

SUZUKI

GS1100

SERVICE MANUAL

99500-39012-03E
(英)

FOREWORD

The SUZUKI GS1100 has been developed as a companion motorcycle to the GS models. It features highly advanced design concepts including an aluminum swing arm, a full-transistorized ignition system and a new highly efficient combustion system (TSCC). The GS1100 provides excellent performance, precise control and handling plus outstanding riding comfort.

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

IMPORTANT

All street-legal SUZUKI motorcycles with engine displacement of 50 cc or greater are subject to Environmental Protection Agency emission regulations. These regulations set specific standards for exhaust emission output levels as well as particular servicing requirements. This manual includes specific information required to properly inspect and service the GS1100 in accordance with all EPA regulations. It is strongly recommended that the chapter on Emission Control, Periodic Servicing and Carburetion be thoroughly reviewed before any type of service work is performed.

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

SUZUKI MOTOR CORPORATION

Motorcycle Technical Service Department

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VIEW OF SUZUKI GS1100



RIGHT SIDE



LEFT SIDE

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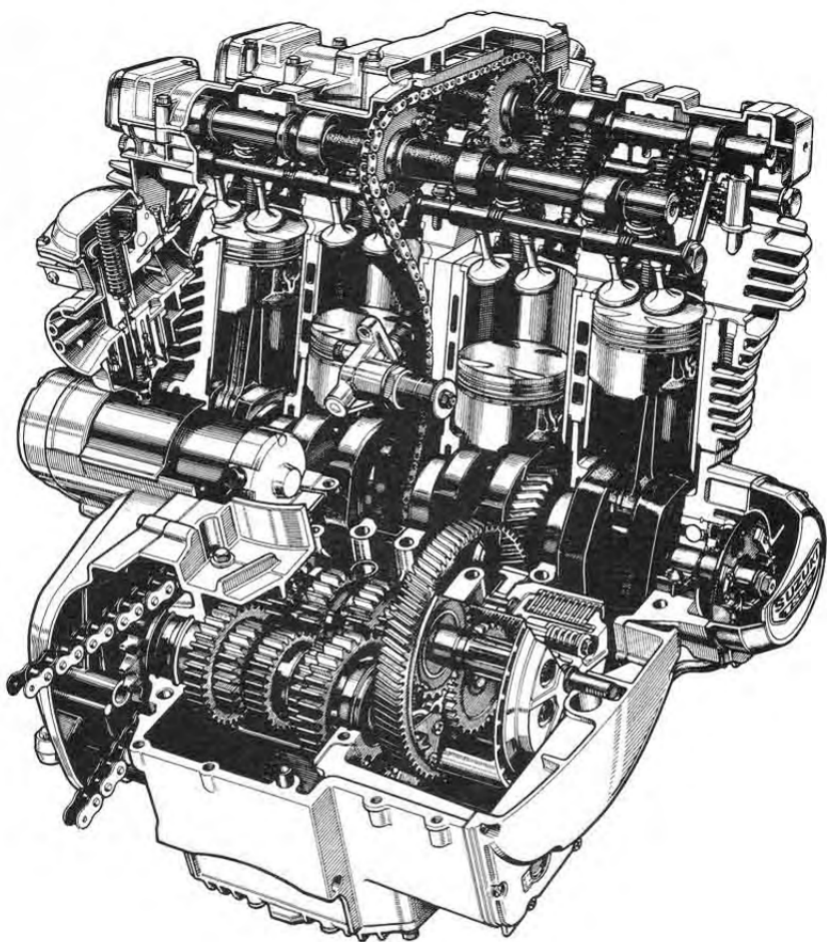
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SERIAL NUMBER LOCATIONS

FRAME NUMBER

The frame serial number ① is stamped on the steering head pipe.



ENGINE NUMBER

The engine serial number ② is located on the right side of the crankcase.



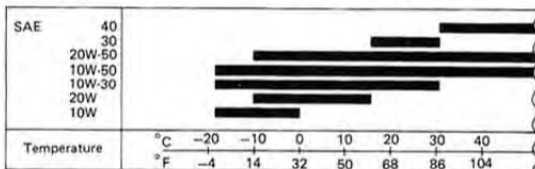
FUEL AND OIL RECOMMENDATIONS

FUEL

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

ENGINE OIL

Be sure that the engine oil you use comes under API classification of SE or SF and that its viscosity rating is SAE 10W/40. If SAE 10W/40 motor oil is not available, select the oil viscosity according to the following chart:



BRAKE FLUID (for front and rear brakes)

Specification and classification	DOT3 or DOT4
----------------------------------	--------------

WARNING:

* Since the brake system of this motorcycle is filled with a glycol-based brake fluid by the manufacturer, do not use or mix different types of fluid such as silicone-based and petroleum-based fluid for refilling the system, otherwise serious damage will result.

* Do not use any brake fluid taken from old or used or unsealed containers.

* Never re-use brake fluid left over from the previous servicing and stored for a long period.

CHASSIS

Front suspension	Telescopic, pneumatic/coil spring, oil dampened, damper 4-way/spring 4-way adjustable
Rear suspension	Swinging arm, oil dampened, damper 4-way/spring 5-way adjustable
Steering angle	40° (right and left)
Caster	62°00'
Trail	103 mm (4.06 in)
Turning radius	2.8 m (9.2 ft)
Front brake	Disc brake, twin
Rear brake	Disc brake
Front tire size	3.50V19 4PR
Rear tire size	4.50V17 4PR
Front tire pressure	1.75 kg/cm ² , (24 psi) (Normal solo riding)
Rear tire pressure	2.00 kg/cm ² , (28 psi) (Normal solo riding)

ELECTRICAL

Ignition type	Transistorized
Ignition timing	12° B.T.D.C. below 1 500 r/min and 32° B.T.D.C. above 2 350 r/min
Spark plug	NGK D8EA or NIPPON DENSO X24ES-U
Battery	12V 50.4 kC (14 Ah)/10 HR
Generator	Three-phase A.C. generator
Fuse	10/10/10/10/15A

CHECK PANEL

Headlamp	14V 1.4W
Tail lamp	14V 1.4W
Brake lamp	14V 1.4W
Battery	14V 1.4W
Brake FL	14V 1.4W

CAPACITIES

Fuel tank	19L (5.0 US gal)
Engine oil	3.2L (3.4 US qt)
Front fork oil	238 ml (8.04 US oz)

* Specifications are subject to change without notice.

FRONT FORK OIL

Use fork oil #15.

BREAKING-IN PROCEDURES

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

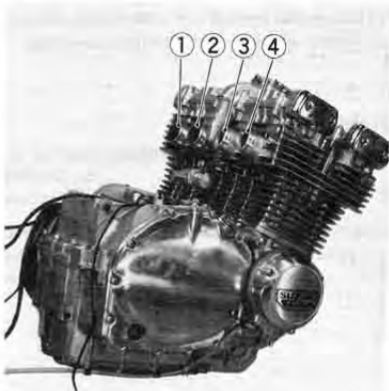
- Keep to these breaking-in engine speed limits:

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

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

CYLINDER IDENTIFICATION

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



SPECIAL FEATURES

TRANSISTORIZED IGNITION SYSTEM

DESCRIPTION

- * Trouble free operation due to elimination of contact breaker points.
- * Ignition timing is precisely controlled at all times and requires no maintenance.
- * Provides the ignition coil with stable primary voltage.
- * Excellent vibration and moisture resistance.

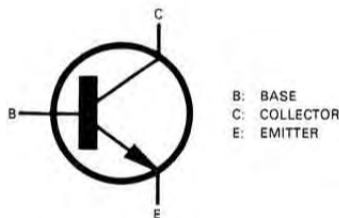
TRANSISTOR

Transistor functions can be divided into four main functions:

1. Amplification
2. Switching
3. Oscillation
4. Modulation

These functions are utilized in the ignition system employed on the GS1100.

Transistors are divided into two groups, NPN and PNP types. The transistors used in the GS1100 are the NPN type only, which work as an amplifier and switching device.



Each transistor has three terminals identified as the Base (B), Collector (C), and Emitter (E), and operation is as follows:

On a NPN type the base is the controlling terminal of the transistor operation. On this type, the base utilizes only a positive or incoming signal to do the "ON", or "OFF" switching. The collector is the terminal where voltage is supplied to the transistor and the emitter is the terminal for passing this current on when the base has the proper "signal". Usually the voltage applied across the collector to the emitter is much larger than that needed at the base. This allows a relatively low voltage at the base to control large working voltages across the collector to the emitter.

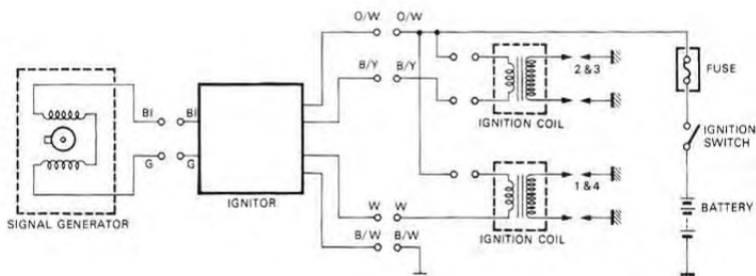
The transistor ignition system used on the GS1100 is the Nippon Denso brand and consists of a signal generator, which employs a rotor and two pick-up coils, the transistor unit, ignition coils, and spark plugs.

SIGNAL GENERATOR

The signal generator is mounted on the right hand side of the engine in the area commonly used for the contact breaker points. It is comprised of an iron rotor attached to a mechanical advance mechanism and two pick-up coils, with magnets at their bases, affixed to a plate. Each pick-up coil consists of a coil of wire and a yoke on which the coil is mounted, 180° apart on the plate.

As the rotor tip is turned past the coils, AC current is produced and used for switching within the transistor unit.

The transistor unit controls power to the ignition coils and causes the spark plugs to fire at the proper time.



TSCC (TWIN SWIRL COMBUSTION CHAMBER)

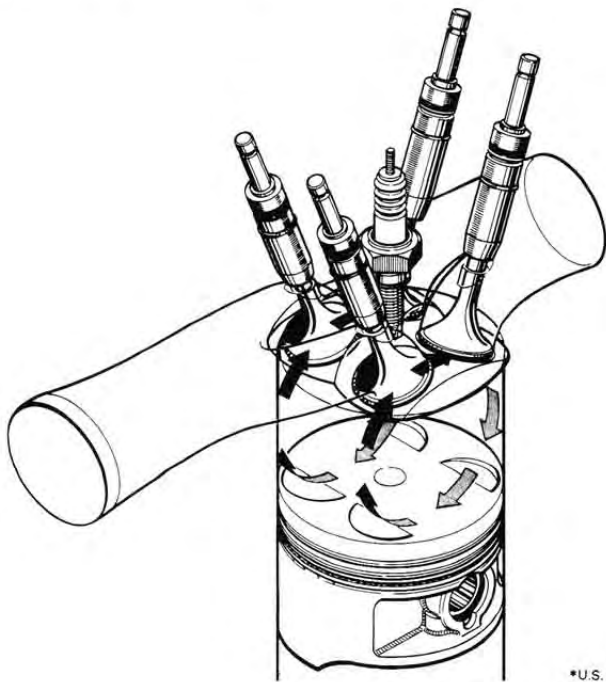
SUZUKI has introduced a new breed of 4-valves-per-cylinder high-performance 4-stroke engines-the TSCC series. TSCC describes the heart of the engine, the Twin Swirl Combustion Chamber.

What the TSCC engine series does better than conventional 4-stroke engines, either 2 valve or 4 valve, is to improve on the two major factors which affect engine performance, charge burning efficiency and intake charging efficiency.

First, charge burning efficiency. The TSCC* system consists of a subtle, yet unique shape machined into the head. Each of the two intake valves is set into adjoining semi-hemispherical depressions in the head. During the intake stroke these depressions channel the incoming fuel/air mixture to form two separate high speed swirls.

During the compression stroke the squish areas machined in the front and the rear of the cylinder head's combustion chamber accelerate the speed of the swirls. Thus, when the spark plug ignites the mixture, the flame spreads rapidly and completes the combustion more quickly.

To further aid burning efficiency, the spark plug is centrally located, the ideal location. This results in the shortest possible path for the flame to travel.

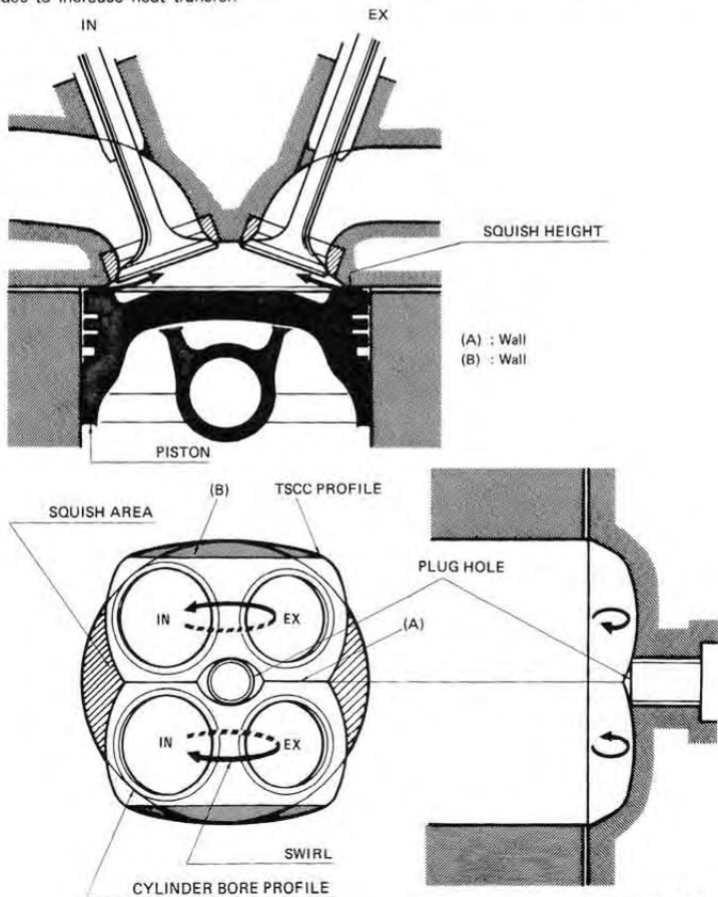


The quick completion of burning results in more energy being developed while the piston is in position to transmit maximum power to the crankshaft.

High burning efficiency results in more power, improved throttle response at all rpm's, more complete combustion of the air/fuel mixture (cleaner combustion) and less chance of detonation.

Second, charging efficiency. The benefits of increased burning efficiency are further multiplied if intake charging efficiency is also increased. Basically, increasing the charging efficiency results in more fuel and air being drawn into the engine during each intake stroke. Thus, greater energy potential.

To achieve this, the four valve head was adopted. Two smaller diameter intake valves can flow more than one large valve. Additionally, two smaller valves run cooler due to increased valve seat area and two valve guides to increase heat transfer.



But, SUZUKI went one step further. The valves are set in at a much shallower angle than other engines. The result is a smoother intake tract with less valve guide protrusion than in conventional cylinder heads. Therefore, increased flow, and smoother, less turbulent flow which contributes to more power and improved throttle response at all engine speeds.

There are several other benefits. This design is more efficient and will flow more air/fuel mixture than a conventional 4 valve head. Therefore, even smaller, lighter valves can be used with no decrease in power. Also, the valves can be shorter due to the placement angle. This allows more precise valve control since shorter, lighter valves are more easily controlled-especially at higher rpm's.

Yet another benefit of valves set at shallower angles is that the volume of the cylinder head combustion area is decreased. This allows the use of racing type flat-topped pistons since the desired compression ratio can be achieved without resorting to domed pistons. Flat topped pistons offer no restriction to the incoming air/fuel mixture and a flat-topped piston exposes the minimum amount of surface area to the hot burning mixture. This means that the flat piston absorbs less heat and therefore has to dissipate less heat through the rings and to the oil than a conventional domed piston. The result is a cooler running engine. Flat-topped pistons can also be made lighter resulting in less vibration and stress.

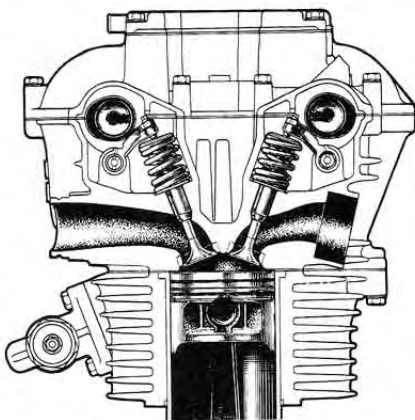
Increased burning efficiency. Increased charging efficiency. The result is more power throughout, from idle to redline. Throttle response is instant and clean. Displacement for displacement, no conventional engine, 2 valve or 4 valve, can compare. This could be enough, but SUZUKI went even further to ensure reliability and ease of maintenance.

A direct acting rocker arm is utilized to activate the valves. Each rocker arm, when depressed by the cam lobe, directly activates two valves at one time. With this system, engine height is reduced and tappets are not necessary. This system allows more room for cooling air flow and allows the use of larger valve springs which increases spring life by reducing stress. Valve adjustment is accomplished without special tools-quickly and easily.

Special sintered steel valve seats are incorporated, manufactured from premium alloys to ensure even more reliability under higher heat loads.

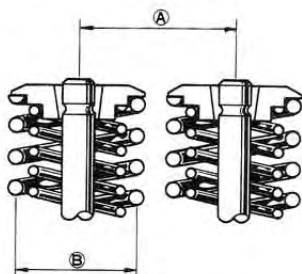
The patented TSCC combustion system combined with SUZUKI's high efficiency charging design results in power and throttle response found only in this new generation 4-stroke engine.

The SUZUKI TSCC engine series-performance without compromise.

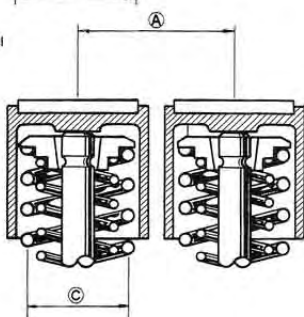


If valve pitch (A) is the same, spring diameter (B) is larger than (C)

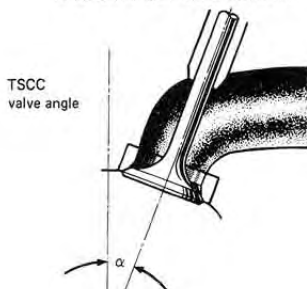
TSCC
4-valve



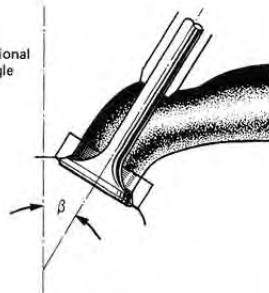
Conventional
4-valve



TSCC valve angle α is smaller than β .



Conventional
valve angle



CHECK PANEL

DESCRIPTION

The check panel monitors the following conditions: ① brake fluid level, ② battery electrolyte level, ③ headlight bulb (LO & HI), ④ taillight bulb and ⑤ brake light bulb. If defect is found, the check panel will let the rider know by turning on the respective indicator light.

OPERATION

- Confirm that each check system operates normally and all indicator lights are lit when the ignition switch is turned on (with the engine stopped.) If, at this state, there is an indicator light which does not light, it means there is defect in its circuit and it is not operating normally.
- As the engine starts and oil pressure rises and oil pressure light goes off, each indicator light will turn off. But only an indicator light which monitors a system which has a defect will remain lighted, indicating the defect.

NOTE:

- * The oil pressure switch, mounted on the upper crankcase, controls all principal circuits. If the oil pressure switch becomes defective (this will be checked by oil pressure indicator light) all five indicator lights on the check panel will light or not light indicating the defect in the switch.
- * Headlight bulb indicator indicates, if a beam of the headlight is burned out by lighting when the engine is running. The position of the dimmer switch when the indicator light comes on, indicates which beam is burned out.

BASIC DIAGRAM

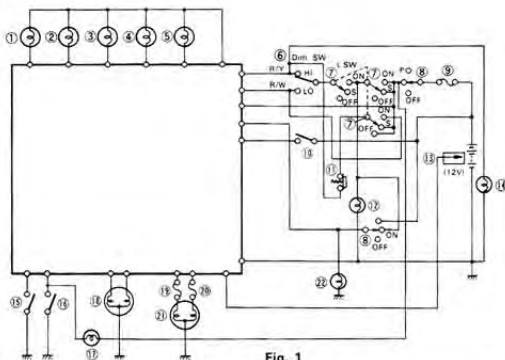


Fig. 1

- | | | |
|---|------------------------------------|--------------------------------|
| ① Brake fluid level indicator light | ⑨ Main fuse | ⑫ Oil pressure indicator light |
| ② Battery electrolyte level indicator light | ⑩ Brake light switch | ⑬ Headlight (HI and LO) |
| ③ Headlight bulb indicator light | ⑪ Passing switch | ⑭ Fuse 2A (for taillight) |
| ④ Taillight bulb indicator light | ⑫ Panel light | ⑮ Fuse 5A (for brake light) |
| ⑤ Brake light indicator light | ⑬ Battery electrolyte level sensor | ⑯ Tail/Brake light |
| ⑥ Dimmer switch | ⑭ High beam indicator light | ⑰ Parking light |
| ⑦ Lighting switch | ⑮ Brake fluid level sensor | |
| ⑧ Ignition switch | ⑯ Oil pressure switch | |

BRAKE FLUID LEVEL AND BATTERY ELECTROLYTE LEVEL CIRCUIT DIAGRAM

- ① Brake fluid level indicator light
- ② Battery electrolyte level indicator light
- ③ Brake fluid level sensor switch
- ④ Oil pressure switch
- ⑤ Oil pressure indicator light
- ⑥ Battery electrolyte level sensor
- ⑦ Ignition switch
- ⑧ Battery

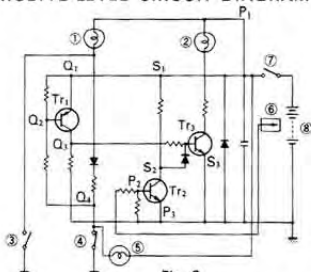


Fig. 2

CIRCUIT CHECK

- When ignition switch ⑦ is turned on with the engine stopped, oil pressure switch ④ is ON and oil pressure indicator light turns on. At this moment, the current from battery flows as, ⑧ → ⑦ → P₁ → ① → Q₄ → ④ → Ground: ① is ON, and ① lights.
- Again the current flows as follows and make Tr₁ ON and simultaneously make Tr₃ ON, then ② lights.
 - ⑧ → ⑦ → S₁ → Q₁ → Tr₁ → Q₂ : Tr₁ is ON
 - Q₁ → Tr₁ → Q₃ → Tr₃ → S₃ : Tr₃ is ON
 - ⑧ → ⑦ → P₁ → ② → Tr₃ → S₃ : ② is ON

NORMAL CONDITION

- As the engine starts the oil pressure will rise and pressure switch ④ will be in OFF condition, and oil pressure indicator light ⑤ will also become OFF. Simultaneously, the following circuit is not effective, so ① goes OFF.
 - ⑧ → ⑦ → P₁ → ① → Q₄ → ④ (OFF) → Ground : ① is OFF
 Naturally, the following circuit is not effective either, and accordingly Tr₁ goes OFF.
 - Q₁ → Q₂ → Q₄ → ④ (OFF) → Ground : Tr₁ is OFF
- As for battery electrolyte sensor ⑥, when the battery is in normal condition, the following circuit is effective, and Tr₂ will turn ON, but as mentioned above, since Tr₁ is OFF, ② is OFF.
 - ⑥ → P₂ → P₃ : Tr₂ is ON
 - ⑧ → ⑦ → S₁ → S₂ → P₃ → Ground : Tr₃ is OFF
 - : ② is OFF

CHECKING DEFECT

- If brake fluid decreased, sensor ③ will turn on and accordingly ① turns on by following route indicating abnormality.
 - ⑧ → ⑦ → P₁ → ① → ③ → Ground : ③ is ON
- If the voltage of battery electrolyte level sensor ⑥ is lowered, Tr₂ turns OFF, but Tr₃ turns ON and ② goes ON indicating abnormality.
 - ⑥ (OFF) → P₂ → P₃ → Ground : Tr₂ is OFF
 - ⑧ → ⑦ → S₁ → S₂ → Tr₃ → S₃ : Tr₃ is ON
 - : ② is ON

BRAKE LIGHT CIRCUIT

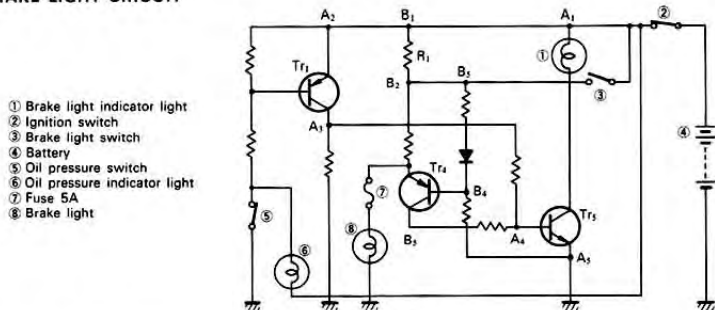


Fig. 3

CHECKING DEFECT

As mentioned before, if ⑤ is ON, TR₁ is ON and Tr₃ turns ON by routing the following circuit, and ① lights.

④ → ② → A₁ → A₂ → Tr₁ → A₃ → A₄ → Tr₅ → A₅ → Ground : Tr₅ is ON

④ → ② → A₁ → ① → Tr₅ → A₅ → Gound : ① is ON

NO DEFECT (brake light functions correctly)

- As the engine starts and ⑤ turns OFF, Tr₁ becomes OFF, and the current flows following circuit route. Tr₄ is in OFF condition, and Tr₅ is also in OFF condition. ① does not light.

④ → ② → B₁ → B₂ → ⑦ → ⑧ → Ground

NOTE:

In this circumstance, as there is big resistance in R_1 , electric potential of B_2 is nearly equal with that of ground, and ⑧ does not light.

- When brake light switch ③ is turned ON, the current flows following two types of circuits and makes ⑧ light, and Tr₁ remains in OFF condition and does not light.

④ → ② → ③ → B₁ → B₂ → ⑦ → ⑧ → Ground : ⑧ is ON

④ → ② → ③ → B_c → B_a → A_c → Ground : Tr_c is OFF and ① is OFF

CHECKING DEFECT

- If there is open circuit in ⑦ or ⑧, the current flows as follows, and Tr₄ turns ON and succeeding Tr₅ turns ON, so ① lights indicating abnormality.

④ → ② → A₁ → B₁ → B₂ → Tr₄ → B₄ : Tr₄ is ON

$$B_2 \rightarrow Tr_4 \rightarrow B_5 \rightarrow A_4 \rightarrow A_5 \rightarrow \text{Ground} : Tr_5 \text{ is ON}$$

④ → ② → A₁ → ① → Tr₅ → A₅ → Ground : ① is ON

The same type circuit is used in connection with the headlight and taillight, and if any defect is found, the respective indicator lights will light.

PRECAUTIONS AND GENERAL INSTRUCTIONS

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

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

CAUTION:

Never reuse a circlip. After a circlip has been removed from a shaft, it should be discarded and a new circlip must be installed.

When installing a new circlip, care must be taken not to expand the end gap larger than required to slip the circlip over the shaft.

After installing a circlip, always insure that it is completely seated in its groove and securely fitted.

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

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

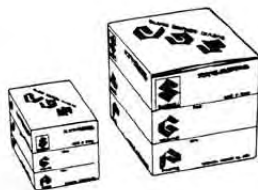
WARNING Personal safety of the rider is involved, and disregard of the information could result in injury.

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

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

USE OF SUZUKI GENUINE PARTS

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



SPECIFICATIONS

DIMENSIONS AND DRY MASS

Overall length.....	2 245 mm (88.4 in)
Overall width.....	870 mm (34.3 in)
Overall height.....	1 190 mm (46.9 in)
Wheelbase.....	1 520 mm (59.8 in)
Ground clearance	155 mm (6.1 in)
Dry mass	243 kg (536 lbs)

ENGINE

Type	Four-stroke, air-cooled, DOHC
Number of cylinders	4
Bore	72.0 mm (2.835 in)
Stroke	66.0 mm (2.598 in)
Piston displacement	1 075 cm ³ (65.6 cu.in)
Compression ratio	9.5 : 1
Carburetor	MIKUNI BS34SS, four
Air cleaner	Paper element
Starter system	Electric
Lubrication system	Wet sump

TRANSMISSION

Clutch	Wet multi-plate type
Transmission	5-speed constant mesh
Gearshift pattern.....	1-down, 4-up
Primary reduction	1.775 (87/49)
Final reduction	2.800 (42/15)
Gear ratios, Low	2.500 (35/14)
2nd	1.777 (32/18)
3rd	1.380 (29/21)
4th	1.125 (27/24)
Top	0.961 (25/26)
Drive chain	DAIDO D.I.D. 630YL or TAKASAGO RK630GSV, 96 links

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SERVICE DATA

VALVES + GUIDES

Unit: mm (in)

Item		Standard	Limit
Valve diam.	IN.	26.9 — 27.1 (1.06 — 1.07)	—
	EX.	22.9 — 23.1 (0.90 — 0.91)	—
Valve lift	IN.	7.0 (0.28)	—
	EX.	6.5 (0.26)	—
Valve clearance (when cold)	IN./EX.	0.07 — 0.12 (0.003 — 0.005)	—
Valve guide to Valve stem clearance	IN.	0.025 — 0.12 (0.0010 — 0.005)	0.35 (0.014)
	EX.	0.040 — 0.067 (0.0016 — 0.0026)	0.35 (0.014)
Valve guide I.D.	IN./EX.	5.500 — 5.512 (0.2165 — 0.2170)	—
Valve stem O.D.	IN.	5.460 — 5.475 (0.2150 — 0.2156)	—
	EX.	5.445 — 5.460 (0.2144 — 0.2150)	—
Valve stem runout	IN./EX.	—	0.05 (0.002)
Valve head thickness	IN./EX.	—	0.5 (0.02)
Valve stem end length	IN./EX.	—	3.6 (0.14)
Valve seat width	IN./EX.	0.9 — 1.1 (0.035 — 0.043)	—
Valve head radial runout	IN./EX.	—	0.03 (0.001)
Valve spring free length (IN./EX.)	INNER	—	31.9 (1.26)
	OUTER	—	35.6 (1.40)
Valve spring tension (IN./EX.)	INNER	4.4 — 6.4 kg (9.7 — 14.1 lbs) at length 28.5 mm (1.12 in)	—
	OUTER	6.5 — 8.9 kg (14.3 — 19.6 lbs) at length 32.0 mm (1.26 in)	—

CAMSHAFT + CYLINDER + HEAD

Unit: mm (in)

Item		Standard	Limit
Cam height	IN.	34.650 — 34.690 (1.3642 — 1.3657)	34.350 (1.3524)
	EX.	34.360 — 34.400 (1.3528 — 1.3543)	34.060 (1.3409)
Camshaft journal oil clearance	IN./EX.	0.020 — 0.054 (0.0008 — 0.0021)	0.150 (0.0059)
Camshaft journal holder I.D.	IN./EX.	22.000 — 22.013 (0.8661 — 0.8667)	—
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		—	157.80 (6.213)
Cam chain pin (at arrow "3")		20th pin	—
Rocker arm I.D.	IN./EX.	12.000 — 12.018 (0.9724 — 0.4731)	—
Rocker arm shaft O.D.	IN./EX.	11.973 — 11.984 (0.4714 — 0.4718)	—
Cylinder head distortion		—	0.2 (0.008)

PISTON + RING + CYLINDER

Unit: mm (in)

Item	Standard	Limit
Compression pressure	9 — 12 kg/cm ² (128 — 171 psi)	7 kg/cm ² (99.5 psi)
Compression pressure difference	—	2 kg/cm ² (28.4 psi)
Piston to Cylinder clearance	0.050 — 0.060 (0.0020 — 0.0024)	0.120 (0.0047)
Cylinder bore	72.000 — 72.015 (2.8346 — 2.8352)	72.080 (2.8378)
Piston dia.	71.945 — 71.960 (2.8325 — 2.8331) Measure 15.0 (0.59) from the piston skirt end.	71.880 (2.8299)
Cylinder distortion	—	0.2 (0.008)

Unit: mm (in)

Item		Standard	Limit
Piston ring free end gap:	1st	Approx $\frac{9.5}{(0.37)}$	7.6 (0.30)
	2nd	Approx $\frac{11.0}{(0.43)}$	8.8 (0.35)
Piston ring end gap:	1st	0.10 – 0.30 (0.004 – 0.012)	0.7 (0.03)
	2nd	0.10 – 0.30 (0.004 – 0.012)	0.7 (0.03)
Piston ring groove clearance:	1st	—	0.180 (0.0071)
	2nd	—	0.150 (0.0059)
Piston ring groove width:	1st	1.03 – 1.05 (0.040 – 0.041)	—
	2nd	1.21 – 1.23 (0.047 – 0.048)	—
	Oil	2.51 – 2.53 (0.099 – 0.100)	—
Piston ring thickness:	1st	0.975 – 0.990 (0.0384 – 0.0390)	—
	2nd	1.170 – 1.190 (0.0461 – 0.0469)	—
Piston pin bore		18.001 – 18.006 (0.7087 – 0.7089)	18.030 (0.7098)
Piston pin O.D.		17.996 – 18.000 (0.7085 – 0.7086)	17.980 (0.7079)

CRANKSHAFT

Unit: mm (in)

Item	Standard	Limit
Conrod small end I.D.	18.006 – 18.014 (0.7089 – 0.7092)	18.040 (0.7102)
Conrod deflection	—	3.0 (0.12)
Conrod big end side clearance	0.10 – 0.65 (0.004 – 0.026)	1.00 (0.039)
Crankshaft runout	—	0.1 (0.004)

OIL PUMP

Unit: mm (in)

Item	Standard	Limit
Oil pump reduction ratio	1.723 (87/49 × 33/34)	—
Oil pressure (at 60°C, 140°F):	Above 0.1 kg/cm ² (1.42 psi), Below 0.5 kg/cm ² (7.11 psi) at 3000 r/min	—
Tip clearance	—	0.20 (0.008)
Outer rotor clearance	—	0.25 (0.010)
Side clearance	—	0.15 (0.006)

CLUTCH

Unit: mm (in)

Item	Standard	Limit
Clutch cable play	2 – 3 (0.08 – 0.12)	—
Drive plate thickness	2.9 – 3.1 (0.11 – 0.12)	2.6 (0.10)
Drive plate claw width	15.6 – 15.8 (0.61 – 0.62)	14.8 (0.58)
Drive plate distortion	—	0.2 (0.008)
Driven plate thickness	2.00 ± 0.06 (0.080 ± 0.002)	—
Driven plate distortion	—	0.1 (0.004)
Clutch spring free length	—	38.5 (1.52)
Primary drive to Driven gear backlash	0 – 0.02 (0 – 0.0008)	0.08 (0.003)

TRANSMISSION

Unit: mm (in)

Item		Standard	Limit
Primary reduction ratio		1.775 (87/49)	—
Final reduction ratio		2.800 (42/15)	—
Gear ratios:	Low	2.500 (35/14)	—
	2nd	1.777 (32/18)	—
	3rd	1.380 (29/21)	—
	4th	1.125 (27/24)	—
	Top	0.961 (25/26)	—
Gear backlash:	Low	0.03 (0.001)	0.08 (0.003)
	2nd	0.03 (0.001)	0.08 (0.003)
	3rd	0.03 (0.001)	0.08 (0.003)
	4th	0.10 (0.004)	0.15 (0.006)
	Top	0.10 (0.004)	0.15 (0.006)
Shift fork to Groove clearance		0.40 — 0.60 (0.016 — 0.024)	0.80 (0.031)
Shift fork groove width		5.45 — 5.55 (0.215 — 0.219)	—
Shift fork thickness		4.95 — 5.05 (0.195 — 0.199)	—
Countershaft length (Low to 2nd)		111.4 — 111.5 (4.386 — 4.390)	—
Drive chain:	Type	DAIDO: D.I.D.: 630 YL or TAKASAGO: RK630GSV	—
	Links	96	—
	20 pitch length	—	383.0 (15.08)
Drive chain slack		20 — 30 (0.8 — 1.2)	—

CARBURETOR

Unit: mm (in)

Item	Specification
Carburetor type	MIKUNI BS34SS
Bore size	34 (1.34)
I.D. No.	49200
Idle r/min	1 050 $\pm$ 100 r/min
Fuel level	5.0 $\pm$ 0.5 (0.20 $\pm$ 0.02)
Float height	22.4 $\pm$ 1.0 (0.88 $\pm$ 0.04)
Main jet (M.J.)	#107.5
Main air jet (M.A.J.)	1.2
Jet needle (J.N.)	5D58
Needle jet (N.J.)	X-1
Pilot jet (P.J.)	#45
Bypass (B.P.)	0.8. 0.8. 0.8
Pilot outlet (P.O.)	0.9
Valve seat (V.S.)	2.0
Starter jet (G.S.)	#32.5
Pilot screw (P.S.)	PRE-SET
Throttle cable play	0.5 – 1.0 (0.02 – 0.04)

ELECTRICAL

Unit: mm (in)

Item	Specification	
Ignition timing	12° B.T.D.C. below 1 500 ± 150 r/min and 32° B.T.D.C. above 2 350 ± 150 r/min	
Firing order	1,2,4,3	
Spark plug:	Type	NGK: D8EA N.D.: X24ES-U
	Gap	0.6 — 0.7 (0.024 — 0.028)
Spark performance	Over 8 (0.3) at 1 atm	
Signal coil resistance	Approx. 290 — 360Ω (BI-G)	
Ignition coil resistance:	Primary	O/W — W or B/Y Approx. 3 — 5Ω
	Secondary	Plug cap — Plug cap Approx. 31 — 33 kΩ
Generator No-Load voltage	More than 80V (AC) at 5 000 r/min	
Regulated voltage	14.0 — 15.5V at 5 000 r/min	
Starter motor:	Brush length	Limit: 9 (0.4)
	Commutator under cut	Limit: 0.2 (0.008)
Starter relay resistance	Approx. 3 — 4Ω	
Battery:	Type designation	SYB14L-A2
	Capacity	12V 50.4 kC (14 Ah)/10HR
	Standard electrolyte S.G.	1.28 at 20°C (68°F)
Fuse size:	Head	10A
	Signal	10A
	Ignition	10A
	Main	15A
	Power source	10A

BRAKE + WHEEL

Unit: mm (in)

Item		Standard	Limit
Rear brake pedal height		20 (0.8)	—
Brake disc thickness:	Front	5.0 ± 0.2 (0.20 ± 0.008)	4.5 (0.18)
	Rear	6.7 ± 0.2 (0.26 ± 0.008)	6.0 (0.24)
Brake disc runout		—	0.30 (0.012)
Master cylinder bore:	Front	15.870 — 15.913 (0.6248 — 0.6265)	—
	Rear	14.000 — 14.043 (0.5512 — 0.5529)	—
Master cylinder piston diam.	Front	15.811 — 15.838 (0.6225 — 0.6235)	—
	Rear	13.957 — 13.984 (0.5495 — 0.5506)	—
Brake caliper cylinder bore:	Front	38.180 — 38.219 (1.5031 — 1.5047)	—
	Rear	38.180 — 38.256 (1.5031 — 1.5061)	—
Brake caliper piston diam.	Front	38.025 — 38.050 (1.4970 — 1.4980)	—
	Rear	38.098 — 38.148 (1.4999 — 1.5019)	—
Wheel rim runout:	Axial	—	2.0 (0.08)
	Radial	—	2.0 (0.08)
Wheel axle runout:	Front	—	0.25 (0.01)
	Rear	—	0.25 (0.01)
Tire size:	Front	3.50V19 4PR	—
	Rear	4.50V17 4PR	—
Tire tread depth:	Front	—	1.6 (0.06)
	Rear	—	2.0 (0.08)

SUSPENSION

Item	Standard	Limit
Front fork stroke	160 (6.3)	—
Front fork spring free length	—	518 (20.4)
Front fork oil level	216 (8.5)	—
Front fork air pressure	0.5 kg/cm ² (7.11 psi)	—
Rear wheel travel	108 (4.25)	—
Swinging arm pivot shaft runout	—	0.3 (0.012)

TIRE PRESSURE

Cold inflation tire pressure	Normal riding				Continuous high speed riding			
	Solo riding		Dual riding		Solo riding		Dual riding	
	kg/cm ²	psi	kg/cm ²	psi	kg/cm ²	psi	kg/cm ²	psi
Front	1.75	24	2.00	28	2.00	28	2.25	32
Rear	2.00	28	2.50	36	2.50	36	2.80	40

FUEL + OIL CAPACITY

Unit: mm (in)

Item		Specification
Fuel type		Use only unleaded or low-lead type gasoline of at least 85 — 95 pump octane ($\frac{R + M}{2}$ method) or 89 octane or higher rated by research method.
Fuel tank		19 L (5.0 US gal)
Engine oil type		SAE 10W/40
Engine oil capacity:	Change	3 200 ml (3.4 US qt)
	Filter change	3 600 ml (3.8 US qt)
	Overhaul	4 000 ml (4.2 US qt)
Front fork oil type		Fork oil #15
Front fork oil capacity (each leg)		238 ml (8.04 US oz)
Brake fluid type		DOT3 or DOT 4

WATTAGE

Unit: W (cp)

Item		Specification
Headlight	HI	60
	LO	55
Tail/Brake light		8/23 (3/32)
Turn signal light		23 (32)
Speedometer light		3.4
Tachometer light		3.4
Turn signal indicator light		3.4
High beam indicator light		3.4
Neutral indicator light		3.4
Oil pressure indicator light		3.4
License light		8 (4)

TORQUE TABLE

ENGINE

Item	Thread dia.	kg-m	lb-ft
Cylinder head cover bolt	6	0.9 – 1.0	6.5 – 7.0
Cylinder head bolt	6	0.7 – 1.1	5.0 – 8.0
Cylinder head nut	10	3.5 – 4.0	25.5 – 29.0
Rocker arm shaft stopper bolt	6	0.8 – 1.0	6.0 – 7.0
Valve clearance adjuster lock nut	5	0.9 – 1.1	6.5 – 8.0
Cam shaft cap bolt	6	0.8 – 1.2	6.0 – 8.5
Cam shaft sprocket bolt (See page 13-14)	6	0.9 – 1.2	6.5 – 8.5
Cam chain tensioner fitting bolt	6	0.6 – 0.8	4.5 – 6.0
Cam chain tensioner shaft ass'y	24	3.1 – 3.5	22.0 – 25.5
Cam chain tensioner adjuster lock shaft nut	8	0.9 – 1.4	6.5 – 10.0
Cam chain guide bolt	8	0.9 – 1.4	6.5 – 10.0
Generator rotor nut	16	16.0 – 17.0	115.5 – 123.0
Starter clutch allen bolt	8	1.5 – 2.0	11.0 – 14.5
Governor center bolt	8	1.3 – 2.3	9.5 – 16.5
Crankcase bolt (6 mm)	6	0.9 – 1.3	6.5 – 9.5
Crankcase bolt (8 mm)	8	2.0 – 2.4	14.5 – 17.0
Starter motor bolt	6	0.4 – 0.7	3.0 – 5.0
Oil pan bolt	6	1.0	7.0
Oil filter cover nut	6	0.6 – 0.8	4.5 – 6.0
Neutral stopper housing	14	1.8 – 2.8	13.0 – 20.0
Gearshift arm stopper	8	1.5 – 2.3	11.0 – 16.5
Clutch sleeve hub nut	24	5.0 – 7.0	36.0 – 50.5
Clutch spring bolt	6	1.1 – 1.3	8.0 – 9.5
Engine sprocket nut (see page 15-13)	25	9.0 – 10.0	65.0 – 72.5
Engine mounting bolt (A) (10 mm)	10	4.5 – 5.5	32.5 – 40.0
Engine mounting bolt (B) (10 mm)	10	3.0 – 3.7	21.5 – 27.0
Engine mounting bolt (C) (8 mm)	8	2.0 – 3.0	14.5 – 21.5
Gearshift lever bolt	8	1.3 – 2.3	9.5 – 16.5
Clutch release arm bolt	6	0.6 – 1.0	4.5 – 7.0

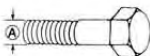
CHASSIS

Item	Thread dia.	kg-m	lb-ft
Disc bolt	8	1.5 – 2.5	11.0 – 18.0
Front axle nut	12	3.6 – 5.2	26.0 – 37.5
Front axle pinch bolt	8	1.5 – 2.5	11.0 – 18.0
Front caliper mounting bolt	10	2.5 – 4.0	18.0 – 29.0
Front caliper axle bolt	12	4.0 – 5.5	29.0 – 40.0
Brake hose union bolt	10	2.0 – 2.5	14.5 – 18.0
Caliper air bleeder	7	0.7 – 0.9	5.0 – 6.5
Front fork damper rod nut	14	2.5 – 3.5	18.0 – 25.5
Air valve	10	1.0 – 1.3	7.0 – 9.5
Air lock bolt	10	0.05 – 0.10	0.4 – 0.7
Air joint bolt	10	1.0 – 1.2	7.0 – 8.5
Front fork lower clamp bolt	8	1.5 – 2.5	11.0 – 18.0
Front fork upper clamp bolt	8	2.0 – 3.0	14.5 – 21.5
Front fork cap bolt	30	1.5 – 3.0	11.0 – 21.5
Steering stem nut	25	4.0 – 5.0	29.0 – 36.0
Steering stem clamp bolt	8	1.5 – 2.5	11.0 – 18.0
Steering stem head nut	18	3.5 – 5.0	25.5 – 36.0
Handlebar clamp bolt	8	1.2 – 2.0	8.5 – 14.5
Front master cylinder clamp bolt	5	0.5 – 0.8	3.5 – 6.0
Front footrest bolt	10	2.7 – 4.3	19.5 – 31.0
Swinging arm pivot nut	14	5.5 – 8.5	40.0 – 61.5
Brake pedal arm bolt	8	1.0 – 1.5	7.0 – 11.0
Rear master cylinder mounting bolt	8	1.5 – 2.5	11.0 – 18.0
Rear torque link nut	10	2.0 – 3.0	14.5 – 21.5
Rear caliper mounting bolt	10	2.5 – 4.0	18.0 – 29.0
Rear caliper bolt	10	2.0 – 3.0	14.5 – 21.5
Muffler bracket nut	8	1.5 – 2.0	11.0 – 14.5
Rear shock absorber fitting bolt or nut	10	2.0 – 3.0	14.5 – 21.5
Rear footrest bolt	10	2.7 – 4.3	19.5 – 31.0
Rear sprocket nut	10	2.5 – 4.0	18.0 – 29.0
Rear axle nut	16	8.5 – 11.5	61.5 – 83.0
Chain adjuster support bolt	8	1.5 – 2.0	11.0 – 14.5

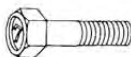
TIGHTENING TORQUE CHART

For other bolts and nuts not listed, refer to this chart:

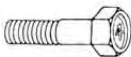
Bolt Diameter (A) (mm)	Conventional or "4" marked bolt			"7" marked bolt		
	kg-m	lb-ft	N.m	kg-m	lb-ft	N.m
4	0.1 — 0.2	0.7 — 1.5	1.0 — 2.0	0.15 — 0.3	1.0 — 2.0	1.5 — 3.0
5	0.2 — 0.4	1.5 — 3.0	2.0 — 4.0	0.3 — 0.6	2.0 — 4.5	3.0 — 6.0
6	0.4 — 0.7	3.0 — 5.0	4.0 — 7.0	0.8 — 1.2	6.0 — 8.5	8.0 — 12.0
8	1.0 — 1.6	7.0 — 11.5	10.0 — 16.0	1.8 — 2.8	13.0 — 20.0	18.0 — 28.0
10	2.2 — 3.5	16.0 — 25.5	22.0 — 35.0	4.0 — 6.0	29.0 — 43.5	40.0 — 60.0
12	3.5 — 5.5	25.5 — 40.0	35.0 — 55.0	7.0 — 10.0	50.5 — 72.5	70.0 — 100.0
14	5.0 — 8.0	36.0 — 58.0	50.0 — 80.0	11.0 — 16.0	79.5 — 115.5	110.0 — 160.0
16	8.0 — 13.0	58.0 — 94.0	80.0 — 130.0	17.0 — 25.0	123.0 — 181.0	170.0 — 250.0
18	13.0 — 19.0	94.0 — 137.5	130.0 — 190.0	20.0 — 28.0	144.5 — 202.5	200.0 — 280.0



Conventional bolt



"7" Marked bolt



"4" Marked bolt

PERIODIC MAINTENANCE

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PERIODIC MAINTENANCE SCHEDULE

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

NOTE:

Vehicles operated under severe conditions may require more frequent servicing.

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

PERIODIC MAINTENANCE CHART

INTERVAL: THIS INTERVAL SHOULD BE JUDGED BY ODOMETER READING OR MONTHS, WHICHEVER COMES FIRST	mile	600	4 000	7 500	11 000	15 000
	km	1 000	6 000	12 000	18 000	24 000
	month	2	12	24	36	48
Battery		—	I	I	I	I
Cylinder head nuts and exhaust pipe bolts		T	T	T	T	T
Air cleaner element	Clean every 2 000 miles (3 000 km), and replace every 7 500 miles (12 000 km)					
Valve clearance		I	I	I	I	I
Spark plug		—	C	R	C	R
Carburetor idle rpm		I	I	I	I	I
Fuel line	Replace every two years.					
Engine oil and oil filter		R	R	R	R	R
Clutch		I	I	I	I	I
Drive chain		I	I	I	I	I
	Clean and lubricate every 600 miles (1 000 km).					
Brakes		I	I	I	I	I
Brake hose	Replace every two years.					
Tire		I	I	I	I	I
Steering		I	I	I	I	I
Front fork		—	—	I	—	I
	Check air pressure every 6 months					
Chassis bolts and nuts		T	T	T	T	T

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

LUBRICATION CHART

The maintenance schedule, which follows, is based on this philosophy: It is timed by odometer indication, and is calculated to achieve the ultimate goal of motorcycle maintenance in the most economical manner.

Item \ Interval	Initial and every 6 000 km (4 000 miles)	Every 12 000 km (7 500 miles)
Clutch and brake lever holder	Motor oil	—
Throttle cable	Motor oil	—
Throttle grip	—	Grease
Clutch cable	Motor oil	—
Clutch release	—	Grease
Speedometer cable	—	Grease
Tachometer cable	—	Grease
Drive chain	Motor oil every 600 miles (1 000 km)	
Brake pedal and rod link	Grease or oil	—
Brake cam shaft	—	Grease
Side stand pivot	Motor oil	—
Ignition timing governor link	—	Grease
Steering stem bearings	Grease every 2 years or 15 000 miles (24 000 km)	
Swinging arm bearings		

NOTE:

- * Lubricate exposed parts which are subject to rust with either motor oil or grease whenever the motorcycle has been operated under wet or rainy conditions.
- * Before lubricating each part, clean off any rusty spots and wipe off any accumulated grease, oil, dirt or grime.

MAINTENANCE AND TUNE-UP PROCEDURES

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

AIR CLEANER

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

- Remove the seat and remove the air cleaner case cover by unscrewing the fixing screw ①. Take out the air cleaner element by pulling up the spring retainer bracket ②.
- Carefully use an air hose to blow the dust from the cleaner element inside.

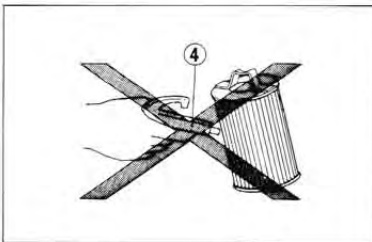
CAUTION:

Always use air pressure ③ on the inside of the cleaner element. If air pressure is used on the outside ④ dirt will be forced into the pores of the cleaner element thus restricting air flow through the cleaner element.

- Reinstall the cleaned or new cleaner element in the reverse order of removal. Make sure that the spring retainer bracket ② is properly engaged with the securing spring.

CAUTION:

If driving under dusty conditions, clean the air cleaner element more frequently. The surest way to accelerate engine wear is to run 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!



BATTERY

6 000, 12 000, 18 000, 24 000 km
4 000, 7 500, 11 000, 15 000 miles

- Remove the right and left frame covers.
- Remove the rear master cylinder reservoir.
- Remove air cleaner case to check battery.
- Check electrolyte for level and specific gravity. Add distilled water, as necessary to keep the surface of the electrolyte above the LOWER level line but not above the UPPER level line.
- For checking specific gravity, use a hydrometer to determine the charged condition.

09900-28403

Hydrometer

Standard specific gravity

1.28 at 20°C

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

CAUTION:

Be careful not to bend, obstruct, or change the routing of the air vent tube from the battery. Make certain that the vent tube is attached to the battery vent fitting and that the opposite end is always open.

- Check that the vent pipe is tightly secured and undamaged, and is routed as shown.



VALVE CLEARANCE

1 000, 6 000, 12 000, 18 000, 24 000 km
600, 4 000, 7 500, 11 000, 15 000 miles

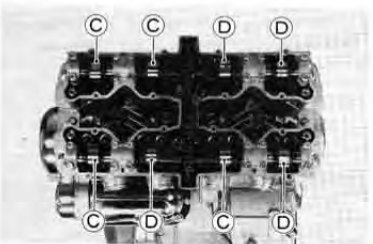
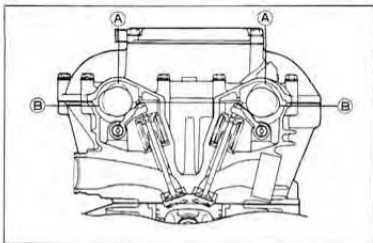
The valve clearance specification is the same for both intake and exhaust valves.

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

Valve clearance (when cold)	0.07 — 0.12 mm (0.003 — 0.005 in)
--------------------------------	--------------------------------------

NOTE:

- * The cam must be at position (A) or (B) in order to check the valve clearance or to adjust valve clearance. Clearance readings should not be taken with the cam in any other position than these two positions.
 - * The clearance specification is for COLD state.
 - * To turn the crankshaft for clearance checking, be sure to use a 19-mm wrench and to rotate in normal running direction. All spark plugs should be removed.
- Turn crankshaft to bring the "T" mark on Nos. 1 and 4 side (of advance governor) to the timing mark and also to bring the notches ① in the both camshaft (Ex and In) of the right ends to the position as shown. In this condition, read the valve clearance at the valves (C) (In and Ex of No. 1 cylinder, Ex of No. 2 and In of No. 3).



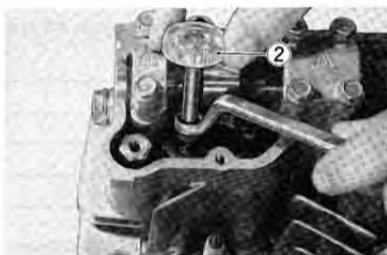
- Use thickness gauge between tappet and valve. If clearance is off the specification, bring it into the specified range by using the tappet adjusting driver ②.

09900-20806	Thickness gauge
09917-14910	Tappet adjust driver

- Turn crankshaft by 360° (one rotation) to bring the "T" mark on Nos. 1 and 4 side to the timing mark and also to bring the notches ① to the position shown.
- Read clearance at the valves ③ and adjust the clearance if necessary.

NOTE

- * The cylinder head cover gasket should be replaced whenever valve clearance adjustment is performed.
- * A thin film of SUZUKI Bond No. 1207B on both sides of the gasket will ensure an oil tight seal.
- * The sealing washers, utilized under the four special philips head screws that help secure the head cover, should also be replaced at this time.



99104-31140	SUZUKI Bond # 1207B
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Cam Position	Notch ① position	
	Intake Camshaft	Exhaust Camshaft
③		
④		

SPARK PLUG

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

The plug gap is adjusted to 0.6—0.7 mm (0.024—0.028 in). The gap is correctly adjusted using a thickness gauge (special tool). When carbon is deposited on the spark plug, remove the carbon with a spark plug cleaning machine or by carefully using tool with a pointed end. If electrodes are extremely worn or burnt, replace the plug. Also replace the plug if it has a broken insulator, damaged thread, etc.

09930-13210	Socket wrench
09930-14530	Universal joint
09914-24510	T handle
09900-20803	Thickness gauge

NGK D8EA or NIPPON DENSO X24ES-U listed in the table should be used as the standard plug. However, the heat range of the plug should be selected to meet the requirements of speed, actual load, fuel, etc. If the plugs need to be replaced, it is recommended that the standard plugs in listed in the table be selected.

Remove the plugs and inspect the insulators. Proper heat range would be indicated if all insulators were light brown in color. If they are blackened by carbon, they should be replaced by a hot type NGK D7EA or NIPPON DENSO X22ES-U and if baked white, by NGK D9EA or NIPPON DENSO X27ES-U.

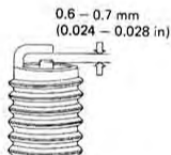
Plugs with high heat range number are used for high speed running. These plugs are designed to run cooler to prevent overheating and are called cold type plugs.

NOTE:

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

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.



NGK	NIPPON DENSO	REMARKS
D7EA	X22ES-U	If the standard plug is apt to get wet, replace with this plug. Hot type.
D8EA	X24ES-U	Standard
D9EA	X27ES-U	If the standard plug is apt to overheat, replace with this plug. Cold type.

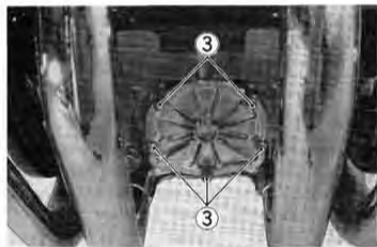
ENGINE OIL AND OIL FILTER

1 000, 6 000, 12 000, 18 000, 24 000 km
600, 4 000, 7 500, 11 000, 15 000 miles

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

The oil should be changed while the engine is hot.

- Keep the motorcycle upright, supported on the center stand.
- Place an oil pan below the engine and drain the oil by removing drain plug ① and filler cap ②.
- Remove five nuts ③ and remove the filter cover.
- Pull out old filter ⑤, and replace with new one.
- Replace O-ring and filter cover, and secure nuts ③ with applying thread lock cement.



99000-32040	Thread lock cement
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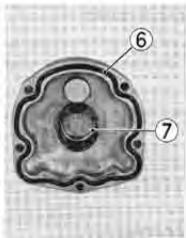
- Fit drain plug ① securely, and add fresh oil through the filler. The engine will hold about 3.6 L (3.8 US qt) of oil.
Use API classification of SE or SF oil with SAE 10W/40 viscosity.
- Start up the engine and allow it to run for several seconds at idling speed.
- Turn off the engine and wait about one minute, then check the oil level through the inspection window ④. If the level is below mark "F", supply oil to that level.

NECESSARY AMOUNT OF ENGINE OIL

Oil change	3.2 L (3.4 US qt)
Filter change	3.6 L (3.8 US qt)
Overhaul engine	4.0 L (4.2 US qt)

NOTE:

Be sure to take care of O-ring ⑥ to prevent any damage and be sure that filter spring ⑦ is properly in place.



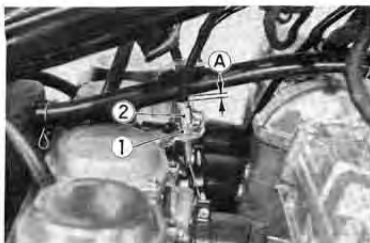
CARBURETOR

1 000, 6 000, 12 000, 18 000, 24 000 km
600, 4 000, 7 500, 11 000, 15 000 miles

THROTTLE CABLE PLAY

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

- Tug on the throttle cable to check the amount of play.
- Loosen the lock nut ① and turn the adjuster ② in or out until the specified play is obtained.
- Retighten lock nuts.



STARTER KNOB ADJUSTMENT

When the starter knob is pulled, and if it is too stiff or too loose, raise seal cover ③ and turn adjuster ④. Turning the adjuster clockwise will make the starter knob harder to pull, and vice versa.



IDLING ADJUSTMENT

NOTE:

Make this adjustment when the engine is hot.

- Set engine speed at anywhere between 950 and 1 150 r/min by turning throttle stop screw ①.



FUEL LINE

Replace every 2 years



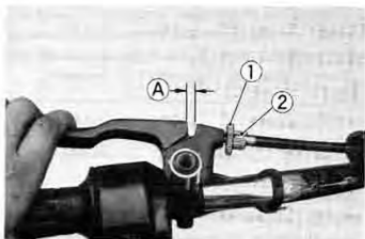
CLUTCH

1 000, 6 000, 12 000, 18 000, 24 000 km
600, 4 000, 7 500, 11 000, 15 000 miles

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

Cable play A	2–3 mm (0.08–0.12 in)
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- If the specified play can not be obtained with adjusting nut ③, carry out the adjustment using the adjusting nut on the clutch lever side.



DRIVE CHAIN

1 000, 6 000, 12 000, 18 000, 24 000 km
600, 4 000, 7 500, 11 000, 15 000 miles
Clean and lubricating Every 600 miles
(1 000 km)

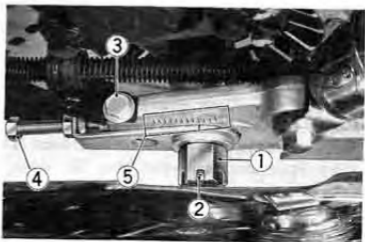
Visually check the drive chain for the possible malconditions listed below. (Set up the machine on its center stand, and turn the rear wheel slowly by hand with the transmission shifted to Neutral.)

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

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

CHECKING

- Loosen axle nut ① after pulling out cotter pin ②.
- Loosen chain adjuster support bolt ③.
- Tense the drive chain fully by tightening the adjusters ④.

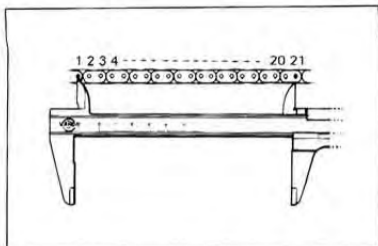


- Remove the chain case. Count out 21 pins (20 pitch) on the chain and measure the distance between the two. If the distance exceeds following limit, the chain must be replaced.

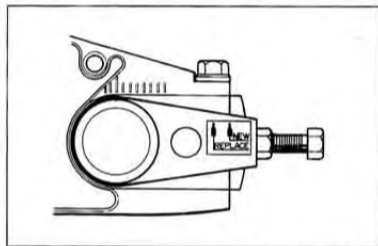
Service Limit	383.0 mm (15.08 in)
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NOTE:

When the indicator mark on the chain adjuster aligns with the end of the swinging arm, the drive chain should be replaced with new one.

**ADJUSTING**

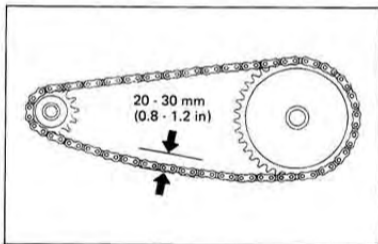
- Loosen the adjuster ④ until the chain has 20–30 mm (0.8–1.2 in) of sag at the middle between engine and rear sprockets. The mark ⑤ on both chain adjusters must be at the same position on the scale to ensure that the front and rear wheels are correctly aligned.
- Place on center stand for accurate adjustment.



Standard	20–30 mm (0.8–1.2 in)
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- After adjusting the drive chain, tighten the axle nut ① securely, and lock with cotter pin ②. Always use a new cotter pin.
- Tighten the chain adjuster support bolts and adjuster lock nuts good and hard.

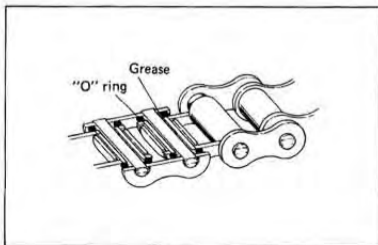
Rear axle nut tightening torque	8.5 – 11.5 kg-m (61.5 – 83.0 lb-ft)
Support bolt	1.5 – 2.0 kg-m (11.0 – 14.5 lb-ft)

**CLEANING AND LUBRICATING**

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

CAUTION:

Do not use trichlene, gasoline or any similar fluids: These fluids have too great a dissolving power for this chain and, what is more important, can spoil the "O" rings 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.

WARNING:

Do not use any oil sold commercially as "drive chain oil". Such oil can damage the "O" rings.

CAUTION:

The standard drive chain is DAIDO DID630YL or TAKASAGO RK630GSV. SUZUKI recommends that the above-mentioned standard drive chain be used for the replacement.



BRAKES

1 000, 6 000, 12 000, 18 000, 24 000 km
600, 4 000, 7 500, 11 000, 15 000 miles
Replace hoses Every 2 years

BRAKE FLUID LEVEL

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

Specification and Classification	DOT3 or DOT4
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WARNING:

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



WARNING:

Brake fluid, if it leaks, will interfere with safe running and discolor painted surfaces.

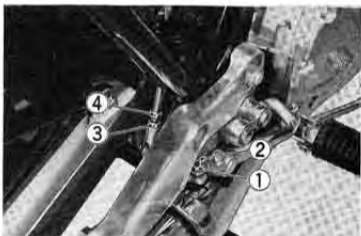
Check the brake hoses for cracks and hose joint for leakage before riding.

BRAKE PADS

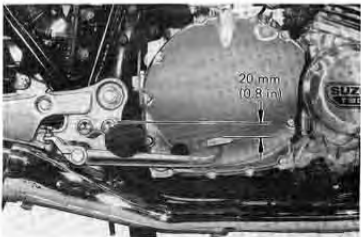
Wearing condition of brake pads can be checked by observing the red limit line ① marked on the pad. When the wear exceeds the limit line, replace the pads with new ones. (see pages 10-16 and 10-28).

**BRAKE PEDAL HEIGHT**

- Loosen lock nut ①, and turn stopper bolt ② away from the stopper.
- Loosen lock nut ③, and rotate push rod ④ to locate brake pedal 20 mm (0.8 in) below the top face of the footrest.
- Turn the stopper bolt ② in so that the clearance between the stopper bolt and stopper is zero.
- Retighten both lock nuts ① and ③.



Brake pedal height	20 mm (0.8 in)
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BRAKE LIGHT SWITCHES

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



AIR BLEEDING THE BRAKE FLUID CIRCUIT

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

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



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

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

NOTE:

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



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

CAUTION:

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

- Differences between front and rear are that the master cylinder is actuated by a pedal and that there are two bleeder valves. Bleed air from the inboard valve first, and then from the outboard valve.

TIRES

1 000, 6 000, 12 000, 18 000, 24 000 km
600, 4 000, 7 500, 11 000, 15 000 miles

TIRE TREAD CONDITION

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

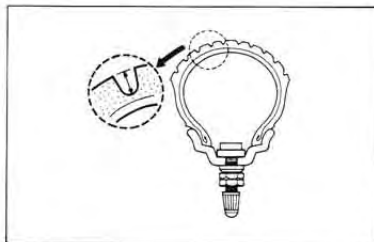
FRONT	REAR
1.6 mm (0.06 in)	2.0 mm (0.08 in)



TIRE PRESSURE

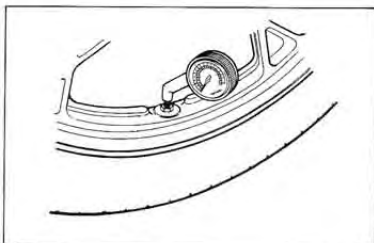
If the tire pressure is too high or too low, steering will be adversely affected and tire wear increased. Therefore, maintain the correct tire pressure for good roadability or shorter tire life will result. Cold inflation tire pressure is as follows.

Tire pressure when cold		FRONT		REAR	
		kg/cm ²	psi	kg/cm ²	psi
Normal	Solo	1.75	24	2.00	28
	Dual	2.00	28	2.50	36
High speed	Solo	2.00	28	2.50	36
	Dual	2.25	32	2.80	40



CAUTION:

The standard tire fitted on this motorcycle is 3.50V 19 4PR for front and 4.50V17 4PR for rear. The use of a tire other than the standard may cause instability. It is highly recommended to use a SUZUKI Genuine Tire.



STEERING

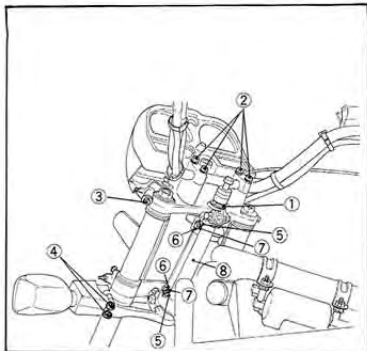
1 000, 6 000, 12 000, 18 000, 24 000 km
600, 4 000, 7 500, 11 000, 15 000 miles

Check that there is no abnormal rattle from the handlebar when it is shaken sideways and up and down. If a rattling sound is detected, the following bolts should be checked whether they are properly tightened or not.

- * Steering stem head nut ①.
- * Handlebar clamp bolts ②.
- * Front fork upper and lower clamp bolts ③, ④.

If it still rattles even after these bolts are correctly tightened, disassemble the steering stem and inspect the following items and replace, if necessary, the malfunctioning parts.

- * Wear of the races ⑤, ⑥.
- * Wear or damage of bearings ⑦.
- * Distortion of steering stem ⑧.



	kg-m	lb-ft
Steering stem head nut ①	3.5 — 5.0	25.5 — 36.0
Front fork upper clamp bolt ②	2.0 — 3.0	14.5 — 21.5
Steering stem clamp bolt ③	1.5 — 2.5	11.0 — 18.0
Steering stem nut ④	4.0 — 5.0	29.0 — 36.0
Handlebars clamp bolt ⑤	1.2 — 2.0	8.5 — 14.5



NOTE:

Adjust the torque of the steering stem bearings as described in the chassis section of this manual.

FRONT FORKS

12 000, 24 000 km
7 500, 15 000 miles

Check air pressure every 6 months

Check the air pressure of the front fork in the following way.

- Set the machine on its center stand, and keep the front wheel off the floor.
- Measure the air pressure by setting the pressure gauge to the valve as shown.



Specified air pressure	0.5 kg/cm ² (7.11 psi)
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- If necessary, inject water-free air with a hand pump through the valve until the pressure gauge reads the specified value.

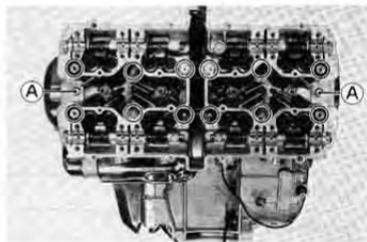
NOTE:

Just before charging with air, see if the valve is tightened.

CYLINDER HEAD NUTS AND BOLTS

1 000, 6 000, 12 000, 18 000, 24 000 km
600, 4 000, 7 500, 11 000, 15 000 miles

- Remove fuel tank.
- Tighten the twelve 10 mm nuts to the specified torque with a torque wrench sequentially in the ascending order, when engine is cold.



Tightening torque	3.5 — 4.0 kg-m (25.5 — 29.0 lb-ft)
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- After firmly tightening 12 nuts, tighten three 6 mm bolts (indicated as A) to this torque value.



Tightening torque	0.7 — 1.1 kg-m (5.0 — 8.0 lb-ft)
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CHASSIS BOLTS AND NUTS

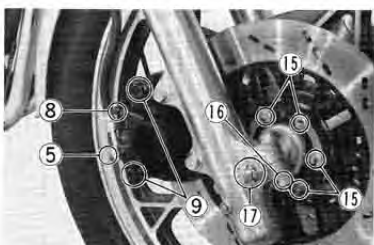
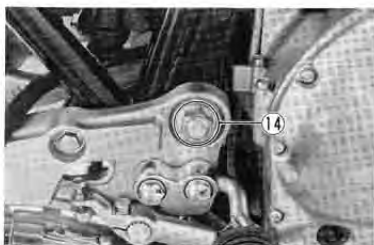
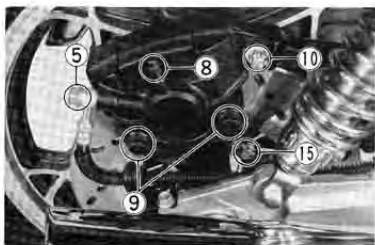
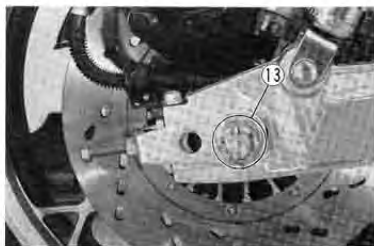
1 000, 6 000, 12 000, 18 000, 24 000 km
600, 4 000, 7 500, 11 000, 15 000 miles

The bolts and nuts listed hereunder are important safety parts. They must be retightened, as necessary, to the specified torque with a torque wrench. (Refer to page 3-20 for the position of the following bolts and nuts on the motorcycle.)

ITEM	kg-m	lb-ft
① Handlebar clamp bolt	1.2 — 2.0	8.5 — 14.5
② *Steering stem head nut	4.0 — 5.0	29.0 — 36.0
③ Front fork tubes upper clamp bolt (R and L)	2.0 — 3.0	14.5 — 21.5
④ Steering stem clamp bolt	1.5 — 2.5	11.0 — 18.0
⑤ Brake hose union bolt	2.0 — 2.5	14.5 — 18.0
⑥ Master cylinder clamp bolt	0.5 — 0.8	3.5 — 6.0
⑦ Front fork tubes lower clamp bolt (R and L)	1.5 — 2.5	11.0 — 18.0
⑧ Caliper air bleeder valve	0.7 — 0.9	5.0 — 6.5
⑨ Front caliper axle bolt	4.0 — 5.5	29.0 — 40.0
⑩ Rear torque link nut	2.0 — 3.0	14.5 — 21.5
⑪ Rear shock absorber nut	2.0 — 3.0	14.5 — 21.5
⑫ Rear shock absorber bolt	2.0 — 3.0	14.5 — 21.5
⑬ Rear axle nut	8.5 — 11.5	61.5 — 83.0
⑭ Swinging arm pivot nut	5.5 — 8.5	40.0 — 61.5
⑮ Disc bolt	1.5 — 2.5	11.0 — 18.0
⑯ Front axle pinch bolt	1.5 — 2.5	11.0 — 18.0
⑰ Front axle nut	3.6 — 5.2	26.0 — 37.5

NOTE:

*This nut must be torqued according to the instructions contained in the Chassis Section of this manual.



SPECIAL MATERIALS

The materials listed below are needed for maintenance work on the GS1100, 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 is described in this manual.

MATERIAL	PART	PAGE	PART	PAGE
 SUZUKI SUPER GREASE "A" 99000-25030	• Oil seals • Throttle grip • Cables (speedometer and tachometer) • Front wheel bearings • Center stand spacer • Rear sprocket mounting drum oil seal	7-70 8-14 10- 5 10-14	• Swinging arm bearing and dust seal • Brake pedal rod arm • Ignition timing governor link • Front fork damper adjuster • Steering stem bearing	10-62 10-39 7-44 10-48 10-57
 SUZUKI SILICONE GREASE 99000-25100	• Caliper axle shaft	10-21		
 SUZUKI MOLY PASTE 99000-25140	• Valve stem • Cam shaft journal • Chain tensioner adjuster shaft • Drive shaft	7-14 7-17 7-31 7-68		
 SUZUKI BOND # 1207B 99104-31140	• Mating surface of upper and lower crankcase • Mating surface of crankcase and clutch cover, generator cover • Cylinder head cover	7-74 7-43 7-51 3- 6 7-22		

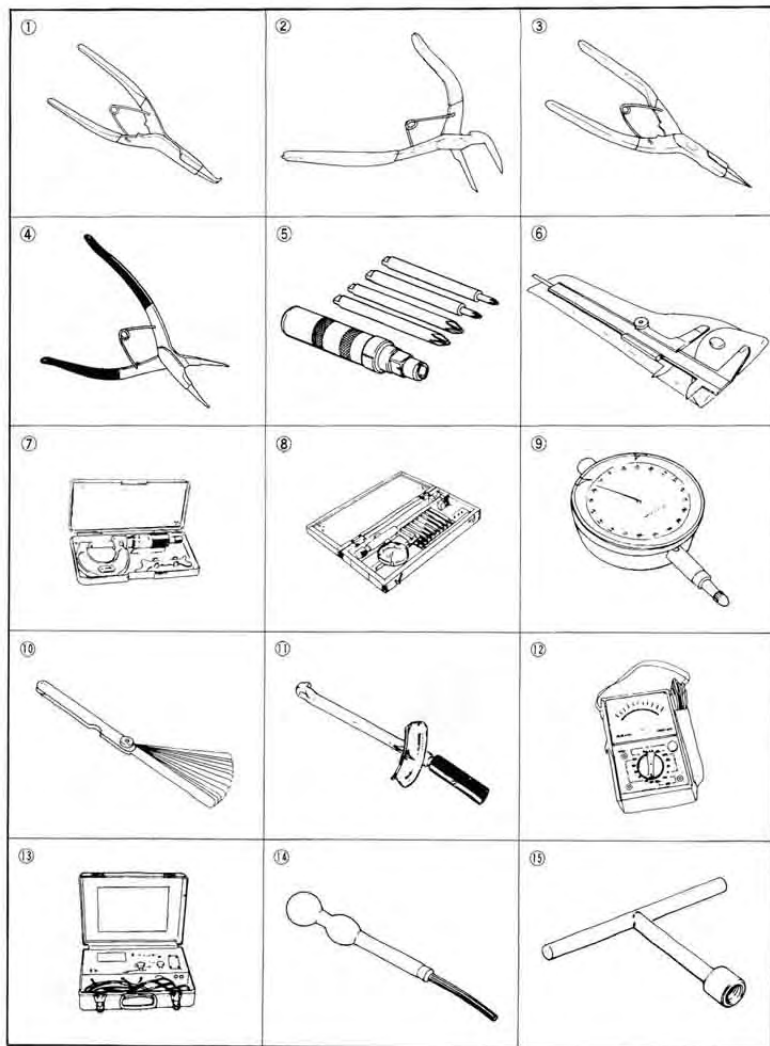
MATERIAL	PART	PAGE	PART	PAGE
 THREAD LOCK SUPER "1333B" 99000-32020	• Cam chain guide holder screw • Cam chain guide bolt • Cam chain guide screw • Engine sprocket damper screw • Muffler cover screw	7-73 7-76 7-35		
 THREAD LOCK SUPER "1303" 99000-32030	• Countershaft 2nd drive gear • Cam sprocket allen bolt • Starter clutch allen bolt • Generator rotor nut	7-66 7-16 7-41 7-42		
 THREAD LOCK CEMENT 99000-32040	• Carburetor upper bracket plate set screw • Carburetor lower bracket plate screw • Carburetor starter shaft lock screw • Oil separator plate screw • Cylinder stud bolt	8-16 8-15 8-16	• Oil filter cap nut • Engine sprocket spacer inner surface • Camshaft end cap screw	3- 8 7-21 7-70 7-22
 THREAD LOCK "1342" 99000-32050	• Generator stator securing screw • Generator stator lead wire screw • Gearshift cam stopper bolt • Starter motor securing bolt • Drive shaft plate screw • Countershaft B/g retainer screw • Oil gallery plate screw • Engine oil pump set screw • Engine oil pump housing screw	7-41 7-41 7-75 7-76 7-76 7-76 7-56 7-56	• Gearshift cam pawl screw • Gearshift cam guide screw • Engine oil sump filter screw • Carburetor throttle stop plate screw • Starter motor housing screw • Front fork damper rod bolt and nut	7-72 7-72 7-59 8-15 11-16 10-47

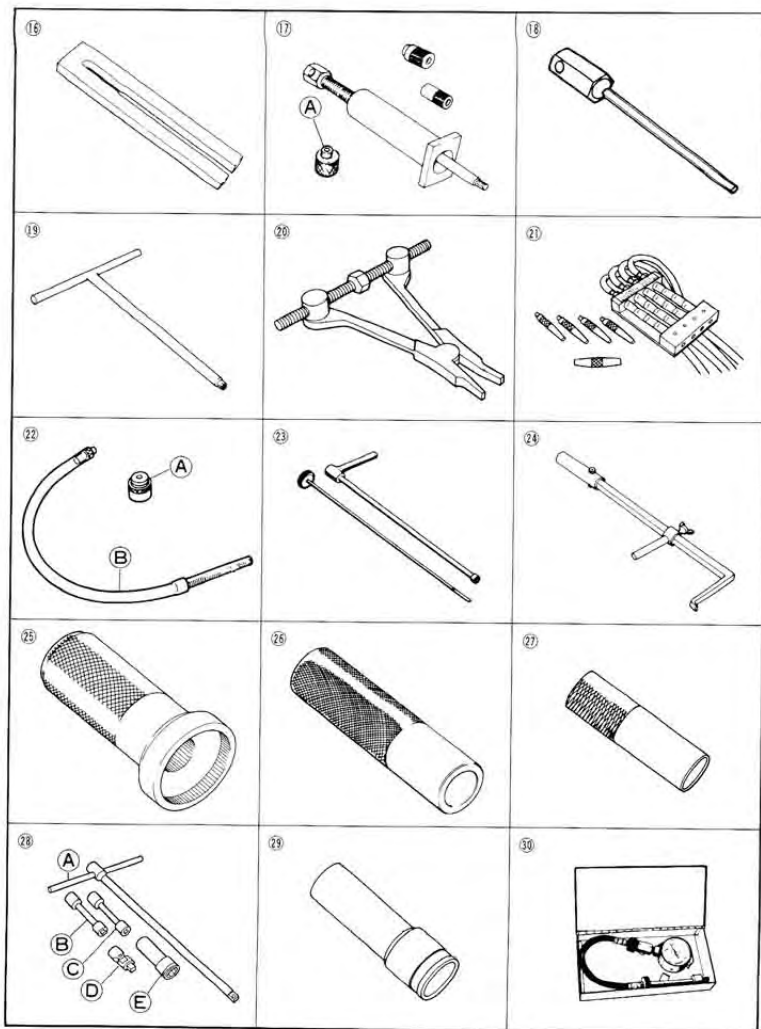
SPECIAL TOOLS

Item	Part no.	Part name
1	09900-06104	Snap ring pliers
2	09900-06105	Snap ring pliers (closing type)
3	09900-06107	Snap ring pliers
4	09900-06108	Snap ring pliers (closing type)
5	09900-09003	Impact driver set
6	09900-20101	Vernier calipers (150 mm)
7	09900-20205	Micrometer (0 — 25 mm)
	09900-20202	Micrometer (25 — 50 mm)
	09900-20203	Micrometer (50 — 75 mm)
8	09900-20508	Cylinder gauge set
9	09900-20602	Dial gauge (1/1000 mm)
	09900-20606	Dial gauge (1/100 mm)
10	09900-20803	Thickness gauge
11	09900-21102	Torque wrench (0 — 1.2 kg·m)
	09900-21103	Torque wrench (1.0 — 9.0 kg·m)
12	09900-25002	Pocket tester
13	09900-28106	Electro tester
14	09900-28403	Hydrometer
15	09910-11510	Stud bolt installer (10 mm)
16	09910-20115	Conrod stopper
17	09910-34510	Piston pin puller
	(A) 09910-33210	Attachment
18	09911-70130	4 mm hexagon wrench
19	09911-73730	"T" type hexagon wrench (5 mm)
	09914-25811	"T" type hexagon wrench (6 mm)
20	09912-34510	Cylinder disassembling tool
21	09913-13121	Carburetor balancer set
22	09913-14410	(A) (16 mm × P1.0 screw) Attachment
	09913-14511	(B) (6 mm × P0.75 screw) Fuel level gauge
23	*09913-14911	Throttle valve adjust wrench
24	09913-50121	Oil seal remover
25	09913-70122	Bearing installer (50 mm)
26	09913-80112	Bearing installer (34 mm)
27	09913-84510	Bearing installer (38 mm)
28	09930-14511	Cylinder head nut and spark plug wrench set
	(A) 09914-24510	"T" handle
	(B) 09911-74510	Long socket (14 mm)
	(C) 09911-74520	Long socket (12 mm)
	(D) 09930-14530	Universal joint
	(E) 09930-14520	Spark plug wrench (21 mm)
29	09930-13210	Spark plug socket wrench

Item	Part no.	Part name
30	09915-64510	Compression gauge
31	* 09915-63210	Compression gauge adaptor
32	09915-74510	Oil pressure gauge
33	09916-14510	Valve lifter
34	* 09916-14910	Valve lifter attachment
35	* 09916-21110	Valve seat cutter set
36	* 09916-34561	(A) Valve guide hole reamer (11.3 mm)
	* 09916-34540	(B) Reamer handle
	* 09916-34550	(C) Valve guide reamer (5.5 mm)
37	* 09916-44910	Valve guide remover
38	* 09916-44920	Valve guide installer attachment
39	09916-74520	Piston ring holder body
	09916-74540	Band (63 — 75 mm)
40	09916-84510	Tweezers
41	* 09917-14910	Tappet adjust driver
42	09920-53710	Clutch sleeve hub holder
43	09924-84510	Bearing installer set
44	09930-34911	Rotor remover
45	09930-44911	Rotor holder
46	09940-14910	Steering nut socket wrench
47	09940-34520	Front fork assembling "T" handle
	09940-34580	Attachment "F"
48	09940-44110	Front fork air pressure gauge (0 — 4.0 kg/cm ²)
49	09940-54910	Front fork oil seal installer
	09940-54920	Attachment
50	09941-34511	Steering race and swinging arm bearing installer
51	09941-44510	Swinging arm bearing remover
52	09941-54910	Bearing inner race remover
53	09941-74910	Steering bearing installer
54	09941-84510	Bearing outer race remover
55	09941-94510	Rim protector
56	09943-74111	Front fork oil level gauge
57	96200-41330	Tire pressure gauge (0 — 3 kg/cm ²)

NOTE: (*) Mark shows newly applied for GS1100.





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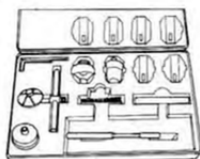
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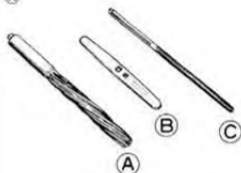
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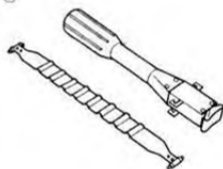
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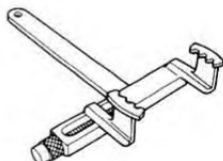
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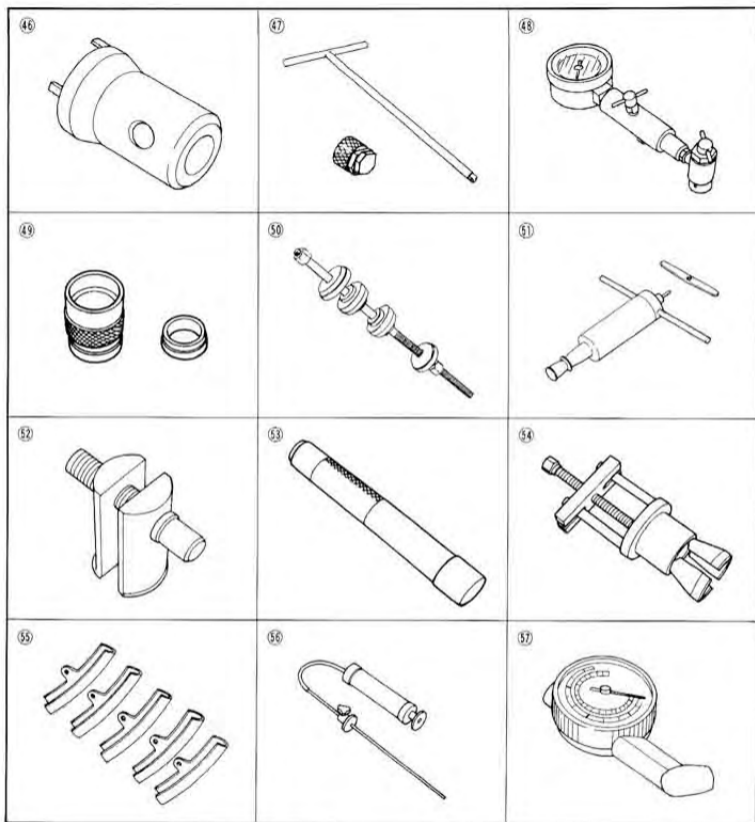


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TROUBLESHOOTING

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CHASSIS.....	6-9

Complaint	Symptom and possible causes	Remedy
Noisy engine.	Noise seems to come from crankshaft 1. Worn or burnt bearings. 2. Big-end bearings worn and burnt. 3. Thrust clearance too large. Noise seems to come from transmission 1. Gears worn or rubbing. 2. Badly worn splines. 3. Primary gears worn or rubbing. 4. Damper spring weakened.	Replace. Replace. Replace. Replace. Replace. Replace. Replace.
Slipping clutch.	1. Clutch control out of adjustment or loss of play. 2. Weakened clutch springs. 3. Worn or distorted pressure plate. 4. Distorted clutch plates, driven and drive. 5. Wave washer weaken or broken piano wire.	Adjust. Replace. Replace. Replace. Replace.
Dragging clutch.	1. Clutch control out of adjustment or too much play. 2. Some clutch springs weakened while others are not. 3. Distorted pressure plate or clutch plates. 4. Wrong viscosity engine oil.	Adjust. Replace. Replace. Replace.
Transmission will not shift.	1. Broken gearshift cam. 2. Distorted gearshift forks. 3. Worn gearshift pawl.	Replace. Replace. Replace.
Transmission will not shift back.	1. Broken return spring on shift shaft. 2. Shift shaft are rubbering or sticky. 3. Distorted or worn gearshift forks.	Replace. Repair. Replace.
Transmission jumps out of gear.	1. Worn shifting gears on drive shaft or countershaft. 2. Distorted or worn gearshift forks. 3. Weakened stopper pawl spring on gearshift cam. 4. Worn gearshift pawl. 5. Worn gear shift drum.	Replace. Replace. Replace. Replace. Replace.
Engine idles poorly.	1. Valve clearance out of adjustment. 2. Poor seating of valves. 3. Defective valve guides. 4. Worn rocker arm or arm shaft. 5. Defective signal generator. 6. Defective transistor unit. 7. Spark plug gaps too wide. 8. Defective ignition coil resulting in weak spark. 9. Float-chamber fuel level out of adjustment in carburetors. 10. Clogged or loosened pilot jet, pilot air jet. 11. Air leaking from carburetors joint, carburetor balancer gauge joint, or starter body. 12. Clogged pilot outlet or bypass. 13. Starter plunger out of adjustment.	Adjust. Replace. Replace. Replace. Replace. Replace. Adjust or replace. Replace. Adjust. Clean or tighten. Tighten or replace. Clean. Adjust.
Engine runs poorly in high-speed range.	1. Valve springs weakened. 2. Valve timing out of adjustment. 3. Worn cams or rocker arms. 4. Spark plug gaps too narrow. 5. Ignition not advanced sufficiently due to poorly working advancer. 6. Defective ignition coil.	Replace. Adjust. Replace. Repair. Repair or replace. Replace.

Complaint	Symptom and possible causes	Remedy
Engine runs poorly in high-speed range.	7. Float-chamber fuel level too low. 8. Clogged air cleaner element. 9. Clogged fuel pipe, resulting in inadequate fuel supply to carburetors. 10. Clogged fuel cock vacuum pipe or pipe sucking air. 11. Clogged main jet or main air jet. 12. Clogged needle jet. 13. Broken O-ring in needle valve. 14. Broken diaphragm of carburetor piston. 15. Clogged needle valve filter. 16. Worn or damaged needle valve. 17. Broken needle valve spring.	Adjust. Clean. Clean, and prime. Clean or replace. Clean. Clean. Replace. Replace. Clean. Replace. Replace.
Dirty or heavy exhaust smoke.	1. Too much engine oil in the engine. 2. Worn piston rings or cylinders. 3. Worn valve guides. 4. Cylinder walls scored or scuffed. 5. Worn valves stems. 6. Defective stem seal. 7. Worn side rails of oil ring.	Check with inspection window drain out excess oil. Replace. Replace. Replace. Replace. Replace. Replace.
Engine lacks power	1. Loss of valve clearance. 2. Weakened valve springs. 3. Valve timing out of adjustment. 4. Worn piston rings or cylinders. 5. Poor seating of valves. 6. Fouled spark plugs. 7. Worn rocker arms or its shafts. 8. Spark plug gaps incorrect. 9. Clogged jets in carburetors. 10. Float-chamber fuel level out of adjustment. 11. Clogged air cleaner element. 12. Carburetor balancing screw loose. 13. Too much engine oil.	Adjust. Replace. Adjust. Replace. Repair. Clean or replace. Replace. Adjust or replace. Clean. Adjust. Clean. Retighten. Drain out excess oil.
Engine overheats	1. Heavy carbon deposit on piston crowns. 2. Not enough oil in the engine. 3. Defective oil pump or clogged oil circuit. 4. Fuel level too low in float chambers. 5. Sucking air from intake pipes. 6. Use of incorrect engine oil.	Clean. Add oil. Repair or clean. Adjust. Retighten or replace. Change.

ELECTRICAL

Complaint	Symptom and possible causes	Remedy
No sparking or poor sparking.	1. Defective ignition coil. 2. Defective spark plugs. 3. Defective signal generator. 4. Defective transistor unit. 5. Low battery charge.	Replace. Replace. Replace. Replace. Recharge.
Spark plugs soon become fouled with carbon.	1. Idling speed set too high. 2. Incorrect gasoline. 3. Dirty element in air cleaner. 4. Spark plugs too cold.	Adjust carburetors. Change. Clean. Replace by hot type plugs.

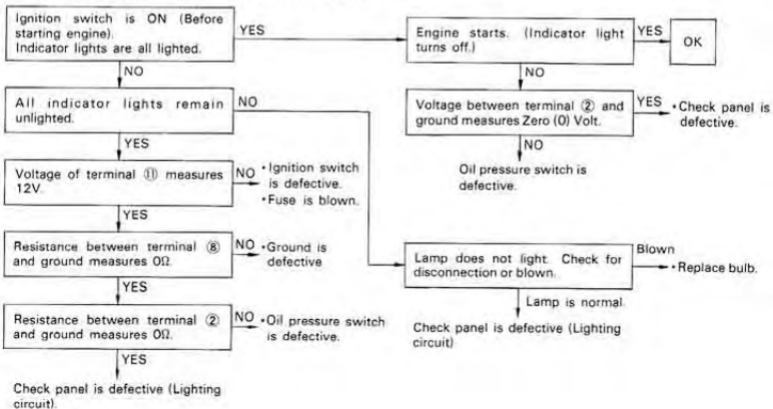
Complaint	Symptom and possible causes	Remedy
Spark plugs become fouled too soon.	1. Worn piston rings. 2. Pistons or cylinders worn. 3. Excessive clearance of valve stems in valve guides. 4. Worn stem oil seal.	Replace. Replace. Replace. Replace.
Spark plug electrodes overheat or burn.	1. Spark plugs too hot. 2. The engine overheats. 3. Spark plugs loosen.	Replace by cold type plugs. Tune up. Retighten.
Generator does not charge.	1. Open or short in lead wires, or loose lead connections. 2. Shorted, grounded or open generator coils. 3. Shorted or punctured regulator/rectifier.	Repair, replace or retighten. Replace. Replace.
Generator does charge, but charging rate is below the specification.	1. Lead wires tend to get shorted or open-circuited or loosely connected at terminals. 2. Grounded or open-circuited stator coils of generator. 3. Defective regulator/rectifier. 4. Not enough electrolyte in the battery. 5. Defective cell plates in the battery.	Repair or retighten. Replace. Replace. Add distilled water to the upper level. Replace the battery.
Generator overcharges.	1. Internal short-circuit in the battery. 2. Resistor element in the regulator/rectifier damaged or defective. 3. Regulator/rectifier poorly grounded.	Replace the battery. Replace. Clean and tighten ground connection.
Unstable charging	1. Lead wire insulation frayed due to vibration, resulting in intermittent shorting. 2. Generator internally shorted. 3. Defective regulator/rectifier.	Repair or replace. Replace. Replace.
Starter button is not effective.	1. Battery run down. 2. Defective switch contacts. 3. Brushes not seating properly on commutator in starter motor. 4. Defective starter relay. 5. Wiring connections loose or disconnected.	Recharge or replace. Replace. Repair or replace. Replace. Connect, tighten or repair.
Battery "sulfation" ("Sulfation"; acidic white powdery substance or spots on surfaces of cell plates.)	1. Charging rate too low or too high. (When not in use batteries should be recharged at least once a month to avoid sulfation.) 2. Battery electrolyte excessive or insufficient, or its specific gravity too high or too low. 3. The battery left unused in a run-down condition for too long in cold climate. 4. Adulterated electrolyte. (Foreign matter has entered, mixed with the electrolyte, and contaminated it.)	Replace the battery. Keep the electrolyte up to the prescribed level, or adjust the S.G. by consulting the battery maker's directions. Replace the battery, if badly sulfated. If "sulfation" has not advanced too far, try to restore the battery by replacing the electrolyte, recharging it fully with the battery detached from the motorcycle and then adjusting electrolyte's S.G.

Complaint	Symptom and possible causes	Remedy
Battery discharges too rapidly.	1. Dirty container. 2. Impurities in the electrolyte or electrolyte S.G. is too high. 3. The charging system is not set for proper charging operation. 4. Cell plates have lost much of their active material as a result of overcharging. 5. A short-circuit condition exists within the battery due to an excessive accumulation of sediments caused by the electrolyte's high S.G. 6. Electrolyte's S.G. is too low. 7. Adulterated electrolyte. 8. Battery is too old.	Clean. Change the electrolyte by consulting the battery maker's directions. Check the generator, regulator/rectifier and circuit connections, and make necessary adjustments for specified charging operation. Replace the battery, and correct the charging system. Replace the battery. Recharge the battery fully and adjust electrolyte's S.G. Replace the electrolyte, recharge the battery and then adjust S.G. Replace the battery.
Reversed battery polarity.	The battery has been connected the other way around in the system, so that it is being charged in the reverse direction.	Replace the battery and be sure to connect the battery properly.

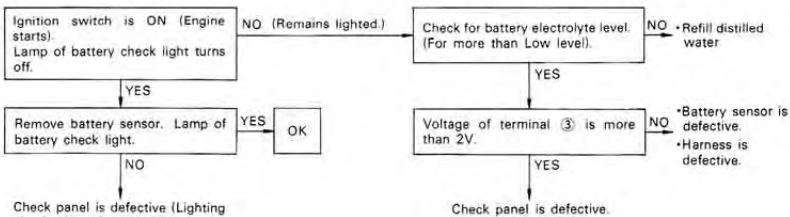
CHECK PANEL

(Resistance is all measured in X10 range.)

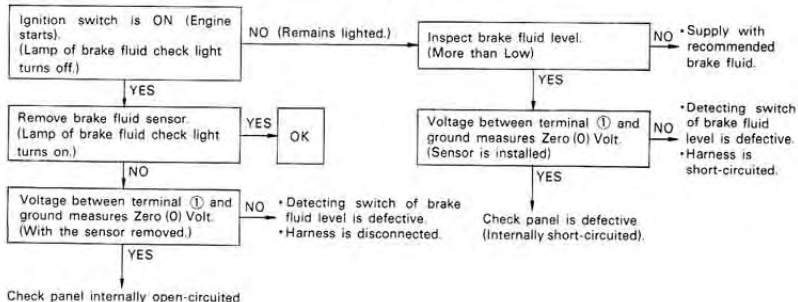
1. INDICATOR LIGHT AND LIGHTING CIRCUIT



2. CHECKING OF BATTERY ELECTROLYTE LEVEL CHECK CIRCUIT

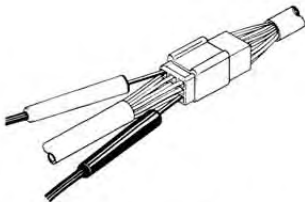


3. CHECKING OF BRAKE FLUID LEVEL CHECK CIRCUIT

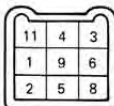


NOTE:

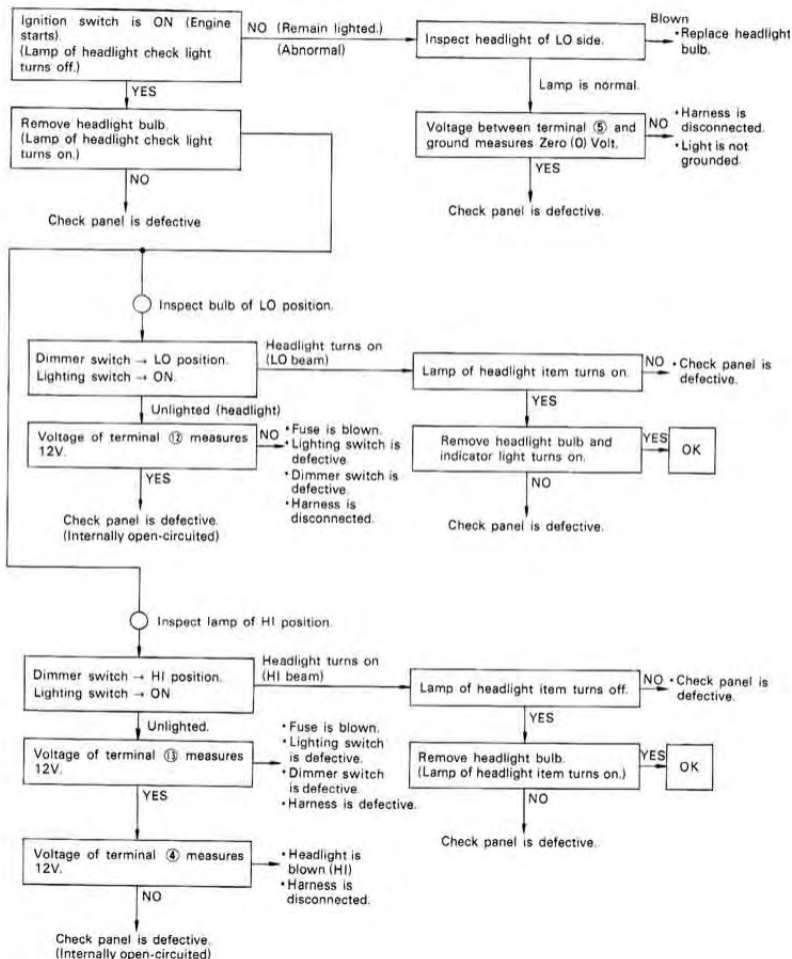
- ① ~ ⑬ in the above chart show the respective lead wires from the check panel as shown right.
- When inspecting, couplers are connected and probe of the tester touches lead wire behind the coupler.



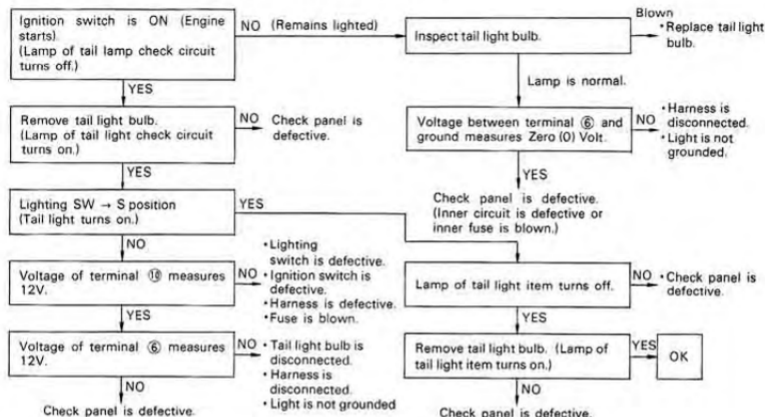
① G/W	⑧ B/W
② G/Y	⑨ R/Bl
③ G/Bl	⑩ R/B
④ Y	⑪ O
⑤ W	⑫ P
⑥ Br	⑬ Lbl
⑦ W	



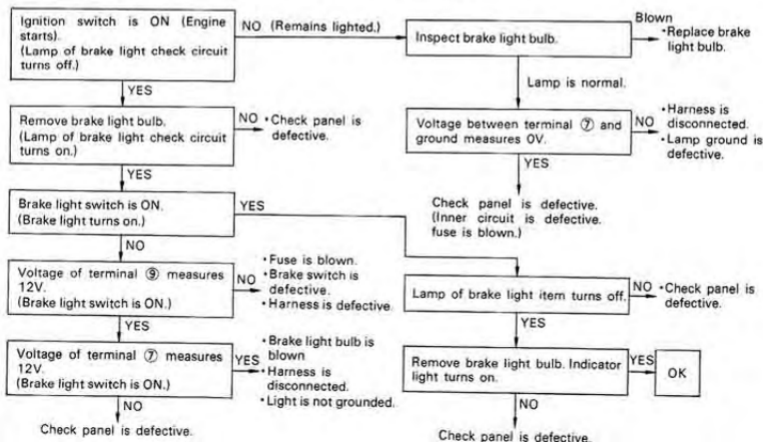
4. CHECKING OF HEADLIGHT BULB CHECK CIRCUIT



5. CHECKING OF TAIL LIGHT BULB CHECK CIRCUIT



6. CHECKING OF BRAKE LIGHT BULB CHECK CIRCUIT



CHASSIS

Complaint	Symptom and possible causes	Remedy
Handling feels too heavy.	1. Steering stem nut overtightened. 2. Worn roller bearing or race in steering stem. 3. Distorted steering stem. 4. Not enough pressure in tires. 5. Overtightened steering races.	Adjust. Replace. Replace. Adjust. Adjust.
Steering oscillation.	1. Loss of balance between right and left suspension. 2. Bent front fork. 3. Bent front axle or cocked tire. 4. Loose steering stem bearings. 5. Worn or incorrect tires or wrong tire pressure	Adjust. Repair or replace. Replace. Adjust. Adjust, or replace
Wobbly front wheel	1. Bent wheel rim. 2. Worn front wheel bearings. 3. Defective or incorrect tire. 4. Loose nut on axle.	Replace. Replace. Replace. Retighten.
Front suspension too soft.	1. Weakened springs. 2. Not enough fork oil. 3. Not enough fork air. 4. Wrong weight fork oil	Replace. Refill. Adjust to specification. Replace.
Front suspension too stiff.	1. Fork oil too viscous. 2. Too much fork oil. 3. Fork air too high 4. Front axle bent 5. Fork tubes not adjusted evenly in fork stem and steering stem head.	Replace. Remove excess oil. Adjust to specification. Replace. Adjust.
Noisy front suspension.	1. Not enough fork oil. 2. Loose nuts on suspension.	Refill. Retighten.
Wobbly rear wheel	1. Distorted wheel rim. 2. Worn-down rear wheel bearings. 3. Loose wheel spokes. 4. Defective or incorrect tire. 5. Worn swinging arm bearing.	Replace. Replace. Retighten. Replace. Replace.
Rear suspension too soft.	1. Weakened springs. 2. Rear suspension adjustment improperly set.	Replace. Reset
Rear suspension too stiff.	1. Rear suspension adjusters improperly set. 2. Shock absorber shaft(s) bent. 3. Swing arm bent	Adjust. Replace. Replace.
Noisy rear suspension	Loose nut on rear suspension.	Retighten.
Insufficient brake power.	1. Leakage of brake fluid from hydraulic system. 2. Worn pads. 3. Oil adhesion on engaging surface of pads. 4. Worn disc. 5. Air entered into hydraulic system.	Repair or replace. Replace. Clean disc and pads. Replace. Bleed air.
Brake squeaking	1. Carbon adhesion on pad surface. 2. Tilted pad. 3. Damaged wheel bearing. 4. Loosened front-wheel axle or rear-wheel axle.	Repair surface with sandpaper. Modify and fitting. Replace. Tighten to regular torque.

Complaint	Symptom and possible causes	Remedy
Brake squeaking	5. Worn pads. 6. Foreign substance entered into brake fluid. 7. Clogged return port of master cylinder. 8. Wrongly fixed pad shims. 9. Calipers binding on caliper axles	Replace. Replace brake fluid. Disassemble and clean master cylinder. Set correctly. Clean and lubricate
Excessive brake lever stroke.	1. Air entered into hydraulic system. 2. Insufficient brake fluid. 3. Improper quality of brake fluid.	Bleed air. Replenish fluid to normal level; bleed air. Replace with correct fluid.
Leakage of brake fluid	1. Insufficient tightening of connection joints. 2. Cracked hose.	Tighten to specified torque. Replace.

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ENGINE REMOVAL

Before taking the engine out of the frame, wash the engine with a steam cleaner and drain engine oil.

The procedure of engine removal is sequentially explained in the following steps, and engine installation is effected by reversing the removal procedure.

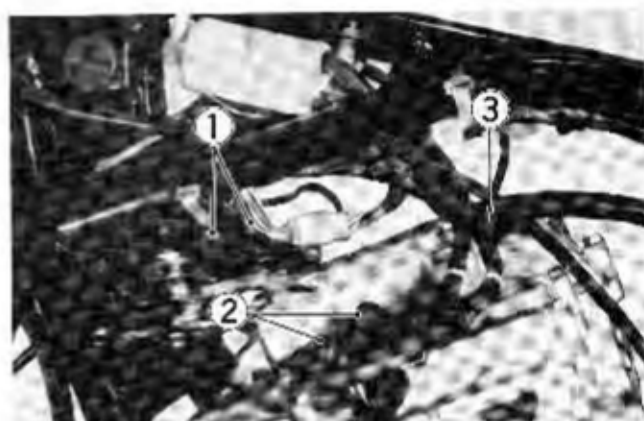
- Place an oil pan under the engine and drain oil by removing oil drain plug and filter cap.
- Remove seat, RH and LH frame covers.
- Remove rear brake fluid reservoir and remove air cleaner case.
- Temporarily fasten the reservoir with the securing bolt.
- Disconnect battery $\ominus$ and $\oplus$ lead wires from battery terminal.
- Disconnect fuel level gauge lead wires, fuel hose and vacuum hose.



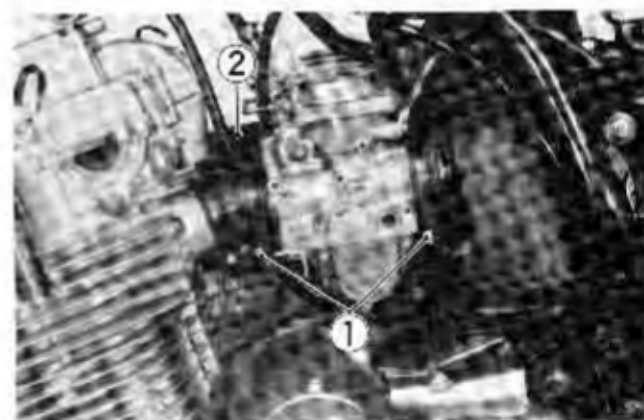
- Remove fuel tank fitting bolt ① and draw fuel tank rearward.



- Remove horn ass'y ① and four spark plug caps ②.
- Disconnect blow-by gas breather pipe ③ from cylinder head cover cap.



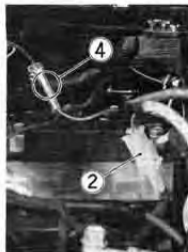
- Loosen eight screws ① for carburetor mounting, and shift carburetor assembly rearward, then remove cylinder head intake pipe No. 4 ②.
- Slightly shift carburetor assembly to right side, remove throttle and starter cables, and then remove carburetors.



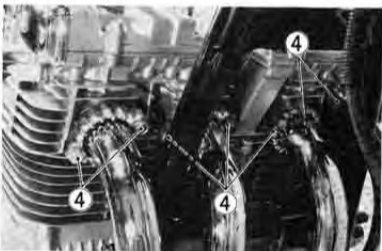
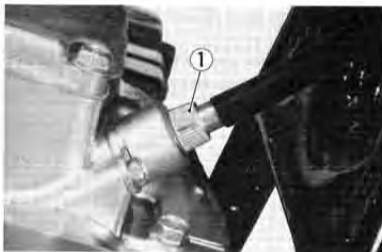
- Remove air chamber body by removing two bolts ①.



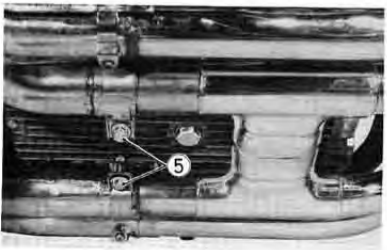
- Disconnect generator lead wires ①, signal generator lead wires ②, oil pressure switch lead wire ③, neutral indicator lead wire ④ and starter motor lead wire ⑤.



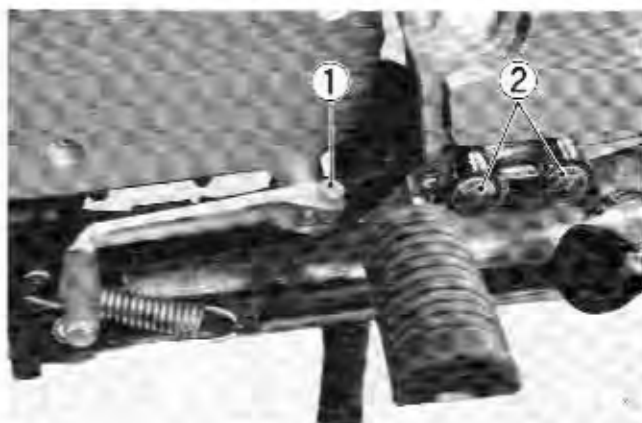
- Remove tachometer cable ① from cylinder head cover.
- Remove clutch cable by removing release arm bolt ② and adjuster ③.
- Remove exhaust pipe clamp bolts ④, and remove No. 2 and No. 3 exhaust pipe after removing two securing bolts ⑤.



- Remove muffler mounting bolts ⑥, and remove right and left mufflers.



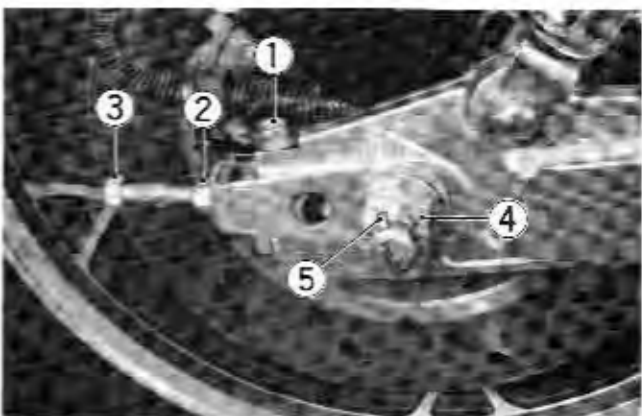
- Remove gearshift lever ① and left footrest ②, and then remove the engine sprocket cover.



- Flatten engine sprocket lock washer, and remove engine sprocket nut ① while depressing rear brake pedal.



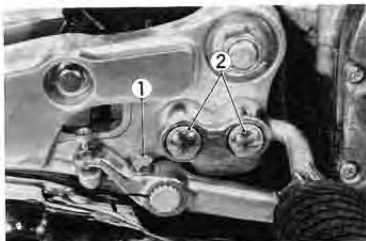
- Loosen chain adjuster support bolt ①, lock nuts ②, adjuster bolt ③, and torque link mounting nut. Then loosen rear axle nut ④ after pulling out cotter pin ⑤.
- Push rear wheel forward, and disengage drive chain from the rear sprocket.



- Disengage drive chain from engine sprocket, and remove engine sprocket.



- Remove rear brake pedal ① and right footrest ②.
- Remove cylinder head cover to provide additional clearance when removing the engine from the chassis.



- Extract six mounting brackets, three mounting nuts, and two mounting bolts.
- Gradually lift up the engine, and lower the engine ass'y on the right side making sure that it does not make contact with the rear bracket.

**NOTE:**

Engine mounting bolts are different lengths. Installing a bolt in the wrong location may damage the crank cases.

ENGINE REINSTALLATION

Install the engine in the reverse order of engine removal.

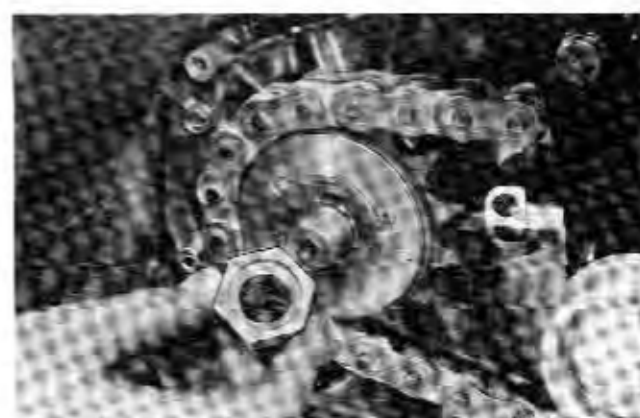
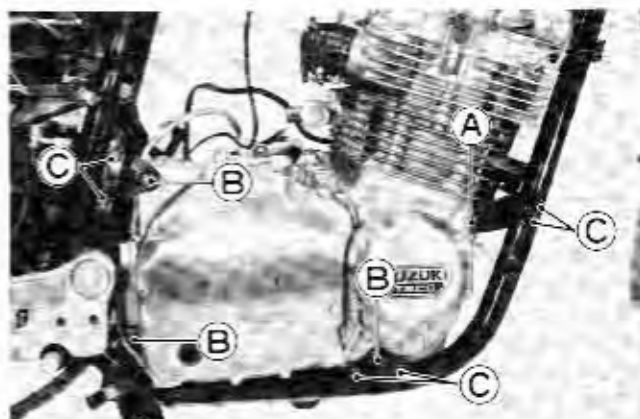
- After inserting the engine mounting bolts, tighten engine mounting bracket bolts and engine mounting bolts. Insert all three long bolts from the left side and insert the rear upper bolt through the spacer on the left side of the engine.
- The nut ① takes its position in the place indicated.



Tightening torque

	kg-m	lb-ft
(A)	4.5—5.5	32.5—40.0
(B)	3.0—3.7	21.5—27.0
(C)	2.0—3.0	14.5—21.5

- The engine sprocket should be installed on the drive shaft beforehand as shown in the figure at the same time of the installation of drive chain. If it is difficult to assemble the engine sprocket, remove the rear axle cotter pin, loosen the axle nut, torque link mounting nut, and chain adjuster bolt to push the wheel forward, and give the drive chain some play. When replacing the engine sprocket nut, stepped side should be faced inside. After completing tightening of the engine mounting bolts, adjust the drive chain free play (see page 3-12).



Tightening torque

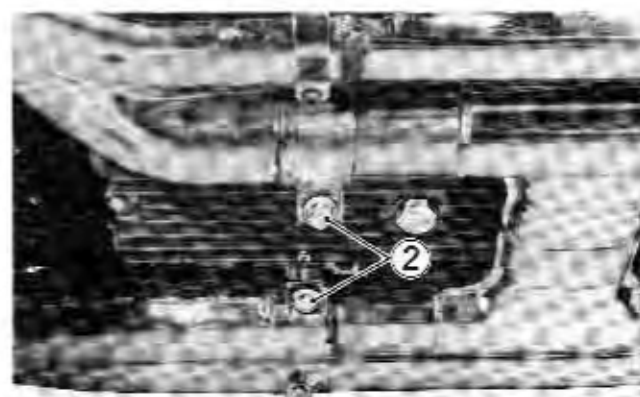
	kg-m	lb-ft
Engine sprocket nut (see page 15-13)	9.0—10.0	65.0—72.5
Rear axle nut	8.5—11.5	61.5—83.0
Rear torque link nut	2.0—3.0	14.5—21.5

- Install exhaust pipe plates ① in Nos. 2 and 3 exhaust pipe, and tighten exhaust pipe bolts.



- Securely tighten bolts ② connecting exhaust pipe and mufflers to prevent gas leakage.

Tightening torque	0.9—1.4 kg-m (6.5—10.0 lb-ft)
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- Mount mufflers, footrests and gearshift lever, and tighten bolts and nuts with specified torque.

Tightening torque

	kg-m	lb-ft
Muffler mounting bracket nut	1.5-2.0	11.0-14.5
Rear footrest mounting bolt	2.7-4.3	19.5-31.0
Front footrest mounting bolt	2.7-4.3	19.5-31.0
Gearshift lever mounting bolt	1.3-2.3	9.5-16.5

- Replace the plug caps on the spark plugs so that their code markings correspond to the cylinder numbers arranged in the order of 1, 2, 3 and 4 from the left.
- Introduce 4.0L (4.2 US.qt) of engine oil SAE 10W/40 under API classification SE into the engine, check that the oil level remains between the marks of oil gauge.
- After remounting the engine, route wiring harness and cables properly by referring to the sections, wire routing and cable routing, and adjust the following items to the specification.



①: for No. 1 cylinder. ④: for No. 4 cylinder



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* Rear brake pedal	3-13
* Brake light switch.....	3-14
* Clutch cable	3-10
* Drive chain play	3-11
* Throttle cable	3- 9
* Idling adjustment	3- 9
* Balancing carburetor.....	8-12

ENGINE COMPONENTS REMOVABLE WITH ENGINE IN PLACE

That may be removed with the engine remaining in the frame.

The following sections describe operational contents from top end to air cleaner, following the previous sections dealing with engine removal. See reference pages with respect to their operations.

ENGINE LEFT SIDE	ENGINE CENTER	ENGINE RIGHT SIDE
Engine sprocket cover.....	Air cleaner.....	Advance governor.....
Engine sprocket and drive chain.....	Carburetor.....	Clutch cover.....
Gear shift lever.....	Clutch cable.....	Clutch release bearing.....
Generator cover.....	Cam chain tensioner.....	Clutch pressure, drive and driven plates.....
Generator rotor.....	Cylinder head cover.....	Gear shifting shaft.....
Generator stator.....	Camshaft.....	Gear shifting pawl and cam drive gear.....
Neutral indicator switch body.....	Cylinder head breather cover.....	Oil pump drive gear.....
Starter clutch idle gear.....	Cylinder head.....	Oil pump ass'y.....
Starter clutch.....	Cylinder.....	Primary driven gear.....
	Exhaust and muffler.....	Signal generator.....
	Oil filter.....	
	Oil pressure switch.....	
	Oil pan.....	
	Piston.....	
	Sump filter.....	
	Starter motor.....	
	Throttle and starter cables.....	
	Tachometer drive gear.....	

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

COMPRESSION CHECK

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

COMPRESSION

Standard	Limit	Difference
9 — 12 kg/cm ² (128 — 171 psi)	7 kg/cm ² (100 psi)	2 kg/cm ² (28.4 psi)

Low compression can indicate any of the following malconditions:

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

Overhaul the engine in the following cases:

- * Compression pressure in any one of cylinders is less than 7 kg/cm²
- * Difference in compression pressure between the two is more than 2 kg/cm²
- * All compression pressures are below 9 kg/cm² (standard) even when they measure more than 7 kg/cm²

COMPRESSION TEST PROCEDURE

NOTE:

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

- Remove fuel tank.
- Remove all spark plugs.

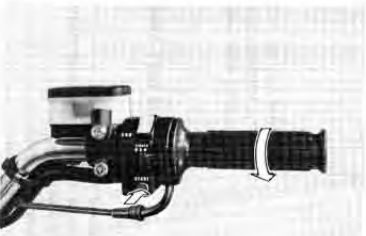
09930-13210	Socket wrench
09930-14530	Universal joint
09914-24510	T handle

- Fit the compression gauge ① to one of the plug holes, taking care that the connection is absolutely tight.

09915-64510	Compression gauge
09915-63210	Compression adapter



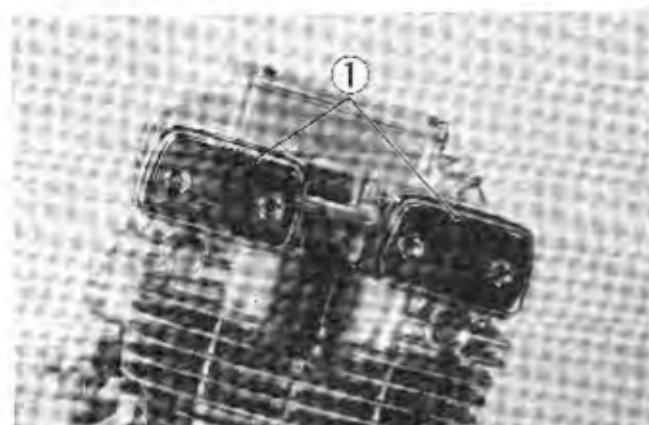
- Twist the throttle grip into full-open position.
- Crank the engine a few seconds with the starter, and read the maximum gauge reading as the compression of that cylinder. Repeat this procedure with the other cylinders.



TOP END

REMOVAL

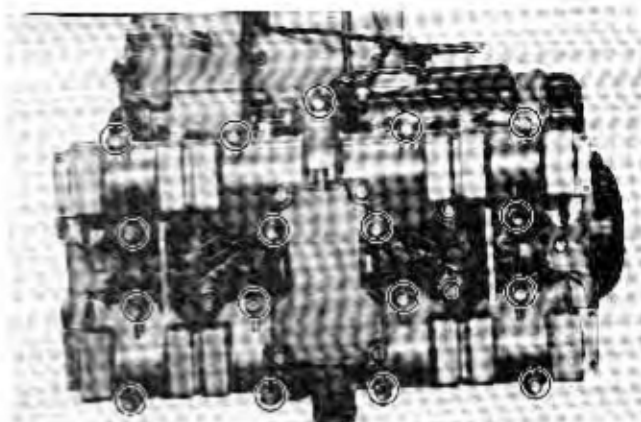
- Remove cylinder head cover after removing camshaft end caps ①.



- To remove the chain tensioner, first loosen the lock nut ① and tighten screw ② and then remove two mounting bolts ③.

NOTE:

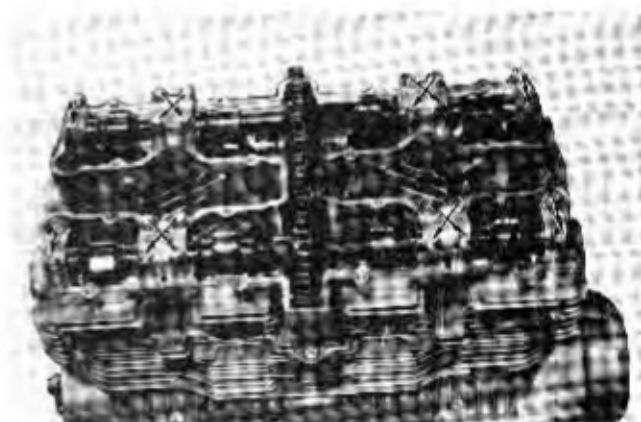
Tightening screw ② locks the spring loaded tensioner pushrod inside.



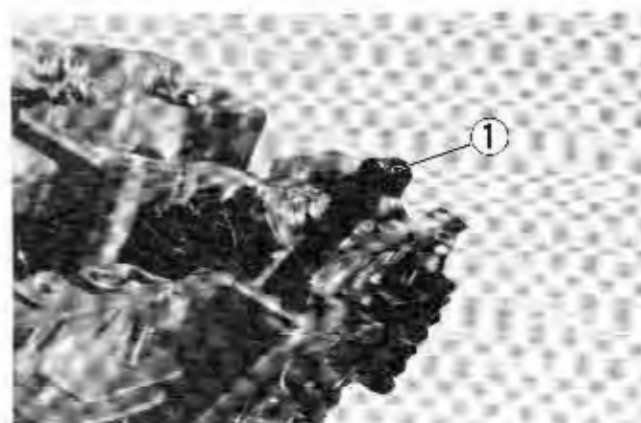
- Remove the two camshafts, intake and exhaust.

NOTE:

* Be sure to loosen camshaft cap bolts evenly by shifting the wrench diagonally after loosening a bolt.



- Pull out cam chain guide ①.

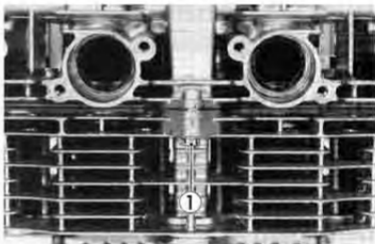
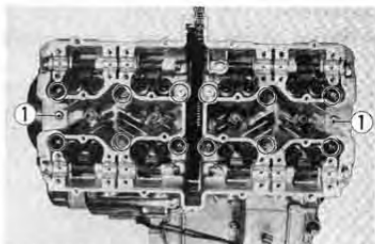


- The cylinder head becomes free for removal when its three 6-mm bolts ①, and twelve 10-mm nuts are moved.

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

NOTE:

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

**CYLINDER HEAD****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", "R" and "L", so that each will be restored to the original location during assembly.

- Using valve lifter and its attachment, compress the valve springs.

09916-14510	Valve lifter
09916-14910	Valve lifter attachment

- Take off the two cotter halves ① from the valve stem, using tweezers.

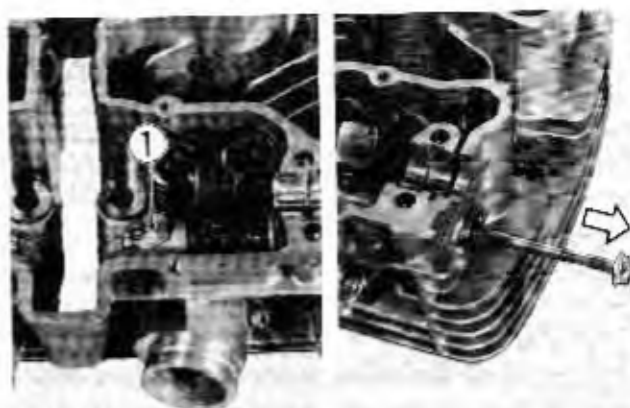
09916-84510	Tweezers
-------------	----------

- Take out the valve spring retainer, inner spring and outer spring.
- From the other side, pull out the valve.



NOTE:

- * Removal of valves completes ordinary disassembling work. If valve guides have to be removed for replacement after inspecting related parts, carry out the steps shown in valve guide servicing.
- * When removing rocker arm shaft, remove the rocker arm shaft stop screw ① and screw 6mm bolt into the rocker arm shaft end and pull it out.



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

NOTE:

Discard the removed valve guide subassemblies.
Only oversized valve guides are available.



- Re-finish the valve guide holes in cylinder head with a 11.3 mm reamer.

09916-34561	Valve guide hole reamer
09916-34540	Reamer handle



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

11115-49290	Valve guide
09289-05003	Valve guide oil seal



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

09916-44910	Valve guide remover
09916-44920	Valve guide installer attachment

CAUTION:

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

- Install the valve spring guide.



- Install valve spring lower seats ①. Be careful not to confuse the lower seats with the spring retainers ②.



- Re-finish the valve guide inner surface with a 5.5 mm reamer.

09916-34550	Valve guide reamer
09916-34540	Reamer handle



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

09916-44910	Valve guide remover
-------------	---------------------

NOTE:

Do not use the oil seals removed in disassembly; use new seals.

CYLINDER HEAD COMPONENTS REASSEMBLY

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

CAUTION:

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

99000-25140	SUZUKI Moly Paste
-------------	-------------------

- Install the valve spring and with the closed-pitch portion (A) down.
- (B): Large-pitch portion.
- Put on the valve retainer and, using the valve lifter, press down the springs, fit the cotter halves to the stem end, and release the lifter to allow the cotter (1) to wedge in between seat and stem. Be sure that the rounded lip (2) of the cotter fits snugly into the groove (3) in the stem end.

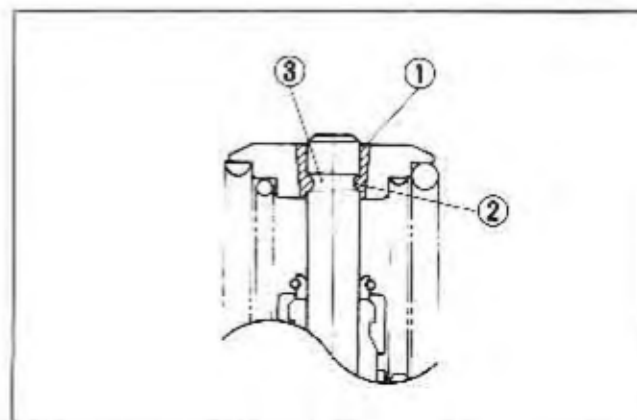
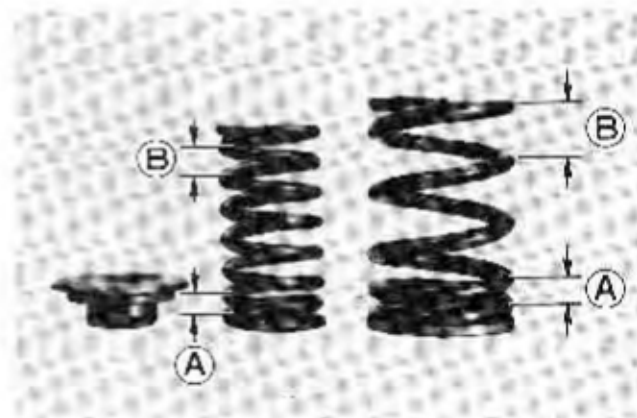
09916-14510	Valve lifter
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09916-14910	Valve lifter attachment
-------------	-------------------------

09916-84510	Tweezers
-------------	----------

CAUTION:

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



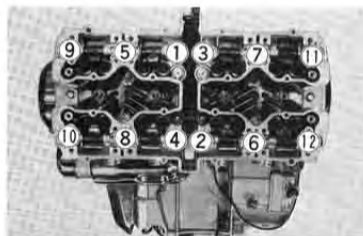
- Be sure to replace cylinder head gasket with new one to prevent gas leakage.

NOTE:

Be sure to identify the top surface by "TOP" mark ① on the cylinder head gasket as shown.

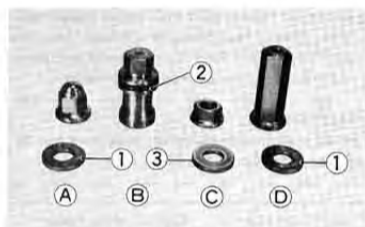
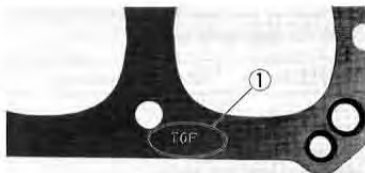
- Fix two dowel pins properly.
- Mount the cylinder head on the cylinder block.
- Install four kinds of cylinder head nuts in the respective positions indicated.
- Tighten the twelve 10-mm nuts to specification with a torque wrench sequentially in the ascending order of numbers.

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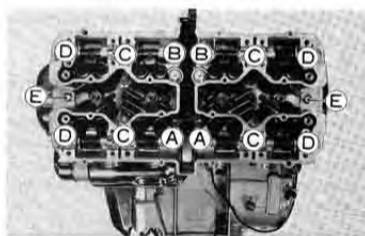


- After firmly tightening the 12-nuts, insert three 6-mm bolts (E) and tighten them with specified torque.

Tightening torque	0.7—1.1 kg-m (5.0—8.0 lb-ft)
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① Copper washer ② O-ring ③ Iron washer

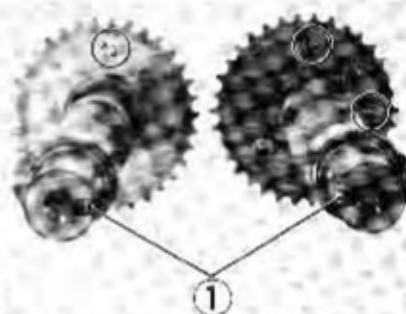


- Place chain guide ① properly.



CAM SPROCKET REASSEMBLY

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



- Apply THREAD LOCK SUPER "1303" to the threads of Allen-head bolts, and tighten them to the following torque value: (See page 13-14)

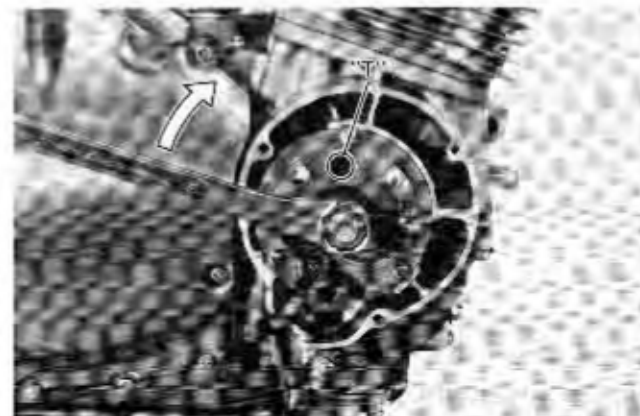
09911-73730	T type hexagon wrench 5 mm
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99000-32030	Thread lock super "1303"
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Tightening torque	0.9—1.2 kg-m (6.5—8.5 lb-ft)
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- While holding down the timing chain, rotate the crankshaft in normal direction to bring the "T" mark (on Nos. 1 and 4 cylinder side of the advance governor) to the timing mark.



CAUTION:

To turn over crankshaft, torque nut with a 19 mm wrench. Never try to rotate crankshaft by putting a 12 mm wrench to bolt.

NOTE:

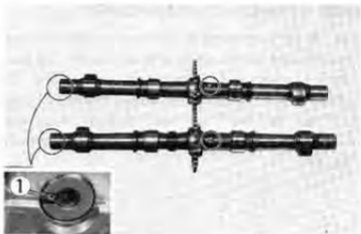
Just before placing the camshaft on the cylinder head, apply high quality molybdenum disulfide lubricant to its journals, fully coating each journal ① with the paste taking care not to leave any dry spot. Apply engine oil to the journal bearings.



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). The right end can be distinguished by the notch ① at the right end.

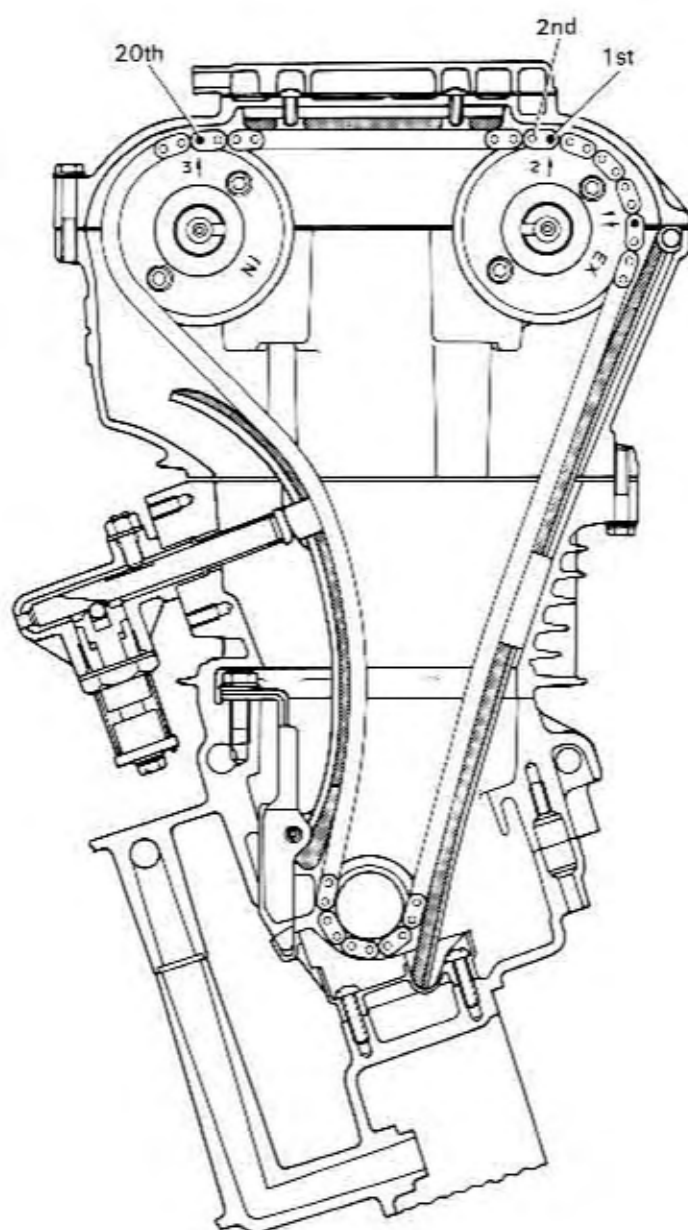


- With "T" mark accurately lined up with the timing mark, hold the crankshaft steady and lightly pull up the chain to remove the slack between the crank sprocket and exhaust sprocket.
- Exhaust sprocket bears an arrow mark "1" indicated as ①. Turn over the exhaust camshaft so that the arrow points flush with the gasketed surface of the cylinder head. Engage the timing chain with this sprocket.
- The other arrow marked "2" is now pointing straight upward. Count the chain roller pins toward the intake camshaft, starting from the roller pin directly above this arrow marked "2" and ending with the 20th roller pin. Engage the chain with intake sprocket, locating the 20th pin at and above the arrow marked "3" on the intake sprocket.

**NOTE:**

The timing chain is now riding on all three sprockets. Be careful not to disturb the crankshaft until the eight caps are secured and the chain tensioner is fitted.





- Each camshaft cap is identified with a cast-on letter with a triangle. A matching cast-on symbol appears on the head. Install each cap at its matching letter, with triangle symbols pointing forward.
- Secure the eight camshaft bearing caps evenly by tightening the camshaft bearing cap bolts sequentially from one bolts to another and from one camshaft bearing cap to another, to push shafts down evenly.

NOTE:

Damage to head or cam bearing cap thrust surfaces may result in cam bearing caps are not drawn down evenly.

- Tighten the camshaft bearing cap bolts to the following torque value:

Camshaft bearing cap bolt tightening torque	0.8 — 1.2 kg-m (6.0 — 8.5 lb-ft)
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CAUTION:

The camshaft bearing cap bolts are made of a special material and much superior in strength compared with other type of high strength bolts.

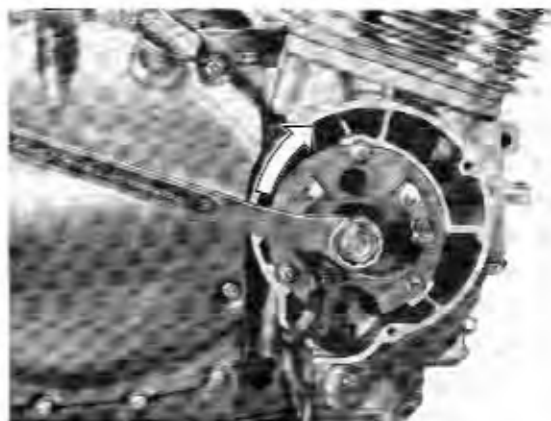
Take special care not to use other type bolts instead of these special bolts. To identify these bolts, each of them has a figure "9" on its head.



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



- If tensioner adjuster is not going in, turn the crankshaft slowly and slightly clockwise to get chain play at inlet side.



- Withdraw the lock screw by one-quarter to half a turn; this separates the tip of the screw from the pushrod, thereby allowing the pushrod to advance under spring force and press the tensioner against the camshaft chain.
- Tighten the lock nut ①.

**NOTE:**

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

- While turning the handle ① counterclockwise, slowly rotate the crankshaft in reverse direction (thus causing the chain to push back the tensioner).



- Release the handle and slowly turn back the crankshaft in normal running direction (to slacken that portion of the chain extending along the tensioner). See if the handle rotates by itself as the chain becomes progressively slackened; if it does, then the pushrod inside is obviously moving forward under spring force as it should, thus signifying that the tensioner is in good operable condition. If the handle rotates, but sluggishly, it means that the pushrod or lock shaft sticking and, in such a case, remove the tensioner and service the pushrod and lock shaft to make them move smoothly. (see page 7-30)

CAUTION:

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



- Adjust the valve clearance. (see page 3-5)
- In fitting the seal ring to the oil filter chamber cap, lightly coat grease on the seal ring groove ① to avoid any chance of dropping or mislocating the ring during the installation work.
- Apply thread lock cement to filter cap nuts.

99000-32040

Thread lock cement



- Tighten engine oil drain plug.
- Pour 50 ml of engine oil in four oil pockets and tachometer drive gear oil bath in the head.



NOTE:

- * The cylinder head cover gasket should be replaced whenever cylinder head cover is removed. A thin film of Suzuki Bond No. 1207B on both sides of gasket will ensure an oil tight seal.
- * The sealing washers, utilized with the screw (B), should also be replaced at this time.

99104-31140

Suzuki Bond No. 1207B

- Install the cylinder head cover.

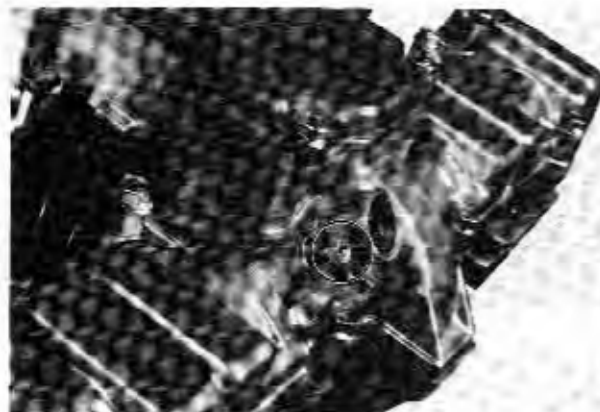
NOTE:

Place the two longer bolts at the dowel pin positions (A). Place the four screws at the position (B).

- Install the tachometer drive gear.
- Apply thread lock cement to the camshaft end cap screws and install camshaft end caps.

99000-32040

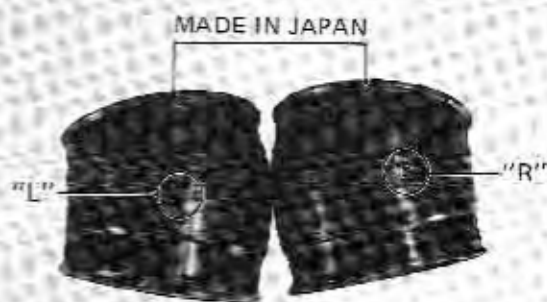
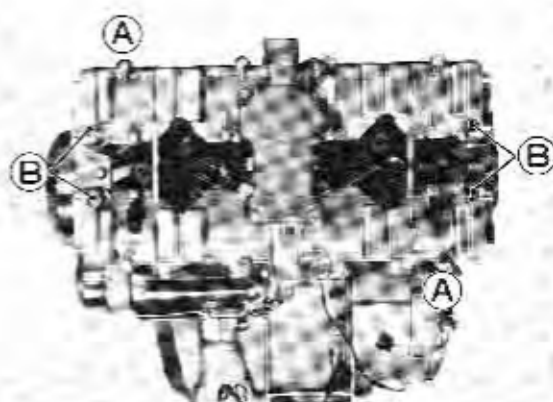
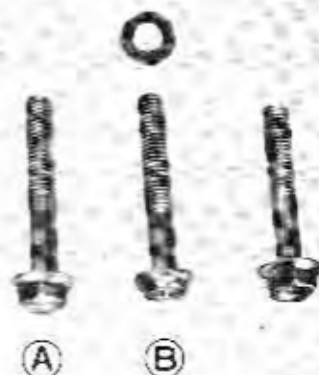
Thread lock cement



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

CAUTION:

"MADE IN JAPAN" mark on the intake pipe faces to the cylinder head side.



TOP END-INSPECTION

CAMSHAFT

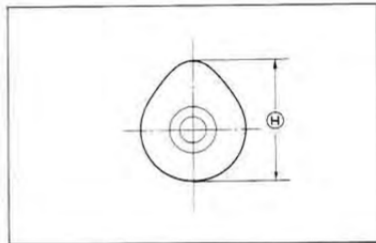
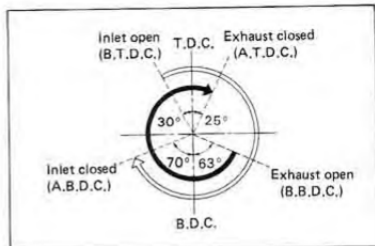
- Both camshafts should be checked for run-out and also for wear of cams and journals if the engine has been noted as giving abnormal noise or vibration or lack power output. Any of these conditions may be caused by camshafts worn down or distorted to the service limit.

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 (H) , which is to be measured with a micrometer. Replace camshafts if found worn down to the limit.

Cam height

Height (H)	Service Limit
Intake cams	34.350 mm (1.3524 in)
Exhaust cams	34.060 mm (1.3409 in)



CAMSHAFT JOURNAL WEAR

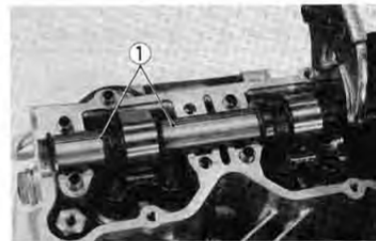
- Determine whether each journal is worn down to the limit or not by measuring the running clearance with the camshaft installed in place. Use plastigauge ① to read the clearance at the widest portion, which is specified as follows:

Camshaft—Journal clearance

Service Limit	0.150 mm (0.0059 in)
---------------	----------------------

NOTE:

Install each cap to their original positions. Each cap has a cast on triangle. This triangle should face forward.



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

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



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

09900-20205	Micrometer (0 – 25 mm)
-------------	------------------------

	Standard
Journal holder I.D. (In and Ex)	22.000 – 22.013 mm (0.8661 – 0.8667 in)
Camshaft journal O.D. (In and Ex)	21.959 – 21.980 mm (0.8645 – 0.8654 in)

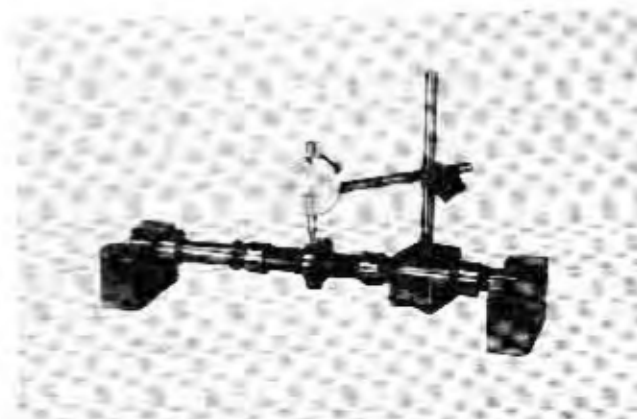


CAMSHAFT RUNOUT

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

Camshaft runout (IN and EX)

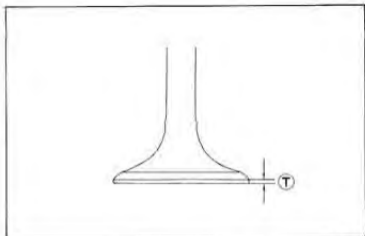
Service Limit	0.1 mm (0.004 in)
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VALVE FACE WEAR

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

Service Limit	0.5 mm (0.02 in)
---------------	------------------



VALVE STEM RUNOUT

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

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

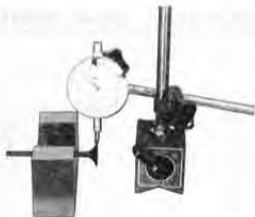
Service Limit	0.05 mm (0.002 in)
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VALVE HEAD RADIAL RUNOUT

- Place the dial gauge at the position shown and measure the valve head radial runout. If it measures more than limit, replace the valve.

Service Limit	0.03 mm (0.001 in)
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VALVE GUIDE—VALVE STEM CLEARANCE

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

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

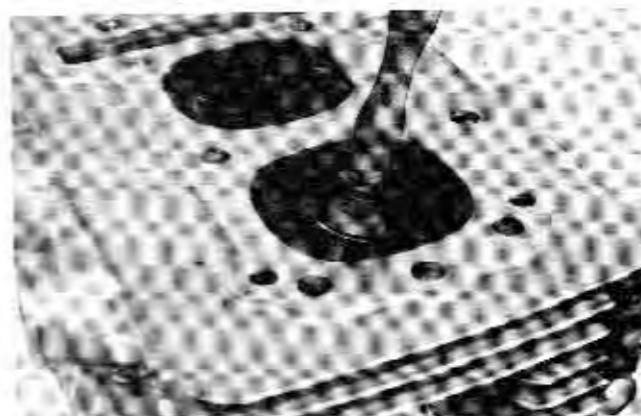
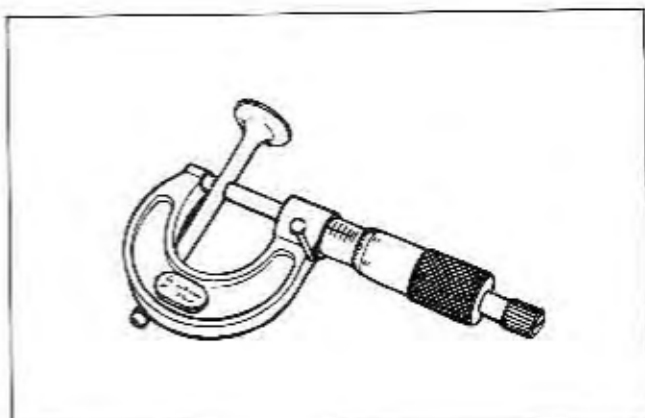


VALVE STEM WEAR

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

09900-20205	Micrometer (0—25 mm)
-------------	-------------------------

Valve	Standard
Intake valves	5.460—5.475 mm (0.2150—0.2156 in)
Exhaust valves	5.445—5.460 mm (0.2144—0.2150 in)



VALVE SEAT WIDTH

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

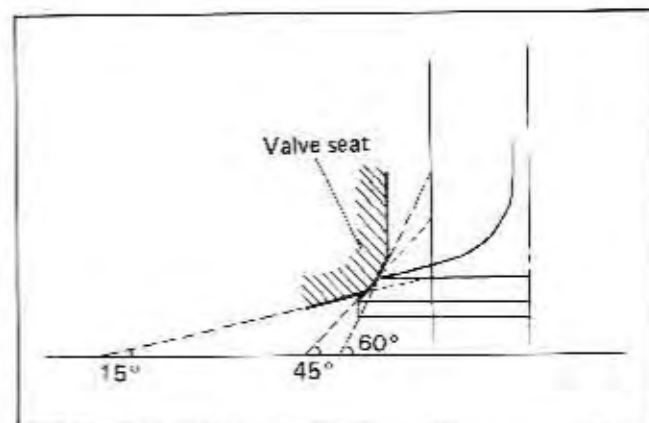
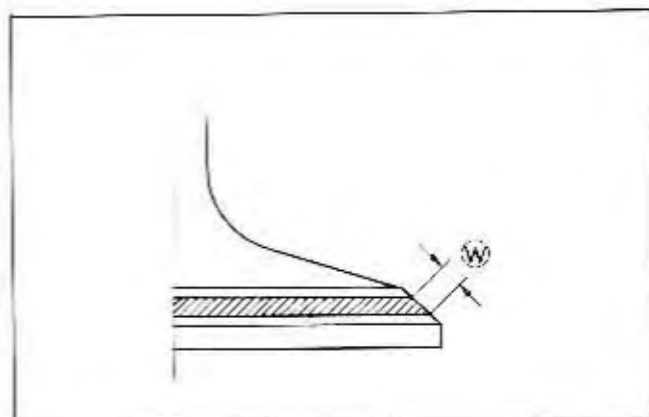
Valve seat width

Seat width	Standard
Ⓢ	0.9—1.1 mm (0.035—0.043 in)

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

VALVE SEAT SERVICING

- The valve seats for both intake and exhaust valves are angled to present three bevels, 60° (inner), 45° (seat contact surface) and 15° (top). To reface the seat, proceed as follows:



09916-21110	Valve seat cutter set
-------------	-----------------------

NOTE:

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

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

NOTE:

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



If the contact area is too low, use 15° cutter to raise and narrow the contact area. If the contact area is too high, use 60° cutter to lower the contact area. After cutting the 15° and 60° angles, it is possible that the valve seat (45°) is too narrow.

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

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



15°

60°

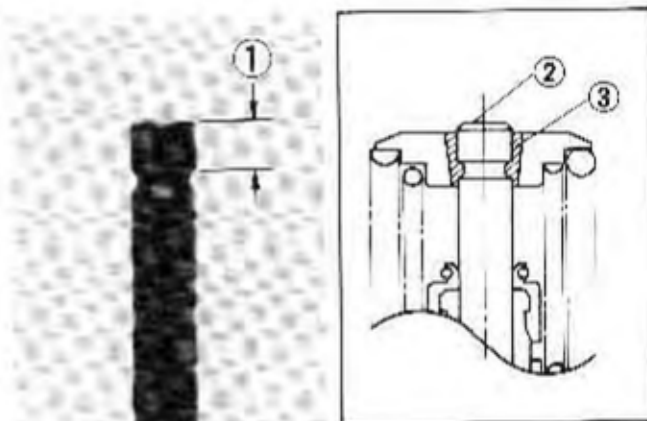
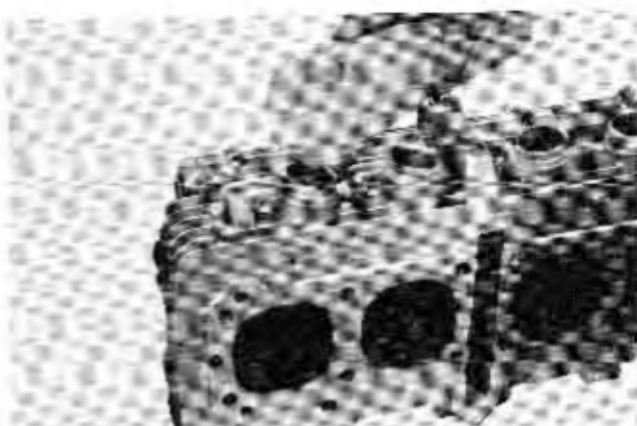
- Clean and assemble the head and valve components. Fill the intake and exhaust ports with gasoline to check for leaks. If any leaks occur, inspect the valve seat and face for burrs or other things that could prevent the valve from sealing.

NOTE:

- * Always use extreme caution when handling gasoline.
- * After servicing the valve seats, be sure to adjust the valve clearance after the cylinder head has been reinstalled. (see page 3-5)

CAUTION:

- * Refacing valve stem end face is permissible where the length ① will not be reduced to less than 3.6 mm. If this length becomes shorter than 3.6 mm (0.14 in), then the valve must be replaced.
- * After installing the valve whose stem end has been ground off as above, check that the face ② of valve stem end is above the valve cotter ③.

**VALVE SPRINGS**

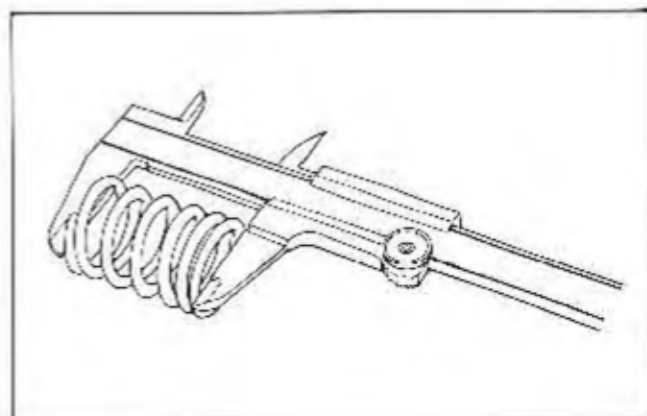
- The force of the two coil springs keeps the valve seats tight. Weakened springs result in reduced engine power output, and often account for the chattering noise coming from the valve mechanism.
- Check the springs for strength by measuring their free lengths and also the force required to compress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

CAUTION:

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

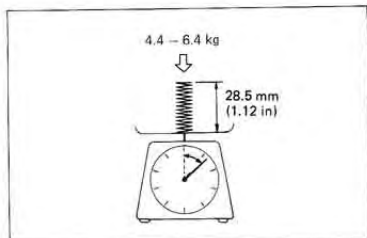
Valve spring free length

Spring	Service Limit
INNER	31.9 mm (1.26 in)
OUTER	35.6 mm (1.40 in)



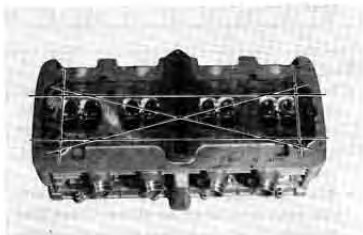
Valve spring tension

Spring	Standard
INNER	4.4—6.4 kg/28.5 mm (9.7—14.1 lbs/1.12 in)
OUTER	6.5—8.9 kg/32.0 mm (14.3—19.6 lbs/1.26 in)



CYLINDER HEAD DISTORTION

- Decarbonize the combustion chambers.
- Check the gasket surface of the cylinder head for distortion with a straightedge and thickness gauge, taking a clearance reading at any position of the straightedge exceeds the limit, replace the cylinder head.



09900-20803	Thickness gauge
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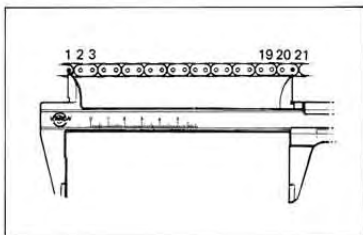
Service Limit	0.2 mm (0.008 in)
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CAM CHAIN 20—PITCH LENGTH

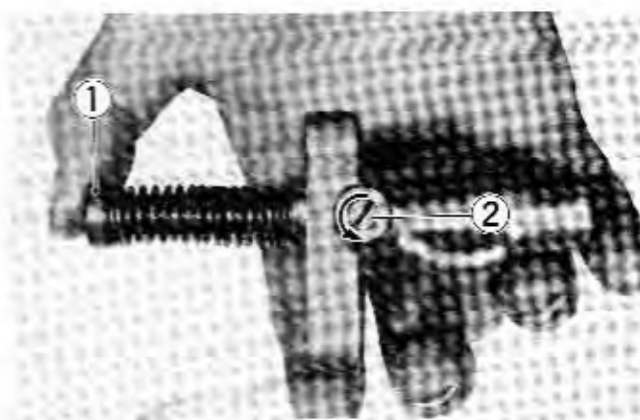
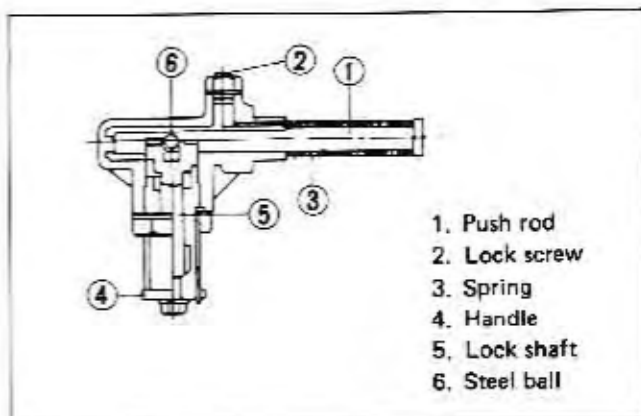
Pull the chain tight to remove any slack, then using vernier calipers, measure the 20 pitch length of cam chain. If it measures more than limit, replace the cam chain.

Service Limit	157.80 mm (6.213 in)
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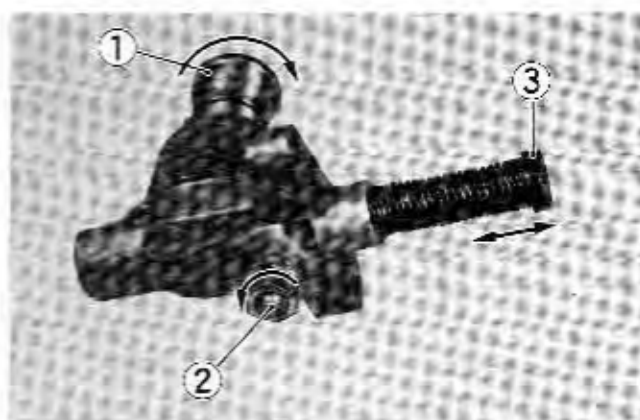
CAM CHAIN TENSIONER DISASSEMBLY

- The tension adjuster used in Model GS1100 is an automatic type that adjusts itself to apply a constant tensioning force to the chain by compensating for the stretch of the chain.
- The spring-loaded pushrod exerts a constant pressure on the camshaft chain. As the chain stretches, it yields to this pressure and remains in a state of tension. Once the adjuster is set after installation, there is no need to make any further adjustment.
- The pushrod effectively contends with the tendency of the camshaft chain tension to vary during driving conditions as it may move to one direction only.
- While pushing the push rod ①, loosen the lock screw ② and extract the push rod.



INSPECTION

- Turn the handle ① all the way counter-clockwise after loosening the lock screw ②, and move the push rod ③ in place to see if it slides smoothly. If any stickiness is noted, remove the rod for inspection. A bent or scratched push rod must be replaced.
- Turn handle ① all the way counterclockwise against the force of its coil spring and then turn it back as assisted by spring force to see if the handle returns to the original position ② without exhibiting any sticking. Repeat this process several times. If any excessive sticking is felt or if the self-adjusting action is faulty, repair the tensioner.

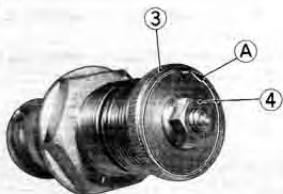
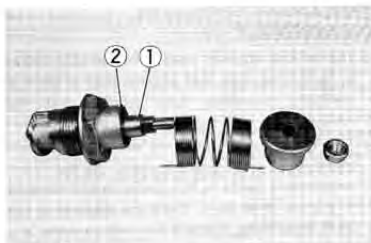


REASSEMBLY

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



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



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

Lock shaft nut tightening torque	0.9—1.4 kg-m (6.5—10.0 lb-ft)
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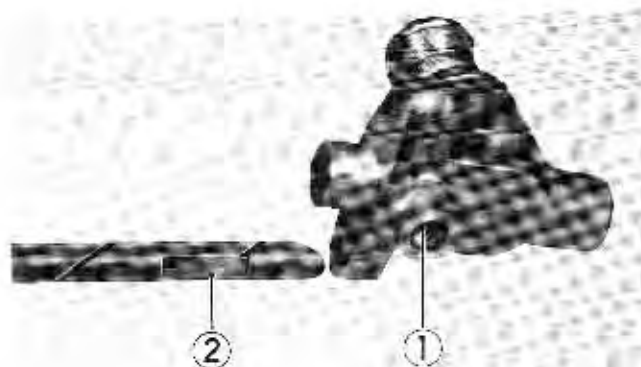
Shaft assembly tightening torque	3.1—3.5 kg-m (22.5—25.5 lb-ft)
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- Apply a high quality molybdenum disulfide lubricant (SUZUKI MOLY PASTE) to the push rod and engine oil to the push rod guide hole.

99000-25140	SUZUKI Moly Paste
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- Match the lock screw hole ① to the long groove ② in the push rod, as shown.
- Slide the pushrod spring onto the pushrod.
- While turning lock shaft handle counter-clockwise, push in the pushrod all the way. Keep on turning the handle until it refuses to turn further.
- Tighten the lock screw to lock the pushrod, so that the pushrod will not plunge out.



CYLINDER REMOVAL

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

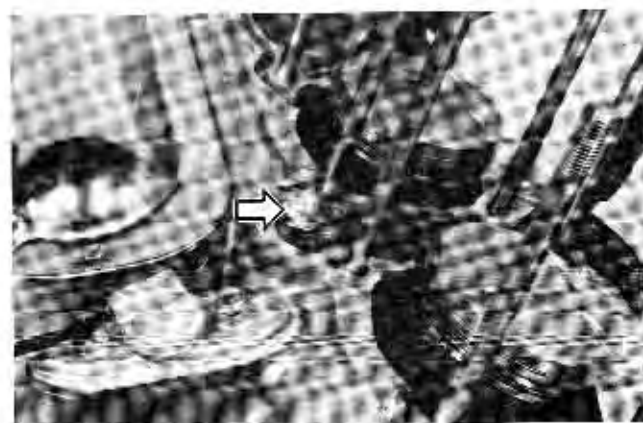
NOTE:

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

09912-34510

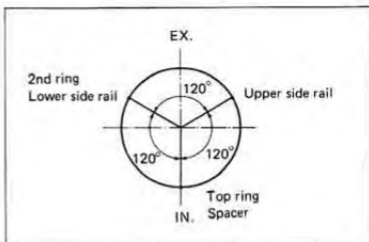
Cylinder disassembling tool

- Remove chain guide.



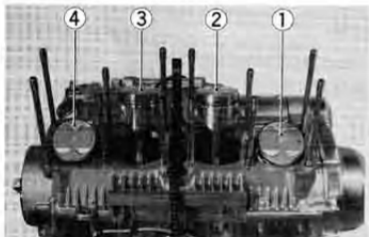
CYLINDER INSTALLATION

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



- Oil the big end bearings and small end of each connecting rod before mounting piston on the connecting rod.

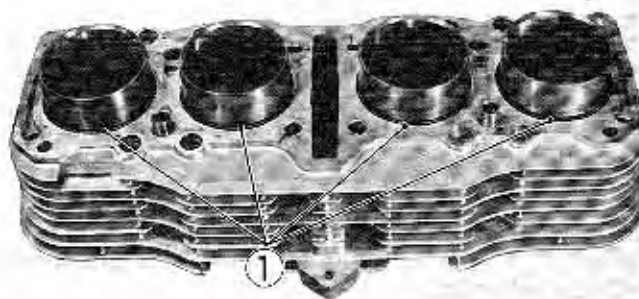
- The piston is in correct position when its triangle (on the crown) points forward.
- Be sure to install the pistons in the cylinder from which they were taken out in disassembly, refer to the letter mark, "1" through "4", scribed on the piston.



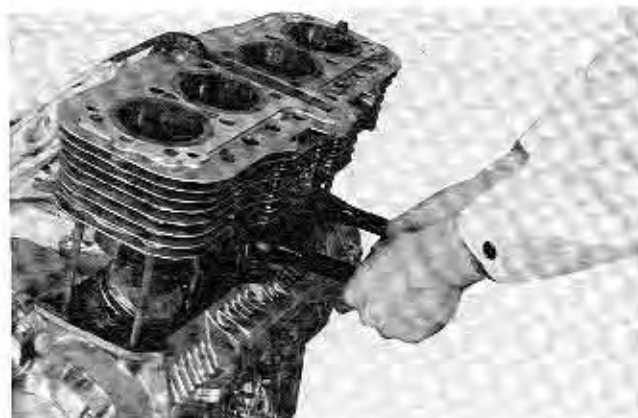
- Oil each piston lightly before installing it.
- Place a rag beneath the piston, and install the circlip.
- Be sure to use new circlips.



- Before putting on the cylinder block, oil the big and small ends of each connecting rod and also the sliding surface of each piston. Check to be sure that the "O" rings ① are accurately positioned in the groove.
- Place the new cylinder gasket on the crankcase.



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



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

NOTE:

- * The extra friction will prevent the cylinder from sliding easily onto the pistons.
- * Each band has a number punchmarked on it. The number refers to a particular range of piston sizes.



CYLINDER INSPECTION**CYLINDER BORE**

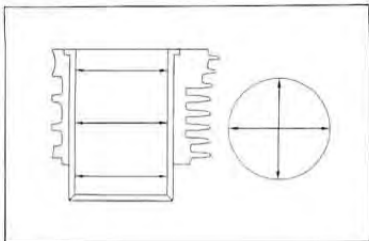
Measure the cylinder bore diameter at six places. If any one of the measurements exceeds the limit, rebore the cylinder and replace the piston with an oversize, or replace the cylinder.

If one cylinder is worn to the point that it needs to go oversize, all cylinder should go oversize at the same time. Otherwise the imbalance might cause excess vibration.

Cylinder bore

Service Limit	72.080 mm (2.8378 in)
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09900-20508	Cylinder gauge set
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**CAM CHAIN GUIDE****NOTE:**

When replacing the following chain guide, apply Suzuki Thread lock super "1333B" to screws thread.

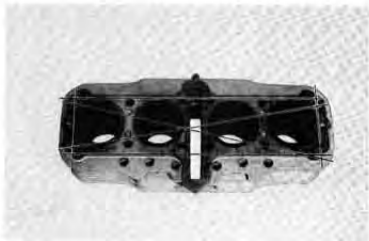
99000-32020	Thread lock super "1333B"
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**CYLINDER DISTORTION**

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

Cylinder distortion

Service Limit	0.2 mm (0.008 in)
---------------	----------------------



PISTON AND RINGS

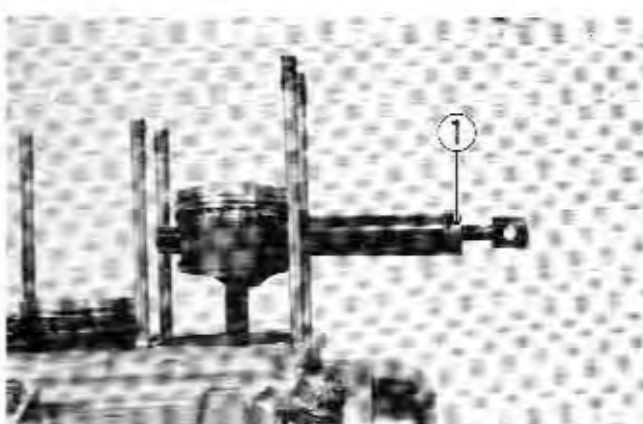
REMOVAL

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



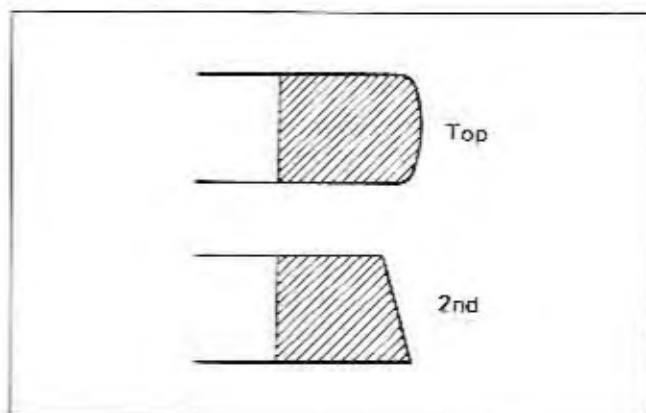
- Scribe the cylinder No. on the head of the piston, and draw out the piston pin with the special tool ①. Place the drawn-out piston pin in the same place as that given the cylinder No. on the head of the piston.

09910-34510	Piston pin puller
09910-33210	Attachment

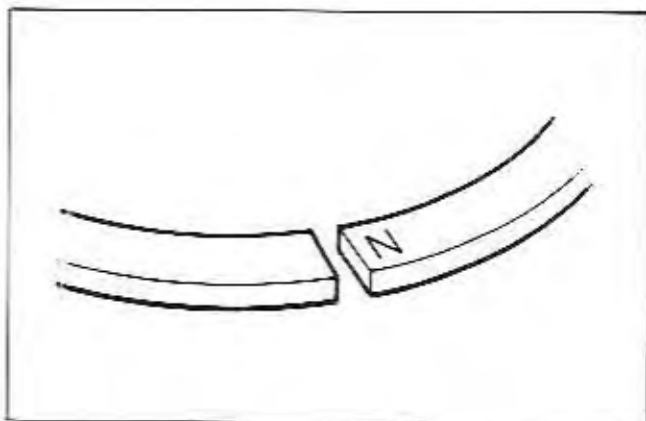


PISTON AND RINGS INSTALLATION

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



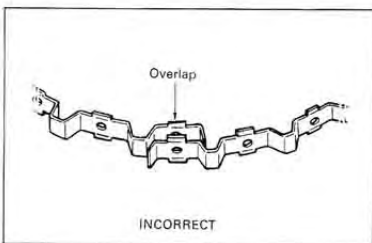
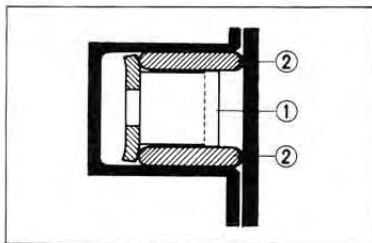
- Top and 2nd (middle) rings have letter "N" marked on the side. Be sure to bring the marked side to top when fitting them to the piston.



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

CAUTION:

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

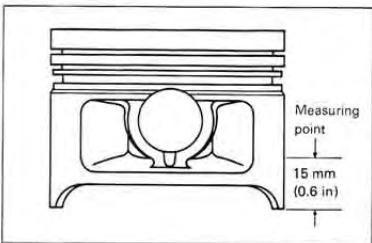


PISTON AND RINGS-INSPECTION

PISTON DIAMETER

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

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



PISTON — CYLINDER CLEARANCE

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

Service Limit	0.120 mm (0.0047 in)
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PISTON RING—GROOVE CLEARANCE

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

09900-20803

Thickness gauge

Piston ring—groove clearance

Piston ring	Service Limit
1st	0.180 mm (0.0071 in)
2nd	0.150 mm (0.0059 in)

Piston ring groove width

Piston ring	Standard
1st	1.03—1.05 mm (0.040—0.041 in)
2nd	1.21—1.23 mm (0.047—0.048 in)
Oil	2.51—2.53 mm (0.099—0.100 in)

Piston ring thickness

Piston ring	Standard
1st	0.975—0.990 mm (0.0384—0.0390 in)
2nd	1.170—1.190 mm (0.0461—0.0469 in)

PISTON RING FREE END GAP AND PISTON RING END GAP

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

Piston ring free end gap

Piston ring	Service Limit
1st	7.6 mm (0.30 in)
2nd	8.8 mm (0.35 in)

Piston ring end gap

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

09900-20803

Thickness gauge



● Oversize piston rings

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

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

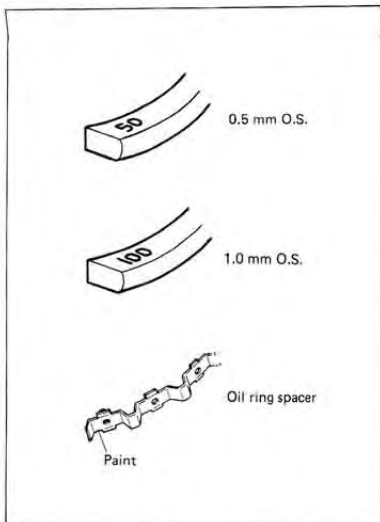
● Oversize oil rings

The following two types of oversize oil rings are used. They bear the following identification marks.

Size	Color
STD	Painted red
0.5 mm O.S.	Painted blue
1.0 mm O.S.	Painted yellow

● Oversize side rail

Just measure outside diameter.



PISTON PIN O.D. AND PIN BORE I.D.

Using a small bore gauge, measure the piston pin bore inside diameter, and using a micrometer, measure the piston pin outside diameter. If the measurement readings are more than limit, replace piston, piston pin or both.

Piston pin bore I.D.

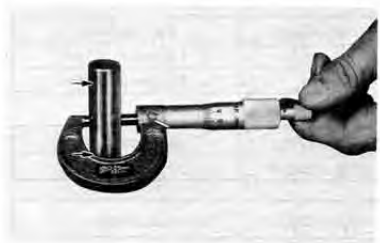
Service Limit	18.030 mm (0.7098 in)
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Using a micrometer, measure the piston pin outside diameter at three positions.

Piston pin O.D.

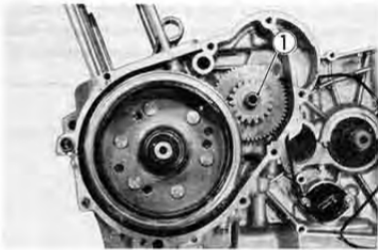
Service Limit	17.980 mm (0.7079 in)
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09900-20205	Micrometer (0—25 mm)
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LOWER END

GENERATOR STATOR

- Remove generator cover and gasket.
- 
- Extract starter motor idle gear shaft ① and remove two washers and idle gear.
- 
- Using rotor holder ①, loosen rotor securing nut by several turns. At this stage, do not remove the rotor securing nut.

09930-44911

Rotor holder

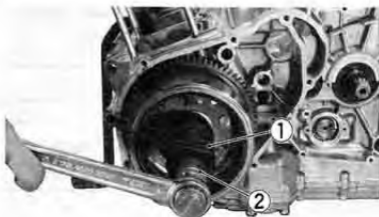
- 
- Install rotor remover ① into the boss of rotor and remove rotor with starter clutch assembly by turning its center bolt ②.

NOTE:

Do not hit the rotor with a hammer.

09930-34911

Rotor remover



STARTER CLUTCH REMOVAL

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



- Clamp the rotor with a vice taking care not to damage it and remove the three hexagon bolts using the 6 mm "T" type hexagon wrench ④.



09914-25811

 "T" type hexagon
wrench (6 mm)

ASSEMBLY

- Apply THREAD LOCK "1342" to the stator set screws and its lead wire guide screws.

99000-32050

Thread lock "1342"

NOTE:

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

- Mount the lead wire clamp as shown in the photo.
- Apply THREAD LOCK SUPER "1303" to allen bolts and tighten with specified torque.



99000-32030

Thread lock super "1303"

Tightening torque

 1.5 – 2.0 kg-m
(11.0 – 14.5 lb-ft)


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



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



- After mounting the rotor, secure the rotor by tightening the center nut to the specified torque value.

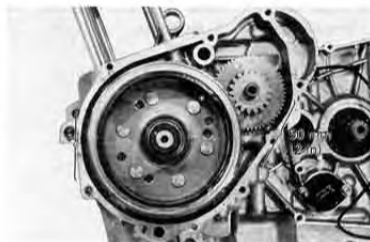
Tightening torque	16.0—17.0 kg-m (115.5—123.0 lb-ft)
09930-44911	Rotor holder
99000-32030	Thread lock super "1303"



- Install the starter idle gear and two thrust washers as shown.



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



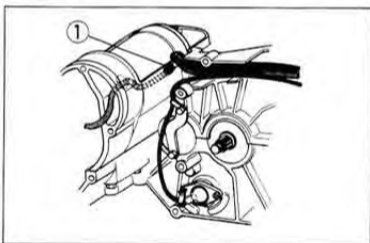
99104-31140

SUZUKI Bond # 1207B

- Pass the generator stator lead wire through gasket and upper crankcase. Route its lead wire and fit rubber pad ① properly.

NOTE:

Always use new gasket and install dowel pin.



SIGNAL GENERATOR REMOVAL

- Remove signal generator cover.



- Unclamp signal generator lead wire and remove three screws ① for securing signal generator assembly.



- Apply wrench to crank turning nut to remove automatic advance governor mounting bolt and the crank turning nut.

Remove signal generator rotor and advance governor.



INSTALLATION

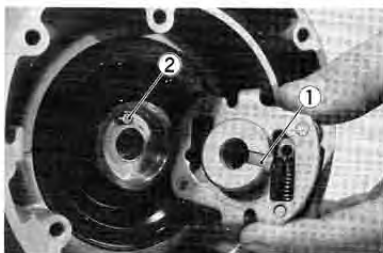
- When installing the signal generator rotor to the advance governor, the lug ① of the rotor should face to the left of the governor weight "1.4" ②.
- Apply grease to the sliding parts.

99000-25030

Suzuki super grease "A"



- Make sure to fit the slot ① on the back surface of the automatic advance governor over the locating pin ② at the end of crankshaft.



- Fit the groove ① of the crankshaft turning nut on protrusion ② of the advance governor body.

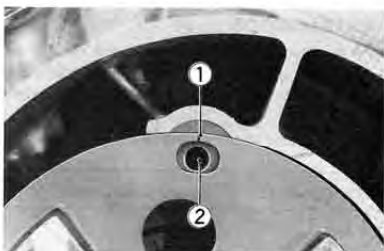


- Hold the crankshaft turning nut and tighten the governor center bolt with specified torque.

Tightening torque	1.3—2.3 kg-m (9.5—16.5 lb-ft)
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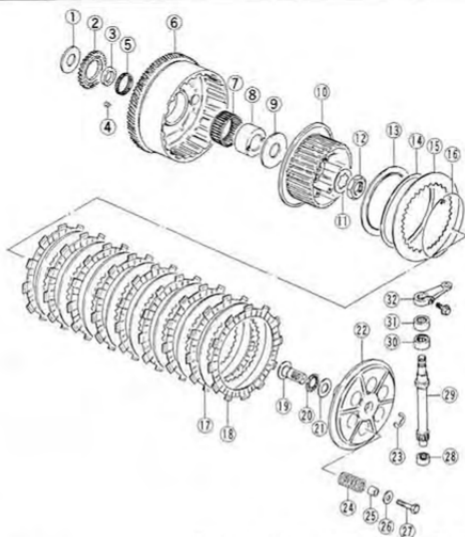
- Install timing mark index plate and signal generator so that the index line ① on the signal generator aligns with the center ② of the fitting screw.



- Route the signal generator lead wire as illustrated.



CLUTCH



- ① Washer
- ② Oil pump drive gear
- ③ Spacer
- ④ Damper rubber
- ⑤ Bearing
- ⑥ Primary driven gear
- ⑦ Primary driven gear bearing
- ⑧ Primary driven gear spacer
- ⑨ Washer
- ⑩ Clutch sleeve hub
- ⑪ Lock washer

- ⑫ Clutch sleeve hub nut
- ⑬ Spring seat
- ⑭ Wave washer (spring)
- ⑮ Clutch driven plate
- ⑯ Piano wire
- ⑰ Clutch driven plate
- ⑱ Clutch drive plate
- ⑲ Release rack
- ⑳ Thrust bearing
- ㉑ Washer
- ㉒ Pressure plate

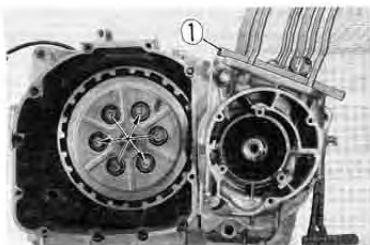
- ㉓ E-ring
- ㉔ Clutch spring
- ㉕ Spacer
- ㉖ Washer
- ㉗ Bolt
- ㉘ Bearing
- ㉙ Release pinion
- ㉚ Bearing
- ㉛ Oil seal
- ㉜ Release arm

REMOVAL

- Remove clutch cover and gasket.



- Using conrod stopper ①, remove clutch spring mounting bolts in a criss cross manner, and remove springs and pressure plate.



09910-20115	Conrod stopper
-------------	----------------

- Remove clutch drive and driven plates.

- Flatten clutch sleeve hub nut lock washer and firmly secure clutch sleeve hub to remove mounting nut with clutch sleeve hub holder ①.



09920-53710	Clutch sleeve hub holder
-------------	--------------------------

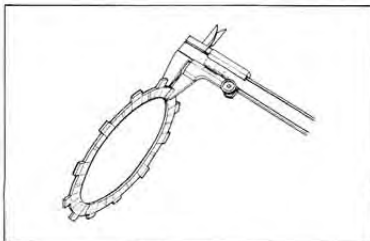
- Remove clutch sleeve hub and washer. Run two 6-mm bolts into the primary driven gear spacer to ease out the spacer by pulling. With the spacer removed, the primary driven gear (integral with the clutch housing) is free to disengage from the primary drive gear.



INSPECTION

CLUTCH DRIVE PLATES AND DRIVEN PLATES

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



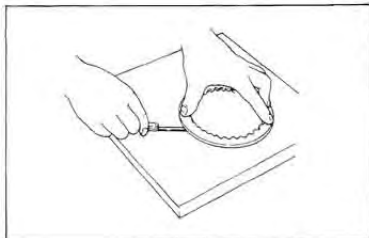
Checking thickness

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

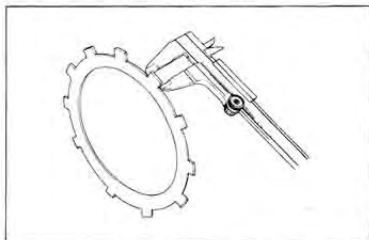
09900-20101	Vernier calipers
09900-20803	Thickness gauge

Unit: mm (in)

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



Checking distortion



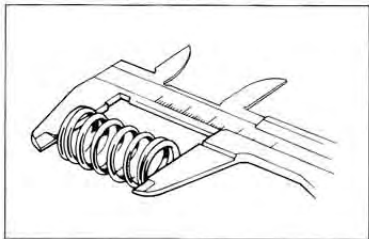
Checking Claw width

CLUTCH SPRING FREE LENGTH

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

Clutch spring free length

Service Limit	38.5 mm (1.52 in)
---------------	----------------------



CLUTCH BEARINGS

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

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



INSTALLATION

SLEEVE HUB WAVE WASHER

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



NOTE:

Always use a new piano wire clip.

NOTE:

When fitting the spring washer, make sure that the concave side faces spring seat for the new type.

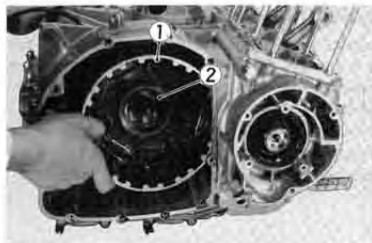
- Install the washer (1) and oil pump drive gear spacer (2).
- Apply engine oil to the oil pump drive gear bearing (1) and fix the drive gear (2) to face the protorusion (3) outside. This protorusion should be aligned with the notches (4) of the primary driven gear.

NOTE:

Check that the rubber damper plug (5) is in position behind the clutch hub.



- Assemble the primary driven gear (1) and apply engine oil to the needle bearing (2) and its spacer with oil groove facing inside.



- Thrust washer must be installed with the oil groove side ① facing in.



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



Clutch sleeve hub nut
tightening torque:

5.0—7.0 kg-m
(36.0—50.5 lb-ft)

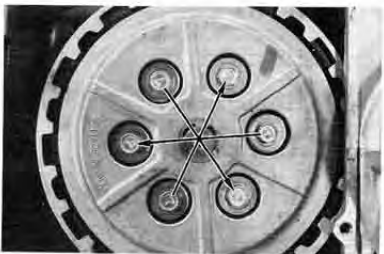
09920-53710

Clutch sleeve hub holder

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



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



NOTE:

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

NOTE:

For new type clutch spacer is located between the washer and boss part for clutch sleeve hub.

Clutch spring bolt
tightening torque:

1.1—1.3 kg-m
(8.0—9.5 lb-ft)

- Coat SUZUKI Bond # 1207B lightly to the portion around mating surface between crankcases as shown.

99104-31140

SUZUKI Bond # 1207B

- Replace clutch cover gasket with new one to prevent oil leakage.

- Engage the teeth of clutch release rack with those of pinion gear at the clutch cover side and replace clutch cover. Make sure that the rack and pinion gear engage positively. To install cover, tap lightly with plastic hammer and tighten screws.



GEARSHIFT SHAFT REMOVAL

- Remove clip ① and washer for gear shifting shaft stopper.



- Extract gear shifting shaft ①.

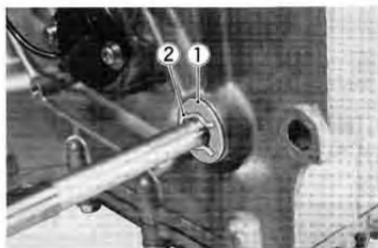


INSTALLATION

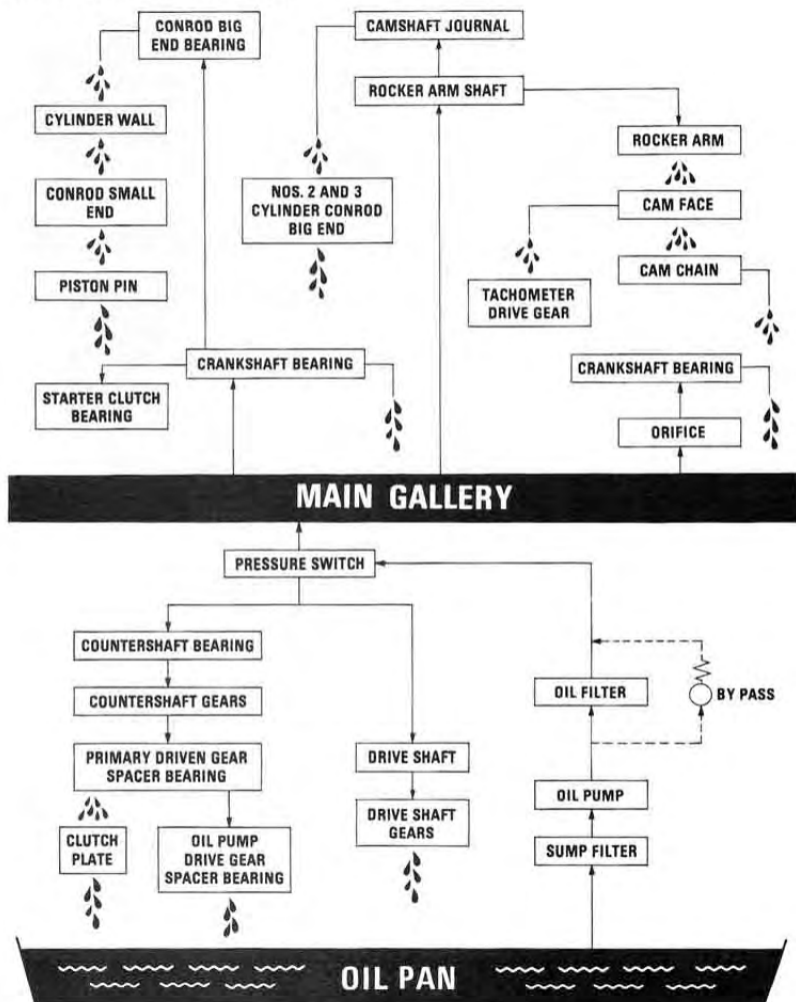
- Install the gearshift shaft, with the center of the gear on shaft side aligned the center of gearshift cam driven gear.

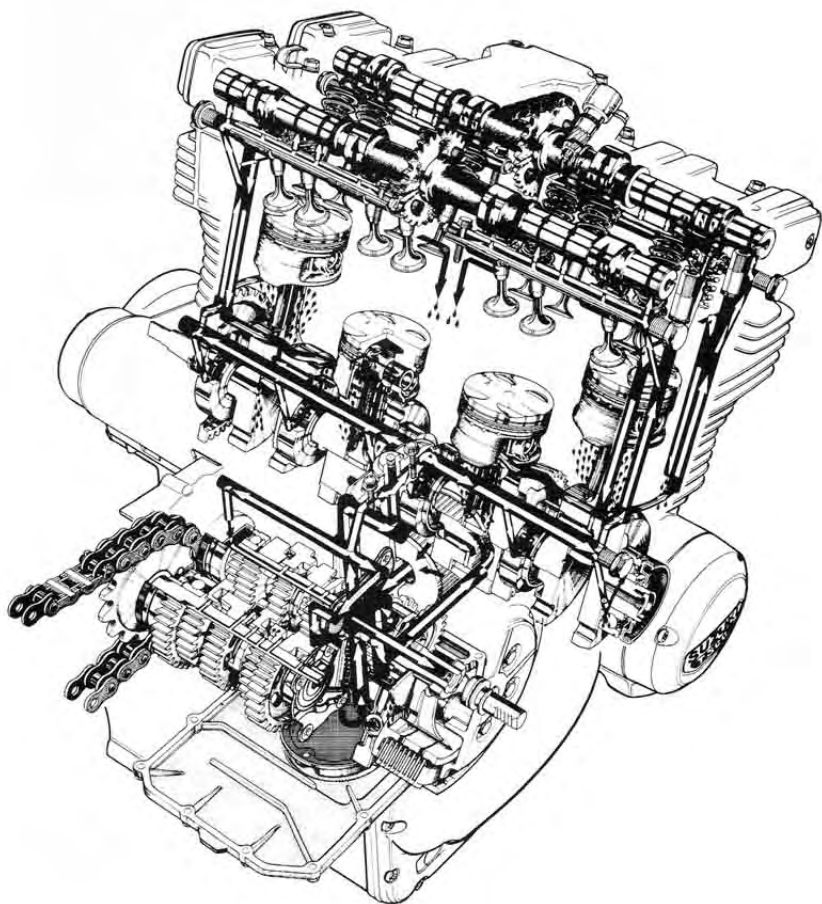


- Fix washer ① and clip ② to the gearshift shaft.



LUBRICATION SYSTEM





OIL PUMP

REMOVAL

- Remove clutch cover and primary driven gear.
- Remove oil pump drive gear, needle bearing and spacer.
- Using circlip remover, remove oil pump driven gear, its drive pin and washer. Then remove oil pump with O-ring.

09900-06107

Snapping pliers

- Remove three screws fastening oil pump body and tap the rotor shaft firmly with plastic mallet and remove the upper case.



INSPECTION

- Check oil pump tip clearance, outer rotor clearance and side clearance by using thickness gauge and straight edge.

Unit: mm (in)

	Service Limit
Tip clearance	0.20 (0.008)
Outer rotor clearance	0.25 (0.010)
Side clearance	0.15 (0.006)



Checking tip clearance



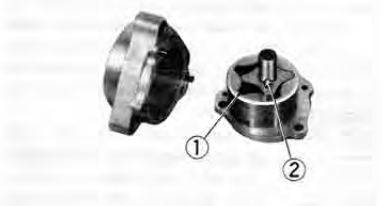
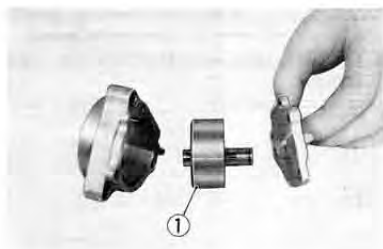
Checking outer rotor clearance



Checking side clearance

ASSEMBLY

- Thoroughly wash the oil pump, inner and outer rotors and oil pump case with solvent and apply engine oil to them before inserting them into case.
- When installing the outer rotor into oil pump case, chamfered side ① should be position inside.
- Since there is rotor shaft drive pin ②, fix the pin into rotor groove and rotor should be inserted respective of these portions.



- Apply thread lock "1342" to oil pump body fastening screw.



99000-32050

Thread lock "1342"

INSTALLATION

- Install oil pump assembly. Install a new O-ring ①.

99000-32050

Thread lock "1342"



- Install washer and oil pump driven gear ① with drive pin and circlip by using circlip opener.
- At this time make sure that oil pump gear rotate smoothly.



OIL PRESSURE

Make sure the oil level is between "F" ① and "L" ② mark in the inspection window, and check there is no sign of oil leakage in any part of the lubrication oil circuit. Be sure, also, that both oil strainer (in the sump) and oil filter (in the pump discharge line) are clean.

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

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



Oil pump pressure specification

Above 0.1 kg/cm² (1.42 psi),
Below 0.5 kg/cm² (7.11 psi) at 3 000 r/min

09915-74510

Oil pressure gauge

If the pressure is too low, it may mean that the oil pump is internally worn or otherwise defective and needs to be overhauled. If inner parts are found to be worn down to or beyond the limit, replace the complete oil pump unit. (see page 7-55)

OIL FILTER

REMOVAL

Replace the oil filter by a new one in the following manner:

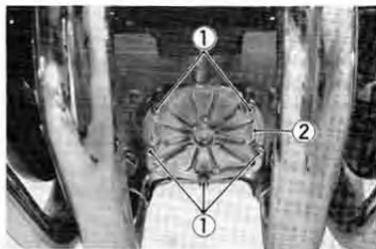
- Remove five nuts ① securing the filter cap ②.
- Take off the cap ②, pull out the old element.

INSTALLATION

- This package contains a rubber seal ring in addition to the oil filter. When replacing the oil filter, be sure to also replace the seal ring to ensure oil-tightness.
- In fitting the seal ring to the filter chamber cap, lightly coat grease on the seal ring groove ③ to avoid any chance of dropping or mislocating the ring during the installation work.
- Put on the cap and secure it tightly.

NOTE:

Pour about 3600 ml (3.8 US.qt) of engine oil into oil pan only when changing oil and replacing oil filter at the same time.



SUMP FILTER

REMOVAL

- Remove bolts of oil pan ① and remove the oil pan from crankcase.



- Remove three screws and then sump filter.



CRANKCASE

INSTALLATION

- Thoroughly wash the sump filter with detergent and install sump filter to face the oil inlet ① to the front.

99000-32050

Thread lock "1342"

- Install oil pan and tighten bolts.
- Replace gasket by new one to prevent oil leakage.



CRANKCASE REMOVAL

- Remove oil pressure switch assembly.



- Remove starter motor cover and starter motor.

NOTE:

Rubber pad ① is located to route generator lead wire properly.



- Flatten lock portion of countershaft oil seal retainer and extract two bolts ① to make lead wire free.
- Remove oil seal retainer plate.



- Remove crankcase securing nut ①



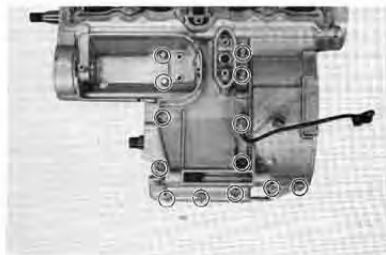
- Using impact driver, extract screws for drive shaft bearing holder ① and countershaft bearing retainer ②.



09900-09003

Impact driver set

- Remove crankcase securing bolts from upper crankcase.

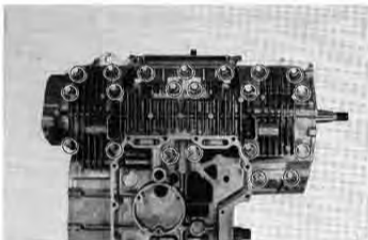


- Turn engine up side down and remove oil pan.



- Make sure that all bolts are removed.
- Tap lightly the lower crankcase side with a plastic hammer to separate the upper and lower crankcase halves and then lift the latter.

09912-34510	Cylinder disassembling tool
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- Remove the countershaft and driveshaft.

NOTE:

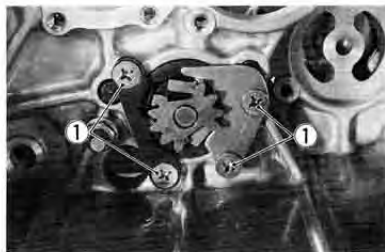
Carefully set aside the five "C" rings, and two wave washers.



- Remove the crankshaft.



- Remove gearshift cam guide and gearshift pawl screws ①.
- Hold gear shifting forks and cam stopper by hand to extract two gear shifting fork shafts from the lower crankcase.



- Remove neutral cam stopper holder to remove cam stopper and spring.



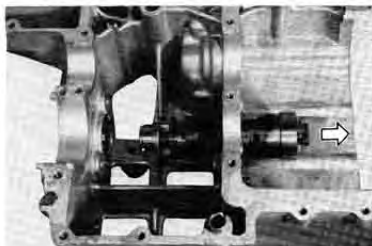
- Remove circlip from gearshift cam by using snapping pliers.



09900-06107

Snapping pliers

- Extract gearshift cam from lower crankcase.



- Using snap ring pliers (closing type), remove bearing stopper circlip.

09900-06105

Snapring pliers



- Using bearing remover, extract cam bearing as shown.



CRANKSHAFT

INSPECTION

CONNECTING ROD SMALL END BORE I.D.

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

Connecting rod small end bore I.D.

Service Limit	18.040 mm (0.7102 in)
---------------	--------------------------

- If the connecting rod small end bore inside diameter exceeds the abovementioned limit, replace connecting rod or crankshaft assembly.



CONNECTING ROD BIG END THRUST CLEARANCE

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

Service Limit	1.00 mm (0.039 in)
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09900-20803	Thickness gauge
-------------	-----------------

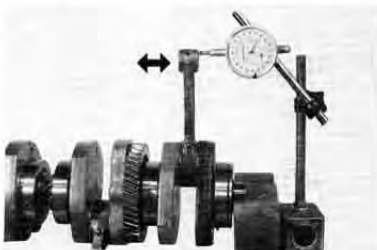


CRANK PIN WEAR AND BIG END BEARING WEAR

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

Service Limit	3.0 mm (0.12 in)
---------------	------------------

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



CRANKSHAFT RUNOUT

Support the crankshaft with "V" blocks as shown, with the two end 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.

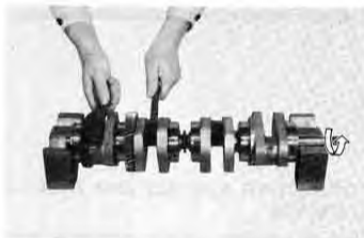


09900-20606	Dial gauge (1/100 mm)
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Crankshaft runout

Service Limit	0.10 mm (0.004 in)
---------------	-----------------------

Check the connecting rod for smooth turning.



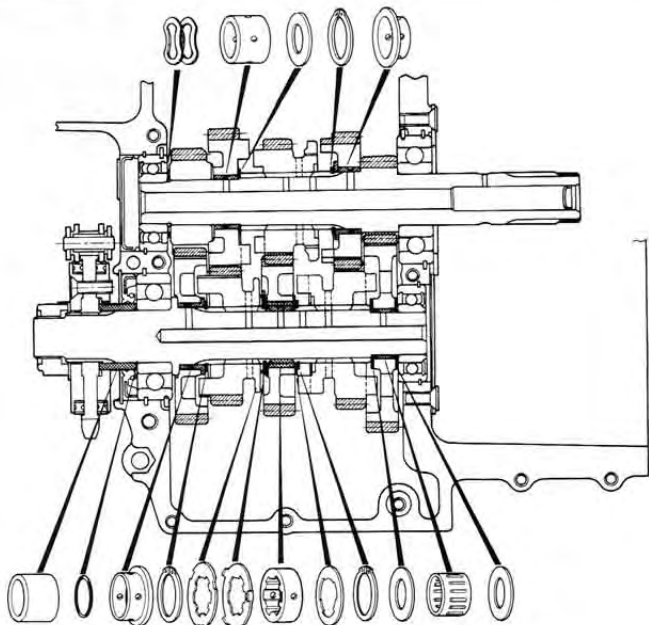
PRIMARY DRIVE—DRIVEN GEAR BACKLASH

Using a dial gauge, measure the backlash. If it exceeds the limit, replace the driven gear and/or the crankshaft assembly.

Service Limit	0.08 mm (0.003 in)
---------------	-----------------------



TRANSMISSION



MOUNTING 2ND DRIVE GEAR

Press 2nd drive gear to a position where the distance between this drive gear and the 1st drive gear assumes the value indicated:

111.4 – 111.5 mm
(4.386 – 4.390 in)



Countershaft
length

111.4 – 111.5 mm
(4.386 – 4.390 in)

99000-32030

Thread lock super "1303"

NOTE:

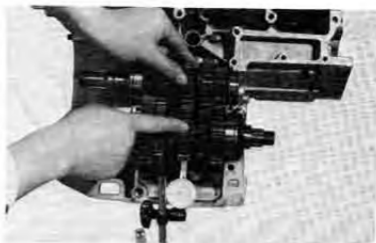
- * Before mounting 2nd drive gear, apply **THREAD LOCK SUPER "1303"** to its bore, taking care not to smear Top drive gear with "SUPER 1303".
- * After mounting the 2nd drive gear, check that Top drive gear spins smoothly, by moving it with your fingers.
- * 2nd drive gear may be replaced twice before it becomes necessary to also replace the countershaft.

TRANSMISSION GEAR BACKLASH

Use a dial gauge to check the backlash. Drive gear and driven gear must be replaced if their backlash exceeds the limiting backlash.

Transmission gear backlash

Gears	Service Limit
Low, 2nd and 3rd	0.08 mm (0.003 in)
4th and Top	0.15 mm (0.006 in)

**SHIFT FORK — GROOVE CLEARANCE**

Using a thickness gauge, check the shifting fork clearance in the groove of its gear.

This clearance for each of the three shifting forks plays an important role in the smoothness and positiveness of shifting action.

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

09900-20803	Thickness gauge
-------------	-----------------

Shift fork-Groove clearance

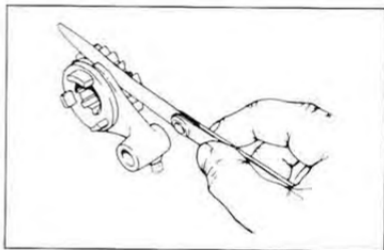
		Service Limit
No. 1	For 4th and Top driven gears	0.80 mm (0.031 in)
No. 2	for 3rd drive gear	

Shift fork groove width

Standard	5.45 — 5.55 mm (0.215 — 0.219 in)
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Shift fork thickness

Standard	4.95 — 5.05 mm (0.195 — 0.199 in)
----------	--------------------------------------



TRANSMISSION GEAR ASSEMBLY

- Using bearing installing tool, install drive shaft bearing.



09913-70122	Bearing installer
-------------	-------------------

- Fix O-ring ① to the drive shaft.



- Mount the 2nd driven gear ② and its bushing on the drive shaft.

NOTE:

Before mounting gears, coat lightly moly paste to the drive shaft.

99000-25140	SUZUKI Moly paste
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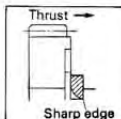
- When mounting circlip, pay attention to the direction of the circlip. Fit it to the side where the thrust is as shown in the figure with the rounded side against the gear surface.



CAUTION:

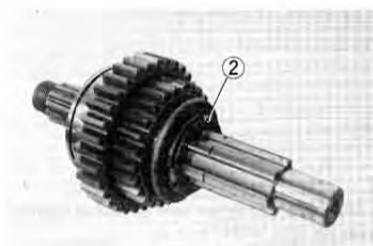
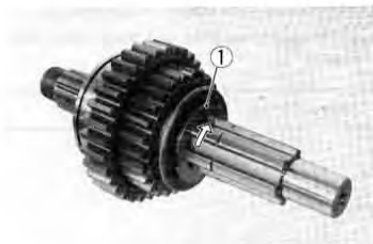
Never reuse a circlip. After a circlip has been removed from a shaft, it should be discarded and a new circlip must be installed.

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.



TOP DRIVEN GEAR

When mounting the top driven gear on the drive shaft, insert lock washer No. 2 ① into the drive shaft, and turn it to fit it into the groove. Then, fit the lock washer No. 1 ② in the lock washer No. 2.



3RD DRIVEN GEAR

- When installing the 3rd driven gear bushing, align its oil hole ① with drive shaft oil hole ②.



- Fix the washer ③ and lock it by circlip ④.



- Mount 4th driven gear, and fix washer ⑤ and bearing ⑥.
- After mounting Low driven gear and washer, fit bearing to the driven shaft by using bearing installer.

09913-80112

Bearing installer



- Apply thread lock cement to the inner surface of engine sprocket spacer ①.

99000-32040

Thread lock cement



- Coat SUZUKI super grease "A" to the lip of oil seal.

99000-25030

SUZUKI Super grease "A"



LOWER END ASSEMBLY

NOTE:

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

- The shape of each gear shifting pawl is different. Mount the one with the narrower width on the gear shifting cam side.
- Mount the cam driven gear on the gearshifting cam as shown.
- Mount the gearshifting cam on the lower crankcase.

NOTE:

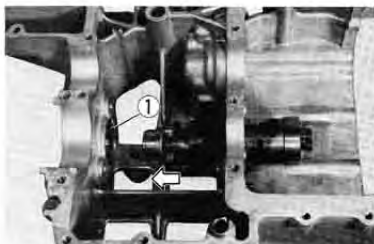
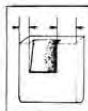
Never fail to fix circlip and bearing ①.

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

09900-06107

Snapping pliers

- Install the gearshifting cam with the indentation for the neutral stopper directed downward, and in alignment with the neutral stopper ②.



- Refer to the following figure in regard to the correct positions and orientations of the forks when installing these parts.

- ① Gear shifting fork for 3rd drive gear.
- ② Gear shifting forks for 4th and Top driven gears.
- ③ Cam stopper.

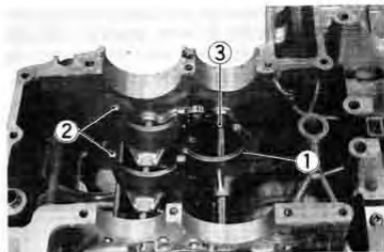
NOTE:

Hitch the cam stopper spring to the correct position.

- Install both gearshift cam guide and gearshift pawl screws (overall length 12 mm) with applying thread lock "1342".

99000-32050

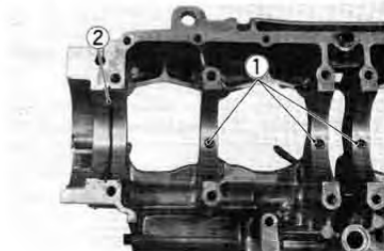
Thread lock "1342"



- Check oil jet ① fitted on the upper crankcase for clogging.



- Firmly insert crankshaft bearing locating pins ① and C ring ② to upper crankcase.



- Mount crankshaft on the upper crankcase. At this time firmly fit each bearing onto the locating pin with punch mark stamped on the circumference of the bearing directed upwards.
- Bearing stopper pin should be in the position shown.

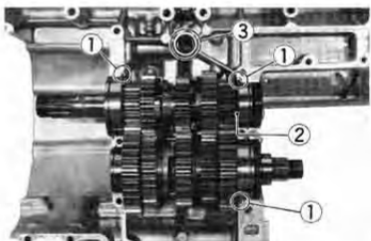


- Install five C-rings ① to the upper crankcase.
- Mount both counter and drive shafts on the upper crankcase.

**NOTE:**

- * Be sure to install the bearing dowel pins ① in the respective positions.
- * Never fail to fix two wave washers ② on the countershaft between 2nd drive gear and bearing.

- Locate the O-ring ③ to the respective position.



- Fix cam chain guide holder to the lower crankcase with two screws.



99000-32020

Thread lock super "1333B"

- Clean the mating surface of the crankcases before matching the upper and lower ones.
- Apply SUZUKI BOND # 1207B to the mating surface of the lower crankcase in the following procedure.

99104-31140

SUZUKI Bond # 1207B

NOTE

Use of SUZUKI BOND # 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 crankcase within few minutes.
 - * Applicable on distorted surface as it forms a comparatively thick film.
- When securing the lower crankcase, tighten the 8-mm bolts and the 6-mm bolts in the ascending order of numbers assigned to these bolts, tightening each bolt a little at a time to equalize the pressure. Tighten all the securing bolts to the specified torque values.

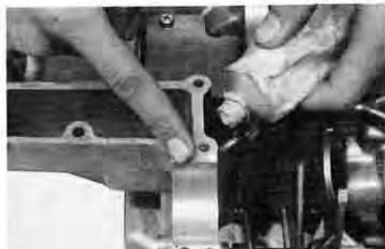
Tightening torque		6 mm bolt	8 mm bolt
Initial	kg-m	0.6	1.3
	lb-ft	4.5	9.5
Final	kg-m	1.3	2.4
	lb-ft	9.5	17.0

CAUTION:

Place O-ring (A) to the position shown.

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

Tightening torque	1.0 kg-m (7.0 lb-ft)
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- Tighten upper crankcase bolts with specified torque. Fix the engine ground wire at the respective position (A).



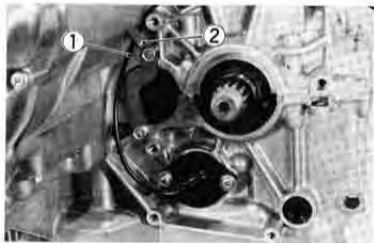
- Tighten crankcase securing nut (1) and install neutral position indicator switch.

NOTE:

When installing neutral position indicator switch, be sure to locate spring, switch contact and O-ring (2).



- Route the neutral indicator lead wire (1) and clamp it with countershaft oil seal retainer (2).



- Mount starter motor and route the lead wire properly.

99000-32050

Thread lock "1342"



- Install the following items.
Countershaft bearing retainer screw
..... 3 pcs (overall length 16 mm)
Drive shaft plate screw
..... 4 pcs (16 mm)
Oil gallery plate screw
..... 3 pcs (16 mm)

99000-32050	Thread lock "1342"
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- Install cam chain guide and tighten bolt with applying thread lock super "1333B".

99000-32020	Thread lock super "1333B"
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Tightening torque	0.9 — 1.4 kg-m (6.5 — 10.0 lb-ft)
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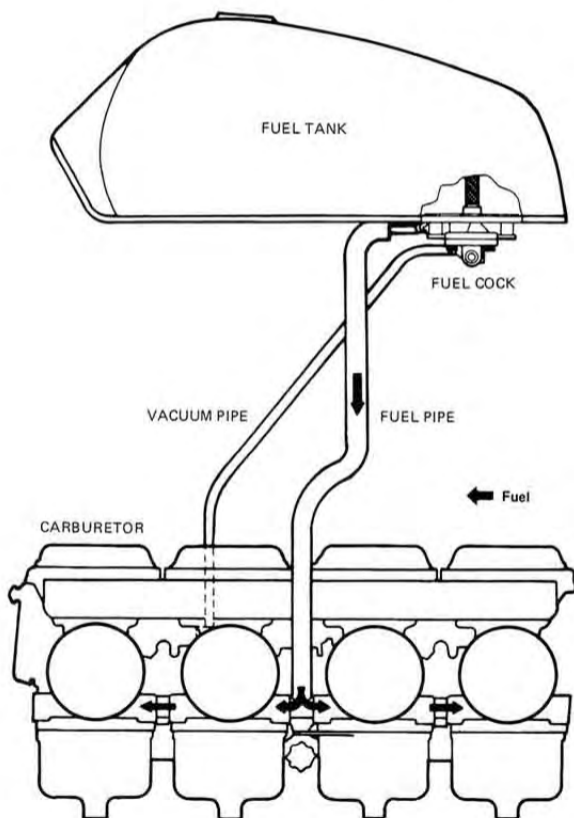
FUEL SYSTEM AND CARBURETORS

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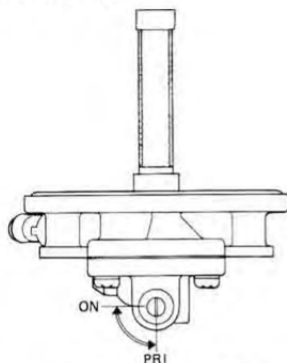
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FUEL SYSTEM

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



FUEL COCK



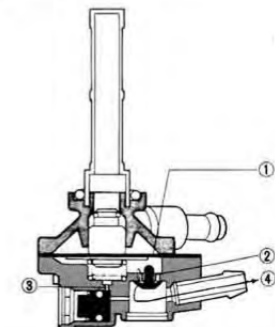
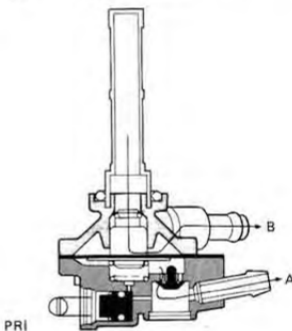
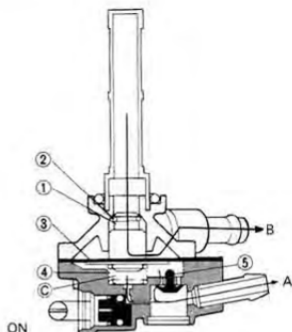
- ① Fuel valve ② O-ring ③ Diaphragm
 ④ Spring ⑤ One way valve
 A Vacuum B Fuel flow C Diaphragm chamber

When the engine is not running and the valve in the ON position, the fuel valve is kept in the closed position by applying pressure utilizing a spring so that no fuel will flow to the carburetors.

When the engine is engaged, a negative pressure is generated in the diaphragm chamber "C" through the vacuum (negative pressure) pipe which is connected to the carburetors, and builds up a negative pressure which is higher than the spring pressure so that the diaphragm is forced to open the fuel valve and thus allow the fuel to flow to the carburetors.

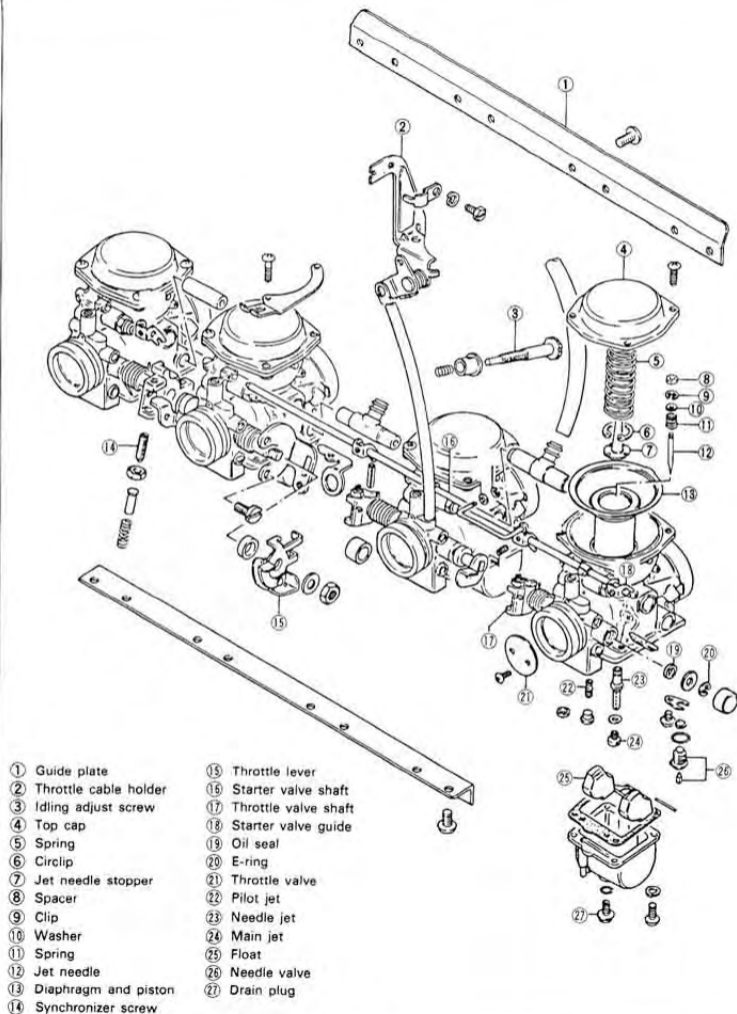
On the other hand, setting the valve in the ON position keeps the air return orifice open. Negative pressure does not accumulate on the diaphragm at the time of engine stopping, and then the spring pressure actuates the diaphragm to move back to its original position and closes the fuel valve.

However, setting the valve in PRI position with a screwdriver causes the air return orifice to close, resulting in negative pressure in the chamber "C" under the diaphragm. This negative pressure doesn't allow the fuel valve to close and therefore the fuel keeps flowing to the carburetors.



- ① Diaphragm ② One way valve
 ③ Air return orifice ④ Vacuum

CARBURETOR



SPECIFICATIONS

ITEM	SPECIFICATIONS
Type	MIKUNI BS34SS
I.D. No.	49200
Bore	34 mm (1.34 in)
Idle r/min	1 050 $\pm$ 100 r/min
Fuel level	5.0 $\pm$ 0.5 mm (0.20 $\pm$ 0.02 in)
Float height	22.4 $\pm$ 1.0 mm (0.88 $\pm$ 0.04 in)
Main jet	#107.5
Main air jet	1.2 mm
Jet needle	5D58
Needle jet	X-1
Pilot jet	#45
By pass	0.8 mm
Pilot outlet	0.9 mm
Valve seat	2.0
Starter jet	# 32.5
Pilot screw	Pre-set
Throttle cable play	0.5—1.0 mm (0.02—0.04 in)

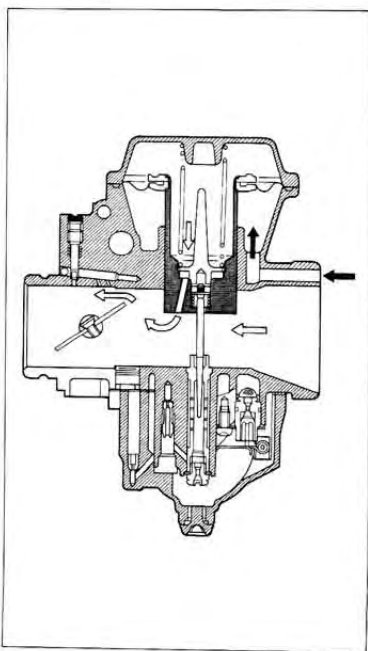
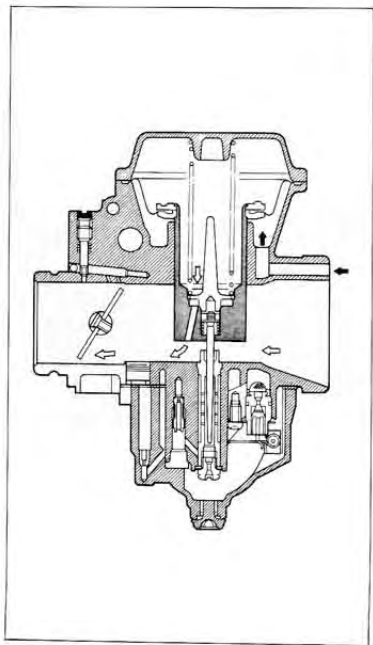
Each carburetor has I.D. Number ① printed on the carburetor body according to its specifications.



DIAPHRAGM AND PISTON OPERATION

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

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

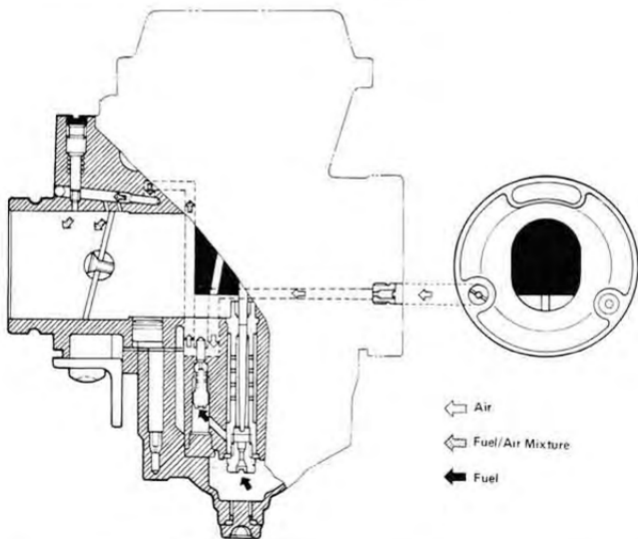


SLOW SYSTEM

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

The fuel from float chamber is first passed through main jet and metered by pilot jet where it mixes with air coming in through pilot air jet.

This mixture, rich with fuel, then goes up through pilot pipe to pilot screw. A part of the mixture is discharged into the main bore out of bypass ports. The remainder is then metered by pilot screw and sprayed out into the main bore through pilot outlet.



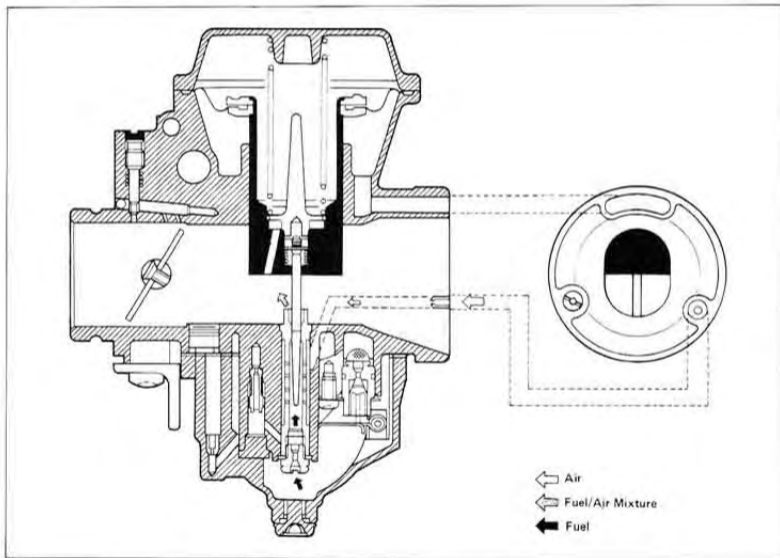
MAIN SYSTEM

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

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

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

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

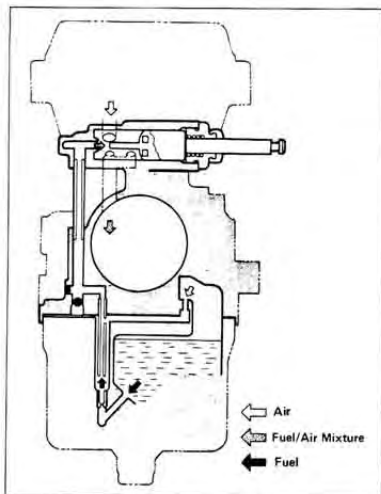


STARTER SYSTEM

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

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

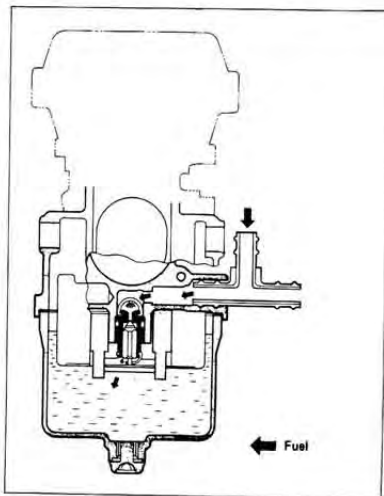
The two successive mixings of fuel with air are such that proper fuel/air mixture for starting is produced when the mixture is sprayed out through starter outlet into the main bore.



FLOAT SYSTEM

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

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

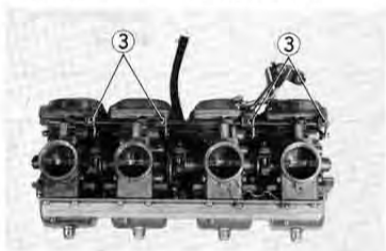


DISASSEMBLY

- Remove throttle bracket and starter bracket by unscrewing 2 throttle bracket screws ① and starter bracket screw ②.

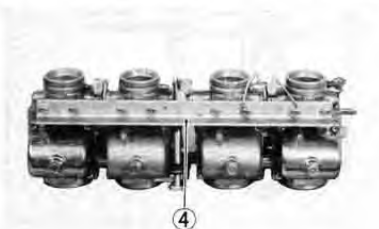


- Loosen 4 tightening screws ③ of starter shaft and pull out starter shaft to the right.



- Remove carburetor set lower plate ④ by unscrewing 8 screws.

09900-09003	Impact driver
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- Remove carburetor set upper plate ⑤ by unscrewing 8 screws.



- Separate 4 carburetors each and remove throttle valve stop screw plate by unscrewing 3 screws ⑥.



- Take off adjuster lever by removing nut ⑦.



- Remove two throttle valve screws ⑧ and pull out the throttle valve by turning throttle valve shaft.



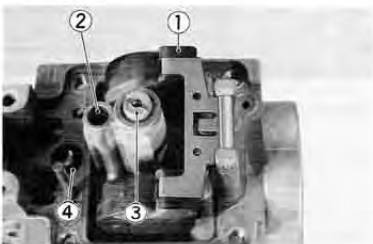
- Take out float chamber by unscrewing 4 screws ⑨.



- Remove float ①, pilot jet ②, main jet ③.

NOTE:

The O-ring ④ uses caution to position properly upon reassembly.



- Take off carburetor top cap by unscrewing 4 screws ①.



- Remove circlip ② from piston.

09900-06108

Snapping pliers



- Remove needle jet ③ from the top side.



- Remove starter valve housing.



NOTE:

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

- Run the engine at the idling speed (950–1150 r/min), and measure the distance with the middle line of the level gauge aligned with the lower surface of carburetor body as shown in photo. (A) should be within the specified range.

Distance (A)

$5.0 \pm 0.5 \text{ mm}$
($0.20 \pm 0.02 \text{ in}$)



FUEL LEVEL INSPECTION

- Place machine on center stand.
- Remove carburetor drain plug and install the fuel level gauge ①.

09913-14511

Fuel gauge set

- Repeat the procedure on each carburetor.

NOTE:

When refitting the screw, be sure to use the "O" ring ①.



FLOAT HEIGHT ADJUSTMENT

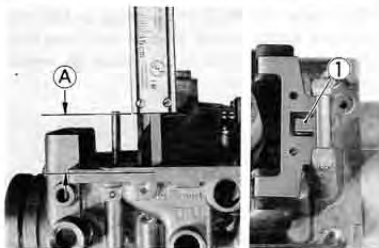
To check the float height, invert the carburetor body, holding the float arm pin so that the pin will not slip off. With the float arm kept free, measure the height (A) while float arm is just in contact with needle valve by using the calipers.

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

NOTE:

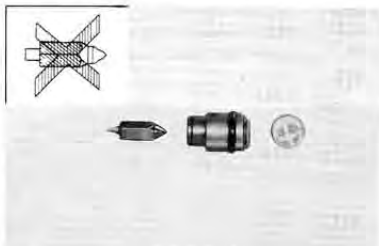
Be sure to have the gasket removed before measuring the height. Also be sure not to compress the spring in the needle valve.

Float height (A)	$22.4 \pm 1.0 \text{ mm}$ ($0.88 \pm 0.04 \text{ in}$)
------------------	---



NEEDLE VALVE

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



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

BALANCING CARBURETORS

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

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

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

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



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



- 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.

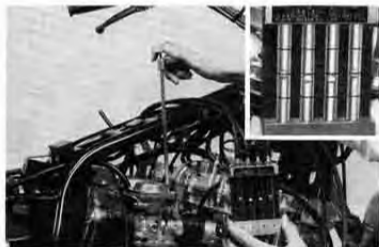


- After making sure that the steel ball stays steady at the center line, disconnect the hose from the adapter and connect the next hose to the adapter. Turn air screw to bring the other steel ball ④ to the center line.
- Repeat the process on the third and fourth tubes. The balancer gauge is now ready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



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

- Start up the engine, and keep it running at 1 750 r/min.
- A correctly adjusted carburetor has the steel balls in the Nos. 1 and 4 tubes at the same level, and those in the Nos. 2 and 3 tubes also at the same level, but lower by one half of the ball diameter than the Nos. 1 and 4 tubes as shown.



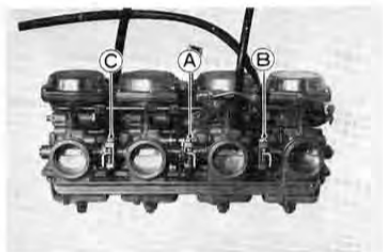
- If the steel balls are not in correct positions, adjust the throttle valve adjusting screw correctly by using throttle valve adjust wrench.

09913-14911

Throttle valve adjust wrench

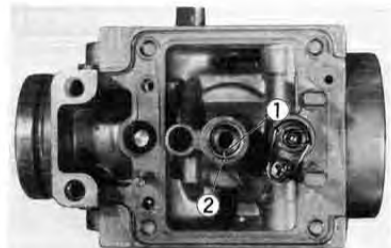
Adjusting order:

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



REASSEMBLY

- Align the groove ① of the needle jet with the pin ② and replace it.



- Place tongue ③ of diaphragm to carburetor body properly.



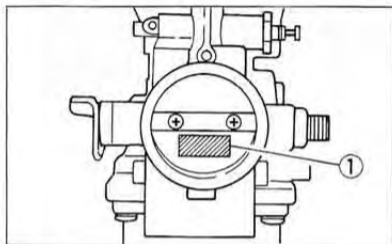
- When fitting throttle valve shaft oil seals, groove should be faced outside ①. Apply grease to lip of oil seal.



- While turning the throttle valve shaft, place the throttle valve in the groove so that the I.D. number ① of the throttle valve comes down-side. Tighten the throttle valve securing screws with applying thread lock cement.

99000-32040

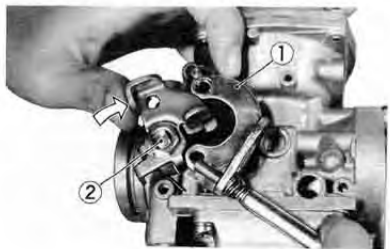
SUZUKI Thread lock cement



- Hitch one end of spring to the boss ① and turn the other end ② clockwise by one turn and hitch it to the cable guide properly. Tighten lock nut and bend up lock washer.



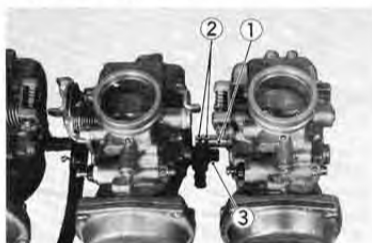
- Fit the throttle stop screw plate ① while turning the throttle valve shaft ②.



- Apply thread lock "1363C" to two screws for securing throttle stop screw plate.



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



- Position throttle valve control lever ① correctly



- Apply thread lock cement to lower bracket screws ①.
Fix the clutch cable guide ② properly.



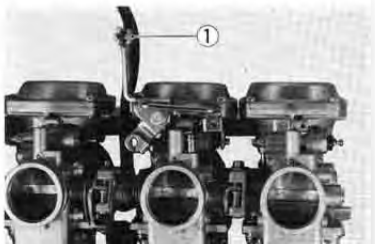
- Apply thread lock cement to the upper bracket screws.

99000-32040

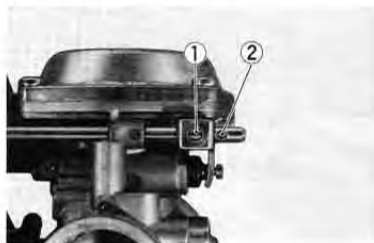
Thread lock cement



- Place the starter cable guide ① as shown.



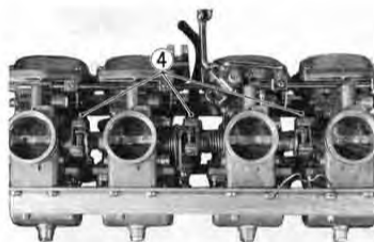
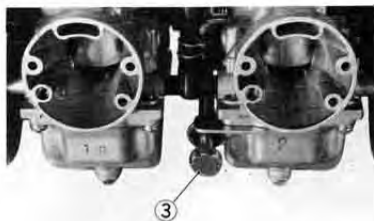
- When mounting starter shaft, align starter valve screw ① with dent mark ② on starter shaft and grease sliding portions.



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



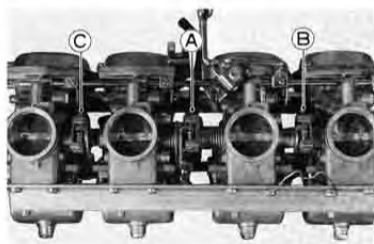
- Set each throttle valve in such a way that its top end ① meets the foremost bypass ②. This is accomplished by turning throttle valve stop screw ③ and balance screw ④.



NOTE:

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

- ① (for No. 2 Carb.) → ② (for No. 1) → ③ (for No.4)



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

- * Engine idle r/min (See page 3-9)
- * Throttle cable play (See page 3-9)
- * Balancing carburetor (See page 8-12)

EMISSION CONTROL & REGULATIONS

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EMISSION REGULATIONS

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

1980 EMISSION LIMITS

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

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

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

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

EMISSION CONTROL CARBURETOR COMPONENTS

GS1100 motorcycles are equipped with precision, manufactured carburetors for emission level control. These carburetors require special mixture control components and other precision adjustments to function properly.

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

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

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

The carburetor specification for the emission-controlled GS1100 are as follows.

Carburetor I.D. No.	Main Jet	Needle Jet	Jet Needle	Pilot Jet	Pilot Screw
49200	#107.5	X-1	5D58	#45	PRE-SET DO NOT ADJUST

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

GENERAL EMISSION INFORMATION

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

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

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

- Hydrocarbons (HC)
- Carbon Monoxide (CO)

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

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

Total NOx emissions from all motorcycles is considered negligible. The EPA states that total NOx emission from motorcycles by 1980 will only amount to approximately 0.5%. NOx is formed during the combustion process at high combustion chamber temperatures.

CARBON MONOXIDE

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

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

CARBURETION MALFUNCTION

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

ENGINE MALFUNCTIONS

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

HYDROCARBONS

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

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

IGNITION SYSTEM MALFUNCTIONS

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

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

MIXTURE-RELATED MALFUNCTIONS

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

Engine wear or damage can also cause high HC emissions.

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

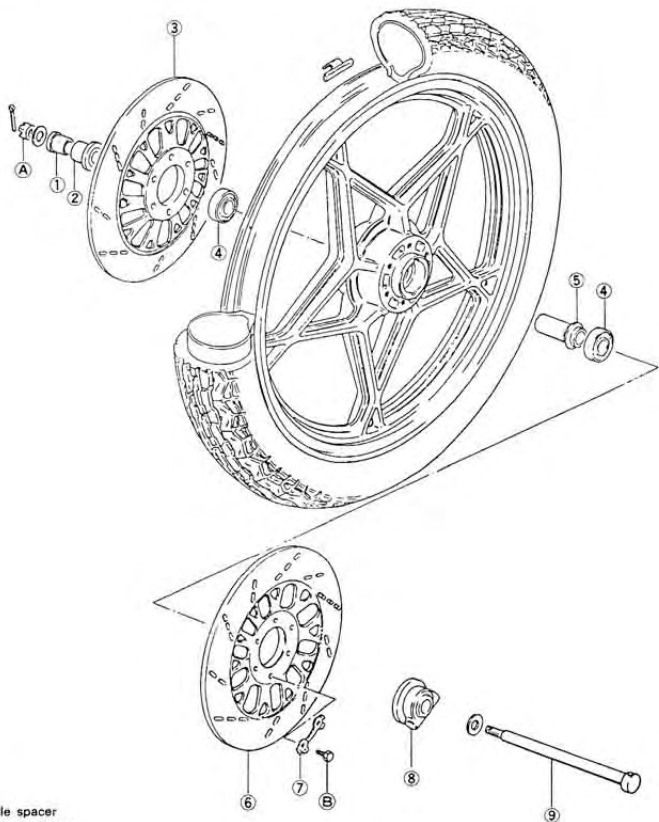
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CHASSIS

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FRONT WHEEL CONSTRUCTION



- ① Axle spacer
- ② Bearing spacer
- ③ Disc (R)
- ④ Wheel bearing
- ⑤ Spacer
- ⑥ Disc (L)
- ⑦ Lock washer
- ⑧ Speedometer gearbox
- ⑨ Axle shaft

Tightening torque		
	kg-m	lb-ft
Ⓐ	3.6-5.2	26.0-39.5
Ⓑ	1.5-2.5	11.0-18.0

REMOVAL AND DISASSEMBLY

Support the machine by center stand and jack.



Dismount the caliper (Right or Left side).

NOTE:

Do not operate the brake lever while dismounting the caliper.



Pull off cotter pin and remove axle nut.



Loosen axle pinch bolt.



Draw out axle shaft and take off front wheel.



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

CAUTION:
Do not reuse the lock washers.



Draw out the right and left wheel bearings.

NOTE:
It makes the job easier to draw out the left
side bearing first.

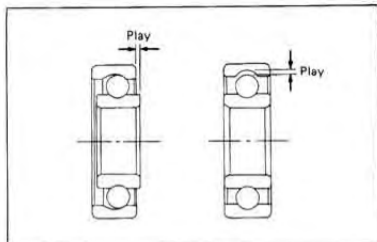
CAUTION:
The removed bearing should be replaced.



INSPECTION

WHEEL BEARINGS

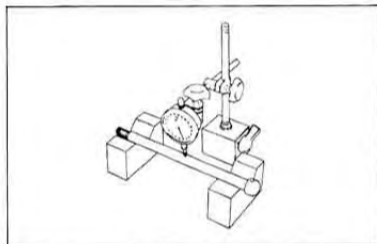
Inspect the play of wheel bearing inner race by hand while fixing it in the wheel hub or wheel. Rotate the inner race by hand to inspect an abnormal noise and a smooth rotation. Replace the bearing if there is something unusual.



AXLE SHAFT

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

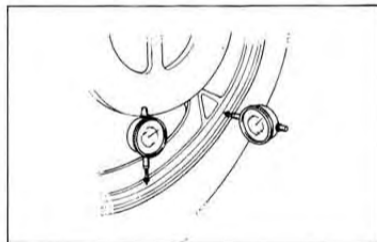
Service Limit	0.25 mm (0.010 in)
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WHEEL AND WHEEL RIM

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

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



REASSEMBLY

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

WHEEL BEARING

Apply grease before installing the bearings.

99000-25030	SUZUKI super grease "A"
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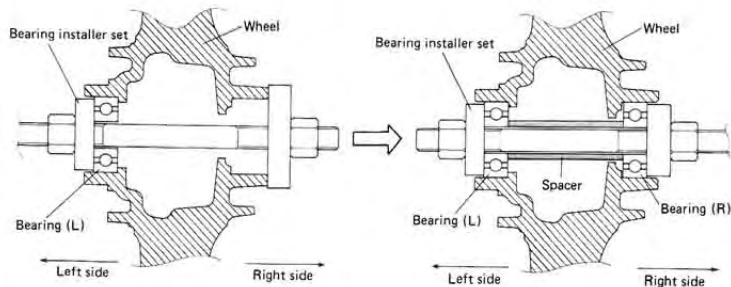
Install the wheel bearings as follows by using special tool.

CAUTION:

First install the wheel bearing for left side.



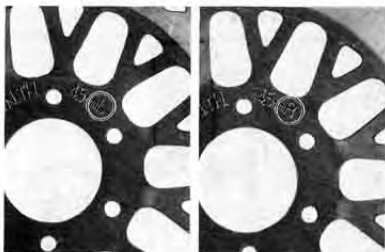
09924-84510	Bearing installer set
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BRAKE DISC

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

"R"	Right side
"L"	Left side



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

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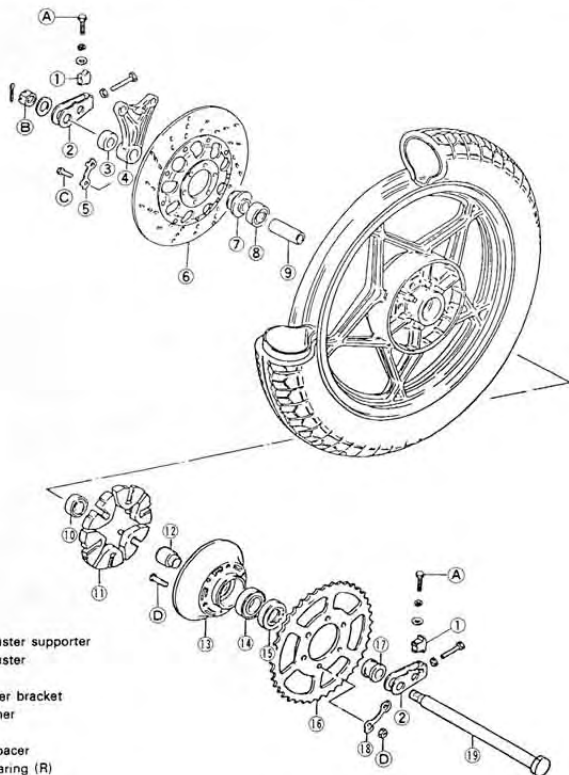


SPEEDOMETER GEARBOX

Before installing the speedometer gearbox ①, grease it and align its groove ②, (for fitting to the hub of two drive pawls) with the hub to insert the gearbox to the wheel side.



REAR WHEEL CONSTRUCTION



- ① Chain adjuster supporter
- ② Chain adjuster
- ③ Spacer
- ④ Rear caliper bracket
- ⑤ Lock washer
- ⑥ Disc
- ⑦ Bearing spacer
- ⑧ Wheel bearing (R)
- ⑨ Spacer
- ⑩ Wheel bearing (L)
- ⑪ Cushion
- ⑫ Bearing holder
- ⑬ Sprocket drum
- ⑭ Sprocket drum bearing
- ⑮ Oil seal
- ⑯ Sprocket
- ⑰ Spacer
- ⑱ Lock washer
- ⑲ Axle shaft

Tightening torque		
	kg-m	lb-ft
(A)	1.5-2.5	11.0-14.5
(B)	8.5-11.5	61.5-83.0
(C)	1.5-2.5	11.0-14.5
(D)	2.5-4.0	18.0-29.0

REMOVAL AND DISASSEMBLY

Support the machine by center stand.
Remove caliper mounting bolts and axle support bolts.
Lift up the caliper.



Pull off cotter pin and loosen axle nut.



Loosen the two fitting bolts and take off chain case.



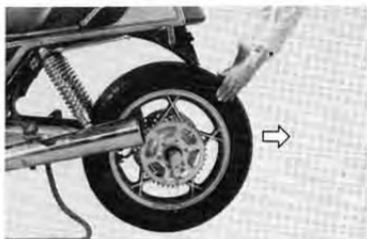
Pull the rear wheel rearward and push down chain adjusters.



Push the rear wheel forward and dismount the drive chain from rear sprocket.



Take off rear wheel rearward.



Remove axle nut and draw out axle shaft.



Unlock the lock washers.
Remove the fitting bolts and separate the disc from the wheel.

CAUTION:
Do not reuse the lock washers.



Draw out rear sprocket with sprocket mounting drum from the wheel.



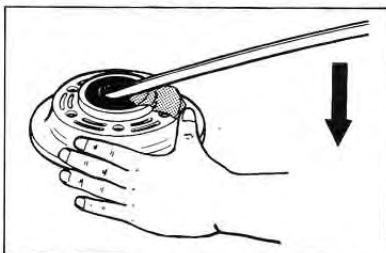
Unlock the lock washers.
Remove fitting bolts and separate the rear sprocket from the wheel.

CAUTION:

Do not reuse the lock washers.



Draw out rear sprocket mounting drum oil seal by using oil seal remover.



Drive out sprocket mounting drum bearing.

CAUTION:

The removed bearing should be replaced.



Drive out wheel bearings right and left.

NOTE:

It makes the job easier to drive out the right side bearing first.

CAUTION:

The bearing should be replaced with a new bearing after removed.



INSPECTION

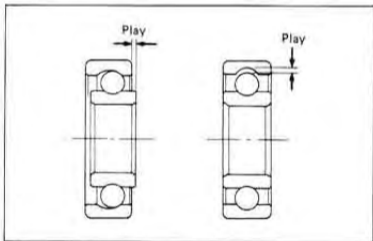
WHEEL BEARINGS

Inspect the play of wheel bearing inner race by hand with the bearing still installed in the wheel hub or wheel. Rotate the inner race by hand to inspect for an abnormal noise and a smooth rotation. Replace the bearing if there is something unusual.



SPROCKET MOUNTING DRUM BEARING

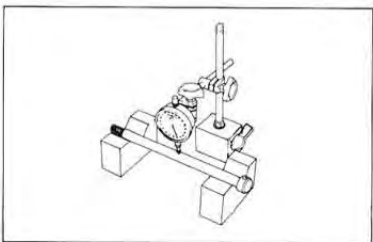
Inspect the play of sprocket mounting drum bearing inner race in the same manner.



AXLE SHAFT

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

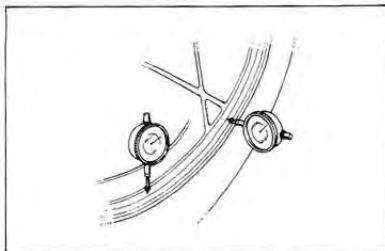
Service Limit	0.25 mm (0.010 in)
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WHEEL OR WHEEL RIM

Inspect the wheel runout as shown. If it exceeds the limit, replace the wheel assembly.

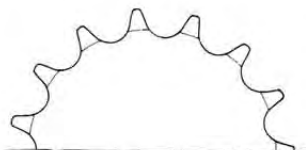
Service Limit (Axial and Radial)	2.0 mm (0.08 in)
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**REAR DRUM SHOCK ABSORBERS**

Inspect the rear drum shock absorbers for damage. If they are damaged, replace the shock absorbers.

**SPROCKET**

Inspect the sprocket teeth for wear. If they are worn as illustrated, replace the sprocket.



Proper wear



Excessive wear

REASSEMBLY

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

WHEEL BEARINGS

Install the wheel bearings by using special tool as shown.

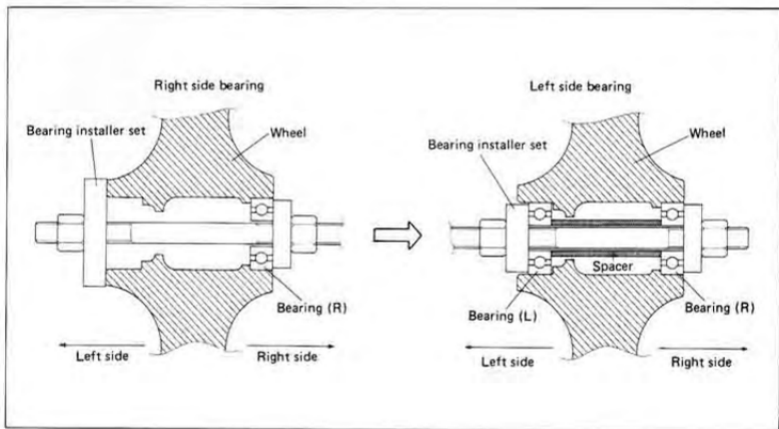


CAUTION:

First install the wheel bearing for right side.

09924-84510

Bearing installer set



CAUTION:

Make sure to identify each bearing, the left side (iron plate sealed type) ① and right side (rubber sealed type) ②.



Left side



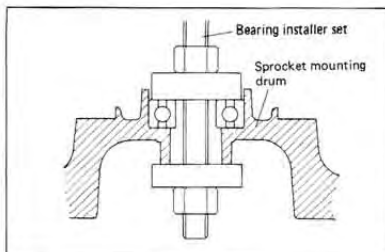
Right side

SPROCKET MOUNTING DRUM BEARING

Install the sprocket mounting drum bearing by using special tool as shown.

09924-84510

Bearing installer set

**SPROCKET MOUNTING DRUM OIL SEAL**

Install the sprocket mounting drum oil seal by using special tool.

09913-76010

Oil seal installer



Apply grease to sprocket mounting drum oil seal.



99000-25030

SUZUKI super grease "A"

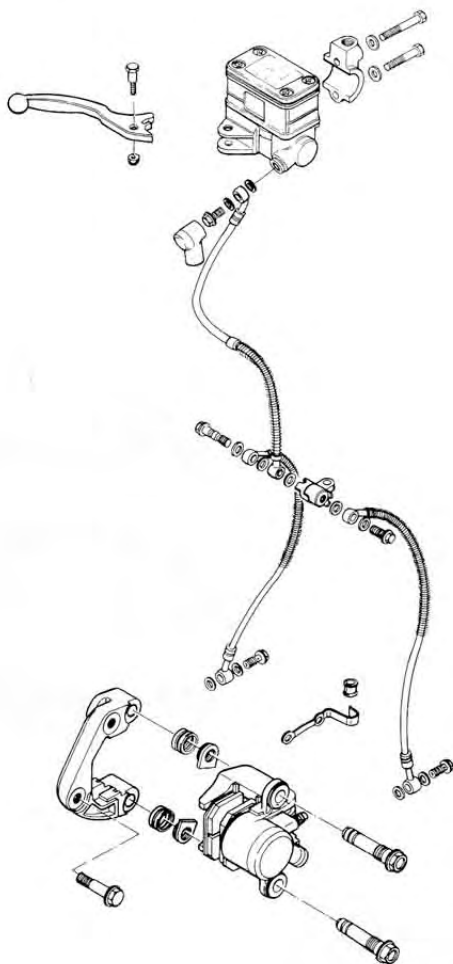
REAR DRUM SHOCK ABSORBERS**NOTE:**

When installing the rear drum shock absorbers and sprocket mounting drum into the wheel hub, apply soapy water to ease assembly. Dry thoroughly before final assembly.

CAUTION:

Adjust the drive chain slack and rear brake pedal height after installation of the rear wheel.

FRONT BRAKE CONSTRUCTION



BRAKE PAD REPLACEMENT

Remove caliper axle bolts and take off caliper.

CAUTION:

Do not operate the brake lever while dismounting the caliper.



Pull out brake pads.

CAUTION:

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

Do not apply pad grease, when installing the brake pads.



NOTE:

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



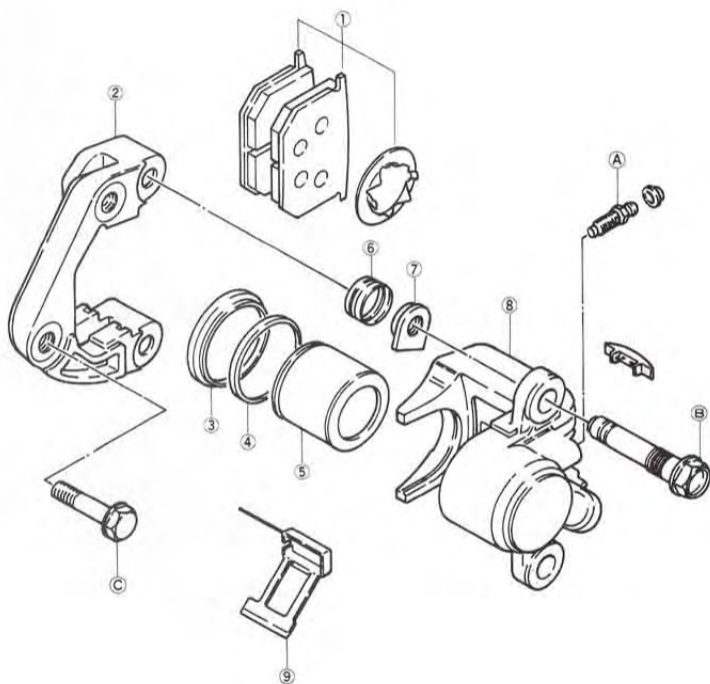
Tighten the caliper axle bolts with specified torque.

Tightening torque

4.0 — 5.5 kg-m
(29.0 — 40.0 lb-ft)



CALIPER



- ① Pad set
- ② Caliper holder
- ③ Dust boot
- ④ Piston seal
- ⑤ Piston
- ⑥ Axle boot
- ⑦ Axle nut
- ⑧ Caliper
- ⑨ Pad spring

Tightening torque		
	kg-m	lb-ft
(A)	0.7-0.9	5.0-6.5
(B)	4.0-5.5	29.0-40.0
(C)	2.5-4.0	18.0-29.0

CALIPER REMOVAL AND DISASSEMBLY

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

Remove caliper mounting bolts ① and take off caliper.

NOTE:

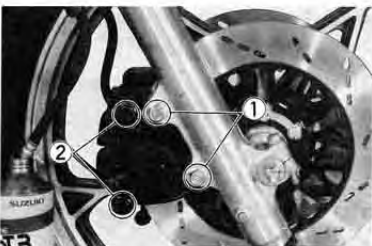
Slightly loosen the caliper axle bolts ② to facilitate later disassembly.

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

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

CAUTION:

Do not use high pressure air to prevent piston damage.



Remove piston boot and piston seal.



Pull off caliper axle nuts and dust boots.

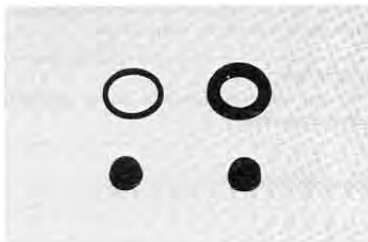


CALIPER AND DISC INSPECTION

Inspect the cylinder bore wall for nick, scratch or other damage.



Inspect the each rubber parts for damage and wear.

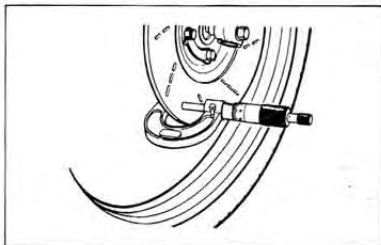


Inspect the piston surface for any flaw or other damage.



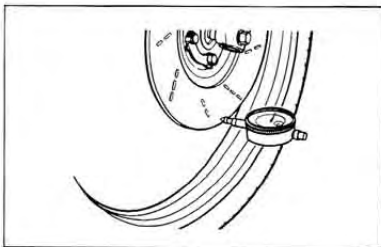
Using a micrometer check the disc for wear. Its thickness can be checked with disc and wheel in place. The service limit is specified for the thickness of the disc:

Service Limit	4.5 mm (0.18 in)
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With the disc mounted on the wheel, check the disc for face runout with a dial gauge, as shown.

Service Limit	0.30 mm (0.012 in)
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CALIPER REASSEMBLY

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

CAUTION:

Wash the caliper components with fresh brake fluid before reassembly.

Never use cleaning solvent or gasoline to wash them.

Apply brake fluid to the caliper bore and piston to be inserted into the bore.

Apply SUZUKI Silicone grease to the caliper axles.

99000-25100	SUZUKI Silicone grease
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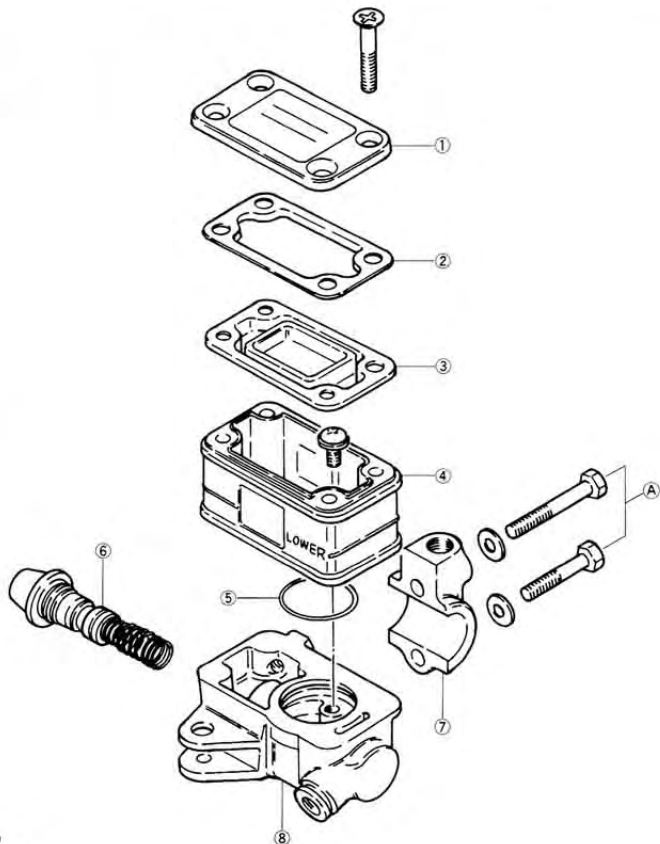


Tighten the caliper axle nuts and caliper mounting bolts with specified torque.

Caliper axle bolt	4.0 — 5.5 kg-m (29.0 — 40.0 lb-ft)
Caliper mounting bolt	2.5 — 4.0 kg-m (18.0 — 29.0 lb-ft)



MASTER CYLINDER

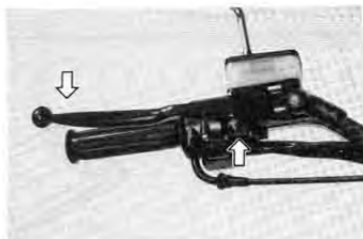


- ① Cap
- ② Plate
- ③ Diaphragm
- ④ Reservoir
- ⑤ "O" ring
- ⑥ Piston and cup set
- ⑦ Holder
- ⑧ Body

Tightening torque		
	kg-m	lb-ft
A	0.5—0.8	3.5—6.0

MASTER CYLINDER REMOVAL AND DISASSEMBLY

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



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

CAUTION:

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



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



Remove filler cap and drain brake fluid.



Remove reservoir securing screws.



Pull out the reservoir and O ring.



Draw out dust boot.



Remove circlip by using special tool.
Pull out washer, secondary cup, piston, spacer,
primary cup, and return spring.



09900-06108	Snap ring pliers
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MASTER CYLINDER INSPECTION

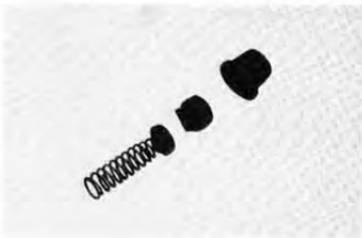
Inspect the cylinder bore wall for any scratch or other damage.



Inspect the piston surface for scratch or other damage.



Inspect the primary cup, secondary cup and dust seal boot for damage.



MASTER CYLINDER REASSEMBLY

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

CAUTION:

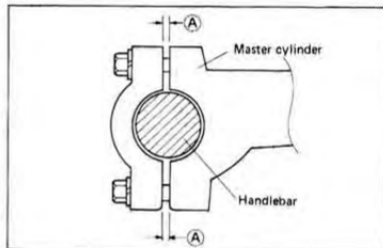
Wash the master cylinder components with fresh brake fluid before reassembly. Never use cleaning solvent or gasoline to wash them.

Apply brake fluid to the cylinder bore and all the internals to be inserted into the bore.



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

Tightening torque	
Brake hose union bolt	2.0 — 2.5 kg-m (14.5 — 18.0 lb-ft)
Master cylinder clamp bolt	0.5 — 0.8 kg-m (3.5 — 6.0 lb-ft)

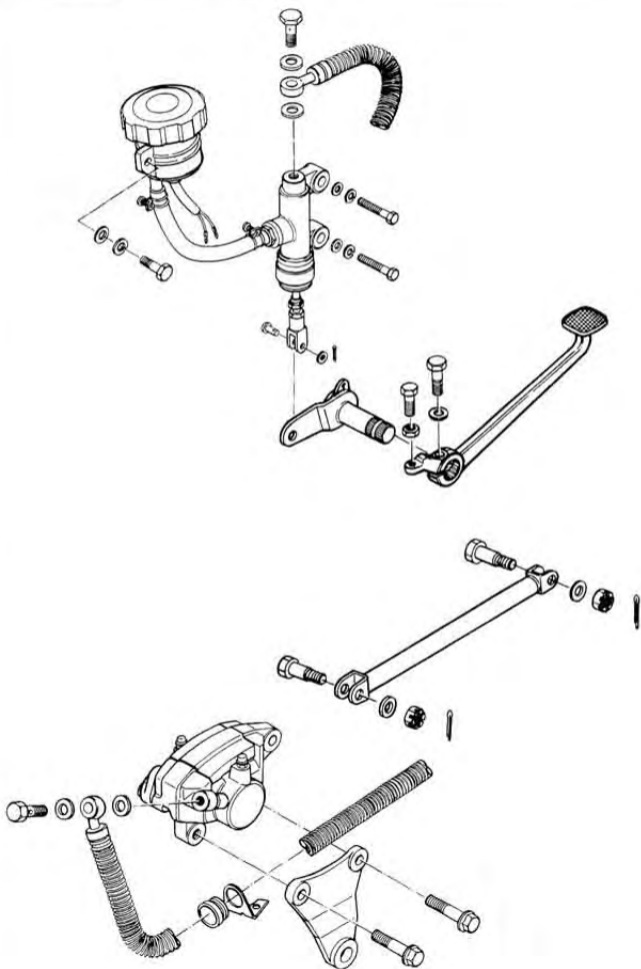


CAUTION:

Adjust the front brake light switch after installation.

Bleeding the air after reassembling master cylinder, (See page 3-15.)

REAR BRAKE CONSTRUCTION



BRAKE PAD REPLACEMENT

Remove dust cover.



Remove clips and pull off pins.



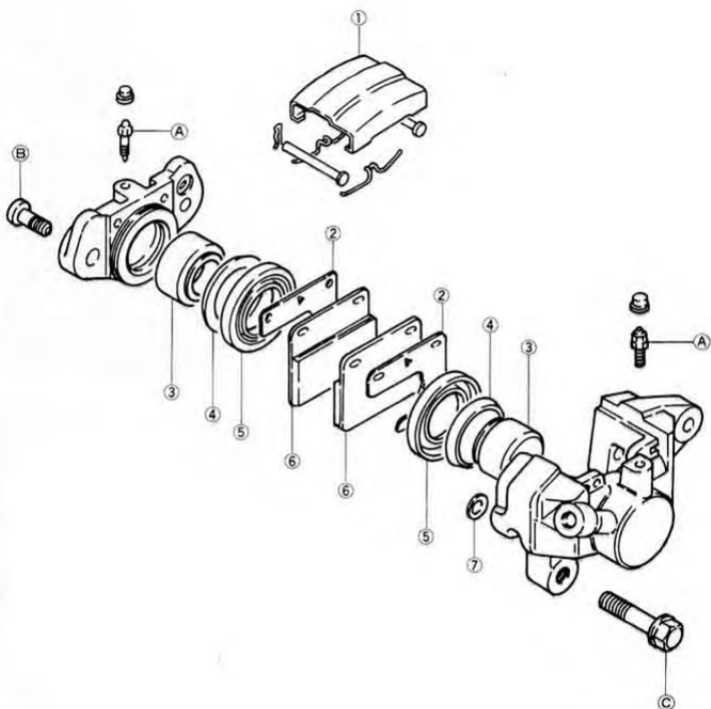
Draw out brake pads with pad shims.



Fit a brake pad shim to the rear of the brake pad so that the "►" hole in the shim points to the front.



CALIPER



- ① Dust cover
- ② Pad shim
- ③ Piston
- ④ Piston seal
- ⑤ Dust boot
- ⑥ Pad
- ⑦ "O" ring

	Tightening torque	
	kg-m	lb-ft
(A)	0.7-0.9	5.0-6.5
(B)	2.0-3.0	14.5-21.5
(C)	2.5-4.0	18.0-29.0

CALIPER REMOVAL AND DISASSEMBLY

Remove brake pads.



Disconnect brake hose by removing union bolt.

NOTE:

Do not operate the brake pedal when disconnecting the brake hose.



Remove two caliper mounting bolts and torque link nut after pulling off cotter pin, and take off caliper.



Separate the caliper after removing caliper bolts.



Place a rag over the piston to prevent popping out. Draw out the piston (Right and Left) by using air gun.

CAUTION:

Do not use high pressure air for preventing piston damage.



Draw out dust seal cover and piston seal.

**CALIPER AND DISC INSPECTION**

Inspect the cylinder bore wall for nick, scratch or other damage.



Inspect the piston surface for any flaw or other damage.

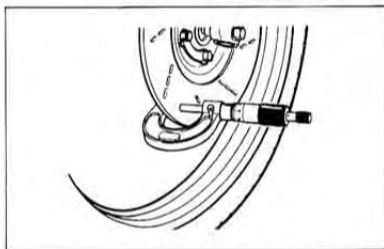


Inspect the each rubber parts for damage and wear.



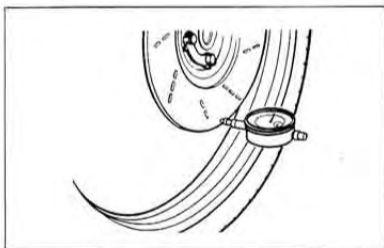
Using a micrometer check the disc for wear. Its thickness can be checked with disc and wheel in place. The service limit is indicated on the disc plate.

Service limit	6.0 mm (0.24 in)
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With the disc mounted on the wheel, check the disc for face runout with a dial gauge, as shown.

Service Limit	0.30 mm (0.012 in)
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CALIPER REASSEMBLY

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

CAUTION:

Wash the caliper components with fresh brake fluid before reassembly.

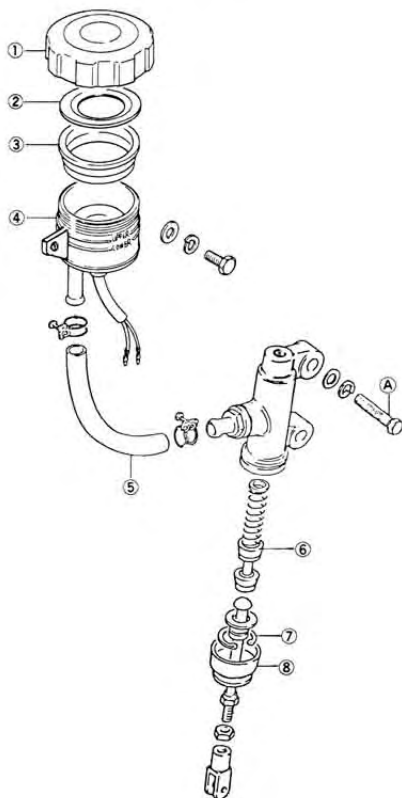
Never use cleaning solvent or gasoline to wash them.

Apply brake fluid to the caliper bore and piston to be inserted into the bore.

Bleeding the air after reassembling master cylinder.



MASTER CYLINDER



- ① Cap
- ② Diaphragm plate
- ③ Diaphragm
- ④ Reservoir
- ⑤ Brake hose
- ⑥ Piston and cap set
- ⑦ Snap ring
- ⑧ Dust boot

Tightening torque		
	kg-m	lb-ft
A	1.5-2.5	11.0-18.0

MASTER CYLINDER REMOVAL AND DISASSEMBLY

Remove right frame cover.

Disconnect brake hose by removing union bolt and remove reservoir mounting bolt.



Remove brake pedal arm pin.

Separate the push rod and pedal arm.

CAUTION:

Do not reuse the cotter pin.



Remove two mounting bolts and take off master cylinder.



Remove filler cap and drain brake fluid.

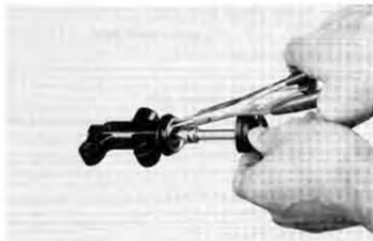


Disconnect reservoir hose.



Draw out dust seal boot and remove circlip by using special tool.

09900-06108	Snap ring pliers
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Pull out push rod and piston.



Draw out primary cup and spring.



MASTER CYLINDER INSPECTION

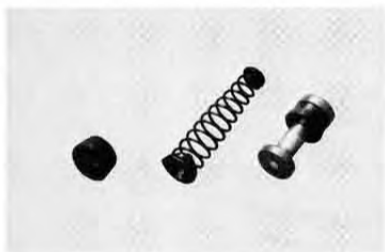
Inspect the cylinder bore wall for any scratch or other damage.



Inspect the piston surface for scratch or other damage.



Inspect the primary cup, secondary cup and each rubber part for damage.



MASTER CYLINDER REASSEMBLY

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

CAUTION:

Wash the master cylinder components with fresh brake fluid before reassembly. Never use cleaning solvent or gasoline to wash them.

Apply brake fluid to the cylinder bore and all the internals to be inserted into the bore.

CAUTION:

Adjust the rear brake light switch and brake pedal height after installation.

Bleed air from the brake circuit after reassembling master cylinder. (See page 3-15)



BRAKE PEDAL REMOVAL

Remove brake pedal bolt and pull out pedal.



Remove brake light switch spring.



Pull off cotter pin and link pin.



Push out brake pedal rod arm.



BRAKE PEDAL REASSEMBLY

Apply grease to the brake pedal rod arm before installing it.

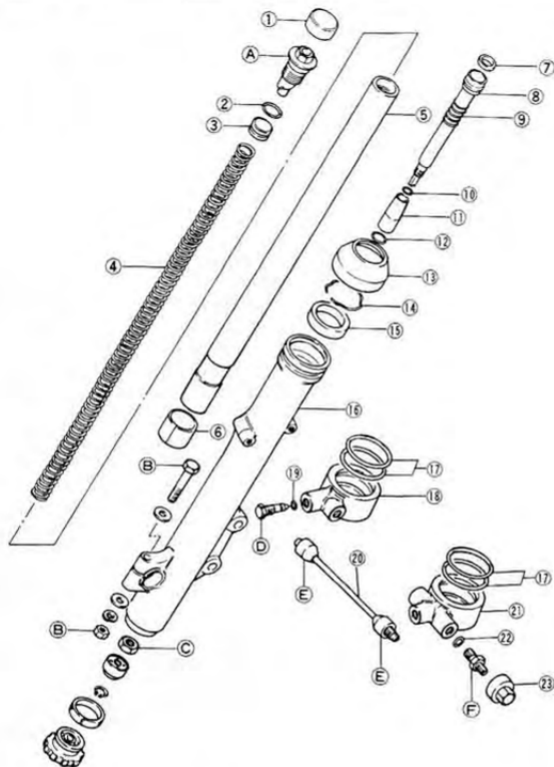
99000-25030

SUZUKI super grease "A"

When installing the rear brake pedal, align the brake pedal groove with punched mark ① provided on the end face of brake pedal shaft.



FRONT FORK CONSTRUCTION



- ① Cap
- ② O ring
- ③ Free piston
- ④ Spring
- ⑤ Inner tube
- ⑥ Metal
- ⑦ Damper rod ring
- ⑧ Damper rod
- ⑨ Rebound spring
- ⑩ O ring
- ⑪ Oil lock piece
- ⑫ O ring
- ⑬ Dust cover
- ⑭ Snap ring
- ⑮ Oil seal
- ⑯ Outer tube
- ⑰ O ring
- ⑱ Air joint (R)
- ⑲ O ring
- ⑳ Air joint pipe
- ㉑ Air joint (L)
- ㉒ O ring
- ㉓ Valve cap

	kg-m	lb-ft
(A)	1.5—3.0	11.0—21.5
(B)	1.5—2.5	11.0—18.0
(C)	2.5—3.5	18.0—25.5
(D)	0.05—0.10	0.4—0.7
(E)	1.0—1.2	7.0—8.5
(F)	1.0—1.3	7.0—9.5

REMOVAL AND DISASSEMBLY

Remove front wheel (See page 10-2).
Take off the brake caliper and disconnect speedometer cable guide.



Remove front fender.



Loosen the two air stop valves.
Remove valve cap and push in the air valve to relieve the air pressure completely.



Loosen the steering stem upper and lower clamp bolts.

NOTE:

Slightly loosen the front fork cap bolt to facilitate later disassembly after loosening upper clamp bolt.



Pull down right and left front fork assemblies.



Remove front fork cap bolt.
Draw out free piston and fork spring.

CAUTION:

When taking out the free piston, lift the front fork outer tube slowly. If an excessive force is applied, the free piston may be popped out by the force of the fork spring.



Invert the fork and stroke it several times to let out the inside oil.

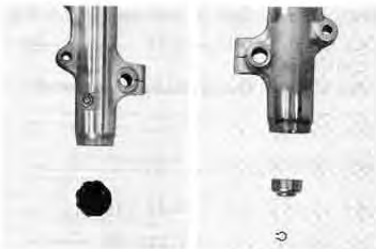
Under this condition (inverted condition), hold the fork for a few minutes.



Pull off damping adjuster.
Remove detent by using special tool.

CAUTION:

The removed circlip should be replaced.

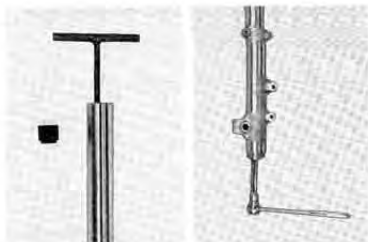


09900-06104

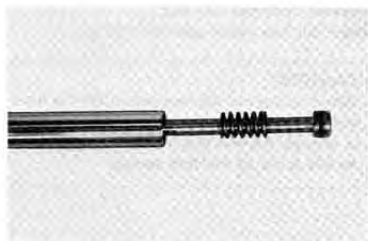
Snap ring pliers

Remove damper rod securing nut by using special tools.

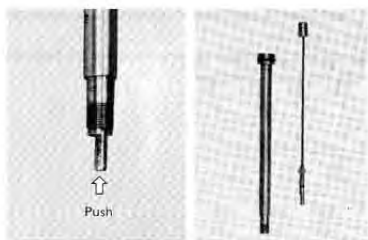
09940-34520	"T" handle
09940-34580	Attachment F



Draw out damper rod with damper adjusting rod and rebound spring.



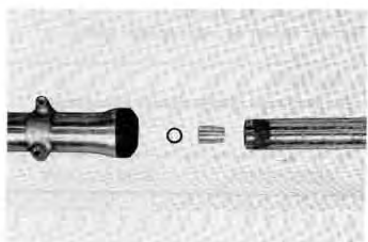
Draw out damper adjusting rod from damper rod.



Draw out inner tube, oil lock piece and O-ring.

CAUTION:

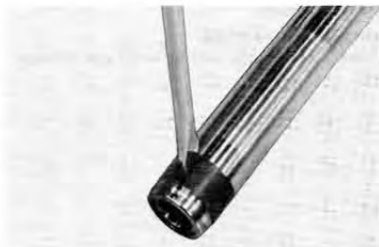
The removed O-ring should be replaced.



Remove inner tube metal.

CAUTION:

The removed inner tube metal should be replaced.



Remove dust cover and stopper ring.



Draw out oil seal by using oil seal remover.

CAUTION:

Do not scratch the outer tube metal while drawing out.



INSPECTION**DAMPER ROD RING**

Inspect damper rod ring for wear and damage.

**FORK SPRING**

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

Service Limit	411 mm (16.2 in)
---------------	------------------

**INNER TUBE**

Inspect inner tube and metal outer surfaces for any scuffing.

**OUTER TUBE**

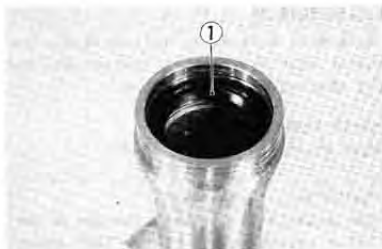
Inspect outer tube and metal inner surfaces for any scuffing.



OIL SEAL

Inspect the lip ① of oil seal for any damage or wear.

If it is damaged, replace it.

**FREE PISTON**

Inspect free piston O-ring for wear and damage.

**VALVE STOP AND VALVE**

Inspect the valve stop and valve O-rings for wear or damage.

**AIR JOINT**

Inspect the air joint O-rings for wear or damage.



REASSEMBLY

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

INNER TUBE METAL

Install the metal by hand as shown.

CAUTION:

Use special care to prevent damage to the Teflon coated surface of the "DU" metal when installing it.



DAMPER ROD

Apply Thread Lock "1342" to the damper rod nut and tighten with specified torque.

99000-32050	Thread Lock "1342"
-------------	--------------------

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



CAUTION:

Before installing the damper rod, make sure that the dented portion ① of the damper rod meet a cut mark ② of adjusting rod as shown in the picture.



DETENT

CAUTION:

The mating portion of detent must stay as it is in the picture while pushed into the rod end.

**DAMPER ADJUSTER**

Apply grease before installing the damper adjuster.

99000-25030

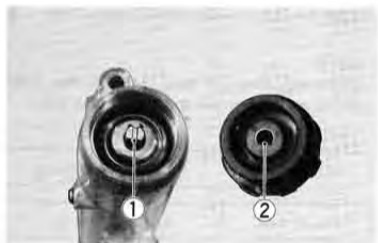
SUZUKI super grease "A"



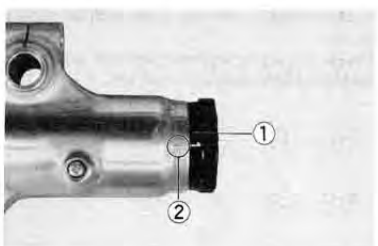
Install the damper adjuster in the manner that both the grooved portions ① of damper adjusting rod and damper adjuster ② be matched.

CAUTION:

Do not rotate damper adjuster in any direction.



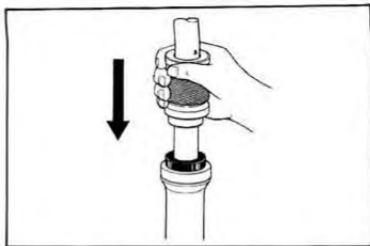
Without rotating damping adjuster ① in any direction while holding by hand, turn the indicator ring in such a way that its "No. 1" mark meets the aligning mark ② of outer tube of front fork.



OIL SEAL

Install oil seal to outer tube by using special tool as shown.

09940-54910	Oil seal installing driver
09940-54920	Oil seal installing tool attachment

**FORK OIL**

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

Fork oil	Front fork oil #15
----------	--------------------

Fork oil capacity	238 ml (8.04 US/oz)
-------------------	------------------------



Adjust the fork oil level with a special tool.

NOTE:

When adjusting oil level, remove the fork spring and compress the inner tube fully.

09943-74111	Fork oil level gauge
-------------	----------------------

For oil level	216 mm (8.5 in)
---------------	-----------------



Install fork spring and free piston with flat surface in top.

Adjust the spring tensioner adjuster position of both front fork caps, right and left.



DAMPING FORCE AND SPRING SETTING

Before installing front fork to the steering stem, be sure to check the spring adjuster setting position and damping force adjuster.

Standard Setting	Damping force	Spring
	"2" 2nd position	"1" softest

INNER TUBE

Install the front fork assembly with aligning upper surface ① of the inner tube with the upper surface ② of the steering stem upper bracket.

**FORK AIR**

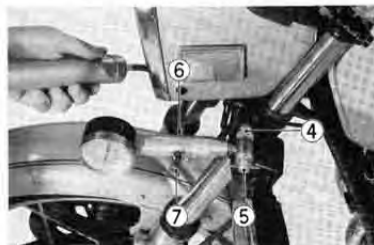
Lift up the front wheel by a jack till it becomes free from any burden, and loosen the air lock screw ③



Set the air pressure gauge to the valve ④ and turn the valve handle ⑤ clockwise. Set the hand pump to the valve ⑥, turn the valve handle ⑦ clockwise, and charge the air.

Let the air out by loosening the handle ⑦ till the specified air pressure is left inside, and tighten the air lock screw ③

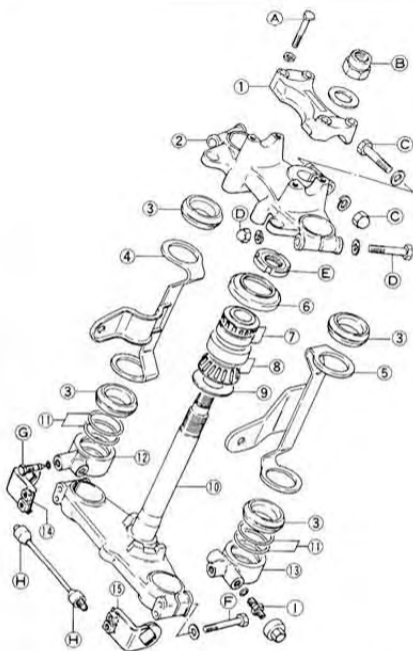
STD Air pressure	0.5 kg/cm ² (7.11 psi)
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**CAUTION:**

Do not charge air more than 2.5 kg/cm² (36 psi.)

Set the each spring load adjusting cam and damping force adjuster at the same position for both right and left forks.

STEERING STEM CONSTRUCTION



- ① Handlebar clamp
- ② Steering stem upper bracket
- ③ Seat rubber
- ④ Headlight bracket (R)
- ⑤ Headlight bracket (L)
- ⑥ Dust cover
- ⑦ Bearing (U)
- ⑧ Bearing (L)
- ⑨ Shim
- ⑩ Steering stem lower bracket
- ⑪ O ring
- ⑫ Air joint (R)
- ⑬ Air joint (L)
- ⑭ Turn signal light bracket (R)
- ⑮ Turn signal light bracket (L)

	Tightening torque	
	kg-m	lb-ft
(A)	1.2—2.0	8.5—14.5
(B)	3.6—5.2	26.0—37.5
(C)	1.5—2.5	11.0—18.0
(D)	2.0—3.0	14.5—21.5
(E)	4.0—5.0	29.0—36.0
(F)	1.5—2.5	11.0—18.0
(G)	0.05—0.10	0.4—0.7
(H)	1.0—1.2	7.0—8.5
(I)	1.0—1.3	7.0—9.5

REMOVAL AND DISASSEMBLY

Remove seat.

Take off fuel tank.

NOTE:

When taking off fuel tank, disconnect fuel hose, vacuum hose and fuel gauge lead wires.



Disconnect choke cable for carburetor side.



Loosen the lock nut and remove choke cable.



Remove handlebars clamp bolts and take off handlebars.



Remove right and left turn signal lights.



Remove headlight ass'y.
Disconnect each couplers and lead wires.



Remove headlight housing.
Disconnect speedometer and tachometer cables.



Remove combination meter mounting nuts and
take off combination meter ass'y



Remove ignition switch by using special tool.

09911-73730

"T" type hexagon wrench



Loosen the steering stem clamp bolt and remove steering stem head nut.

Take off steering stem upper bracket.



Remove steering stem nut by using special tool.

NOTE:

Hold the steering stem lower bracket by hand to prevent dropping.

09940-14910

Steering nut socket wrench



Draw out upper bearing and steering stem lower bracket.



Draw out lower steering stem bearing by using special tool.

CAUTION:

The removed bearing should be replaced.

09941-84510

Bearing inner race remover



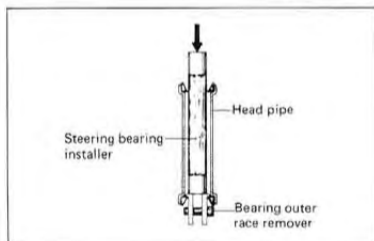
Draw out steering stem bearing outer races, upper and lower, by using special tools.

09941-54910

Steering race remover

09941-74910

Steering bearing installer

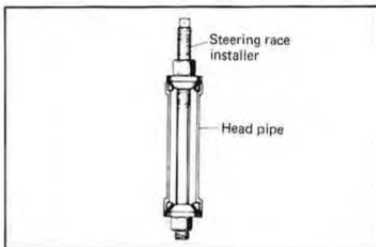


REASSEMBLY

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

OUTER RACES

Press in the upper and lower outer races by using special tool.



BEARINGS

Press in the lower bearing by using special tool.



Apply grease upper and lower bearings before remounting the steering stem.

99000-25030

SUZUKI super grease "A"

STEM NUT ADJUSTMENT

Using special tool, tighten the steering stem nut with specified torque.

09940-14910	Steering nut socket wrench
Tightening torque	4.0—5.0 kg-m (29.0—36.0 lb-ft)

Turn the steering stem right and left lock-to-lock, five or six times to "seat" the bearings.

Loosen the steering stem nut approximately 1/4 — 1/2 turn.

**NOTE:**

This adjustment will vary from motorcycle to motorcycle.

Place the steering stem upper blacket, tighten the steering head nut and head pinch bolt with specified torque.

Tightening torque:

	kg-m	lb-ft
Steering stem head nut	3.6 — 5.2	26.0 — 37.5
Steering stem pinch bolt	1.5 — 2.5	11.0 — 18.0

CAUTION:

After performing the adjustment and installing the steering stem upper blacket, "rock" the front wheel assembly forward and backward to ensure that there is no play and that the procedure was accomplished correctly. If play is noticeable, re-adjust the steering stem nut.

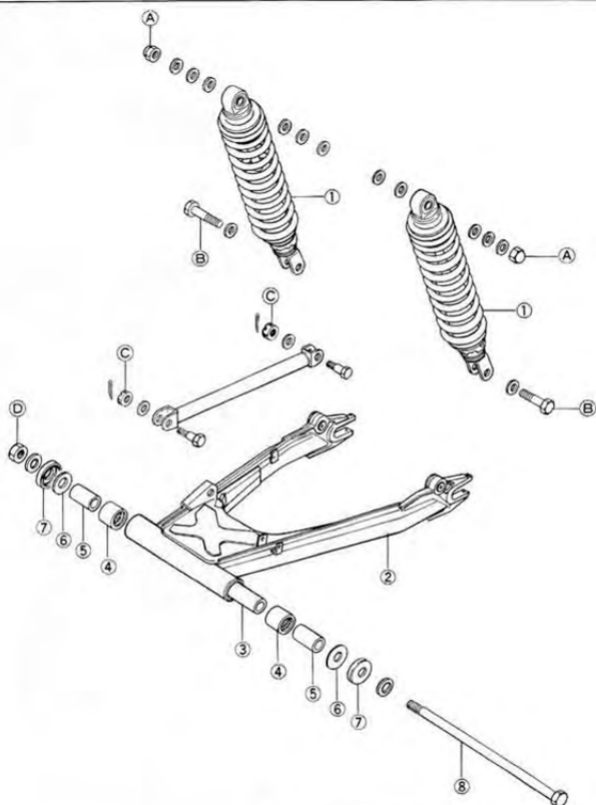
HANDLEBARS

Set the handlebars to match its punched mark ① to the mating face of the holder.

Secure the each handlebars clamp in such a way that the clearances (A) ahead of and behind the handlebars are equalized.

Clamp bolt tightening torque	1.2—2.0 kg-m (8.5—14.5 lb-ft)
------------------------------	----------------------------------

REAR SUSPENSION CONSTRUCTION



- ① Rear shock absorber
- ② Swing arm
- ③ Spacer
- ④ Bearing
- ⑤ Bearing inner race
- ⑥ Shim
- ⑦ Dust cover
- ⑧ Pivot shaft

Tightening torque		
	kg-m	lb-ft
(A)	2.3-3.0	14.5-21.5
(B)	2.3-3.0	14.5-21.5
(C)	2.3-3.0	14.5-21.5
(D)	5.0-8.0	36.0-58.0

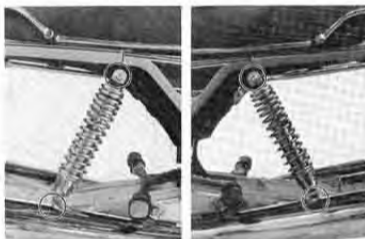
REMOVAL AND DISASSEMBLY

Remove rear wheel (See page 10-8).

Disconnect rear torque link from the swing arm.



Dismount the right and left rear shock absorbers.



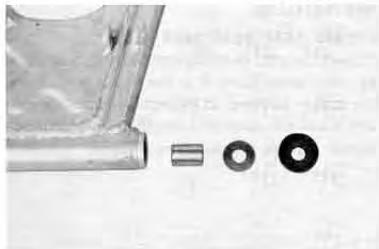
Remove swing arm pivot nut.



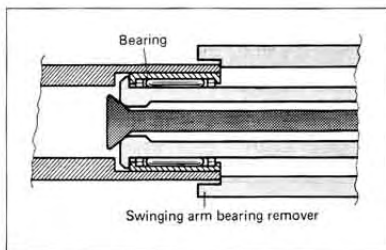
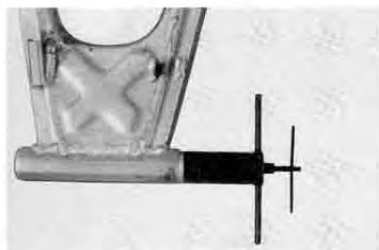
Draw out pivot shaft and pull off swing arm.



Draw out dust cover, washer and inner race.



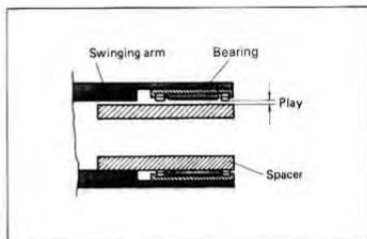
Draw out swing arm bearings by using special tool.



INSPECTION

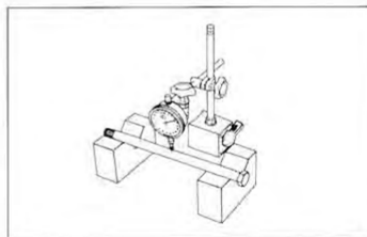
SWING ARM BEARINGS

Inspect the play of swing arm bearing inner spacer by hand while fixing it in the swing arm. Rotate the spacer by hand to inspect an abnormal noise and a smooth rotation. Replace the bearing and spacer if there is something unusual.



SWING ARM PIVOT SHAFT

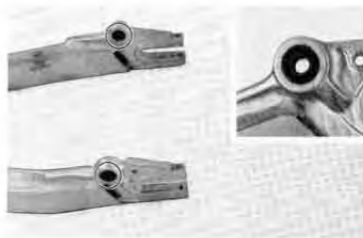
Using dial gauge, check the pivot shaft for runout and replace it if the runout exceeds the limit.



09900-20606	Dial gauge (1/100)
09900-20701	Magnetic stand
Service Limit	0.30 mm (0.012 in)

SHOCK ABSORBER BUSHING

Inspect the rear shock absorbers bushings for damage and wear.



REASSEMBLY

Reassemble and remount the swing arm and rear shock absorbers in the reverse order of disassembly and removal, and also carry out the following steps:

SWING ARM BEARINGS

Press in the bearings by using special tool.

09941-34511	Bearing installer
-------------	-------------------

CAUTION:

When installing a set of bearings, punch marked side of each bearing faces to the outside.

Apply grease to inside of bearing.

99000-25030	SUZUKI super grease "A"
-------------	-------------------------

REAR SHOCK ABSORBERS

After installing rear shock absorbers, be sure to check the positions of both spring cam and damping force adjuster according to the following standard setting.

Specification	Spring	Damper
	"3"	"2"

Apply grease to dust seal cover.

99000-25030	Suzuki super grease "A"
-------------	-------------------------

CAUTION:

It is strongly recommended that the shock absorbers always be replaced as a set to insure proper balance between left and right units, unless the only one shock needs to be replaced and the operational time on the remaining shock is minimal.



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ELECTRICAL

CONTENTS

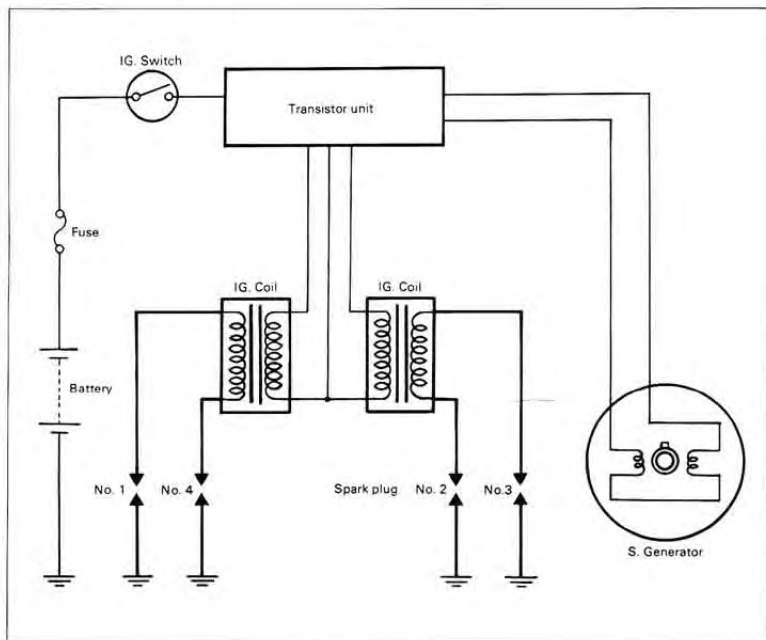
IGNITION SYSTEM.....	11- 1
CHARGING SYSTEM.....	11- 5
BATTERY	11- 9
STARTER SYSTEM	11-12
COMBINATION METER.....	11-17
LAMPS	11-23
SELF CANCELLING DEVICE	11-25
SWITCHES.....	11-27

IGNITION SYSTEM

DESCRIPTION

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

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



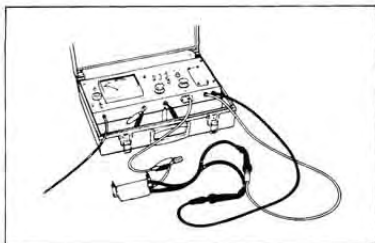
INSPECTION

IGNITION COILS

(Checking with Electro Tester)

Using the electro tester, test each ignition coil for sparking performance. The test connection is as indicated. Make sure that the sparking distance is at least 8 mm (0.3 in).

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

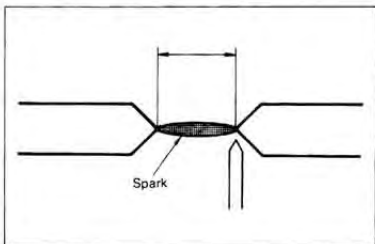


09900-28106

Electro tester

STD Spark performance

8 mm (0.3 in)



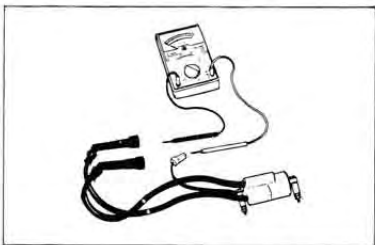
IGNITION COILS

(Checking with Pocket Tester)

A SUZUKI pocket tester or an ohmmeter 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.

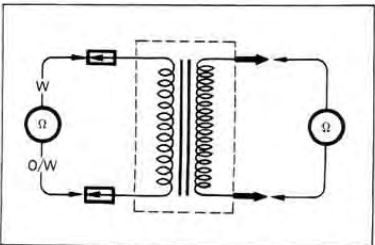
09900-25002

Pocket tester



STD Ignition coil resistance

Primary	O/W — W	Approx. 3 — 5Ω
Secondary	Plug cap — Plug cap	Approx. 31 — 33kΩ

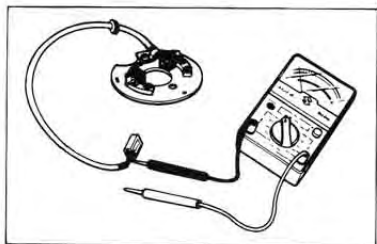


SIGNAL GENERATOR

Measure the resistance between lead wires.
If the resistance noted indicates infinity or too low
a resistance value to must be replaced.

09900-25002	Pocket tester
-------------	---------------

STD resistance	
BI - G	250 - 360 Ω

**IGNITOR UNIT (TRANSISTOR UNIT)**

Remove each spark plug of Nos. 3 and 4 cylinders,
fit it to respective plug cap and place it on the
cylinder head.

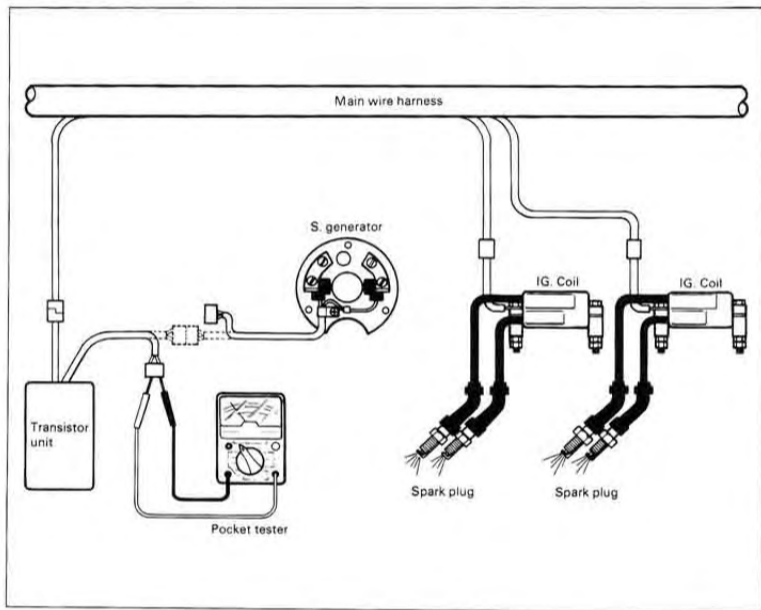


Remove the frame cover on the right side and disconnect the lead wire from the signal generator. Now, connect ⊕ pin of SUZUKI Pocket Tester (X1 Ω range) with Blue lead wire on the ignitor side and ⊖ pin with Green lead wire. The ignitor is in good condition if the following is observed: The moment the test pins are connected the spark plug of No. 3 cylinder sparks. Next the polarity should be reversed (positive to green and negative to blue). This should cause No. 4 spark plug to fire. If the ignitor unit fails this test, it must be replaced.



NOTE:

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

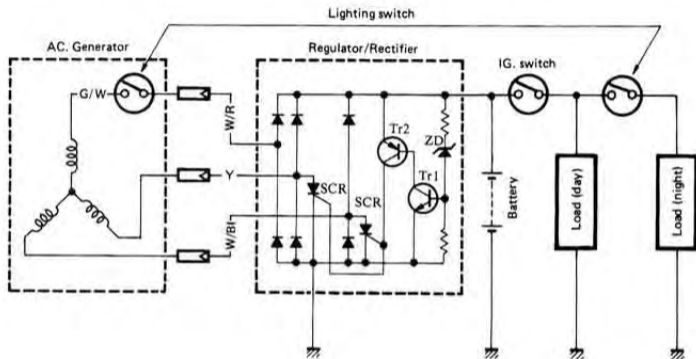


CHARGING SYSTEM

DESCRIPTION

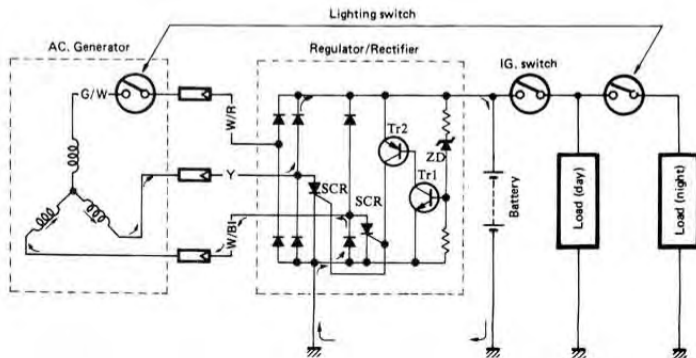
The circuit of the charging system is indicated in figure, which is composed of an AC generator, regulator/rectifier unit and battery.

The AC current generated from AC generator is rectified by rectifier and is turned into DC current, then it charges the battery.



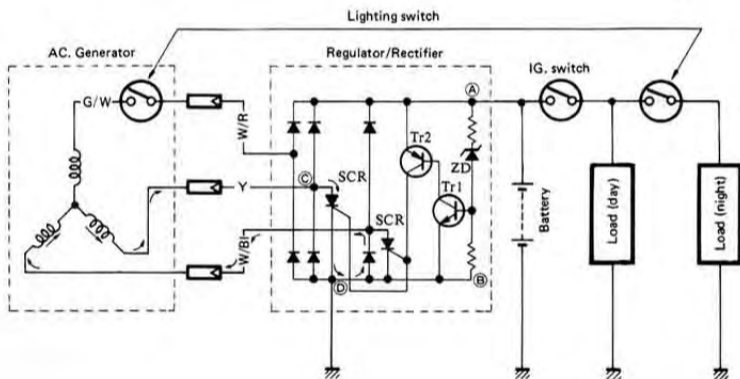
Function of Regulator

While the engine r/min is low and the generated voltage of AC generator is lower than the adjusted voltage of Regulator, the regulator does not function, incidentally the generated current charges the battery directly.



When the engine r/min becomes higher, the generated voltage of AC generator also becomes higher and the voltage between points (A) and (B) of regulator becomes high accordingly, and when it reaches the adjusted voltage of regulator, ZD (Zener diode) becomes "ON" condition and Tr1 becomes "ON" condition because the base current flows to Tr1 and also Tr2 becomes "ON" condition consequently because the base current flows to Tr2. When Tr2 becomes "ON", signal will be sent to the SCR (Thyristor) gate probe and SCR will become "ON" condition.

Then the SCR becomes conductive to the direction from point (C) to point (D). Namely at the state of this, the current generated from the AC generator gets through SCR without charging the battery and returns to AC generator again. At the end of this state, since the AC current generated from AC generator flows into the point (D), reverse current tends to flow to SCR, then the circuit of SCR turns to OFF mode and begins to charge the battery again. Thus these repetitions maintain charging voltage to the battery constant and protect it from overcharging.



INSPECTION**CHARGING OUTPUT CHECK**

Start the engine and keep it running at 5 000 r/min with the lighting switch turned High position.

Using the pocket tester, measure the DC voltage between the starter relay $\oplus$ terminal and ground. If the tester reads under 14V or over 15.5V, the regulator/rectifier is faulty.

NOTE:

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



STD charging output

14 — 15.5V (DC)
at 5 000 r/min

09900-25002

Pocket tester

AC GENERATOR NO-LOAD PERFORMANCE

Disconnect the three lead wires from the AC generator terminal.

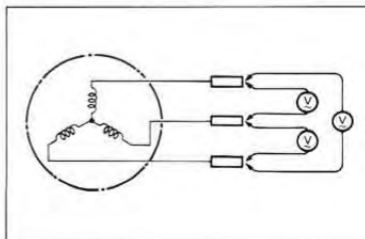
Start the engine and keep it running at 5 000 r/min.

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

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



STD No-load performance

80V (AC) or over
at 5 000 r/min

AC GENERATOR STATOR COIL

Using the pocket tester, check the continuity between the lead wires of the stator.

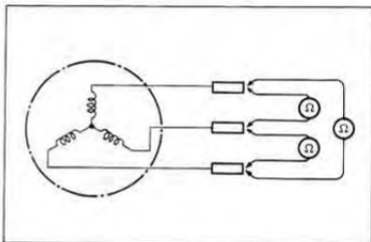
Also check that the stator core is insulated.

NOTE:

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

09900-25002

Pocket tester

**REGULATOR/RECTIFIER**

Using the pocket tester, measure the resistance between the read wires in the following table.

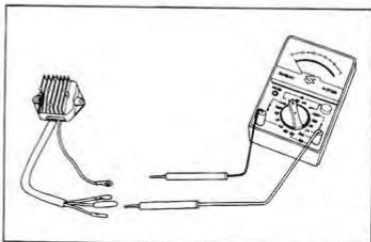
If the reading is incorrect, replace the regulator/rectifier.



Tester range: X1Ω

Unit: Ω

⊕ probe of tester	⊕ probe of tester					
	R	W/B	W/R	Y	B/W	
R		∞	∞	∞	∞	
W/B	5-6		∞	∞	∞	
W/R	5-6	∞		∞	∞	
Y	5-6	∞	∞		∞	
B/W	35-45	5-6	5-6	5-6		



BATTERY

DESCRIPTION

YUASA SYB14L-A2 vacuumsealed dry cell battery is furnished with every GS1100. This battery, when properly activated and initially charged, has a capacity of amperehours on a 14-hour rating basis. All necessary information is contained in the instructions given under the heading of INITIAL CHARGING METHOD. The battery's serviceable life depends mainly both on initial charge and on the attention it subsequently receives. Each GS1100 user should be reminded of the importance of giving proper care to their batteries.

SPECIFICATIONS

Type designation	SYB14L-A2
Battery voltage	12 volts
Standard electrolyte S.G.	1.280 (at 20°C or 68°F)

INITIAL CHARGING METHOD

Each new GS1100 motorcycle is delivered with the battery in a "vacuum-sealed dry" condition. The battery can be used after conducting the four following steps:

1. Initial electrolyte filling

Take the battery off the motorcycle, and place it on a battery servicing bench. Fill each cell to the upper level with electrolyte:

Dilute sulfuric acid solution with acid concentration of 34.6% by weight, having a specific gravity of 1.26 at 20°C (68°F). Electrolyte temperature, at the time of filling, should not be higher than 30°C (86°F).

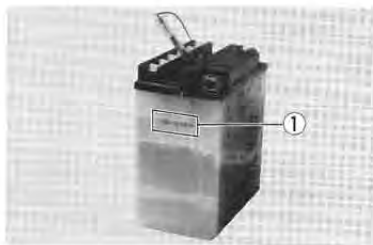
After filling, let the battery stand for about 30 minutes. Then, check electrolyte level in each cell and, if the level in any cell has fallen, add more electrolyte to bring it back to the upper level.

2. Initial charging duration

The acting materials on the cell plates have a store of energy equivalent to 75% of the rated capacity if the battery is new manufactured recently. This stored energy, however, dissipates spontaneously and progressively with lapse of time, so that, after filling it with electrolyte, the charging duration must be extended if a period of more than 6 months has elapsed since the date of manufacture (which is indicated on each battery as shown in picture). The standard initial charging duration being 20 hours. The charging time is to be determined according to the following schedule.

Age of dry battery (since manufacture)	Charging time
Up to 6 months	20 hours
Over 6 months or up to 9 months	30 hours
Over 9 months and up to 12 months	40 hours
Over 12 months	50 hours

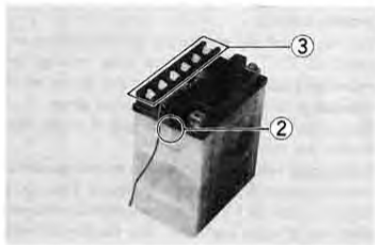
Date of manufacture ① is indicated by a threepart number, the leftmost part indicating for the month, the middle part the year, and the last part the day of the month.



3. Initial charging current

The constant-current method of charging is recommended for initial charging, and is carried out in the following manner.

- 1) Before turning on the charger, to which the filled battery is connected, remove the seal cap ② and cell caps ③. Make sure that the polarity marks are matched correctly.



- 2) Start charging, with the charger set for charging rate of amperes. While charging, occasionally check the electrolyte S.G. (specific gravity) and also the charging voltage, particularly towards the end of the charging time.
- 3) Towards the end of the charge, the electrolyte will start releasing gas bubbles and the voltage and S.G. will be up and leveling; if not, it is likely that the vacuum seal was damaged during transit or in storage. Continue charging, even in excess of the predetermined time, until the voltage and S.G. stay level, for one or two hours, with the battery allowed to continue releasing gas.

4. Electrolyte adjustment

After charging re-check the electrolyte S.G. to make sure it is 1.280 corrected for 20°C (68°F). Add distilled water, if necessary, to adjust the S.G. of each cell. Replace the caps, and wash the surfaces of the battery container with fresh water. Let the battery dry before mounting it on the motorcycle.

BATTERY SERVICING

Removal

1. Remove seat and right frame cover.
2. Remove rear master cylinder reservoir mounting bolt.
3. Take off air cleaner case by removing fitting bolt and loosen clamp screw.
4. Disconnect — lead wire and + lead wire.
5. Disconnect the breather hose and take off battery.

Installation

Before mounting the battery, make sure that the exterior surface of the battery container is dry and free from electrolyte. Be careful not to forget to re-connect the battery breather hose. The installing procedure is the reverse of removal.



Inspection

1. Visually inspect the surface of the battery. If signs of cracking or electrolyte leakage from the sides of the battery are noticed, replace the battery with a new one.
2. 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 or hot water, respectively.
3. Check the electrolyte level and add distilled water, if necessary, to raise the electrolyte in each cell to the upper level.

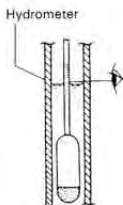
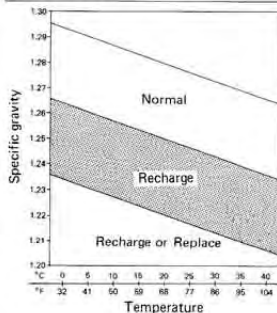
**S.G. Reading to corresponding temperature**

When reading specific gravity by using hydrometer, measure the temperature of the air firstly, and read the accurate specific gravity by the graph below.

If S.G. is less than normal range, recharge or replace the battery.

NOTE:

It needs recharging when the gravity reading is 1.24 at 20°C.



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

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

Do not permit the electrolyte temperature to exceed 45°C (113°F), at any time, during the recharging operation. Interrupt the operation, if necessary, to let the electrolyte cool down.

The battery is properly recharged if three conditions are met:

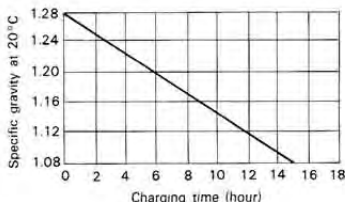
Recharging has been carried out to the specification indicated in the graph in figure Electrolyte S.G. has risen to 1.28 or higher and has remained there for at least one hour. The battery terminal voltage has risen to 15 — 16 volts or higher and has remained there for at least one hour. Gas bubbles are being released in every cell.

WARNING:

- * Before charging a battery, remove the seal cap from each cell.
- * Keep fire and sparks away from a battery being charged.

NOTE:

Constant-voltage charging, otherwise called "quick" charging, is not recommended for recharging because it may shorten the life of the battery.



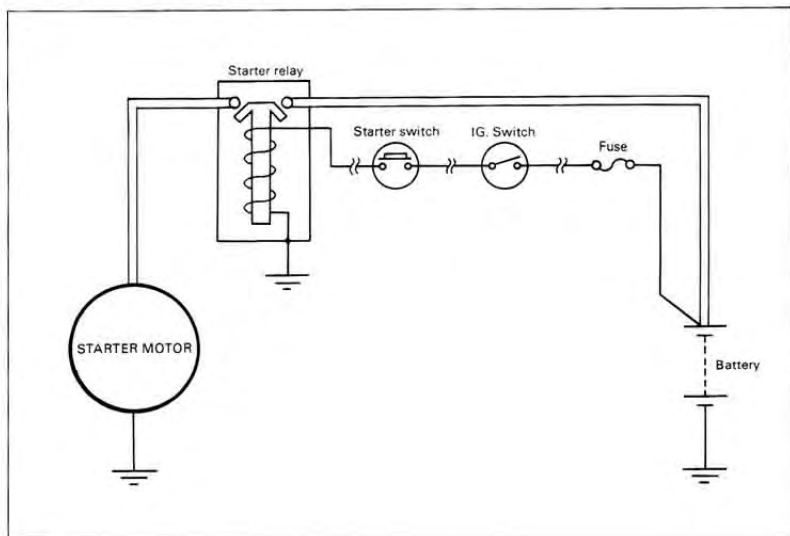
STARTER SYSTEM

DESCRIPTION

The starter system is operated by starter motor, starter relay, starter switch, ignition switch, and battery. The diagram below shows the electrical circuit of the system.

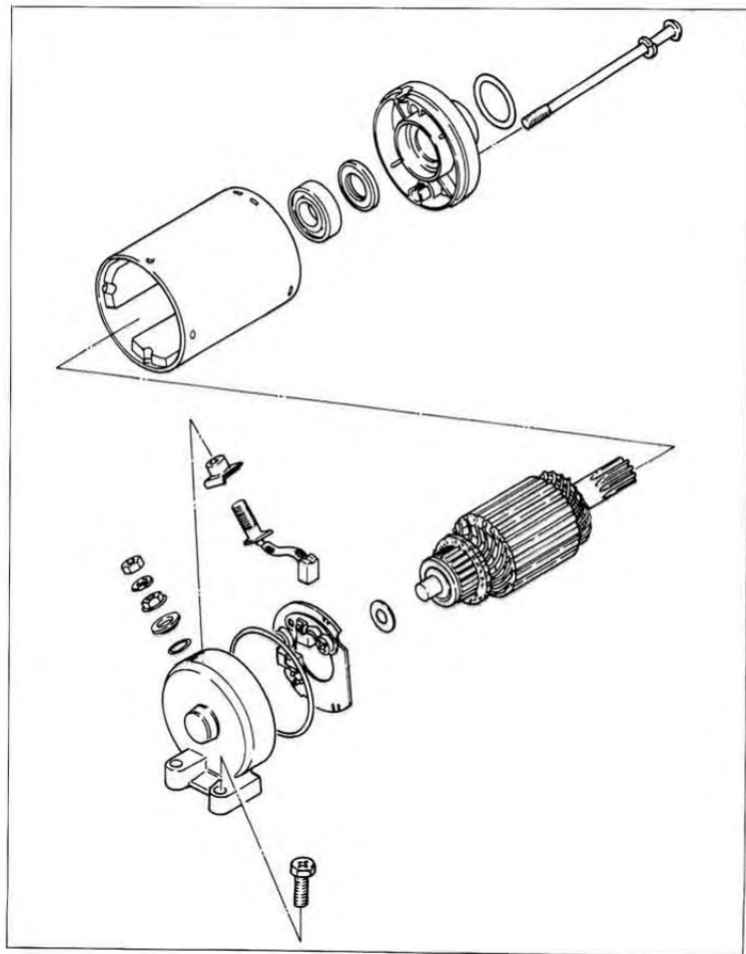
When the starter switch is "ON", the plunger is forced to link the main contact points of the relay by the magnetic power of the pull-in coil.

The current from the battery now flows to the starter motor through these connected points, and next the starter motor makes the engine start to run.



DISASSEMBLY

STARTER MOTOR CONSTRUCTION



INSPECTION

CARBON BRUSHES

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

Service Limit	6 mm (0.24 in)
---------------	----------------



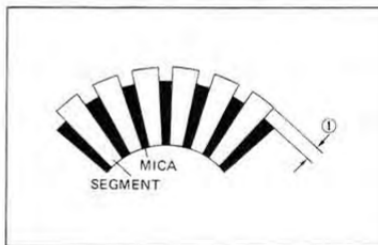
COMMUTATOR

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 wipe the commutator with a clean dry cloth.



Measure the commutator under cut ①.

Service Limit	0.2 mm (0.008 in)
---------------	-------------------



ARMATURE COIL

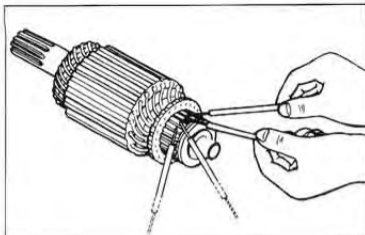
Using a pocket tester, check the coil for open and ground by placing probe pins on each commutator segment and rotor core (to test for ground) and on any two segments at various places (to test for open), with the brushes lifted off the commutator surface.

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



09900-25002

Pocket tester

**STARTER RELAY**

Disconnect lead wire of the starter motor at starter relay.

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

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



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

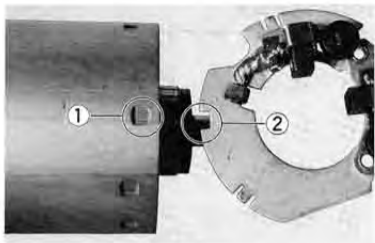
STD resistance

3 — 4 Ω 

REASSEMBLY

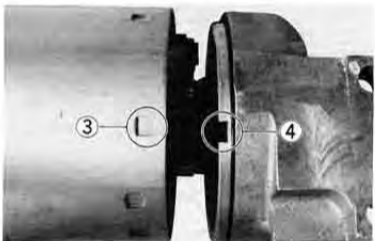
BRUSH HOLDER

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



HOUSING END

When installing housing end, fix the dent ③ of the brush holder to the groove ④ on the housing end.



SECURING SCREWS

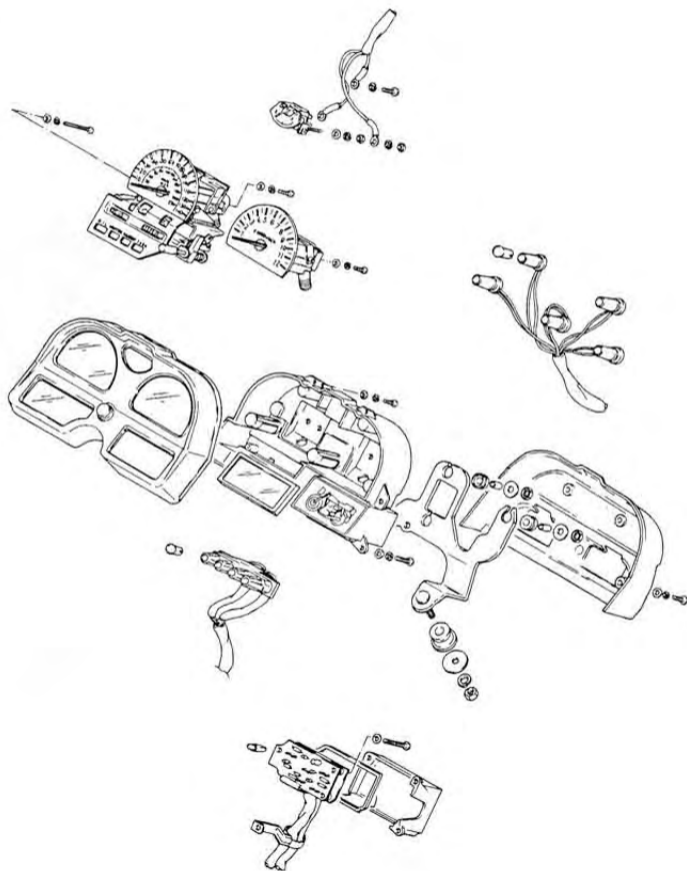
Apply Thread Lock "1342" to starter motor securing screws.



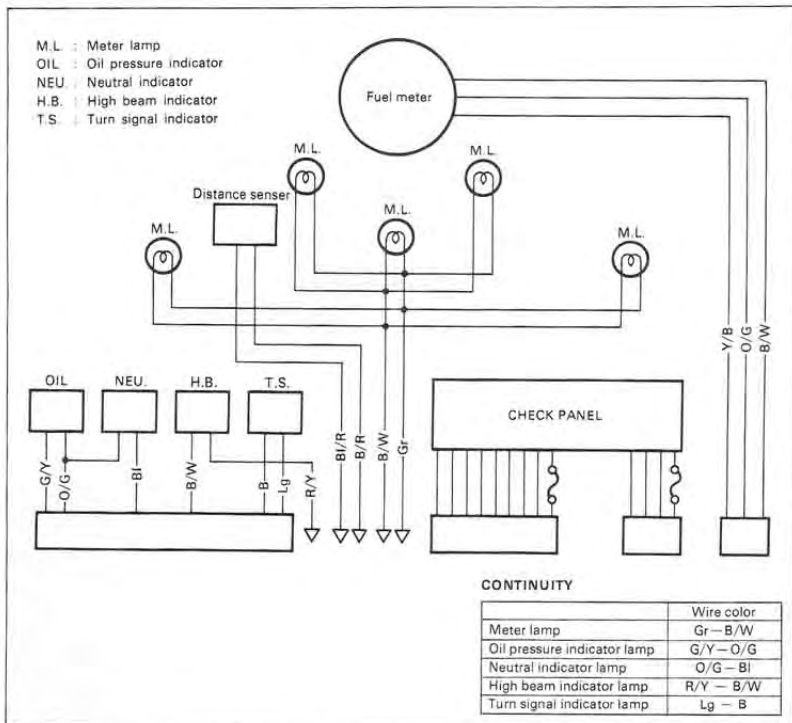
99000-32050	Thread Lock "1342"
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COMBINATION METER

DISASSEMBLY



INSPECTION DIAGRAM



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

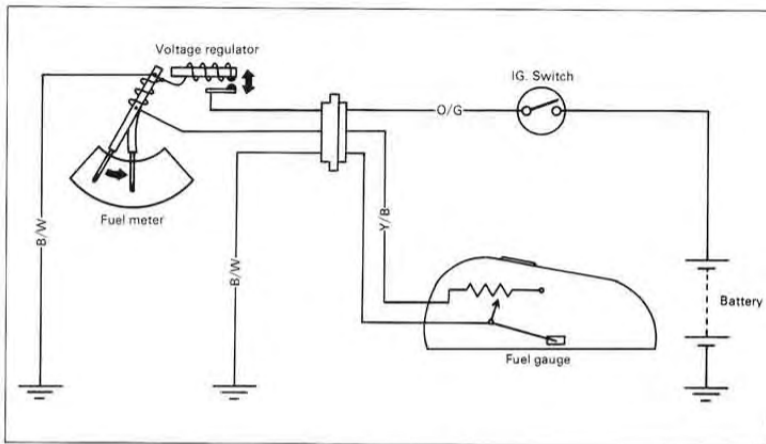
09900-25002

Pocket tester

NOTE:

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



FUEL METER**WIRING****FUEL METER**

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

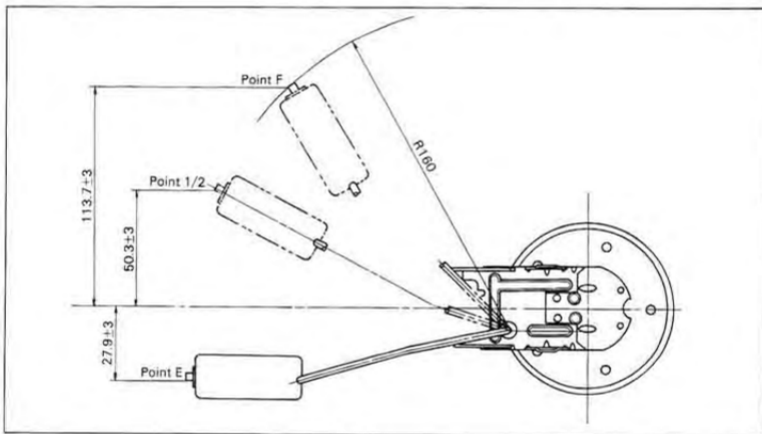


FUEL GAUGE

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

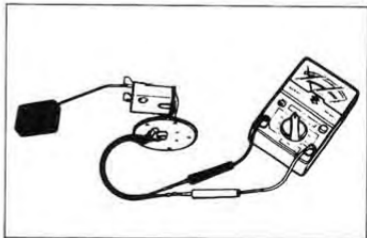
If the resistance measured is incorrect, replace the fuel gauge assembly with new one.

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



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

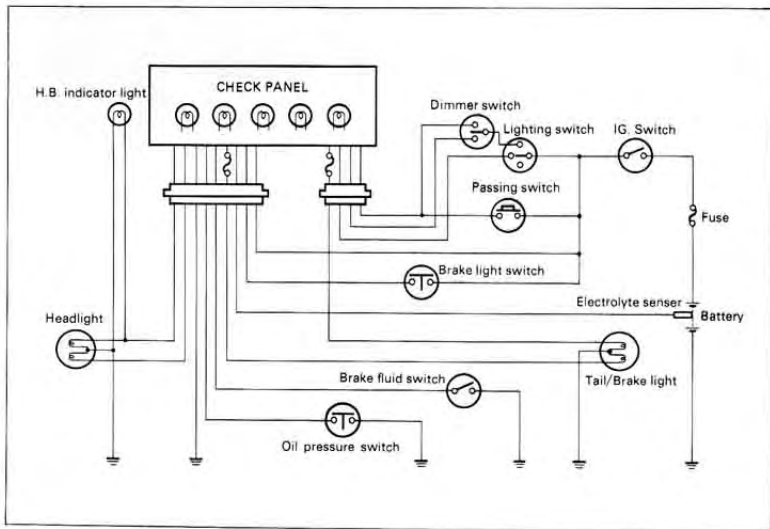
F	Approx.: 16L (16.9 US/qt)
H	Approx.: 9.5L (10.0 US/qt)
E	Approx.: 3L (3.2 US/qt)



CHECK PANEL

This motorcycle is equipped with a check panel.

This panel indicates if the bulb of head light, stop light, or tail light is in a sound condition, and if battery solution or rear brake fluid is kept at a specified level.



INSPECTION

Check the following items to see if the check panel is working properly.

If the items checked are in good order, replace the check panel.

- Circuit to and from the check panel.
- Fuses.
- Each bulb of indicator lights.
- Bulbs of headlight and tail/brake light.
- Brake fluid level sensor.
- Battery electrolyte level sensor.

NOTE:

None of the indicator works properly in the panel when oil pressure switch is out of order.

CAUTION:

Choose the fuse used for check panel circuit from the Suzuki genuine parts.

BRAKE FLUID LEVEL SENSOR

Check the continuity with the SUZUKI Pocket Tester after disconnecting the lead wire from the reservoir of rear master cylinder. The level gauge is working properly if the discontinuity is observed when the fluid is at the upper level, and if the continuity is observed when at the lower level – this can be also done by lowering the float. If neither of the observations can be found, replace the reservoir.

09900-25002

Pocket tester



BATTERY ELECTROLYTE LEVEL SENSOR

Check the voltage between the plus $\oplus$ terminal of battery and the level sensor. If the specified voltage is not observed, replace the level sensor.

NOTE:

The battery should be fully charged condition, and the solution be kept at an upper level.



STD voltage

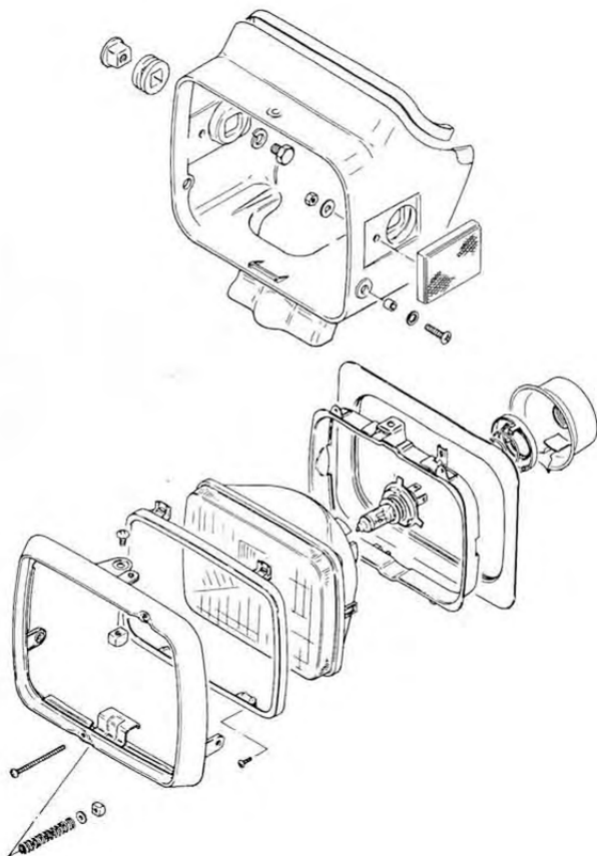
1.5 – 2.0V

BULBS

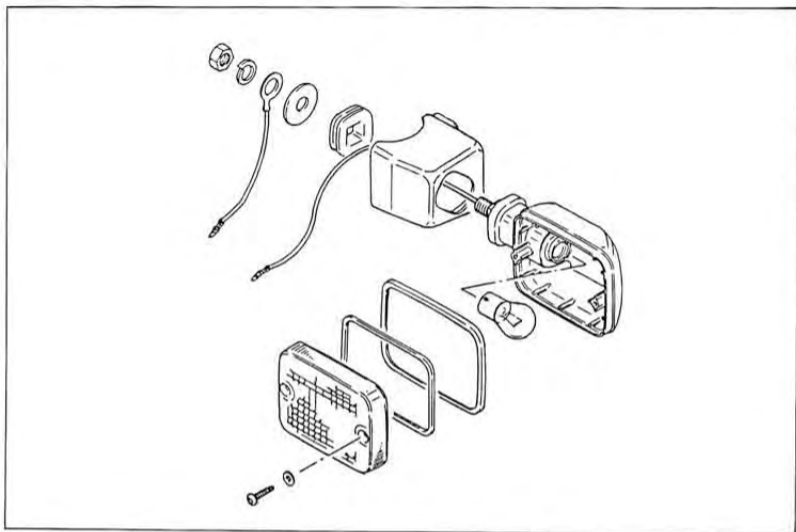
Check the continuity of bulbs of the headlight (Hl and LO), and tail/brake light.

LAMPS

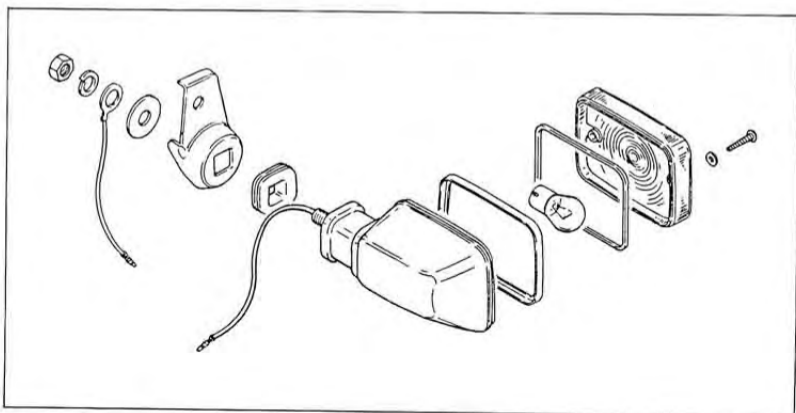
HEADLIGHT



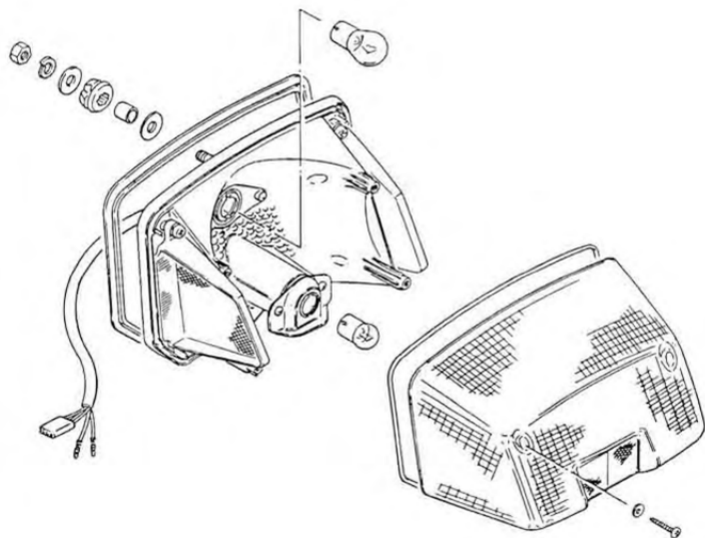
TURN SIGNAL LIGHT FRONT



REAR



TAIL/BRAKE LIGHT

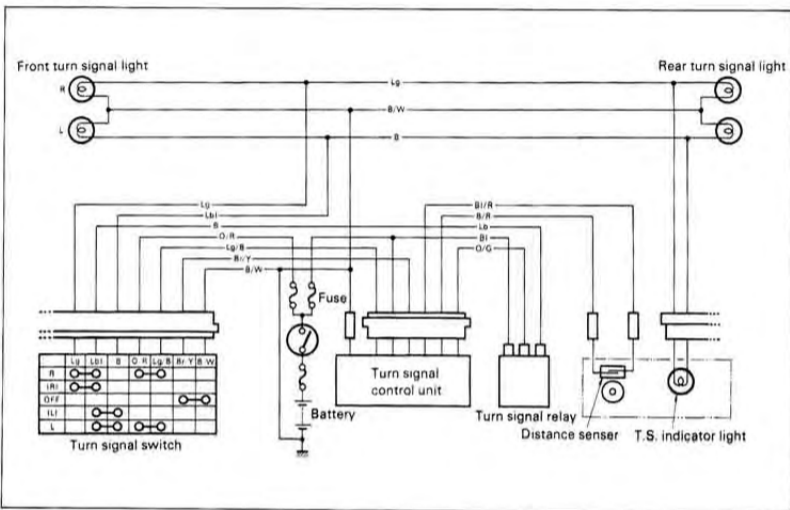


SELF CANCELLING DEVICE

DESCRIPTION

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

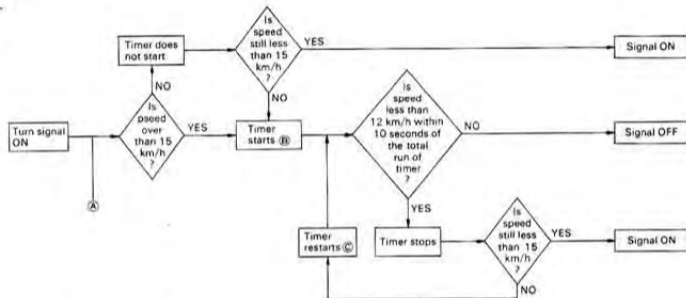
DIAGRAM



SELF CANCELLING DEVICE FUNCTIONS

TIMER SPECIFICATION:

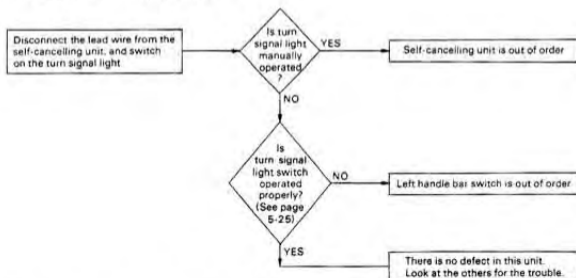
- * The speed at which the timer starts to run: 15 km/h.
- * The speed at which the timer stops: Less than 12 km/h.
- * The time during which the timer runs: 10 ± 1 seconds (= Time needed for discharge from the condenser.)
- * The timer calculates the amount of condenser discharge. Once the timer stops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



- (A) After the turn signal is on, any change of the switch cancels the device and reapply for the switch begins at this position again.
- (B) At the level that the condenser is fully charged.
- (C) At the level that the condenser is partially discharged.

INSPECTION

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



CAUTION:

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

SWITCHES

Inspect each switch for continuity with the pocket tester referring to the chart.

If any abnormality is found, replace the respective switch assembly with new one.

09900-25002

Pocket tester



IGNITION SWITCH

Wire color	R	O	Gr	Br
OFF				
ON	○	○	○	○
P	○			○



RIGHT HANDLEBAR SWITCH

ENGINE STOP SWITCH

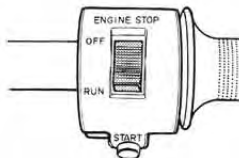
LIGHTING SWITCH

STARTER SWITCH



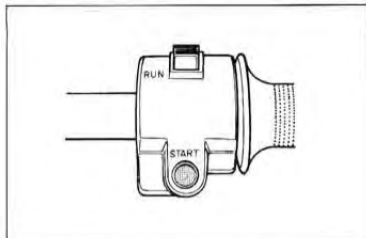
ENGINE STOP SWITCH

Wire color	O	D/W
RUN	○	○
OFF		



STARTER SWITCH

Wire color	O/W	Y/G
ON (Push)		
OFF		



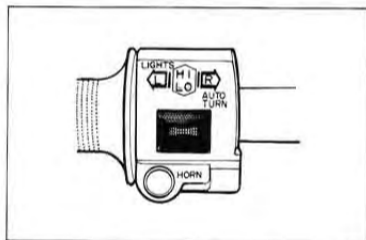
LEFT HANDLEBAR SWITCH
DIMMER AND PASSING SWITCH
TURN SIGNAL LIGHT SWITCH
HORN SWITCH

DIMMER SWITCH

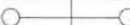
Wire color	W	Y	Y/W
HI			
LO			

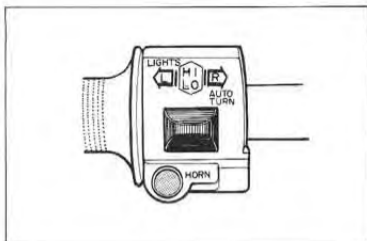
**TURN SIGNAL LIGHT SWITCH**

	B	Lbl	Lg
R			
●			
L			

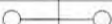


HORN SWITCH

	Y/W	B/W
OFF		
ON (Push)		



REAR BRAKE LIGHT SWITCH

Wire color	R/BI	O/G
OFF		
ON		



OIL PRESSURE LIGHT SWITCH

Continuity, when engine is stopped.

No continuity, when engine is running.

NOTE:

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



NEUTRAL INDICATOR LIGHT SWITCH

Position	Wire color	BI	Ground
1st, 2nd, 3rd, 4th and Top			
Neutral			



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GS1100LT

The Suzuki GS1100LT is a new 1980 model. This section has been produced to aid Suzuki mechanics in properly maintaining and repairing this motorcycle, which incorporate so many new and innovative changes. These technical improvements have further enhanced the comfort, handling and overall performance of this outstanding model.

Please also refer to the sections 1 through 11 for all other areas of information not covered in this section before performing any servicing works.

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VIEW OF SUZUKI GS1100LT



RIGHT SIDE



LEFT SIDE

SPECIFICATIONS

DIMENSIONS AND DRY MASS

Overall length	2 255 mm (88.8 in)
Overall width	905 mm (35.6 in)
Overall height	1 230 mm (48.4 in)
Wheelbase	1 530 mm (60.2 in)
Ground clearance	155 mm (6.1 in)
Seat height	810 mm (31.9 in)
Dry mass	237 kg (522 lbs)
Gross vehicle weight rating	516 kg (1 137 lbs)

ENGINE

Type	Four-stroke, air cooled, DOHC
Number of cylinders	4
Bore	72.0 mm (2.835 in)
Stroke	66.0 mm (2.598 in)
Piston displacement	1 075 cm ³ (65.6 cu.in)
Compression ratio	9.5 : 1
Carburetor	MIKUNI BS34SS, four
Air cleaner	Paper element
Starter system	Electric
Lubrication system	Wet sump

TRANSMISSION

Clutch	Wet multi-plate type
Transmission	5-speed constant mesh
Gearshift pattern	1-down, 4-up
Primary reduction	1.775 (87/49)
Final reduction	2.666 (40/15)
Gear ratios, Low	2.500 (35/14)
2nd	1.777 (32/18)
3rd	1.380 (29/21)
4th	1.125 (27/24)
Top	0.961 (25/26)
Drive chain	DAIDO D.I.D. 630YL or TAKASAGO RK630 GSV, 96 links

CHASSIS

Front suspension	Telescopic, pneumatic/coil spring, oil dampened
Rear suspension	Swinging arm, oil dampened, damper 4-way/spring 5-way adjustable
Steering angle	40° (right and left)
Caster	62°00'
Trail	103 mm (4.06 in)
Turning radius	2.8 m (9.2 ft)
Front brake	Disc brake, twin
Rear brake	Disc brake
Front tire size	100/90-19 57H
Rear tire size	130/90-16 67H
Front tire pressure	1.75 kg/cm ² , (24 psi) (Normal solo riding)
Rear tire pressure	2.00 kg/cm ² , (28 psi) (Normal solo riding)

ELECTRICAL

Ignition type	Transistorized
Ignition timing	12° B.T.D.C. below 1 500 r/min and 32° B.T.D.C. above 2 350 r/min
Spark plug	NGK D8EA or NIPPON DENSO X24ES-U
Battery	12V 50.4 kC (14 Ah)/10 HR
Generator	Three-phase A.C. generator
Fuse	10/10/10/10/15A

CAPACITIES

Fuel tank	15 L (4.0 US gal)
Engine oil	3.2 L (3.4 US qt)
Front fork oil	245 ml (8.28 US oz)

* Specifications subject to change without notice.

SERVICE DATA

VALVES + GUIDES

Unit: mm (in)

Item		Standard	Limit
Valve diam.	IN.	26.9 — 27.1 (1.06 — 1.07)	—
	EX.	22.9 — 23.1 (0.90 — 0.91)	—
Valve lift	IN.	7.0 (0.28)	—
	EX.	6.5 (0.26)	—
Valve Clearance (when cold)	IN./EX.	0.07 — 0.12 (0.003 — 0.005)	—
Valve guide to Valve stem clearance	IN.	0.025 — 0.052 (0.0010 — 0.0020)	0.35 (0.014)
	EX.	0.040 — 0.067 (0.0016 — 0.0026)	0.35 (0.014)
Valve guide I.D.	IN./EX.	5.500 — 5.512 (0.2165 — 0.2170)	—
Valve stem O.D.	IN.	5.460 — 5.475 (0.2150 — 0.2156)	—
	EX.	5.445 — 5.460 (0.2144 — 0.2150)	—
Valve stem runout	IN./EX.	—	0.05 (0.002)
Valve head thickness	IN./EX.	—	0.5 (0.02)
Valve stem end length	IN./EX.	—	3.6 (0.14)
Valve seat width	IN./EX.	0.9 — 1.1 (0.035 — 0.043)	—
Valve head radial runout	IN./EX.	—	0.03 (0.001)
Valve spring free length (IN./EX.)	INNER	—	31.9 (1.26)
	OUTER	—	35.6 (1.40)
Valve spring tension (IN./EX.)	INNER	4.4 — 6.4 kg (9.7 — 14.1 lbs) at length 28.5 mm (1.12 in)	—
	OUTER	6.5 — 8.9 kg (14.3 — 19.6 lbs) at length 32.0 mm (1.26 in)	—

CAMSHAFT + CYLINDER + HEAD

Unit: mm (in)

Item		Standard	Limit
Cam height	IN.	34.650 — 34.690 (1.3642 — 1.3657)	34.350 (1.3524)
	EX.	34.360 — 34.400 (1.3528 — 1.3543)	34.060 (1.3409)
Camshaft journal oil clearance	IN./EX.	0.020 — 0.054 (0.0008 — 0.0021)	0.150 (0.0059)
Camshaft journal holder I.D.	IN./EX.	22.000 — 22.013 (0.8661 — 0.8667)	—
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		—	157.80 (6.213)
Cam chain pin (at arrow "3")		20th pin	—
Rocker arm I.D.	IN./EX.	12.000 — 12.018 (0.9724 — 0.4731)	—
Rocker arm shaft O.D.	IN./EX.	11.973 — 11.984 (0.4714 — 0.4718)	—
Cylinder head distortion		—	0.2 (0.008)

PISTON + RING + CYLINDER

Unit: mm (in)

Item	Standard	Limit
Compression pressure	9 — 12 kg/cm ² (128 — 171 psi)	7 kg/cm ² (99.5 psi)
Compression pressure difference	—	2 kg/cm ² (28.4 psi)
Piston to Cylinder clearance	0.050 — 0.060 (0.0020 — 0.0024)	0.120 (0.0047)
Cylinder bore	72.000 — 72.015 (2.8346 — 2.8352)	72.080 (2.8378)
Piston dia.	71.945 — 71.960 (2.8325 — 2.8331) Measure 15.0 (0.59) from the piston skirt end.	71.880 (2.8299)
Cylinder distortion	—	0.2 (0.008)

Unit: mm (in)

Item		Standard	Limit
Piston ring free end gap:	1st	Approx. 9.5 (0.37)	7.6 (0.30)
	2nd	Approx. 11.0 (0.43)	8.8 (0.35)
Piston ring end gap:	1st	0.10 — 0.30 (0.004 — 0.012)	0.7 (0.03)
	2nd	0.10 — 0.30 (0.004 — 0.012)	0.7 (0.03)
Piston ring groove clearance:	1st	—	0.180 (0.0071)
	2nd	—	0.150 (0.0059)
Piston ring groove width:	1st	1.03 — 1.05 (0.040 — 0.041)	—
	2nd	1.21 — 1.23 (0.047 — 0.048)	—
	Oil	2.51 — 2.53 (0.099 — 0.100)	—
Piston ring thickness:	1st	0.975 — 0.990 (0.0384 — 0.0390)	—
	2nd	1.170 — 1.190 (0.0461 — 0.0469)	—
Piston pin bore		18.001 — 18.006 (0.7087 — 0.7089)	18.030 (0.7098)
Piston pin O.D.		17.996 — 18.000 (0.7085 — 0.7086)	17.980 (0.7079)

CRANKSHAFT

Unit: mm (in)

Item	Standard	Limit
Conrod small end I.D.	18.006 — 18.014 (0.7089 — 0.7092)	18.040 (0.7102)
Conrod deflection	—	3.0 (0.12)
Conrod big end side clearance	0.10 — 0.65 (0.004 — 0.026)	1.00 (0.039)
Crankshaft runout	—	0.1 (0.004)

OIL PUMP

Unit: mm (in)

Item	Standard	Limit
Oil pump reduction ratio	1.723 (87/49 × 33/34)	—
Oil pressure (at 60°C, 140°F):	Above 0.1 kg/cm ² (1.42 psi), Below 0.5 kg/cm ² (7.11 psi) at 3000 r/min	—
Tip clearance	—	0.20 (0.008)
Outer rotor clearance	—	0.25 (0.010)
Side clearance	—	0.15 (0.006)

CLUTCH

Unit: mm (in)

Item	Standard	Limit
Clutch cable play	2 — 3 (0.08 — 0.12)	—
Drive plate thickness	2.9 — 3.1 (0.11 — 0.12)	2.6 (0.10)
Drive plate claw width	15.6 — 15.8 (0.61 — 0.62)	14.8 (0.58)
Driven plate thickness	2.00 ± 0.06 (0.080 ± 0.002)	—
Driven plate distortion	—	0.1 (0.004)
Clutch spring free length	—	38.5 (1.52)

TRANSMISSION

Unit: mm (in)

Item		Standard	Limit
Primary reduction ratio		1.775 (87/49)	—
Final reduction ratio		2.666 (40/15)	—
Gear ratios:	Low	2.500 (35/14)	—
	2nd	1.777 (32/18)	—
	3rd	1.380 (29/21)	—
	4th	1.125 (27/24)	—
	Top	0.961 (25/26)	—
Shift fork to Groove clearance		0.40 — 0.60 (0.016 — 0.024)	0.80 (0.031)
Shift fork groove width		5.45 — 5.55 (0.215 — 0.219)	—
Shift fork thickness		4.95 — 5.05 (0.195 — 0.199)	—
Countershaft length (Low to 2nd)		111.4 — 111.5 (4.386 — 4.390)	—
Drive chain:	Type	DAIDO: D.I.D.: 630 YL or TAKADAGO: RK630GSV	—
	Links	96	—
	20 pitch length	—	383.0 (15.08)
Drive chain slack		20 — 30 (0.8 — 1.2)	—

CARBURETOR

Unit: mm (in)

Item	Specification
Carburetor type	MIKUNI BS34SS
Bore size	34 (1.34)
I.D. No.	49200
Idle r/min	1 050 $\pm$ 100 r/min
Fuel level	5.0 $\pm$ 0.5 (0.20 $\pm$ 0.02)
Float height	22.4 $\pm$ 1.0 (0.88 $\pm$ 0.04)
Main jet (M.J.)	#107.5
Main air jet (M.A.J.)	1.2
Jet needle (J.N.)	5D58
Needle jet (N.J.)	X-1
Pilot jet (P.J.)	#45
Bypass (B.P.)	0.8, 0.8, 0.8
Pilot outlet (P.O.)	0.9
Valve seat (V.S.)	2.0
Starter jet (G.S.)	#32.5
Pilot screw (P.S.)	PRE-SET
Throttle cable play	0.5 – 1.0 (0.02 – 0.04)

ELECTRICAL

Unit: mm (in)

Item	Specification	
Ignition timing	12° B.T.D.C. below 1 500 ± 150 r/min and 32° B.T.D.C. above 2 350 ± 150 r/min	
Firing order	1, 2, 4, 3	
Spark plug:	Type	NGK: D8EA N.D.: X24ES-U
	Gap	0.6 — 0.7 (0.024 — 0.028)
Spark performance	Over 8 (0.3) at 1 atm	
Signal coil resistance	Approx. 290 — 360Ω (BI-G)	
Ignition coil resistance:	Primary	O/W — W or B/Y Approx. 3 — 5Ω
	Secondary	Plug cap — Plug cap Approx. 31 — 33 kΩ
Generator No-Load voltage	More than 80V (AC) at 5 000 r/min	
Regulated voltage	14.0 — 15.5V at 5 000 r/min	
Starter motor:	Brush length	Limit: 9 (0.4)
	Commutator under cut	Limit: 0.2 (0.008)
Starter relay resistance	Approx. 3 — 4Ω	
Battery:	Type designation	YB14L-A2
	Capacity	12V 50.4 kC (14 Ah)/10HR
	Standard electrolyte S.G.	1.28 at 20°C (68°F)
Fuse size:	Head	10A
	Signal	10A
	Ignition	10A
	Main	15A
	Output terminal	10A

BRAKE + WHEEL

Unit: mm (in)

Item		Standard	Limit
Rear brake pedal height		15 (0.6)	—
Brake disc thickness:	Front	5.0 ± 0.2 (0.20 ± 0.008)	4.5 (0.18)
	Rear	6.7 ± 0.2 (0.26 ± 0.008)	6.0 (0.24)
Brake disc runout		—	0.30 (0.012)
Master cylinder bore:	Front	15.870 — 15.913 (0.6248 — 0.6265)	—
	Rear	14.000 — 14.043 (0.5512 — 0.5529)	—
Master cylinder piston diam.	Front	15.811 — 15.838 (0.6225 — 0.6235)	—
	Rear	13.957 — 13.984 (0.5495 — 0.5506)	—
Brake caliper cylinder bore:	Front	38.180 — 38.219 (1.5031 — 1.5047)	—
	Rear	38.180 — 38.256 (1.5031 — 1.5061)	—
Brake caliper piston diam.	Front	38.025 — 38.050 (1.4970 — 1.4980)	—
	Rear	38.098 — 38.148 (1.4999 — 1.5019)	—
Wheel rim runout:	Axial	—	2.0 (0.08)
	Radial	—	2.0 (0.08)
Wheel axle runout:	Front	—	0.25 (0.01)
	Rear	—	0.25 (0.01)
Tire size:	Front	100/90-19 57H	—
	Rear	130/90-16 67H	—
Tire tread depth:	Front	—	1.6 (0.06)
	Rear	—	2.0 (0.08)

SUSPENSION

Unit: mm (in)

Item	Standard	Limit
Front fork stroke	160 (6.3)	—
Front fork spring free length	—	516 (20.3)
Front fork oil level	260 (10.2)	—
Front fork air pressure	0.8 kg/cm ² (11.38 psi)	—
Rear wheel travel	108 (4.25)	—
Swinging arm pivot shaft runout	—	0.3 (0.012)

TIRE PRESSURE

Cold inflation tire pressure	Normal riding				Continuous high speed riding			
	Solo riding		Dual riding		Solo riding		Dual riding	
	kg/cm ²	psi	kg/cm ²	psi	kg/cm ²	psi	kg/cm ²	psi
Front	1.75	24	2.00	28	2.00	28	2.25	32
Rear	2.00	28	2.25	32	2.25	32	2.80	40

FUEL + OIL CAPACITY

Item		Specification
Fuel type		Use only unleaded or low-lead type gasoline of at least 85 — 95 pump octane ($\frac{R+M}{2}$ method) or 89 octane or higher rated by research method.
Fuel tank		15 L (4.0 US gal)
Engine oil type		SAE 10W/40
Engine oil capacity:	Change	3 200 ml (3.4 US qt)
	Filter change	3 600 ml (3.8 US qt)
	Overhaul	4 000 ml (4.2 US qt)
Front fork oil type		Fork oil #15
Front fork oil capacity (each leg)		245 ml (8.28 US oz)
Brake fluid type		DOT3 or DOT 4

WATTAGE

Unit: W (cp)

Item		Specification
Headlight	HI	60
	LO	55
Tail/Brake light		8/23 (3/32)
Turn signal light		23 (32)
Speedometer light		3.4
Tachometer light		3.4
Turn signal indicator light		3.4
High beam indicator light		3.4
Neutral indicator light		3.4
Oil pressure indicator light		3.4
License light		8 (4)

TORQUE TABLE

ENGINE

Item	Thread dia.	kg-m	lb-ft
Cylinder head cover bolt	6	0.9 – 1.0	6.5 – 7.0
Cylinder head bolt	6	0.7 – 1.1	5.0 – 8.0
Cylinder head nut	10	3.5 – 4.0	25.5 – 29.0
Rocker arm shaft stopper bolt	6	0.8 – 1.0	6.0 – 7.0
Valve clearance adjuster lock nut	5	0.9 – 1.1	6.5 – 8.0
Camshaft cap bolt	6	0.8 – 1.2	6.0 – 8.5
Camshaft sprocket bolt (See page 13-14)	6	0.9 – 1.2	6.5 – 8.5
Cam chain tensioner fitting bolt	6	0.6 – 0.8	4.5 – 6.0
Cam chain tensioner shaft ass'y	24	3.1 – 3.5	22.0 – 25.5
Cam chain tensioner adjuster lock shaft nut	8	0.9 – 1.4	6.5 – 10.0
Cam chain guide bolt	8	0.9 – 1.4	6.5 – 10.0
Generator rotor nut	16	16.0 – 17.0	115.5 – 123.0
Starter clutch allen bolt	8	1.5 – 2.0	11.0 – 14.5
Governor center bolt	8	1.3 – 2.3	9.5 – 16.5
Crankcase bolt (6 mm)	6	0.9 – 1.3	6.5 – 9.5
Crankcase bolt (8 mm)	8	2.0 – 2.4	14.5 – 17.0
Starter motor bolt	6	0.4 – 0.7	3.0 – 5.0
Oil pan bolt	6	1.0	7.0
Oil filter cover nut	6	0.6 – 0.8	4.5 – 6.0
Neutral stopper housing	14	1.8 – 2.8	13.0 – 20.0
Gearshift arm stopper	8	1.5 – 2.3	11.0 – 16.5
Clutch sleeve hub nut	24	5.0 – 7.0	36.0 – 50.5
Clutch spring bolt	6	1.1 – 1.3	8.0 – 9.5
Engine sprocket nut (See page 15-13)	25	9.0 – 10.0	65.0 – 72.5
Engine mounting bolt (A) (10 mm)	10	4.5 – 5.5	32.5 – 40.0
Engine mounting bolt (B) (10 mm)	10	3.0 – 3.7	21.5 – 27.0
Engine mounting bolt (C) (8 mm)	8	2.0 – 3.0	14.5 – 21.5
Gearshift lever bolt	8	1.3 – 2.3	9.5 – 16.5
Clutch release arm bolt	6	0.6 – 1.0	4.5 – 7.0

CHASSIS

Item	Thread dia.	kg-m	lb-ft
Disc bolt	8	1.5 — 2.5	11.0 — 18.0
Front axle nut	12	3.6 — 5.2	26.0 — 37.5
Front axle pinch bolt	8	1.5 — 2.5	11.0 — 18.0
Front caliper mounting bolt	10	2.5 — 4.0	18.0 — 29.0
Front caliper axle bolt	12	4.0 — 5.5	29.0 — 40.0
Brake hose union bolt	10	2.0 — 2.5	14.5 — 18.0
Caliper air bleeder	7	0.7 — 0.9	5.0 — 6.5
Front fork damper rod nut	14	2.5 — 3.5	18.0 — 25.5
Air valve	10	1.0 — 1.3	7.0 — 9.5
Front fork lower clamp bolt	8	1.5 — 2.5	11.0 — 18.0
Front fork upper clamp bolt	10	2.0 — 3.0	14.5 — 21.5
Front fork cap bolt	30	1.5 — 3.0	11.0 — 21.5
Steering stem nut	25	4.0 — 5.0	29.0 — 36.0
Steering stem clamp bolt	8	1.5 — 2.5	11.0 — 18.0
Steering stem head nut	18	3.5 — 5.0	25.5 — 36.0
Handlebar clamp bolt	8	1.2 — 2.0	8.5 — 14.5
Front master cylinder clamp bolt	5	0.5 — 0.8	3.5 — 6.0
Front footrest bolt	10	2.7 — 4.3	19.5 — 31.0
Swinging arm pivot nut	14	5.5 — 8.5	40.0 — 61.5
Brake pedal arm bolt	8	1.0 — 1.5	7.0 — 11.0
Rear master cylinder mounting bolt	8	1.5 — 2.5	11.0 — 18.0
Rear torque link nut	10	2.0 — 3.0	14.5 — 21.5
Rear caliper mounting bolt	10	2.5 — 4.0	18.0 — 29.0
Rear caliper bolt	10	2.0 — 3.0	14.5 — 21.5
Muffler bracket nut	8	1.5 — 2.0	11.0 — 14.5
Rear shock absorber fitting bolt or nut	10	2.0 — 3.0	14.5 — 21.5
Rear footrest bolt	10	2.7 — 4.3	19.5 — 31.5
Rear sprocket nut	10	2.5 — 4.0	18.0 — 29.0
Rear axle nut	16	8.5 — 11.5	61.5 — 83.0
Chain adjuster support bolt	8	1.5 — 2.0	11.0 — 14.5

SPECIAL MATERIALS

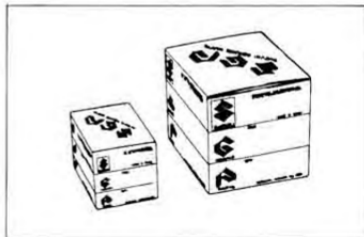
The materials listed below are needed for maintenance work on the GS1100L, and should be kept on hand for ready use. They supplement such standard materials as cleaning fluids, lubricants, emery cloth and the like. How to use them and where to use them is described in this manual.

MATERIAL	PART
 SUZUKI SUPER GREASE "A" 99000-25030	• Oil seals • Throttle grip • Cables (speedometer and tachometer) • Front wheel bearings • Center stand spacer • Rear sprocket mounting drum oil seal • Swinging arm bearing and dust seal • Brake pedal rod arm • Ignition timing governor link • Steering stem bearing
 SUZUKI SILICONE GREASE 99000-25100	• Caliper axle shaft
 SUZUKI MOLY PASTE 99000-25140	• Valve stem • Cam shaft journal • Chain tensioner adjuster shaft • Drive shaft
 SUZUKI BOND #1207B 99104-31140	• Mating surface of upper and lower crankcase • Mating surface of crankcase and clutch cover, generator cover • Cylinder head cover
 THREAD LOCK SUPER "1333B" 99000-32020	• Cam chain guide holder screw • Cam chain guide bolt • Cam chain guide screw • Starter clutch allen bolt • Engine sprocket damper screw • Muffler cover screw

MATERIAL	PART
 THREAD LOCK SUPER "1303" 99000-32030	• Countershaft 2nd drive gear • Cam sprocket allen bolt • Generator rotor nut
 THREAD LOCK CEMENT 99000-32040	• Carburetor upper bracket plate set screw • Carburetor lower bracket plate screw • Carburetor starter shaft lock screw • Oil separator plate screw • Cylinder stud bolt • Oil filter cap nut • Engine sprocket spacer inner surface • Camshaft end cap screw
 THREAD LOCK "1342" 99000-32050	• Generator stator securing screw • Generator stator lead wire screw • Gearshift cam stopper bolt • Starter motor securing bolt • Drive shaft plate screw • Countershaft B/g retainer screw • Oil gallery plate screw • Engine oil pump set screw • Engine oil pump housing screw • Gearshift cam pawl screw • Gearshift cam guide screw • Engine oil sump filter screw • Carburetor throttle stop plate screw • Starter motor housing screw • Front fork damper rod bolt and nut

USE OF SUZUKI GENUINE PARTS

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



PERIODIC MAINTENANCE SCHEDULE

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

NOTE:

Vehicles operated under severe conditions may require more frequent servicing.

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

PERIODIC MAINTENANCE CHART

INTERVAL: THIS INTERVAL SHOULD BE JUDGED BY ODOMETER READING OR MONTHS, WHICHEVER COMES FIRST	mile	600	4 000	7 500	11 000	15 000
	km	1 000	6 000	12 000	18 000	24 000
	month	2	12	24	36	48
Battery		—	I	I	I	I
Cylinder head nuts and exhaust pipe bolts		T	T	T	T	T
Air cleaner element	Clean every 2 000 miles (3 000 km), and replace every 7 500 miles (12 000 km)					
Valve clearance		I	I	I	I	I
Spark plug		—	C	R	C	R
Carburetor idle rpm		I	I	I	I	I
Fuel line	Replace every two years.					
Engine oil and oil filter		R	R	R	R	R
Clutch		I	I	I	I	I
Drive chain		I	I	I	I	I
	Clean and lubricate every 600 miles (1 000 km).					
Brakes		I	I	I	I	I
Brake hose	Replace every two years.					
Tire		I	I	I	I	I
Steering		I	I	I	I	I
Front fork		—	—	I	—	I
	Check air pressure every 6 months					
Chassis bolts and nuts		T	T	T	T	T

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

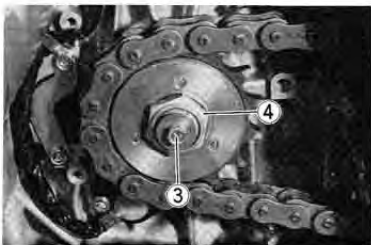
ENGINE SPROCKET

REMOVAL

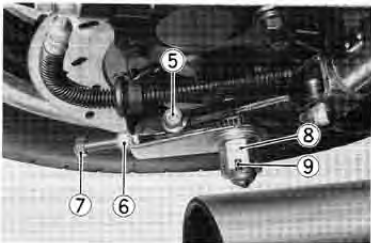
- Remove gearshift lever ① and left footrest ②, and then remove the engine sprocket cover.



- Remove the sprocket nut stopper bolt ③, and remove engine sprocket nut ④ while depressing rear brake pedal.



- Loosen rear axle stopper bolts ⑤, lock nuts ⑥, adjuster bolts ⑦, and torque link mounting nut. Then loosen rear axle nut ⑧ after pulling out cotter pin ⑨.
- Push rear wheel forward, and disengage drive chain from rear sprocket.



- Disengage drive chain from engine sprocket, and remove engine sprocket.



INSTALLATION

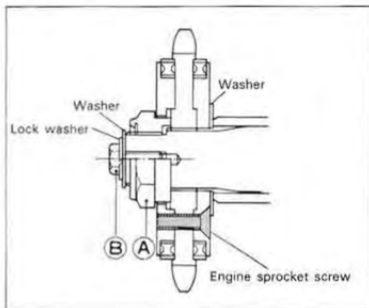
Reinstall the engine sprocket in the reverse of engine sprocket removal.

NOTE:

Install the engine sprocket with the sprocket screw head facing inward, and tighten it with the engine sprocket nut, as shown in the below figure. Be sure to place the washer between the spacer and the engine sprocket.

	N-m	kg-m	lb-ft
Engine sprocket nut A	90—100	9.10—10.0	56.0—72.5
Sprocket nut stopper bolt B	6—9	0.6—0.9	4.5—6.5

See page 15-13 for tightening torque.



DRIVE CHAIN ADJUSTING

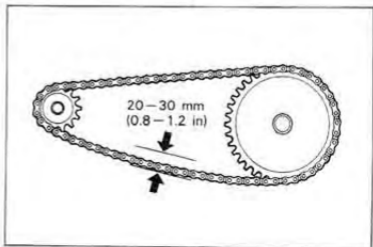
- Tighten the adjuster bolt ① until the chain has 20—30 mm (0.8—1.2 in) of sag at the middle between engine and rear sprockets. The mark ② on both chain adjusters must be at the same position on the scale to ensure that the front and rear wheels are correctly aligned. Place on center stand for accurate adjustment.



Standard	20—30 mm (0.8—1.2 in)
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Tightening torque

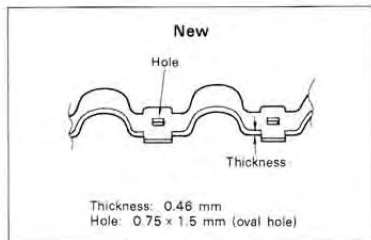
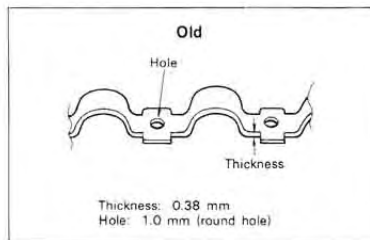
	N-m	kg-m	lb-ft
Rear axle nut	85—115	8.5—11.5	61.5—83.0
Rear torque link nut	20—30	2.0—3.0	14.5—21.5



PISTON OIL RING SPACER

MODIFICATION

- Thickness of spacer and shape of oil path hole are changed as shown in the figure below.

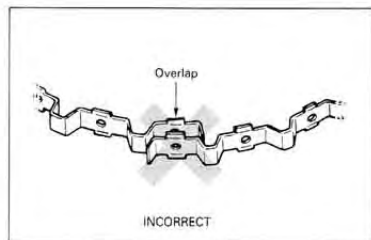
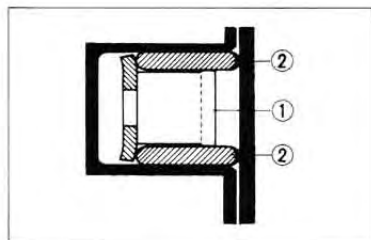


INSTALLATION

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

CAUTION:

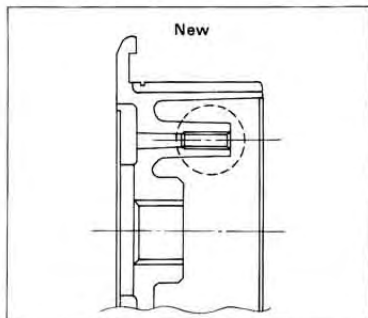
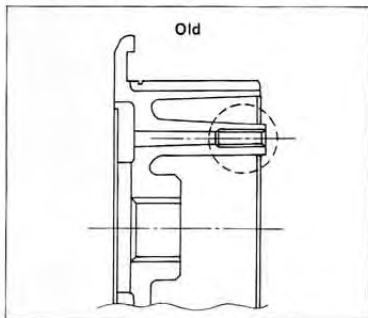
When mounting the spacer, be careful not to allow its two ends to overlap in the groove.



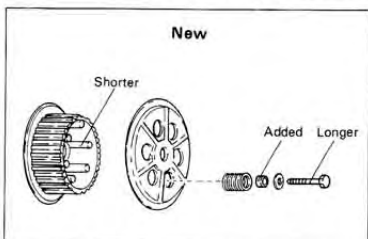
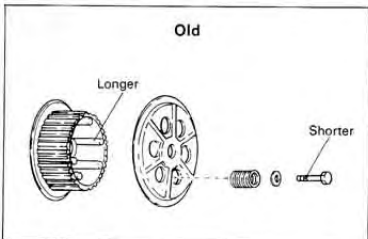
CLUTCH SLEEVE HUB

MODIFICATION

- The boss part of sleeve hub are changed as shown in the figure below.



- Distinction between old type and new type of clutch sleeve hub can tell the difference of height of boss part for the clutch sleeve hub bolt. Old type has a higher boss part than that of new type. For new type longer bolt should be employed and spacer is added on the boss to fulfill the difference.



INSTRUMENTS

REMOVAL

- Remove the seat.
- Take off the fuel tank.

NOTE:

When taking off the fuel tank, disconnect fuel hose, vacuume hose, and fuel gauge lead wires.

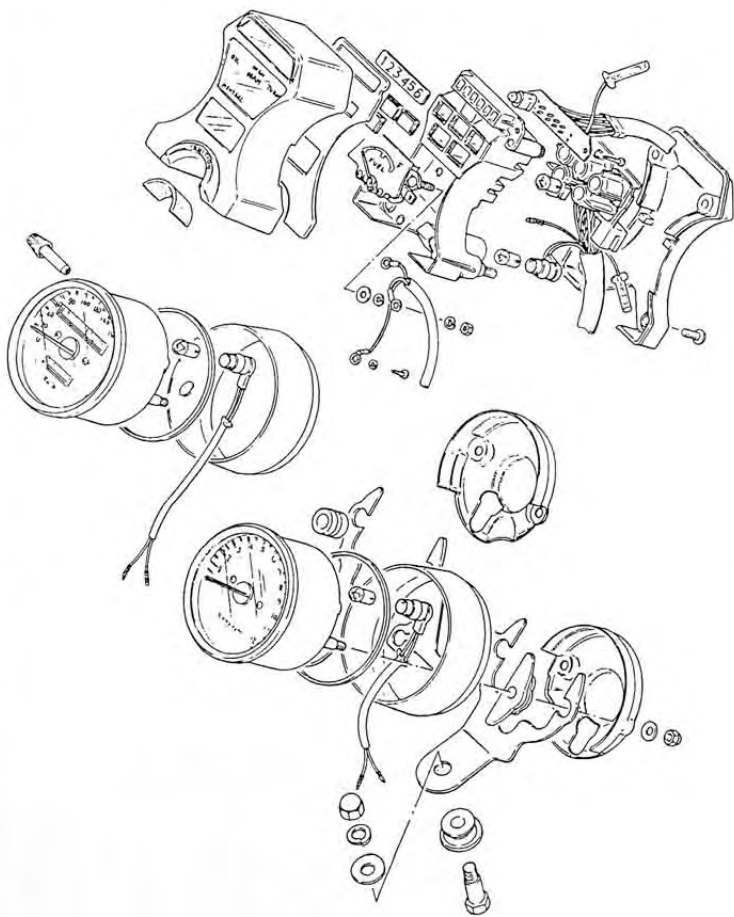
- Disconnect the coupler from combination meter.

- Remove the headlight from headlight housing and disconnect the couplers from combination meter.
- Disconnect speedometer and tachometer cables.

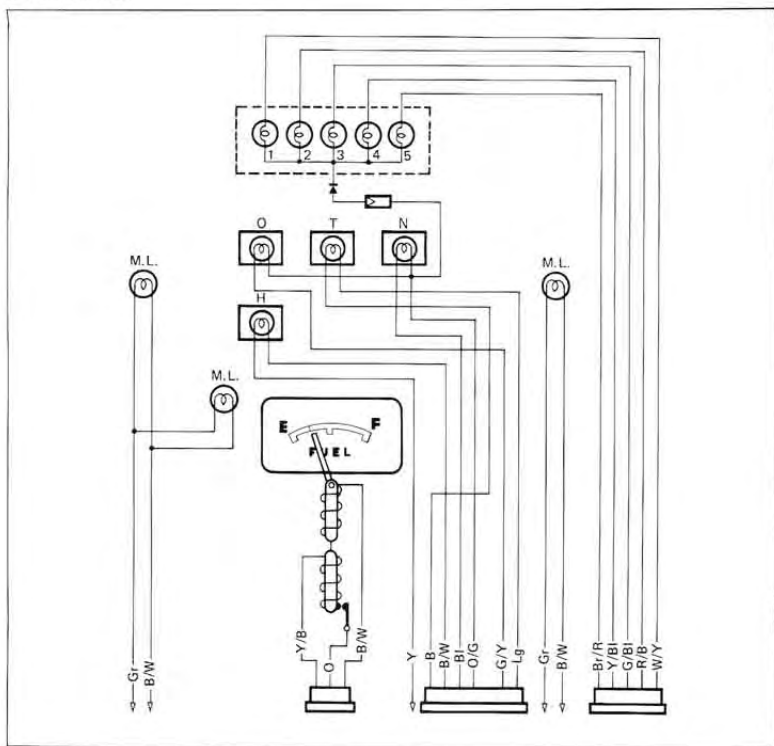
- Remove two mounting nuts and take off the combination meter.



DISASSEMBLY



INSPECTION



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

NOTE:

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



FUEL METER

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



FUEL GAUGE

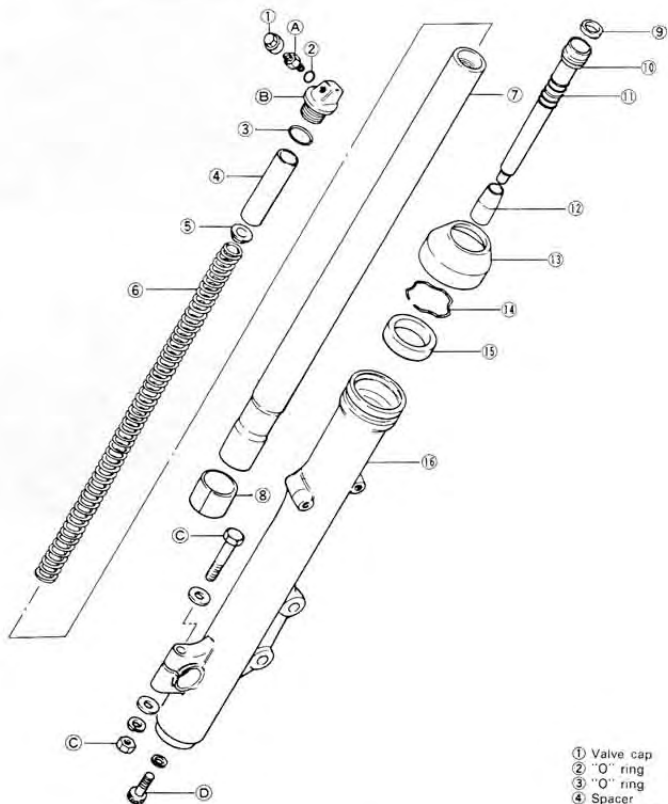
Remove the lead wires coming out of the fuel gauge and check resistance of each of them. If the resistance measured is incorrect, replace the fuel gauge assembly with new one.

09900-25002	Pocket tester
-------------	---------------

POSITION	RESISTANCE
FULL	Approx. 7 Ω
1/2	Approx. 32.5 Ω
ENP	Approx. 95 Ω



FRONT FORK



- ① Valve cap
- ② "O" ring
- ③ "O" ring
- ④ Spacer
- ⑤ Spring guide
- ⑥ Fork spring
- ⑦ Inner tube
- ⑧ Metal
- ⑨ Damper rod ring
- ⑩ Damper rod
- ⑪ Rebound spring
- ⑫ Oil lock piece
- ⑬ Dust cover
- ⑭ Snap ring
- ⑮ Oil seal
- ⑯ Outer tube

Tightening torque

	N·m	kg·m	lb·ft
(A)	10 - 13	1.0 - 1.3	7.0 - 9.5
(B)	15 - 30	1.5 - 3.0	11.0 - 21.5
(C)	15 - 25	1.5 - 2.5	11.0 - 18.0
(D)	20 - 25	2.0 - 2.5	14.5 - 18.0

REMOVAL AND DISASSEMBLY

- Remove front wheel.
- Take off the brake caliper and disconnect speedometer cable guide.



- Remove front fender.



- Remove valve cap and push in the air valve to relieve the air pressure completely.



- Loosen the steering stem upper and lower clamp bolts.

NOTE:

Slightly loosen the front fork cap bolt to facilitate later disassembly after loosening upper clamp bolt.



- Pull down right and left front fork assemblies.



- Remove front fork bolt, spacer, spring guide and fork spring.



- Invert the fork and stroke it several times to let out the oil inside.
Under this condition (inverted condition), hold the fork for a few minutes.



- Remove damper rod securing bolt by using special tools.

09940-34520	"T" handle
09940-34561	Attachment "D"
09914-25811	"T" type hexagon wrench



- Draw out damper rod and rebound spring.



- Draw out inner tube and oil lock piece.



- Draw out inner tube metal.

CAUTION:

The removed inner tube metal should be replaced.



- Remove dust boot and snap ring.



- Draw out oil seal by using special tool.

CAUTION:

The removed oil seal should be replaced.
When removing oil seal, be careful not to
damage the outer tube metal surface.

09913-50121

Oil seal remover



INSPECTION

DAMPER ROD RING

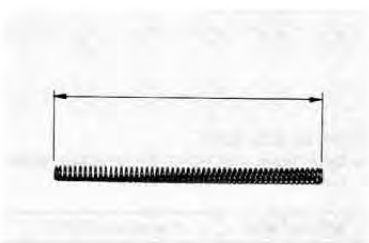
- Inspect damper rod ring for wear and damage.



FORK SPRING

- Measure the fork spring free length. If it is shorter than service limit, replace it.

Service Limit	516 mm (20.3 in)
---------------	------------------



INNER TUBE

- Inspect inner tube and metal outer surfaces for any scuffing.



OUTER TUBE

- Inspect outer tube and metal inner surfaces for any scuffing.



REASSEMBLY

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

INNER TUBE METAL

- Install the metal by hand as shown.

CAUTION:

Use special care to prevent damage to the Teflon coated surface of the "DU" metal when mounting it.



DAMPER ROD BOLT

- Apply thread Lock "1342" to the damper rod bolt and tighten with specified torque.

99000-32050	Thread Lock "1342"
-------------	--------------------

09940-34520	"T" handle
09940-34561	Attachment "D"
09914-25811	"T" type hexagon wrench

Tightening torque	20 — 25 N·m
	2.0 — 2.5 kg·m
	14.5 — 18.0 lb·ft



OUTER TUBE METAL, SPACER AND OIL SEAL

- Fix oil seal into the outer tube properly by using special tool as shown.

09940-50111	Oil seal installer
-------------	--------------------



FORK OIL

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

Fork oil	Front fork oil #15
----------	--------------------

Fork oil capacity	245 ml (8.28 US oz)
-------------------	------------------------

- Adjust the fork oil level with a special tool.

NOTE:

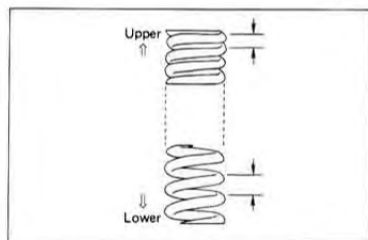
When adjusting oil level, remove the fork spring and compress the inner tube fully.

09943-74111	Fork oil level gauge
-------------	----------------------

For oil level	260 mm (10.2 in)
---------------	------------------

**FORK SPRING**

- When installing the fork spring large pitch end should position in bottom.

**INNER TUBE**

- Install the front fork assembly with aligning inner tube upper surface ① to the upper surface ② of the steering stem upper bracket.

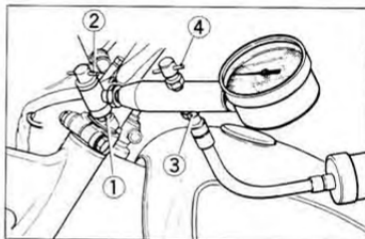


FORK AIR

- Lift up the front wheel by jack.



- Set the air pressure gauge to the valve ①, and turn the valve handle ② clockwise. Set the hand pump to the valve ③, turn the valve handle ④ clockwise, and pump the air. Let the air out by loosening the handle ④ till the specified air pressure is left inside. Loosen the valve handle ②, and remove the air pressure gauge.

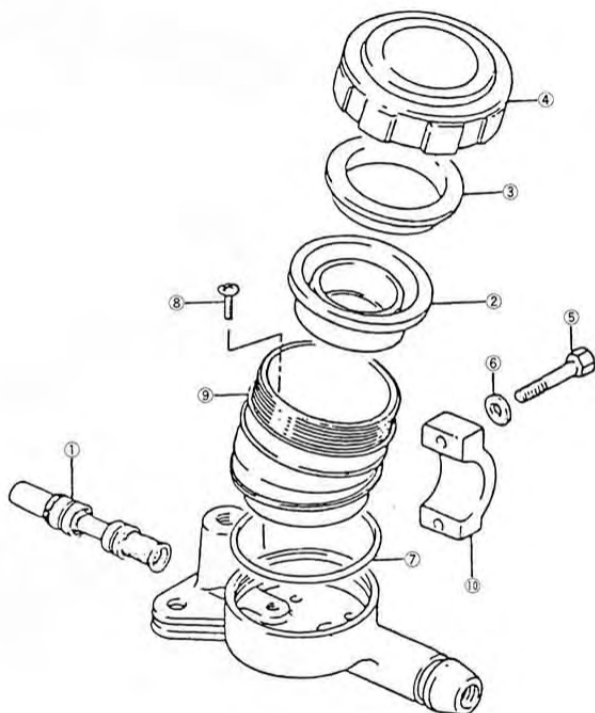
**CAUTION:**

Do not charge air more than 250 kPa (2.5 kg/cm² or 35 psi.)

Balance the air pressure of both right and left forks.

STD Air pressure	80 kPa (0.8 kg/cm ² , 11.38 psi)
------------------	---

FRONT MASTER CYLINDER



Tightening torque

	N·m	kg·m	lb·ft
⑤	5—8	0.5—0.8	3.5—6.0
⑧	3—5	0.3—0.5	2.0—3.5

- ① Piston and cup set
- ② Diaphragm
- ③ Plate
- ④ Cap
- ⑤ Bolt
- ⑥ Washer
- ⑦ O ring
- ⑧ Screw
- ⑨ Reservoir
- ⑩ Holder

MASTER CYLINDER REMOVAL AND DISASSEMBLY

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



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



CAUTION:

Immediately completely wipe off any brake fluid adhering to any part of motorcycle. The fluid reacts chemically with paints, plastics, rubber materials, etc. and will damage them severally.

- Remove master cylinder ass'y after removing two fitting bolts.



- Remove the screw.



- Pull out the reservoir and O ring.



- Draw out dust seal boot.



- Remove circlip by using special tool.

09900-06108

Snap ring pliers



- Pull out piston, primary cup and spring.



MASTER CYLINDER INSPECTION

- Inspect the cylinder bore wall for any scratch or other damage.



- Inspect the piston surface for scratch or other damage.



- Inspect the primary cup, secondary cup and dust seal boot for damage.



MASTER CYLINDER REASSEMBLY

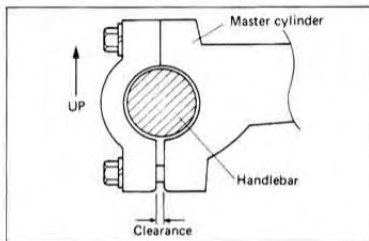
- Reassemble the master cylinder in the reverse order of disassembly and by taking the following steps:

CAUTION:

Wash the master cylinder components with fresh brake fluid before reassembly. Never use cleaning solvent or gasoline to wash them.

Apply brake fluid to the cylinder bore and all the internals to be inserted into the bore.

- When remount the master cylinder to the handlebars, first tighten the clamp bolt for upside as shown.

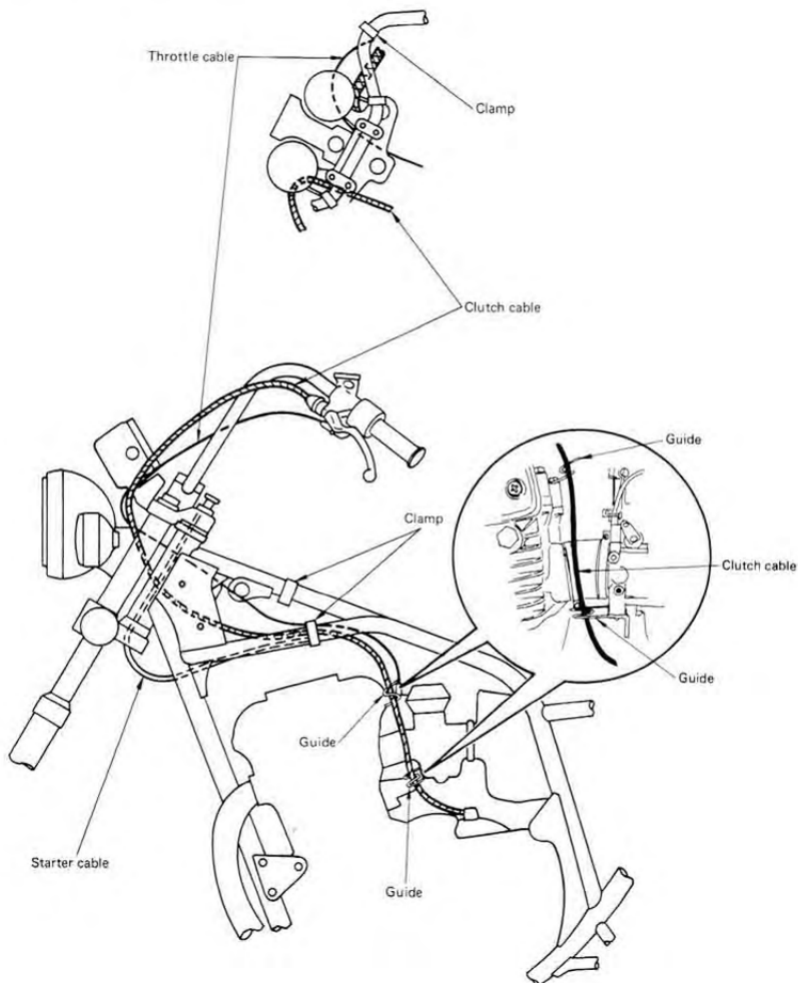


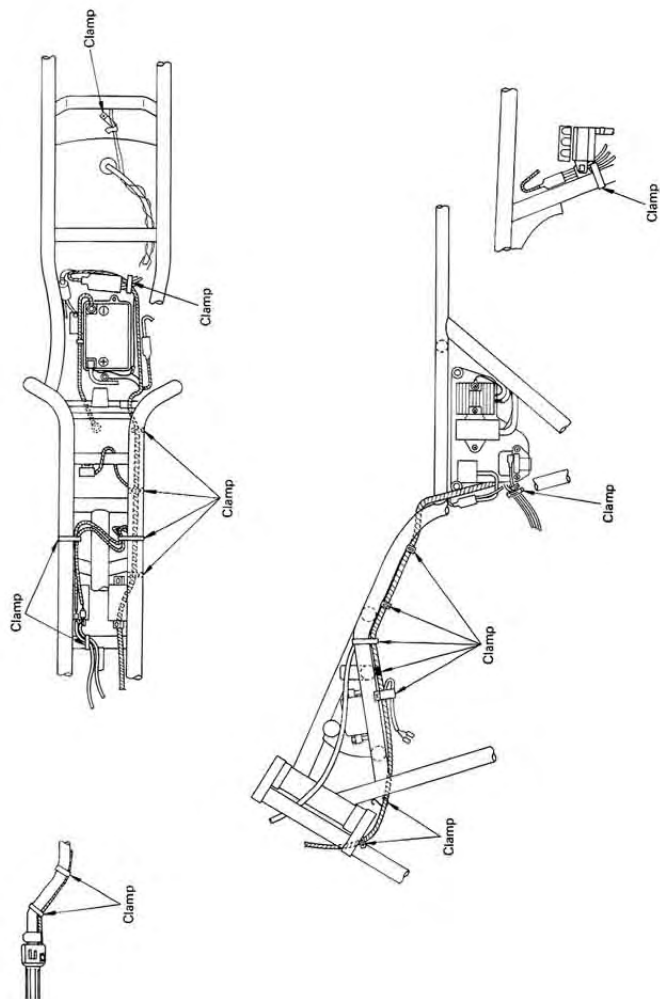
CAUTION:

Adjust the front brake light switch after installation.

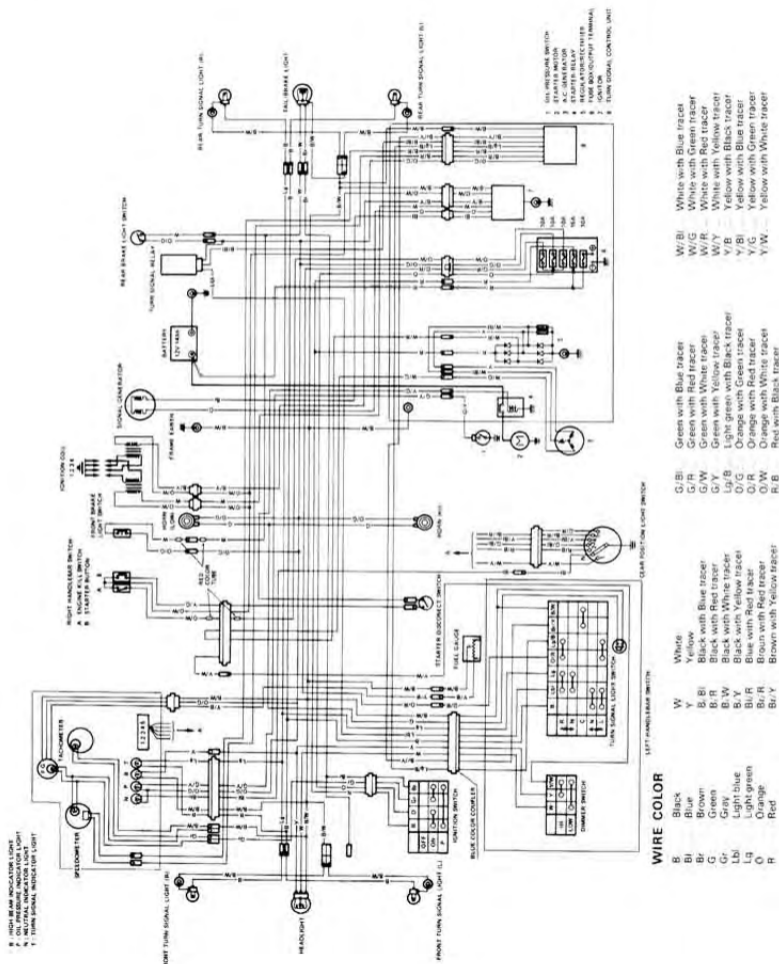
Bleeding the air after reassembling master cylinder.

WIRE AND CABLE ROUTING





WIRING DIAGRAM



GS1100EX

FOREWORD

The GS1100EX model was introduced as a new model in 1981. Many innovative refinements were incorporated in the new model. The 1981 GS1100EX model utilizes the same technical innovations that were introduced on the "T" model. This supplement has been produced to aid SUZUKI mechanics in properly maintaining and repairing the 1981 "X" model.

This section has been written primarily for the experienced SUZUKI mechanic but will also be very useful even for the amateur, do-it-yourself mechanic. The entire manual should be thoroughly reviewed before any servicing is performed;

Please also refer to the GS1100 "T" MODEL (1980 MODEL) sections 1 through 11 for all other areas of information not covered in this publication.

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VIEW OF SUZUKI GS1100EX



RIGHT SIDE



LEFT SIDE

SPECIFICATIONS

DIMENSIONS AND DRY MASS

Overall length	2 245 mm (88.4 in)
Overall width	870 mm (34.3 in)
Overall height	1 190 mm (46.9 in)
Wheelbase	1 520 mm (59.8 in)
Ground clearance	155 mm (6.1 in)
Dry mass	243 kg (536 lbs)
Gross vehicle weight	467 kg (1 030 lbs)

ENGINE

Type	Four-stroke, air-cooled, DOHC, TSCC
Number of cylinders	4
Bore	72.0 mm (2.835 in)
Stroke	66.0 mm (2.598 in)
Piston displacement	1 075 cm ³ (65.6 cu. in)
Compression ratio	9.5 : 1
Carburetor	MIKUNI BS34SS, four
Air cleaner	Paper element
Starter system	Electric
Lubrication system	Wet sump

TRANSMISSION

Clutch	Wet multi-plate type
Transmission	5-speed constant mesh
Gearshift pattern	1-down, 4-up
Primary reduction	1.775 (87/49)
Final reduction	2.800 (42/15)
Gear ratios, Low	2.500 (35/14)
2nd	1.777 (32/18)
3rd	1.380 (29/21)
4th	1.125 (27/24)
Top	0.961 (25/26)
Drive chain	DAIDO D.I.D.630YL or TAKASAGO RK630GSV, 96 links

CHASSIS

Front suspension	Telescopic, pneumatic/coil spring, oil dampened damper 4-way/spring 4-way adjustable
Rear suspension	Swinging arm, oil dampened, damper 4-way/spring 5-way adjustable
Steering angle	40° (right & left)
Caster	62° 00'
Trail	103 mm (4.06 in)
Turning radius	2.8 m (9.2 ft)
Front brake	Disc brake, twin
Rear brake	Disc brake
Front tire size	3.50V19 4PR
Rear tire size	4.50V17 4PR
Front fork stroke	160 mm (6.30 in)
Rear wheel travel	108 mm (4.25 in)
Front tire pressure	175 kPa (1.75 kg/cm ² , 24 psi) (Normal solo riding)
Rear tire pressure	200 kPa (2.00 kg/cm ² , 28 psi) (Normal solo riding)

ELECTRICAL

Ignition type	Transistorized
Ignition timing	12° B.T.D.C. below 1 500 r/min and 32° B.T.D.C. above 2 350 r/min
Spark plug	NGK D8EA or NIPPON DENSO X24ES-U
Battery	12V 50.4kC (14Ah)/10HR
Generator	Three-phase A.C. generator
Fuse	10/10/10/10/15A

CAPACITIES

Fuel tank including reserve	19 L (5.0 US gal)
reserve	4.0 L (4.2 US qt)
Engine oil	3.2 L (3.4 US qt)
Front fork oil (each leg)	238 ml (8.04 US oz)

SERVICE DATA

VALVES + GUIDES

Unit: mm (in)

Item		Standard	Limit
Valve diam.	IN.	26.9 – 27.1 (1.06 – 1.07 in)	—
	EX.	22.9 – 23.1 (0.90 – 0.91)	—
Valve lift	IN.	7.0 (0.28)	—
	EX.	6.5 (0.26)	—
Valve clearance (when cold)	IN./EX.	0.07 – 0.12 (0.003 – 0.005)	—
Valve guide to Valve stem clearance	IN.	0.025 – 0.052 (0.0010 – 0.0020)	0.35 (0.014)
	EX.	0.040 – 0.067 (0.0016 – 0.0026)	0.35 (0.014)
Valve guide I.D.	IN./EX.	5.500 – 5.512 (0.2165 – 0.2170)	—
Valve stem O.D.	IN.	5.460 – 5.475 (0.2150 – 0.2156)	—
	EX.	5.445 – 5.460 (0.2144 – 0.2150)	—
Valve stem runout	IN./EX.	—	0.05 (0.002)
Valve head thickness	IN./EX.	—	0.5 (0.02)
Valve stem end length	IN./EX.	—	3.6 (0.14)
Valve seat width	IN./EX.	0.9 – 1.1 (0.035 – 0.043)	—
Valve head radial runout	IN./EX.	—	0.03 (0.001)
Valve spring free length (IN./EX.)	INNER	—	31.9 (1.26)
	OUTER	—	35.6 (1.40)
Valve spring tension (IN./EX.)	INNER	4.4 – 6.4 kg (9.7 – 14.1 lbs) at length 28.5 mm (1.12 in)	—
	OUTER	6.5 – 8.9 kg (14.3 – 19.6 lbs) at length 32.0 mm (1.26 in)	—

CAMSHAFT + CYLINDER + HEAD

Unit: mm (in)

Item		Standard	Limit
Cam height	IN.	34.650 – 34.690 (1.3642 – 1.3657)	34.350 (1.3524)
	EX.	34.360 – 34.400 (1.3528 – 1.3543)	34.060 (1.3409)
Camshaft journal oil clearance	IN./EX.	0.020 – 0.054 (0.0008 – 0.0021)	0.150 (0.0059)
Camshaft journal holder I.D.	IN./EX.	22.000 – 22.013 (0.8661 – 0.8667)	—
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		—	157.80 (6.213)
Cam chain pin (at arrow "3")		20th pin	—
Rocker arm I.D.	IN./EX.	12.000 – 12.018 (0.4724 – 0.4731)	—
Rocker arm shaft O.D.	IN./EX.	11.973 – 11.984 (0.4714 – 0.4718)	—
Cylinder head distortion		—	0.2 (0.008)

PISTON + RING + CYLINDER

Unit: mm (in)

Item	Standard	Limit
Compression pressure	900 – 1200 kPa (9 – 12 kg/cm ² , 128 – 171 psi)	700 kPa (7 kg/cm ² , 99.5 psi)
Compression pressure difference	—	200 kPa (2 kg/cm ² , 28.4 psi)
Piston to Cylinder clearance	0.050 – 0.060 (0.0020 – 0.0024)	0.120 (0.0047)
Cylinder bore	72.000 – 72.015 (2.8346 – 2.8352)	72.080 (2.8378)
Piston diam.	71.945 – 71.960 (2.8325 – 2.8331) Measure 15.0 (0.59) from the piston skirt end.	71.880 (2.8299)
Cylinder distortion	—	0.2 (0.008)

Unit: mm (in)

Item		Standard	Limit
Piston ring free end gap:	1st	Approx. 9.5 (0.37)	7.6 (0.30)
	2nd	Approx. 11.0 (0.43)	8.8 (0.35)
Piston ring end gap:	1st	0.10 – 0.30 (0.004 – 0.012)	0.7 (0.03)
	2nd	0.10 – 0.30 (0.004 – 0.012)	0.7 (0.03)
Piston ring groove clearance:	1st	—	0.180 (0.0071)
	2nd	—	0.150 (0.0059)
Piston ring groove width:	1st	1.03 – 1.05 (0.040 – 0.041)	—
	2nd	1.21 – 1.23 (0.047 – 0.048)	—
	Oil	2.51 – 2.53 (0.099 – 0.100)	—
Piston ring thickness:	1st	0.975 – 0.990 (0.0384 – 0.0390)	—
	2nd	1.170 – 1.190 (0.0461 – 0.0469)	—
Piston pin bore		18.001 – 18.006 (0.7087 – 0.7089)	18.030 (0.7098)
Piston pin O.D.		17.996 – 18.000 (0.7085 – 0.7086)	17.980 (0.7079)

CRANKSHAFT

Unit: mm (in)

Item	Standard	Limit
Conrod small end I.D.	18.006 – 18.014 (0.7089 – 0.7092)	18.040 (0.7102)
Conrod deflection	—	3.0 (0.12)
Conrod big end side clearance	0.10 – 0.65 (0.004 – 0.026)	1.00 (0.039)
Crankshaft runout	—	0.1 (0.004)

OIL PUMP

Unit: mm (in)

Item	Standard	Limit
Oil pump reduction ratio	1.723 (87/49 X 33/34)	—
Oil pressure (at 60°C, 140°F):	Above 10 kPa (0.1 kg/cm ² , 1.42 psi) Below 50 kPa (0.5 kg/cm ² , 7.11 psi) at 3 000 r/min	—
Tip clearance	—	0.20 (0.008)
Outer rotor clearance	—	0.25 (0.010)
Side clearance	—	0.15 (0.006)

CLUTCH

Unit: mm (in)

Item	Standard	Limit
Clutch cable play	2 – 3 (0.08 – 0.12)	—
Drive plate thickness	2.9 – 3.1 (0.11 – 0.12)	2.6 (0.10)
Drive plate claw width	15.6 – 15.8 (0.61 – 0.62)	14.8 (0.58)
Driven plate thickness	2.00±0.06 (0.080±0.002)	—
Driven plate distortion	—	0.1 (0.004)
Clutch spring free length	—	38.5 (1.52)

TRANSMISSION

Unit: mm (in)

Item		Standard	Limit
Primary reduction ratio		1.775 (87/49)	—
Final reduction ratio		2.800 (42/15)	—
Gear ratios:	Low	2.500 (35/14)	—
	2nd	1.777 (32/18)	—
	3rd	1.380 (29/21)	—
	4th	1.125 (27/24)	—
	Top	0.961 (25/26)	—
Shift fork to Groove clearance		0.40 – 0.60 (0.016 – 0.024)	0.80 (0.031)
Shift fork groove width		5.45 – 5.55 (0.215 – 0.219)	—
Shift fork thickness		4.95 – 5.05 (0.195 – 0.199)	—
Countershaft length (Low to 2nd)		111.4 – 111.5 (4.386 – 4.390)	—
Drive chain:	Type	DAIDO: D.I.D.: 630YL or TAKASAGO: RK630GSV	—
	Links	96	—
	20 pitch length	—	383.0 (15.08)
Drive chain slack		20 – 30 (0.8 – 1.2)	—

CARBURETOR

Unit: mm (in)

Item	Specification
Carburetor type	MIKUNI BS34SS
Bore size	34 (1.34)
I.D. No.	49200
Idle r/min	1 050 $\pm$ 100 r/min
Fuel level	5.0 $\pm$ 0.5 (0.20 $\pm$ 0.02)
Float height	22.4 $\pm$ 1.0 (0.88 $\pm$ 0.04)
Main jet (M.J.)	# 107.5
Main air jet (M.A.J.)	1.2
Jet needle (J.N.)	5D58
Needle jet (N.J.)	X-1
Pilot jet (P.J.)	# 45
Bypass (B.P.)	0.8, 0.8, 0.8
Pilot outlet (P.O.)	0.9
Valve seat (V.S.)	2.0
Starter jet (G.S.)	# 32.5
Pilot screw (P.S.)	PRE-SET
Throttle cable play	0.5 – 1.0 (0.02 – 0.04)

ELECTRICAL

Unit: mm (in)

Item	Specification	
Ignition timing	12° B.T.D.C. below 1 500 ± 150 r/min and 32° B.T.D.C. above 2 350 ± 150 r/min	
Firing order	1, 2, 4, 3	
Spark plug:	Type	NGK: D8EA N.D.: X24ES-U
	Gap	0.6 – 0.7 (0.024 – 0.028)
Spark performance	Over 8 (0.3) at 1 atm	
Signal coil resistance	Approx. 290 – 360 Ω (BI-G)	
Ignition coil resistance:	Primary	O/W – W or B/Y Approx. 3 – 5 Ω
	Secondary	Plug cap – Plug cap Approx. 31 – 33 kΩ
Generator No-Load voltage	More than 80V (AC) at 5 000 r/min	
Regulated voltage	14.0 – 15.5V at 5 000 r/min	
Starter motor:	Brush length	Limit: 9 (0.4)
	Commutator under cut	Limit: 0.2 (0.008)
Starter relay resistance	Approx. 3 – 4 Ω	
Battery:	Type designation	SYB14L-A2
	Capacity	12V 50.4 kC (14 Ah)/10 HR
	Standard electrolyte S.G.	1.28 at 20°C (68°F)
Fuse size:	Head	10A
	Signal	10A
	Ignition	10A
	Main	15A
	Power source	10A

BRAKE + WHEEL

Unit: mm (in)

Item		Standard	Limit
Rear brake pedal height		20 (0.8)	
Brake disc thickness:	Front	5.0 ± 0.2 (0.20 ± 0.008)	4.5 (0.18)
	Rear	6.7 ± 0.2 (0.26 ± 0.008)	6.0 (0.24)
Brake disc runout		—	0.30 (0.012)
Master cylinder bore:	Front	15.870 – 15.913 (0.6248 – 0.6265)	—
	Rear	14.000 – 14.043 (0.5512 – 0.5529)	—
Master cylinder piston diam.	Front	15.811 – 15.838 (0.6225 – 0.6235)	—
	Rear	13.957 – 13.984 (0.5495 – 0.5506)	—
Brake caliper cylinder bore:	Front	38.180 – 38.219 (1.5031 – 1.5047)	—
	Rear	38.180 – 38.256 (1.5031 – 1.5061)	—
Brake caliper piston diam.	Front	38.025 – 38.050 (1.4970 – 1.4980)	—
	Rear	38.098 – 38.148 (1.4999 – 1.5019)	—
Wheel rim runout:	Axial	—	2.0 (0.08)
	Radial	—	2.0 (0.08)
Wheel axle runout:	Front	—	0.25 (0.01)
	Rear	—	0.25 (0.01)
Tire size:	Front	3.50V19 4PR	—
	Rear	4.50V17 4PR	—
Tire tread depth:	Front	—	1.6 (0.06)
	Rear	—	2.0 (0.08)

SUSPENSION

Unit: mm (in)

Item	Standard	Limit
Front fork stroke	160 (6.3)	—
Front fork spring free length	—	518 (20.4)
Front fork oil level	216 (8.5)	—
Front fork air pressure	50 kPa (0.5 kg/cm ² , 7.11 psi)	—
Rear wheel travel	108 (4.25)	—
Swinging arm pivot shaft runout	—	0.3 (0.012)

TIRE PRESSURE

Cold inflation tire pressure	Normal riding						Continuous high speed riding					
	Solo riding			Dual riding			Solo riding			Dual riding		
	kPa	kg/cm ²	psi	kPa	kg/cm ²	psi	kPa	kg/cm ²	psi	kPa	kg/cm ²	psi
Front	175	1.75	24	200	2.00	28	200	2.00	28	225	2.25	32
Rear	200	2.00	28	250	2.50	36	250	2.50	36	280	2.80	40

FUEL + OIL CAPACITY

Item		Specification
Fuel type		Use only unleaded or low-lead type gasoline of at least 85 – 95 pump octane ($\frac{R+M}{2}$ method) or 89 octane or higher rated by research method.
Fuel tank including reserve		19 L (5.0 US gal)
reserve		4.0 L (4.2 US qt)
Engine oil type		SAE 10W/40
Engine oil capacity:	Change	3 200 ml (3.4 US qt)
	Filter change	3 600 ml (3.8 US qt)
	Overhaul	4 000 ml (4.2 US qt)
Front fork oil type		Fork oil #15
Front fork oil capacity (each leg)		238 ml (8.04 US oz)
Brake fluid type		DOT3 or DOT4

WATTAGE

Unit: W (cp)

Item		Specification
Headlight	HI	60
	LO	55
Tail/Brake light		8/23 (3/32)
Running/Front turn signal light		8/23 (3/32)
Rear turn signal light		23 (32)
Speedometer light		3.4
Tachometer light		3.4
Turn signal indicator light		3.4
High beam indicator light		3.4
Neutral indicator light		3.4
Oil pressure indicator light		3.4
License light		8 (4)
Check panel light		1.4

CAMSHAFT AND SPROCKET

This is to inform you of the change of cam shaft, cam sprocket and bolt.

1) Material required

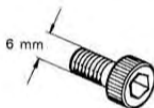
	Part Number
Torque wrench	09900-21001
SUZUKI Thread lock "1303"	99000-32030

2) Contents of modification

(A) Type

Part Name	Tightening torque
6 mm Allen bolt + Thread Lock "1303"	0.8 — 1.2 kg.m (6.0-8.5 lb-ft)

(A)



(B) Type

Part Name	Tightening torque
6 mm bolt + lock washer + thread lock "1303"	1.5 — 2.0 kg.m (11.0-14.5 lb-ft)

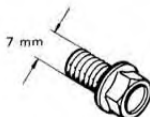
(B)



(C) Type

Part Name	Tightening torque
7 mm flange bolt + thread lock "1303"	2.4 — 2.6 kg.m (17.5-19.0 lb-ft)

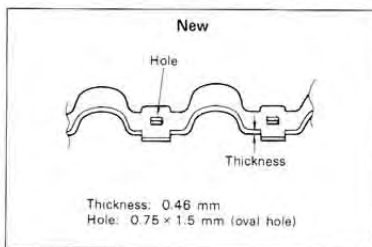
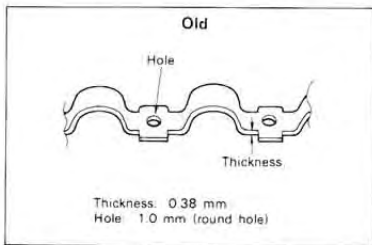
(C)



PISTON OIL RING SPACER

MODIFICATION

- Thickness of spacer and shape of oil path hole are changed as shown in the figure below.

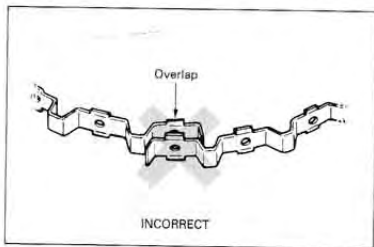
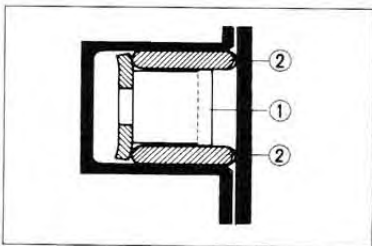


INSTALLATION

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

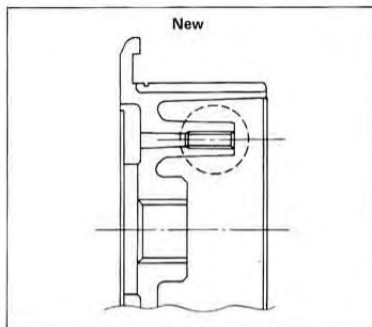
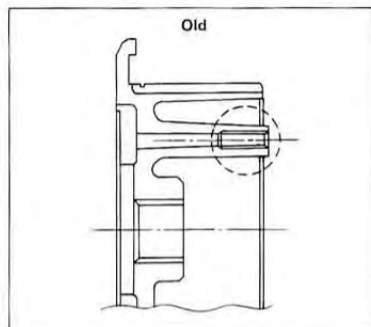
CAUTION:

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

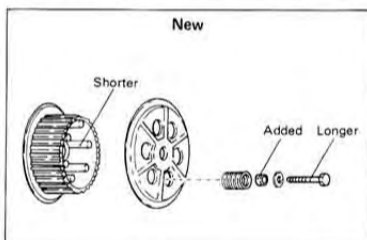
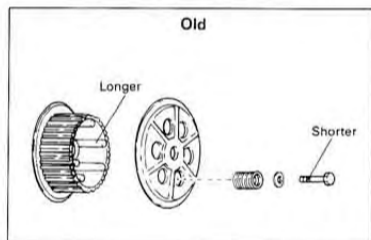


CLUTCH SLEEVE HUB MODIFICATION

- The boss part of sleeve hub are changed as shown in the figure below.



- Distinction between old type and new type of clutch sleeve hub can tell the difference of height of boss part for the clutch sleeve hub bolt. Old type has a higher boss part than that of new type. For new type longer bolt should be employed and spacer is added on the boss to fulfill the difference.

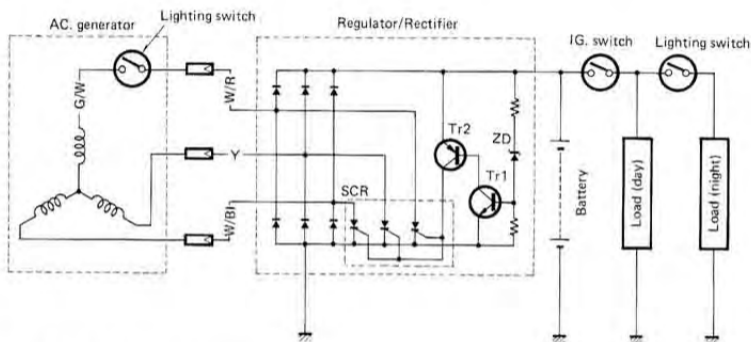


CHARGING SYSTEM

DESCRIPTION

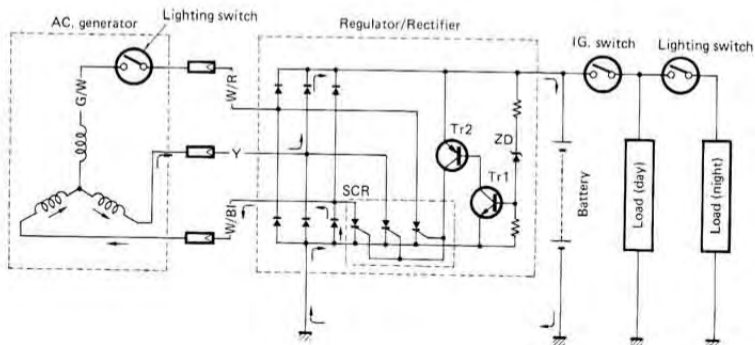
The circuit of the charging system is indicated in figure, which is composed of an AC generator, regulator/rectifier unit and battery.

The AC current generated from AC generator is rectified by rectifier and is turned into DC current, then it charges the battery.



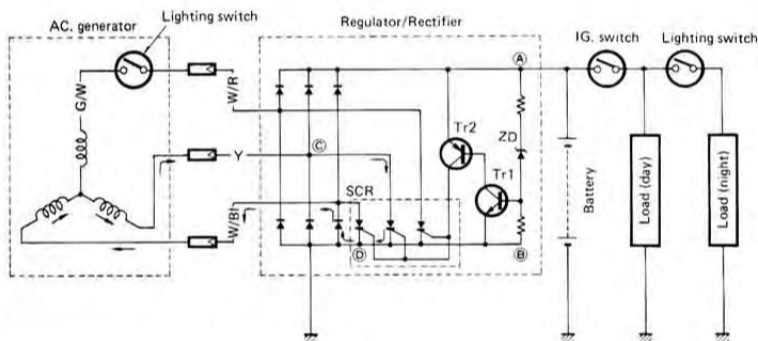
FUNCTION OF REGULATOR

While the engine r/min is low and the generated voltage of AC generator is lower than the adjusted voltage of Regulator, the regulator does not function, incidentally the generated current charges the battery directly.



When the engine r/min becomes higher, the generated voltage of AC generator also becomes higher and the voltage between points (A) and (B) of regulator becomes high accordingly, and when it reaches the adjusted voltage of regulator, ZD (Zener diode) becomes "ON" condition and Tr1 becomes "ON" condition because the base current flows to Tr1 and also Tr2 becomes "ON" condition consequently because the base current flows to Tr2. When Tr2 becomes "ON", signal will be sent to the SCR (Thyristor) gate probe and SCR will become "ON" condition.

Then the SCR becomes conductive to the direction from point (C) to point (D). Namely at the state of this, the current generated from the AC generator gets through SCR without charging the battery and returns to AC generator again. At the end of this state, since the AC current generated from AC generator flows into the point (D), reverse current tends to flow to SCR, then the circuit of SCR turns to OFF mode and begins to charge the battery again. Thus these repetitions maintain charging voltage to the battery constant and protect it from overcharging.



INSPECTION**CHARGING OUTPUT CHECK**

Start the engine and keep it running at 5 000 r/min with the lighting switch turned ON (High position). Using the pocket tester, measure the DC voltage between the starter relay $\oplus$ terminal and ground. If the tester reads under 14V or over 15.5V, the regulator/rectifier may be faulty. Inspect the remainder of the system in either case.

**NOTE:**

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

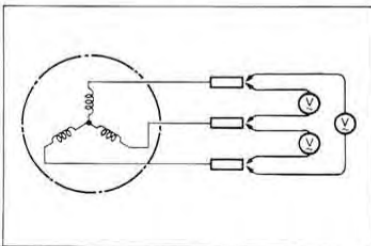
STD charging output	14 – 15.5V (DC) at 5 000 r/min
---------------------	-----------------------------------

09900-25002	Pocket tester
-------------	---------------

AC GENERATOR NO-LOAD PERFORMANCE
Disconnect the three lead wires from the AC generator terminal.

Start the engine and keep it running at 5 000 r/min. Using the pocket tester, measure the AC voltage between the three lead wires. If the tester reads under 80V, the AC generator is faulty.

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



AC GENERATOR STATOR COIL

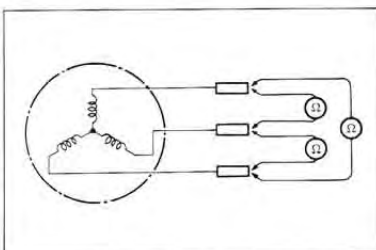
Using the pocket tester, check the continuity between the lead wires of the stator. Also check that the stator core is insulated.

NOTE:

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

09900-25002

Pocket tester

**REGULATOR/RECTIFIER**

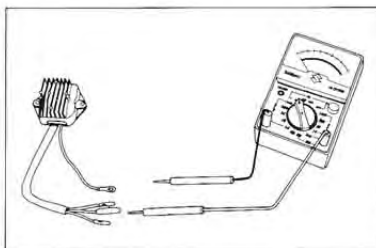
Using the pocket tester, measure the resistance between the lead wires in the following table. If the reading is incorrect, replace the regulator/rectifier.



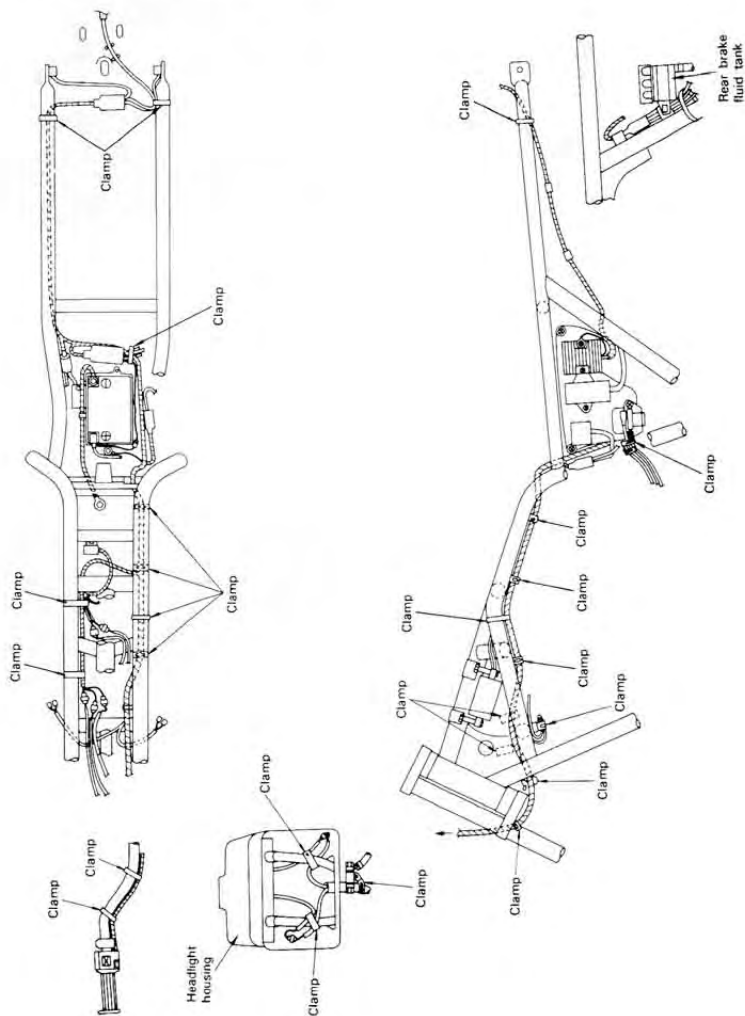
Tester range: X1Ω

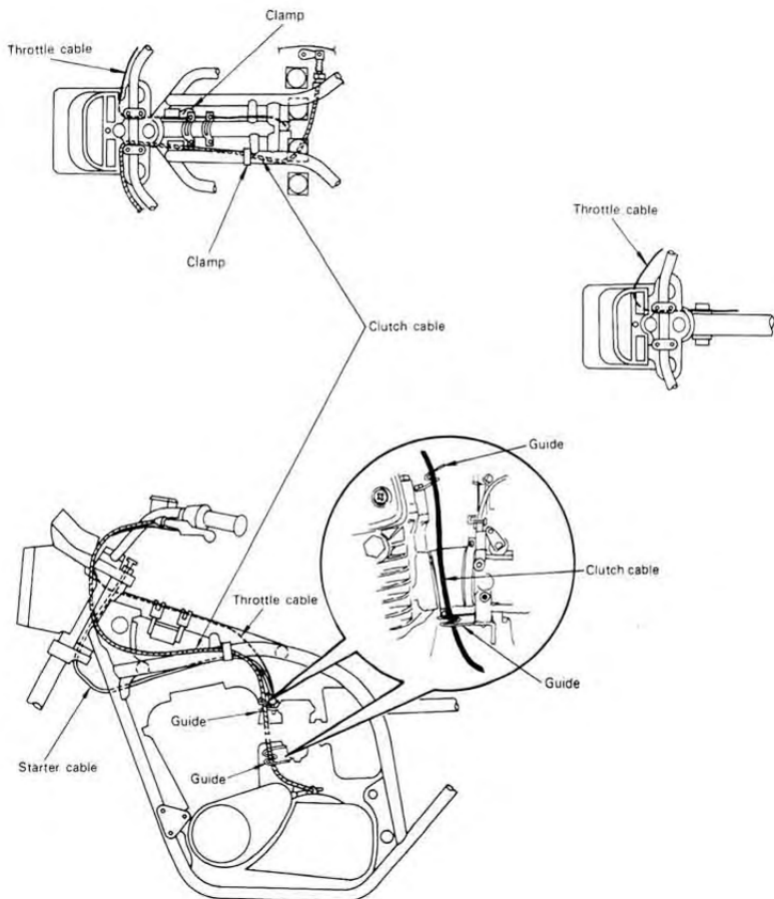
Unit : Ω

Probe of tester	⊕ Probe of tester					
	R	W/B	W/R	Y	B/W	
R		∞	∞	∞	∞	
W/B	5-7		∞	∞	∞	
W/R	5-7	∞		∞	∞	
Y	5-7	∞	∞		∞	
B/W	30-40	5-7	5-7	5-7		



WIRE AND CABLE ROUTING





GS1000SZ

FOREWORD

This supplementary section has been produced to aid Suzuki mechanics in properly maintaining and repairing the 1982 "Z" model.

This manual has been written primarily for the experienced Suzuki mechanic but will also be very useful even for the apprentice mechanics and do-it-yourself mechanics. The entire manual should be thoroughly reviewed before any servicing is performed.

Please also refer to the sections, 1 through 13, for all other areas of information not covered in this section.

IMPORTANT

All street-legal SUZUKI motorcycles with engine displacement of 50 cc or greater are subject to Environmental Protection Agency emission regulations.

These regulations set specific standards for emission control, and also set new servicing requirements. This manual contains pertinent information that should be carefully studied. Other vital emission information is also contained in the GS1100 1981 "X" MODEL section and should also be carefully reviewed.

NOTE:

1. How the section is compiled

This section lists only the points relating to maintenance work which differ from those applying to the GS1100 "X" model.

In order to make this section easier to use, service data, service specifications and tightening torque values that apply to the GS1000SZ model are clearly indicated with an asterisk ().*

2. How to use the section

Give precedence to this supplementary section when using it as the service manual for the GS1000S "Z" model.

Refer to the section, 1 through 13, for details which are not given in this section.

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VIEW OF SUZUKI GS1000SZ



RIGHT SIDE



LEFT SIDE

SPECIFICATIONS

DIMENSIONS AND DRY MASS

Overall length.....	* 2 260 mm (89.0 in)
Overall width	* 715 mm (28.1 in)
Overall height.....	* 1 205 mm (47.4 in)
Wheelbase.....	1 520 mm (59.8 in)
Ground clearance.....	* 175 mm (6.9 in)
Seat height	* 775 mm (30.5 in)
Dry weight.....	* 232 kg (511 lbs)

ENGINE

Type.....	Four-stroke, air cooled, DOHC
Number of cylinders	4
Bore	* 69.4 mm (2.732 in)
Stroke.....	66.0 mm (2.598 in)
Piston displacement	* 998 cm ³ (60.9 cu. in)
Compression ratio.....	9.5 : 1
Carburetor.....	MIKUNI BS34SS, four
Air cleaner	Paper element
Starter system.....	Electric
Lubrication system.....	Wet sump

TRANSMISSION

Clutch.....	Wet multi-plate type
Transmission	5-speed constant mesh
Gearshift pattern	1-down, 4-up
Primary reduction	1.775 (87/49)
Final reduction.....	2.800 (42/15)
Gear ratios, Low	2.500 (35/14)
2nd	1.777 (32/18)
3rd.....	1.380 (29/21)
4th.....	1.125 (27/24)
Top	0.961 (25/26)
Drive chain	DAIDO D.I.D. 630YL or TAKASAGO RK630GSV, 96 links

CHASSIS

Front suspension	* Telescopic, oil dampened, spring 4-way adjustable with ANTI-DIVE
Rear suspension	Swinging arm, oil dampened, damper 4-way/spring 5-way adjustable
Steering angle	* 30° (right & left)
Caster	* 61° 50'
Trail	* 118 mm (4.65 in)
Turning radius	* 3.5 m (11.5 ft)
Front brake	Disc brake, twin
Rear brake	Disc brake
Front tire size	3.50V19 4PR
Rear tire size	4.50V17 4PR
Front fork stroke	* 150 mm (5.91 in)
Rear wheel travel	* 109 mm (4.29 in)

ELECTRICAL

Ignition type	Transistorized
Ignition timing	12° B.T.D.C. below 1 500 r/min and 32° B.T.D.C. above 2 350 r/min
Spark plug	NGK D8EA or NIPPON DENSO X24ES-U
Battery	12V 50.4 kC (14Ah)/10 HR
Generator	Three-phase A.C. generator
Fuse	10/10/10/10/15A

CAPACITIES

Fuel tank including reserve	* 22 L (5.8/4.8 US/lmp gal)
reserve	* 5.0 L (5.3/4.4 US/lmp qt)
Engine oil	3.2 L (3.4/2.8 US/lmp qt)
Front fork oil	* 227 ml (7.67/7.99 US/lmp oz)

* * These specifications are subject to change without notice.

SERVICE DATA

VALVE+GUIDE

Unit: mm (in)

ITEM	STANDARD		LIMIT
Valve diam.	IN.	27.0 (1.06)	—
	EX.	23.0 (0.91)	—
Valve lift	IN.	7.0 (0.28)	—
	EX.	*7.0 (0.28)	—
Valve clearance (when cold)	IN. & EX.	0.07—0.12 (0.003—0.005)	—
Valve guide to valve stem clearance	IN.	0.025—0.052 (0.0010—0.0020)	0.35 (0.014)
	EX.	0.040—0.067 (0.0016—0.0026)	0.35 (0.014)
Valve guide I.D.	IN. & EX.	5.500—5.512 (0.2165—0.2170)	—
Valve stem O.D.	IN.	5.460—5.475 (0.2150—0.2156)	—
	EX.	5.445—5.460 (0.2144—0.2150)	—
Valve stem runout	IN. & EX.	—	0.05 (0.002)
Valve head thickness	IN. & EX.	—	0.5 (0.02)
Valve stem end length	IN. & EX.	—	3.6 (0.14)
Valve seat width	IN. & EX.	0.9—1.1 (0.035—0.043)	—
Valve head radial runout	IN. & EX.	—	0.03 (0.001)
Valve spring free length (IN. & EX.)	INNER	—	31.9 (1.26)
	OUTER	—	35.6 (1.40)
Valve spring tension (IN. & EX.)	INNER	4.4—6.4 kg (9.7—14.1 lbs) at length 28.5 mm (1.12 in)	—
	OUTER	6.5—8.9 kg (14.3—19.6 lbs) at length 32.0 mm (1.26 in)	—

CAMSHAFT + CYLINDER HEAD

Unit: mm (in)

ITEM		STANDARD	LIMIT
Cam height	IN.	34.650—34.690 (1.3642—1.3657)	34.350 (1.3524)
	EX.	34.360—34.400 (1.3528—1.3543)	34.060 (1.3409)
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		—	157.80 (6.213)
Cam chain pin (at arrow "3")		20 th pin	—
Rocker arm I.D.	IN. & EX.	12.000—12.018 (0.4724—0.4731)	—
Rocker arm shaft O.D.	IN. & EX.	11.973—11.984 (0.4714—0.4718)	—
Cylinder head distortion		—	0.2 (0.008)

CYLINDER + PISTON + PISTON RING

Unit: mm (in)

ITEM		STANDARD	LIMIT
Compression pressure		*11—14 kg/cm ² (156—199 psi)	*9 kg/cm ² (128 psi)
Compression pressure difference		—	2 kg/cm ² (28 psi)
Piston to cylinder clearance		0.050—0.060 (0.0020—0.0024)	0.120 (0.0047)
Cylinder bore		*69.400—69.415 (2.7323—2.7329)	*69.480 (2.7354)
Piston diam.		*69.345—69.360 (2.7301—2.7307)	*69.280 (2.7276)
		Measure at 15.0(0.59) from the skirt end.	
Cylinder distortion		—	0.2 (0.008)

Unit: mm (in)

ITEM	STANDARD		LIMIT
Piston ring free end gap	1st	N Approx. $\begin{matrix} * 8.5 \\ (0.33) \end{matrix}$	$\begin{matrix} * 6.8 \\ (0.27) \end{matrix}$
	2nd	N Approx. $\begin{matrix} * 10.0 \\ (0.39) \end{matrix}$	$\begin{matrix} * 8.0 \\ (0.31) \end{matrix}$
Piston ring end gap	1st	$\begin{matrix} * 0.10-0.25 \\ (0.004-0.010) \end{matrix}$	$\begin{matrix} 0.7 \\ (0.03) \end{matrix}$
	2nd	$\begin{matrix} 0.10-0.30 \\ (0.004-0.012) \end{matrix}$	$\begin{matrix} 0.7 \\ (0.03) \end{matrix}$
Piston ring to groove clearance	1st	—	$\begin{matrix} 0.180 \\ (0.0071) \end{matrix}$
	2nd	—	$\begin{matrix} 0.150 \\ (0.0059) \end{matrix}$
Piston ring groove width	1st	$\begin{matrix} 1.01-1.03 \\ (0.040-0.041) \end{matrix}$	—
	2nd	$\begin{matrix} 1.21-1.23 \\ (0.047-0.048) \end{matrix}$	—
	Oil	$\begin{matrix} 2.51-2.53 \\ (0.099-0.100) \end{matrix}$	—
Piston ring thickness	1st	$\begin{matrix} 0.975-0.990 \\ (0.0384-0.0390) \end{matrix}$	—
	2nd	$\begin{matrix} 1.170-1.190 \\ (0.0461-0.0469) \end{matrix}$	—
Piston pin bore	$\begin{matrix} 18.001-18.006 \\ (0.7087-0.7089) \end{matrix}$		$\begin{matrix} 18.030 \\ (0.7098) \end{matrix}$
Piston pin O.D.	$\begin{matrix} 17.996-18.000 \\ (0.7085-0.7086) \end{matrix}$		$\begin{matrix} 17.980 \\ (0.7079) \end{matrix}$

CONROD + CRANKSHAFT

Unit: mm (in)

ITEM	STANDARD	LIMIT
Conrod small end I.D.	18.006—18.014 (0.7089—0.7092)	18.040 (0.7102)
Conrod deflection	—	3.0 (0.12)
Conrod big end side clearance	0.10—0.65 (0.004—0.026)	1.00 (0.039)
Crankshaft runout	—	0.1 (0.004)

OIL PUMP

ITEM	STANDARD	LIMIT
Oil pump reduction ratio	1.723 (87/49 x 33/34)	—
Oil pressure (at 60°C, 140°F)	Above 0.1 kg/cm ² (1.42 psi) Below 0.5 kg/cm ² (7.11 psi) at 3000 r/min.	

CLUTCH

Unit: mm (in)

ITEM	STANDARD	LIMIT
Clutch cable play	2—3 (0.08—0.12)	—
Drive plate thickness	2.9—3.1 (0.11—0.12)	2.6 (0.10)
Drive plate claw width	15.6—15.8 (0.61—0.62)	14.8 (0.58)
Driven plate thickness	2.00±0.06 (0.080±0.002)	—
Driven plate distortion	—	0.1 (0.004)
Clutch spring free length	—	38.5 (1.52)

TRANSMISSION + DRIVE CHAIN

Unit: mm (in)

ITEM	STANDARD		LIMIT
Primary reduction ratio	1.775 (87/49)		—
Final reduction ratio	2.800 (42/15)		—
Gear ratios	Low	2.500 (35/14)	—
	2nd	1.777 (32/18)	—
	3rd	1.380 (29/21)	—
	4th	1.125 (27/24)	—
	Top	0.961 (25/26)	—
Shift fork to groove clearance	0.40—0.60 (0.016—0.024)		0.80 (0.031)
Shift fork groove width	5.45—5.55 (0.215—0.219)		—
Shift fork thickness	4.95—5.05 (0.195—0.199)		—
Countershaft length (Low to 2nd)	111.4—111.5 (4.386—4.390)		—
Drive chain	Type	D.I.D.: 630 YL TAKASAGO: RK630GSV	—
	Links	96	—
	20 pitch length	—	383.0 (15.08)
Drive chain slack	20—30 (0.8—1.2)		—

CARBURETOR

Unit: mm (in)

ITEM	SPECIFICATION
Carburetor type	MIKUNI BS34SS
Bore size	34
I. D. No.	* 49300
Idle r/min.	1050 $\pm$ 100 r/min.
Fuel level	5.0 $\pm$ 0.5 (0.20 $\pm$ 0.02)
Float height	22.4 $\pm$ 1.0 (0.88 $\pm$ 0.04)
Main jet (M. J.)	* # 110
Main air jet (M. A. J.)	1.2
Jet needle (J. N.)	5D58
Needle jet (N. J.)	X-1
Pilot jet (P. J.)	# 45
By pass (B. P.)	0.8, 0.8, 0.8
Pilot outlet (P. O.)	0.9
Valve seat (V. S.)	2.0
Starter jet (G. S.)	# 32.5
Pilot screw (P. S.)	PRE-SET
Throttle cable play	0.5—1.0 (0.02—0.04)
Choke cable play	0.5—1.0 (0.02—0.04)

SUSPENSION

Unit: mm (in)

ITEM	STANDARD	LIMIT	NOTE
Front fork stroke	* 150 (5.9)	—	
Front fork spring free length	—	* 467 (18.4)	
Front fork oil level	* 221 (8.7)	—	
Rear wheel travel	* 109 (4.29)	—	
Swing arm pivot shaft runout	—	0.3 (0.012)	

FUEL + OIL

ITEM	SPECIFICATION	NOTE
	Use only unleaded or low-lead type gasoline of at least 85-95 pump octane ($\frac{R+M}{2}$ method) or 89 octane or higher rated by the Research Method.	
Fuel tank including reserve	* 22 L (5.8/4.8 US/Imp gal)	
reserve	* 5.0 L (5.3/4.4 US/Imp qt)	
Engine oil type	SAE10W/40 API SE or SF	
Engine oil capacity	Change (3200 ml 3.4/2.8 US/Imp qt)	
	Filter change (3600 ml 3.8/3.2 US/Imp qt)	
	Overhaul (4000 ml 4.2/3.5 US/Imp qt)	
Front fork oil type	Foil oil SAE # 15	
Front fork oil capacity (each leg)	* 227 ml (7.67/7.99 US/Imp oz)	
Brake fluid type	DOT3, DOT4 or SAE J1703	

TIRE PRESSURE

COLD INFLATION TIRE PRESSURE	NORMAL RIDING						CONTINUOUS HIGH SPEED RIDING					
	SOLO RIDING			DUAL RIDING			SOLO RIDING			DUAL RIDING		
	kPa	kg/cm ²	psi	kPa	kg/cm ²	psi	kPa	kg/cm ²	psi	kPa	kg/cm ²	psi
FRONT	175	1.75	24	200	2.00	28	200	2.00	28	225	2.25	32
REAR	200	2.00	28	250	2.50	36	250	2.50	36	280	2.80	40

WATTAGE

(W)

ITEM		SPECIFICATION
Headlight	HI	60
	LO	55
Tail/Brake light		8/23
License light		8
Turn signal light		23
Combination meter light		3.4
Turn signal indicator light		3.4
High beam indicator light		3.4
Neutral indicator light		3.4
Oil pressure indicator light		3.4

EMISSION REGULATIONS

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

1980 EMISSION LIMITS

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

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

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

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

EMISSION CONTROL CARBURETOR COMPONENTS

GS1000S motorcycles are equipped with precision, manufactured carburetors for emission level control. These carburetors require special mixture control components and other precision adjustments to function properly.

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

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

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

The carburetor specification for the emission-controlled GS1000S are as follows.

Carburetor I.D. No.	Main Jet	Needle Jet	Jet Needle	Pilot Jet	Pilot Screw
49300	# 110	X-1	5D58	# 45	PRE-SET DO NOT ADJUST

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

GENERAL EMISSION INFORMATION

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

- Hydrocarbons (HC)
- Carbon Monoxide (CO)
- Oxides of Nitrogen (NO_x)

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

- Hydrocarbons (HC)
- Carbon Monoxide (CO)

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

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

Total NO_x emissions from all motorcycles is considered negligible. The EPA states that total NO_x emission from motorcycles by 1980 will only amount to approximately 0.5%. NO_x is formed during the combustion process at high combustion chamber temperatures.

CARBON MONOXIDE

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

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

CARBURETION MALFUNCTION

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

ENGINE MALFUNCTIONS

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

HYDROCARBONS

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

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

IGNITION SYSTEM MALFUNCTIONS

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

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

MIXTURE-RELATED MALFUNCTIONS

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

Engine wear or damage can also cause high HC emissions.

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

PERIODIC MAINTENANCE SCHEDULE

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

NOTE:

Vehicles operated under severe conditions may require more frequent servicing.

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

PERIODIC MAINTENANCE CHART

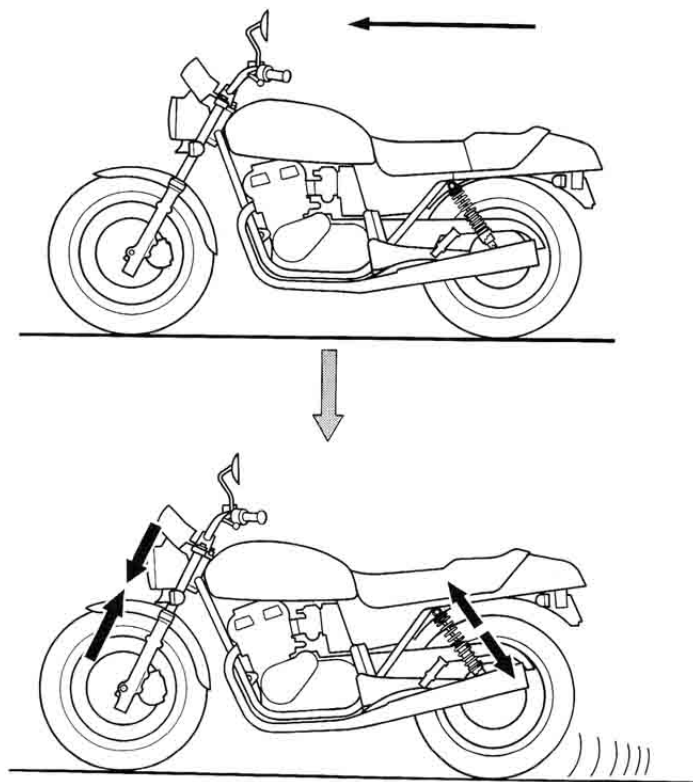
INTERVAL: THIS INTERVAL SHOULD BE JUDGED BY ODOMETER READING OR MONTHS, WHICHEVER COMES FIRST	mile	600	4 000	7 500	11 000	15 000
	km	1 000	6 000	12 000	18 000	24 000
	month	2	12	24	36	48
Battery		—	I	I	I	I
Cylinder head nuts and exhaust pipe bolts		T	T	T	T	T
Air cleaner element	Clean every 2 000 miles (3 000 km), and replace every 7 500 miles (12 000 km)					
Valve clearance		I	I	I	I	I
Spark plug		—	C	R	C	R
Carburetor idle rpm		I	I	I	I	I
Fuel line	Replace every two years.					
Engine oil and oil filter		R	R	R	R	R
Clutch		I	I	I	I	I
Drive chain		I	I	I	I	I
	Clean and lubricate every 600 miles (1 000 km).					
Brakes, * anti-dive modulator		I	I	I	I	I
Brake hose, * anti-dive hose	Replace every two years.					
Tire		I	I	I	I	I
Steering		I	I	I	I	I
Front fork		—	—	I	—	I
Chassis bolts and nuts		T	T	T	T	T

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

SPECIAL FEATURES

ANTI-DIVE FRONT FORK

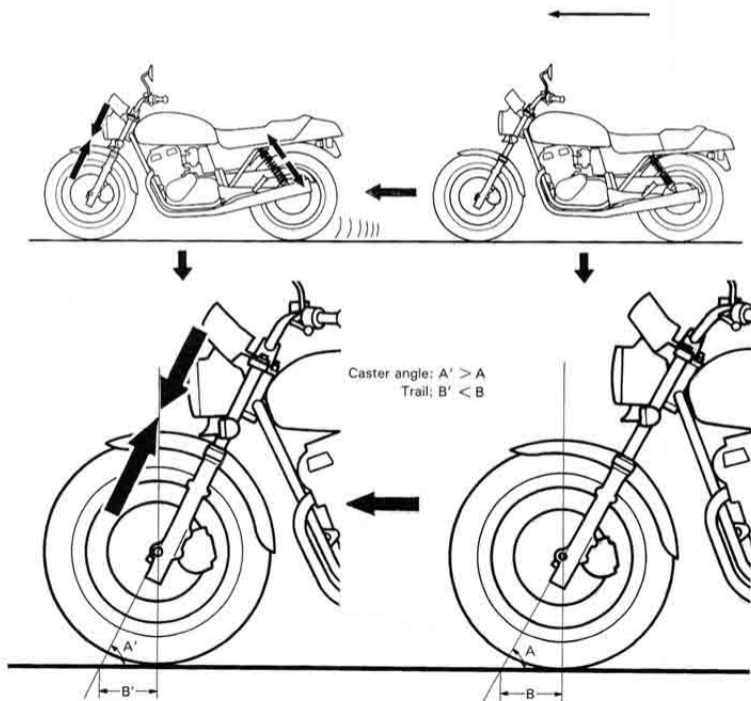
Consider the case of the motorcycle that is stopped suddenly. Excepting the rider, the machine itself cannot automatically counteract the momentum of its center of gravity moving forward to maintain its balance. At the point of "stoppage" the momentum continues its forward motion to exert its weight through the front fork on the point of contact of the front wheel. Simultaneously, the rear wheel tends to lift as the weight on it is reduced proportionately to the forward momentum. This has the effect of compressing the front fork and extending the rear shock absorber.



ANTI-DIVE DEVICE

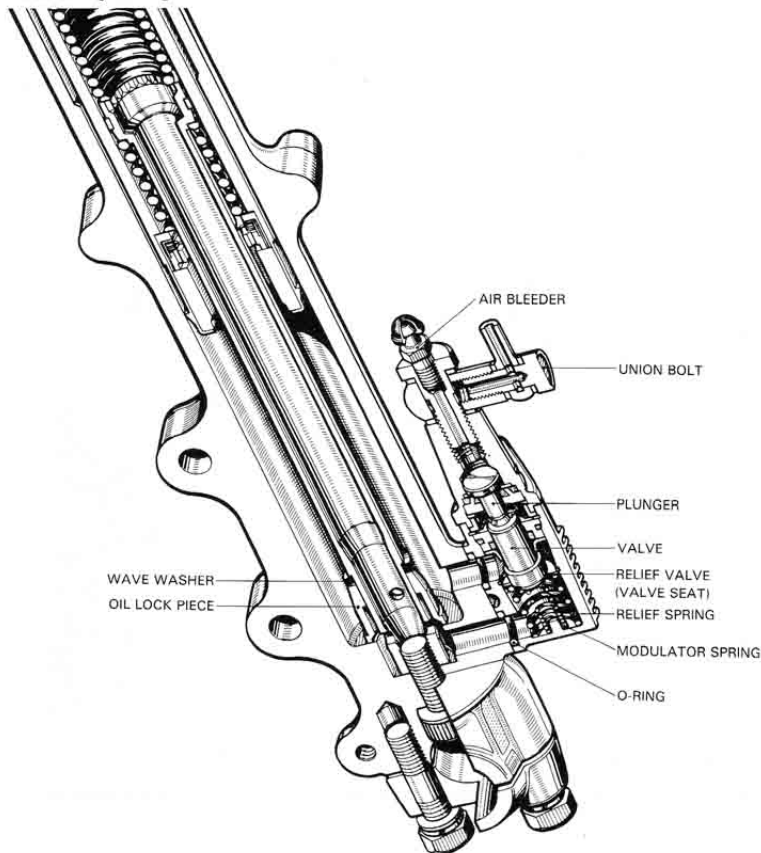
When a speeding motorcycle is stopped, it is impossible to prevent the front fork dive because the momentum of the machine's center of gravity continues forward. The front fork is compressed and extended, as it is braked before cornering and full throttle applied coming out of the corner, which naturally changes its cornering clearance (motorcycle-to-ground clearance) and balance. In order to minimize this change of the front fork length on a racing motorcycle, the spring of the front fork has to be stiffened, while the damping force of the rear shock absorber must be strengthened. However, the suspension system of the street motorcycle is generally set soft for absorbing the bump and shock of the road to ensure riding comfort. However, when the bike's cornering performance requires improvement, the suspension system must be reinforced.

Suzuki's hydraulic anti-dive fork was developed to provide exceptional handling performance and a smooth ride. It ensures the bike's stability during high-speed cornering by preventing the caster angle from being changed during braking and preventing loss of cornering clearance, while assuring riding comfort on the road.



ANTI-DIVE SYSTEM

Suzuki's anti-dive system, developed from the feedback of racing technology, is now equipped on many of Suzuki's 1982 models. The new system is attached to the outer tube of the front fork. The brake line of the front brakes master cylinder leading to the caliper is connected by a hose to the anti-dive device. When the master cylinder's hydraulic line functions to brake the front wheel, it simultaneously operates the anti-dive device's plunger, which regulates and limits the flow of oil in the front fork. This reduces the compression of the front fork, which also reduces the extension of the rear shock absorber. Hence, the device serves to counteract the change in the motorcycle's attitude during braking.

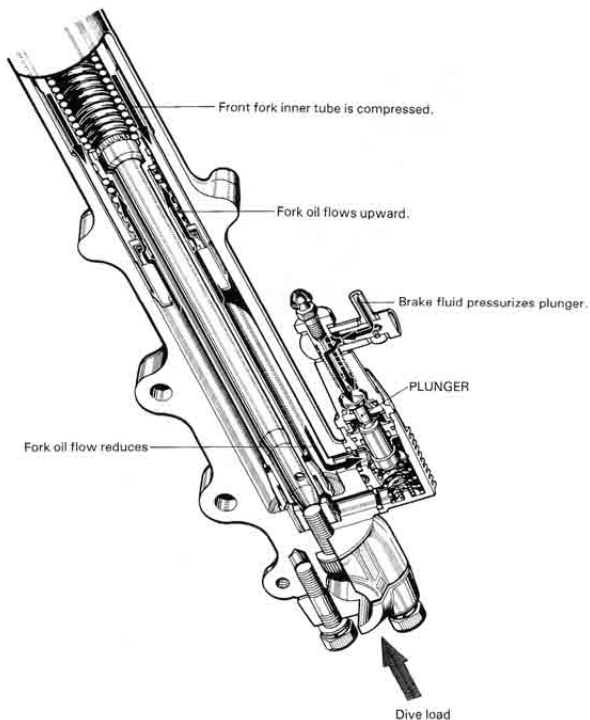


THE ANTI-DIVE SYSTEM IS INACTIVE, WHILE THE FRONT BRAKE IS INACTIVE

As long as the front brake remains inactive, the oil in the front fork passes through the clearance between the valve and valve seat (relief valve) without restriction. Consequently, the telescopic front fork functions normally.

WHEN THE ANTI-DIVE SYSTEM IS ACTIVATED

When the rider squeezes the lever of the front brake, pressure is exerted on the brake's master cylinder, then transmitted through the brake hose to pressurize the plunger of the anti-dive system. The plunger then lowers the valve, which reduces the clearance between the valve and the valve seat (relief valve). This in turn reduces the flow of fork oil, which reduces the allowable compression of the fork; stiffening it. As a result, the front fork is compressed less, while the extension of the rear shock absorber is also reduced. This stabilizes the motorcycle's braking attitude, and braking during cornering becomes much more controllable.

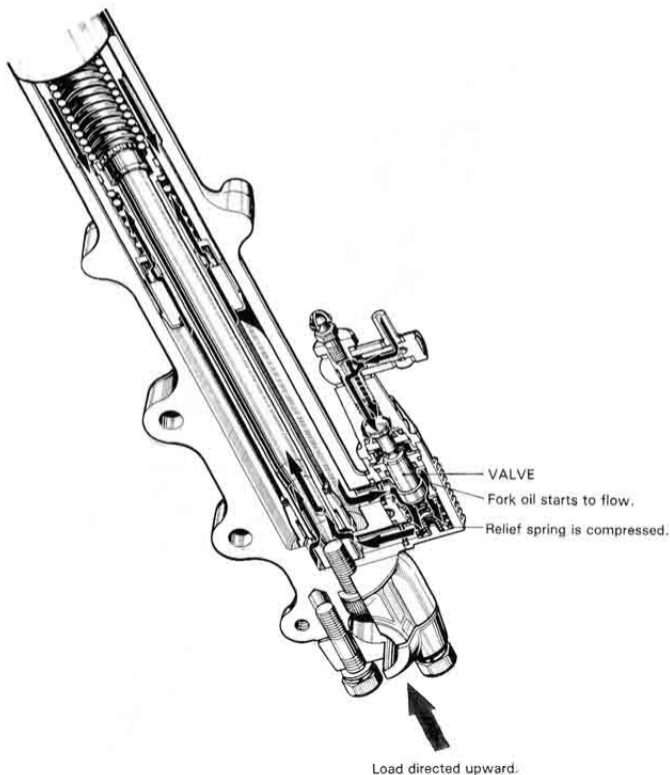


WHAT HAPPENS WHEN THE MOTORCYCLE RECEIVES A JOLT FROM THE ROAD, WHILE THE ANTI-DIVE DEVICE IS ACTIVE?

While the anti-dive device is restricting fork oil flow, any road shock could be directly transmitted to the chassis because the front fork would react as if it were equipped with very stiff springs.

However, the road shock is reduced by the following mechanism: The relief valve, mounted on a spring, is compressed and opened in direct proportion to the pressure on the front-fork oil, permitting the oil to progressively flow through the clearance between the valve and valve seat. Hence the pressure of the fork oil is automatically regulated at a predetermined level. In other words, the clearance at the relief valve represents the difference of fork oil pressure developed by the upward load from the road and the strength of the relief valve's spring.

In order to ensure safety, separate chambers are provided for the fork oil and brake fluid to prevent their mixture.



OUTLINE OF MODIFICATIONS

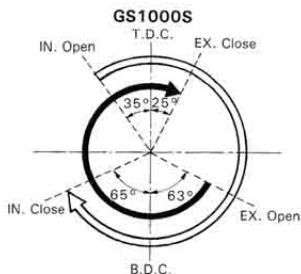
ENGINE RELATED FEATURES

GS1000S

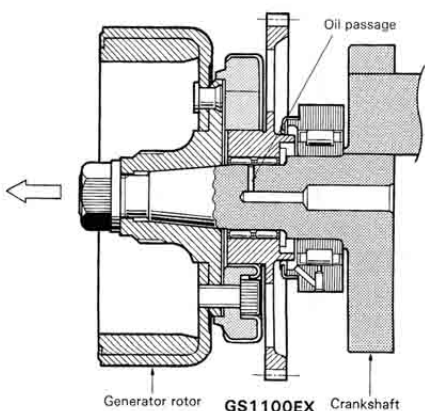
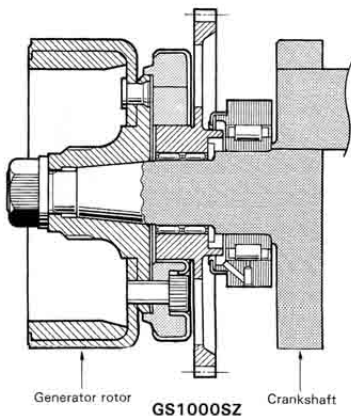
Basically this model's engine is a down-sized bore version of the GS1100 engine. However, improvements have been made to many parts based on the GS1100 engine to yield an increase in power and durability. The main improvements and related parts are described below.

1. The camshaft (valve timing) has been changed to increase the power and enhance fuel economy. In addition, following parts are modified.

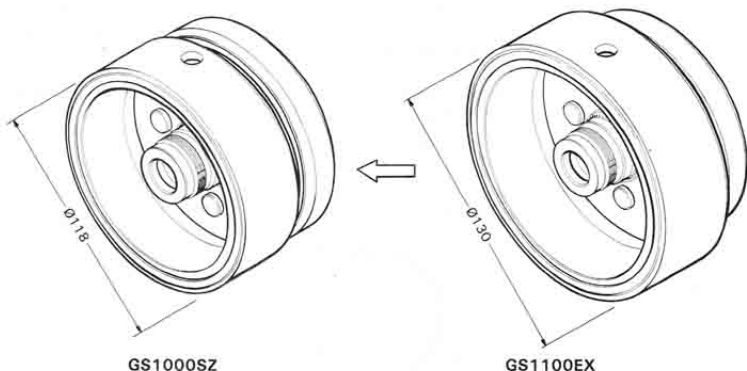
- * Piston, rings, cylinder and cylinder head
- * Intake cam sprocket



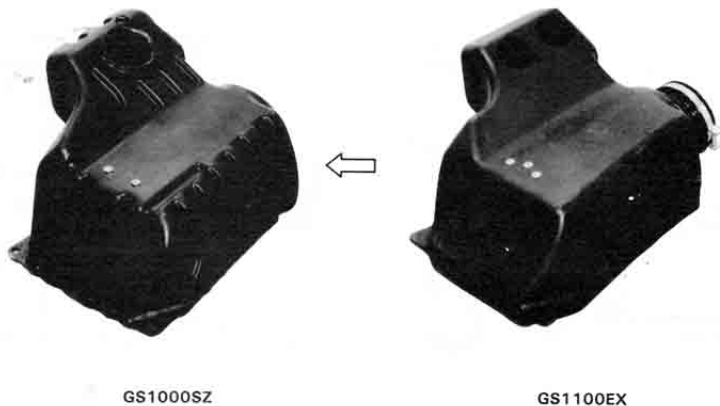
2. The piston has been modified using material containing additional silicon to improve the durability. Also, the piston pin has been specially treated for better wear-in during the break-in period.
3. The connecting rod strength is increased in size and by the use of high nickel alloy strength.
4. A lubrication passageway for the starter clutch bearing located on the left crankshaft end has been discontinued in order to strengthen the crankshaft.



5. The size of the generator rotor has been reduced to lighten the component. The throttle response is improved due to less reciprocating mass (weight).



6. The number of air intakes of the cleaner case has been reduced from two to one, and a funnel which guides the intake air has been installed in order to improve the intake efficiency. In order to improve the riding position, the air cleaner element has been configured.



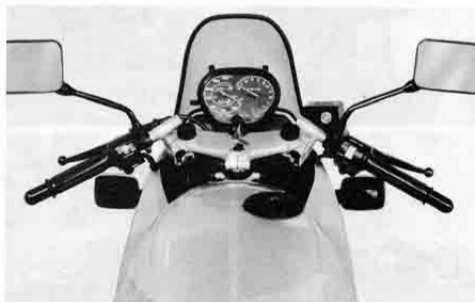
CHASSIS-RELATED FEATURES

The chassis of the GS1000S have been given a fresh look and configuration to produce a riding position that is more suitable for high speeds. The windscreen, now provided as a standard accessory, makes riding more comfortable at high speeds and over long distances. Moreover, it is designed so that it will not affect handling in any way.

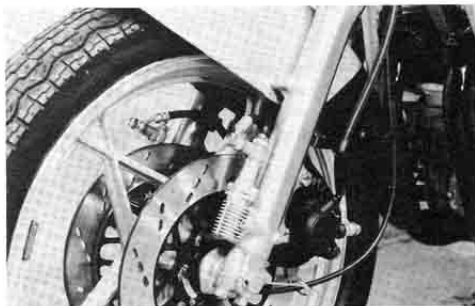
1. The shape of the windscreen has been derived from extensive wind tunnel experiments. It features excellent high-speed stability and is designed to compliment the handling requirements. The windscreen helps to reduce fatigue of the rider over long-distance riding. The surface of this windscreen has been specially treated so that it is very hard to scratch or mark.



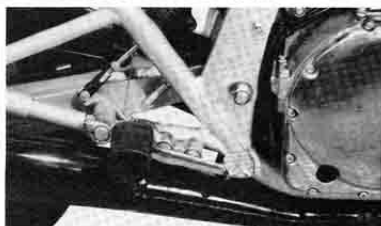
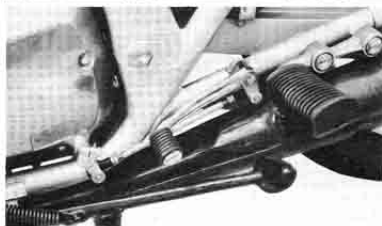
2. The handlebars are a duralmine-forged separate type mounted on the front fork's inner tube. They are designed with special consideration for handling and riding position at high speeds. Balancers are provided at each end to reduce vibration.



3. A center axle type of front fork is featured for enhancing high-speed stability and the spring preload can be adjusted to one of four levels in line with personal preferences. An anti-dive system has been fitted to each of the forks in order to stabilize the chassis during braking. (See page 14-37 for setting properly.)



4. The seat height has been lowered for ease of handling and stopping; it yields an almost perfect riding position along with the separate handlebars. Provision has also been made to produce optimal positioning of the footrest, gearshift lever and brake pedal; the resulting design is quite sufficient to handle left and right banking angles.



5. A dial type choke lever has been adopted and mounted on the left frame cover for ease of operation.



6. The rear swing arm is made of aluminum, and a needle roller bearing is adopted for the pivot in order to improve both durability and freedom of movement.



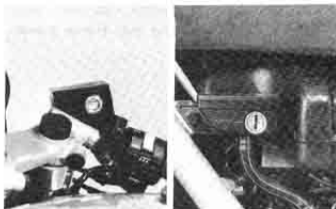
7. Four way adjustment to the damping force and five spring pre-loads can be selected for the rear shock absorbers in line with personal preference. Adjustment levers have been provided to facilitate spring pre-load adjustments. (See page 14-37 for setting properly.)



8. The muffler has been given a classy look with black chrome.



9. The front and rear brake fluid reservoirs are made of aluminum and a fluid level inspection window has been installed so that it is easier to see the fluid level.



ELECTRICAL PARTS-RELATED FEATURES

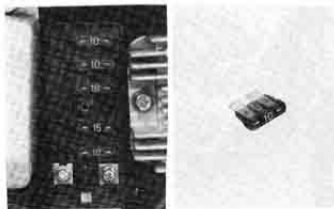
1. The headlight features a rectangular halogen lamp to match overall styling. Both vertical and horizontal adjustments can be performed quite easily.
2. An electrically controlled tachometer has been adopted in the combination meter assembly.



3. Blade type fuses have been adopted for increased durability.



4. Two switch controlled, accessory terminals have been provided in the left frame cover as standard equipment.



SERVICING

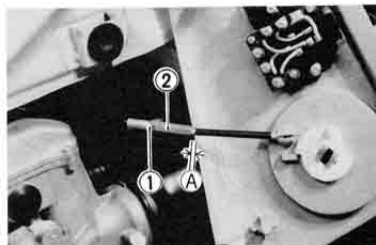
CHOKE LEVER

Choke cable adjustment:

Loosen lock nut ①.

Adjust the cable slack $\bar{A}$ by turning adjuster ② in or out to obtain the correct slack.

After adjusting the slack, tighten the lock nut.



Standard $\bar{A}$	0.5—1.0 mm
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HEADLIGHT

To adjust beam horizontally:

Turn the knob ③ clockwise or counterclockwise.

To adjust beam vertically:

Loosen the headlight housing lower fitting bolt ④ and move the headlight housing up and down as required.



OPTIONAL SWITCH

Two switches are provided on the left frame cover for optional electrical parts. When installing the optional electrical part, strictly adhere to the following instruction.



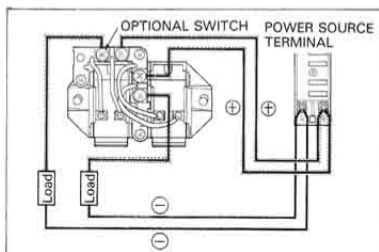
MAXIMUM WATTAGE

HEADLIGHT CONSTANT-ON	Below 12W
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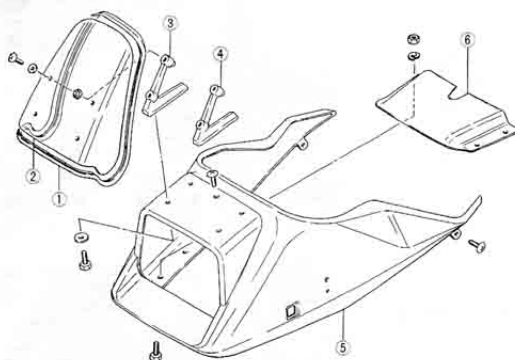
CAUTION:

If the total capacity of the optional electrical parts is more than above limit, the battery will discharge quickly and will need to be recharged frequently.

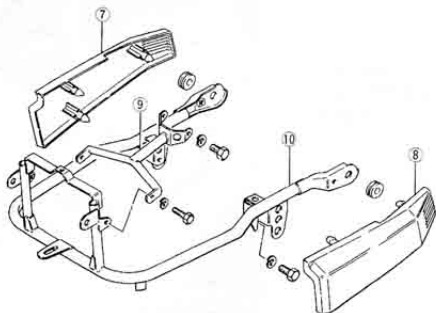
Connect the lead wire of an optional electrical part properly as shown in figure.



WINDSCREEN



- ① Screen mould
- ② Screen
- ③ Screen bracket RH
- ④ Screen bracket LH
- ⑤ Windscreen
- ⑥ Lower cover
- ⑦ Windscreen lower cover, RH
- ⑧ Windscreen lower cover, LH
- ⑨ Windscreen front bracket
- ⑩ Windscreen brace



HANDLEBARS

Handlebar adjustment:

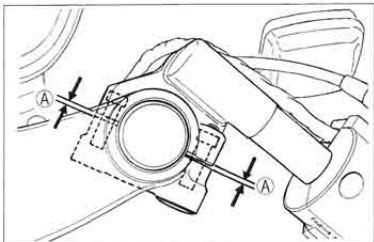
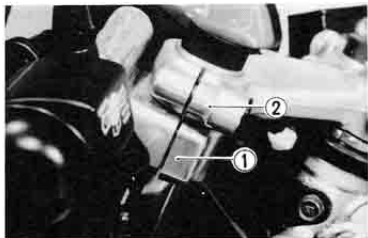
To set the handlebars in the standard position, bring the top surface of the handlebars ① to contact the lower surface of the steering stem upper bracket ② and at the same time, align the slits in the upper bracket and handlebars.

CAUTION:

Secure each handlebar clamp in such a way that the clearances **A** right side and left side of the handlebars are equalized.

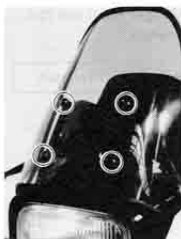
Tightening torque:

8.0—12.0 N·m
(0.8—1.2 kg·m)



FRONT FORK REMOVAL

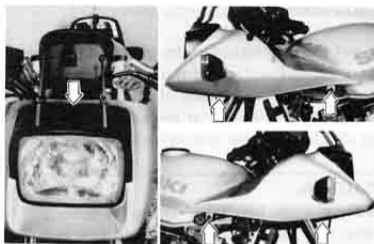
Support the machine by center stand and jack. Take off screen by removing four fitting screws. Disconnect front turn signal light lead wires, right and left.



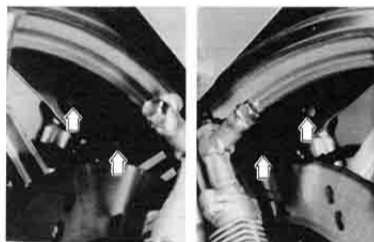
Remove right and left lower windscreen covers.



Take off windscreen by removing fitting screws.

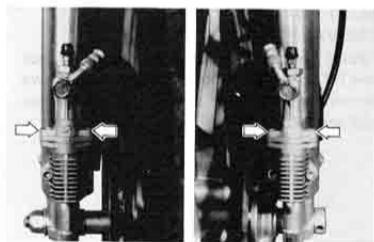


Remove front fender.



Separate each modulator plunger from the fork, by using 4 mm hexagon wrench.

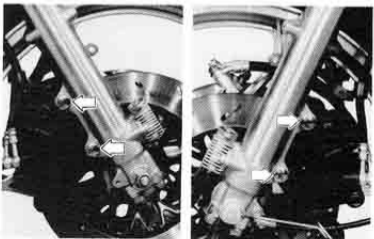
09911-70130	4 mm hexagon wrench
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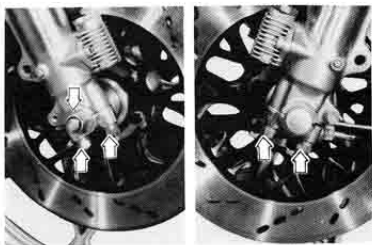
Remove caliper mounting bolts and dismount the calipers (right and left).

NOTE:

Do not operate the brake lever while dismounting the calipers.



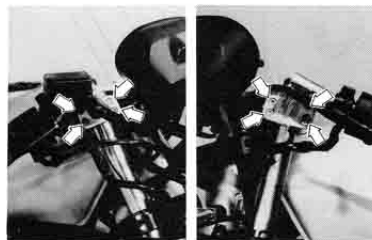
Remove axle nut and axle holders, right and left.



Draw out axle shaft and take off front wheel.



Remove four fitting bolts and take off each handlebar.

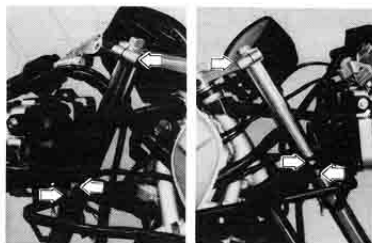


Loosen the front fork clamp bolts, upper and lower.

09911-71510 "L" type hexagon wrench

NOTE:

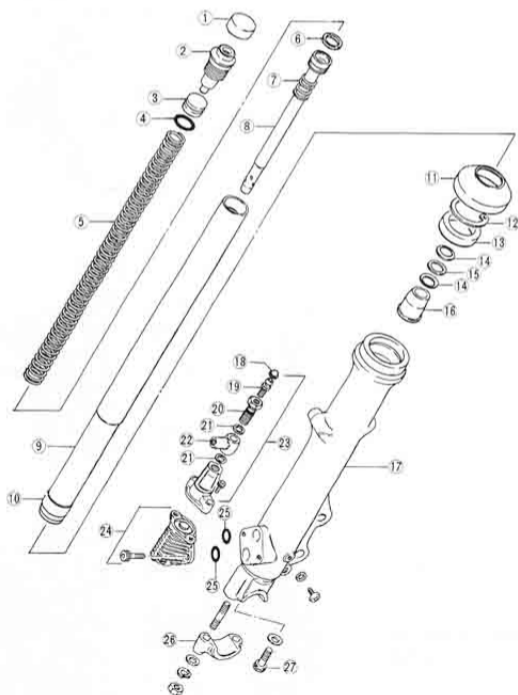
Slightly loosen the front fork cap bolt to facilitate later disassembly after loosening upper clamp bolt.



Pull down front fork assembly.



DISASSEMBLY



- 1 Rubber cap
- 2 Cap bolt
- 3 Free piston
- 4 O-ring
- 5 Spring
- 6 Damper rod ring
- 7 Rebound spring
- 8 Damper rod
- 9 Inner tube
- 10 Anti-friction ring
- 11 Dust cover
- 12 Circlip
- 13 Oil seal
- 14 Wave washer
- 15 Washer
- 16 Oil lock piece
- 17 Outer tube
- 18 Air bleeder cap
- 19 Air bleeder
- 20 Union bolt
- 21 Gasket
- 22 Union
- 23 Modulator plunger set
- 24 Modulator valve set
- 25 O-ring
- 26 Axle holder
- 27 Damper rod bolt

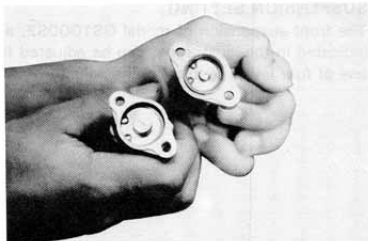
INSPECTION

MODULATOR PLUNGER ASSEMBLY AND VALVE ASSEMBLY

After separating the modulator plunger from the modulator valve, inspect each sliding part for leakage of brake fluid or front fork oil. If any defect is found, replace affected unit with new one.

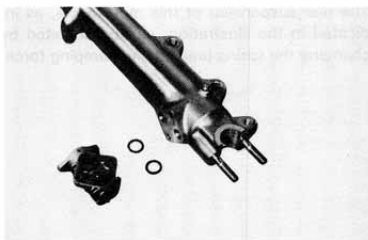
NOTE:

Modulator plunger and valve is only available as a replacement unit.



MODULATOR VALVE O-RINGS

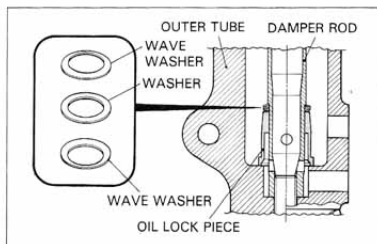
Inspect the O-rings located between modulator valve and front fork for wear or damage.



REASSEMBLY

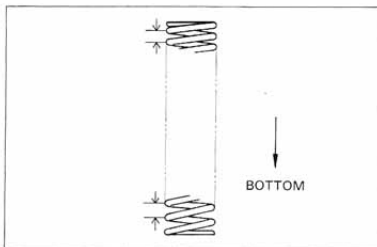
OIL LOCK PIECE

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



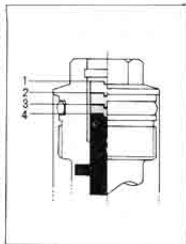
FORK SPRING

Install the fork spring, large pitch end should position in bottom.

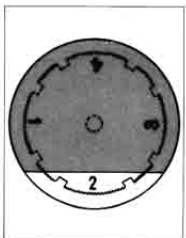


SUSPENSION SETTING

The front suspension of model GS1000SZ, as indicated in the illustration, can be adjusted to one of four levels by turning the adjuster.



The rear suspension of this motorcycle, as indicated in the illustration, can be adjusted by changing the spring preload and damping force.



Both front and rear suspensions of GS1000SZ is adjustable according to the rider's requirements. GS1000SZ has been designed especially for high speed riding and thus it is vitally dangerous to drive under unbalanced suspension settings.

Use the following table for the most balanced settings of both front and rear suspensions.

SUSPENSION SETTING TABLE

ITEM	FRONT FORK	REAR SHOCK ABSORBER		REMARKS
		Spring preload	Damping force	
SOFTER	2	2	2	—
STANDARD	3	3 *(4)	2	*Shows that it is good for circuit running.
STIFFER	4	5	3	—
DUAL RIDING	3	4	2	Good for both high speed and ordinary ridings.

NOTE:

Standard setting recommendations are the most suitable setting for all conceivable running conditions.

We, strongly recommend, urge you to operate the motorcycle only with these recommended settings which ensure riding comfort and stability.

WARNING:

Always equally adjust the settings of all the four suspension components, front and rear, and right and left to the proper setting. As tires also affect the riding stability, we strongly recommend to use only genuine Suzuki replacement tires, and to change to a new one whenever observing any crack or wear in a tire.

AIR BLEEDING PROCEDURE

Bleed the air from the anti-dive components in an ascending order as shown in fig. Always start with the left side.

① Left anti-dive device



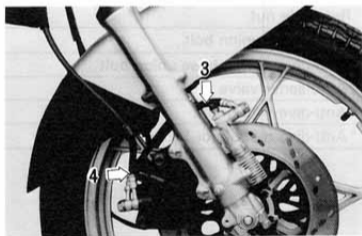
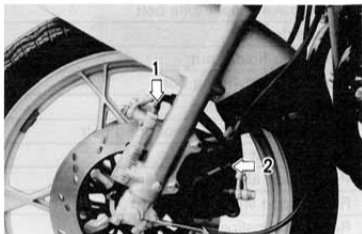
② Left caliper



③ Right anti-dive device



④ Right caliper

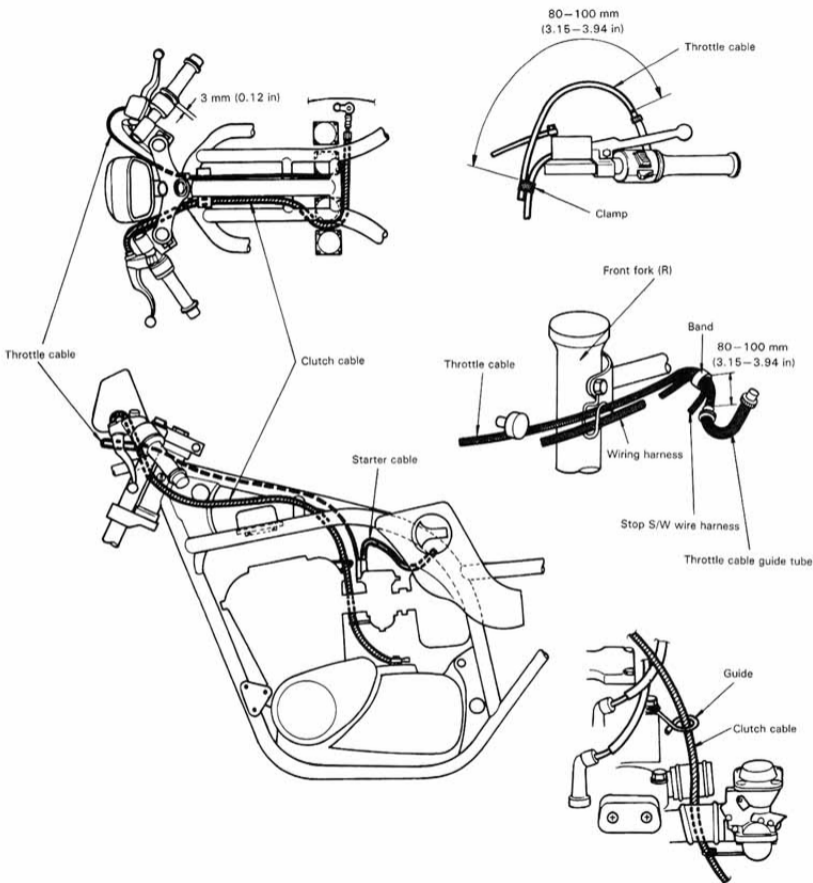


TIGHTENING TORQUE

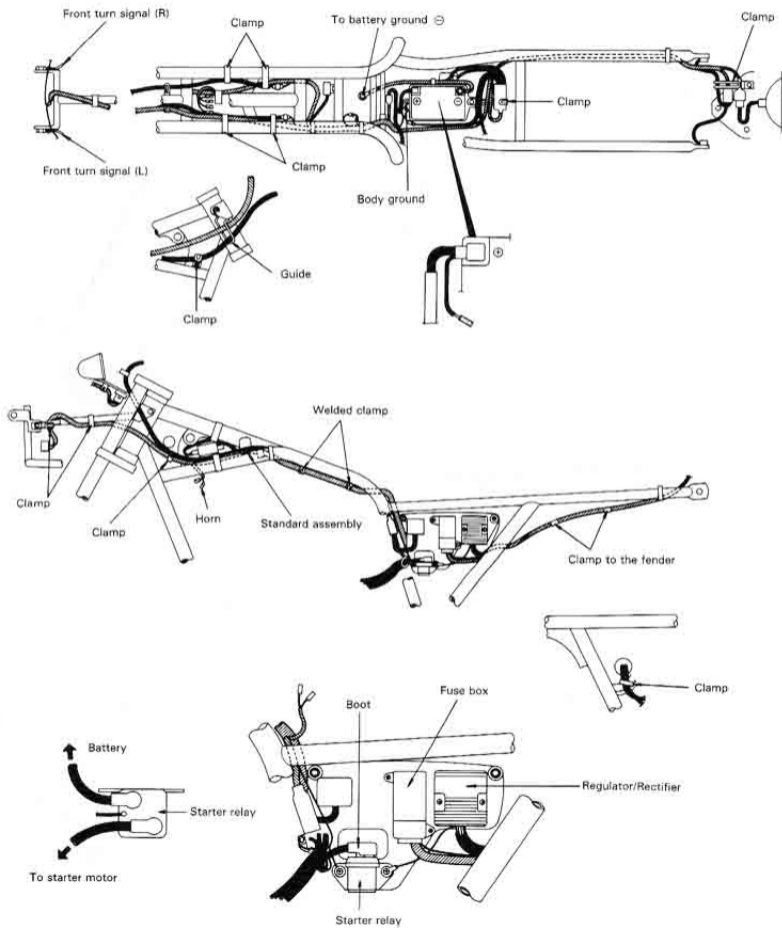
CHASSIS

ITEM	N·m	kg·m	lb·ft
Handlebar clamp bolt	8.0–12.0	0.8–1.2	6.0–8.5
Steering stem head bolt	35.0–50.0	3.5–5.0	25.5–36.0
Steering stem clamp bolt	15.0–25.0	1.5–2.5	11.0–18.0
Front fork cap bolt	20.0–30.0	2.0–3.0	14.5–21.5
Front fork upper clamp bolt	20.0–30.0	2.0–3.0	14.5–21.5
Front fork lower clamp bolt	15.0–25.0	1.5–2.5	11.0–18.0
Front master cylinder clamp bolt	10.0–16.0	1.0–1.6	7.0–11.5
Front brake caliper mounting bolt	25.0–40.0	2.5–4.0	18.0–29.0
Front brake caliper axle bolt	15.0–20.0	1.5–2.0	11.0–14.5
Front axle nut	36.0–52.0	3.6–5.2	26.0–37.5
Front axle holder nut	15.0–25.0	1.5–2.5	11.0–18.0
Front footrest fitting bolt	27.0–43.0	2.7–4.3	19.5–31.0
Swing arm pivot nut	55.0–85.0	5.5–8.5	40.0–61.5
Rear master cylinder mounting bolt	10.0–16.0	1.0–1.6	7.0–11.5
Rear footrest fitting bolt	27.0–43.0	2.7–4.3	19.5–31.0
Rear shock absorber bolt and nut	20.0–30.0	2.0–3.0	14.5–21.5
Rear torque link bolt and nut	20.0–30.0	2.0–3.0	14.5–21.5
Rear brake caliper mounting bolt	25.0–40.0	2.5–4.0	18.0–29.0
Chain adjuster support bolt	18.0–28.0	1.8–2.8	13.0–20.0
Rear axle nut	85.0–115.0	8.5–11.5	61.5–83.0
Brake hose union bolt	20.0–25.0	2.0–2.5	14.5–18.0
*Anti-dive device hose union bolt	20.0–25.0	2.0–2.5	14.5–18.0
*Air bleeder valve	6.0–9.0	0.6–0.9	4.5–6.5
*Anti-dive fitting bolt	6.0–8.0	0.6–0.8	4.5–6.0
*Anti-dive modulator fitting bolt	4.0–5.0	0.4–0.5	3.0–3.5

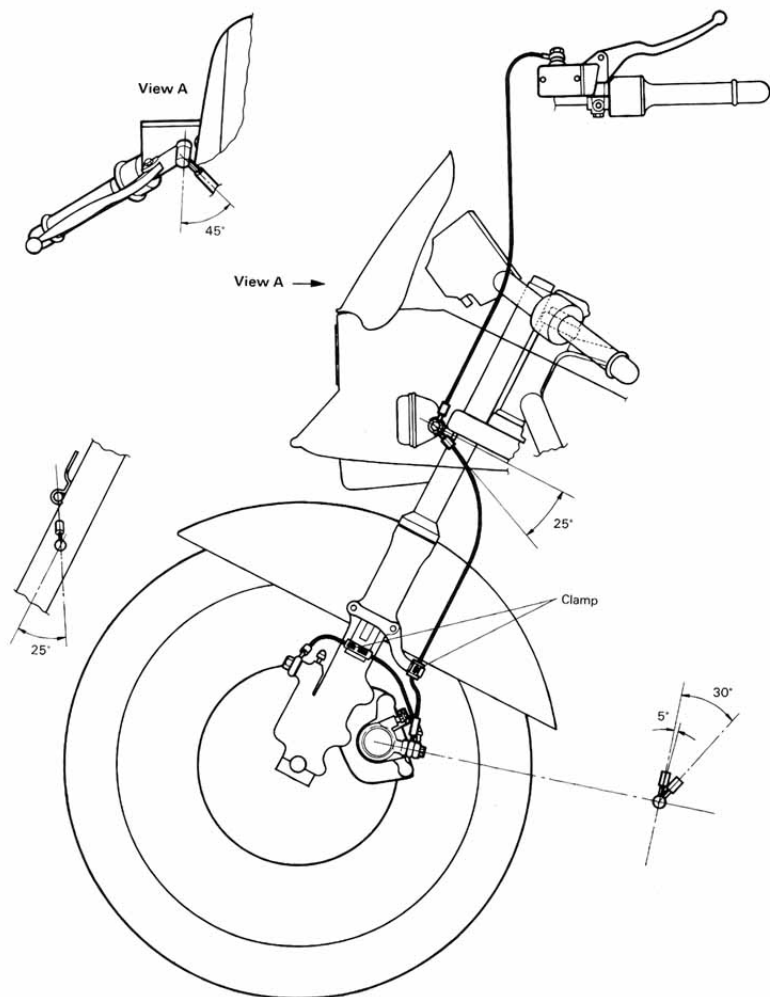
CABLE ROUTING



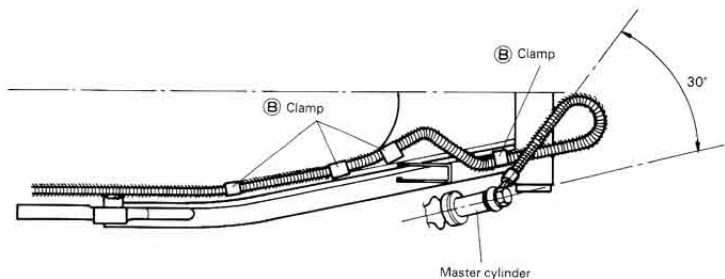
HARNESS ROUTING



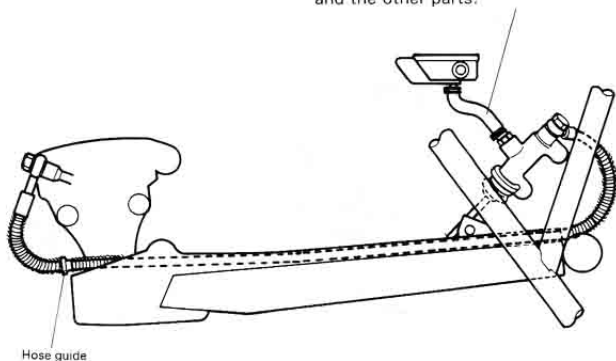
BRAKE HOSE ROUTING



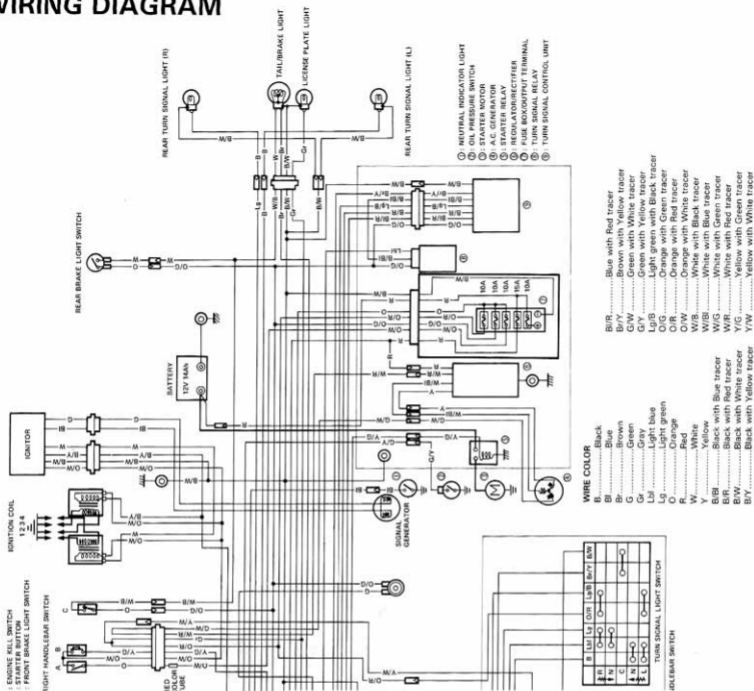
- Ⓐ 1. Turning radius of the brake hose should be more than 30 mm at the center of brake hose.
 2. Hose winding should be less than 15° at the length of 300 mm.
 3. Do not fix the hose to the caliper/master cylinder with the extended condition.
 4. Make sure that no protective part does not contact with the other parts.
 Ⓑ Bend the clamp after routing the hose.



- Ⓐ Keep more than 6 mm clearance between this hose and the other parts.



WIRING DIAGRAM



VIEW OF SUZUKI GS1100EZ



RIGHT SIDE



LEFT SIDE

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SPECIFICATIONS

DIMENSIONS AND DRY MASS

Overall length	*2 225 mm (87.6 in)
Overall width	*850 mm (33.5 in)
Overall height	*1 165 mm (45.9 in)
Wheelbase	*1 510 mm (59.4 in)
Ground clearance	155 mm (6.1 in)
Seat height	*790 mm (31.1 in)
Dry mass	*237 kg (522 lbs)

ENGINE

Type	Four-stroke, air-cooled, DOHC, TSCC
Number of cylinders	4
Bore	72.0 mm (2.835 in)
Stroke	66.0 mm (2.598 in)
Piston displacement	1 074 cm ³ (65.5 cu. in)
Compression ratio	9.5 : 1
Carburetor	MIKUNI BS34SS, four
Air cleaner	Paper element
Starter system	Electric
Lubrication system	Wet sump

TRANSMISSION

Clutch	Wet multi-plate type
Transmission	5-speed constant mesh
Gearshift pattern	1-down, 4-up
Primary reduction	1.775 (87/49)
Final reduction	2.800 (42/15)
Gear ratios, Low	2.500 (35/14)
2nd	1.777 (32/18)
3rd	1.380 (29/21)
4th	1.125 (27/24)
Top	0.961 (25/26)
Drive chain	DAIDO D.I.D.630YL or TAKASAGO RK630GSV, 96 links

* Asterisk indicates new Z model specifications.

CHASSIS

Front suspension	*Telescopic, pneumatic/coil spring, oil dampened, damper 4-way/ spring 4-way adjustable with ANTI-DIVE
Rear suspension	Swinging arm, oil dampened, damper 4-way/spring 5-way adjustable
Steering angle.....	40° (right & left)
Caster.....	62° 00'
Trail	*116 mm (4.57 in)
Turning radius.....	*2.7 m (8.9 ft)
Front brake.....	Disc brake, twin
Rear brake.....	Disc brake
Front tire size.....	3.50V19 4PR
Rear tire size	4.50V17 4PR
Front fork stroke.....	160 mm (6.30 in)
Rear wheel travel.....	108 mm (4.25 in)
Front tire pressure	1.75kg/cm (24 psi) (Normal solo riding)
Rear tire pressure.....	2.00 kg/cm ² (28 psi) (Normal solo riding)

ELECTRICAL

Ignition type.....	Transistorized
Ignition timing	12° B.T.D.C. below 1 500 r/min and 32° B.T.D.C. above 2 350 r/min
Spark plug.....	NGK D8EA or NIPPON DENSO X24ES-U
Battery	12V 50.4kC (14Ah)/10HR
Generator.....	Three-phase A.C. generator
Fuse.....	10/10/10/10/15A

CAPACITIES

Fuel tank including reserve	*22 L (5.8 US gal)
reserve	4.0 L (4.2 US qt)
Engine oil	3.2 L (3.4 US qt)
Front fork oil (each leg).....	*246 ml (8.31 US oz)

Specifications are subject to change without notice.

*Asterisk indicates new Z model specifications.

SERVICE DATA

VALVE + GUIDE

Unit: mm (in)

Item		Standard	Limit
Valve diam.	IN.	27.0 (1.06)	—
	EX.	23.0 (0.91)	—
Valve lift	IN.	7.0 (0.28)	—
	EX.	6.5 (0.26)	—
Valve clearance (when cold)	IN./EX.	0.07 – 0.12 (0.003 – 0.005)	—
Valve guide to Valve stem clearance	IN.	0.025 – 0.052 (0.0010 – 0.0020)	0.35 (0.014)
	EX.	0.040 – 0.067 (0.0016 – 0.0026)	0.35 (0.014)
Valve guide I.D.	IN./EX.	5.500 – 5.512 (0.2165 – 0.2170)	—
Valve stem O.D.	IN.	5.460 – 5.475 (0.2150 – 0.2156)	—
	EX.	5.445 – 5.460 (0.2144 – 0.2150)	—
Valve stem runout	IN./EX.	—	0.05 (0.002)
Valve head thickness	IN./EX.	—	0.5 (0.02)
Valve stem end length	IN./EX.	—	3.6 (0.14)
Valve seat width	IN./EX.	0.9 – 1.1 (0.035 – 0.043)	—
Valve head radial runout	IN./EX.	—	0.03 (0.001)
Valve spring free length (IN./EX.)	INNER	—	31.9 (1.26)
	OUTER	—	35.6 (1.40)
Valve spring tension (IN./EX.)	INNER	4.4 – 6.4 kg (9.7 – 14.1 lbs) at length 28.5 mm (1.12 in)	—
	OUTER	6.5 – 8.9 kg (14.3 – 19.6 lbs) at length 32.0 mm (1.26 in)	—

CAMSHAFT + CYLINDER + HEAD

Unit: mm (in)

Item		Standard	Limit
Cam height	IN.	34.650 – 34.690 (1.3642 – 1.3657)	34.350 (1.3524)
	EX.	34.360 – 34.400 (1.3528 – 1.3543)	34.060 (1.3409)
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		—	157.80 (6.213)
Cam chain pin (at arrow "3")		20th pin	—
Rocker arm I.D.	IN./EX.	12.000 – 12.018 (0.4724 – 0.4731)	—
Rocker arm shaft O.D.	IN./EX.	11.973 – 11.984 (0.4714 – 0.4718)	—
Cylinder head distortion		—	0.2 (0.008)

PISTON + RING + CYLINDER

Unit: mm (in)

Item		Standard	Limit
Compression pressure		9 – 12 kg/cm ² (128 – 171 psi)	7 kg/cm ² (100 psi)
Compression pressure difference		—	2 kg/cm ² (28 psi)
Piston to Cylinder clearance		0.050 – 0.060 (0.0020 – 0.0024)	0.120 (0.0047)
Cylinder bore		72.000 – 72.015 (2.8346 – 2.8352)	72.080 (2.8378)
Piston diam.		71.945 – 71.960 (2.8325 – 2.8331) Measure at 15.0 mm (0.59 in) from the piston skirt end	71.880 (2.8299)
Cylinder distortion		—	0.2 (0.008)

Unit: mm (in)

Item		Standard	Limit
Piston ring free end gap:	1st	Approx. 9.5 (0.37)	7.6 (0.30)
	2nd	Approx. 11.0 (0.43)	8.8 (0.35)
Piston ring end gap:	1st	0.10 – 0.30 (0.004 – 0.012)	0.7 (0.03)
	2nd	0.10 – 0.30 (0.004 – 0.012)	0.7 (0.03)
Piston ring groove clearance:	1st	—	0.180 (0.0071)
	2nd	—	0.150 (0.0059)
Piston ring groove width:	1st	1.03 – 1.05 (0.040 – 0.041)	—
	2nd	1.21 – 1.23 (0.047 – 0.048)	—
	Oil	2.51 – 2.53 (0.099 – 0.100)	—
Piston ring thickness:	1st	0.975 – 0.990 (0.0384 – 0.0390)	—
	2nd	1.170 – 1.190 (0.0461 – 0.0469)	—
Piston pin bore		18.001 – 18.006 (0.7087 – 0.7089)	18.030 (0.7098)
Piston pin O.D.		17.996 – 18.000 (0.7085 – 0.7086)	17.980 (0.7079)

CRANKSHAFT

Unit: mm (in)

Item	Standard	Limit
Conrod small end I.D.	18.006 – 18.014 (0.7089 – 0.7092)	18.040 (0.7102)
Conrod deflection	—	3.0 (0.12)
Conrod big end side clearance	0.10 – 0.65 (0.004 – 0.026)	1.00 (0.039)
Crankshaft runout	—	0.1 (0.004)

OIL PUMP

Item	Standard	Limit
Oil pump reduction ratio	1.723 (87/49 × 33/34)	—
Oil pressure (at 60°C, 140°F):	Above 0.1 kg/cm ² (1.42 psi) Below 0.5 kg/cm ² (7.11 psi) at 3 000 r/min	—

CLUTCH

Unit:mm (in)

Item	Standard	Limit
Clutch cable play	2 – 3 (0.08 – 0.12)	—
Drive plate thickness	2.9 – 3.1 (0.11 – 0.12)	2.6 (0.10)
Drive plate claw width	15.6 – 15.8 (0.61 – 0.62)	14.8 (0.58)
Driven plate thickness	2.00±0.06 (0.080±0.002)	—
Driven plate distortion	—	0.1 (0.004)
Clutch spring free length	—	38.5 (1.52)

TRANSMISSION

Unit: mm (in)

Item		Standard	Limit
Primary reduction ratio		1.775 (87/49)	—
Final reduction ratio		2.800 (42/15)	—
Gear ratios:	Low	2.500 (35/14)	—
	2nd	1.777 (32/18)	—
	3rd	1.380 (29/21)	—
	4th	1.125 (27/24)	—
	Top	0.961 (25/26)	—
Shift fork to Groove clearance		0.40 – 0.60 (0.016 – 0.024)	0.80 (0.031)
Shift fork groove width		5.45 – 5.55 (0.215 – 0.219)	—
Shift fork thickness		4.95 – 5.05 (0.195 – 0.199)	—
Countershaft length (Low to 2nd)		111.4 – 111.5 (4.386 – 4.390)	—
Drive chain:	Type	DAIDO: D. I. D.: 630YL or TAKASAGO: RK630GSV	—
	Links	96	—
	20pitch length	—	383.0 (15.08)
Drive chain slack		20 – 30 (0.8 – 1.2)	—

CARBURETOR

Unit: mm (in)

Item		Specification
Carburetor type		MIKUNI BS34SS
Bore size		34 (1.34)
I. D. No.		*49220
Idle r/min		1 050 $\pm$ 100 r/min
Fuel level		5.0 $\pm$ 0.5 (0.20 $\pm$ 0.02)
Float height		22.4 $\pm$ 1.0 (0.88 $\pm$ 0.04)
Main jet	(M. J.)	* #11□
Main air jet	(M. A. J.)	1.2
Jet needle	(J. N.)	5D58
Needle jet	(N. J.)	X-1
Throttle valve	(T. V.)	#135
Pilot jet	(P. J.)	#45
Bypass	(B. P.)	0.8, 0.8, 0.8
Pilot outlet	(P. O.)	0.9
Valve seat	(V. S.)	2.0
Starter jet	(G. S.)	#32.5
Pilot screw	(P. S.)	PRE-SET
Pilot air jet	(P. A. J.)	* #170
Throttle cable play		0.5 – 1.0 (0.02 – 0.04)
Choke cable play		0.5 – 1.0 (0.02 – 0.04)

*Asterisk indicates new Z model specification.

ELECTRICAL

Unit: mm (in)

Item	Specification	
Ignition timing	12° B. T. D. C. below 1 500 ± 150 r/min and 32° B. T. D. C. above 2 350 ± 150 r/min	
Firing order	1, 2, 4, 3	
Spark plug:	Type	NGK:D8EA N.D.: X24ES-U
	Gap	0.6 – 0.7 (0.024 – 0.028)
Spark performance	Over 8 (0.3) at 1 atm.	
Signal coil resistance	Approx. 290 – 360 Ω (BI-G)	
Ignition coil resistance:	Primary	O/W – W or B/Y Approx. 3 – 5 Ω
	Secondary	Plug cap – Plug cap Approx. 31 – 33kΩ
Generator No-Load voltage	More than 80 V (AC) at 5 000 r/min	
Regulated voltage	14.0 – 15.5 V at 5000 r/min	
Starter motor:	Brush length	Limit: 9 (0.4)
	Commutator under cut	Limit: 0.2 (0.008)
Starter relay resistance	Approx. 3 – 4 Ω	
Battery:	Type designation	SYB14L-A2
	Capacity	12V 50.4 kC (14 Ah)/10HR
	Standard electrolyte S. G.	1.28 at 20°C (68°F)
Fuse size:	Head	10A
	Signal	10A
	Ignition	10A
	Main	15A
	Output terminal	10A

BRAKE + WHEEL

Unit: mm (in)

Item		Standard	Limit
Rear brake pedal height		20 (0.8)	—
Brake disc thickness:	Front	5.0 ± 0.2 (0.20 ± 0.008)	4.5 (0.18)
	Rear	6.7 ± 0.2 (0.26 ± 0.008)	6.0 (0.24)
Brake disc runout		—	0.30 (0.012)
Master cylinder bore:	Front	15.870 – 15.913 (0.6248 – 0.6265)	—
	Rear	14.000 – 14.043 (0.5512 – 0.5529)	—
Master cylinder piston diam.	Front	15.811 – 15.838 (0.6225 – 0.6235)	—
	Rear	13.957 – 13.984 (0.5495 – 0.5506)	—
Brake caliper cylinder bore:	Front	38.180 – 38.219 (1.5031 – 1.5047)	—
	Rear	38.180 – 38.256 (1.5031 – 1.5061)	—
Brake caliper piston diam.	Front	38.025 – 38.050 (1.4970 – 1.4980)	—
	Rear	38.098 – 38.148 (1.4999 – 1.5019)	—
Wheel rim runout:	Axial	—	2.0 (0.08)
	Radial	—	2.0 (0.08)
Wheel axle runout:	Front	—	0.25 (0.01)
	Rear	—	0.25 (0.01)
Tire size:	Front	3.50V19 4PR	—
	Rear	4.50V17 4PR	—
Tire tread depth:	Front	—	1.6 (0.06)
	Rear	—	2.0 (0.08)

SUSPENSION

Unit: mm (in)

Item	Standard	Limit
Front fork stroke	160 (6.3)	—
Front fork spring free length	—	*442 (17.4)
Front fork oil level	*195 (7.7)	—
Front fork air pressure	0.5 kg/cm ² (7.11 psi)	—
Rear wheel travel	108 (4.25)	—
Swinging arm pivot shaft runout	—	0.3 (0.012)

TIRE PRESSURE

Cold inflation tire pressure	Normal riding				Continuous high speed riding			
	Solo riding		Dual riding		Solo riding		Dual riding	
	kg/cm ²	psi	kg/cm ²	psi	kg/cm ²	psi	kg/cm ²	psi
Front	1.75	24	2.00	28	2.00	28	2.25	32
Rear	2.00	28	2.50	36	2.50	36	2.90	42

* Asterisk indicates new Z model specifications.

FUEL + OIL CAPACITY

Item		Specification
Fuel type		Use only unleaded or low-lead type gasoline of at least 85 – 95 pump octane ($\frac{R+M}{2}$ method) or 89 octane or higher rated by research method.
Fuel tank including reserve		*22L (5.8 US gal)
reserve		4.0 L (4.2 US qt)
Engine oil type and grade		SAE 10W/40 SE or SF
Engine oil capacity:	Change	3 200 ml (3.4 US qt)
	Filter change	3 600 ml (3.8 US qt)
	Overhaul	4 000 ml (4.2 US qt)
Front fork oil type		Fork oil # 15
Front fork oil capacity (each leg)		*246 ml (8.31 US oz)
Brake fluid type		DOT3 or DOT4

WATTAGE

Unit: W (cp)

Item		Specification
Headlight	HI	60
	LO	55
Running/Front turn signal light		8/23 (3/32)
Tail/Brake light		8/23 (3/32)
License light		8 (4)
Rear turn signal light		23 (32)
Speedometer light		3.4
Tachometer light		3.4
Fuelmeter light		2
Oil temperature gauge light		2
CHECK PANEL	Oil	3.4
	Battery	3.4
	Side stand	3.4
	Turn	3.4
	Neutral	3.4
	Head lamp	3.4
	Tail lamp	3.4
	Stop lamp	3.4
	High beam	3.4

* Asterisk indicates new Z model specifications.

TORQUE TABLE

ENGINE

Item	Thread dia.	kg-m	lb-ft
Cylinder head cover bolt	6	0.9 - 1.0	6.5 - 7.0
Cylinder head bolt	6	0.7 - 1.1	5.0 - 8.0
Cylinder head nut	10	3.5 - 4.0	25.5 - 29.0
Rocker arm shaft stopper bolt	6	0.8 - 1.0	6.0 - 7.0
Valve clearance adjuster lock nut	5	0.9 - 1.1	6.5 - 8.0
Cam shaft cap bolt	6	0.8 - 1.2	6.0 - 8.5
Cam shaft sprocket bolt	*7	*2.4 - 2.6	*17.5 - 19.0
Cam chain tensioner fitting bolt	6	0.6 - 0.8	4.5 - 6.0
Cam chain tensioner shaft ass'y	24	3.1 - 3.5	22.0 - 25.5
Cam chain tensioner adjuster lock shaft nut	8	0.9 - 1.4	6.5 - 10.0
Cam chain guide bolt	8	0.9 - 1.4	6.5 - 10.0
Generator rotor nut	16	16.0 - 17.0	115.5 - 123.0
Starter clutch allen bolt	8	1.5 - 2.0	11.0 - 14.5
Governor center bolt	8	1.3 - 2.3	9.5 - 16.5
Crankcase bolt (6 mm)	6	0.9 - 1.3	6.5 - 9.5
Crankcase bolt (8 mm)	8	2.0 - 2.4	14.5 - 17.0
Starter motor bolt	6	0.4 - 0.7	3.0 - 5.0
Oil pan bolt	6	1.0	7.0
Oil filter cover nut	6	0.6 - 0.8	4.5 - 6.0
Neutral stopper housing	14	1.8 - 2.8	13.0 - 20.0
Gearshift arm stopper	8	1.5 - 2.3	11.0 - 16.5
Clutch sleeve hub nut	24	5.0 - 7.0	36.0 - 50.5
Clutch spring bolt	6	1.1 - 1.3	8.0 - 9.5
Engine sprocket nut	25	*10.0 - 15.0	*72.5 - 108.5
Engine mounting bolt (A)(10 mm)	10	4.5 - 5.5	32.5 - 40.0
Engine mounting bolt (B)(10 mm)	10	3.0 - 3.7	21.5 - 27.0
Engine mounting bolt (C)(8 mm)	8	2.0 - 3.0	14.5 - 21.5
Gearshift lever bolt	8	1.3 - 2.3	9.5 - 16.5
Clutch release arm bolt	6	0.6 - 1.0	4.5 - 7.0

CHASSIS

Item	Thread dia.	kg-m	lb-ft
Disc bolt	8	1.5 – 2.5	11.0 – 18.0
Front axle nut	12	3.6 – 5.2	26.0 – 37.5
*Front axle holder nut	8	*1.5 – 2.5	*11.0 – 18.0
Front caliper mounting bolt	10	2.5 – 4.0	18.0 – 29.0
Front caliper axle bolt	12	4.0 – 5.5	29.0 – 40.0
Brake hose union bolt	10	2.0 – 2.5	14.5 – 18.0
Caliper air bleeder	7	0.7 – 0.9	5.0 – 6.5
*Front fork damper rod bolt	10	*2.0 – 2.6	*14.5 – 19.0
Air valve	10	1.0 – 1.3	7.0 – 9.5
Air lock bolt	10	0.05 – 0.10	0.4 – 0.7
Air joint bolt	10	1.0 – 1.2	7.0 – 8.5
Front fork lower clamp bolt	8	1.5 – 2.5	11.0 – 18.0
Front fork upper clamp bolt or nut	10	2.0 – 3.0	14.5 – 21.5
Front fork cap bolt	30	1.5 – 3.0	11.0 – 21.5
*Modulator air bleeder	7	*0.6 – 0.9	*4.5 – 6.5
*Brake hose union bolt (modulator side)	10	*2.0 – 2.5	*14.5 – 18.0
*Modulator mounting bolt	5	*0.4 – 0.5	*3.0 – 3.5
*Modulator valve mounting bolt	6	*0.6 – 0.8	*4.5 – 6.0
Steering stem nut	25	4.0 – 5.0	29.0 – 36.0
Steering stem clamp bolt	8	1.5 – 2.5	11.0 – 18.0
*Steering stem head bolt	18	*2.0 – 3.0	*14.5 – 21.5
Handlebar clamp bolt	8	1.2 – 2.0	8.5 – 14.5
Front master cylinder clamp bolt	5	0.5 – 0.8	3.5 – 6.0
Front footrest bolt	10	2.7 – 4.3	19.5 – 31.0
Swinging arm pivot nut	14	5.5 – 8.5	40.0 – 61.5
Brake pedal arm bolt	8	1.0 – 1.5	7.0 – 11.0
Rear master cylinder mounting bolt	8	1.5 – 2.5	11.0 – 18.0
Rear torque link nut	10	2.0 – 3.0	14.5 – 21.5
Rear caliper mounting bolt	10	2.5 – 4.0	18.0 – 29.0
Rear caliper bolt	10	2.0 – 3.0	14.5 – 21.5
Muffler bracket nut	8	1.5 – 2.0	11.0 – 14.5
Rear shock absorber fitting bolt or nut	10	2.0 – 3.0	14.5 – 21.5
Rear footrest bolt	10	2.7 – 4.3	19.5 – 31.0
Rear sprocket nut	10	2.5 – 4.0	18.0 – 29.0
Rear axle nut	16	8.5 – 11.5	61.5 – 83.0
Chain adjuster support bolt	8	1.5 – 2.0	11.0 – 14.5

* Asterisk indicates new Z model specifications:

SPECIAL MATERIALS

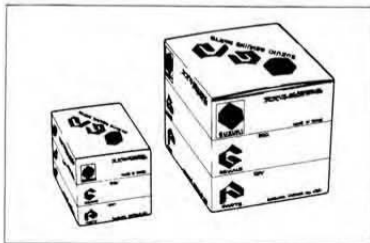
The materials listed below are needed for maintenance work on the GS1100E, and should be kept on hand for ready use. They supplement such standard materials as cleaning fluids, lubricants, emery cloth and the like. How to use them and where to use them is described in this manual.

MATERIAL	PART
 SUZUKI SUPER GREASE "A" 99000-25030	• Oil seals • Throttle grip • Cables (speedometer and tachometer) • Front wheel bearing • Center stand spacer • Rear sprocket mounting drum oil seal • Swinging arm bearing and dust seal • Brake pedal rod arm • Ignition timing governor link • Steering stem bearing • Gear shift lever mounting shaft*
 SUZUKI SILICONE GREASE 99000-25100	• Caliper axle shaft
 SUZUKI MOLY PASTE 99000-25140	• Valve stem • Cam shaft journal • Chain tensioner adjuster shaft • Drive shaft
 SUZUKI BOND # 1207B 99104-31140	• Mating surface of upper and lower crankcase • Mating surface of crankcase and clutch cover, generator cover • Cylinder head cover • Front fork damper rod bolt
 THREAD LOCK SUPER "1333B" 99000-32020	• Cam chain guide holder screw • Cam chain guide bolt • Cam chain guide screw • Starter clutch allen bolt • Engine sprocket damper screw • Muffler cover screw

MATERIAL	PART
 THREAD LOCK SUPER "1303" 99000-32030	- Countershaft 2nd drive gear - Cam sprocket bolt* - Generator rotor nut
 THREAD LOCK CEMENT 99000-32040	- Carburetor upper bracket plate set screw - Carburetor lower bracket plate screw - Carburetor starter shaft lock screw - Oil separator plate screw - Cylinder stud bolt - Oil filter cap nut - Engine sprocket spacer inner surface - Camshaft end cap screw - Front fork damper rod bolt
 THREAD LOCK "1342" 99000-32050	- Generator stator securing screw - Generator stator lead wire screw - Gearshift cam stopper bolt - Starter motor securing bolt - Drive shaft plate screw - Countershaft bearing retainer screw - Oil gallery plate screw - Engine oil pump set bolt* - Engine oil pump housing screw - Gearshift cam pawl screw - Gearshift cam guide screw - Engine oil sump filter screw - Carburetor throttle stop plate screw - Starter motor housing screw - Front fork air joint pipe - Anti-dive modulator securing bolt* - Anti-dive modulator valve securing bolt*

USE OF SUZUKI GENUINE PARTS

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



PERIODIC MAINTENANCE SCHEDULE

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

NOTE:

Vehicles operated under severe conditions may require more frequent servicing.

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

PERIODIC MAINTENANCE CHART

INTERVAL: THIS INTERVAL SHOULD BE JUDGED BY ODOMETER READING OR MONTHS, WHICHEVER COMES FIRST	mile	600	4 000	7 500	11 000	15 000
	km	1 000	6 000	12 000	18 000	24 000
	month	2	12	24	36	48
Battery		—	I	I	I	I
Cylinder head nuts and exhaust pipe bolts		T	T	T	T	T
Air cleaner element		Clean every 2 000 miles (3 000 km), and replace every 7 500 miles (12 000 km).				
Valve clearance		I	I	I	I	I
Spark plug		—	C	R	C	R
Carburetor idle rpm		I	I	I	I	I
Fuel line		Replace every two years.				
Engine oil and oil filter		R	R	R	R	R
Clutch		I	I	I	I	I
Drive chain		I	I	I	I	I
		Clean and lubricate every 600 miles (1 000 km).				
Brakes		I	I	I	I	I
Brake hose		Replace every two years.				
Tire		I	I	I	I	I
Steering		I	I	I	I	I
Front fork		—	—	I	—	I
		Check air pressure every 6 months.				
Chassis bolts and nut		T	T	T	T	T

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

LUBRICATION CHART

The maintenance schedule, which follows, is based on this philosophy: It is timed by odometer indication, and is calculated to achieve the ultimate goal motorcycle maintenance in the most economical manner.

Item \ Interval	Initial and every 6 000 km (4 000 miles)	Every 12 000 km (7 500 miles)
Clutch and brake lever holder	Motor oil	—
Throttle cable	Motor oil	—
Throttle grip	—	Grease
Clutch cable	Motor oil	—
Clutch release	—	Grease
Speedometer cable	—	Grease
Tachometer cable	—	Grease
Drive chain	Motor oil every 600 miles (1 000 km)	
Brake pedal and rod link	Grease or oil	—
Brake cam shaft	—	Grease
Side stand pivot	Motor oil	—
Ignition timing governor link	—	Grease
Steering stem bearings	Grease every 2 years or 15 000 miles (24 000 km)	
Swinging arm bearings		

NOTE:

- * Lubricate exposed parts which are subject to rust with either motor oil or grease whenever the motorcycle has been operated under wet or rainy conditions.
- * Before lubricating each part, clean off any rusty spots and wipe off any accumulated grease, oil, dirt or grime.

EMISSION CONTROL & REGULATIONS

EMISSION REGULATIONS

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

1980 EMISSION LIMITS

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

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

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

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

EMISSION CONTROL CARBURETOR COMPONENTS

GS1100 motorcycles are equipped with precision, manufactured carburetors for emission level control. These carburetors require special mixture control components and other precision adjustments to function properly.

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

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

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

The carburetor specification for the emission-controlled GS1100 are as follows.

Carburetor I.D. No.	Main Jet	Needle Jet	Jet Needle	Pilot Jet	Pilot Screw
49220	#11□	X-1	5D58	#45	PRE-SET DO NOT ADJUST

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

GENERAL EMISSION INFORMATION

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

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

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

- Hydrocarbons (HC)
- Carbon Monoxide (CO)

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

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

Total NOx emissions from all motorcycles is considered negligible. The EPA states that total NOx emission from motorcycles by 1980 will only amount to approximately 0.5%. NOx is formed during the combustion process at high combustion chamber temperatures.

CARBON MONOXIDE

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

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

CARBURETION MALFUNCTION

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

ENGINE MALFUNCTIONS

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

HYDROCARBONS

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

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

IGNITION SYSTEM MALFUNCTIONS

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

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

MIXTURE-RELATED MALFUNCTIONS

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

Engine wear or damage can also cause high HC emissions.

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

SPECIAL FEATURES

ANTI-DIVE FRONT FORK

Consider the case of the motorcycle that is stopped suddenly. Excepting the rider, the machine itself cannot automatically counteract the momentum of its center of gravity moving forward to maintain its balance. At the point of "stoppage" the momentum continues its forward motion to exert its weight through the front fork on the point of contact of the front wheel. Simultaneously, the rear wheel tends to lift as the weight on it is reduced proportionately to the forward momentum. This has the effect of compressing the front fork and extending the rear shock absorber.

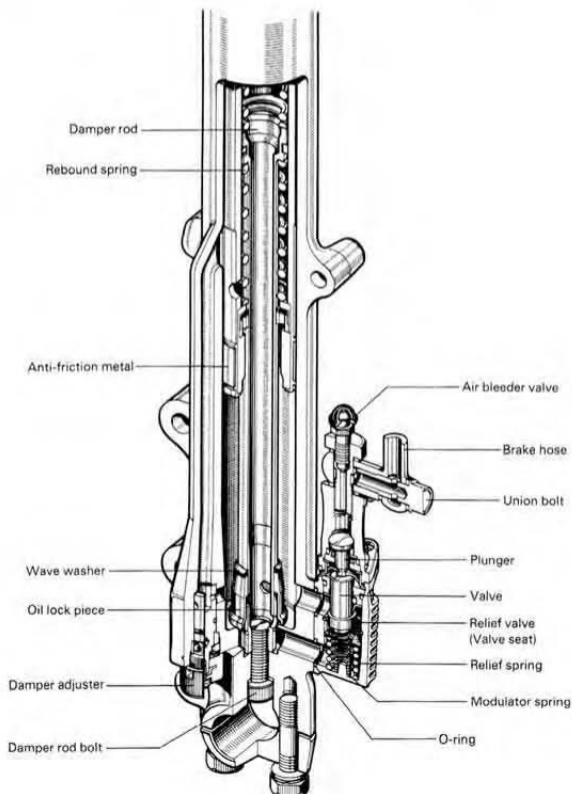
ANTI-DIVE DEVICE

When a speeding motorcycle is stopped, it is impossible to prevent the front fork dive because the momentum of the machine's center of gravity continues forward. The front fork is compressed and extended, as it is braked before cornering and full throttle applied coming out of the corner, which naturally changes its cornering clearance (motorcycle-to-ground clearance) and balance. In order to minimize this change of the front fork length on a racing motorcycle, the spring of the front fork has to be stiffened, while the damping force of the rear shock absorber must be strengthened. However, the suspension system of the street motorcycle is generally set soft for absorbing the bump and shock of the road to ensure riding comfort. However, when the bike's cornering performance requires improvement, the suspension system must be reinforced.

Suzuki's hydraulic anti-dive fork was developed to provide exceptional handling performance and a smooth ride. It ensures the bike's stability during high-speed cornering by preventing the caster angle from being changed during braking and preventing loss of cornering clearance, while assuring riding comfort on the road.

ANTI-DIVE SYSTEM

Suzuki's anti-dive system, developed from the feedback of racing technology, is now equipped on many of Suzuki's 1982 models. The new system is attached to the outer tube of the front fork. The brake line of the front brakes master cylinder leading to the caliper is connected by a hose to the anti-dive device. When the master cylinder's hydraulic line functions to brake the front wheel, it simultaneously operates the anti-dive device's plunger, which regulates and limits the flow of oil in the front fork. This reduces the compression of the front fork, which also reduces the extension of the rear shock absorber. Hence, the device serves to counteract the change in the motorcycle's attitude during braking.

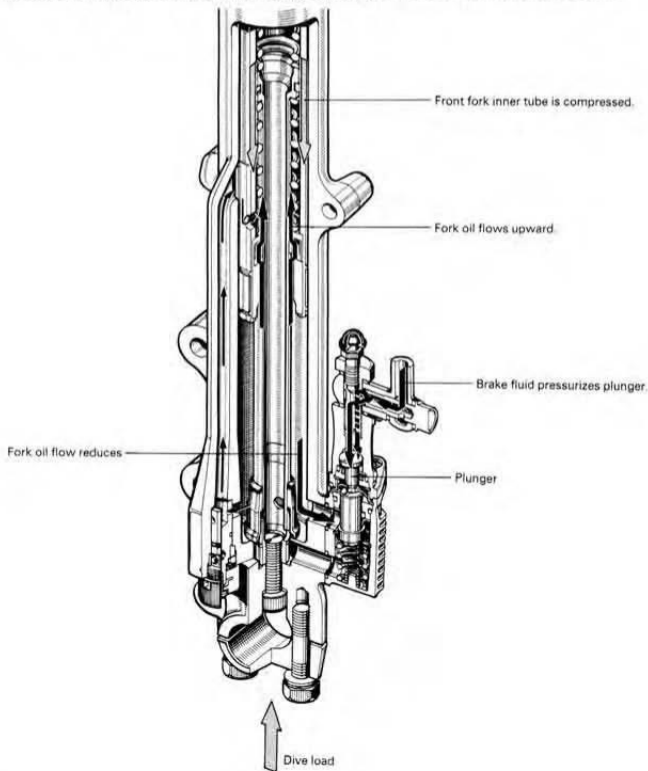


THE ANTI-DIVE SYSTEM IS INACTIVE, WHILE THE FRONT BRAKE IS INACTIVE.

As long as the front brake remains inactive, the oil in the front fork passes through the clearance between the valve and valve seat (relief valve) without restriction. Consequently, the telescopic front fork functions normally.

WHEN THE ANTI-DIVE SYSTEM IS ACTIVATED

When the rider squeezes the lever of the front brake, pressure is exerted on the brake's master cylinder, then transmitted through the brake hose to pressurize the plunger of the anti-dive system. The plunger then lowers the valve, which reduces the clearance between the valve and the valve seat (relief valve). This in turn reduces the flow of fork oil, which reduces the allowable compression of the fork; stiffening it. As a result, the front fork is compressed less, while the extension of the rear shock absorber is also reduced. This stabilizes the motorcycle's braking attitude, and braking during cornering becomes much more controllable.

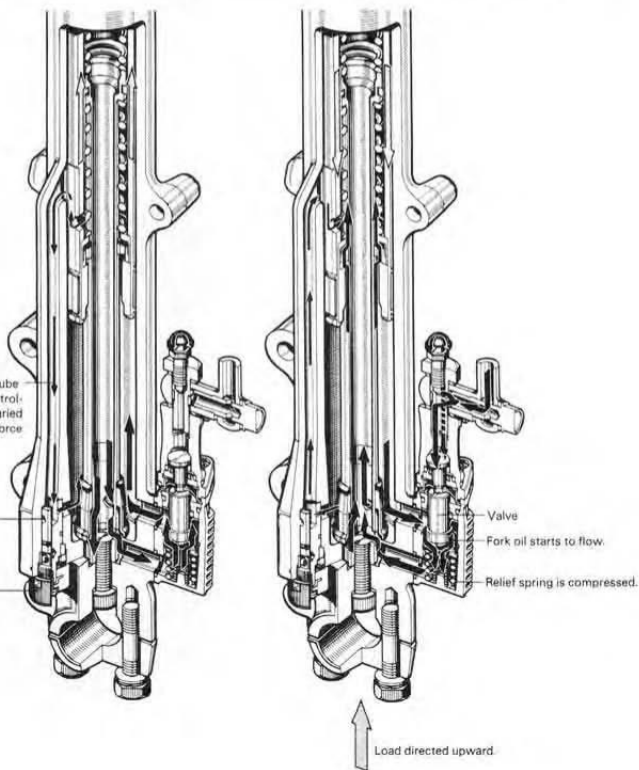


WHAT HAPPENS WHEN THE MOTORCYCLE RECEIVES A JOLT FROM THE ROAD, WHILE THE ANTI-DIVE DEVICE IS ACTIVE?

While the anti-dive device is restricting fork oil flow, any road shock could be directly transmitted to the chassis because the front fork would react as if it were equipped with very stiff springs.

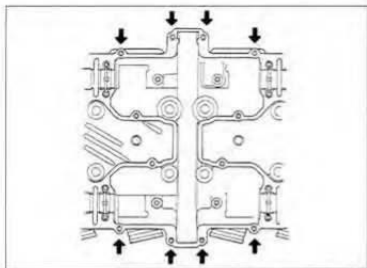
However, the road shock is reduced by the following mechanism: The relief valve, mounted on a spring, is compressed and opened in direct proportion to the pressure on the front-fork oil, permitting the oil to progressively flow through the clearance between the valve and valve seat. Hence the pressure of the fork oil is automatically regulated at a predetermined level. In other words, the clearance at the relief valve represents the difference of fork oil pressure developed by the upward load from the road and the strength of the relief valve's spring.

In order to ensure safety, separate chambers are provided for the fork oil and brake fluid to prevent their mixture.

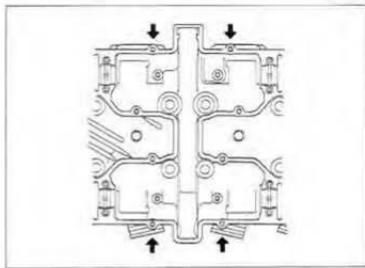


CYLINDER HEAD AND HEAD COVER

The cylinder head and head cover have been modified as illustrated below to improve sealing between cylinder head and head cover.



LATE



EARLY

COVER TIGHTENING BOLT

The engine case covers fasteners have been changed from screws to bolts.

- Clutch cover
- Signal generator cover
- Generator cover
- Engine sprocket cover
- Starter motor cover



NOTE:

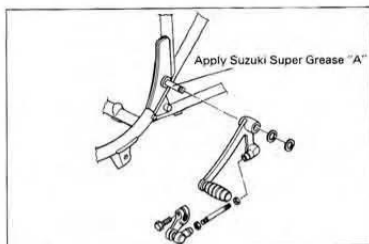
When unscrewing or tightening bolt use a box wrench.



GEAR SHIFT LEVER

Apply Suzuki Super Grease "A" to the frame, as shown below before remounting the gear shift lever.

99000-25030	Suzuki Super Grease "A"
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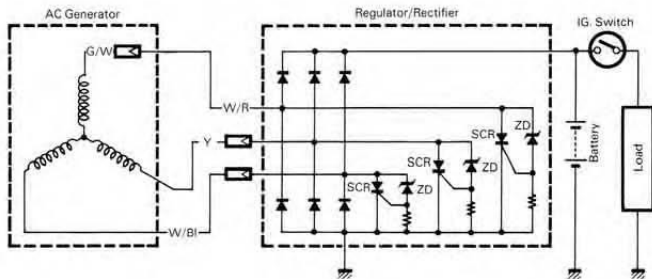


CHARGING SYSTEM

DESCRIPTION

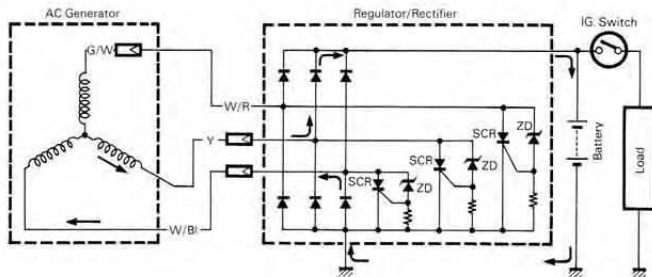
The charging circuit is comprised of an AC generator, regulator/rectifier unit and battery as shown in the illustration.

The AC current generated is changed to DC by the rectifier so the battery can be charged.



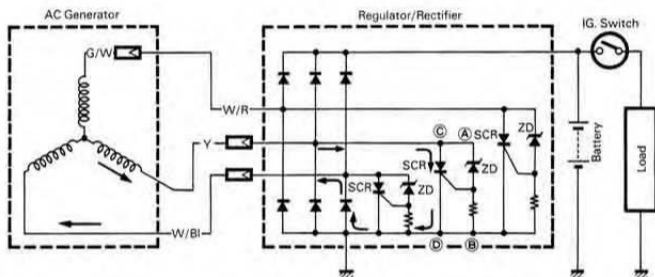
Function of Regulator

When the engine r/min and the AC voltage are low, the regulator portion is inoperative and all current being generated goes directly to the battery, charging it.



When the engine r/min becomes higher, the generated AC voltage also becomes higher and the voltage between points (A) and (B) of regulator becomes higher. When it reaches the adjusted voltage of the regulator, ZD (Zener diode) becomes conductive and the signal will be sent to the SCR (Thyristor) gate probe and SCR will become conductive.

The SCR is now conductive in the direction from point (C) to point (D). At this time the current generated from the AC generator passes through SCR without charging the battery and returns to the AC generator. At the completion of this phase the AC current generated flows to point (D) and reverse current tries to flow to SCR, then the circuit of the SCR turns to the OFF mode and begins to charge the battery again. Thus these repetitions maintain charging voltage to the battery constant and protect it from overcharging.



INSPECTION

CHARGING OUTPUT CHECK

Remove the left frame cover and part holder plate.
Start the engine and keep it running at 5 000 r/min with dimmer switch is HI position.

Using pocket tester, measure the DC voltage between the $\oplus$ terminal of starter relay and ground.

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

NOTE:

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



STD charging output

14 – 15.5V (DC) at 5 000 r/min

09900-25002	Pocket tester
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AC GENERATOR NO-LOAD PERFORMANCE

Disconnect the three lead wires from the AC generator terminal.

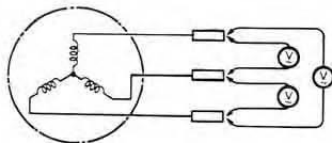
Start the engine and keep it running at 5 000 r/min. Using the pocket tester, measure the AC voltage between the three lead wires.

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



STD No-load performance

80V (AC) or Over at 5 000 r/min



REGULATOR/RECTIFIER

Using the pocket tester (RX1 Ω range), measure the resistance between the lead wires in the following table.

If the resistance checked is incorrect, replace the regulator/rectifier.

09900-25002	Pocket tester
-------------	---------------

Unit: Ω

Ⓢ Probe of tester to:	Ⓢ Probe of tester to:					
	R	W/Bl	W/R	Y	B/W	
R		OFF	OFF	OFF	OFF	
W/Bl	Approx. 5-9		OFF	OFF	OFF	
W/R	Approx. 5-9	OFF		OFF	OFF	
Y	Approx. 5-9	OFF	OFF		OFF	
B/W	Approx. 40-150	Approx. 5-9	Approx. 5-9	Approx. 5-9		

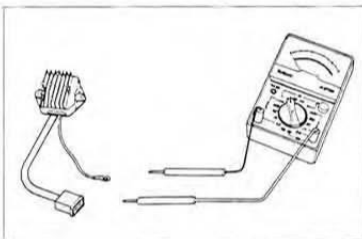
WIRE COLOR

R: Red

Y: Yellow

W/Bl: White with Blue tracer

W/R: White with Red tracer

**COIL TYPE FUEL GAUGE**

The GS1100EZ is equipped with an electro-magnetic oil damped fuel gauge. This type of instrument differs from the type previously used and does not return to the "E" position when the ignition switch is turned off.

OPERATION**SENDING UNIT**

When the ignition switch is turned on, the resistance from the fuel tank float assembly will vary with the amount of fuel in the tank.

FUEL GAUGE

As shown in Fig. 1, four coils are located in the fuel gauge (N_1 , N_2 , N_3 and N_4). As the resistance from the sending unit varies along with the fuel level, the current at points L1 and L2 will also vary. This in turn will cause the strength of the magnetic field generated in the four coils to increase or decrease (causing a related increase or decrease in the force vector H in Fig. 2) which will force the needle to move to the proper position (Fig. 3).

When the ignition is turned off, the pointer remains in the position where it was when the switch was ON. This function is displayed by using high-viscosity oil and a balanced magnet (Fig. 4).

FUEL LEVEL SYSTEM

The Fuel System can be divided into two sections:

- (1) The Fuel Meter : Located in the instrument cluster
- (2) The Fuel Tank Float Assembly (Fuel gauge sending unit)

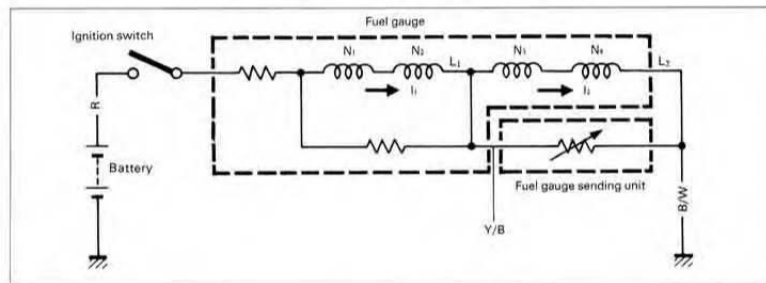


Fig. 1

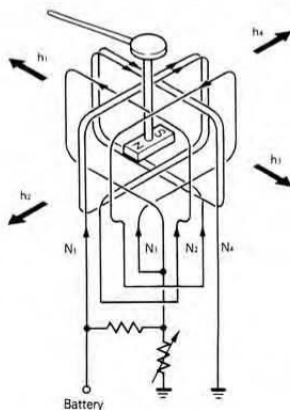


Fig. 3

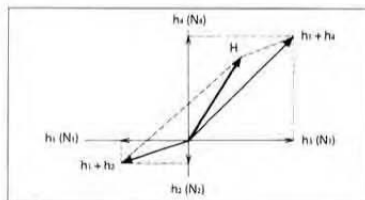


Fig. 2

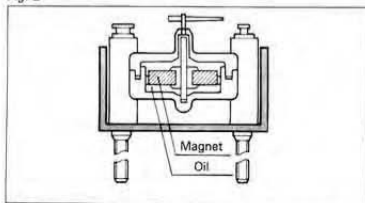


Fig. 4

NOTE:

Prior to testing the Fuel Level System, Verify that the battery is in a fully charged condition.

FUEL METER

To test the Fuel Meter two different checks may be used. The first, and simplest test will tell if the meter is operating but will not indicate the meters accuracy throughout the range.

To perform this test, disconnect the B/W and Y/B wires going to the Fuel Tank Float Assembly. Connect a jumper wire between the B/W and Y/B wires coming from the main harness. With the ignition switch turned on, the fuel meter should indicate "F".

The second test will check the accuracy of the meter in the full and empty positions.

Disconnect the B/W and Y/B wires which connect to the Float Assembly and install a 3Ω resistor between the two leads coming from the main harness. Turn the ignition switch on and the fuel meter should indicate "F". Remove the 3Ω resistor and install a 110Ω resistor in its place and the fuel meter should indicate "E".

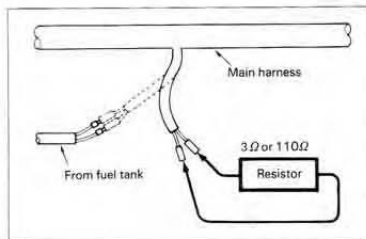
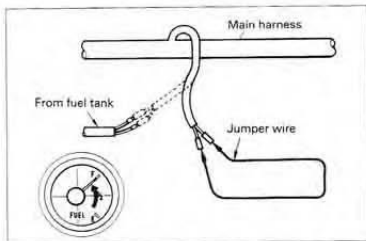
If the fuel meter does not read as prescribed above, replace the meter.

FUEL TANK FLOAT ASSEMBLY**(FUEL GAUGE SENDING UNIT)**

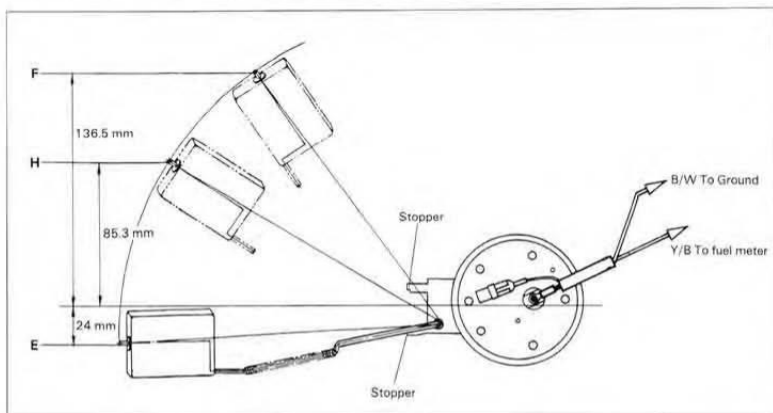
To check the variable resistor in the Float Assembly, disconnect the two wires (B/W – Y/B) coming out of the Float Assembly. Using the Pocket tester, measure the resistance in each of the following positions:

09900-25002	Pocket Tester
-------------	---------------

FLOAT POSITION	RESISTANCE
Full	Approx. 3Ω
1/2	Approx. 32.5Ω
Empty	Approx. 110Ω



If the resistance measured is incorrect, replace the Float Assembly.

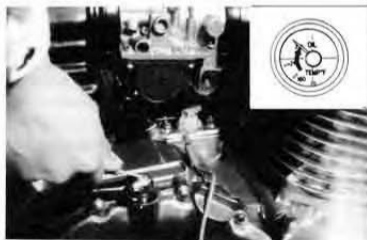


OIL TEMPERATURE GAUGE

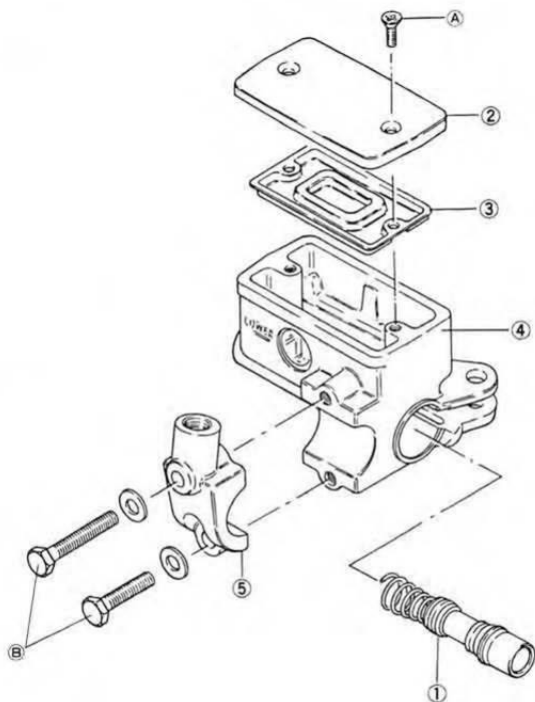
With the ignition switch turned on, disconnect lead wire from oil temperature gauge unit, ground the lead wire and check the temperature gauge. If "320°F" is indicated, the temperature gauge is in good condition.

NOTE:

The normal oil operating temperature range is between 160°F and 280°F.



FRONT MASTER CYLINDER

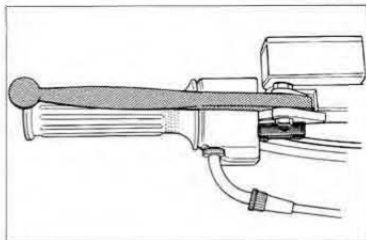


- ① Piston and cup set
 ② Cap
 ③ Diaphragm
 ④ Body
 ⑤ Holder

Tightening torque		
	kg-m	lb-ft
Ⓐ	0.08 - 0.15	0.6 - 1.0
Ⓑ	0.5 - 0.8	3.5 - 6.0

REMOVAL AND DISASSEMBLY

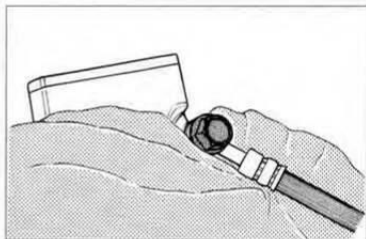
- Remove the front brake light switch and front brake lever.



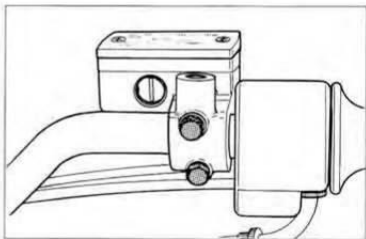
- Place a cloth underneath the union bolt on the master cylinder to catch spilled drops of brake fluid. Unscrew the union bolt and disconnect the brake hose/master cylinder joint.

CAUTION:

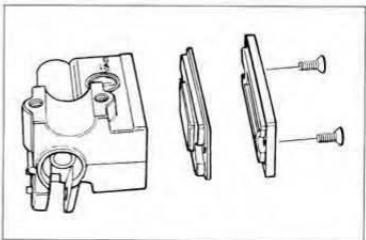
Immediately and completely wipe off any brake fluid contacting any part of the motorcycle. The fluid reacts chemically with paint, plastics, rubber, materials, etc. and will damage them severely.



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



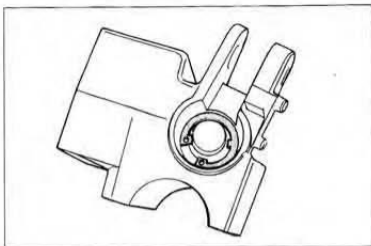
- Remove the two fitting screws, and remove the cap and diaphragm.
- Drain brake fluid.



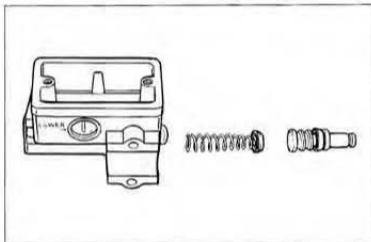
- Remove the dust seal boot.
- Remove the circlip by using special tool.

09900-06108

Snap ring pliers

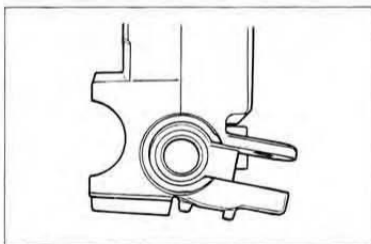


- Remove the piston, primary cup and spring.

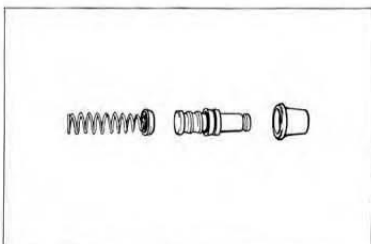


MASTER CYLINDER INSPECTION

- Inspect the master cylinder bore for any scratches or other damage.



- Inspect the piston surface for scratches or other damage.
- Inspect the primary cup, secondary cup, and dust seal boot for wear or damage.



MASTER CYLINDER REASSEMBLY

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

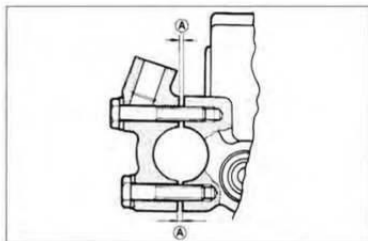
CAUTION:

Wash the master cylinder components with fresh brake fluid before reassembly. Never use cleaning solvent or gasoline to wash brake parts. Apply brake fluid to the cylinder bore and all internal parts before inserting into the bore.

- When remounting the master cylinder on the handlebars, secure the clamp so that the clearances (A) of the handlebars stay equally.

CAUTION:

Bleed the air after reassembling master cylinder.
Adjust the front brake light switch after installation



FRONT BRAKE AIR BLEEDING PROCEDURE

Bleed the air from the anti-dive components in an ascending order as shown in illustration. Always start with the left side.

① Left anti-dive device



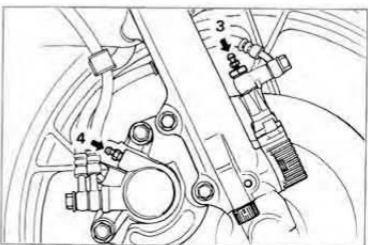
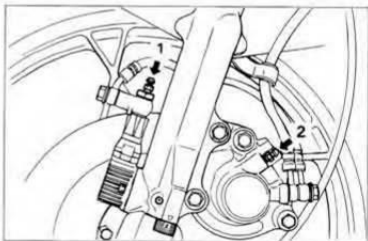
② Left caliper



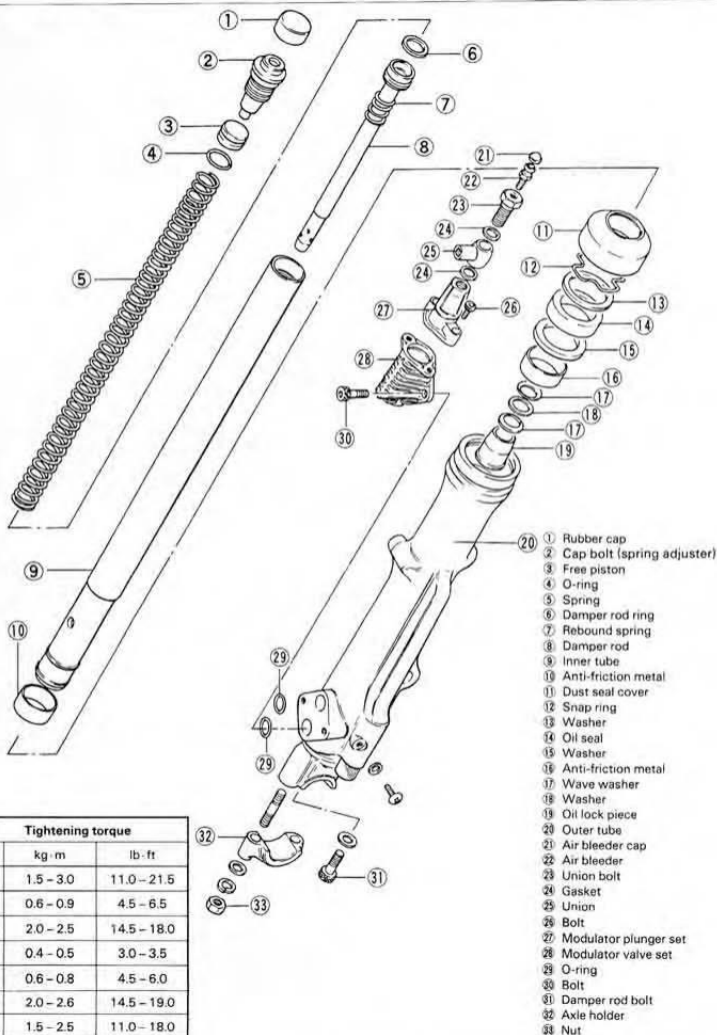
③ Right anti-dive device



④ Right caliper



FRONT FORK



REMOVAL AND DISASSEMBLY

- Support the machine by center stand and a jack.



- Remove the four bolts and take off the front fender.



- Separate each modulator plunger from the forks, by using hexagon wrench.

09911-70130

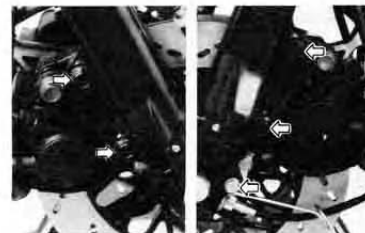
4 mm hexagon wrench



- Remove the caliper mounting bolts, cable guide bolt and dismount the right and left calipers.

NOTE:

Do not operate the brake lever while dismounting the calipers.



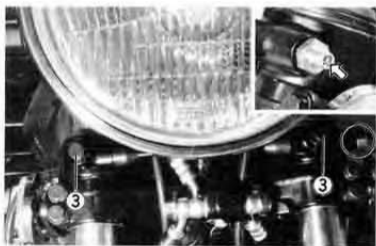
- Pull out the cotter pin ① and remove axle nut ② and axle holder nuts, right and left.



- Remove the axle shaft and take off the front wheel.



- Loosen the two air stop valves ③.
- Remove the valve cap and push in the air valve to relieve the air pressure completely.



- Loosen the two nuts and remove the air joint pipe.



- Loosen the steering stem upper and lower clamp bolts, on both the right and left sides.

NOTE:

Slightly loosen the front fork cap bolts to facilitate later disassembly before loosening upper and lower clamp bolts.



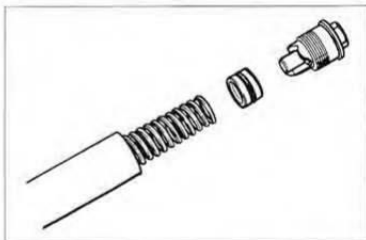
- Pull down right and left front fork assemblies.



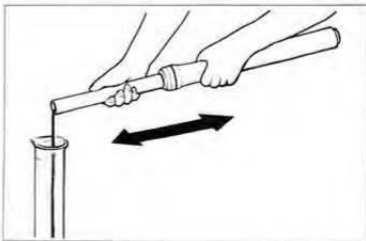
- Remove the front fork cap bolt.
- Remove the free piston and fork spring.

CAUTION:

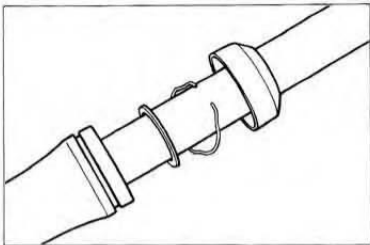
When taking out the free piston, lift the front fork outer tube slowly. If an excessive force is applied, the free piston may be popped out by the force of the fork spring.



- Invert the fork and stroke it several times to remove the oil. Hold the fork in the inverted position for a few minutes to drain all the oil.

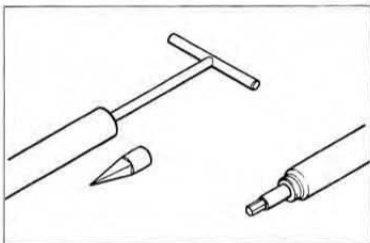


- Remove the dust seal, stopper ring and washer.

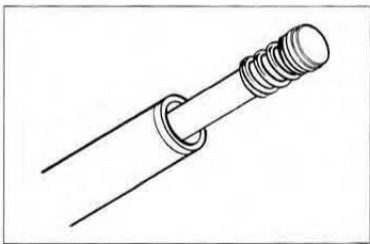


- Remove damper rod securing bolt by using special tools.

09940-34520	"T" handle
09940-34561	Attachment "D"



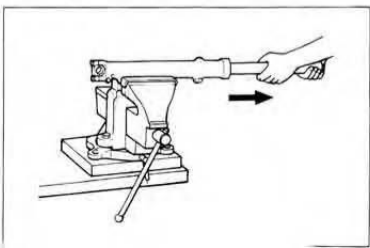
- Draw out damper rod and rebound spring.



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

CAUTION:

Do not clamp on outer fork tube as damage may occur.



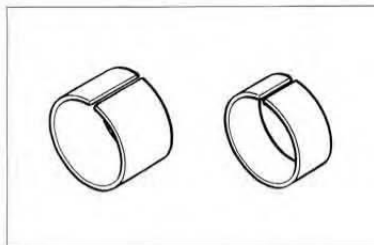
CAUTION:

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

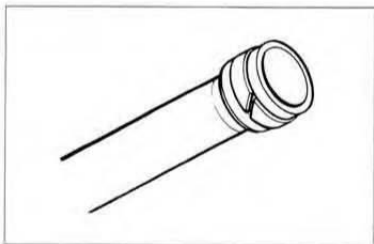
- Remove the modulator valve assembly, by using hexagon wrench.

09911-73730

"T" type hexgon wrench

**INSPECTION****DAMPER ROD RING**

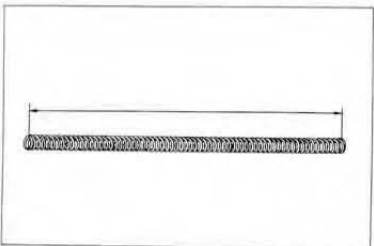
Inspect the damper rod ring for wear and damage.

**FORK SPRING**

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

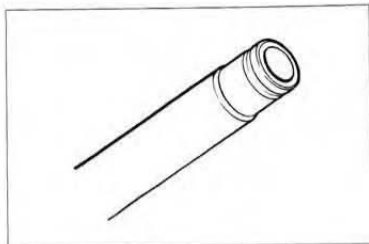
Service limit

442 mm (17.4 in)



INNER TUBE

Inspect the inner tube outer surface for any scuffing.

**OUTER TUBE**

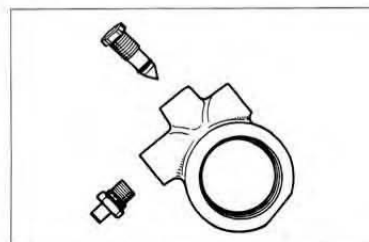
Inspect the outer tube inner surface for any scuffing.

**FREE PISTON**

Inspect the free piston O-ring for wear or damage.

**AIR LOCK SCREW AND VALVE**

Inspect the air lock screw and valve O-rings for wear or damage.



AIR JOINT PIPE

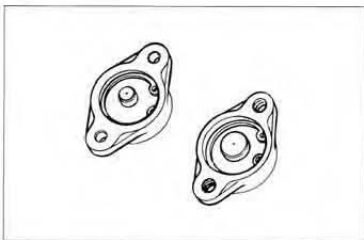
Inspect the air joint pipe O-rings for wear or damage.

**MODULATOR PLUNGER ASSEMBLY AND VALVE ASSEMBLY**

After separating the modulator plunger from the modulator valve, inspect each sliding part for leakage of brake fluid or fork oil. If any defect is found, replace affected unit with new one.

NOTE:

Modulator plunger and valve is only available as a replacement unit.

**MODULATOR VALVE O-RINGS**

Inspect the O-rings located between modulator valve and front fork for wear or damage.



REASSEMBLY

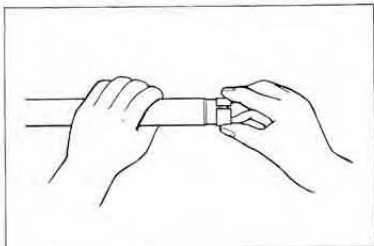
Reassemble and remount the front fork in the reverse order of disassembly and removal, and also carry out the following steps.

INNER TUBE METAL

Install the anti-friction metal by hand as shown.

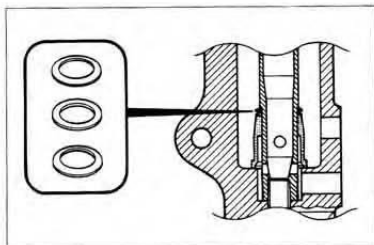
CAUTION:

Use special care to prevent damage to the teflon coated surface of the Anti-friction metal when mounting it.



OIL LOCK PIECE

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



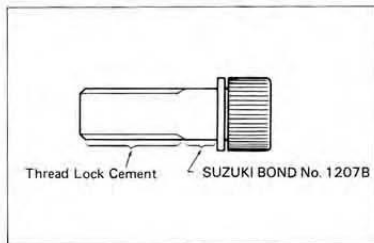
DAMPER ROD BOLT

Apply Suzuki Bond No. 1207B and Thread Lock cement to the damper rod bolt and tighten with specified torque.

99104-31140	Suzuki Bond 1207B
99000-32040	Thread Lock Cement

09940-34520	"T" handle
09940-34561	Attachment "D"

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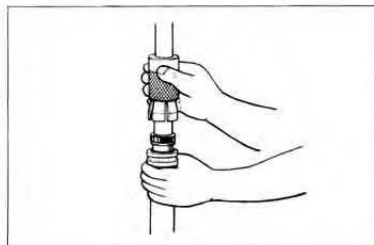


OUTER TUBE METAL, WASHER AND OIL SEAL

Install outer tube metal, washer and oil seal by using special tool as shown.

CAUTION:

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



09940-50111	Front fork oil seal installer
-------------	-------------------------------

MODULATOR VALVE

Tighten the two bolts with specified torque.

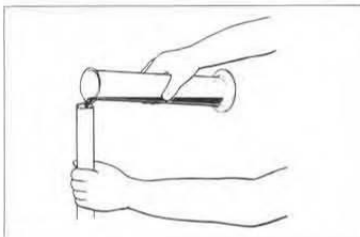
Tightening torque	0.6 – 0.8 kg-m (4.5 – 6.0 lb-ft)
-------------------	-------------------------------------

**FORK OIL**

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

Fork oil	Fork oil # 15
----------	---------------

Capacity	246 ml (8.31 US oz)
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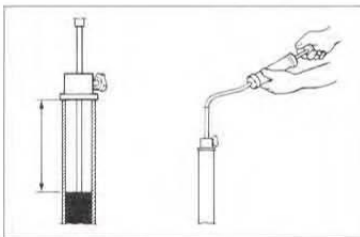
- Hold the front fork vertical and adjust the fork oil level with a special tool.

NOTE:

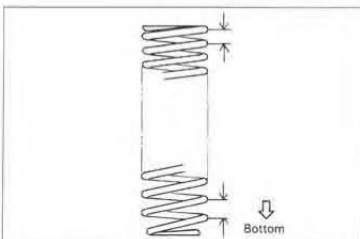
When adjusting oil level, remove the fork spring and compress the inner tube fully.

09943-74111	Fork oil level gauge
-------------	----------------------

Oil level	195 mm (7.7 in)
-----------	-----------------

**FORK SPRING**

Install the fork spring, the large pitch end should position in bottom.



INNER TUBE

- Install the front fork assembly with aligning upper surface ① of the inner tube with the upper surface ② of the steering stem upper bracket.



- Tighten the upper and lower clamp bolts.

Tightening torque	Upper	2.0–3.0 kg-m (14.5–21.5 lb-ft)
	Lower	1.5–2.5 kg-m (11.0–18.0 lb-ft)

AIR JOINT PIPE

Apply Thread Lock "1342" to the air joint pipe bolts, right and left, and tighten to the specified torque.

99000-32050	Thread Lock "1342"
-------------	--------------------

Tightening torque	1.0 – 1.2 kg-m (7.0 – 8.5 lb-ft)
-------------------	-------------------------------------

**DAMPING FORCE AND SPRING SETTING**

Check the damping force adjuster position and spring adjuster setting position.

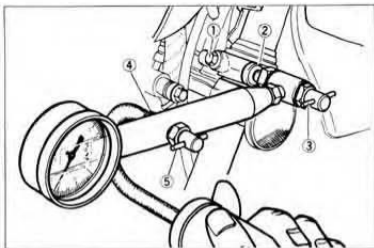
Standard setting	
Damping force	Spring
"2" 2nd position	"1" softest

WARNING:

Set the each damping force adjuster and spring adjuster at same position for both right and left forks.

FORK AIR

- Lift up the front wheel by a jack till it becomes free from the ground, and loosen the air lock screws ①.
- Connect the air pressure gauge to the valve ②, and turn the valve handle ③ clockwise. Connect the hand pump to the valve ④, turn the valve handle ⑤ clockwise, and pump the air. Let the air out by loosening the handle ⑤ till the specified air pressure is left inside, and remove the air pressure gauge.
- Tighten the air lock screws ①.

**CAUTION:**

During the air filling procedure do not exceed more than 2.50 kg/cm² (36 psi) or damage to the seals may result.

S.T.D. Air pressure

0.5 kg/cm²
(7.11 psi)

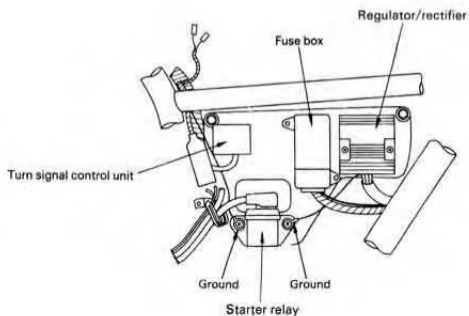
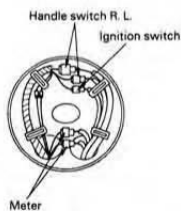
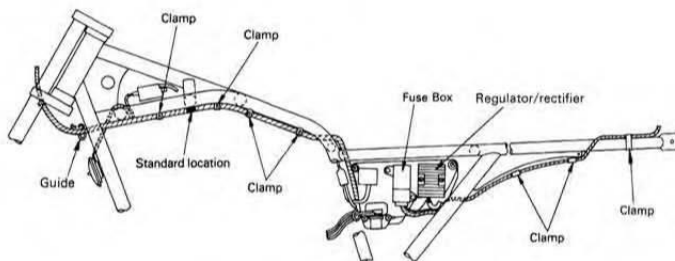
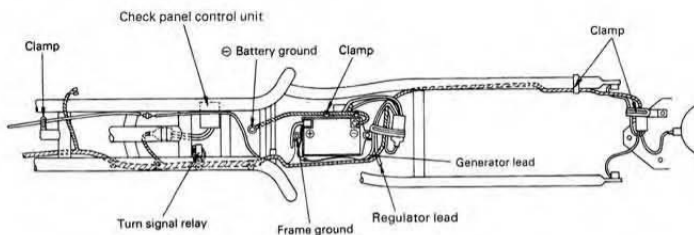
Tightening torque ①

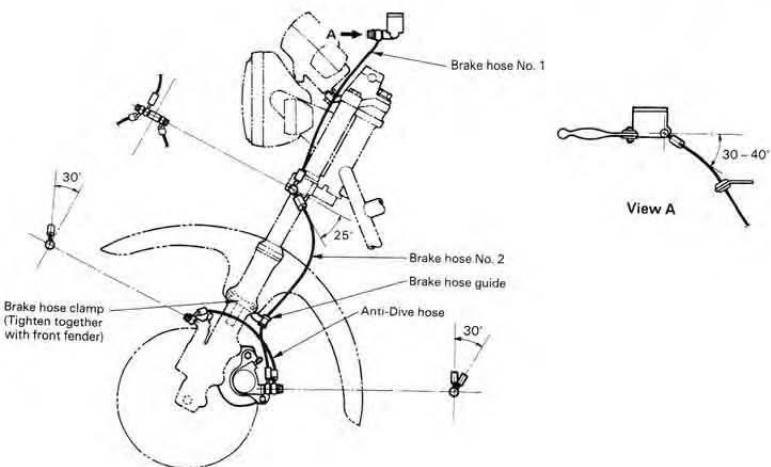
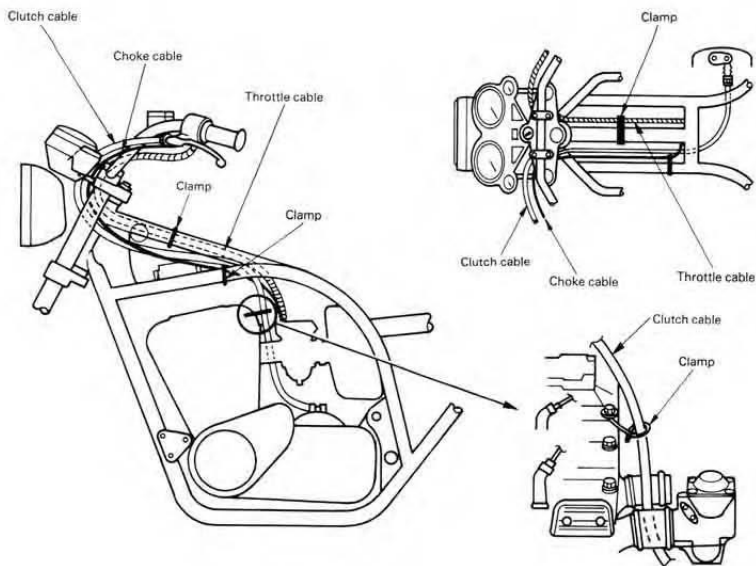
5 kg-cm
(4.3 lb-in)

09940-44110

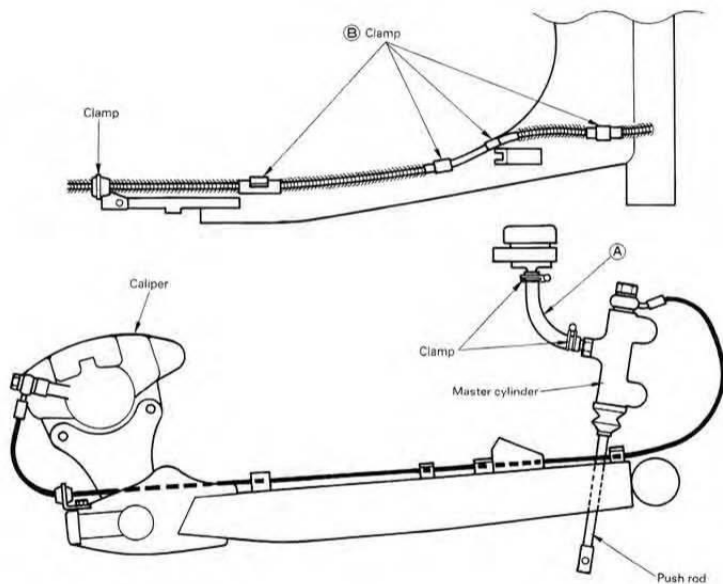
Front fork air
pressure gauge

WIRE AND CABLE ROUTING

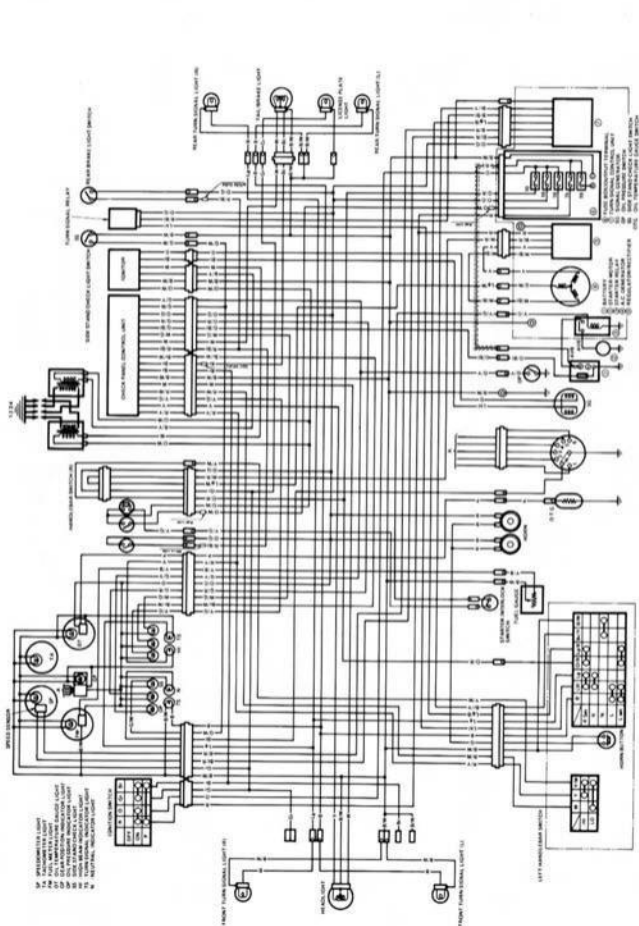




- Ⓐ
1. Turning radius of the brake hose should be more than 30 mm at the center of brake hose.
 2. Hose winding should be less than 15° at the length of 300 mm.
 3. Do not fix the hose to the caliper/master cylinder with the extended condition.
 4. Make sure that no protective part does not contact with the other parts.
- Ⓑ
1. Bend the clamp after routing the hose.



WIRING DIAGRAM



WIRE COLOR

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

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

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

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

GS1100SD ('83-model)

FOREWORD

The GS1100SD was introduced as new model in 1983. Many refinements were incorporated in the new model. This supplementary section has been produced to aid Suzuki mechanics in properly maintaining and repairing the 1983 "D" model.

This section has been written primarily for the experienced Suzuki mechanic but will also be very useful even for the apprentice mechanic and do-it-yourself mechanic. The entire manual should be thoroughly reviewed before any servicing is performed.

Please also refer to the sections 1 through 15 for all other areas of information not covered in this publication.

This section contains up-to-date information at the time of its issue. Latermade modifications and changes will be explained to each Suzuki distributor in respective markets, to whom you are kindly requested to make query about updated information, if any.

IMPORTANT

All street-legal SUZUKI motorcycles with engine displacement of 50 cc or greater are subject to Environmental Protection Agency emission regulations. These regulations set specific standards for emission control, and also set new servicing requirements. This section contains pertinent information that should be carefully studies. Other vital emission information is also contained in this manual and should also be carefully reviewed.

NOTE:

1. How the section is compiled.

- This section lists only the points relating to maintenance work which differ from those applying to the GS1000SZ model.
- However, in order to make this section easier to use some parts have the same information as provided in the sections 1 through 15.
- Any differences in service data, service specifications and tightening torque tables with those that apply to the GS1100SD model is clearly indicated with an asterisk (*).

2. How to use the section.

- Give precedence to this section when using it as the service manual for the GS1100SD model.
- Refer to the sections 1 through 15 for details which are not given in this section.

VIEW OF SUZUKI GS1100SD



GS1100SD

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SPECIAL MATERIALS	16-13
MODIFICATIONS	16-14
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WIRING DIAGRAM	16-21
CABLE, HARNESS AND HOSE ROUTING	16-22

SPECIFICATIONS

DIMENSION AND WEIGHT

Overall length	2 260 mm (89.0 in)
Overall width	715 mm (28.1 in)
Overall height	1 205 mm (47.4 in)
Wheelbase	1 520 mm (59.8 in)
Ground clearance	175 mm (6.9 in)
Seat height.....	775 mm (30.5 in)
Dry mass	232 kg (511 lbs)

ENGINE

Type	Four-stroke, air-cooled, DOHC
Number of cylinders	4
Bore	*72.0 mm (2.835 in)
Stroke.....	66.0 mm (2.598 in)
Piston displacement.....	*1074 cm ³ (65.5 cu. in)
Compression ratio	9.5 : 1
Carburetor.....	MIKUNI BS34SS, four
Air cleaner.....	*Dual element (Paper and Polyurethane)
Starter system	Electric
Lubrication system	Wet sump

TRANSMISSION

Clutch.....	Wet multi-plate type
Transmission	5-speed constant mesh
Gearshift pattern	1-down, 4-up
Primary reduction	1.775 (87/49)
Final reduction	2.800 (42/15)
Gear ratios, Low.....	2.500 (35/14)
2nd	1.777 (32/18)
3rd.....	1.380 (29/21)
4th.....	1.125 (27/24)
Top	0.961 (25/26)
Drive chain.....	DAIDO D.I.D. 630YL or TAKASAGO RK630GSV, 96 links

CHASSIS

Front suspension	Telescopic, oil dampened, spring 4-way adjustable with ANTI-DIVE
Rear suspension	Swinging arm, oil dampened, damper 4-way/spring 5-way adjustable
Steering angle	30° (right & left)
Caster	61° 50'
Trail	118 mm (4.65 in)
Turning radius	3.5 m (11.5 ft)
Front brake	Disc brake, twin
Rear brake	Disc brake
Front tire size	3.50V19 4PR
Rear tire size	4.50V17 4PR
Front fork stroke	150 mm (5.91 in)
Rear wheel travel	109 mm (4.29 in)

ELECTRICAL

Ignition type	Transistorized
Ignition timing	12° B.T.D.C. below 1500 r/min and 32° B.T.D.C. above 2350 r/min
Spark plug	NGK D8EA or NIPPON DENSO X24ES-U
Battery	12V 50.4 kC (14 Ah)/10HR
Generator	Three-phase A.C. generator
Fuse	10/10/10/10/15A

CAPACITIES

Fuel tank including reserve	22 L (5.8 US/gal)
reserve	5.0 L (5.3 US/qt)
Engine oil	3.2 L (3.4 US/qt)
Front fork oil	227 ml (7.67 US/oz)

These specifications are subject to change without notice.

SERVICE DATA

VALVE+GUIDE

Unit: mm (in)

ITEM	STANDARD		LIMIT
Valve diam.	IN.	27.0 (1.06)	—
	EX.	23.0 (0.91)	—
Valve lift	IN.	* 7.5 (0.30)	—
	EX.	7.0 (0.28)	—
Valve clearance (when cold)	IN. & EX.	0.07–0.12 (0.003–0.005)	—
Valve guide to valve stem clearance	IN.	0.025–0.052 (0.0010–0.0020)	0.35 (0.014)
	EX.	0.040–0.067 (0.0016–0.0026)	0.35 (0.014)
Valve guide I.D.	IN. & EX.	5.500–5.512 (0.2165–0.2170)	—
Valve stem O.D.	IN.	5.460–5.475 (0.2150–0.2156)	—
	EX.	5.445–5.460 (0.2144–0.2150)	—
Valve stem runout	IN. & EX.	—	0.05 (0.002)
Valve head thickness	IN. & EX.	—	0.5 (0.02)
Valve stem end length	IN. & EX.	—	3.6 (0.14)
Valve seat width	IN. & EX.	0.9–1.1 (0.035–0.043)	—
Valve head radial runout	IN. & EX.	—	0.03 (0.001)
Valve spring free length (IN. & EX.)	INNER	—	31.9 (1.26)
	OUTER	—	35.6 (1.40)
Valve spring tension (IN. & EX.)	INNER	4.4–6.4 kg (9.7–14.1 lbs) at length 28.5 mm (1.12 in)*	—
	OUTER	6.5–8.9 kg (14.3–19.6 lbs) at length 32.0 mm (1.26 in)	—

* Asterisk indicates the new GS1100SD specification.

CAMSHAFT + CYLINDER HEAD

Unit: mm (in)

ITEM		STANDARD	LIMIT
Cam height	IN.	*34.940—34.980 (1.3756—1.3772)	*34.640 (1.3638)
	EX.	*34.650—34.690 (1.3642—1.3657)	*34.350 (1.3524)
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		—	157.80 (6.213)
Cam chain pin (at arrow "3")		20 th pin	—
Rocker arm I.D.	IN. & EX.	12.000—12.018 (0.4724—0.4731)	—
Rocker arm shaft O.D.	IN. & EX.	11.973—11.984 (0.4714—0.4718)	—
Cylinder head distortion		—	0.2 (0.008)

CYLINDER + PISTON + PISTON RING

Unit: mm (in)

ITEM		STANDARD	LIMIT
Compression pressure		11—14 kg/cm ² (156—200 psi)	9 kg/cm ² (128 psi)
Compression pressure difference		—	2 kg/cm ² (28 psi)
Piston to cylinder clearance		0.050—0.060 (0.0020—0.0024)	0.120 (0.0047)
Cylinder bore		*72.000—72.015 (2.8346—2.8352)	*72.080 (2.8378)
Piston diam.		*71.945—71.960 (2.8325—2.8331) Measure at 15.0 (0.59) from the skirt end.	*71.880 (2.8299)
Cylinder distortion		—	0.2 (0.008)

* Asterisk indicates the new GS1100SD specification.

Unit: mm (in)

ITEM	STANDARD			LIMIT
Piston ring free end gap	1st	N	Approx. *9.5 (0.37)	*7.6 (0.30)
	2nd	N	Approx. *11.0 (0.43)	*8.8 (0.35)
Piston ring end gap	1st		*0.10–0.30 (0.004–0.012)	0.7 (0.03)
	2nd		0.10–0.30 (0.004–0.012)	0.7 (0.03)
Piston ring to groove clearance	1st		—	0.180 (0.0071)
	2nd		—	0.150 (0.0059)
Piston ring groove width	1st		1.01–1.03 (0.040–0.041)	—
	2nd		1.21–1.23 (0.047–0.048)	—
	Oil		2.51–2.53 (0.099–0.100)	—
Piston ring thickness	1st		0.975–0.990 (0.0384–0.0390)	—
	2nd		1.170–1.190 (0.0461–0.0469)	—
Piston pin bore			18.001–18.006 (0.7087–0.7089)	18.030 (0.7098)
Piston pin O.D.			17.996–18.000 (0.7085–0.7086)	17.980 (0.7079)

* Asterisk indicates the new GS1100SD specification.

CONROD + CRANKSHAFT

Unit: mm (in)

ITEM	STANDARD	LIMIT
Conrod small end I.D.	18.006–18.014 (0.7089–0.7092)	18.040 (0.7102)
Conrod deflection	—	3.0 (0.12)
Conrod big end side clearance	0.10–0.65 (0.004–0.026)	1.00 (0.039)
Crankshaft runout	—	0.1 (0.004)

OIL PUMP

ITEM	STANDARD	LIMIT
Oil pump reduction ratio	1.723 (87/49 x 33/34)	—
Oil pressure (at 60°C, 140°F)	Above 0.1 kg/cm ² (1.42 psi) Below 0.5 kg/cm ² (7.11 psi) at 3000 r/min.	—

CLUTCH

Unit: mm (in)

ITEM	STANDARD	LIMIT
Clutch cable play	2–3 (0.08–0.12)	—
Drive plate thickness	*2.15–2.35 (0.085–0.093)	*1.85 (0.073)
Drive plate claw width	15.6–15.8 (0.61–0.62)	14.8 (0.58)
Driven plate thickness	2.00 ± 0.06 (0.080 ± 0.002)	—
Driven plate distortion	—	0.1 (0.004)
Clutch spring free length	—	38.5 (1.52)

* Asterisk indicates the new GS1100SD specification.

TRANSMISSION + DRIVE CHAIN

Unit: mm (in) Except ratio

ITEM	STANDARD		LIMIT
Primary reduction ratio	1.775 (87/49)		—
Final reduction ratio	2.800 (42/15)		—
Gear ratios	Low	2.500 (35/14)	—
	2nd	1.777 (32/18)	—
	3rd	1.380 (29/21)	—
	4th	1.125 (27/24)	—
	Top	0.961 (25/26)	—
Shift fork to groove clearance	0.40—0.60 (0.016—0.024)		0.80 (0.031)
Shift fork groove width	5.45—5.55 (0.215—0.219)		—
Shift fork thickness	4.95—5.05 (0.195—0.199)		—
Counter shaft length (Low to 2nd)	111.4—111.5 (4.386—4.390)		—
Drive chain	Type	D.I.D.: 630 YL TAKASAGO: RK630GSV	—
	Links	96	—
	20 pitch length	—	383.0 (15.08)
Drive chain slack	20—30 (0.8—1.2)		—

CARBURETOR

ITEM	SPECIFICATION
Carburetor type	MIKUNI BS34SS
Bore size	34 mm (1.3 in)
I.D. No.	*49350
Idle r/min.	1 050 $\pm$ 50 r/min.
Fuel level	5.0 $\pm$ 0.5 mm (0.20 $\pm$ 0.02 in)
Float height	22.4 $\pm$ 1.0 mm (0.88 $\pm$ 0.04 in)
Main jet (M.J.)	* # 112.5
Main air jet (M.A.J.)	1.2 mm (0.05 in)
Jet needle (J.N.)	5D58
Needle jet (N.J.)	X -
Pilot jet (P.J.)	# 45
By pass (B.P.)	0.8, 0.8, 0.8 mm (0.03 in)
Pilot outlet (P.O.)	*1.0
Valve seat (V.S.)	2.0
Starter jet (G.S.)	# 32.5
Pilot screw (P.S.)	PRE-SET
Pilot air jet (P.A.J.)	# 160
Throttle cable play	0.5 - 1.0 mm (0.02 - 0.04 in)
Choke cable play	0.5 - 1.0 mm (0.02 - 0.04 in)

* Asterisk indicates the new GS1100SD specification.

ELECTRICAL

Unit: mm (in)

ITEM	SPECIFICATION			NOTE
Ignition timing	12 ° B.T.D.C. Below 1500 ± 150 r/min and 32 ° B.T.D.C. Above 2350 ± 150 r/min.			
Firing order	1, 2, 4, 3			
Spark plug	Type	NGK: D8EA N.D.: X24ES-U		
	Gap	0.6–0.7 (0.024–0.028)		
Spark performance	Over 8 (0.3) at 1 atm.			
Signal coil resistance	290–360 Ω			BI-G
Ignition coil resistance	Primary	O/W–W or B/Y 3–5 Ω		
	Secondary	Plug cap — Plug cap 31–33 k Ω		
Generator no-load voltage	More than 80 V (AC) at 5000 r/min.			
Regulated voltage	14.0–15.5 V at 5000 r/min.			
Starter motor	Brush length	N. D.	Limit: ($\frac{9}{0.4}$)	
	Commutator under cut		Limit: ($\frac{0.2}{0.008}$)	
Starter relay resistance	3–4 Ω			
Battery	Type designation	YB14L-A2		
	Capacity	12V50.4kC(14Ah)/10HR		
	Standard electrolyte S. G.	1.28 at 20° C (68° F)		
Fuse size	Headlight	10	A	
	Signal	10	A	
	Ignition	10	A	
	Main	15	A	
	Output terminal	10	A	

BRAKE + WHEEL

Unit: mm (in)

ITEM	STANDARD		LIMIT
Rear brake pedal height	55 (2.2)		—
Brake disc thickness	Front	5.0 ± 0.2 (0.20 ± 0.008)	4.5 (0.18)
	Rear	6.7 ± 0.2 (0.26 ± 0.008)	6.0 (0.24)
Brake disc runout	—		0.30 (0.012)
Master cylinder bore	Front	15.870—15.913 (0.6248—0.6265)	—
	Rear	14.000—14.043 (0.5512—0.5529)	—
Master cylinder piston diam.	Front	15.811—15.838 (0.6225—0.6235)	—
	Rear	13.957—13.984 (0.5495—0.5506)	—
Brake caliper cylinder bore	Front	38.180—38.219 (1.5031—1.5047)	—
	Rear	38.180—38.256 (1.5031—1.5061)	—
Brake caliper piston diam.	Front	38.025—38.050 (1.4970—1.4980)	—
	Rear	38.098—38.148 (1.4999—1.5019)	—
Wheel rim runout	Axial	—	2.0 (0.08)
	Radial	—	2.0 (0.08)
Wheel axle runout	Front	—	0.25 (0.01)
	Rear	—	0.25 (0.01)
Tire size	Front	3.50V19 4PR	—
	Rear	4.50V17 4PR	—
Tire tread depth	Front	—	1.6 (0.06)
	Rear	—	2.0 (0.08)

SUSPENSION

Unit: mm (in)

ITEM	STANDARD	LIMIT	NOTE
Front fork stroke	150 (5.9)	—	
Front fork spring free length	—	*471 (18.5)	
Front fork oil level	221 (8.7)	—	
Rear wheel travel	109 (4.29)	—	
Swing arm pivot shaft runout	—	0.3 (0.012)	

FUEL + OIL

ITEM	SPECIFICATION	NOTE
	Use only unleaded or low-lead type gasoline of at least 85-95 pump octane ($\frac{B+M}{2}$ method) or 89 octane or higher rated by the Research method.	
Fuel tank including reserve	22 L (5.8/4.8 US/lmp gal)	
reserve	5.0 L (5.3/4.4 US/lmp qt)	
Engine oil type	SAE 10W/40, API SE or SF	
Engine oil capacity	Change 3200 ml (3.4/2.8 US/lmp qt)	
	Filter change 3600 ml (3.8/3.2 US/lmp qt)	
	Overhaul 4000 ml (4.2/3.5 US/lmp qt)	
Front fork oil type	Fork oil # 15	
Front fork oil capacity (each leg)	227 ml (7.67/7.99 US/lmp oz)	
Brake fluid type	DOT3 or DOT4	

* Asterisk indicates the new GS1100SD specification.

TIRE PRESSURE

COLD INFLATION TIRE PRESSURE	NORMAL RIDING						CONTINUOUS HIGH SPEED RIDING					
	SOLO RIDING			DUAL RIDING			SOLO RIDING			DUAL RIDING		
	kPa	kg/cm ²	psi	kPa	kg/cm ²	psi	kPa	kg/cm ²	psi	kPa	kg/cm ²	psi
FRONT	175	1.75	24	200	2.00	28	*225	*2.25	*32	225	2.25	32
REAR	200	2.00	28	250	2.50	36	250	2.50	36	*290	*2.90	*42

WATTAGE

Unit: W

ITEM		SPECIFICATION
Headlight	Hi	60
	LO	55
Tail/Brake light		8/23
License light		8
Turn signal light		23
Combination meter light		3.4
Turn signal indicator light		3.4
High beam indicator light		3.4
Neutral indicator light		3.4
Oil pressure indicator light		3.4
Side stand check light		*3.4

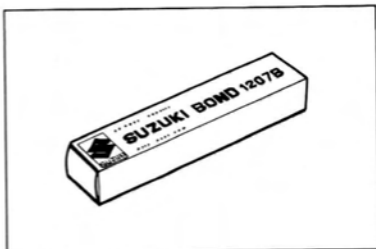
* Asterisk indicates the new GS1100SD specification.

SPECIAL MATERIALS

SUZUKI BOND No. 1207B

As the engine has been painted black, the bonding agent should be changed accordingly. That is, Bond No. 1207B (P/No. 99104-31140) which is black should be used instead of Bond No. 1215 (P/No. 99104-31110) which has hitherto been used.

Bond No. 1207B is silicone-based type of bonding agent. The heat resistance of Bond No. 1207B is approximately 250°C. The hardening time of Bond No. 1207B is approximately 7 minutes. Therefore, the upper and lower crankcases should be mated within several minutes after application of this new type of bonding agent.



Necessary part

- Cylinder head cover gasket
- Mating surface of upper and lower crankcase
- Mating surface of crankcase and clutch cover, generator cover
- Front fork damper rod bolt
- Cylinder stud bolts

THREAD LOCK SUPER 1363A

The locking agent used for the generator rotor nuts should be changed from Thread Lock Super 1332B (P/No. 99104 - 32090) to Thread Lock Super 1303 (P/No. 99000-32030) which has a stronger locking force than the 1332B does.

NOTE:

Apply Thread Lock Super 1303 to the generator rotor bolts and nuts of all models of the GS Series.



Necessary part

- Generator rotor nut

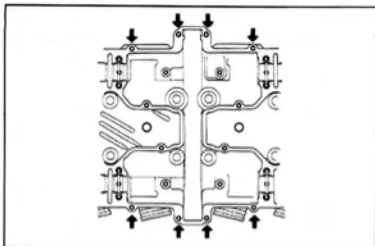
RETURNING TORQUE

1332B	150 - 250 %
1303	250 - 350 %

MODIFICATIONS

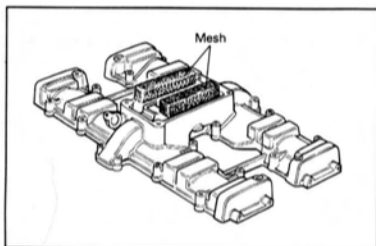
1. CYLINDER HEAD COVER

The cylinder head cover and cylinder head have been modified, and the number of the securing-bolts has been increased by 4 so that the head cover is fixed more securely.



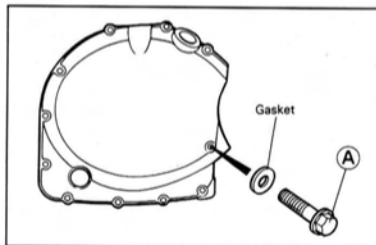
2. OIL SEPARATOR MESH

Iron wire meshes have been added to the two pockets of the cylinder head cover so that the oil component of the oil/air vapour in the crankcase is separated and returned to the crankcase.



3. CLUTCH COVER SCREW GASKET

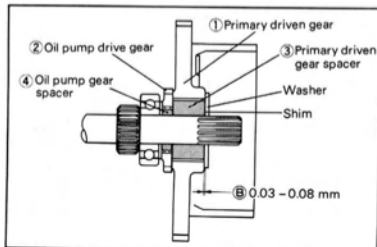
A gasket has been added to the clutch cover securing-bolt (A).



4. PRIMARY DRIVEN GEAR SPACER AND SHIM

A primary driven gear spacer shim has been added and consequently the primary driven gear spacer has become shorter.

As shown in the illustration, put the oil pump drive gear, its spacer, primary driven gear, and its spacer and washer on a flat surface plate. Select an appropriate shim referring to the shim size chart, measure the clearance (B) between the primary driven gear and the washer, and check that the clearance is 0.03 – 0.08 mm.



Standard thrust clearance

0.03 – 0.08 mm
(0.0012 – 0.0031 in)

When any one of the parts shown in the previous illustration ① - ④ is replaced, be sure to adjust and check the shim to confirm that the clearance is normal.

Shim size chart

P/No.	Thickness
21262 - 09300	1.05 mm
21263 - 09300	1.10 mm
21264 - 09300	1.15 mm
21265 - 09300	1.20 mm

5. CLUTCH PLATES

The number of the clutch drive plates and driven plates have been increased to increase the clutch capacity.

To facilitate the above, the drive plate thickness also has been changed.

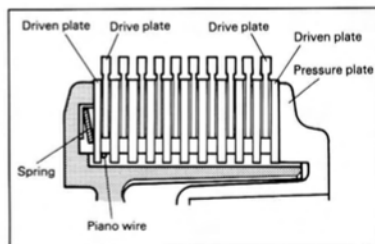
	Number of Plates	
	early	late
Drive plate (Cork)	9	10
Driven plate (Iron)	9	11

Drive plate thickness service limit	early	late
	2.6 mm	1.85 mm

As shown in the illustration, assemble the parts in the due order of the driven plate and drive plate. Finally, install the driven plate and then install the pressure plate.

NOTE:

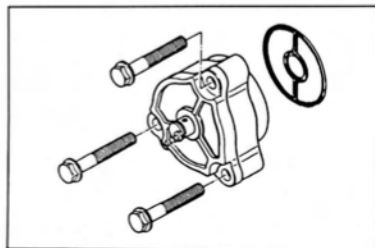
The clutch spring is made of a premium-quality material for long durability. To discriminate it from those used for other models, it is identified with white paint.



6. OIL PUMP

The mounting method of the oil pump has been changed from with three screws to with three bolts. The tightening torque of the bolts is as follows:

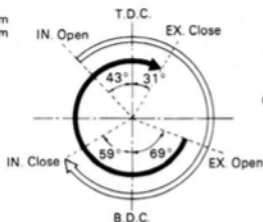
Tightening torque	0.7 - 0.9 kg-m (5.0 - 6.5 lb-ft)
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7. CAMSHAFT AND VALVE TIMING

The GS1100SD employs the new camshaft. Its specifications are as follows.

Valve lift
IN: 7.5 mm
EX: 7.0 mm

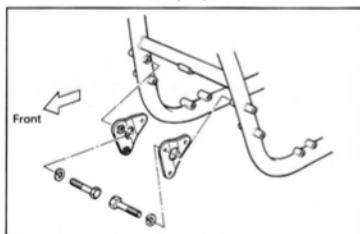


Cam height
IN: 34.940 – 34.980 mm
EX: 34.650 – 34.690 mm

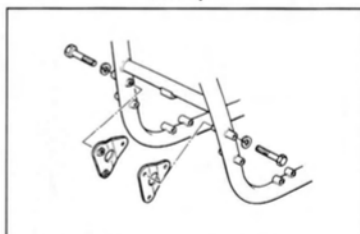
8. ENGINE MOUNTING

Engine mounting bolts were tightened from inside for Z-model, and these are changed as following illustration.

early style

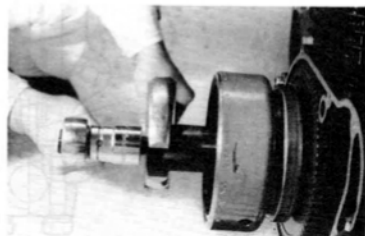


late style



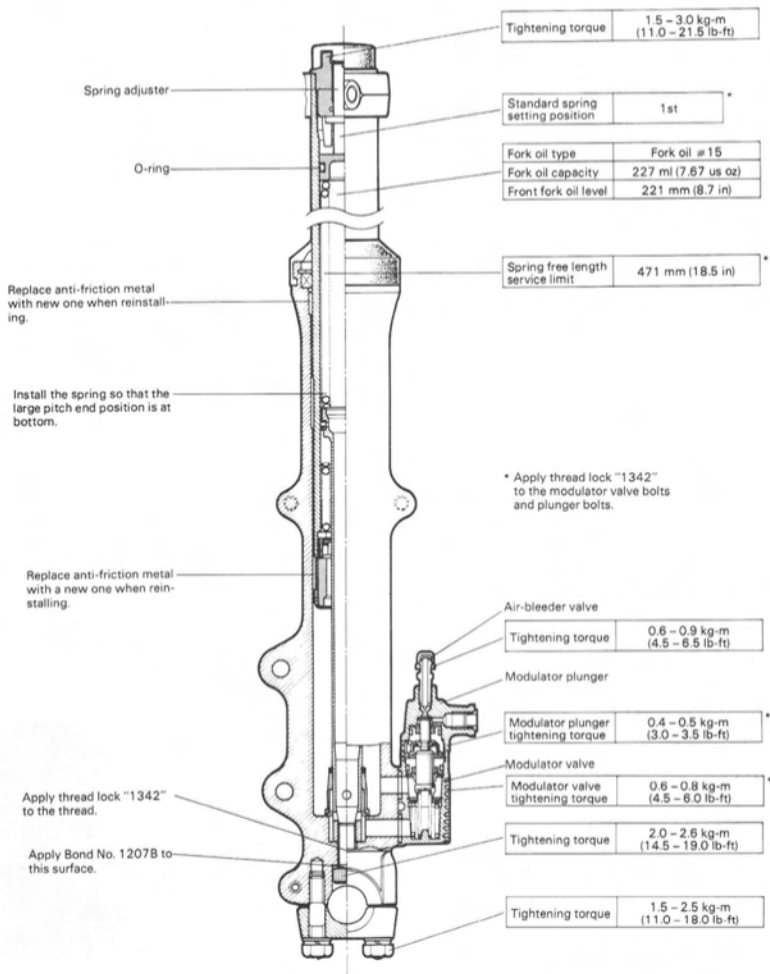
9. ROTOR REMOVER

When removing the generator rotor from the crankshaft, use the special tool (P/No. 09930-34930). This tool is also applicable to the models GS1100ED/ESD.



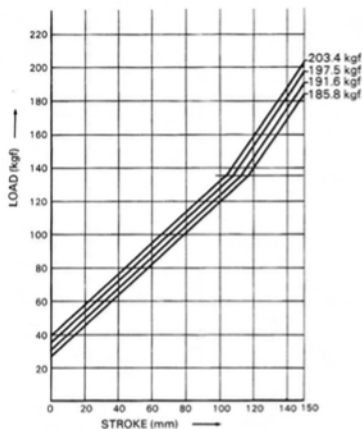
FRONT FORK AND REAR SHOCK ABSORBER

Front fork and rear shock absorber have been changed to improve riding comfort.

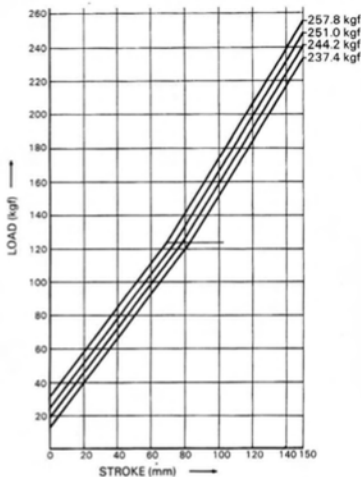


FRONT FORK SPRING CHARACTERISTICS

GS1100SD

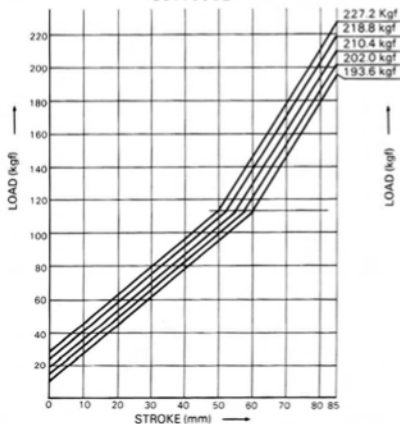


GS1000SZ

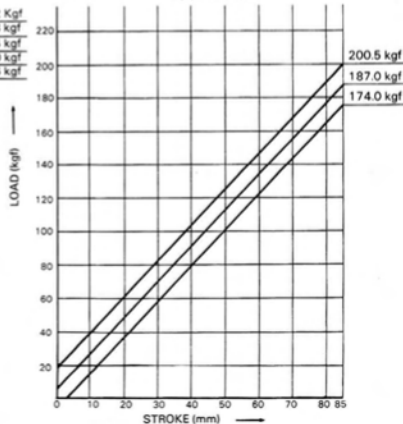


REAR SHOCK ABSORBER SPRING CHARACTERISTICS

GS1100SD



GS1000SZ



TORQUE TABLE

ENGINE

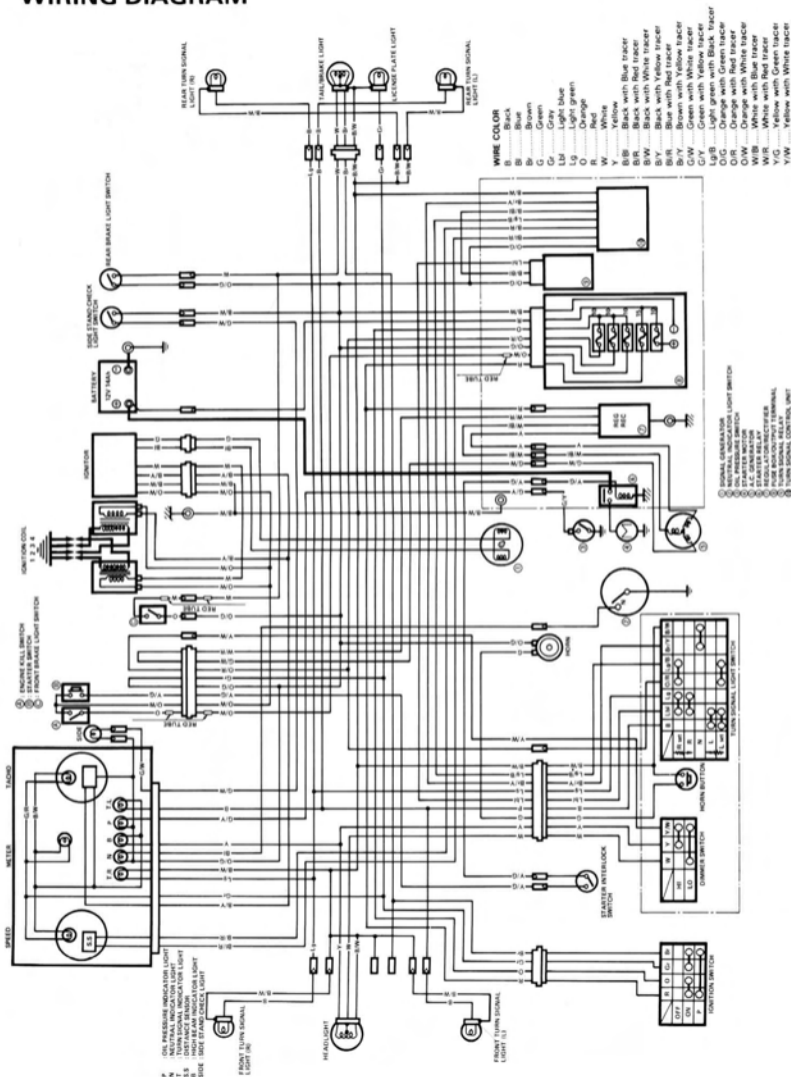
Item	lb-ft	kg-m
Cylinder head cover bolt	6.5 – 7.0	0.9 – 1.0
Cylinder head bolt	5.0 – 8.0	0.7 – 1.1
Cylinder head nut	25.5 – 29.0	3.5 – 4.0
Rocker arm shaft stopper bolt	6.0 – 7.0	0.8 – 1.0
Valve clearance adjuster lock nut	6.5 – 8.0	0.9 – 1.1
Camshaft cap bolt	6.0 – 8.5	0.8 – 1.2
*Camshaft sprocket bolt	*17.5 – 19.0	*2.4 – 2.6
Cam chain tensioner fitting bolt	4.5 – 6.0	0.6 – 0.8
Cam chain tensioner shaft ass'y	22.5 – 25.5	3.1 – 3.5
Cam chain tensioner adjuster lock shaft nut	6.5 – 10.0	0.9 – 1.4
Cam chain guide bolt	6.5 – 10.0	0.9 – 1.4
*Generator rotor nut	*115.5 – 123.0	*16.0 – 17.0
*Starter clutch allen bolt	*16.5 – 20.0	*2.3 – 2.8
Governor center bolt	9.5 – 16.5	1.3 – 2.3
Crankcase bolt (6 mm)	6.5 – 9.5	0.9 – 1.3
Crankcase bolt (8 mm)	14.5 – 17.5	2.0 – 2.4
Starter motor bolt	3.0 – 5.0	0.4 – 0.7
Oil pan bolt	7.0	1.0
Oil filter cover nut	4.5 – 6.0	0.6 – 0.8
Neutral stopper housing	13.0 – 20.0	1.8 – 2.8
Gearshift arm stopper	11.0 – 16.5	1.5 – 2.3
Clutch sleeve hub nut	36.0 – 50.5	5.0 – 7.0
Clutch spring bolt	8.0 – 9.5	1.1 – 1.3
*Engine sprocket nut	*72.5 – 108.5	*10.0 – 15.0
Engine mounting bolt A upper front (10 mm)	32.5 – 40.0	4.5 – 5.5
Engine mounting bolt B (10 mm)	21.5 – 27.0	3.0 – 3.7
Engine mounting bolt C (8 mm)	14.5 – 21.5	2.0 – 3.0
Gearshift lever bolt	9.5 – 16.5	1.3 – 2.3
Clutch release arm bolt	4.5 – 7.0	0.6 – 1.0

CHASSIS

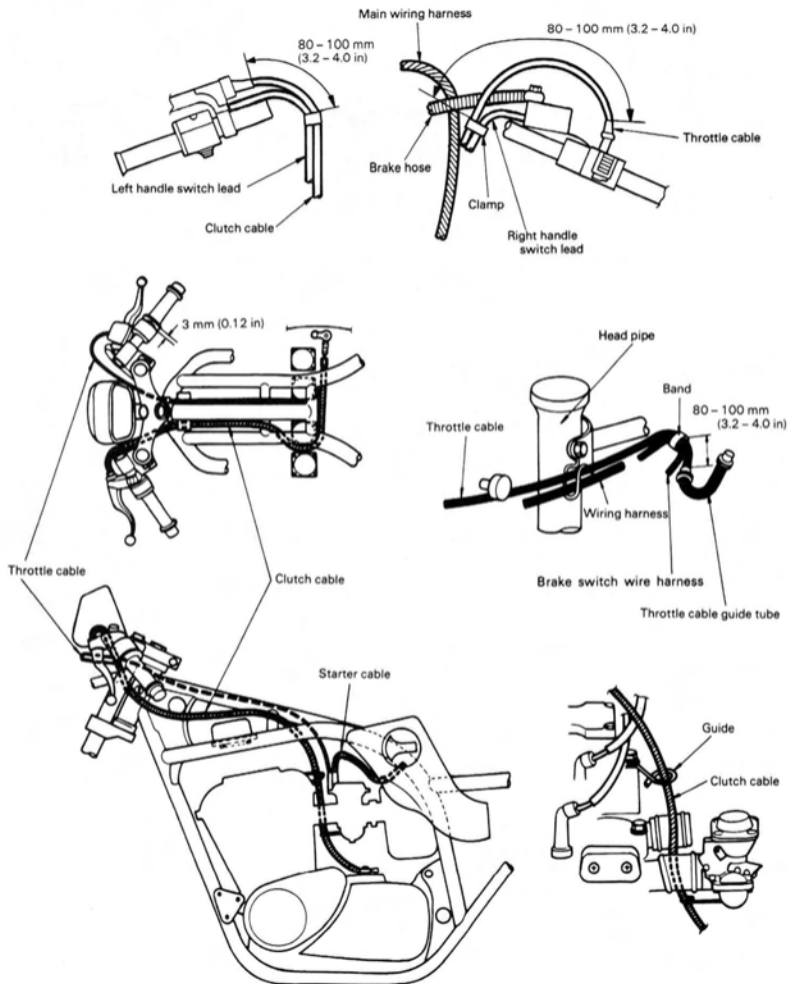
Item	lb-ft	kg-m
Disc bolt	11.0 – 18.0	1.5 – 2.5
Front axle nut	26.0 – 37.0	3.6 – 5.2
*Front axle holder nut	*11.0 – 18.0	*1.5 – 2.5
Front caliper mounting bolt	18.0 – 29.0	2.5 – 4.0
Front caliper axle bolt	11.0 – 14.5	1.5 – 2.0
Brake hose union bolt	14.5 – 18.0	2.0 – 2.5
Caliper air bleeder	4.5 – 6.5	0.6 – 0.9
*Front fork damper rod bolt	*14.5 – 19.0	*2.0 – 2.6
Front fork lower clamp bolt	11.0 – 18.0	1.5 – 2.5
Front upper clamp bolt	14.5 – 21.5	2.0 – 3.0
Front cap bolt	11.0 – 21.5	1.5 – 3.0
*Modulator air bleeder	*4.5 – 6.5	*0.6 – 0.9
*Brake hose union bolt (modulator side)	*14.5 – 18.0	*2.0 – 2.5
*Modulator plunger mounting bolt	*3.0 – 3.5	*0.4 – 0.5
*Modulator valve mounting bolt	*4.5 – 6.0	*0.6 – 0.8
Steering stem nut	29.0 – 36.0	4.0 – 5.0
Steering stem clamp bolt	11.0 – 18.0	1.5 – 2.5
*Steering stem head bolt	*14.5 – 21.5	*2.0 – 3.0
Handlebar clamp bolt	6.0 – 8.5	0.8 – 1.2
Front master cylinder clamp bolt	3.5 – 6.0	0.5 – 0.8
Front footrest bolt	19.5 – 31.0	2.7 – 4.3
Swing arm pivot nut	40.0 – 61.5	5.5 – 8.5
Brake pedal arm bolt	7.0 – 11.0	1.0 – 1.5
Rear master cylinder mounting bolt	11.0 – 18.0	1.5 – 2.5
Rear torque link nut	14.5 – 21.5	2.0 – 3.0
Rear caliper mounting bolt	18.0 – 29.0	2.5 – 4.0
Rear caliper bolt	14.5 – 21.5	2.0 – 3.0
Muffler bracket nut	11.0 – 14.5	1.5 – 2.0
Rear shock absorber fitting bolt or nut	14.5 – 21.5	2.0 – 3.0
Rear footrest bolt	19.5 – 31.0	2.7 – 4.3
Rear sprocket nut	18.0 – 29.0	2.5 – 4.0
Rear axle nut	61.5 – 83.0	8.5 – 11.5
Chain adjuster support bolt	13.0 – 20.0	1.8 – 2.8

* Asterisk indicates new D model specifications:

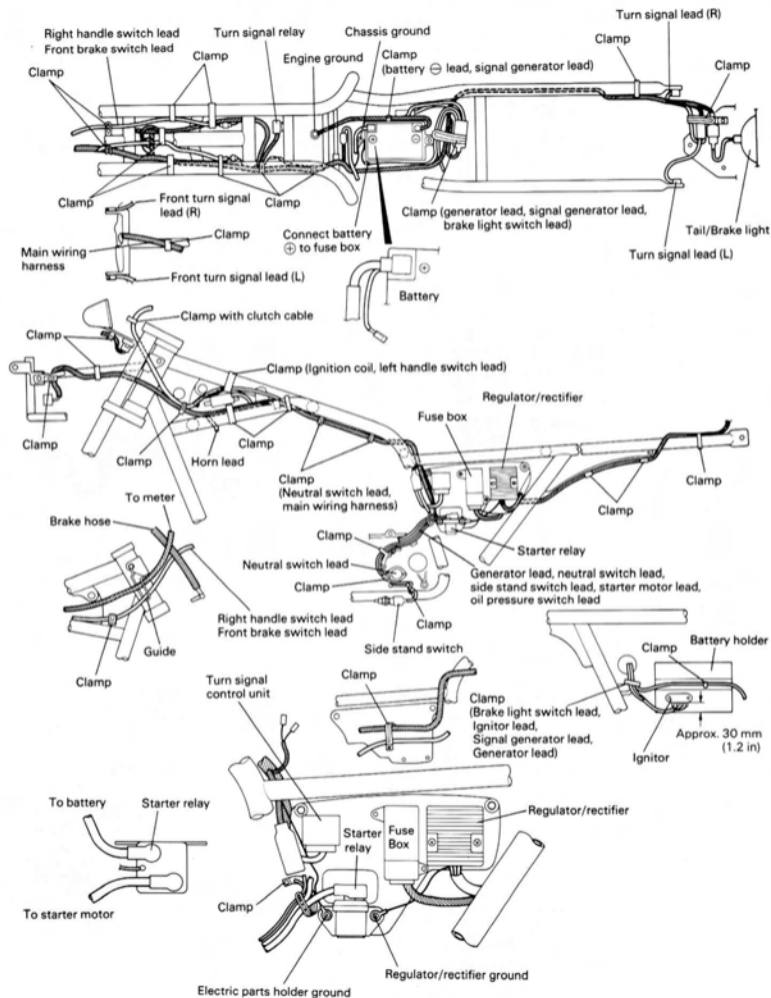
WIRING DIAGRAM

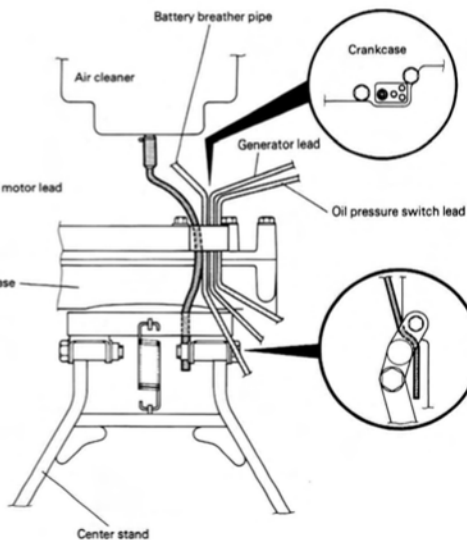
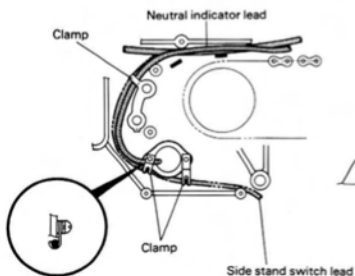
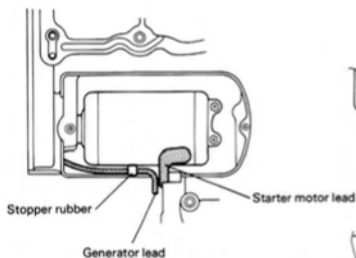
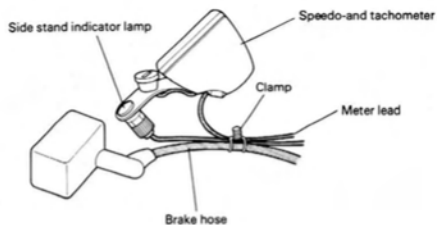


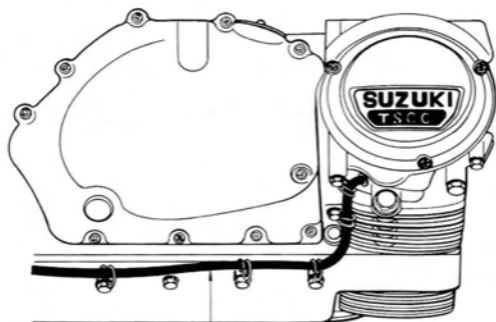
CABLE ROUTING



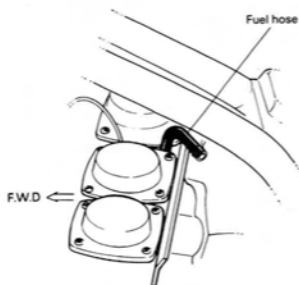
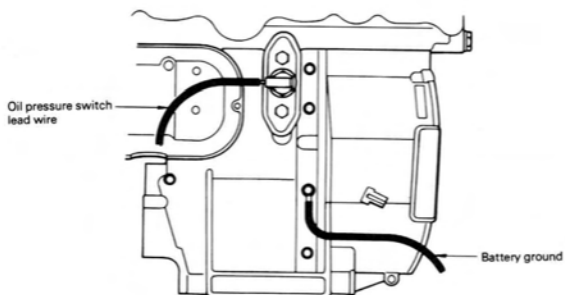
HARNESS ROUTING



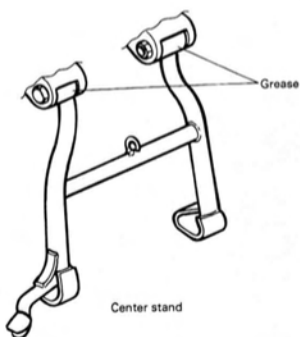
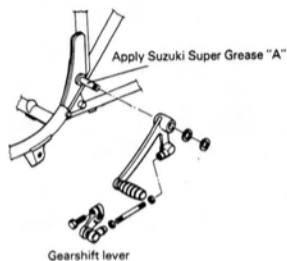
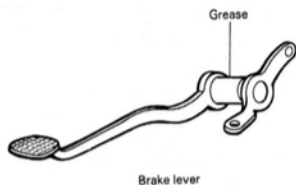




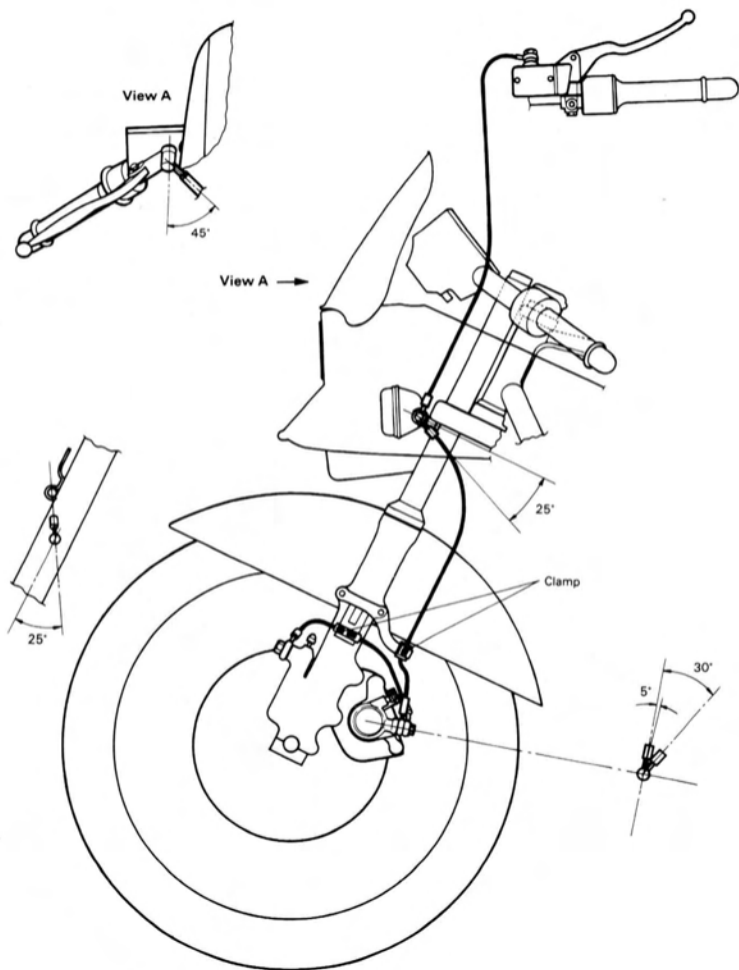
Signal generator lead wire



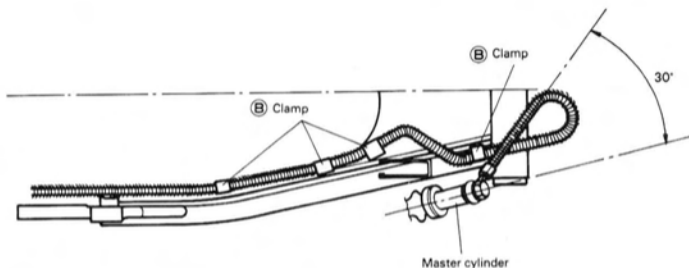
GREASING POINT



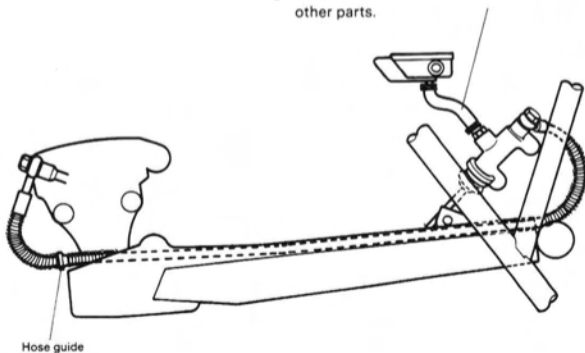
BRAKE HOSE ROUTING



- (A)
1. Turning radius of the brake hose should be more than 30 mm at the center of brake hose.
 2. Hose winding should be less than 15° at the length of 300 mm.
 3. Do not fix the hose to the caliper/master cylinder with the extended condition.
 4. Make sure that no protective part does not contact with the other parts.
- (B) Bend the clamp after routing the hose.



- (A) Keep more than 6 mm clearance between this hose and the other parts.



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SERVICE DATA

4 STROKE

VALVE + GUIDE

Unit: mm (in)

ITEM	STANDARD		LIMIT
Valve diam.	IN.	27 (1.1)	_____
	EX.	23 (0.9)	_____
Valve lift	IN.	7.0 (0.28)	_____
	EX.	7.0 (0.28)	_____
Valve clearance (when cold)	IN. & EX.	0.07—0.12 (0.003—0.005)	_____
Valve guide to valve stem clearance	IN.	0.025—0.052 (0.0010—0.0020)	0.35 (0.014)
	EX.	0.040—0.067 (0.0016—0.0026)	0.35 (0.014)
Valve guide I.D.	IN. & EX.	5.500—5.512 (0.2165—0.2170)	_____
Valve stem O.D.	IN.	5.460—5.475 (0.2150—0.2156)	_____
	EX.	5.445—5.460 (0.2144—0.2150)	_____
Valve stem runout	IN. & EX.	_____	0.05 (0.002)
Valve head thickness	IN. & EX.	_____	0.5 (0.02)
Valve stem end length	IN. & EX.	_____	3.6 (0.14)
Valve seat width	IN. & EX.	0.9—1.1 (0.035—0.043)	_____
Valve head radial runout	IN. & EX.	_____	0.03 (0.001)
Valve spring free length (IN. & EX.)	INNER	_____	31.9 (1.26)
	OUTER	_____	35.6 (1.40)
Valve spring tension (IN. & EX.)	INNER	4.4—6.4 kg (9.7—14.1 lbs) at length 28.5 mm (1.12 in)	_____
	OUTER	6.5—8.9 kg (14.3—19.6 lbs) at length 32.0 mm (1.26 in)	_____

CAMSHAFT + CYLINDER HEAD

Unit: mm (in)

ITEM	STANDARD		LIMIT
Cam height	IN.	34.65–34.69 (1.364–1.366)	34.35 (1.352)
	EX.	34.36–34.40 (1.353–1.355)	34.06 (1.341)
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		—	157.8 (6.21)
Cam chain pin (at arrow "3")		20 th pin	—
Rocker arm I.D.	IN. & EX.	12.000–12.018 (0.4724–0.4731)	—
Rocker arm shaft O.D.	IN. & EX.	11.973–11.984 (0.4714–0.4718)	—
Cylinder head distortion		—	0.2 (0.008)

CYLINDER + PISTON + PISTON RING

Unit: mm (in)

ITEM	STANDARD		LIMIT
Compression pressure	11–15 kg/cm ² (156–213 psi)		9 kg/cm ² (128 psi)
Compression pressure difference	—		2 kg/cm ² (28 psi)
Piston to cylinder clearance	0.050–0.060 (0.0020–0.0024)		0.120 (0.0047)
Cylinder bore	72.000–72.015 (2.8346–2.8352)		72.080 (2.8378)
Piston diam.	71.945–71.960 (2.8325–2.8331) Measure at the 15.0 mm (0.59 in) from piston skirt end		71.880 (2.8299)
Cylinder distortion	—		0.2 (0.008)

Unit: mm (in)

ITEM	STANDARD		LIMIT
Piston ring free end gap	1st	Approx. $\frac{9.5}{(0.37)}$	$\frac{7.6}{(0.30)}$
	2nd	Approx. $\frac{11.0}{(0.43)}$	$\frac{8.8}{(0.35)}$
Piston ring end gap	1st	$\frac{0.10-0.30}{(0.004-0.012)}$	$\frac{0.7}{(0.03)}$
	2nd	$\frac{0.10-0.30}{(0.004-0.012)}$	$\frac{0.7}{(0.03)}$
Piston ring to groove clearance	1st	—	$\frac{0.180}{(0.0071)}$
	2nd	—	$\frac{0.150}{(0.0059)}$
Piston ring groove width	1st	$\frac{1.01-1.03}{(0.040-0.041)}$	—
	2nd	$\frac{1.21-1.23}{(0.047-0.048)}$	—
	Oil	$\frac{2.51-2.53}{(0.099-0.100)}$	—
Piston ring thickness	1st	$\frac{0.975-0.990}{(0.0384-0.0390)}$	—
	2nd	$\frac{1.170-1.190}{(0.0461-0.0469)}$	—
Piston pin bore	$\frac{18.000-18.006}{(0.7087-0.7089)}$		$\frac{18.030}{(0.7098)}$
Piston pin O.D.	$\frac{17.996-18.000}{(0.7085-0.7086)}$		$\frac{17.980}{(0.7079)}$

CRANKSHAFT

Unit: mm (in)

ITEM	STANDARD	LIMIT
Conrod small end I.D.	$\frac{18.006-18.014}{(0.7089-0.7092)}$	$\frac{18.040}{(0.7102)}$
Conrod deflection	—	$\frac{3.0}{(0.12)}$
Conrod big end side clearance	$\frac{0.10-0.65}{(0.004-0.026)}$	$\frac{1.00}{(0.039)}$
Crankshaft runout	—	$\frac{0.10}{(0.004)}$

OIL PUMP

ITEM	STANDARD	LIMIT
Oil pump reduction ratio	1.723 (87/49 x 33/34)	—
Oil pressure (at 60°C, 140°F)	Above 0.2 kg/cm ² (2.84 psi) Below 0.4 kg/cm ² (5.69 psi) at 3 000 r/min	—

CLUTCH

Unit: mm (in)

ITEM	STANDARD	LIMIT
Clutch cable play	2–3 (0.08–0.12)	—
Drive plate thickness	2.15–2.35 (0.085–0.093)	1.85 (0.073)
Drive plate claw width	15.6–15.8 (0.61–0.62)	14.8 (0.58)
Driven plate thickness	2.00 ± 0.06 (0.008 ± 0.002)	—
Driven plate distortion	—	0.1 (0.004)
Clutch spring free length	—	38.5 (1.52)

TRANSMISSION

Unit: mm (in) Except ratio

ITEM	STANDARD		LIMIT
Primary reduction ratio	1.775 (87/49)		—
Final reduction ratio	2.800 (42/15)		—
Gear ratios	Low	2.500 (35/14)	—
	2nd	1.777 (32/18)	—
	3rd	1.380 (29/21)	—
	4th	1.125 (27/24)	—
	Top	0.961 (25/26)	—
Shift fork to groove clearance	0.40–0.60 (0.016–0.024)		0.80 (0.031)
Shift fork groove width	5.45–5.55 (0.215–0.219)		—
Shift fork thickness	4.95–5.05 (0.195–0.199)		—
Counter shaft length (Low to 2nd)	111.4–111.5 (4.386–4.390)		—
Drive chain	Type	DAIDO: D.I.D.: 630YL or TAKASAGO: RK630GSV	
	Links	GS1100E	96 links
		GS1100ES	98 links
	20 pitch length	—	383.6 (15.10)
Drive chain slack	20–30 (0.8–1.2)		—

CARBURETOR

Unit: mm (in)

ITEM	SPECIFICATION
Carburetor type	MIKUNI BS34SS
Bore size	34 (1.34)
I. D. No.	49380
Idle r/min.	1 050 $\pm$ 100 r/min.
Fuel level	5.0 $\pm$ 0.5 mm (0.20 $\pm$ 0.02 in)
Float height	22.4 $\pm$ 1.0 mm (0.88 $\pm$ 0.04 in)
Main jet (M. J.)	# 112.5
Main air jet (M. A. J.)	1.2 (0.05)
Jet needle (J. N.)	5D58
Needle jet (N. J.)	X-1
Pilot jet (P. J.)	# 45
By pass (B. P.)	0.8 (0.03), 0.8 (0.03), 0.8 (0.03)
Pilot outlet (P. O.)	1.0 (0.04)
Valve seat (V. S.)	2.0 (0.08)
Starter jet (G. S.)	# 32.5
Pilot screw (P. S.)	PRE-SET
Pilot air jet (P. A. J.)	# 180
Throttle cable play	0.5—1.0 mm (0.02—0.04 in)

ELECTRICAL

Unit: mm (in)

ITEM	SPECIFICATION		NOTE
Ignition timing	12° B.T.D.C. below 1 500 $\pm$ 150 r/min and 32° B.T.D.C. above 2 350 $\pm$ 150 r/min		
Firing order	1, 2, 4, 3		
Spark plug	Type	NGK: D8EA N.D.: X24ES-U	
	Gap	0.6–0.7 (0.024–0.028)	
Spark performance	Over 8 (0.3) at 1 atm.		
Signal coil resistance	290–360 Ω		BI-G
Ignition coil resistance	Primary	O/W–W or B/Y 3–5 Ω	
	Secondary	Plug cap–Plug cap 31–33 k Ω	
Generator no-load voltage	More than 80 V (AC) at 5 000 r/min.		
Regulated voltage	14.0–15.5 V at 5 000 r/min.		
Starter motor	Brush length	Limit: 9 (0.4)	
	Commutator under cut	Limit: 0.2 (0.008)	
Starter relay resistance	3–4 Ω		
Battery	Type designation	SYB14L-A2	
	Capacity	12V 50.4kC(14Ah)/10HR	
	Standard electrolyte S. G.	1.28 at 20°C (68°F)	
Fuse size	Head	10A	
	Signal	10A	
	Ignition	10A	
	Main	15A	
	Output terminal	10A	

BRAKE + WHEEL

Unit: mm (in)

ITEM	STANDARD		LIMIT
Rear brake pedal height	20 (0.8)		—
Brake disc thickness	Front	5.0 ± 0.2 (0.20 ± 0.008)	4.5 (0.18)
	Rear	6.7 ± 0.2 (0.26 ± 0.008)	6.0 (0.24)
Brake disc runout	—		0.30 (0.012)
Master cylinder bore	Front	15.870—15.913 (0.6248—0.6265)	—
	Rear	14.000—14.043 (0.5512—0.5529)	—
Master cylinder piston diam.	Front	15.811—15.838 (0.6225—0.6235)	—
	Rear	13.957—13.984 (0.5495—0.5506)	—
Brake caliper cylinder bore	Front	38.180—38.219 (1.5031—1.5047)	—
	Rear	38.180—38.256 (1.5031—1.5061)	—
Brake caliper piston diam.	Front	38.025—38.050 (1.4970—1.4980)	—
	Rear	38.098—38.148 (1.4999—1.5019)	—
Wheel rim runout	Axial	—	2.0 (0.08)
	Radial	—	2.0 (0.08)
Wheel axle runout	Front	—	0.25 (0.01)
	Rear	—	0.25 (0.01)
Tire size	Front	3.50V19 4PR	—
	Rear	4.50V17 4PR	—
Tire tread depth	Front	—	1.6 (0.06)
	Rear	—	2.0 (0.08)

SUSPENSION

Unit: mm (in)

ITEM	STANDARD	LIMIT	NOTE
Front fork stroke	160 (6.3)	—	
Front fork spring free length	—	442 (17.4)	GS 1100E
	—	454 (17.9)	GS 1100ES
Front fork oil level	195 (7.7)	—	GS 1100ES
Front fork air pressure	0.5 kg/cm ² (7.11 psi)	—	
Rear wheel travel	108 (4.25)	—	
Swing arm pivot shaft runout	—	0.30 (0.012)	

TIRE PRESSURE

COLD INFLATION TIRE PRESSURE	NORMAL RIDING						CONTINUOUS HIGH SPEED RIDING					
	SOLO RIDING			DUAL RIDING			SOLO RIDING			DUAL RIDING		
	kPa	kg/cm ²	psi	kPa	kg/cm ²	psi	kPa	kg/cm ²	psi	kPa	kg/cm ²	psi
FRONT	175	1.75	24	200	2.00	28	200	2.00	28	225	2.25	32
REAR	200	2.00	28	250	2.50	36	250	2.50	36	290	2.90	42

FUEL + OIL

ITEM	SPECIFICATION	NOTE
Fuel type	Use only unleaded or low-lead type gasoline of at least 85-95 pump octane ($\frac{R+M}{2}$ method) or 89 octane or higher rated by research method.	
Fuel tank including reserve	22 L (5.8 US gal)	
reserve	4.0 L (4.2 US qt)	
Engine oil type	SAE 10W/40	
Engine oil capacity	Change 3200 ml (3.4 US qt)	
	Filter change 3600 ml (3.8 US qt)	
	Overhaul 4000 ml (4.2 US qt)	
Front fork oil type	Fork oil # 15	
Front fork oil capacity (each leg)	246 ml (8.3 US oz)	
Brake fluid type	DOT3 or DOT4	

WATTAGE

Unit: W (cp)

ITEM		SPECIFICATION
Headlight	HI	60
	LO	55
Running/Front turn signal light		8/23 (3/32)
Tail/Brake light		8/23 (3/32)
License light		8 (4)
Rear turn signal light		23 (32)
Speedometer light		3.4
Tachometer light		3.4
Fuelmeter light		2
Oil temperature gauge light		2
CHECK PANEL	Oil	3.4
	Battery	3.4
	Side stand	3.4
	Turn	3.4
	Neutral	3.4
	Head lamp	3.4
	Tail lamp	3.4
	Stop lamp	3.4
	High beam	3.4