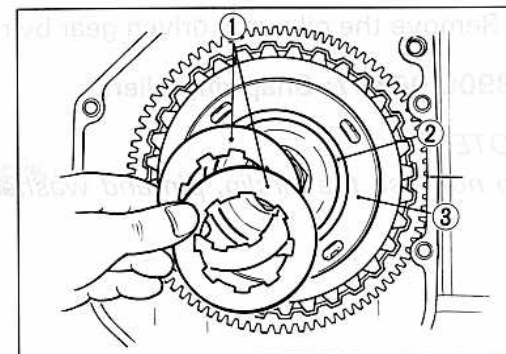
- Remove the clutch diaphragm spring holder nut with the special tools.

09920-34820: Clutch pressure plate holder

09941-58010: 50 mm socket wrench

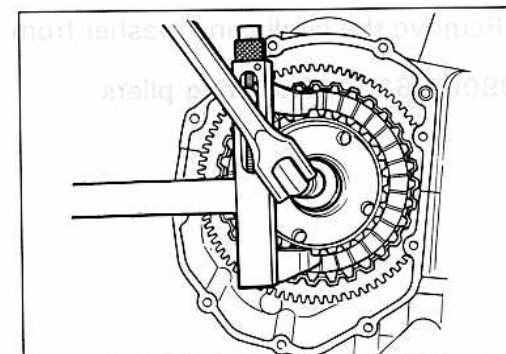


- After removing the clutch diaphragm spring holder nut, remove the clutch diaphragm springs ①, clutch diaphragm spring seat ② and clutch pressure plate ③.

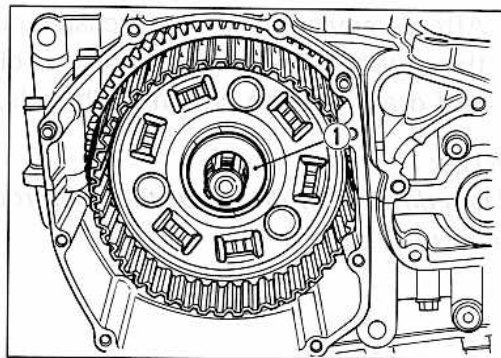


- After removing the several clutch plates, remove the clutch sleeve hub nut after firmly locking the clutch sleeve hub with a clutch sleeve hub holder, and then remove the remainder of clutch drive and driven plates along with the clutch sleeve hub.

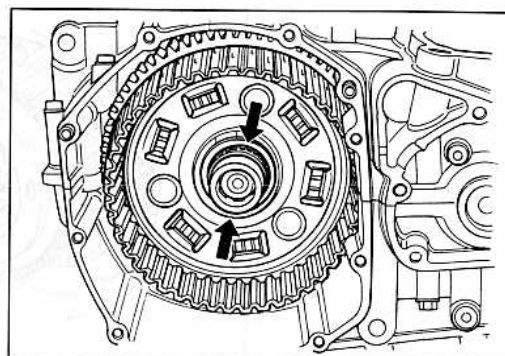
09920-53740: Clutch sleeve hub holder



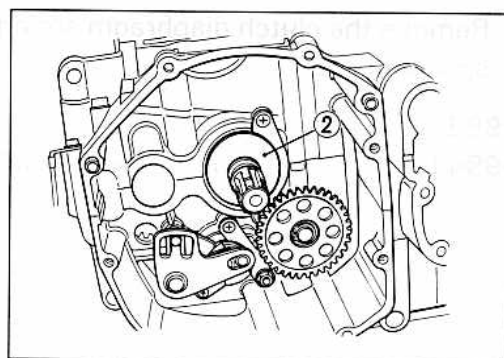
- Remove the thrust washer ① .



- With the spacer and bearing 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 .

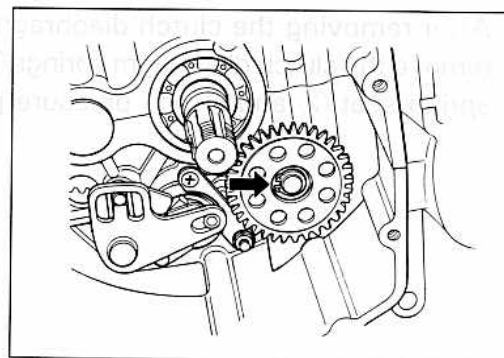


- Remove the oil pump driven gear by removing the circlip.

09900-06107: Snap ring pliers

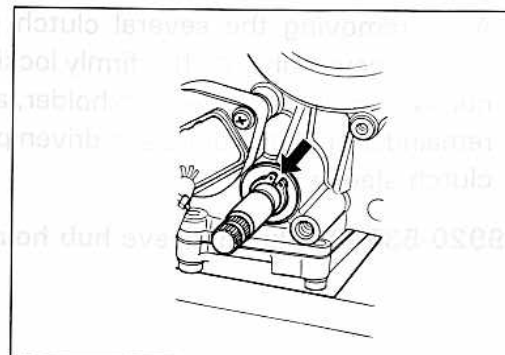
NOTE:

Do not lose the circlip, pin and washers.



- Remove the circlip and washer from the gearshift shaft.

09900-06107: Snap ring pliers

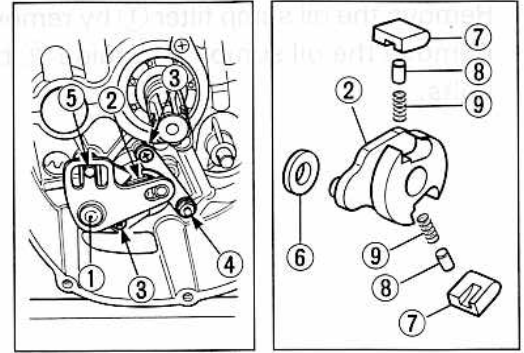


- Draw out the gearshift shaft/gearshift arm ① , and then remove the cam shifter ② by removing the screws ③ , nut ④ and arm stopper bolt ⑤ .

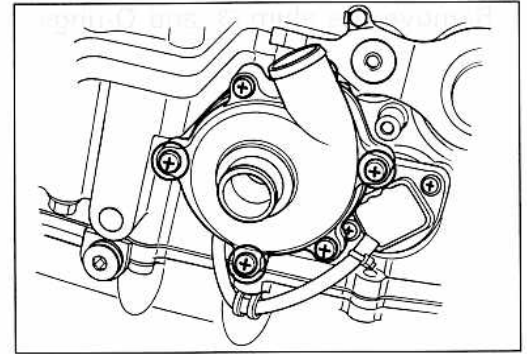
09900-09003: Impact driver set

NOTE:

When removing the cam shifter ② , do not lose the gear shifting roller ⑥ , pawl ⑦ , pin ⑧ and spring ⑨ .



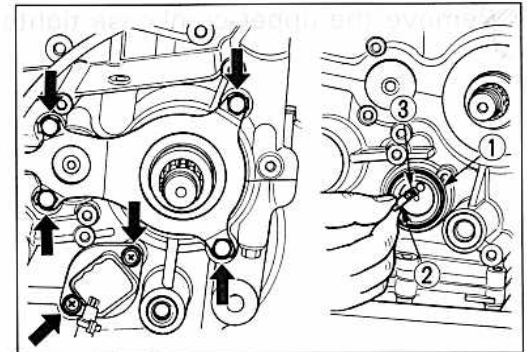
- Remove the water pump by removing the mounting screws.



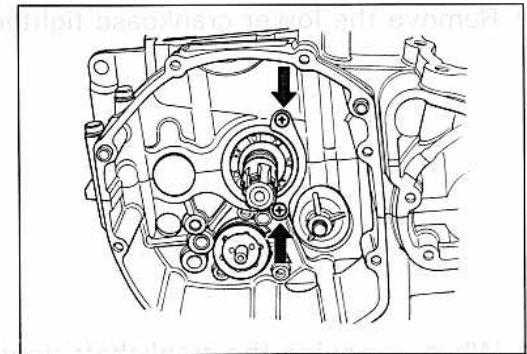
- Flatten the lock portions of the oil seal retainer and remove it by removing the four bolts.
- Remove the neutral position indicator switch by removing the screws.

NOTE:

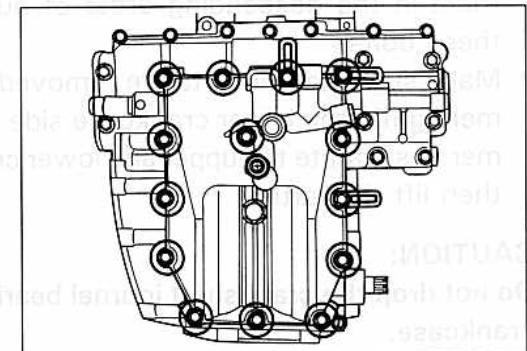
Do not lose the O-ring ① , switch contact ② and its spring ③ .



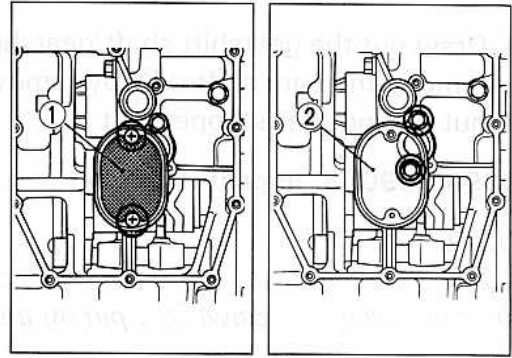
- Remove the countershaft bearing retainer by removing the two screws.



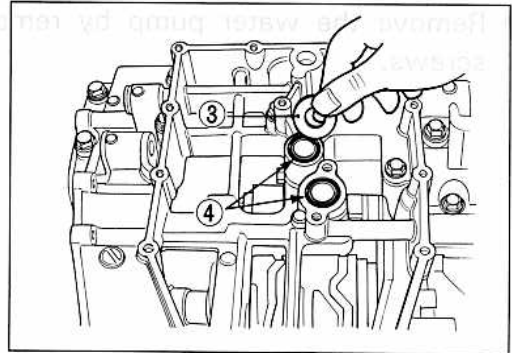
- Remove the oil pan by removing the bolts.



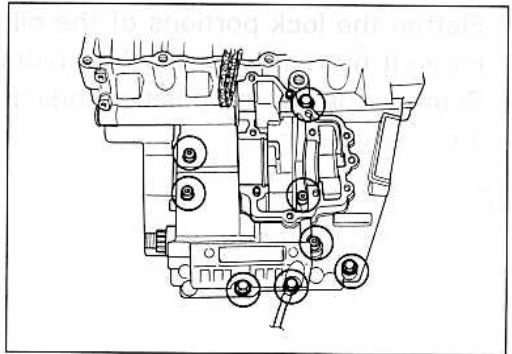
- Remove the oil sump filter ① by removing the two screws.
- Remove the oil sump filter guide ② by removing the two bolts.



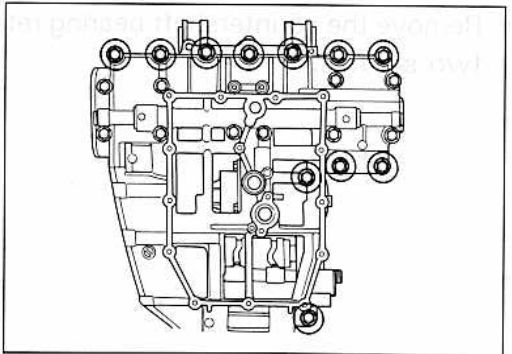
- Remove the shim ③ and O-rings ④ .



- Remove the upper crankcase tightening bolts.



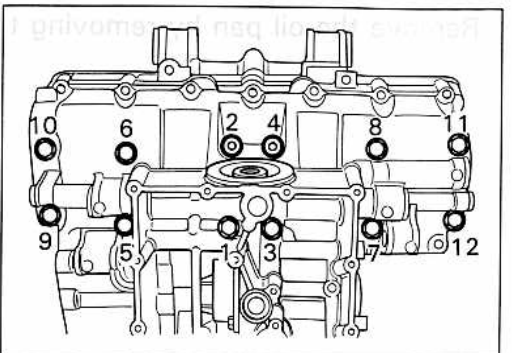
- Remove the lower crankcase tightening bolts.



- When removing the crankshaft tightening bolts, loosen them in the descending order of numbers assigned to these bolts.
- Make sure that all bolts are removed without fail. Hammer lightly the lower crankcase side with a plastic hammer to separate the upper and lower crankcase halves and then lift the latter.

CAUTION:

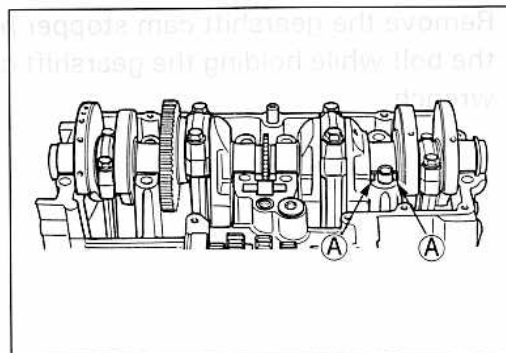
Do not drop the crankshaft journal bearings from the lower crankcase.



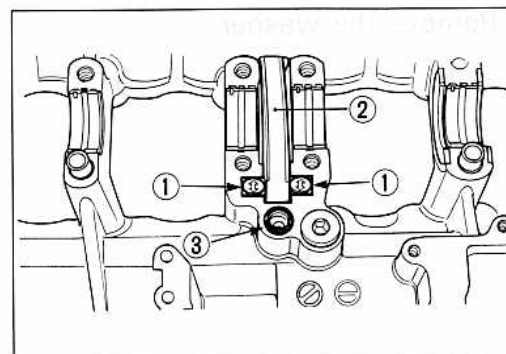
- Remove the crankshaft assembly from the upper crankcase.

NOTE:

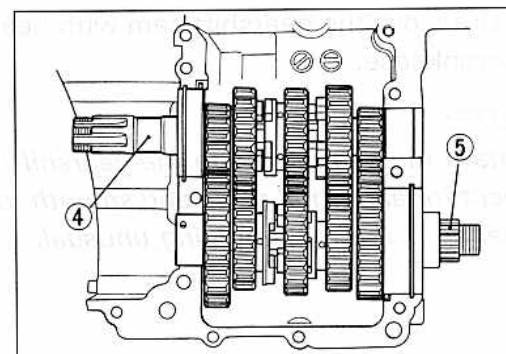
Bear in mind that the crankshaft thrust bearings (A) are located between the shaft and the case.



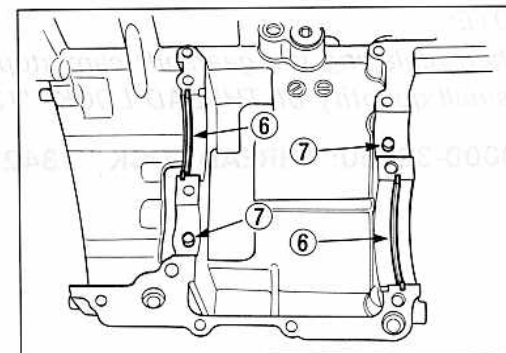
- Remove the two dampers (1) and cam chain guide (2).
- Remove the O-ring (3).



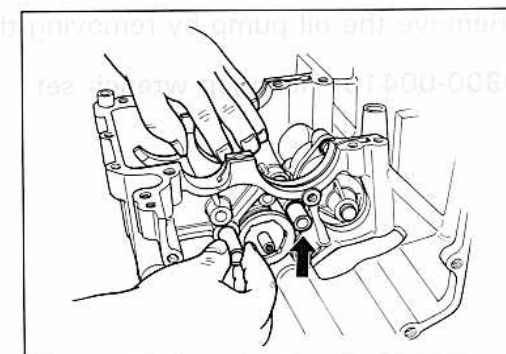
- Remove the countershaft assembly (4) and driveshaft assembly (5).

**NOTE:**

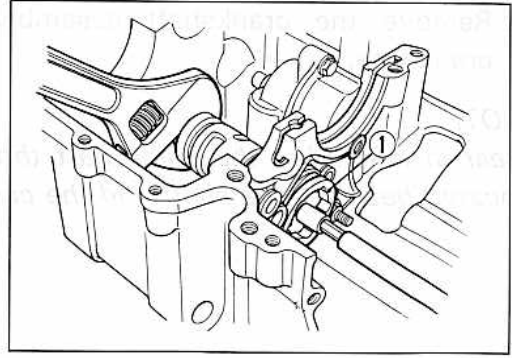
Do not lose the C-rings (6) and bearing pins (7).



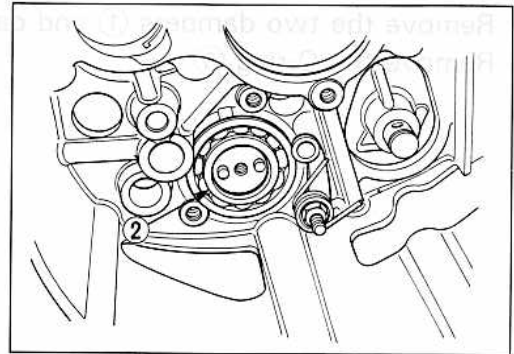
- Hold the gearshift forks by hand while drawing out the gearshift fork shafts from the lower crankcase.



- Remove the gearshift cam stopper plate ① by removing the bolt while holding the gearshift cam with an adjuster wrench.



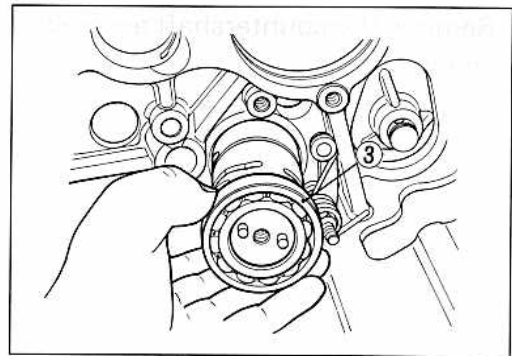
- Remove the washer ② .



- Draw out the gearshift cam with bearing from the lower crankcase.

NOTE:

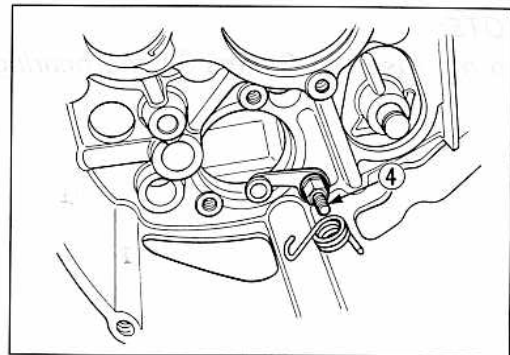
Rotate the bearing ③ on the gearshift cam by hand to inspect for abnormal noise and smooth rotation. Replace the bearing if there is anything unusual.



NOTE:

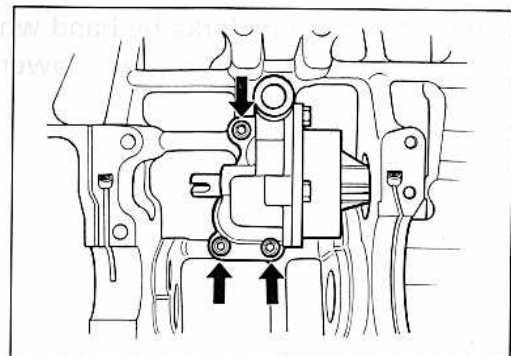
When replacing the gearshift cam stopper bolt ④ , apply a small quantity of THREAD LOCK "1342" to the bolt.

99000-32050: THREAD LOCK "1342"



- Remove the oil pump by removing the mounting bolts.

09900-00410: Hexagon wrench set



ENGINE COMPONENTS INSPECTION AND SERVICE

CYLINDER HEAD SERVICE

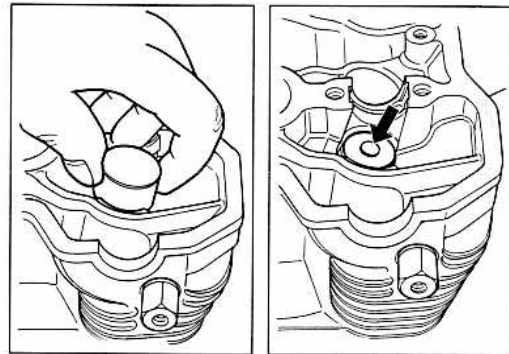
CAUTION:

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:

If valve guides have to be removed for replacement after inspecting related parts, carry out the steps shown in valve guide servicing.

- Remove the tappets and shims by fingers or magnetic hand.

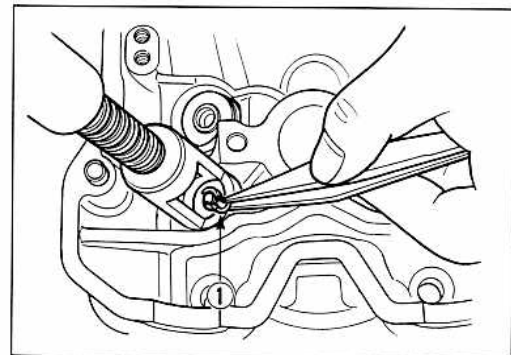
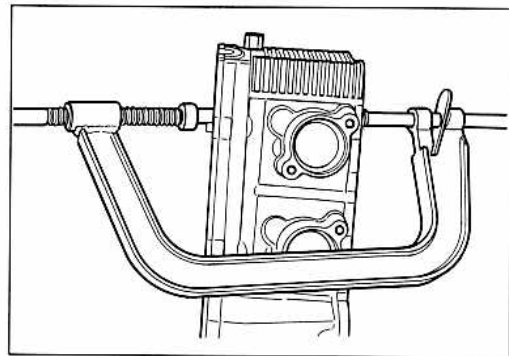


- Using special tools, compress the valve spring and remove the two cotter halves ① from valve stem.

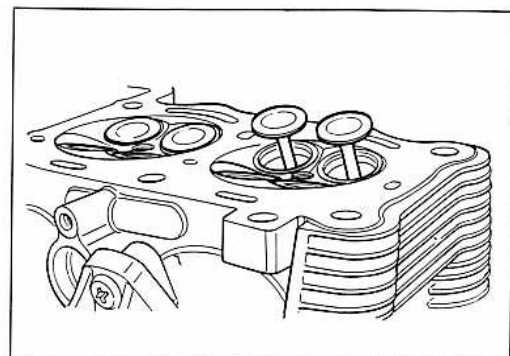
09916-14510: Valve lifter

09916-14520: Valve lifter attachment

09916-84511: Tweezers



- Remove the valve spring retainer, valve spring and valve spring seat.
- 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.

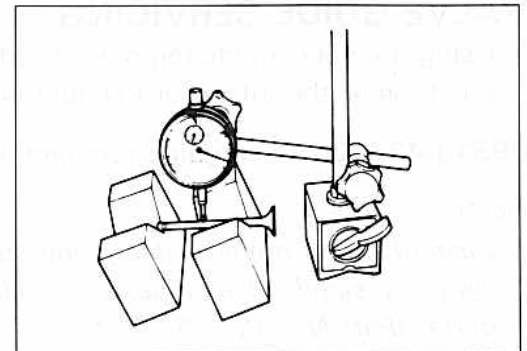
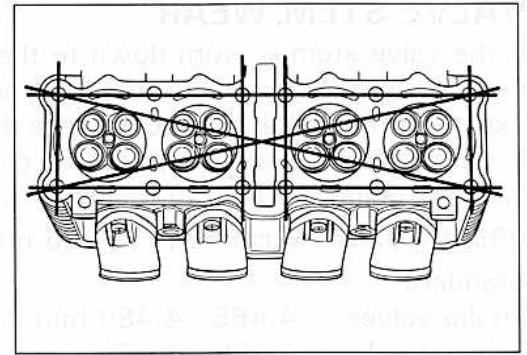
The valve must be replaced if the runout exceeds the limit.

09900-20606: Dial gauge (1/100 mm)

09900-20701: Magnetic stand

09900-21304: V-block (100 mm)

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.

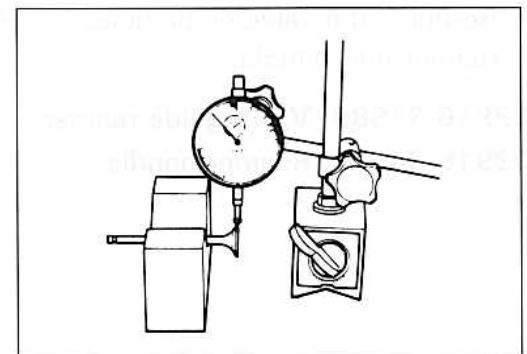
If it measures more than the limit, replace the valve.

09900-20606: Dial gauge (1/100 mm)

09900-20701: Magnetic stand

09900-21304: V-block (100 mm)

Service Limit: 0.03 mm (0.001 in.)

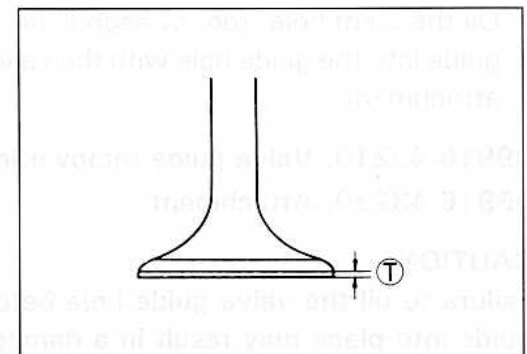


VALVE FACE WEAR

Visually inspect each valve for wear of its seating face. Replace any valve with an abnormally worn face. The thickness $\text{\textcircled{T}}$ 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.

09900-20102: Vernier calipers

Service Limit $\text{\textcircled{T}}$: 0.5 mm (0.02 in)



VALVE STEM DEFLECTION

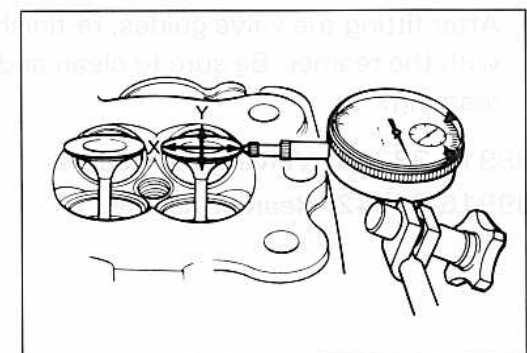
Lift the valve about 10 mm (0.39 in) from the valve seat. Measure the valve stem deflection in two directions, "X" and "Y", perpendicular to each other, by positioning the dial gauge as shown. If the deflection measured exceeds the limit, (see below) then determine whether the valve or the guide should be replaced with a new one.

09900-20606: Dial gauge (1/100 mm)

09900-20701: Magnetic stand

Service Limit

Intake and exhaust valves: 0.35 mm (0.014 in)



VALVE STEM WEAR

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


09900-20205: Micrometer (0–25 mm)

Standard

Intake valves : 4.465–4.480 mm (0.1758–0.1764 in)

Exhaust valves: 4.455–4.470 mm (0.1754–0.1760 in)

VALVE GUIDE SERVICING

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

09916-43210: Valve guide remover/installer

NOTE:

- * Discard the removed valve guide subassemblies.
- * Only oversized valve guides are available as replacement parts. (Part No. 11115-17E70)

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

09916-34580: Valve guide reamer

09916-34542: Reamer handle

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

09916-43210: Valve guide remover/installer

09916-43230: Attachment

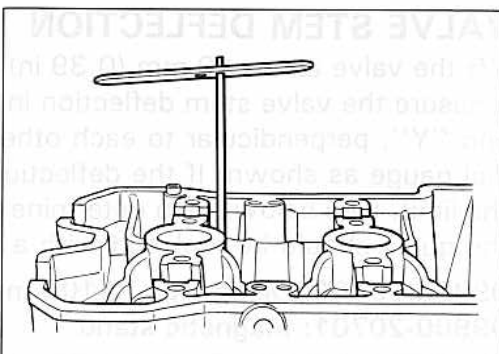
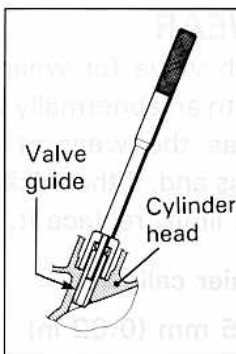
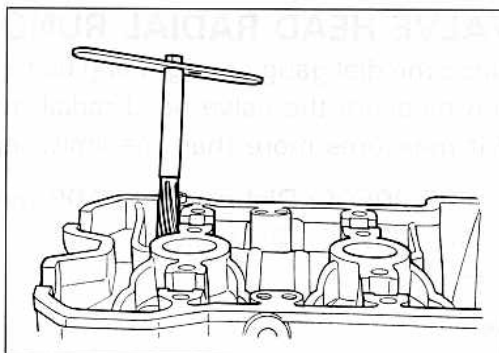
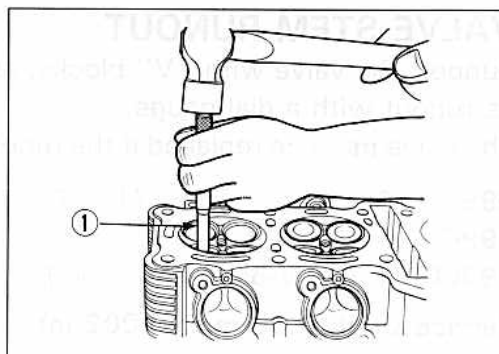
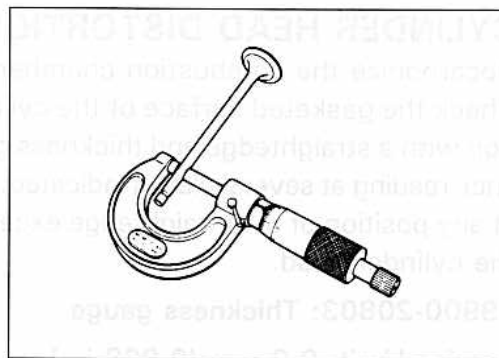
CAUTION:

Failure to oil the valve guide hole before driving the new guide into place may 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.

09916-33210: Valve guide reamer

09916-34542: Reamer handle



VALVE SEAT WIDTH

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

Standard

Valve seat width $\text{\textcircled{W}}$: 0.8–1.2 mm (0.032–0.047 in)

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

VALVE SEAT SERVICING

The valve seats for both intake and exhaust valves are machined to four different angles. (The seat contact surface is cut 45°.)

	INTAKE		EXHAUST
45°	N-116 or N-122	45°	N-116 or N-122
30°	N-126	15°	N-120 or N-121
60°	N-111		

Valve seat cutter: (N-111), (N-126), (N-121), (N-122), (N-116) and (N-120)

Solid pilot: (N-100-4.5)

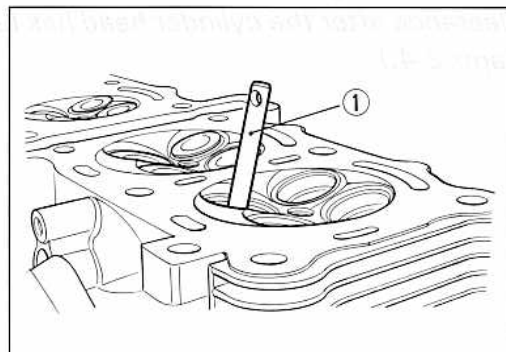
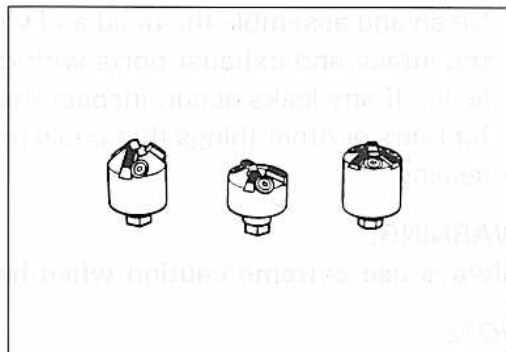
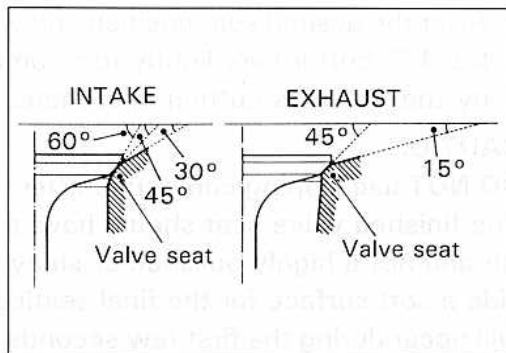
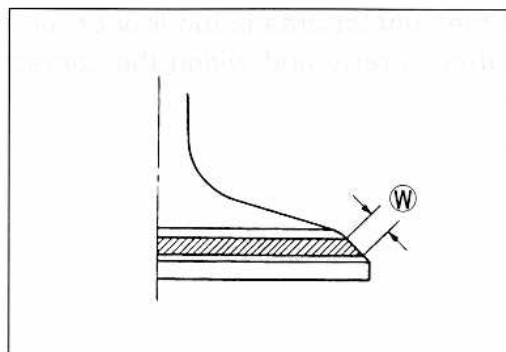
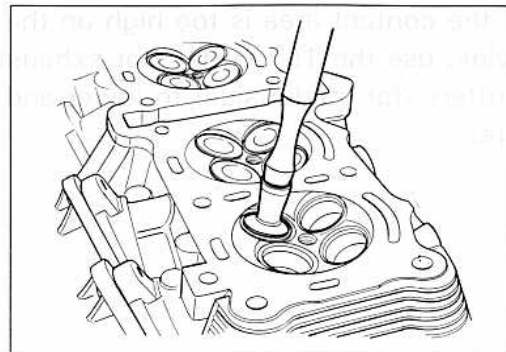
NOTE:

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

- Insert the solid pilot $\text{\textcircled{1}}$ 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.

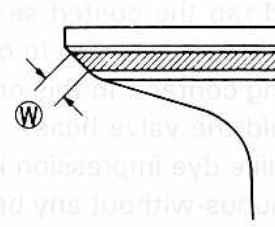
NOTE:

Cut only the minimum amount necessary from the seat to prevent the possibility of the tappet shim replacement.



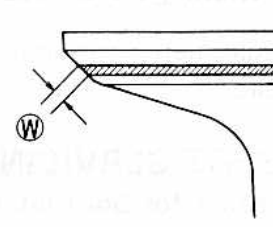
If the contact area is too high and too wide, use the 15° cutter (for exhaust side) and 30°/60° cutters (for intake side) to lower and narrow the contact area.

Contact area too high and too wide on face of valve



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

Contact area too low and too narrow on face of valve



- 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.

CAUTION:

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.

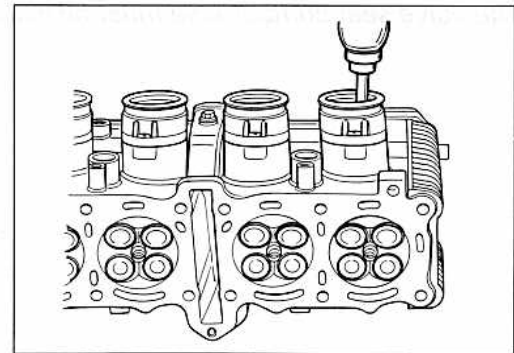
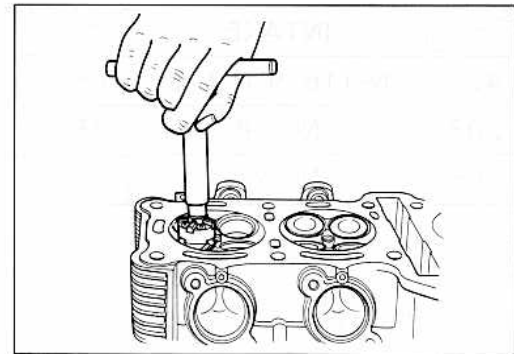
- Clean and assemble the head and valve components. Fill the intake and exhaust ports with gasoline to check for leaks. If any leaks occur, inspect the valve seat and face for burrs or other things that could prevent the valve from sealing.

WARNING:

Always use extreme caution when handling gasoline.

NOTE:

After servicing the valve seats, be sure to check the tappet clearance after the cylinder head has been reinstalled. (See page 2-4.)



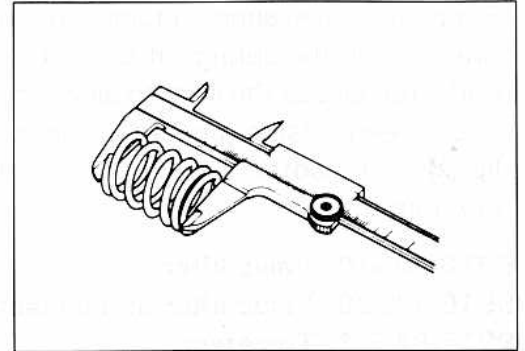
VALVE SPRING

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

Check the valve spring for proper strength by measuring its free length and also by the force required to compress it. If the spring length is less than the service limit, or if the force required to compress the spring does not fall within the range specified, replace the spring.

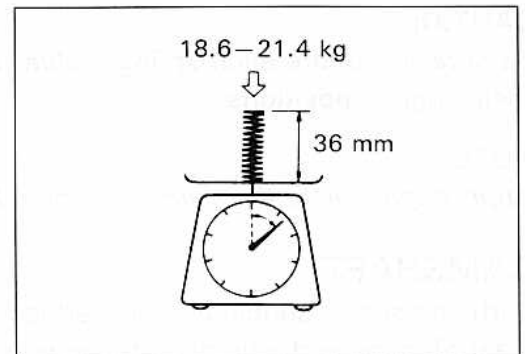
Valve spring free length

Service Limit: 40.4 mm (1.59 in)



Valve spring tension

Standard: 18.6–21.4 kg/36 mm (41.0–47.2 lbs/1.4 in)



REASSEMBLY

- Oil each oil seal, and press-fit them into position with the valve guide installer.

09916-43210: Valve guide remover/installer

CAUTION:

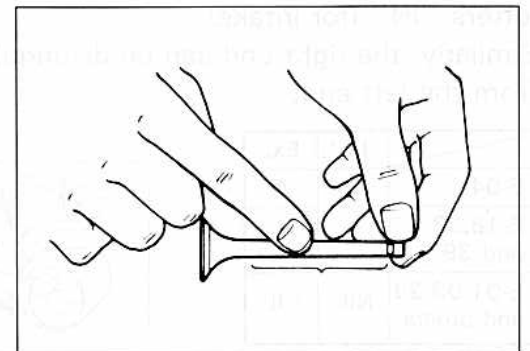
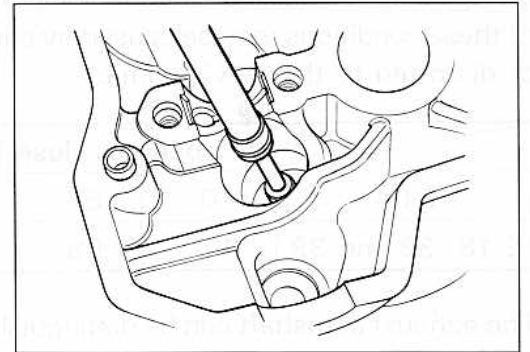
Do not reuse the oil seals.

- Install each valve spring seat.
- 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.

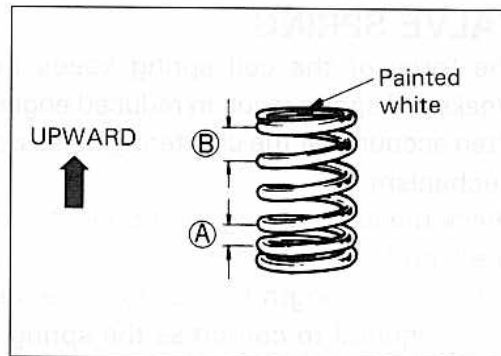
CAUTION:

When inserting each valve, take care not to damage the lip of the oil seal.

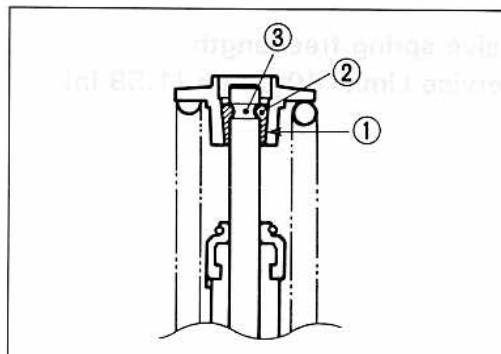
99000-25140: SUZUKI MOLY PASTE



- Install the valve spring with the small-pitch portion (A) facing cylinder head. (B) Large-pitch portion.



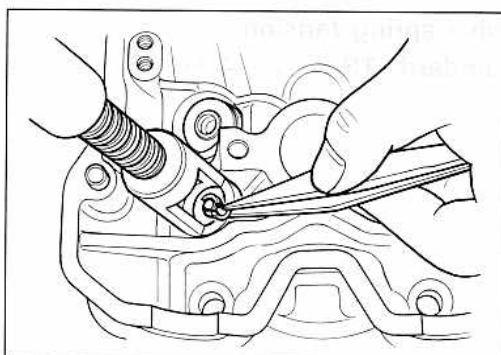
- Put on the valve spring retainer and, using the valve lifter, press down the spring, fit the cotter halves to the stem end, and release the lifter to allow the cotter (1) to wedge in between retainer and stem. Be sure that the rounded lip (2) of the cotter fits snugly into the groove (3) in the stem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



- 09916-14510: Valve lifter
- 09916-14520: Valve lifter attachment
- 09916-84511: Tweezers

CAUTION:

Be sure to restore each spring, valve, shim and tappet to their original positions.

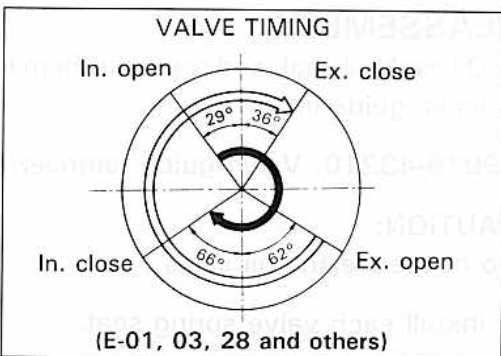


NOTE:

Apply engine oil to the shim and tappet before fitting them.

CAMSHAFT

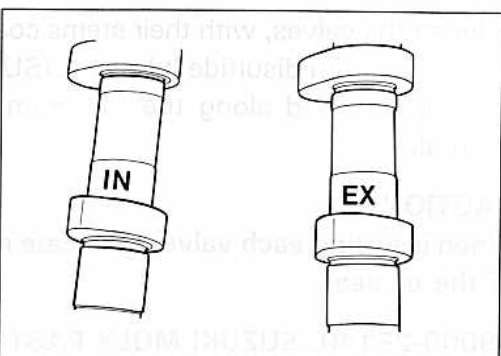
Both camshafts should be checked for runout and also for wear of cams and journals if the engine has been noted as giving abnormal noise or vibration or lack power output. Any of these conditions may be caused by camshafts worn down or distorted to the service limit.



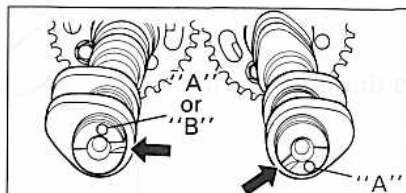
	In. open	In. close	Ex. open	Ex. close
E-04	10°	67°	63°	18°
E-18, 33 and 39	11°	68°	63°	18°

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.



	In.	Ex.
E-04	B	A
E-18,33 and 39	A	A
E-01,03,28 and others	NIL	NIL



CAM WEAR

Worn-down cams are often the cause of mistimed valve operation resulting in reduced power output.

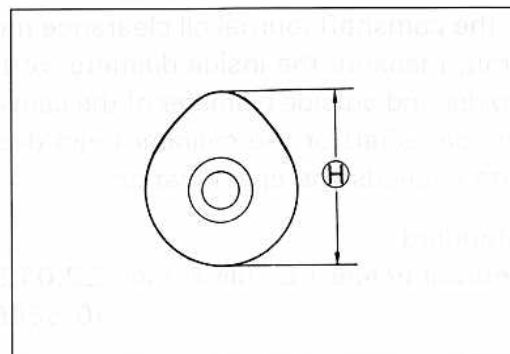
The limit of cam wear is specified for both intake and exhaust cams in terms of cam height \oplus , which is to be measured with a micrometer. Replace camshafts if found worn down to the limit.

09900-20202: Micrometer (25–50 mm)

Cam height \oplus

Service Limit

	Intake cams	Exhaust cams
E-01,03,28 and others	36.40 mm (1.433 in)	36.32 mm (1.430 in)
E-04	32.70 mm (1.287 in)	34.66 mm (1.365 in)
E-18,33 and 39	35.00 mm (1.378 in)	34.66 mm (1.365 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 the plastigauge $\textcircled{1}$ 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. (page 3-65.)

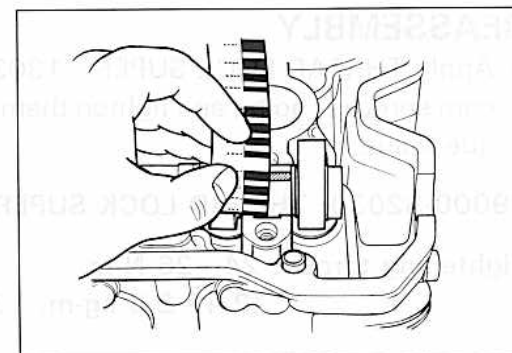
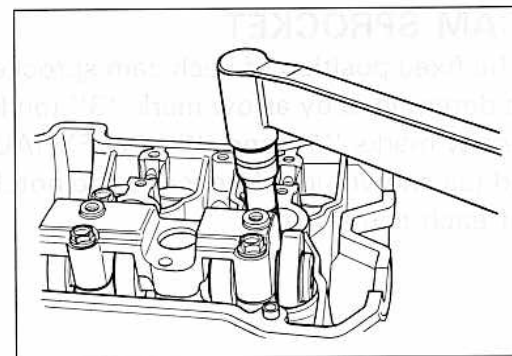
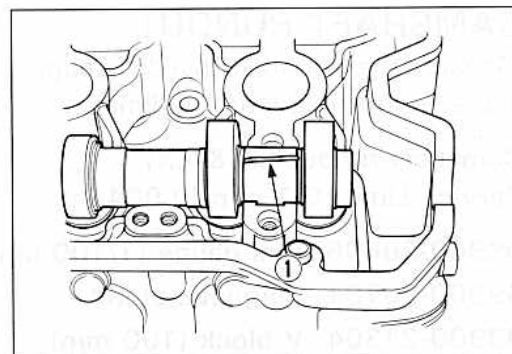
Tighten the camshaft holder bolts evenly and diagonally to the specified torque.

**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 the plastigauge in place.

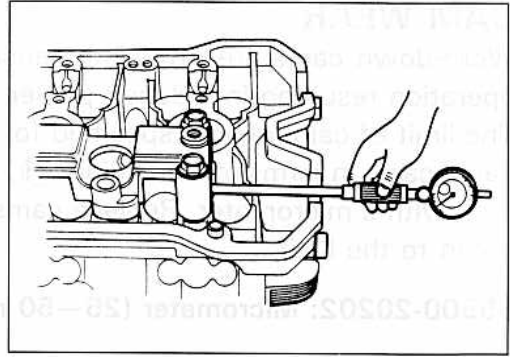
Remove the camshaft holders, and read the width of the compressed plastigauge with envelope scale. This measurement should be taken at the widest part.



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

Standard

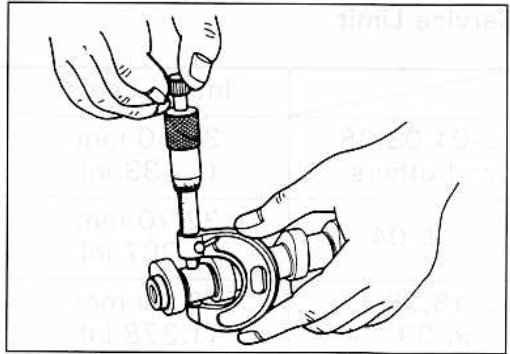
Journal holder I.D. (IN & EX): 22.012–22.025 mm
(0.8666–0.8671 in)



09900-20205: Micrometer (0–25 mm)

Standard

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



CAMSHAFT RUNOUT

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

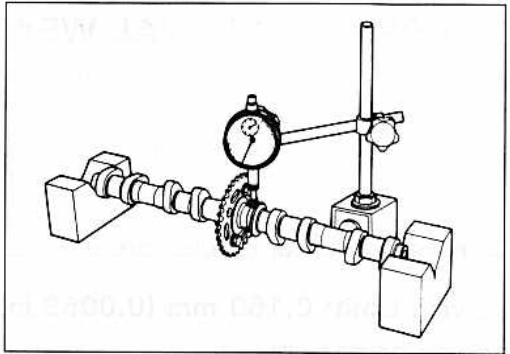
Camshaft runout (IN & EX)

Service Limit: 0.1 mm (0.004 in)

09900-20606: Dial gauge (1/100 mm, 10 mm)

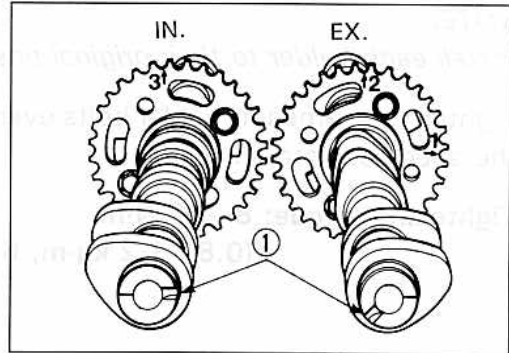
09900-20701: Magnetic stand

09900-21304: V-block (100 mm)



CAM SPROCKET

The fixed position of each cam sprocket on each camshaft 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 right end of each camshaft.

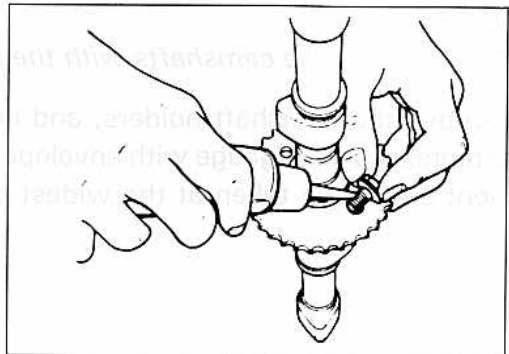


REASSEMBLY

- 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"

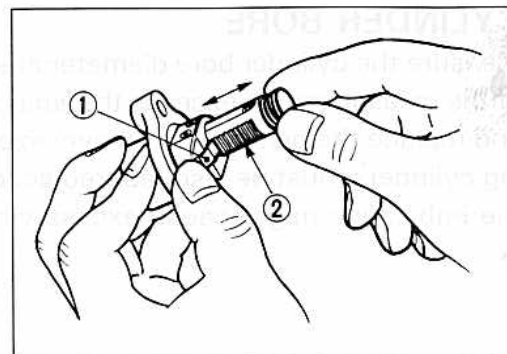
Tightening torque: 24–26 N·m
(2.4–2.6 kg·m, 17.5–19.0 lb·ft)



CAM CHAIN TENSIONER

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

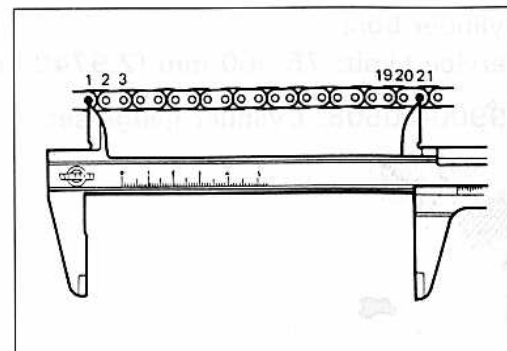
Unlock the ratchet mechanism ①, and move the push rod ② in place to see if it slides smoothly. If any stickiness is noted or ratchet mechanism is faulty, replace the cam chain tensioner assembly with a new one.



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

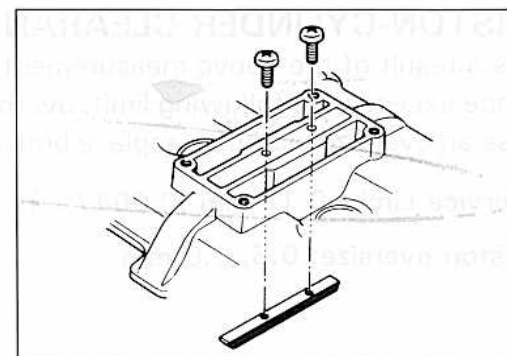
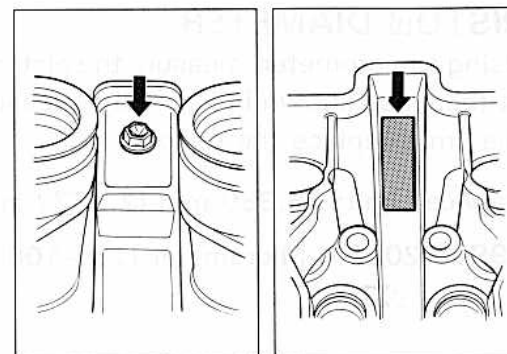
NOTE:

When replacing the cam chain guides, apply **SUZUKI THREAD LOCK SUPER "1303"** to threads of bolt and screws.

99000-32030: THREAD LOCK SUPER "1303"

Cam chain guide

mounting bolt: 4–7 N·m
(0.4–0.7 kg-m, 3.0–5.0 lb-ft)



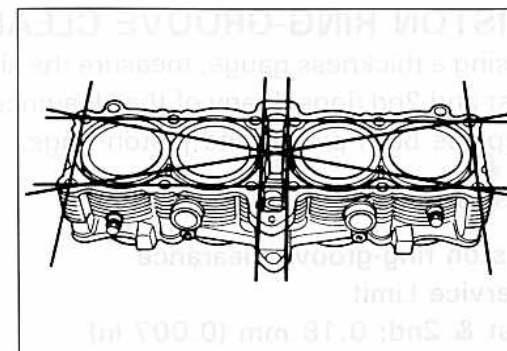
CYLINDER BLOCK DISTORTION

Check the gasketed surface of the cylinder block 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 block.

09900-20803: Thickness gauge

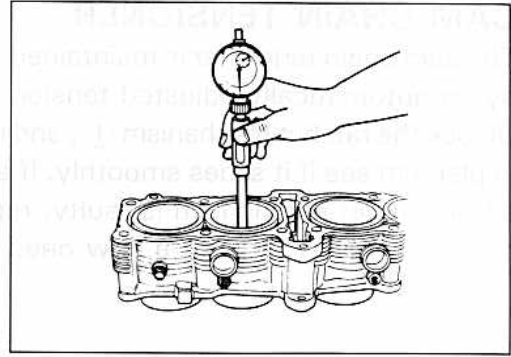
Cylinder distortion

Service Limit: 0.2 mm (0.008 in)



CYLINDER BORE

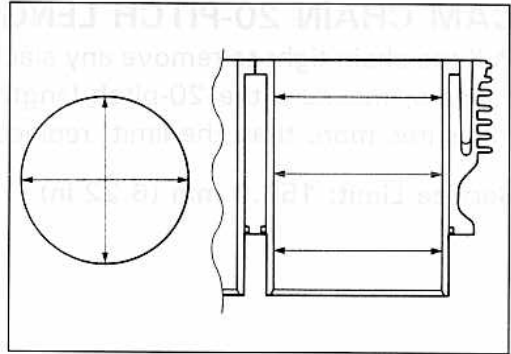
Measure the cylinder bore diameter at six places. If any one of the measurements exceeds the limit, overhaul the cylinder and replace the piston with an oversize piston. The remaining cylinders must be also rebored accordingly. Otherwise, the imbalance might cause excess vibration.



Cylinder bore

Service Limit: 75.560 mm (2.9748 in)

09900-20508: Cylinder gauge set

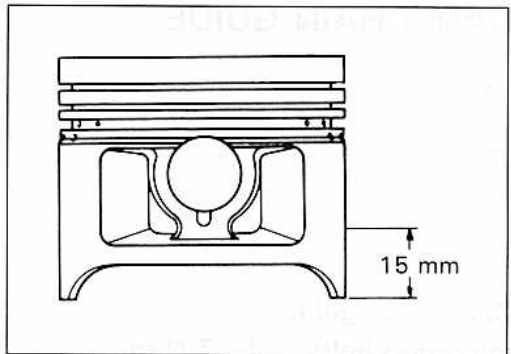


PISTON DIAMETER

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

Service Limit: 75.380 mm (2.9677 in)

09900-20204: Micrometer (75—100 mm)

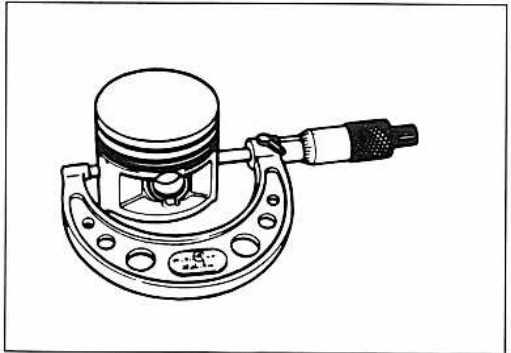


PISTON-CYLINDER CLEARANCE

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

Service Limit: 0.12 mm (0.0047 in)

Piston oversize: 0.5, 1.0 mm



PISTON RING-GROOVE CLEARANCE

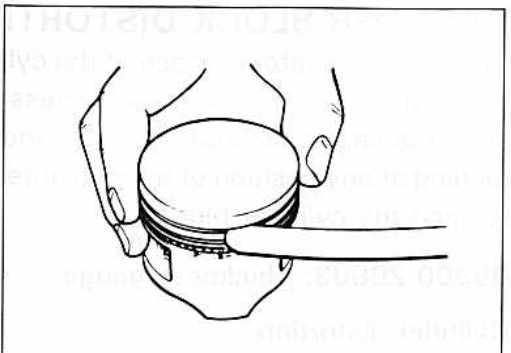
Using a thickness gauge, measure the side clearances of the 1st and 2nd rings. If any of the clearances exceeds the limit, replace both piston and piston rings.

09900-20803: Thickness gauge

Piston ring-groove clearance

Service Limit

1st & 2nd: 0.18 mm (0.007 in)

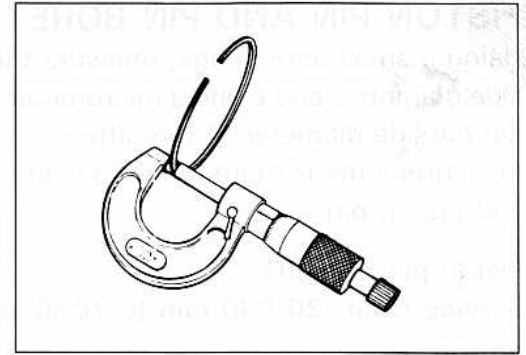


Piston ring groove width

	1st: 1.03–1.05 mm (0.040–0.041 in)
Standard	2nd: 1.03–1.05 mm (0.040–0.041 in)
	Oil : 2.01–2.03 mm (0.079–0.080 in)

Piston ring thickness

Standard	1st & 2nd: 0.97–0.99 mm (0.038–0.039 in)
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**PISTON RING FREE END GAP AND PISTON RING END GAP**

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

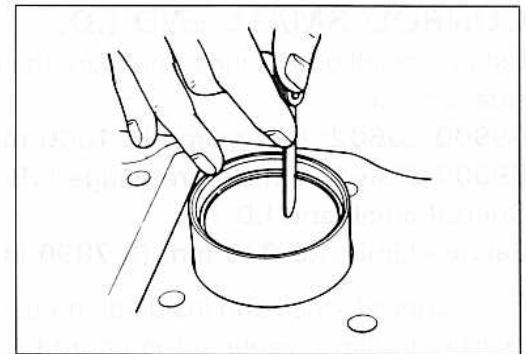
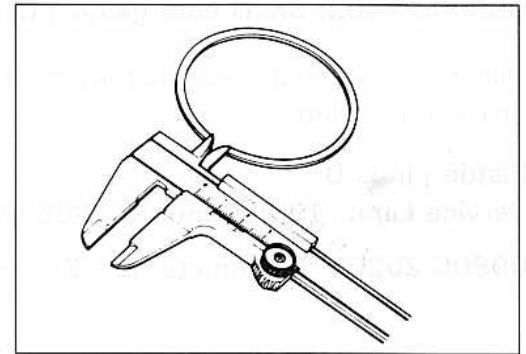
If any ring has an excess end gap, replace the ring.

Piston ring free end gap

Service Limit	1st : 8.9 mm (0.35 in)
	2nd: 6.8 mm (0.27 in)

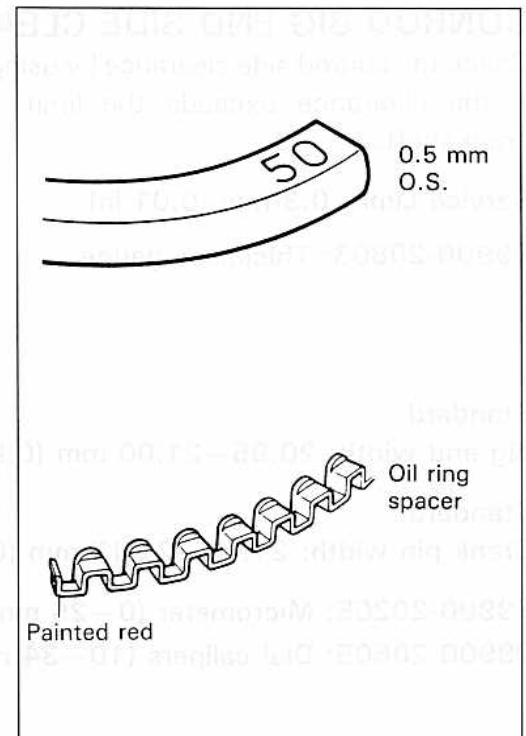
09900-20102: Vernier calipers**Piston ring end gap**

Service Limit	1st & 2nd: 0.5 mm (0.02 in)
---------------	-----------------------------

09900-20803: Thickness gauge**Oversize piston ring**

The following type of oversize piston ring is used.

SIZE	1st ring	2nd ring
0.5 mm O.S.	50	50

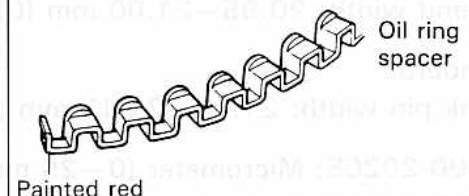
**Oversize oil ring**

The following type of oversize oil ring is used.

SIZE	COLOR
STD	NIL
0.5 mm O.S.	Painted red

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)

09900-20602: Dial gauge (1/1000 mm, 1 mm)

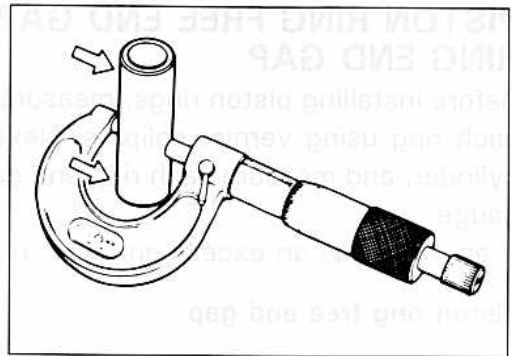
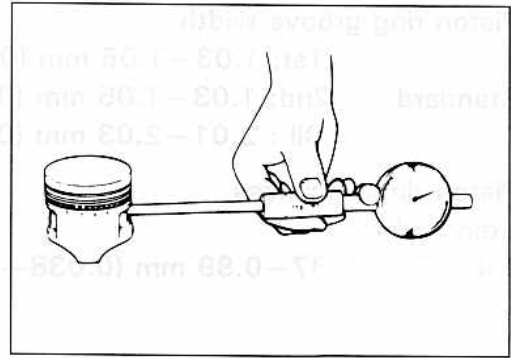
09900-22403: Small bore gauge (18–35 mm)

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.

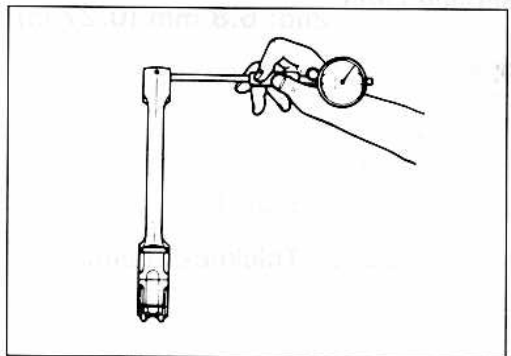
09900-20602: Dial gauge (1/1000 mm, 1 mm)

09900-22403: Small bore gauge (18–35 mm)

Conrod small end I.D.

Service Limit: 20.040 mm (0.7890 in)

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

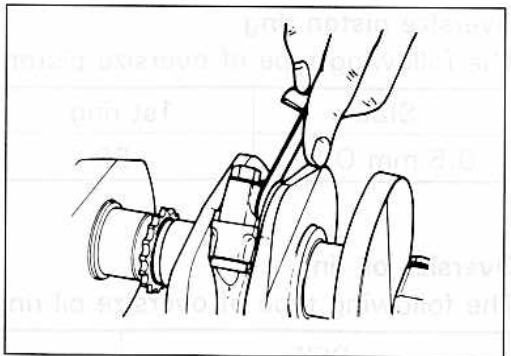


CONROD BIG END SIDE CLEARANCE

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

Service Limit: 0.3 mm (0.01 in)

09900-20803: Thickness gauge



Standard

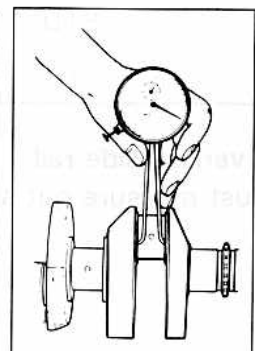
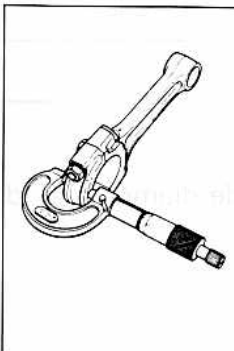
Big end width: 20.95–21.00 mm (0.825–0.827 in)

Standard

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

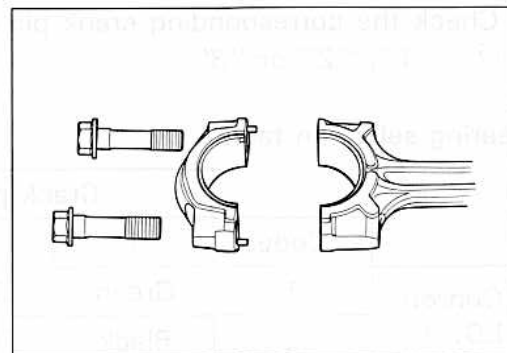
09900-20205: Micrometer (0–25 mm)

09900-20605: Dial calipers (10–34 mm)



CONROD-CRANK PIN BEARING SELECTION

- Remove the bearing cap bolts, and tap the bearing cap lightly with plastic hammer to remove the 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.



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

Initial tightening torque: 32–37 N·m

(3.2–3.7 kg-m, 23.0–27.0 lb-ft)

Final tightening torque: 65–68 N·m

(6.5–6.8 kg-m, 47.0–49.0 lb-ft)

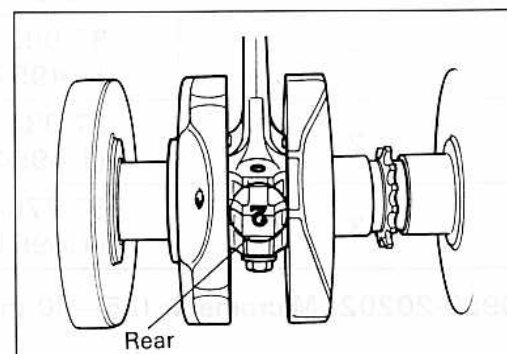
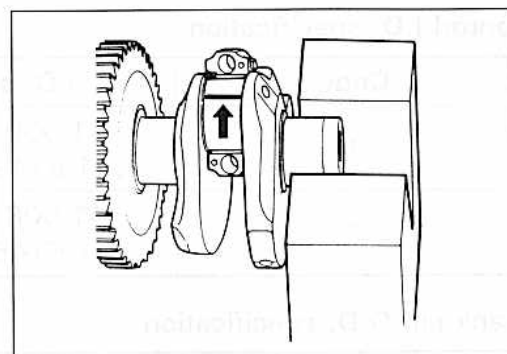
09900-22301: Plastigauge

NOTE:

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

NOTE:

Never rotate the crankshaft or conrod when a piece of plastigauge is in the clearance.

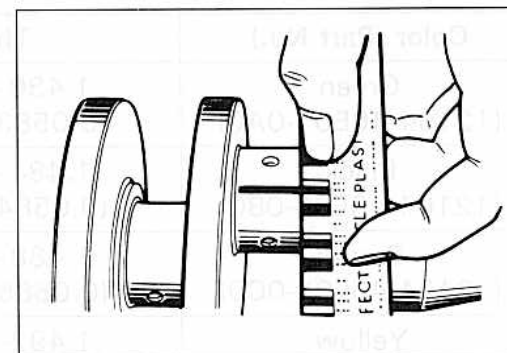


- Remove the caps, and measure the width of compressed plastigauge with envelope scale. This measurement should be taken at the widest part.

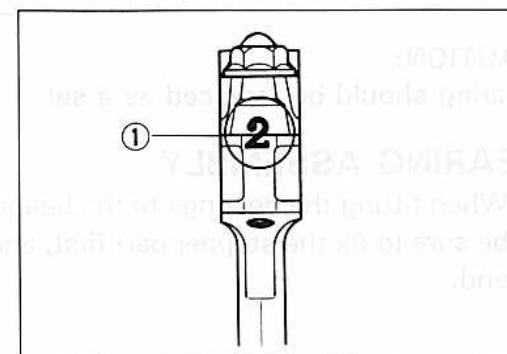
Crank pin bearing oil clearance

Standard: 0.032–0.056 mm (0.0013–0.0022 in)

Service Limit: 0.080 mm (0.0031 in)



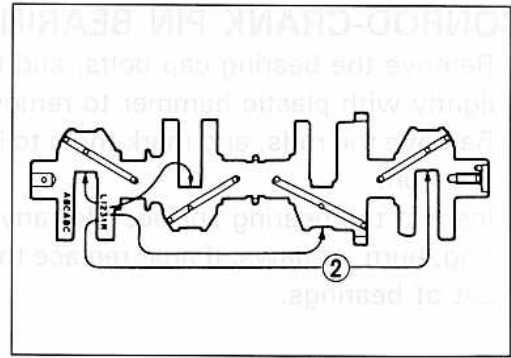
- If oil clearance exceeds the service limit, select the specified bearings from the bearing selection table.
- Check the corresponding conrod I.D. code number ①, "1" or "2".



- Check the corresponding crank pin O.D. code number ②, "1", "2" or "3".

Bearing selection table

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



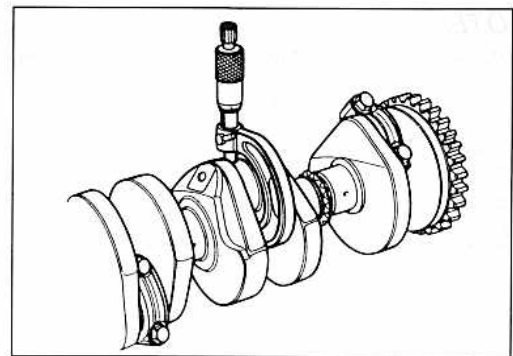
Conrod I.D. specification

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

Crank pin O.D. specification

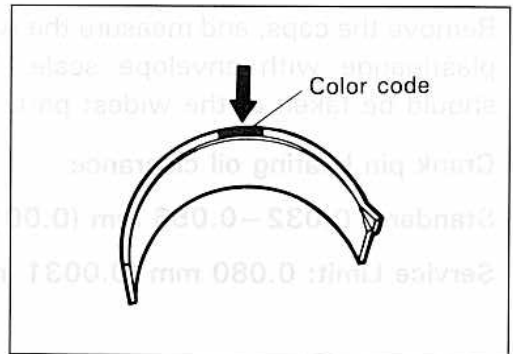
Code	O.D. specification
1	37.992–38.000 mm (1.4957–1.4961 in)
2	37.984–37.992 mm (1.4954–1.4957 in)
3	37.976–37.984 mm (1.4951–1.4954 in)

09900-20202: Micrometer (25–50 mm)



Bearing thickness

Color (Part No.)	Thickness
Green (12164-46E01-OA0)	1.480–1.484 mm (0.0583–0.0584 in)
Black (12164-46E01-OB0)	1.484–1.488 mm (0.0584–0.0586 in)
Brown (12164-46E01-OC0)	1.488–1.492 mm (0.0586–0.0587 in)
Yellow (12164-46E01-OD0)	1.492–1.496 mm (0.0587–0.0589 in)

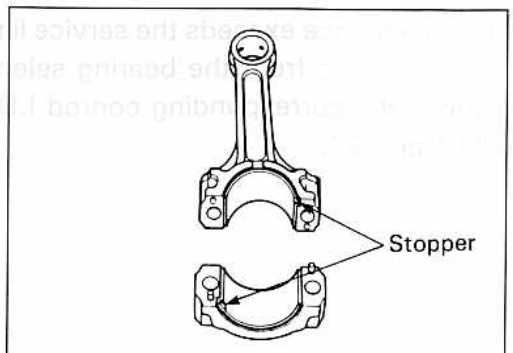


CAUTION:

Bearing should be replaced 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 in the other end.



- Apply engine oil or SUZUKI MOLY PASTE to the crank pin and bearing surface.

99000-25140: SUZUKI MOLY PASTE

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

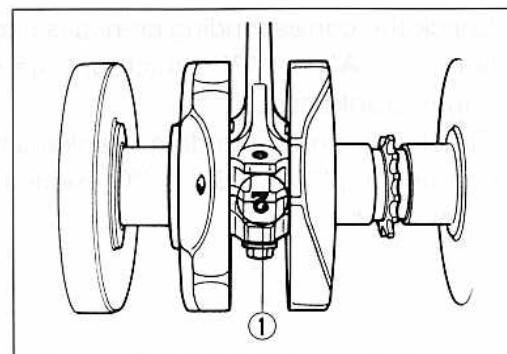
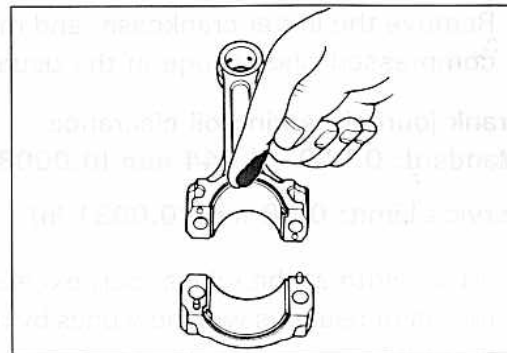
Initial tightening torque: 32–37 N·m

(3.2–3.7 kg-m, 23.0–27.0 lb-ft)

Final tightening torque : 65–68 N·m

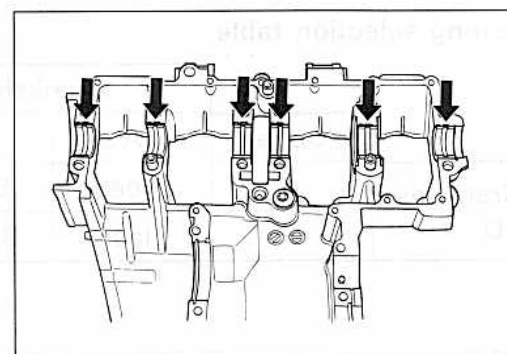
(6.5–6.8 kg-m, 47.0–49.0 lb-ft)

- Check the conrod movement for smooth turning.



CRANKCASE-CRANKSHAFT BEARING SELECTION

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

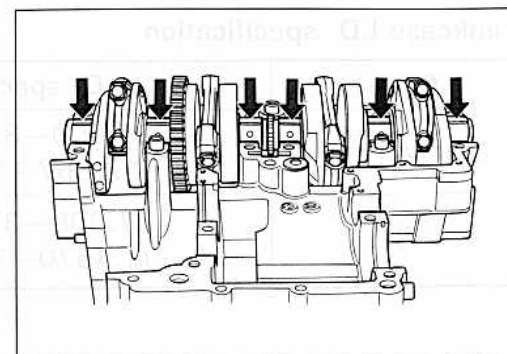


- Place the plastigauge on each crankshaft journal in the usual manner.

09900-22301: Plastigauge

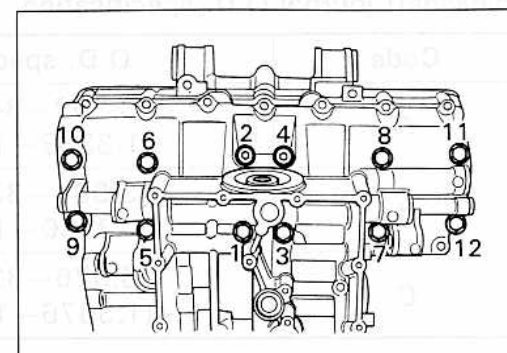
NOTE:

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
9 mm bolt	13 N·m 1.3 kg-m 9.5 lb-ft	24–28 N·m 2.4–2.8 kg-m 17.5–20.0 lb-ft



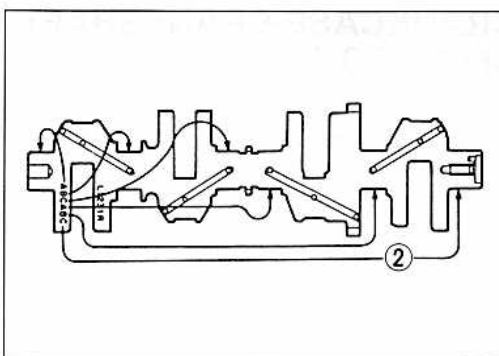
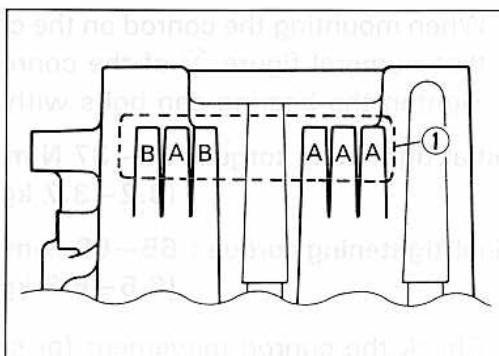
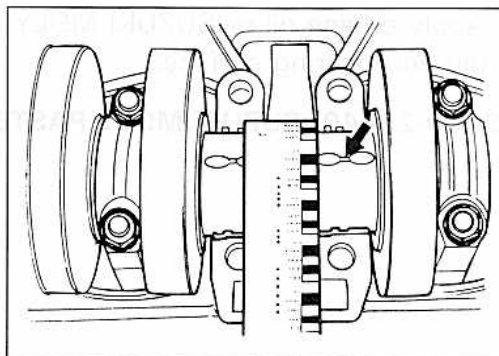
- Remove the lower crankcase, and measure the width of compressed plastigauge in the usual manner.

Crank journal bearing oil clearance

Standard: 0.020–0.044 mm (0.0008–0.0017 in)

Service Limit: 0.08 mm (0.0031 in)

- If the width at the widest part exceeds the limit, replace the set of bearings with new ones by referring to the selection table.
- Check the corresponding crankcase journal I.D. code number ①, "A" or "B" which are stamped on the rear of upper crankcase.
- Check the corresponding crankshaft journal O.D. code number ②, "A", "B" or "C" which are stamped on the crankshaft.



Bearing selection table

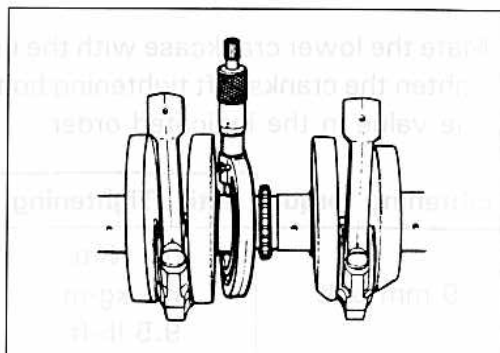
		Crankshaft O.D. ②		
		A	B	C
Crankcase I.D. ①	A	Green	Black	Brown
	B	Black	Brown	Yellow

Crankcase I.D. specification

Code	I.D. specification
A	37.000–37.008 mm (1.4567–1.4570 in)
B	37.008–37.016 mm (1.4570–1.4573 in)

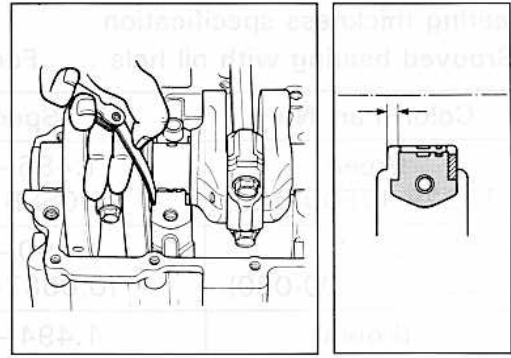
Crankshaft journal O.D. specification

Code	O.D. specification
A	33.992–34.000 mm (1.3383–1.3386 in)
B	33.984–33.992 mm (1.3380–1.3383 in)
C	33.976–33.984 mm (1.3376–1.3380 in)



09900-20202: Micrometer (25–50 mm)

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



Thrust bearing selection table

Clearance before inserting left-side thrust bearing	Color (Part No.)	Thrust bearing thickness	Thrust clearance
2.560–2.585 mm (0.1008–0.1018 in)	White (12228-17E00-0F0)	2.475–2.500 mm (0.0974–0.0984 in)	0.060–0.110 mm (0.0024–0.0043 in)
2.535–2.560 mm (0.0998–0.1008 in)	Yellow (12228-17E00-0E0)	2.450–2.475 mm (0.0965–0.0974 in)	0.060–0.110 mm (0.0024–0.0043 in)
2.510–2.535 mm (0.0988–0.0998 in)	Green (12228-17E00-0D0)	2.425–2.450 mm (0.0955–0.0965 in)	0.060–0.110 mm (0.0024–0.0043 in)
2.485–2.510 mm (0.0978–0.0988 in)	Blue (12228-17E00-0C0)	2.400–2.425 mm (0.0945–0.0955 in)	0.060–0.110 mm (0.0024–0.0043 in)
2.460–2.485 mm (0.0969–0.0978 in)	Black (12228-17E00-0B0)	2.375–2.400 mm (0.0935–0.0945 in)	0.060–0.110 mm (0.0024–0.0043 in)
2.430–2.460 mm (0.0957–0.0969 in)	Red (12228-17E00-0A0)	2.350–2.375 mm (0.0925–0.0935 in)	0.055–0.110 mm (0.0022–0.0043 in)

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

NOTE:

Right-side thrust bearing has the same specification as the GREEN (12228-17E00-0D0) of left-side thrust bearing.

CRANKSHAFT RUNOUT

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

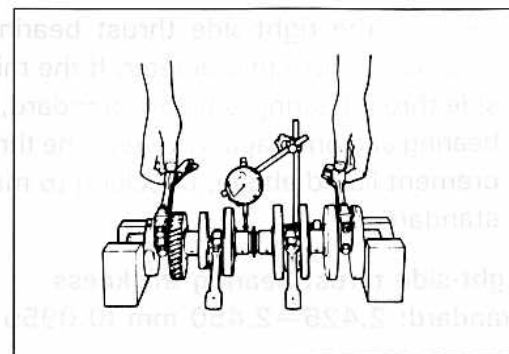
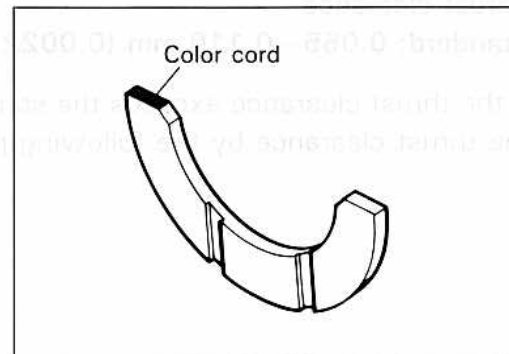
09900-20606: Dial gauge (1/100 mm, 10 mm)

09900-20701: Magnetic stand

09900-21304: V-block (100 mm)

Crankshaft runout

Service Limit: 0.05 mm (0.002 in)

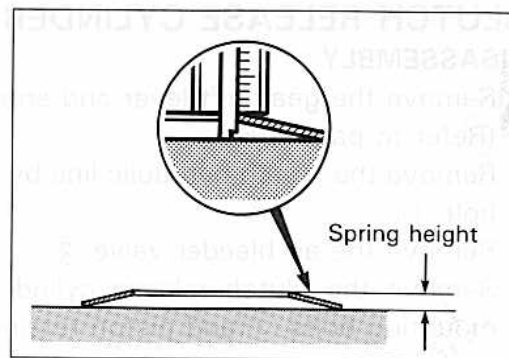


CLUTCH DIAPHRAGM SPRING

Measure the free height of each diaphragm spring with a vernier calipers. If each diaphragm spring height is not within the specified limit, replace it with a new one.

09900-20102: Vernier calipers

Service Limit: 3.1 mm (0.12 in)

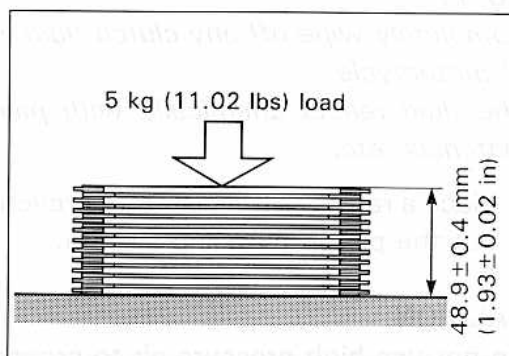


CLUTCH DRIVE AND DRIVEN PLATES

Measure the total thickness of drive and driven plates by compressing them with a 5 kg load.

NOTE:

Wipe off the engine oil from the drive and driven plates with a clean rag and put them one by one on the surface plate. If the total thickness of drive and driven plates is not within specification, replace the drive plates with new ones or measure each drive plate thickness and driven plate distortion.



Total thickness of drive and driven plates	48.9 ± 0.4 mm at 5 kg load (1.93 ± 0.02 in at 11.02 lbs load)
--	--

PARTS SUPPLY DATA

21400-40C00: Clutch plate assembly

21441-48B00: Clutch drive plate No.1

21442-46E00: Clutch drive plate No.2

21451-48B00: Clutch driven plate

(The clutch drive plate NO.2 is not included in the clutch plate assembly.)

Measure the thickness of each drive plate with a vernier calipers. If each drive plate is not within the standard range, replace it with a new one.

09900-20102: Vernier calipers

Standard (No.1 and No.2 drive plates)

Thickness: 2.52–2.68 mm (0.100–0.106 in)

Measure each driven plate for distortion with a thickness gauge.

Replace driven plates which exceed the limit.

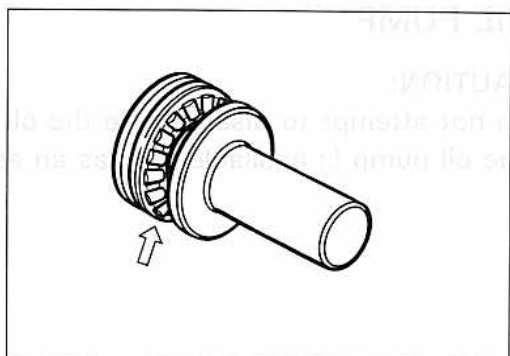
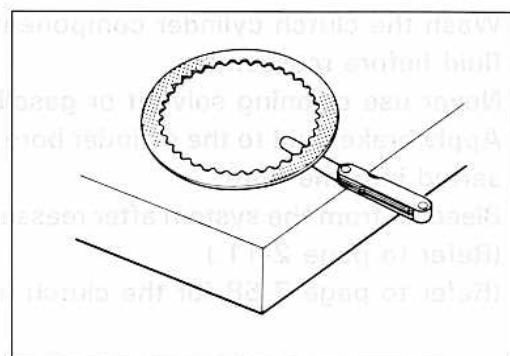
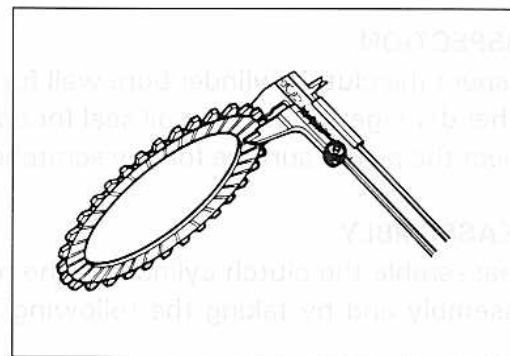
09900-20803: Thickness gauge

Service Limit: 0.1 mm (0.004 in)

CLUTCH BEARING

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

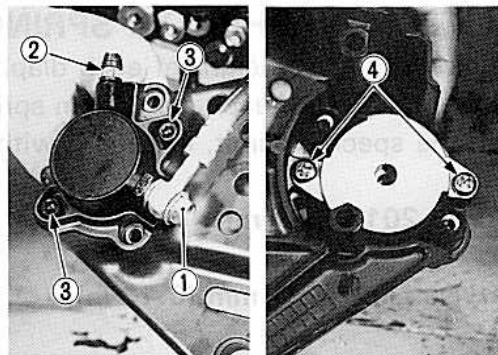
Smooth engagement and disengagement of the clutch depends on the condition of this bearing.



CLUTCH RELEASE CYLINDER

DISASSEMBLY

- Remove the gearshift lever and engine sprocket cover. (Refer to page 3-6.)
- Remove the clutch hydraulic line by removing the union bolt ①.
- Remove the air bleeder valve ②.
- Remove the clutch release cylinder by removing the mounting bolts ③ and piston retainer screws ④.



NOTE:

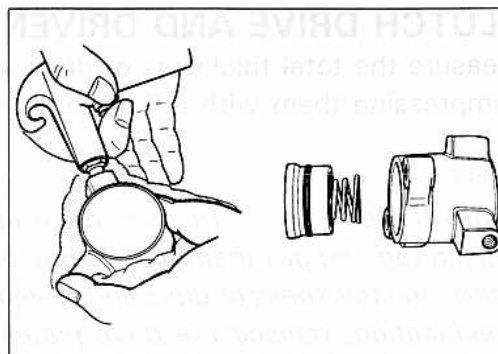
Completely wipe off any clutch fluid adhering to any part of motorcycle.

The fluid reacts chemically with paint, plastics, rubber materials, etc.

- 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

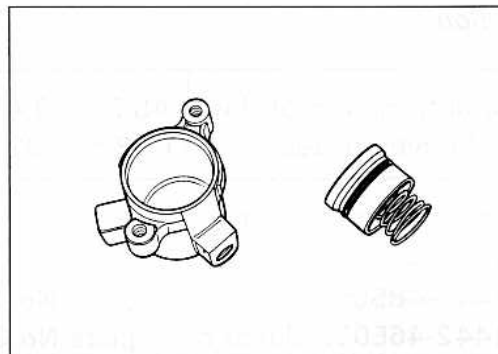
Inspect the clutch cylinder bore wall for nicks, scratches or other damage. Inspect the oil seal for damage and wear. Inspect the piston surface for any scratches or other damage.

REASSEMBLY

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

CAUTION:

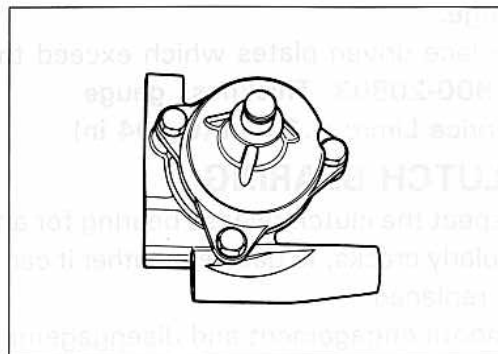
- * Wash the clutch cylinder components with fresh brake fluid before reassembly.
- * Never use cleaning solvent or gasoline to wash them.
- * Apply brake fluid to the cylinder bore and piston to be inserted into the bore.
- * Bleed air from the system after reassembling the cylinder. (Refer to page 2-11.)
(Refer to page 7-58 for the clutch master cylinder.)



OIL PUMP

CAUTION:

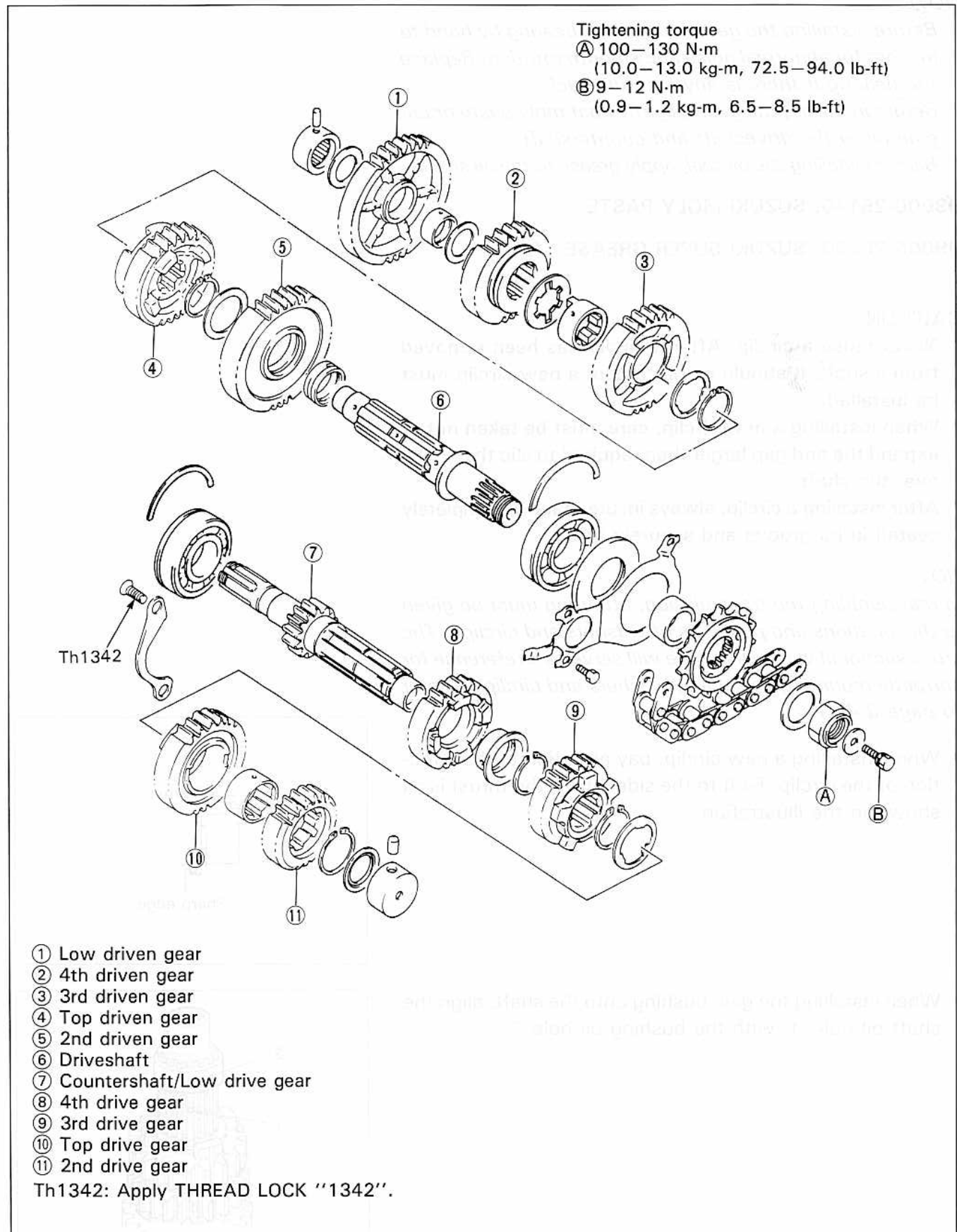
Do not attempt to disassemble the oil pump assembly. The oil pump is available only as an assembly.



TRANSMISSION

DISASSEMBLY

- Disassemble the transmission gears as shown in the illustration.



REASSEMBLY

Assemble the countershaft and driveshaft in the reverse order of disassembly. Pay attention to the 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, lightly coat moly paste or engine oil to the driveshaft and countershaft.
- * Before installing the oil seal, apply grease to the oil seal lip.

99000-25140: SUZUKI MOLY PASTE

99000-25030: SUZUKI SUPER GREASE "A"

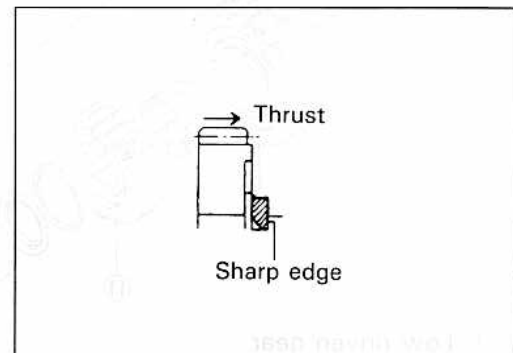
CAUTION:

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

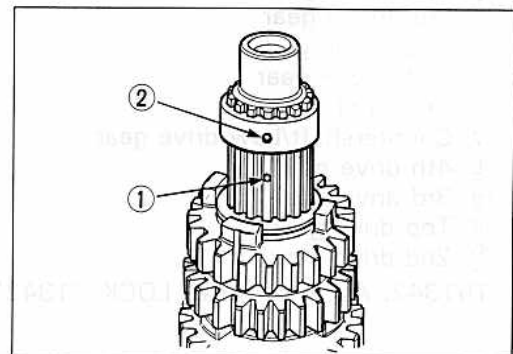
NOTE:

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

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



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



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 the shifting action.

Gearshift fork-Groove clearance

Standard : 0.10–0.30 mm (0.004–0.012 in)

Service Limit: 0.50 mm (0.020 in)

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

09900-20803: Thickness gauge

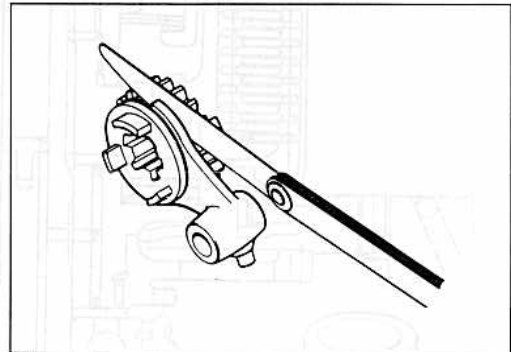
09900-20102: Vernier calipers

Shift fork groove width

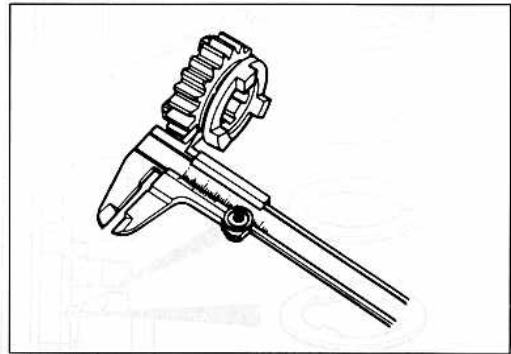
Standard: 5.00–5.10 mm (0.197–0.201 in)

Shift fork thickness

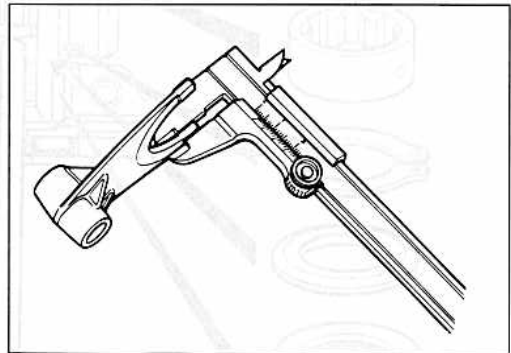
Standard: 4.80–4.90 mm (0.189–0.193 in)



Checking clearance



Checking groove width



Checking thickness

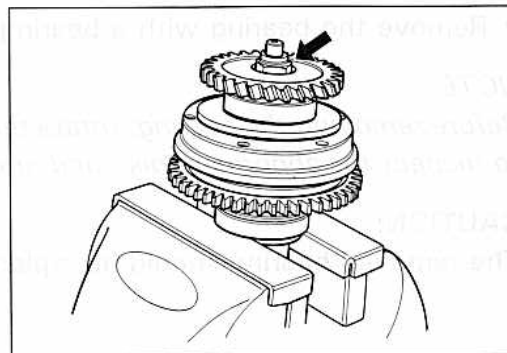
STARTER CLUTCH

DISASSEMBLY AND INSPECTION

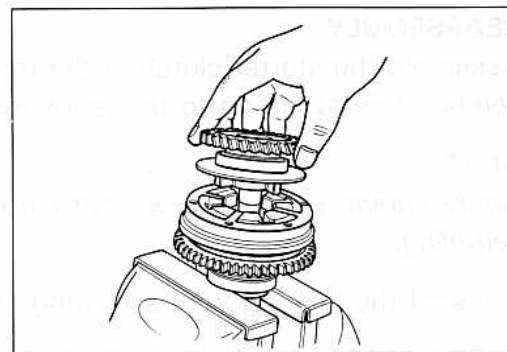
- Hold the starter clutch shaft to use a vise and appropriate pieces of soft metals, and remove the nut as shown in the Fig.

CAUTION:

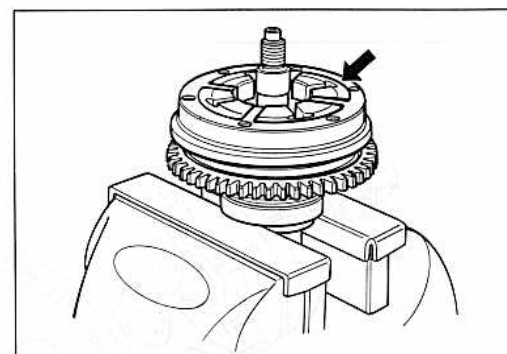
This is a left-hand thread nut.



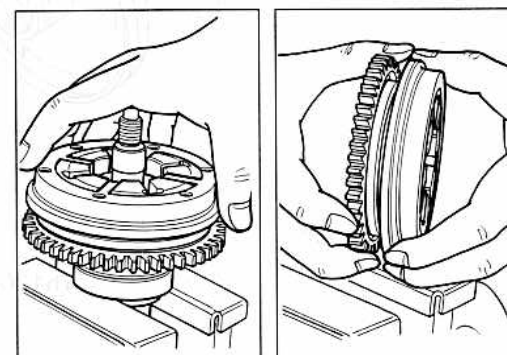
- Remove the generator driven gear assembly.



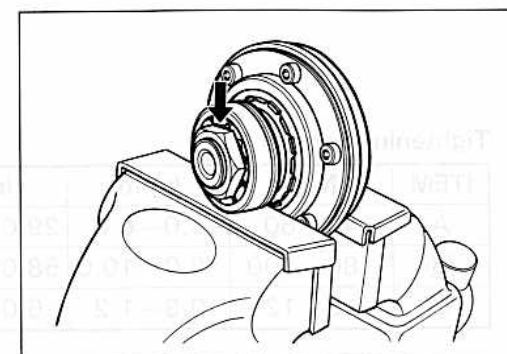
- Inspect the dampers for wear and damage. If any defects are found, replace the dampers as a set.



- Remove the starter clutch and its driven gear.
- Remove the driven gear from the starter clutch.



- Install the starter clutch onto the starter clutch shaft and hold the starter clutch to use a vise and appropriate pieces of soft metals, and remove the nut.



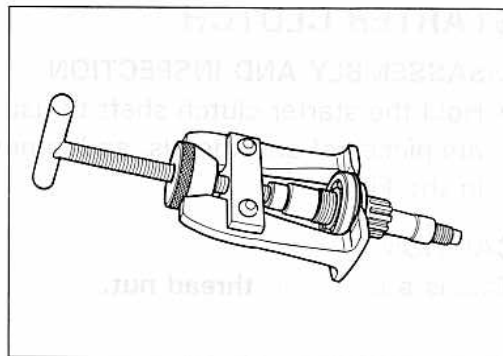
- Remove the bearing with a bearing puller.

NOTE:

Before removing the bearing, rotate the outer race by hand to inspect for abnormal noise and smooth rotation.

CAUTION:

The removed bearing should be replaced with a new one.



REASSEMBLY

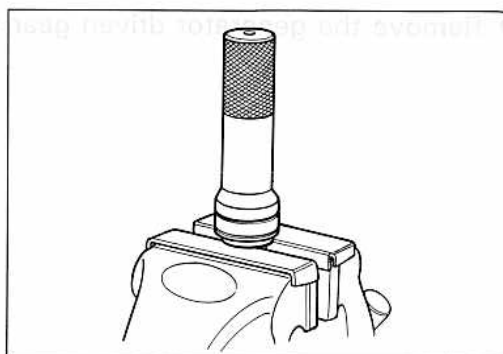
Assemble the starter clutch in the reverse order of disassembly. Pay attention to the following points:

NOTE:

Apply engine oil to each starter clutch part before reassembling.

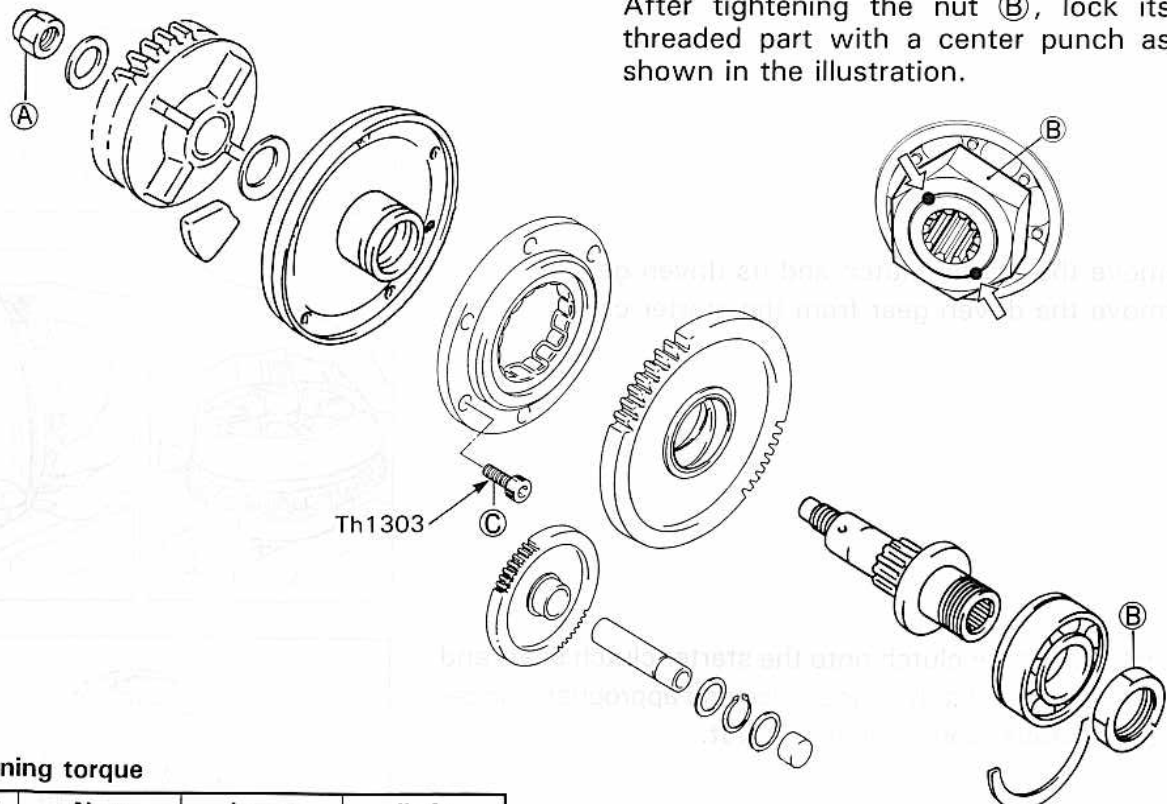
- Install the bearing with a bearing installer.

09951-16080: Bearing installer



Th1303: Apply THREAD LOCK SUPER "1303".

After tightening the nut (B), lock its threaded part with a center punch as shown in the illustration.



Tightening torque

ITEM	N·m	kg·m	lb·ft
(A)	40-60	4.0-6.0	29.0-43.5
(B)	80-100	8.0-10.0	58.0-72.5
(C)	8-12	0.8-1.2	6.0-8.5

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.

- Fit the O-rings (① , ② and ③) and dowel pins ④ to the correct positions, as shown in the Figs.

CAUTION:

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

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

NOTE:

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

99000-32050: THREAD LOCK "1342"

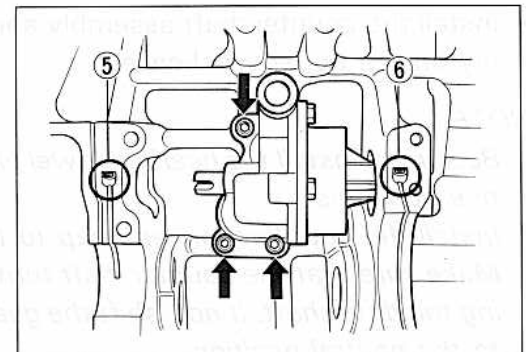
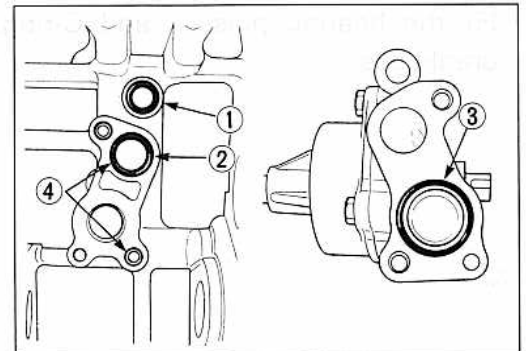
**Tightening torque: 8–12 N·m
(0.8–1.2 kg-m, 6.0–8.5 lb-ft)**

NOTE:

Check the oil jets (⑤ and ⑥) fitted on the lower crankcase for clogging.

Each oil jet can be distinguished by the numbers and colors.

- ⑤ Oil jet Number 12, Yellow
- ⑥ Oil jet Number 14, White



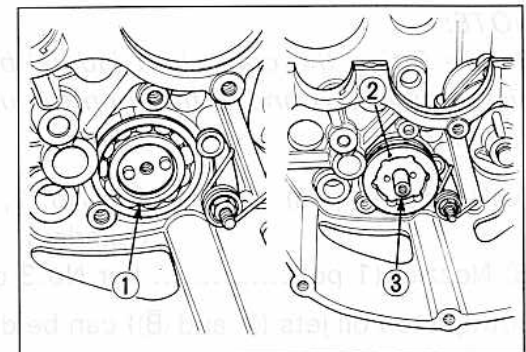
- Install the gearshift cam related parts.

- ① Washer
- ② Gearshift cam stopper plate
- ③ Bolt

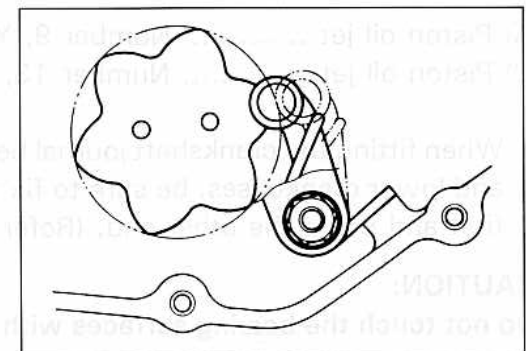
NOTE:

When installing the gearshift cam stopper plate ② , apply a small quantity of **THREAD LOCK "1342"** to its bolt ③ .

99000-32050: THREAD LOCK "1342"

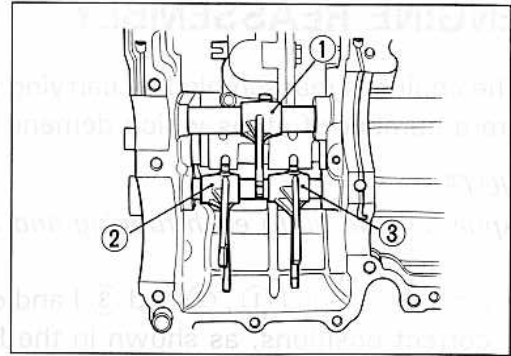


- Position the gearshift cam as shown in Fig. so that the gearshift forks and transmission can be installed easily.

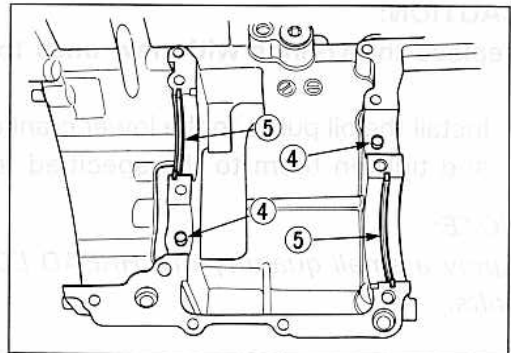


- Install the gearshift forks to the crankcase in the correct positions and directions.

- ① For 3rd drive gear
- ② For Top driven gear
- ③ For 4th driven gear



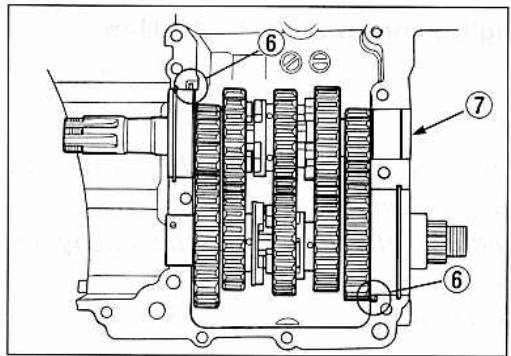
- Fit the bearing pins ④ and C-rings ⑤ on the upper crankcase.



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

NOTE:

- * Be sure to install the bearing dowel pins ⑥ in the respective positions.
- * Install the countershaft end cap to the position ⑦ .
- * Make sure that the countershaft turns freely while holding the driveshaft. If not, shift the gear which is engaged to the neutral position.



NOTE:

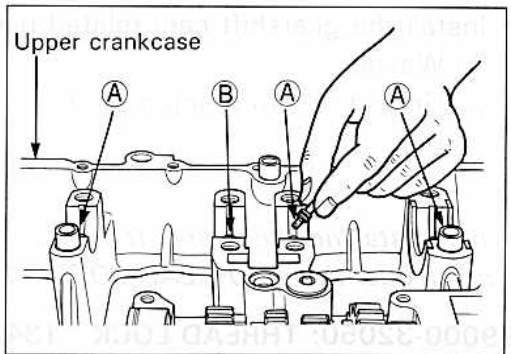
Before fitting the crankshaft journal bearings, check the piston oil jets (A) and (B) fitted on the upper crankcase for clogging.

- (A) Nozzle (3 pcs) For No. 1, No. 2 and No. 4 cylinders
- (B) Nozzle (1 pc)..... For No.3 cylinder

Both piston oil jets (A) and (B) can be distinguished by the numbers and colors.

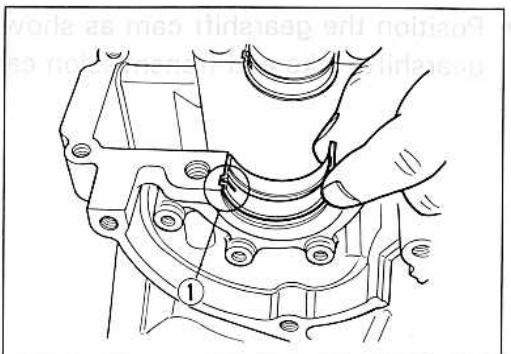
- (A) Piston oil jet Number 9, Yellow
- (B) Piston oil jet Number 13, White

- When fitting the crankshaft journal bearings to the upper and lower crankcases, be sure to fix the stopper part ① first and press the other end. (Refer to page 3-38.)



CAUTION:

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



- Install the cam chain guide ① and two dampers ② properly.

NOTE:

Be sure to face the arrow mark on the damper to the front and rear, not to the left and right.

- Fit the O-ring ③ .

CAUTION:

Replace the O-ring with a new one to prevent oil leakage.

- Before installing the crankshaft, apply SUZUKI MOLY PASTE to each journal bearing lightly.

99000-25140: SUZUKI MOLY PASTE

- 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. (Refer to page 3-40.)

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

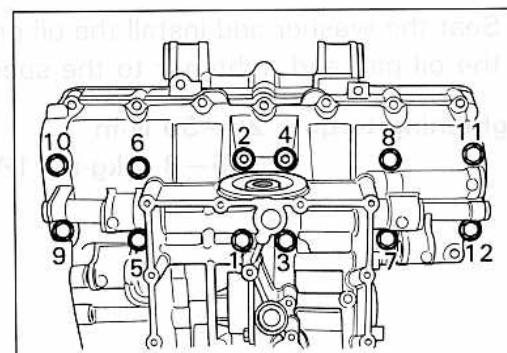
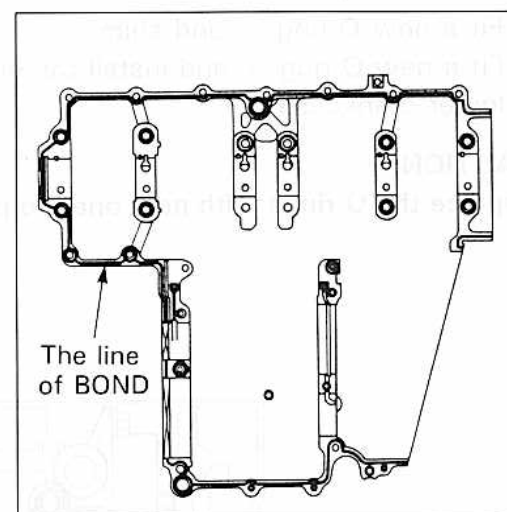
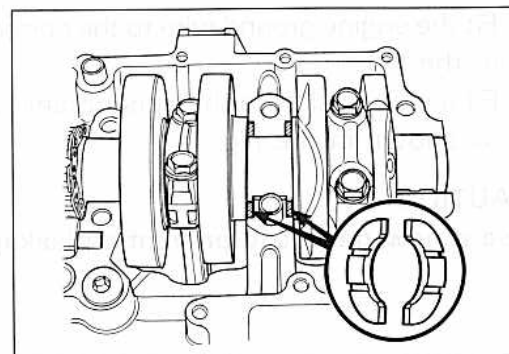
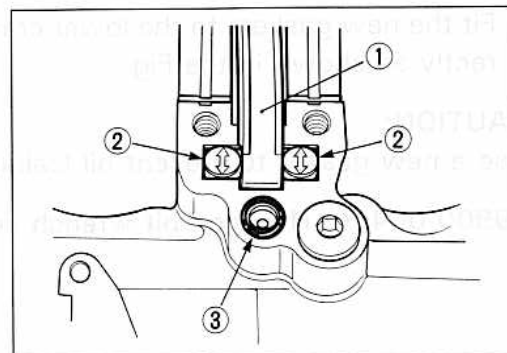
99104-31140: SUZUKI BOND NO. 1207B**NOTE:**

Use of SUZUKI BOND NO. 1207B is as follows:

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

- Tighten the crankshaft tightening 9-mm bolts in 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 tightening bolts to the specified torque values.

Tightening torque	Initial tightening			Final tightening		
	N·m	kg·m	lb·ft	N·m	kg·m	lb·ft
6 mm bolt	6	0.6	4.5	13	1.3	9.5
8 mm bolt	13	1.3	9.5	26	2.6	19.0
9 mm bolt	13	1.3	9.5	26	2.6	19.0

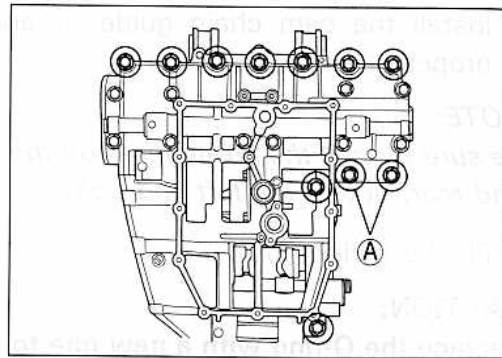


- Fit the new gaskets to the lower crankcase bolts (A) correctly as shown in the Fig.

CAUTION:

Use a new gasket to prevent oil leakage.

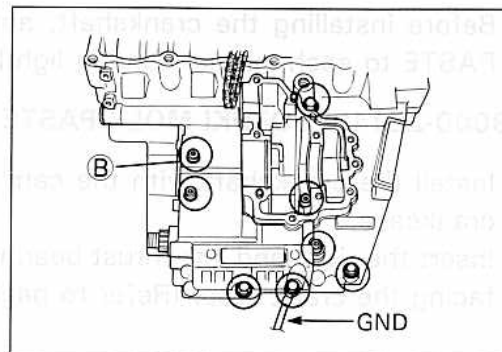
09900-00410: Hexagon bit wrench set



- Fit the engine ground wire to the correct position as shown in the Fig.
- Fit a new gasket to the upper crankcase bolt (B) correctly as shown in the Fig.

CAUTION:

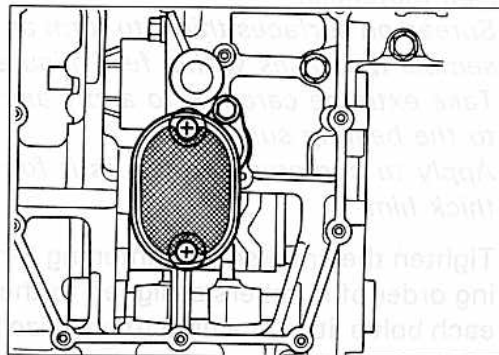
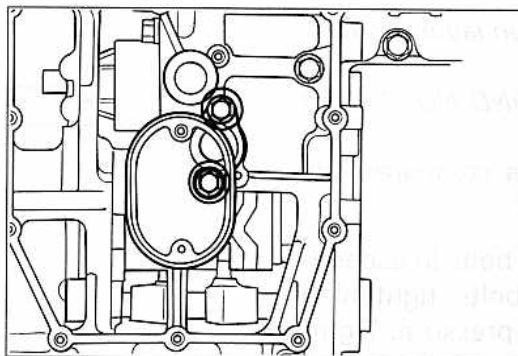
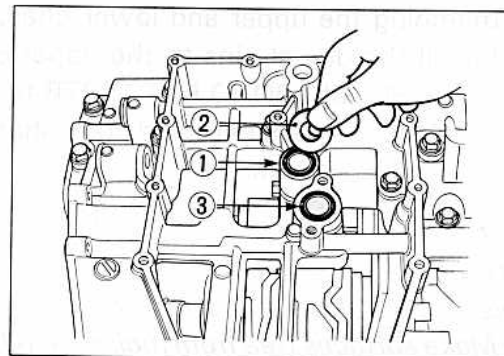
Use a new gasket to prevent oil leakage.



- Fit a new O-ring (1) and shim (2) .
- Fit a new O-ring (3) and install the oil sump filter to the lower crankcase.

CAUTION:

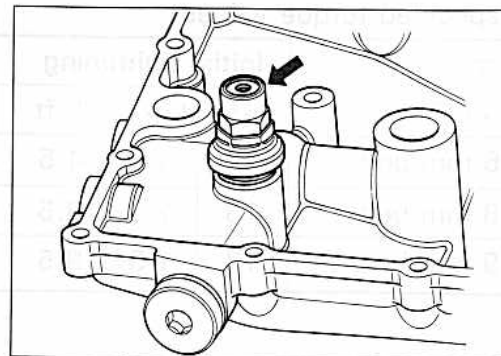
Replace the O-rings with new ones to prevent oil leakage.



- Seat the washer and install the oil pressure regulator to the oil pan and tighten it to the specified torque.

Tightening torque: 25–30 N·m

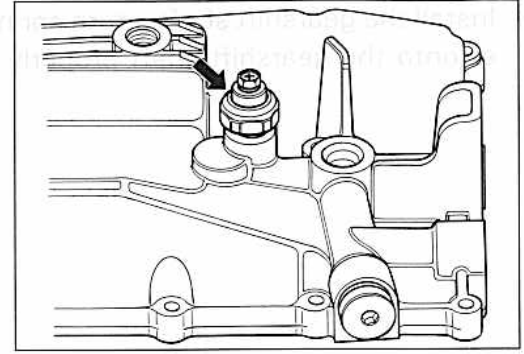
(2.5–3.0 kg-m, 18.0–21.5 lb-ft)



NOTE:

When replacing the oil pressure switch, apply SUZUKI BOND NO. 1207B to its thread lightly.

99104-31140: SUZUKI BOND NO. 1207B



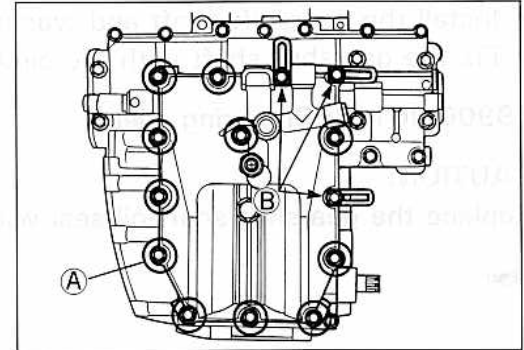
- Fit the gasket and install the oil pan. Tighten the oil pan bolts to the specified torque.

Tightening torque: 12–16 N·m

(1.2–1.6 kg-m, 8.5–11.5 lb-ft)

NOTE:

- * Fit a new gasket to the oil pan bolt (A) correctly as shown in the Fig.
- * Fit the lead wire clamps to the oil pan bolts (B) correctly as shown in the Fig.

**CAUTION:**

Use a new gasket to prevent oil leakage.

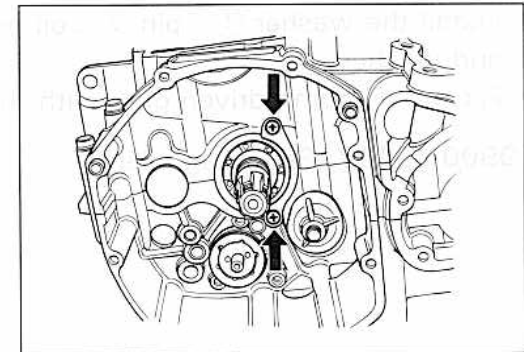
- Tighten the engine oil drain plug to the specified torque. (Refer to page 8-37.)
- Install the countershaft bearing retainer with two screws.

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 shifter. The large shoulder (A) must face to the outside as shown.



- Apply a small quantity of THREAD LOCK "1342" to the screws (1) and nut (2).

99000-32050: THREAD LOCK "1342"

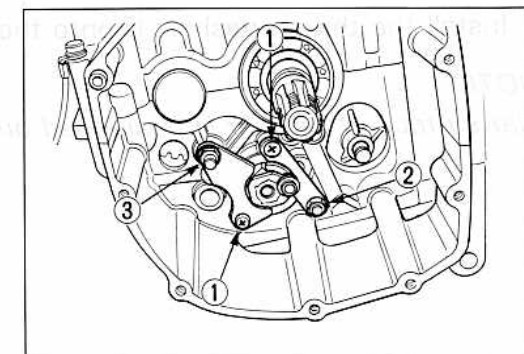
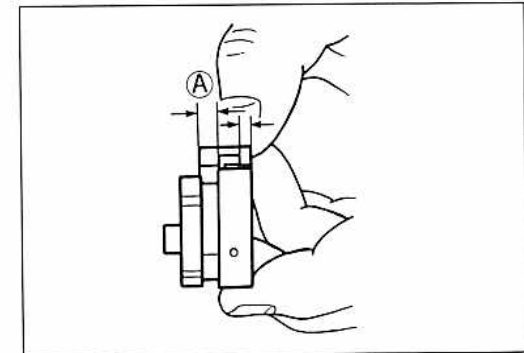
09900-09003: Impact driver set

- Apply a small quantity of THREAD LOCK SUPER "1303" to the gearshift arm stopper bolt (3) and tighten it to the specified torque.

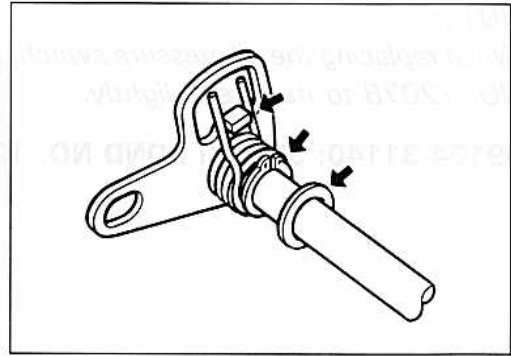
99000-32030: THREAD LOCK SUPER "1303"

Tightening torque: 15–23 N·m

(1.5–2.3 kg-m, 11.0–16.5 lb-ft)



- Install the gearshift shaft return spring, circlip and washer onto the gearshift shaft properly.

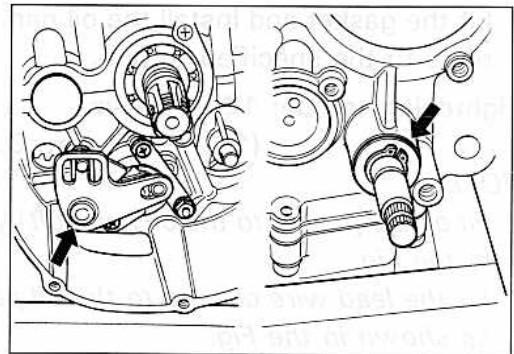


- Install the gearshift shaft and washer.
- Fix the gearshift shaft with the circlip.

09900-06107: Snap ring pliers

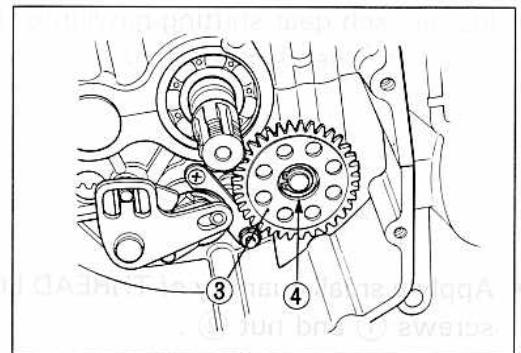
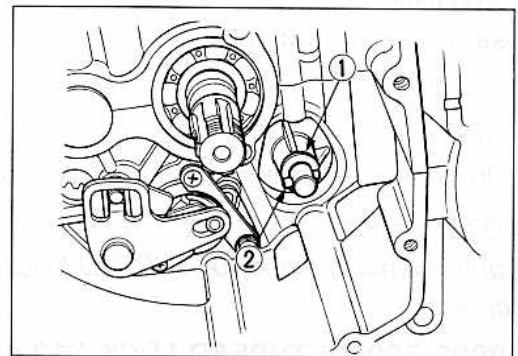
CAUTION:

Replace the gearshift shaft oil seal with a new one.



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

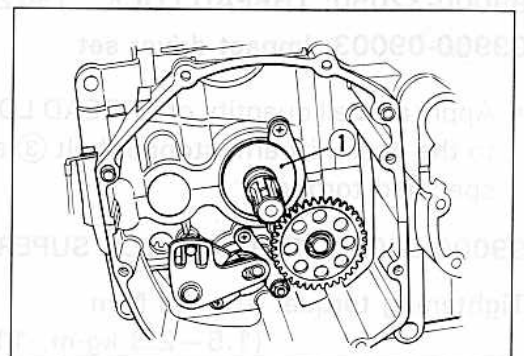
09900-06107: Snap ring pliers



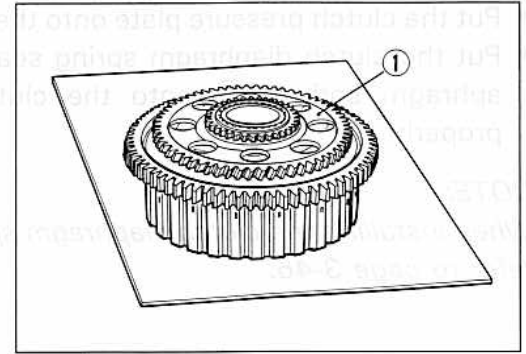
- Install the thrust washer ① onto the countershaft.

NOTE:

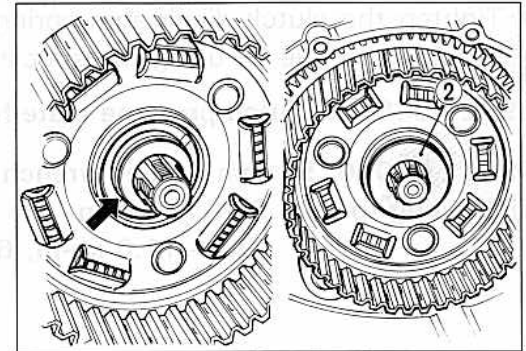
Flat surface of washer is positioned outside.



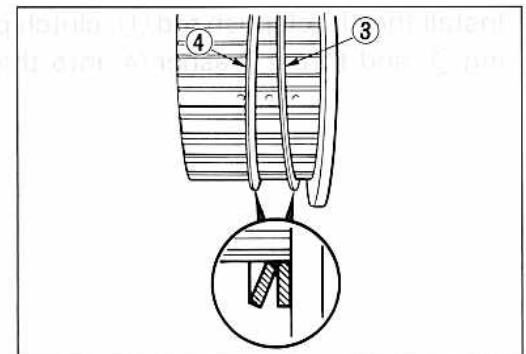
- Install the generator/oil pump drive gears ① onto the primary driven gear.



- 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 spring washer seat ③ and spring washer ④ onto the clutch sleeve hub correctly.

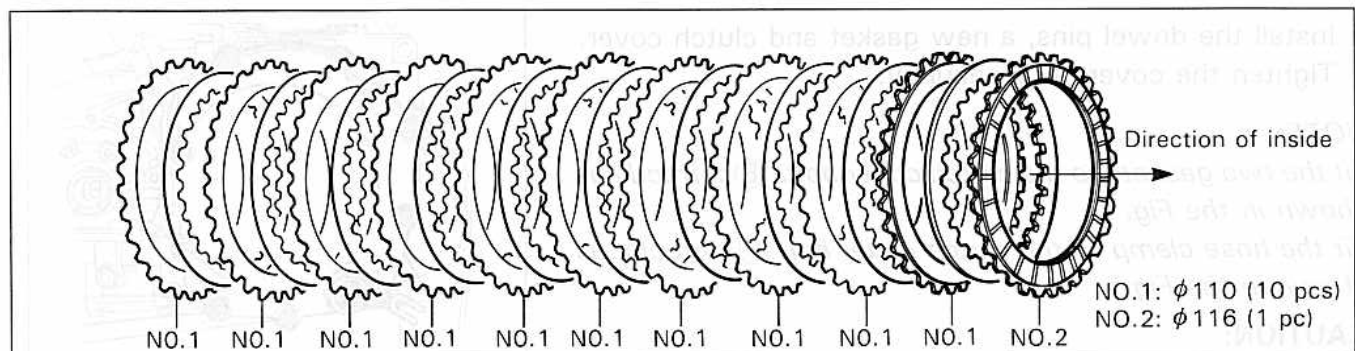
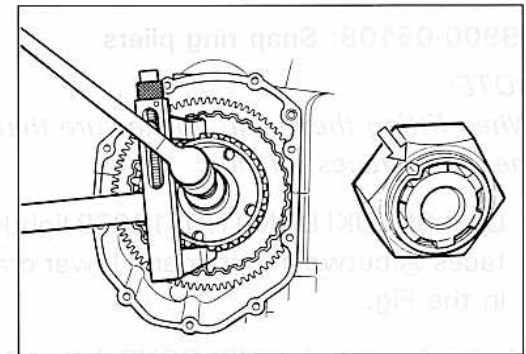


- Install the clutch sleeve hub onto the countershaft.
- Tighten the clutch sleeve hub nut to the specified torque by using the torque wrench and clutch sleeve hub holder.
- Lock the clutch sleeve hub nut with a center punch.

09920-53740: Clutch sleeve hub holder

**Tightening torque: 140–160 N·m
(14.0–16.0 kg·m, 101.5–115.5 lb-ft)**

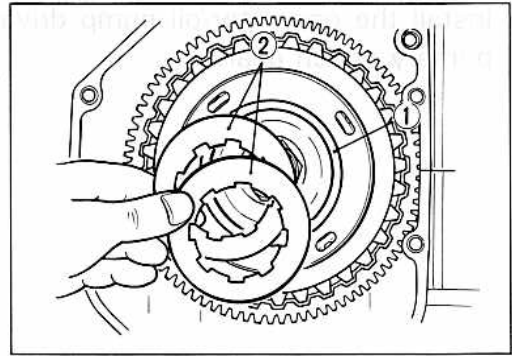
- Insert the clutch drive plates and driven plates one by one into the clutch sleeve hub in the prescribed order, drive plate first. No. 1 and No. 2 drive plates can be distinguished by the inside diameters.



- Put the clutch pressure plate onto the clutch sleeve hub.
- Put the clutch diaphragm spring seat ① and clutch diaphragm springs ② onto the clutch pressure plate properly.

NOTE:

When installing the clutch diaphragm springs and its seat, refer to page 3-46.



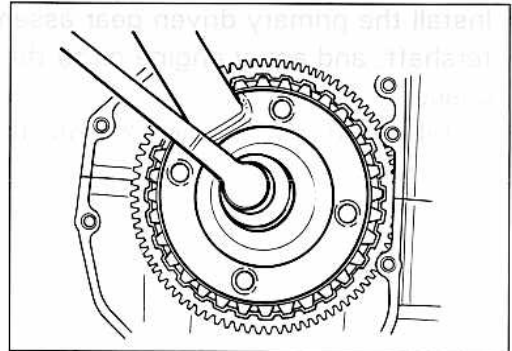
- Tighten the clutch diaphragm spring holder nut to the specified torque by using the special tools.

09920-34820: Clutch pressure plate holder

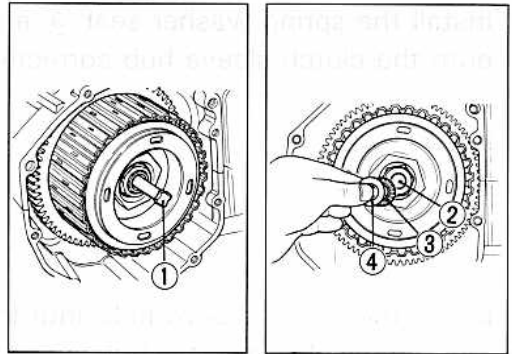
09941-58010: 50 mm socket wrench

Tightening torque: 90–110 N·m

(9.0–11.0 kg-m, 65.0–79.5 lb-ft)



- Install the clutch push rod ①, clutch push piece ②, bearing ③ and thrust washer ④ into the countershaft.



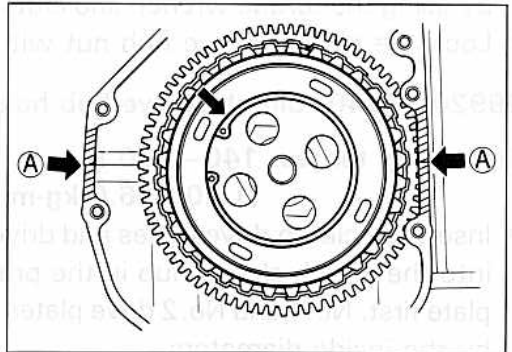
- Fix the clutch pressure plate lifter with the circlip.

09900-06108: Snap ring pliers

NOTE:

When fitting the circlip, make sure that the sharp edge of the circlip faces outside.

- Coat SUZUKI BOND NO. 1207B lightly to the mating surfaces ① between upper and lower crankcases as shown in the Fig.



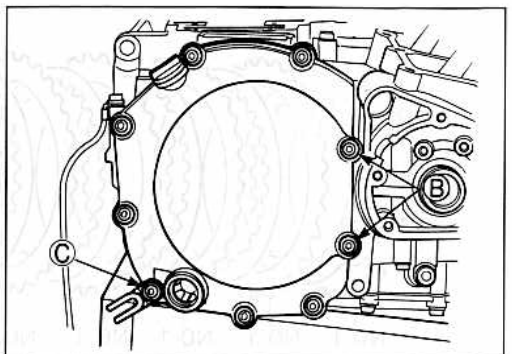
99104-31140: SUZUKI BOND NO. 1207B

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

NOTE:

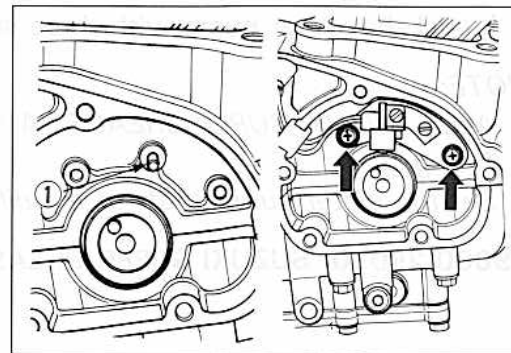
Fit the two gaskets to the clutch cover bolts ① correctly as shown in the Fig.

Fit the hose clamp to the clutch cover bolt ② correctly as shown in the Fig.

**CAUTION:**

Use only new gasket to prevent oil leakage.

- Put the signal generator dowel pin ① to the crankcase.
- Install the signal generator stator with two screws.

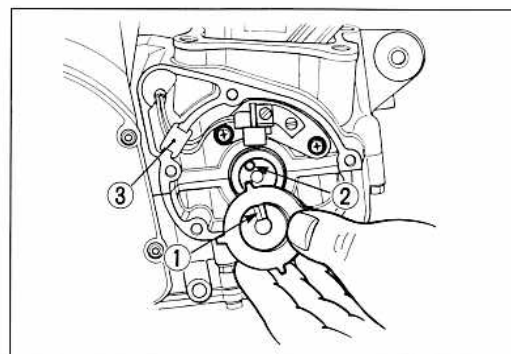


- Make sure to fit the slot ① on the back surface of the signal generator rotor over the locating pin ② at the end of crankshaft.

NOTE:

BOND NO. 1207B should be applied to the groove of the signal generator lead wire grommet ③ .

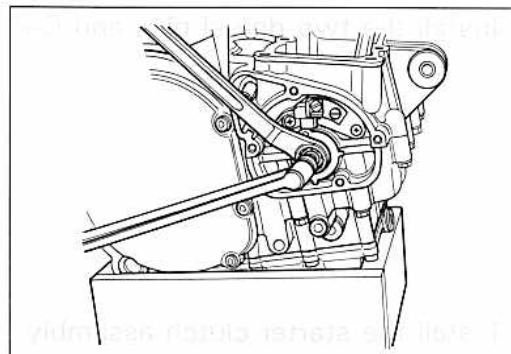
99104-31140: SUZUKI BOND NO. 1207B



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

09900-00410: Hexagon wrench set

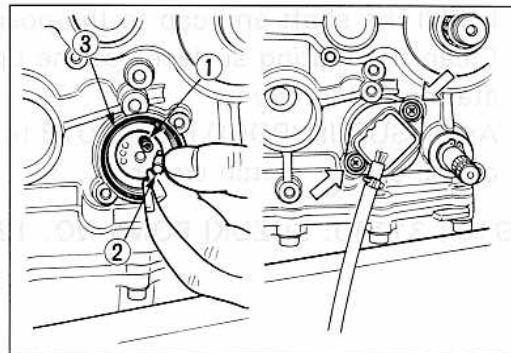
**Tightening torque: 23–26 N·m
(2.3–2.6 kg·m, 16.5–19.0 lb·ft)**



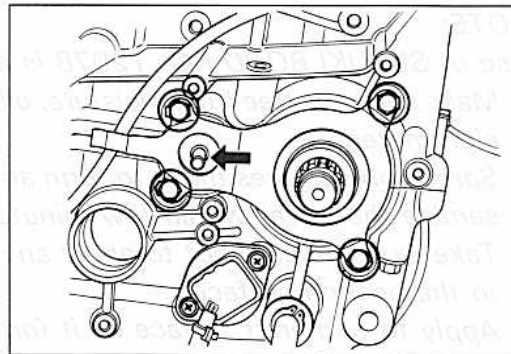
- Install the neutral position indicator switch with two screws.

NOTE:

When installing the neutral position indicator switch, be sure to locate the spring ① , switch contact ② and O-ring ③ .



- 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.

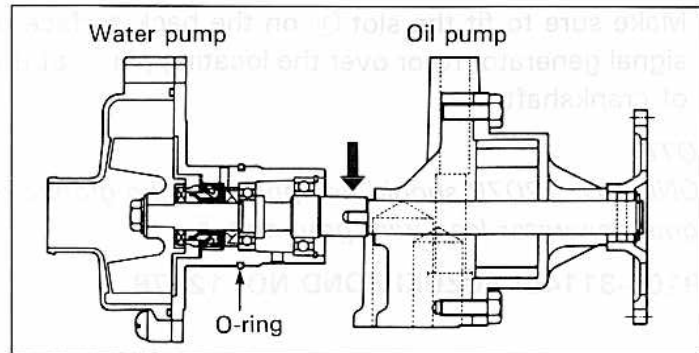
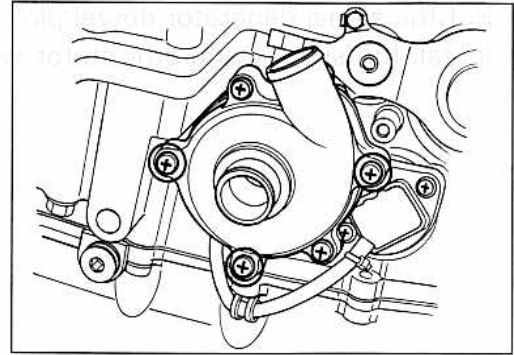


- Install the water pump with three screws.

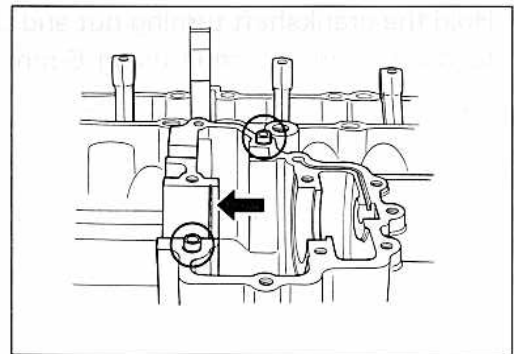
NOTE:

- * Apply SUZUKI SUPER GREASE "A" to the water pump O-ring.
- * Set the water pump shaft to the oil pump shaft.

99000-25030: SUZUKI SUPER GREASE "A"

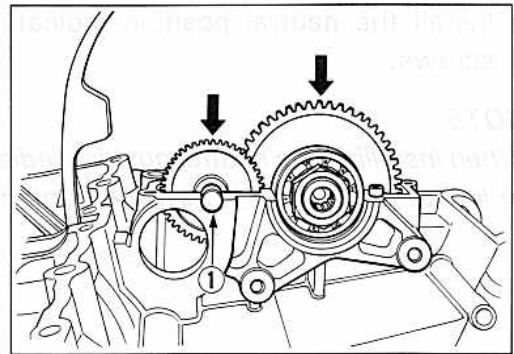


- Install the two dowel pins and C-ring.



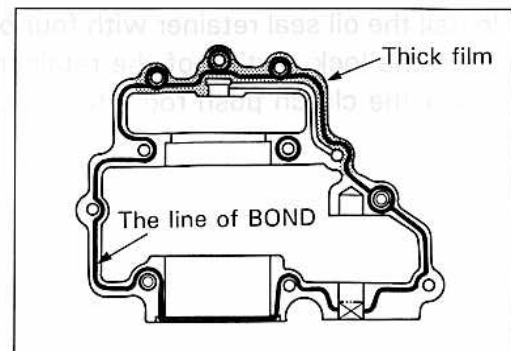
- Install the starter clutch assembly.
- Install the starter idle gear and its shaft.
- Install the shaft end cap to the position ①.
- Clean the mating surfaces of the upper crankcase and starter clutch cover.
- Apply SUZUKI BOND NO. 1207B to the mating surface of the starter clutch cover.

99104-31140: SUZUKI BOND NO. 1207B

**NOTE:**

Use of SUZUKI BOND NO. 1207B is as follows:

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



- Place the starter clutch cover and tighten its bolts to the specified torque.

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

NOTE:

- Fit the gaskets to the starter clutch cover bolt **(A)** and bolts **(B)** correctly as shown in the Fig.
- Fit the oil hose clamp to the starter clutch cover bolt **(C)** correctly as shown in the Fig.

Bolt **(A)**: Copper washer gasket

Bolt **(B)**: Steel washer with rubber gasket

CAUTION:

Use a new gasket to prevent oil leakage.

- Install the generator with three bolts.

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

NOTE:

Apply SUZUKI SUPER GREASE "A" to the generator O-ring.

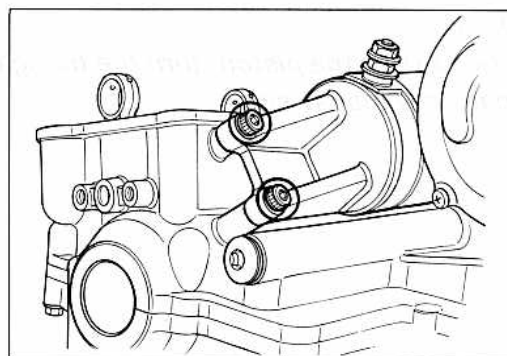
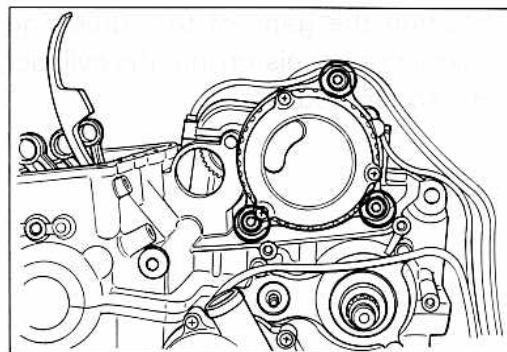
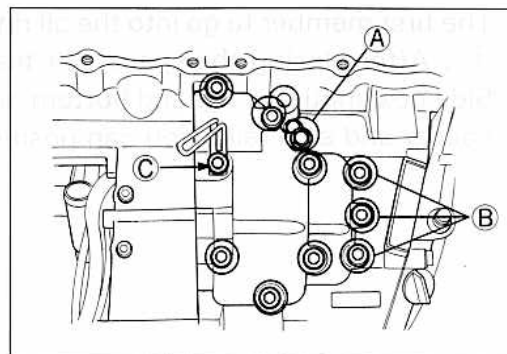
99000-25030: SUZUKI SUPER GREASE "A"

- Install the starter motor with two bolts.

Tightening torque: 4.0–7.0 N·m
(0.4–0.7 kg-m, 3.0–5.0 lb-ft)

NOTE:

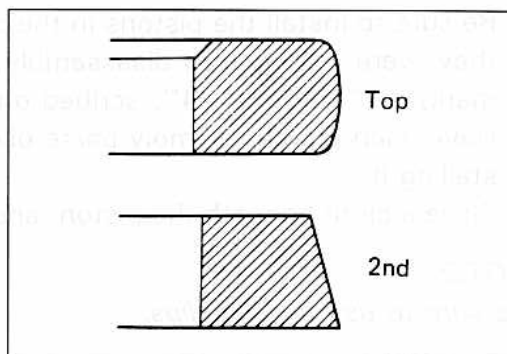
Apply SUZUKI SUPER GREASE "A" to the starter motor O-ring.



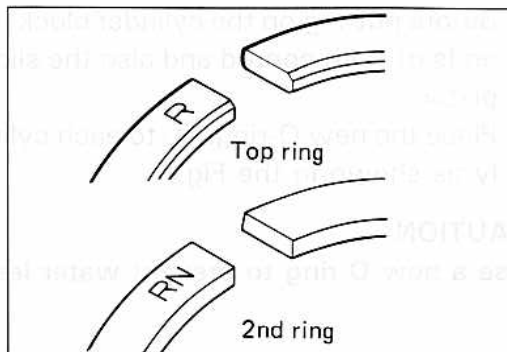
- Install the piston rings in the order of oil ring, 2nd ring and top ring.

NOTE:

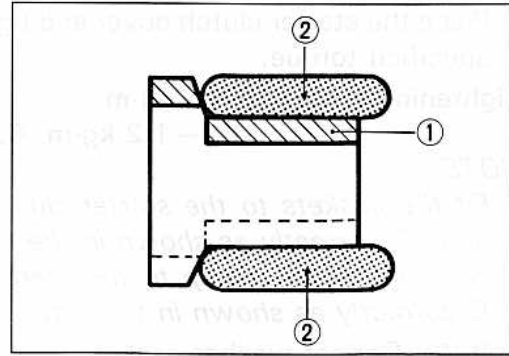
Top ring and 2nd ring differ in the shape of the ring face.



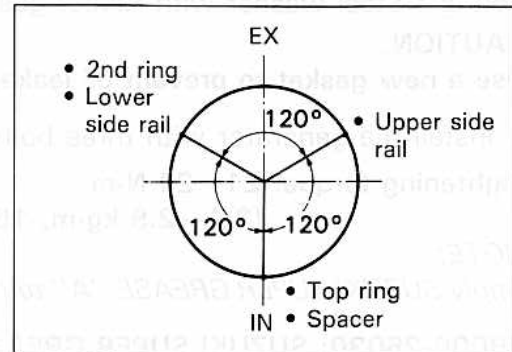
- Top and 2nd rings have a letter "R" or "RN" marked on the side. Be sure to bring the marked side to the top when fitting them to the piston.



- The first member to go into the oil ring groove is a spacer ① . After placing the 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.

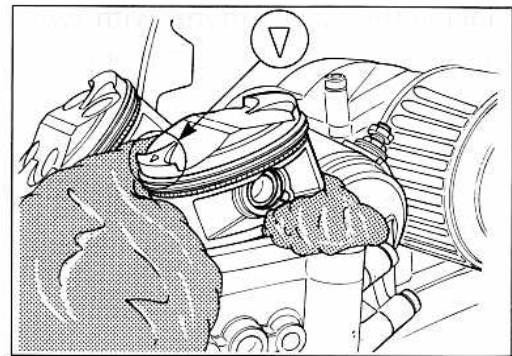


- Position the gaps of the three rings as shown. Before inserting each piston into the cylinder, check that the gaps are so located.



NOTE:

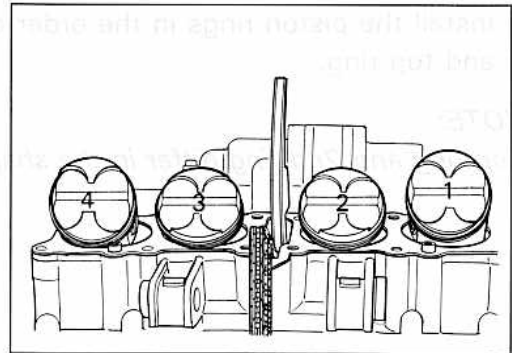
When fitting the piston, turn the triangle mark on the piston head to exhaust side.



- Be sure to install the pistons in the cylinder from which they were removed in disassembly, refer to the letter mark, "1" through "4", scribed on the piston.
- Have each piston pin moly paste oiled lightly before installing it.
- Place a cloth beneath the piston, and install the circlips.

NOTE:

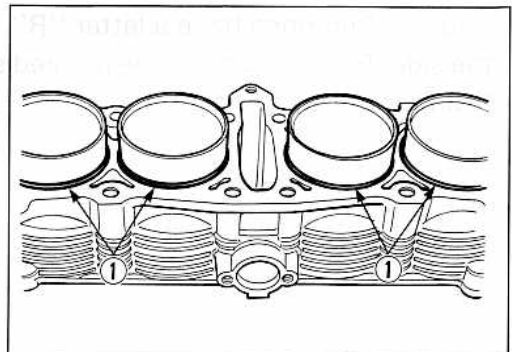
Be sure to use new circlips.



- 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 new O-rings ① to each cylinder sleeve correctly as shown in the Fig.

CAUTION:

Use a new O-ring to prevent water leakage.



- Place the dowel pins and new cylinder gasket on the crankcase.

CAUTION:

Use a new gasket to prevent oil leakage.

NOTE:

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

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

09916-74521: Holder body

09916-74540: Band

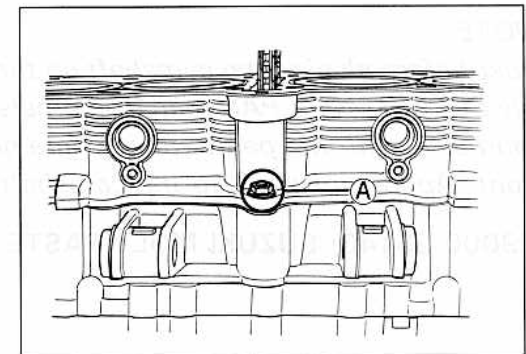
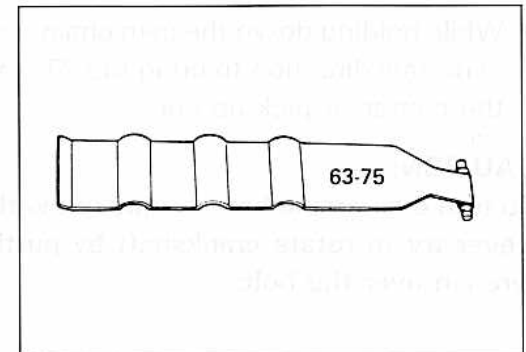
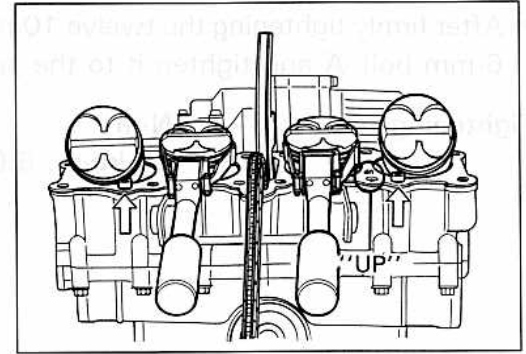
NOTE:

Do not overtighten the special tool bands or the pistons entry into the cylinders will be difficult.

- Tighten the cylinder nut **A** to the specified torque.

Tightening torque: 7–11 N·m

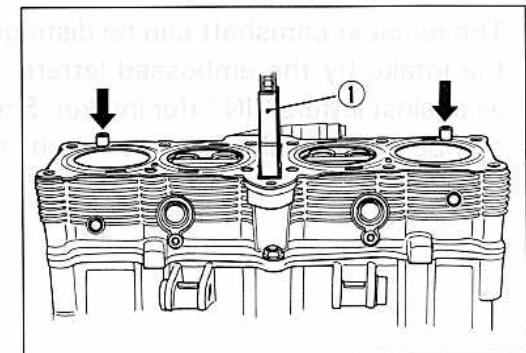
(0.7–1.1 kg·m, 5.0–8.0 lb-ft)



- Install the cam chain guide **1** properly.
- Place the dowel pins and new cylinder head gasket on the cylinder.

CAUTION:

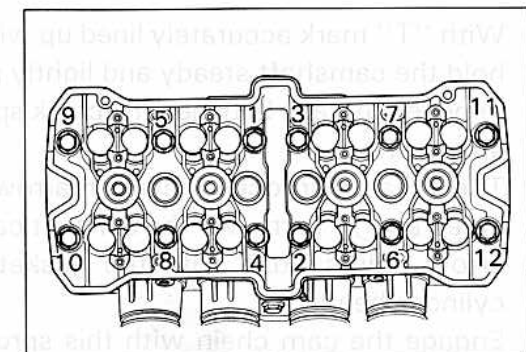
Use a new gasket to prevent gas leakage.



- Place the cylinder head on the cylinder block.
- Tighten the twelve 10-mm bolts to the specified with a torque wrench sequentially in the ascending order of numbers.

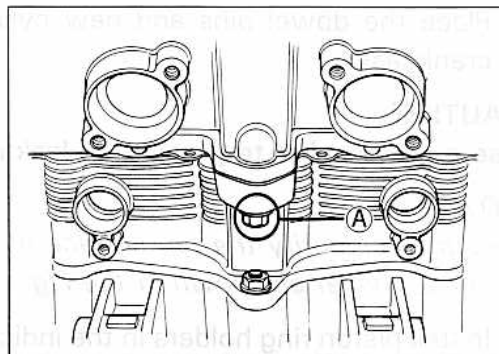
Tightening torque: 40–45 N·m

(4.0–4.5 kg·m, 29.0–32.5 lb-ft)



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

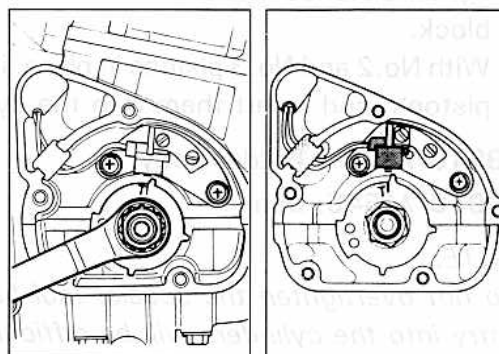
Tightening torque: 8–12 N·m
(0.8–1.2 kg-m, 6.0–8.5 lb-ft)



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

CAUTION:

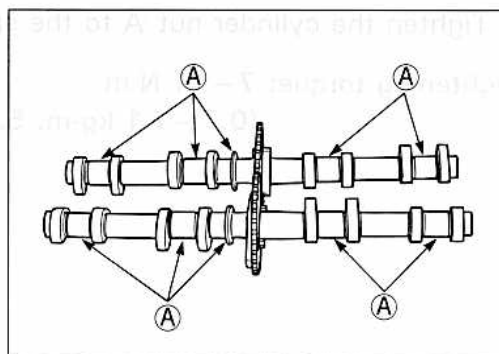
To turn over crankshaft, torque nut with a 19 mm wrench. Never try to rotate crankshaft by putting a 6 mm T-type wrench over the bolt.



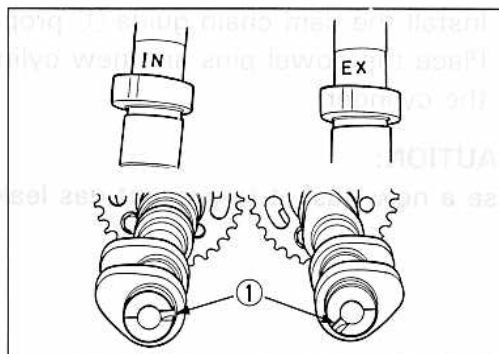
NOTE:

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

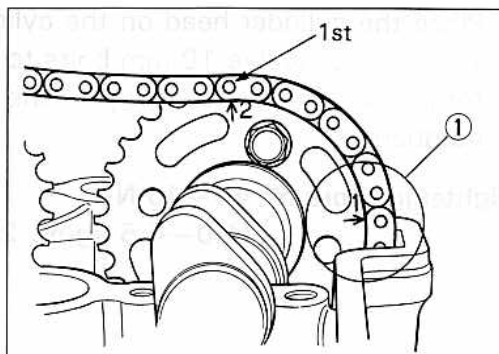
99000-25140: SUZUKI MOLY PASTE



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



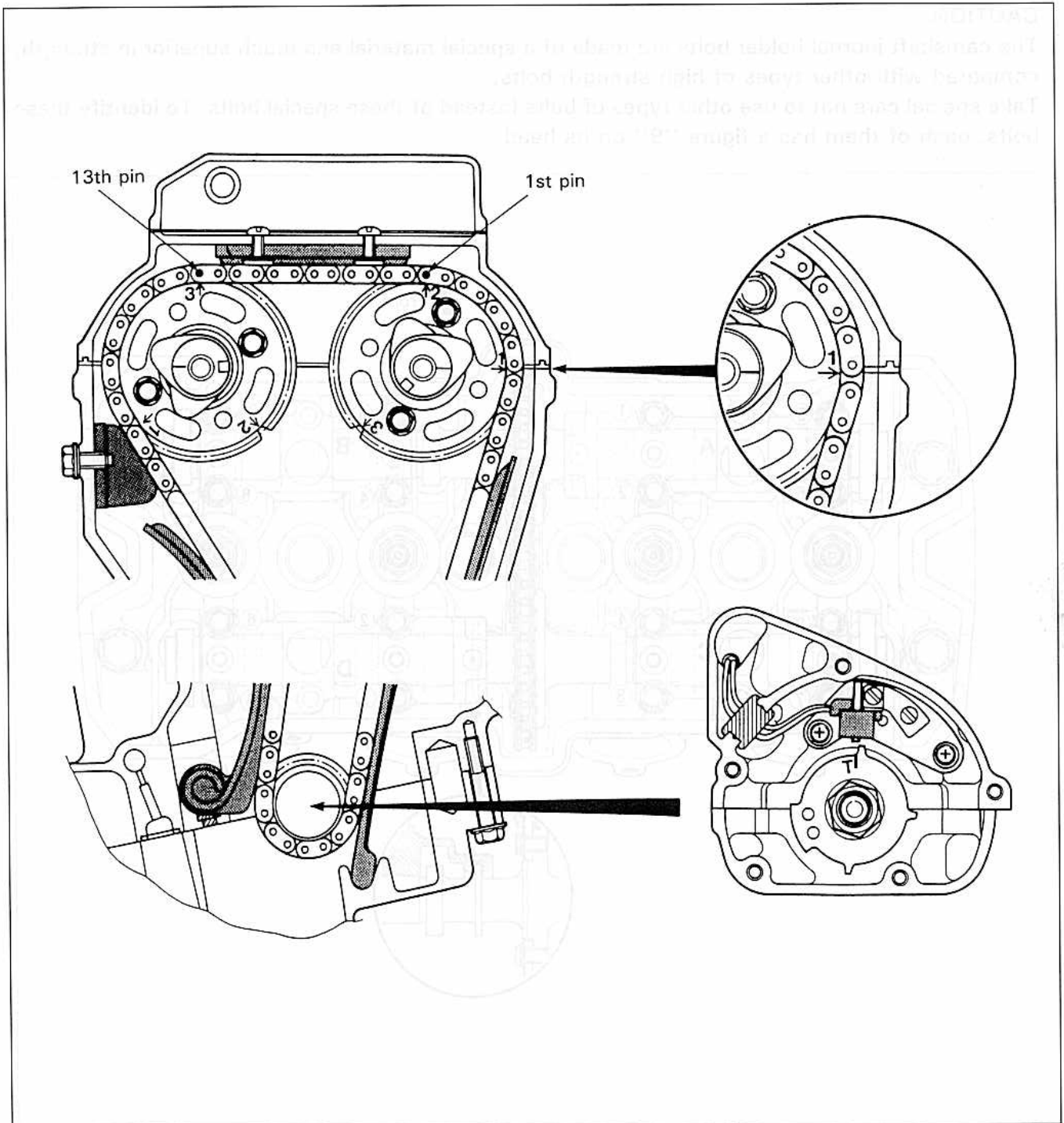
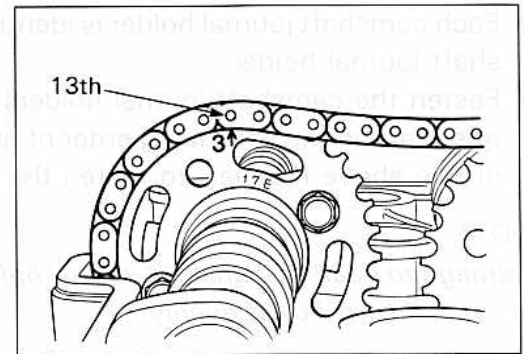
- With "T" mark accurately lined up with the timing mark, hold the camshaft steady and lightly pull up the chain to remove the slack between the crank sprocket and exhaust sprocket.
- The exhaust sprocket bears an arrow marked "1" indicated as (1). Turn over the exhaust camshaft so that the arrow points 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 13th roller pin. Engage the cam chain with intake sprocket, locating the 13th 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 camshaft journal holders 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.
- Fasten the camshaft journal holders evenly by tightening the camshaft journal holder bolts sequentially in the ascending order of numbers. (Try to equalize the pressure by shifting the wrench in this above manner, to fasten the shafts evenly.)

NOTE:

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

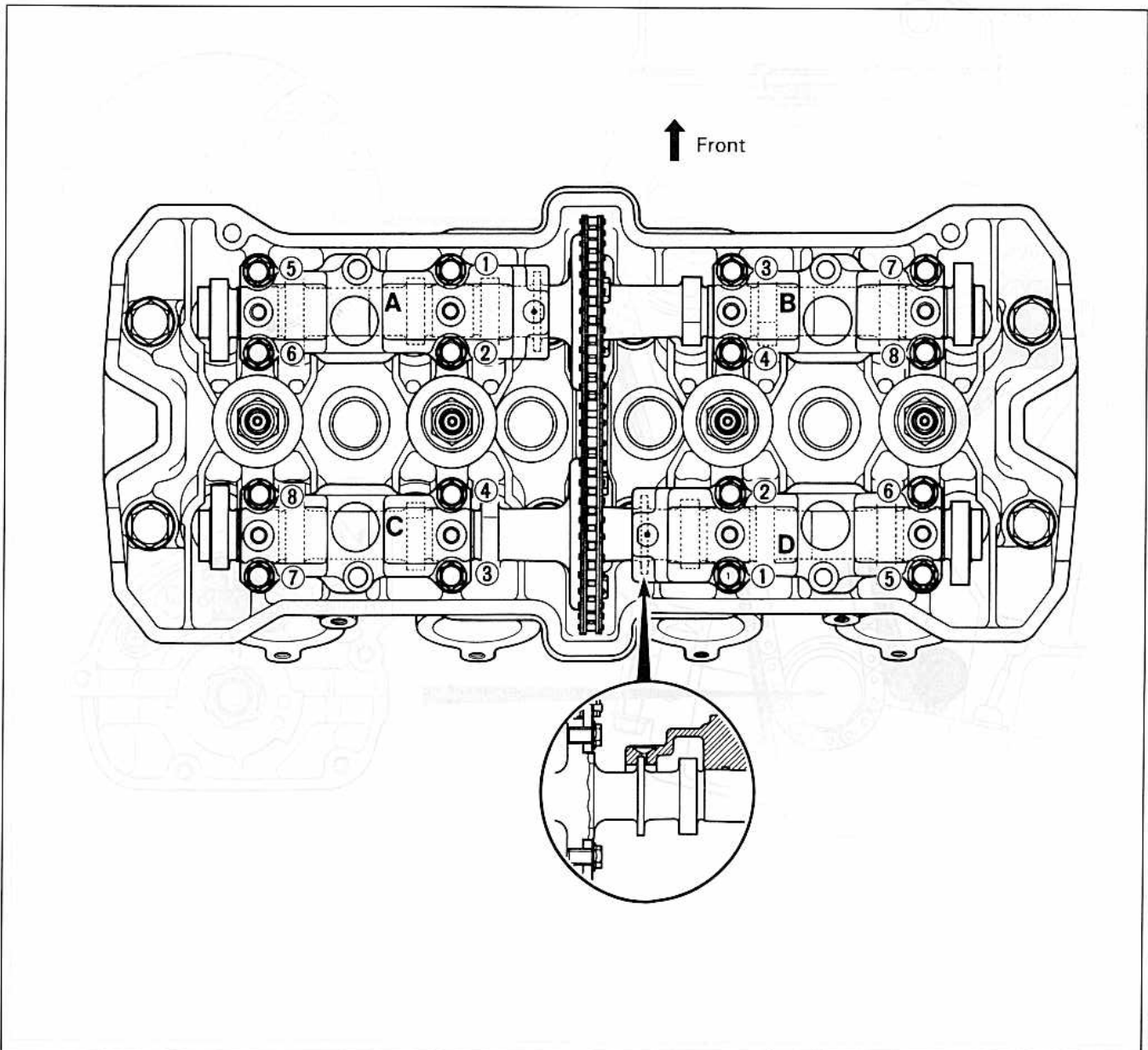
- Tighten the camshaft journal holder bolts to the specified torque.

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

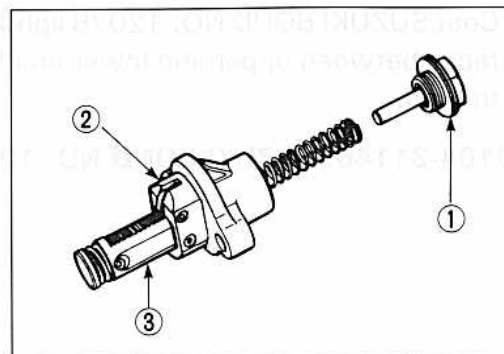
CAUTION:

The camshaft journal holder bolts are made of a special material and much superior in strength, compared with other types 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.



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

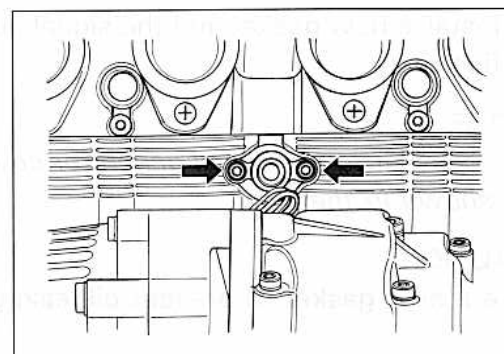


- Install a new gasket and the cam chain tensioner to the cylinder block with two bolts and tighten them to the specified torque.

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

NOTE:

Before installing the cam chain tensioner, turn the crankshaft clockwise to remove the cam chain slack between crank sprocket and exhaust sprocket.

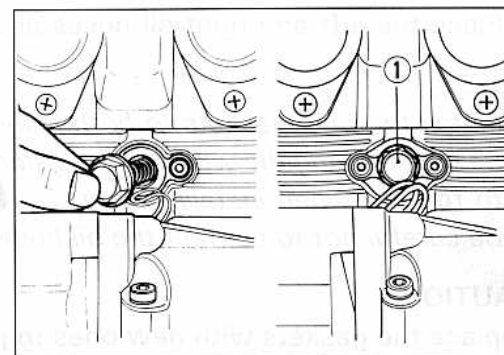


- Insert the spring into the cam chain tensioner and tighten the spring holder bolt ① to the specified torque.

Tightening torque: 30–40 N·m
(3.0–4.0 kg-m, 21.5–29.0 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.



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

NOTE:

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

CAUTION:

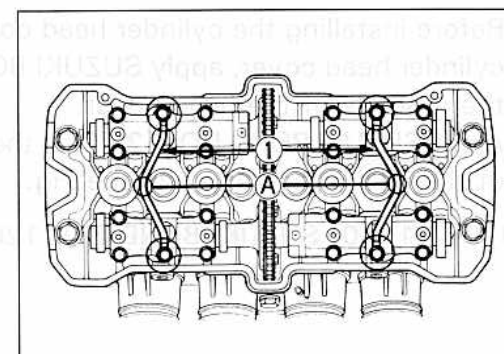
Be sure to check the tappet clearance. (Refer to page 2-4.)

- Place the oil pipes ① to the camshaft journal holders as shown in the Fig.

NOTE:

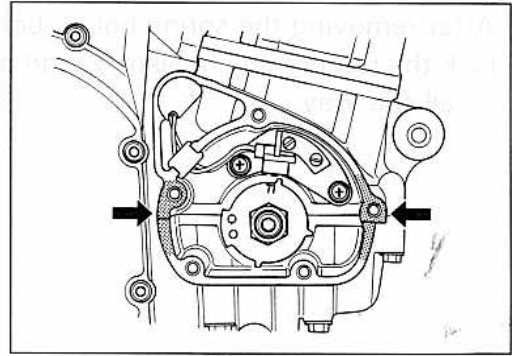
Be sure to bring the white painted side (A) on the oil pipes to the top when installing them to the camshaft journal holders.

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



- Coat SUZUKI BOND NO. 1207B lightly to the mating surfaces between upper and lower crankcases as shown in the Fig.

99104-31140: SUZUKI BOND NO. 1207B



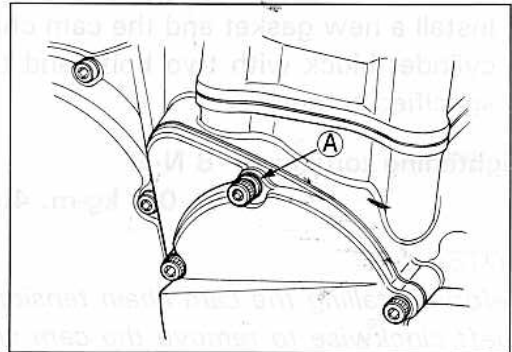
- Install a new gasket and the signal generator cover with five bolts.

NOTE:

Fit a gasket to the signal generator cover bolt (A) correctly as shown in the Fig.

CAUTION:

Use a new gasket to prevent oil leakage.



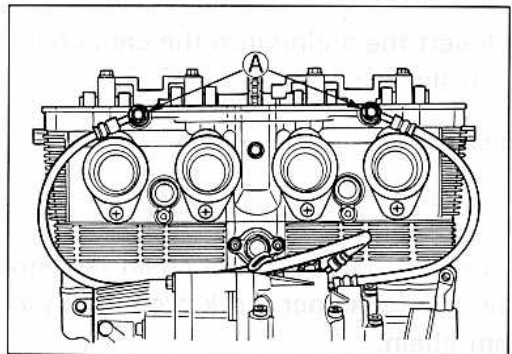
- Place the left and right oil hoses as shown in the Fig.

NOTE:

- * Install the new gaskets to both sides of the union bolt.
- * Be sure to bring the white painted side (1) on the oil hoses to the top when installing them.
- * Be careful not to contact the oil hose to the intake pipe.

CAUTION:

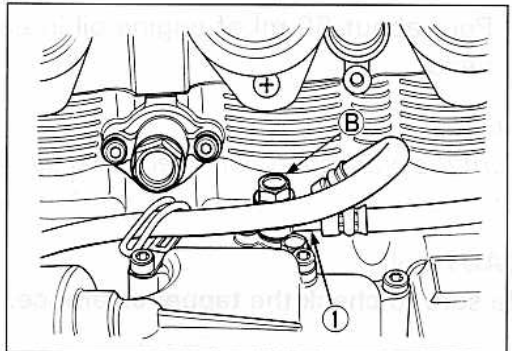
Replace the gaskets with new ones to prevent oil leakage.



Tightening torque

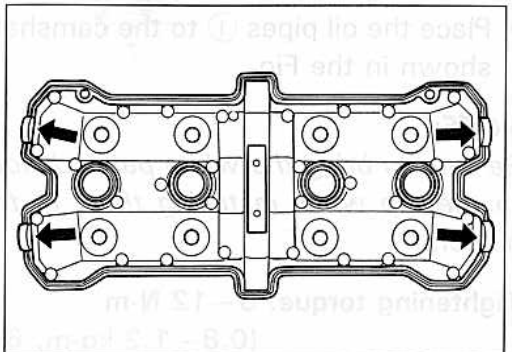
Upper side (A) : 20–23 N·m
(2.0–2.3 kg·m, 14.5–16.5 lb-ft)

Lower side (B) : 25–29 N·m
(2.5–2.9 kg·m, 18.0–21.0 lb-ft)



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

99104-31140: SUZUKI BOND NO. 1207B



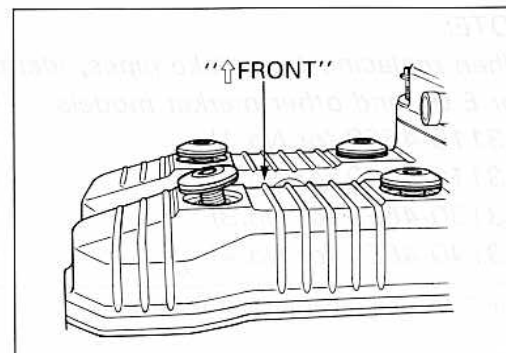
- Place the cylinder head cover on the cylinder head.
- Fit the eight gaskets to each head cover bolt.

NOTE:

Be sure to face the arrow mark on the cylinder head cover to the front side.

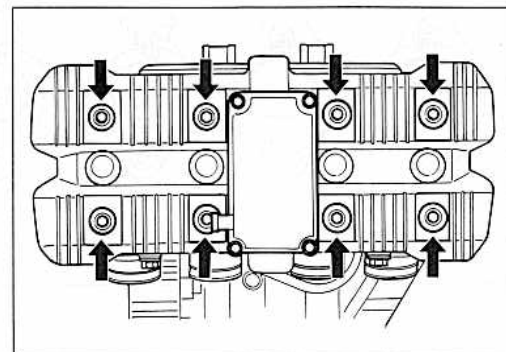
CAUTION:

Replace the gaskets with new ones to prevent oil leakage.

**Tightening torque**

Head cover bolt: 13–15 N·m

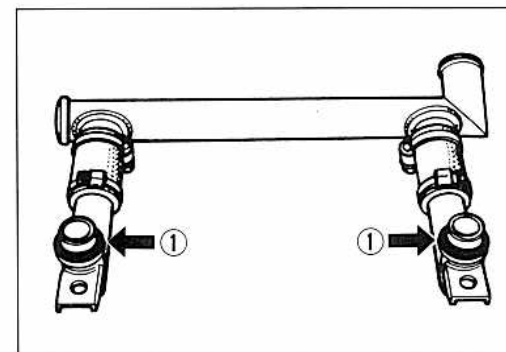
(1.3–1.5 kg-m, 9.5–11.0 lb-ft)



- Fit the new O-rings ① to the inlet and outlet water pipes.

NOTE:

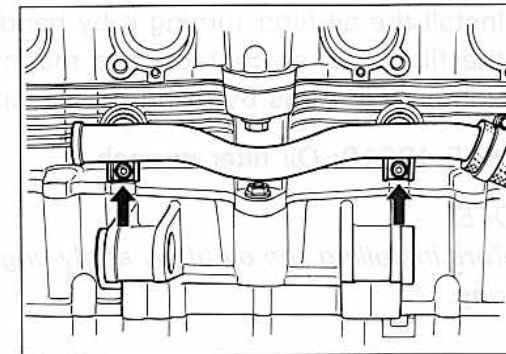
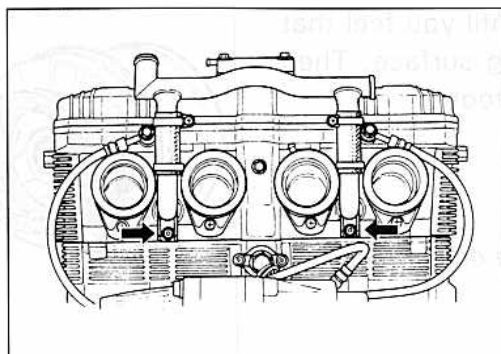
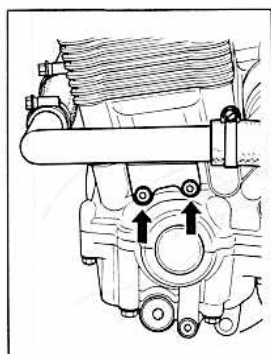
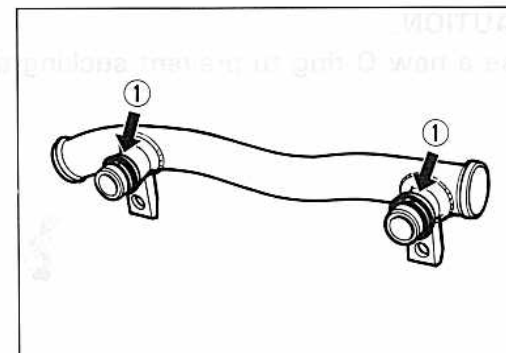
Before installing the water pipes to the cylinder block, apply engine oil lightly to each O-ring.



- Install the inlet and outlet water pipes to the cylinder block.
- Tighten the water pipe mounting bolts to the specified torque.

Tightening torque: 8–12 N·m

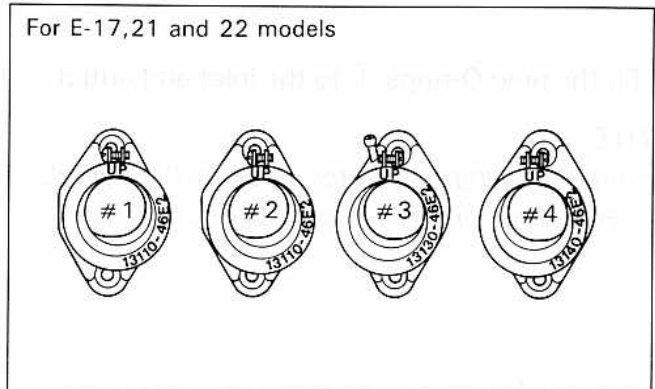
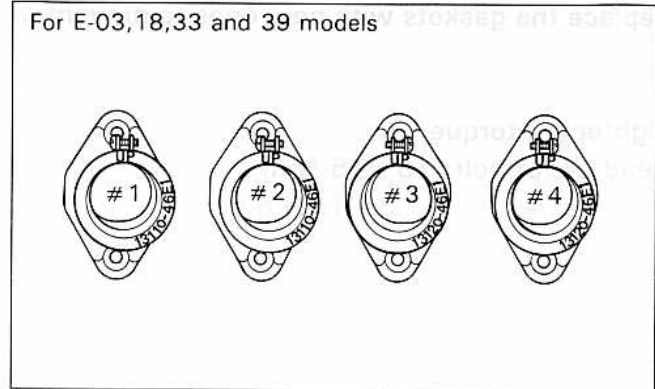
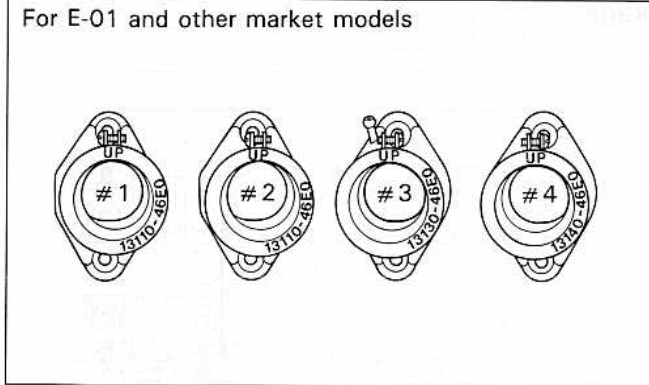
(0.8–1.2 kg-m, 6.0–8.5 lb-ft)



NOTE:

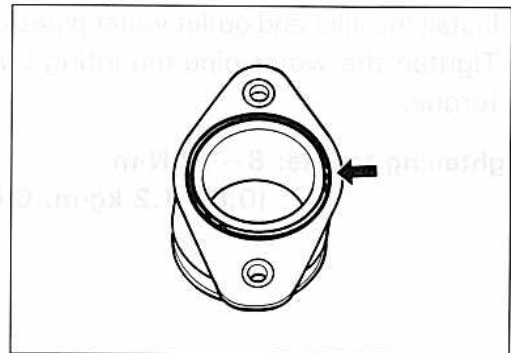
When replacing the intake pipes, identify the different intake pipes according to each I.D. code.

For E-01 and other market models	For E-03,18,33,39 models	For E-17,21,22 models
(13110-46E0 for No.1)	(13110-46E1 for No.1)	(13110-46E2 for No.1)
(13110-46E0 for No.2)	(13110-46E1 for No.2)	(13110-46E2 for No.2)
(13130-46E0 for No.3)	(13120-46E1 for No.3)	(13130-46E2 for No.3)
(13140-46E0 for No.4)	(13120-46E1 for No.4)	(13140-46E2 for No.4)



CAUTION:

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

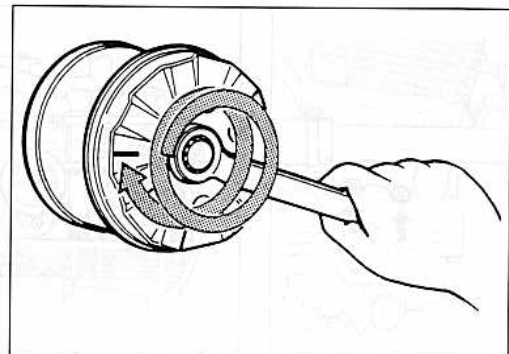


- Install the oil filter turning it by hand until you feel that the filter gasket contacts the mounting surface. Then tighten it 2 turns by using the special tool.

09915-40610: Oil filter wrench

NOTE:

Before installing the oil filter, apply engine oil lightly to its O-ring.



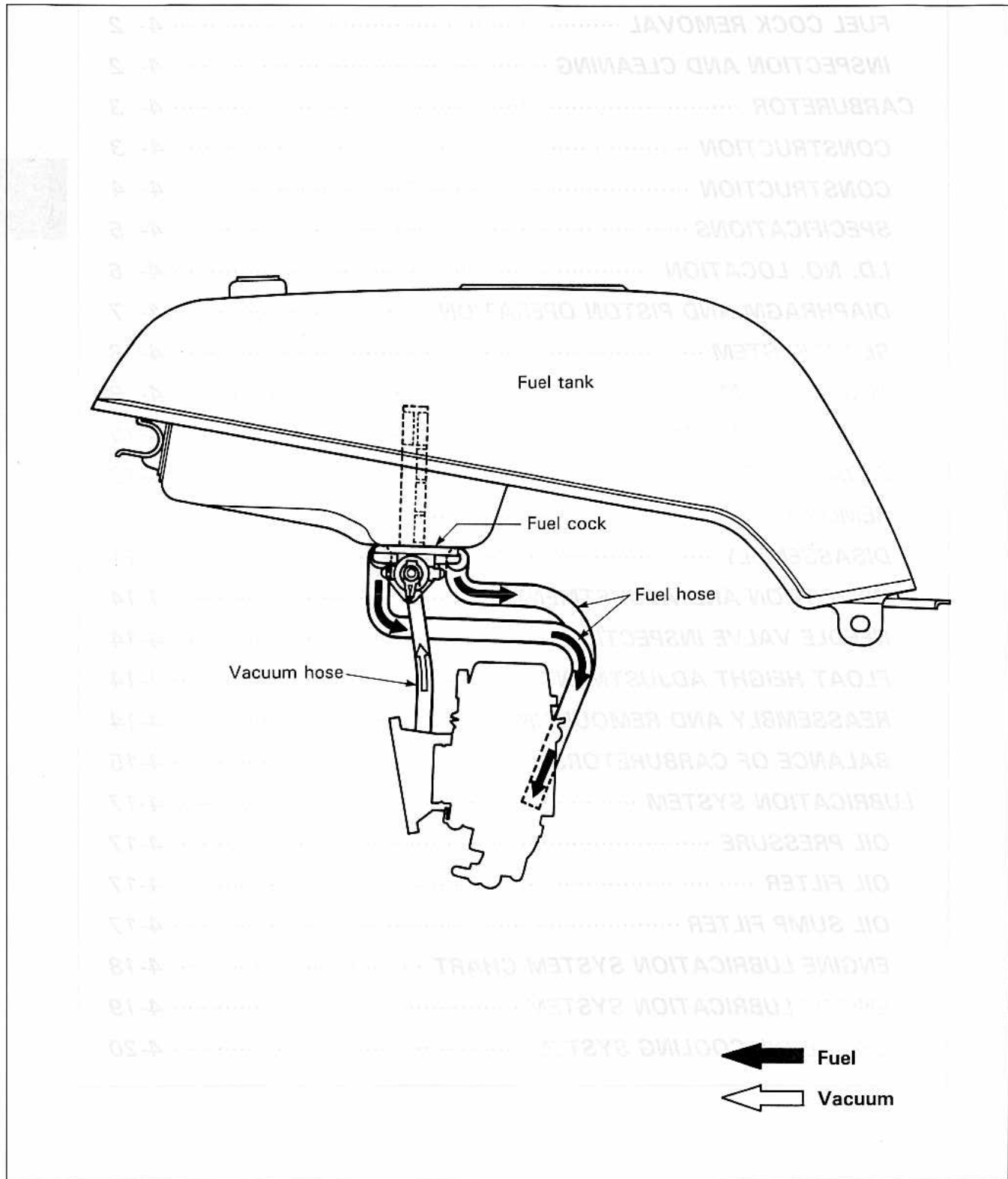
FUEL AND LUBRICATION SYSTEM

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FUEL SYSTEM

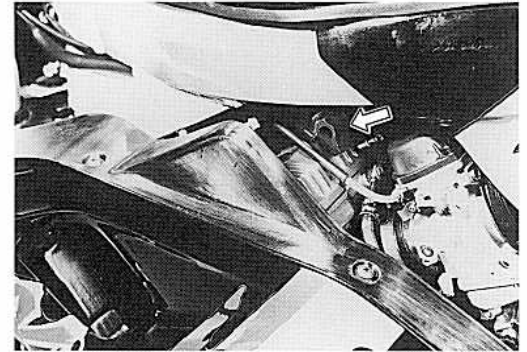
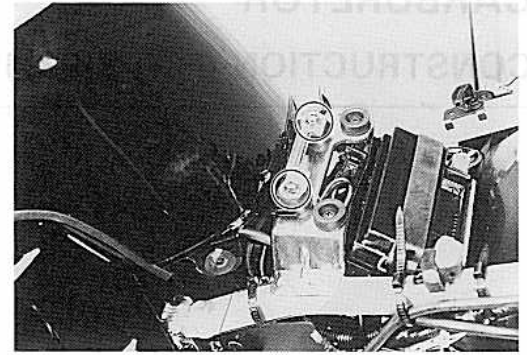
When turning the starter motor, a negative pressure is generated in the combustion chamber. This negative pressure draws on the fuel cock diaphragm, (through a passage way in the carburetor main bore) and vacuum hose. Due to this, the negative pressure increases behind the fuel cock diaphragm, until it is higher than this valves spring pressure. The fuel valve in the fuel cock is then forced to open (due to this diaphragm operation) and allows fuel to flow into the carburetor float chamber.



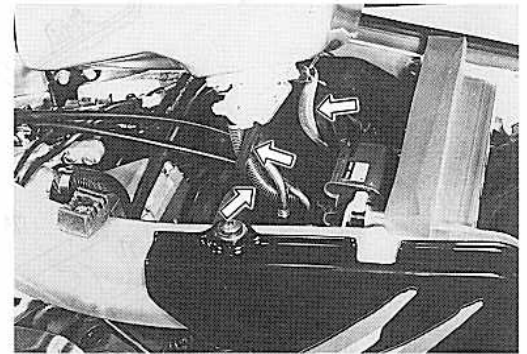
FUEL TANK AND FUEL COCK

FUEL TANK REMOVAL

- Remove the seats and frame cover assembly. (Refer to page 7-2.)
 - Remove the fuel tank mounting bolts.
-
- Turn the fuel cock to "ON" position and remove the fuel cock lever.



- Disconnect the fuel hoses and vacuum hose from the fuel cock.
- Disconnect the fuel level indicator switch lead wire coupler.
- Remove the fuel tank.



WARNING:

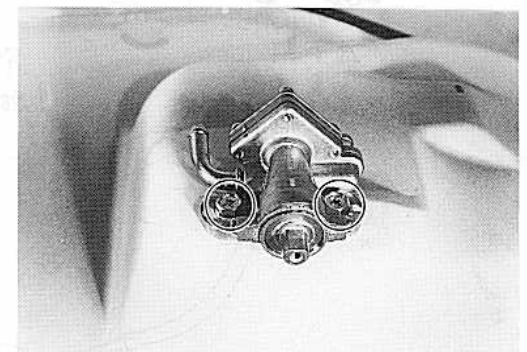
Gasoline is very explosive. Extreme care must be taken.

FUEL COCK REMOVAL

- Remove the fuel cock by removing the bolts.

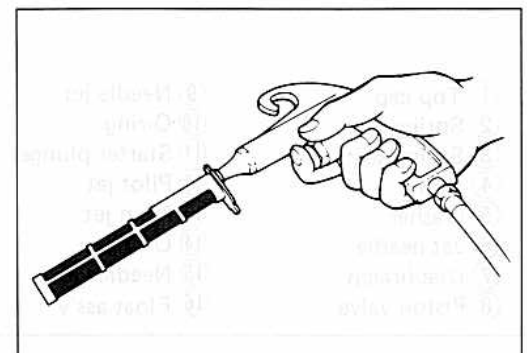
WARNING:

Gasoline is very explosive. Extreme care must be taken. Gaskets and O-ring must be replaced with new ones to prevent fuel leakage.



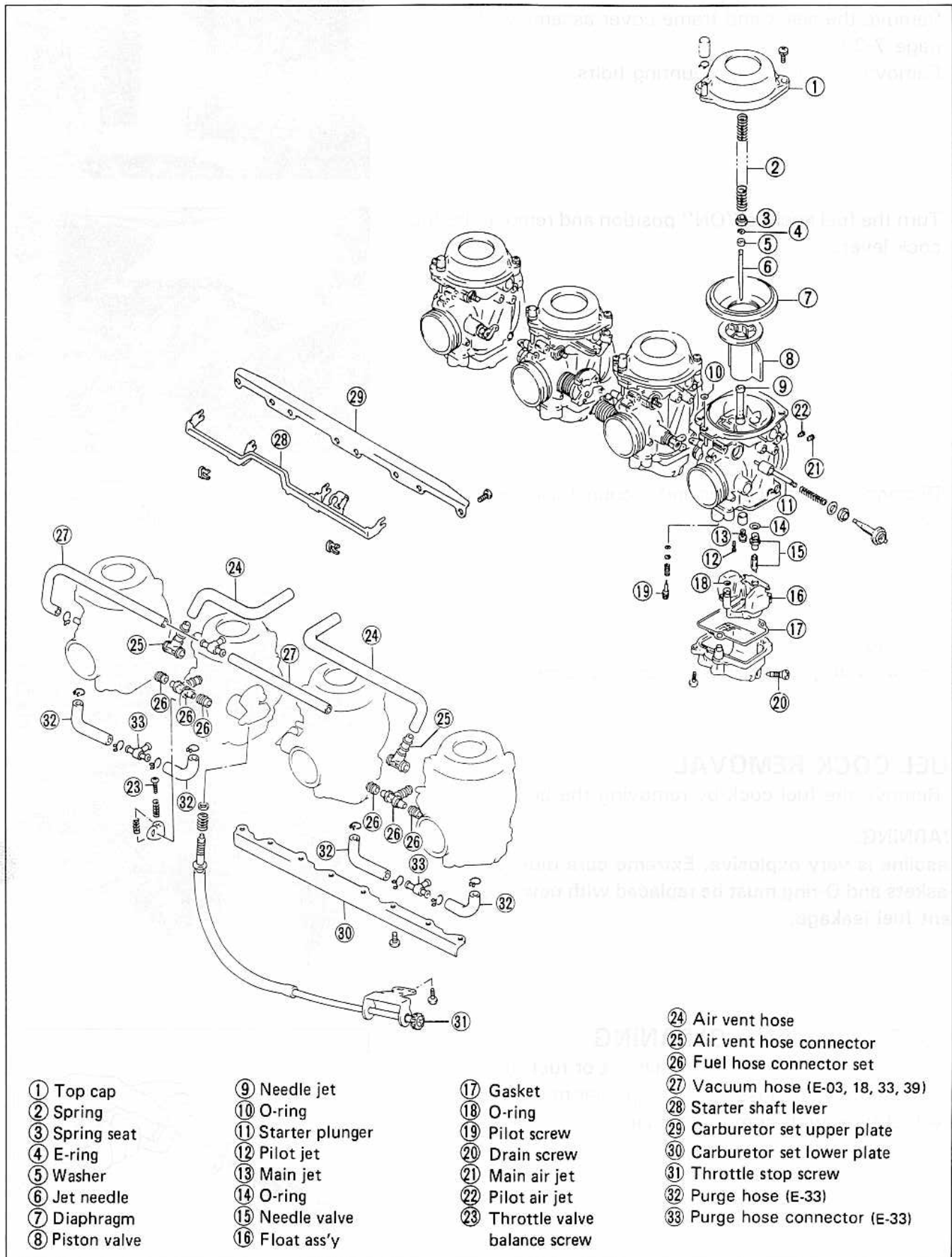
INSPECTION AND CLEANING

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



CARBURETOR

CONSTRUCTION (FOR E-03,18,33 AND 39 MODELS)



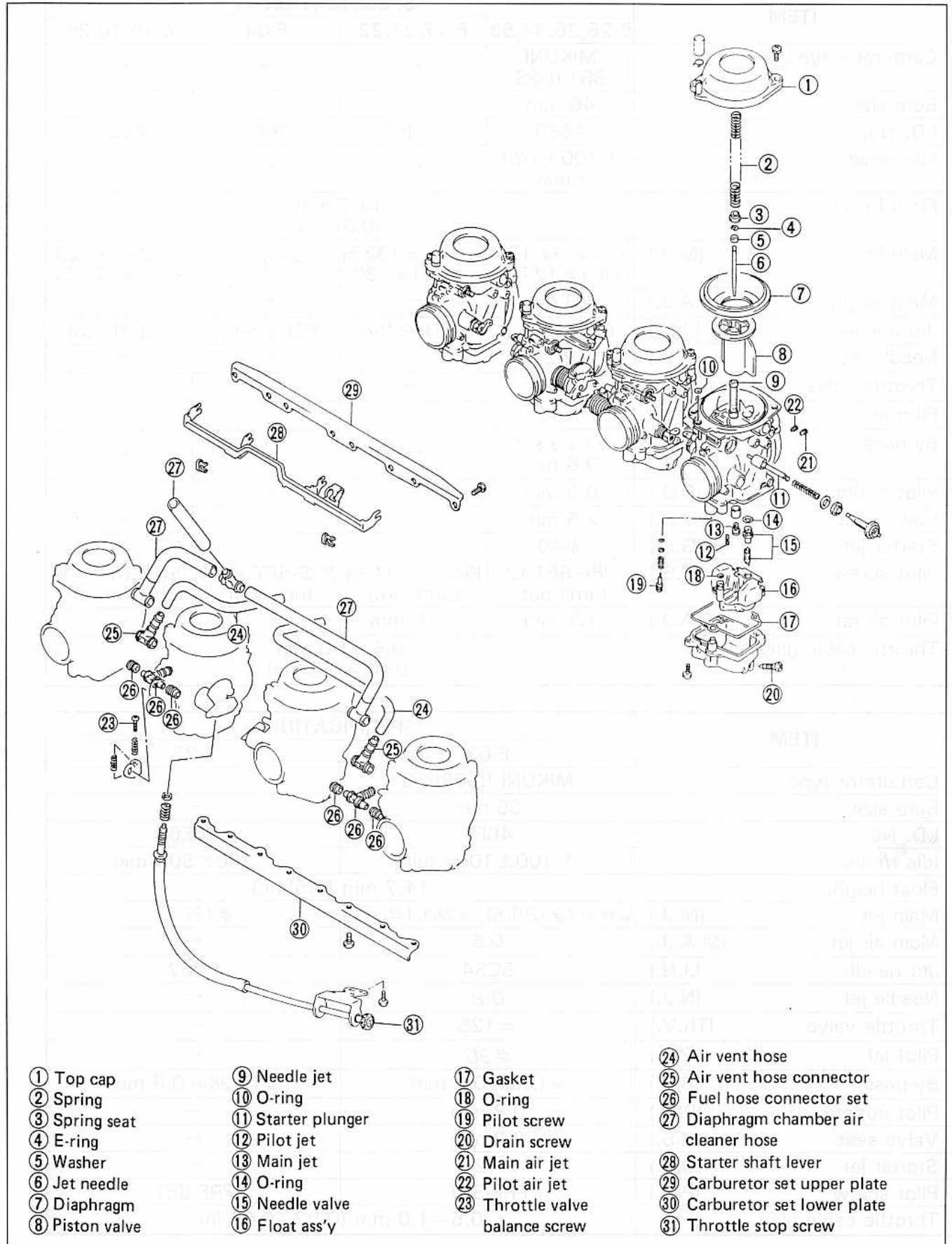
- ① Top cap
- ② Spring
- ③ Spring seat
- ④ E-ring
- ⑤ Washer
- ⑥ Jet needle
- ⑦ Diaphragm
- ⑧ Piston valve

- ⑨ Needle jet
- ⑩ O-ring
- ⑪ Starter plunger
- ⑫ Pilot jet
- ⑬ Main jet
- ⑭ O-ring
- ⑮ Needle valve
- ⑯ Float ass'y

- ⑰ Gasket
- ⑱ O-ring
- ⑲ Pilot screw
- ⑳ Drain screw
- ㉑ Main air jet
- ㉒ Pilot air jet
- ㉓ Throttle valve balance screw

- ㉔ Air vent hose
- ㉕ Air vent hose connector
- ㉖ Fuel hose connector set
- ㉗ Vacuum hose (E-03, 18, 33, 39)
- ㉘ Starter shaft lever
- ㉙ Carburetor set upper plate
- ㉚ Carburetor set lower plate
- ㉛ Throttle stop screw
- ㉜ Purge hose (E-33)
- ㉝ Purge hose connector (E-33)

CONSTRUCTION (FOR E-01,02 AND OTHER MARKET MODELS)



- ① Top cap
- ② Spring
- ③ Spring seat
- ④ E-ring
- ⑤ Washer
- ⑥ Jet needle
- ⑦ Diaphragm
- ⑧ Piston valve

- ⑨ Needle jet
- ⑩ O-ring
- ⑪ Starter plunger
- ⑫ Pilot jet
- ⑬ Main jet
- ⑭ O-ring
- ⑮ Needle valve
- ⑯ Float ass'y

- ⑰ Gasket
- ⑱ O-ring
- ⑲ Pilot screw
- ⑳ Drain screw
- ㉑ Main air jet
- ㉒ Pilot air jet
- ㉓ Throttle valve balance screw

- ㉔ Air vent hose
- ㉕ Air vent hose connector
- ㉖ Fuel hose connector set
- ㉗ Diaphragm chamber air cleaner hose
- ㉘ Starter shaft lever
- ㉙ Carburetor set upper plate
- ㉚ Carburetor set lower plate
- ㉛ Throttle stop screw

SPECIFICATIONS

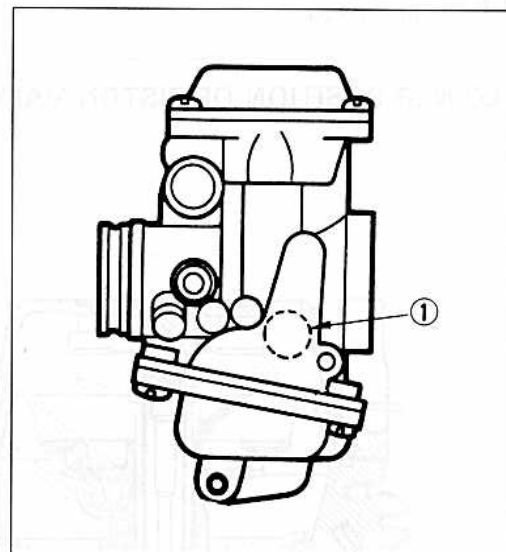
ITEM	SPECIFICATION			
	E-25,28,34,53	E-17,21,22	E-04	E-15,16,24
Carburetor type	MIKUNI BST40SS	←	←	←
Bore size	40 mm	←	←	←
I.D. No.	46E0	46E3	46E2	46EA
Idle r/min.	1 100 ± 100 r/min	←	←	←
Float height	14.7 mm (0.58 in)			
Main jet (M.J.)	#1,2&4: (# 125) #3: (# 127.5)	#1&4: (# 132.5) #2&3: (# 130)	# 127.5	#1,2&4: (# 125) #3: (# 127.5)
Main air jet (M.A.J.)	2.0 mm	←	←	←
Jet needle (J.N.)	6ZD13-2nd	6ZD19-3rd	6ZD20-4th	6ZD20-3rd
Needle jet (N.J.)	P-2	←	←	←
Throttle valve (Th.V.)	# 120	←	←	←
Pilot jet (P.J.)	# 40	←	←	←
By-pass (B.P.)	#1,2,3 & 4: 0.8 mm	←	←	←
Pilot outlet (P.O.)	0.8 mm	←	←	←
Valve seat (V.S.)	2.5 mm	←	←	←
Starter jet (G.S.)	# 40	←	←	←
Pilot screw (P.S.)	PRE-SET (2 turns out)	PRE-SET (1-5/8 turns out)	PRE-SET (1-3/4 turns out)	PRE-SET (1-5/8 turns out)
Pilot air jet (P.A.J.)	1.2 mm	1.15 mm	←	←
Throttle cable play	0.5–1.0 mm (0.02–0.04 in)			

ITEM	SPECIFICATION	
	E-03	E-33
Carburetor type	MIKUNI BST36SS	←
Bore size	36 mm	←
I.D. No.	46E1	46E6
Idle r/min.	1 100 ± 100 r/min	1 200 ± 50 r/min
Float height	14.7 mm (0.58 in)	
Main jet (M.J.)	#1&4: (# 127.5), #2&3: (# 125)	# 122.5
Main air jet (M.A.J.)	0.5	←
Jet needle (J.N.)	5C34	5D62
Needle jet (N.J.)	D-B	←
Throttle valve (Th.V.)	# 125	←
Pilot jet (P.J.)	# 30	←
By-pass (B.P.)	#1,2&3: 0.8 mm	#1,2,3&4: 0.8 mm
Pilot outlet (P.O.)	0.8 mm	←
Valve seat (V.S.)	2.3 mm	←
Starter jet (G.S.)	# 42.5	←
Pilot screw (P.S.)	PRE-SET	PRE-SET
Throttle cable play	0.5–1.0 mm (0.02–0.04 in)	

- | | | |
|---------------|-------------------|---------------------------|
| E-03: U.S.A. | E-21: Belgium | E-28: Canada |
| E-04: France | E-22: Germany | E-33: California (U.S.A.) |
| E-15: Finland | E-24: Australia | E-34: Italy |
| E-16: Norway | E-25: Netherlands | E-53: Spain |
| E-17: Sweden | | |

I.D. NO. LOCATION

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

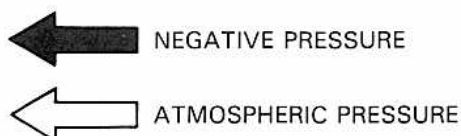
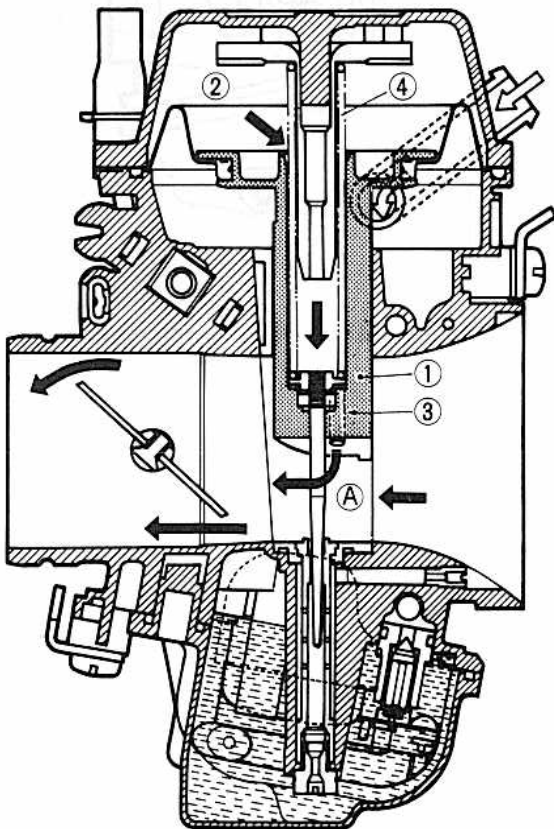


DIAPHRAGM AND PISTON OPERATION

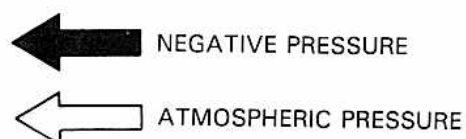
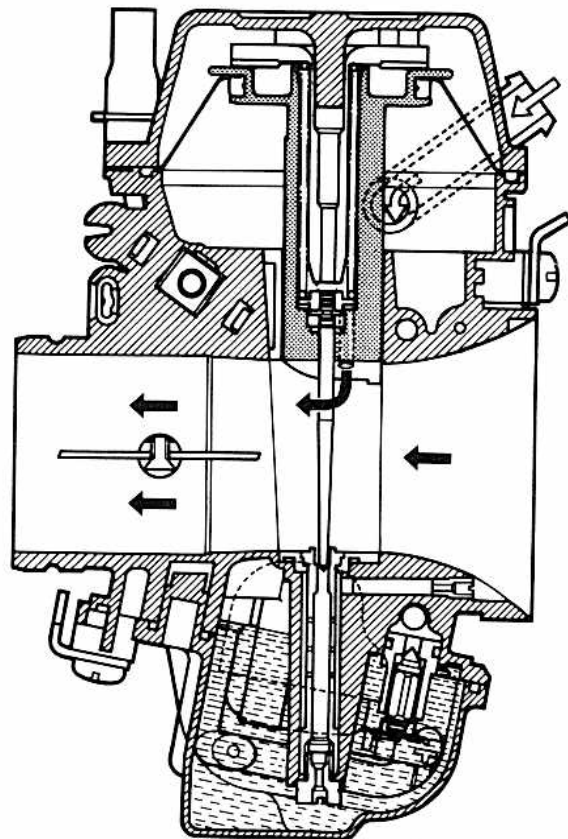
The carburetor is a variable-venturi type, whose venturi cross section area is increased or decreased automatically by the piston valve ① which moves according to the negative pressure present on the downstream side of the venturi (A). Negative pressure is admitted into the diaphragm chamber ② through two orifices ③ provided in the piston valve ①.

Rising negative pressure overcomes the spring ④ force, causing the piston valve ① 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 optimum ratio of fuel/air mixture.

LOWER POSITION OF PISTON VALVE

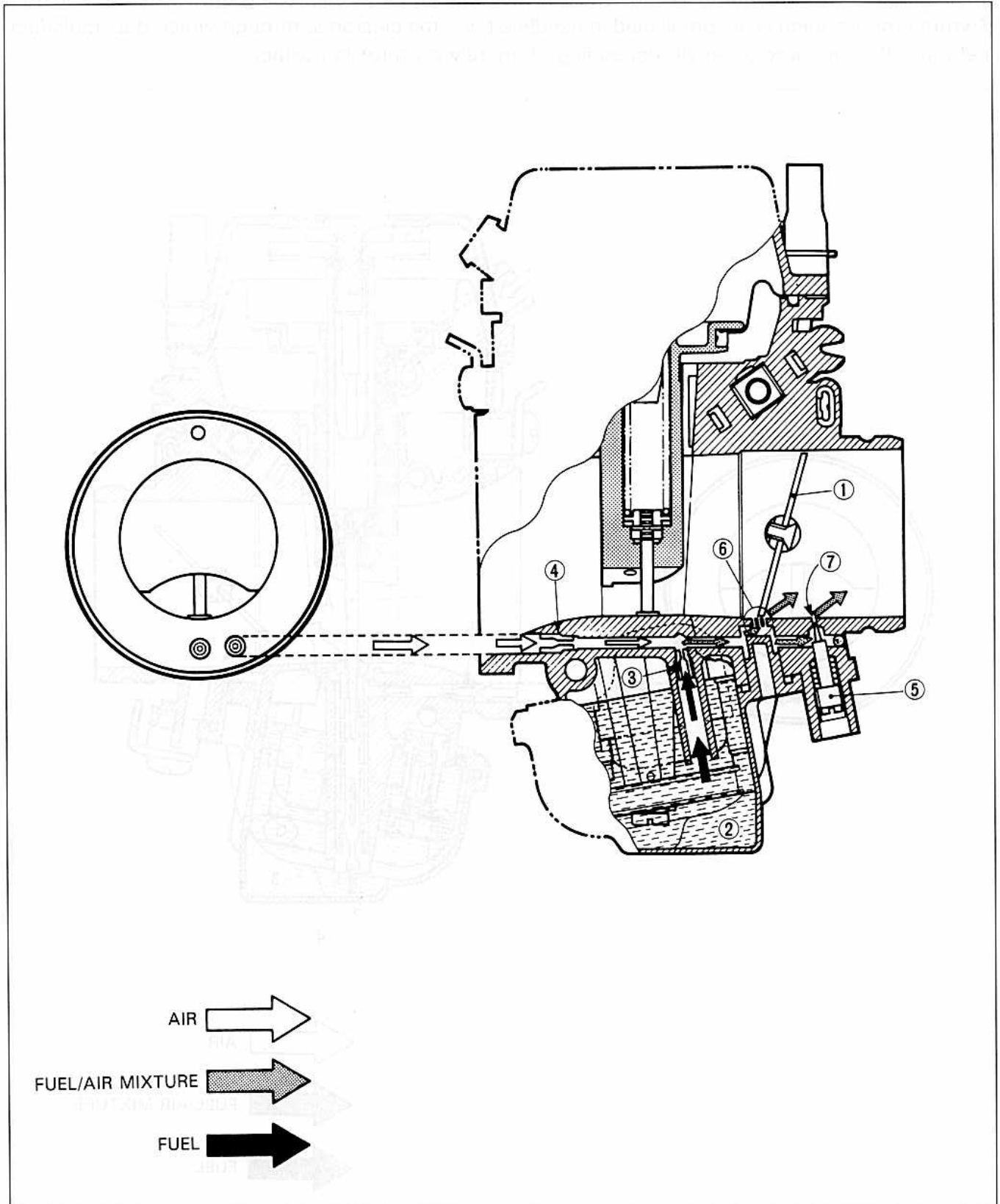


UPPER POSITION OF PISTON VALVE



SLOW SYSTEM

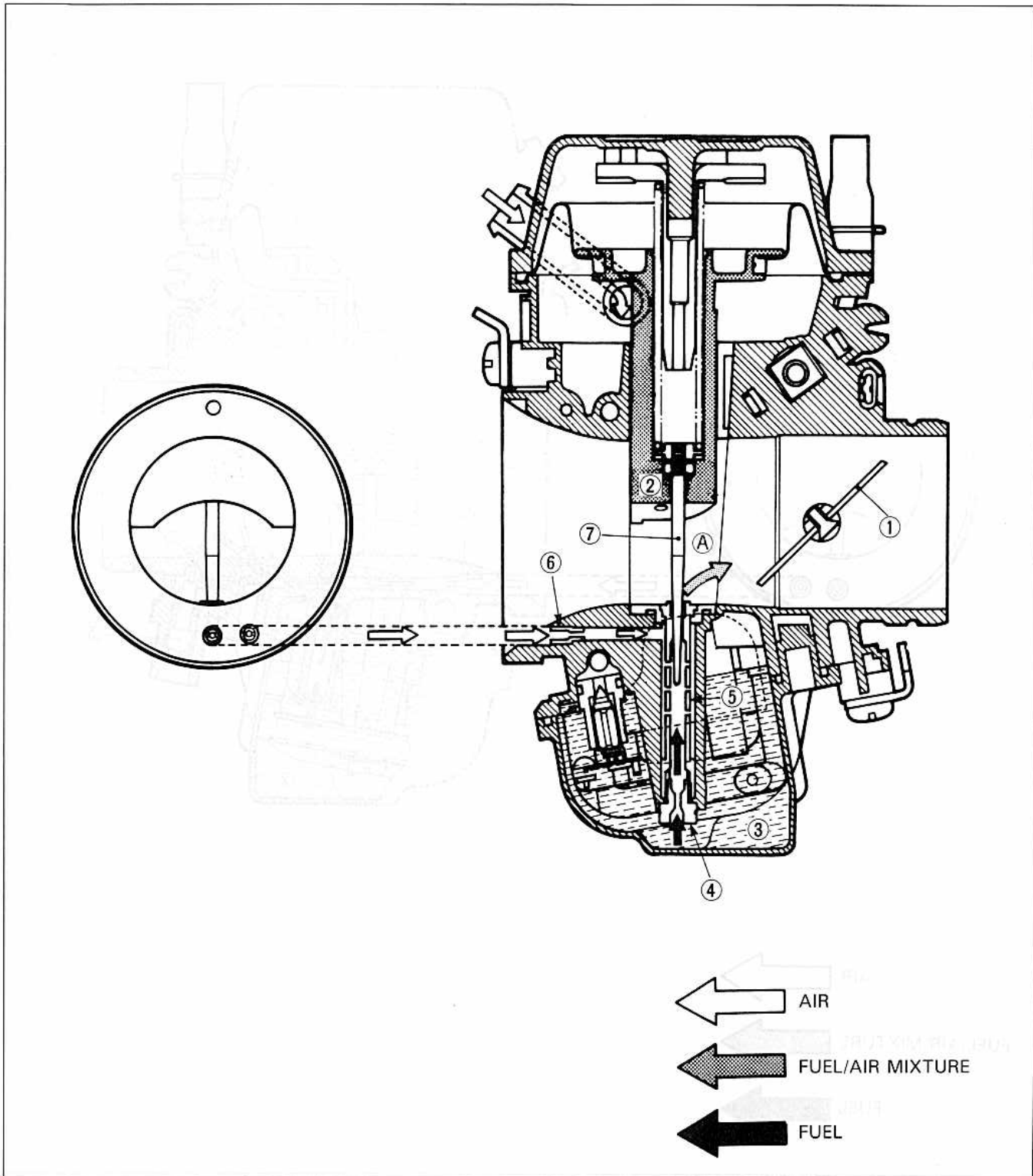
This system supplies fuel during engine operation with throttle valve ① closed or slight opened. The fuel from float chamber ② is metered by pilot jet ③ where it mixes with air coming in through pilot air jet ④. This mixture, rich with fuel, then goes up through pilot passage to pilot screw ⑤. A part of the mixture is discharged into the main bore out of bypass ports ⑥. The remainder is then metered by pilot screw ⑤ and sprayed out into the main bore through pilot outlet ⑦.



MAIN SYSTEM

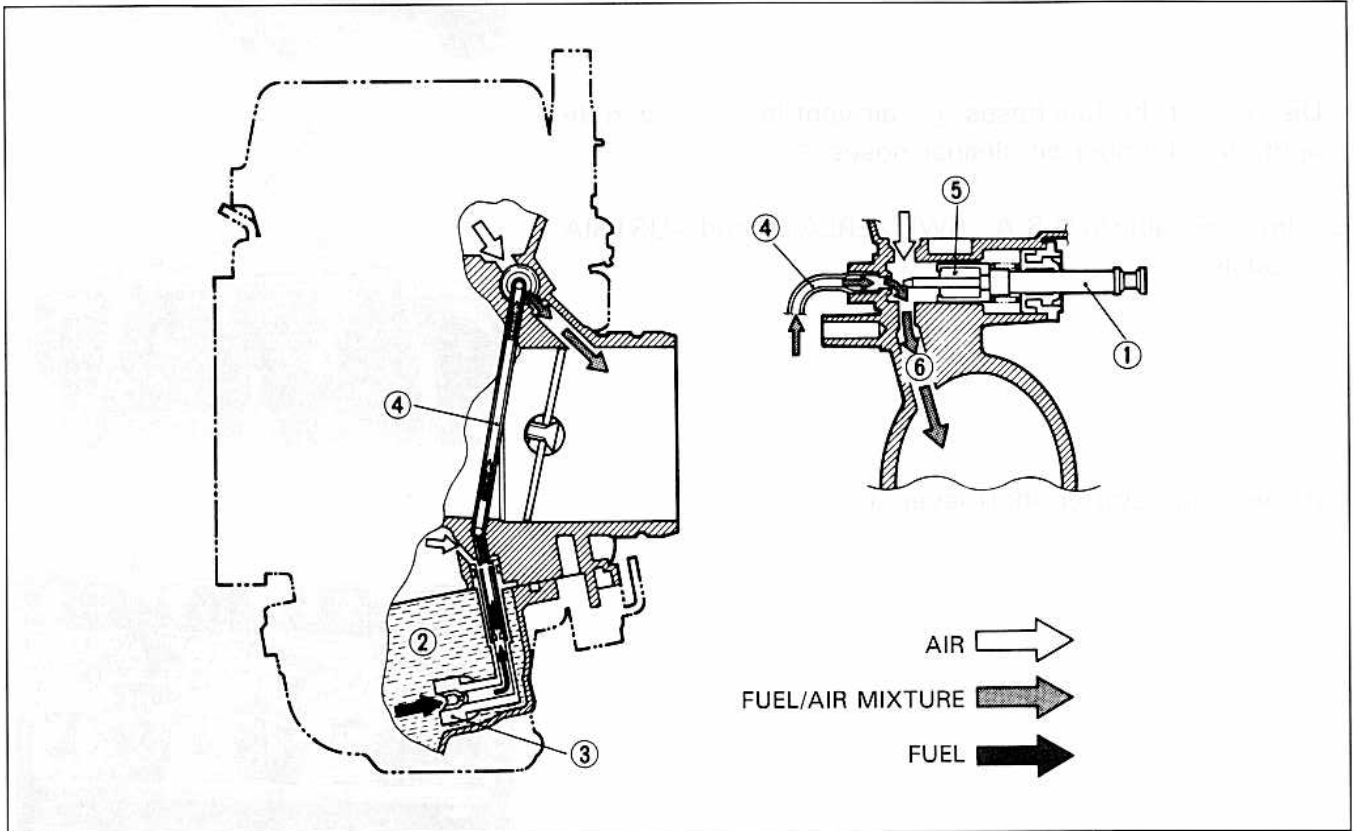
As throttle valve ① is opened, engine speed rises, and this increases negative pressure in the venturi (A). Consequently the piston valve ② moves upward.

Meanwhile, the fuel in float chamber ③ is metered by main jet ④, and the metered fuel enters needle jet ⑤, in which it mixes with the air admitted through main air jet ⑥ to form an emulsion. The emulsified fuel then passes through the clearance between needle jet ⑤ and jet needle ⑦, and is discharged into the venturi (A), in which it meets main air stream being drawn by the engine. Mixture proportioning is accomplished in needle jet ⑤; the clearance through which the emulsified fuel must flow in large or small, depending ultimately on throttle position.



STARTER SYSTEM

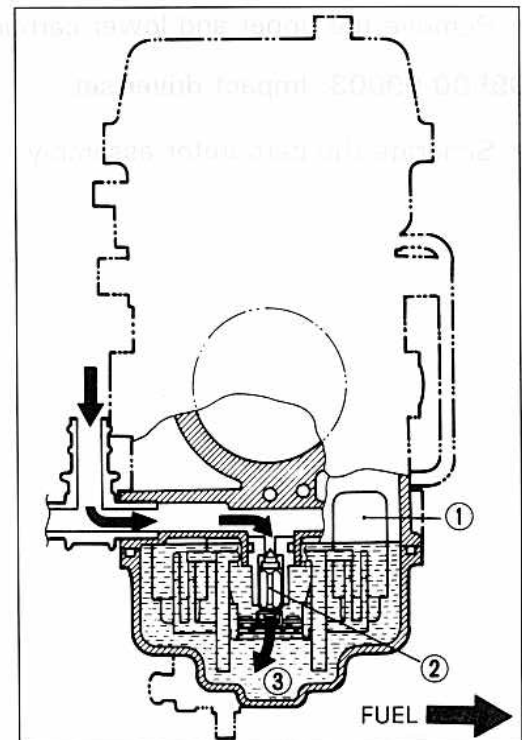
Pulling up the starter shaft ①, fuel is drawn into the starter circuit from the float chamber ②. Starter jet ③ meters this fuel, which then flows into starter pipe ④ and mixes with the air coming from the float chamber ②. The mixture, rich in fuel content, reaches starter plunger ⑤ and mixes again with 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 ⑥ into the main bore.



FLOAT SYSTEM

Floats ① and needle valve ② are associated with the same mechanism, so that, as the floats ① move up and down, the needle valve ② too moves likewise.

When fuel level is up in float chamber ③, floats ① are up and needle valve ② remains pushed up against valve seat. Under this condition, no fuel enters the float chamber ③. As the fuel level falls, floats ① go down and needle valve ② unseats itself to admit fuel into the chamber ③. In this manner, needle valve ② admits and shuts off fuel alternately to maintain a practically constant fuel level inside the float chamber ③.

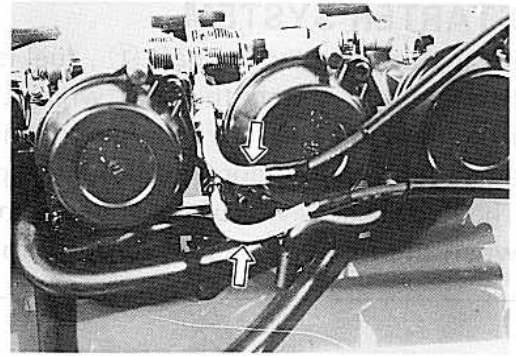


REMOVAL

Refer to page 3-3.

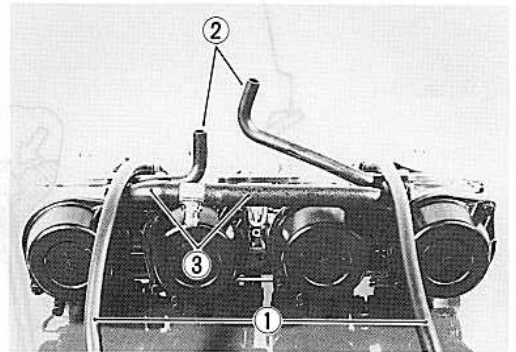
DISASSEMBLY

- Remove the throttle cables from the throttle lever.

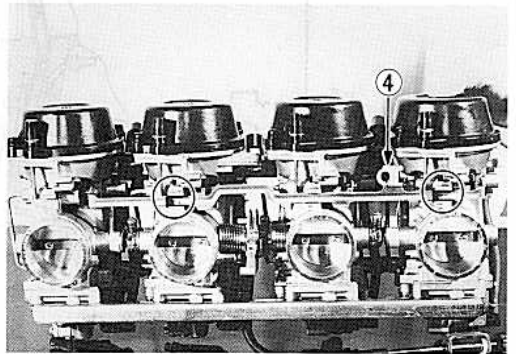


- Disconnect the fuel hoses ① , air vent hoses ② and diaphragm chamber air cleaner hoses ③ .

③: Not applicable in U.S.A., SWITZERLAND and AUSTRIA models



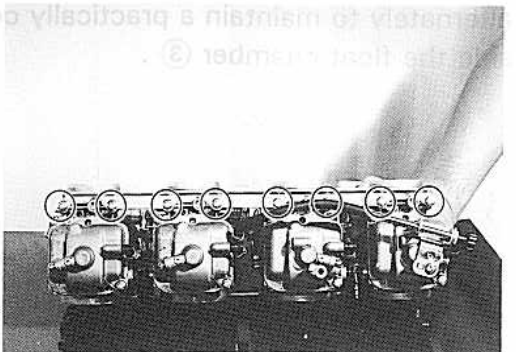
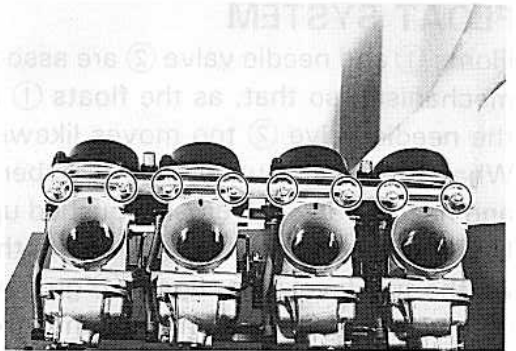
- Remove the starter shaft lever ④ .



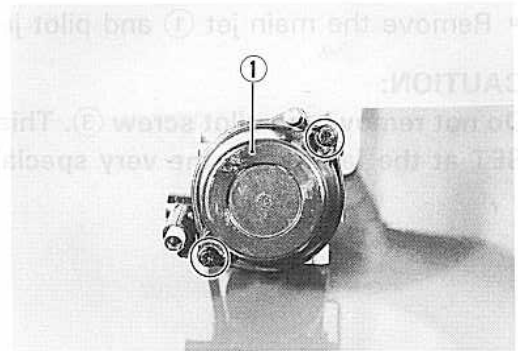
- Remove the upper and lower carburetor set plates.

09900-09003: Impact driver set

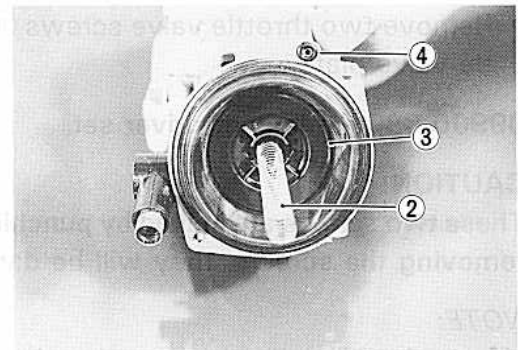
- Separate the carburetor assembly.



- Remove the carburetor top cap ① .

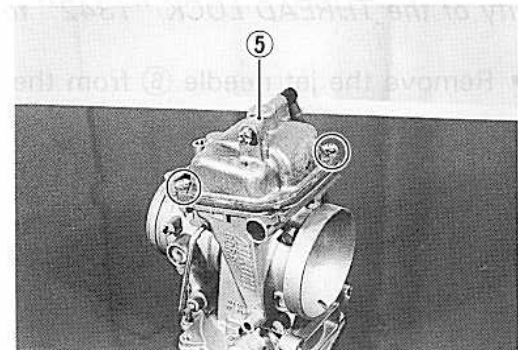


- Remove the piston valve return spring ② and piston valve with diaphragm ③ .
- Remove the O-ring ④ .



- Remove the float chamber body ⑤ .

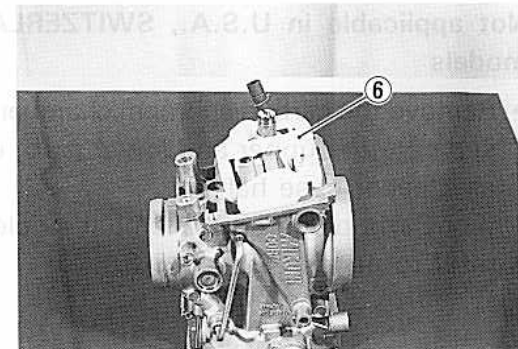
09900-09003: Impact driver set



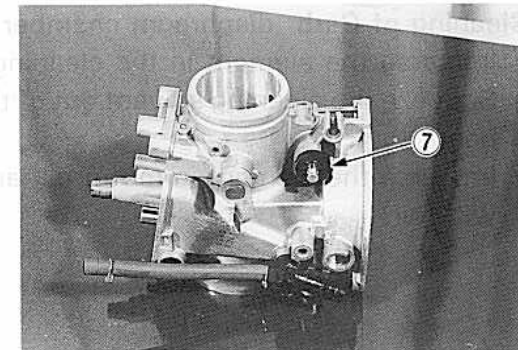
- Remove the float assembly ⑥ .

CAUTION:

When removing the float assembly with fingers, be careful not to break it which is made of plastics.



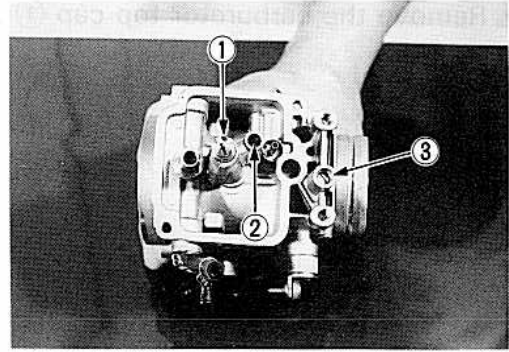
- Remove the starter plunger assembly ⑦ .



- Remove the main jet ① and pilot jet ② .

CAUTION:

Do not remove the pilot screw ③. This component is PRE-SET at the factory by the very specialized equipment.



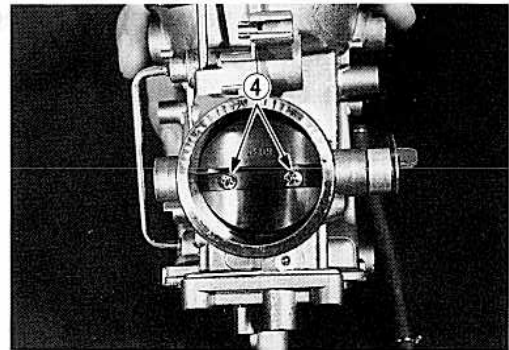
- Remove two throttle valve screws ④ and pull out throttle valve plate.

09900-09003: Impact driver set**CAUTION:**

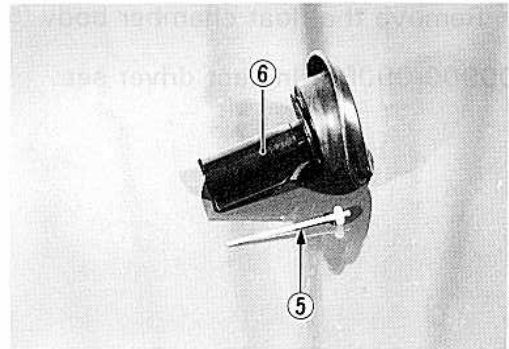
These two screws are locked by punching these ends. Once removing the screws, they will be damaged.

NOTE:

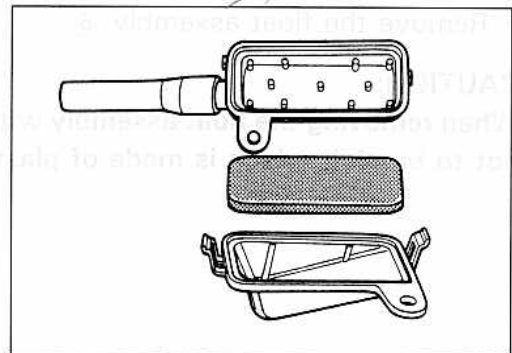
When reinstalling the throttle valve plate, apply a small quantity of the *THREAD LOCK "1342"* to its screws ④.



- Remove the jet needle ⑤ from the piston valve ⑥.

**Not applicable in U.S.A., SWITZERLAND and AUSTRIA models**

- Remove the carb. diaphragm chamber air cleaner case and separate the upper and lower carb. diaphragm chamber air cleaner case halves.
(For Carb. diaphragm chamber air cleaner case removal, refer to pages 3-2 and 3-3.)

**Cleaning of Carb. diaphragm chamber air cleaner element**

- Immerse the element in the cleaning solvent and wash it clean.
- Squeeze the cleaning solvent out of the washed element by pressing it between the palms of both hands.
- Immerse the element in motor oil, and squeeze the oil out of the element leaving it slightly wet with oil.

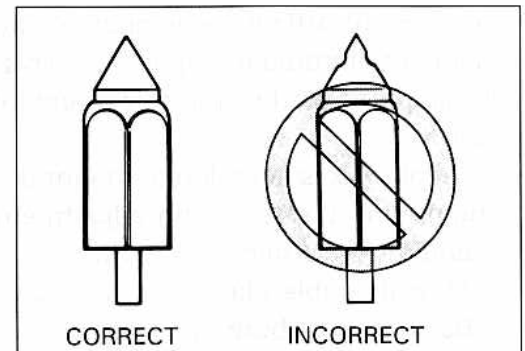
INSPECTION AND ADJUSTMENT

Check following items for any damage or clogging.

- * Pilot jet
- * Main jet
- * Main air jet
- * Pilot air jet
- * Needle jet air bleeding hole
- * Float
- * Needle valve
- * Starter jet
- * Gasket and O-ring
- * Throttle shaft oil seal
- * Diaphragm
- * Pilot outlet and by-pass 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.

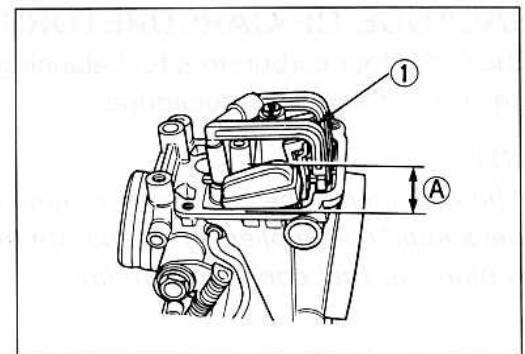


FLOAT HEIGHT ADJUSTMENT

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) : 14.7 ± 1.0 mm (0.58 ± 0.04 in)

09900-20102: Vernier calipers

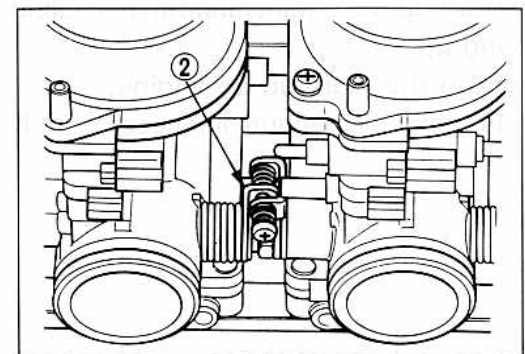


REASSEMBLY AND REMOUNTING

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

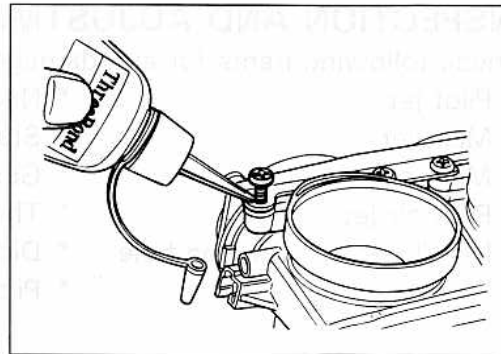
Pay attention to the following points:

- When engaging two carburetors, position the throttle valve control lever (2) correctly.

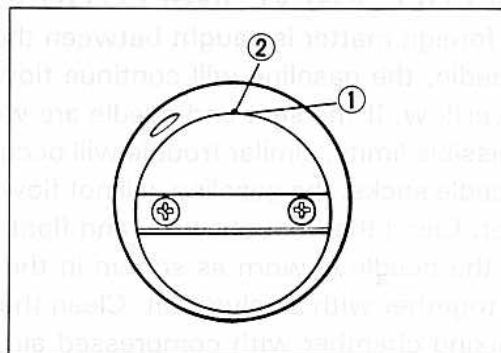


- Apply THREAD LOCK "1342" to the upper and lower plates' screws.

99000-32050: THREAD LOCK "1342"



- Set each throttle valve in such a way that its top end ① meets the foremost by-pass ②. This is accomplished by turning the throttle stop screw and throttle valve balance screw.
- 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 4-16

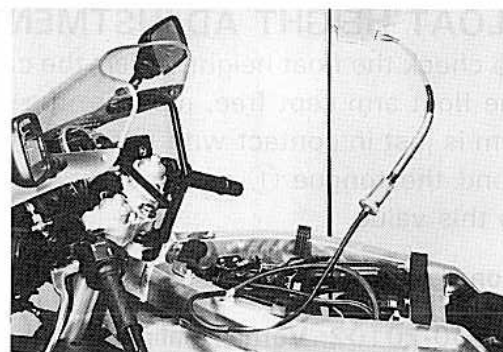


BALANCE OF CARBURETORS

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

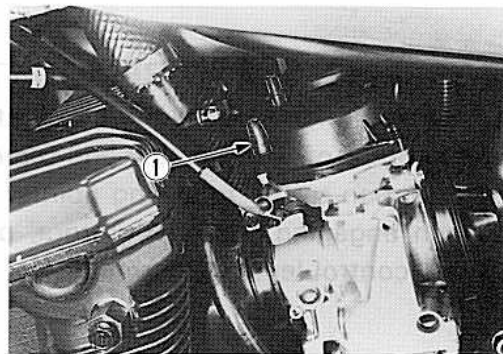
NOTE:

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



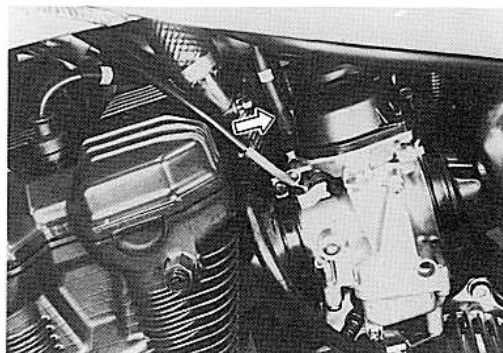
CALIBRATING EACH GAUGE

- Start up the engine and run it in idling condition for warming up.
- Stop the warmed-up engine.
- Remove the vacuum inlet cap ① for No.1 or No.4 cylinder.

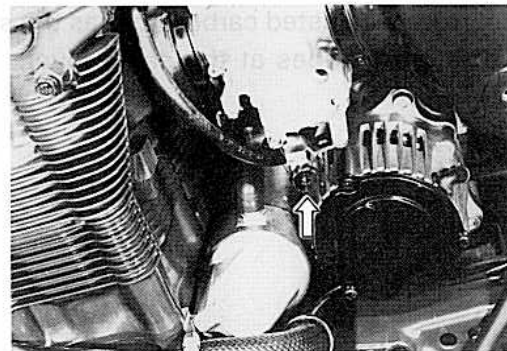


- Connect one of the four rubber hoses of balancer gauge to this inlet.

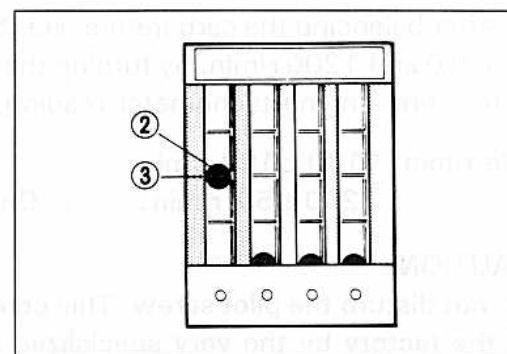
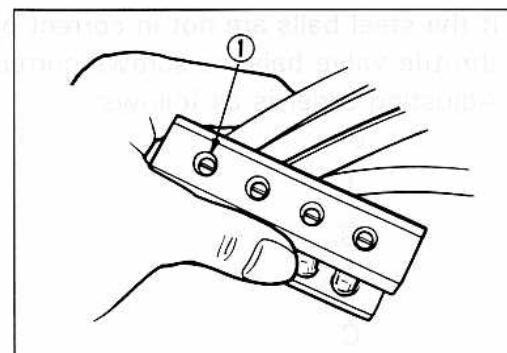
09913-13121: Carburetor balancer



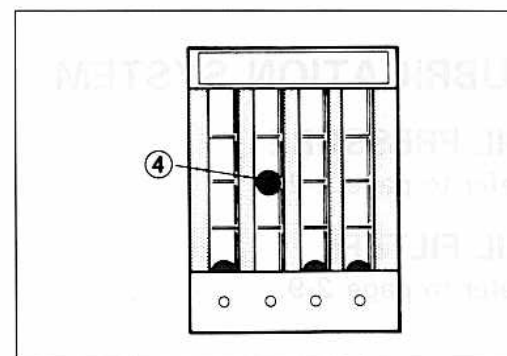
- Start up the engine and keep it running at 1 750 r/min by turning throttle stop screw.



- Turn the air screw ① of the gauge so that the vacuum acting on the tube of that hose will bring the steel ball ② in the tube to the center line ③ .



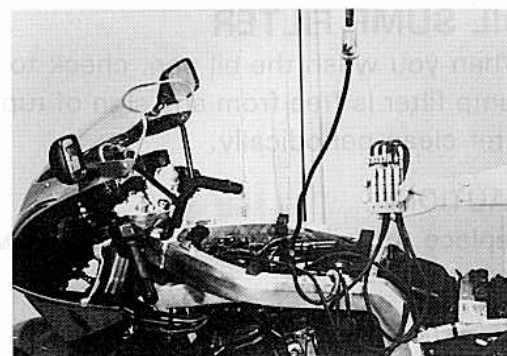
- After making sure that the steel ball stays steady at the center line, disconnect the hose from inlet and connect the next hose to the inlet.
- Turn air screw to bring the other steel ball ④ to the center line.
- Repeat the above process on the third and fourth hoses. The balancer gauge is now ready for use in balancing the carburetors.



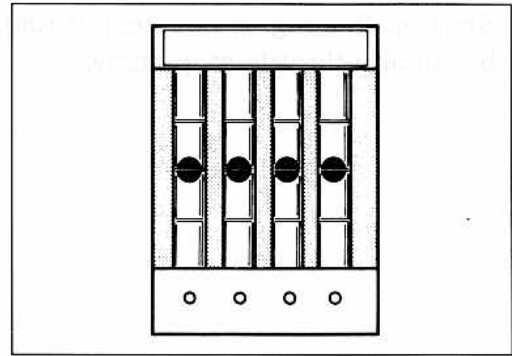
BALANCING CARBURETORS

For balancing all the carburetor movement, remove all the vacuum inlet caps from each carburetor. Connect the balancer gauge hoses to these vacuum inlets and adjust the balance of four carburetors as follows:

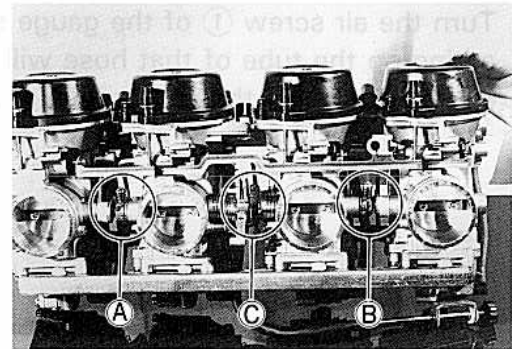
- Start up the engine and keep it running at 1 750 r/min to see engine tachometer reading.



A correctly adjusted carburetor has the steel balls in the Nos. 1 through 4 tubes at the same level.



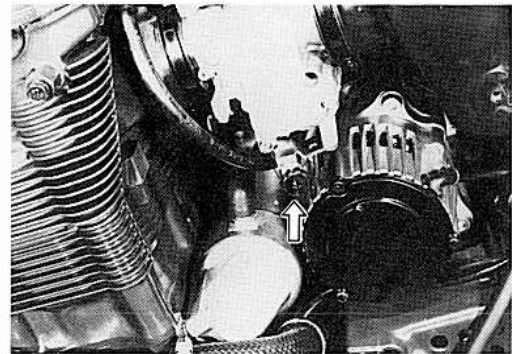
- If the steel balls are not in correct positions, adjust the throttle valve balance screws correctly.
- Adjusting order is as follows.



- After balancing the carburetors, set there speed between 1000 and 1200 r/min. by turning the throttle stop screw referring engine tachometer reading.

Idle r/min: 1100 ± 100 r/min
 : 1200 ± 50 r/min. Only for Calif. model

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



LUBRICATION SYSTEM

OIL PRESSURE

Refer to page 2-22.

OIL FILTER

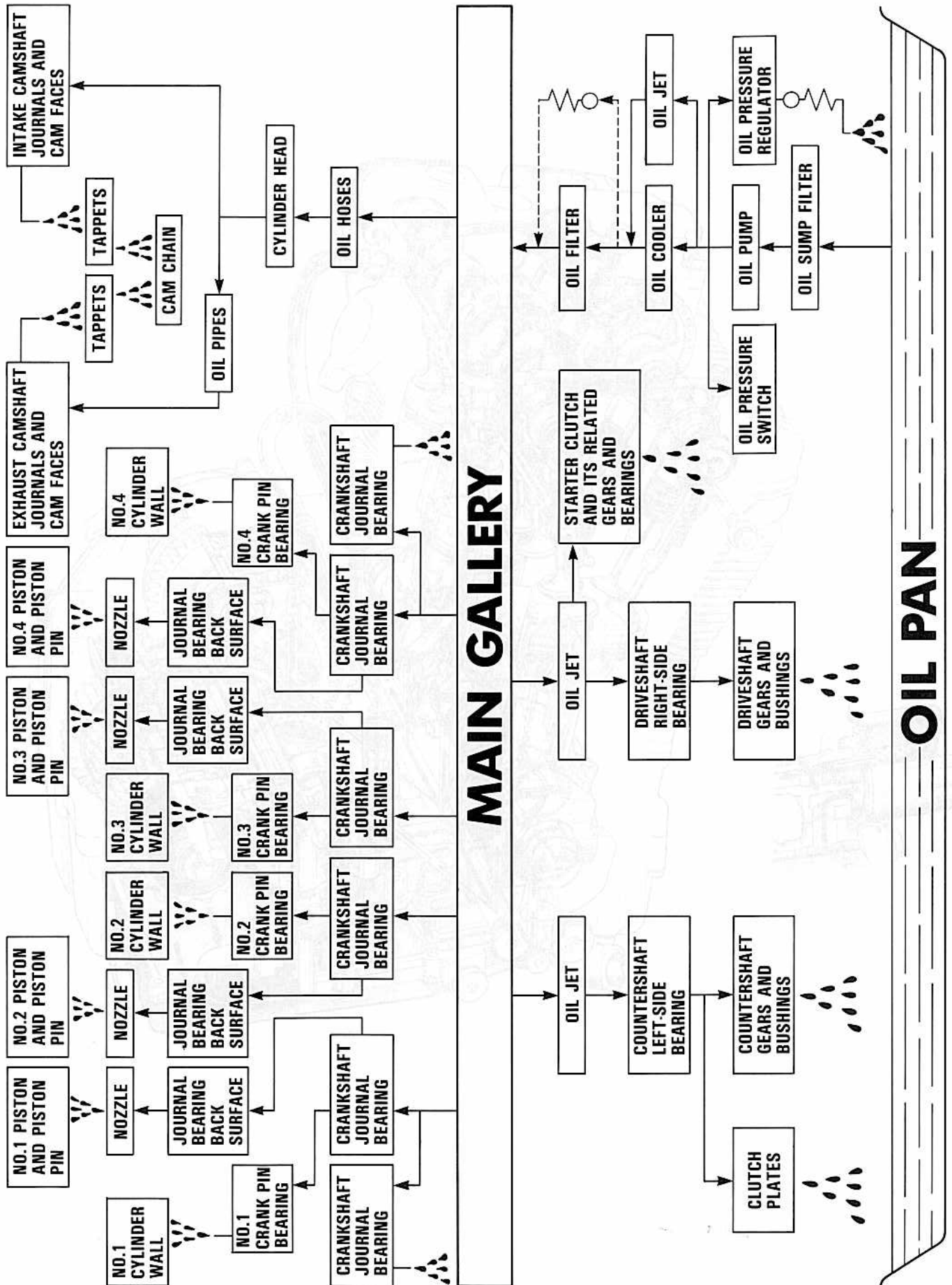
Refer to page 2-9.

OIL SUMP FILTER

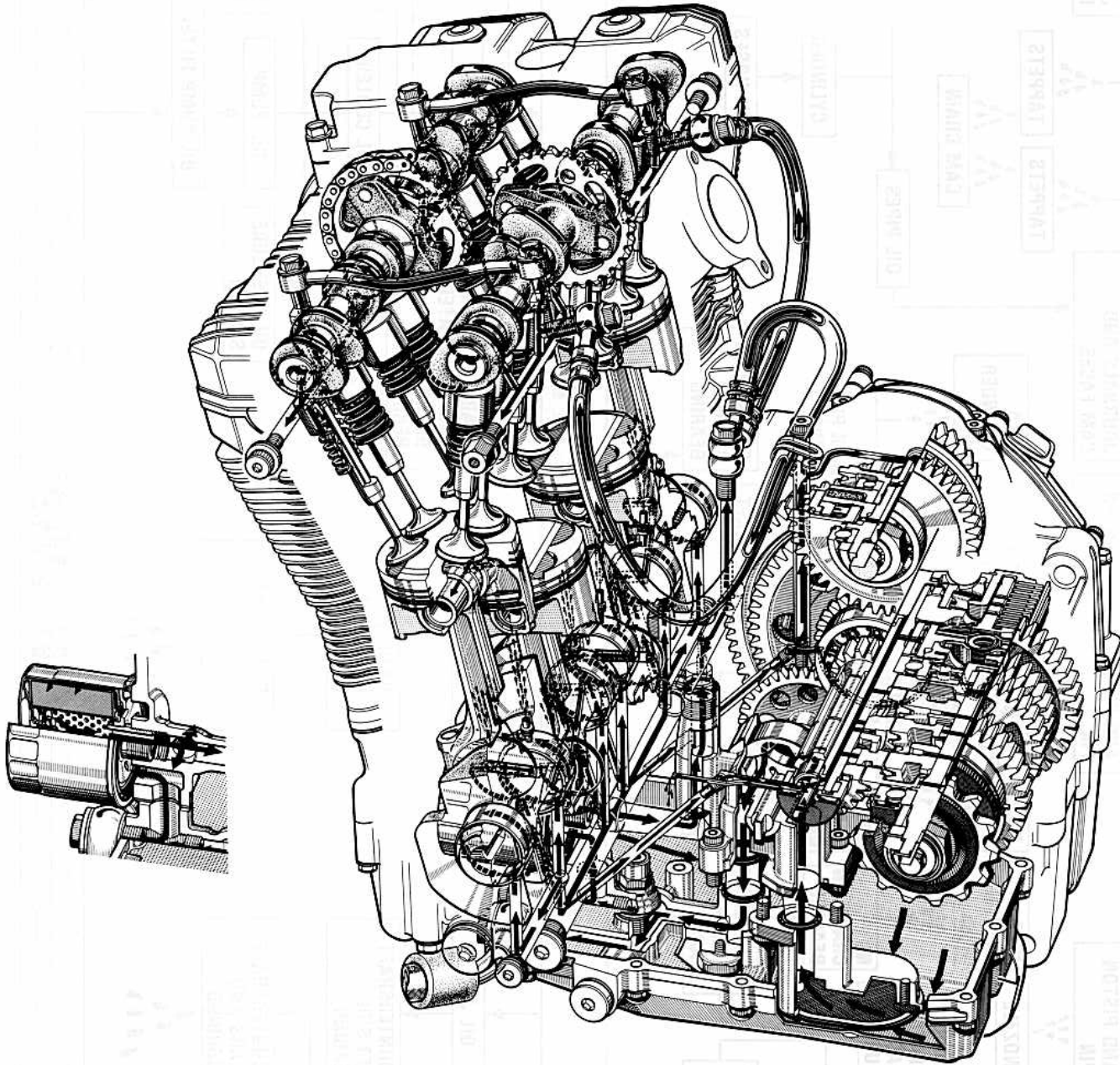
When you wash the oil pan, check to be sure that the oil sump filter is free from any sign of rupture, also wash the filter clean periodically.

CAUTION:
 Replace the oil pan gasket with a new one to prevent oil leakage.
 (Refer to pages 3-53 and 3-54.)

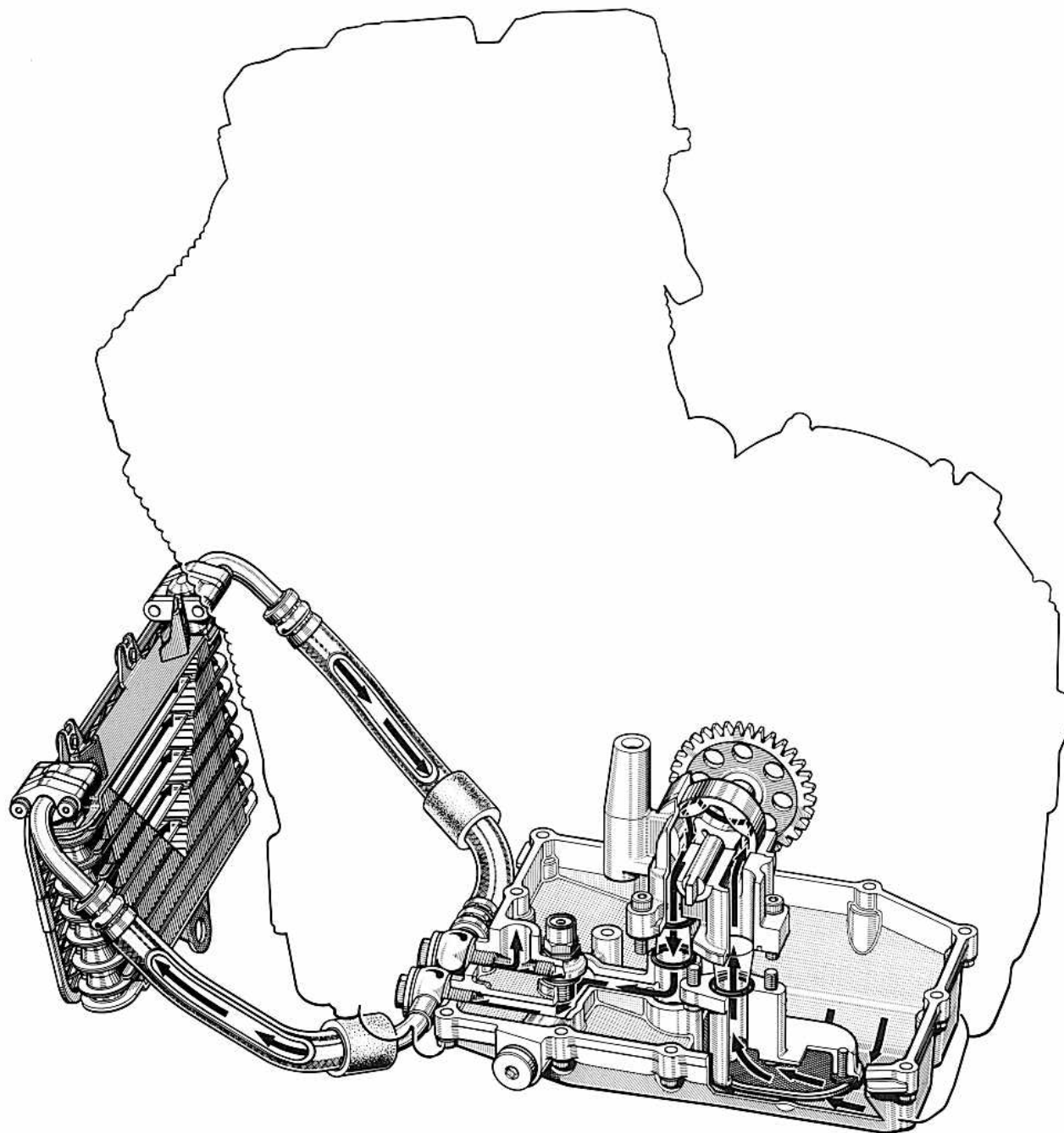
ENGINE LUBRICATION SYSTEM CHART



ENGINE LUBRICATION SYSTEM



ENGINE OIL COOLING SYSTEM



COOLING SYSTEM

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COOLING SYSTEM

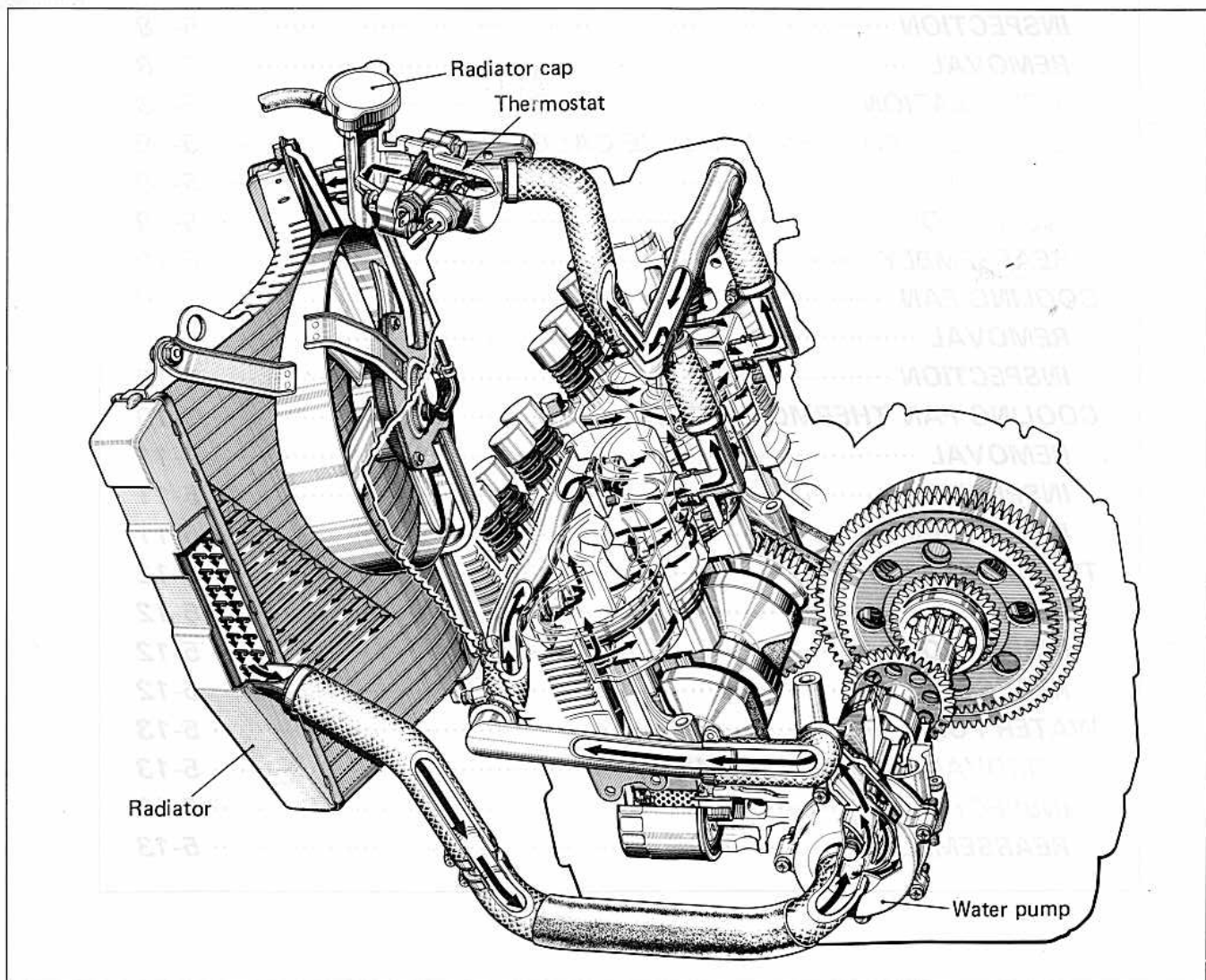
DESCRIPTION

The engine is cooled by engine coolant set in forced recirculation through jackets formed in the cylinder and cylinder head, and through the radiator. For the water pump, a high-capacity centrifugal pump is used. The radiator is a tube-and-fin type made of aluminum material, which is characterized by lightness in weight and good heat dissipation.

The thermostat is of wax pellet type, complete with a valve as the means of temperature-dependent control over the flow of engine coolant through the radiator. The valve is actuated by the temperature-sensitive wax contained in the pellet.

Referring to the following illustration, the thermostat is in the closed condition, so that engine coolant recirculates through the route comprising pump, engine, by-pass hole of the thermostat and radiator in the regulated condition.

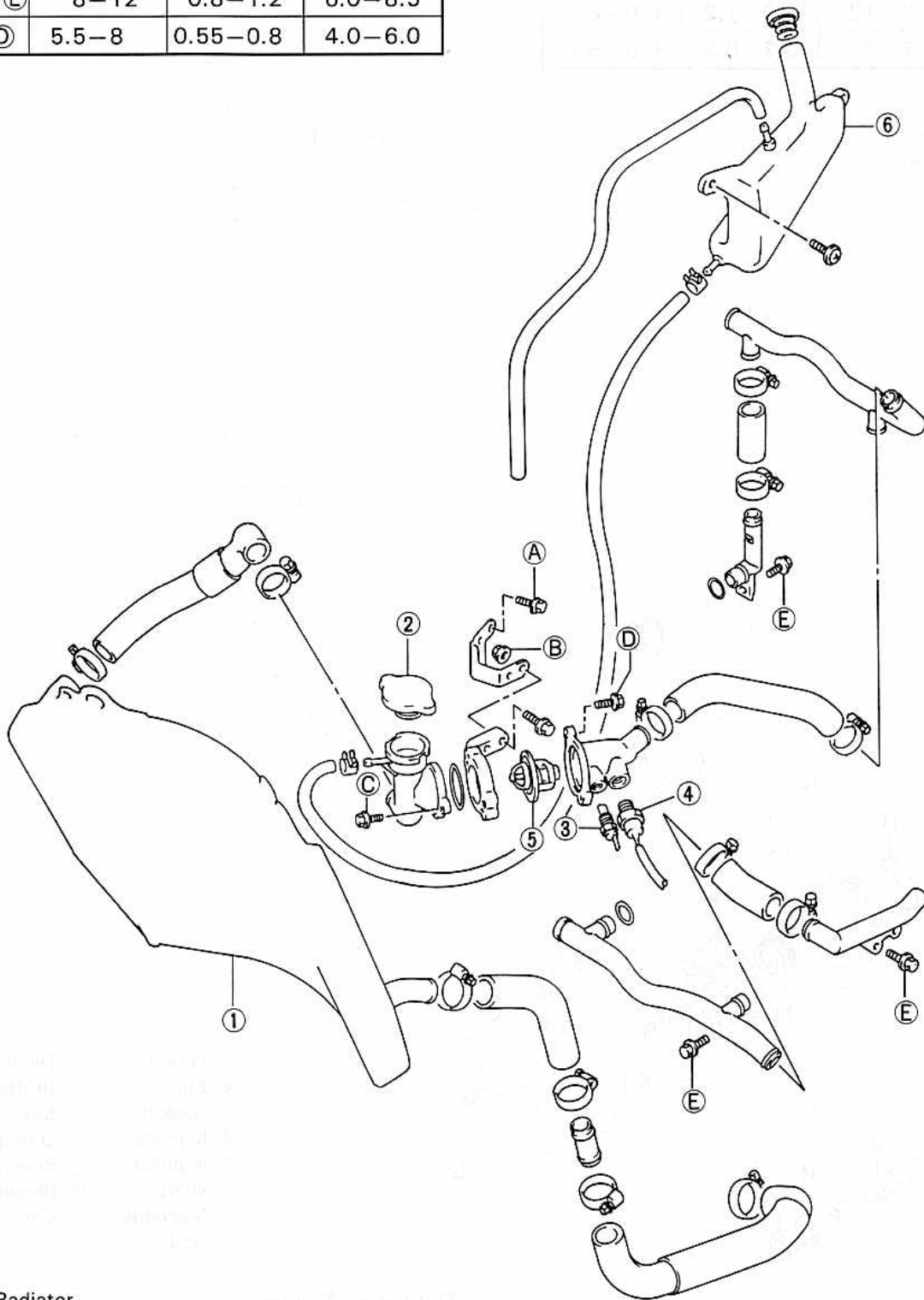
As the engine coolant temperature rises to 76.5°C and the thermostat valve unseats, the normal engine coolant flow is established. At about 90°C of engine coolant temperature, the thermostat becomes completely open and most of heat is released to the atmosphere through the radiator core.



CONSTRUCTION

Tightening torque

ITEM	N·m	kg·m	lb·ft
ⒶⒷⒺ	8-12	0.8-1.2	6.0-8.5
ⒸⒹ	5.5-8	0.55-0.8	4.0-6.0

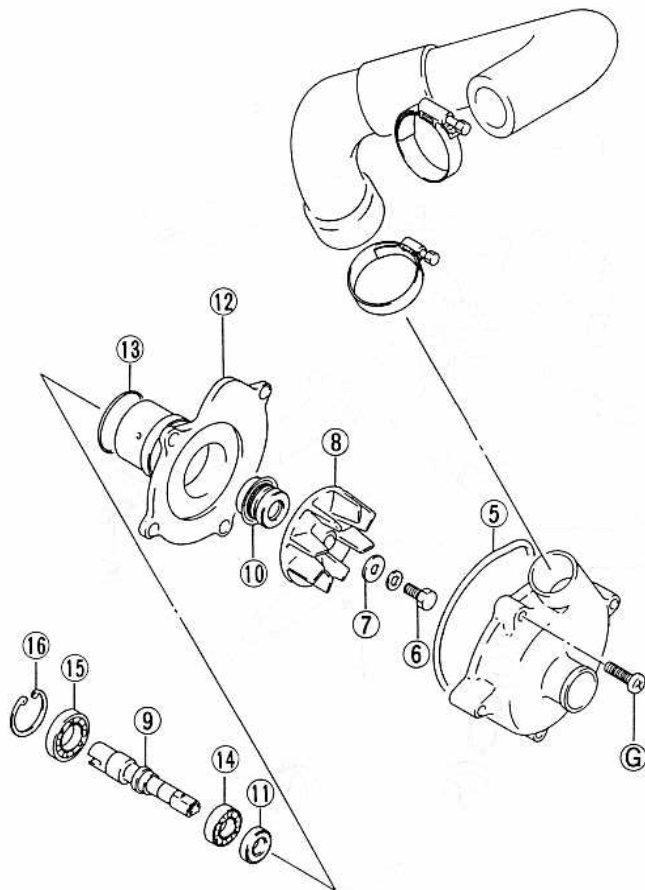
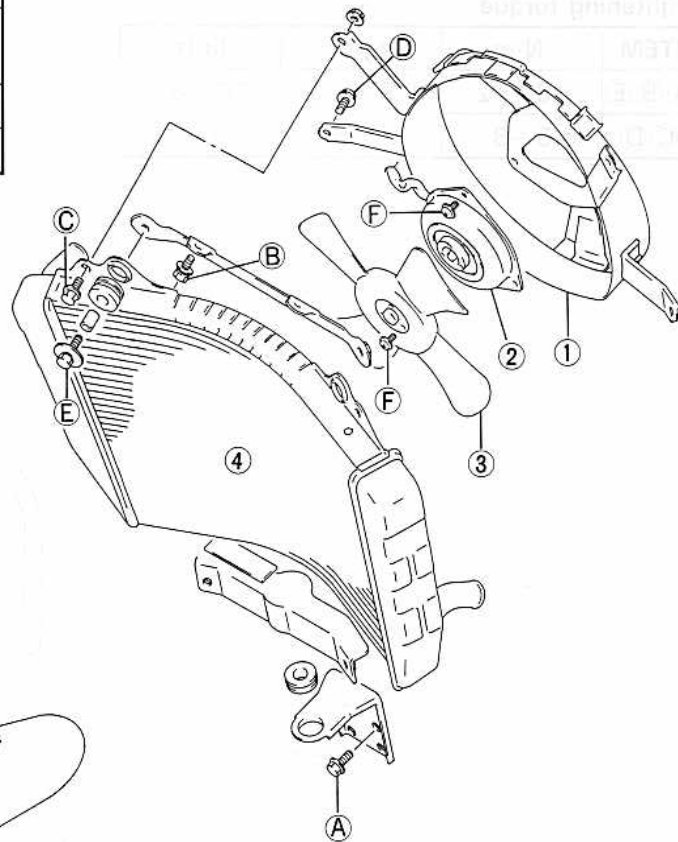


- ① Radiator
- ② Radiator cap
- ③ Engine coolant temperature gauge
- ④ Cooling fan thermo-switch
- ⑤ Thermostat
- ⑥ Engine coolant reservoir

Tightening torque

ITEM	N·m	kg·m	lb-ft
Ⓐ Ⓑ Ⓒ Ⓓ	4-7	0.4-0.7	3.0-5.0
Ⓔ	8-12	0.8-1.2	6.0-8.5
Ⓕ	7-9	0.7-0.9	5.0-6.5

- ① Shroud
- ② Fan motor
- ③ Cooling fan
- ④ Radiator



- ⑤ O-ring
- ⑥ Bolt
- ⑦ Gasket
- ⑧ Impeller
- ⑨ Impeller shaft
- ⑩ Mechanical seal
- ⑪ Oil seal
- ⑫ Stuffing box
- ⑬ O-ring
- ⑭ Bearing
- ⑮ Bearing
- ⑯ Circlip seal

Tightening Torque

ITEM	N·m	kg·m	lb-ft
Ⓒ	7-11	0.7-1.1	5.0-8.0
⑥	7-9	0.7-0.9	5.0-6.5

COOLING SOLUTION

At the time of manufacture, the cooling system is filled with a 50 : 50 solution of distilled water and anti-freeze/summer coolant. This 50 : 50 mixture will provide excellent heat protection, and will protect the cooling system from freezing at temperatures above -31°C (-24°F).

If the motorcycle is to be exposed to temperatures below -31°C (-24°F), this mixing ratio should be increased up to 55% or 60% according to the Fig. 2.

NOTE:

The characteristics of different anti-freezes vary. Read the label to know the protection you will have.

CAUTION:

**Do not put in more than 60% anti-freeze or less than 50%.
Do not mix different brands of anti-freeze.**

50%	Water	1225 ml (1.3/1.1 US/Imp. qt)
	Engine coolant	1225 ml (1.3/1.1 US/Imp. qt)

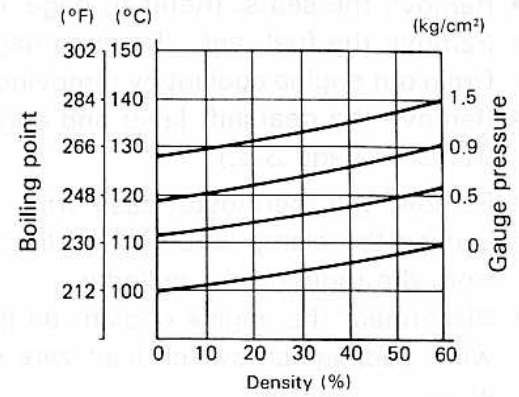


Fig. 1 Engine coolant density-boiling point curve.

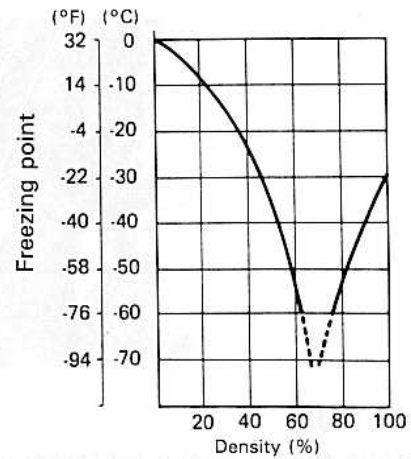
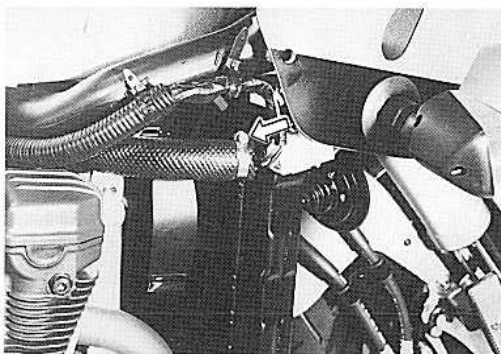
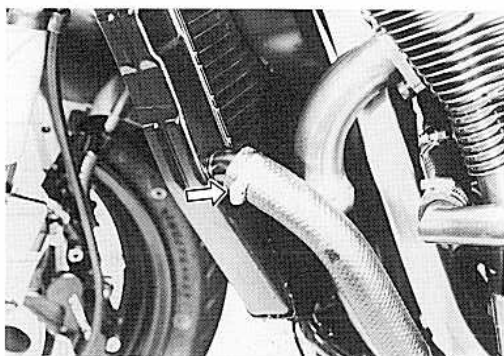
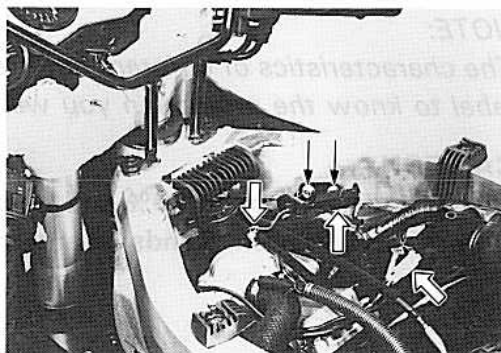
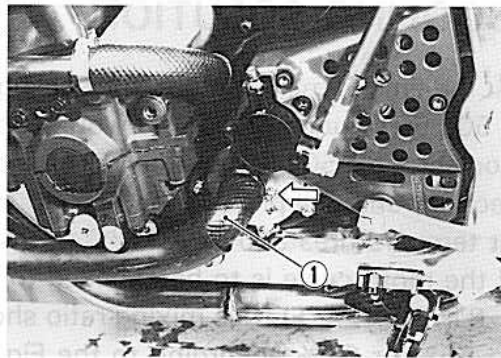


Fig. 2 Engine coolant density-freezing point curve.

COOLING SYSTEM REMOVAL AND DISASSEMBLY

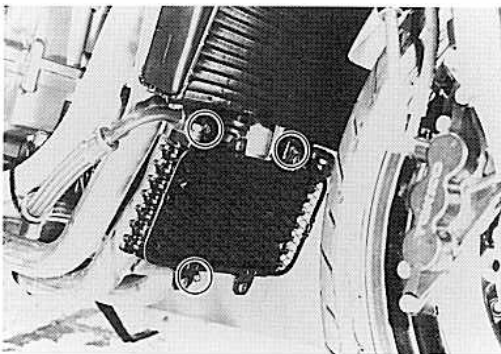
WATER HOSES AND THERMOSTAT CASE

- Remove the lower cowling. (Refer to page 7-4.)
- Remove the seats. (Refer to page 7-2.)
- Remove the fuel tank. (Refer to page 7-3.)
- Drain out engine coolant by removing the water hose ①.
- Remove the gearshift lever and engine sprocket cover. (Refer to page 3-6.)
- Remove the thermostat case bracket mounting bolts.
- Loosen the clamp screws and disconnect water hoses from the radiator and cylinder.
- Disconnect the engine coolant temperature gauge lead wire, cooling fan switch lead wire coupler and ground wire.
- Remove the thermostat case along with the water hoses.

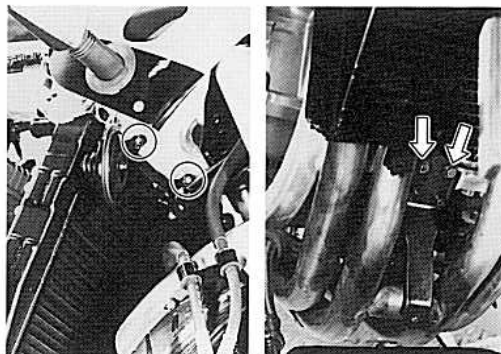


RADIATOR

- Remove the oil cooler by removing the mounting bolts.

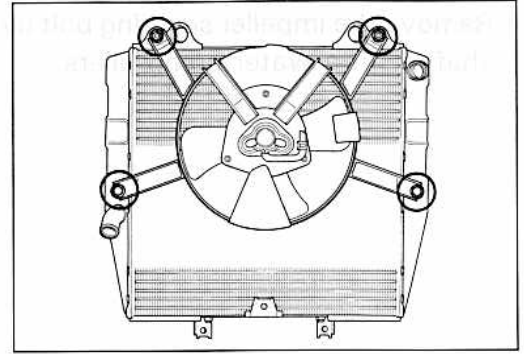


- Remove the radiator by removing the mounting bolts.



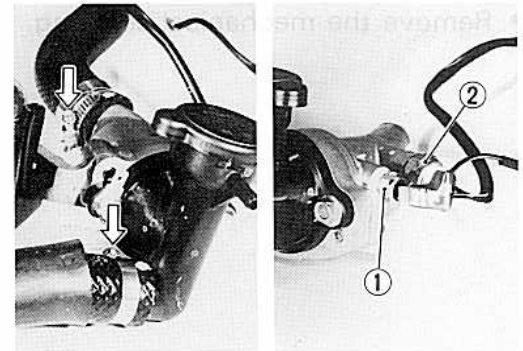
COOLING FAN

- Remove the cooling fan.



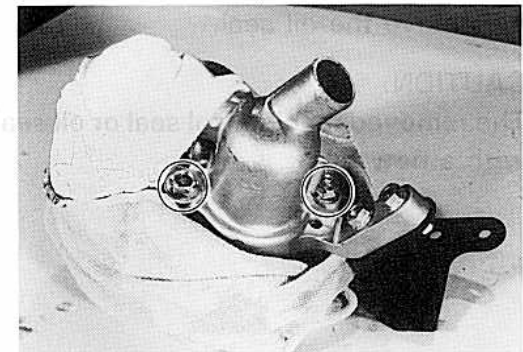
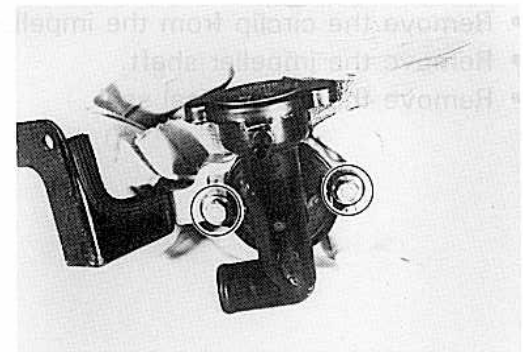
ENGINE COOLANT TEMPERATURE GAUGE AND COOLING FAN THERMO-SWITCH

- Loosen the clamp screws and disconnect the water hoses.
- Remove the water temperature gauge ① and cooling fan thermo-switch ②.



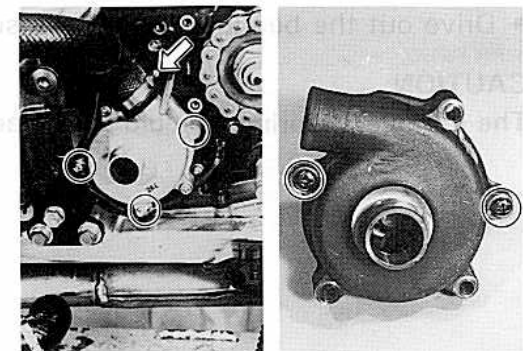
THERMOSTAT

- Separate the thermostat case into halves and remove the thermostat.

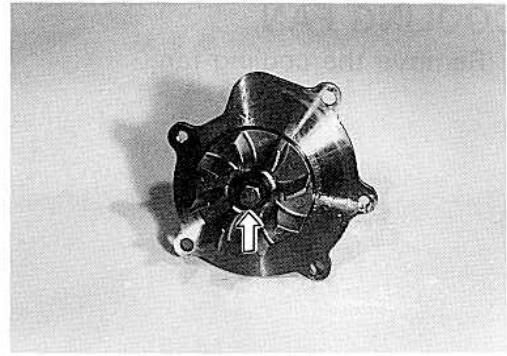


WATER PUMP

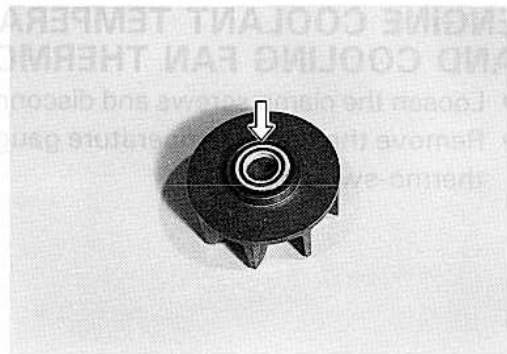
- Remove the gearshift lever and engine sprocket cover. (Refer to page 3-6.)
- Remove the water pump assembly.
- Remove the water pump cover.



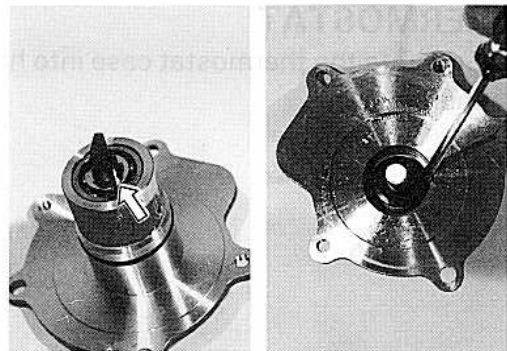
- Remove the impeller securing bolt by holding the impeller shaft with a water pump pliers.



- Remove the mechanical seal ring.



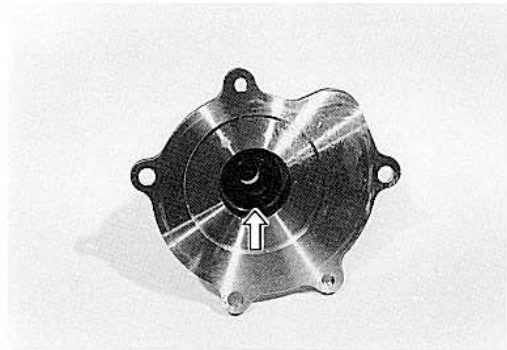
- Remove the circlip from the impeller shaft.
- Remove the impeller shaft.
- Remove the mechanical seal.



- Remove the oil seal.

CAUTION:

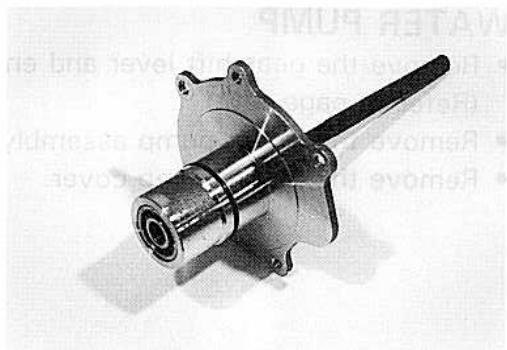
The removed mechanical seal or oil seal should be replaced with a new one.



- Drive out the bearings by using a suitable bar.

CAUTION:

The removed bearings should be replaced with new ones.

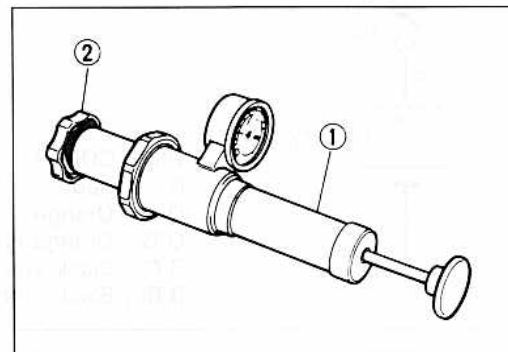


RADIATOR

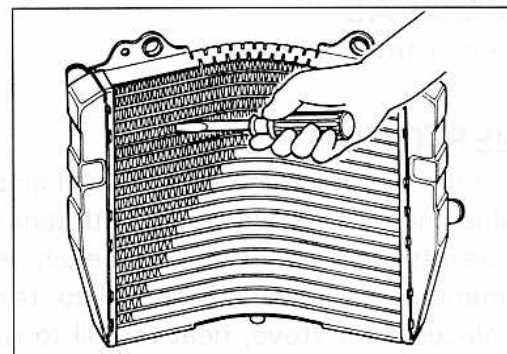
INSPECTION

Before removing the radiator and draining the engine coolant, inspect the following items.

1. Test the cooling system for tightness by using the radiator tester as follows: Remove the radiator cap, and connect the tester to the filler. Give a pressure of about 1.2 kg/cm^2 (17 psi, 120 kPa) and see if the system holds this pressure for 10 seconds. If the pressure should fall during this 10-second interval, it means that there is a leaking point in the system. In such a case, inspect the entire system and replace the leaking component or part.
2. Test the radiator cap for relieving pressure by using the radiator tester in the following manner: Fit the cap to the tester, as shown, and build up pressure slowly by operating the tester. Make sure that the pressure build-up stops at $1.1 \pm 0.15 \text{ kg/cm}^2$ ($15.6 \pm 2.1 \text{ psi}$, $110 \pm 15 \text{ kPa}$) and that, with the tester held standstill, the cap is capable of that pressure for at least 10 seconds. Replace the cap if it is found not to satisfy either of these two requirements.



① Radiator cap tester ② Radiator cap



Radiator cap valve

release pressure: $1.1 \pm 0.15 \text{ kg/cm}^2$

($15.6 \pm 2.1 \text{ psi}$, $110 \pm 15 \text{ kPa}$)

3. Road dirt or trash stuck to the fins must be removed. Use of compressed air is recommended for this cleaning. Fins bent down or dented can be repaired by straightening them with the blade of a small screwdriver.
4. Any water hose found in a cracked condition or flattened must be replaced. Any leakage from the connecting section should be corrected by proper tightening.

REMOVAL

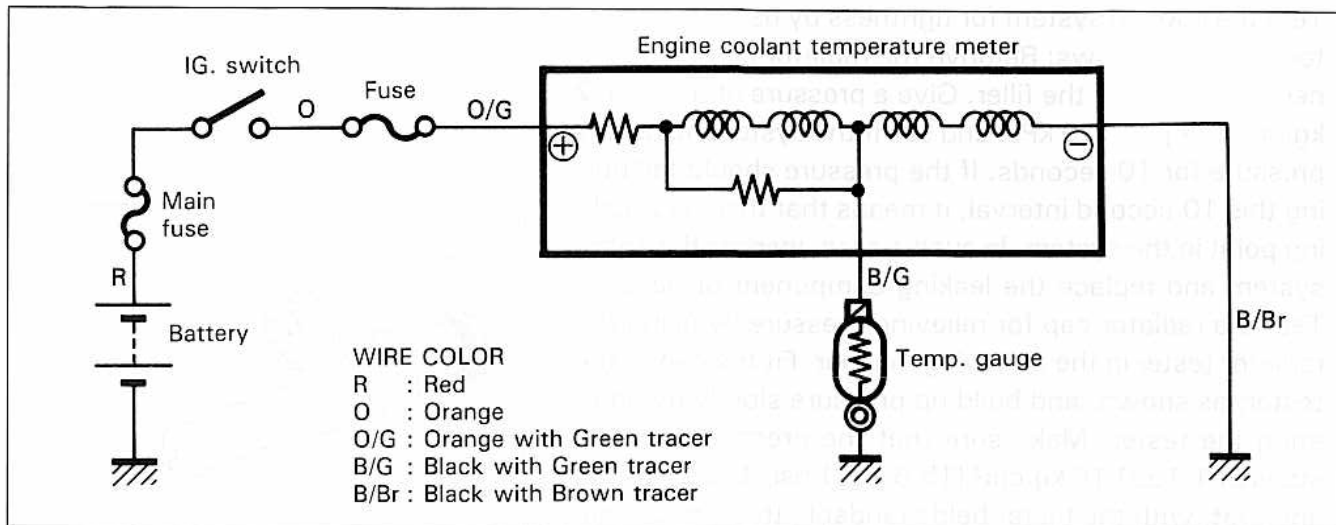
- Refer to page 5-5.

INSTALLATION

The radiator is to be installed in the reverse order of the removal procedure. After installing the radiator, be sure to add engine coolant: refer to page 2-13 for refilling information.

ENGINE COOLANT TEMPERATURE GAUGE

The following circuit diagram shows the electrical wiring for the thermometer. The major components are temperature gauge in contact with engine coolant; and temperature indicator (engine coolant temperature meter).

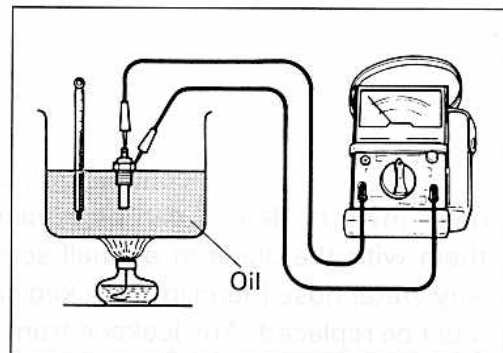


REMOVAL

- Refer to page 5-6.

INSPECTION

Test the temperature gauge at the bench to see if its ohmic value changes, as specified, with temperature. The test is to be run as follows: Connect the temperature gauge to the ohmmeter and place it in the oil contained in a pan, which is placed on a stove; heat the oil to raise its temperature slowly, reading the thermometer placed in the pan and also the ohmmeter. A temperature gauge whose ohmic value does not change in the proportion indicated in the table must be replaced.



09900-25002: Pocket tester

Temperature gauge specification

Engine coolant temperature	Standard resistance
50°C (122°F)	Approx. 153.9 Ω
80°C (176°F)	Approx. 51.9 Ω
100°C (212°F)	Approx. 27.4 Ω
120°C (248°F)	Approx. 16.1 Ω

If the resistance noted to show infinity or too much different resistance value, temperature gauge must be replaced. For inspecting the engine coolant temperature meter, refer to page 6-24.

REASSEMBLY

Apply SUZUKI BOND NO.1207B to the thread portion of the temperature gauge and tighten it to the specified torque.

99000-31140: SUZUKI BOND NO.1207B

Tightening torque

Engine coolant temperature gauge: **6.0—9.0 N·m**
(0.6—0.9 kg-m, 4.5—6.5 lb-ft)

CAUTION:

Take special care when handling the temperature gauge. It may cause damage if it gets a sharp impact.

- Fill the specified engine coolant. (Refer to page 2-13.)

COOLING FAN

REMOVAL

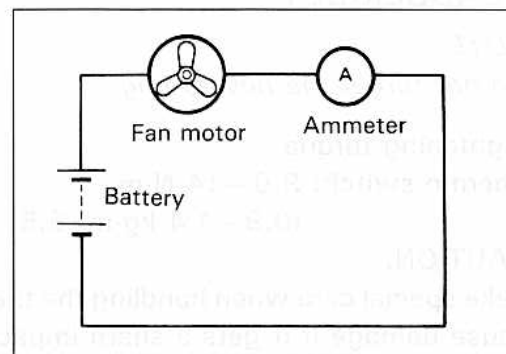
- Refer to page 5-6.

INSPECTION

Test the cooling fan drive motor for load current with an ammeter connected as shown in the illustration.

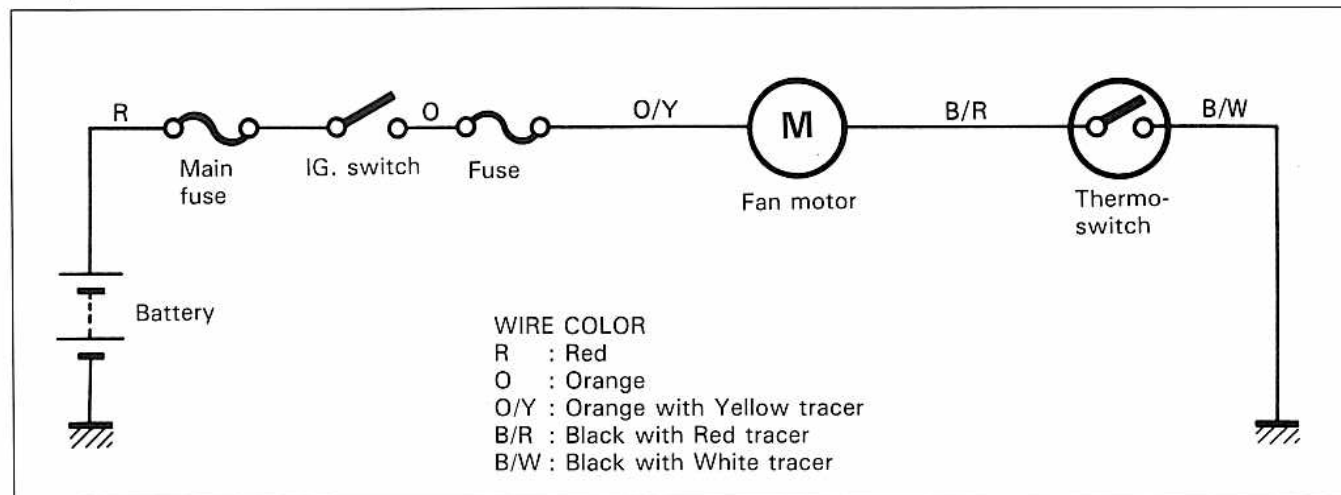
The voltmeter is for making sure that the battery applies 12 volts to the motor. With the motor with electric motor fan running at full speed, the ammeter should be indicating not more than 5 amperes.

If the fan motor does not turn, replace the motor assembly with a new one.



COOLING FAN THERMO-SWITCH

The cooling fan, being located behind the radiator, is secured to the radiator by three bolts. The fan drive motor is automatically controlled by the thermo-switch. This switch remains open when the temperature of engine coolant is low, but it closes at about 105°C (221°F) of rising engine coolant temperature to set the fan in motion.

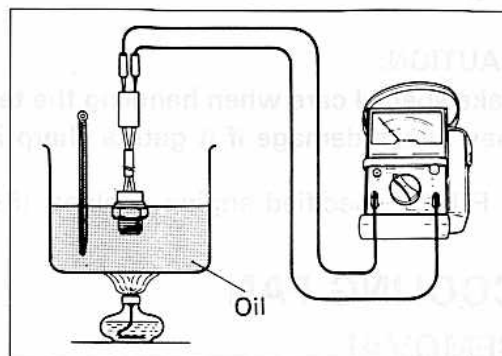


REMOVAL

- Refer to page 5-6.

INSPECTION

- The thermo-switch must be checked for its temperature-initiated closing action at the specification value of 105°C (221°F) by testing it at the bench as shown in the figure. Connect the thermo-switch to a circuit tester and place it in the oil contained in a pan, which is placed on a stove; heat the oil to raise its temperature slowly, and read the column thermometer when the switch closes.



09900-25002: Pocket tester

Thermo-switch specification

OFF → ON	Approx. 105°C (221°F)
ON → OFF	Approx. 100°C (212°F)

REASSEMBLY

NOTE:

Do not forget the new O-ring.

Tightening torque

Thermo-switch: 9.0 – 14 N·m
(0.9 – 1.4 kg·m, 6.5 – 10.0 lb-ft)

CAUTION:

Take special care when handling the thermo-switch. It may cause damage if it gets a sharp impact.

Replace the O-ring with a new one.



THERMOSTAT

REMOVAL

- Refer to page 5-6.

INSPECTION

Inspect the thermostat pellet for signs of cracking.

Test the thermostat at the bench for control action, in the following manner.

- Pass a string between flange, as shown in the illustration.
- Immerse the thermostat in the water contained in a beaker, as shown in the illustration. Note that the immersed thermostat is in suspension. Heat the water by placing the beaker on a stove and observe the rising temperature on a thermometer.
- Read the thermometer just when opening the thermostat. This reading, which is the temperature level at which the thermostat valve begins to open, should be anywhere between 74.5°C (166.1°F) and 78.5°C (173.3°F).

**Thermostat valve opening temperature: 74.5–78.5°C
(166.1–173.3°F)**

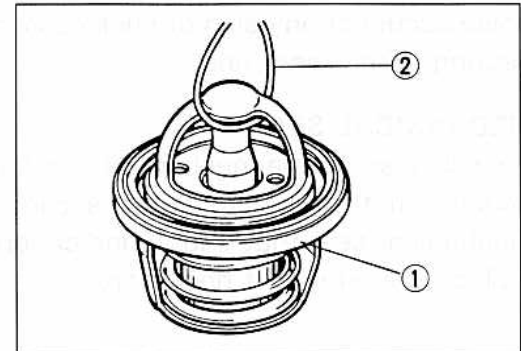
- Keep on heating the water to raise its temperature to and beyond 90°C (194°F).
- Just when the water reaches 90°C (194°F), the thermostat valve should have lifted by at least 7.0 mm (0.28 in).

**Thermostat valve lift: Over 7.0 mm at 90°C
(Over 0.28 in at 194°F)**

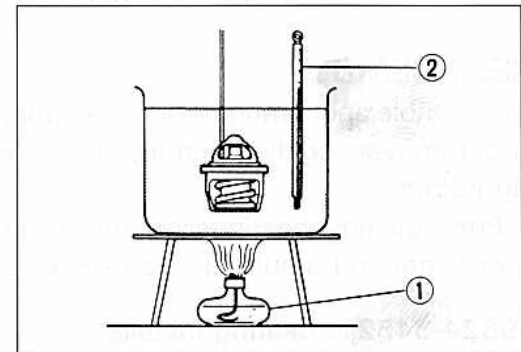
- A thermostat failing to satisfy either of the two requirements (start-to-open temperature and valve lift) must be replaced.

REASSEMBLY

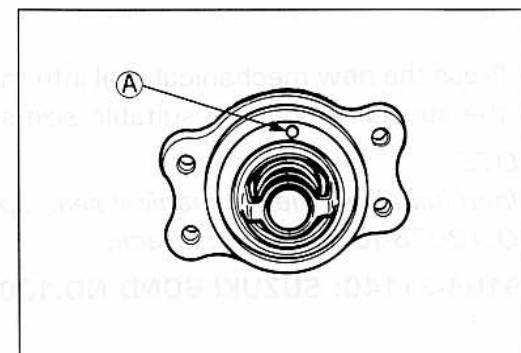
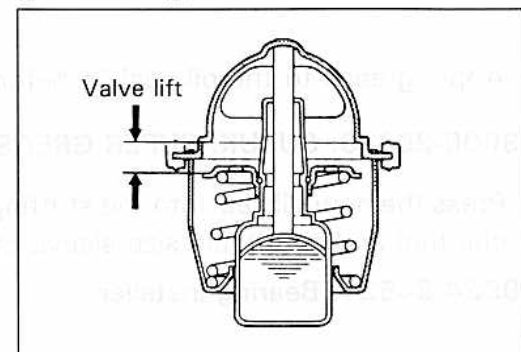
- The air bleeder hole (A) of the thermostat faces upside.



① Thermostat ② String



① Stove ② Thermometer



WATER PUMP

REMOVAL AND DISASSEMBLY

- Refer to page 5-6 for the water pump removal and disassembly procedures.

INSPECTION

WATER PUMP BEARING

Turn the inner race and check the bearing play. If abnormal noise occurs or any sign of stickiness is noted, replace the bearing with a new one.

MECHANICAL SEAL

Visually inspect the mechanical seal for damage, with particular attention given to the sealing face. Replace the mechanical seal that shows indications of leakage. Also replace the oil seal if necessary.

REASSEMBLY

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

- Press the new bearings into the stuffing box with the special tool and a suitable size sleeve etc.

09924-84521: Bearing installer

- Apply grease to the oil seal lip before installing.

99000-25030: SUZUKI SUPER GREASE "A"

- Press the new oil seal into the stuffing box with the special tool and a suitable size sleeve etc.

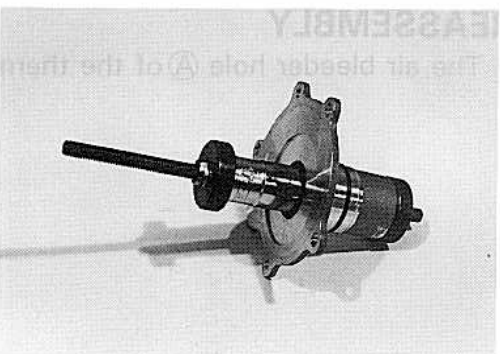
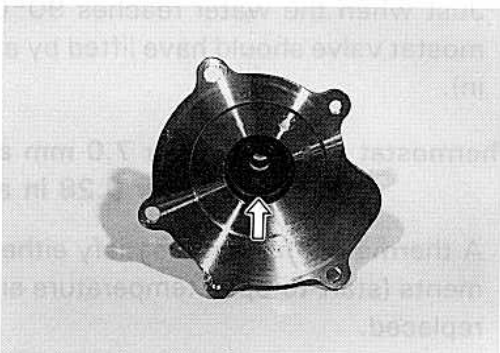
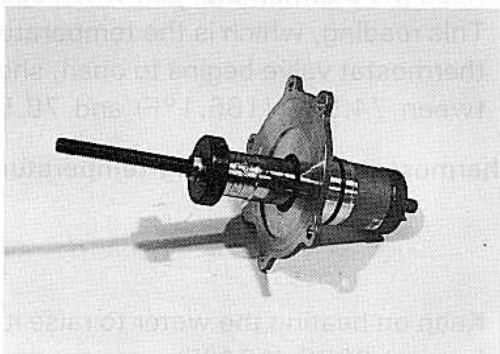
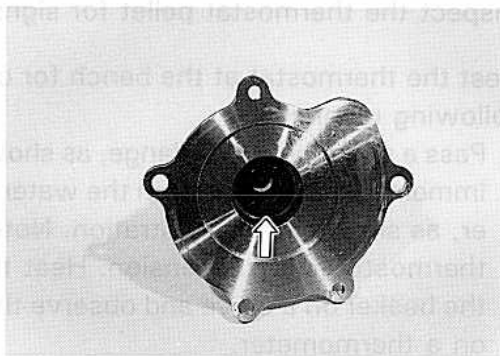
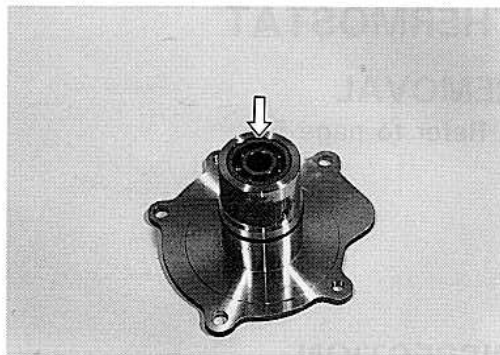
09924-84521: Bearing installer

- Press the new mechanical seal into the stuffing box with the special tool and a suitable size sleeve etc.

NOTE:

When installing the mechanical seal, apply SUZUKI BOND NO.1207B to its outer surface.

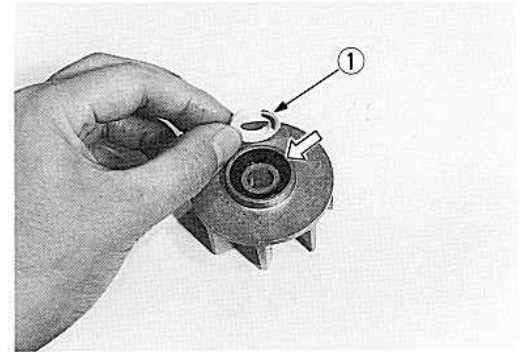
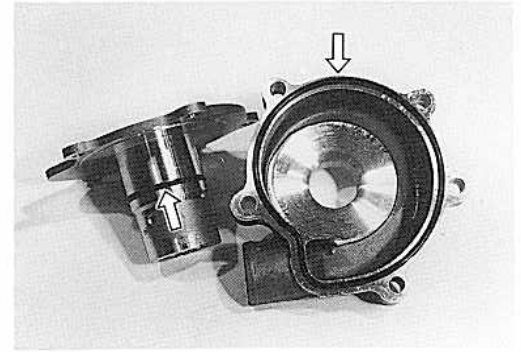
99104-31140: SUZUKI BOND NO.1207B



- Replace the O-rings and water seal with new ones when reassembling the water pump.

NOTE:

The mechanical seal ring must be assembled with marked face ① of the ring toward the impeller.

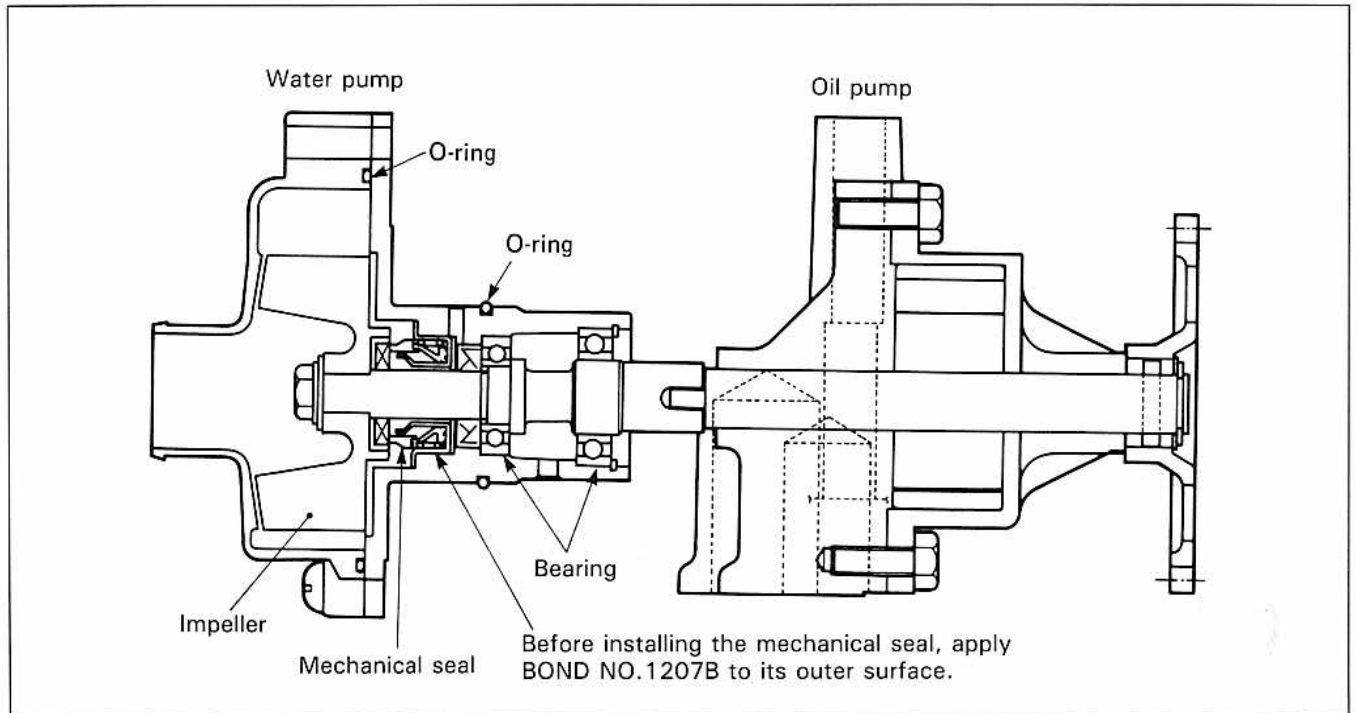
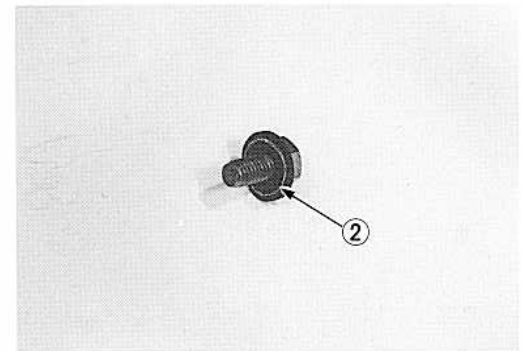


- Tightening the impeller securing bolt to the specified torque.

**Tightening torque: 7–9 N·m
(0.7–0.9 kg-m, 5.0–6.5 lb-ft)**

NOTE:

The seal lip side ② faces impeller.



Refer to page 8-26 for the radiator hose routing.

ELECTRICAL SYSTEM

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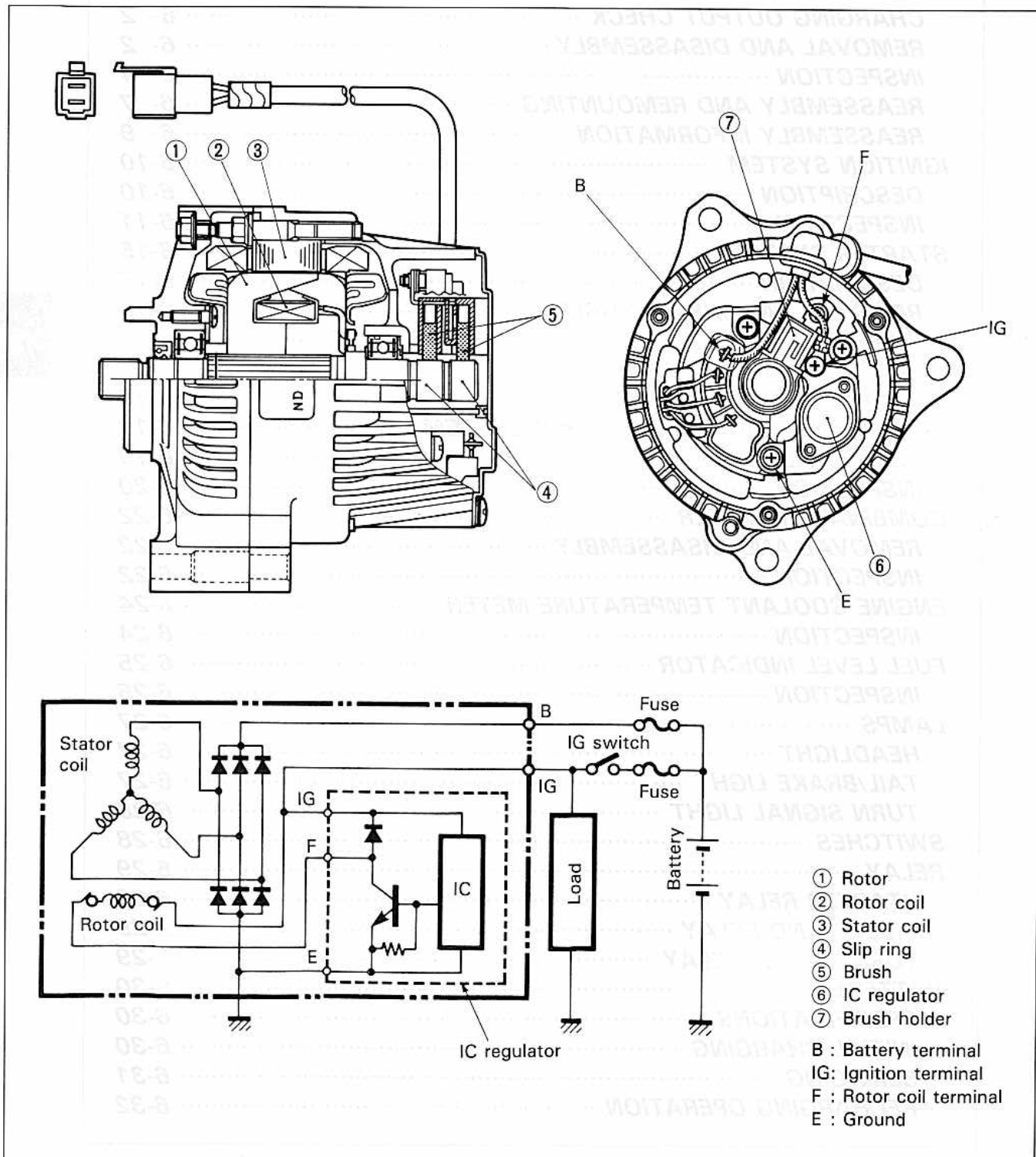
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CHARGING SYSTEM

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.



CHARGING OUTPUT CHECK

- Remove the front seat.
- Start the engine and keep it running at 5 000 r/min.
- Measure the DC voltage between the battery terminals \oplus and \ominus with a pocket tester. If the tester reads under 13.5V, check the stator coil, rectifier and IC regulator mounted in the generator.

CAUTION:

If the pocket tester is set to read current or resistance and a voltage is applied across the test probes, damage will result. Therefore, it is important that the tester knob on the pocket tester be set the proper position before making any measurements.

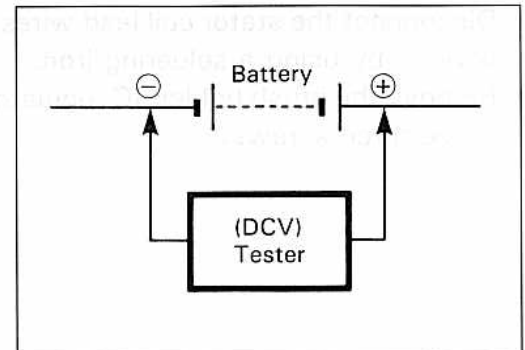
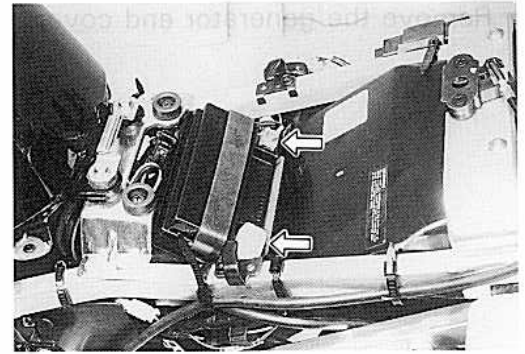
NOTE:

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

09900-25002: Pocket tester

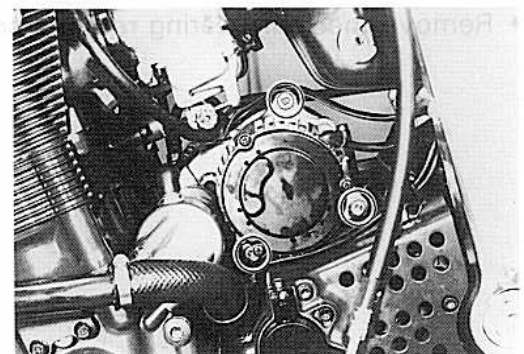
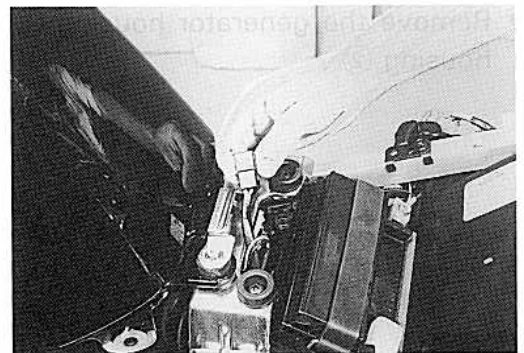
Tester knob indication: DC25V

STD charging output	Above DC13.5V at 5 000 r/min
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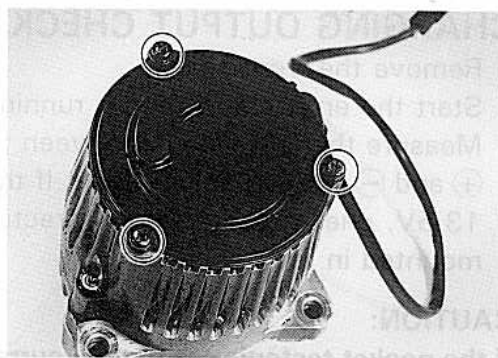


REMOVAL AND DISASSEMBLY

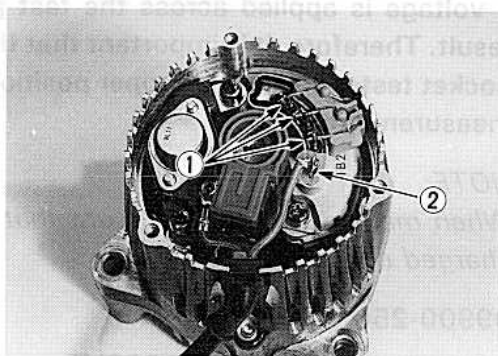
- Remove the front seat. (Refer to page 7-2.)
- Remove the lower cowling. (Refer to page 7-4.)
- Disconnect the generator lead wires coupler.
- Remove the generator by removing the bolts.



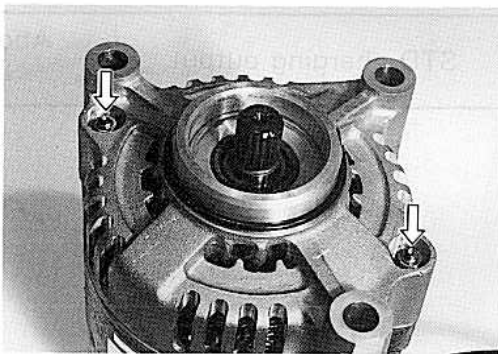
- Remove the generator end cover.



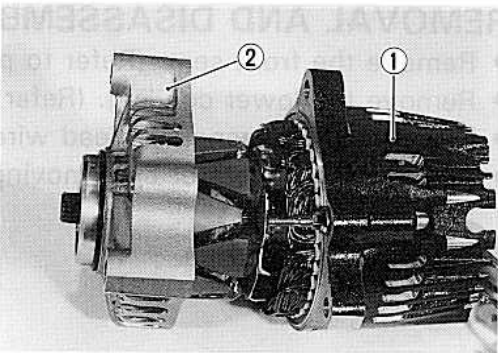
- Disconnect the stator coil lead wires ① and battery lead wire ② by using a soldering iron.
- Remove the brush holder, IC regulator and rectifier to remove three screws.



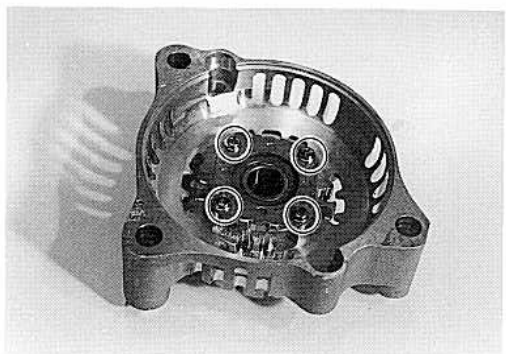
- Remove the two nuts.



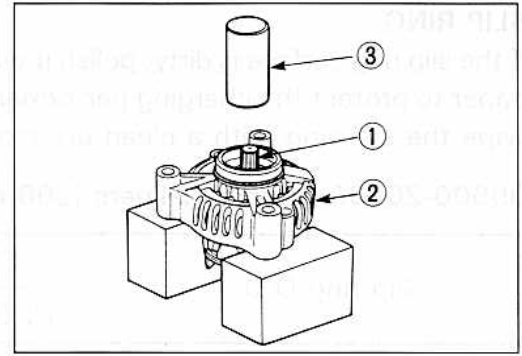
- Remove the generator housing ① from generator end housing ② .



- Remove the four bearing retainer screws.



- Remove the rotor ① from generator end housing ② by using a hand-press ③ as shown.



INSPECTION

ROTOR BEARING

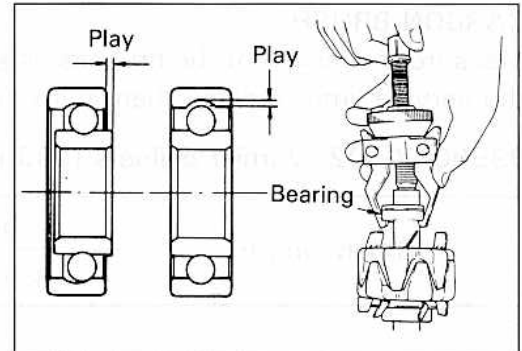
Inspect the rotor bearings for abnormal noise and smooth rotation to rotate them by hand.

If there is anything unusual, remove the bearing with a bearing puller.

09913-60910: Bearing puller (40–60 mm)

CAUTION:

The removed bearing should be replaced with a new one.

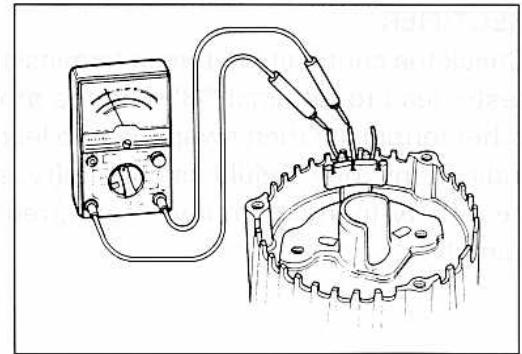


STATOR COIL CONTINUITY CHECK

Check the continuity between the lead wires of the stator with a pocket tester.

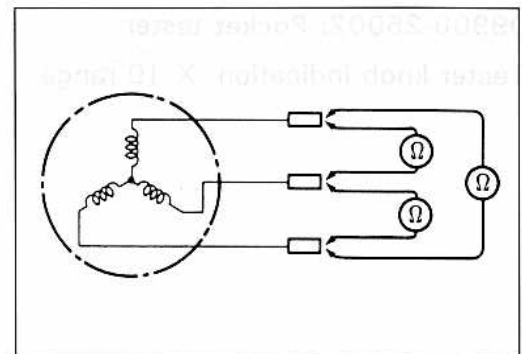
If there is no continuity, replace the stator.

Also check that the stator core is insulated.



09900-25002: Pocket tester

Tester knob indication: X 1Ω range



ROTOR COIL CONTINUITY CHECK

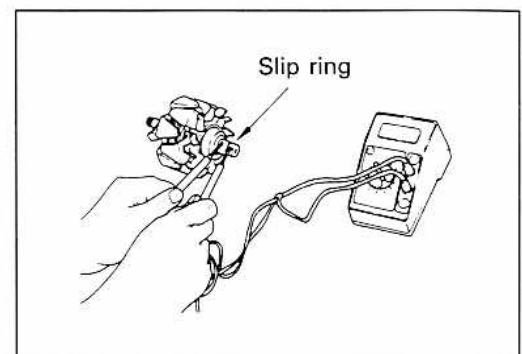
Check the continuity between the two slip rings of the rotor with a pocket tester.

If there is no continuity, replace the rotor.

Also check that the rotor is insulated.

09900-25002: Pocket tester

Tester knob indication: x 1Ω range



REASSEMBLY AND REMOUNTING

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

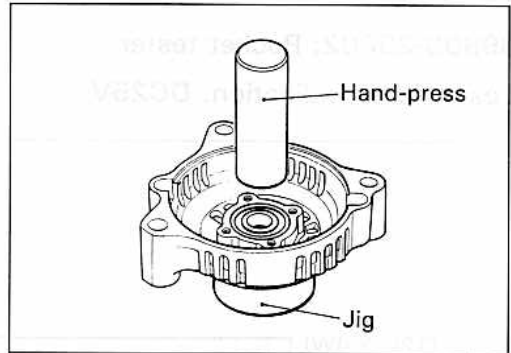
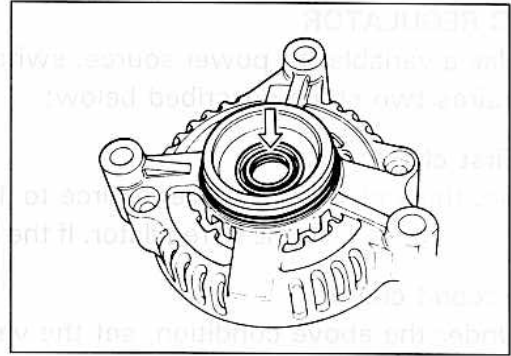
- Apply grease to the lip of the oil seal.

99000-25030: SUZUKI SUPER GREASE "A"

CAUTION:

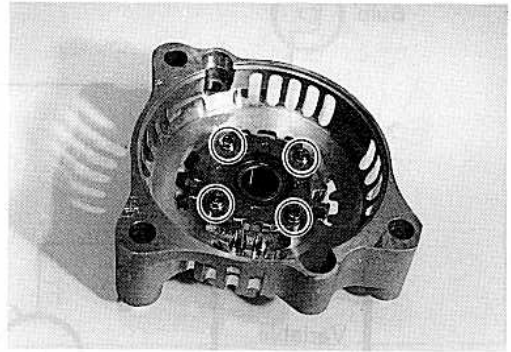
The removed oil seal should be replaced with a new one.

- Install the bearing by using a hand-press as shown.

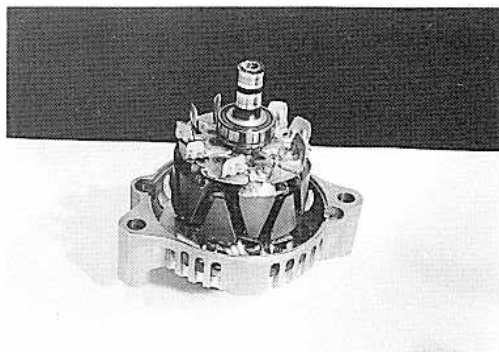
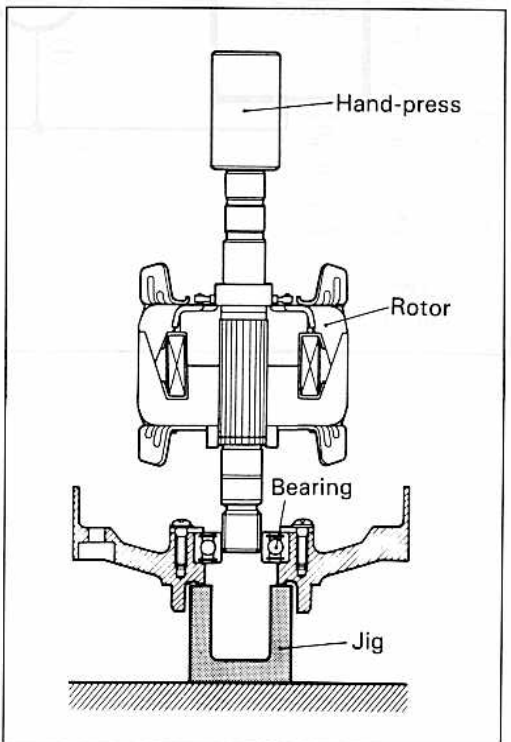


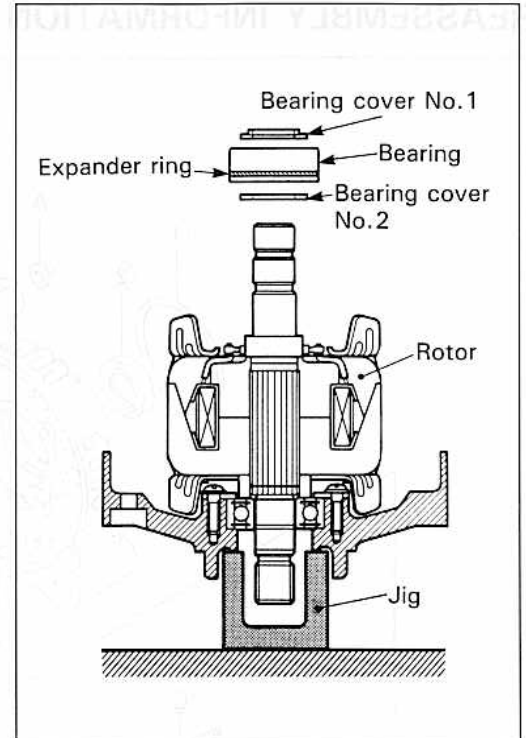
- Apply a small quantity of THREAD LOCK "1342" to the bearing retainer screws.

99000-32050: THREAD LOCK "1342"



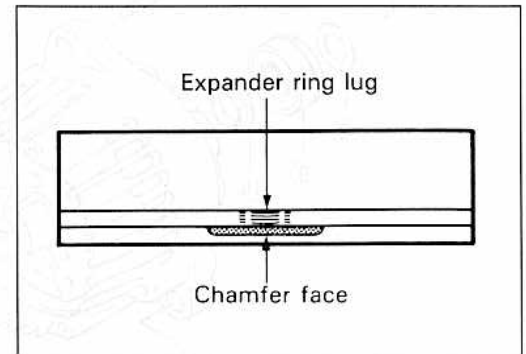
- Install the rotor and bearing by using a hand-press as shown.



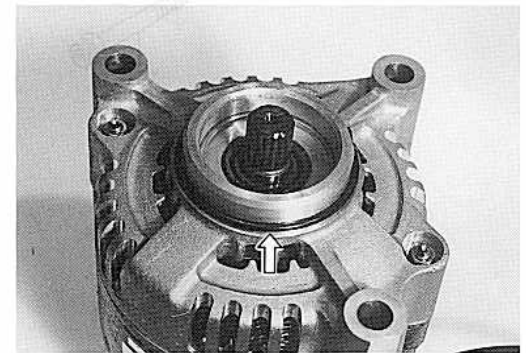


NOTE:

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

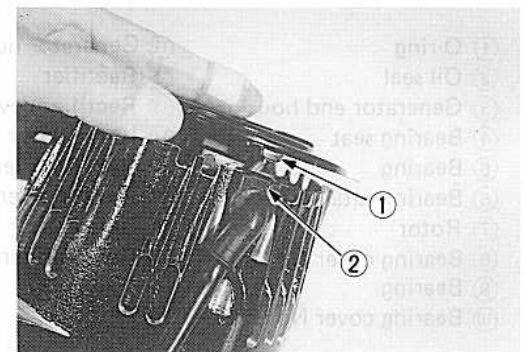


- Fit a new O-ring to the generator end housing.

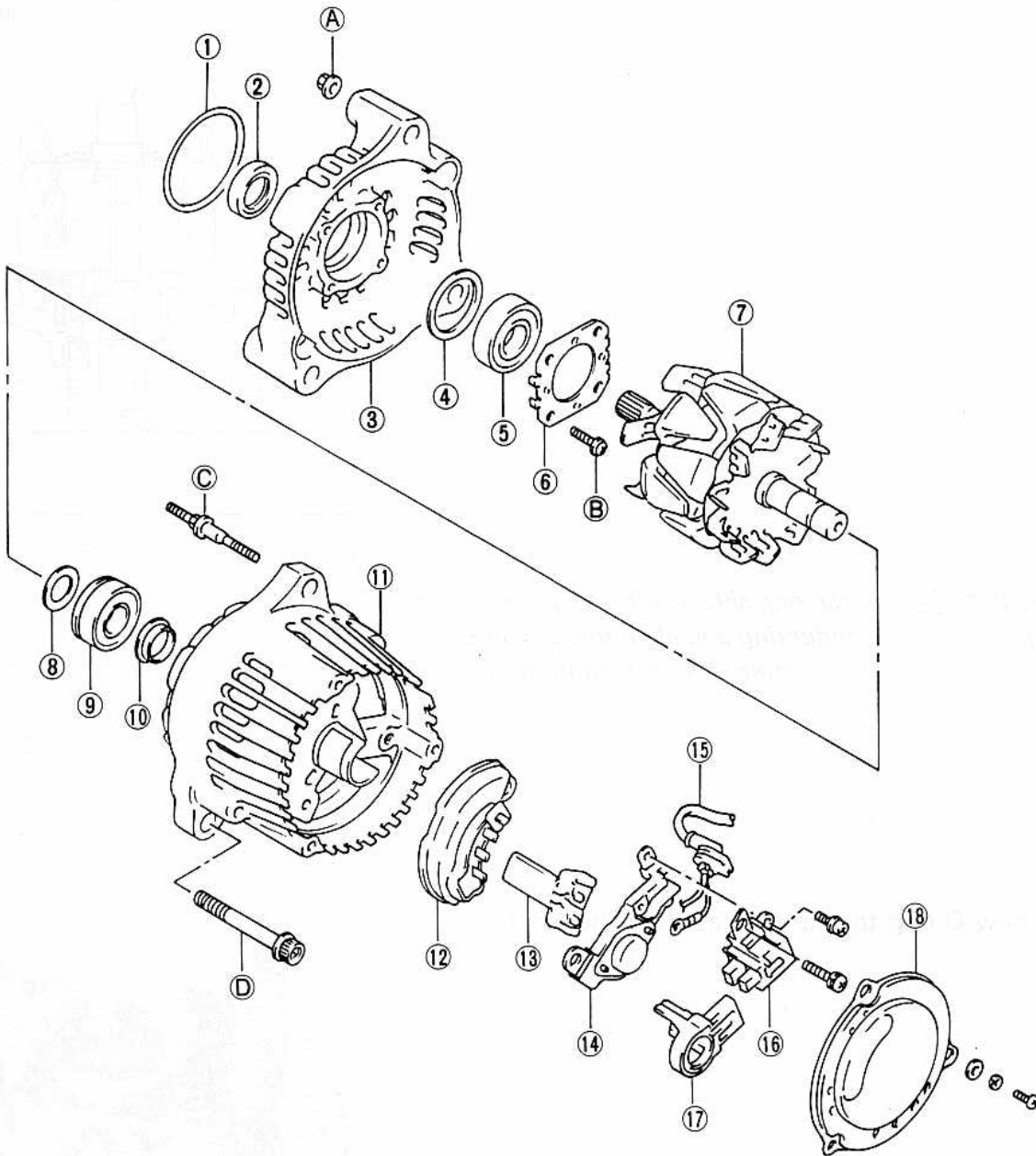


- Align the lug ① of the generator end cover with the groove ② of the lead wire grommet.

ITEM	mm	inch
A	1.7-1.8	0.07-0.07
H	2.3-2.4	0.09-0.09
C	2.1-2.2	0.08-0.08
D	2.1-2.1	0.08-0.08



REASSEMBLY INFORMATION



- ① O-ring
- ② Oil seal
- ③ Generator end housing
- ④ Bearing seat
- ⑤ Bearing
- ⑥ Bearing retainer
- ⑦ Rotor
- ⑧ Bearing cover No. 2
- ⑨ Bearing
- ⑩ Bearing cover No. 1
- ⑪ Generator housing
- ⑫ Rectifier
- ⑬ Rectifier cover
- ⑭ IC regulator
- ⑮ Generator lead wire
- ⑯ Brush holder
- ⑰ Brush cover
- ⑱ Generator end cover

Tightening torque			
ITEM	N-m	kg-m	lb-ft
A	3.7-5.5	0.37-0.55	2.6-4.0
B	2.2-3.3	0.22-0.33	1.5-2.5
C	3.7-5.5	0.37-0.55	2.6-4.0
D	21-29	2.1-2.9	15.0-21.0

IGNITION SYSTEM (DIGITAL IGNITOR)

DESCRIPTION

The fully transistorized ignition system consists of a signal generator, ignitor unit (including 8-BIT MICROCOMPUTER and CERAMIC 4MHZ VIBRATOR), ignition coils and spark plugs. The characteristic of the ignition timing is programmed and stored in the "ROM" (READ ONLY MEMORY) of the ignitor unit.

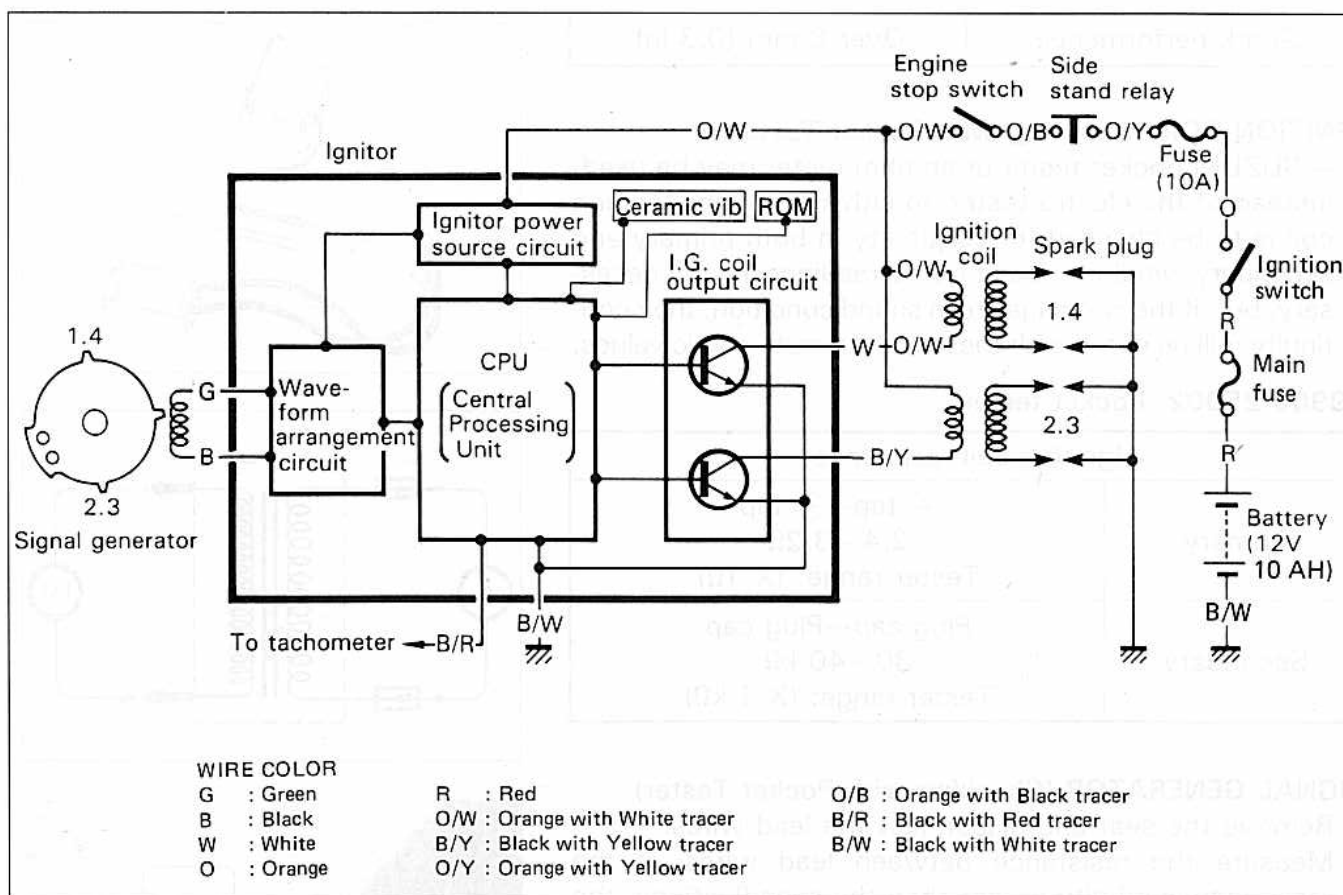
The signal generator comprises the rotor tip and pickup coil.

The signal generator is mounted at the right end of the crankshaft. The induced signal in the signal generator is sent to wave-form arrangement circuit, and CPU receives this signal and calculates the best ignition timing from the signal of ceramic vibrator and data stored in the ROM. The CPU outputs signal to the transistor of the I.G. coil output circuit which is connected to the primary windings of the ignition coil which is 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 11 000 r/min., this circuit cuts off the ignition primary current for all spark plugs.

CAUTION:

Engine can run over 11 000 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 11 000 r/min. at anytime.



INSPECTION

IGNITION COIL (Checking with Electro Tester)

- Remove the front seat, lower cowling assembly and fuel tank. (Refer to pages 7-2, 3 and 4.)
- Remove the thermostat case mounting bracket (A).
- Remove the ignition coils.

NOTE:

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

- With the tester and jumper wire, test the ignition coil for sparking performance in accordance with the following two steps.

STEP ① : Connect the jumper wire to the spark plug cap and ignition coil ground.

STEP ② : Switch over the jumper wire to the other plug cap and ground.

If no sparking or orange color sparking occurs in the above conditions, it may be caused by defective coil.

09900-28106: Electro tester

Spark performance	Over 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	\oplus tap — \ominus tap 2.4–3.2 Ω Tester range: (X 1 Ω)
Secondary	Plug cap — Plug cap 30–40 k Ω Tester range: (X 1 k Ω)

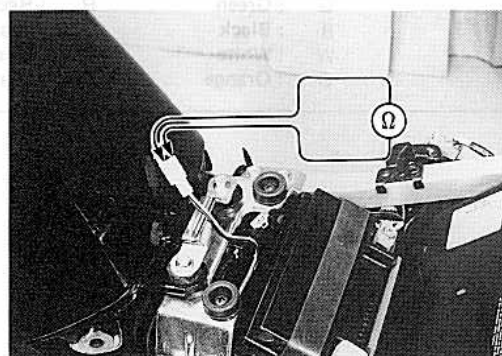
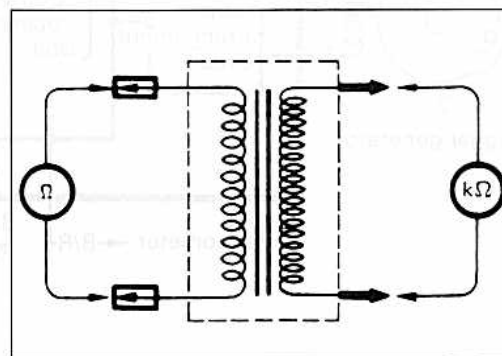
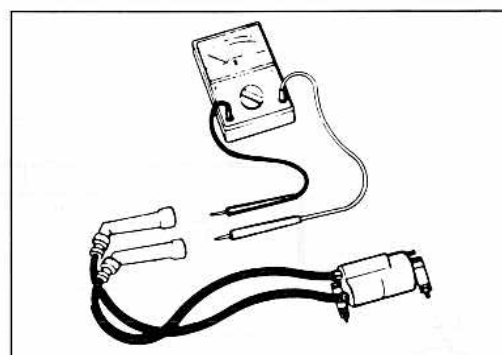
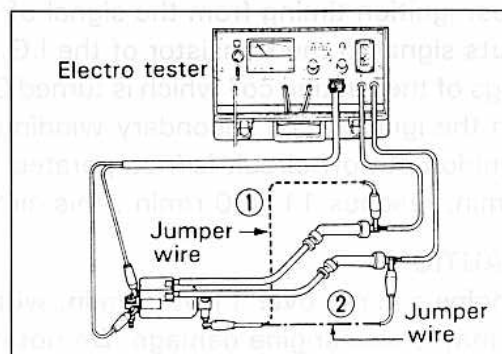
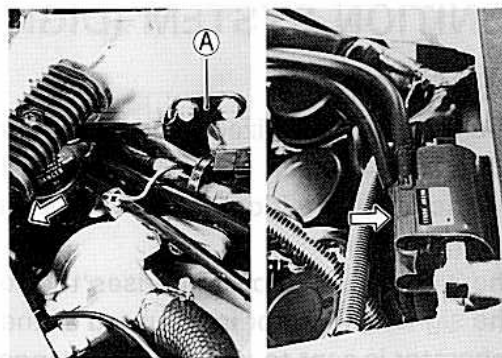
SIGNAL GENERATOR (Checking with Pocket Tester)

- Remove the seat and disconnect the lead wires.
- 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

Signal coil resistance	Approx. 135–200 Ω (Black — Green)
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Tester knob indication: X 100 Ω range



SPARK PLUGS

- Remove the front seat and fuel tank. (Refer to page 7-3.)
- Remove all the spark plugs.

Carbon Deposit

Check to see the carbon deposit on the plug.

If the carbon is deposited, remove it with a spark plug cleaner machine or carefully using a tool with a pointed end.

Spark Plug Gap

Measure the plug gap with a thickness gauge if it is correct. If not, adjust it to the following gap.

09900-20803: Thickness gauge

Spark plug gap	Standard
	0.7–0.8 mm (0.028–0.032 in)

Electrode's Condition

Check to see a worn or burnt condition of the electrode. If it is extremely worn or burnt, replace the plug. Also replace the plug if it has a broken insulator, damaged thread, etc.

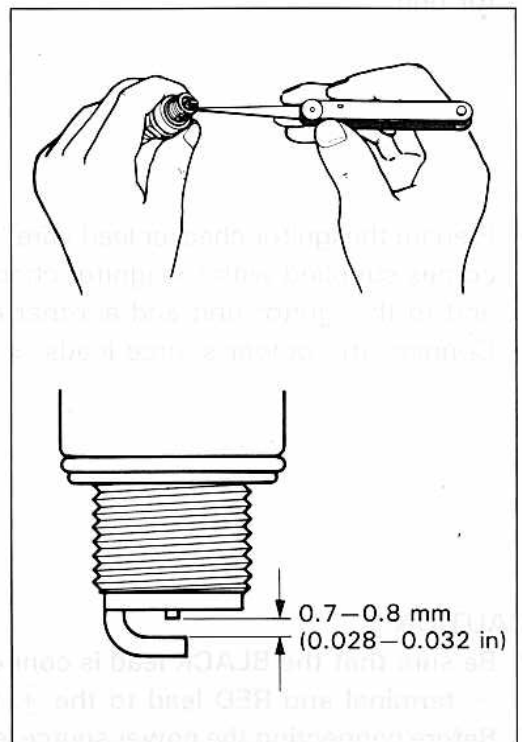
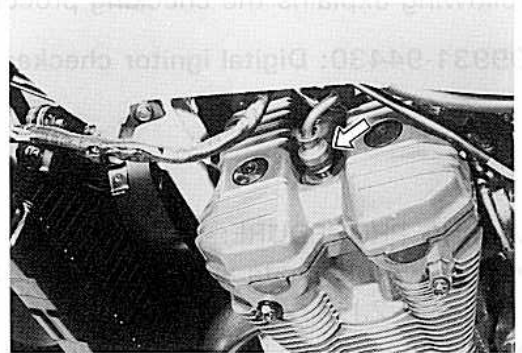
Heat Range

NGK CR9E should be used as the standard. However, the heat range of the spark plug should be selected to meet the requirements of speed, actual load, fuel and etc. Proper heat range would be indicated if all insulators were LIGHT BROWN in color. If they are baked white, they should be replaced with a cold type plug NGK CR10E or NIPPONDENSO U31ESR-N.

	Standard	Cold type	Hot type
NGK	CR9E	CR10E	CR8E
NIPPONDENSO	U27ESR-N	U31ESR-N	U24ESR-N

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.



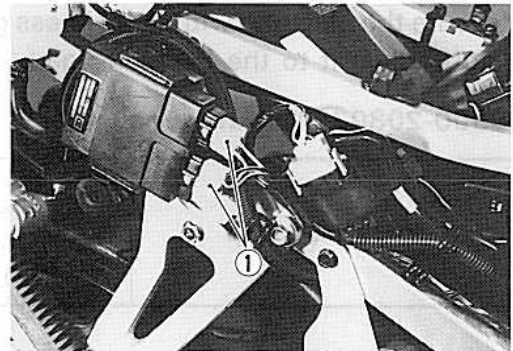
IGNITOR UNIT (Checking with Digital Ignitor Checker)

This section explains the checking procedure for the ignitor unit using Digital Ignitor Checker (special tool).

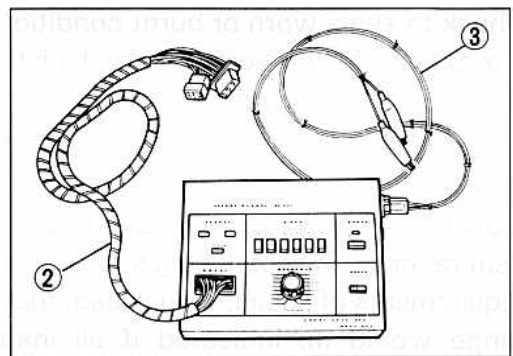
With this checker, the ignitor unit can be checked either on the machine or off the machine. The following explains the checking procedure on the machine.

09931-94430: Digital ignitor checker**WIRING PROCEDURE:**

- Remove the seats and frame cover assembly. (Refer to page 7-2.)
- Disconnect two ignitor lead wire couplers ① at the ignitor unit.



- Prepare the ignitor checker lead wire "MODE 1" ② which comes supplied with the ignitor checker and connect its end to the ignitor unit and another end to the checker.
- Connect the power source leads ③ to the battery.

**CAUTION:**

- * Be sure that the **BLACK** lead is connected to the battery \ominus terminal and **RED** lead to the \oplus terminal.
- * Before connecting the power source leads, make sure that both "POWER" button and "START" switch are in "off" position (POWER button not depressed).

NOTE:

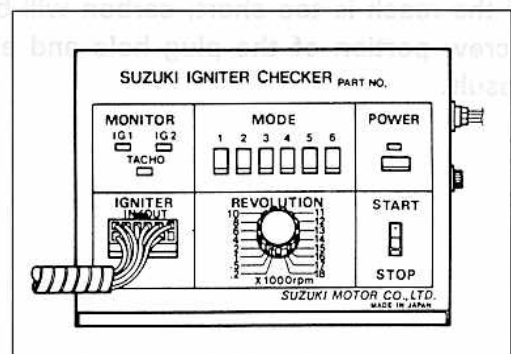
Be sure that the battery used is in fully-charged condition.

CHECK PROCEDURE:

With all the lead wires properly connected, check the ignitor unit in the following three steps.

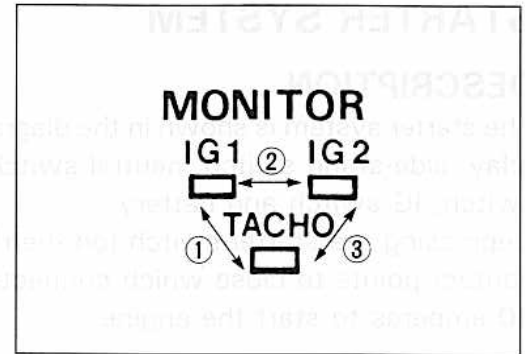
First Step:

Depress "MODE 1" button then "POWER" button. This time, "POWER" lamp should come on, if not, battery is undercharged.



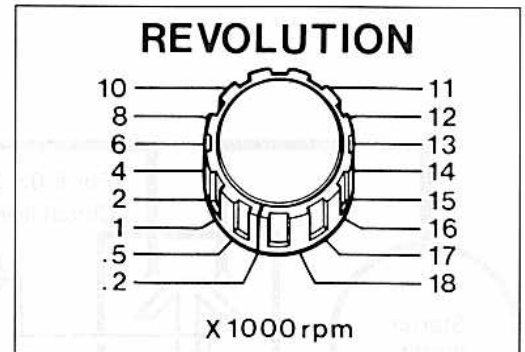
Second Step:

Set "REVOLUTION" dial pointer to ".2" position in which the checker produces the ignition primary current pulses simulating 200 r/min of engine revolution when "START" switch is turned on. With "START" switch is turned to ON position, check that three "MONITOR" lamps turn on and off in slow frequency in order of ①—②—③ or ①—③—② as illustrated.

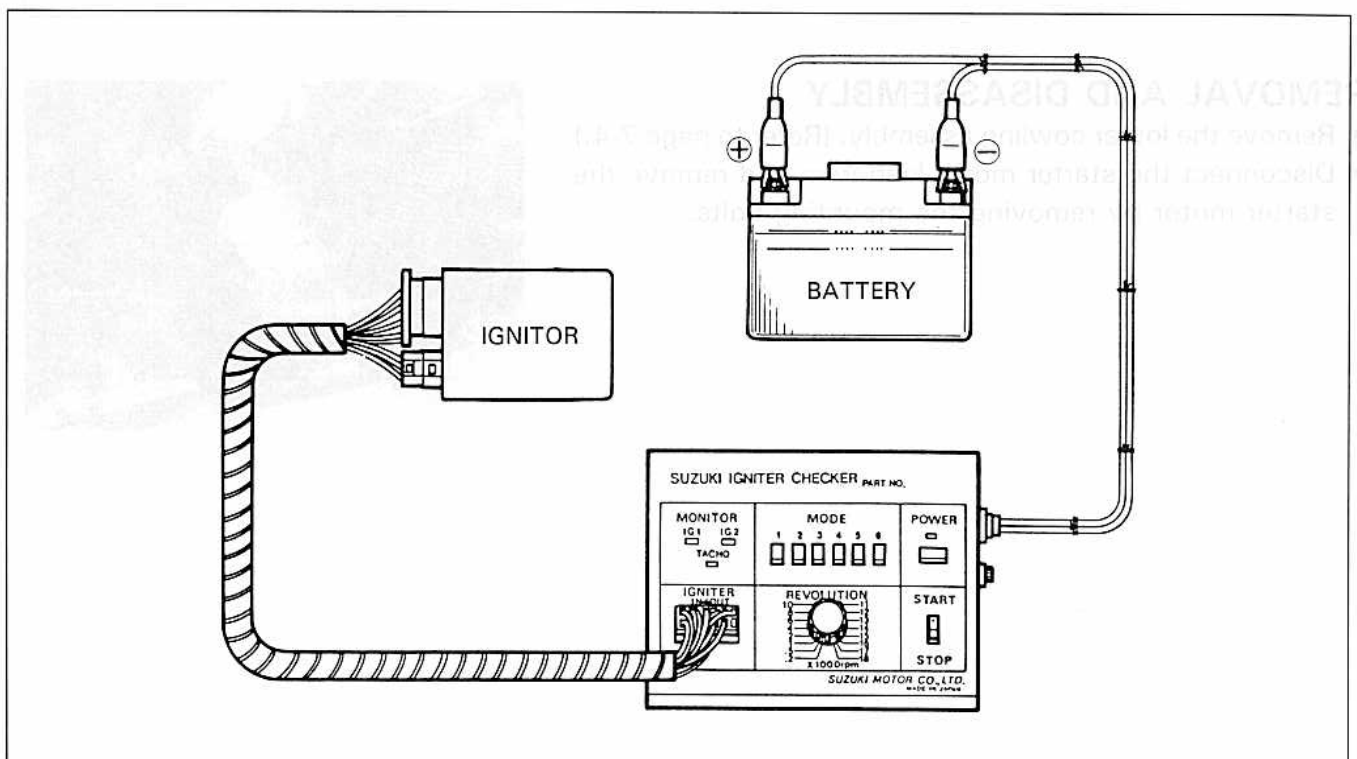
**Third Step:**

Turn "REVOLUTION" dial up gradually (assuming the engine gradually revved up) and check that the MONITOR lamp flash frequency as explained in the second step above increases. As the dial pointer passes beyond the graduation "4" (4 000 r/min), all the three lamps should show continuously lighted.

When REVOLUTION dial pointer reaches between "10" and "12" (10 000—12 000 r/min), MONITOR "IG1" and "IG2" lamps should go off while "TACHO" lamp stays on. This is because the ignition "cut-off" provided in the GSX-R1100W ignition system functions at $11\ 000 \pm 100$ r/min. If the lamps go off at the graduation below "11", the engine can not perform properly and therefore the ignitor unit must be replaced.

**Fourth Step:**

Turn "START" switch to STOP position. If the "IG1" or "IG2", or both lamps remain light more than 5 seconds, the ignitor unit must be replaced.

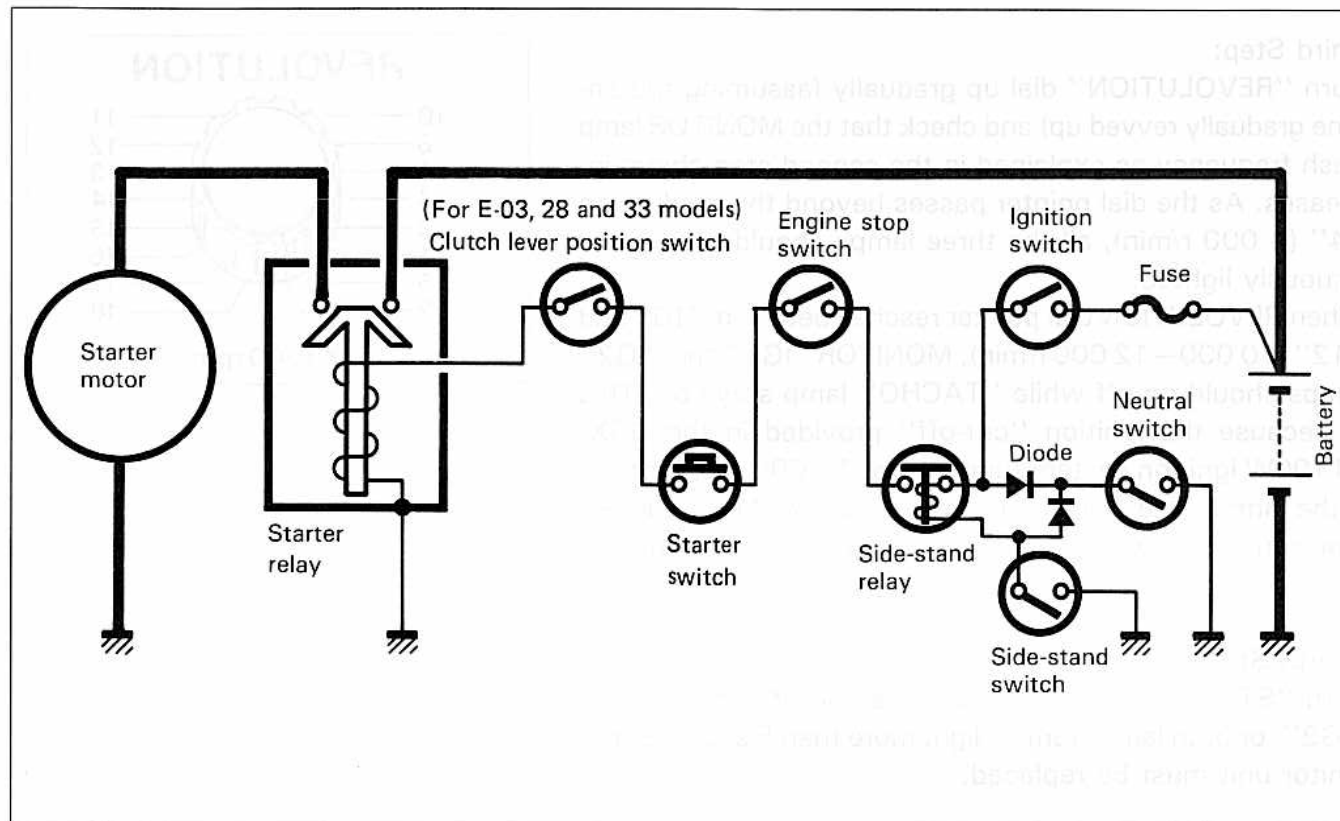


STARTER SYSTEM

DESCRIPTION

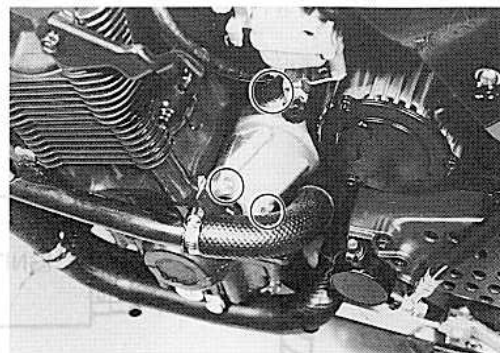
The starter system is shown in the diagram below: namely, the starter motor, starter relay, side-stand relay, side-stand switch, neutral switch, clutch lever position switch, starter switch, engine stop switch, IG switch and battery.

Depressing the starter switch (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.

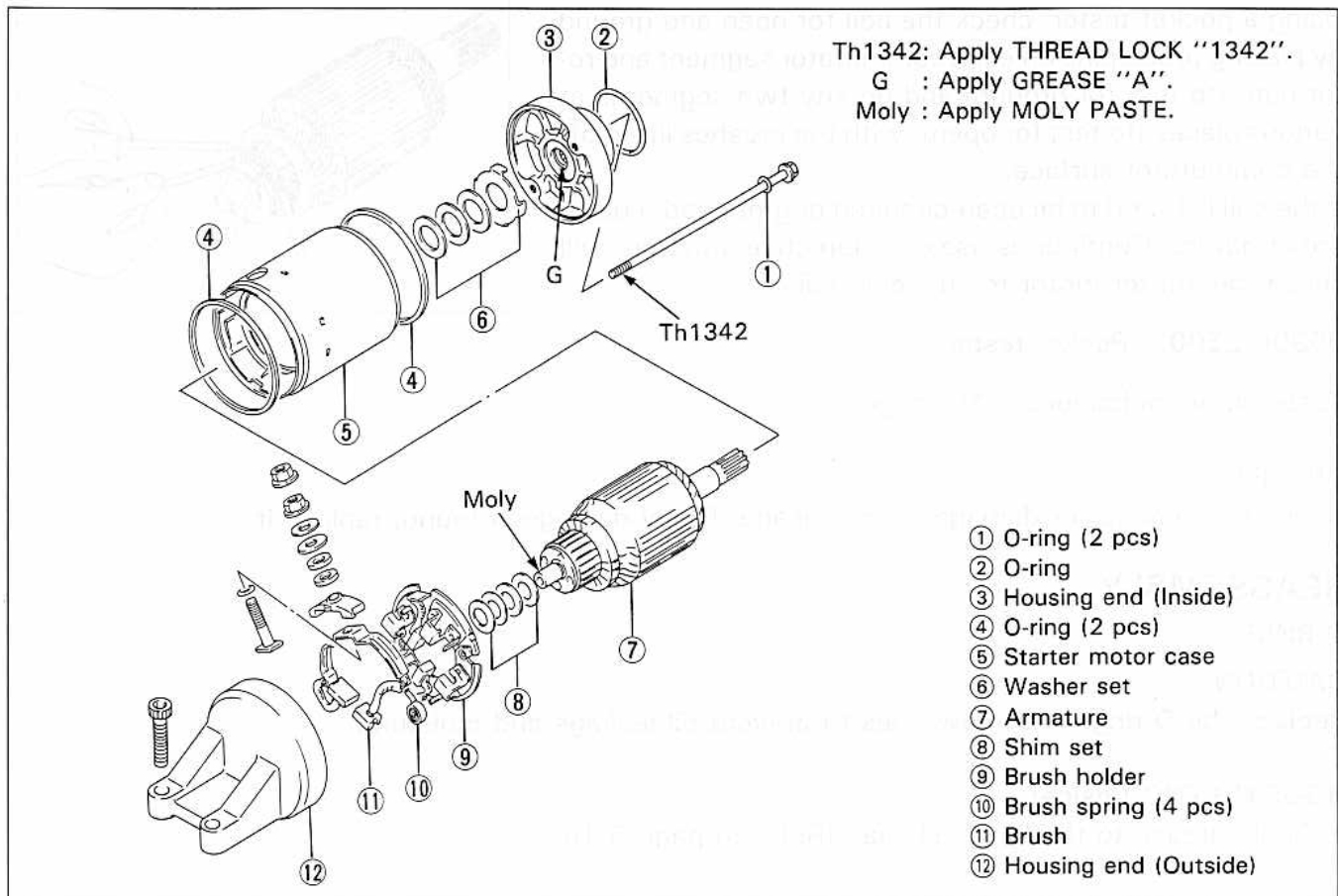


REMOVAL AND DISASSEMBLY

- Remove the lower cowl assembly. (Refer to page 7-4.)
- Disconnect the starter motor lead wire and remove the starter motor by removing the mounting bolts.



- Disassemble the starter motor as shown in the illustration.



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 with a vernier calipers, replacing them when they are too short or chipping.

09900-20102: Vernier calipers (200 mm)

Brush length	Service Limit
	6 mm (0.2 in)

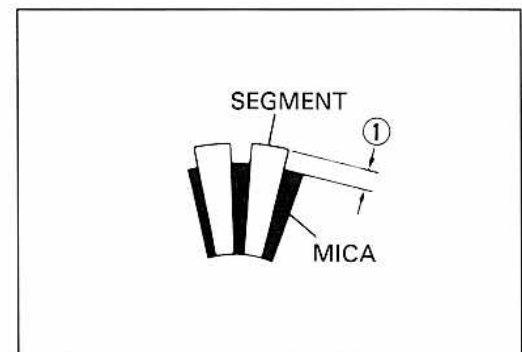
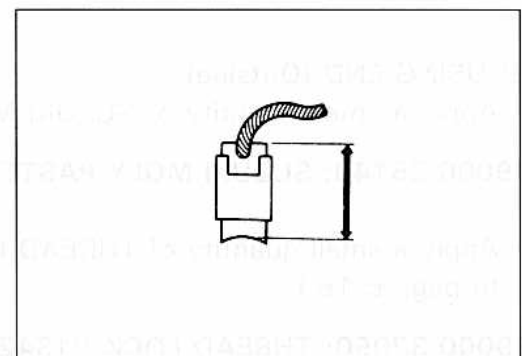
COMMUTATOR

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 with a vernier calipers.

09900-20102: Vernier calipers (200 mm)

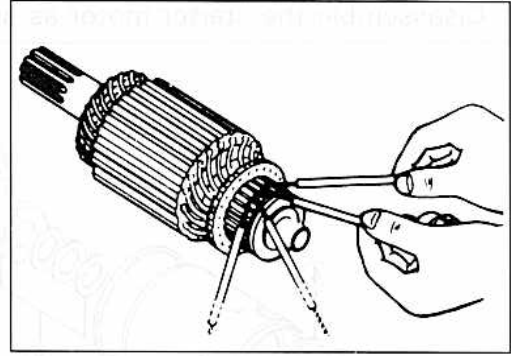
Commutator under-cut	Service Limit
	0.2 mm (0.008 in)



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

Tester knob indication: X 1Ω range

OIL SEAL

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

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 oil seal. (Refer to page 6-16.)

99000-25030: SUZUKI SUPER GREASE "A"

HOUSING END (Outside)

- Apply a small quantity of SUZUKI MOLY PASTE to the armature end. (Refer to page 6-16.)

99000-25140: SUZUKI MOLY PASTE

- Apply a small quantity of THREAD LOCK "1342" to the starter motor housing screws. (Refer to page 6-16.)

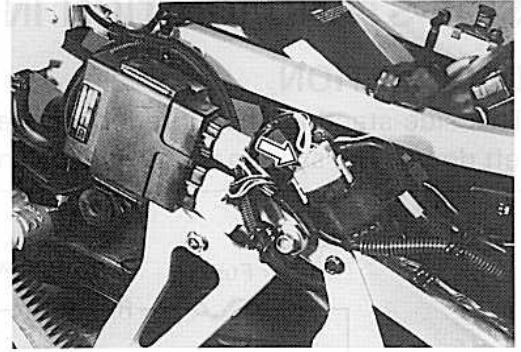
99000-32050: THREAD LOCK "1342"

Brush length	5 pin (D) (mm)
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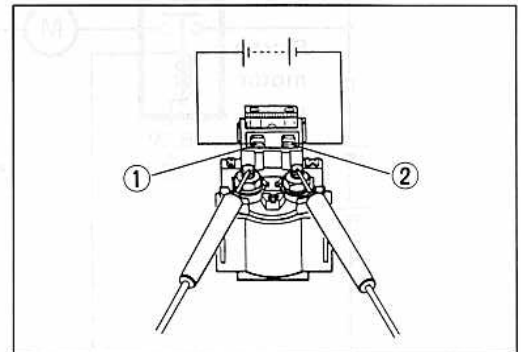
Pin length	5 pin (D) (mm)
------------	----------------

STARTER RELAY INSPECTION

- Remove the seats and frame cover assembly.
- Disconnect the starter motor lead wire and battery lead wire at the starter relay which is located behind the right frame cover.
- Disconnect the lead wire coupler from the starter relay.



- Apply 12 volts to ① and ② terminals, inspect the continuity between the terminals, positive and negative. If the starter relay is in sound condition, continuity is found.



09900-25002: Pocket tester

Tester knob indication: X 1Ω range

CAUTION:

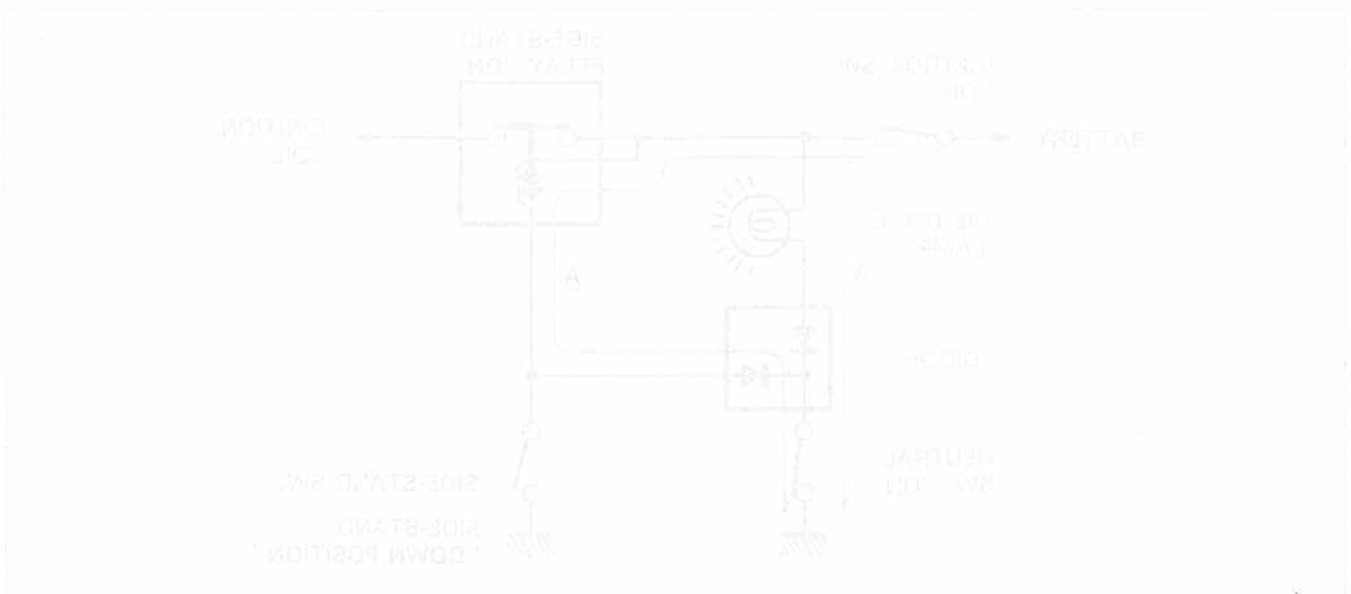
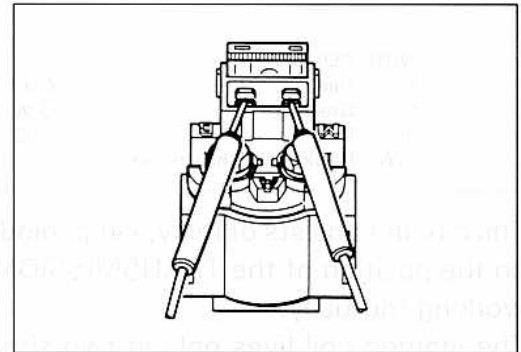
Do not apply a battery voltage more than 5 seconds to the starter relay as it may overheat and cause damage to the relay coil.

- 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

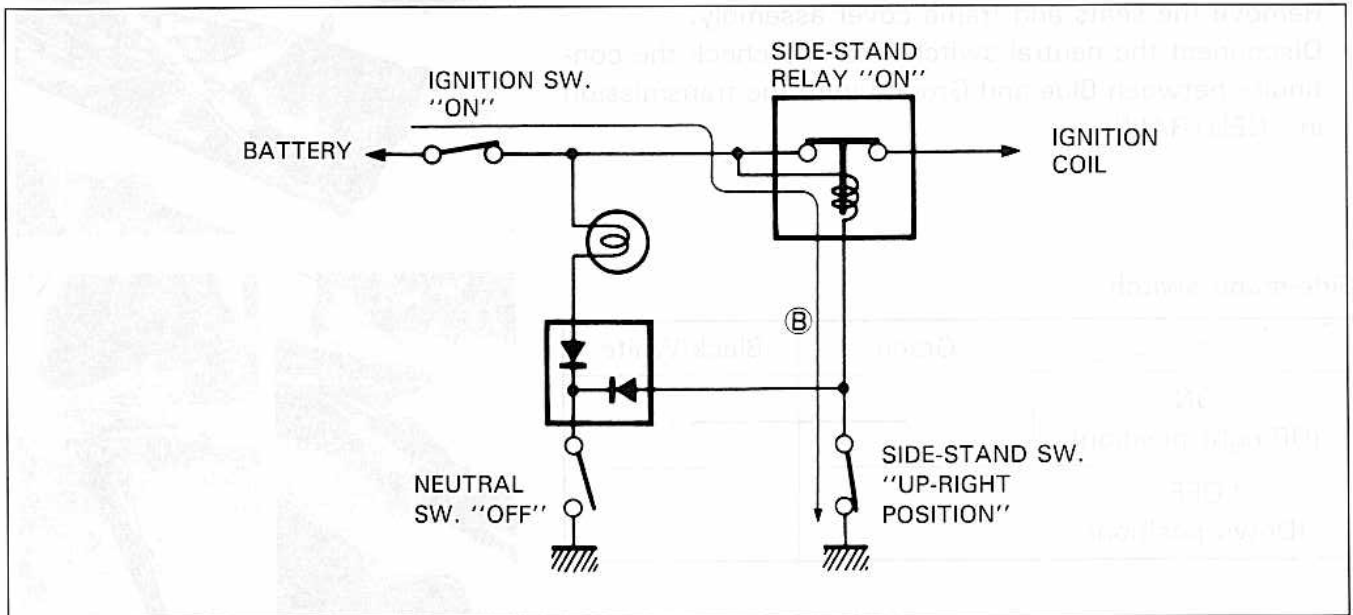
Tester knob indication: X 1Ω range

Starter relay resistance	Standard
	3–5Ω



2. Side-stand: "UP-RIGHT (ON)"

The current flow ② 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.

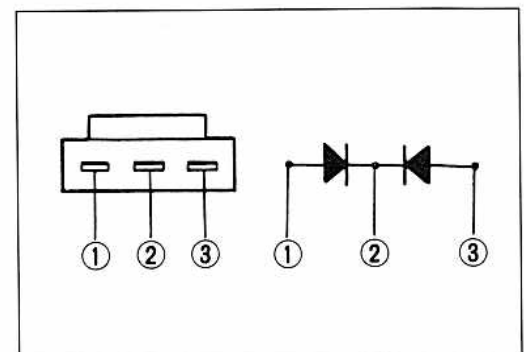
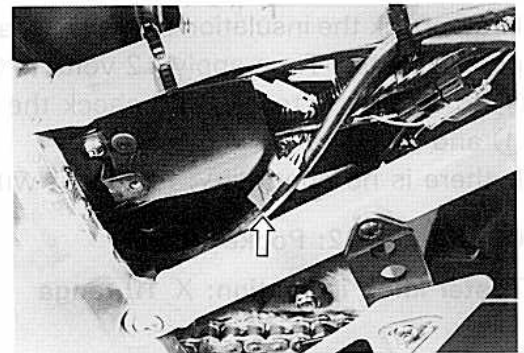
09900-25002: Pocket tester

Diode

The diode is located behind the left frame cover.

The diode can pass current only in one direction.

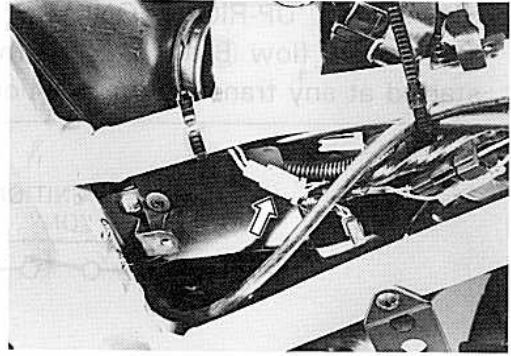
- Check the continuity between ① and ②. If one way continuity the diode is in good condition.
- Also check the continuity between ② and ③ as required.



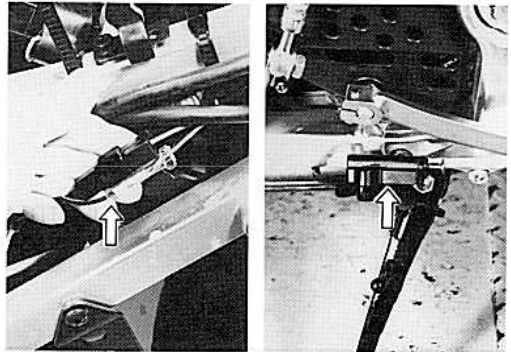
Neutral switch

The neutral lead wire coupler is located behind the left frame cover.

- Remove the seats and frame cover assembly.
- Disconnect the neutral switch lead and check the continuity between Blue and Ground with the transmission in "NEUTRAL".

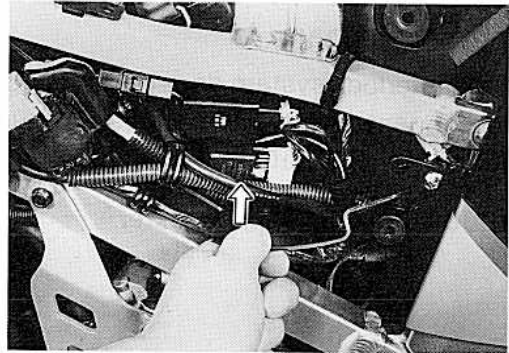
**Side-stand switch**

	Green	Black/White
ON (UP-right position)	○ ————— ○	○ ————— ○
OFF (Down position)		

**Side-stand/ignition interlock relay**

The side-stand/ignition interlock relay is located behind the right frame cover.

- Remove the seats and frame cover assembly.

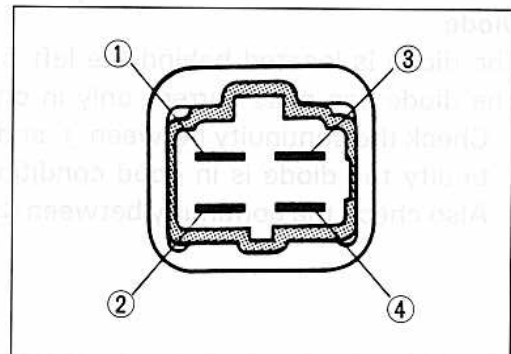


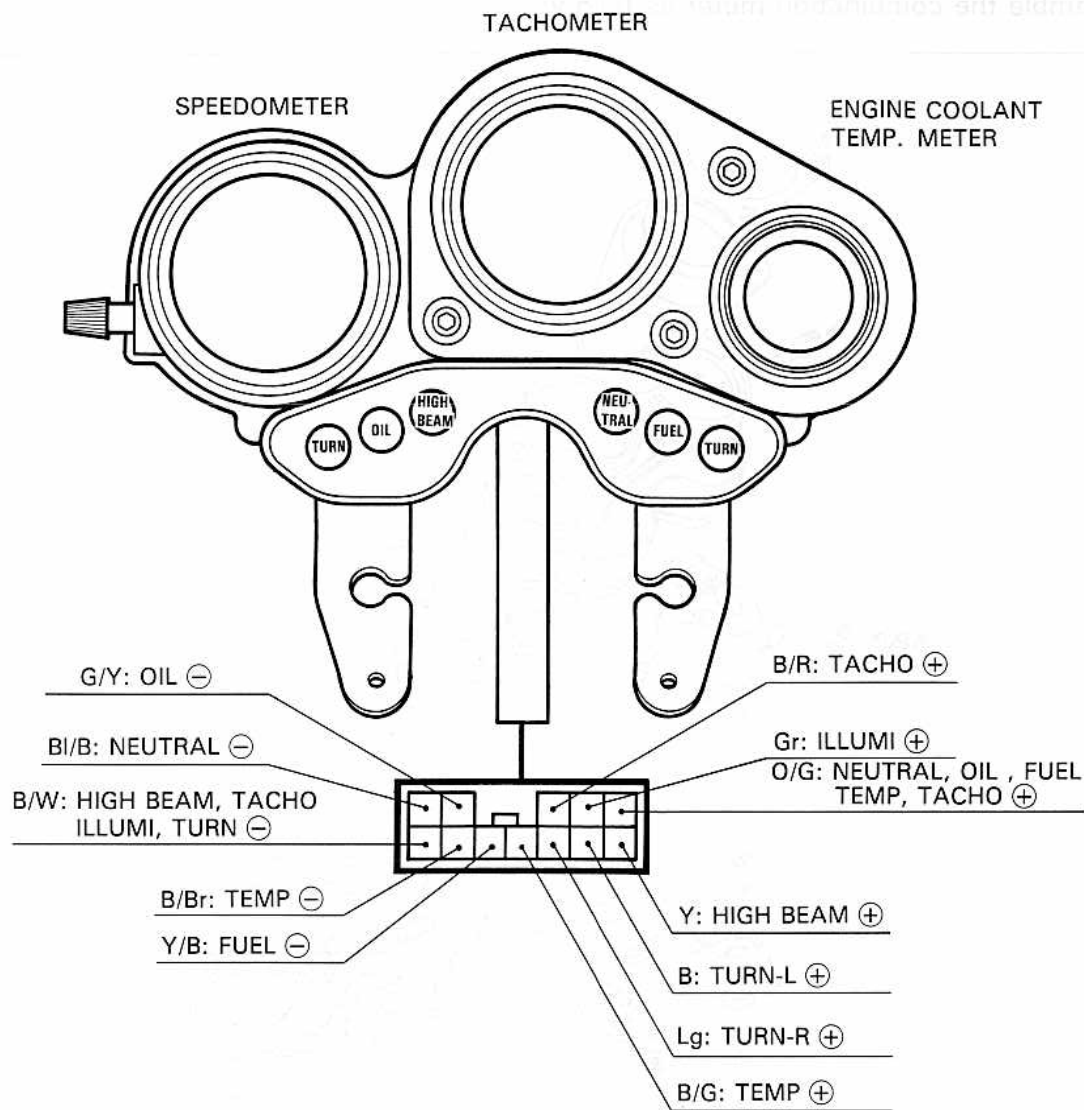
First, check the insulation between ① and ② terminals with pocket tester. Then apply 12 volts to ③ and ④ terminals, ⊕ to ③ and ⊖ to ④, and check the continuity between ① and ②.

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

09900-25002: Pocket tester

Tester knob indication: X 1Ω range





ITEM	⊕ Probe of tester to:	⊖ Probe of tester to:
OIL	O/G	G/Y
TURN (L)	B	B/W
TACHO SIGNAL	B/R	B/W
HIGH BEAM	Y	B/W
TURN (R)	Lg	B/W
NEUTRAL	O/G	BI/B
ILLUMI	Gr	B/W
TEMP	O/G	B/Br
TEMP	O/G	B/G
TACHO	O/G	B/W
FUEL	O/G	Y/B

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

ENGINE COOLANT TEMPERATURE METER

INSPECTION

As the coil spring is installed on the needle shaft of the engine coolant temperature meter, the needle is forcibly back to the original position when ignition switch is turned OFF. To test the engine coolant temperature meter two different checks may be used. The first, and simplest test will tell if the meter is operating but will not indicate the meters accuracy throughout the range.

To perform this test, remove the front seat and fuel tank and disconnect the B/G lead wire of the engine coolant temperature meter from the engine coolant temperature gauge. Connect a jumper wire between B/G wire coming from the main wiring harness and engine ground. With the ignition switch turned on, the engine coolant temperature meter should indicate "H".

B/G: Black with Green tracer

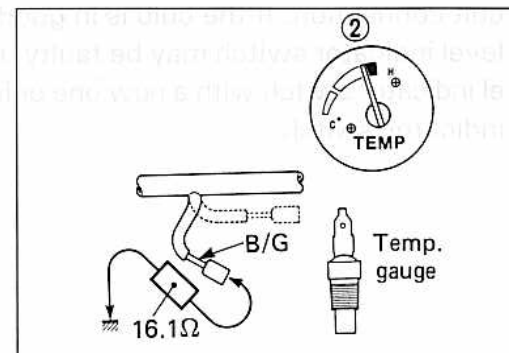
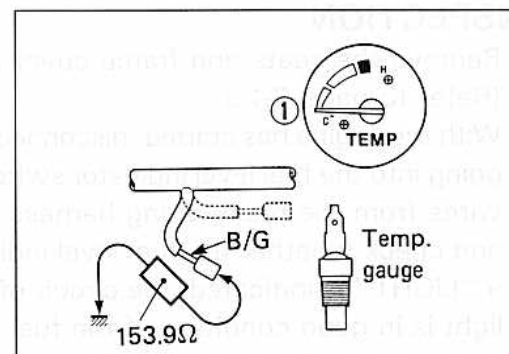
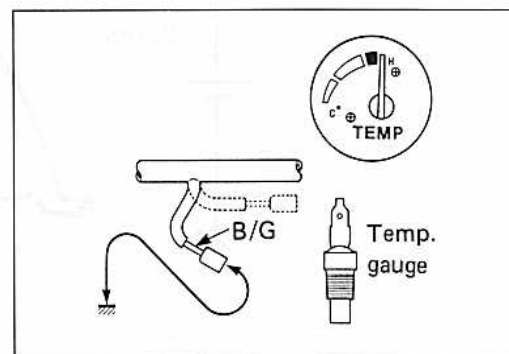
The second test will check the accuracy of the meter in the "H" and "C" positions.

Connect a 153.9-ohm resistor between the B/G lead wire of the engine coolant temperature meter and engine ground. The engine coolant temperature meter is normal if its pointer indicates the ① position when the specified voltage is applied to the circuit and if its pointer indicates the ② position when the resistor is changed to 16.1 ohms. If either one or both indications are abnormal, replace the engine coolant temperature meter with a new one.

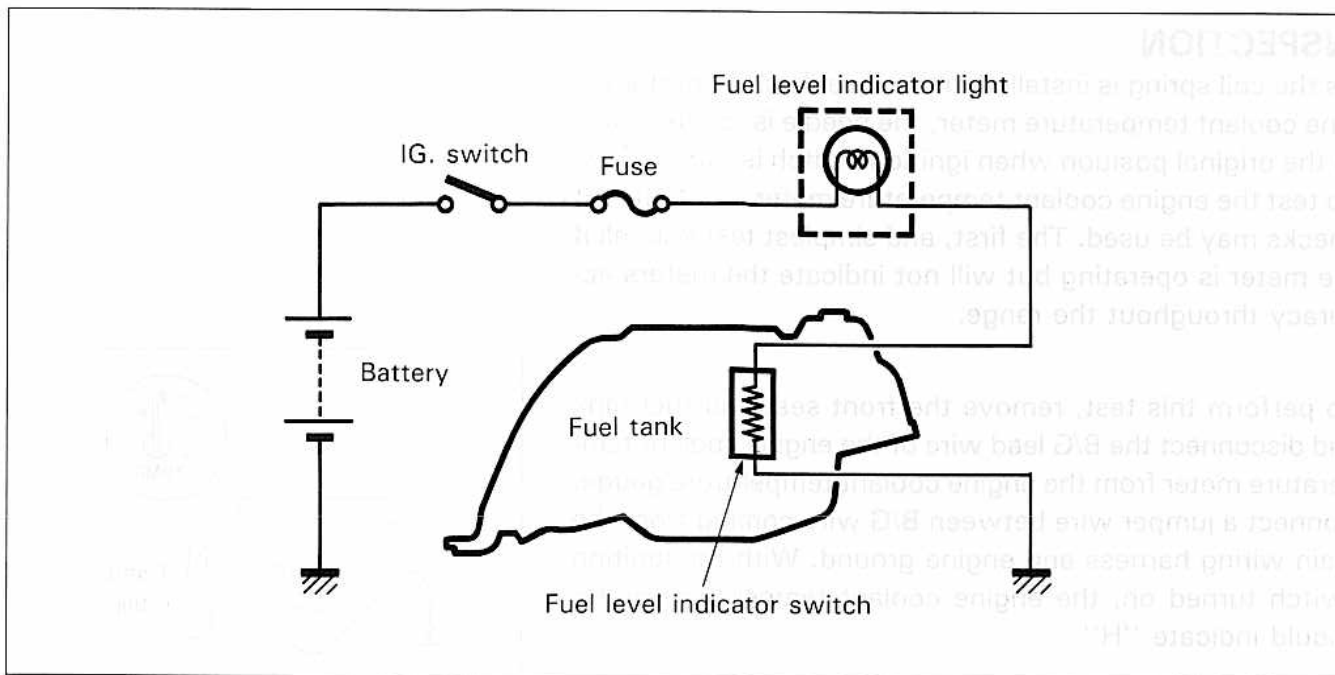
The relation between the position of the engine coolant temperature meter and resistance is shown in the following table.

POSITION	RESISTANCE
①	153.9 Ω
②	16.1 Ω

For inspecting the engine coolant temperature gauge, refer to page 5-9.

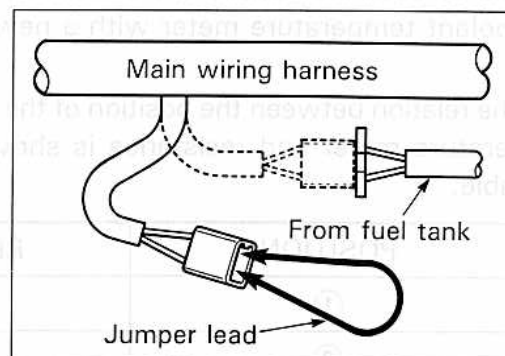
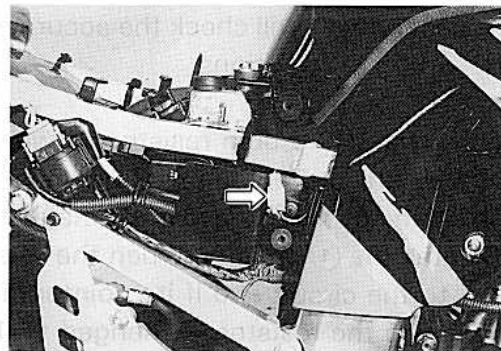


FUEL LEVEL INDICATOR

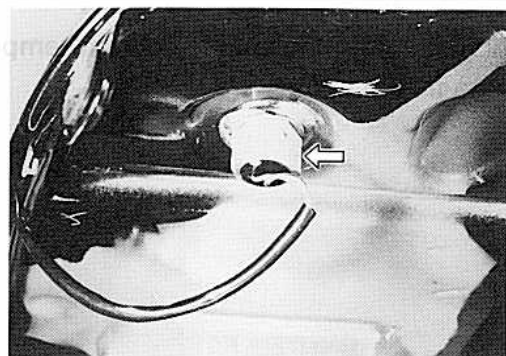


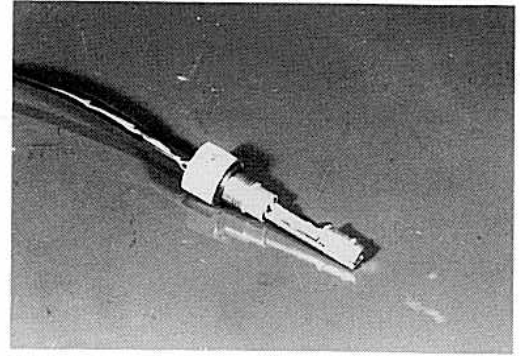
INSPECTION

- Remove the seats and frame cover assembly. (Refer to page 7-2.)
- With the engine has started, disconnect the two lead wires going into the fuel level indicator switch, connect the lead wires from the main wiring harness with a jumper lead and check whether the fuel level indicator light is ON. If a "LIGHT" is indicated, the circuit of fuel level indicator light is in good condition. If the fuel level indicator light does not light, replace the indicator bulb or repair the circuit connection. If the bulb is in good condition, the fuel level indicator switch may be faulty, replace the fuel level indicator switch with a new one or inspect the fuel level indicator switch.

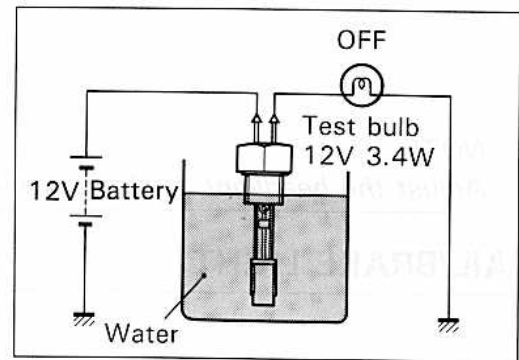
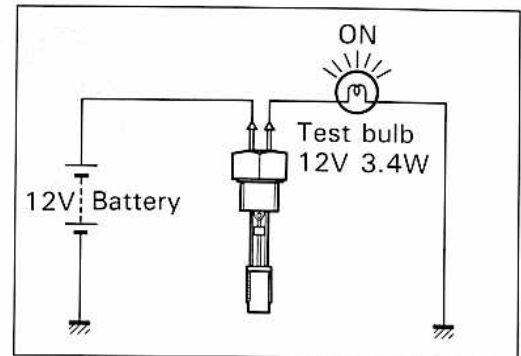


- Remove the fuel tank. (Refer to page 7-3.)
- Remove the fuel level indicator switch from the fuel tank.

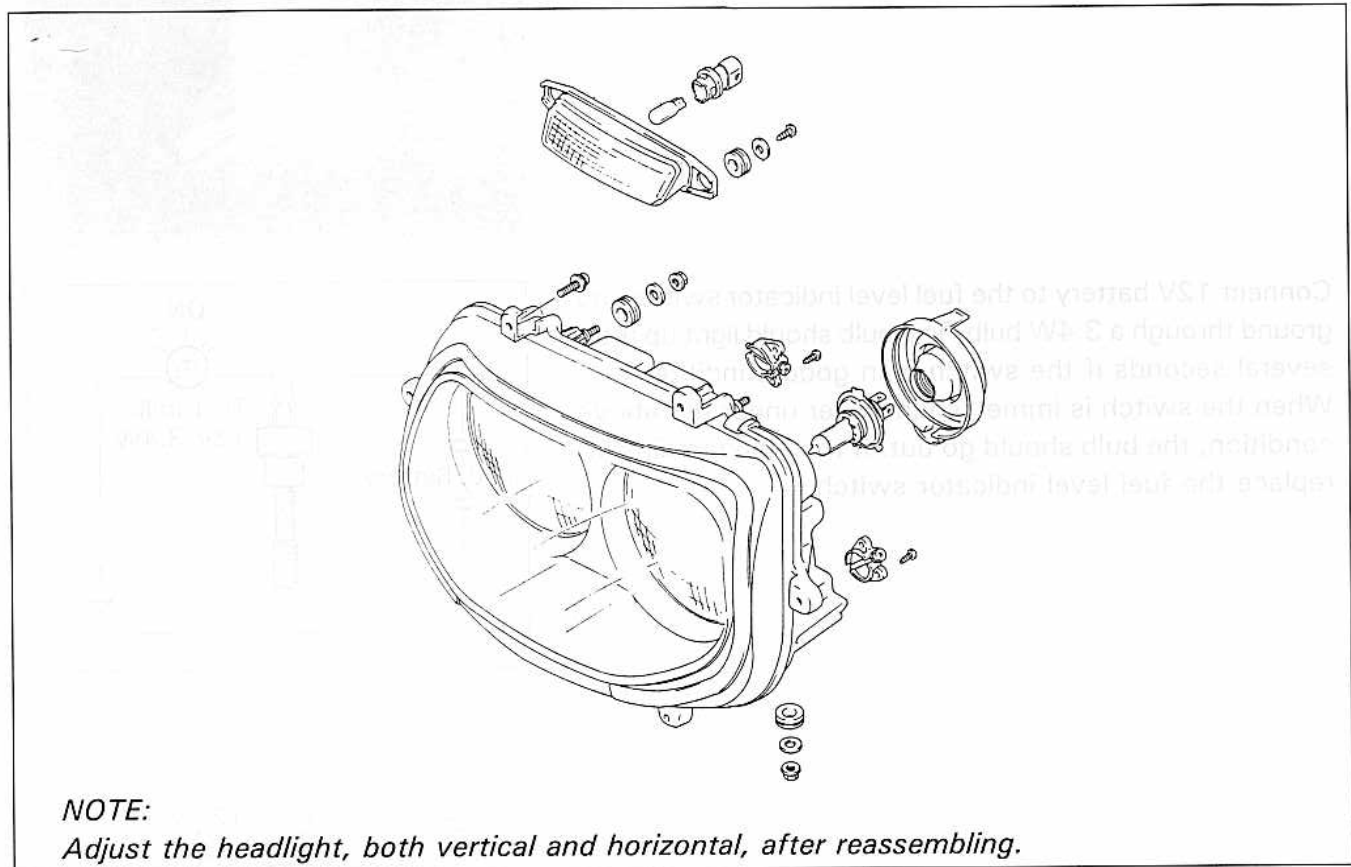




- Connect 12V battery to the fuel level indicator switch and ground through a 3.4W bulb. The bulb should light up after several seconds if the switch is in good condition.
- When the switch is immersed in water under the above condition, the bulb should go out. If the bulb remains lit, replace the fuel level indicator switch.



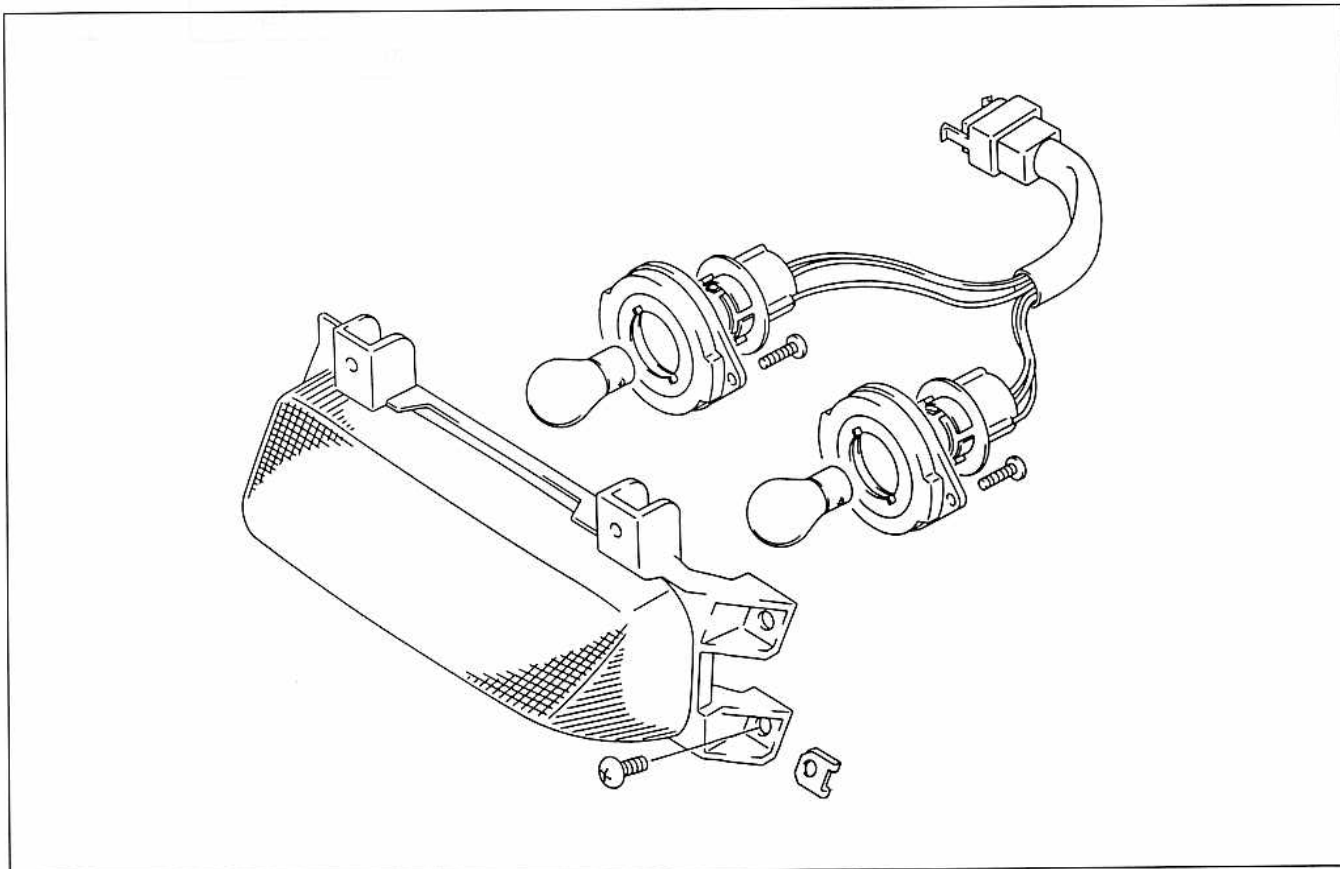
LAMPS HEADLIGHT



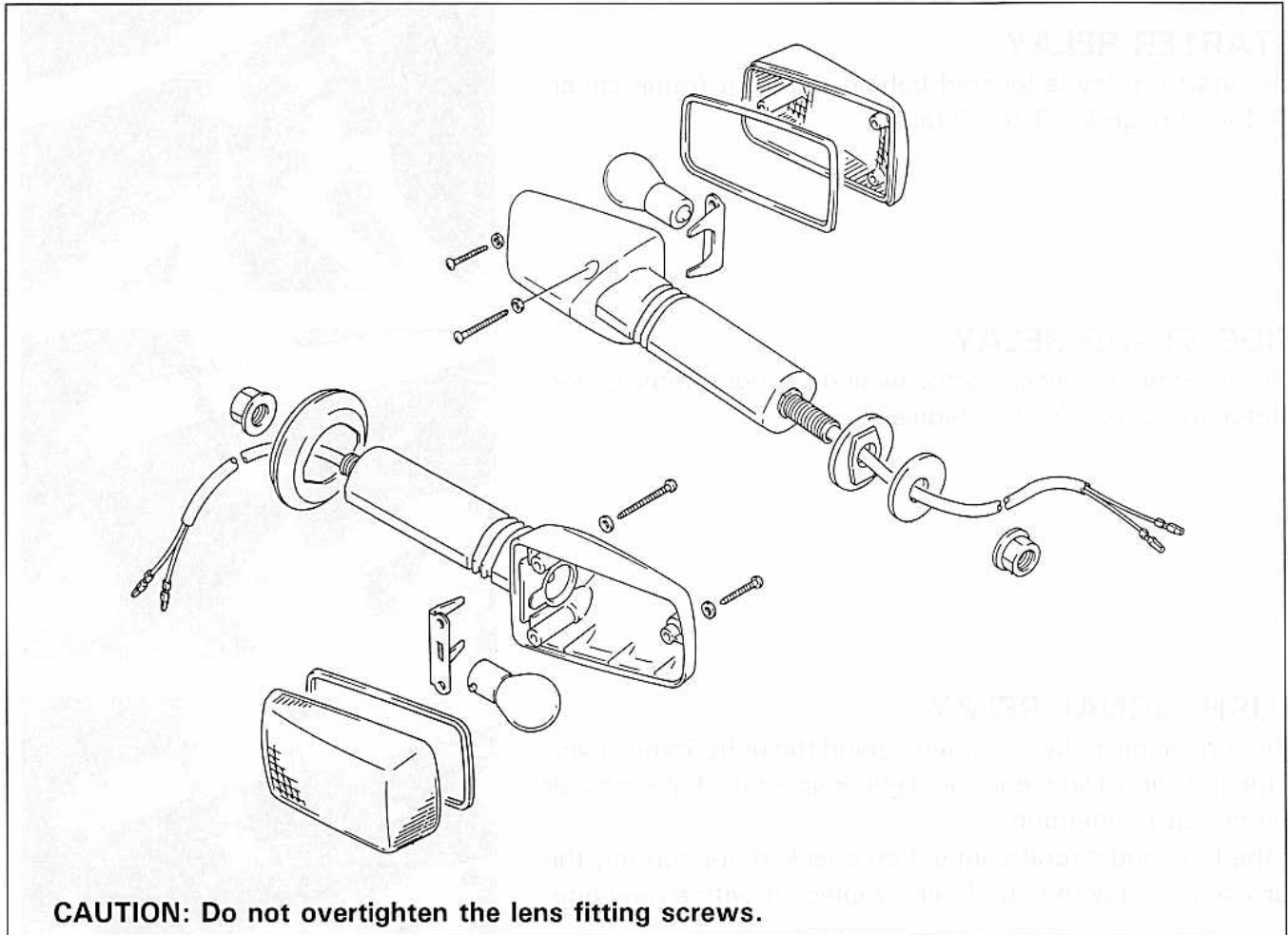
NOTE:

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

TAIL/BRAKE LIGHT



TURN SIGNAL LIGHT



SWITCHES

Inspect each switch for continuity with the pocket tester referring to the WIRING DIAGRAM. If any abnormality is found, replace the respective switch assemblies with new ones. (Refer to the chapter 8 for wiring diagram.)

09900-25002: Pocket tester

Tester knob indication: X 1 Ω range

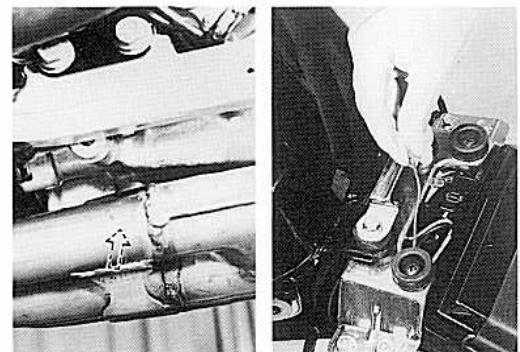
OIL PRESSURE SWITCH

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

	Black	Ground
ON	○ — ○	○ — ○
OFF		

NOTE:

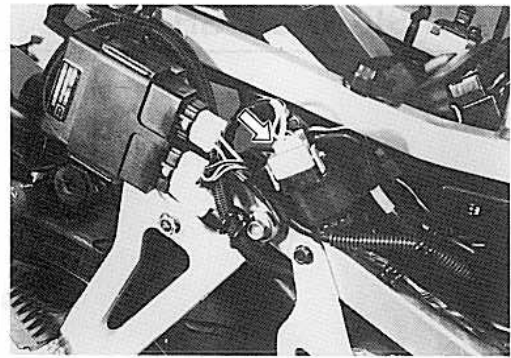
Before inspecting the oil pressure switch, check if the engine oil level is enough.



RELAY

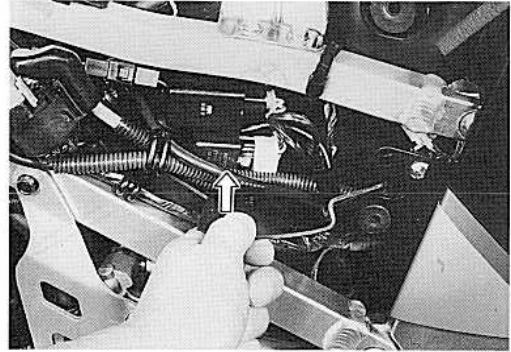
STARTER RELAY

The starter relay is located behind the right frame cover. (Refer to page 6-18 for details.)



SIDE-STAND RELAY

The side-stand relay is located behind the right frame cover. (Refer to page 6-21 for details.)



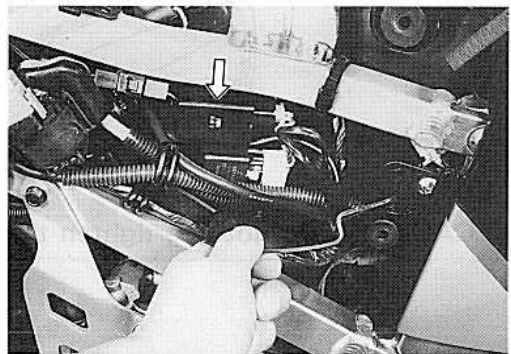
TURN SIGNAL RELAY

The turn signal relay is located behind the right frame cover. If the turn signal light does not light. Inspect the bulb or repair the circuit connection.

If the bulb and circuit connection checked are correct, the turn signal relay may be faulty, replace it with a new one.

NOTE:

Be sure that the battery used is in fully-charged condition.



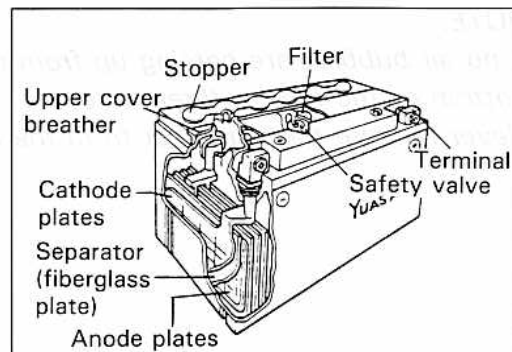
Relay	Function
Starter	Starts the engine
Side Stand	Locks the side stand
Turn Signal	Controls the turn signal lights

OIL PRESSURE SWITCH
• Continuity when engine is stopped.
• No continuity when engine is running.

BATTERY

SPECIFICATIONS

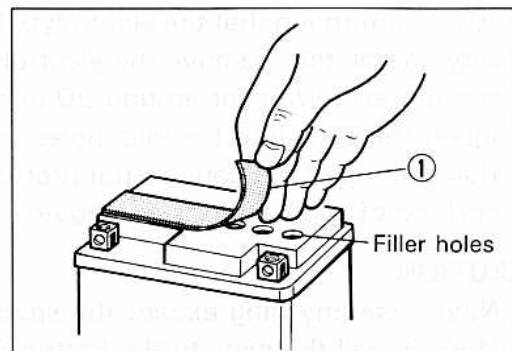
Type designation	YTX12-BS
Capacity	12V, 36 kC (10 Ah)/10HR
Standard electrolyte S.G.	1.320 at 20°C (68°F)



INITIAL CHARGING

Filling electrolyte

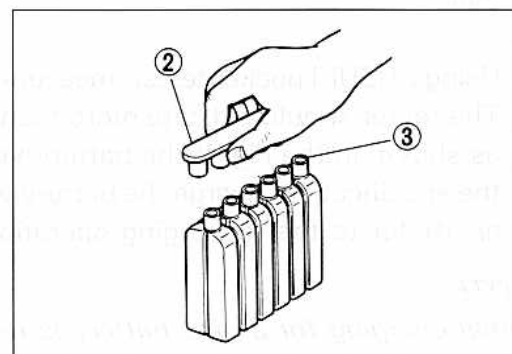
- Remove the aluminum tape ① sealing the battery electrolyte filler holes.



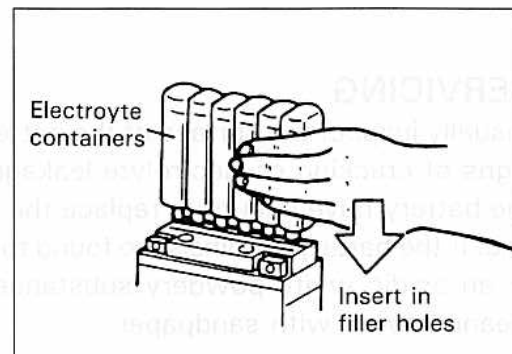
- Remove the caps ②.

NOTE:

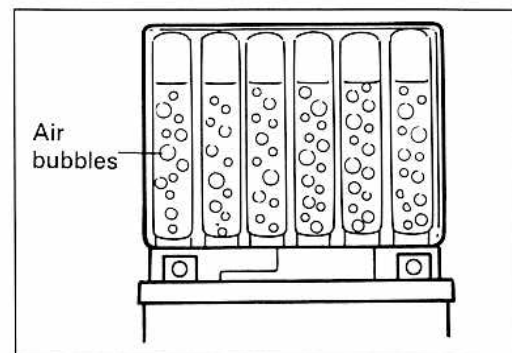
- * After filling the electrolyte completely, use the removed cap ② as the sealed caps of battery-filler holes.
- * Do not remove or pierce the sealed areas ③ of the electrolyte container.



- Insert the nozzles of the electrolyte container into the battery's electrolyte filler holes, holding the container firmly so that it does not fall. Take precaution not to allow any of the fluid to spill.

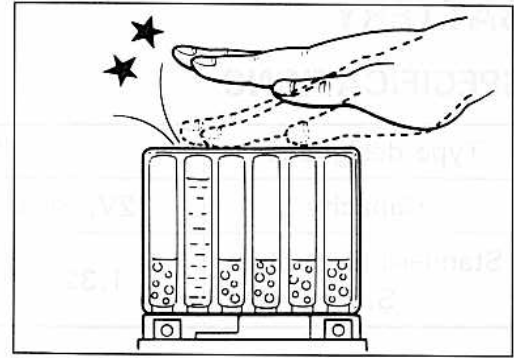


- Make sure air bubbles are coming up each electrolyte container, and leave in this position for about more than 20 minutes.

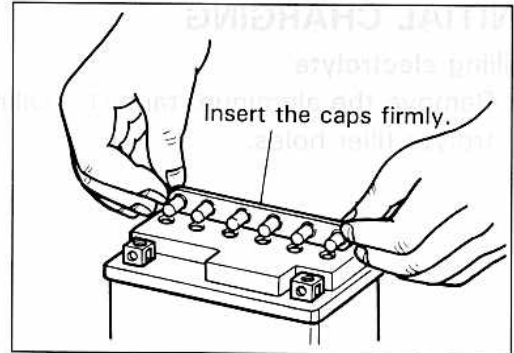


NOTE:

If no air bubbles are coming up from a filler port, tap the bottom of the two or three times.
 Never remove the container from the battery.



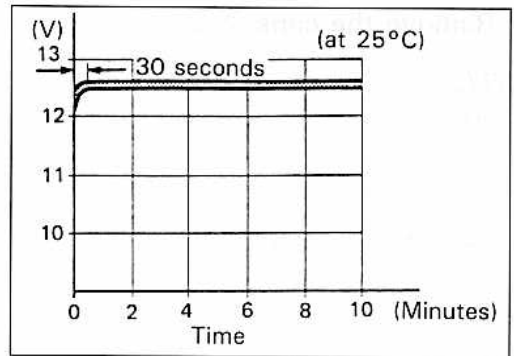
- After confirming that the electrolyte has entered the battery completely, remove the electrolyte containers from the battery. Wait for around 20 minutes.
- Insert the caps into the filler holes, pressing in firmly so that the top of the caps do not protrude above the upper surface of the battery's top cover.



CAUTION:

- * Never use anything except the specified battery.
- * Once install the caps to the battery; do not remove the caps.

- Using SUZUKI pocket tester, measure the battery voltage. The tester should indicate more than 12.5–12.6V (DC) as shown in the Fig. If the battery voltage is lower than the specification, charge the battery with a battery charger. (Refer to the recharging operation.)



NOTE:

Initial charging for a new battery is recommended if two years have elapsed since the date of manufacture.

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.



RECHARGING OPERATION

- Using the pocket tester, check the battery voltage. If the voltage reading is less than the 12.0V (DC), recharge the battery with a battery charger.

CAUTION:

When recharging the battery, remove the battery from the motorcycle.

NOTE:

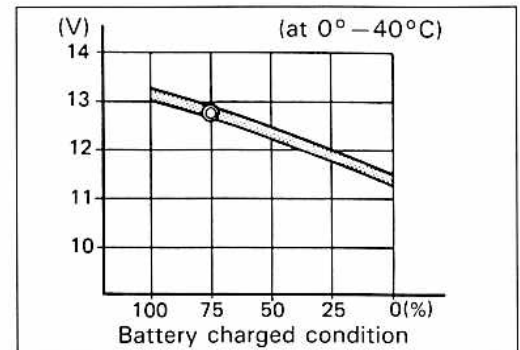
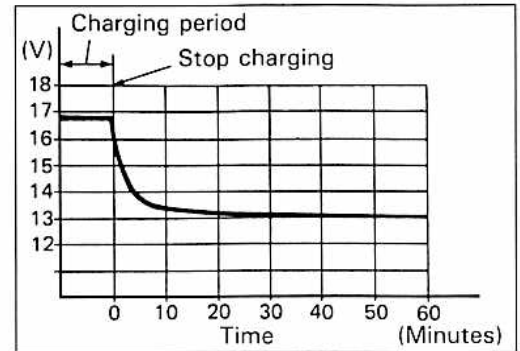
Do not remove the caps on the battery top while recharging.

Recharging time: 5A for one hour or 1.2A for 5 hours

CAUTION:

Be careful not to permit the charging current to exceed 4A at any time.

- After recharging, wait for more than 30 minutes and check the battery voltage with a pocket tester.
- If the battery voltage is less than the 12.5V, recharge the battery again.
- If battery voltage is still less than 12.5V, after recharging, replace the battery with a new one.
- When the motorcycle is not used for a long period, check the battery every 3 months to prevent the battery discharge.

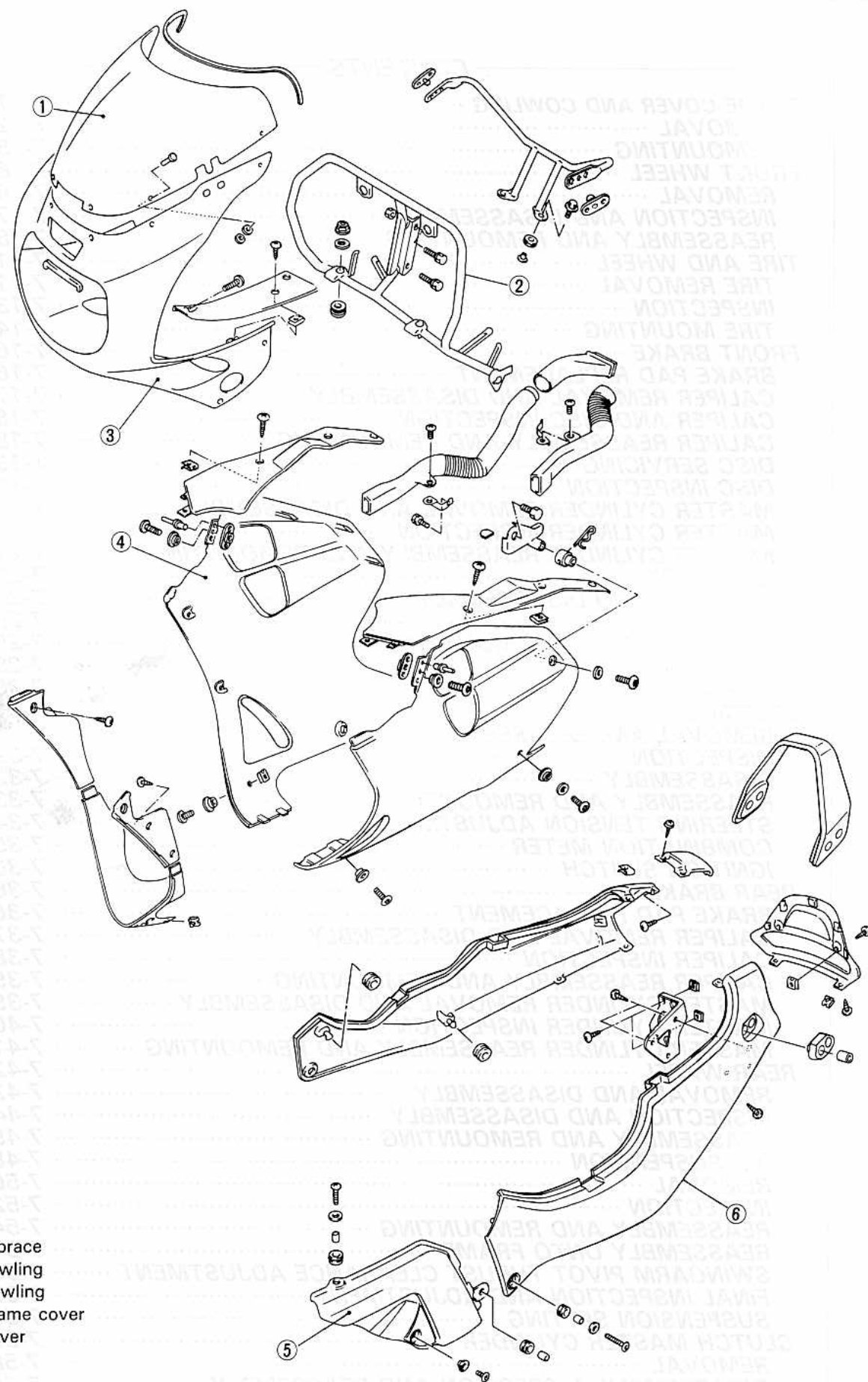


CHASSIS

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FRAME COVER AND COWLING



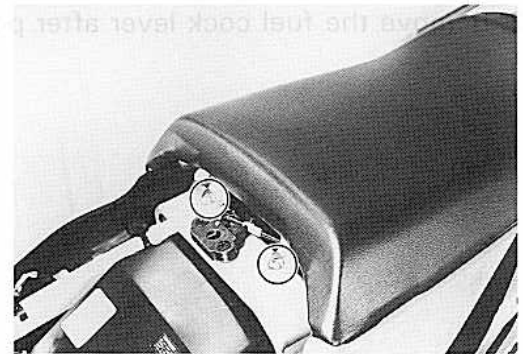
- ① Screen
- ② Cowling brace
- ③ Upper cowling
- ④ Lower cowling
- ⑤ Center frame cover
- ⑥ Frame cover

REMOVAL**FRAME COVER ASSEMBLY**

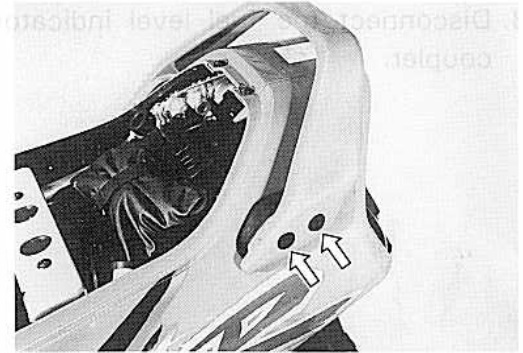
1. Remove the front seat with the ignition key.



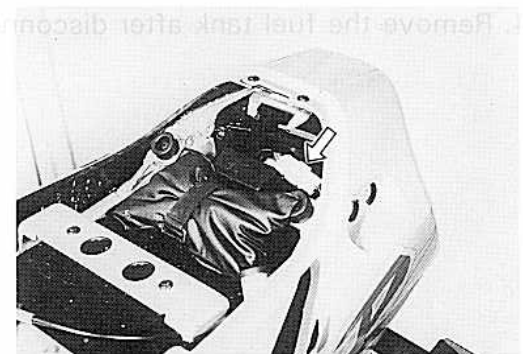
2. Remove the rear seat by removing the screws.



3. Remove the pillion rider grabber mounting bolts, left and right.

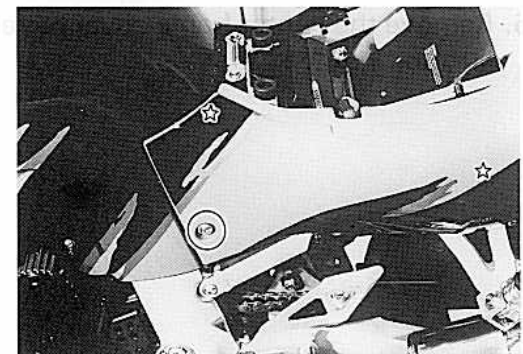


4. Disconnect the tail/brake light lead wire coupler.



5. Remove the frame cover mounting screws and extract the hooked parts, left and right.

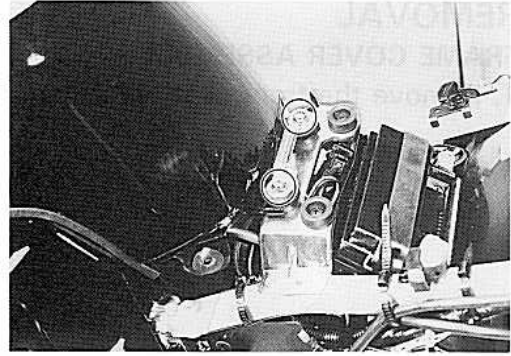
6. Remove the frame cover assembly along with the taillight from the frame.



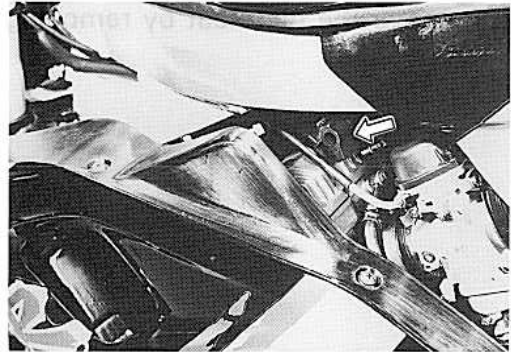
☆: hooked part

FUEL TANK AND CENTER FRAME COVERS

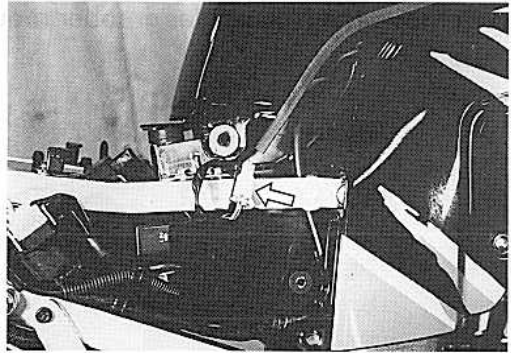
1. Remove the fuel tank mounting bolts.



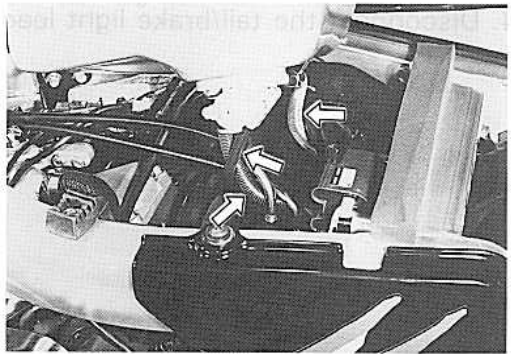
2. Remove the fuel cock lever after positioning at "ON".



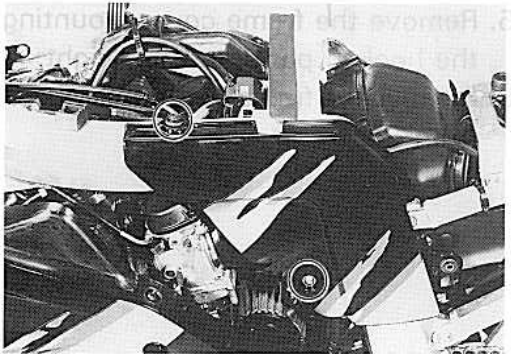
3. Disconnect the fuel level indicator switch lead wire coupler.



4. Remove the fuel tank after disconnecting all hoses.

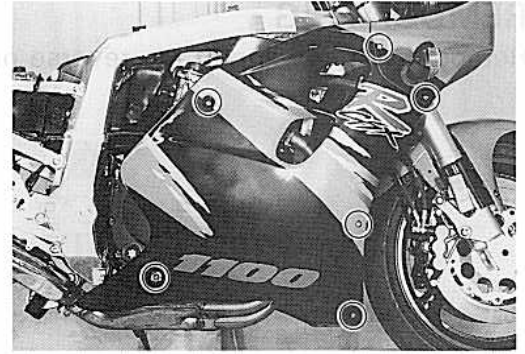


5. Remove the center frame cover by removing the screws, left and right.

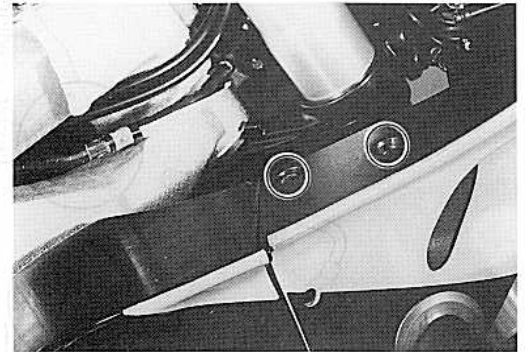


COWLING

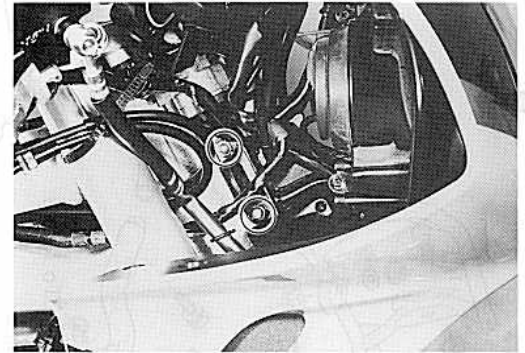
1. Remove the lower cowling assembly by removing the screws, left and right.



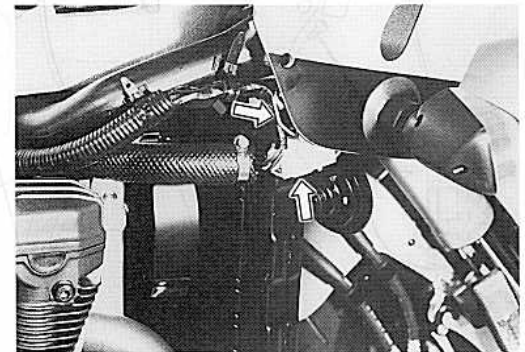
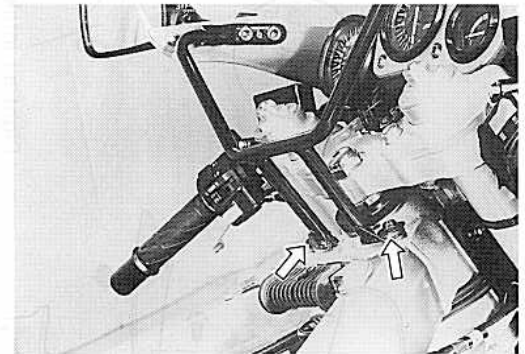
2. Remove the upper cowling brace bolts, upper and lower.



3. Remove the cowling brace bolts, left and right.

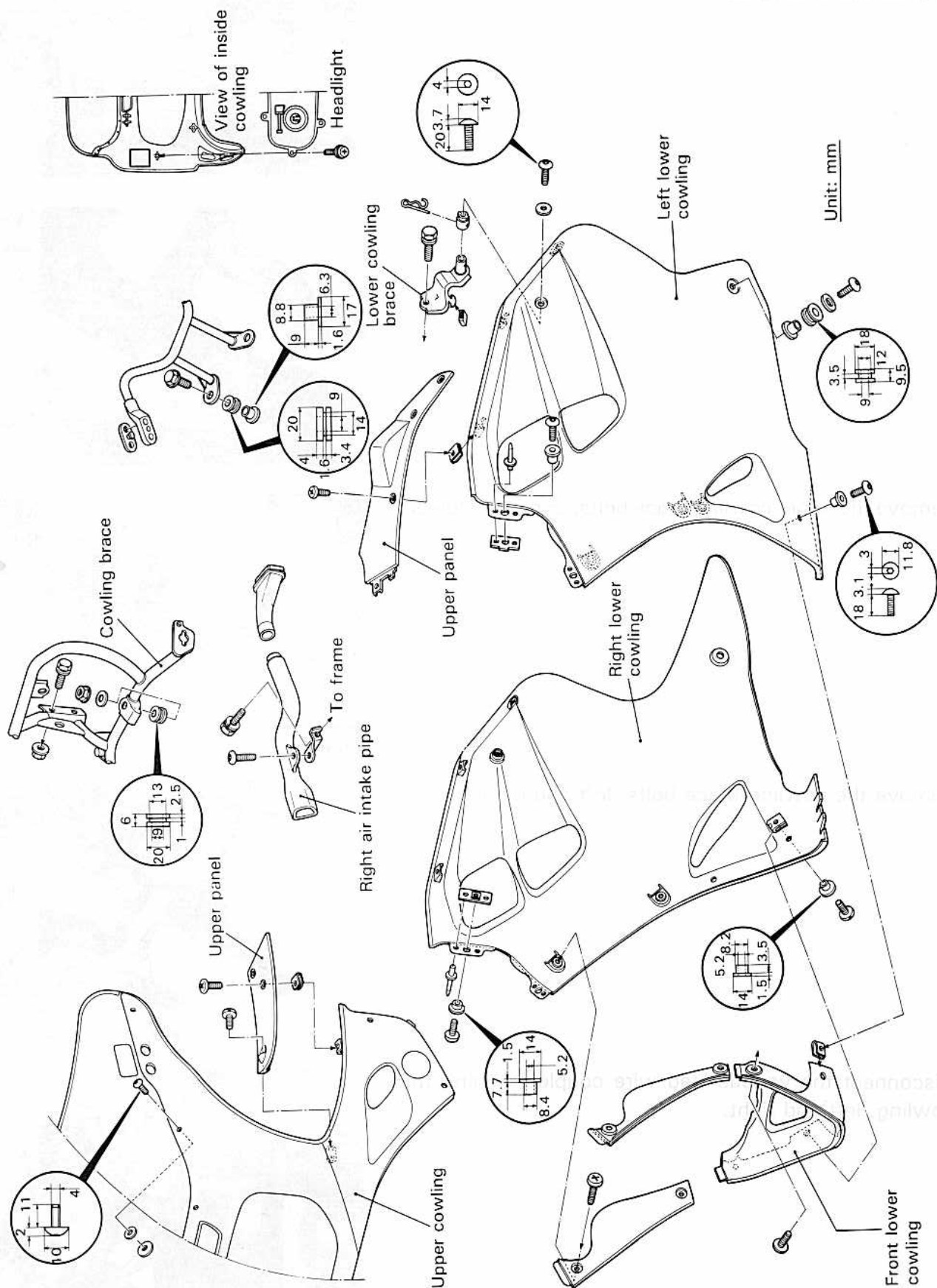


4. Disconnect the various lead wire couplers behind the cowling, left and right.

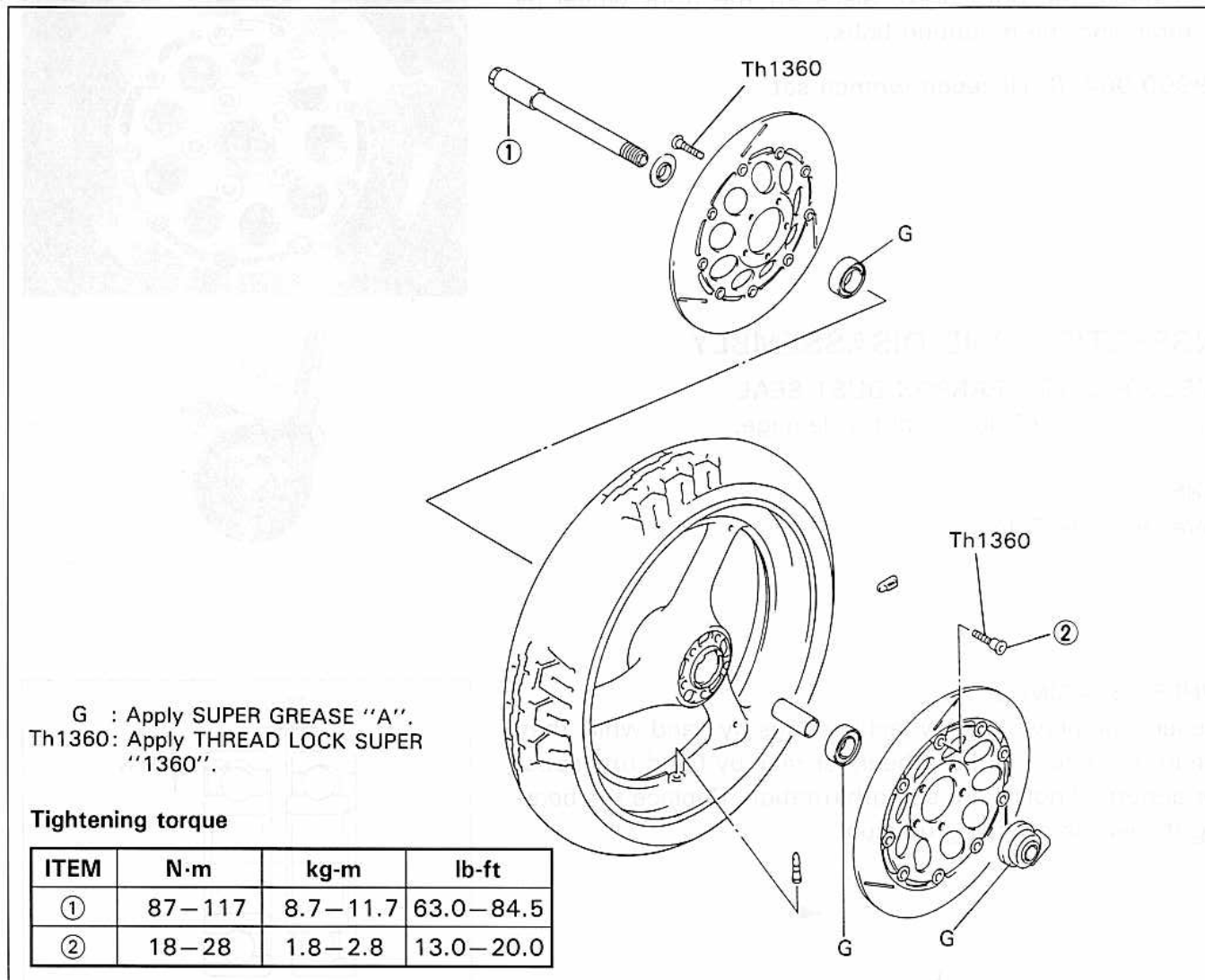


REMOUNTING

Remount the cowling in the reverse order of its removal.

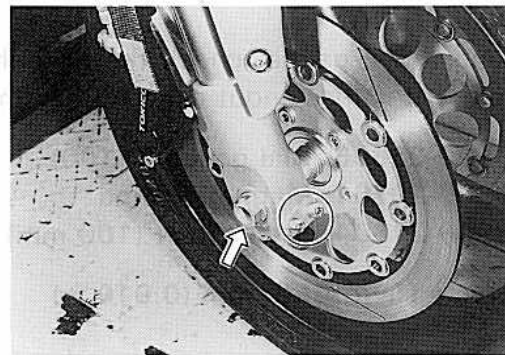


FRONT WHEEL



REMOVAL

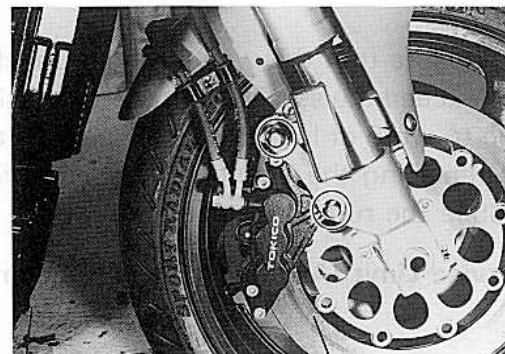
1. Remove the lower cowling. (Refer to page 7-4.)
2. Support the motorcycle with a jack or a wooden block.
3. Loosen the axle pinch bolts.
4. Loosen the axle shaft.



5. Remove the brake calipers, left and right.
6. Remove the axle shaft and front wheel.

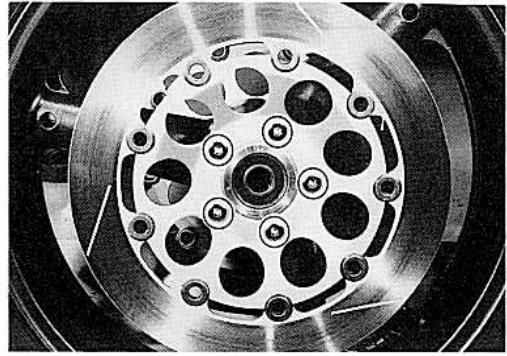
CAUTION:

- * Do not operate the brake lever while dismantling the brake calipers.
- * Hang the brake caliper on the motorcycle frame with a string etc., taking care not to bend the brake hose.



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

09900-00410: Hexagon wrench set



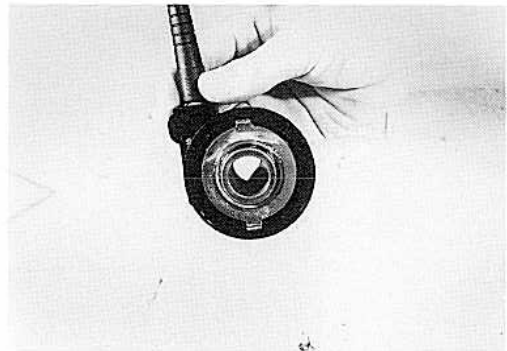
INSPECTION AND DISASSEMBLY

SPEEDOMETER GEARBOX DUST SEAL

Inspect the lip of dust seal for damage.

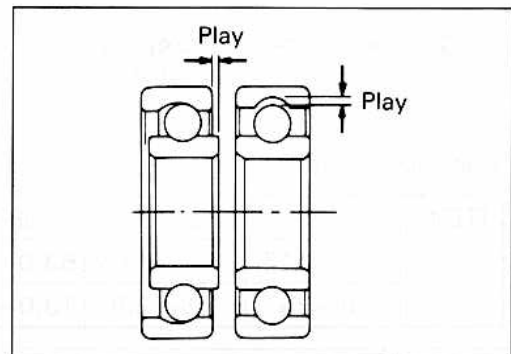
TIRE

Refer to page 7-11.



WHEEL BEARINGS

Inspect the play of the wheel bearings by hand while they are 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

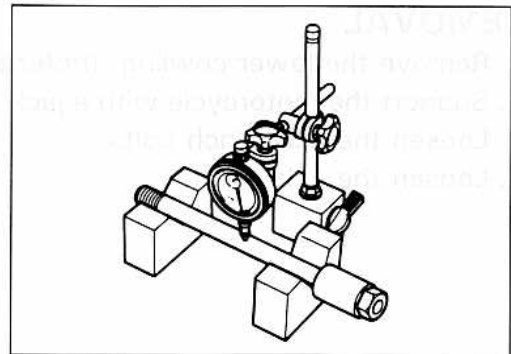
Using a dial gauge, check the axle shaft for runout and replace it if the runout exceeds the limit.

09900-20606: Dial gauge (1/100)

09900-20701: Magnetic stand

09900-21304: V-block set (100 mm)

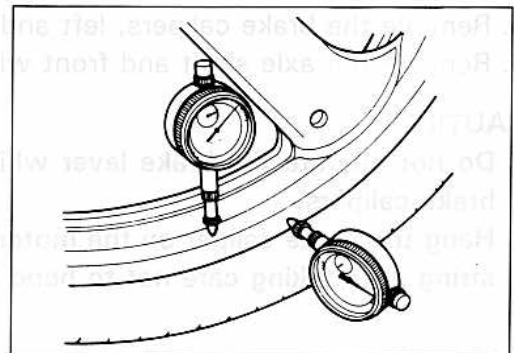
Service Limit: 0.25 mm (0.010 in)



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 loosen wheel bearings and can be reduced by replacing the bearings. If bearing replacement fails to reduce the runout, replace the wheel.

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

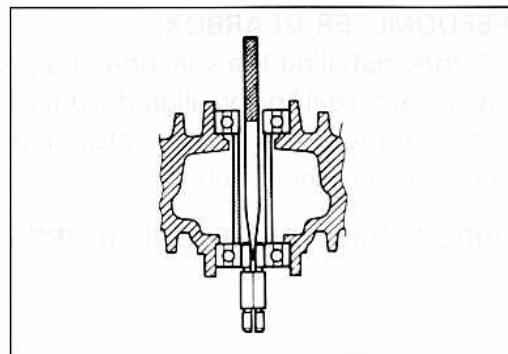


- Drive out both wheel bearings by using the special tool in the following procedures.

09941-50110: Bearing remover

09941-50120: Attachment

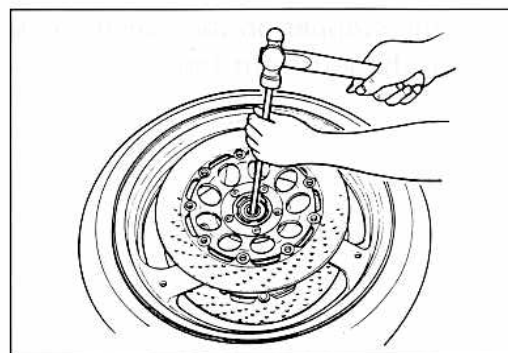
- Insert the special tool into the wheel bearing.



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

CAUTION:

The removed bearings should be replaced with new ones.



REASSEMBLY AND REMOUNTING

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

WHEEL BEARING

- Apply grease to the bearing before installing.

99000-25030: SUZUKI SUPER GREASE "A"

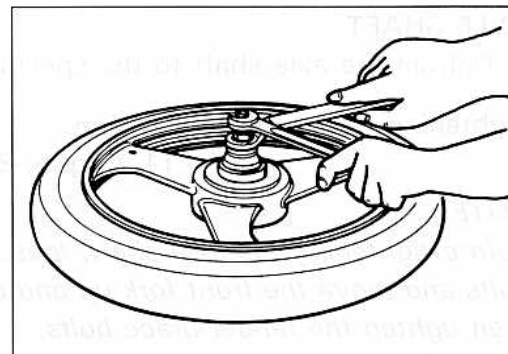


- Install the wheel bearings as follows by using the special tool.

09924-84510: Bearing installer set

NOTE:

First install the left wheel bearing, then install the right wheel bearing. The sealed cover on the bearing is positioned outside. Refer to page 7-10 for details.



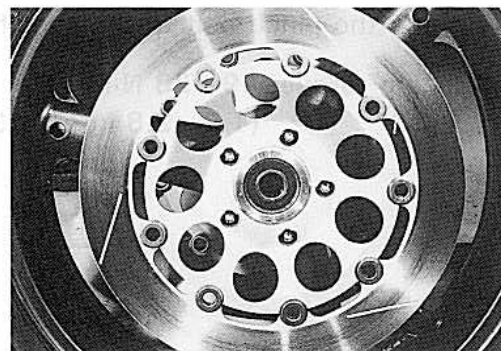
BRAKE DISC

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

Tightening torque: 18–28 N·m

(1.8–2.8 kg-m, 13.0–20.0 lb-ft)

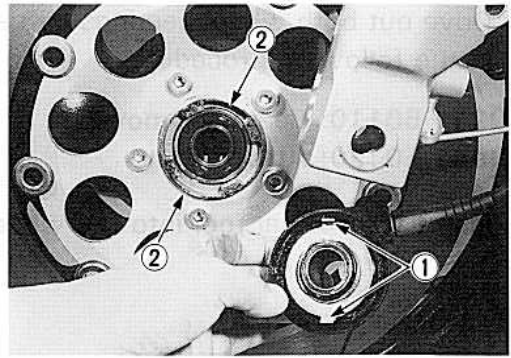
99000-32130: THREAD LOCK SUPER "1360"



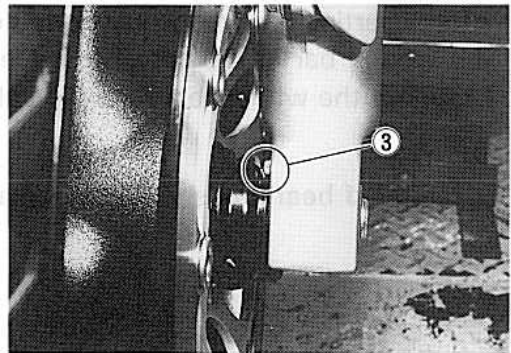
SPEEDOMETER GEARBOX

- Before installing the speedometer gearbox, apply grease to its dust seal lip and align the drive lugs ① to the recesses ② of the wheel hub and attach the speedometer gearbox to the wheel hub.

99000-25030: SUZUKI SUPER GREASE "A"



- Set the stopper on the speedometer gearbox to the lug ③ on the left front fork.



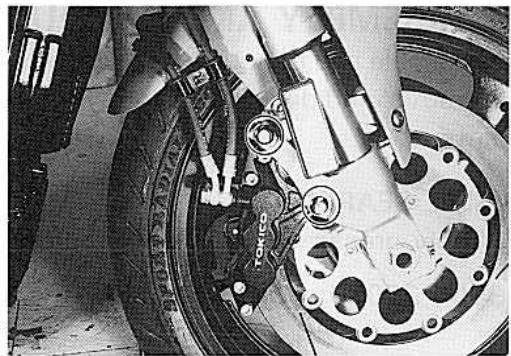
BRAKE CALIPER

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

Tightening torque: 31–48 N·m
(3.1–4.8 kg-m, 22.5–34.5 lb-ft)

NOTE:

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



AXLE SHAFT

- Tighten the axle shaft to the specified torque.

Tightening torque: 87–117 N·m
(8.7–11.7 kg-m, 63.0–84.5 lb-ft)

NOTE:

Before tightening the axle shaft, loosen the fender brace bolts and move the front fork up and down 4 or 5 times, then tighten the fender brace bolts.

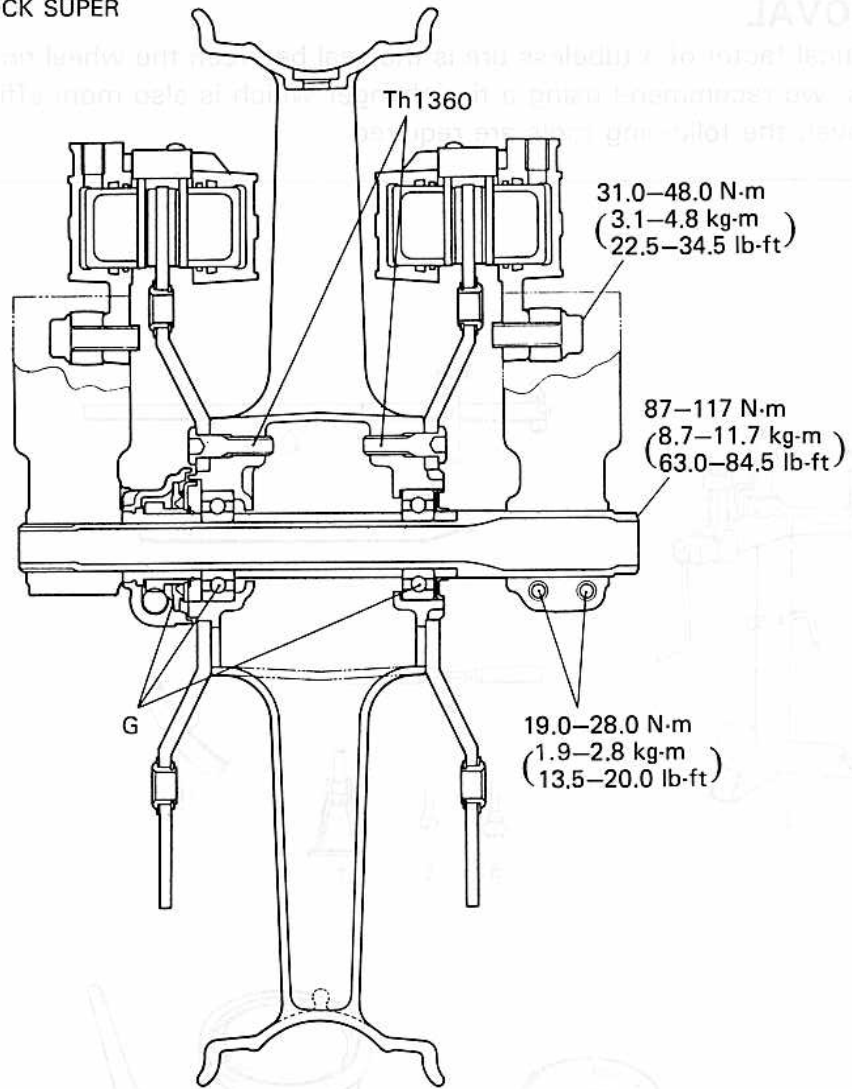


- Tighten the pinch bolt to the specified torque.

Tightening torque: 19–28 N·m
(1.9–2.8 kg-m, 13.5–20.0 lb-ft)



G : Apply SUPER GREASE "A".
 Th1360: Apply THREAD LOCK SUPER
 "1360".

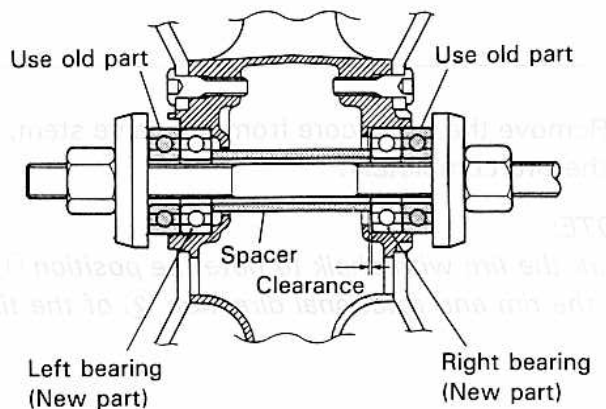
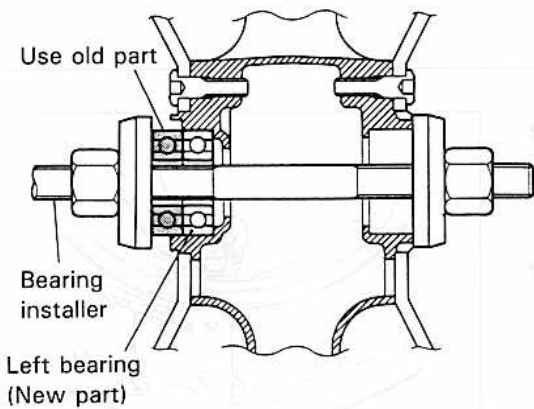


Left ←

⇒ Right

Left ←

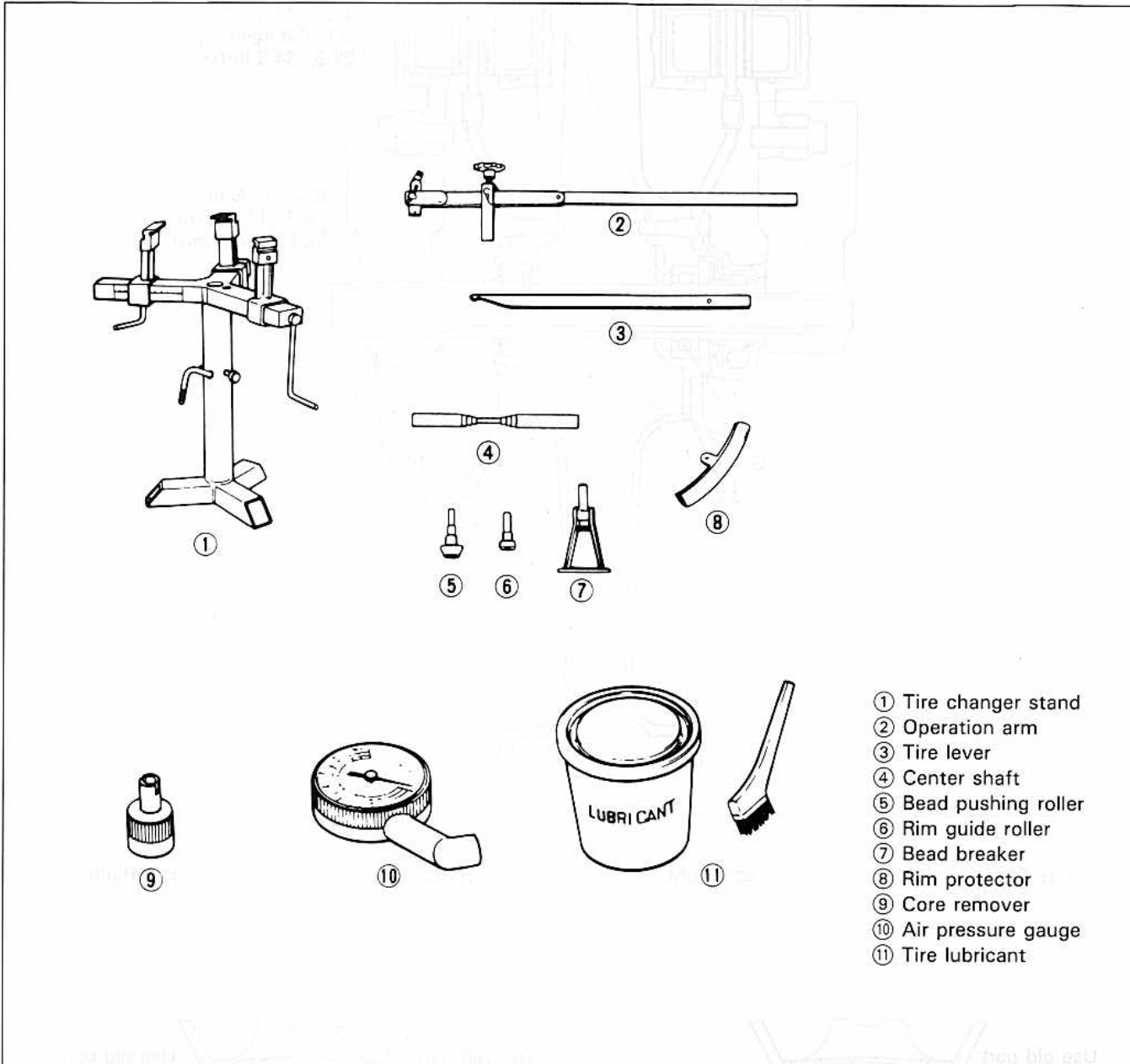
⇒ Right



TIRE AND WHEEL

TIRE REMOVAL

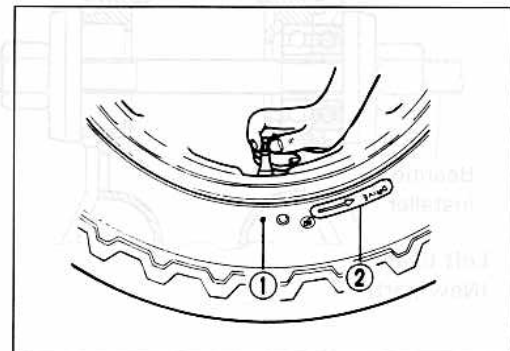
The most critical factor of a tubeless tire is the seal between the wheel rim and the tire bead. Because of this, we recommend using a tire changer which is also more efficient than tire levers. For tire removal, the following tools are required.



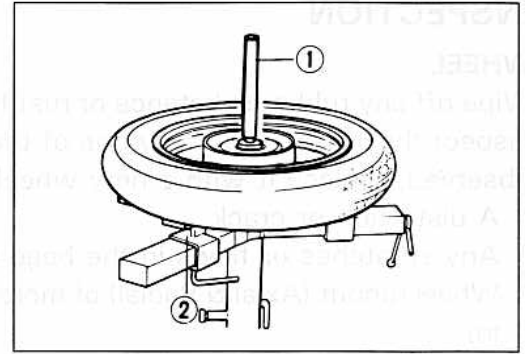
- Remove the valve core from the valve stem, and deflate the tire completely.

NOTE:

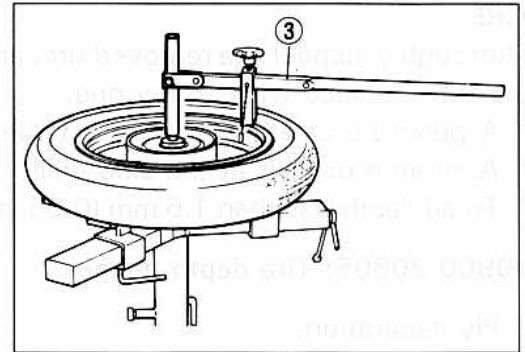
Mark the tire with chalk to note the position ① of the tire on the rim and rotational direction ② of the tire.



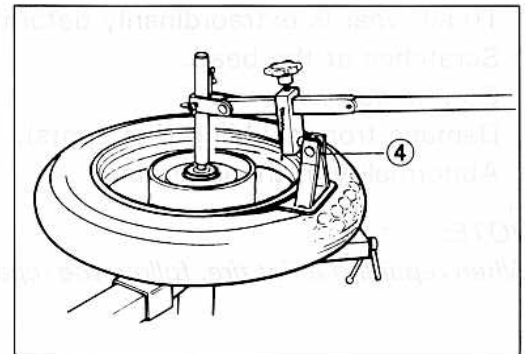
- Place the center shaft ① to the wheel, and fix the wheel with the rim holder ② .



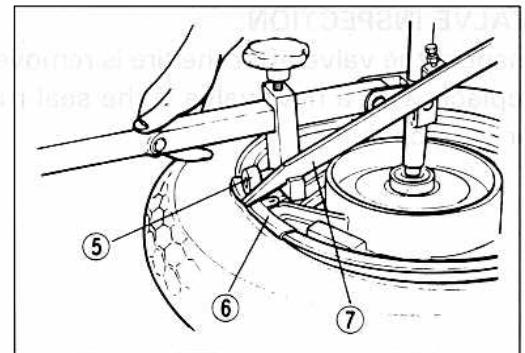
- Attach the operation arm ③ to the center shaft.



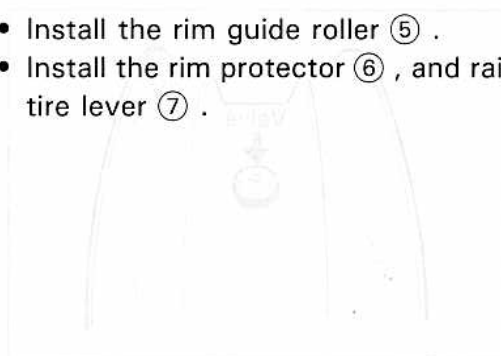
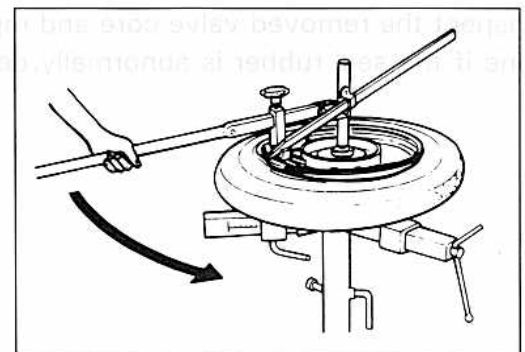
- Attach the bead breaker ④ to the operation arm, and dismount the bead from the rim. Turn the wheel over and dismount the other bead from the rim.



- Install the rim guide roller ⑤ .
- Install the rim protector ⑥ , and raise the 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.

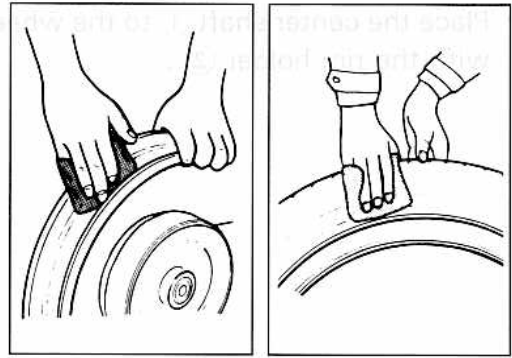


INSPECTION

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 a new one.

- * A puncture or a split whose total length or diameter exceeds 6.0 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.

09900-20805: Tire depth gauge

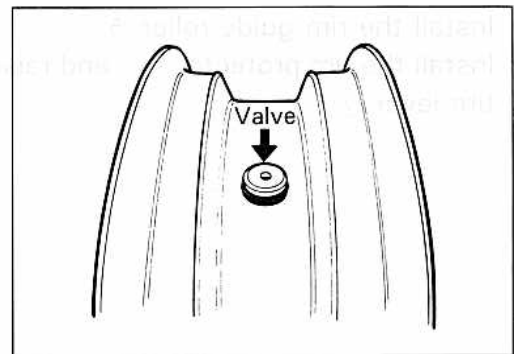
- * Ply separation.
- * Tread separation.
- * Tread wear is extraordinarily deformed or distributed around the tire.
- * Scratches at the bead.
- * Cord is cut.
- * Damage from skidding (flat spots).
- * Abnormality in the inner liner.

NOTE:

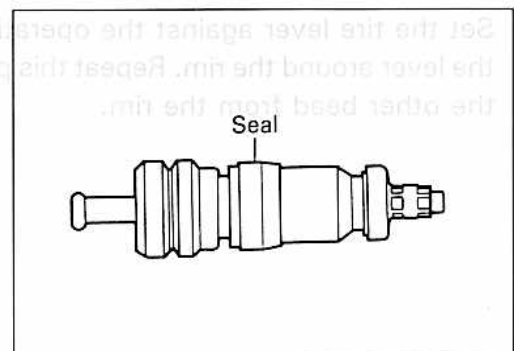
When repairing a flat tire, follow the repair instructions and use only recommended repairing materials.

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.

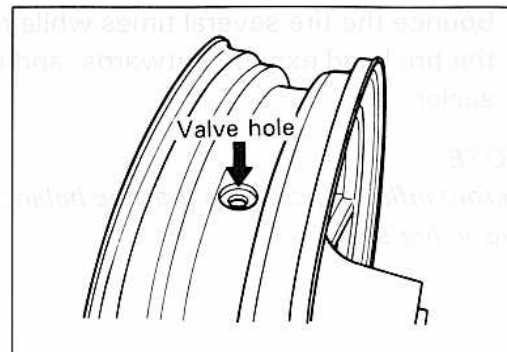


VALVE INSTALLATION

Any dust or rust around the valve hole must be cleaned off. Then install the valve in the rim.

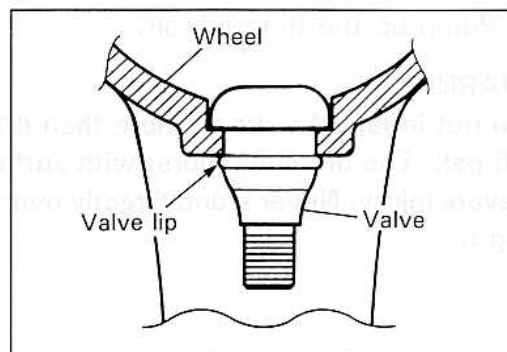
NOTE:

To properly install the valve into the valve hole, apply a special tire lubricant or neutral soapy liquid to the valve.



CAUTION:

Be careful not to damage the threads and lip of valve.

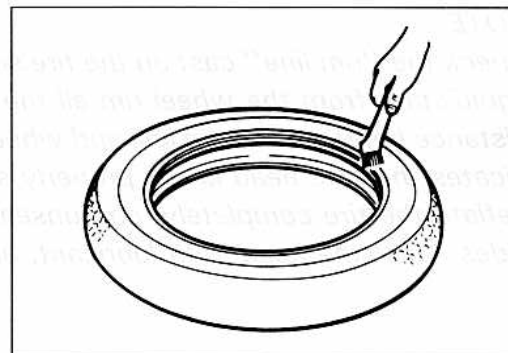


TIRE MOUNTING

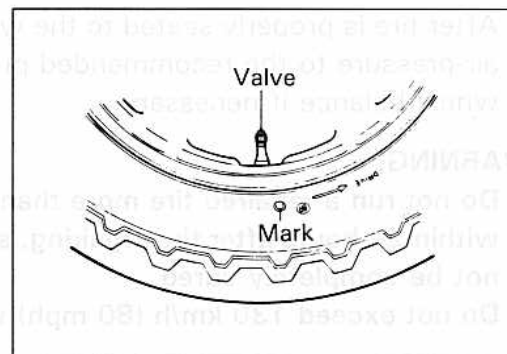
- Apply a special tire lubricant or neutral soapy liquid to the tire bead.

CAUTION:

Never apply grease, oil or gasoline to the tire bead.



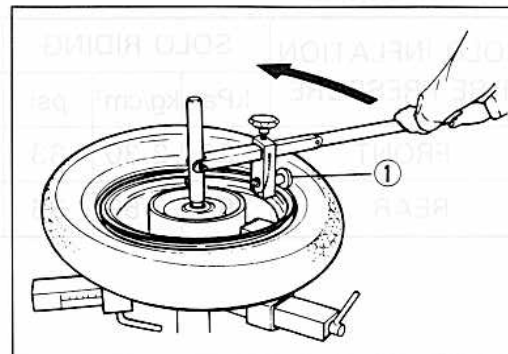
- When installing the tire, make certain that the directional arrow faces the direction of wheel rotation and align the balancing mark of the tire with the valve as shown.



- Set the bead pushing roller ①.
- Rotate the 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:

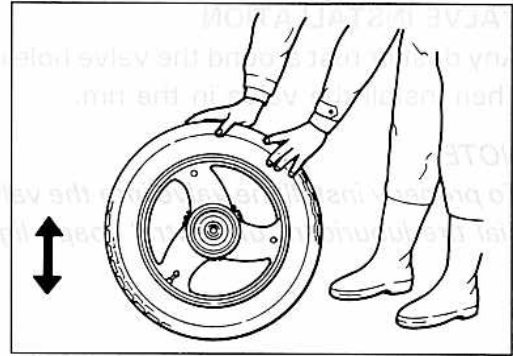
Before installing the valve core, inspect the core.



- Bounce the tire several times while rotating. This makes the tire bead expand outwards, and thus makes inflation easier.

NOTE:

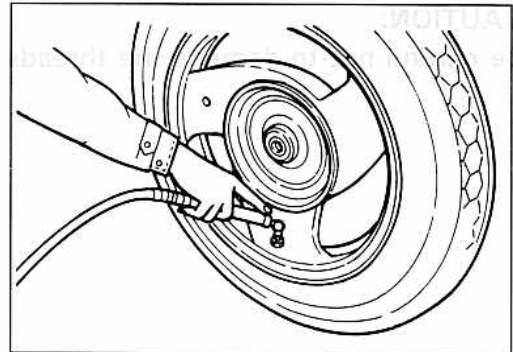
Before inflating, confirm that the balance mark lines up with the valve stem.



- Pump up the tire with air.

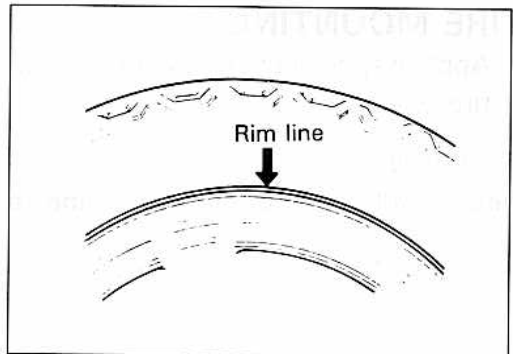
WARNING:

Do not inflate the tire to more than 400 kPa (4.0 kg/cm², 56 psi). The tire could burst with sufficient force to cause severe injury. Never stand directly over the tire while inflating it.



NOTE:

Check the "rim line" cast on the tire side walls. It must be equidistant from the wheel rim all the way around. If the distance between the rim line and wheel rim varies, this indicates that the bead is not properly seated. If this is so, deflate the tire completely, and unseat the bead for both sides. Coat the bead with lubricant, and try again.



- After tire is properly seated to the wheel rim, adjust the air-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.

TIRE PRESSURE

COLD INFLATION TIRE PRESSURE	SOLO RIDING			DUAL RIDING		
	kPa	kg/cm ²	psi	kPa	kg/cm ²	psi
FRONT	230	2.30	33	230	2.30	33
REAR	250	2.50	36	250	2.50	36

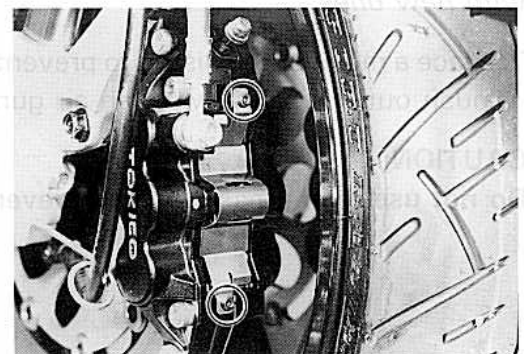
FRONT BRAKE

Tightening torque

ITEM	N-m	kg-m	lb-ft
①	8-12	0.8-1.2	6.0-8.5
②	16-20	1.6-2.0	11.5-14.5
③	6-9	0.6-0.9	4.5-6.5
④	31-48	3.1-4.8	22.5-34.5
⑤	20-25	2.0-2.5	14.5-18.0

BRAKE PAD REPLACEMENT

1. Remove the brake pad spring by removing the bolts.



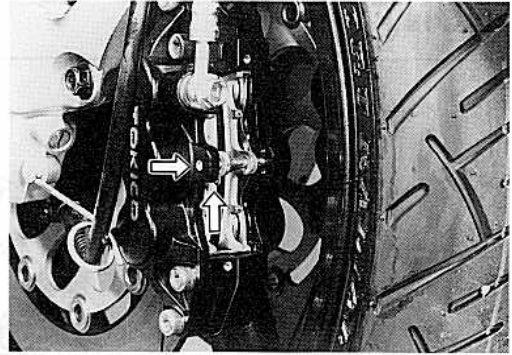
- Remove the brake pads by removing the cotter pin and brake pad mounting rod.

09900-00401: "L" type hexagon wrench set

- Remove the brake pads.

CAUTION:

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



CALIPER REMOVAL AND DISASSEMBLY

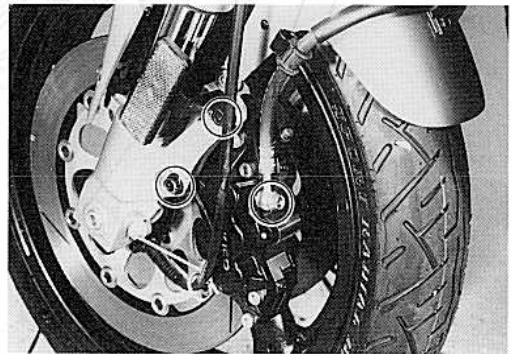
- Remove the brake caliper by removing the caliper mounting bolts.
- Disconnect the brake hose from the caliper by removing the union bolt and catch the brake fluid in a suitable receptacle.

CAUTION:

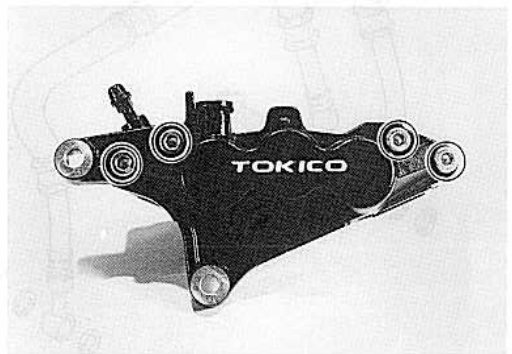
Never reuse the brake fluid left over from previous servicing and stored for long periods.

WARNING:

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



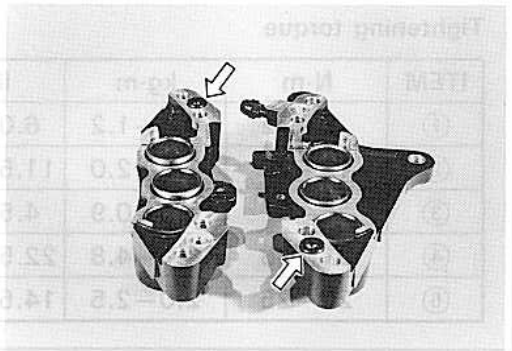
- Remove the brake pads. (Refer to page 7-16.)
- Remove the caliper mounting bolts and take off the caliper.



NOTE:

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

- Separate the caliper halves to remove the caliper housing bolts.



09900-00410: Hexagon wrench set

- Remove the seals.

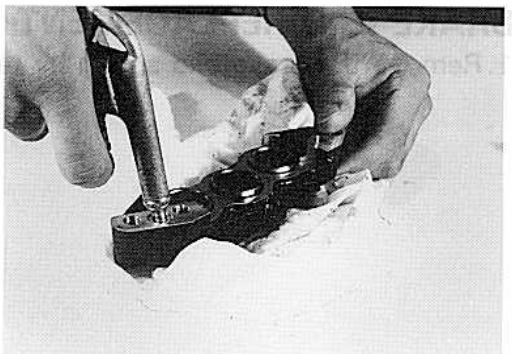
NOTE:

When once separate the caliper halves, replace the seals with new ones.

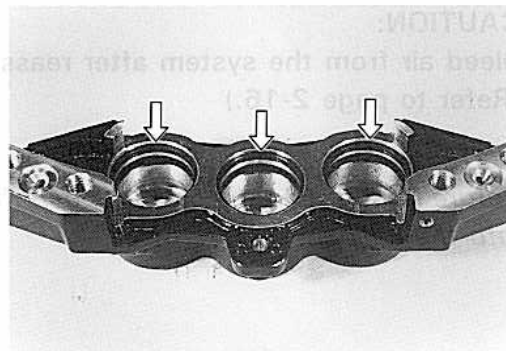
- Place a rag over the piston to prevent its popping out and push out the piston with an air gun.

CAUTION:

Do not use high pressure air to prevent piston damage.



8. Remove the dust seals and piston seals.



CALIPER AND DISC INSPECTION

CALIPER

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

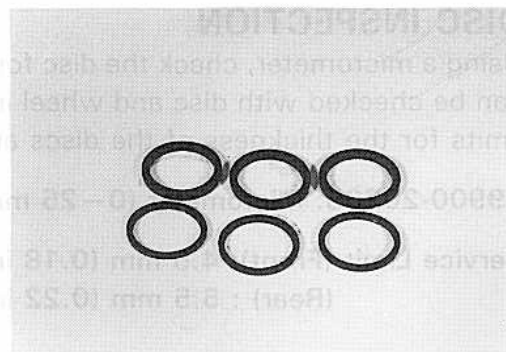
PISTON

Inspect the piston surface for any scratches or other damage.



RUBBER PARTS

The rubber parts removed should be replaced with new ones.



CALIPER REASSEMBLY AND REMOUNTING

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

CAUTION:

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

99000-23110: SUZUKI BRAKE FLUID DOT3 & DOT4

CALIPER BOLTS

- Tighten each bolt to the specified torque.

Tightening torque

Front brake caliper

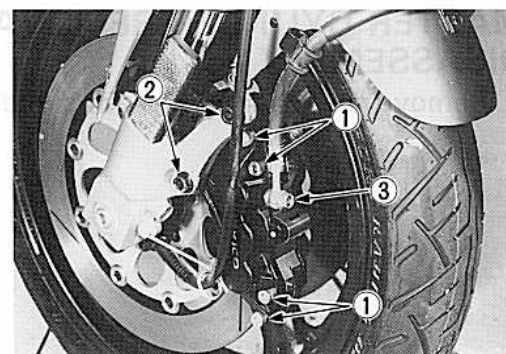
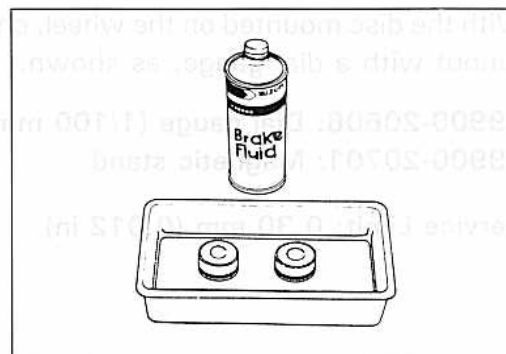
housing bolt ① : 20–25 N·m
(2.0–2.5 kg-m, 14.5–18.0 lb-ft)

Front brake caliper

mounting bolt ② : 31–48 N·m
(3.1–4.8 kg-m, 22.5–34.5 lb-ft)

Brake hose

union bolt ③ : 16–20 N·m
(1.6–2.0 kg-m, 11.5–14.5 lb-ft)



CAUTION:

Bleed air from the system after reassembling the caliper.
(Refer to page 2-16.)

NOTE:

Before remounting the caliper, push the piston all the way into the caliper.

DISC SERVICING

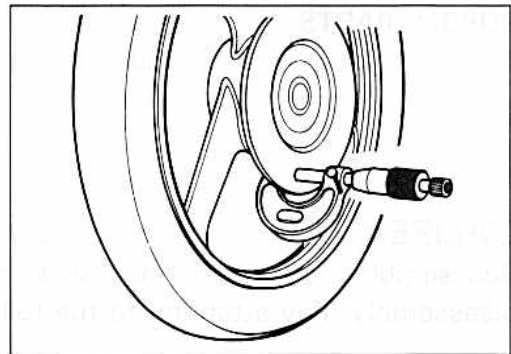
- Remove the front and rear wheels. (Refer to pages 7-6 and 7-42.)
- Remove the disc. (Refer to pages 7-7 and 7-44.)
- Install the disc. (Refer to pages 7-8 and 7-46.)

DISC INSPECTION

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

09900-20205: Micrometer (0–25 mm)

Service Limit (Front): 4.5 mm (0.18 in)
(Rear) : 5.5 mm (0.22 in)

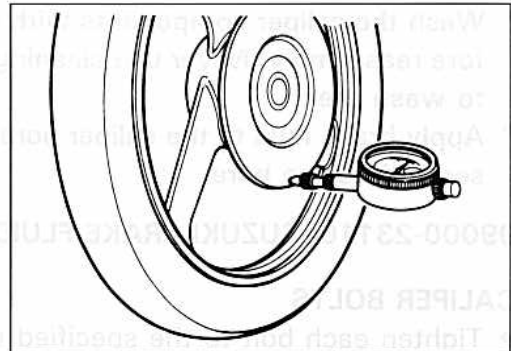


With the disc mounted on the wheel, check the disc for face runout with a dial gauge, as shown.

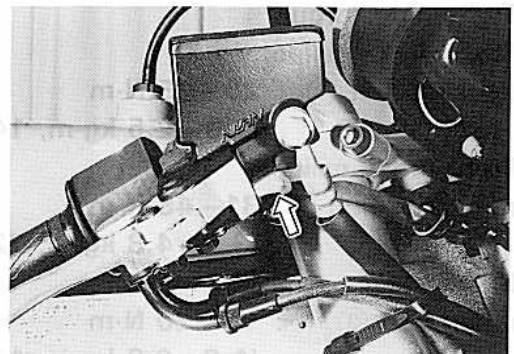
09900-20606: Dial gauge (1/100 mm)

09900-20701: Magnetic stand

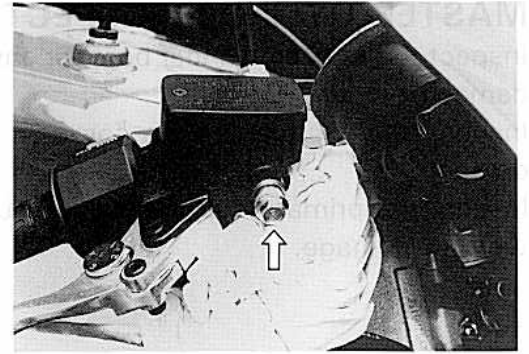
Service Limit: 0.30 mm (0.012 in)

**MASTER CYLINDER REMOVAL AND DISASSEMBLY**

1. Remove the front brake light switch lead wires.



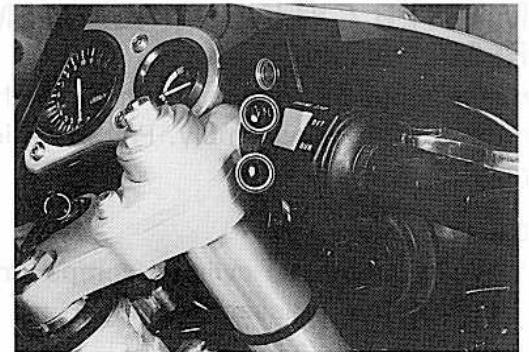
- Place a rag underneath the union bolt on the master cylinder to catch any spilled drops of brake fluid. Remove the union bolt and disconnect the brake hose/master cylinder joint.



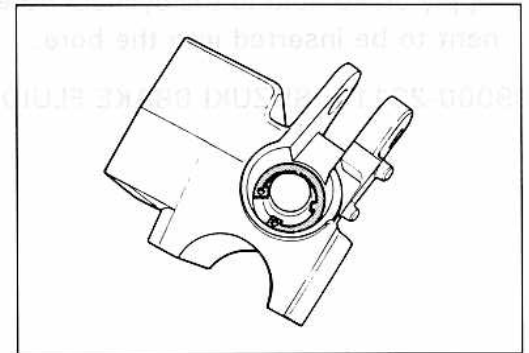
CAUTION

Immediately and completely wipe off any brake fluid contacting any parts of the motorcycle. The fluid reacts chemically with paint, plastics and rubber materials, etc. and will damage them severely.

- Remove the master cylinder assembly.



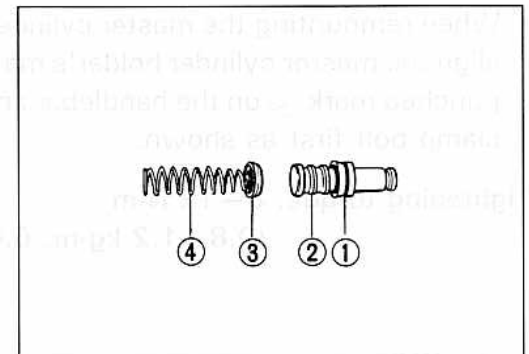
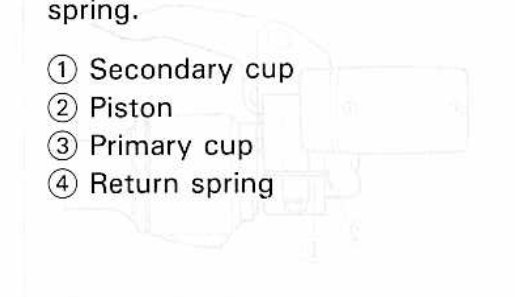
- Remove the front brake lever, reservoir cap and diaphragm.
- Drain brake fluid.
- Remove the dust seal, then remove the circlip by using the special tool.



09900-06108: Snap ring pliers

- Remove the piston/secondary cup, primary cup and spring.

- Secondary cup
- Piston
- Primary cup
- Return spring

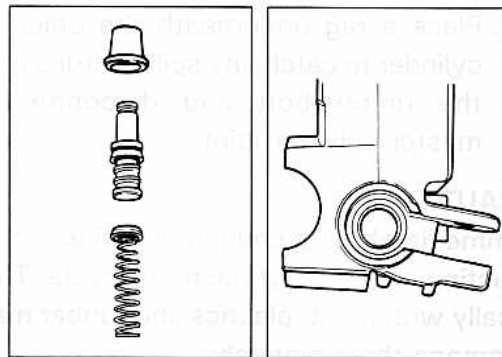


MASTER CYLINDER INSPECTION

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, secondary cup and dust seal for wear or damage.

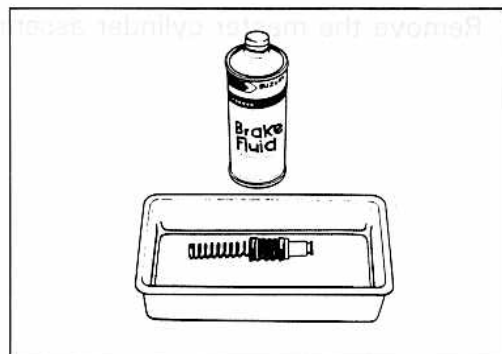


MASTER CYLINDER REASSEMBLY AND REMOUNTING

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

CAUTION:

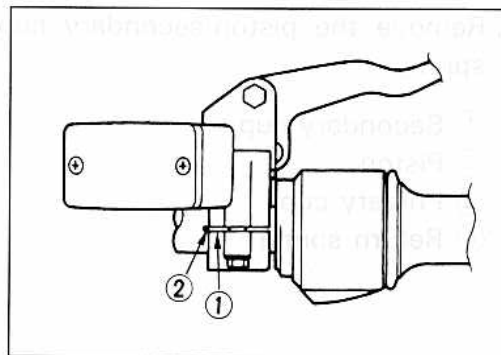
- * Wash the master cylinder components with fresh brake fluid before reassembly. Never use cleaning solvent or gasoline to wash them.
- * Apply brake fluid to the cylinder bore and all the component to be inserted into the bore.



99000-23110: SUZUKI BRAKE FLUID DOT3 & DOT4

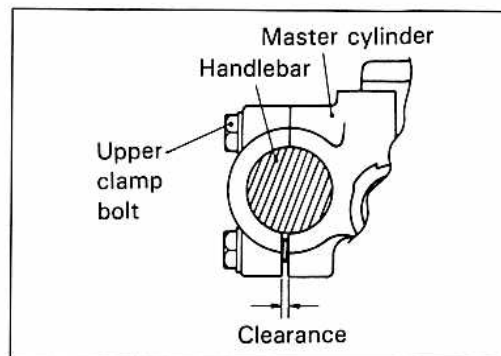
- When remounting the master cylinder on the handlebar, align the master cylinder holder's mating surface ① with punched mark ② on the handlebar and tighten the upper clamp bolt first as shown.

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



CAUTION:

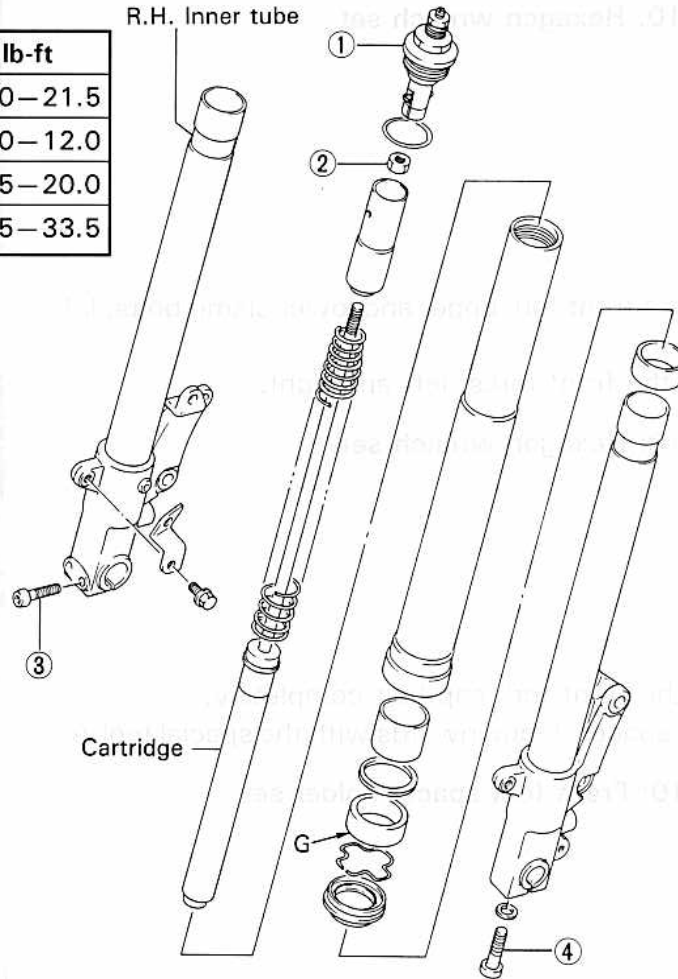
Bleed air from the system after reassembling master cylinder.
(Refer to page 2-16.)



FRONT FORK

Tightening torque

ITEM	N·m	kg-m	lb-ft
①	15-30	1.5-3.0	11.0-21.5
②	13.5-16.5	1.35-1.65	10.0-12.0
③	19-28	1.9-2.8	13.5-20.0
④	34-46	3.4-4.6	24.5-33.5

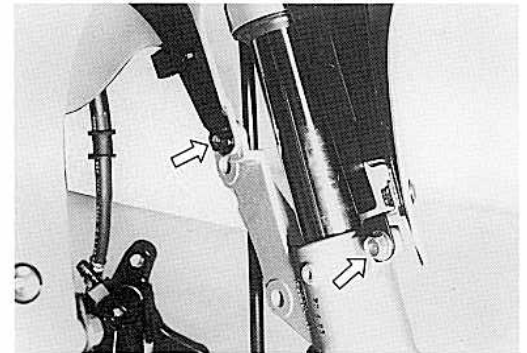


G: Apply SUZUKI SUPER GREASE "A".

REMOVAL AND DISASSEMBLY

1. Remove the lower cowling. (Refer to page 7-4.)
2. Remove the front wheel. (Refer to page 7-6.)
3. Remove the front fender by removing the bolts, left and right.

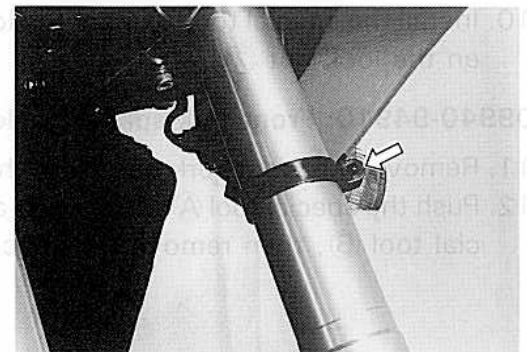
09900-00410: Hexagon wrench set



4. Remove the speedometer cable clamp from the front fork.

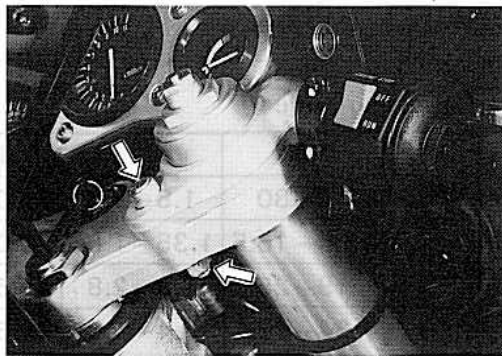
NOTE:

Slightly loosen the front fork cap bolt to facilitate later disassembly before loosening the front fork lower clamp bolts.



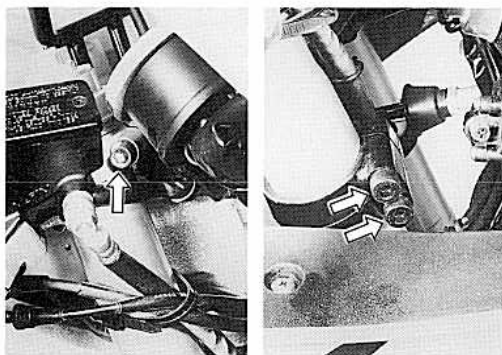
5. Loosen the handlebar mounting bolts and nuts, left and right.

09900-00410: Hexagon wrench set



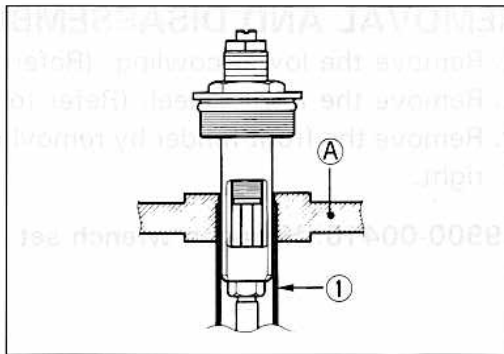
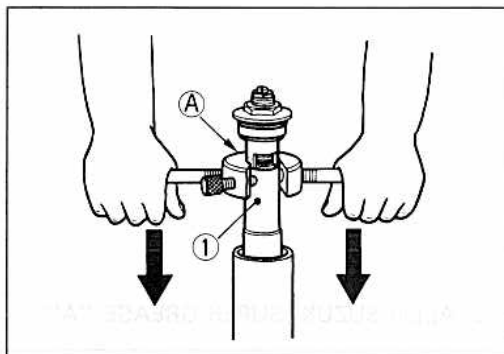
6. Loosen the front fork upper and lower clamp bolts, left and right.
7. Remove the front forks, left and right.

09900-00410: Hexagon wrench set



8. Loosen the front fork cap bolt completely.
9. Push the spacer ① downwards with the special tool ④.

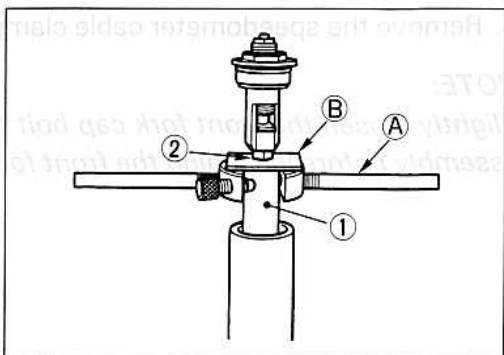
09940-94910: Front fork spacer holder set



10. Install the special tool ⑤ under the lock nut ② and loosen the lock nut ②.

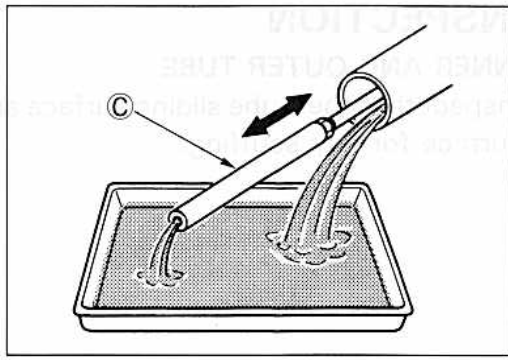
09940-94910: Front fork spacer holder set

11. Remove the front fork cap from the inner rod.
12. Push the special tool ④ downwards and remove the special tool ⑤, then remove the spacer ① and spring.

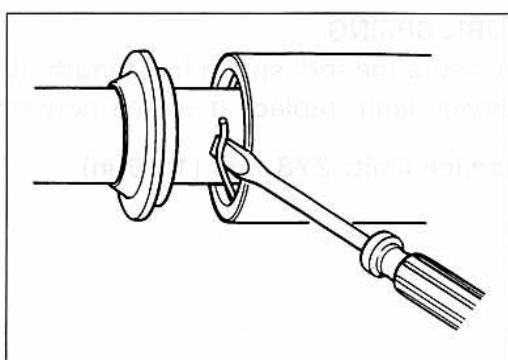


- 13. Invert the fork and stroke the inner rod several times with the special tool © to let out fork oil.
- 14. Under the inverted condition of front fork, drain oil to hold it for a few minutes.

09940-52840: Front fork inner rod holder



- 15. Remove the dust seal and oil seal stopper ring.



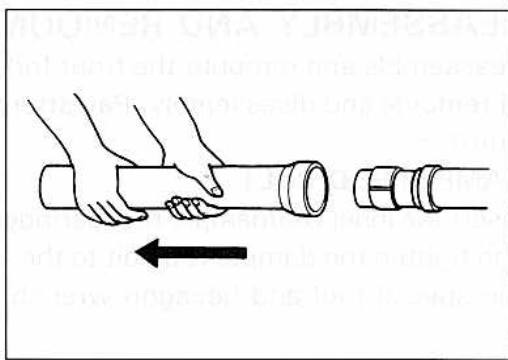
- 16. Separate the outer tube from the inner tube.

NOTE:

Be careful not to damage the inner tube.

CAUTION:

The outer tube and inner tube "ANTI-FRICTION" metals must be replaced along with the oil seal and dust seal, when assembling the front fork.

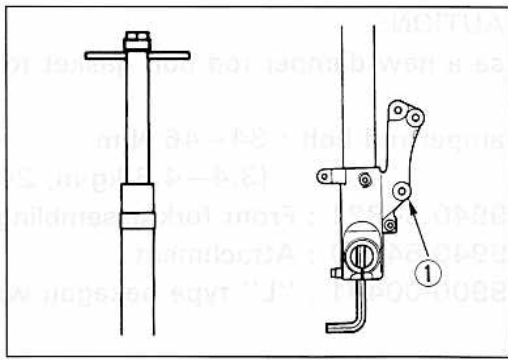


- 17. While holding the brake caliper mounting portion ① by vise and remove the damper rod bolt with the special tool and hexagon wrench.

09940-54821: Front fork disassembling tool

09940-54830: Attachment

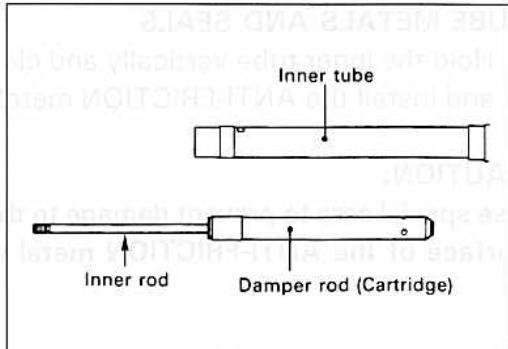
09900-00401: "L" type hexagon wrench set



- 18. Remove the inner rod/damper rod (cartridge) out of the inner tube.

CAUTION:

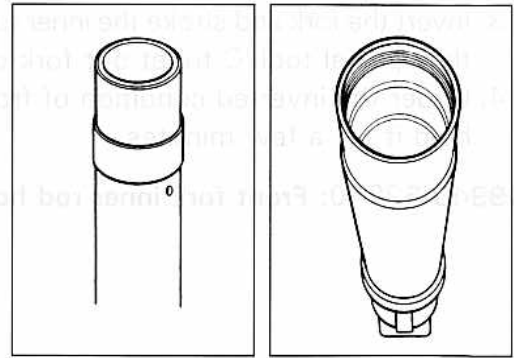
Do not attempt to disassemble the inner rod/damper rod.



INSPECTION

INNER AND OUTER TUBE

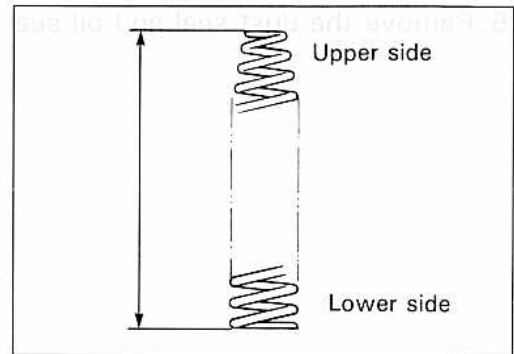
Inspect the inner tube sliding surface and outer tube sliding surface for any scuffing.



FORK SPRING

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

Service limit: 278 mm (10.9 in)



REASSEMBLY AND REMOUNTING

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

DAMPER ROD BOLT

Insert the inner rod/damper rod (cartridge) into the inner tube and tighten the damper rod bolt to the specified torque with the special tool and hexagon wrench.

CAUTION:

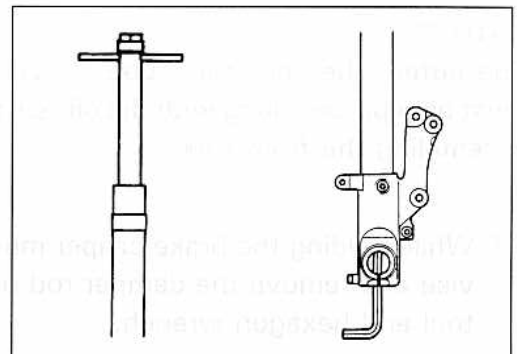
Use a new damper rod bolt gasket to prevent oil leakage.

Damper rod bolt : 34–46 N·m
(3.4–4.6 kg·m, 24.5–33.5 lb-ft)

09940-54821 : Front fork assembling tool

09940-54830 : Attachment

09900-00401 : "L" type hexagon wrench set

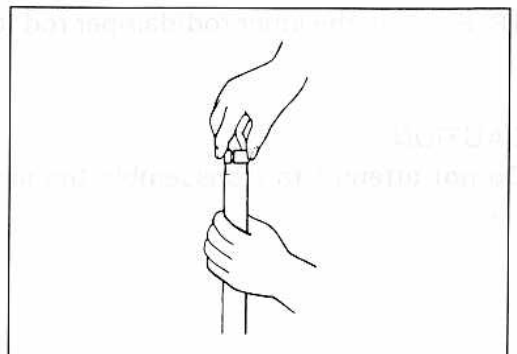


TUBE METALS AND SEALS

- Hold the inner tube vertically and clean the metal groove and install the ANTI-FRICTION metal by hand as shown.

CAUTION:

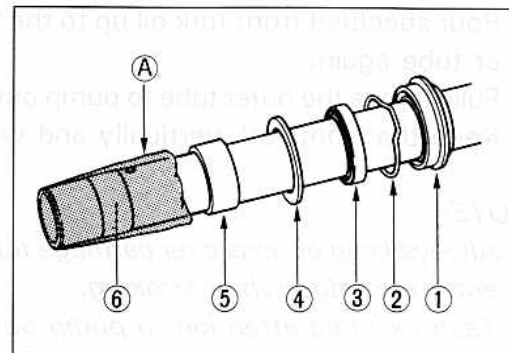
Use special care to prevent damage to the "TEFLON" coated surface of the ANTI-FRICTION metal when mounting it.



- Install the dust seal, oil seal stopper ring, oil seal, oil seal retainer and anti-friction metal onto the inner tube.

CAUTION:

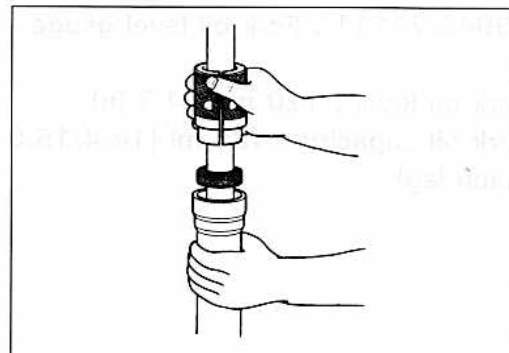
- * When installing the dust seal ① and oil seal ③ onto the inner tube, protect their seal lips with a vinyl film **A** to prevent oil seal damage.
- * Do not use solvents for washing to prevent oil seal damage.



- ① Dust seal
- ② Oil seal stopper ring
- ③ Oil seal
- ④ Oil seal retainer
- ⑤ Anti-friction metal (outer tube)
- ⑥ Anti-friction metal (inner tube)

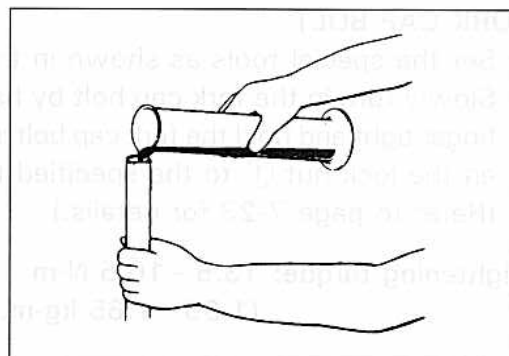
- Insert the inner tube into the outer tube and install the oil seal and dust seal with the special tool.

09940-52850 : Front fork oil seal installer

**FORK OIL**

- Place the front fork vertically with fully compressed and without spring.
- Pour specified front fork oil up to the top level of the outer tube.

99000-99044-L01 : Fork oil L01

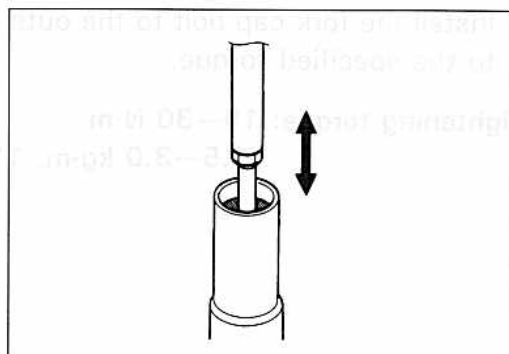


- Move the inner rod slowly with the special tool more than ten times until bubbles do not come out from oil.

09940-52840 : Front fork inner rod holder

NOTE:

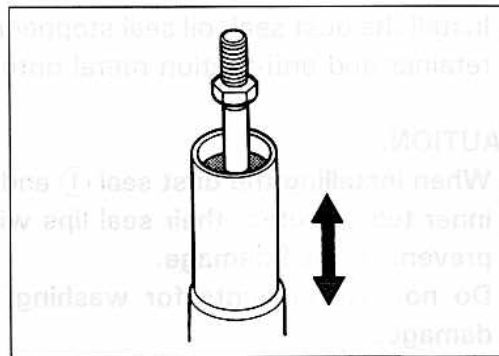
Pour front fork oil up to the top of the outer tube to find bubbles while bleeding air.



- Pour specified front fork oil up to the top level of the outer tube again.
- Fully stroke the outer tube to pump out air from outer tube.
- Keep the front fork vertically and wait 5–6 minutes.

NOTE:

- * Always keep oil level over cartridge top surface, or air may enter cartridge when stroking.
- * Take extreme attention to pump out air completely.



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

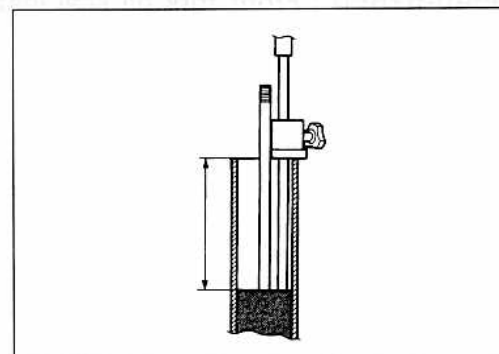
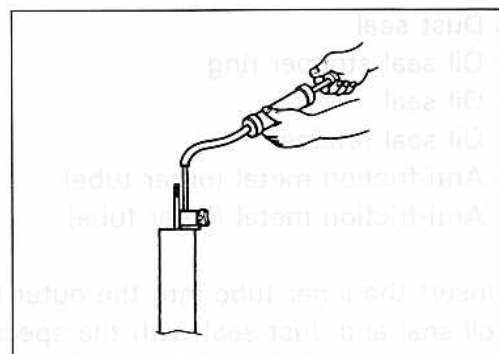
NOTE:

When adjusting fork oil level, remove the fork spring and compress the outer tube fully.

09943-74111 : Fork oil level gauge

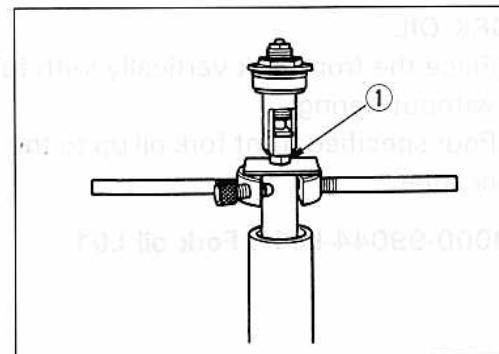
Fork oil level : 120 mm (4.7 in)

Fork oil capacity : 425 ml (14.4/15.0 US/lmp oz)
(each leg)

**FORK CAP BOLT**

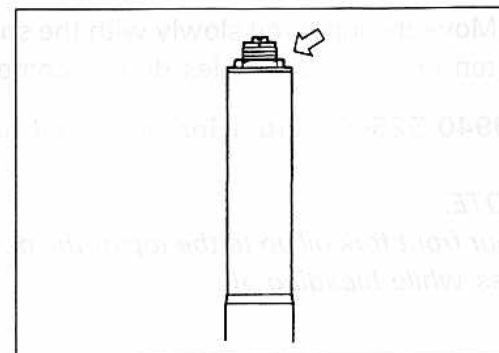
- Set the special tools as shown in the illustration.
- Slowly turn in the fork cap bolt by hand until it stops by finger tight and hold the fork cap bolt in this position, tighten the lock nut ① to the specified torque.
(Refer to page 7-23 for details.)

Tightening torque: 13.5–16.5 N·m
(1.35–1.65 kg-m, 10.0–12.0 lb-ft)

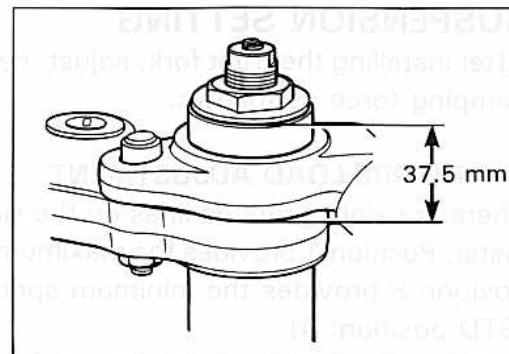


- Install the fork cap bolt to the outer tube and tighten it to the specified torque.

Tightening torque: 15–30 N·m
(1.5–3.0 kg-m, 11.0–21.5 lb-ft)

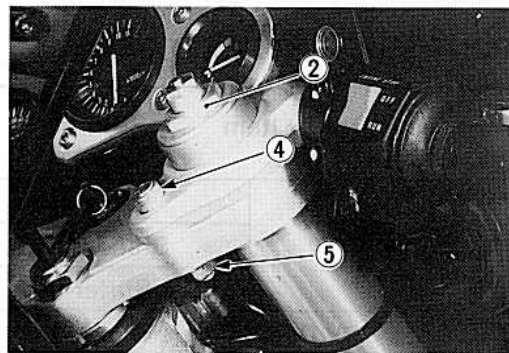
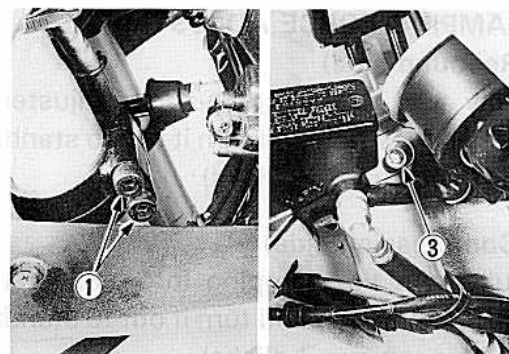


- When remounting the front fork assembly, set the upper surface of the outer tube at 37.5 mm (1.48 in) height from the upper surface of the steering stem upper bracket.



- Install the steering damper properly. (Refer to page 7-30.)
- Tighten the bolts to the specified.

Item	N·m	kg·m	lb·ft
① Fork lower clamp bolt	21–30	2.1–3.0	15.0–21.5
② Fork cap	15–30	1.5–3.0	11.0–21.5
③ Fork upper clamp bolt	21–30	2.1–3.0	15.0–21.5
④ Handlebar mounting bolt	41–61	4.1–6.1	29.5–44.0
⑤ Handlebar mounting nut	23–35	2.3–3.5	16.5–25.5



NOTE:

Before tightening the fender brace bolts, move the front fork up and down 4 or 5 times.



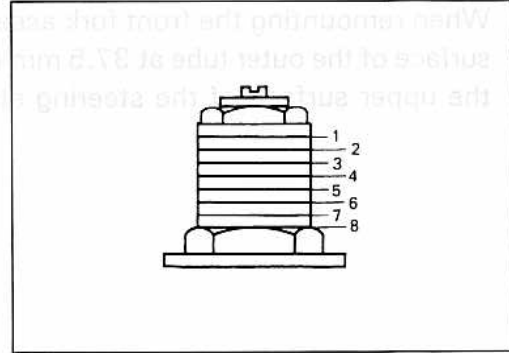
SUSPENSION SETTING

After installing the front fork, adjust the spring pre-load and damping force as follows.

SPRING PRE-LOAD ADJUSTMENT

There are eight grooved lines on the side of the spring adjuster. Position 1 provides the maximum spring pre-load and position 8 provides the minimum spring pre-load.

(STD position: 4)



DAMPING FORCE ADJUSTMENT

(Rebound side)

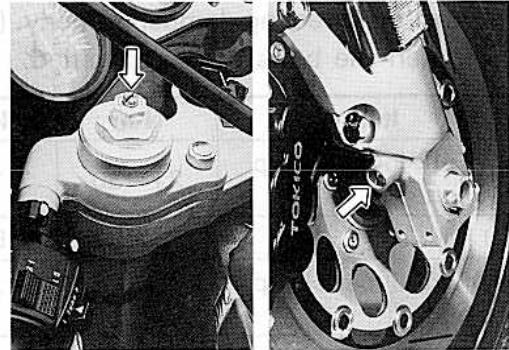
Fully turn the damping force adjuster clockwise. It is at stiffest position and turn it out to standard setting position.

(STD position: 6 clicks)

(Compression side)

Fully turn the damping force adjuster clockwise. It is at stiffest position and turn it out to standard setting position.

(STD position: 7 clicks)



Rebound side

Compression side

FRONT SUSPENSION SETTING

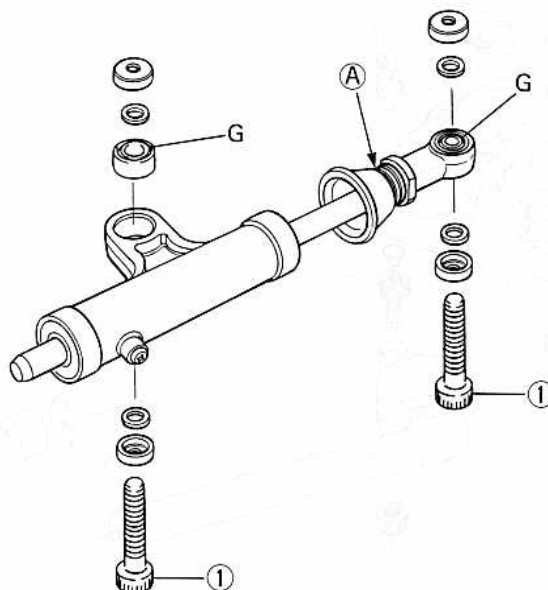
Item		Spring pre-load	Damping force	
			Compression	Rebound
Solo riding	Softer	5	8	7
	Standard	4	7	6
	Stiffer	3	6	5
Dual riding		4	7	6

WARNING:

Be sure to adjust the spring pre-load and damping force on both front fork legs equally.

STEERING DAMPER

STEERING



ITEM	N·m	kg·m	lb·ft
①	25	2.5	18.0

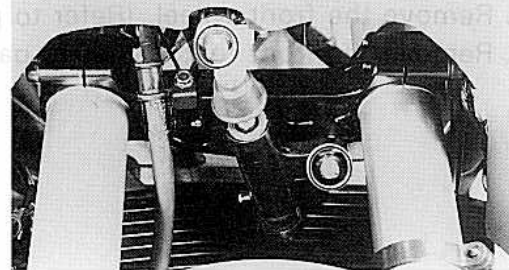
CAUTION:**Do not turn the nut ①.**

G: Apply a small quantity of SUZUKI SUPER GREASE "A".

REMOVAL

- Remove the steering damper by removing the bolts.

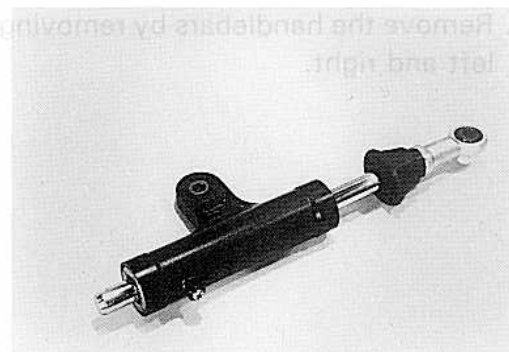
09900-00410: Hexagon wrench set

**INSPECTION**

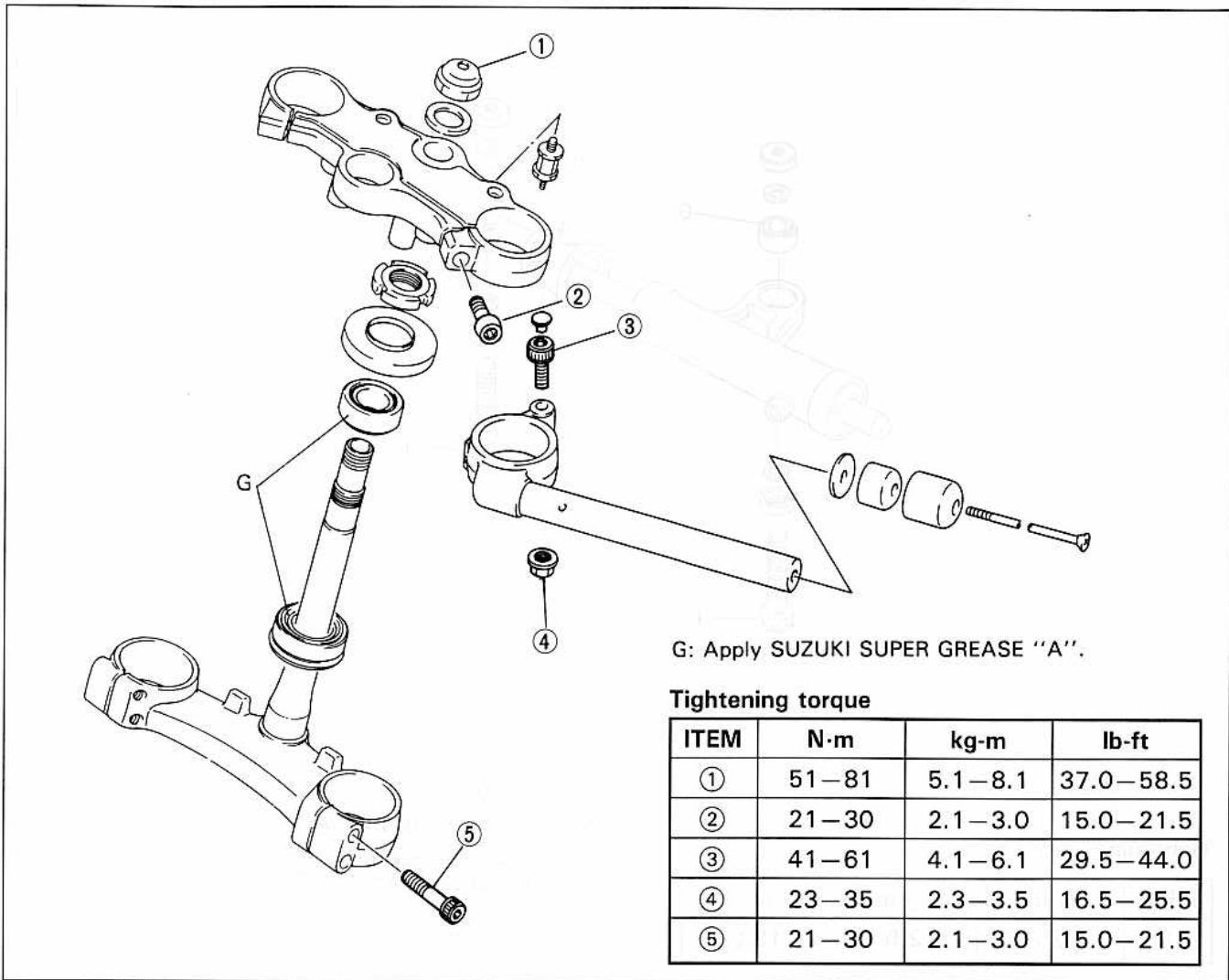
Inspect the steering damper body, bearing and oil seal for damage and oil leakage.

Move the steering damper rod by hand to inspect for a smooth movement.

If any defects are found, replace the steering damper with a new one.



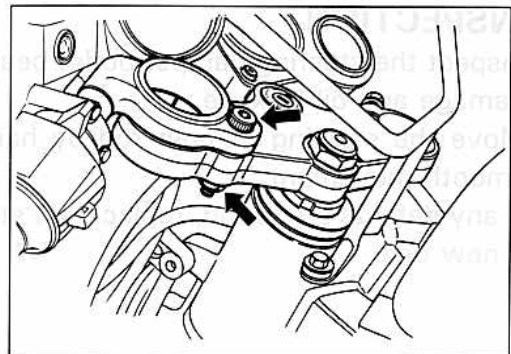
STEERING



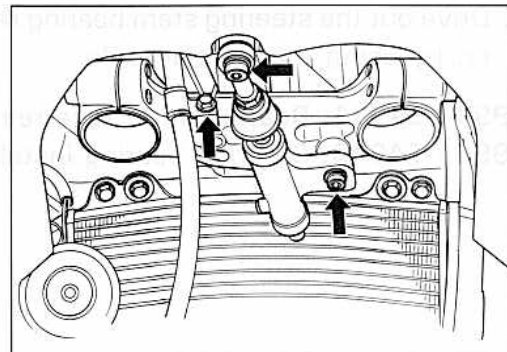
REMOVAL AND DISASSEMBLY

1. Remove the lower cowling. (Refer to page 7-4.)
2. Remove the front wheel. (Refer to page 7-6.)
3. Remove the front fork. (Refer to page 7-22.)

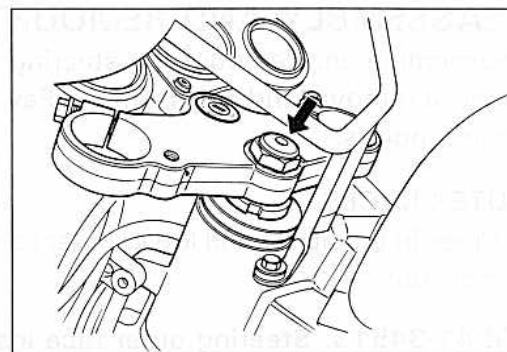
4. Remove the handlebars by removing the bolts and nuts, left and right.



5. Remove the brake hose clamp bolt.
6. Disconnect the combination meter couplers.
7. Remove the steering damper bolts.



8. Remove the steering stem head nut.
9. Remove the speedometer cable.
10. Remove the upper bracket along with the combination meter.



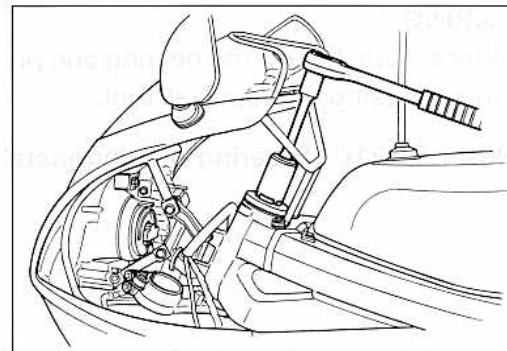
11. Remove the steering stem nut with the special tool.
- 09940-14911: Steering stem nut wrench**

12. Draw out the steering stem lower bracket.

NOTE:

Hold the steering stem lower bracket by hand to prevent it from falling.

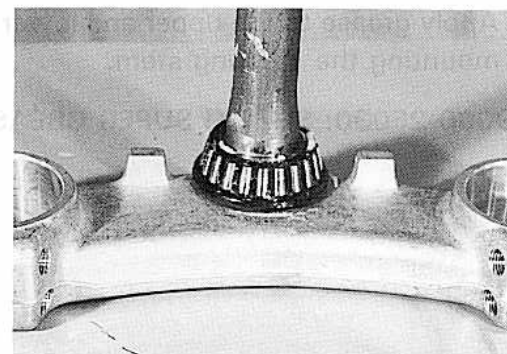
13. Remove the steering stem upper bearing.



INSPECTION

Inspect the removed parts for the following abnormalities.

- * Handlebar distortion
- * Handlebar clamp wear
- * Race wear and brinelling
- * Bearing wear or damage
- * Abnormal noise of bearing
- * Distortion of steering stem



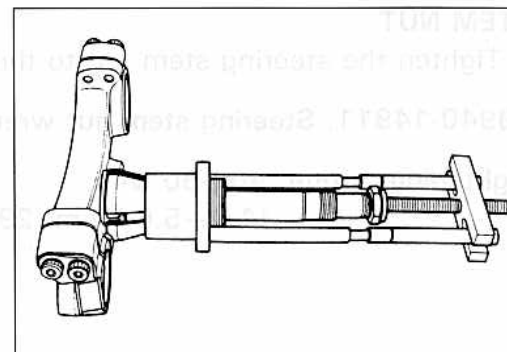
DISASSEMBLY

1. Remove the steering stem upper bearing.
2. Remove the steering stem lower bearing by using the special tool.

09941-84510: Bearing remover

CAUTION:

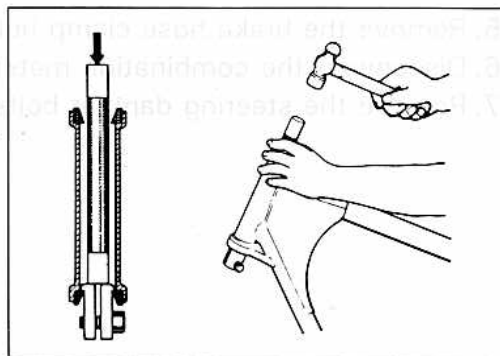
The removed bearing should be replaced with a new one.



3. Drive out the steering stem bearing races, upper and lower, by using the special tools.

09941-54911: Bearing outer race remover

09941-74910: Steering bearing installer



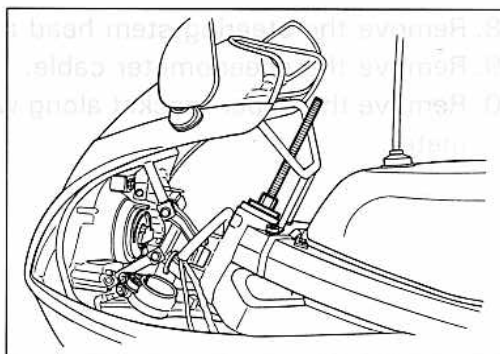
REASSEMBLY AND REMOUNTING

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

OUTER RACES

- Press in the upper and lower outer races by using the special tool.

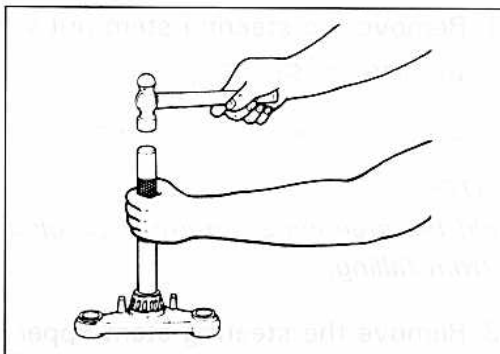
09941-34513: Steering outer race installer



BEARING

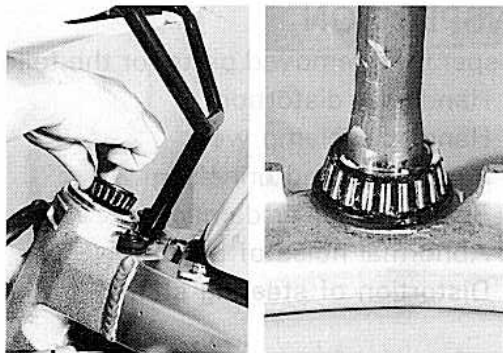
- Place a washer on the bearing and press in the lower bearing by using the special tool.

09941-74910: Steering bearing installer



- Apply grease to the upper and lower bearings before remounting the steering stem.

99000-25030: SUZUKI SUPER GREASE "A"



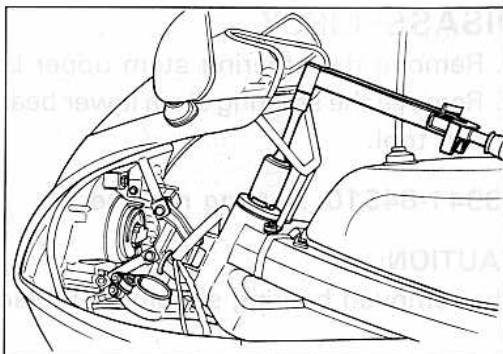
STEM NUT

- Tighten the steering stem nut to the specified torque.

09940-14911: Steering stem nut wrench

Tightening torque: 40–50 N·m

(4.0–5.0 kg-m, 29.0–36.0 lb-ft)



- Turn the steering stem lower bracket about five or six times to the left and right so that the taper roller bearing will be seated properly.
- Turn back the stem nut by 1/4–1/2 turn.

NOTE:

This adjustment will vary from motorcycle to motorcycle.

- Reassemble the front forks. (Refer to page 7-29.)
- Tighten the front fork lower clamp bolt ① steering stem head nut ② , upper clamp bolt ③ , handlebar holder mounting bolt ④ and handlebar holder set bolt ⑤ .

Tightening torque

Front fork lower clamp bolt ① : 21–30 N·m
(2.1–3.0 kg-m, 15.0–21.5 lb-ft)

Stem head nut ② : 51–81 N·m
(5.1–8.1 kg-m, 37.0–58.5 lb-ft)

Front fork upper clamp bolt ③ : 21–30 N·m
(2.1–3.0 kg-m, 15.0–21.5 lb-ft)

Handlebar mounting bolt ④ : 41–61 N·m
(4.1–6.1 kg-m, 29.5–44.0 lb-ft)

Handlebar mounting nut ⑤ : 23–35 N·m
(2.3–3.5 kg-m, 16.5–25.5 lb-ft)

STEERING TENSION ADJUSTMENT

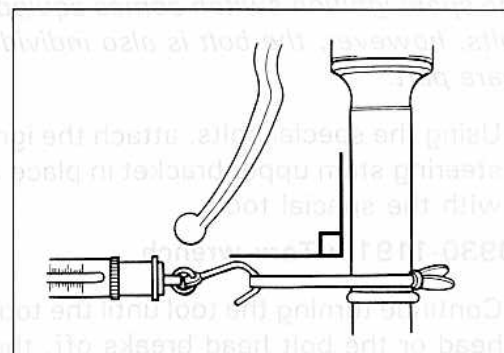
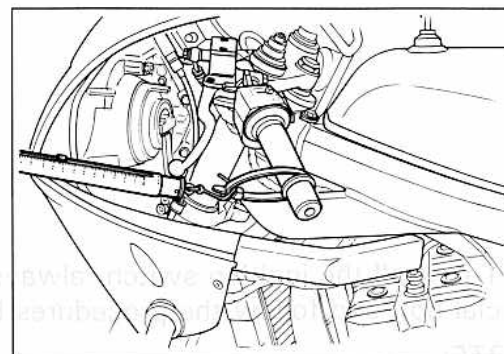
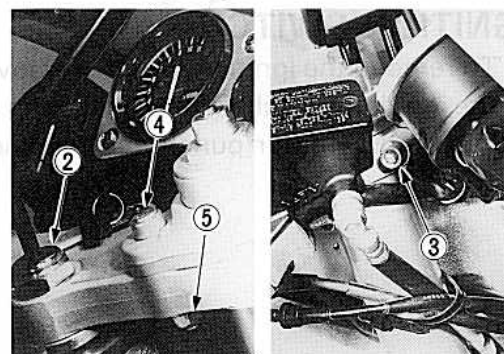
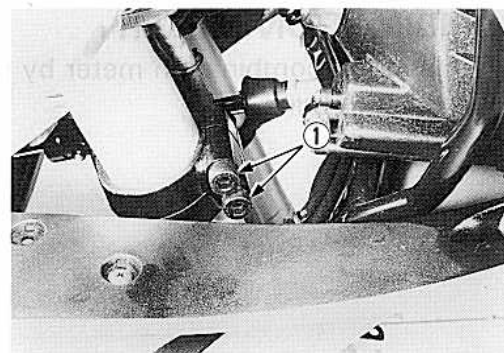
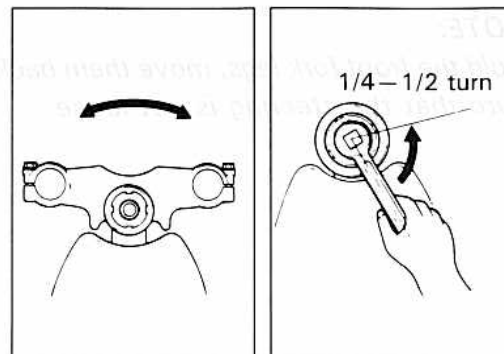
Check the steering movement in the following procedure.

- By supporting the motorcycle with a jack, lift the front wheel until it is off the floor by 20–30 mm (0.8–1.2 in).
- Check to make sure that the cables and wire harnesses are properly routed.
- Remove the steering damper ass'y from the steering stem lower bracket.
- 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

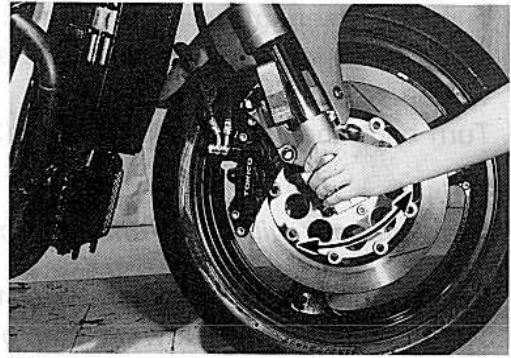
09940-92710: Spring scale

- 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 and steering stem head nut, and then adjust the steering stem nut by loosening or tightening it.
 - 2) Tighten the stem head nut and front fork upper clamp bolts to the specified torque and re-check the initial force with the spring scale according to the previously described procedure.
 - 3) If the initial force is found within the specified range, adjustment has been completed.



NOTE:

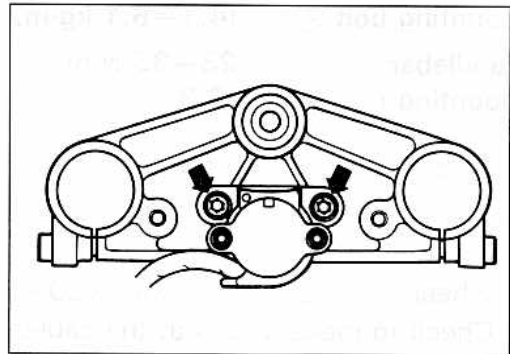
Hold the front fork legs, move them back and forth and make sure that the steering is not loose.

**COMBINATION METER**

- Remove the combination meter by removing its mounting bracket bolts.

**IGNITION SWITCH**

- To remove the ignition switch, remove the bolt to detach the ignition switch from the steering stem upper bracket by using a center punch and hammer.



- To install the ignition switch, always use the new special bolt and follow the procedures below:

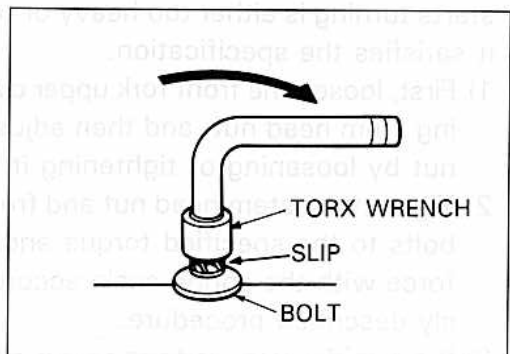
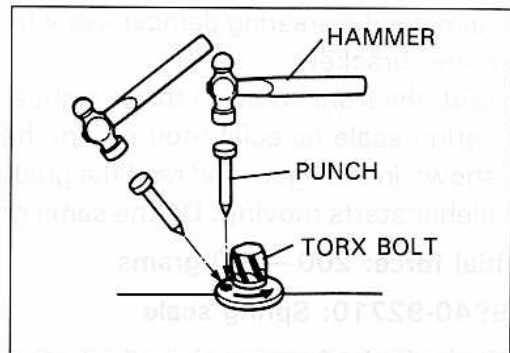
NOTE:

The spare ignition switch comes equipped with the special bolts, however, the bolt is also individually available as a spare part.

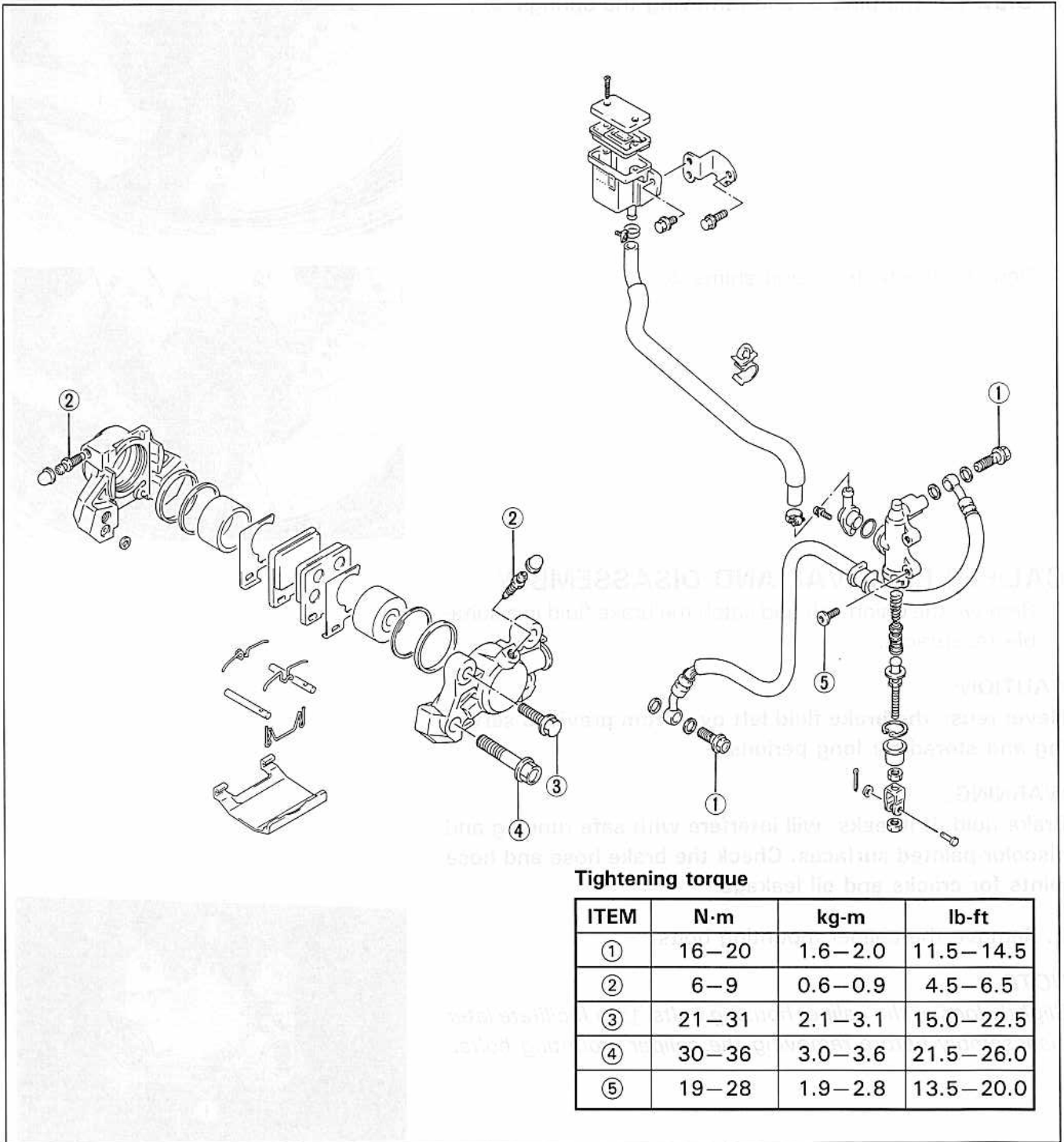
- Using the special bolts, attach the ignition switch on the steering stem upper bracket in place and run in the bolts with the special tool.

09930-11910: Torx wrench

- Continue turning the tool until the tool slips from the bolt head or the bolt head breaks off, then the bolt has become tightened to the proper specification.



REAR BRAKE

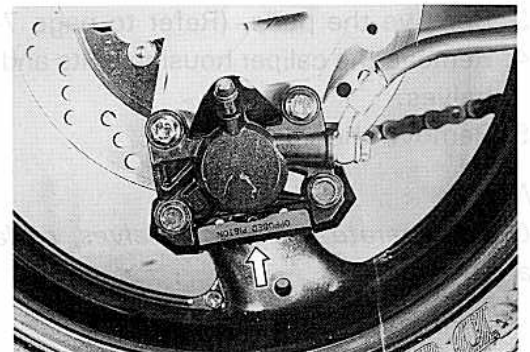


BRAKE PAD REPLACEMENT

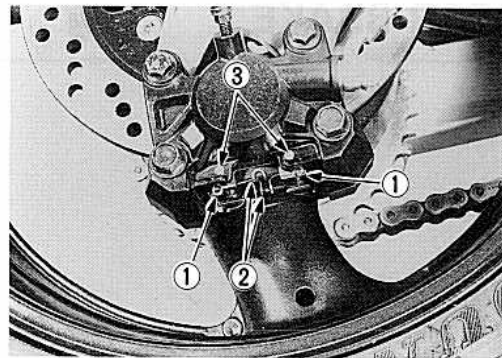
1. Remove the dust cover.

CAUTION:

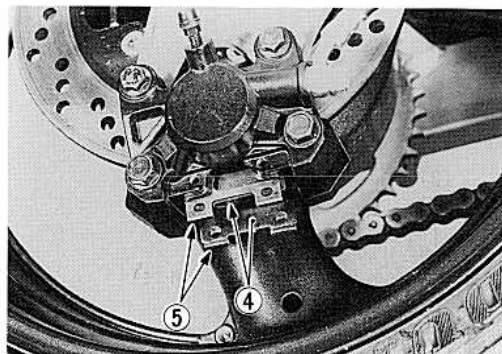
- * Do not operate the brake pedal while dismounting the pads.
- * Replace the brake pad as a set, otherwise braking performance will be adversely affected.



2. Remove the clips ① .
3. Draw out the pins ③ and removing the springs ② .



4. Remove the pads ④ and shims ⑤ .



CALIPER REMOVAL AND DISASSEMBLY

1. Remove the union bolt and catch the brake fluid in a suitable receptacle.

CAUTION:

Never reuse the brake fluid left over from previous servicing and stored for long periods.

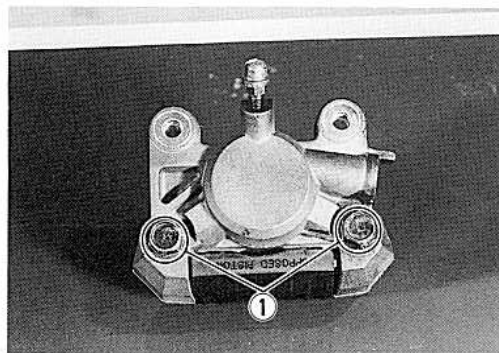
WARNING:

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

2. Remove the caliper mounting bolts.

NOTE:

Slightly loosen the caliper housing bolts ① to facilitate later disassembly before removing the caliper mounting bolts.



3. Remove the pads. (Refer to page 7-37.)
4. Remove the caliper housing bolts and separate the caliper halves.
5. Remove the O-ring.

NOTE:

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



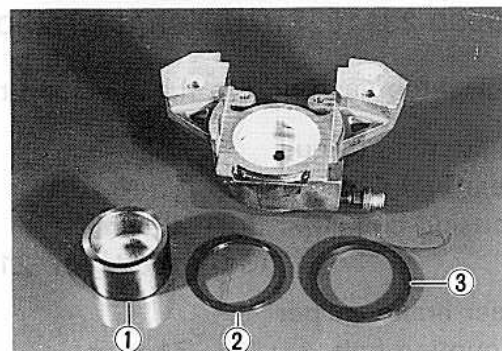
6. Place a rag over the piston to prevent it from popping out and push out the piston by using an air gun.

CAUTION:

Do not use high pressure air to prevent piston damage.



7. Remove the dust seal (2), piston (1) and piston seal (3) out of the caliper.



CALIPER INSPECTION

- CYLINDER** Refer to page 7-18.
- PISTON** Refer to page 7-18.
- RUBBER PARTS** Refer to page 7-18.
- DISC** Refer to page 7-19.



MASTER CYLINDER REMOVAL AND DISASSEMBLY

1. Remove both seals.
2. Remove the frame nut. (Refer to page 7-31.)
3. From the reservoir tank to remove its mounting bolt.
4. To use the lock nut.
5. Remove the master cylinder mounting plate.

NOTE:
Slightly loosen the brake hose union nut 2 to facilitate disassembly before removing the master cylinder.
5. Place a cloth underneath the union bolt 2 on the master cylinder to catch spilled drops of brake fluid.
4. Loosen the union nut and disconnect the brake hose from the master cylinder joint.

NOTE:
Immediately and completely wipe off any brake fluid contacting any parts of the motorcycle. The fluid reacts chemically with paint, plastics and rubber materials, etc. and will damage them severely.

CALIPER REASSEMBLY AND REMOUNTING

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

CAUTION:

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

99000-23110: SUZUKI BRAKE FLUID DOT3 & DOT4

- Tighten each bolt to the specified torque.

Tightening torque

Rear brake caliper

housing bolt ① : 30–36 N·m
(3.0–3.6 kg-m, 21.5–26.0 lb-ft)

Rear brake caliper

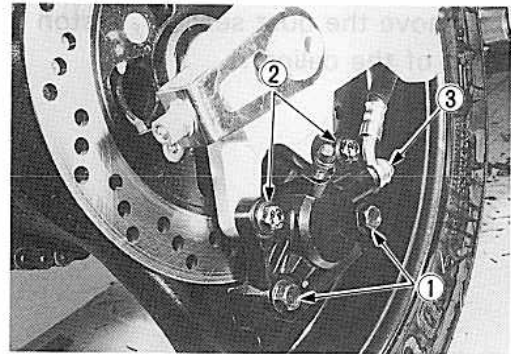
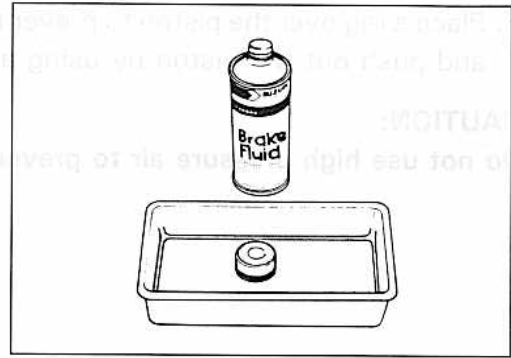
mounting bolt ② : 21–31 N·m
(2.1–3.1 kg-m, 15.0–22.5 lb-ft)

Brake hose

union bolt ③ : 16–20 N·m
(1.6–2.0 kg-m, 11.5–14.5 lb-ft)

CAUTION:

Bleed air from the system after reassembling the caliper. (Refer to page 2-16.)



MASTER CYLINDER REMOVAL AND DISASSEMBLY

1. Remove both seats.
2. Remove the frame cover. (Refer to page 7-2.)
3. Free the reservoir tank to remove its mounting bolt ①.
4. Loosen the lock nut ③.
5. Remove the master cylinder mounting bolts ④.

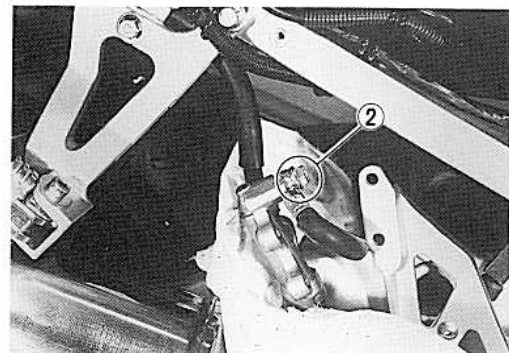
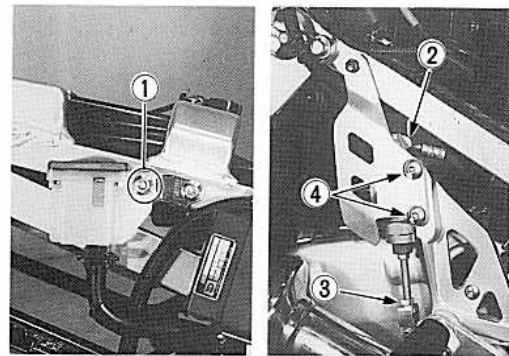
NOTE:

Slightly loosen the brake hose union bolt ② to facilitate later disassembly before removing the master cylinder.

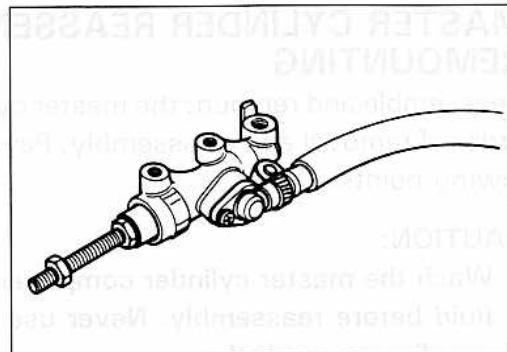
6. Place a cloth underneath the union bolt ② on the master cylinder to catch spilled drops of brake fluid.
7. Loosen the union bolt and disconnect the brake hose from the master cylinder joint.

NOTE:

Immediately and completely wipe off any brake fluid contacting any parts of the motorcycle. The fluid reacts chemically with paint, plastics and rubber materials, etc. and will damage them severely.

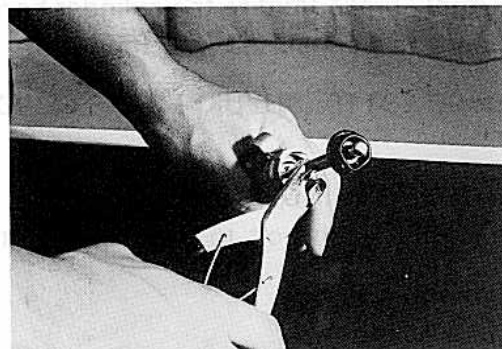


8. Remove the master cylinder assembly from the reservoir tank and its hose.

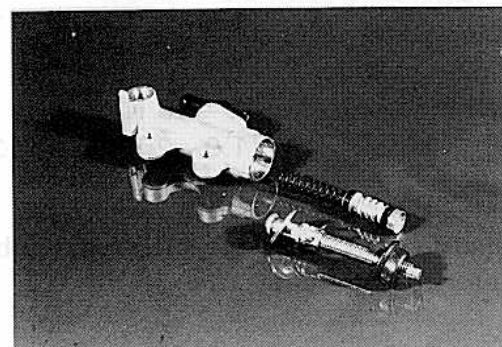


9. Pull out the dust seal then remove the circlip by using the special tool.

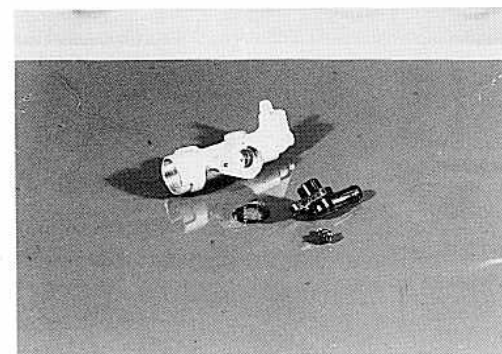
09900-06105: Snap ring pliers



10. Remove the push rod, piston/primary cup and spring.



11. Remove the connector and O-ring.



MASTER CYLINDER INSPECTION

CYLINDER, PISTON AND CUP SET

- 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.

MASTER CYLINDER REASSEMBLY AND REMOUNTING

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

CAUTION:

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

99000-23110: SUZUKI BRAKE FLUID DOT3 & DOT4

MASTER CYLINDER BOLTS

- Tighten each bolt to the specified torque.

Tightening torque

Brake hose

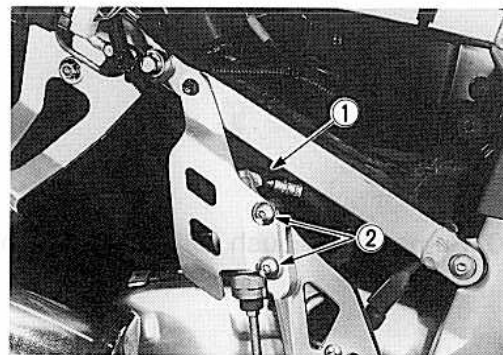
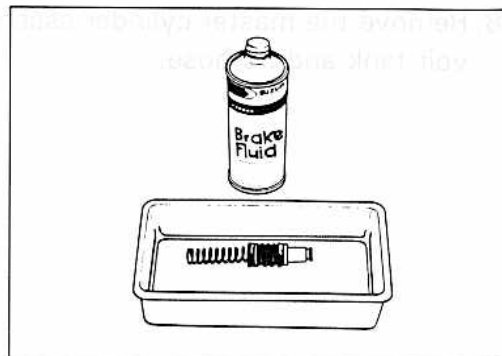
union bolt ①: 16–20 N·m
(1.6–2.0 kg-m, 11.5–14.5 lb-ft)

Master cylinder

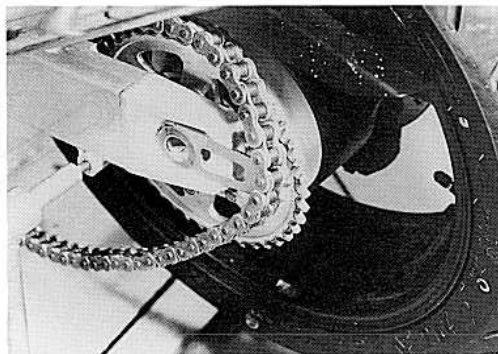
mounting bolt ②: 19–28 N·m
(1.9–2.8 kg-m, 13.5–20.0 lb-ft)

CAUTION:

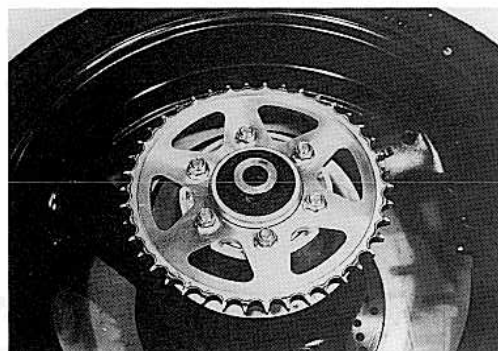
Bleed air from the system after reassembling master cylinder.
(Refer to page 2-16.)



5. Remove the drive chain from the rear sprocket, remove the rear wheel.



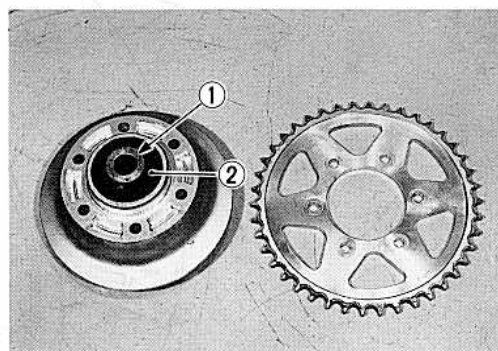
6. Draw out the rear sprocket mounting drum from the wheel.



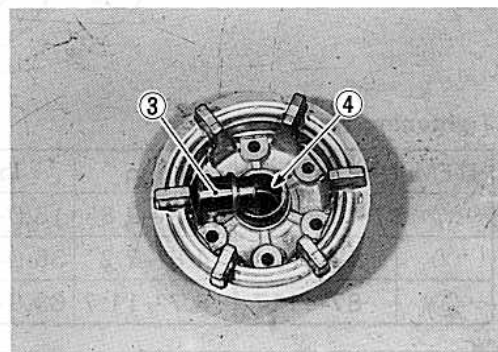
NOTE:

Slightly loosen the rear sprocket mounting nuts to facilitate later disassembly before separate the mounting drum.

7. Separate the rear sprocket mounting drum from the wheel.
8. Remove the spacer ① and oil seal ② .



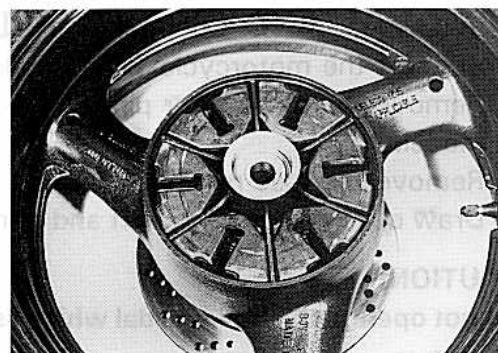
9. Remove the drum retainer ③ , draw out the sprocket mounting drum bearing ④ using an appropriate tool.



CAUTION:

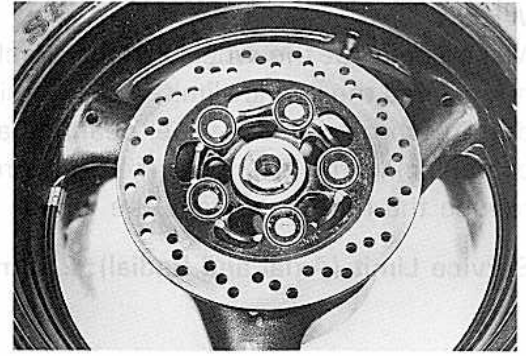
The bearing removed should be replaced with a new one.

10. Remove the six cushions.



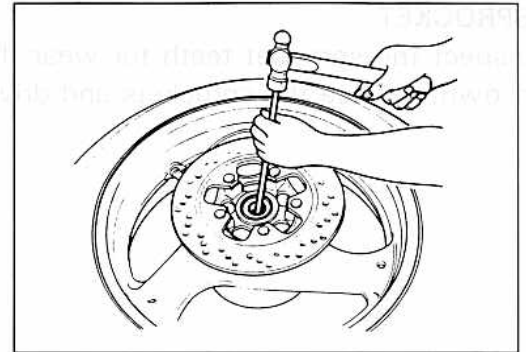
11. Separate the brake disc from the wheel by using the special tool.

09900-00410: Hexagon wrench set



12. Drive out the left and right wheel bearings with an appropriate steel bar.

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



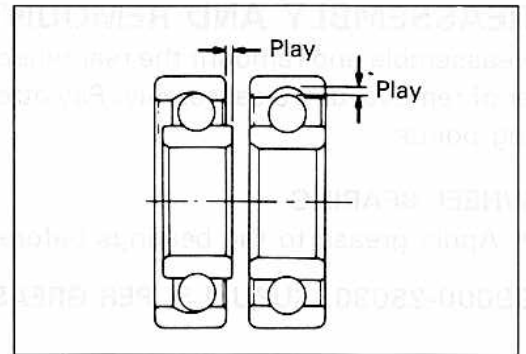
INSPECTION AND DISASSEMBLY

TIRE Refer to page 7-11.

WHEEL BEARINGS

Inspect the play of the wheel bearings by hand while they are 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.

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

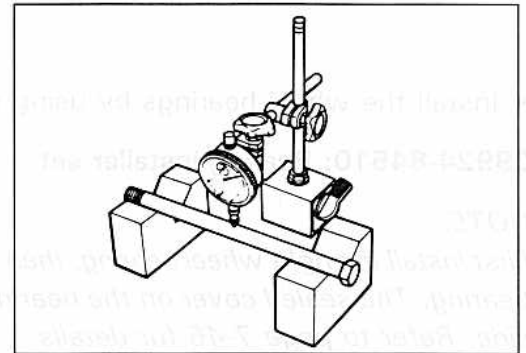


AXLE SHAFT

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

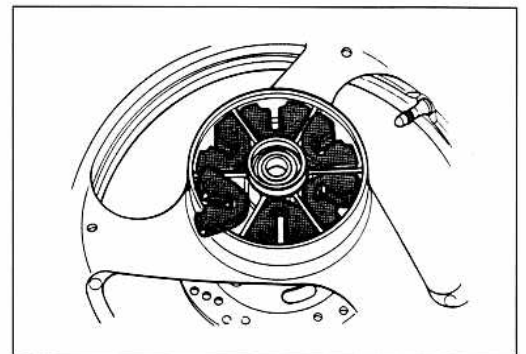
- 09900-20606: Dial gauge (1/100)
- 09900-20701: Magnetic stand
- 09900-21304: V-block set (100 mm)

Service Limit: 0.25 mm (0.010 in)



CUSHION

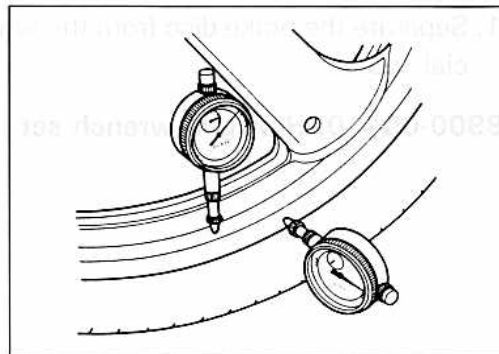
Inspect the cushion for wear and damage.



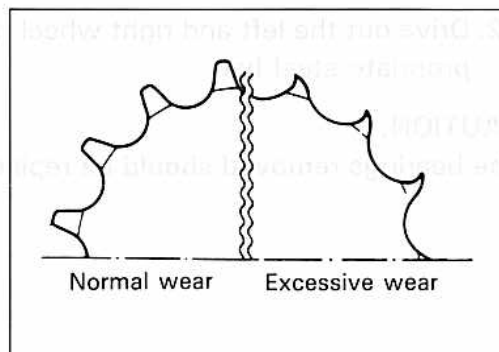
WHEEL

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

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

**SPROCKET**

Inspect the sprocket teeth for wear. If they are worn as shown, replace the sprockets and drive chain as a set.

**REASSEMBLY AND REMOUNTING**

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

WHEEL BEARING

- Apply grease to the bearings before installing.

99000-25030: SUZUKI SUPER GREASE "A"

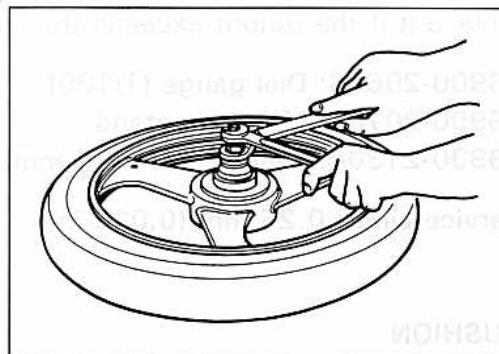


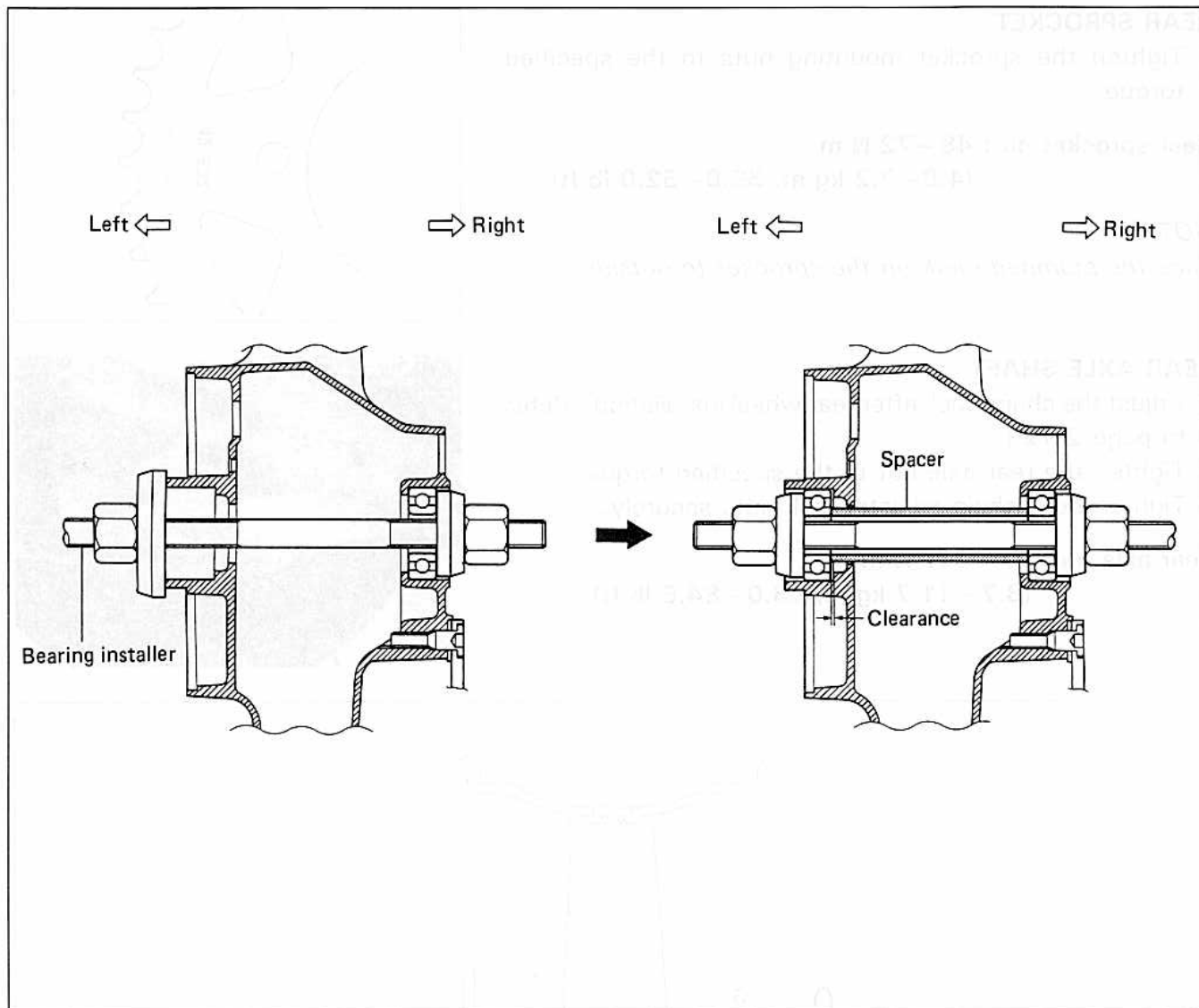
- Install the wheel bearings by using the special tool.

09924-84510: Bearing installer set

NOTE:

First install the right wheel bearing, then install the left wheel bearing. The sealed cover on the bearing is positioned outside. Refer to page 7-46 for details.





MOUNTING DRUM BEARING

- Install the bearing using the bearing installer.

09913-75520: Bearing installer

NOTE:

Apply grease to the bearing and oil seal lip before assembling rear wheel.

BRAKE DISC

- Place the shims between the disc and wheel hub when mounting the disc. (Refer to page 7-47.)
- Apply THREAD LOCK SUPER "1360" to the disc bolts and tighten them to the specified torque.

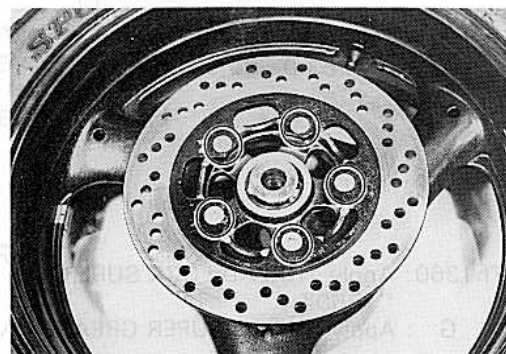
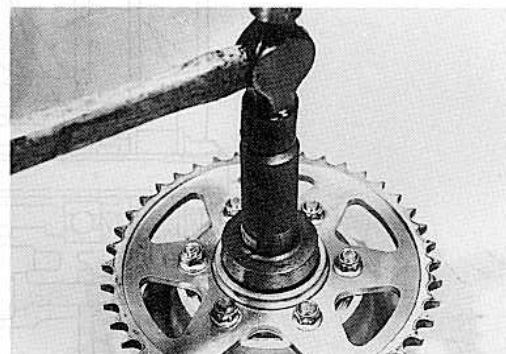
NOTE:

Make sure that the brake disc is clean and free of any greasy matter.

99000-32130: THREAD LOCK SUPER "1360"

Brake disc bolt: 18–28 N·m

(1.8–2.8 kg-m, 13.0–20.0 lb-ft)



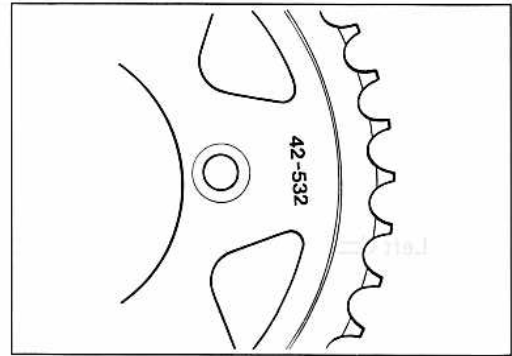
REAR SPROCKET

- Tighten the sprocket mounting nuts to the specified torque.

Rear sprocket nut: **48–72 N·m**
(4.8–7.2 kg-m, 35.0–52.0 lb-ft)

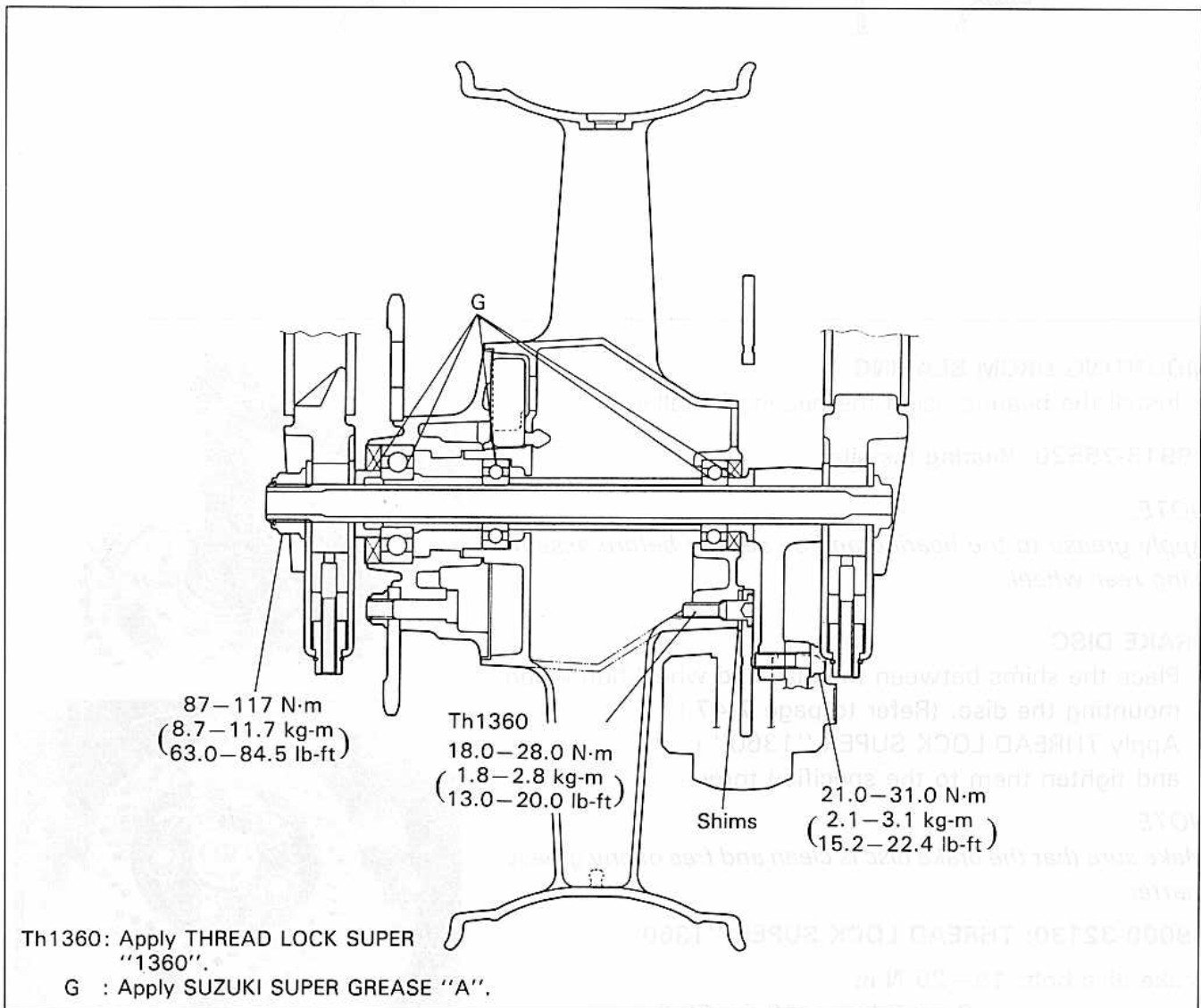
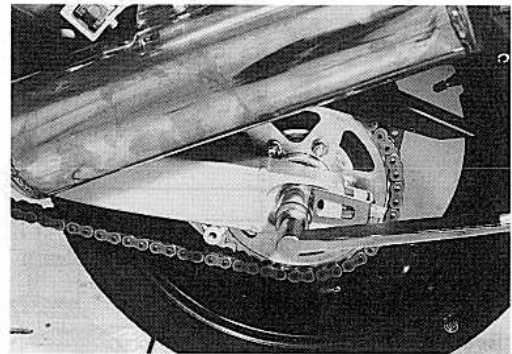
NOTE:

Face the stamped mark on the sprocket to outside.

**REAR AXLE SHAFT**

- Adjust the chain slack after rear wheel installation. (Refer to page 2-12.)
- Tighten the rear axle nut to the specified torque.
- Tighten both chain adjuster lock nuts securely.

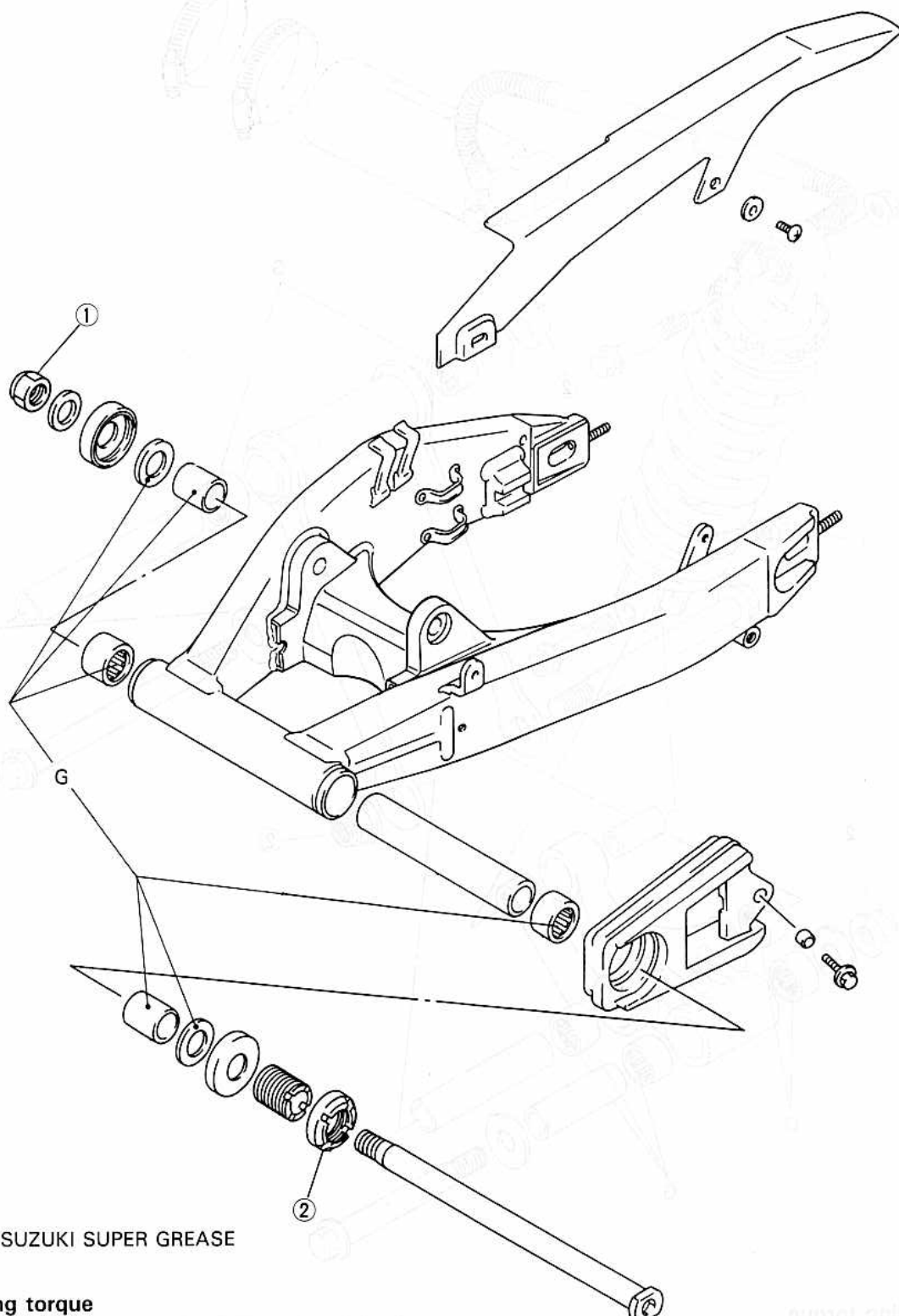
Rear axle nut: **87–117 N·m**
(8.7–11.7 kg-m, 63.0–84.5 lb-ft)



REAR SUSPENSION

SHOCK ABSORBER AND CUSHION LEVER

SWINGARM



G: Apply SUZUKI SUPER GREASE "A".

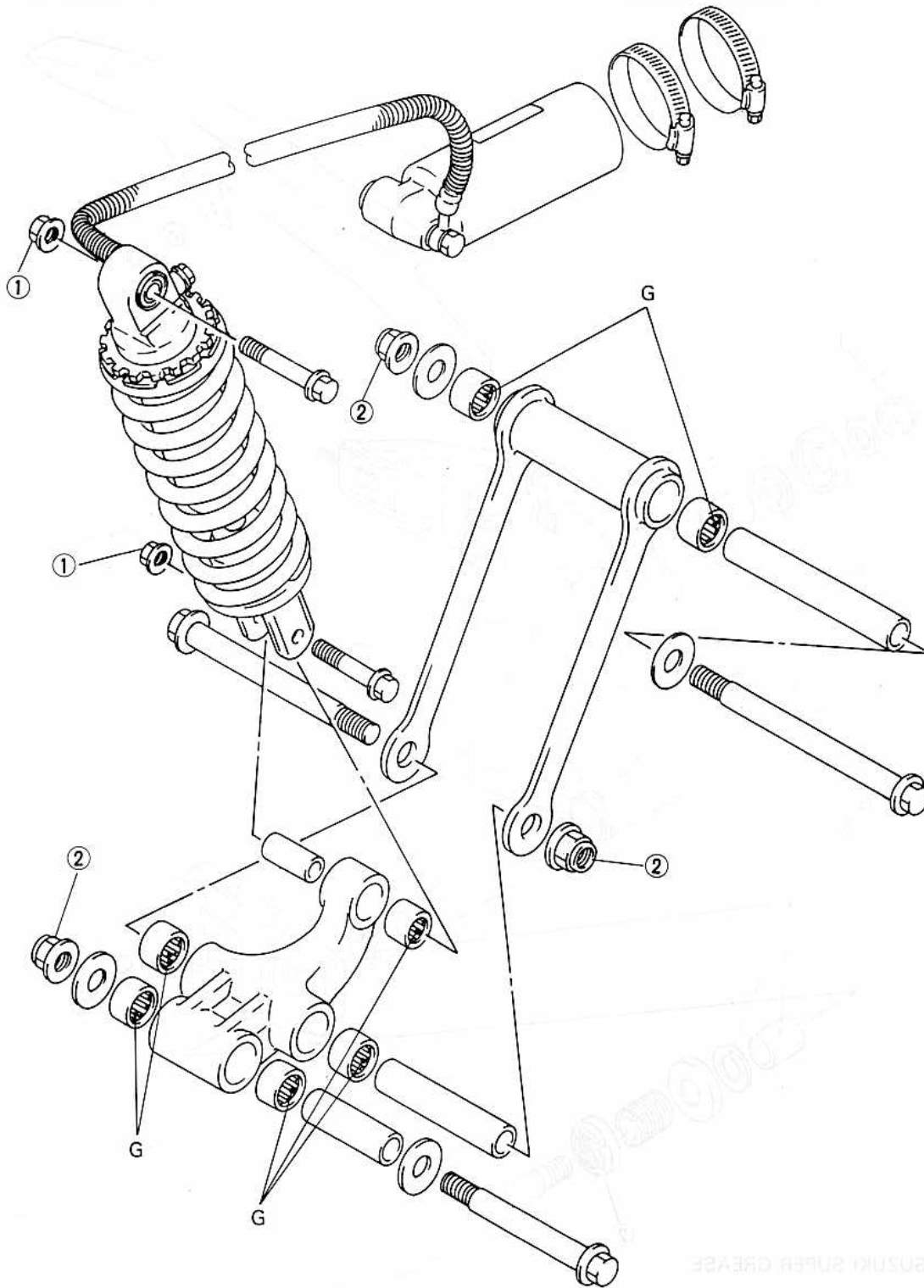
Tightening torque

ITEM	N·m	kg-m	lb-ft
①	87-117	8.7-11.7	63.0-84.5
②	60-70	6.0-7.0	43.5-50.5

Tightening torque

ITEM	N·m	kg-m	lb-ft
①	87-117	8.7-11.7	63.0-84.5
②	60-70	6.0-7.0	43.5-50.5

SHOCK ABSORBER AND CUSHION LEVER



Tightening torque

ITEM	N·m	kg-m	lb-ft
①	41-61	4.1-6.1	29.5-44.0
②	110-160	11.0-16.0	79.5-115.5

G: Apply SUZUKI SUPER GREASE "A".

REMOVAL

1. Remove the seats, lower cowling and frame cover assembly. (Refer to pages 7-2 and 3.)
2. Remove the rear wheel. (Refer to page 7-42.)
3. Remove the rear brake hose union bolt.

CAUTION:

Completely wipe off any brake fluid contacting any parts of the motorcycle. The fluid reacts chemically with paint, plastics, and rubber materials, etc.

4. Remove the brake hose from the brake hose guides at inside of swingarm.
5. Loosen the lock nut of the swingarm thrust adjuster by using the special tool.

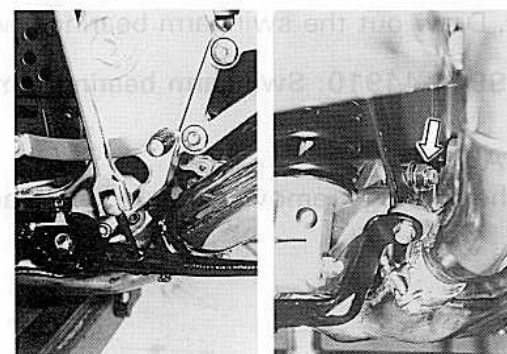
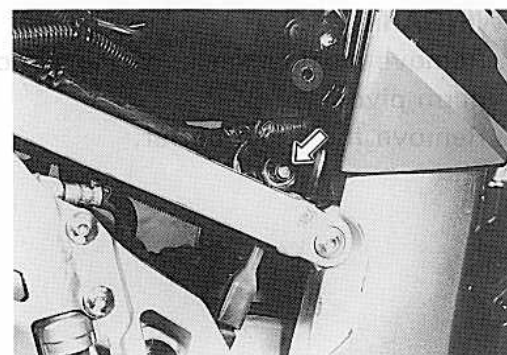
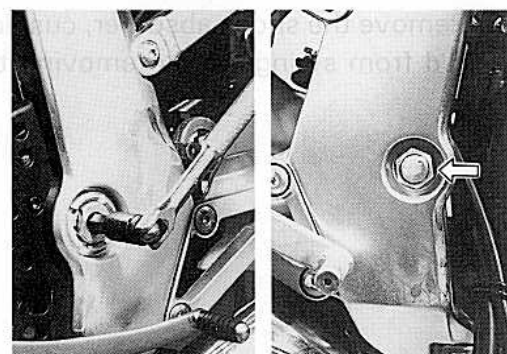
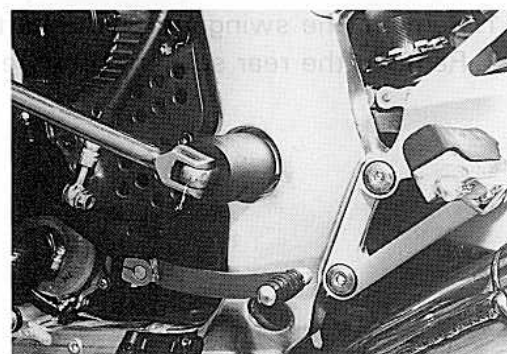
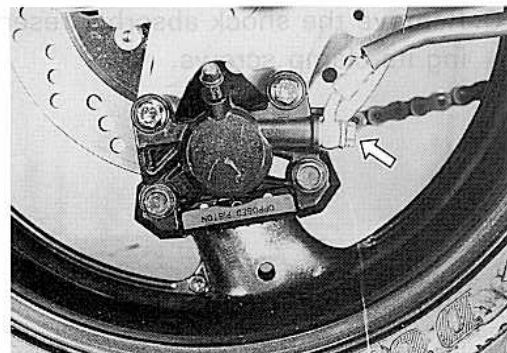
09940-14940: Adjuster lock nut wrench

6. Hold the swingarm pivot shaft with the hexagon wrench and remove the swingarm pivot nut.
7. Loosen the swingarm thrust adjuster.

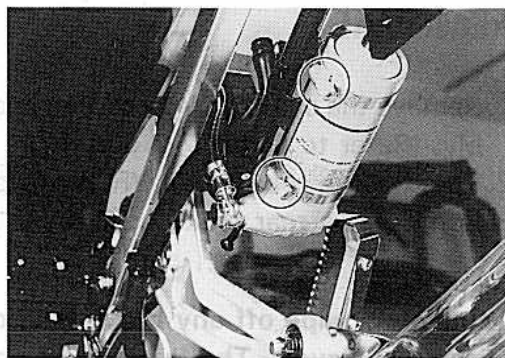
09940-14950: Adjuster turning wrench

8. Remove the shock absorber upper mounting bolt and nut.

9. Remove the cushion lever mounting bolt and nut.



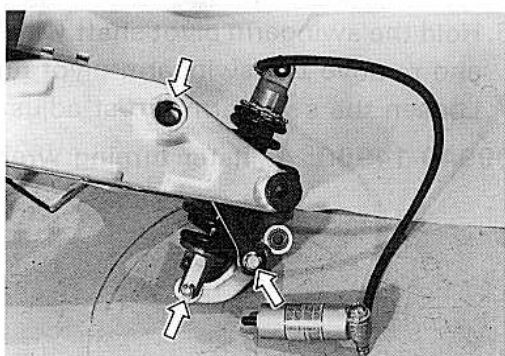
10. Remove the shock absorber reservoir tank by loosening its clamp screws.



11. Remove the swingarm pivot shaft.
12. Remove the rear suspension assembly.

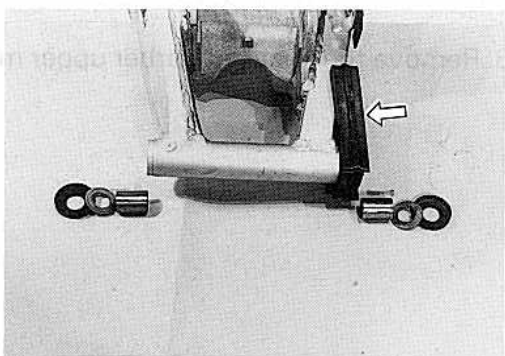


13. Remove the shock absorber, cushion lever and cushion rod from swingarm by removing the bolts and nuts.



SWINGARM

1. Remove the dust seals, washers and spacers from swingarm pivot.
2. Remove the chain buffer.

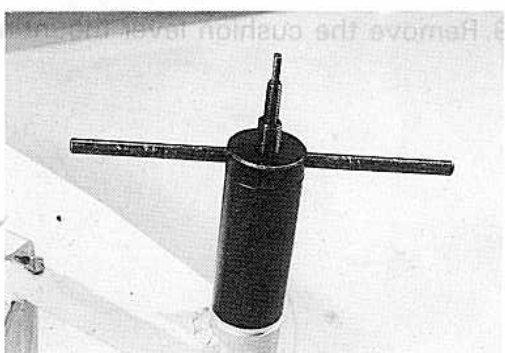


3. Draw out the swingarm bearings with the special tool.

09941-44910: Swingarm bearing remover

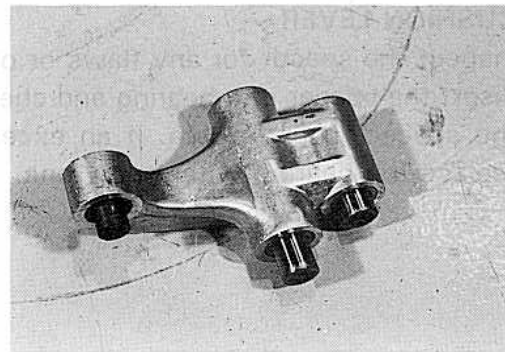
CAUTION:

The bearings removed should be replaced with new ones.

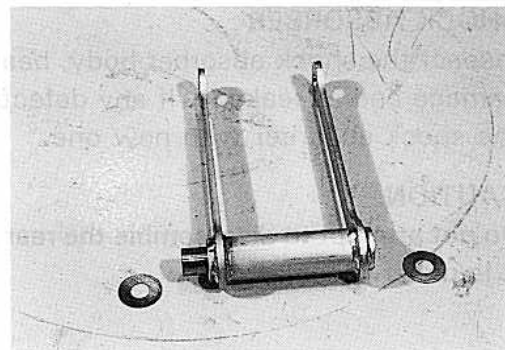


CUSHION LEVER AND ROD

1. Remove the cushion lever spacers.



2. Remove the cushion rod spacer and washers.



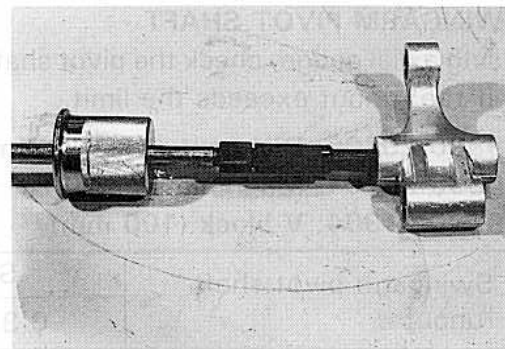
3. Draw out the bearing with the special tools.

09923-74510: Bearing puller (20–38 mm)

09930-30102: Sliding shaft

CAUTION:

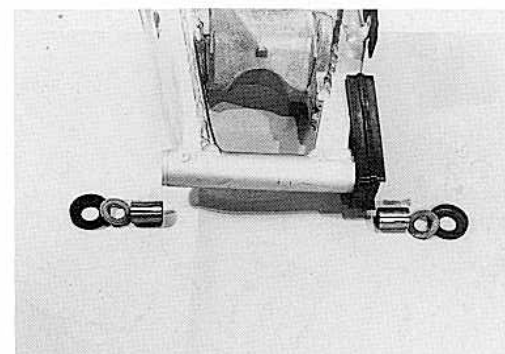
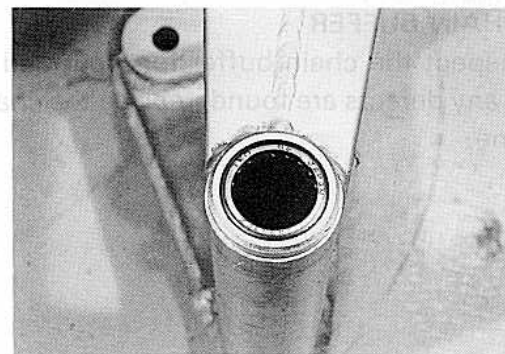
The bearings removed should be replaced with new ones.

**INSPECTION****SWINGARM**

Insert the spacer into bearing and check the play to move the spacer up and down.

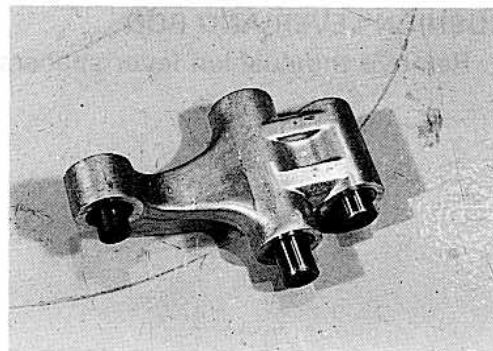
If excessive play is noted, replace the bearing with a new one.

Inspect the spacer for any flaws or other damage.



CUSHION LEVER

Inspect the spacer for any flaws or other damage. Insert the spacer into bearing and check the play to move the spacer up and down. If an excessive play is noted, replace the bearing with a new one.

**SHOCK ABSORBER**

Inspect the shock absorber body, bearing and oil hose for damage and oil leakage. If any defects are found, replace the shock absorber with new one.

CAUTION:

Do not attempt to disassemble the rear shock absorber unit. It is unserviceable.

**SWINGARM PIVOT SHAFT**

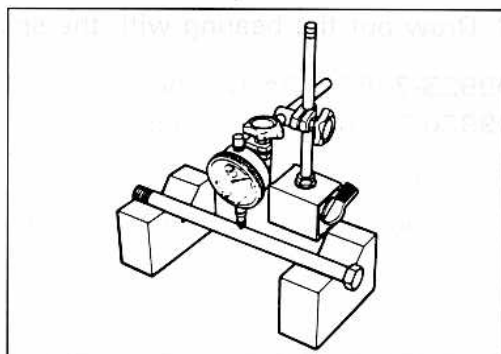
Using a dial gauge, check the pivot shaft runout and replace it if the runout exceeds the limit.

09900-20606: Dial gauge (1/100 mm, 10 mm)

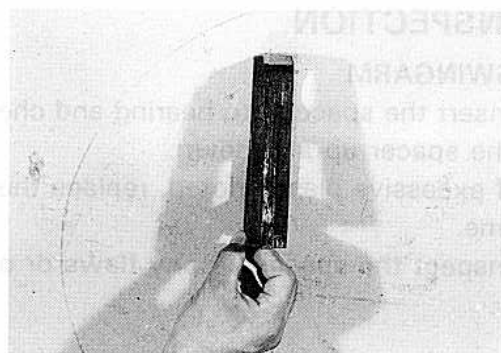
09900-20701: Magnetic stand

09900-21304: V-block (100 mm)

Swingarm pivot shaft runout	Service Limit
	0.3 mm (0.01 in)

**CHAIN BUFFER**

Inspect the chain buffer for wear and damage. If any defects are found, replace the chain buffer with a new one.



REASSEMBLY AND REMOUNTING

Reassemble and remount the swingarm and shock absorber in the reverse order of disassembly and removal, and also carry out the following steps:

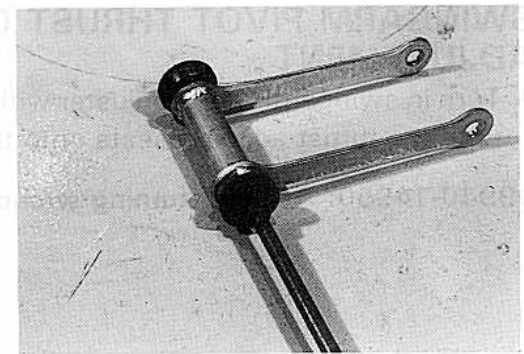
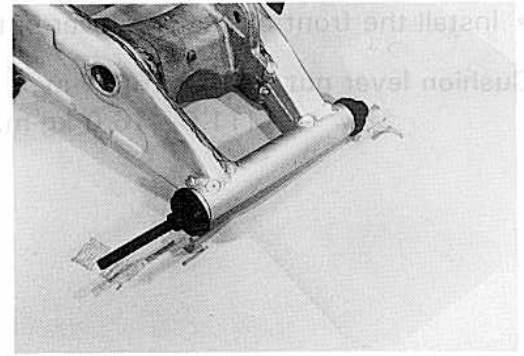
SWINGARM BEARING

- Press the bearing into the swingarm pivot by using the special tool.

09941-34513: Steering race installer

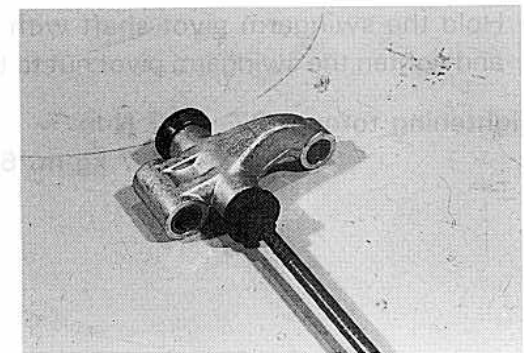
NOTE:

When installing the bearing, stamped mark of bearing is positioned outside.



- Apply grease to the spacers, bearings, washers and dust seals.

99000-25030: SUZUKI SUPER GREASE "A"



REASSEMBLY ONTO FRAME

- First of all assemble the shock absorber, cushion lever and cushion rods onto the swingarm.

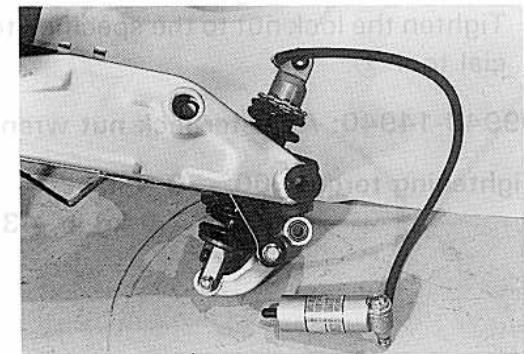
Rear shock absorber

mounting nut: 41–61 N·m

(4.1–6.1 kg-m, 29.5–44.0 lb-ft)

Cushion lever nut : 110–160 N·m

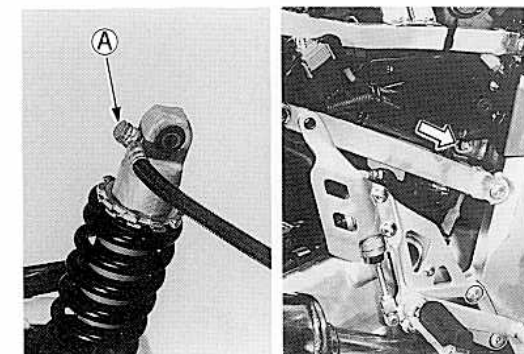
(11.0–16.0 kg-m, 79.5–115.5 lb-ft)



NOTE:

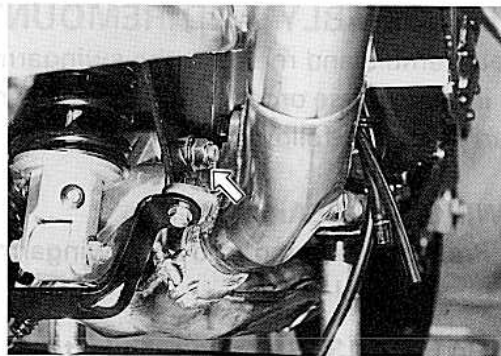
When installing the shock absorber, be sure to face the compression damping oil hose connector (A) to backward.

- Install the upper part of rear shock absorber onto the frame.



- Install the front of cushion lever onto the frame.

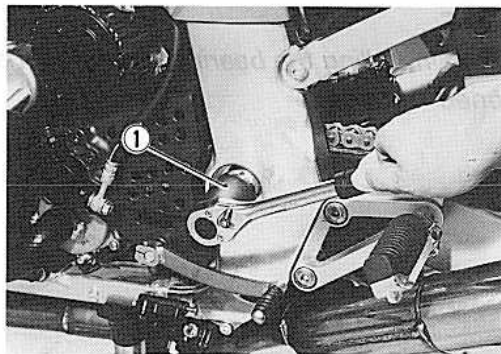
Cushion lever nut : 110–160 N·m
(11.0–16.0 kg-m, 79.5–115.5 lb-ft)



SWINGARM PIVOT THRUST CLEARANCE ADJUSTMENT

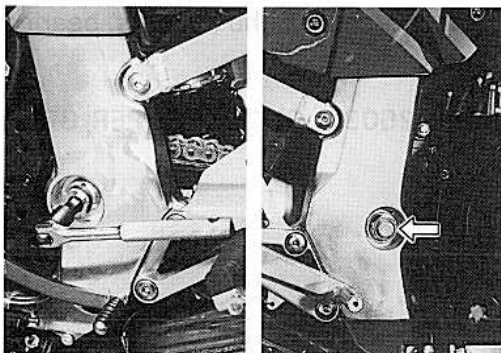
- Turn in swingarm thrust adjuster with the special tool ① until the thrust adjuster seats onto the dust seal cover.

09940-14950: Adjuster turning wrench ①



- Hold the swingarm pivot shaft with a hexagon wrench and tighten the swingarm pivot nut to the specified torque.

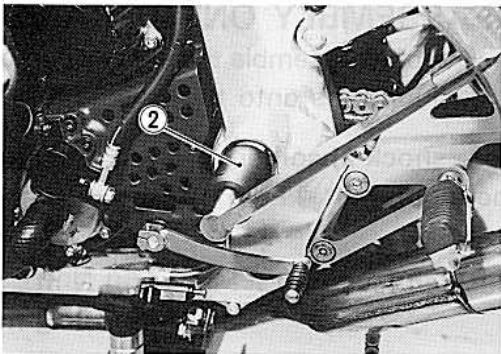
Tightening torque: 87–117 N·m
(8.7–11.7 kg-m, 63.0–84.5 lb-ft)

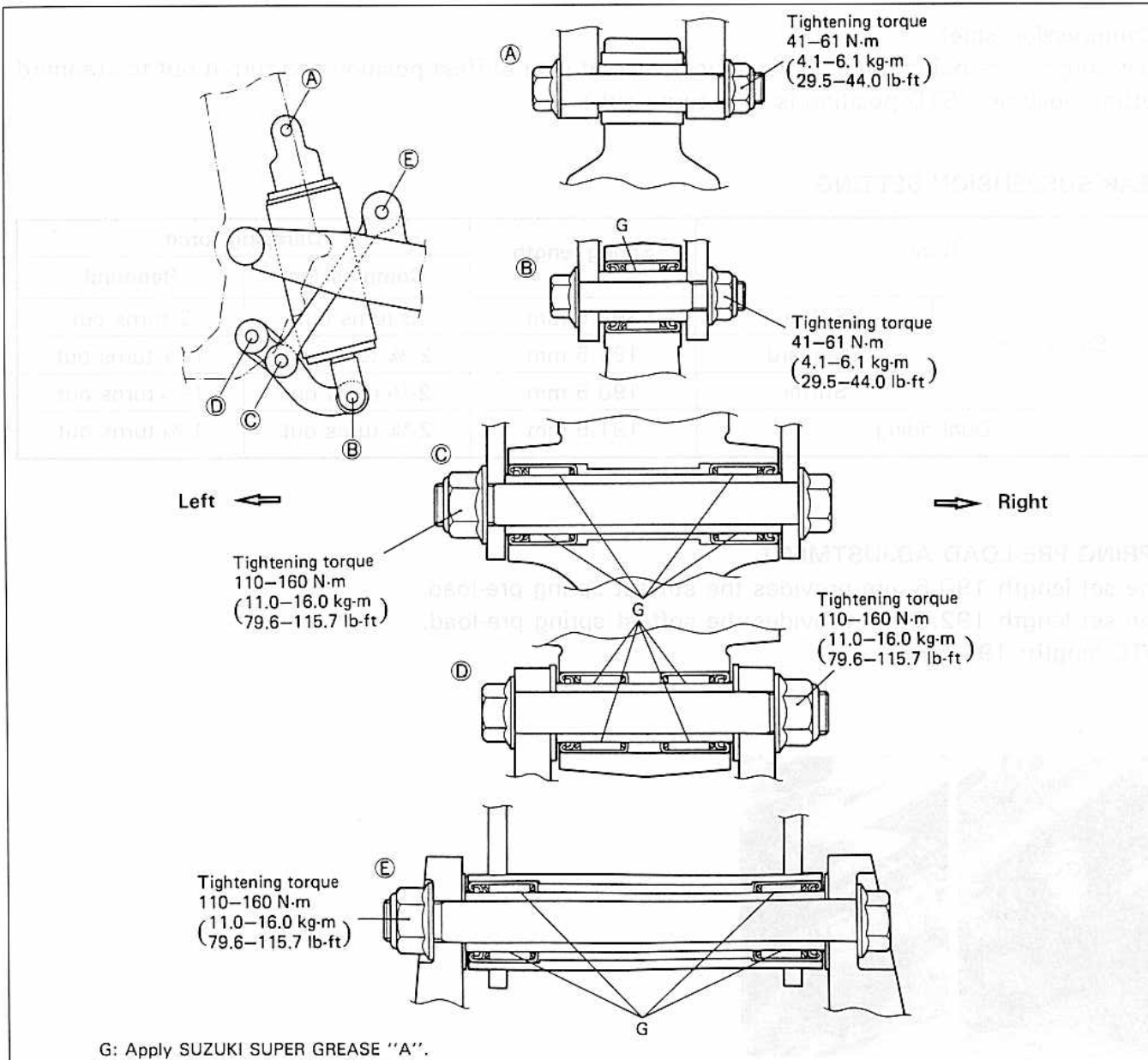
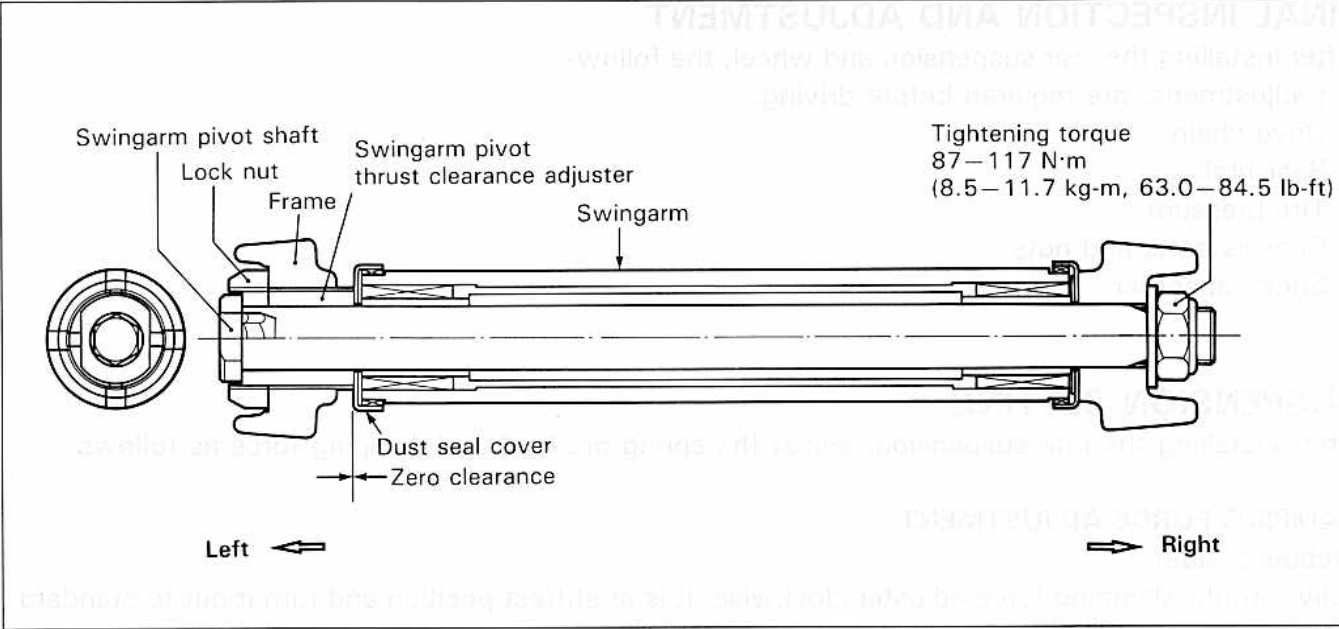


- Tighten the lock nut to the specified torque with the special tool ②.

09940-14940: Adjuster lock nut wrench ②

Tightening torque: 60–70 N·m
(6.0–7.0 kg-m, 43.5–49.0 lb-ft)





FINAL INSPECTION AND ADJUSTMENT

After installing the rear suspension and wheel, the following adjustments are required before driving.

- * Drive chain
- * Rear brake
- * Tire pressure
- * Chassis bolts and nuts
- * Shock absorber

SUSPENSION SETTING

After installing the rear suspension, adjust the spring pre-load and damping force as follows.

DAMPING FORCE ADJUSTMENT

(Rebound side)

Fully turn the damping force adjuster clockwise. It is at stiffest position and turn it out to standard setting position. (STD position is 1- $\frac{3}{4}$ turns out.)

(Compression side)

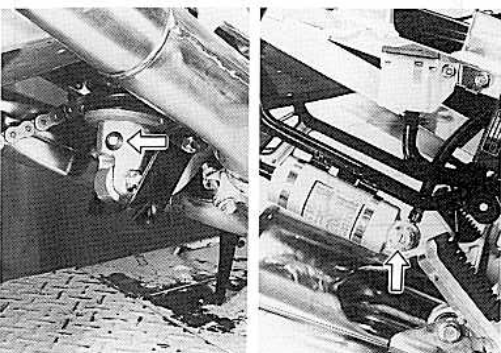
Fully turn the damping force adjuster clockwise. It is at stiffest position and turn it out to standard setting position. (STD position is 2- $\frac{3}{4}$ turns out.)

REAR SUSPENSION SETTING

Item		Spring length	Damping force	
			Compression	Rebound
Solo riding	Softer	192.5 mm	3 turns out	2 turns out
	Standard	191.5 mm	2- $\frac{3}{4}$ turns out	1- $\frac{3}{4}$ turns out
	Stiffer	190.5 mm	2- $\frac{2}{4}$ turns out	1- $\frac{2}{4}$ turns out
Dual riding		191.5 mm	2- $\frac{1}{4}$ turns out	1- $\frac{3}{4}$ turns out

SPRING PRE-LOAD ADJUSTMENT

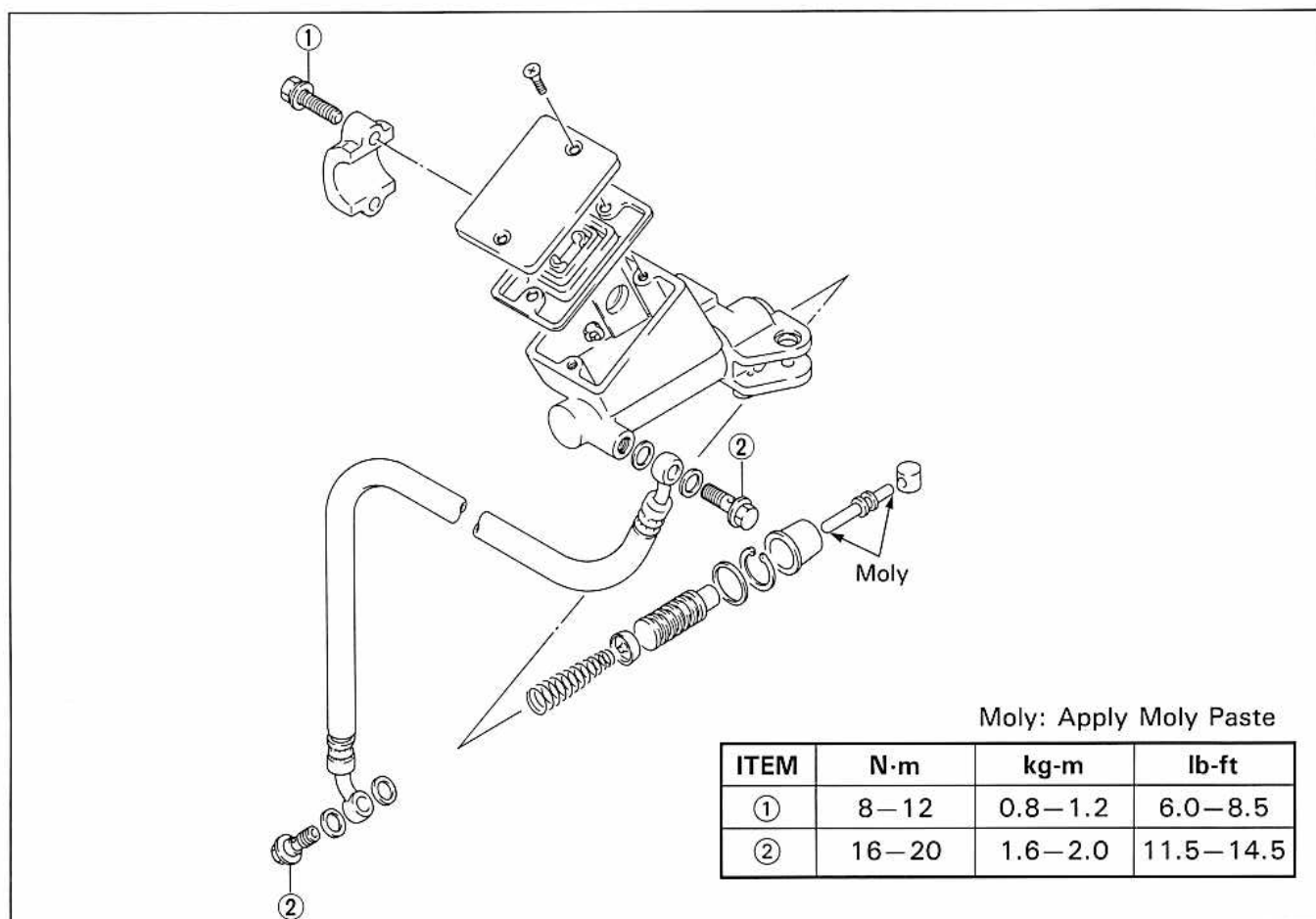
The set length 190.5 mm provides the stiffest spring pre-load.
The set length 192.5 mm provides the softest spring pre-load.
(STD length: 191.5 mm)



Rebound side

Compression side

CLUTCH MASTER CYLINDER



REMOVAL

1. Remove the clutch lever position switch. (For U.S.A. and CANADA models)
2. Place a rag underneath the union bolt on the master cylinder to catch any spilled drops of brake fluid. Unscrew the union bolt and disconnect the clutch hose from the master cylinder.

CAUTION:

Immediately and completely wipe off any brake fluid contacting any parts of the motorcycle. The fluid reacts chemically with paint, plastics and rubber materials, etc. and will damage them severely.

3. Remove the clutch master cylinder by removing its clamp bolts.

DISASSEMBLY, INSPECTION AND REASSEMBLY

Disassemble, inspect and reassemble the clutch master cylinder in the same manner of the front brake master cylinder.

(Refer to pages 7-20 and 21 for details.)



SERVICING INFORMATION

ENGINE

Complaint	Symptom and possible causes	Remedy
Engine will not start. Compression too low.	1. Out of adjustment 2. Worn valve guides 3. Excessively worn piston rings	1. Adjust 2. Replace 3. Replace
Engine stalls easily.	1. Fouled spark plugs 2. Defective signal generator or pickup coil 3. Clogged fuel hose 4. Clogged jets in carburetor 5. Out of adjustment valve clearance	1. Clean 2. Replace 3. Clean 4. Clean 5. Adjust
Noisy engine.	Excessive valve chatter 1. Too large valve clearance 2. Weakened or broken valve spring 3. Worn tappet or camshaft 4. Worn and burnt camshaft journal Noise seems to come from piston 1. Worn down pistons or cylinders 2. Fouled with carbon composition pistons 3. Worn piston pins or piston pin bore 4. Worn piston rings or ring grooves Noise seems to come from timing chain 1. Stretched chain 2. Worn sprockets 3. Not working tension adjuster Noise seems to come from clutch 1. Worn splines of countershaft or hub 2. Worn teeth of clutch plates 3. Distorted clutch plates, driver and drive 4. Worn clutch release bearing 5. Weakened clutch hampers	Adjust Replace Replace Replace Replace Replace Clean Replace Replace Replace Replace Replace Repair or replace Replace Replace Replace Replace Replace the pressure drive-in gear

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TROUBLESHOOTING

ENGINE

Complaint	Symptom and possible causes	Remedy
<p>Engine will not start, or is hard to start.</p>	<p>Compression too low</p> <ol style="list-style-type: none"> 1. Out of adjustment valve clearance. 2. Worn valve guides or poor seating of valves. 3. Mistiming valves. 4. Excessively worn piston rings. 5. Worn-down cylinder bores. 6. Too slowly starter motor cranks. 7. Poor seating of spark plugs. <p>Plugs not sparking</p> <ol style="list-style-type: none"> 1. Fouled spark plugs. 2. Wet spark plugs. 3. Defective ignition coil. 4. Open or short in high-tension cords. 5. Defective signal generator or ignitor unit. <p>No fuel reaching the carburetors</p> <ol style="list-style-type: none"> 1. Clogged fuel tank vent hose. 2. Clogged or defective fuel/cook. 3. Defective carburetor needle valve. 4. Clogged fuel hose or fuel filter. 	<p>Adjust. Repair or replace. Adjust. Replace. Replace or rebore. See electrical section. Retighten.</p> <p>Clean. Clean and dry. Replace. Replace. Replace.</p> <p>Clean or replace. Clean or replace. Replace. Clean or replace.</p>
<p>Engine stalls easily.</p>	<ol style="list-style-type: none"> 1. Fouled spark plugs. 2. Defective signal generator or ignitor unit. 3. Clogged fuel hose. 4. Clogged jets in carburetors. 5. Out of adjustment valve clearance. 	<p>Clean. Replace. Clean. Clean. Adjust.</p>
<p>Noisy engine.</p>	<p>Excessive valve chatter</p> <ol style="list-style-type: none"> 1. Too large valve clearance. 2. Weakened or broken valve springs. 3. Worn tappet or cam surface. 4. Worn and burnt camshaft journal. <p>Noise seems to come from piston</p> <ol style="list-style-type: none"> 1. Worn down pistons or cylinders. 2. Fouled with carbon combustion chambers. 3. Worn piston pins or piston pin bore. 4. Worn piston rings or ring grooves. <p>Noise seems to come from timing chain</p> <ol style="list-style-type: none"> 1. Stretched chain. 2. Worn sprockets. 3. Not working tension adjuster. <p>Noise seems to come from clutch</p> <ol style="list-style-type: none"> 1. Worn splines of countershaft or hub. 2. Worn teeth of clutch plates. 3. Distorted clutch plates, driven and drive. 4. Worn clutch release bearing. 5. Weakened clutch dampers. 	<p>Adjust. Replace. Replace. Replace.</p> <p>Replace. Clean. Replace. Replace.</p> <p>Replace. Replace. Repair or replace.</p> <p>Replace. Replace. Replace. Replace. Replace the primary driven gear.</p>

Complaint	Symptom and possible causes	Remedy
Noisy engine.	<p>Noise seems to come from crankshaft</p> <ol style="list-style-type: none"> 1. Due to wear rattling bearings. 2. Worn and burnt big-end bearings. 3. Worn and burnt journal bearings. 4. Too large thrust clearance. <p>Noise seems to come from transmission</p> <ol style="list-style-type: none"> 1. Worn or rubbing gears. 2. Badly worn splines. 3. Worn or rubbing primary gears. 4. Badly worn bearings. <p>Noise seems to come from water pump</p> <ol style="list-style-type: none"> 1. Too much play on pump shaft bearing. 2. Worn or damaged mechanical seal. 3. Touches pump case and impeller. 	<p>Replace. Replace. Replace. Replace thrust bearing.</p> <p>Replace. Replace. Replace. Replace.</p> <p>Replace. Replace. Replace.</p>
Slipping clutch.	<ol style="list-style-type: none"> 1. Out of adjustment or loss of play clutch control. 2. Weakened clutch springs. 3. Worn or distorted pressure plate. 4. Distorted clutch plates, driven and drive. 	<p>Adjust. Replace. Replace. Replace.</p>
Dragging clutch.	<ol style="list-style-type: none"> 1. Out of adjustment or too much play clutch control. 2. Some clutch springs weakened. 3. Distorted pressure plate or clutch plate. 	<p>Adjust. Replace. Replace.</p>
Transmission will not shift.	<ol style="list-style-type: none"> 1. Broken gearshift cam. 2. Distorted gearshift forks. 3. Worn gearshift pawl. 	<p>Replace. Replace. Replace.</p>
Transmission will not shift back.	<ol style="list-style-type: none"> 1. Broken return spring on shift shaft. 2. Rubbing or stickly shift shaft. 3. Distorted or worn gearshift forks. 	<p>Replace. Repair or replace. Replace.</p>
Transmission jumps out of gear.	<ol style="list-style-type: none"> 1. Worn shifting gears on driveshaft or countershaft. 2. Distorted or worn gearshift forks. 3. Weakened stopper spring on gearshift stopper. 4. Worn gearshift pawl. 	<p>Replace. Replace. Replace. Replace.</p>
Engine idles poorly.	<ol style="list-style-type: none"> 1. Out of adjustment valve clearance. 2. Poor seating of valves. 3. Defective valve guides. 4. Worn tappet or cam surface. 5. Too wide spark plug gaps. 6. Defective ignition coil. 7. Defective signal generator or ignitor unit. 8. Out of adjustment in carburetors float-chamber fuel level. 9. Clogged jets or imbalance of carburetors. 	<p>Adjust. Replace or repair. Replace. Replace. Adjust or replace. Replace. Replace. Adjust. Clean or adjust.</p>

ELECTRICAL

Complaint	Symptom and possible causes	Remedy
No sparking or poor sparking.	<ol style="list-style-type: none"> 1. Defective ignition coil. 2. Defective spark plugs. 3. Defective signal generator or ignitor unit. 	Replace. Replace. Replace.
Spark plug soon become fouled with carbon.	<ol style="list-style-type: none"> 1. Mixture too rich. 2. Idling speed set to high. 3. Incorrect gasoline. 4. Dirty element in air cleaner. 5. Too cold spark plugs. 	Adjust carburetors. Adjust carburetors. Change. Clean. Replace with hot type plugs.
Spark plugs become fouled too soon.	<ol style="list-style-type: none"> 1. Worn piston rings. 2. Worn piston or cylinders. 3. Excessive clearance of valve stems in valve guides. 4. Worn stem oil seal. 	Replace. Replace. Replace. Replace.
Spark plug electrodes overheat or burn.	<ol style="list-style-type: none"> 1. Too hot spark plugs. 2. Overheated the engine. 3. Loose spark plugs. 4. Too lean mixture. 	Replace with cold type plugs. Tune up. Retighten. Adjust carburetors.
Generator does not charge.	<ol style="list-style-type: none"> 1. Open or short lead wires, or loose lead connections. 2. Shorted, grounded or open generator coils. 3. Shorted or punctured regulator/rectifiers. 	Repair or replace or retighten. Replace. Replace.
Generator does charge, but charging rate is below the specification.	<ol style="list-style-type: none"> 1. Lead wires tend to get shorted or open-circuited or loosely connected at terminals. 2. Grounded or open-circuited stator coils or generator. 3. Defective regulator/rectifier. 4. Not enough electrolyte in the battery. 5. Defective cell plates in the battery. 	Repair or retighten. Replace. Replace. Add distilled water to the upper level. Replace the battery.
Generator overcharges.	<ol style="list-style-type: none"> 1. Internal short-circuit in the battery. 2. Damaged or defective resistor element in the regulator/rectifier. 3. Poorly grounded regulator/rectifier. 	Replace the battery. Replace. Clean and tighten ground connection.
Unstable charging.	<ol style="list-style-type: none"> 1. Lead wire insulation frayed due to vibration, resulting in intermittent shorting. 2. Internally shorted generator. 3. Defective regulator/rectifier. 	Repair or replace. Replace. Replace.
Starter button is not effective.	<ol style="list-style-type: none"> 1. Run down battery. 2. Defective switch contacts. 3. Not seating properly brushes on commutator in starter motor. 4. Defective starter relay/starter interlock switch. 	Repair or replace. Replace. Repair or replace. Replace.

BATTERY

Complaint	Symptom and possible causes	Remedy
“Sulfation”, acidic white powdery substance or spots on surfaces of cell plates.	<ol style="list-style-type: none"> 1. Cracked battery case. 2. Battery has been left in a run-down condition for a long time. 	<p>Replace the battery.</p> <p>Replace the battery.</p>
Battery runs down quickly.	<ol style="list-style-type: none"> 1. Not correct the charging system. 2. Cell plates have lost much of their active material as a result of overcharging. 3. A short-circuit condition exists within the battery. 4. Too low battery voltage. 5. Too old battery. 	<p>Check the generator, regulator/rectifier and circuit connections and make necessary adjustments to obtain specified charging operation.</p> <p>Replace the battery, and correct the charging system.</p> <p>Replace the battery.</p> <p>Recharge the battery fully.</p> <p>Replace the battery.</p>
Battery “sulfation”.	<ol style="list-style-type: none"> 1. Too low or too high charging rate. (When not in use batteries should be recharged at least once a month to avoid sulfation.) 2. Left unused the battery for too long in cold climate. 	<p>Replace the battery.</p> <p>Replace the battery, if badly sulfated.</p>
Battery discharges too rapidly.	Dirty container top and sides.	Clean.

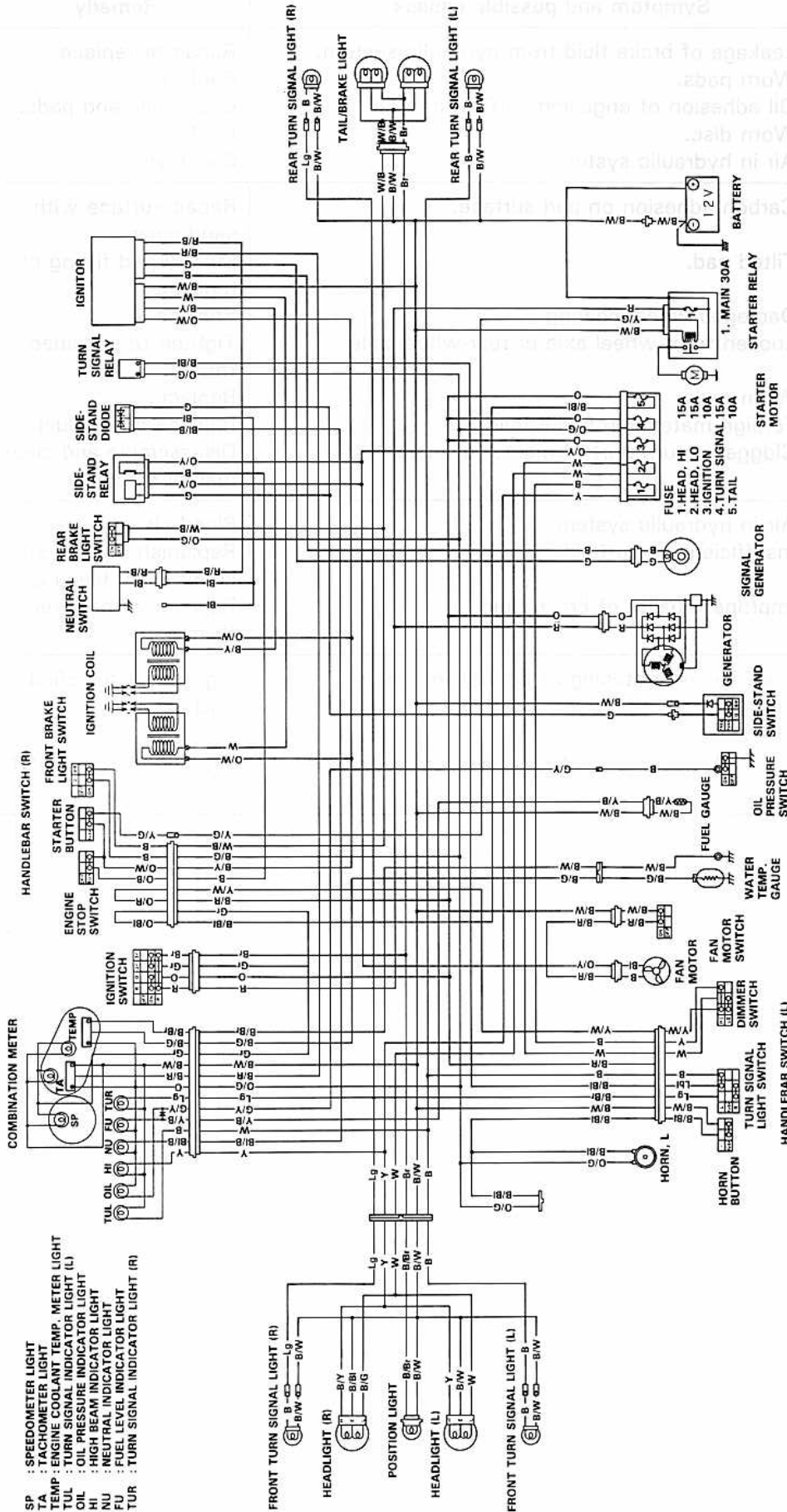
CHASSIS

Complaint	Symptom and possible causes	Remedy
Heavy steering.	<ol style="list-style-type: none"> 1. Overtightened steering stem nut. 2. Broken bearing in steering stem. 3. Distorted steering stem. 4. Not enough pressure in tires. 	Adjust. Replace. Replace. Adjust.
Wobbly handlebars.	<ol style="list-style-type: none"> 1. Loss of balance between right and left front forks. 2. Distorted front fork. 3. Distorted front axle or crooked tire. 	Replace. Repair or replace. Replace.
Wobby front wheel.	<ol style="list-style-type: none"> 1. Distorted wheel rim. 2. Worn front wheel bearings. 3. Defective or incorrect tire. 4. Loose axle. 5. Incorrect front fork oil. 	Replace. Replace. Replace. Retighten. Adjust.
Front suspension too soft.	<ol style="list-style-type: none"> 1. Weakened springs. 2. Not enough fork oil. 	Replace. Replenish.
Front suspension too stiff.	<ol style="list-style-type: none"> 1. Too viscous fork oil. 2. Too much fork oil. 	Replace. Drain excess oil.
Noisy front suspension.	<ol style="list-style-type: none"> 1. Not enough fork oil. 2. Loose bolts on suspension. 	Replenish. Retighten.
Wobbly rear wheel.	<ol style="list-style-type: none"> 1. Distorted wheel rim. 2. Worn rear wheel bearing or swingarm bearings. 3. Defective or incorrect tire. 4. Worn swingarm and rear cushion related bearings. 5. Loose nuts or bolts on rear suspensions. 	Replace. Replace. Replace. Replace. Retighten.
Rear suspension too soft.	<ol style="list-style-type: none"> 1. Weakened shock absorber spring. 2. Improperly set rear suspension adjuster. 3. Leakage oil of shock absorber. 4. Leakage gas of shock absorber. 	Replace. Adjust. Replace. Replace.
Rear suspension too stiff.	<ol style="list-style-type: none"> 1. Improperly set rear suspension adjuster. 2. Bent shock absorber shaft. 3. Bent swingarm. 4. Worn swingarm and rear cushion related bearings. 	Adjust. Replace. Replace. Replace.
Noisy rear suspension.	<ol style="list-style-type: none"> 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.	<ol style="list-style-type: none"> 1. Leakage of brake fluid from hydraulic system. 2. Worn pads. 3. Oil adhesion of 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.	<ol style="list-style-type: none"> 1. Carbon adhesion on pad surface. 2. Tilted pad. 3. Damaged wheel bearing. 4. Loosen 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 or replace. Replace. Tighten to specified torque. Replace. Replace brake fluid. Disassemble and clean master cylinder.
Excessive brake lever stroke.	<ol style="list-style-type: none"> 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.	<ol style="list-style-type: none"> 1. Insufficient tightening of connection joints. 2. Cracked hose. 3. Worn piston and/or cup. 	Tighten to specified torque. Replace. Replace piston and/or cup.

WIRING DIAGRAM

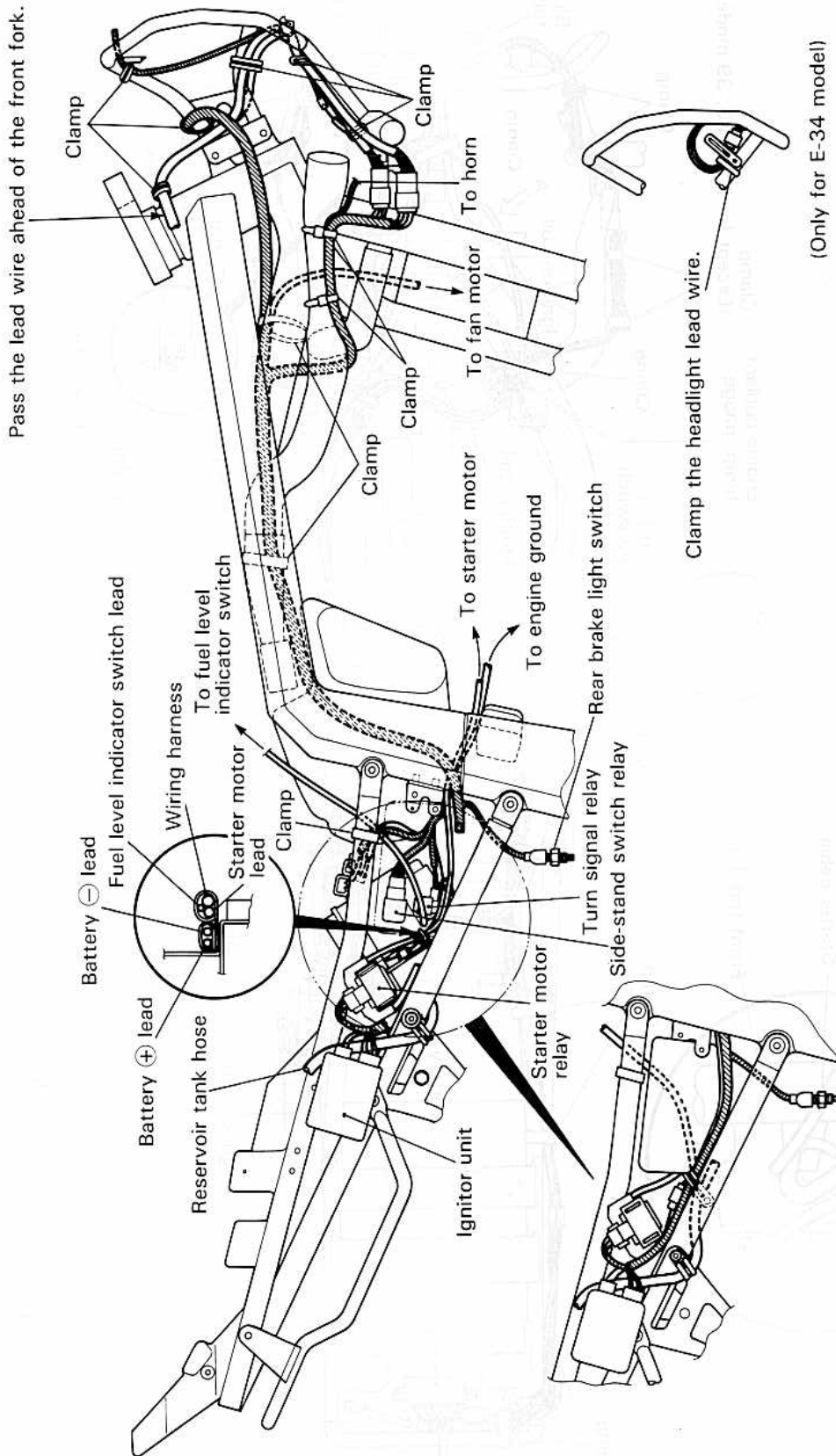


WIRE COLOR

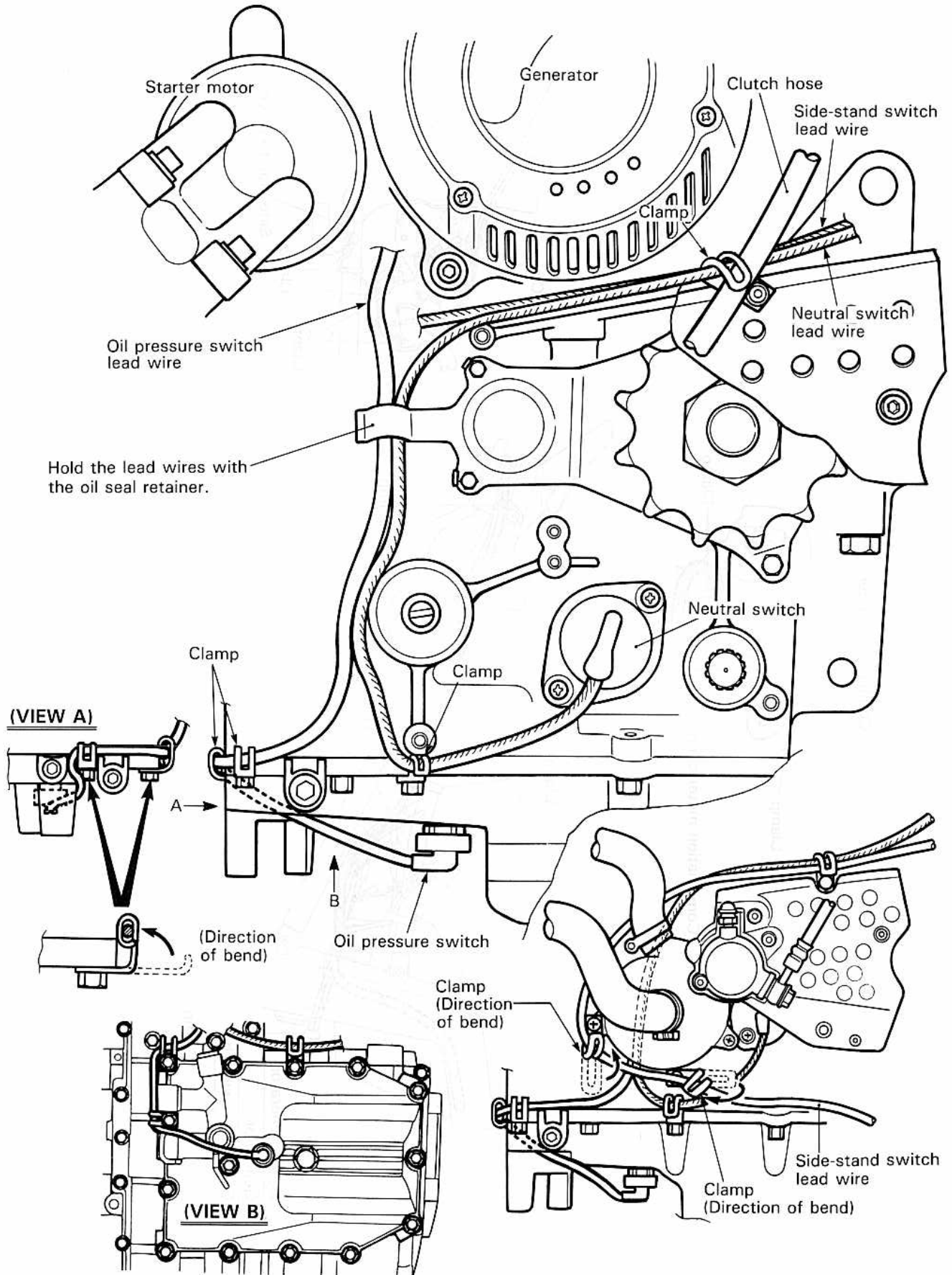
- B : Black
- Bl : Blue
- Br : Brown
- G : Green
- Gr : Gray
- Lbl : Light blue
- Lg : Light green
- O : Orange
- R : Red
- W : White
- Y : Yellow
- B/Bl : Black with Blue tracer
- B/Br : Black with Brown tracer
- B/G : Black with Green tracer
- B/R : Black with Red tracer
- B/W : Black with White tracer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

- SP : SPEEDOMETER LIGHT
- TA : TACHOMETER LIGHT
- TEMP : ENGINE COOLANT TEMP. METER LIGHT
- TUL : TURN SIGNAL INDICATOR LIGHT (L)
- OIL : OIL PRESSURE INDICATOR LIGHT
- HI : HIGH BEAM INDICATOR LIGHT
- NU : NEUTRAL INDICATOR LIGHT
- FU : FUEL LEVEL INDICATOR LIGHT
- TUR : TURN SIGNAL INDICATOR LIGHT (R)

WIRE HARNESS ROUTING

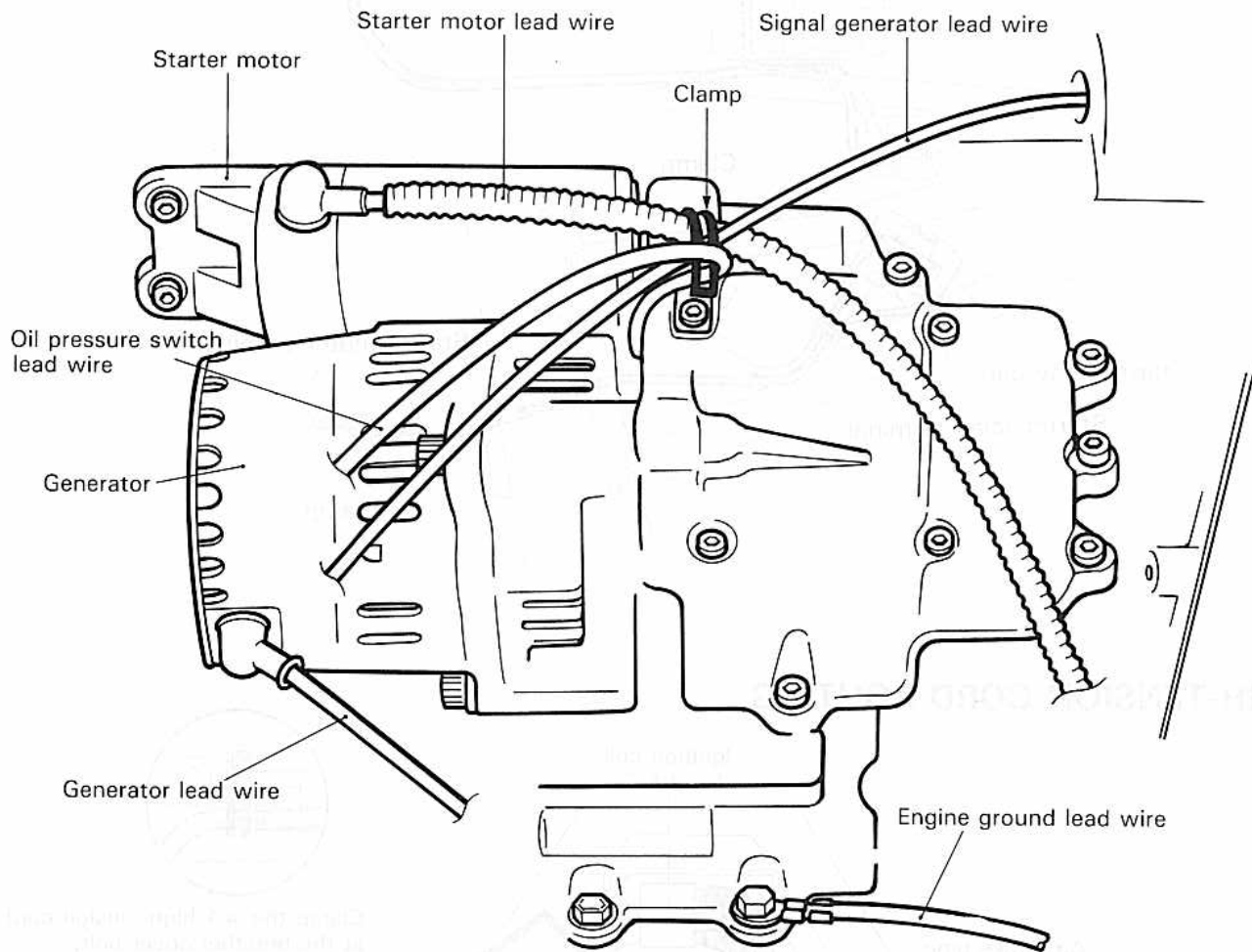


WIRE ROUTING

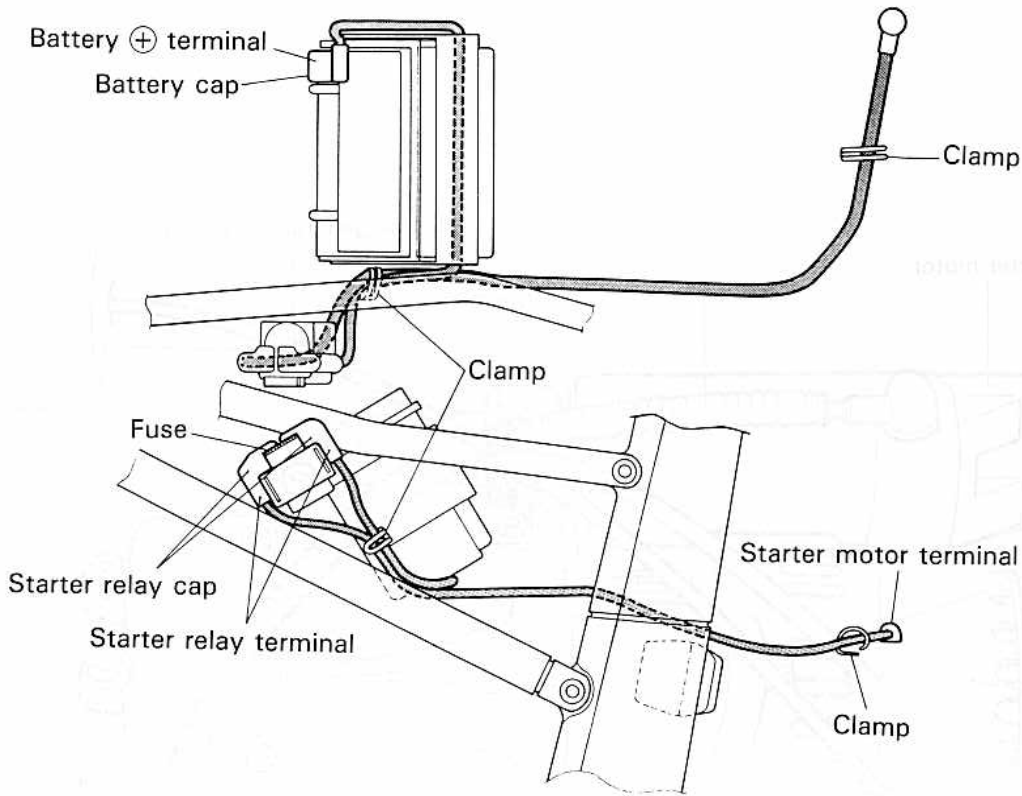


WIRE ROUTING

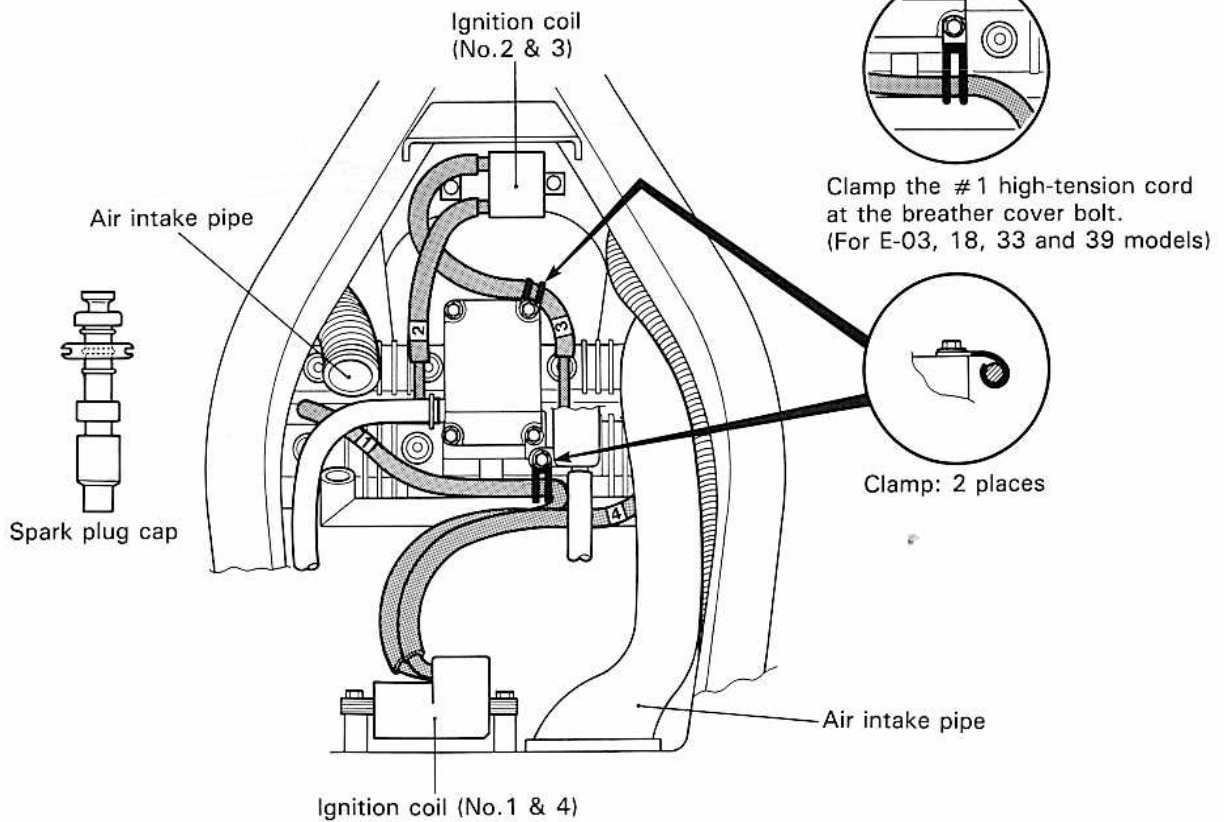
WIRE ROUTING



WIRE ROUTING

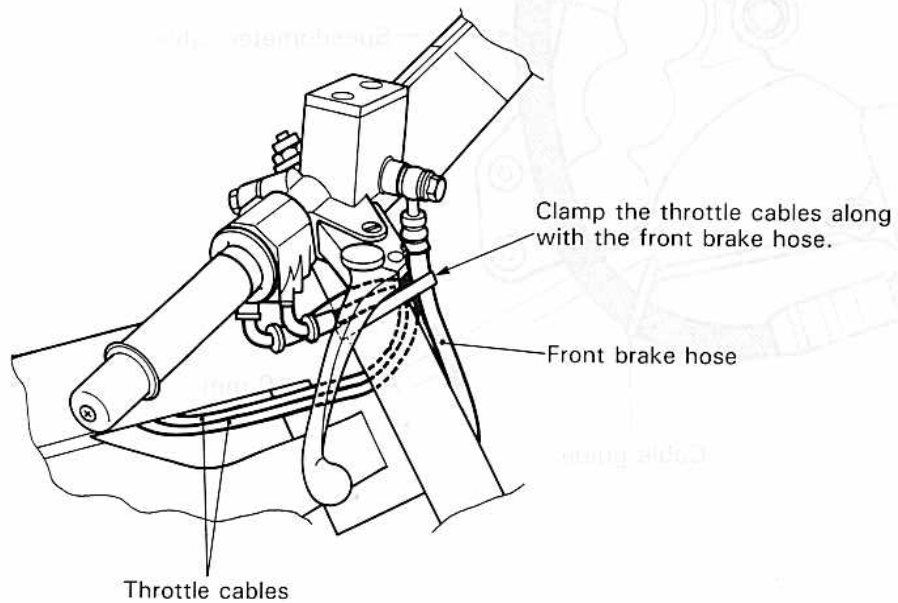
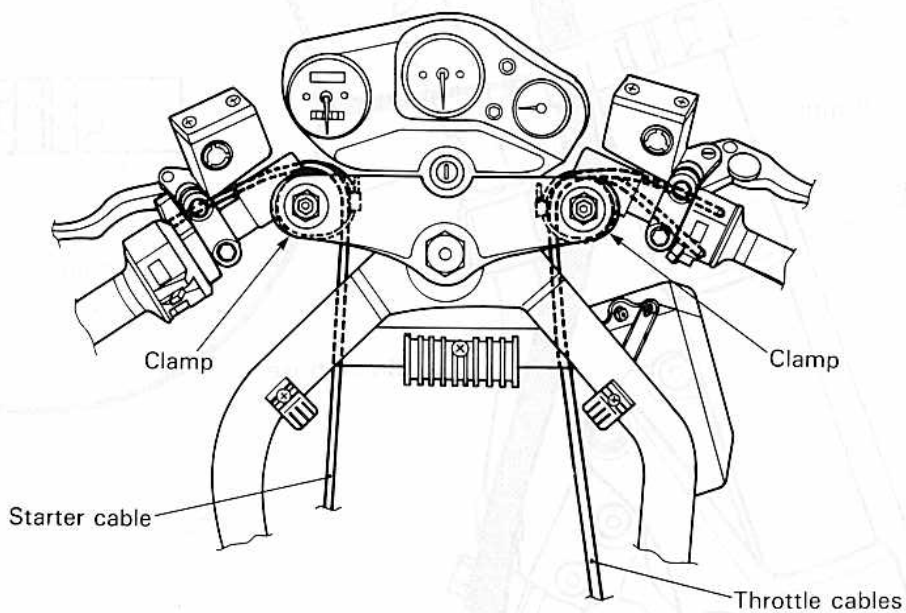
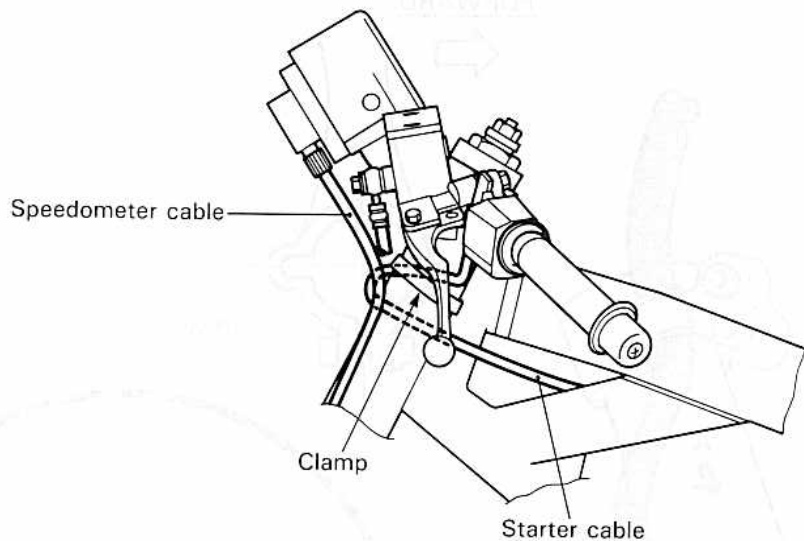


HIGH-TENSION CORD ROUTING



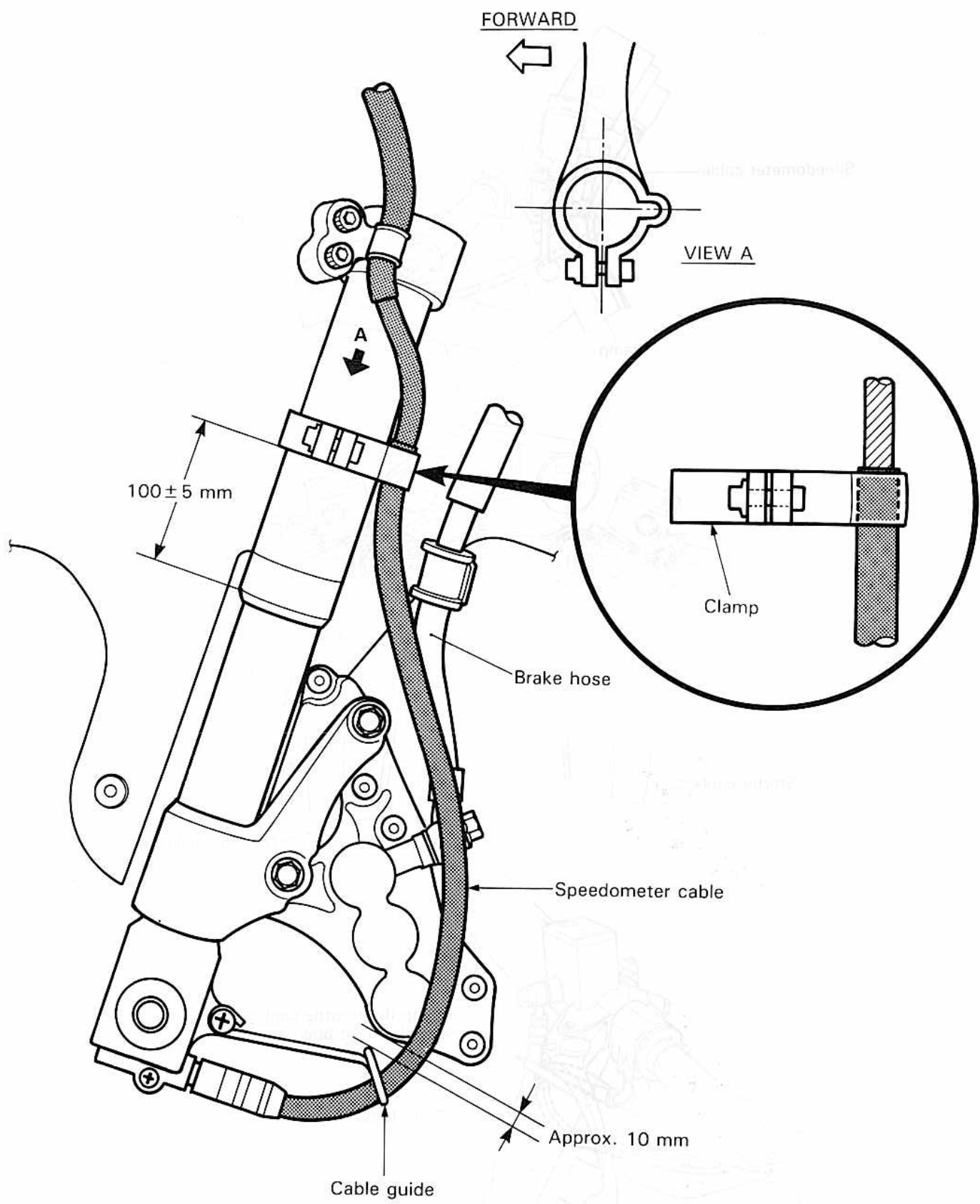
CABLE ROUTING

SPEEDOMETER CABLE ROUTING



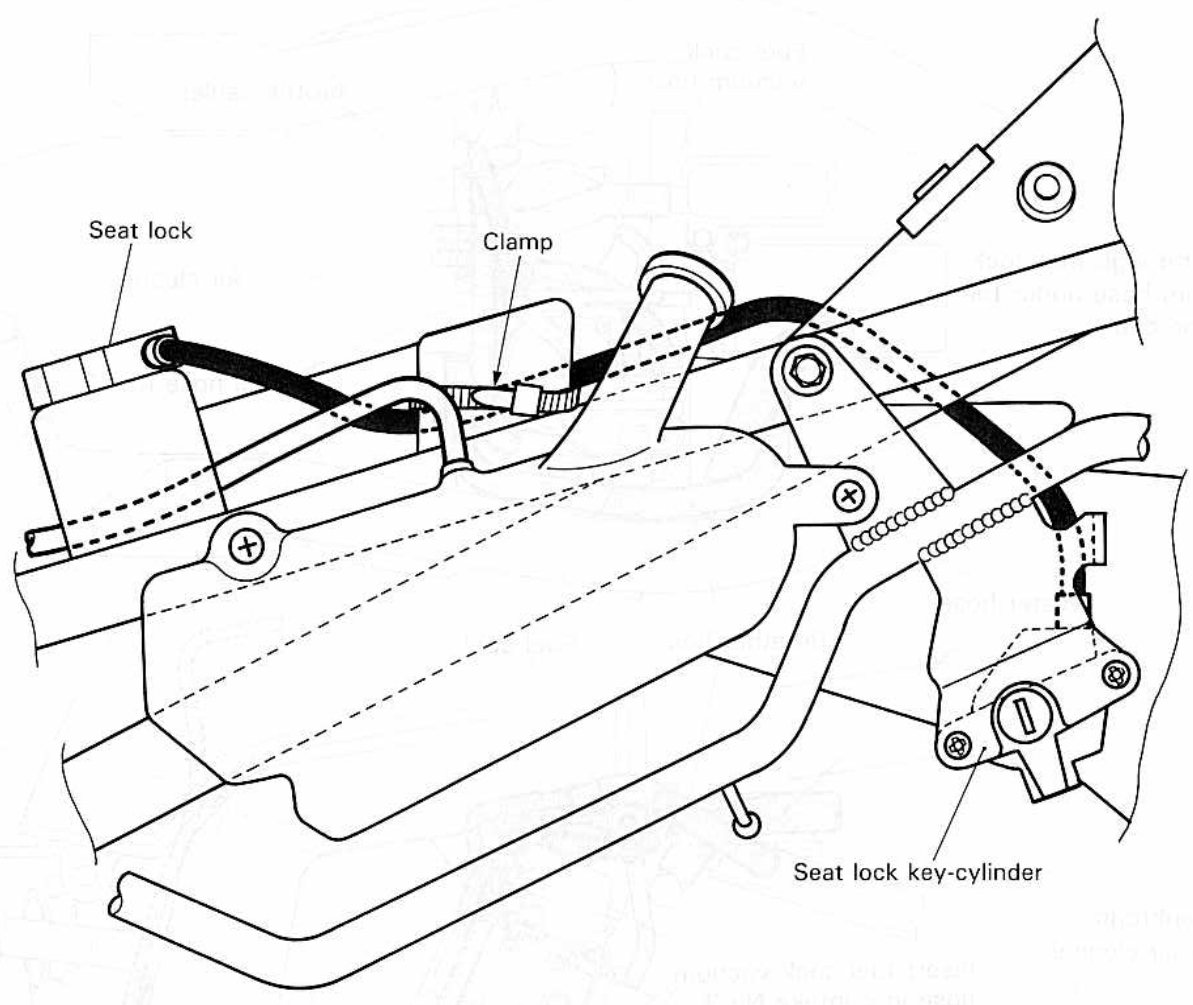
SPEEDOMETER CABLE ROUTING

CABLE ROUTING



SEAT LOCK CABLE ROUTING

FUEL SYSTEM HOSE ROUTING

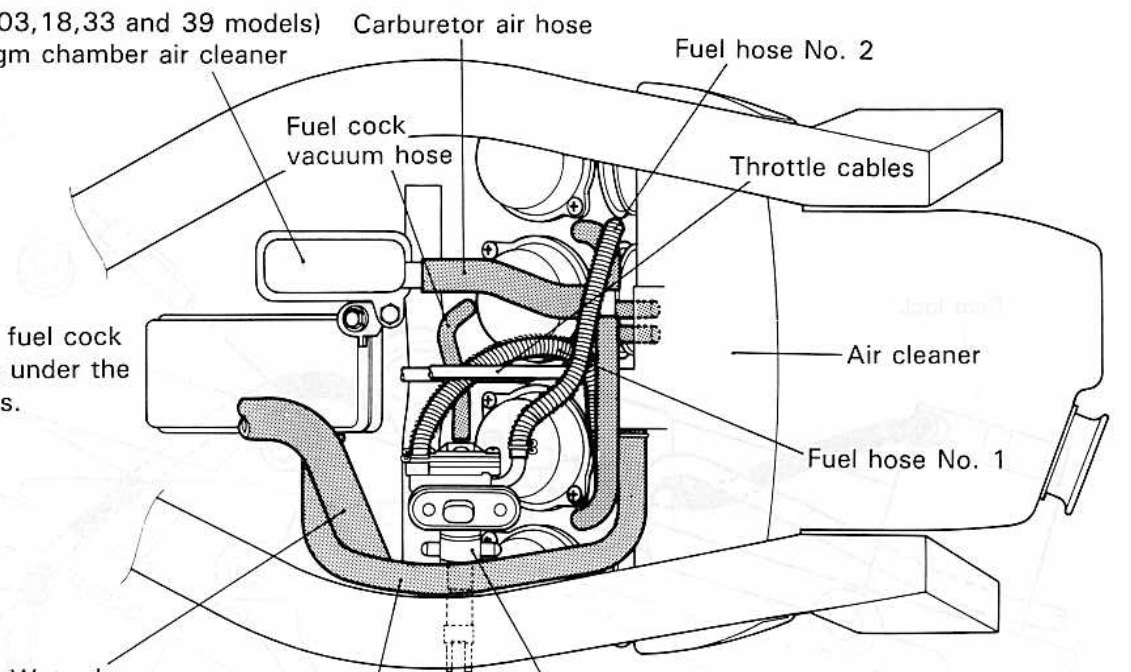


FUEL SYSTEM HOSE ROUTING

REAR VIEW OF ENGINE HOUSING

(Except for E-03,18,33 and 39 models) Carburetor air hose
 Carb. diaphragm chamber air cleaner

Pass through fuel cock vacuum hose under the throttle cables.



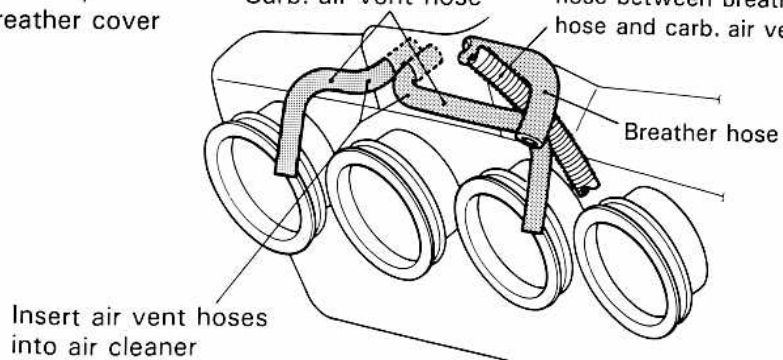
Water hose Breather hose Fuel cock

Carb. diaphragm chamber air cleaner

Insert fuel cock vacuum hose into intake No.3
 (Except for E-03,18,33 and 39 models)

Carb. diaphragm chamber air cleaner bracket
 Carb. air vent hose
 Breather cover

Pass through No. 1 fuel hose between breather hose and carb. air vent hose.

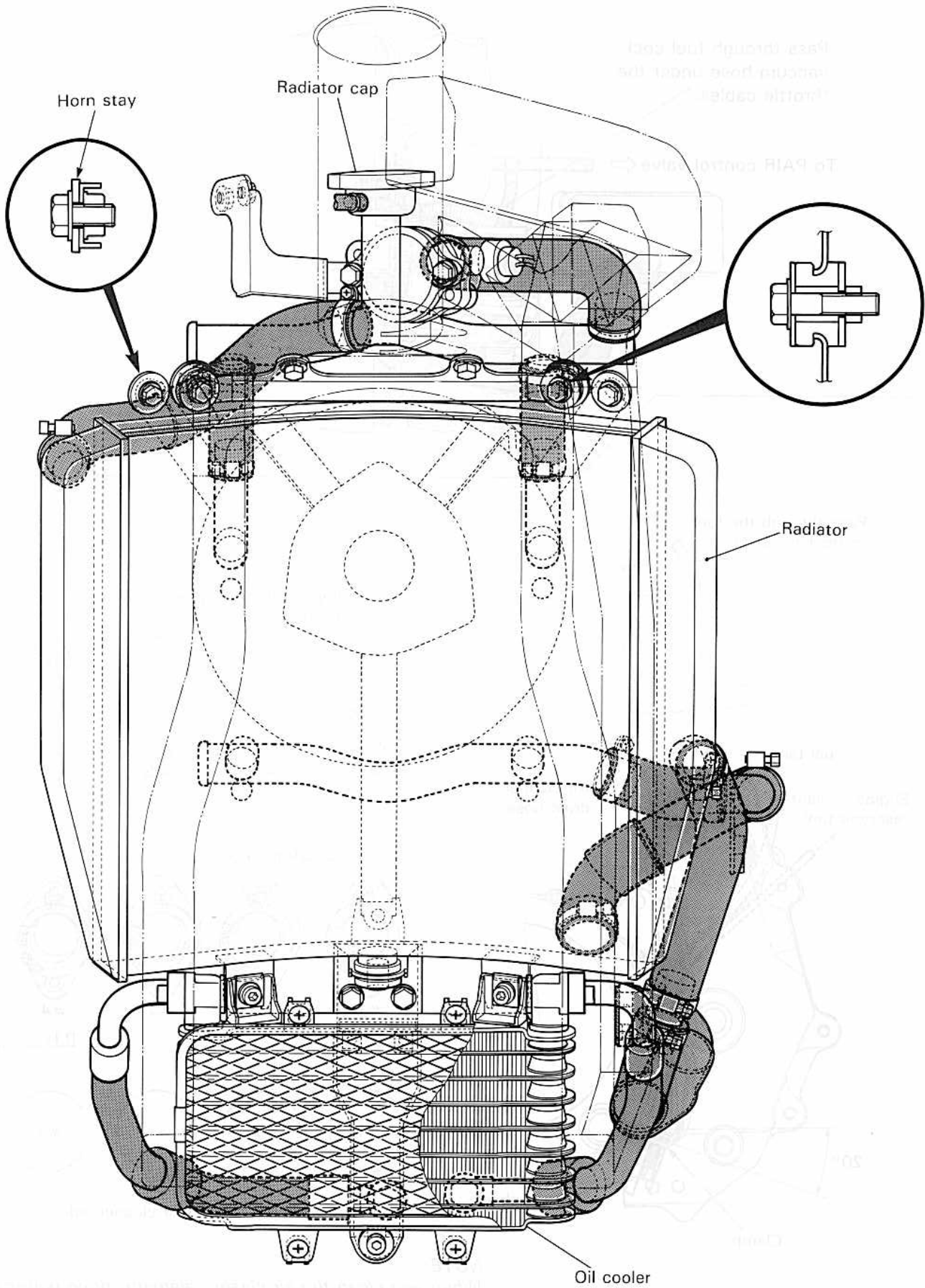


Insert air vent hoses into air cleaner

E-03: U.S.A.
 E-33: Calif. (U.S.A.)

COOLING SYSTEM HOSE ROUTING

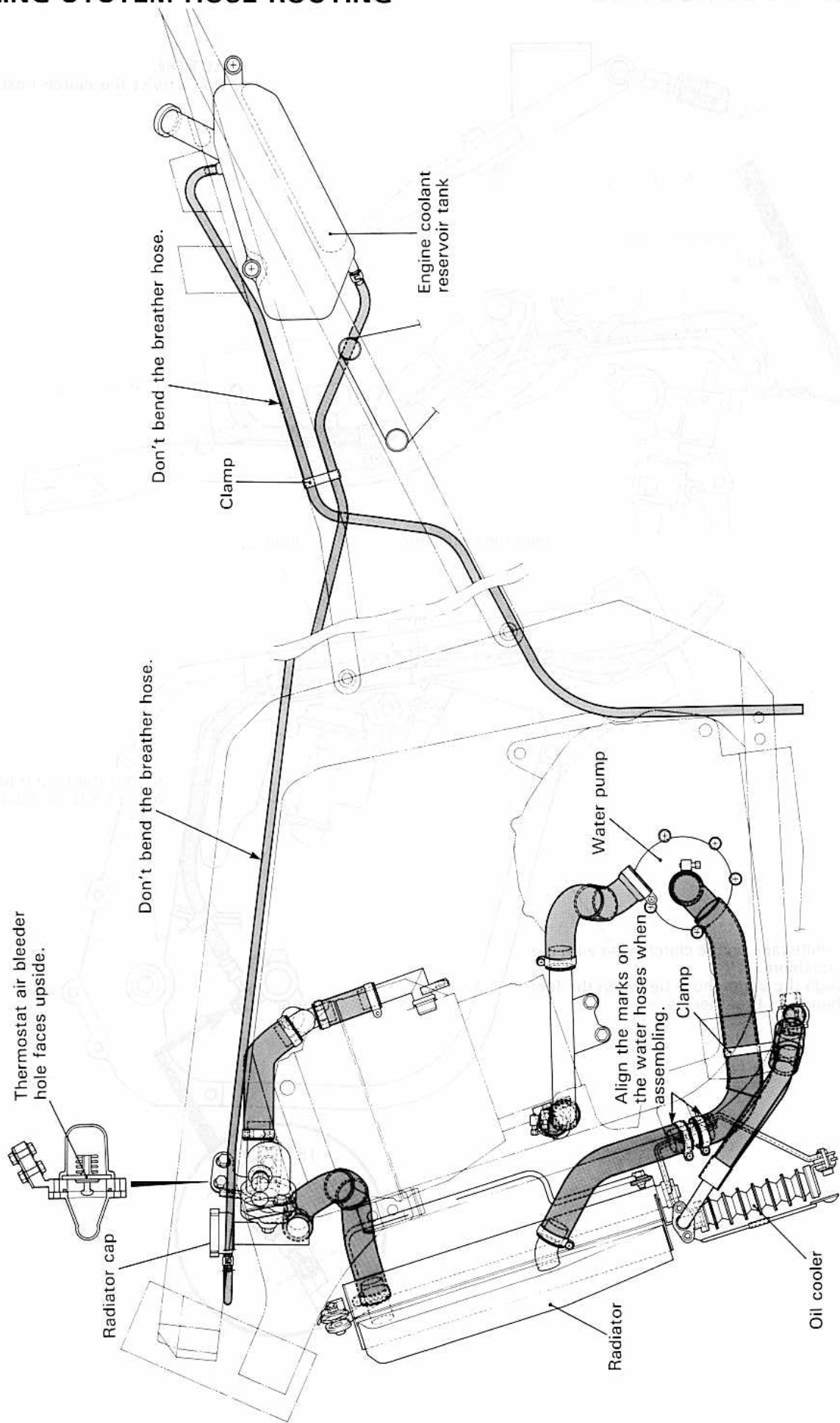
(Left model only)



1-09 43-A

8-21 00-00-00-00-00

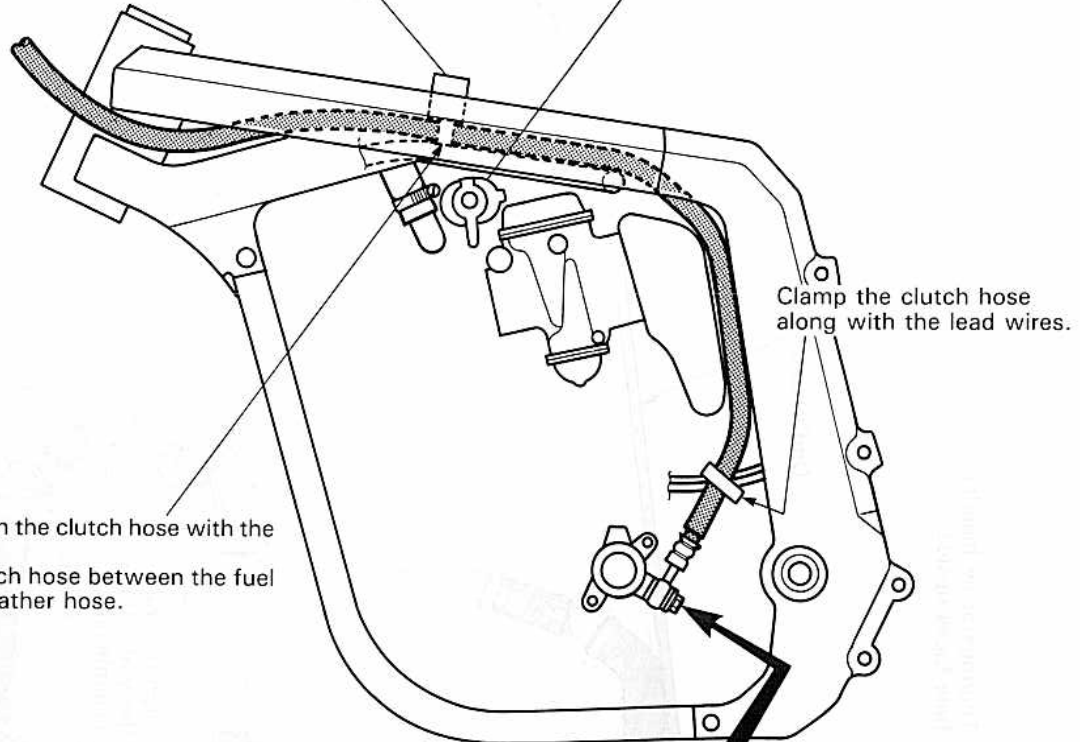
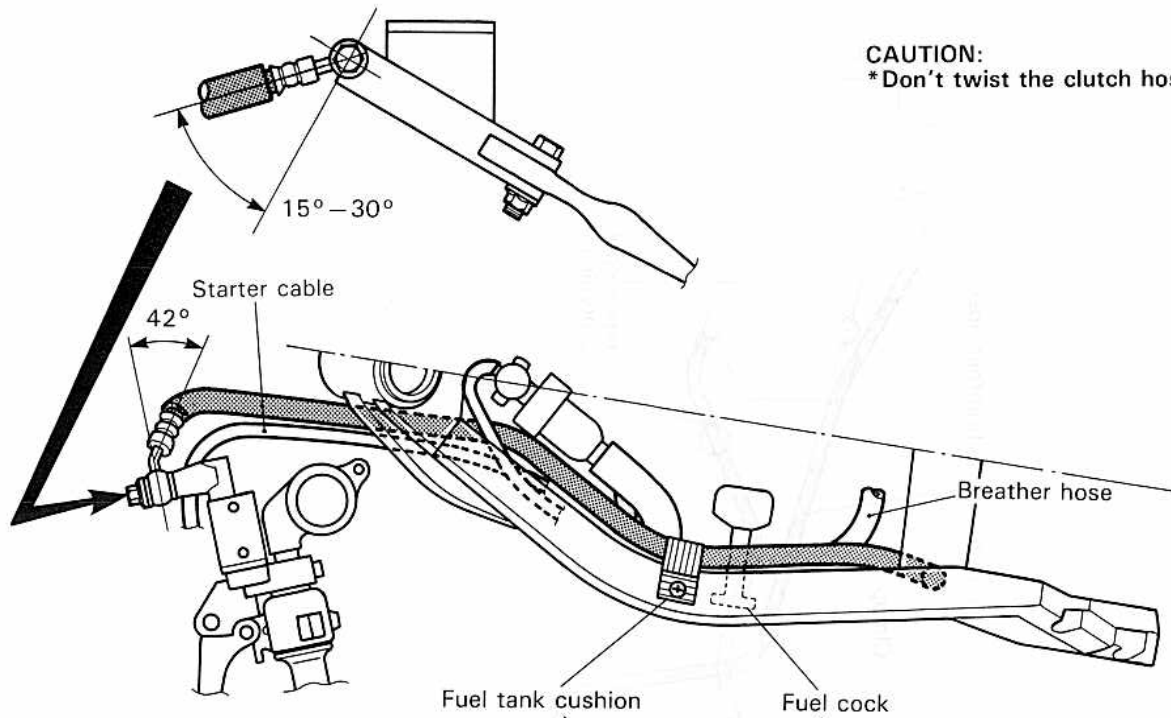
COOLING SYSTEM HOSE ROUTING



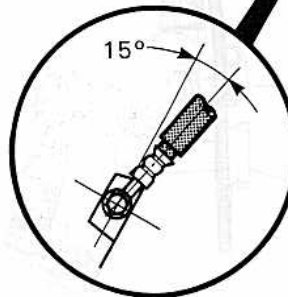
CLUTCH HOSE ROUTING

CLUTCH HOSE ROUTING

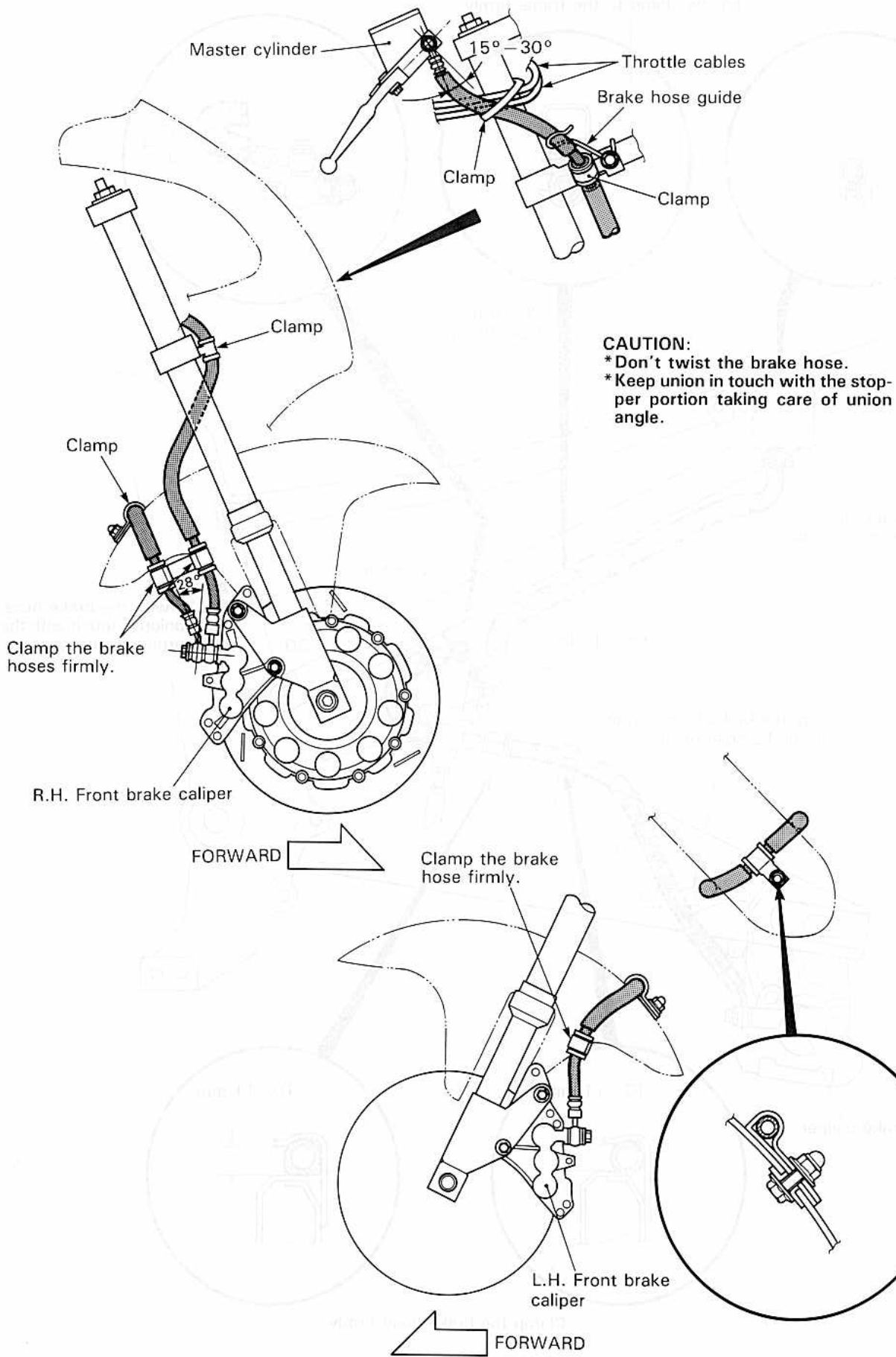
CAUTION:
*Don't twist the clutch hose.



Align the white tape on the clutch hose with the fuel tank cushion.
Pass through the clutch hose between the fuel tank cushion and breather hose.

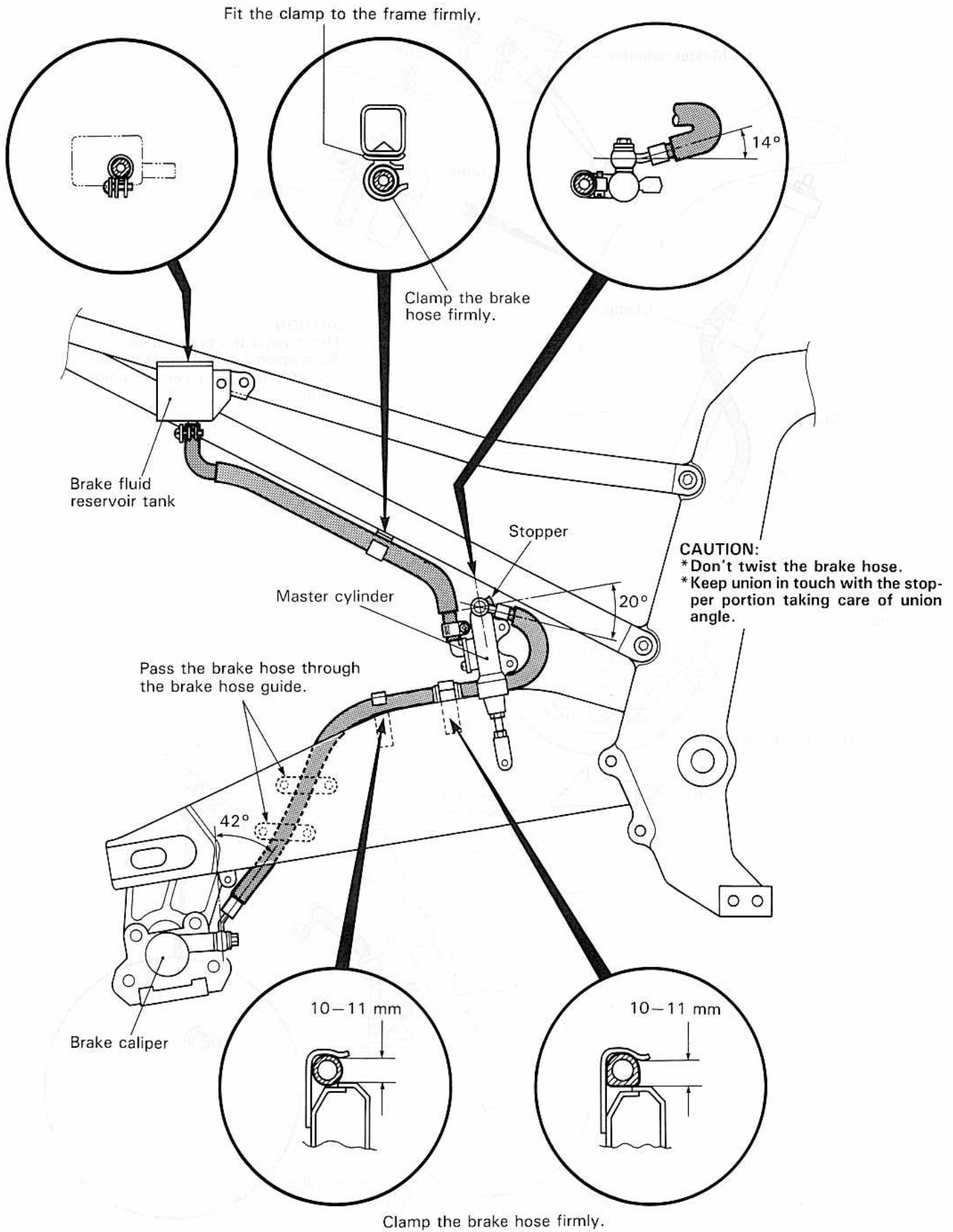


FRONT BRAKE HOSE ROUTING

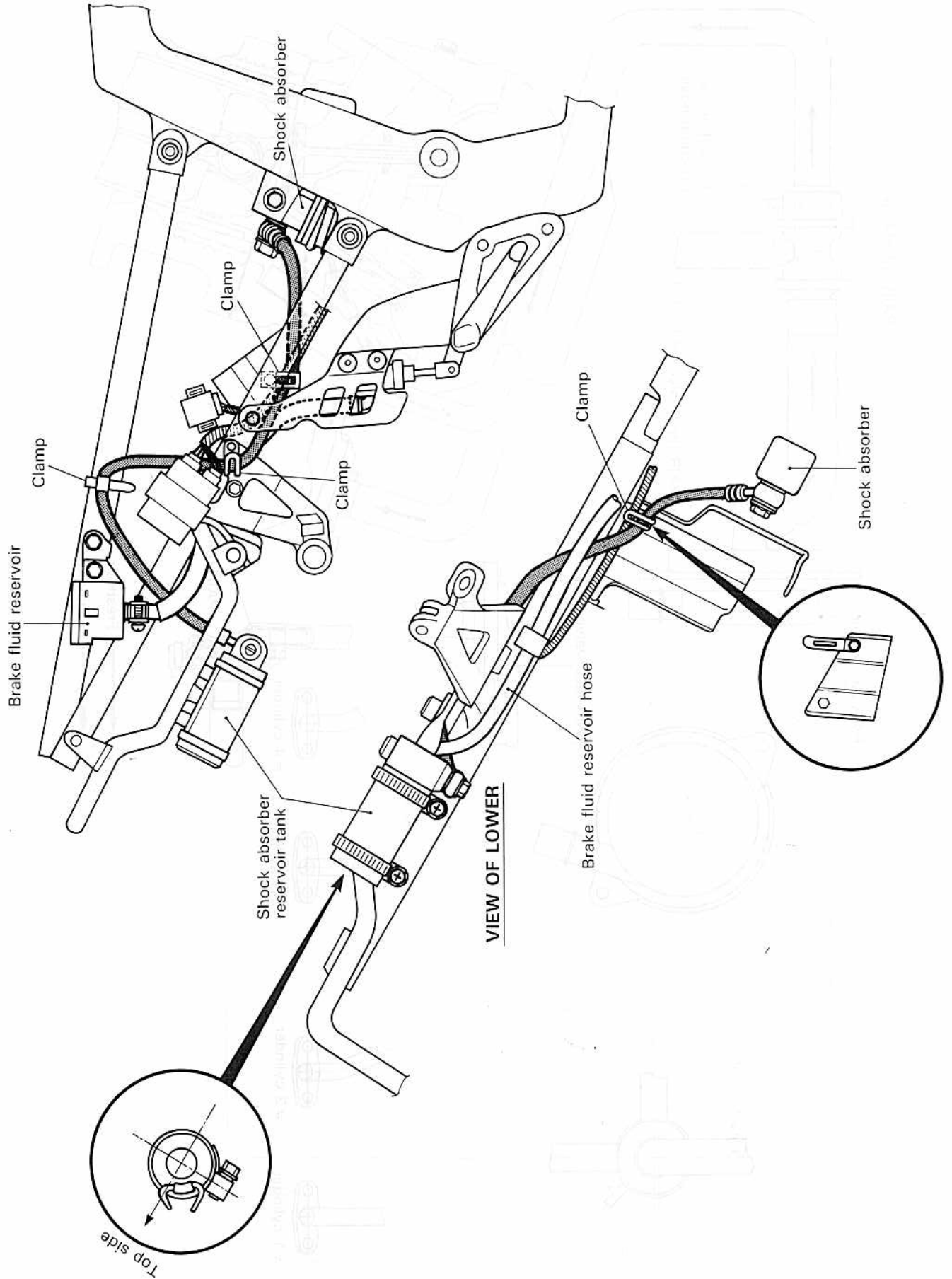


REAR BRAKE HOSE ROUTING

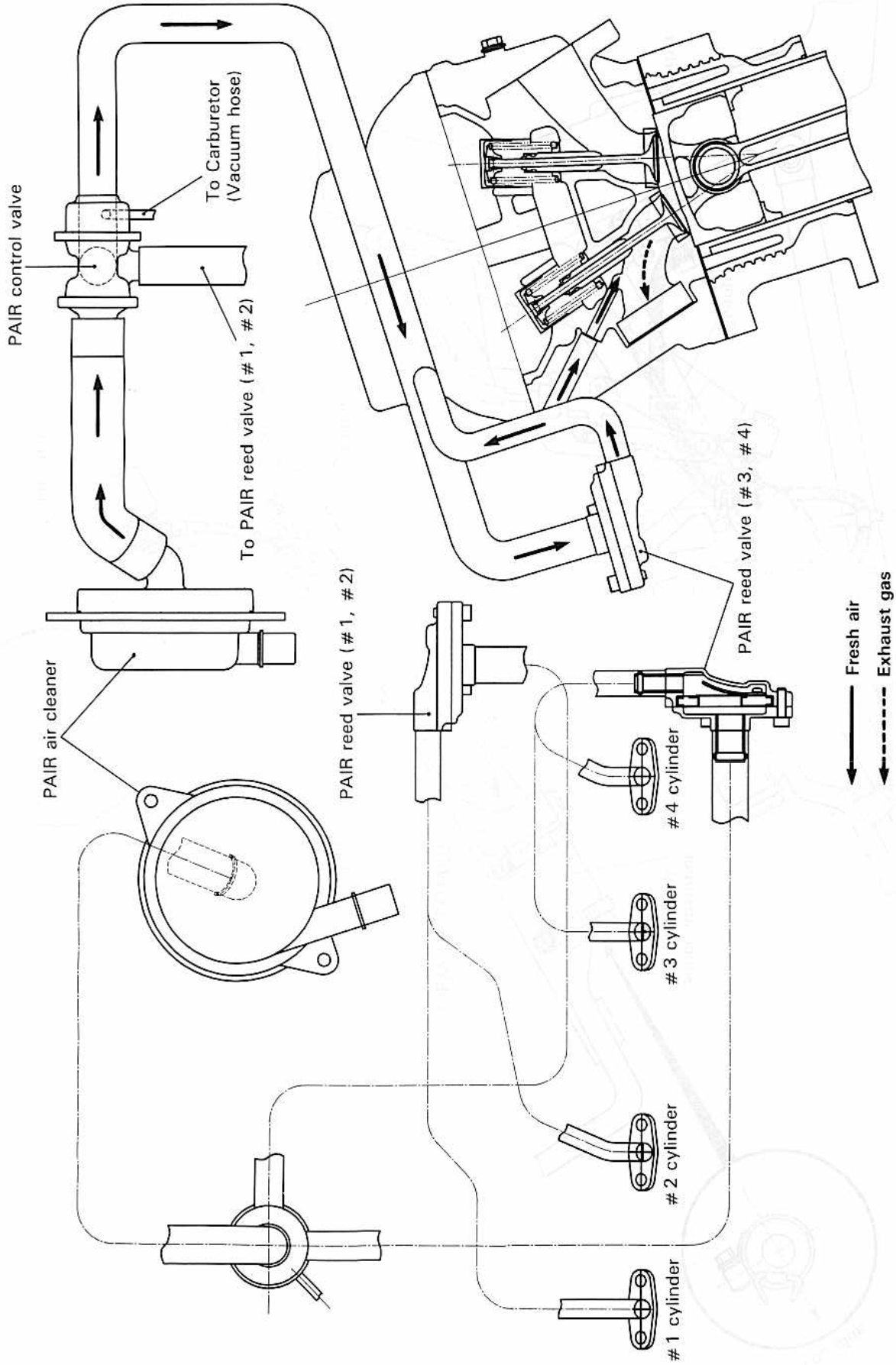
FRONT BRAKE HOSE ROUTING



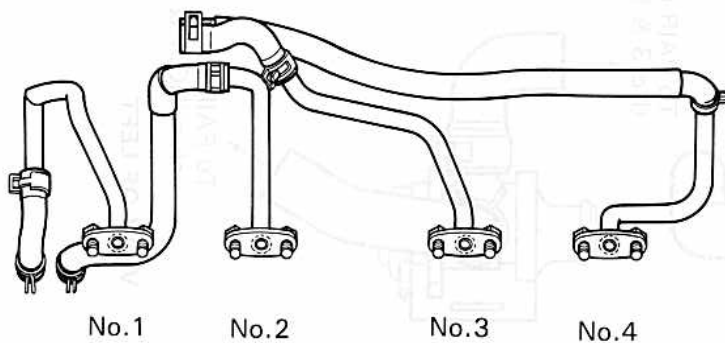
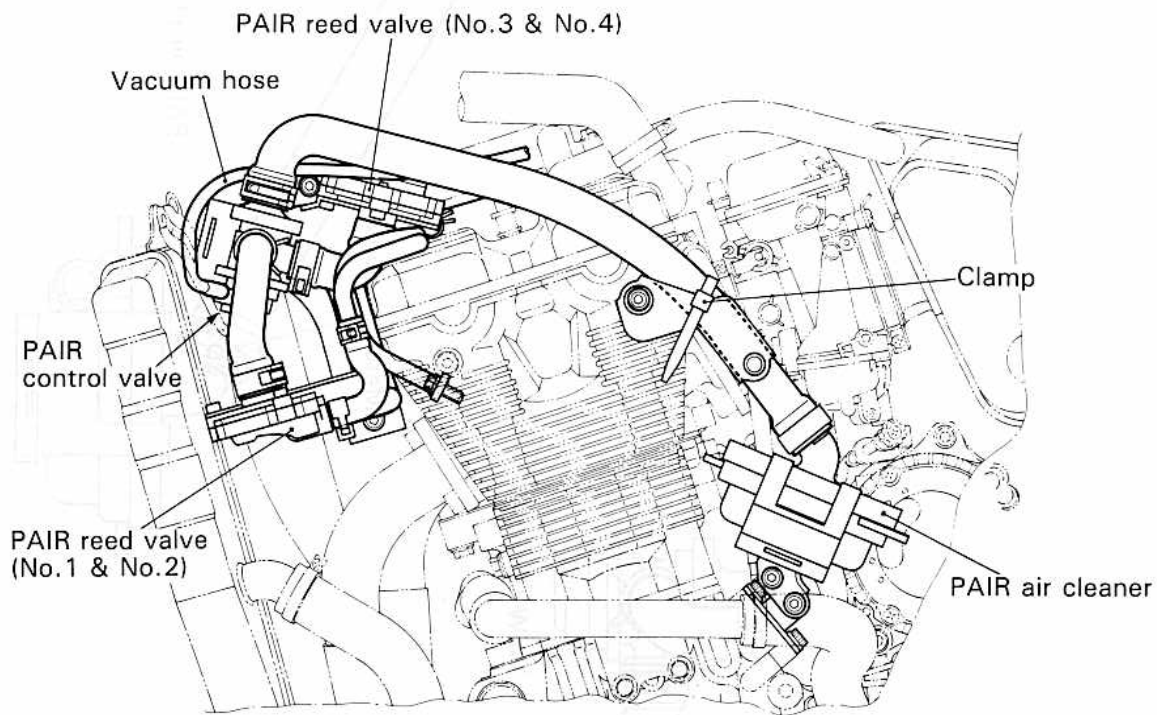
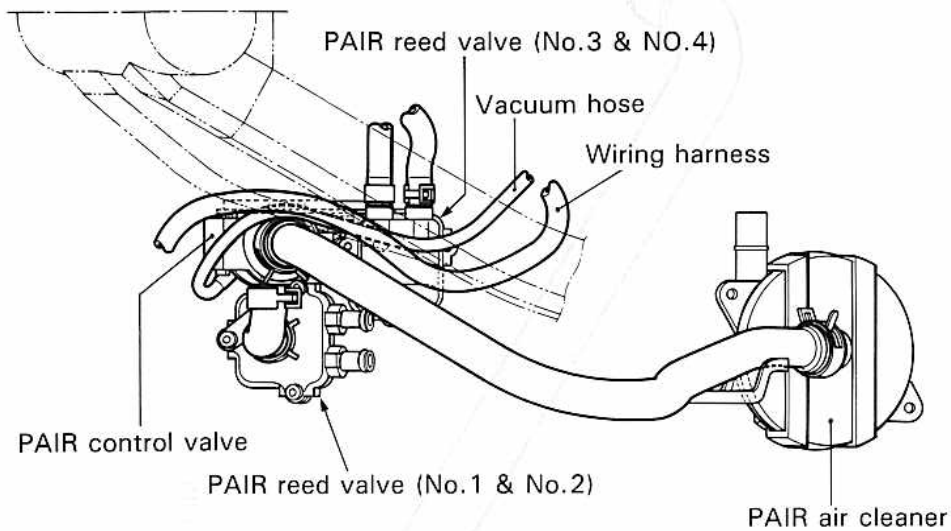
SHOCK ABSORBER RESERVOIR TANK HOSE ROUTING



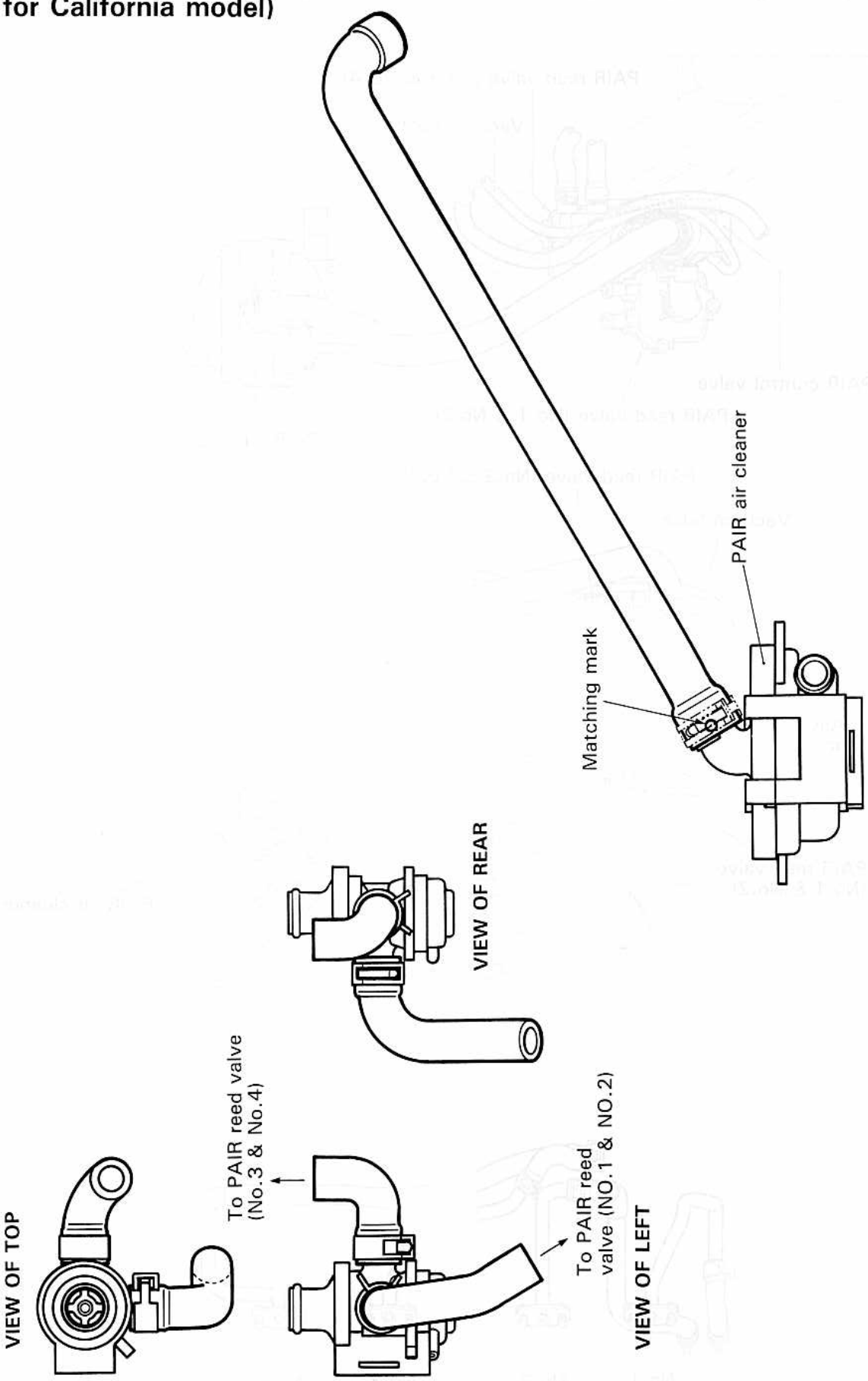
PAIR SYSTEM DIAGRAM (Only for California model)



PAIR HOSE ROUTING (Only for California model)

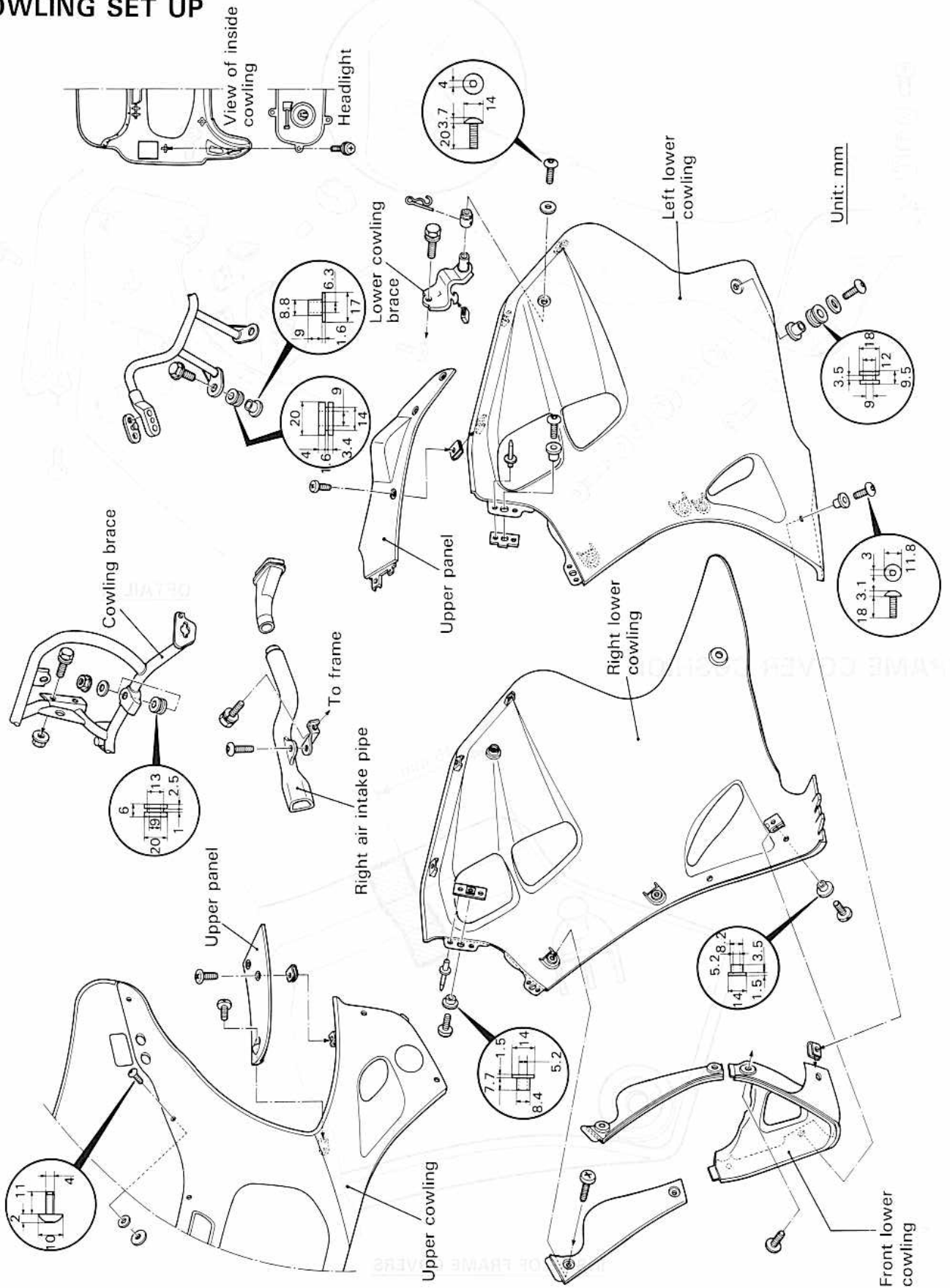


PAIR CONTROL VALVE AND PAIR AIR CLEANER INSTALLATION (Only for California model)

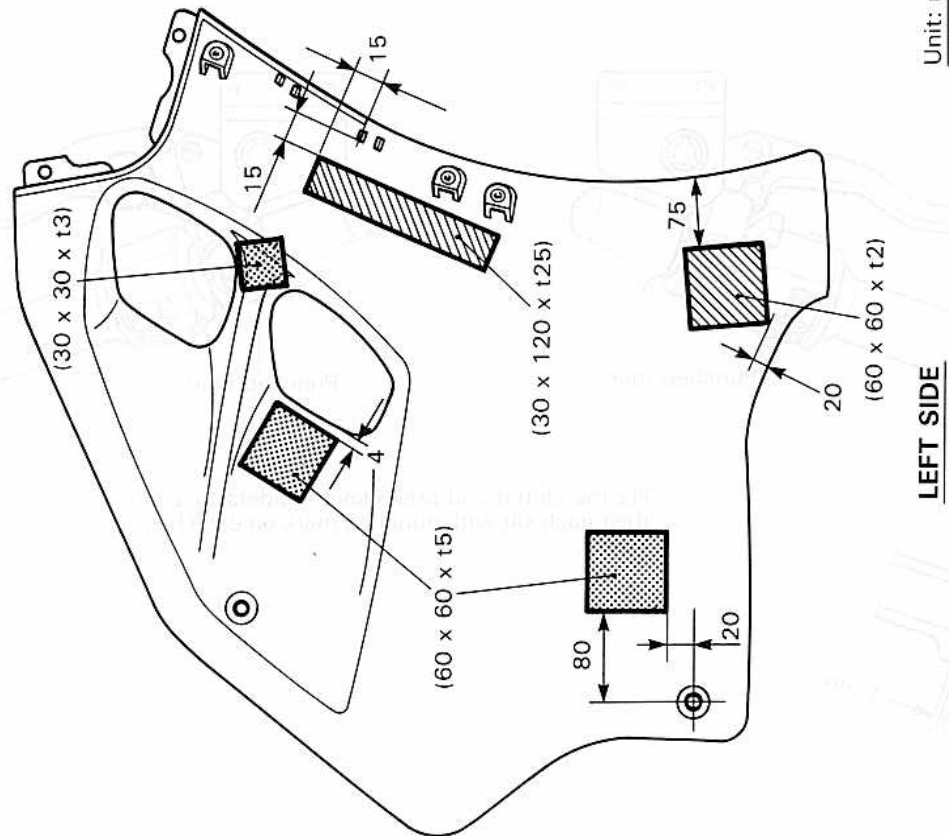
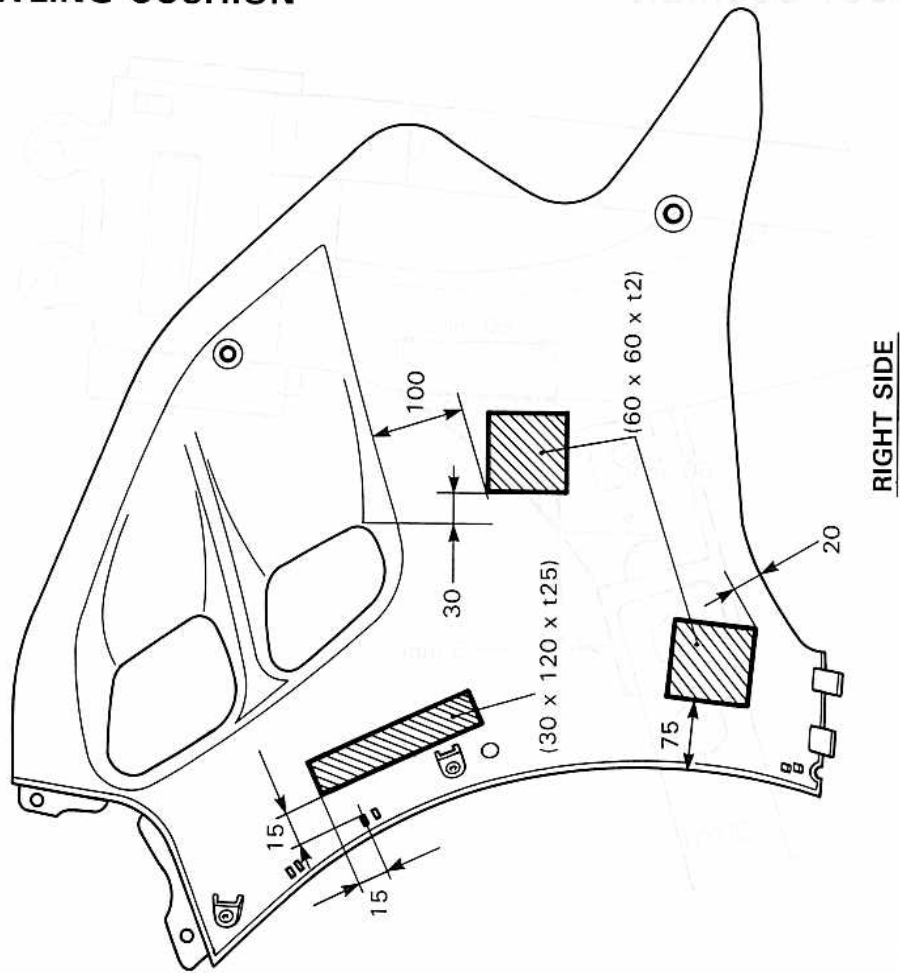


COWLING AND FRAME COVER SET UP

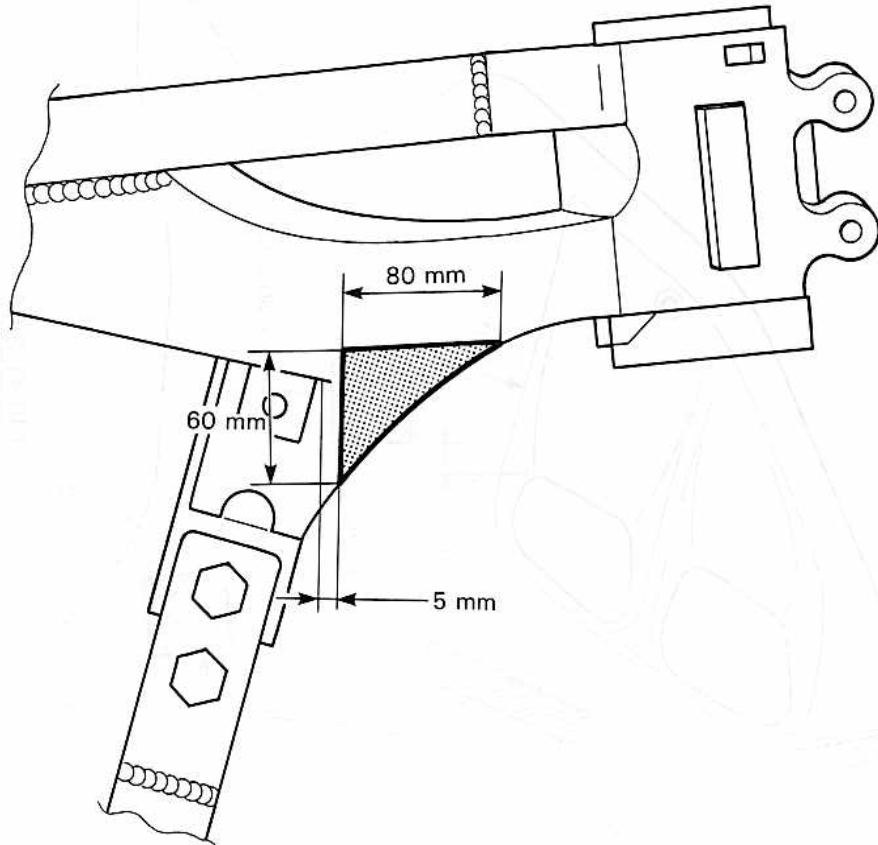
COWLING SET UP



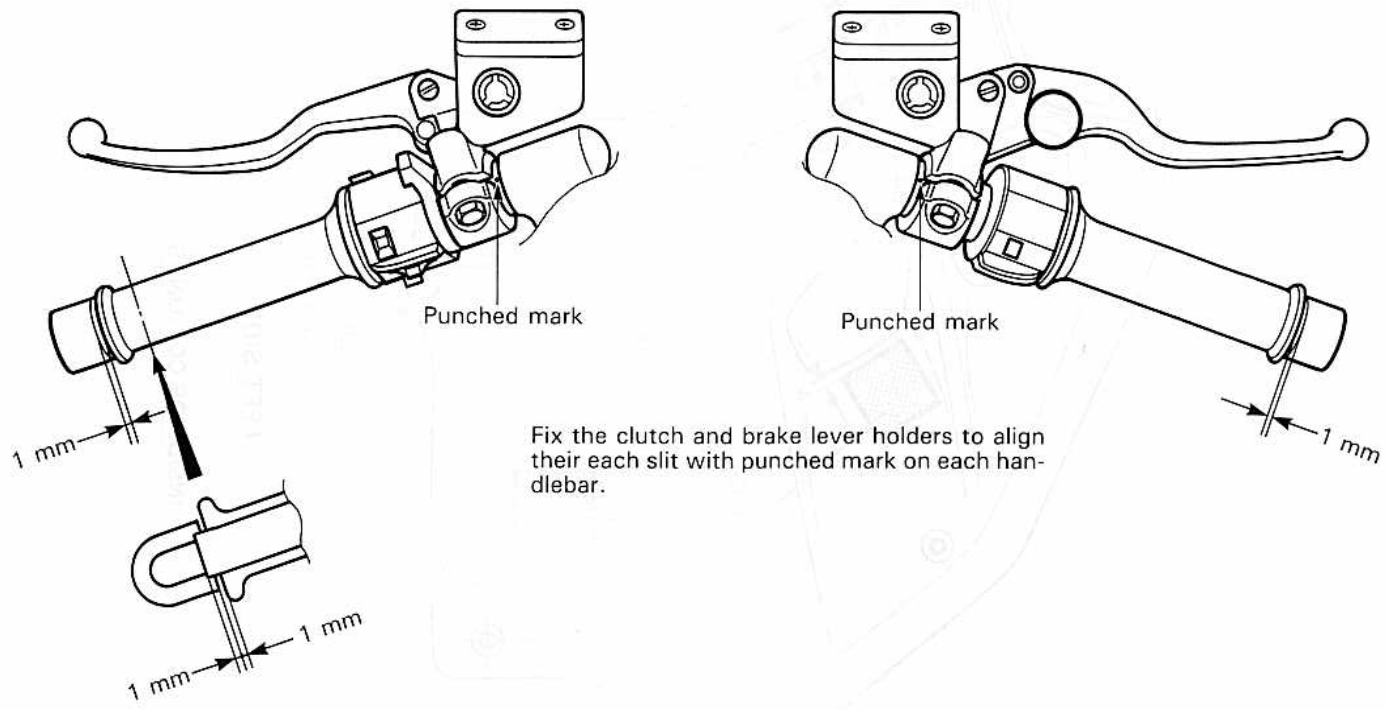
LOWER COWLING CUSHION



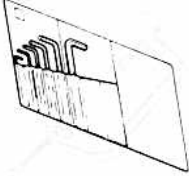


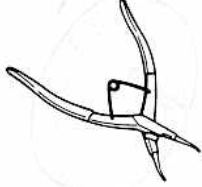

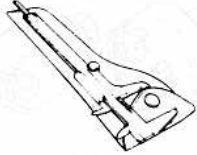
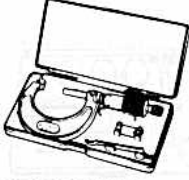






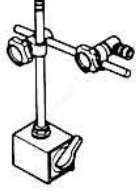
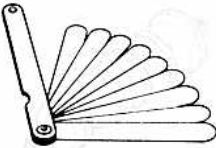

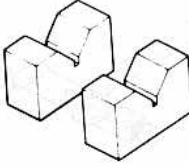


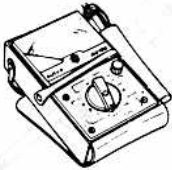




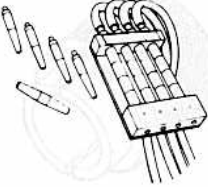



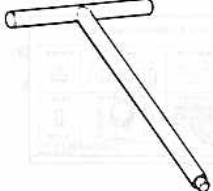
AIR INTAKE DUCT CUSHION




HANDLEBARS

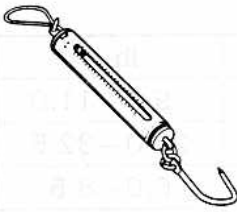



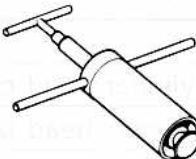
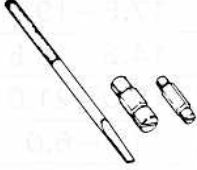
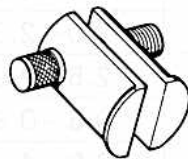

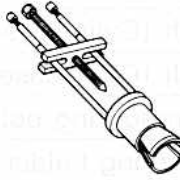
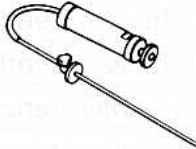
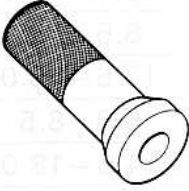
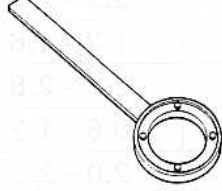

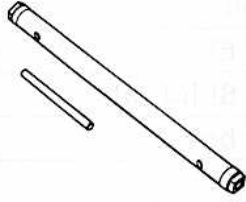
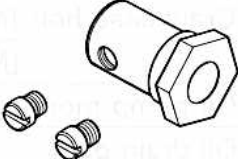


SPECIAL TOOLS

 09900-00401 "L" type hexagon wrench set	 09900-00410 Hexagon wrench set	 09900-06105 Snap ring pliers	 09900-06107 Snap ring pliers	 09900-06108 Snap ring pliers
 09900-09003 Impact driver set	 09900-20102 Vernier calipers (1/20 mm, 200 mm)	 09900-20202 Micrometer (1/100 mm, 25–50 mm)	 09900-20204 Micrometer (1/100 mm, 75–100 mm)	 09900-20205 Micrometer (1/1000 mm, 0–25 mm)
 09900-20508 Cylinder gauge set (1/100 mm, 40–80 mm)	 09900-20602 Dial gauge (1/1000 mm, 1 mm)	 09900-20605 Dial calipers (1/100 mm, 10–34 mm)	 09900-20606 Dial gauge (1/100 mm, 10 mm)	 09900-20701 Magnetic stand
 09900-20803 Thickness gauge	 09900-20805 Tire depth gauge	 09900-21304 V-block set (100 mm)	 09900-22301 Plastigauge	 09900-22403 Small bore gauge (18–35 mm)
 09900-25002 Pocket tester	 09900-28106 Electro tester	 09910-20116 Con-rod holder	 09911-73730 "T" type hexagon wrench (5 mm)	 09911-74520 Long socket (12 mm)
 09913-13121 Carburetor balancer	 09913-60910 Bearing puller (40–60 mm)	 09913-75520 Bearing installer	 09914-24510 T-handle	 09914-25811 "T" type hexagon wrench (6 mm)

 <p>09915-40610 Oil filter wrench</p>	 <p>09915-64510 Compression gauge 09915-63310 (Adaptor)</p>	 <p>09915-74510 Oil pressure gauge 09915-77330 (for high pressure meter)</p>	 <p>09915-74540 Oil pressure gauge adaptor</p>	 <p>09916-14510 Valve lifter</p>
 <p>09916-14520 Valve lifter attachment</p>	 <p>09916-20640 Solid pilot (N-100-4.5)</p>	 <p>09916-21110 Valve seat cutter set</p>	 <p>See page 3-24. Valve seat cutter head (N-111, 116, 120, 121, 122, 126)</p>	 <p>09916-33210 Valve guide reamer (4.5 mm)</p>
 <p>09916-34542 Valve guide reamer handle</p>	 <p>09916-34580 Valve guide reamer (10.8 mm)</p>	 <p>09916-43210 Valve guide remover/ installer</p>	 <p>09916-43230 Attachment</p>	 <p>09916-74521 Piston ring compressor body</p>
 <p>09916-74540 Piston ring compressor band (63-75 mm)</p>	 <p>09916-84511 Tweezers</p>	 <p>09920-53740 Clutch sleeve hub holder</p>	 <p>09923-74510 Bearing puller (20-38 mm)</p>	 <p>09924-84510 Bearing installer set</p>
 <p>09924-84521 Bearing installer</p>	 <p>09930-10121 Spark plug socket wrench set</p>	 <p>09930-11910 Torx wrench</p>	 <p>09930-14530 Universal joint</p>	 <p>09930-30102 Sliding shaft</p>
 <p>09931-94430 Ignitor checker (Digital type)</p>	 <p>09940-14911 Steering stem nut wrench</p>	 <p>09940-14940 Adjuster lock nut wrench</p>	 <p>09940-14950 Adjuster turning wrench</p>	 <p>09940-52850 Front fork oil seal installer</p>

TIGHTENING TORQUE

 <p>09940-92710 Spring scale</p>	 <p>09940-52840 Front fork inner rod holder</p>	 <p>09940-94910 Front fork spacer holder set</p>	 <p>09941-34513 Steering outer race installer</p>	 <p>09941-44910 Swingarm bearing remover</p>
 <p>09941-50110 Bearing remover 09941-50120 Attachment</p>	 <p>09941-54911 Bearing outer race remover</p>	 <p>09941-74910 Steering bearing installer</p>	 <p>09941-84510 Bearing remover</p>	 <p>09943-74111 Front fork oil level gauge</p>
 <p>09951-16080 Bearing installer</p>	 <p>09920-34820 Clutch pressure plate holder</p>	 <p>09941-58010 50 mm socket wrench</p>	 <p>09940-54821 Front fork assembling tool</p>	 <p>09940-54830 Attachment</p>

NOTE:

When ordering the special tool, please confirm whether it is available or not.

TIGHTENING TORQUE

ENGINE

ITEM	N·m	kg-m	lb-ft
Cylinder head cover bolt	13–15	1.3–1.5	9.5–11.0
Cylinder head bolt [M: 10]	40–45	4.0–4.5	29.0–32.5
Cylinder head bolt [M: 6]	8–12	0.8–1.2	6.0–8.5
Cylinder base nut	7–11	0.7–1.1	5.0–8.0
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
Oil hose mounting bolt [Cylinder side]	20–23	2.0–2.3	14.5–16.5
Oil hose mounting bolt [Crankcase side]	25–29	2.5–2.9	18.0–21.0
Cam chain tensioner mounting bolt	6–8	0.6–0.8	4.5–6.0
Cam chain tensioner spring holder bolt	30–40	3.0–4.0	21.5–29.0
Conrod bearing cap bolt	65–68	6.5–6.8	47.0–49.0
Starter clutch bolt	23–28	2.3–2.8	16.5–20.0
Signal generator bolt	23–26	2.3–2.6	16.5–19.0
Crankcase bolt [M: 6]	12–16	1.2–1.6	8.5–16.5
[M: 8] [M: 9]	24–28	2.4–2.8	17.5–20.0
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	8–12	0.8–1.2	6.0–8.5
Gearshift cam stopper plate bolt	8–12	0.8–1.2	6.0–8.5
Gearshift arm stopper bolt	15–23	1.5–2.3	11.0–16.5
Clutch sleeve hub nut	140–160	14.0–16.0	101.5–115.5
Clutch diaphragm spring holder nut	90–110	9.0–11.0	65.0–79.5
Exhaust pipe bolt	18–28	1.8–2.8	13.0–20.0
Muffler mounting bolt	18–28	1.8–2.8	13.0–20.0
Engine sprocket nut	100–130	10.0–13.0	72.5–94.0
Engine sprocket nut stopper bolt	9–12	0.9–1.2	6.5–8.5
Engine mounting bolt [L: 55]	50–60	5.0–6.0	36.0–43.5
[L: 150 and 165]	70–88	7.0–8.8	50.5–63.5
Starter clutch shaft nut	80–100	8.0–10.0	58.0–72.5
Generator driven gear nut	40–60	4.0–6.0	29.0–43.5
Generator mounting bolt	21–29	2.1–2.9	15.0–21.0
Oil cooler mounting bolt	8–12	0.8–1.2	6.0–8.5
Oil pressure regulator	25–30	2.5–3.0	18.0–21.5
Oil pressure switch	12–15	1.2–1.5	8.5–11.0
Oil gallery plug [M: 16]	35–45	3.5–4.5	25.5–32.5
[M: 14]	25–30	2.5–3.0	18.0–21.5
[M: 10]	12–18	1.2–1.8	8.5–13.0
Crankcase plug [M: 22]	35–45	3.5–4.5	25.5–32.5
[M: 18]	25–30	2.5–3.0	18.0–21.5

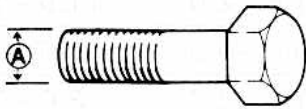
CHASSIS

ITEM	N·m	kg-m	lb-ft
Steering stem head nut	51–81	5.1–8.1	37.0–58.5
Front fork upper clamp bolt	21–30	2.1–3.0	15.0–21.5
Front fork lower clamp bolt	21–30	2.1–3.0	15.0–21.5
Front fork cap bolt	15–30	1.5–3.0	11.0–21.5
Front axle	87–117	8.7–11.7	63.0–84.5
Front axle pinch bolt	19–28	1.9–2.8	13.5–20.0
Handlebar holder mounting nut	23–35	2.3–3.5	16.5–25.5
Handlebar holder mounting bolt	41–61	4.1–6.1	29.5–44.0
Front brake master cylinder mounting bolt	8–12	0.8–1.2	6.0–8.5
Front brake caliper mounting bolt	31–48	3.1–4.8	22.5–34.5
Front brake caliper housing bolt	20–25	2.0–2.5	14.5–18.0
Brake hose union bolt (Cylinder & Caliper)	16–20	1.6–2.0	11.5–14.5
Air bleeder valve (Front & Rear)	6–9	0.6–0.9	4.5–6.5
Front and rear disc bolt	18–28	1.8–2.8	13.0–20.0
Clutch master cylinder mounting bolt	8–12	0.8–1.2	6.0–8.5
Front footrest bracket mounting bolt	19–28	1.9–2.8	13.5–20.0
Swingarm pivot nut	87–117	8.7–11.7	63.0–84.5
Swingarm pivot adjuster lock nut	60–70	6.0–7.0	43.5–50.5
Front footrest nut	35–55	3.5–5.5	25.5–40.0
Rear shock absorber mounting nut (Upper & Lower)	41–61	4.1–6.1	29.5–44.0
Rear cushion lever/rod mounting nut	110–160	11.0–16.0	79.5–115.5
Rear brake caliper mounting bolt	21–31	2.1–3.1	15.0–22.5
Rear brake caliper housing bolt	30–36	3.0–3.6	21.5–26.0
Rear brake master cylinder mounting bolt	19–28	1.9–2.8	13.5–20.0
Rear axle nut	87–117	8.7–11.7	63.0–84.5
Rear sprocket nut	48–72	4.8–7.2	35.0–52.0

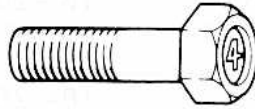
TIGHTENING TORQUE CHART

For other bolts and nuts listed previously, refer to this chart:

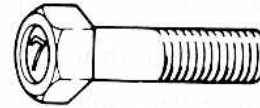
Bolt Diameter Ⓐ (mm)	Conventional or "4" marked bolt			"7" marked bolt		
	N·m	kg·m	lb·ft	N·m	kg·m	lb·ft
4	1.0–2.0	0.1–0.2	0.7–1.5	1.5–3.0	0.15–0.3	1.0–2.0
5	2.0–4.0	0.2–0.4	1.5–3.0	3.0–6.0	0.3–0.6	2.0–4.5
6	4.0–7.0	0.4–0.7	3.0–5.0	8.0–12.0	0.8–1.2	6.0–8.5
8	10.0–16.0	1.0–1.6	7.0–11.5	18.0–28.0	1.8–2.8	13.0–20.0
10	22.0–35.0	2.2–3.5	16.0–25.5	40.0–60.0	4.0–6.0	29.0–43.5
12	35.0–55.0	3.5–5.5	25.5–40.0	70.0–100.0	7.0–10.0	50.5–72.5
14	50.0–80.0	5.0–8.0	36.0–58.0	110.0–160.0	11.0–16.0	79.5–115.5
16	80.0–130.0	8.0–13.0	58.0–94.0	170.0–250.0	17.0–25.0	123.0–181.0
18	130.0–190.0	13.0–19.0	94.0–137.5	200.0–280.0	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.	31 (1.2)	—	
	EX.	27 (1.1)	—	
Valve lift	IN.	E-01,03 and others	8.7 (0.34)	—
		E-04	5.0 (0.20)	—
		E-18, 33,39	7.3 (0.29)	—
	EX.	E-01,03 and others	8.6 (0.34)	—
		E-04	7.0 (0.28)	—
		E-18, 33,39	7.0 (0.28)	—
Tappet clearance (when cold)	IN.	0.10–0.20 (0.004–0.008)	—	
	EX.	0.20–0.30 (0.008–0.010)	—	
Valve guide to valve stem clearance	IN.	0.020–0.047 (0.0008–0.0019)	—	
	EX.	0.030–0.057 (0.0012–0.0022)	—	
Valve stem deflection	IN. & EX.	—	0.35 (0.014)	
Valve guide I.D.	IN. & EX.	4.500–4.512 (0.1772–0.1776)	—	
Valve stem O.D.	IN.	4.465–4.480 (0.1758–0.1764)	—	
	EX.	4.455–4.470 (0.1754–0.1760)	—	
Valve stem runout	IN. & EX.	—	0.05 (0.002)	
Valve head thickness	IN. & EX.	—	0.5 (0.02)	
Valve seat width	IN. & EX.	0.8–1.2 (0.031–0.047)	—	
Valve head radial runout	IN. & EX.	—	0.03 (0.001)	
Valve spring free length (IN. & EX.)	—		40.4 (1.59)	
Valve spring tension (IN. & EX.)	18.6–21.4 kg (41.0–47.2 lbs) at length 36 mm (1.4 in)		—	

CAMSHAFT + CYLINDER HEAD

Unit: mm (in)

ITEM	STANDARD		LIMIT	
Cam height	IN.	E-01,03 and others	36.692–36.748 (1.4446–1.4468)	36.40 (1.433)
		E-04	32.992–33.048 (1.2989–1.3011)	32.70 (1.287)
		E-18, 33,39	35.292–35.348 (1.3894–1.3917)	35.00 (1.378)
	EX.	E-01,03 and others	36.612–36.668 (1.4414–1.4436)	36.32 (1.430)
		E-04	34.952–35.008 (1.3761–1.3783)	34.66 (1.365)
		E-18, 33,39	34.952–35.008 (1.3761–1.3783)	34.66 (1.365)
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)	—	
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")		13th pin	—	
Cylinder head distortion		—	0.20 (0.008)	

CYLINDER + PISTON + PISTON RING

Unit: mm (in)

ITEM	STANDARD		LIMIT	
Compression pressure	1 000–1 500 kPa (10–15 kg/cm ²) (142–213 psi)		800 kPa (8 kg/cm ²) (114psi)	
Compression pressure difference	—		200 kPa (2 kg/cm ²) (28 psi)	
Piston to cylinder clearance	0.070–0.080 (0.0028–0.0031)		0.120 (0.0047)	
Cylinder bore	75.500–75.515 (2.9724–2.9730)		75.560 (2.9748)	
Piston diam.	75.425–75.440 (2.9695–2.9701) Measure at 15 mm (0.6 in) from the skirt end.		75.380 (2.9677)	
Cylinder distortion	—		0.20 (0.008)	
Piston ring free end gap	1st	R	Approx. 11.2 (0.44)	8.9 (0.35)
	2nd	R	Approx. 8.6 (0.34)	6.8 (0.27)
Piston ring end gap	1st		0.20–0.30 (0.008–0.012)	0.5 (0.02)
	2nd		0.20–0.30 (0.008–0.012)	0.5 (0.02)

ITEM	STANDARD		LIMIT
Piston ring to groove clearance	1st	—	0.18 (0.007)
	2nd	—	0.18 (0.007)
Piston ring groove width	1st	1.03–1.05 (0.040–0.041)	—
	2nd	1.03–1.05 (0.040–0.041)	—
	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)	—
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 (0.010)
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.	33.976–34.000 (1.3376–1.3386)		—
Crankshaft thrust clearance	0.055–0.110 (0.0022–0.0043)		—
Crankshaft thrust bearing thickness	Right side	2.425–2.450 (0.0955–0.0965)	—
	Left side	2.350–2.500 (0.0925–0.0984)	—
Crankshaft runout	—		0.05 (0.002)

OIL PUMP

ITEM	STANDARD	LIMIT
Oil pump reduction ratio	1.703 (72/46 x 37/34)	—

ITEM	STANDARD	LIMIT
Oil pressure (at 60°C, 140°F)	Above 300 kPa (3.0 kg/cm ² , 43 psi) Below 600 kPa (6.0 kg/cm ² , 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)
Drive plate distortion	—	0.10 (0.004)
Clutch spring free height	—	3.1 (0.12)
Clutch master cylinder bore	14.000–14.043 (0.5511–0.5529)	—
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)	—

THERMOSTAT + RADIATOR + FAN

ITEM	STANDARD	LIMIT	
Thermostat valve opening temperature	74.5–78.5°C (166.1–173.3°F)	—	
Thermostat valve lift	Over 7 mm (0.28 in) at 90°C (194°F)	—	
Radiator cap valve opening pressure	110 kPa (1.1 kg/cm ² , 15.6 psi)	—	
Cooling fan thermo-switch operating temperature	ON	Approx. 105°C (221°F)	—
	OFF	Approx. 100°C (212°F)	—
Engine coolant temperature gauge resistance	50°C (122°F)	Approx. 153.9 Ω	—
	80°C (176°F)	Approx. 51.9 Ω	—
	100°C (212°F)	Approx. 27.4 Ω	—
	120°C (248°F)	Approx. 16.1 Ω	—

TRANSMISSION + DRIVE CHAIN

Unit: mm (in) Except ratio

ITEM	STANDARD	LIMIT	
Primary reduction ratio	1.565 (72/46)	—	
Final reduction ratio	2.800 (42/15)	—	
Gear ratios	Low	2.714 (38/14)	—
	2nd	1.809 (38/21)	—
	3rd	1.409 (31/22)	—
	4th	1.181 (26/22)	—
	Top	1.038 (27/26)	—

ITEM	STANDARD		LIMIT
Shift fork to groove clearance	0.10–0.30 (0.004–0.012)		0.50 (0.020)
Shift fork groove width	5.00–5.10 (0.197–0.201)		—
Shift fork thickness	4.80–4.90 (0.189–0.193)		—
Drive chain	Type	RK532GSV ₂	—
	Links	114 links, ENDLESS	—
	20-pitch length	—	319.4 (12.6)
Drive chain slack	25–35 (1.0–1.4)		—
Gearshift lever height	65–75 (2.6–3.0)		—

CARBURETOR

ITEM	SPECIFICATION	
	E-03	E-33
Carburetor type	MIKUNI BST36SS	←
Bore size	36 mm	←
I.D. No.	46E1	46E6
Idle r/min.	1 100 ± 100 r/min	1 200 ± 50 r/min
Float height	14.7 mm (0.58 in)	
Main jet (M.J.)	#1&4: (#127.5), #2&3: (#125)	#122.5
Main air jet (M.A.J.)	0.5	←
Jet needle (J.N.)	5C34	5D62
Needle jet (N.J.)	D-B	←
Throttle valve (Th.V.)	#125	←
Pilot jet (P.J.)	#30	←
By-pass (B.P.)	#1,2&3: 0.8 mm	#1,2,3&4: 0.8 mm
Pilot outlet (P.O.)	0.8 mm	←
Valve seat (V.S.)	2.3 mm	←
Starter jet (G.S.)	#42.5	←
Pilot screw (P.S.)	PRE-SET	PRE-SET
Throttle cable play	0.5–1.0 mm (0.02–0.04 in)	

ELECTRICAL

Unit: mm (in)

ITEM		SPECIFICATION		NOTE
Ignition timing		7° B.T.D.C. below 1 500 r/min.		E-18,33,39
		13° B.T.D.C. below 1 500 r/min.		The others
Firing order		1-2-4-3		
Spark plug		Type	NGK: CR9E ND: U27ESR-N	
		Gap	0.7-0.8 (0.028-0.032)	
Spark performance		Over 8 (0.3) at 1 atm.		
Signal coil resistance		(Black-Green) Approx. 135-200 Ω		Tester range: (x 100 Ω)
Ignition coil resistance		Primary	⊕ tap-⊖ tap Approx. 2.4-3.2 Ω	Tester range: (x 1 Ω)
		Secondary	Plug cap-Plug cap Approx. 30-40 kΩ	Tester range: (x 1 kΩ)
Generator		Slip ring O.D.	Limit: 14.0 (0.55)	ND
		Brush length	Limit: 4.5 (0.18)	
Generator Max. output		Approx. 405 W at 5 000 r/min		The rotation of the generator
Regulated voltage		Above 13.5 V at 5 000 r/min.		
Starter motor		Brush length	Limit: 9 (0.35)	ND
		Commutator under-cut	Limit: 0.2 (0.008)	
Starter relay resistance		3-5 Ω		
Battery	Type designation	YTX12-BS		
	Capacity	12 V 36 kC (10 Ah)/10 HR		
	Standard electrolyte S.G.	1.320 at 20°C (68°F)		
Fuse size	Headlight	HI	15 A	
		LO	15 A	
	Turn signal	15 A		
	Ignition	10 A		
	Taillight	10 A		
	Main	30 A		

WATTAGE

Unit: W

ITEM		SPECIFICATION		
		E-01,02,03, 24,28,33	E-04,15,16,17,18, 21,22,25,39,53	E-34
Headlight	HI	60 x 2	60 + 55	35 x 2
	LO	55 x 2	55	35 x 2
Position light		5	←	←
Tail/Brake light		5/21 x 2	←	←
Turn signal light		21	←	←
Tachometer light		1.7 x 2	←	←
Speedometer light		1.7	←	←

ITEM	SPECIFICATION		
	E-01,02,03, 24,28,33	E-04,15,16,17,18, 21,22,25,39,53	E-34
Turn signal indicator light	3	←	←
High beam indicator light	3	←	←
Neutral indicator light	3	←	←
Oil pressure indicator light	3	←	←
Fuel level indicator light	3	←	←

BRAKE + WHEEL

Unit: mm (in)

ITEM	STANDARD		LIMIT
Rear brake pedal height	65–75 (2.6–3.0)		—
Brake disc thickness	Front	5.0 ± 0.2 (0.197 ± 0.008)	4.5 (0.18)
	Rear	6.0 ± 0.2 (0.236 ± 0.008)	5.5 (0.22)
Brake disc runout (Front & Rear)	—		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 (0.4983–0.4993)	—
Brake caliper cylinder bore	Front	27.000–27.050 (1.0630–1.0650)	—
	Rear	38.180–38.256 (1.5031–1.5061)	—
Brake caliper piston diam.	Front	26.937–26.970 (1.0605–1.0618)	—
	Rear	38.098–38.148 (1.5000–1.5019)	—
Wheel rim runout (Front & Rear)	Axial	—	2.0 (0.08)
	Radial	—	2.0 (0.08)
Wheel axle runout	Front	—	0.25 (0.010)
	Rear	—	0.25 (0.010)
Tire size	Front	120/70 ZR17	—
	Rear	180/55 ZR17	—
Tire tread depth	Front	—	1.6 (0.06)
	Rear	—	2.0 (0.08)

SUSPENSION

Unit: mm (in)

ITEM	STANDARD	LIMIT	NOTE
Front fork stroke	120 (4.7)	—	
Front fork spring free length	—	278 (10.9)	
Front fork oil level	120 (4.7)	—	
Rear wheel travel	160 (6.3)	—	
Swingarm pivot shaft runout	—	0.3 (0.01)	

TIRE PRESSURE

COLD INFLATION TIRE PRESSURE	SOLO RIDING			DUAL RIDING		
	kPa	kg/cm ²	psi	kPa	kg/cm ²	psi
FRONT	230	2.30	33	230	2.30	33
REAR	250	2.50	36	250	2.50	36

FUEL + OIL + ENGINE COOLANT

ITEM	SPECIFICATION	NOTE
Fuel type	Use only unleaded gasoline of at least 87 pump octane ($\frac{R+M}{2}$) or 91 octane or higher rated by the research method. Gasoline containing MTBE (Methyl Tertiary Butyl Ether), less than 10% ethanol, or less than 5% methanol with appropriate cosolvents and corrosion inhibitor is permissible.	E-03,33
	Use only unleaded gasoline of at least 87 pump octane ($\frac{R+M}{2}$ method) or 91 octane or higher rated by the Research Method.	E-28
	Gasoline used should be graded 85-95 octane or higher. An unleaded gasoline is recommended.	The others
Fuel tank including reserve	21.0 L (5.5/4.6 US/Imp gal)	E-01 and others
	18.5 L (4.9/4.1 US/Imp gal)	E-33
	reserve 3.1 L (0.8/0.7 US/Imp gal)	
Engine oil type	SAE 10W/40, API SE or SF	
Engine oil capacity	Change 3 000 ml (3.2/2.6 US/Imp qt)	
	Filter change 3 300 ml (3.5/2.9 US/Imp qt)	
	Overhaul 3 900 ml (4.1/3.4 US/Imp qt)	
Front fork oil type	Fork oil L01	
Front fork oil capacity (each leg)	425 ml (14.4/15.0 US/Imp oz)	

ITEM	SPECIFICATION	NOTE
Brake fluid type	DOT 4	
Engine coolant type	Use an anti-freeze/coolant compatible with aluminum radiator, mixed with distilled water only, at the ratio of 50:50.	
Engine coolant including reserve	2 450 ml (2.6/2.2 US/Imp qt)	

E-03: U.S.A.

E-33: California (U.S.A.)

EMISSION CONTROL INFORMATION

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Part No.	Part Name	Part No.	Part Name	Part No.	Part Name
15-52	Carburetor	0-B	Idle Jet	0-B	Idle Jet
0-B	Idle Jet	0-B	Idle Jet	0-B	Idle Jet
0-B	Idle Jet	0-B	Idle Jet	0-B	Idle Jet
0-B	Idle Jet	0-B	Idle Jet	0-B	Idle Jet

The idle jet is preset by the factory utilizing special testing and adjusting procedures. The idle jet is not adjustable at the idle circuit is "sealed" after factory adjustment. Adjusting the idle jet will require replacement or resetting of any of the carburetor components may adversely affect carburetor performance and cause the motorcycle to exceed the exhaust emission level limits. If necessary, the idle jet or the carburetor adjusting requirements number with the carburetor should be replaced. Before the carburetor is replaced, the carburetor to first original condition or if unable to do so, contact the distributor for further technical information and assistance.

EMISSION CONTROL CARBURETOR COMPONENTS

GSX-R1100W motorcycles are equipped with precision, manufactured carburetors for emission level control.

These carburetors require special mixture control components and other precision adjustments to function properly.

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

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

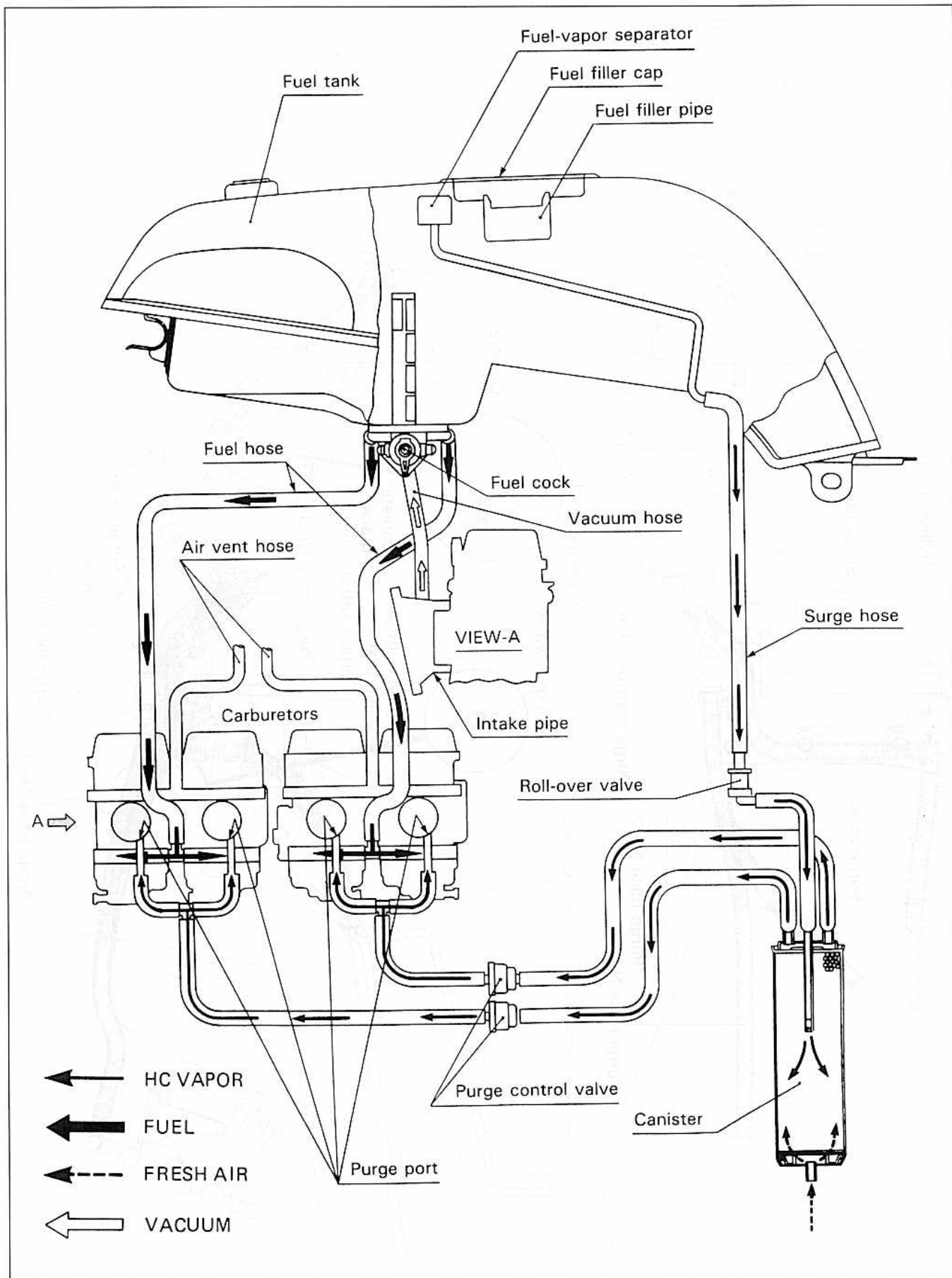
Conventional Figures Used on Standard Tolerance Jet Components	1	2	3	4	5	6	7	8	9	0
Emission Type Figures Used on Close Tolerance Jet Components	1	2	3	4	5	6	7	8	9	0

The carburetor specifications for the emission-controlled GSX-R1100W are as follows.

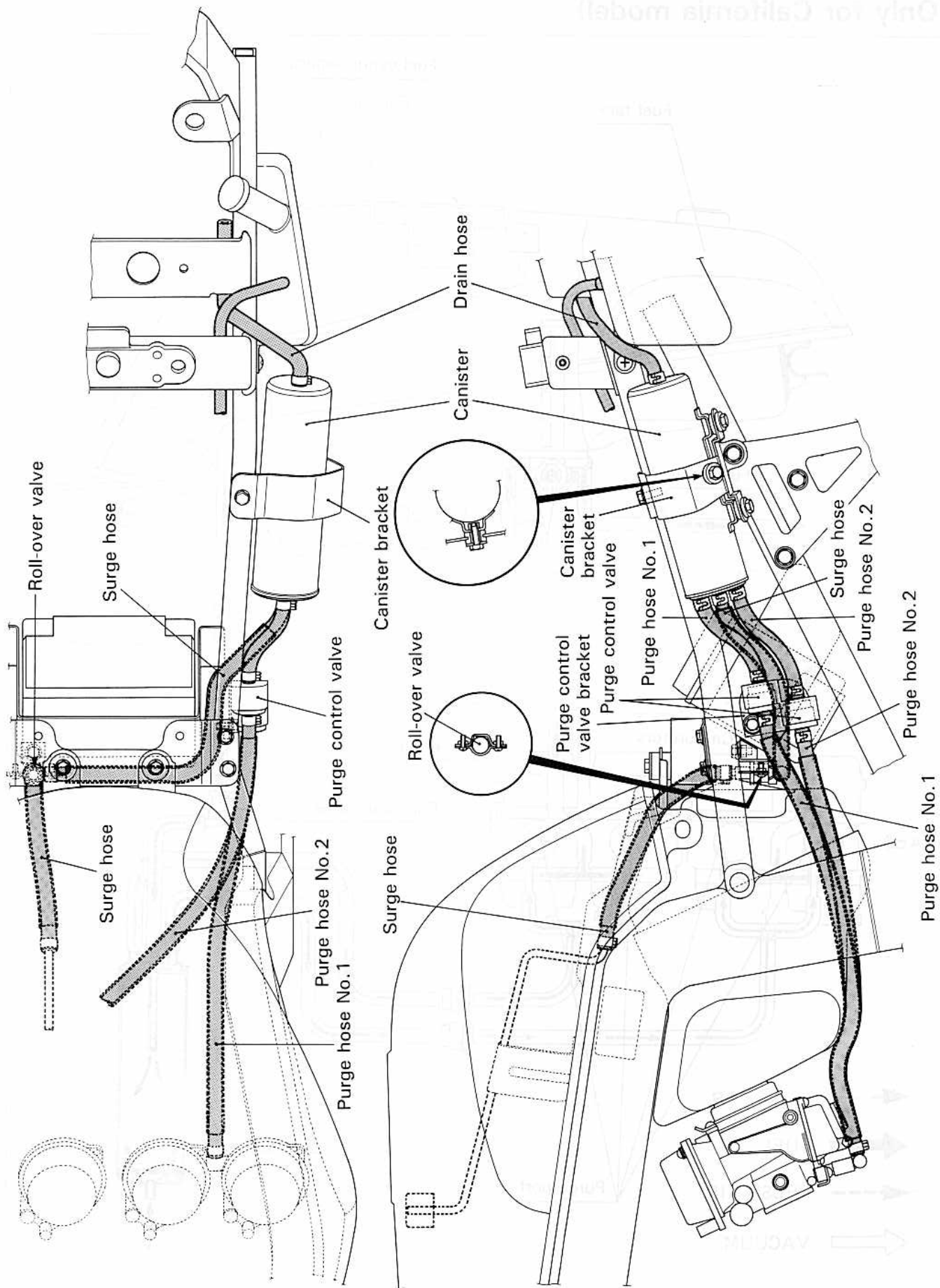
Carburetor I.D. No.	Main Jet	Needle Jet	Jet Needle	Pilot Jet	Pilot Screw
46E6 (California model only)	#122.5	0-8	5D62	#30	PRE-SET DO NOT ADJUST
46E1	#1&4 carbs: #127.5 #2&3 carbs: #125	0-8	5C34	#30	

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

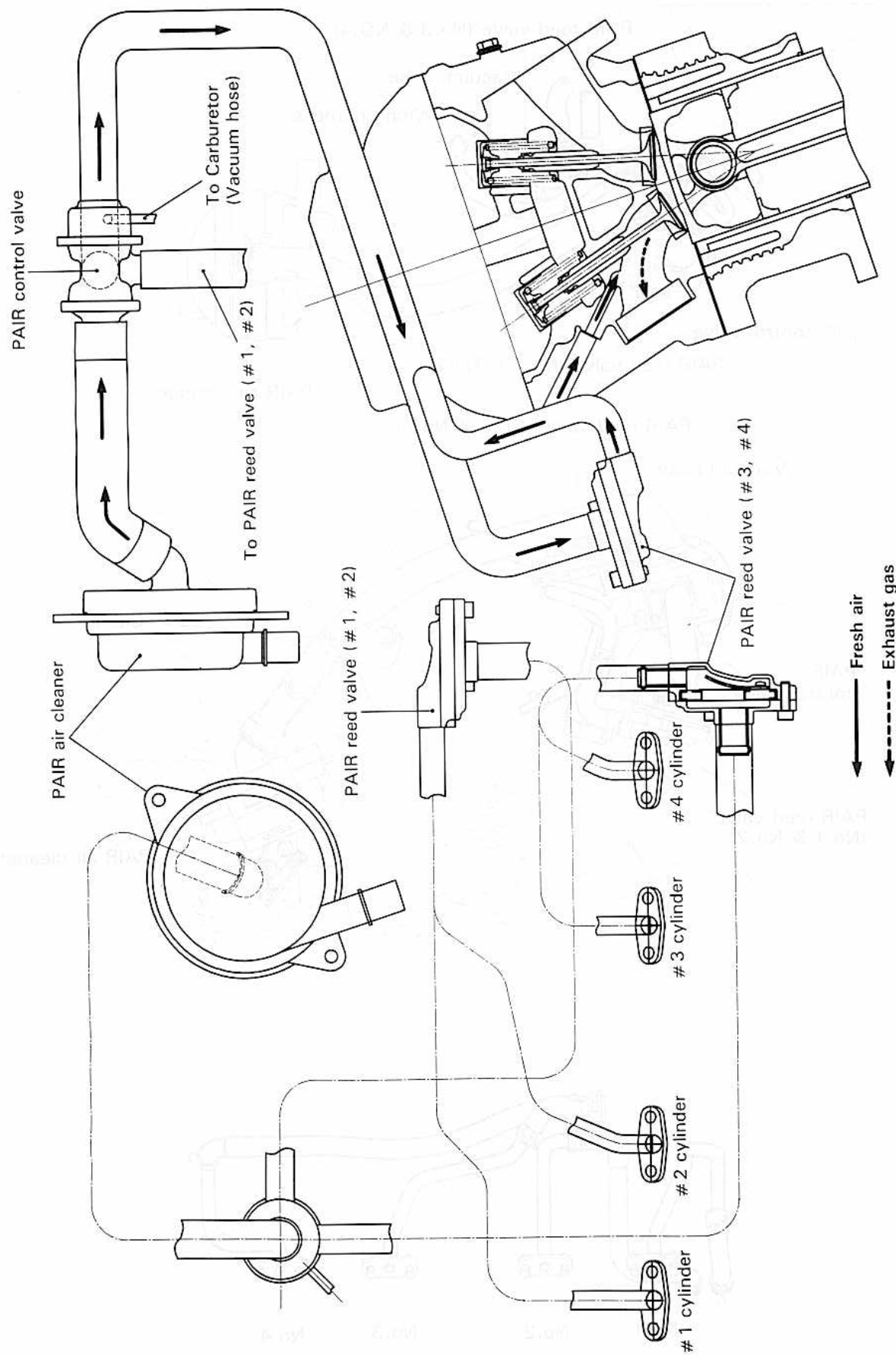
EVAPORATIVE EMISSION CONTROL SYSTEM (Only for California model)



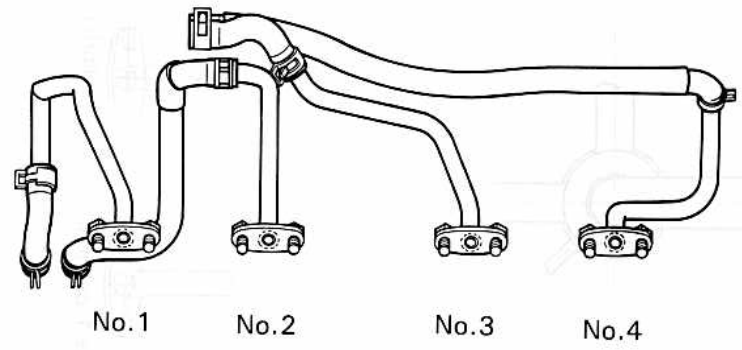
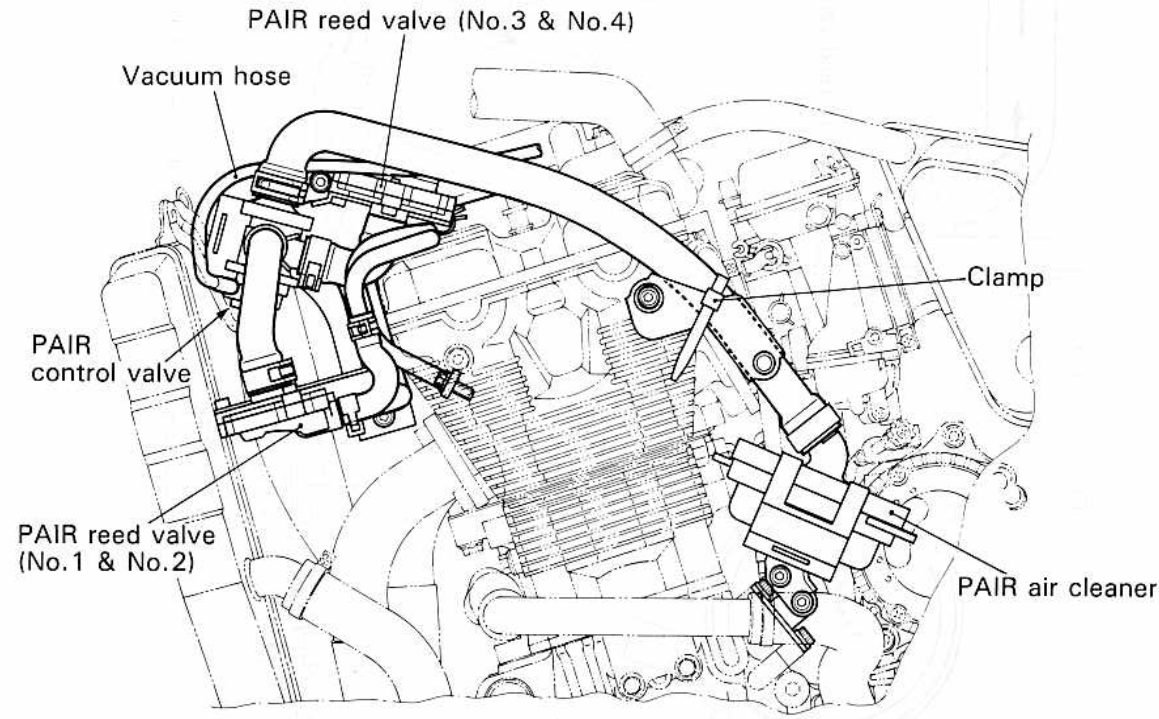
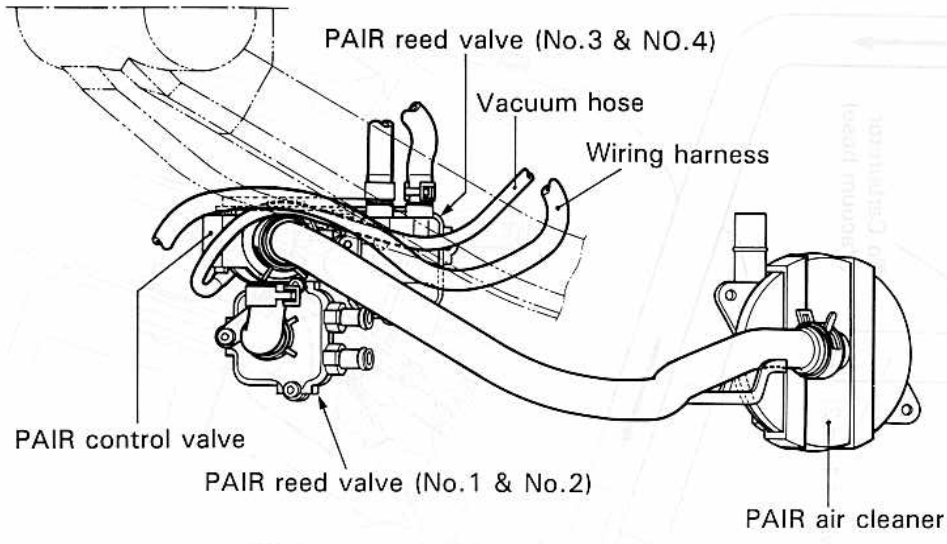
CANISTER HOSE ROUTING (Only for California model)



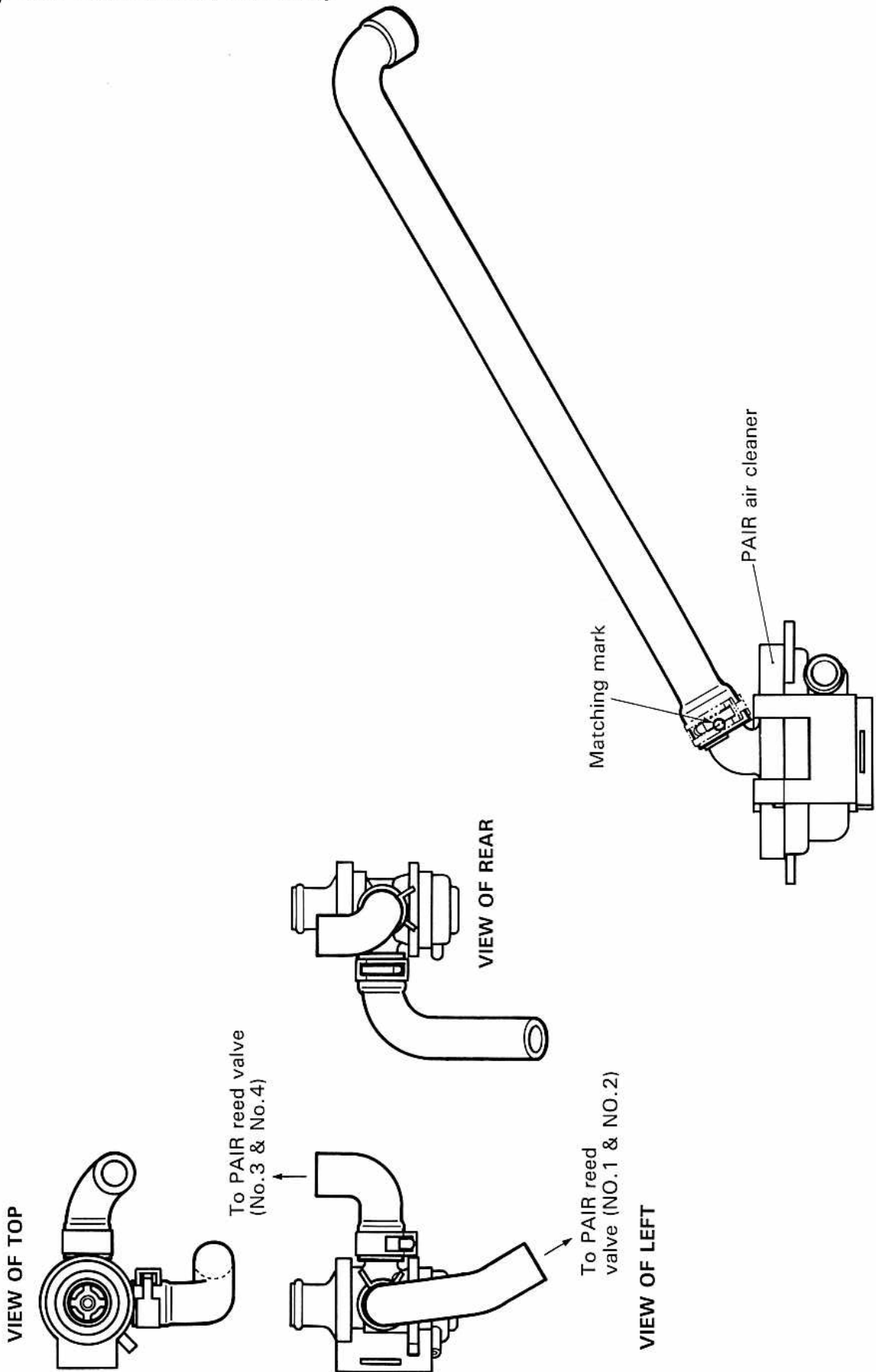
PAIR SYSTEM DIAGRAM (Only for California model)



PAIR HOSE ROUTING (Only for California model)



PAIR CONTROL VALVE AND PAIR AIR CLEANER INSTALLATION (Only for California model)



GSX-R1100WR ('94-MODEL)

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SPECIFICATIONS

DIMENSIONS AND DRY MASS

Overall length	2 130 mm (83.9 in) . . . E01,02,03,21,24,28,33,34,53
	2 115 mm (83.3 in) . . . E04
	2 245 mm (88.4 in) . . . E15,17,18,22,25,39
Overall width	755 mm (29.7 in)
Overall height	1 190 mm (46.9 in)
Wheelbase	1 485 mm (58.5 in)
Ground clearance	130 mm (5.1 in)
Seat height	815 mm (32.1 in)
Dry mass	231 kg (509 lbs) . . . Others
	233 kg (513 lbs) . . . E33, 18, 39

ENGINE

Type	Four-stroke, liquid-cooled, DOHC, TSCC
Number of cylinders	4
Valve clearance, IN	0.10—0.20 mm (0.004—0.008 in)
EX	0.20—0.30 mm (0.008—0.012 in)
Bore	75.5 mm (2.972 in)
Stroke	60.0 mm (2.362 in)
Piston displacement	1 074 cm ³ (65.5 cu. in)
Compression ratio	11.2:1
Carburetor	BST40, four . . . Others
	BST36, four . . . E03,18,33,39
Air cleaner	Non-woven fabric element
Starter system	Starter motor
Lubrication system	Wet sump

TRANSMISSION

Clutch	Wet multi-plate type
Transmission	5-speed constant mesh
Gearshift pattern	1-down, 4-up
Primary reduction ratio	1.565 (72/46)
Gear ratios, Low	2.714 (38/14)
2nd	1.809 (38/21)
3rd	1.409 (31/22)
4th	1.181 (26/22)
Top	1.038 (27/26)
Final reduction ratio	2.800 (42/15)
Drive chain	RK532GSV ₂ , 114 links

CHASSIS

Front suspension	Inverted telescopic, coil spring, spring preload adjustable, compression and rebound damping force adjustable
Rear suspension	Link type, coil spring, gas/oil damped, spring preload adjustable, compression and rebound damping force adjustable
Front suspension stroke	120 mm (4.7 in)
Rear wheel travel	160 mm (6.3 in)
Caster	65°10'
Trail	100 mm (3.9 in)
Steering angle	30° (right and left)
Turning radius	3.2 m (10.5 ft)
Front brake	Disc brake, twin, hydraulically operated
Rear brake	Disc brake, hydraulically operated
Front tire size	120/70 ZR17, tubeless
Rear tire size	180/55 ZR17, tubeless

ELECTRICAL

Ignition type	Transistorized
Ignition timing	13° B.T.D.C. below 1 500 r/min . . . Others
	7° B.T.D.C. below 1 500 r/min . . . E33, 18, 39
Spark plug	NGK CR9E or NIPPONDENSO U27ESR-N
Battery	12V 36.0 kC (10 Ah)/10 hr
Generator	Three-phase AC generator
Fuse	30/15/15/15/10/10A
Headlight	12V 60/55W x 2 pcs E01,02,03,24,28,33
	12V 60/55W + 12V 55W . . . E04,15,17,18,21,22,25,39,53
	12V 35/35W x 2pcs . . . E34
	12V 21W
Turn signal light	12V 5/21W x 2 pcs
Tail/Brake light	12V 1.7W
Speedometer light	12V 1.7W
Tachometer light	14V 3W
Neutral indicator light	14V 3W
High beam indicator light	14V 3W
Turn signal indicator light	14V 3W
Oil pressure indicator light	14V 3W
Fuel level indicator light	14V 3W

CAPACITIES

Fuel tank including reserve	21.0 L (5.5/4.6 US/Imp gal) . . . Others
	18.5 L (4.9/4.1 US/Imp gal) . . . E33
Reserve	3.1 L (0.8/0.7 US/Imp gal)
Engine oil, oil change	3 000 ml (3.2/2.6 US/Imp qt)
with filter change	3 300 ml (3.5/2.9 US/Imp qt)
overhaul	3 900 ml (4.1/3.4 US/Imp qt)
Engine coolant	2 450 ml (2.6/2.2 US/Imp qt)

SERVICE DATA

VALVE + GUIDE

Unit: mm (in)

ITEM	STANDARD		LIMIT
Valve diam.	IN.	31 (1.2)	—
	EX.	27 (1.1)	—
Valve lift	IN.	E-01,03 and others	8.7 (0.34)
		E-04	5.0 (0.20)
		E-18, 33,39	7.3 (0.29)
	EX.	E-01,03 and others	8.6 (0.34)
		E-04	7.0 (0.28)
		E-18, 33,39	7.0 (0.28)
Tappet clearance (when cold)	IN.	0.10–0.20 (0.004–0.008)	—
	EX.	0.20–0.30 (0.008–0.010)	—
Valve guide to valve stem clearance	IN.	0.020–0.047 (0.0008–0.0019)	—
	EX.	0.030–0.057 (0.0012–0.0022)	—
Valve stem deflection	IN. & EX.	—	0.35 (0.014)
Valve guide I.D.	IN. & EX.	4.500–4.512 (0.1772–0.1776)	—
Valve stem O.D.	IN.	4.465–4.480 (0.1758–0.1764)	—
	EX.	4.455–4.470 (0.1754–0.1760)	—
Valve stem runout	IN. & EX.	—	0.05 (0.002)
Valve head thickness	IN. & EX.	—	0.5 (0.02)
Valve seat width	IN. & EX.	0.8–1.2 (0.031–0.047)	—
Valve head radial runout	IN. & EX.	—	0.03 (0.001)
Valve spring free length (IN. & EX.)	—		40.4 (1.59)
Valve spring tension (IN. & EX.)	18.6–21.4 kg (41.0–47.2 lbs) at length 36 mm (1.4 in)		—

CAMSHAFT + CYLINDER HEAD

Unit: mm (in)

ITEM	STANDARD		LIMIT	
Cam height	IN.	E-01,03 and others	36.692–36.748 (1.4446–1.4468)	36.40 (1.433)
		E-04	32.992–33.048 (1.2989–1.3011)	32.70 (1.287)
		E-18, 33,39	35.292–35.348 (1.3894–1.3917)	35.00 (1.378)
	EX.	E-01,03 and others	36.612–36.668 (1.4414–1.4436)	36.32 (1.430)
		E-04	34.952–35.008 (1.3761–1.3783)	34.66 (1.365)
		E-18, 33,39	34.952–35.008 (1.3761–1.3783)	34.66 (1.365)
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)	—	
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")	13th pin		—	
Cylinder head distortion	—		0.20 (0.008)	

CYLINDER + PISTON + PISTON RING

Unit: mm (in)

ITEM	STANDARD		LIMIT	
Compression pressure	1 000–1 500 kPa (10–15 kg/cm ²) (142–213 psi)		800 kPa (8 kg/cm ²) (114psi)	
Compression pressure difference	—		200 kPa (2 kg/cm ²) (28 psi)	
Piston to cylinder clearance	0.070–0.080 (0.0028–0.0031)		0.120 (0.0047)	
Cylinder bore	75.500–75.515 (2.9724–2.9730)		75.560 (2.9748)	
Piston diam.	75.425–75.440 (2.9695–2.9701) Measure at 15 mm (0.6 in) from the skirt end.		75.380 (2.9677)	
Cylinder distortion	—		0.20 (0.008)	
Piston ring free end gap	1st	R	Approx. 11.2 (0.44)	8.9 (0.35)
	2nd	R	Approx. 8.6 (0.34)	6.8 (0.27)
Piston ring end gap	1st	0.20–0.30 (0.008–0.012)		0.5 (0.02)
	2nd	0.20–0.30 (0.008–0.012)		0.5 (0.02)

ITEM	STANDARD		LIMIT
Piston ring to groove clearance	1st	—	0.18 (0.007)
	2nd	—	0.18 (0.007)
Piston ring groove width	1st	1.03–1.05 (0.040–0.041)	—
	2nd	1.03–1.05 (0.040–0.041)	—
	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)	—
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 (0.010)
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.	33.976–34.000 (1.3376–1.3386)		—
Crankshaft thrust clearance	0.055–0.110 (0.0022–0.0043)		—
Crankshaft thrust bearing thickness	Right side	2.425–2.450 (0.0955–0.0965)	—
	Left side	2.350–2.500 (0.0925–0.0984)	—
Crankshaft runout	—		0.05 (0.002)

OIL PUMP

ITEM	STANDARD	LIMIT
Oil pump reduction ratio	1.703 (72/46 x 37/34)	—

ITEM	STANDARD	LIMIT
Oil pressure (at 60°C, 140°F)	Above 300 kPa (3.0 kg/cm ² , 43 psi) Below 600 kPa (6.0 kg/cm ² , 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)
Drive plate distortion	—	0.10 (0.004)
Clutch spring free height	—	3.1 (0.12)
Clutch master cylinder bore	14.000–14.043 (0.5511–0.5529)	—
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)	—

THERMOSTAT + RADIATOR + FAN

ITEM	STANDARD	LIMIT	
Thermostat valve opening temperature	74.5–78.5°C (166.1–173.3°F)	—	
Thermostat valve lift	Over 7 mm (0.28 in) at 90°C (194°F)	—	
Radiator cap valve opening pressure	110 kPa (1.1 kg/cm ² , 15.6 psi)	—	
Cooling fan thermo-switch operating temperature	ON	Approx. 105°C (221°F)	—
	OFF	Approx. 100°C (212°F)	—
Engine coolant temperature gauge resistance	50°C (122°F)	Approx. 153.9 Ω	—
	80°C (176°F)	Approx. 51.9 Ω	—
	100°C (212°F)	Approx. 27.4 Ω	—
	120°C (248°F)	Approx. 16.1 Ω	—

TRANSMISSION + DRIVE CHAIN

Unit: mm (in) Except ratio

ITEM	STANDARD	LIMIT	
Primary reduction ratio	1.565 (72/46)	—	
Final reduction ratio	2.800 (42/15)	—	
Gear ratios	Low	2.714 (38/14)	—
	2nd	1.809 (38/21)	—
	3rd	1.409 (31/22)	—
	4th	1.181 (26/22)	—
	Top	1.038 (27/26)	—

ITEM	STANDARD		LIMIT
Shift fork to groove clearance	0.10–0.30 (0.004–0.012)		0.50 (0.020)
Shift fork groove width	5.00–5.10 (0.197–0.201)		—
Shift fork thickness	4.80–4.90 (0.189–0.193)		—
Drive chain	Type	RK532GSV ₂	
	Links	114 links, ENDLESS	
	20-pitch length	—	319.4 (12.6)
Drive chain slack	25–35 (1.0–1.4)		—
Gearshift lever height	65–75 (2.6–3.0)		—

CARBURETOR

ITEM	SPECIFICATION	
	E-03	E-33
Carburetor type	MIKUNI BST36SS	←
Bore size	36 mm	←
I.D. No.	46E1	46E6
Idle r/min.	1 100 ± 100 r/min	1 200 ± 50 r/min
Float height	14.7 mm (0.58 in)	
Main jet (M.J.)	#1&4: (#127.5), #2&3: (#125)	#122.5
Main air jet (M.A.J.)	0.5	←
Jet needle (J.N.)	5C34	5D62
Needle jet (N.J.)	□-B	←
Throttle valve (Th.V.)	#125	←
Pilot jet (P.J.)	#30	←
By-pass (B.P.)	#1,2&3: 0.8 mm	#1,2,3&4: 0.8 mm
Pilot outlet (P.O.)	0.8 mm	←
Valve seat (V.S.)	2.3 mm	←
Starter jet (G.S.)	#42.5	←
Pilot screw (P.S.)	PRE-SET	PRE-SET
Throttle cable play	0.5–1.0 mm (0.02–0.04 in)	

ITEM	SPECIFICATION			
	E-25,28,34,53	E-17,21,22	E-04	E-15,16,24
Carburetor type	MIKUNI BST40SS	←	←	←
Bore size	40 mm	←	←	←
I.D. No.	46E0	46E3	46E2	46EA
Idle r/min.	1 100 ± 100 r/min	←	←	←
Float height	14.7 mm (0.58 in)			
Main jet (M.J.)	#1,2&4: (#125) #3: (#127.5)	#1&4: (#132.5) #2&3: (#130)	#127.5	#1,2&4: (#125) #3: (#127.5)
Main air jet (M.A.J.)	2.0 mm	←	←	←

ITEM	SPECIFICATION			
	E-25,28,34,53	E-17,21,22	E-04	E-15,16,24
Jet needle (J.N.)	6ZD13-2nd	6ZD19-3rd	6ZD20-4th	6ZD20-3rd
Needle jet (N.J.)	P-2	←	←	←
Throttle valve (Th.V.)	# 120	←	←	←
Pilot jet (P.J.)	# 40	←	←	←
By-pass (B.P.)	# 1,2,3 & 4: 0.8 mm	←	←	←
Pilot outlet (P.O.)	0.8 mm	←	←	←
Valve seat (V.S.)	2.5 mm	←	←	←
Starter jet (G.S.)	# 40	←	←	←
Pilot screw (P.S.)	PRE-SET (2 turns out)	PRE-SET (1-5/8 turns out)	PRE-SET (1-3/4 turns out)	PRE-SET (1-5/8 turns out)
Pilot air jet (P.A.J.)	1.2 mm	1.15 mm	←	←
Throttle cable play	0.5–1.0 mm (0.02–0.04 in)			

ITEM	SPECIFICATION			
	E-01	E-02	E-18	E-39
Carburetor type	BST40SS	←	BST36SS	←
Bore size	40 mm	←	36 mm	←
I.D. No.	46E8	46E9	46E4	46E7
Idle r/min.	1 100 ± 100 r/min.	←	1200 ± ¹⁰⁰ / ₅₀ r/min.	1200 ± 100 r/min.
Float height	14.7 mm (0.58 in)			
Main jet (M.J.)	# 1,2&4: (# 125), # 3: (# 127.5)	# 127.5	←	# 122.5
Main air jet (M.A.J.)	2.0 mm	←	1.5 mm	←
Jet needle (J.N.)	6ZD19-3rd	←	5D44-2nd	5D51-3rd
Needle jet (N.J.)	P-2	←	O-9	O-8
Throttle valve (Th.V.)	# 120	←	# 125	←
Pilot jet (P.J.)	# 40	←	# 30	←
By-pass (B.P.)	# 1,2,3 & 4: 0.8 mm	←	# 1,2 & 3: 0.8 mm	←
Pilot outlet (P.O.)	0.8 mm	←	0.7 mm	←
Valve seat (V.S.)	2.5 mm	←	2.3 mm	←
Stater jet (G.S.)	# 40	←	# 42.5	←
Pilot screw (P.S.)	PRE-SET (2 turns out)	PRE-SET (1-3/4 turns out)	PRE-SET (1-1/2 turns out)	←
Pilot air jet (P.A.J.)	1.2 mm	1.15 mm	1.3 mm	←
Throttle cable play	0.5–1.0 mm (0.02–0.04 in)			

ELECTRICAL

Unit: mm (in)

ITEM		SPECIFICATION		NOTE
Ignition timing		7° B.T.D.C. below 1 500 r/min.		E-18,33,39
		13° B.T.D.C. below 1 500 r/min.		The others
Firing order		1-2-4-3		
Spark plug		Type	NGK: CR9E ND: U27ESR-N	
		Gap	0.7-0.8 (0.028-0.032)	
Spark performance		Over 8 (0.3) at 1 atm.		
Signal coil resistance		(Black-Green) Approx. 135-200 Ω		Tester range: (x 100 Ω)
Ignition coil resistance		Primary	⊕ tap - ⊖ tap Approx. 2.4-3.2 Ω	Tester range: (x 1 Ω)
		Secondary	Plug cap-Plug cap Approx. 30-40 kΩ	Tester range: (x 1 kΩ)
Generator		Slip ring O.D.	Limit: 14.0 (0.55)	ND
		Brush length	Limit: 4.5 (0.18)	
Generator Max. output		Approx. 405 W at 5 000 r/min		The rotation of the generator
Regulated voltage		Above 13.5 V at 5 000 r/min.		
Starter motor		Brush length	Limit: 9 (0.35)	ND
		Commutator under-cut	Limit: 0.2 (0.008)	
Starter relay resistance		3-5 Ω		
Battery	Type designation	YTX12-BS		
	Capacity	12 V 36 kC (10 Ah)/10 HR		
	Standard electrolyte S.G.	1.320 at 20°C (68°F)		
Fuse size	Headlight	HI	15 A	
		LO	15 A	
	Turn signal		15 A	
	Ignition		10 A	
	Taillight		10 A	
	Main		30 A	

WATTAGE

Unit: W

ITEM		SPECIFICATION		
		E-01,02,03, 24,28,33	E-04,15,16,17,18, 21,22,25,39,53	E-34
Headlight	HI	60 x 2	60 + 55	35 x 2
	LO	55 x 2	55	35 x 2
Position light		5	←	←
Tail/Brake light		5/21 x 2	←	←
Turn signal light		21	←	←
Tachometer light		1.7 x 2	←	←
Speedometer light		1.7	←	←

ITEM	SPECIFICATION		
	E-01,02,03, 24,28,33	E-04,15,16,17,18, 21,22,25,39,53	E-34
Turn signal indicator light	3	←	←
High beam indicator light	3	←	←
Neutral indicator light	3	←	←
Oil pressure indicator light	3	←	←
Fuel level indicator light	3	←	←

BRAKE + WHEEL

Unit: mm (in)

ITEM	STANDARD		LIMIT
Rear brake pedal height	65—75 (2.6—3.0)		—
Brake disc thickness	Front	5.0 ± 0.2 (0.197 ± 0.008)	4.5 (0.18)
	Rear	6.0 ± 0.2 (0.236 ± 0.008)	5.5 (0.22)
Brake disc runout (Front & Rear)	—		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—0.4993)	—
Brake caliper cylinder bore	Front	27.000—27.050 (1.0630—1.0650)	—
	Rear	38.180—38.256 (1.5031—1.5061)	—
Brake caliper piston diam.	Front	26.937—26.970 (1.0605—1.0618)	—
	Rear	38.098—38.148 (1.5000—1.5019)	—
Wheel rim runout (Front & Rear)	Axial	—	2.0 (0.08)
	Radial	—	2.0 (0.08)
Wheel axle runout	Front	—	0.25 (0.010)
	Rear	—	0.25 (0.010)
Tire size	Front	120/70 ZR17	—
	Rear	180/55 ZR17	—
Tire tread depth	Front	—	1.6 (0.06)
	Rear	—	2.0 (0.08)

SUSPENSION

Unit: mm (in)

ITEM	STANDARD	LIMIT	NOTE
Front fork stroke	120 (4.7)	—	
Front fork spring free length	—	278 (10.9)	
Front fork oil level	120 (4.7)	—	
Rear wheel travel	160 (6.3)	—	
Swingarm pivot shaft runout	—	0.3 (0.01)	

TIRE PRESSURE

COLD INFLATION TIRE PRESSURE	SOLO RIDING			DUAL RIDING		
	kPa	kg/cm ²	psi	kPa	kg/cm ²	psi
FRONT	230	2.30	33	230	2.30	33
REAR	250	2.50	36	250	2.50	36

FUEL + OIL + ENGINE COOLANT

ITEM	SPECIFICATION	NOTE
Fuel type	Use only unleaded gasoline of at least 87 pump octane ($\frac{R+M}{2}$) or 91 octane or higher rated by the research method. Gasoline containing MTBE (Methyl Tertiary Butyl Ether), less than 10% ethanol, or less than 5% methanol with appropriate cosolvents and corrosion inhibitor is permissible.	E-03,33
	Use only unleaded gasoline of at least 87 pump octane ($\frac{R+M}{2}$ method) or 91 octane or higher rated by the Research Method.	E-28
	Gasoline used should be graded 85-95 octane or higher. An unleaded gasoline is recommended.	The others
Fuel tank including reserve	21.0 L (5.5/4.6 US/Imp gal)	E-01 and others
	18.5 L (4.9/4.1 US/Imp gal)	E-33
	reserve 3.1 L (0.8/0.7 US/Imp gal)	
Engine oil type	SAE 10W/40, API SE or SF	
Engine oil capacity	Change 3 000 ml (3.2/2.6 US/Imp qt)	
	Filter change 3 300 ml (3.5/2.9 US/Imp qt)	
	Overhaul 3 900 ml (4.1/3.4 US/Imp qt)	
Front fork oil type	Fork oil L01	
Front fork oil capacity (each leg)	425 ml (14.4/15.0 US/Imp oz)	

ITEM	SPECIFICATION	NOTE
Brake fluid type	DOT 4	
Engine coolant type	Use an anti-freeze/coolant compatible with aluminum radiator, mixed with distilled water only, at the ratio of 50:50.	
Engine coolant including reserve	2 450 ml (2.6/2.2 US/Imp qt)	

GSX-R1100WS ('95-MODEL)

FOREWORD

This section describes service data, service specifications and servicing procedures which differ from those of the GSX-R1100WR ('94-model).

NOTE:

- Any differences between GSX-R1100WR ('94-model) and GSX-R1100WS ('95-model) in specifications and service data are clearly indicated with the asterisk marks (*).
- Please refer to the sections 1 through 10 for details which are not given in this section.

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SPECIFICATIONS

DIMENSIONS AND DRY MASS

Overall length	2 130 mm (83.9 in)	For E-02, 03, 24, 28, 33, 34 models
	2 115 mm (83.3 in)	For E-04 model
	2 245 mm (88.4 in)	For E-18, 22, 39 models
	* 2 155 mm (84.8 in)	For E-25 model
Overall width	755 mm (29.7 in)	
Overall height	1 190 mm (46.9 in)	
Wheelbase	1 485 mm (58.5 in)	
Ground clearance	130 mm (5.1 in)	
Dry mass	* 222 kg (489 lbs)	For E-18, 39 models
	* 223 kg (491 lbs)	For E-33 model
	* 221 kg (487 lbs)	For other models

ENGINE

Type	Four-stroke, Water-cooled, DOHC, TSCC
Number of cylinders	4
Bore	75.5 mm (2.972 in)
Stroke	60.0 mm (2.362 in)
Piston displacement	1074 cm ³ (65.5 cu. in)
Carburetor	MIKUNI BST36 E-03, 18, 33, 39 MIKUNI BST40 For other models
Air cleaner	Non-woven fabric element
Starter system	Electric starter
Lubrication system	Wet sump

TRANSMISSION

Clutch	Wet multi-plate type
Transmission	5-speed constant mesh
Gearshift pattern	1-down, 4-up
Primary reduction ratio	1.565 (72/46)
Final reduction ratio	* 2.750 (44/16)
Gear ratios, Low	2.714 (38/14)
2nd	1.809 (38/21)
3rd	1.409 (31/22)
4th	1.181 (26/22)
5th	1.038 (27/26)
Drive chain	* TAKASAGO RK532GSV ₂ , 116 links

CHASSIS

Front suspension	Inverted telescopic, coil spring, oil damped, spring pre-load adjustable, rebound and compression damping force adjustable.
Rear suspension	Link type system, gas/oil damped, coil spring, spring pre-load adjustable, rebound and compression force adjustable.
Steering angle	30° (right & left)
Caster	65° 10'
Trail	100 mm (3.9 in)
Turning radius	3.2 m (10.5 ft)
Front brake	Disc brake, twin
Rear brake	Disc brake
Front tire size	120/70 ZR17, tubeless
Rear tire size	180/55 ZR17, tubeless
Front fork stroke	120 mm (4.7 in)
Rear wheel travel	160 mm (6.3 in)

ELECTRICAL

Ignition type	Electronic ignition (Fully Transistorized)
Ignition timing	* 4° B.T.D.C. at 1500 r/min For E-03, 18, 33, 39 models
	* 7° B.T.D.C. at 1500 r/min For other models
Spark plug	N.G.K.: CR9E NIPPONDENSO U27ESR-N
Battery	12V 36.0 kC (10 Ah)/10 HR
Generator	Three-phase A.C. Generator
Main fuse	30A
Fuse	15/15/10/15/10A
Headlight	12V 60/55W x 2 E-02, 03, 24, 28, 33 models
	12V 60/55W + 12V 55W..... E-04, 18, 22, 25, 34, 37, 39 models
Turn signal light	12V 21W
Front position light	12V 5W Except for E-03, 24, 28, 33 models
Tail/Brake light	12V 5/21W x 2
Speedometer light	12V 1.7W x 2
Tachometer light	12V 1.7W x 2
Neutral indicator light	14V 3W
High beam indicator light	14V 3W
Turn signal indicator light	14V 3W
Oil pressure indicator light	14V 3W
Fuel level indicator light.....	14V 3W

CAPACITIES

Fuel tank, including reserve	21.0 L (5.5/4.6 US/lmp gal)
Engine oil, oil change	3 000 ml (3.2/2.6 US/lmp qt)
with filter change	3 300 ml (3.5/2.9 US/lmp qt)
overhaul	3 900 ml (4.1/3.4 US/lmp qt)
Front fork oil	* 548 ml (18.5/19.3 US/lmp oz)
Coolant	2 450 ml (2.6/2.2 US/lmp qt)

These specifications are subject to change without notice.

SERVICE DATA

VALVE + GUIDE

Unit: mm (in)

ITEM	STANDARD		LIMIT	
Valve diam.	IN.	31 (1.2)	—	
	EX.	27 (1.1)	—	
Valve lift	IN.	E-01,03 and others	8.7 (0.34)	—
		E-04	5.0 (0.20)	—
		E-18, 33,39	7.3 (0.29)	—
	EX.	E-01,03 and others	* 8.2 (0.32)	—
		E-04	7.0 (0.28)	—
		E-18, 33,39	7.0 (0.28)	—
Tappet clearance (when cold)	IN.	0.10–0.20 (0.004–0.008)	—	
	EX.	0.20–0.30 (0.008–0.010)	—	
Valve guide to valve stem clearance	IN.	0.020–0.047 (0.0008–0.0019)	—	
	EX.	0.030–0.057 (0.0012–0.0022)	—	
Valve stem deflection	IN. & EX.	—	0.35 (0.014)	
Valve guide I.D.	IN. & EX.	4.500–4.512 (0.1772–0.1776)	—	
Valve stem O.D.	IN.	4.465–4.480 (0.1758–0.1764)	—	
	EX.	4.455–4.470 (0.1754–0.1760)	—	
Valve stem runout	IN. & EX.	—	0.05 (0.002)	
Valve head thickness	IN. & EX.	—	0.5 (0.02)	
Valve seat width	IN. & EX.	0.8–1.2 (0.031–0.047)	—	
Valve head radial runout	IN. & EX.	—	0.03 (0.001)	
Valve spring free length (IN. & EX.)	—		40.4 (1.59)	
Valve spring tension (IN. & EX.)	18.6–21.4 kg (41.0–47.2 lbs) at length 36 mm (1.4 in)		—	

CAMSHAFT + CYLINDER HEAD

Unit: mm (in)

ITEM	STANDARD		LIMIT	
Cam height	IN.	E-01,03 and others	36.692–36.748 (1.4446–1.4468)	36.40 (1.433)
		E-04	32.992–33.048 (1.2989–1.3011)	32.70 (1.287)
		E-18, 33,39	35.292–35.348 (1.3894–1.3917)	35.00 (1.378)
	EX.	E-01,03 and others	*36.222–36.278 (1.4260–1.4282)	35.93 (1.414)
		E-04	34.952–35.008 (1.3761–1.3783)	34.66 (1.365)
		E-18, 33,39	34.952–35.008 (1.3761–1.3783)	34.66 (1.365)
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)	—	
Camshaft journal O.D.	IN. & EX.	21.959–21.980 (0.8645–0.8654)	—	
Camshaft runout	IN. & EX	—	0.10 (0.004)	
Cam chain pin (at arrow "3")	13th pin		—	
Cylinder head distortion	—		0.20 (0.008)	

CYLINDER + PISTON + PISTON RING

Unit: mm (in)

ITEM	STANDARD		LIMIT	
Compression pressure	1 000–1 500 kPa (10–15 kg/cm ²) (142–213 psi)		800 kPa (8 kg/cm ²) (114psi)	
Compression pressure difference	—		200 kPa (2 kg/cm ²) (28 psi)	
Piston to cylinder clearance	* 0.040–0.050 (0.0016–0.0020)		0.120 (0.0047)	
Cylinder bore	75.500–75.515 (2.9724–2.9730)		* 75.590 (2.9760)	
Piston diam.	* 75.455–75.470 (2.9707–2.9713) Measure at 15 mm (0.6 in) from the skirt end.		75.380 (2.9677)	
Cylinder distortion	—		0.20 (0.008)	
Piston ring free end gap	1st	R	Approx. 11.2 (0.44)	8.9 (0.35)
	2nd	R	Approx. 8.6 (0.34)	6.8 (0.27)
Piston ring end gap	1st		0.20–0.30 (0.008–0.012)	0.5 (0.02)
	2nd		0.20–0.30 (0.008–0.012)	0.5 (0.02)

ITEM	STANDARD		LIMIT
Piston ring to groove clearance	1st	—	0.18 (0.007)
	2nd	—	0.18 (0.007)
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)	—
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 (0.010)
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.	33.976–34.000 (1.3376–1.3386)		—
Crankshaft thrust clearance	0.055–0.110 (0.0022–0.0043)		—
Crankshaft thrust bearing thickness	Right side	2.425–2.450 (0.0955–0.0965)	—
	Left side	2.350–2.500 (0.0925–0.0984)	—
Crankshaft runout	—		0.05 (0.002)

OIL PUMP

ITEM	STANDARD	LIMIT
Oil pump reduction ratio	1.703 (72/46 x 37/34)	—

ITEM	STANDARD	LIMIT
Oil pressure (at 60°C, 140°F)	Above 300 kPa (3.0 kg/cm ² , 43 psi) Below 600 kPa (6.0 kg/cm ² , 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)
Drive plate distortion	—	0.10 (0.004)
Clutch spring free height	—	3.1 (0.12)
Clutch master cylinder bore	14.000–14.043 (0.5511–0.5529)	—
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)	—

THERMOSTAT + RADIATOR + FAN

ITEM	STANDARD	LIMIT	
Thermostat valve opening temperature	74.5–78.5°C (166.1–173.3°F)	—	
Thermostat valve lift	Over 7 mm (0.28 in) at 90°C (194°F)	—	
Radiator cap valve opening pressure	110 kPa (1.1 kg/cm ² , 15.6 psi)	—	
Cooling fan thermo-switch operating temperature	ON	Approx. 105°C (221°F)	—
	OFF	Approx. 100°C (212°F)	—
Engine coolant temperature gauge resistance	50°C (122°F)	Approx. 153.9 Ω	—
	80°C (176°F)	Approx. 51.9 Ω	—
	100°C (212°F)	Approx. 27.4 Ω	—
	120°C (248°F)	Approx. 16.1 Ω	—

TRANSMISSION + DRIVE CHAIN

Unit: mm (in) Except ratio

ITEM	STANDARD	LIMIT	
Primary reduction ratio	1.565 (72/46)	—	
Final reduction ratio	*2.750 (44/16)	—	
Gear ratios	Low	2.714 (38/14)	—
	2nd	1.809 (38/21)	—
	3rd	1.409 (31/22)	—
	4th	1.181 (26/22)	—
	Top	1.038 (27/26)	—

ITEM	STANDARD		LIMIT
Shift fork to groove clearance	0.10–0.30 (0.004–0.012)		0.50 (0.020)
Shift fork groove width	5.00–5.10 (0.197–0.201)		—
Shift fork thickness	4.80–4.90 (0.189–0.193)		—
Drive chain	Type	RK532GSV ₂	—
	Links	*116 links, ENDLESS	—
	20-pitch length	—	319.4 (12.6)
Drive chain slack	25–35 (1.0–1.4)		—
Gearshift lever height	65–75 (2.6–3.0)		—

*** CARBURETOR**

ITEM	SPECIFICATION	
	E-03	E-33
Carburetor type	MIKUNI BST36SS	←
Bore size	36 mm	←
I.D. No.	46EC	46EJ
Idle r/min.	1 100 ⁺¹⁰⁰ ₋₅₀ r/min.	1 200 ⁺¹⁰⁰ ₋₅₀ r/min.
Float height	14.7 mm (0.58 in)	
Main jet (M.J.)	#1&4: (#117.5), #2&3: (#120)	#117.5
Main air jet (M.A.J.)	0.5 mm	←
Jet needle (J.N.)	5D75	5D62
Needle jet (N.J.)	□-BM	←
Throttle valve (Th.V.)	#115	#125
Pilot jet (P.J.)	#30	←
By-pass (B.P.)	#1,2&3: 0.8 mm	#1,2,3&4: 0.8 mm
Pilot outlet (P.O.)	0.8 mm	0.9 mm
Valve seat (V.S.)	2.3 mm	←
Starter jet (G.S.)	#40	←
Pilot screw (P.S.)	PRE-SET	PRE-SET
Throttle cable play	0.5–1.0 mm (0.02–0.04 in)	

ITEM	SPECIFICATION			
	E-24,25,28,34	E-22	E-04	E-37
Carburetor type	MIKUNI BST40SS	←	←	←
Bore size	40 mm	←	←	←
I.D. No.	46EH	46EF	46ED	46EL
Idle r/min.	1 100 ± 100 r/min	←	←	←
Float height	14.7 mm (0.58 in)			
Main jet (M.J.)	#1&4: (#122.5) #2&3: (#125)	#127.5	#1&4: (#122.5) #2&3: (#125)	←
Main air jet (M.A.J.)	2.0 mm	←	←	←

ITEM	SPECIFICATION			
	E-24,25,28,34	E-22	E-04	E-37
Jet needle (J.N.)	6ZD13-4th	←	6ZD21-3rd	6ZD13-4th
Needle jet (N.J.)	P-2	←	←	←
Throttle valve (Th.V.)	# 120	←	←	←
Pilot jet (P.J.)	# 40	←	←	←
By-pass (B.P.)	# 1,2,3 & 4: 0.8 mm	←	←	←
Pilot outlet (P.O.)	0.8 mm	←	←	←
Valve seat (V.S.)	2.5 mm	←	←	←
Starter jet (G.S.)	# 37.5	←	←	←
Pilot screw (P.S.)	PRE-SET (1- $\frac{5}{8}$ turns out)	←	PRE-SET (1- $\frac{3}{4}$ turns out)	PRE-SET (1- $\frac{5}{8}$ turns out)
Pilot air jet (P.A.J.)	1.2 mm	←	←	←
Throttle cable play	0.5–1.0 mm (0.02–0.04 in)			

ITEM	SPECIFICATION		
	E-02	E-18	E-39
Carburetor type	BST40SS	BST36SS	←
Bore size	40 mm	36 mm	←
I.D. No.	46EB	46EE	46EK
Idle r/min.	1 100 ± 100 r/min.	1 200 \pm $\frac{100}{50}$ r/min.	1 200 ± 100 r/min.
Float height	14.7 mm (0.58 in)		
Main jet (M.J.)	# 1&4: (# 122.5) # 2&3: (# 125)	# 122.5	# 117.5
Main air jet (M.A.J.)	2.0 mm	1.5 mm	←
Jet needle (J.N.)	6ZD13-4th	5D44-2nd	5D51-3rd
Needle jet (N.J.)	P-2	O-9	O-8
Throttle valve (Th.V.)	# 120	# 125	←
Pilot jet (P.J.)	# 40	# 30	←
By-pass (B.P.)	# 1,2,3 & 4: 0.8 mm	# 1,2 & 3: 0.8 mm	←
Pilot outlet (P.O.)	0.8 mm	0.7 mm	←
Valve seat (V.S.)	2.5 mm	2.3 mm	←
Stater jet (G.S.)	# 37.5	# 40	←
Pilot screw (P.S.)	PRE-SET (1- $\frac{5}{8}$ turns out)	←	PRE-SET (2- $\frac{1}{2}$ turns out)
Pilot air jet (P.A.J.)	1.2 mm	1.25 mm	1.35 mm
Throttle cable play	0.5–1.0 mm (0.02–0.04 in)		

ELECTRICAL

Unit: mm (in)

ITEM		SPECIFICATION		NOTE
Ignition timing		*4° B.T.D.C. below 1 500 r/min.		E-03,18,33,39
		*7° B.T.D.C. below 1 500 r/min.		The others
Firing order		1-2-4-3		
Spark plug		Type	NGK: CR9E ND: U27ESR-N	
		Gap	0.7-0.8 (0.028-0.032)	
Spark performance		Over 8 (0.3) at 1 atm.		
Signal coil resistance		(Black-Green) Approx. 135-200 Ω		Tester range: (x 100 Ω)
Ignition coil resistance		Primary	⊕ tap - ⊖ tap Approx. 2.4-3.2 Ω	Tester range: (x 1 Ω)
		Secondary	Plug cap-Plug cap Approx. 30-40 kΩ	Tester range: (x 1 kΩ)
Generator		Slip ring O.D.	Limit: 14.0 (0.55)	ND
		Brush length	Limit: 4.5 (0.18)	
Generator Max. output		Approx. 405 W at 5 000 r/min		The rotation of the generator
Regulated voltage		Above 13.5 V at 5 000 r/min.		
Starter relay resistance		3-5 Ω		
Battery	Type designation	YTX12-BS		
	Capacity	12 V 36 kC (10 Ah)/10 HR		
	Standard electrolyte S.G.	1.320 at 20°C (68°F)		
Fuse size	Headlight	HI	15 A	
		LO	15 A	
	Turn signal	15 A		
	Ignition	10 A		
	Taillight	10 A		
	Main	30 A		

WATTAGE

Unit: W

ITEM		SPECIFICATION		
		E-03,24,28,33	E-02	E-04,18,22, 25,34,37,39
Headlight	HI	60 x 2	←	60 + 55
	LO	55 x 2	←	55
Position light			5	←
Tail/Brake light		5/21 x 2	←	←
Turn signal light		21	←	←
Tachometer light		1.7 x 2	←	←
Speedometer light		1.7 x 2	←	←

Unit: W

ITEM	SPECIFICATION		
	E-03,24,28,33	E-02	E-04,18,22, 25,34,37,39
Turn signal indicator light	3	←	←
High beam indicator light	3	←	←
Neutral indicator light	3	←	←
Oil pressure indicator light	3	←	←
Fuel level indicator light	3	←	←

BRAKE + WHEEL

Unit: mm (in)

ITEM	STANDARD		LIMIT
Rear brake pedal height	65–75 (2.6–3.0)		—
Brake disc thickness	Front	5.0 ± 0.2 (0.197 ± 0.008)	4.5 (0.18)
	Rear	6.0 ± 0.2 (0.236 ± 0.008)	5.5 (0.22)
Brake disc runout (Front & Rear)	—		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 (0.4983–0.4993)	—
Brake caliper cylinder bore	Front	27.000–27.050 (1.0630–1.0650)	—
	Rear	38.180–38.256 (1.5031–1.5061)	—
Brake caliper piston diam.	Front	26.937–26.970 (1.0605–1.0618)	—
	Rear	38.098–38.148 (1.5000–1.5019)	—
Wheel rim runout (Front & Rear)	Axial	—	2.0 (0.08)
	Radial	—	2.0 (0.08)
Wheel axle runout	Front	—	0.25 (0.010)
	Rear	—	0.25 (0.010)
Tire size	Front	120/70 ZR17	—
	Rear	180/55 ZR17	—
Tire tread depth	Front	—	1.6 (0.06)
	Rear	—	2.0 (0.08)

SUSPENSION

Unit: mm (in)

ITEM	STANDARD	LIMIT	NOTE
Front fork stroke	120 (4.7)	—	
Front fork spring free length	—	*297 (11.7)	
Front fork oil level	*107 (4.2)	—	
Rear wheel travel	160 (6.3)	—	
Swingarm pivot shaft runout	—	0.3 (0.01)	

TIRE PRESSURE

COLD INFLATION TIRE PRESSURE	SOLO RIDING			DUAL RIDING		
	kPa	kg/cm ²	psi	kPa	kg/cm ²	psi
FRONT	230	2.30	33	230	2.30	33
REAR	250	2.50	36	250	2.50	36

FUEL + OIL + ENGINE COOLANT

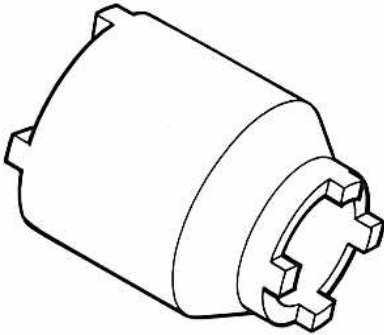
ITEM	SPECIFICATION	NOTE
Fuel type	Use only unleaded gasoline of at least 87 pump octane ($\frac{R+M}{2}$) or 91 octane or higher rated by the research method. Gasoline containing MTBE (Methyl Tertiary Butyl Ether), less than 10% ethanol, or less than 5% methanol with appropriate cosolvents and corrosion inhibitor is permissible.	E-03,33
	Use only unleaded gasoline of at least 87 pump octane ($\frac{R+M}{2}$ method) or 91 octane or higher rated by the Research Method.	E-28
	Gasoline used should be graded 85-95 octane or higher. An unleaded gasoline is recommended.	The others
Fuel tank including reserve	21.0 L (5.5/4.6 US/Imp gal)	E-01 and others
	18.5 L (4.9/4.1 US/Imp gal)	E-33
	reserve 3.1 L (0.8/0.7 US/Imp gal)	
Engine oil type	SAE 10W/40, API SE or SF	
Engine oil capacity	Change 3 000 ml (3.2/2.6 US/Imp qt)	
	Filter change 3 300 ml (3.5/2.9 US/Imp qt)	
	Overhaul 3 900 ml (4.1/3.4 US/Imp qt)	
Front fork oil type	Fork oil L01	
Front fork oil capacity (each leg)	*548 ml (18.5/19.3 US/Imp oz)	

ITEM	SPECIFICATION	NOTE
Brake fluid type	DOT 4	
Engine coolant type	Use an anti-freeze/coolant compatible with aluminum radiator, mixed with distilled water only, at the ratio of 50:50.	
Engine coolant including reserve	2 450 ml (2.6/2.2 US/Imp qt)	

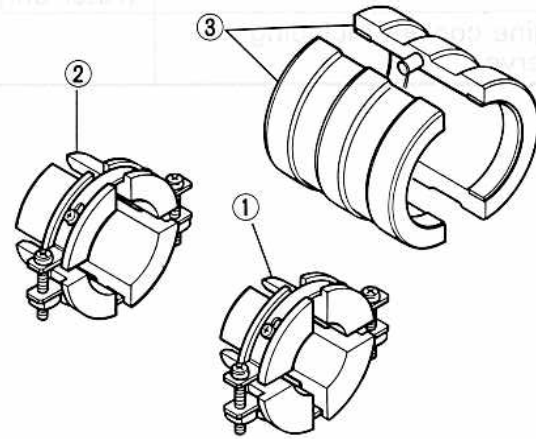


SERVICE INFORMATION

SPECIAL TOOLS



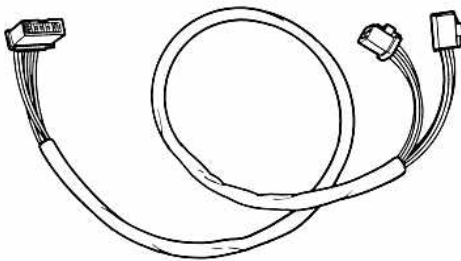
This special tool is used for swingarm pivot thrust clearance adjustment.
 09940-14970 : Swingarm pivot thrust adjuster socket wrench



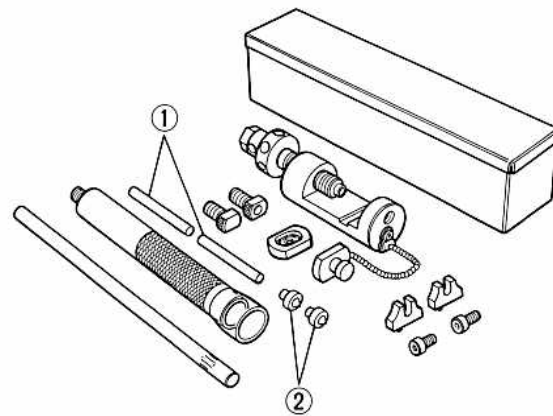
This special tool is used for installing the front fork oil seal.

09940-52860 : Front fork oil seal installer set

- ① 09940-52870 : Attachment for fork diam. 26–36 mm
- ② 09940-52880 : Attachment for fork diam. 36–46 mm
- ③ Body : This tool is not separately available.



This special tool is used in conjunction with ignitor checker for checking the ignitor unit.
 09931-94480 : Ignitor checker lead (MODE 1-A)



This special tool is used for cutting and joining the drive chain.

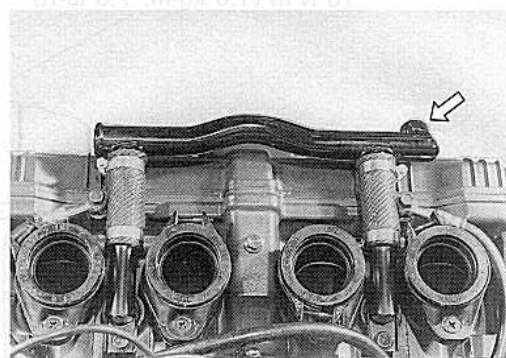
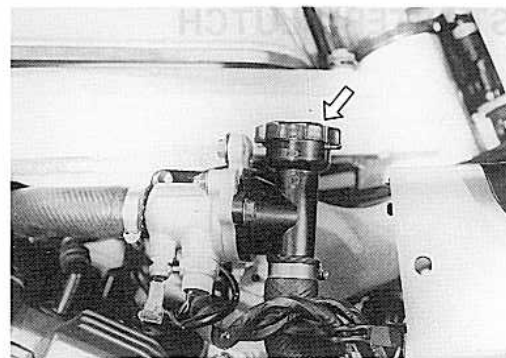
09922-22711 : Drive chain cutting and joining tool

Inner parts of the drive chain cutting tool is as follows.

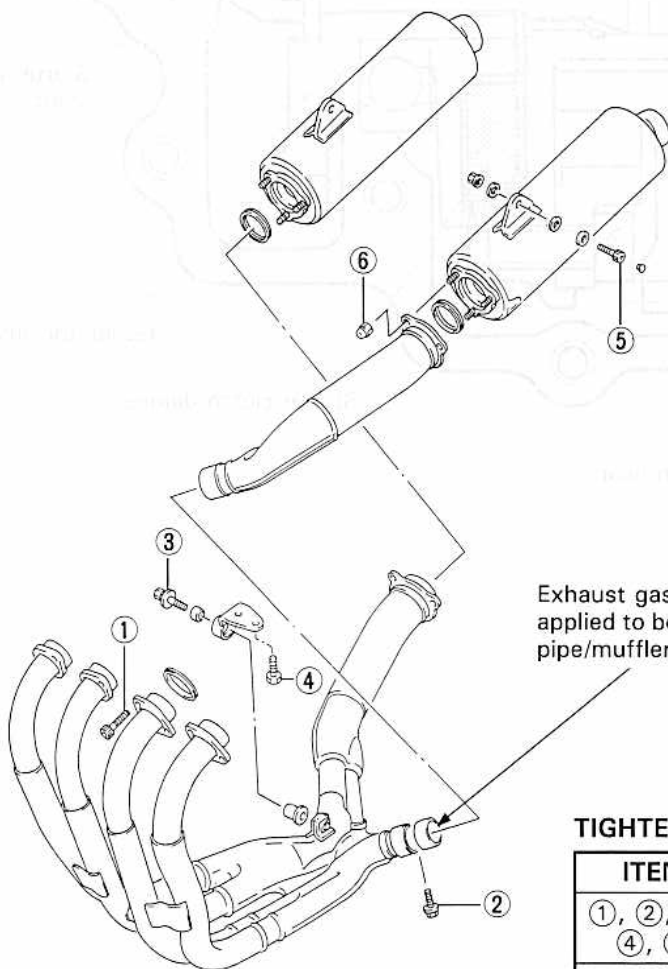
- ① 09922-22740 : Pin remover (2 pcs/set)
- ② 09922-22750 : Attachment for staking pin (2 pcs/set)

RADIATOR CAP AND OUTLET WATER PIPE

The radiator cap location has been changed from under the fuel tank to behind the right cowling. According to this changed, the outlet water pipe has been changed. Refer to page 11-44 for the radiator hose routing.



EXHAUST PIPE/MUFFLER MOUNTING

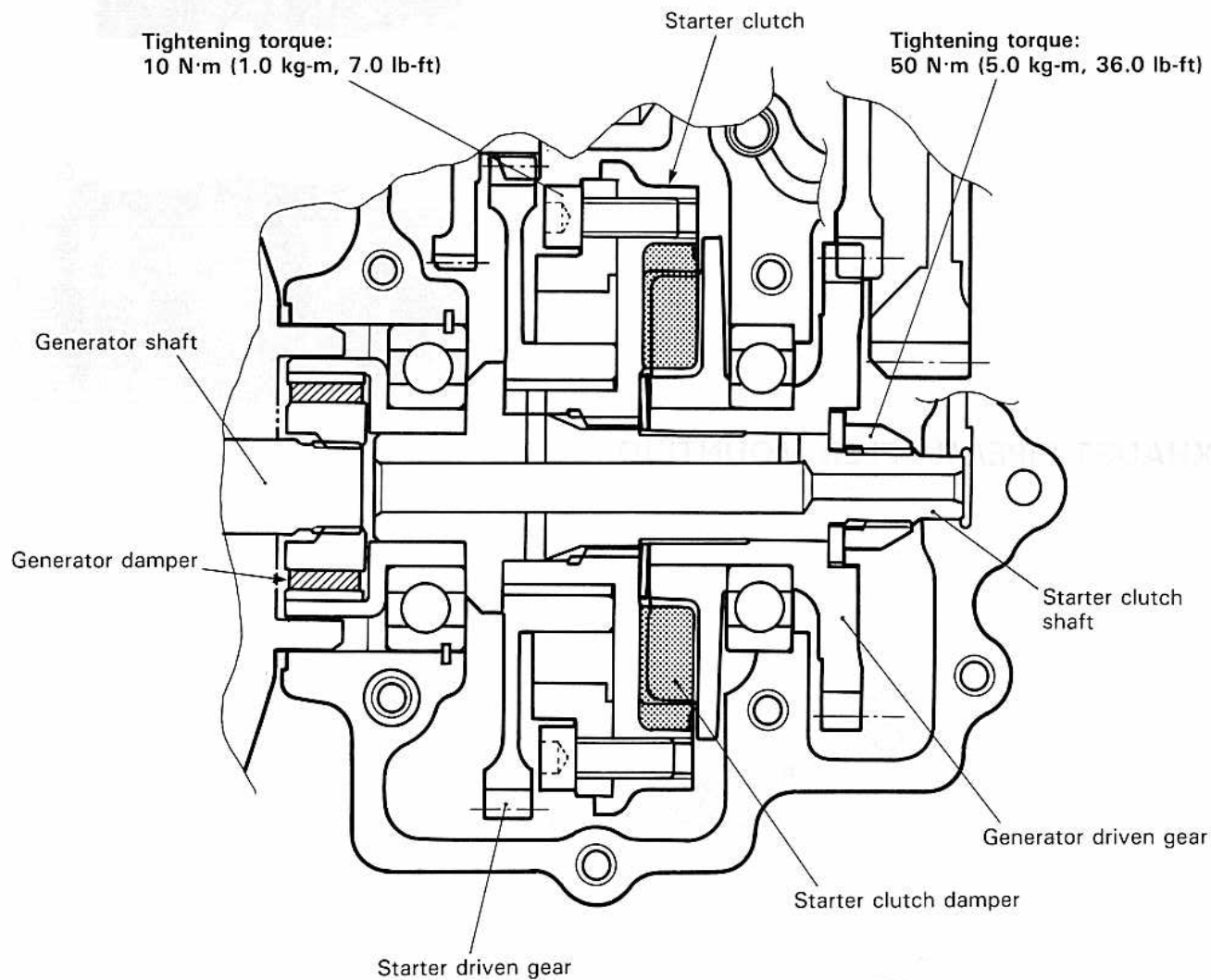


Exhaust gas sealer (PERMATEX 1372) should be applied to both the inside and outside of the exhaust pipe/muffler connector.

TIGHTENING TORQUE

ITEM	N·m	kg-m	lb-ft
①, ②, ③, ④, ⑤	23	2.3	16.5
⑥	20	2.0	14.5

STARTER CLUTCH

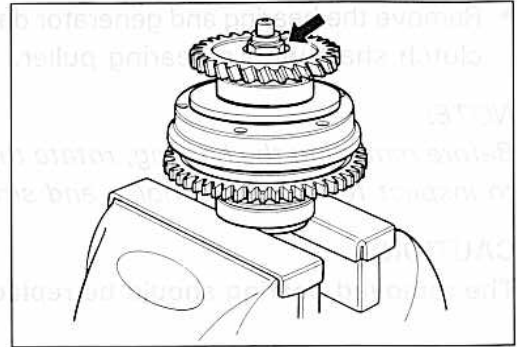


DISASSEMBLY AND INSPECTION

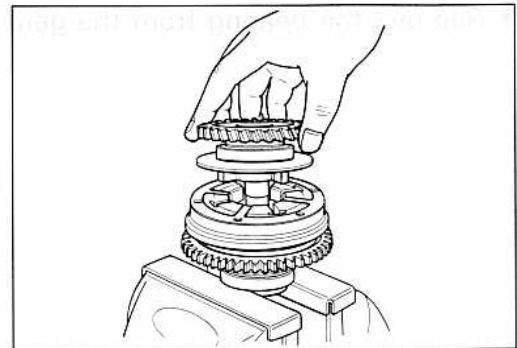
- Hold the starter clutch shaft to use a vise and appropriate pieces of soft metals, and remove the nut as shown in the Fig.

CAUTION:

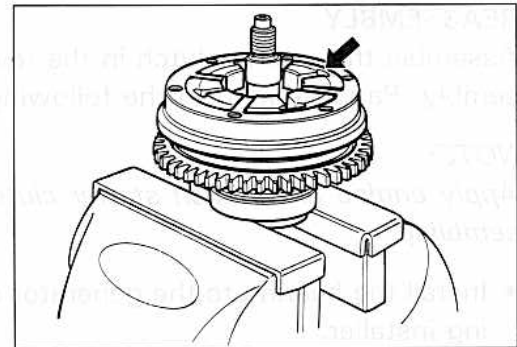
This is a left-hand thread nut.



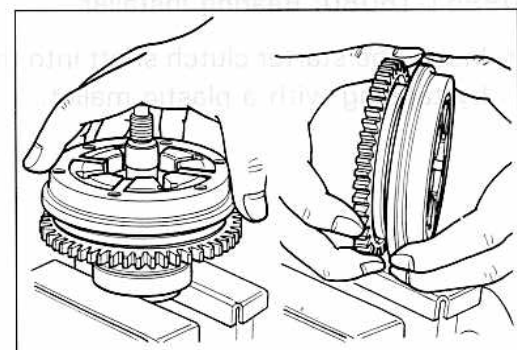
- Remove the generator driven gear assembly.



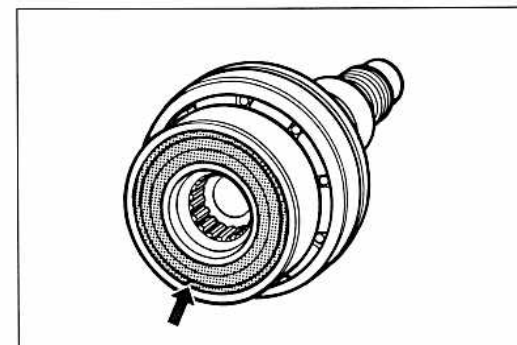
- Inspect the dampers for wear and damage. If any defects are found, replace the dampers as a set.
- Inspect the starter clutch and its contacting surface of the starter driven gear for wear or damage. If they are found to be damaged, replace them with new ones.



- Remove the starter clutch and its driven gear.
- Remove the driven gear from the starter clutch.



- Inspect the generator damper for damage. If any defects are found, replace the damper or starter clutch shaft assembly.



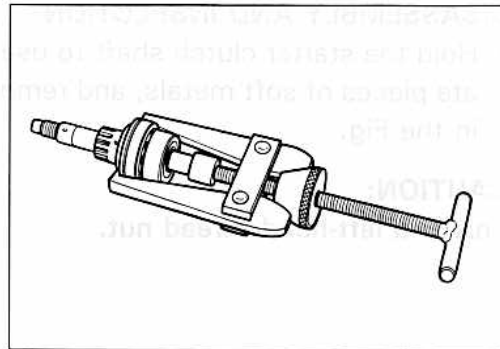
- Remove the bearing and generator damper from the starter clutch shaft with a bearing puller.

NOTE:

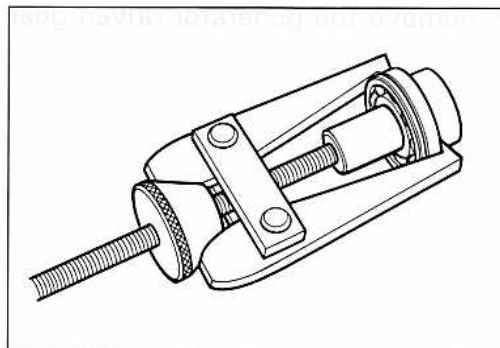
Before removing the bearing, rotate the outer race by hand to inspect for abnormal noise and smooth rotation.

CAUTION:

The removed bearing should be replaced with a new one.



- Remove the bearing from the generator damper.



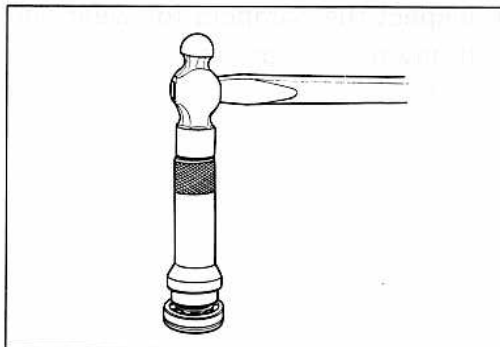
REASSEMBLY

Assemble the starter clutch in the reverse order of disassembly. Pay attention to the following points:

NOTE:

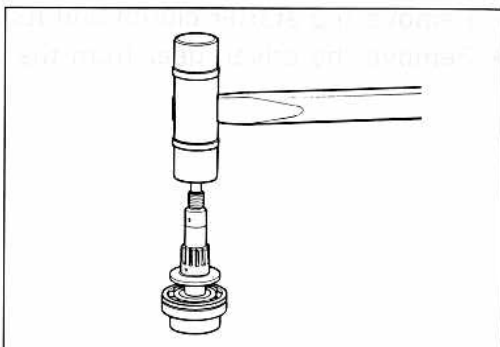
Apply engine oil to each starter clutch part before reassembling.

- Install the bearing to the generator damper with a bearing installer.



09951-16080: Bearing installer

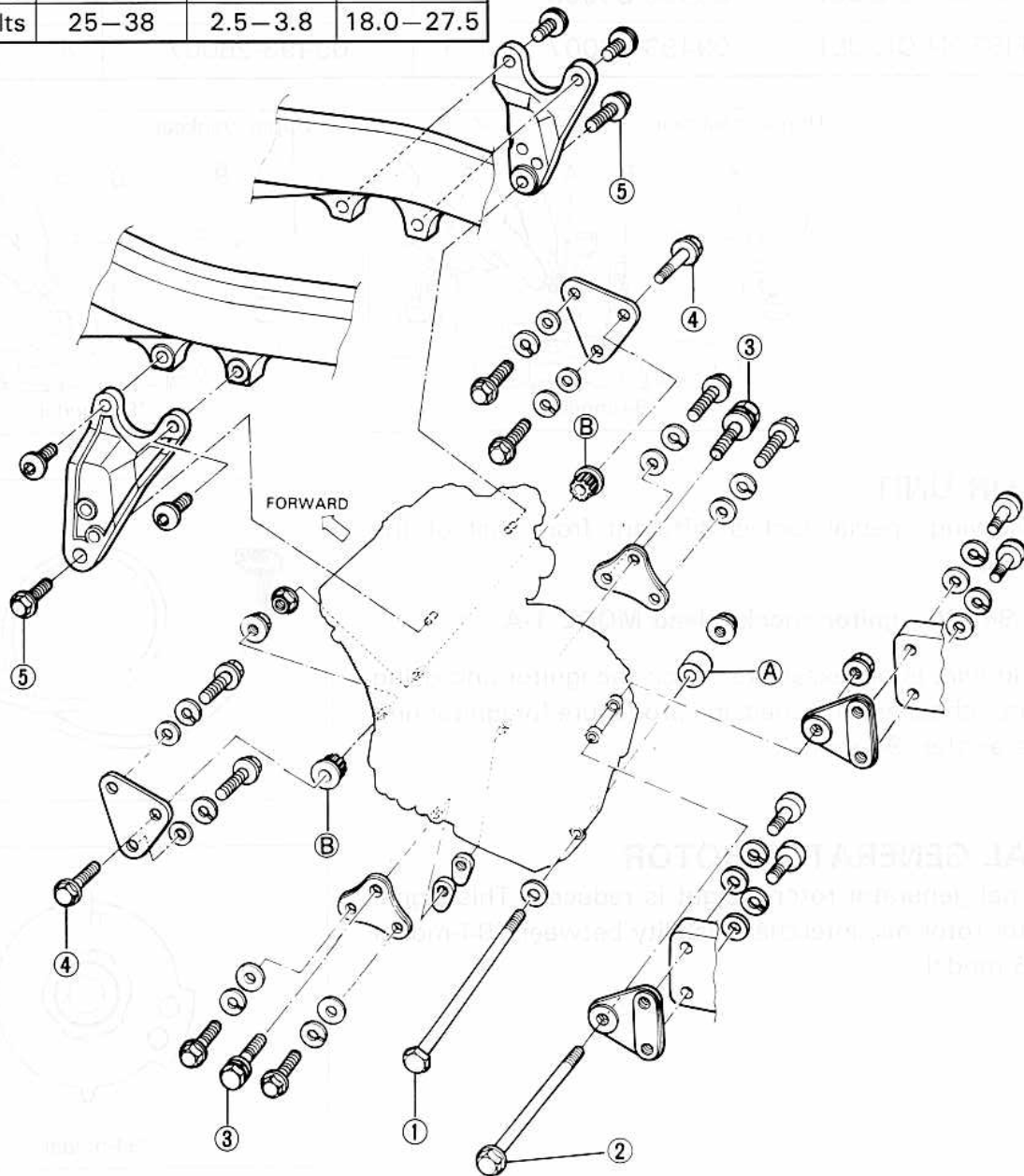
- Install the starter clutch shaft into the generator damper by tapping with a plastic mallet.



ENGINE MOUNTING

TIGHTENING TORQUE

ITEM	N·m	kg·m	lb·ft
①	80-95	8.0-9.5	58.0-68.5
②	70-88	7.0-8.8	50.5-63.5
③, ④, ⑤	50-60	5.0-6.0	36.0-43.5
Other bolts	25-38	2.5-3.8	18.0-27.5



LENGTH

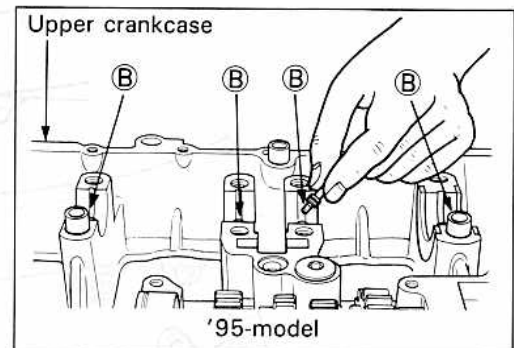
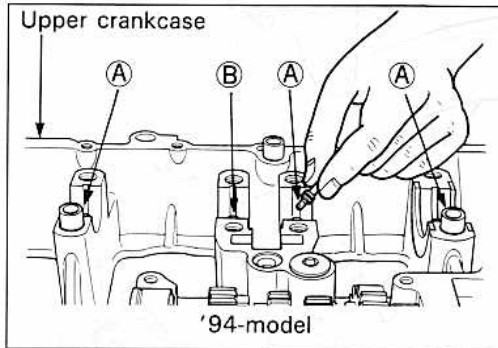
Bolt ①	165 mm (6.5 in)
Bolt ②	150 mm (5.9 in)
Bolt ③	55 mm (2.2 in)
Bolt ④	55 mm (2.2 in)
*Bolt ⑤	*40 mm (1.6 in)
Spacer RH ①	13 mm (0.5 in)
Bush (R & L) ②	39 mm (1.5 in)

PISTON OIL JET

The size of the piston oil jet has been changed as follows.

PART SUPPLY DATA

	Part Name	Part No. ('94-model)	Q'ty	Part No. ('95-model)	Q'ty	Size No. /Color
Ⓐ	PISTON OIL JET	09493-80008	3	—	—	9/Yellow
Ⓑ	PISTON OIL JET	09493-26007	1	09493-26007	4	13/White

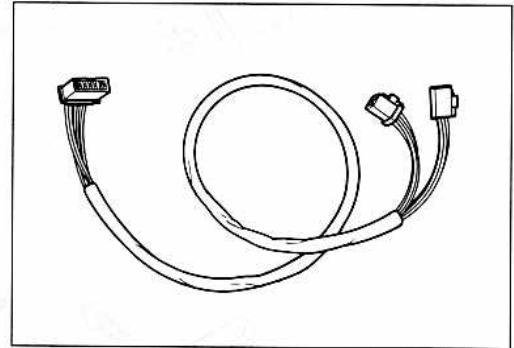


IGNITOR UNIT

The following special tool is different from that of the '94-model.

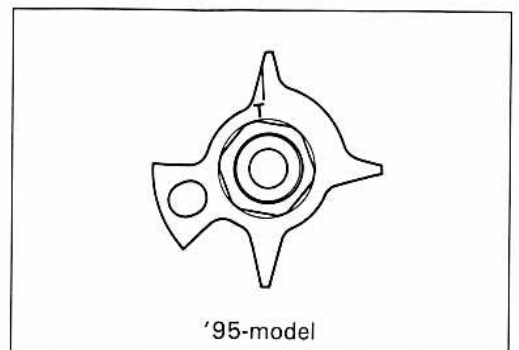
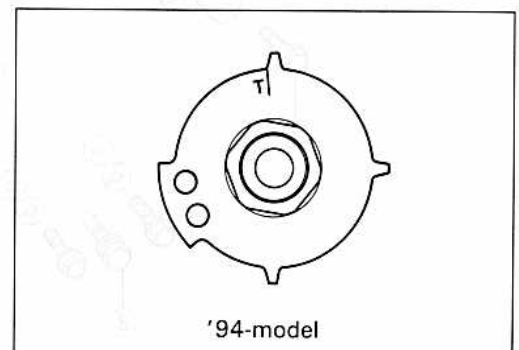
09931-94480: Ignitor checker lead MODE 1-A

This lead wire is necessary to check the ignitor unit using the ignitor checker. The checking procedure for ignitor unit is same as the '94-model.



SIGNAL GENERATOR ROTOR

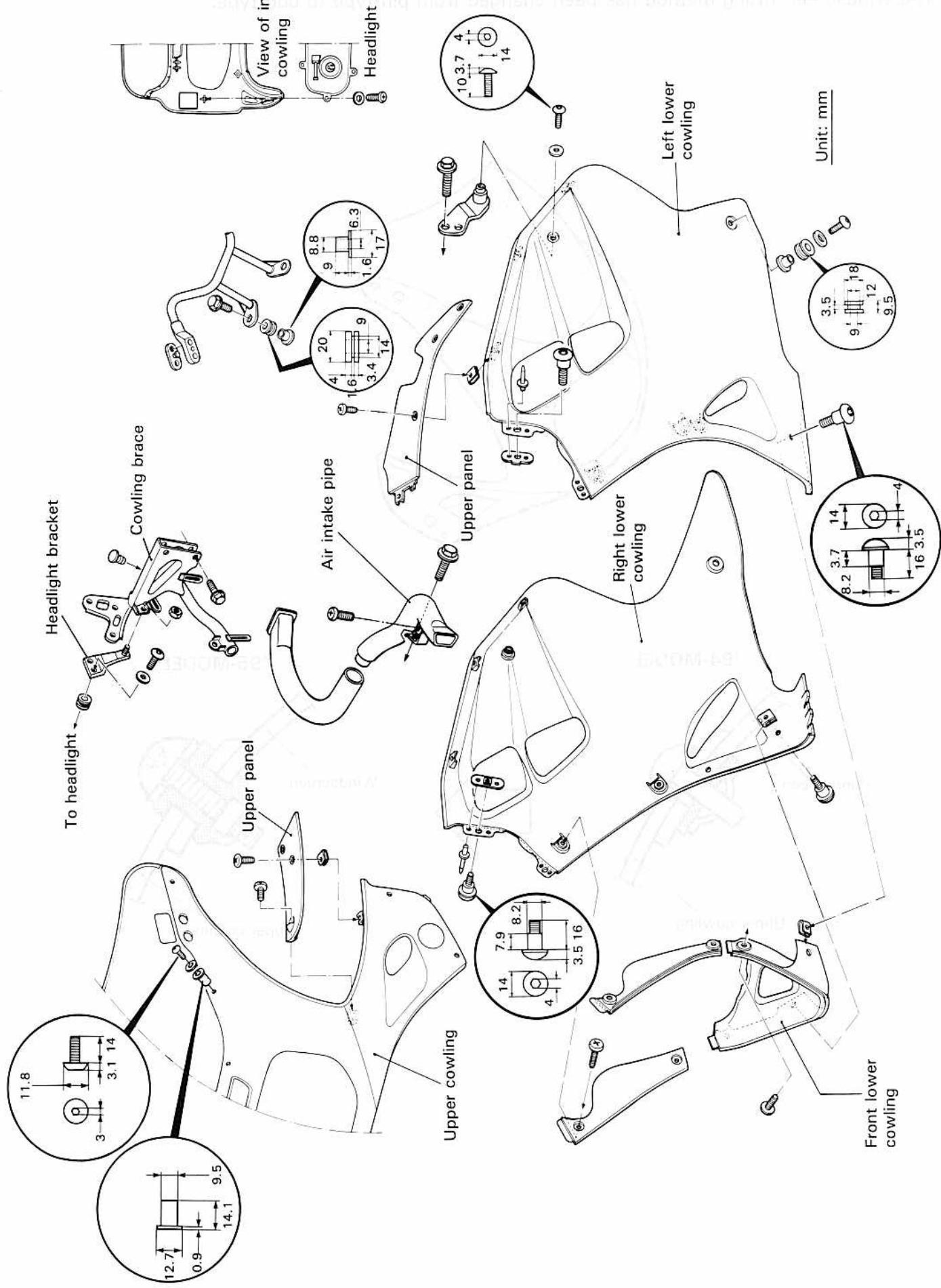
The signal generator rotor weight is reduced. This signal generator rotor has interchangeability between '94-model and '95-model.



COWLING SET-UP

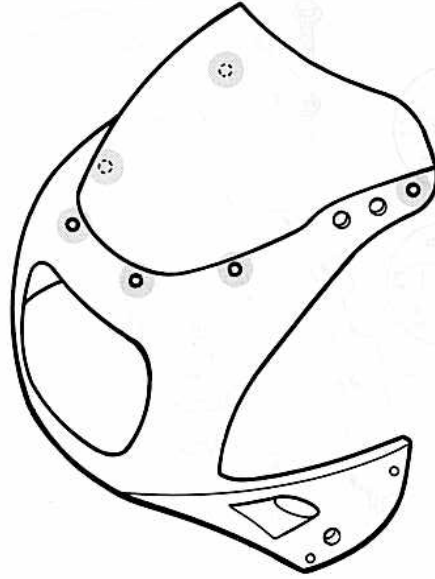
WINDSCREEN

The windscreen will be changed from high to low by the following method.

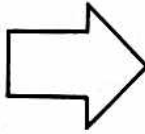
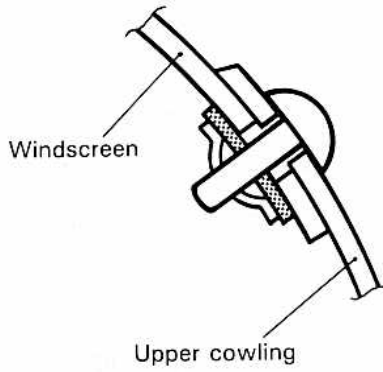


WINDSCREEN

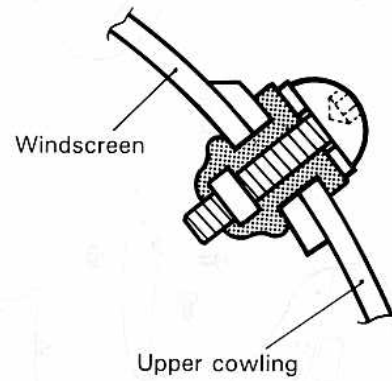
The windscreen fitting method has been changed from pin type to bolt type.



'94-MODEL



'95-MODEL

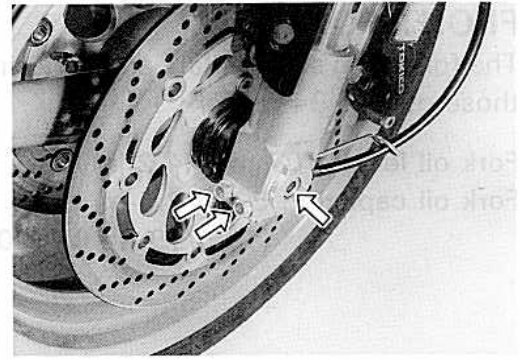


FRONT AXLE

TIGHTENING TORQUE

Axle shaft: 85–115 N·m
(8.5–11.5 kg-m, 61.5–83.0 lb-ft)

Pinch bolt: 18–28 N·m
(1.8–2.8 kg-m, 13.0–20.0 lb-ft)

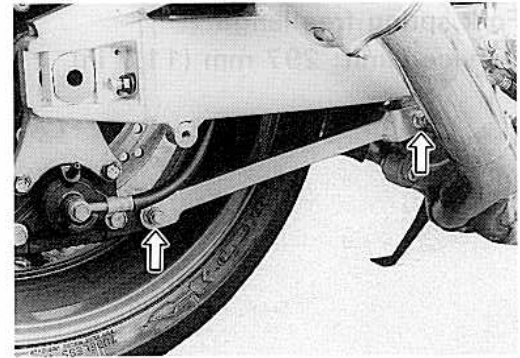


TORQUE LINK ROD

TIGHTENING TORQUE

Front side : 18–28 N·m
(1.8–2.8 kg-m, 13.0–20.0 lb-ft)

Rear side: 22–35 N·m
(2.2–3.5 kg-m, 16.0–25.5 lb-ft)

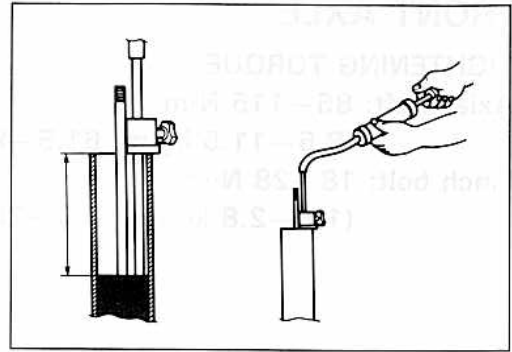


FRONT FORK

The following service data and servicing are different from those of the '94-model.

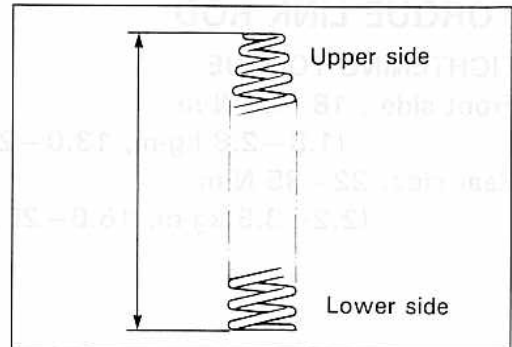
Fork oil level: 107 mm (4.2 in)

Fork oil capacity: 548 ± 2.5 ml
(18.5/19.3 ± 0.08/0.09 US/Imp oz)



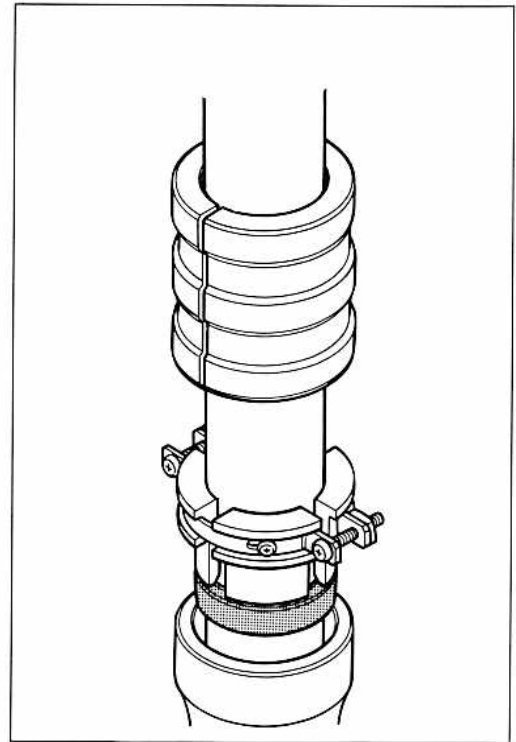
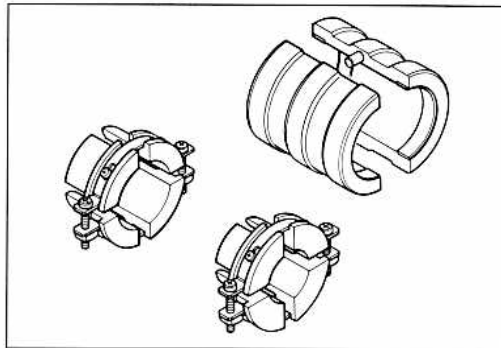
Fork spring free length

Service Limit: 297 mm (11.7 in)



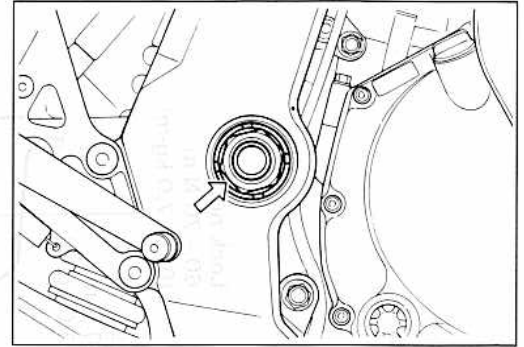
When installing the oil seal, use the new special tool.

09940-52860: Front fork oil seal installer set



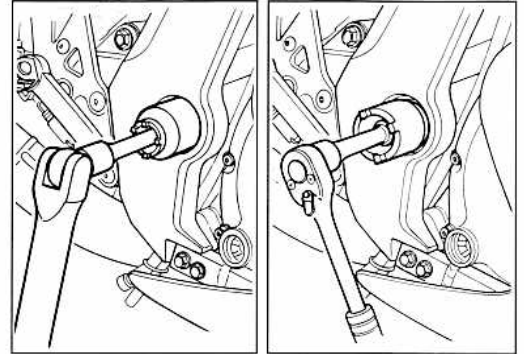
SWINGARM PIVOT THRUST CLEARANCE ADJUSTMENT

- Remove the swingarm pivot nut.



- Remove the swingarm thrust adjuster lock nut with the special tool and loosen the swingarm thrust adjuster with the special tool.

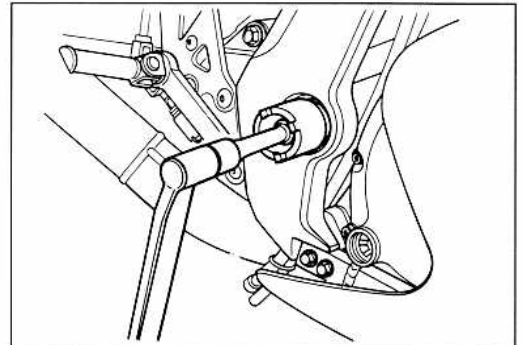
09940-14970: Swingarm pivot thrust adjuster socket wrench



- Tighten the swingarm thrust adjuster to the specified torque with the special tool.

09940-14970: Swingarm pivot thrust adjuster socket wrench

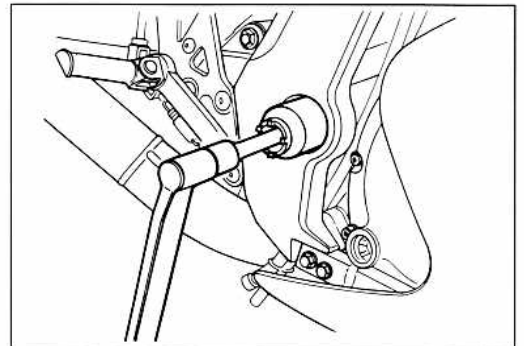
Tightening torque: 10–20 N·m (1.0–2.0 kg·m)



- Tighten the swingarm thrust adjuster lock nut to the specified torque with the special tool.

09940-14970: Swingarm pivot thrust adjuster socket wrench

Tightening torque: 60–70 N·m (6.0–7.0 kg·m)

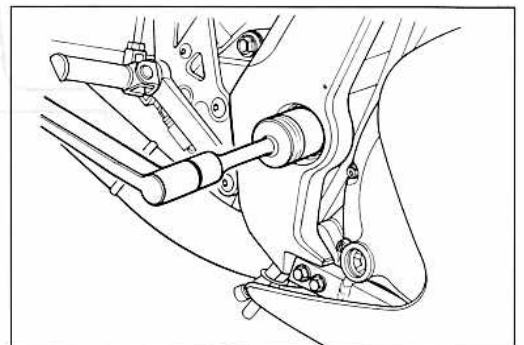


- Hold the swingarm pivot shaft with a socket wrench and tighten the swingarm pivot nut to the specified torque.

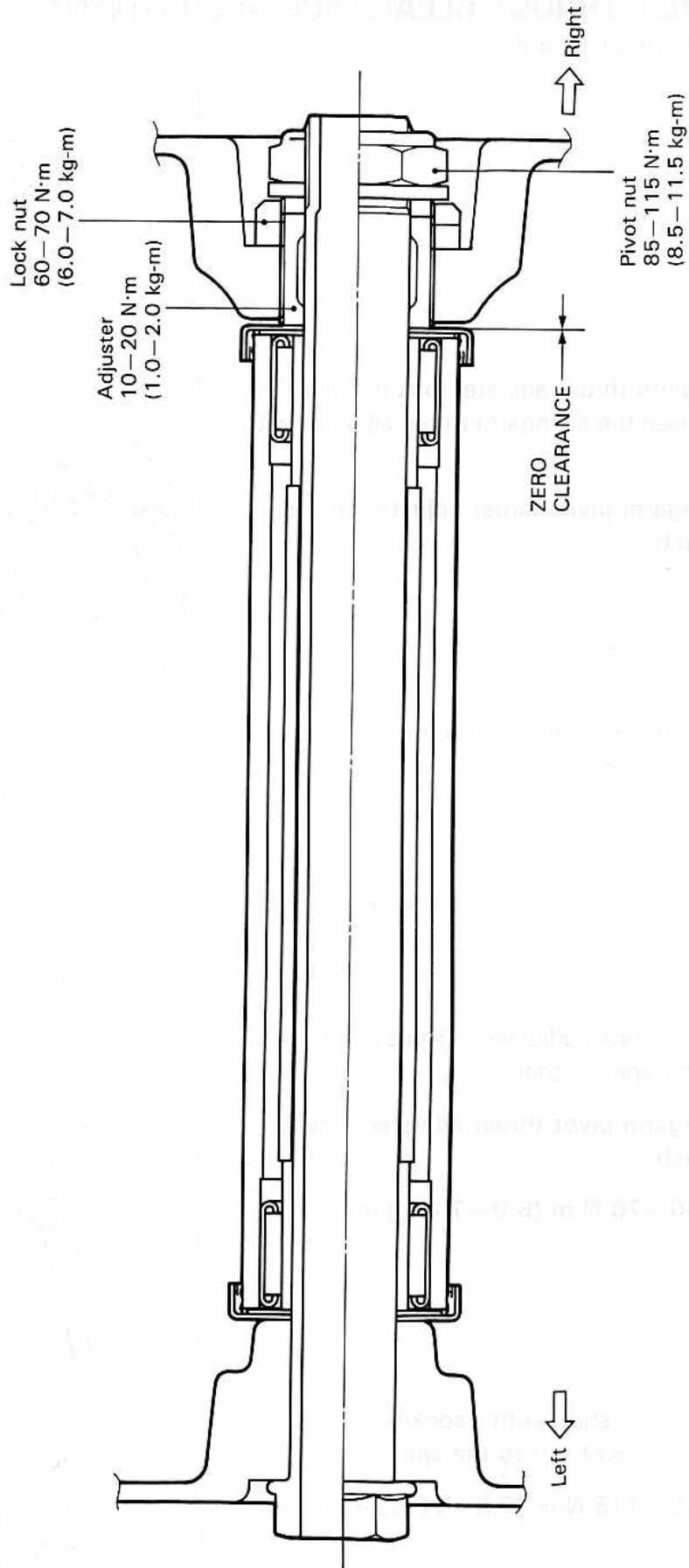
Tightening torque: 85–115 N·m (8.5–11.5 kg·m)

NOTE:

After tightening the swingarm pivot nut, be sure to check the swingarm operation.



SWINGARM PIVOT



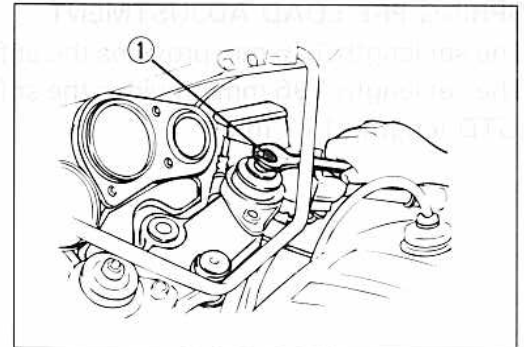
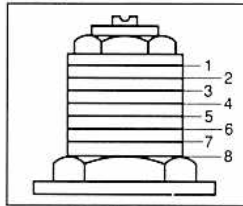
FRONT SUSPENSION SETTING

ITEM		Spring pre-load	Damping force	
			Compression	Rebound
Solo riding	Softer	4	7 clicks	5 clicks
	Standard	4	6 clicks	4 clicks
	Stiffer	4	5 clicks	3 clicks
Dual riding		4	6 clicks	4 clicks

SPRING PRE-LOAD ADJUSTMENT

There are eight grooved lines on the side of the spring adjuster ①. Position 1 provides the maximum spring pre-load and position 8 provides the minimum spring pre-load.

(STD position: 4)

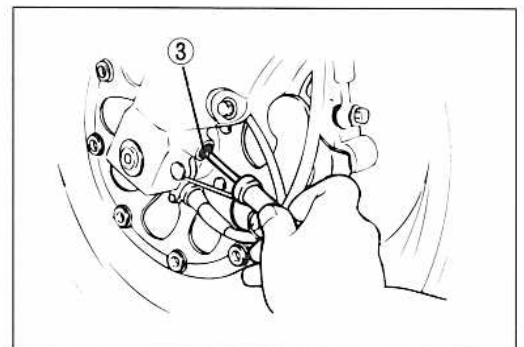
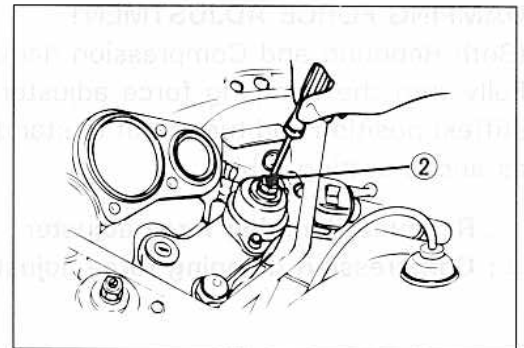


DAMPING FORCE ADJUSTMENT

(Both Rebound and Compression damping force)

Fully turn the damping force adjuster clockwise. It is at stiffest position and turn it out to standard setting position as above setting table.

- ②: Rebound damping force adjuster
- ③: Compression damping force adjuster

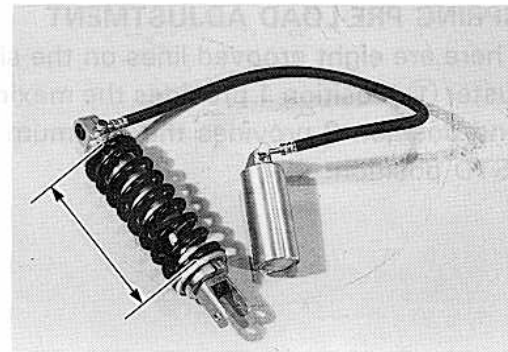


REAR SUSPENSION SETTING

ITEM		Spring set length	Damping force	
			Compression	Rebound
Solo riding	Softer	196 mm	9 clicks	8 clicks
	Standard	191 mm	7 clicks	7 clicks
	Stiffer	176 mm	5 clicks	6 clicks
Dual riding		191 mm	7 clicks	7 clicks

SPRING PRE-LOAD ADJUSTMENT

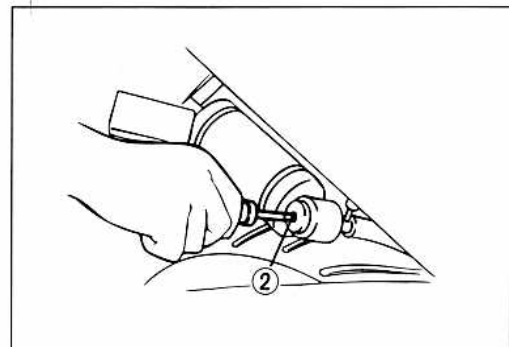
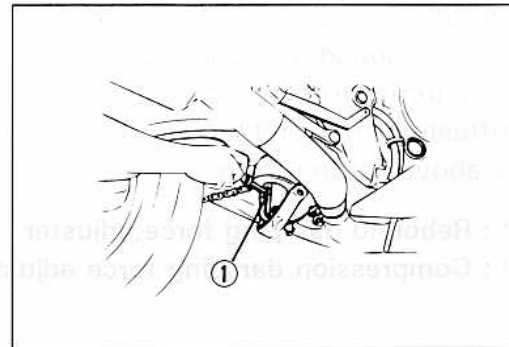
The set length 176 mm provides the stiffest spring pre-load.
 The set length 196 mm provides the softest spring pre-load.
 (STD length: 191 mm)



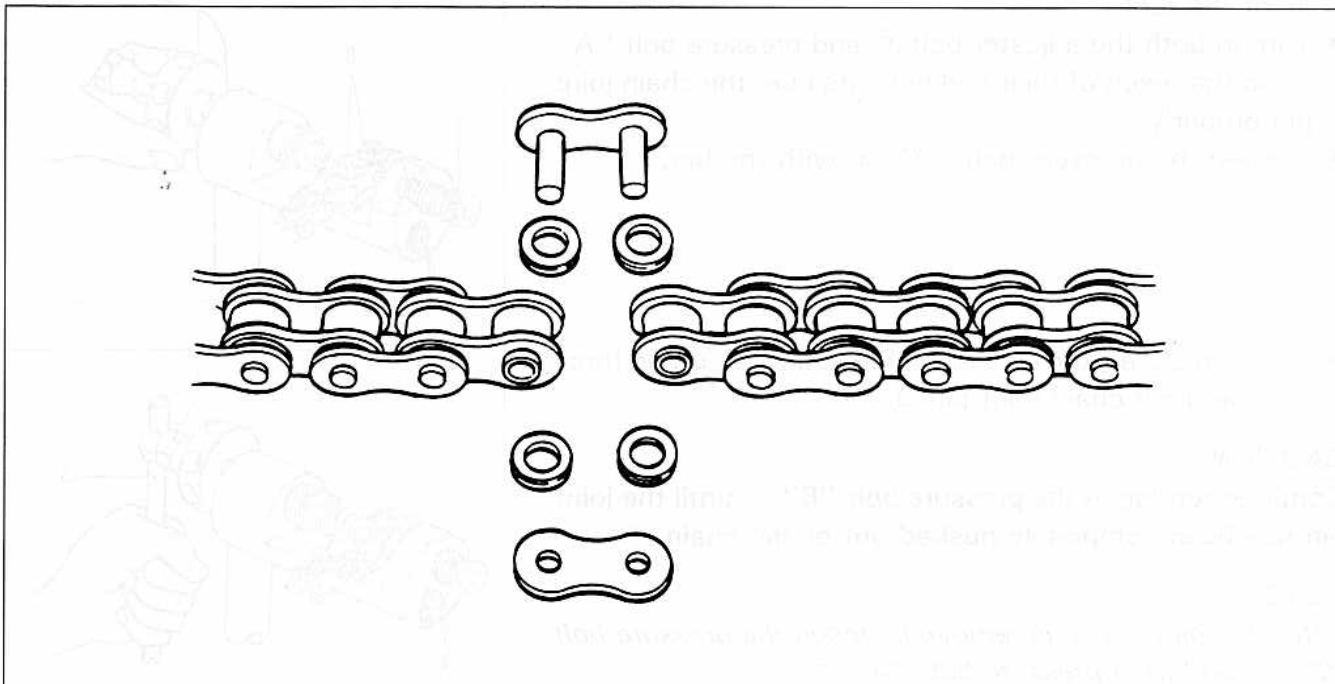
DAMPING FORCE ADJUSTMENT

(Both Rebound and Compression damping force)
 Fully turn the damping force adjuster clockwise. It is at stiffest position and turn it out to standard setting position as above setting table.

- ①: Rebound damping force adjuster
- ②: Compression damping force adjuster



DRIVE CHAIN

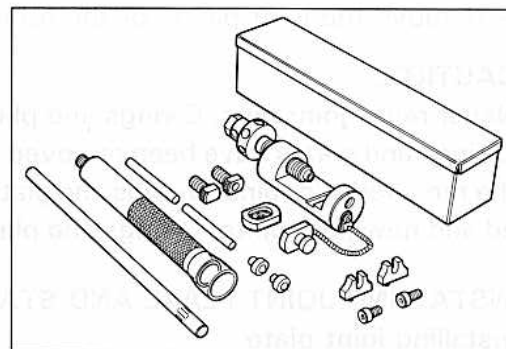


To cut and rejoin the drive chain, use the special tool in the following procedures.

09922-22711: Drive chain cutting and joining tool set

NOTE:

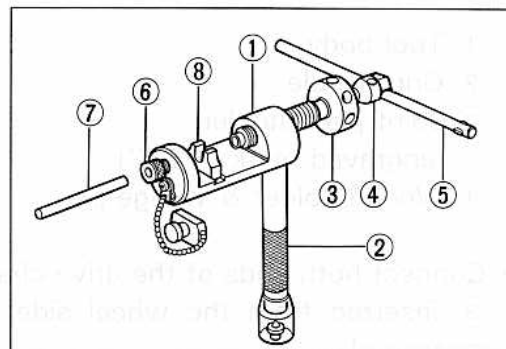
When using the special tool, apply a small quantity of grease to the threaded parts of the special tool.



REMOVING JOINT PIN

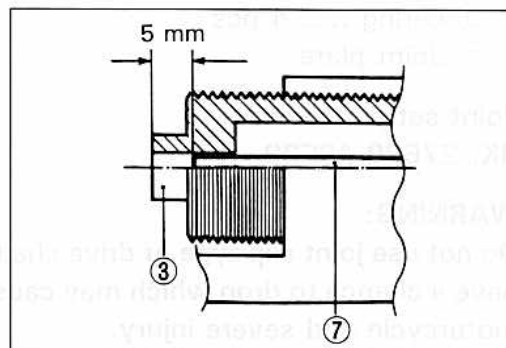
- Set up the special tool as shown in the illustration.

- ① Tool body
- ② Grip handle
- ③ Pressure bolt "A"
- ④ Pressure bolt "B"
- ⑤ Bar
- ⑥ Adjuster bolt (with through hole)
- ⑦ Pin remover
- ⑧ Chain holder (engraved mark 532)
with reamer bolt M5 × 10

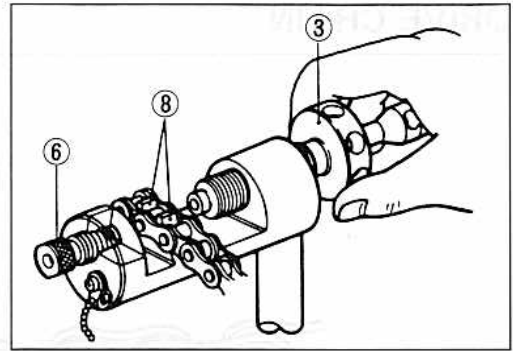


NOTE:

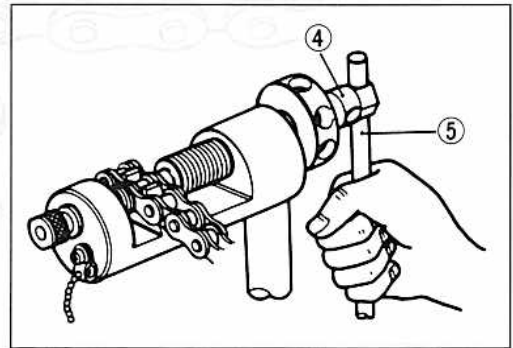
The tip of pin remover ⑦ should be positioned inside approximately 5 mm (0.2 in) from the end face of pressure bolt "A" ③ as shown in the illustration.



- Place the drive chain link being disjoined on the holder part ⑧ of the tool.
- Turn in both the adjuster bolt ⑥ and pressure bolt "A" ③ so that each of their end hole fits over the chain joint pin properly.
- Tighten the pressure bolt "A" ③ with the bar.



- Turn in the pressure bolt "B" ④ with the bar ⑤ and force out the drive chain joint pin ⑨.



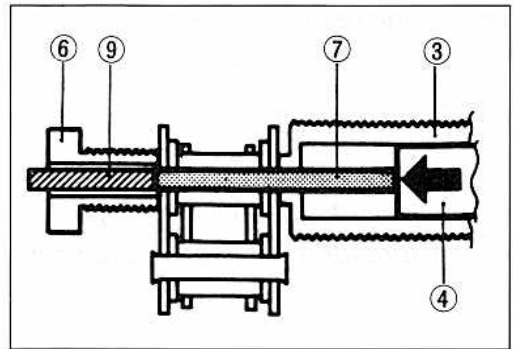
CAUTION:

Continue turning in the pressure bolt "B" ④ until the joint pin has been completely pushed out of the chain.

NOTE:

After the joint pin ⑨ is removed, loosen the pressure bolt "B" ④ and then pressure bolt "A" ③.

- Remove the joint pin ⑨ of the other side of joint plate.



CAUTION:

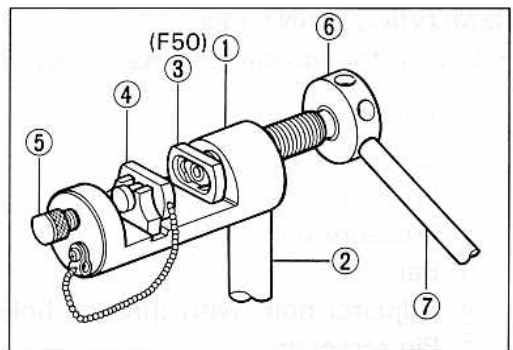
Never reuse joint pins, O-rings and plates. After joint pins, O-rings and plates have been removed from the drive chain, the removed joint pins, O-rings and plates should be discarded and new joint plate, O-rings and plate must be installed.

INSTALLING JOINT PLATE AND STAKING JOINT PIN

Installing joint plate

- Set up the special tool as shown in the illustration.

- | | |
|----------------------------|---------------------|
| ① Tool body | ⑤ Adjuster bolt |
| ② Grip handle | (without hole) |
| ③ Joint plate holder | ⑥ Pressure bolt "A" |
| (engraved mark "F50") | ⑦ Bar |
| ④ Wedge holder & wedge pin | |



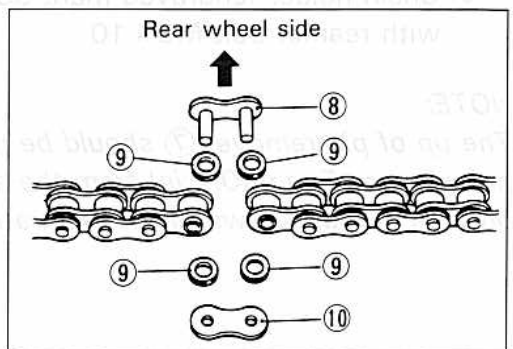
- Connect both ends of the drive chain with the joint pin ⑧ inserted from the wheel side as installed on the motorcycle.

- ⑨ O-ring 4 pcs
- ⑩ Joint plate

Joint set part number
RK: 27620-46E20

WARNING:

Do not use joint clip type of drive chain. The joint clip may have a chance to drop which may cause severe damage to motorcycle and severe injury.

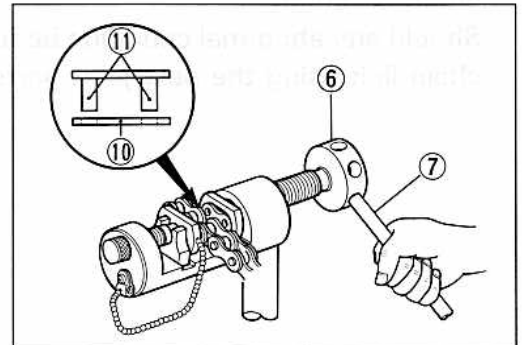
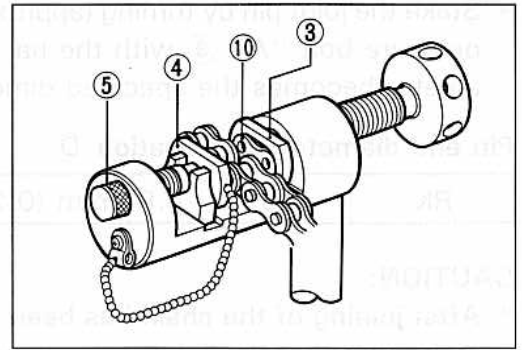


- Apply grease on the recessed portion of the joint plate holder ③ and set the joint plate ⑩.


NOTE:

When positioning the joint plate ⑩ on the tool, bring its stamp mark on the joint plate holder ③ side.

- Set the drive chain on the tool as illustrated and turn in the adjuster bolt ⑤ to secure the wedge holder & wedge pin ④.
- Turn in the pressure bolt "A" ⑥ and align two joint pins ⑪ properly with the respective holes in joint plate ⑩.
- Turn in the pressure bolt "A" ⑥ further using the bar ⑦ to press the joint plate over the joint pins.



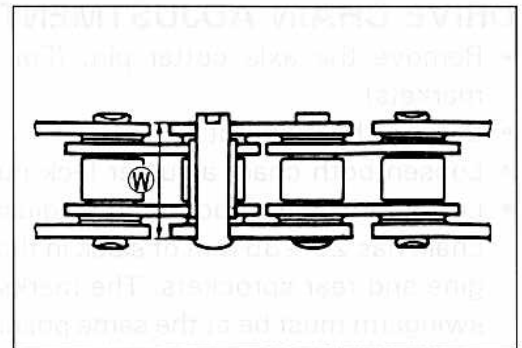
- Continue pressing the joint plate until the distance between the two joint plates comes to the specification.

Joint plates distance specification 

RK	21.85–22.15 mm (0.860–0.872 in)
----	---------------------------------

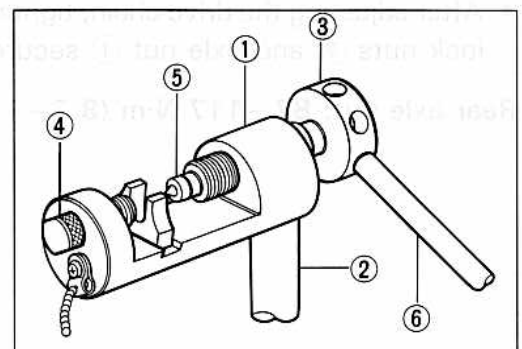
CAUTION:

Should pressing of the joint plate be made excessively beyond the specified dimension, the work should be redone using the new joint parts.

**Staking joint pin**

- Set up the special tool as shown in the illustration.

- ① Tool body
- ② Grip handle
- ③ Pressure bolt "A"
- ④ Adjuster bolt (without hole)
- ⑤ Staking pin (stowed inside grip handle behind rubber cap)
- ⑥ Bar

**NOTE:**

Before staking the joint pin, apply a small quantity of grease to the staking pin ⑤.

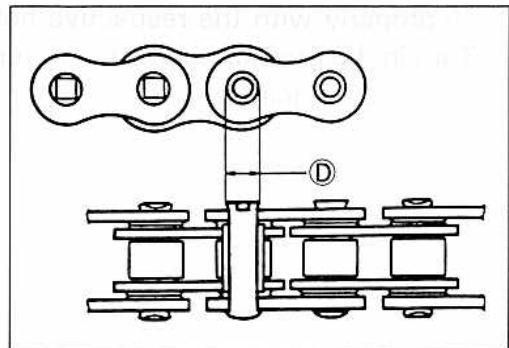
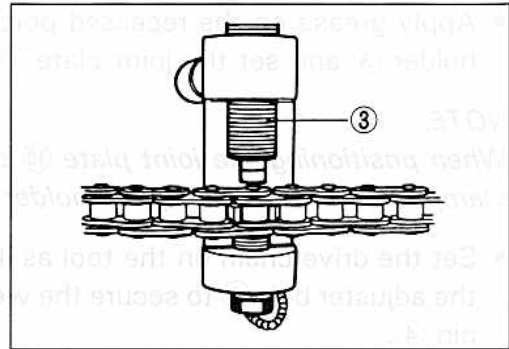
- Stake the joint pin by turning (approximately 7/8 turn) the pressure bolt "A" ③ with the bar until the pin end diameter becomes the specified dimension.

Pin end diameter specification ④

RK	5.45–5.85 mm (0.215–0.230 in)
----	-------------------------------

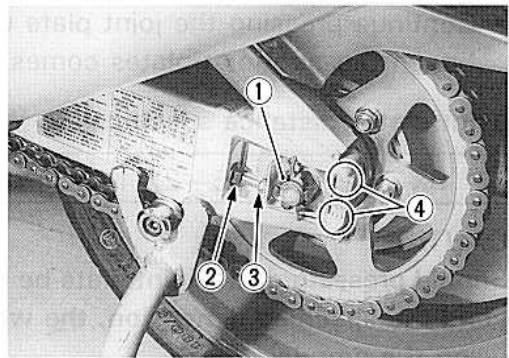
CAUTION:

- * After joining of the chain has been completed, check to make sure that the link is smooth and no abnormal condition is found.
- * Should any abnormal condition be found, reassemble the chain link using the new joint parts.

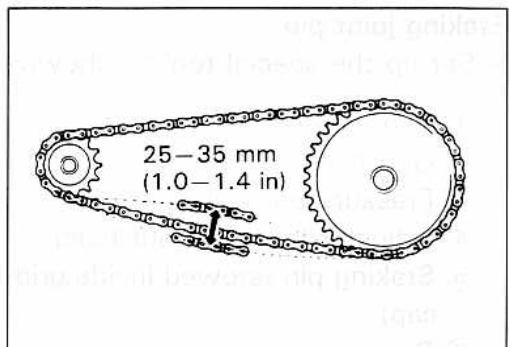


DRIVE CHAIN ADJUSTMENT

- Remove the axle cotter pin. (For U.S.A. and Canada markets)
- Loosen the axle nut ①.
- Loosen both chain adjuster lock nuts ②.
- Loosen or tighten both chain adjuster bolts ③ until the chain has 25–35 mm of slack in the middle between engine and rear sprockets. The marks ④ on both sides of swingarm must be at the same position to ensure that the front and rear wheels are correctly aligned.
- After adjusting the drive chain, tighten both chain adjuster lock nuts ② and axle nut ① securely.

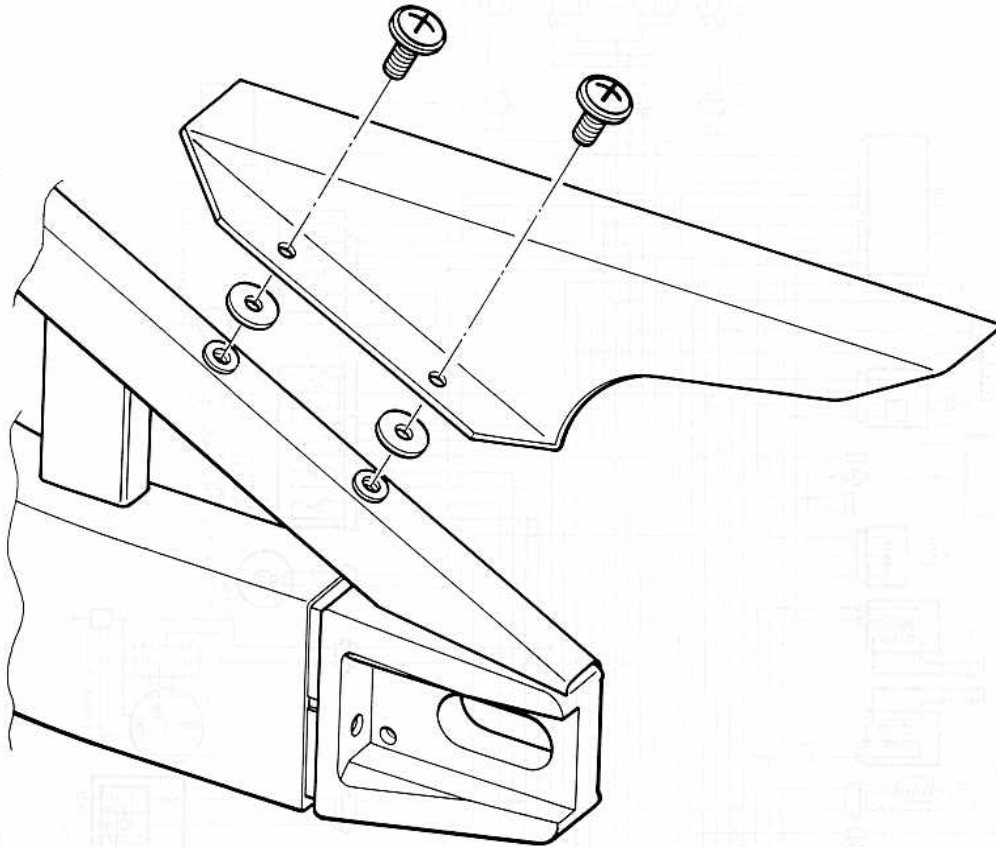


Rear axle nut: 87–117 N·m (8.7–11.7 kg-m)



NOTE:
Before staking the joint pin, apply a small pin to the staking pin.

DRIVE CHAIN COVER SET-UP



CARBURETOR

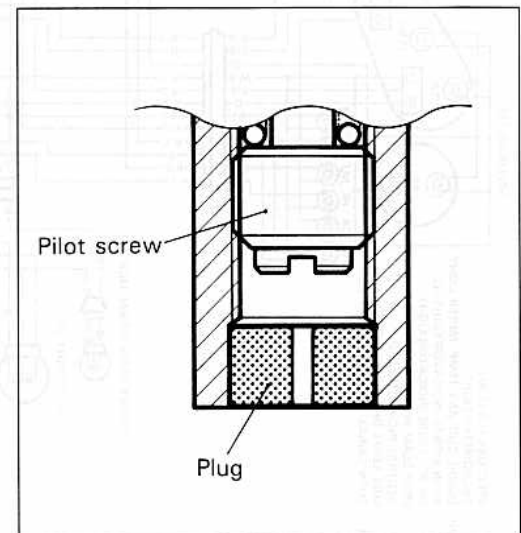
PILOT SCREW REMOVAL AND INSTALLATION

- Remove the plug by carefully punching a hole in it using an awl or suitable tool.
- Before removing the pilot screw, determine the setting by slowly turning it clockwise and count the number of turns required to lightly seat the screw. Turn the screw counterclockwise to remove it.

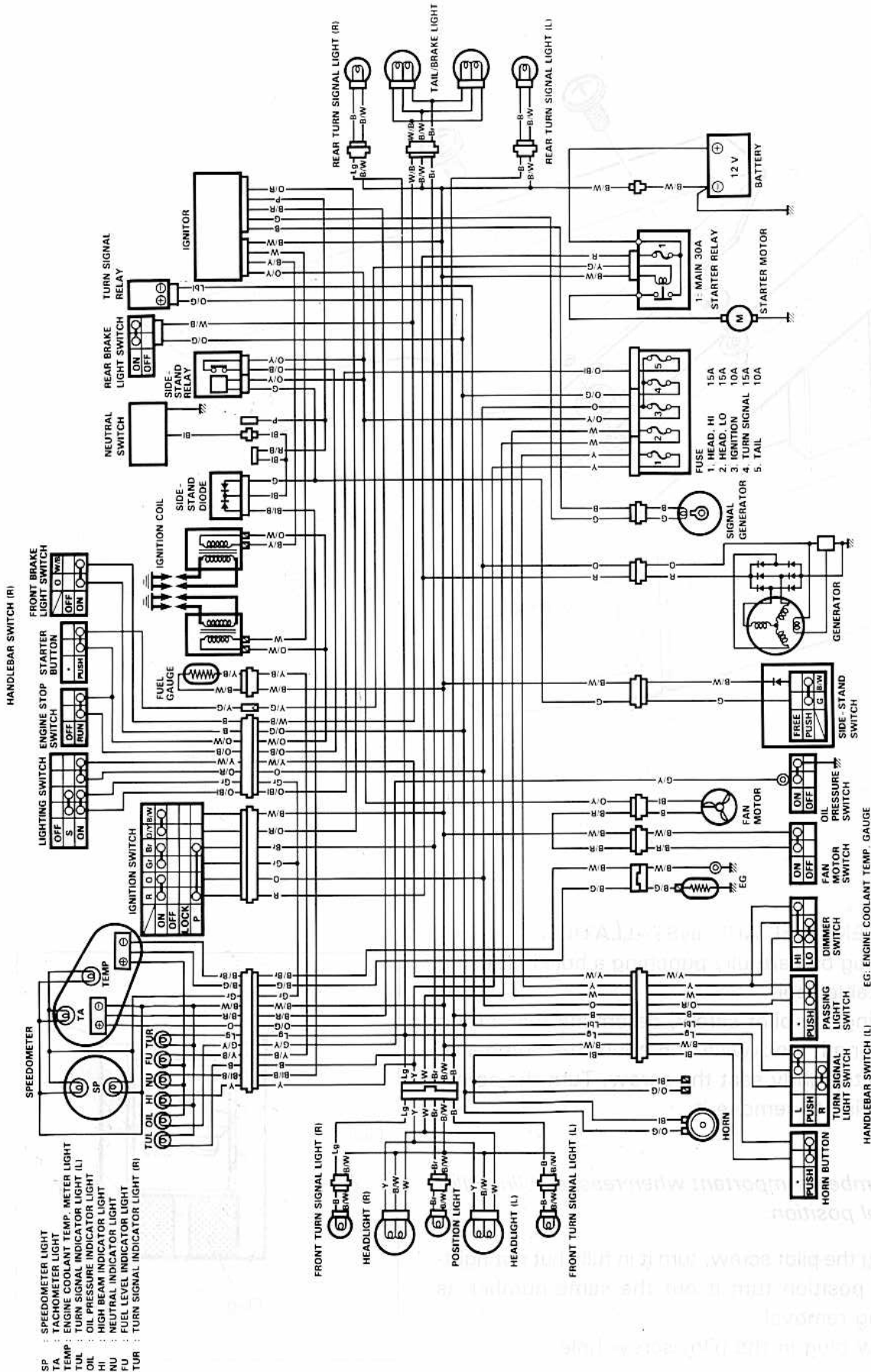
NOTE:

This counted number is important when reassembling pilot screw to original position.

- When installing the pilot screw, turn it in fully but not tightly. From that position turn it out the same number as counted during removal.
- Install the new plug in the pilot screw hole.



WIRING DIAGRAM FOR GENERAL AND ENGLAND MODELS

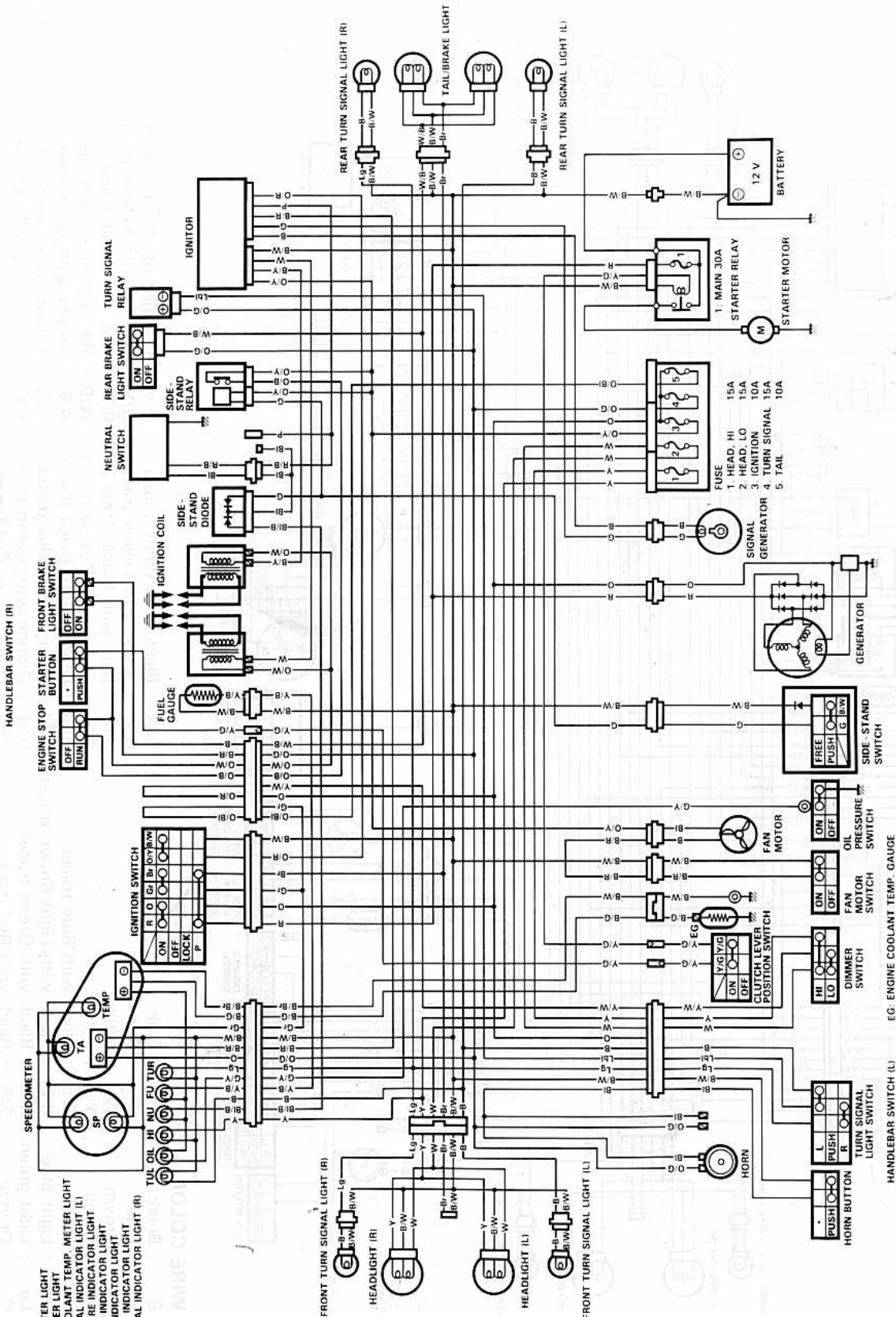


- WIRE COLOR**
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- SP : SPEEDOMETER LIGHT
- TA : TACHOMETER LIGHT
- TEMP : ENGINE COOLANT TEMP. METER LIGHT
- TUL : TURN SIGNAL INDICATOR LIGHT (L)
- OIL : OIL PRESSURE INDICATOR LIGHT
- HI : HIGH BEAM INDICATOR LIGHT
- NU : NEUTRAL INDICATOR LIGHT
- FJL : FUEL LEVEL INDICATOR LIGHT
- TUR : TURN SIGNAL INDICATOR LIGHT (R)

EG: ENGINE COOLANT TEMP. GAUGE

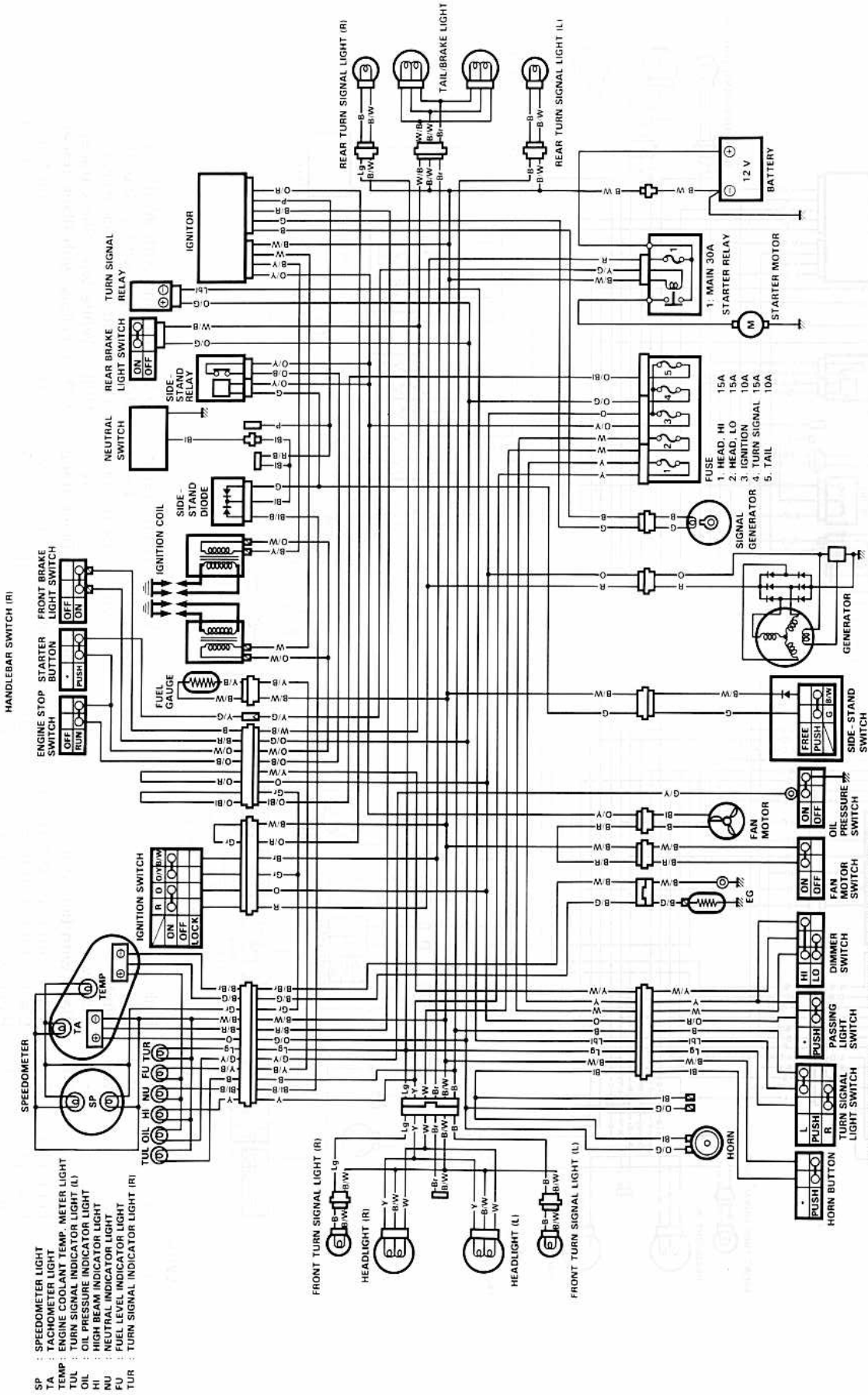
FOR U.S.A. MODEL



- SP : SPEEDOMETER
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- HANDLEBAR SWITCH (L)**
- ENGINE STOP SWITCH
 - STARTER BUTTON
 - FRONT BRAKE LIGHT SWITCH
 - IGNITION SWITCH
 - FUEL GAUGE
 - TURN SIGNAL LIGHT SWITCH (L)
 - TURN SIGNAL LIGHT SWITCH (R)
 - HEADLIGHT (L)
 - HEADLIGHT (R)
 - HORN BUTTON
 - DIMMER SWITCH
 - FAN MOTOR SWITCH
 - OIL PRESSURE SWITCH
 - SIDE STAND SWITCH
 - GENERATOR
 - STARTER MOTOR
 - STARTER RELAY
 - IGNITOR
 - TURN SIGNAL RELAY
 - REAR BRAKE LIGHT SWITCH
 - NEUTRAL SWITCH
 - SIDE STAND RELAY
 - IGNITION COIL
 - SIGNAL GENERATOR
 - FAN MOTOR
 - ECO POSITION SWITCH
 - EG. ENGINE COOLANT TEMP. GAUGE

FOR AUSTRALIA MODEL



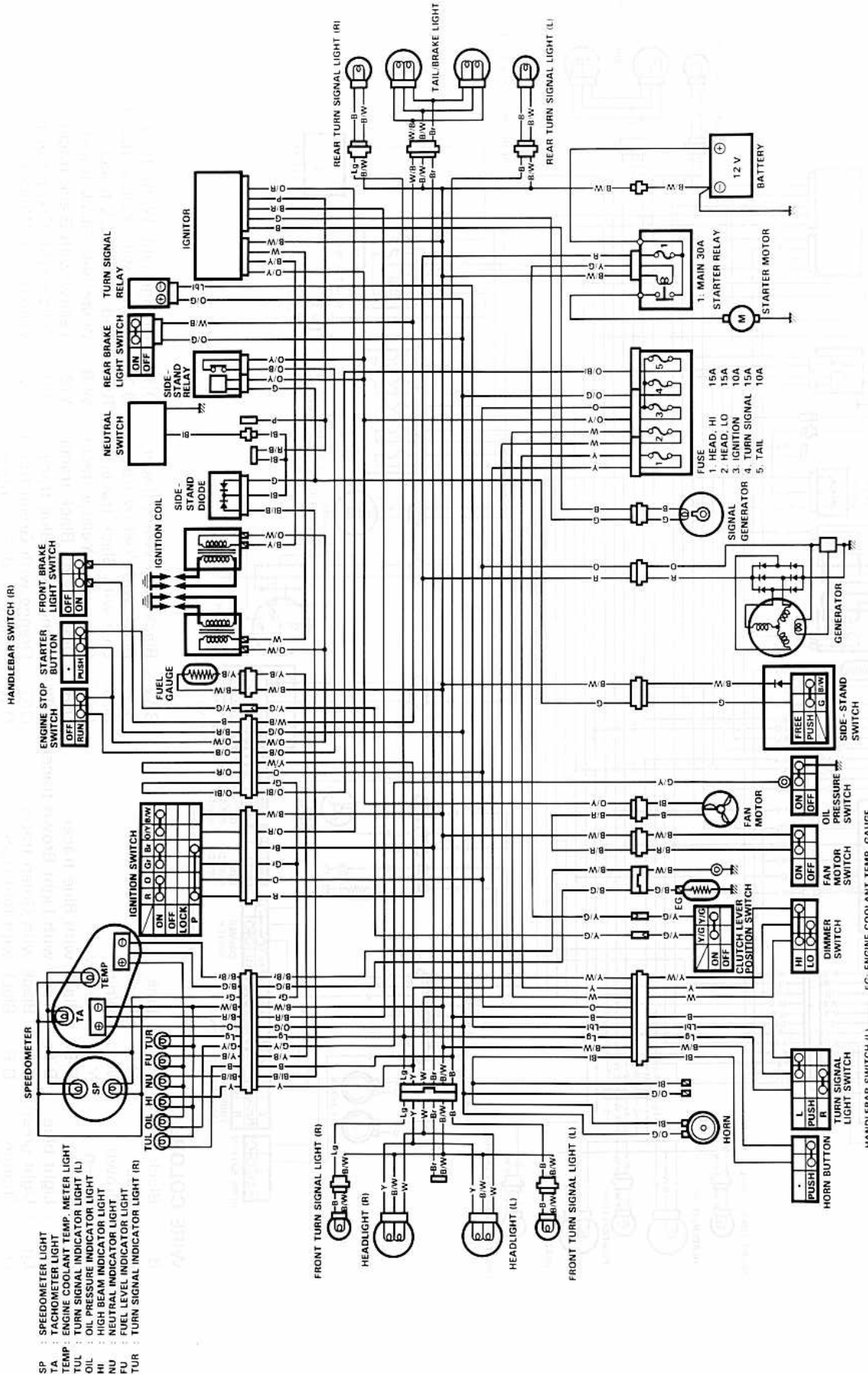
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EG: ENGINE COOLANT TEMP. GAUGE

FOR CANADA MODEL



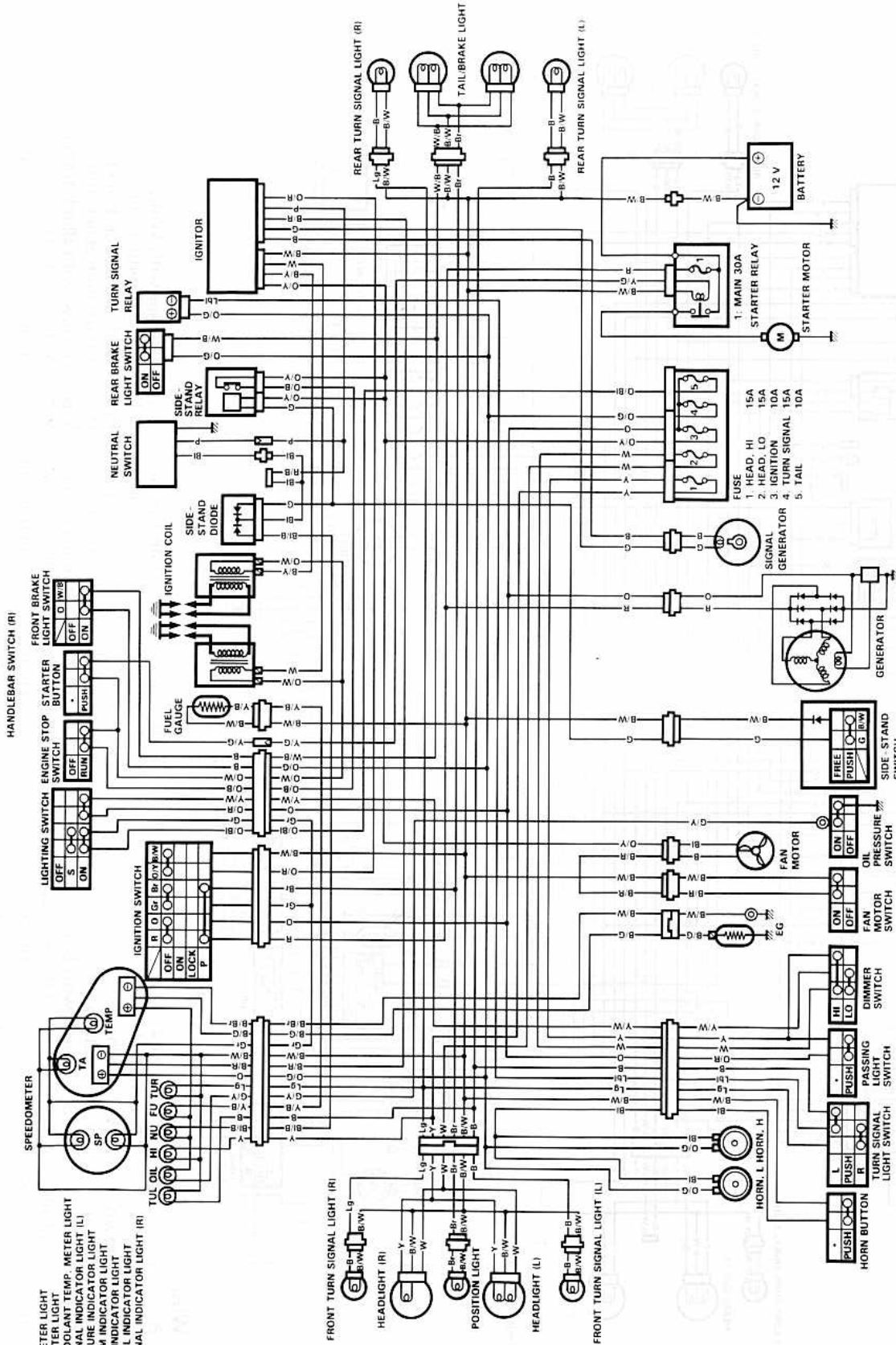
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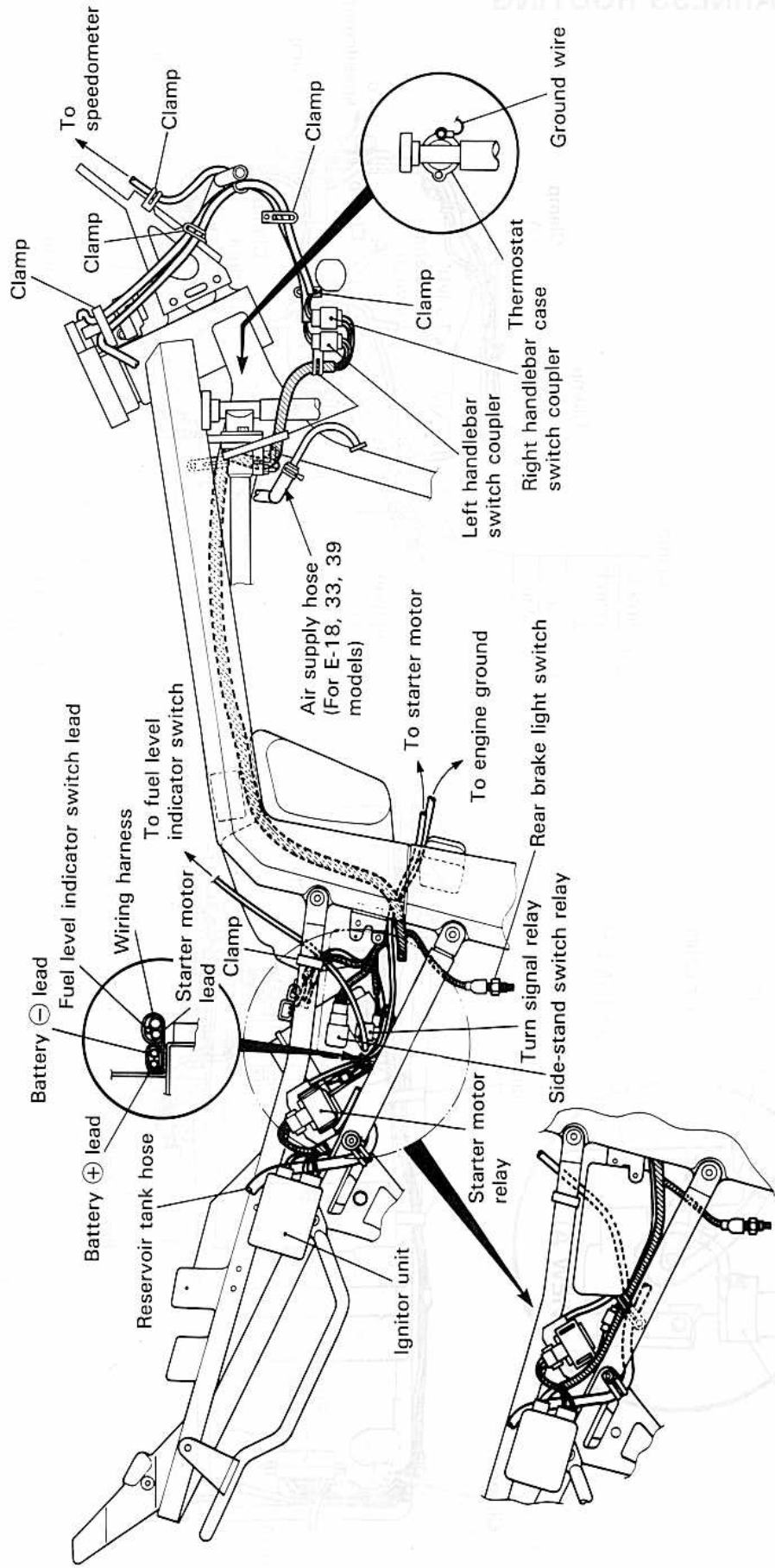
EG: ENGINE COOLANT TEMP. GAUGE

FOR OTHER MODELS



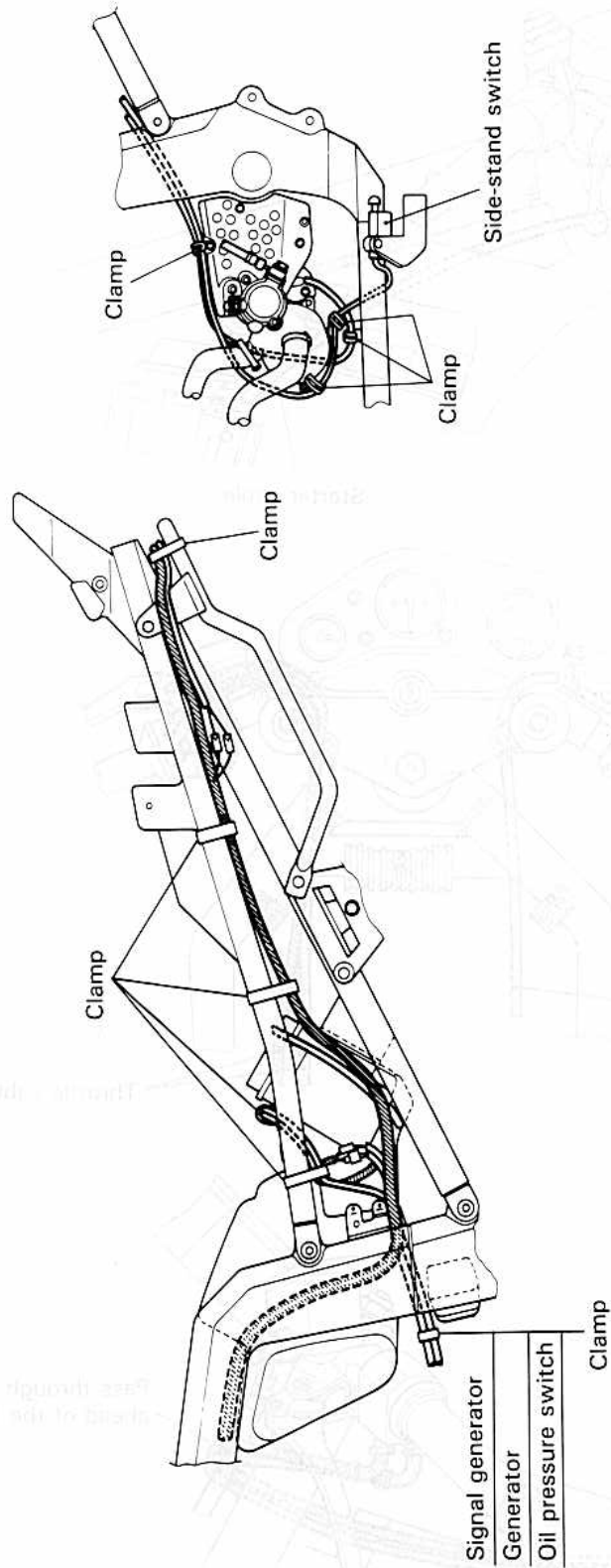
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WIRE HARNESS ROUTING



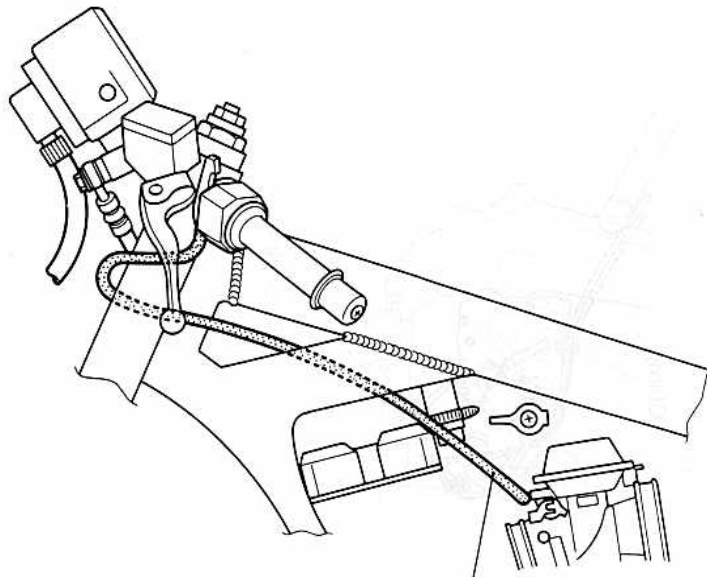
WIRE HARNESS ROUTING

THROTTLE CABLE ROUTING

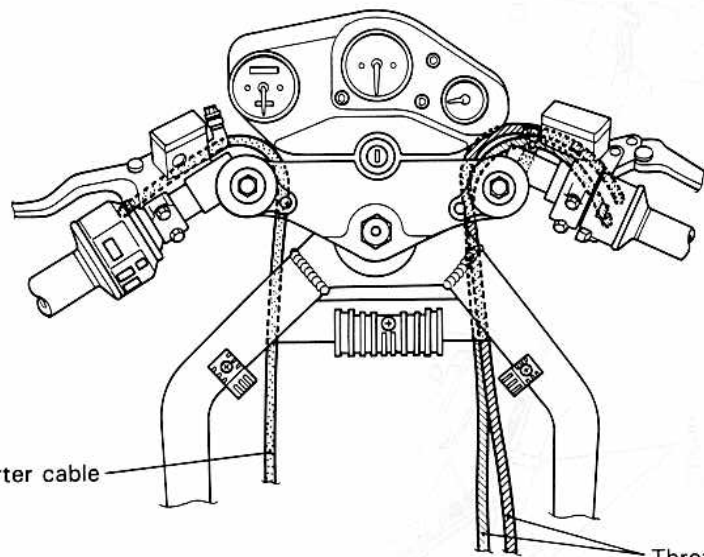


THROTTLE CABLE ROUTING

WIRE HARNESS ROUTING

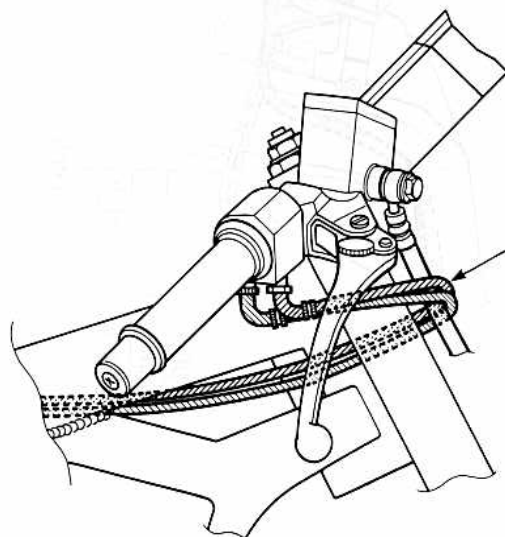


Starter cable



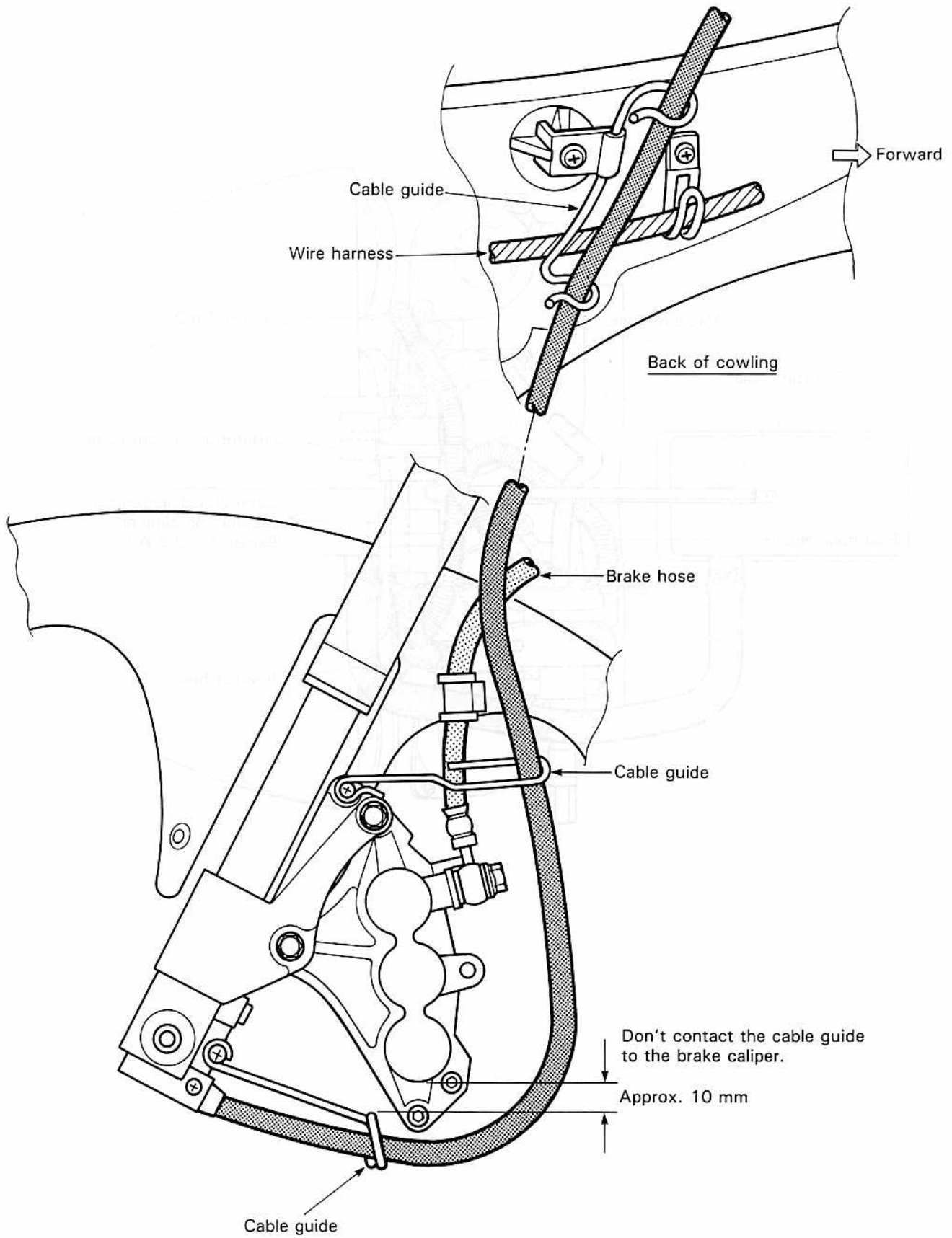
Starter cable

Throttle cables

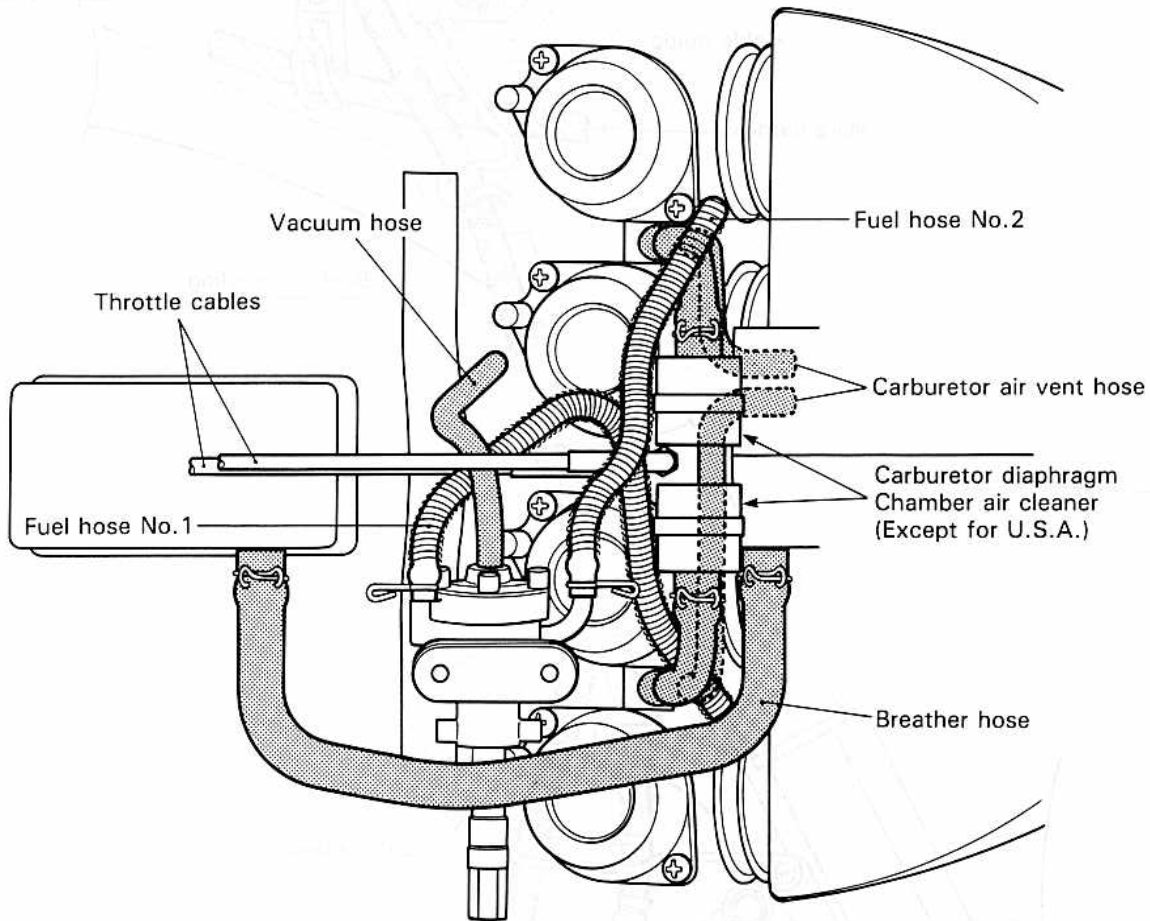


Pass through the throttle cables ahead of the brake hose.

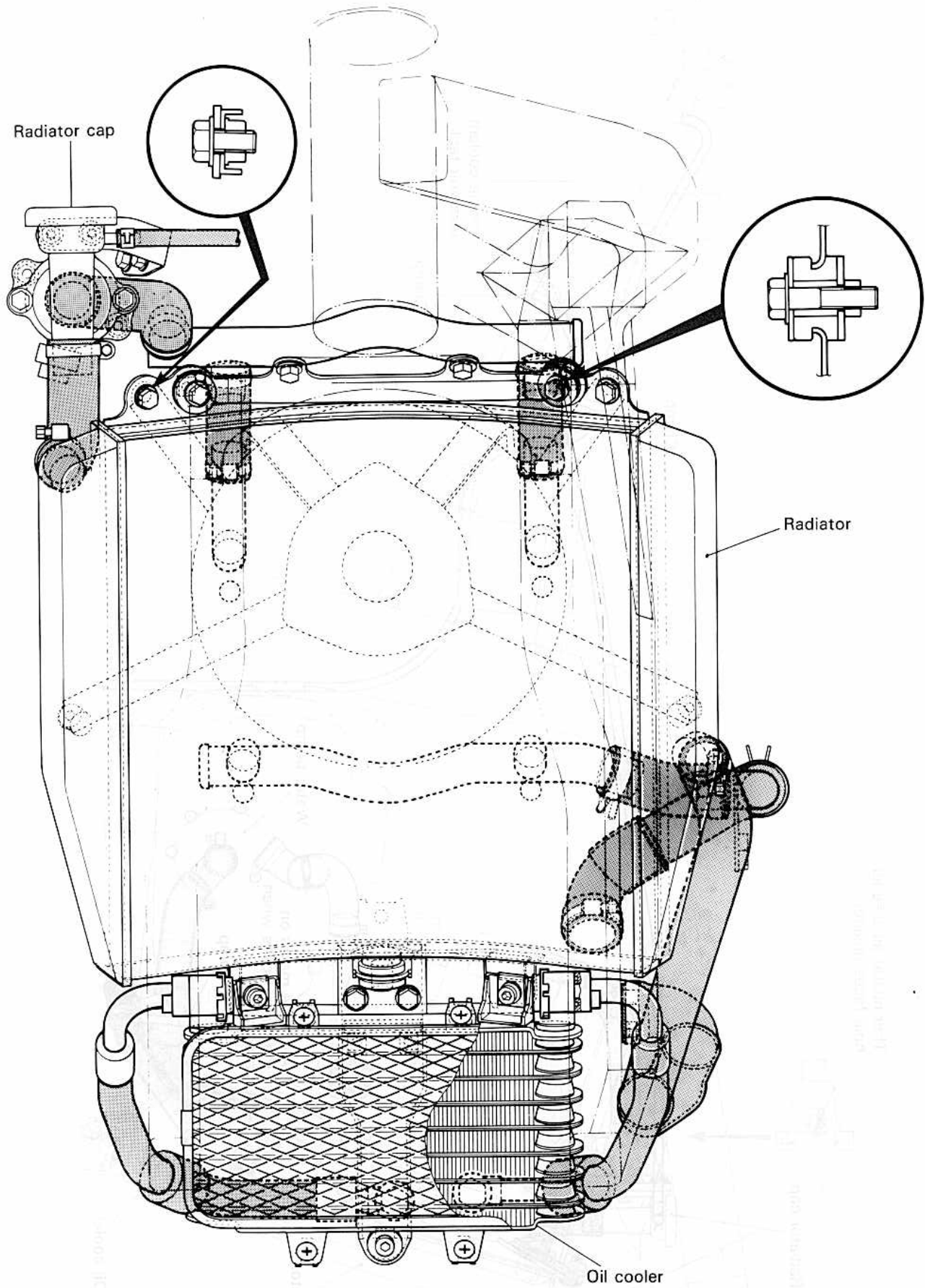
SPEEDOMETER CABLE ROUTING



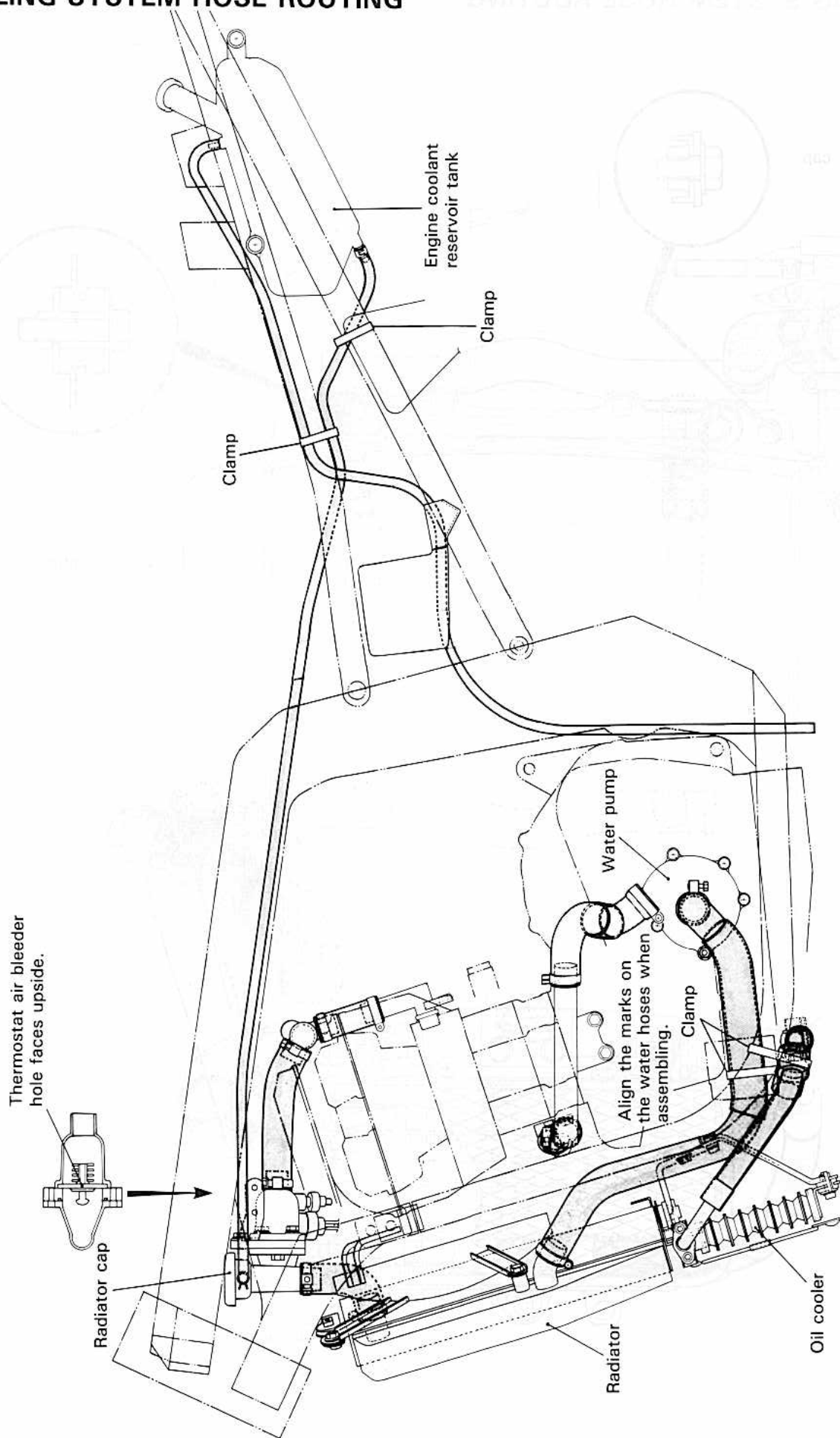
FUEL SYSTEM HOSE ROUTING



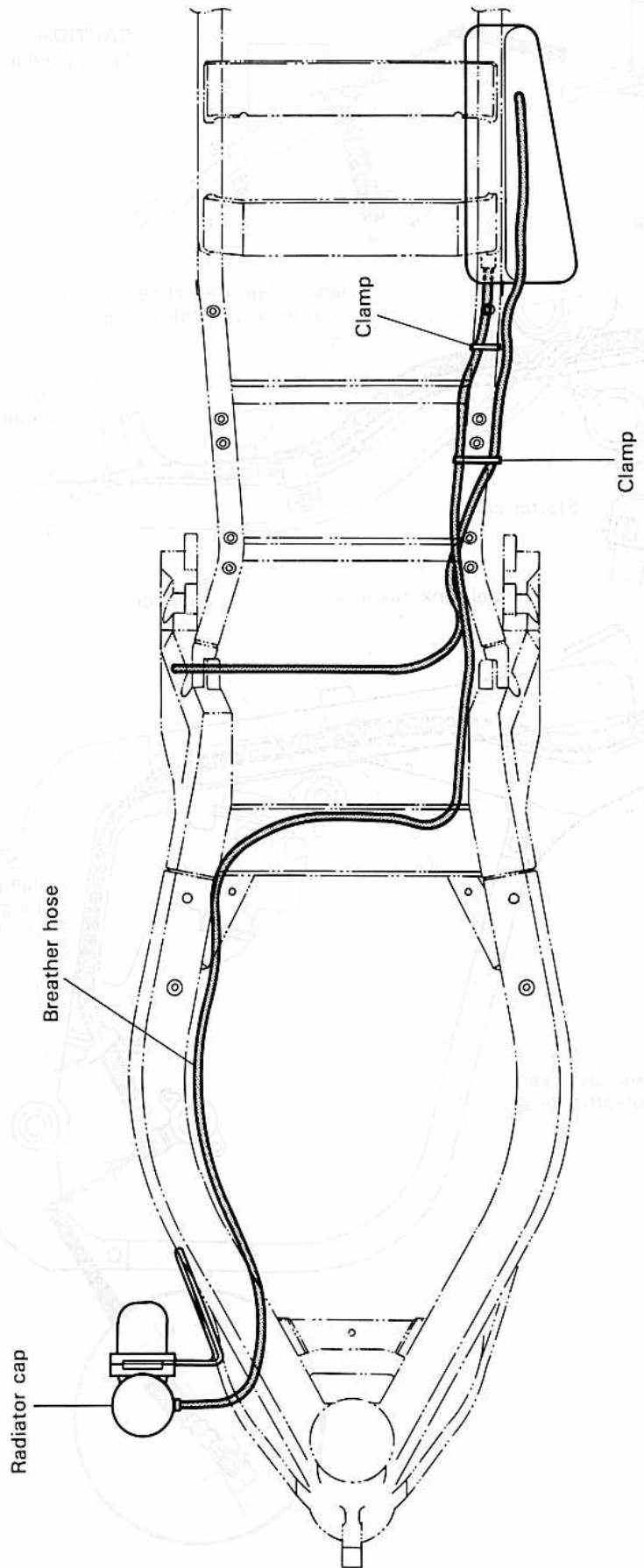
COOLING SYSTEM HOSE ROUTING



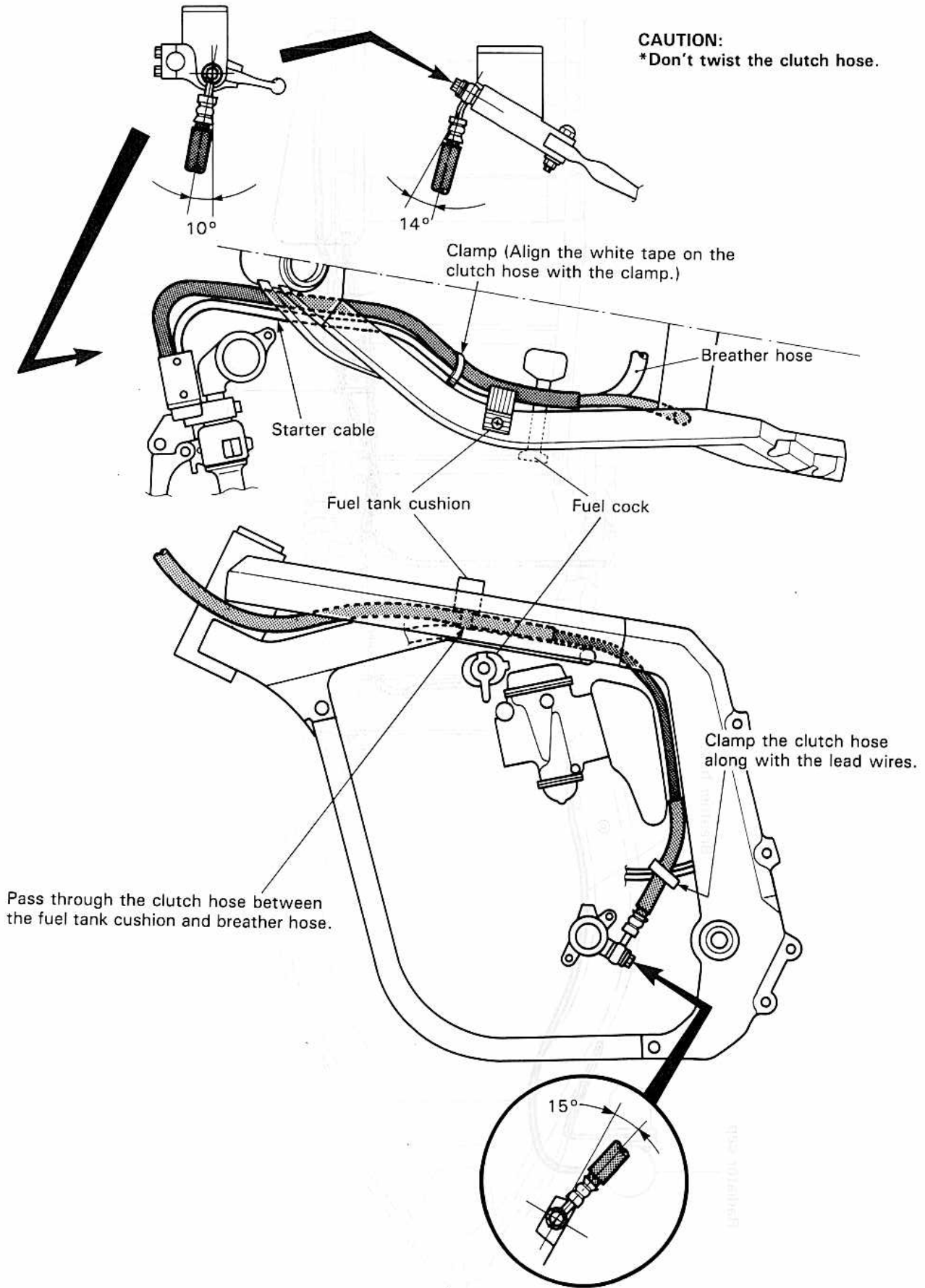
COOLING SYSTEM HOSE ROUTING



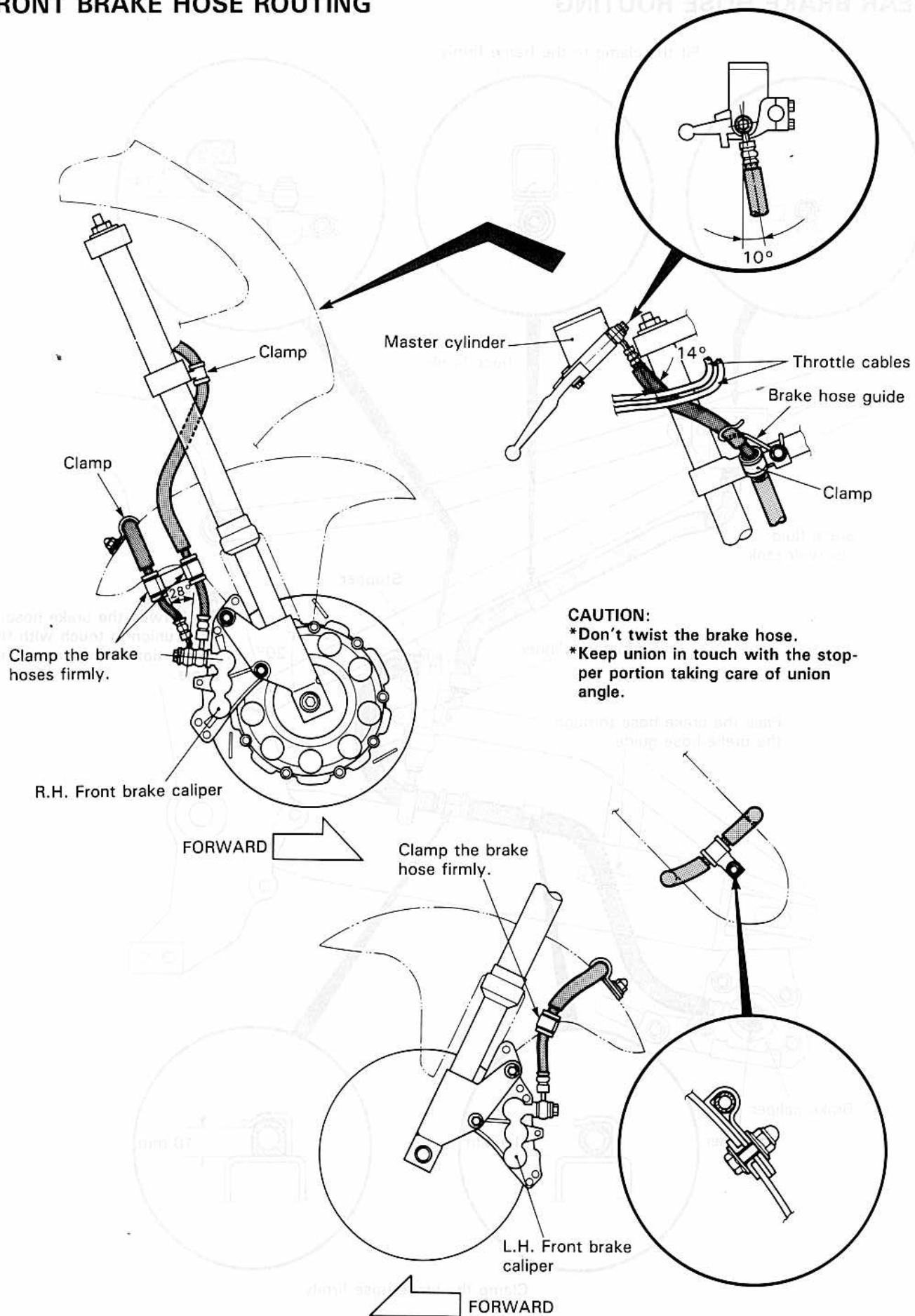
COOLING SYSTEM HOSE ROUTING



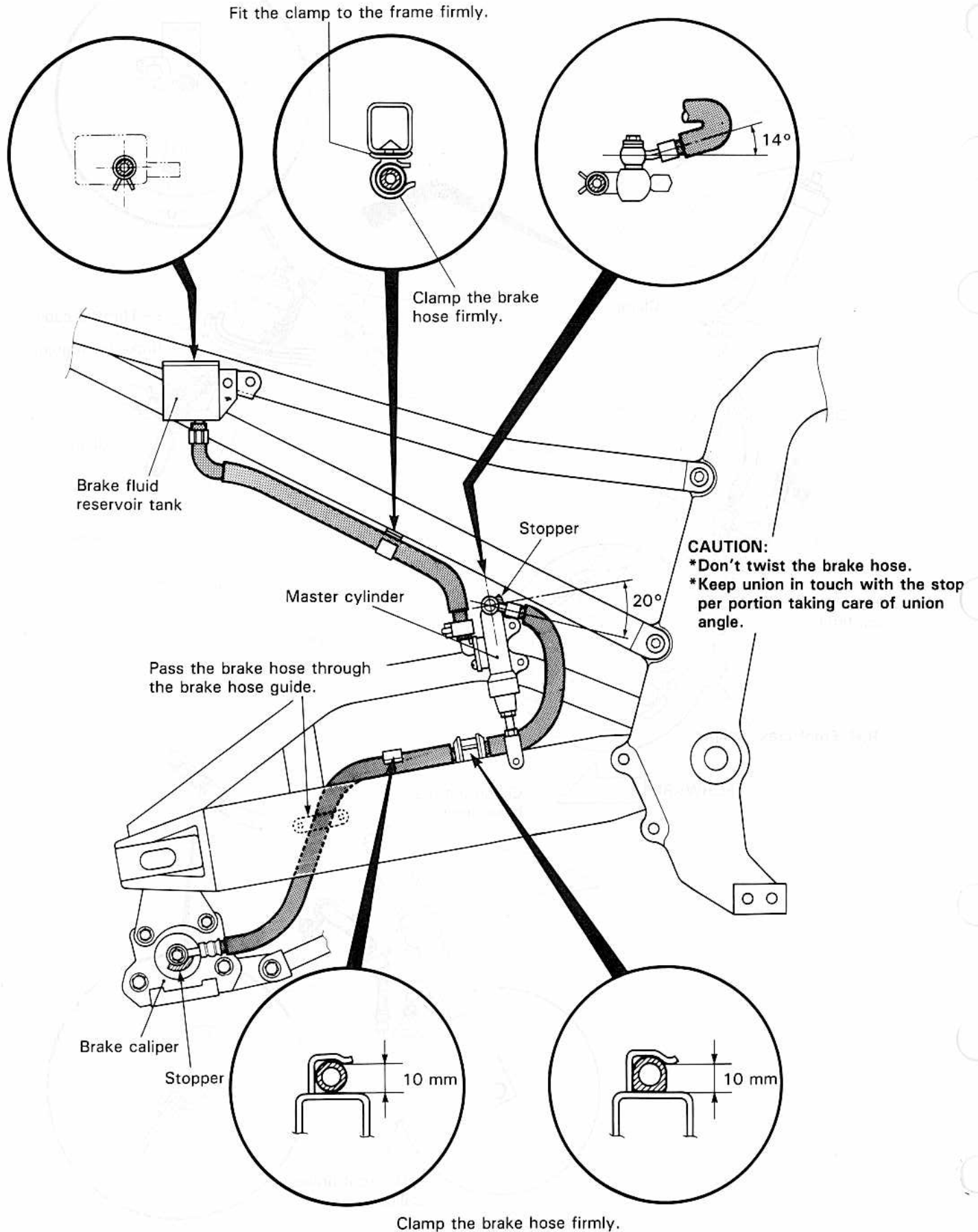
CLUTCH HOSE ROUTING



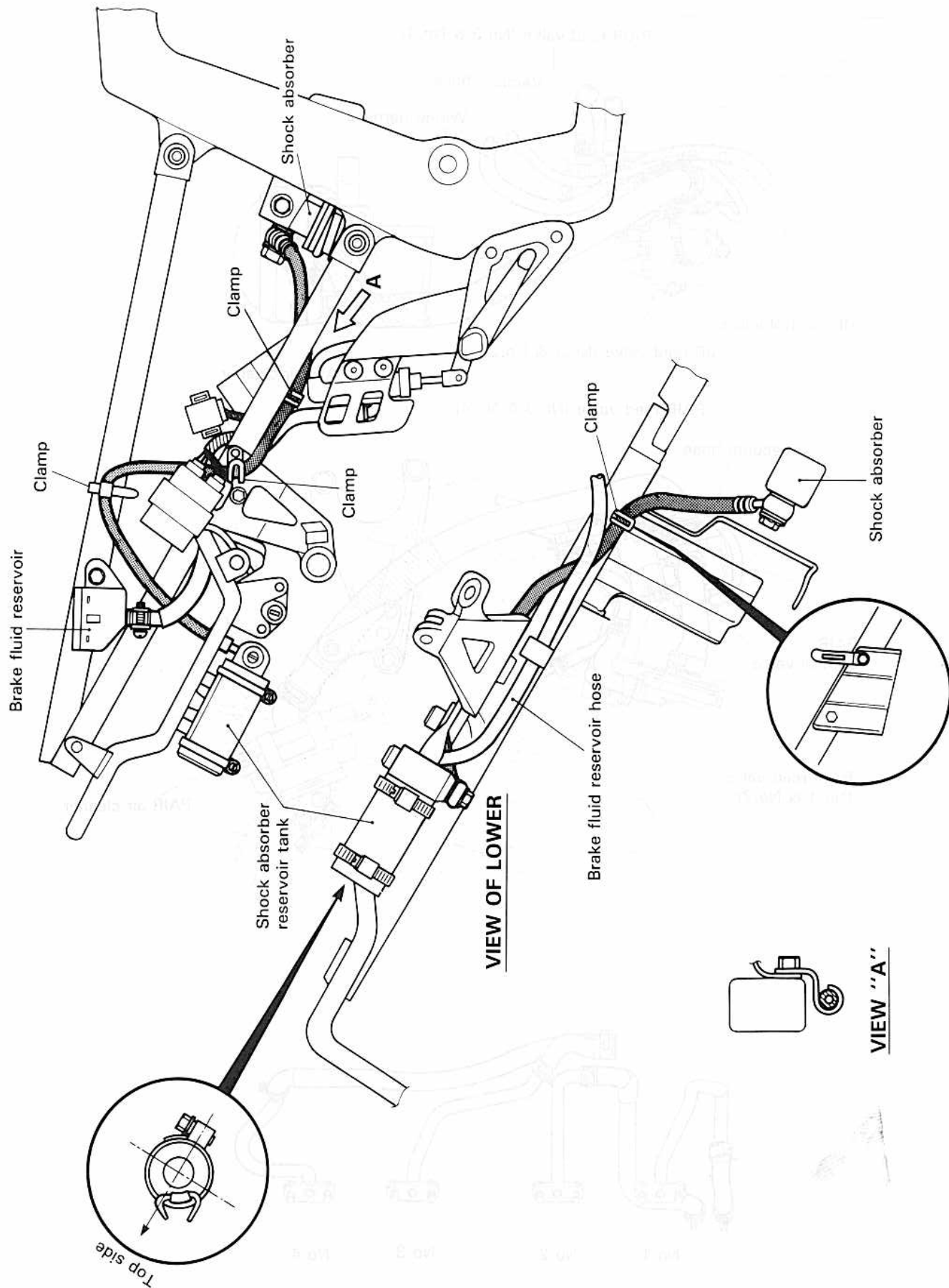
FRONT BRAKE HOSE ROUTING



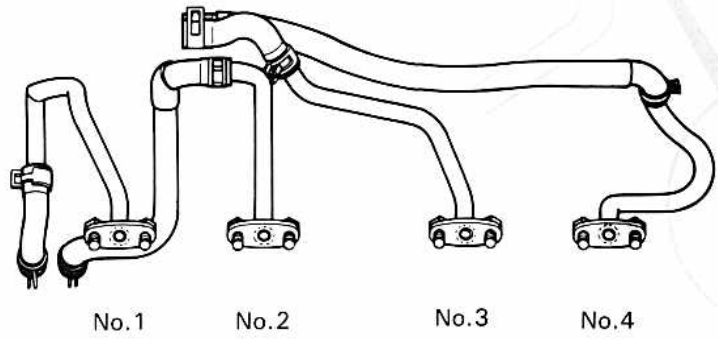
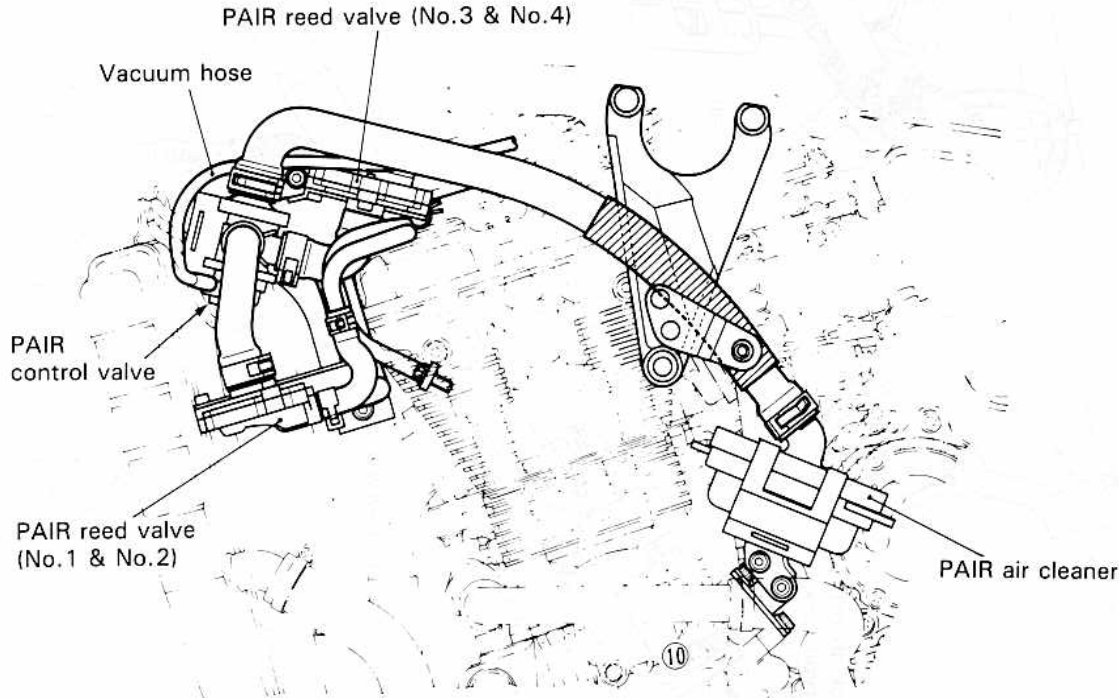
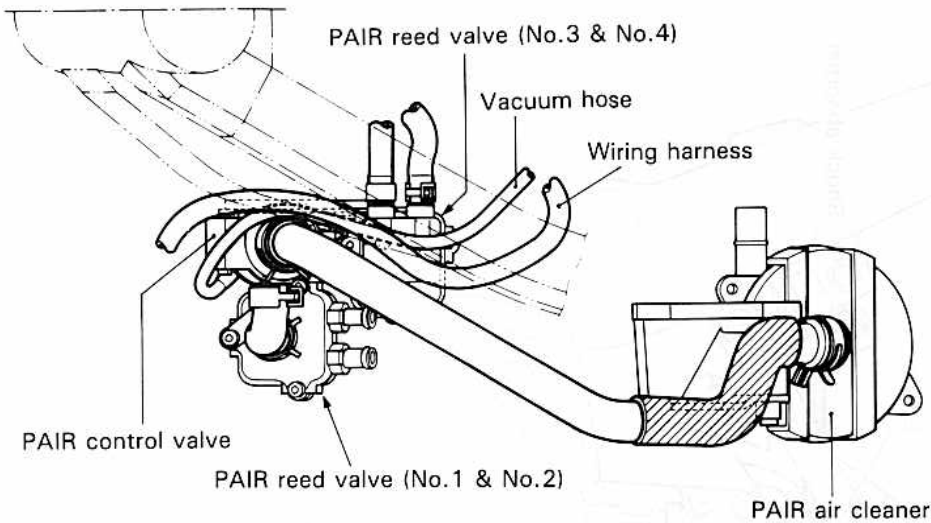
REAR BRAKE HOSE ROUTING



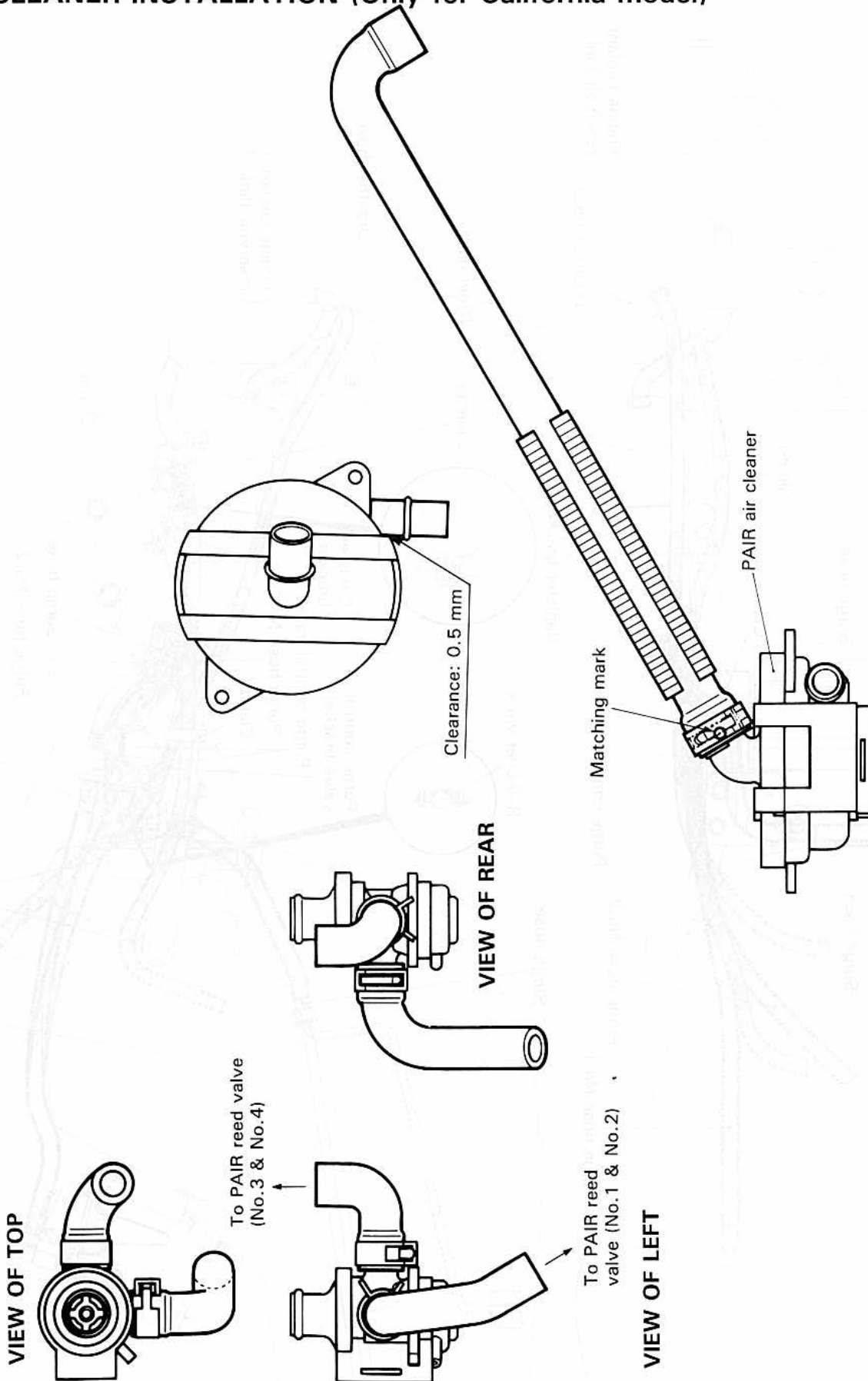
SHOCK ABSORBER RESERVOIR TANK HOSE ROUTING



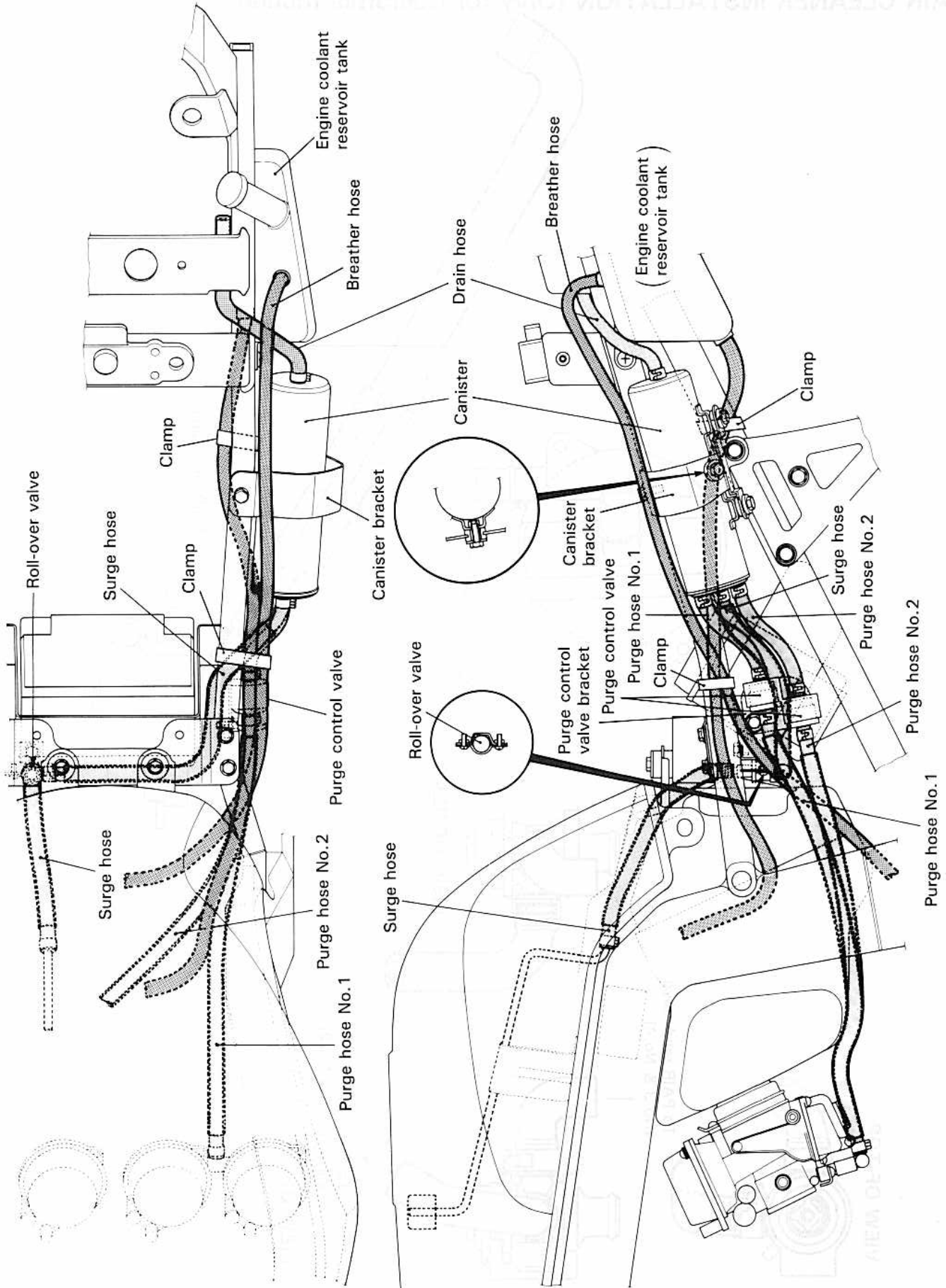
PAIR (AIR SUPPLY) SYSTEM HOSE ROUTING (Only for California model)



PAIR (AIR SUPPLY) SYSTEM CONTROL VALVE AND PAIR (AIR SUPPLY) AIR CLEANER INSTALLATION (Only for California model)



CANISTER HOSE ROUTING (Only for California model)



GSX-R1100WT ('96-MODEL)

CONTENTS

SPECIFICATIONS	12- 1
SERVICE DATA	12- 3

NOTE:

The specifications and service data are the same as those of the '95-MODEL.

SPECIFICATIONS

DIMENSIONS AND DRY MASS

Overall length	2 130 mm (83.9 in)	For E-02, 03, 24, 28, 33, 34 models
	2 115 mm (83.3 in)	For E-04 model
	2 245 mm (88.4 in)	For E-18, 22, 39 models
	2 155 mm (84.8 in)	For E-25 model
Overall width	755 mm (29.7 in)	
Overall height	1 190 mm (46.9 in)	
Wheelbase	1 485 mm (58.5 in)	
Ground clearance	130 mm (5.1 in)	
Dry mass	222 kg (489 lbs)	For E-18, 39 models
	223 kg (491 lbs)	For E-33 model
	221 kg (487 lbs)	For other models

ENGINE

Type	Four-stroke, Water-cooled, DOHC, TSCC
Number of cylinders	4
Bore	75.5 mm (2.972 in)
Stroke	60.0 mm (2.362 in)
Piston displacement	1074 cm ³ (65.5 cu. in)
Carburetor	MIKUNI BST36 E-03, 18, 33, 39 MIKUNI BST40 For other models
Air cleaner	Non-woven fabric element
Starter system	Electric starter
Lubrication system	Wet sump

TRANSMISSION

Clutch	Wet multi-plate type
Transmission	5-speed constant mesh
Gearshift pattern	1-down, 4-up
Primary reduction ratio	1.565 (72/46)
Final reduction ratio	2.750 (44/16)
Gear ratios, Low	2.714 (38/14)
2nd	1.809 (38/21)
3rd	1.409 (31/22)
4th	1.181 (26/22)
5th	1.038 (27/26)
Drive chain	TAKASAGO RK532GSV ₂ , 116 links

CHASSIS

Front suspension	Inverted telescopic, coil spring, oil damped, spring pre-load adjustable, rebound and compression damping force adjustable.
Rear suspension	Link type system, gas/oil damped, coil spring, spring pre-load adjustable, rebound and compression force adjustable.
Steering angle	30° (right & left)
Caster	65° 10'
Trail	100 mm (3.9 in)
Turning radius	3.2 m (10.5 ft)
Front brake	Disc brake, twin
Rear brake	Disc brake
Front tire size	120/70 ZR17, tubeless
Rear tire size	180/55 ZR17, tubeless
Front fork stroke	120 mm (4.7 in)
Rear wheel travel	160 mm (6.3 in)

ELECTRICAL

Ignition type	Electronic ignition (Fully Transistorized)
Ignition timing	4° B.T.D.C. at 1500 r/min For E-03, 18, 33, 39 models 7° B.T.D.C. at 1500 r/min For other models
Spark plug	N.G.K.: CR9E NIPPONDENSO U27ESR-N
Battery	12V 36.0 kC (10 Ah)/10 HR
Generator	Three-phase A.C. Generator
Main fuse	30A
Fuse	15/15/10/15/10A
Headlight	12V 60/55W x 2 E-02, 03, 24, 28, 33 models 12V 60/55W + 12V 55W..... E-04, 18, 22, 25, 34, 37, 39 models
Turn signal light	12V 21W
Front position light	12V 5W Except for E-03, 24, 28, 33 models
Tail/Brake light	12V 5/21W x 2
Speedometer light	12V 1.7W x 2
Tachometer light	12V 1.7W x 2
Neutral indicator light	14V 3W
High beam indicator light	14V 3W
Turn signal indicator light	14V 3W
Oil pressure indicator light	14V 3W
Fuel level indicator light.....	14V 3W

CAPACITIES

Fuel tank, including reserve	21.0 L (5.5/4.6 US/Imp gal)
Engine oil, oil change	3 000 ml (3.2/2.6 US/Imp qt)
with filter change	3 300 ml (3.5/2.9 US/Imp qt)
overhaul	3 900 ml (4.1/3.4 US/Imp qt)
Front fork oil	548 ml (18.5/19.3 US/Imp oz)
Coolant	2 450 ml (2.6/2.2 US/Imp qt)

These specifications are subject to change without notice.

SERVICE DATA

VALVE + GUIDE

Unit: mm (in)

ITEM	STANDARD		LIMIT	
Valve diam.	IN.	31 (1.2)	—	
	EX.	27 (1.1)	—	
Valve lift	IN.	E-01,03 and others	8.7 (0.34)	—
		E-04	5.0 (0.20)	—
		E-18, 33,39	7.3 (0.29)	—
	EX.	E-01,03 and others	8.2 (0.32)	—
		E-04	7.0 (0.28)	—
		E-18, 33,39	7.0 (0.28)	—
Tappet clearance (when cold)	IN.	0.10–0.20 (0.004–0.008)	—	
	EX.	0.20–0.30 (0.008–0.010)	—	
Valve guide to valve stem clearance	IN.	0.020–0.047 (0.0008–0.0019)	—	
	EX.	0.030–0.057 (0.0012–0.0022)	—	
Valve stem deflection	IN. & EX.	—	0.35 (0.014)	
Valve guide I.D.	IN. & EX.	4.500–4.512 (0.1772–0.1776)	—	
Valve stem O.D.	IN.	4.465–4.480 (0.1758–0.1764)	—	
	EX.	4.455–4.470 (0.1754–0.1760)	—	
Valve stem runout	IN. & EX.	—	0.05 (0.002)	
Valve head thickness	IN. & EX.	—	0.5 (0.02)	
Valve seat width	IN. & EX.	0.8–1.2 (0.031–0.047)	—	
Valve head radial runout	IN. & EX.	—	0.03 (0.001)	
Valve spring free length (IN. & EX.)	—		40.4 (1.59)	
Valve spring tension (IN. & EX.)	18.6–21.4 kg (41.0–47.2 lbs) at length 36 mm (1.4 in)		—	

CAMSHAFT + CYLINDER HEAD

Unit: mm (in)

ITEM	STANDARD		LIMIT	
Cam height	IN.	E-01,03 and others	36.692–36.748 (1.4446–1.4468)	36.40 (1.433)
		E-04	32.992–33.048 (1.2989–1.3011)	32.70 (1.287)
		E-18, 33,39	35.292–35.348 (1.3894–1.3917)	35.00 (1.378)
	EX.	E-01,03 and others	36.222–36.278 (1.4260–1.4282)	35.93 (1.414)
		E-04	34.952–35.008 (1.3761–1.3783)	34.66 (1.365)
		E-18, 33,39	34.952–35.008 (1.3761–1.3783)	34.66 (1.365)
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)	—	
Camshaft journal O.D.	IN. & EX.	21.959–21.980 (0.8645–0.8654)	—	
Camshaft runout	IN. & EX.	—	0.10 (0.004)	
Cam chain pin (at arrow "3")	13th pin		—	
Cylinder head distortion	—		0.20 (0.008)	

CYLINDER + PISTON + PISTON RING

Unit: mm (in)

ITEM	STANDARD		LIMIT	
Compression pressure	1 000–1 500 kPa (10–15 kg/cm ²) (142–213 psi)		800 kPa (8 kg/cm ²) (114psi)	
Compression pressure difference	—		200 kPa (2 kg/cm ²) (28 psi)	
Piston to cylinder clearance	0.040–0.050 (0.0016–0.0020)		0.120 (0.0047)	
Cylinder bore	75.500–75.515 (2.9724–2.9730)		75.590 (2.9760)	
Piston diam.	75.455–75.470 (2.9707–2.9713) Measure at 15 mm (0.6 in) from the skirt end.		75.380 (2.9677)	
Cylinder distortion	—		0.20 (0.008)	
Piston ring free end gap	1st	R	Approx. 11.2 (0.44)	8.9 (0.35)
	2nd	R	Approx. 8.6 (0.34)	6.8 (0.27)
Piston ring end gap	1st	0.20–0.30 (0.008–0.012)		0.5 (0.02)
	2nd	0.20–0.30 (0.008–0.012)		0.5 (0.02)

ITEM	STANDARD		LIMIT
Piston ring to groove clearance	1st	—	0.18 (0.007)
	2nd	—	0.18 (0.007)
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)	—
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 (0.010)
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.	33.976–34.000 (1.3376–1.3386)		—
Crankshaft thrust clearance	0.055–0.110 (0.0022–0.0043)		—
Crankshaft thrust bearing thickness	Right side	2.425–2.450 (0.0955–0.0965)	—
	Left side	2.350–2.500 (0.0925–0.0984)	—
Crankshaft runout	—		0.05 (0.002)

OIL PUMP

ITEM	STANDARD	LIMIT
Oil pump reduction ratio	1.703 (72/46 x 37/34)	—

ITEM	STANDARD	LIMIT
Oil pressure (at 60°C, 140°F)	Above 300 kPa (3.0 kg/cm ² , 43 psi) Below 600 kPa (6.0 kg/cm ² , 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)
Drive plate distortion	—	0.10 (0.004)
Clutch spring free height	—	3.1 (0.12)
Clutch master cylinder bore	14.000–14.043 (0.5511–0.5529)	—
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)	—

THERMOSTAT + RADIATOR + FAN

ITEM	STANDARD	LIMIT	
Thermostat valve opening temperature	74.5–78.5°C (166.1–173.3°F)	—	
Thermostat valve lift	Over 7 mm (0.28 in) at 90°C (194°F)	—	
Radiator cap valve opening pressure	110 kPa (1.1 kg/cm ² , 15.6 psi)	—	
Cooling fan thermo-switch operating temperature	ON	Approx. 105°C (221°F)	—
	OFF	Approx. 100°C (212°F)	—
Engine coolant temperature gauge resistance	50°C (122°F)	Approx. 153.9 Ω	—
	80°C (176°F)	Approx. 51.9 Ω	—
	100°C (212°F)	Approx. 27.4 Ω	—
	120°C (248°F)	Approx. 16.1 Ω	—

TRANSMISSION + DRIVE CHAIN

Unit: mm (in) Except ratio

ITEM	STANDARD	LIMIT	
Primary reduction ratio	1.565 (72/46)	—	
Final reduction ratio	2.750 (44/16)	—	
Gear ratios	Low	2.714 (38/14)	—
	2nd	1.809 (38/21)	—
	3rd	1.409 (31/22)	—
	4th	1.181 (26/22)	—
	Top	1.038 (27/26)	—

ITEM	STANDARD		LIMIT
Shift fork to groove clearance	0.10–0.30 (0.004–0.012)		0.50 (0.020)
Shift fork groove width	5.00–5.10 (0.197–0.201)		—
Shift fork thickness	4.80–4.90 (0.189–0.193)		—
Drive chain	Type	RK532GSV ₂	—
	Links	116 links, ENDLESS	—
	20-pitch length	—	319.4 (12.6)
Drive chain slack	25–35 (1.0–1.4)		—
Gearshift lever height	65–75 (2.6–3.0)		—

CARBURETOR

ITEM	SPECIFICATION	
	E-03	E-33
Carburetor type	MIKUNI BST36SS	←
Bore size	36 mm	←
I.D. No.	46EC	46EJ
Idle r/min.	1 100 ⁺¹⁰⁰ ₋₅₀ r/min.	1 200 ⁺¹⁰⁰ ₋₅₀ r/min.
Float height	14.7 mm (0.58 in)	
Main jet (M.J.)	#1&4: (#117.5), #2&3: (#120)	#117.5
Main air jet (M.A.J.)	0.5 mm	←
Jet needle (J.N.)	5D75	5D62
Needle jet (N.J.)	□-BM	←
Throttle valve (Th.V.)	#115	#125
Pilot jet (P.J.)	#30	←
By-pass (B.P.)	#1,2&3: 0.8 mm	#1,2,3&4: 0.8 mm
Pilot outlet (P.O.)	0.8 mm	0.9 mm
Valve seat (V.S.)	2.3 mm	←
Starter jet (G.S.)	#40	←
Pilot screw (P.S.)	PRE-SET	PRE-SET
Throttle cable play	0.5–1.0 mm (0.02–0.04 in)	

ITEM	SPECIFICATION			
	E-24,25,28,34	E-22	E-04	E-37
Carburetor type	MIKUNI BST40SS	←	←	←
Bore size	40 mm	←	←	←
I.D. No.	46EH	46EF	46ED	46EL
Idle r/min.	1 100 ± 100 r/min	←	←	←
Float height	14.7 mm (0.58 in)			
Main jet (M.J.)	#1&4: (#122.5) #2&3: (#125)	#127.5	#1&4: (#122.5) #2&3: (#125)	←
Main air jet (M.A.J.)	2.0 mm	←	←	←

ITEM	SPECIFICATION			
	E-24,25,28,34	E-22	E-04	E-37
Jet needle (J.N.)	6ZD13-4th	←	6ZD21-3rd	6ZD13-4th
Needle jet (N.J.)	P-2	←	←	←
Throttle valve (Th.V.)	# 120	←	←	←
Pilot jet (P.J.)	# 40	←	←	←
By-pass (B.P.)	# 1,2,3 & 4: 0.8 mm	←	←	←
Pilot outlet (P.O.)	0.8 mm	←	←	←
Valve seat (V.S.)	2.5 mm	←	←	←
Starter jet (G.S.)	# 37.5	←	←	←
Pilot screw (P.S.)	PRE-SET (1- ⁵ / ₈ turns out)	←	PRE-SET (1- ³ / ₄ turns out)	PRE-SET (1- ⁵ / ₈ turns out)
Pilot air jet (P.A.J.)	1.2 mm	←	←	←
Throttle cable play	0.5—1.0 mm (0.02—0.04 in)			

ITEM	SPECIFICATION		
	E-02	E-18	E-39
Carburetor type	BST40SS	BST36SS	←
Bore size	40 mm	36 mm	←
I.D. No.	46EB	46EE	46EK
Idle r/min.	1 100 ± 100 r/min.	1 200 ⁺¹⁰⁰ / ₋₅₀ r/min.	1 200 ± 100 r/min.
Float height	14.7 mm (0.58 in)		
Main jet (M.J.)	# 1&4: (# 122.5) # 2&3: (# 125)	# 122.5	# 117.5
Main air jet (M.A.J.)	2.0 mm	1.5 mm	←
Jet needle (J.N.)	6ZD13-4th	5D44-2nd	5D51-3rd
Needle jet (N.J.)	P-2	O-9	O-8
Throttle valve (Th.V.)	# 120	# 125	←
Pilot jet (P.J.)	# 40	# 30	←
By-pass (B.P.)	# 1,2,3 & 4: 0.8 mm	# 1,2 & 3: 0.8 mm	←
Pilot outlet (P.O.)	0.8 mm	0.7 mm	←
Valve seat (V.S.)	2.5 mm	2.3 mm	←
Stater jet (G.S.)	# 37.5	# 40	←
Pilot screw (P.S.)	PRE-SET (1- ⁵ / ₈ turns out)	←	PRE-SET (2- ¹ / ₂ turns out)
Pilot air jet (P.A.J.)	1.2 mm	1.25 mm	1.35 mm
Throttle cable play	0.5—1.0 mm (0.02—0.04 in)		

Unit: W

ITEM	SPECIFICATION		
	E-03,24,28,33	E-02	E-04,18,22,25,34,37,39
Turn signal indicator light	3	←	←
High beam indicator light	3	←	←
Neutral indicator light	3	←	←
Oil pressure indicator light	3	←	←
Fuel level indicator light	3	←	←

BRAKE + WHEEL

Unit: mm (in)

ITEM	STANDARD		LIMIT
Rear brake pedal height	65–75 (2.6–3.0)		—
Brake disc thickness	Front	5.0 ± 0.2 (0.197 ± 0.008)	4.5 (0.18)
	Rear	6.0 ± 0.2 (0.236 ± 0.008)	5.5 (0.22)
Brake disc runout (Front & Rear)	—		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 (0.4983–0.4993)	—
Brake caliper cylinder bore	Front	27.000–27.050 (1.0630–1.0650)	—
	Rear	38.180–38.256 (1.5031–1.5061)	—
Brake caliper piston diam.	Front	26.937–26.970 (1.0605–1.0618)	—
	Rear	38.098–38.148 (1.5000–1.5019)	—
Wheel rim runout (Front & Rear)	Axial	—	2.0 (0.08)
	Radial	—	2.0 (0.08)
Wheel axle runout	Front	—	0.25 (0.010)
	Rear	—	0.25 (0.010)
Tire size	Front	120/70 ZR17	—
	Rear	180/55 ZR17	—
Tire tread depth	Front	—	1.6 (0.06)
	Rear	—	2.0 (0.08)

SUSPENSION

Unit: mm (in)

ITEM	STANDARD	LIMIT	NOTE
Front fork stroke	120 (4.7)	—	
Front fork spring free length	—	297 (11.7)	
Front fork oil level	107 (4.2)	—	
Rear wheel travel	160 (6.3)	—	
Swingarm pivot shaft runout	—	0.3 (0.01)	

TIRE PRESSURE

COLD INFLATION TIRE PRESSURE	SOLO RIDING			DUAL RIDING		
	kPa	kg/cm ²	psi	kPa	kg/cm ²	psi
FRONT	230	2.30	33	230	2.30	33
REAR	250	2.50	36	250	2.50	36

FUEL + OIL + ENGINE COOLANT

ITEM	SPECIFICATION	NOTE
Fuel type	Use only unleaded gasoline of at least 87 pump octane ($\frac{R+M}{2}$) or 91 octane or higher rated by the research method. Gasoline containing MTBE (Methyl Tertiary Butyl Ether), less than 10% ethanol, or less than 5% methanol with appropriate cosolvents and corrosion inhibitor is permissible.	E-03,33
	Use only unleaded gasoline of at least 87 pump octane ($\frac{R+M}{2}$ method) or 91 octane or higher rated by the Research Method.	E-28
	Gasoline used should be graded 85-95 octane or higher. An unleaded gasoline is recommended.	The others
Fuel tank including reserve	21.0 L (5.5/4.6 US/Imp gal)	E-01 and others
	18.5 L (4.9/4.1 US/Imp gal)	E-33
	reserve 3.1 L (0.8/0.7 US/Imp gal)	
Engine oil type	SAE 10W/40, API SE or SF	
Engine oil capacity	Change 3 000 ml (3.2/2.6 US/Imp qt)	
	Filter change 3 300 ml (3.5/2.9 US/Imp qt)	
	Overhaul 3 900 ml (4.1/3.4 US/Imp qt)	
Front fork oil type	Fork oil L01	
Front fork oil capacity (each leg)	548 ml (18.5/19.3 US/Imp oz)	

ITEM	SPECIFICATION	NOTE
Brake fluid type	DOT 4	
Engine coolant type	Use an anti-freeze/coolant compatible with aluminum radiator, mixed with distilled water only, at the ratio of 50:50.	
Engine coolant including reserve	2 450 ml (2.6/2.2 US/Imp qt)	

NOTE	DESCRIPTION	ITEM
	DOT 4	Brake fluid type
	Use an anti-freeze coolant compatible with aluminum radiator. Mixed with distilled water only at the ratio of 80% coolant to 20% water.	Engine coolant type
	1.4 liter (1.4 lmp qt)	Engine coolant including reserve

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